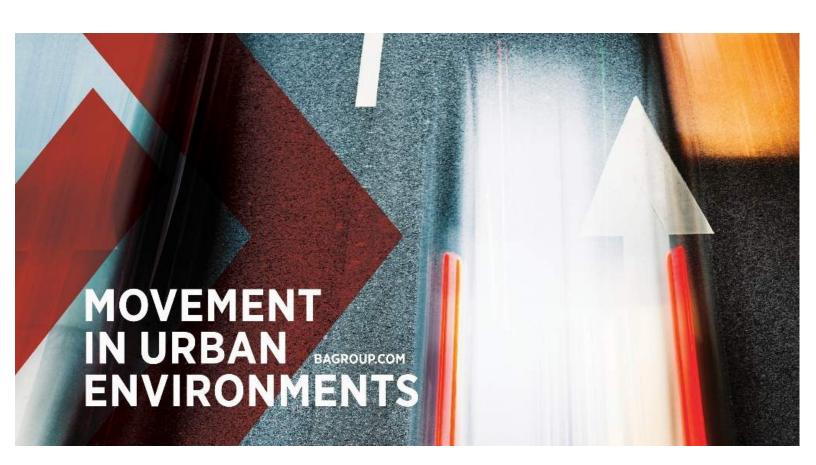


6728 SIXTH LINE - DERRY GREEN PROPOSED INDUSTRIAL DEVELOPMENT

Updated Traffic Impact Study and Parking Justification Milton, Ontario

Prepared For: Anatolia Investments Corp.

December 2023



Responses to Town of Milton and Halton Region Comments – Submission 1

Official Plan Amendment / Zoning By-law Amendment / Draft Plan of Subdivision

Parts of Lots 10, Concession 6, New Survey (Geographic Township of Trafalgar)

6728 Sixth Line, Town of Milton

Responses to June 19, 2023 Town of Milton comments

Development Services – Development Review

Comment 2b: A Peer Review of the Transportation Impact Study will be required. Upon submission of the Draft Plan of Subdivision Application, staff will provide the applicant with an invoice for the peer review.

Response: Noted.

Comment 2c: Confirm if the development will be phased. If so, provide a phasing plan.

Response: From a construction perspective, Phase 1 will be built in 2025 and Phase 2 will be built in 2026. As there is only one year between Phase 1 and Phase 2, the traffic analysis was undertaken for full build-out only.

Comment 2d: Comments have been provided from Halton Region and Town Transportation staff on the location of the Clark Boulevard Extension. The comments should be substantially addressed prior to the submission of the Draft Plan of Subdivision application.

Response: Noted. Comments related to Clark Boulevard are addressed further in this letter.

Comment 2e: Sixth line is identified as a minor arterial road in the Town of Milton Official Plan and a road widening will be required. Additionally, the Derry Green Secondary Plan includes the following policy: A portion of Sixth Line south of Derry Road is within the Regional Storm flood plain associated with the Sixteen Mile Creek and is subject to seasonal flooding. As a result, Sixth Line may have to be diverted in order to move it outside of the Regional Storm flood line. No development shall occur on adjacent lands until flood free access is available and has received all required approvals, including but not limited to the approval of an Environmental Assessment. (Section C.9.4.1.2).

Staff have confirmed with Conservation Halton staff that Building 3 does not have flood free access to 6th line. Flood free access must be provided.

Additional comments on the Sixth Line access, widenings, and road widening will be provided.

Response: Comments related to Sixth Line are addressed further in this letter.

Comment 2f: Further discussions regarding the Clark Boulevard Extension and Sixth Line will be required.

Response: Noted. The developer will participate in discussions with relevant parties, including Region and Town staff, regarding Clark Boulevard and Sixth Line as they pertain to the development.

Infrastructure & Traffic - Development Services

Comment: Please note detailed comments will be provided following the subsequent site plan application(s), and the following will be required:

- Updates to the TIS (if major changes to the site concept are proposed)
- Traffic Signage and Pavement Marking Plan
- AutoTURN / Swept Path analysis.

Response: Updates to the TIS, a Traffic Signage and Pavement marking Plan and the AutoTURN/ Swept Path analysis, have been included in BA Group's Updated December 2023 Traffic Impact Study and Parking Justification.

Comment: Please note that for the swept path analysis, the Town highly recommends one be submitted prior to Site Plan Application, in order to confirm access/site circulation requirements. See below for more detail:

As part of a complete application, it must be ensured that truck traffic (garbage/loading) can enter and exit the site in a forward motion and access to the waste storage and loading areas are functional. On separate plans, illustrate truck turning movements with one continuous path with AutoTURN and insert the design vehicles on the plan. The site must be able to accommodate the largest design vehicles which will be accessing the property. Please also confirm via Auto-Turn (PTAC design vehicle) that ramps and underground parking stalls located near corners / walls and / or at the end of aisles are functional. Please be advised that reversing of vehicles onto/from the road allowance is not permitted. An access will not be granted unless the Owner/Applicant can demonstrate (via AutoTURN sweptpath analysis) that the design vehicles can enter the site in a forward manner, turn around on private property, and exit the site in a forward manner.

Furthermore, the site access(es) must conform to Town of Milton Engineering Standard No. E-43, for heavy industrial land uses.

Response: Noted. The swept path analysis has been undertaken and is included in the appendices of BA Group's Updated December 2023 Traffic Impact Study and Parking Justification.

Comment: Additional comments will be provided on the ultimate right-of-way width requirement for Sixth Line. The Owner will be required to dedicate lands sufficient to provide the required widening.

Response: Comments related to Sixth Line are addressed further in this letter.

Comment: It is noted in the report that the consultant recommends the future intersection of Clark Boulevard with Derry Road be relocated 55-meters east of where it is currently proposed.

It is the Town's opinion that the Clark Boulevard intersection be located as per the Derry Green Secondary Plan. However, please be advised this needs to be further coordinated/discussed with Halton Region.

Response:

Based upon further discussions and justification, the Town is now supportive (see correspondence in **Appendix B** of BA Group's Updated December 2023 Traffic Impact Study and Parking Justification) of the site's proposed location for the intersection of Clark Boulevard at Derry Road that is 55 metres east of the location proposed within the Derry Green Secondary Plan.

Zoning – Development Services

Comment: Note: Any proposed second floor area and mezzanine areas are subject to parking supply requirements.

Response: Parking supply calculations have been updated within BA Group's Updated December 2023 Traffic Impact Study and Parking Justification as per Zoning By-law 016-2014 (HUSP Urban Area – June 2019).

Comment: The proposed factor should be expressed to a whole number of space rather than a fraction of a space (i.e. 1 space / 200 sq. m.) to be consistent with the parking ratio format in the by-law.

Response: BA Group's Updated December 2023 Traffic Impact Study and Parking Justification has been revised to describe the parking as 1 space/ "x" square metres.

Parks and Facility Planning – Community Services

Comment: We appreciate that the Applicant and their consultant team have referenced this future public trail (a label was included on the Composite Plan circulated). As depicted in Schedule C-9-A Derry Green Corporate Business Park Structure Plan, included in By-Law 088- Page 13 2015, connectivity of the trail from Fifth Line comprises three (3) potential links to Sixth Line, including one connection generally depicted in the area of proposed Block 6 (Natural Heritage System, NHS).

Response: Noted.

Comment: The Town standard for the existing trail is as follows: 3.0 m wide asphalt multi-use pathway with lighting, grading to meet AODA compliance, designed for year-round use and connectivity to the overall active transportation network of the adjacent road network, Town parks and open space areas. Tie-ins to a piped storm system and/or minimum 2% overland flow with an outlet for stormwater management (SWM) and electrical servicing to construct the trail to Town standard may be applicable to development applications. Since the MPT is part of an overall network, application submissions are to include contextual design and layout information around the trail; e.g. development plans of adjacent properties, design or asbuilt information of abutting roads etc.

Response: Noted.

Comment a: Proposed locations within the subject lands

Community Services will be carefully reviewing any subsequent drawing and report submissions for the subject property to ensure the Town's ability to design and construct the MPT will not be hindered or negatively impacted by the proposed development. Acknowledgment of the MPT, including information regarding how it is being addressed/considered, should be included in any relevant report submissions; e.g. the updated Constraints & Opportunities Map, the Functional Servicing & Stormwater Management Report (site grading, stormwater design), Planning Justification Report, Urban Design Brief (community plan), Traffic Impact Study and Parking Justification, as well as the forthcoming, detailed subdivision design drawings. Further, subsequent submittals must, where relevant, illustrate the opportunity(ies) that will be available with the proposed development to implement the MPT with the proposed design of the subject blocks; e.g. illustrate the layout(s) of the MPT within Blocks 5 and 6, with consideration for the NHS/stormwater and 'pipeline easement' functions necessary within those blocks. On the current draft plan, Street 1/Clark Blvd is shown solely within the limits of the subject property; however, in order to confirm that connections from the MPT to the easterly and westerly boulevards of Street 1 are feasible (to Town standard), information on the road design extending south into the limits of the gas corridor and the adjacent lands will be needed. Also recognizing that a crossing of Street 1 for trail users may be required by Town Traffic, details regarding the desired location(s) for that crossing should be included.

Response: Noted.

Comment: If the intent is to phase this development, please provide a phasing plan with any subsequent submission for the plan of subdivision or future site plan applications. It will be used for the purposes of informing the required PIL of land conveyance fees, as outlined in the preceding section above. Note if any access routes/roads/SWM ponds are to remain in private ownership, the building phase that is to include construction of the said access routes/roads/SWM ponds is to include these lands.

Response:

From a construction perspective, Phase 1 will be built in 2025 and Phase 2 will be built in 2026.

Responses to June 15, 2023 Town of Milton Development Engineering comments

Comment 1a: Development Engineering will require a 0.3m reserve, the entire width of Clarke Blvd at the south end of the development.

Response: Noted.

Comment 1b: Development Engineering will require a 0.3m reserve, along the frontage of Blocks 1 and 2 on Clarke Blvd and along the frontage of Block 3 on Sixth Line.

Response: Noted.

Comment 1c: Based on the Town of Milton Official Plan a road widening will be requirement along Sixth Line in order to provide a 26.0m road allowance. The applicant is to confirm the widening requirements on the west side of Sixth Line, as the constraints on the east side of the road may require the widening to be entirely (roughly 6m) on the west side, adjacent to Block 3.

Response: The development proposal supports the provision of a minimum right-of-way of 30.0 metres along Sixth Line as per the Secondary Plan and Town Staff comments. The entirety of the widening can be accommodated on the west side of the road.

Comment 1d: Based on the information provided with the submission, the proposed access onto Sixth Line will be used by commercial and large transportation vehicles. An assessment of Sixth Line including, but not limited to, structural integrity, truck turning movements, etc. will be required. Reconstruction, road improvements and urbanization of Sixth Line adjacent to the development will be required. Interim and ultimate conditions are to be considered. Depending on the widening requirements, a modified road cross section may be required.

Response: The truck turning movements included within BA Group's Updated December 2023 Traffic Impact Study and Parking Justification consider the existing (interim) design and conditions on Sixth Line. As the future design of Sixth Line is unknown at this time, truck turning movements were only undertaken for the existing (interim conditions). It is noted that a consultant has been retained to evaluate the structural integrity of Sixth Line. The results of the evaluation will be provided to the Town with the next submission.

Comment 1e: Coordination with the Landowner to the south is required for the construction of Clarke Boulevard, through the Union Gas corridor. The first landowner to construct will be responsible for the construction of this portion of the road to the adjacent land.

Response: Noted.

Comment 1f: Development Engineering requests additional information with regards to the proposed culde-sac shown on the Conceptual Site Plan at the south end of Clark Boulevard.

Response: The Town of Milton Standard has been used to inform the functional design of the proposed culde-sac at the south end of Clark Boulevard.

Comment 1g: Interim conditions may be required for Clark Blvd, depending on adjacent landowner's schedule.

Response: Noted

Comment 1h: Development Engineering defers comments regarding the intersection(s) of Clark Boulevard and Derry Road to the Region of Halton.

Response: Noted.

Comment 1i: Region of Halton to confirm road widening(s) and daylighting requirements along Derry Road and the requirement of a 0.3m reserve block along the Derry Road frontage.

Response: Noted.

Comment 3h: The FSR-SWM Report notes the following:

i. "The EA concluded that the current 2-lane rural cross section ROW is to be widened to an urban 4-lane section within a 37.5 m ROW. This included a proposed realignment of the roadway and

centerline....In terms of profile, the existing road is proposed to be raised between 0.5 m to 1.5 m. It should be noted that Halton Region has indicated that consideration of a future 6 lane configuration of Fifth Line within a future 47.0 m road right-of-way, which is to be considered during the design and development of the Site. Through discussions with the Town, detail design of Fifth Line is anticipated to commence in 2022, with construction anticipated to start by 2024/2025...It is anticipated that Fifth Line reconstruction will be completed prior to the construction of Clark Boulevard, therefore no interim grade transition has been accounted for. This will be re-evaluated at the time of detailed design."

Development Engineering notes that should Fifth Line not be reconstructed prior to the construction of Clark Boulevard that the interim road design drawings will be included at the time of detailed design/engineering submission.

Response: Noted. The proposed development includes protection for a future 47.0 metre right-of-way along Fifth Line in order to accommodate a future potential six-lane Regional Road.

Responses to June 13, 2023 Halton Region comments

Transportation

Comment: Halton Region's Transportation Master Plan – The Road to Change (2011) identified the need for additional roadway network capacity to support new growth in the Town of Halton Hills and Town of Milton. A new 6 lane corridor, known as 5 ½ Line, is shown in the Region's TMP between Fifth Line and Sixth Line and referred to in the policies of the Derry Green Corporate Business Park Secondary Plan (C.9.4.3.1). This corridor will provide additional north-south capacity between Britannia Road and Steeles Avenue, including a proposed interchange with Highway 401. 5 ½ Line is currently programmed by the Region for 2031. In consideration of the Council approved policy framework noted above, and in an effort to ensure the proposed development remains viable, the development proposal must consider that the future north-south roadway (Clark Boulevard) may ultimately be identified as a six-lane Regional Road, requiring a 47 metre right-of-way.

Response: The proposed development includes protection for a future 47.0 metre right-of-way along Clark Boulevard in order to accommodate a future potential six-lane Regional Road (5 ½ Line).

Comment: The development proposes a right-in/right-out (RI/RO) access to Derry Road for Building 3 on the easterly portion of the property (fronting Sixth Line). Per Halton Region's preconsultation comments and TIS Terms of Reference comments, Halton Region Access By-law (NO.32-17). Section 6.1 (a) states that "access to a Regional Road from private property shall be permitted only where such access is necessary because access to a local road is not feasible." It is noted that access to Derry Road could be provided solely via Sixth Line for this property, the site traffic volumes assigned to and from Building 3 do not indicate the need for an additional access to Derry Road, and the site frontage along Derry Road for this portion of the property would not allow for the minimum spacing requirement of 115 metres between the proposed RI/RO access and Sixth Line to be satisfied (per Halton Region's Access Management Guideline). Therefore, Halton Region will not approve the proposed RI/RO access to Derry Road unless the TIS can demonstrate that access to Derry Road is absolutely necessary (i.e. from a traffic operations, safety and circulation perspective).

Halton Region must maintain priority and consideration for access requirements for adjacent properties on both the north and south side of Derry Road in the area, in coordination with the approved Derry Green Secondary Plan intersection locations.

If a RI/RO access to Derry Road is ultimately permitted, the RI/RO restriction must be enforced by a raised centre median on Derry Road (i.e. an extension of the raised intersection centre median at the west leg of Derry Road and Sixth Line) as opposed to the illustrated pork-chop island.

Response:

The previously proposed right-in/right-out along Derry Road has been removed from the development proposal. The revised plans for Building 3 only include a full movement access along Sixth Line.

Comment: Per Halton Region's pre-consultation comments, TIS Terms of Reference comments and subsequent discussions with the project team, the future intersection of Derry Road and Clark Boulevard must be located so that the future Clark Boulevard roadway alignment is in line with the easterly limit of the 11319 Derry Road property on the north side of Derry Road. This would require that the intersection be shifted to the west approximately 55 metres from where currently shown. This shift would meet the intent of the Derry Green Secondary Plan and Halton Region's overall corridor access plan. The TIS provides justification for the proposed intersection location of approximately 55 metres east of the location per the Derry Green Secondary Plan. Given the implications of this intersection location from a Transportation Planning perspective (especially when considering the future potential 5 ½ Line alignment as noted earlier), further review and discussion of the proposed intersection location and supporting justification will be required between the applicant's project team and all necessary stakeholders at Halton Region prior to the formal application submission.

Response: Based upon further discussions and justification, the Town is now supportive (see correspondence in **Appendix B** of BA Group's Updated December 2023 Traffic Impact Study and Parking Justification) of the site's proposed location for the intersection of Clark Boulevard at Derry Road, 55 metres east of the location included within the Derry Green Secondary Plan.

Comment: Include James Snow Parkway in the Existing Area Road Network description (Section 2.1.1).

Response: Noted and updated in BA Group's Updated December 2023 Traffic Impact Study and Parking Justification.

Comment: Update Figure 5 to identify the currently active Britannia Road improvement to a six-lane roadway instead of a four-lane roadway.

Response: Noted and updated in BA Group's Updated December 2023 Traffic Impact Study and Parking Justification.

Comment: Update Figure 9 to illustrate the existing multi-use path on the west side of James Snow Parkway in the study area.

Response: Noted and updated in BA Group's Updated December 2023 Traffic Impact Study and Parking Justification.

Comment: If the proposed development is to be built out in phases, then consider evaluating the horizon year associated with the build-out of each major phase as to quantify impacts associated with interim phases compared to impacts associated with the entire development.

Response: The development will not be phased.

Comment: Reference Halton Region's 2023 Budget and Business Plan as the source for the timing of future Regional roadway improvements under Section 2.1.2.1.

Response: Noted and updated in BA Group's Updated December 2023 Traffic Impact Study and Parking Justification.

Comment: Update the anticipated start year of construction for the future James Snow Parkway widening to six lanes from 2023 to 2026 per Halton Region's 2023 Budget and Business Plan.

Response: Noted and updated in BA Group's Updated December 2023 Traffic Impact Study and Parking Justification.

Comment: Ensure that the latest development concept and trip assignment estimates for the background developments are accounted for under future background conditions.

Response:

This has been included and updated in BA Group's Updated December 2023 Traffic Impact Study and Parking Justification.

Comment: Ensure that background development traffic has not been assigned to "Regional Road to-Regional Road" movements on the road network (e.g. eastbound and westbound through movements on Derry Road at Fifth and Sixth Line, or all intersection movements at Derry Road and James Snow Parkway) when forecasting future background traffic volumes. Per Halton Region's TIS Terms of Reference comments, it can be assumed that the growth rates provided for these Regional corridors includes background development traffic. Thus, this traffic should not be double counted for these movements. Background development traffic must still be assigned to "Regional Road-to-Town Road" movements and vice versa (e.g. eastbound left-turn or southbound right-turn movement at Derry Road and Fifth Line).

Response: Noted.

Comment: Incorporate the following missing analysis components agreed upon during the Terms of Reference consultation:

- A comparison between minimum clear throat length requirements and provided clear throat length availability at the proposed RI/RO access to Derry Road.
- A comparison between minimum corner clearance requirements and provided corner clearance availability on Sixth Line between Derry Road and the proposed full-moves access to Sixth Line.
- A comparison of the trip generation forecasts between the proposed development and the subject property from the Derry Green Secondary Plan Transportation Study.

Response:

The previously proposed right-in/right-out along Derry Road has been removed from the development proposal. The revised plans only include a full movement access along Sixth Line.

A comparison between minimum corner clearance requirements and provided corner clearance availability on Sixth Line between Derry Road and the proposed full-moves access to Sixth Line has been included in BA Group's Updated December 2023 Traffic Impact Study and Parking Justification, in addition to a comparison of the trip generation forecasts between the proposed development and the site from the Derry Green Secondary Plan Transportation Study.

Comment: Provide more details for the proxy sites for the trip generation data to justify how these proxy sites are comparable to the proposed development.

Response:

BA Group's Updated December 2023 Traffic Impact Study and Parking Justification did not adopt proxy rates but used ITE rates (as per the initial report) and adopted ITE rates for heavy vehicle percentages in the updated analysis.

Comment: For consistency with the other traffic studies prepared in the area, consider using data from the Institute of Transportation Engineers (ITE) Trip Generation Manual for the heavy truck trip generation forecasts.

Response: Consideration for using data from the Institute of Transportation Engineers (ITE) Trip Generation Manual for the heavy truck trip generation forecasts has been included in BA Group's Updated December 2023 Traffic Impact Study and Parking Justification.

Comment: Append all supporting trip generation and distribution data to the TIS report.

Response: The Transportation Tomorrow Survey (TTS) data is provided in the appendices of BA Group's Updated December 2023 Traffic Impact Study and Parking Justification. There is no additional background data to include.

Comment: Bold or highlight all critical volume-to-capacity ratios and 95th percentile queue lengths listed in the traffic operations results tables. Critical volume-to-capacity ratios are those which exceed 0.85 for through movements or shared through/turning movements and 0.95 for exclusive turning movements. Critical 95th percentile queue lengths are those which exceed the available turning storage length.

Response: This has been addressed in BA Group's Updated December 2023 Traffic Impact Study and Parking Justification.

Comment: Under the sensitivity analysis section where the acceleration of the future Derry Road widening is discussed, acknowledge:

 the benefit of the Region's long-term plans as identified in the 2011-2031 Transportation Master Plan, namely the future 5 ½ Line corridor to connect Britannia Road and Steeles Avenue to Highway 401 and provide additional roadway network capacity. The exact location and configuration will be confirmed through a future Municipal Class Environmental Assessment 8 (MCEA) Study which has not yet been initiated. However, this future corridor would improve connectivity to and from the study area and thus be expected to alleviate traffic volumes on the existing Derry Road corridor.

• that the Region will monitor the need and timing of all corridor level improvement through future updates to the Transportation Master Plan.

Response: BA Group's Updated December 2023 Traffic Impact Study and Parking Justification includes further information regarding the benefit of the Region's long-term plans as identified in the 2011-2031 Transportation Master Plan, namely the future 5 ½ Line corridor to connect Britannia Road and Steeles Avenue to Highway 401 and provide additional roadway network capacity.

Comment: Halton Region's Transportation Master Plan identified the need to widen Derry Road to six lanes from Tremaine Road to Highway 407. This improvement is currently scheduled to start construction in 2031. A right-of-way dedication will be required from this development. Depending on when the development is finalized, the land dedication will be required to satisfy the greatest dedication of the following listed below. Currently, a Municipal Class Environmental Assessment or Detail Design project has not been initiated. Thus, the Transportation Master Plan Right-of-way requirement currently applies.

Response: Noted.

Comment: Official Plan/Transportation Master Plan Right-of-Way Requirements:

Any lands within 23.5m of the centreline of the original right-of-way of Derry Road (Regional Road 7) that are part of the subject property shall be dedicated to the Regional Municipality of Halton for the purpose of road right-of-way widening and future road improvements.

Response: Noted.

Comment: Municipal Class Environmental Assessment Study/Environmental Study Report (Transportation Planning) Right-of-Way Requirements – Derry Road:

 Any additional lands that are part of the subject property and have been identified as required for the future widening of Derry Road (Regional Road 7) per a Municipal Class Environmental Assessment Study / Environmental Study Report shall be dedicated to the Regional Municipality of Halton for the purpose of road right-of-way widening and future road improvements.

Response: Noted.

Comment: Detail Design Project (Engineering & Construction) Right-of-Way Requirements – Derry Road:

 Any additional lands that are part of the subject property and have been identified as required for the future widening of Derry Road (Regional Road 7) per a Detail Design Project shall be dedicated to the Regional Municipality of Halton for the purpose of road right-of-way widening and future road improvements.

Response: Noted.

Comment: A daylight triangle measuring 15m along Derry Road and 15m along Sixth Line shall be dedicated to the Regional Municipality of Halton for the purpose of road right-of-way widening and future road improvements.

Response: Noted.

Comment: A daylight triangle measuring 15m along Derry Road and 15m along the future north-south collector roadway (Clark Boulevard) shall be dedicated to the Regional Municipality of Halton for the purpose of road right-of-way widening and future road improvements.

Response: Noted.

Comment: All daylighting triangles must reference the ultimate Derry Road right-of-way limit.

Response: Noted.

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EXECUTIVE SUMMARY

BA Group was retained by Anatolia Investments Corp. to provide transportation consulting services related to a proposed industrial development located at 6728 Sixth Line, in the Town of Milton, in the Region of Halton. The site is the current location of the Trafalgar Golf & Country Club, and is bounded by Derry Road to the north, future industrial lands to the west and south (Remington Lands) and Sixth Line to the east. The site is north of the future Milton Phase 4 lands and is within the Town's Derry Green Secondary Plan Area.

The proposed development of the site includes the construction of three industrial buildings, with a total gross floor area (GFA) of approximately 182,115 m². The proposed use of the buildings is warehouse/logistics facilities. It is estimated that the buildings will be completed and fully leased by the end of 2026.

The north-south portion of a new public road (Clark Boulevard) is proposed to be constructed as part of the development proposal. In the interim condition, Clark Boulevard is proposed to connect to a new signalized intersection at Derry Road in the north and terminate with a cul-de-sac to the south, adjacent to the Remington lands south of the site. In the future ultimate condition, the remaining east-west segment of Clark Boulevard will connect from the cul-de-sac on the Anatolia property (cul-de-sac to be eliminated in the ultimate condition) to a new signalized intersection at Fifth Line.

Access driveways to both Buildings 1 and 2 are proposed along the new Clark Boulevard while access to Building 3 is proposed via a full movement access along Sixth Line. The Remington lands to the west of the site will be provided access via a driveway easement to Clark Boulevard.

Area Transportation Context

The site is adjacent to Derry Road (Halton Regional Road 7), an east-west major arterial road. The Region has future plans to widen Derry Road in the area from 4 to 6 lanes. Town roads in the area include Fifth Line to the west of the site and Sixth Line, directly adjacent to the eastern border of the site. There are future plans to widen Fifth Line in the area from 2 to 4 lanes. GO Regional Bus Services provides direct connections from the Milton GO Station with the nearest stop to the site being located at Derry Road and James Snow Parkway. The distance between the site and the GO Station via the existing area road network is approximately 6 kilometres. In the vicinity of the site, a multi-use pathway is provided along James Snow Parkway and a shared roadway cycle route is located along Sixth Line, providing access to the Great Lakes Waterfront Trail and Greenbelt Route. Off-street multiuse trails are provided along Derry Road between Ontario Street South and Trudeau Drive, and painted bike lanes are provided Trudeau Drive approximately 1.8 kilometres west of the site.



Transportation Demand Management (TDM)

The TDM strategies incorporated into the development proposal will facilitate a reduction in vehicle trips and encourage a shift to sustainable modes of travel. TDM measures proposed as part of the development include a reduced vehicle parking supply (0.49 spaces/100 m² or 1 space/203 m²), a bicycle parking supply that meets the Zoning By-law requirements, carpool parking with an emergency ride home program, information and education for employees that promote sustainable travel and an employee travel monitoring program.

Vehicle Parking Considerations

The site is subject to the Town of Milton Comprehensive Zoning By-law 016-2014 (HUSP Urban Area – March 2023) for parking considerations. Application of this By-law to the site results in a total minimum parking requirement of 1,057 spaces (equivalent rate of 0.58 spaces/100 m² or 1 space/172 m²). On average, the proposed parking supply for the site of 897 spaces is equivalent to 0.49 spaces/100 m² (1 space/203 m²). However, as Building 1 includes a parking supply of 0.45 spaces/100 m² (1 space/223 m²), the proposed minimum parking rate for the site is 0.45 spaces/100 m² (1 space/223 m²), in order to align with the parking supply of Building 1. The proposed parking supply for the site is 160 spaces less than the Zoning By-law minimum requirements and will meet the needs of the site.

Bicycle Parking Considerations

Application of Zoning By-law 016-2014 to the site requires a total minimum of 34 bicycle parking spaces. The current architectural drawings provide a total of 34 parking spaces for bicycles. The proposed bicycle parking supply meets the requirements of the Zoning By-law and will meet the needs of the site.

Loading Considerations

Application of Zoning By-law 016-2014 to the site, results in a minimum requirement of 28 loading spaces. As the development proposal includes a total of 315 loading spaces, the requirements of the Zoning By-law are exceeded and the loading supply will meet the practical needs of the site.

Travel Demand

Travel demand forecasts were established for the near-term (2027) and long-term (2032) horizons. The detailed traffic analysis for both the 2027 and 2032 horizons include a variety of scenarios that consider the status of the Clark Boulevard Extension, as well as the potential development on the adjacent Remington Lands. Background traffic forecasts were based upon recent traffic data, traffic growth rates provided by the Town and Region, and transportation studies completed for nearby developments, in addition to the Derry Green Secondary Plan. The site is expected to generate a total of 334 and 353 two-way trips, during the morning and afternoon peak period, respectively. Within this total, 40 two-way trips during the morning peak period and approximately 60 two-way trips during the afternoon peak period, are expected to be heavy vehicles (trucks).



Traffic Analysis

While the area road network operates acceptably under existing conditions, capacity constraints arise in both the 2027 and 2032 future horizons. Specific vehicle movements at intersections along Derry Road are capacity constrained in 2027, and these operational issues are increased due to additional growth in 2032. It is noted, however, that the analysis includes compounding growth for every turning movement at intersections along Derry Road, and this contributes to substantial increases in traffic volumes for movements carrying high volumes under existing conditions. In practice, traffic growth may increase across a broader network with travel patterns reflecting capacity constraints for particular movements and intersections. The most pronounced capacity issues in the network occur at the intersections of Sixth Line / Derry Road and Fifth Line / Derry Road. Because the corridor growth rates adopted by the Region are meant to account for development in the area, the inclusion of site-specific growth on Town roads results in some degree of double-counting for area traffic growth. Furthermore, there is some uncertainty inherent in accounting for sites for which no transportation studies have yet been published, and the use of Secondary Plan traffic volumes to account for such sites may have led to unrealistically high volumes for specific turning movements.

A sensitivity analysis was undertaken in which Derry Road is expanded to six lanes beyond Sixth Line for the 2032 horizon. The results of the sensitivity analysis suggest that if all forecasted growth occurs, the widening of Derry Road would mitigate most capacity issues in the network, leaving all intersections essentially at, or below capacity. Overall, operational issues in the network under future conditions are primarily caused by the substantial background growth that is assumed to occur, and actual future operations will depend on the extent to which this growth actually materializes. Furthermore, the sensitivity analysis conducted shows that the widening of Derry Road can mitigate the impacts of high growth, and that the necessity of widening Derry Road is also dependent on the extent of actual growth.

Safety Assessment

A comprehensive sight distance review was completed for the proposed site access for Building 3 at the full movement access along Sixth Line. The sight distance review utilized both the vertical and horizontal profile data obtained from surveys. The sight distances were evaluated in accordance with the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads. The sight distance assessment assumed that there are curve advisory speed limit signs of 40 km/h posted for both the northbound and southbound directions of travel on Sixth Line. A 40 km/h advisory sign currently exists for the northbound direction of travel only. Based upon the comprehensive site driveway sight distance review, the site access at Sixth Line is expected to be adequate at the proposed access point. Sight lines do not restrict the ability for right-turns and left-turns inbound or outbound and are sufficient to functionally accommodate the proposed driveways.

A queuing analysis of key movements was also undertaken as part of the safety review. Queueing behaviour at intersections within the network was assessed according to Highway Capacity Manual (HCM) methodology using Synchro Version 11.0; 50th and 95th percentile queues were reported for signalized intersection movements. The queue assessment for key movements under existing conditions, 2027 future conditions, and 2032 future conditions indicates that queues can be accommodated by the available storage capacity in all scenarios. Storage capacities for key movements used by site traffic were based upon available plans for proposed intersections; 50th percentile and 95th percentile queues can be accommodated and are not expected to cause any safety or operational issues.



Conclusion & Recommendations

The traffic analysis indicated that, with consideration of the following recommendations, the existing and future transportation network can acceptably accommodate the travel demands of the site.

- As part of the development proposal, it is recommended that the location of intersection of Clark
 Boulevard on Derry Road be shifted approximately 55 metres east of the intersection location shown
 in the Derry Green Secondary Plan.
- It is recommended that future traffic operations at the intersections of Sixth Line / Derry Road and
 Fifth Line / Derry Road be monitored to assess the accuracy of the background growth assumptions
 and to confirm the timing of the widening of Derry Road between Fifth and Sixth Line, as the widening
 of Derry Road can mitigate the impacts of high growth, and that the necessity of widening Derry Road
 is also dependent on the extent of actual growth.
- A reduced posted curve advisory speed limit of 40 km/h is recommended to address visibility and sight distance concerns along Sixth Line's existing S-curve road segment, between the signalized Derry Road and Sixth Line intersection to the north and the newly proposed site driveway along Sixth Line to the south.

1.0 INTRODUCTION

BA Group has been retained by Anatolia Investments Corp. to provide transportation consulting services related to a proposed industrial development located at 6728 Sixth Line, in the Town of Milton, in the Region of Halton. The subject site has an area of 62 hectares and is the current location of the Trafalgar Golf & Country Club, and is bounded by Derry Road to the north, future industrial lands to the west and south (Remington Lands) and Sixth Line to the east. The site is north of the future Milton Phase 4 lands and is within the Town's Derry Green Secondary Plan Area. The site location is illustrated in **Figure 1**.

This Updated Traffic Impact Study and Parking Justification has been prepared as an update BA Group's May 2023 Traffic Impact Study and Parking Justification, in order to address comments provided by the Town of Milton and the Region of Halton. This report has been completed as part of the **Official Plan Amendment** (**OPA**), **Zoning By-law Amendment (ZBA)** application and **Draft Plan of Subdivision (DPOS)** being submitted to the Town of Milton.

1.1 DEVELOPMENT PROPOSAL

1.1.1 Summary of Site Statistics

The proposed development of the site is for the construction of three industrial buildings, with a total gross floor area (GFA) of approximately 182,115 m². The proposed use of the buildings will be warehouse/logistics facilities. It is estimated that the buildings will be completed and fully leased by the end of 2026.

The proposed development is summarized in **Table 1** and includes a comparison of the previous and current development proposal.

The development proposal is illustrated in **Figure 2** and a reduced scale drawing of the site plan is provided in **Appendix A**.

The pavement marking and signage plan is provided in **Appendix L**.



TABLE 1 PROPOSED DEVELOPMENT SUMMARY

Industrial Land Use	Total Building GFA		Vehicle Parking (number of spaces)		Bicycle Parking (number of spaces)		Proposed Points of Access	
Warehouse Buildings	May 2023	Current Submission	May 2023	Current Submission	May 2023	Current Submission	May 2023	Current Submission
Building 1	106,415 m²	104,660 m ²	480	469	28	18	2 full movement accesses along west side of Clark Boulevard.	
Building 2	59,261 m²	59,053 m²	276	296	18	12	2 full movement accesses along east side of Clark Boulevard.	
Building 3	18,277 m²	18,402 m²	162	132	7	4	1 right- in/right-out access on Derry Road and 1 full movement access on Sixth Line.	1 full movement access on Sixth Line.
Total	183,953 m²	182,115 m ²	918	897	53	34		

Notes:

1.1.2 Site Access and Circulation

1.1.2.1 New Public Road - Clark Boulevard

The north-south portion of a new public road (Clark Boulevard) is proposed to be constructed as part of the development proposal.

In the interim condition, Clark Boulevard is proposed to be constructed with a 26.0 metre right-of-way and will connect to a new signalized intersection at Derry Road in the north and terminate in a cul-de-sac to the south, adjacent to the Remington lands south of the site.

In the future ultimate condition, the remaining east-west segment of Clark Boulevard is proposed to be constructed with a 26.0 metre right-of-way and will connect from the cul-de-sac on the Anatolia property (cul-de-sac to be eliminated in the ultimate condition) to a new signalized intersection at Fifth Line.



Site statistics based on site plans provided by Ware Malcolm dated November 28, 2023.

1.1.2.2 Connectivity to Remington Lands

Access driveways to both Buildings 1 and 2 are proposed along the new Clark Boulevard while access to Building 3 is proposed via a full movement access along Sixth Line. The Remington lands to the west of the site will be provided access via a driveway easement to Clark Boulevard.

1.1.2.3 Vehicle Access to Buildings

Building 1

- 2 full movement accesses east of the building at Clark Boulevard (one access north of the building and one access south of the building).
- The driveway along the north side of Building 1 is proposed to connect to the Remington lands such that vehicles from the future Remington Building 1 can travel across the Anatolia lands to Clark Boulevard.

Building 2

• 2 full accesses west of the building at Clark Boulevard (one access north of the building and one access south of the building).

Building 3

• One full movement access on Sixth Line (east side of the building).

In the interim condition, all Buildings 1 & 2 site traffic will access Clark Boulevard via Derry Road while in the ultimate condition, Buildings 1 & 2 site traffic will be able to access the site via both Clark Boulevard and Fifth Line.



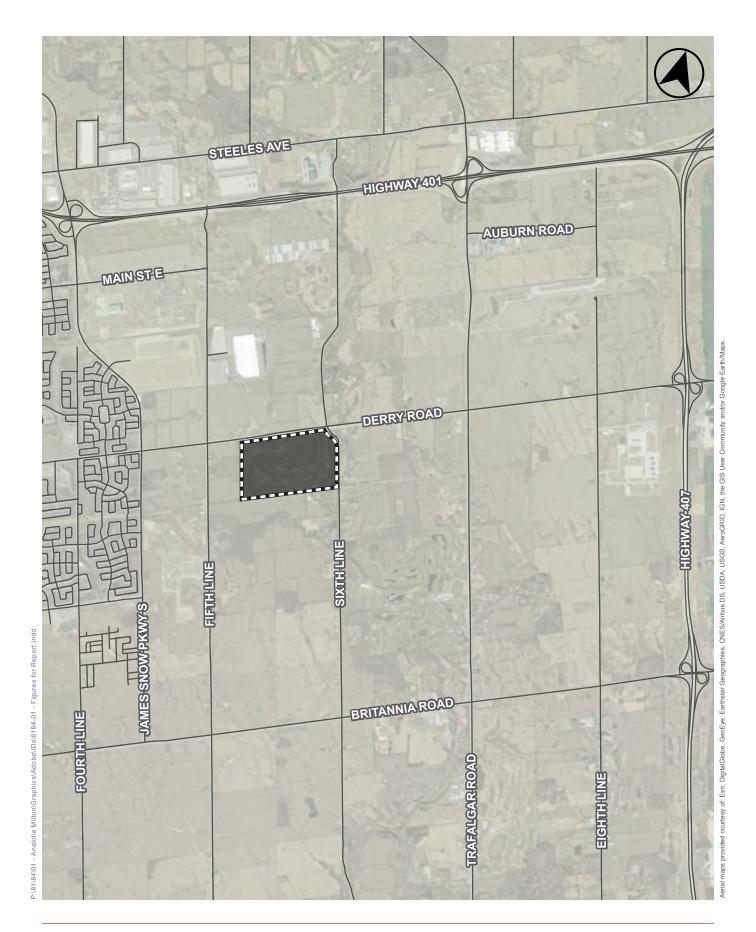


FIGURE 1 SITE LOCATION



FIGURE 2 DEVELOPMENT PROPOSAL

1.2 STUDY SCOPE

The study scope is summarized below. The initial comprehensive comments received from the Halton Region and the Town of Milton regarding the terms of reference for the Traffic Impact Study, are provide in **Appendix B**.

Development Proposal

- A summary of the development proposal.
- An overview of the site and the area-wide transportation system that provides for automobiles but
 encourages a shift towards non-automobile travel for prospective residents and visitors while still
 being able to meet the practical and operational needs of the proposed development plan.
- A review of the transportation elements of the proposed development plan that includes vehicle access and circulation, loading and parking facilities.

Transportation Context

- A description of the existing transportation context with consideration for the area road network, transit system and active transportation facilities.
- A description of future transportation changes and/or improvements to the area context such as planned road upgrades, transit and active transportation improvements.

Transportation Demand Management Framework

An overview of potential Transportation Demand Management (TDM) measures and initiatives that
are being considered to encourage prospective employees and visitors to use more active and
sustainable modes of transportation.

Site Plan

- A review of the adequacy of the vehicle parking supply.
- A review of the adequacy of the loading space provisions.
- A review of the bicycle parking supply.
- A review of the functionality and appropriateness of the proposed vehicle and cycling facilities incorporated into the site plan including loading/garbage collection facility arrangements.

Traffic Operations Review

- An assessment of the existing traffic patterns and traffic volumes in the study area during the key weekday morning and afternoon peak hours.
- A comprehensive review of traffic-related changes that may occur in the area with consideration for corridor growth and construction of other area development projects.
- A review of traffic operations at intersections in the area under existing and future conditions, including an assessment of the operational impacts of the proposed development.

Safety Review

- A review of the proposed accesses at the intersections with Derry Road, Sixth Line and Fifth Line.
- Confirmation of the proposed traffic control and lane configuration at the site access points.
- Evaluation of the need for road improvements.
- Evaluation of the sight distance at the proposed access points.
- Queuing assessment for key vehicle movements.

The findings of this review are summarized in the following sections.



2.0 TRANSPORTATION CONTEXT

2.1 AREA ROAD NETWORK

2.1.1 Existing Area Road Network

The existing area road network is illustrated in **Figure 3** and described in detail as follows. The existing lane configuration and traffic control is provided in

Derry Road (Halton Regional Road 7) is an east-west major arterial road under the jurisdiction of the Region of Halton in the vicinity of the site. It extends from Milburough Line in the west to Ninth Line in the east, where it continues into Mississauga. In the vicinity of the site, Derry Road has a 4-lane cross section with 2 lanes in each direction. Auxiliary turn lanes are provided at the signalized intersections of Fifth Line and Sixth Line (eastbound and westbound left turn lanes). In the study area, the posted speed limit is 80 km/h in both directions.

Fifth Line is a north-south collector road under the jurisdiction of the Town of Milton in the vicinity of the site. It extends from Lower Base Line in the south and 32 Side Road (Region of Halton border) in the north where it continues north into the County of Wellington. In the vicinity of the site, Fifth Line has a 2-lane cross section with 1 lane in each direction. Auxiliary turn lanes are provided at the signalized intersection of Derry Road (northbound and southbound left turn lanes). In the study area, the posted speed limit is 70 km/h in both directions.

Sixth Line is a north-south minor arterial road under the jurisdiction of the Town of Milton in the vicinity of the site. It extends from Queen Elizabeth Way in the south and 32 Side Road (Region of Halton border) in the north, where it continues into the County of Wellington. In the vicinity of the site, Sixth Line has a 2-lane cross section with 1 lane in each direction. Auxiliary turn lanes are provided at the signalized intersection of Derry Road (northbound and southbound left turn lanes). North of Derry Road, the posted speed limit is 60 km/h in both directions, and south of Derry Road the posted speed limit is 70 km/h in both directions.

James Snow Parkway is a north-south major arterial road under the jurisdiction of the Region of Halton and is located to the west of the site. It extends from Dublin Line East in the north and Britannia Road in the south. In the vicinity of the site, James Snow Parkway has a 2-lane cross section with 1 lane in each direction. Auxiliary turn lanes are provided on all approaches at the signalized intersection of Derry Road. James Snow Parkway has a posted speed limit of 70 km/h.

2.1.2 Future Area Road Network

Figure 5 illustrates the major road improvements proposed for the area road network. Key elements are described in detail as follows.

2.1.2.1 Planned Road Upgrades

The Region of Halton has identified several future roadway improvements in the vicinity of the site, outlined in Halton Region's 2023 Budget and Business Plan.



Additionally, a review of the Town of Milton's construction project forecasts and the 2019 - 2023 Milton Transit Services Review & Master Plan Update has identified other improvements in the study area. The planned road improvements are described below.

Region of Halton

- "5 ½ Line" A new 6-lane road from Britannia Road to Steeles Avenue and Interchange at Highway 401; construction to begin in 2031.
- Derry Road Road widening from 4 to 6 lanes between Tremaine Road and Highway 407; construction to begin in 2031.
- Britannia Road Road widening from 2 to 6 lanes between Tremaine Road and Highway 407.
 Project to be completed in three Phases. Phase 1 (Tremaine Road to Regional Road 25) began construction in September of 2019 and completed in February of 2022. Phase 2 (James Snow Parkway to Highway 407) and Phase 3 (Regional Road 25 to James Snow Parkway) began construction in June 2021 and is anticipated to be completed by December 2024.
- **James Snow Parkway** Road widening from 4 to 6 lanes between Britannia Road to Highway 401; construction to begin in 2026.
- Trafalgar Road Road widening from 4 to 6 lanes between Britannia Road to Steeles Avenue; construction to begin in 2030.

Town of Milton

- **Fifth Line** Road widening from 2 to 4 lanes between Highway 401 and Derry Road. Construction between Highway 401 and Main Street East began in 2021 and is anticipated to be completed by early 2023. The remaining segment is anticipated to be completed by 2024.
- Louis St. Laurent Extension to Fifth Line A new 4-lane road with a 35 metre right-of-way from James Snow Parkway to Fifth Line. Construction began in early 2022, with expected completion to base asphalt by late 2022.
- Louis St. Laurent Extension to Sixth Line A new road construction from Fifth Line to Sixth Line, which will require a Schedule C Municipal Class Environmental Assessment (MCEA). MCEA work to begin in 2024 and construction anticipated for 2026-2027.

2.1.3 Development Proposal Road Network

The proposed alignment and functional plans for the interim and future condition of Clark Boulevard, along with the functional plan for the proposed site access on Sixth Line, are shown in **Appendix C**.

2.1.3.1 Clark Boulevard

The north-south portion of a new public road (Clark Boulevard) is proposed to be constructed as part of the development proposal. In the interim condition, Clark Boulevard is proposed to be constructed with a 26.0 metre right-of-way and will connect to a new signalized intersection at Derry Road in the north and end in a cul-de-sac to the south, adjacent to the Remington lands south of the site.

In the future ultimate condition, the remaining east-west segment of Clark Boulevard is proposed to be constructed with a 26.0 metre right-of-way and will connect from the cul-de-sac on the Anatolia property (cul-de-sac to be eliminated in the ultimate condition) to a new signalized intersection at Fifth Line.

The future lane configuration and traffic control for the 2027 horizon, **without** the Clark Boulevard Extension is provided in **Figure 6**. The future lane configuration and traffic control for the 2027 horizon, **with** the Clark Boulevard Extension is provided in **Figure 7**. The future lane configuration and traffic control for the 2032 horizon is provided in **Figure 8**.

2.1.4 Intersection of Clark Boulevard at Derry Road

As part of the transportation work undertaken for this study, consideration was provided to Halton Region's July 13, 2021 pre-consultation following comments that were reiterated in the Region's April 27, 2022 comments regarding the Traffic Impact Study Terms of Reference:

"The Conceptual Site Plan illustrates a future north-south collector roadway (labelled as Clark Boulevard on the plan) spanning through the subject property. This north-south collector roadway was identified in the Derry Green Secondary Plan but the Secondary Plan illustrates the roadway alignment to be in line with the easterly limit of the 11319 Derry Road property on the north side of Derry Road. Consideration must be given to the location of the future north-south collector roadway alignment through the subject property and intersection location to Derry Road to be consistent with the Secondary Plan. This will result in the slight shifting of the future north-south collector roadway to the west to achieve this alignment and meet the intent of the Secondary Plan and Halton Region's overall corridor access plan."

It is acknowledged that the Region requested that the location of the intersection of Clark Boulevard at Derry Road align with the location shown in the Derry Green Secondary Plan. However, as part of the development proposal, the location of intersection of Clark Boulevard on Derry Road has been shifted approximately **55 metres east** of the intersection location shown in the Derry Green Secondary Plan.

The Town's Derry Green Secondary Plan shows the conceptual location and alignment of the future Clark Boulevard based on existing natural heritage conditions. The Secondary Plan also provides policy flexibility to assess the appropriate alignment of future roads, in relation to the final determination of the natural heritage system, derived through the approved Subwatershed Implementation Study (SIS), without an amendment to the Secondary Plan.

The natural heritage features and systems impacted by the future Clark Boulevard alignment were assessed through the SIS, which now has been approved by the Town. That SIS illustrates the appropriate realignment and channelization of the watercourse that traverses north and south of Derry Road. The proposed development shows the alignment of Clark Boulevard that is approximately 55 metres east of the alignment shown in the Secondary Plan, to respect and accommodate the future naturalized channel approved in the SIS.

Based on further discussions with the Town, and as per the email provided by the Town in **Appendix B**, "*Staff are generally supportive of the Clark Boulevard alignment*". It is important to note that the proposed location of the intersection of Clark Boulevard at Derry Road is not expected to create operational concerns in regard to other future planned driveways along Derry Road. For example, the distance between the approved driveway for the Brocollini property at 11319 Derry Road and the proposed location of Clark Boulevard, is approximately 291 metres. It is noted that the driveway at 11319 Derry Road will become a right-in/right-out once Clark Boulevard connects to Derry Road. There are no operational issues expected related to the Brocollini driveway and the proposed location of Clark Boulevard.

The location of the intersection of Clark Boulevard at Derry Road proposed as part of the development of the site, is deemed to be appropriate for the following reasons:

- The proposed intersection location of Clark Boulevard lessens the impact on the proposed channel boundary along the Broccolini eastern property limit, as the alignment of Clark Boulevard north of Derry Road would be required to cross a narrower section of the channel when compared to the alignment of the Secondary Plan that crosses the channel at an angle.
- The proposed location of Clark Boulevard also includes a relatively straight alignment north of Derry Road that follows the east side of the channel. By contrast, the Secondary Plan alignment includes back-to-back sharp curves until the alignment straightens on the east side of the channel.
- The angles of the intersection legs created at Derry Road and Clark Boulevard are closer to 90 degrees in the proposed alignment than in the Secondary Plan alignment.
- The proposed alignment allows the creation of larger rectangular blocks that facilitate a more efficient use of the site for a large scale industrial warehouse development.
- The proposed alignment is consistent with the Clark Boulevard alignment and NHS illustrated within the Subwatershed Impact Study Addendum SIS Area 5A prepared by MGM Consulting Ltd et al, dated May 2021, as reviewed and approved by the Town, Region and Conservation Halton
- As the Region requires a minimum distance of 115 metres between a right-in/ right-out access and
 the nearest point of access, the proposed location of Clark Boulevard at Derry Road provides more
 than adequate minimum spacing (and 56 metres more than the Secondary Plan location) for a rightin/ right-out access at the Brocollini property.
- The proposed alignment is consistent with the Town's Derry Green Secondary Plan, without shifting to the west, as noted by the Region in their comments to the Town.

As shown in the drawing in **Appendix D**, the distance between Clark Boulevard, as proposed by the Anatolia development, and the planned driveway on the Brocollini property at 11319 Derry Road, is 291 metres. The Brocollini driveway will operate as a full access initially but will become a right-in/ right-out once Clark Boulevard is constructed and/or Derry Road is widened to 6 lanes. As the minimum distance required between Clark Boulevard to a right-in/ right-out access is 115 metres (as per Halton Region's Access Management Guidelines), the distance between Clark Boulevard and the Brocollini driveway exceeds the Region's minimum spacing requirement.

The distance from Clark Boulevard, as proposed by the Anatolia development, to a proposed driveway for a development at 11801 Derry Road is 237 metres. As the 11801 Derry Road driveway is planned to be a right-in/right-out only, the spacing of 237 metres exceeds the Region's minimum spacing requirement of 155 metres. Figures that compare the proposed intersection of Clark Boulevard on Derry Road (drawing prepared by BA Group) vs. the location shown in the Derry Green Secondary location (Town of Milton Official Plan Schedule C-9-B Derry Green Corporate Business Park Land Use Plan), along with a figure that shows the distances between Clark Boulevard and future planned driveways along Derry Road, are included in **Appendix D.**

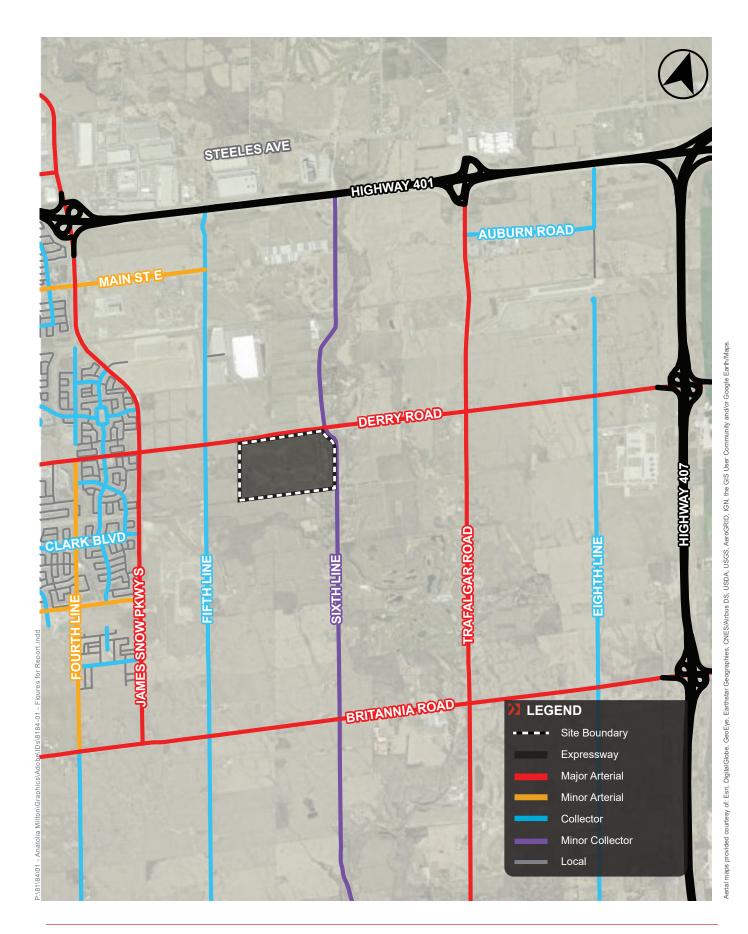
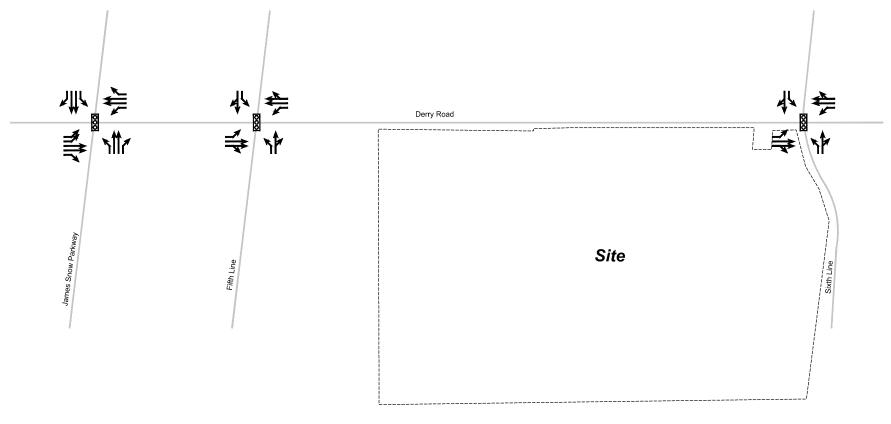
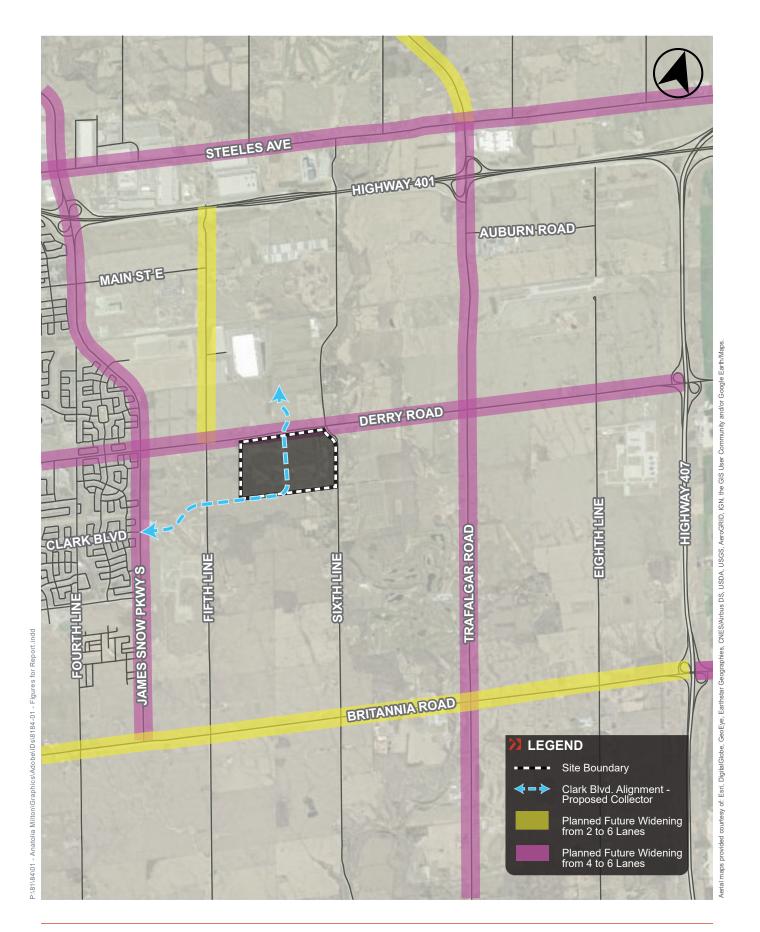


FIGURE 3 EXISTING AREA ROAD NETWORK

Traffic Signal







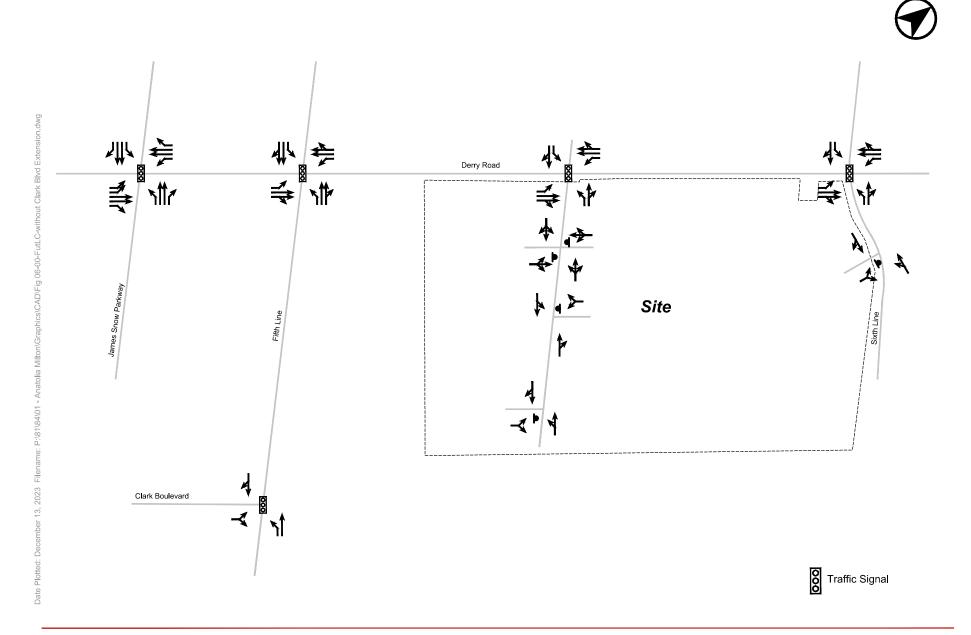


FIGURE 6 FUTURE LANE CONFIGURATION & TRAFFIC CONTROL - 2027 HORIZON - WITHOUT CLARK BOULEVARD EXTENSION

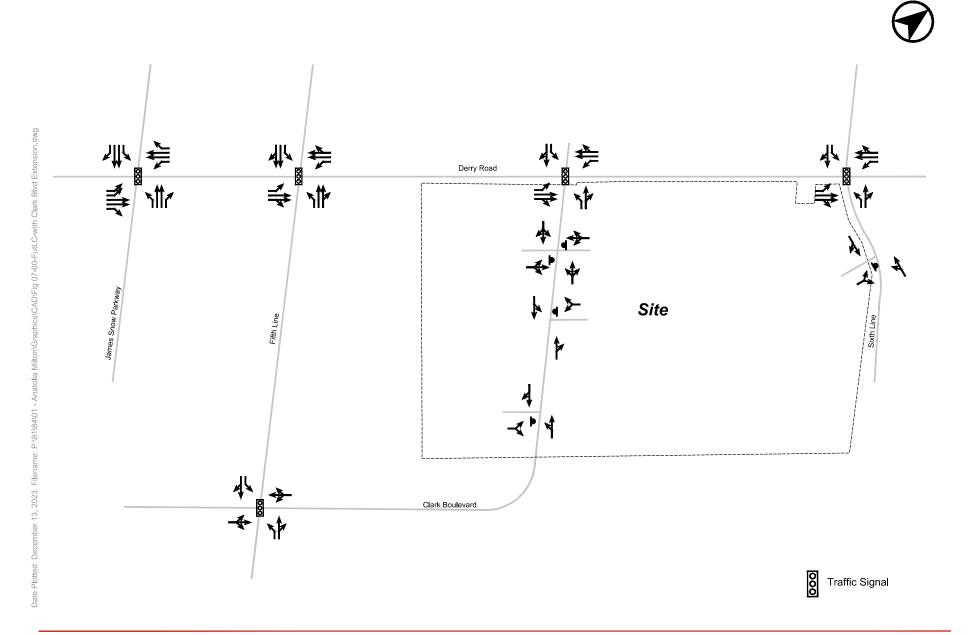
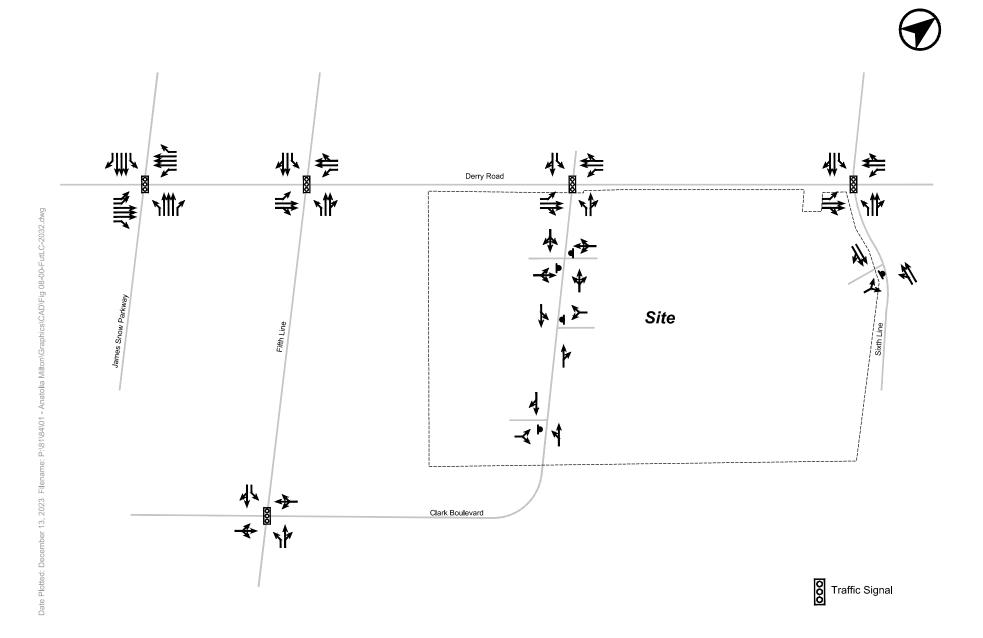


FIGURE 7 FUTURE LANE CONFIGURATION & TRAFFIC CONTROL - 2027 HORIZON - WITH CLARK BOULEVARD EXTENSION



2.2 AREA TRANSIT NETWORK

The closest transit stops to the site are at the intersection of Derry Road and James Snow Parkway (approximately 700 to 1,000 meters away) and are serviced by GO Regional bus services.

Milton GO Rail Line provides a key transit link between Milton and Toronto. The distance between the site and the GO Station via the existing area road network is approximately 6 kilometres. The Milton GO Rail Line operates during peak hours, with rail service to Union Station during the morning peak hour and rail service from Union Station in the afternoon peak hour. All other times, the station is serviced by GO Regional Bus Services.

GO Regional Bus Services also provide direct connections from Milton GO Station to Meadowvale Town Centre, Mississauga, Square One and Union Station. The 21 Milton and 27 Milton – North York GO Bus routes operate along Derry Road in the vicinity of the site, the nearest stops are located at the Trafalgar Road and James Snow Parkway South intersections.

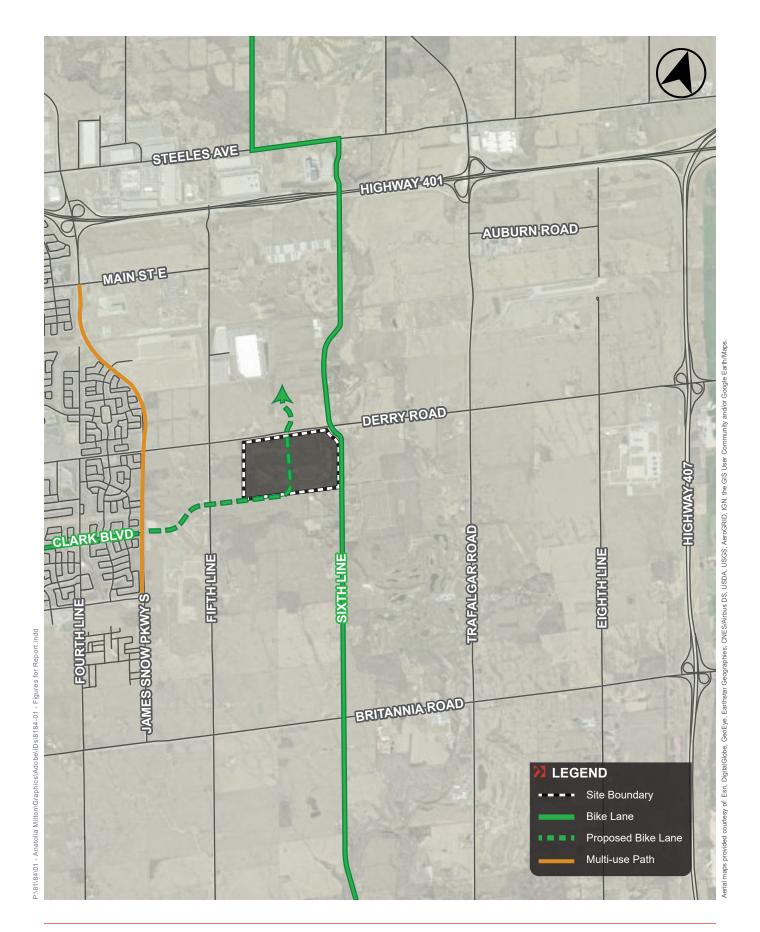
Milton Transit is a municipal bus service within the Town of Milton. The transit service consists of 12 bus lines, providing service within the area bounded by Steeles Avenue West to the north, Tremaine Road to the west, Trudeau Drive to the west and Louis St Laurent Avenue to the south. All bus lines provide service to Milton GO Station, which provides connections to the Milton GO Rail Line and GO Regional Bus Services. The bus service operates during the weekdays and Saturday.

2.3 AREA CYCLING AND PEDESTRIAN NETWORK

In the vicinity of the site, a multi-use pathway is provided on the west side of James Snow Parkway and a shared roadway cycle route is located along Sixth Line, providing access to the Great Lakes Waterfront Trail and Greenbelt Route. Off-street multiuse trails are provided along Derry Road between Ontario Street S and Trudeau Drive, and painted bike lanes are provided Trudeau Drive approximately 1.8 kilometres west of the site.

The area cycling network is illustrated in Figure 9.

The existing pedestrian infrastructure in the vicinity of the site is limited. However, sidewalks will be installed along both sides of Clark Boulevard and will likely be installed along both sides of Derry Road as part of the future planned widening.



3.0 VEHICLE PARKING CONSIDERATIONS

3.1 COMPREHENSIVE ZONING BY-LAW 016-2014

The site is subject to the Town of Milton Comprehensive Zoning By-law 016-2014 (HUSP Urban Area – March 2023) for parking considerations. Application of this By-law to the site is summarized in **Table 2** and results in a total minimum parking requirement of 1,057 spaces. The average required parking rate for the site is 0.58 spaces per unit (1 space/172 m²) while the highest required parking rate is for Building 1 at 0.55 spaces per unit (1 space/183 m²).

TABLE 2 ZONING BY-LAW 06-2014: MINIMUM PARKING REQUIREMENTS

Building	Gross Floor Area (GFA)	Zoning By-law Requirement	Minimum Number of Required Parking Spaces	Minimum Required Equivalent Parking Rate
Duilding 1	104 660 m²			
Building 1	104,660 m ²	0 to 1,000 m ² = 1	572	(1 space/183 m²)
Duilding 2	50.052 m²	space/30 m ² 1,001 m ² to 5,000 m ² = 1	244	0.58 spaces/unit
Building 2	59,053 m ² space/100 m ² >5,000 m ² = 1 space/200		344	(1 space/172 m ²)
Duilding 2	10.400 m²	m ²	4.44	0.77 spaces/unit
Building 3	18,402 m ²		141	(1 space/131 m ²)
Total	402 445 2		4.057	0.58 spaces/unit
Total	182,115 m²		1,057	(1 space/172 m²)

Notes:

- 1. Site statistics based on site plans provided by Ware Malcolm dated November 28, 2023.
- 2. As per Section 5.13 in the Zoning By-law, partial parking spaces must be rounded up to the nearest whole number.
- 3. As per Section 5.2, 10% may be deducted from the GFA for non-residential parking calculations.

3.2 PROPOSED PARKING SUPPLY

3.2.1 Summary of Proposed Parking Supply

As summarized in **Table 3**, the total proposed parking supply for the site is 897 spaces which is 160 spaces less than the minimum requirements of the Zoning By-law 016-2014.

On average, the proposed parking supply for the site is 0.49 spaces/100 m² (1 space/203 m²). However, as Building 1 includes a parking supply of 0.45 spaces/100 m² (1 space/223 m²), the proposed minimum parking rate for the site is 0.45 spaces/100 m² (1 space/223 m²), in order to align with the parking supply of Building 1. The proposed parking supply for the site is 160 spaces less than the Zoning By-law minimum requirements.

TABLE 3 PROPOSED PARKING SUPPLY

Land Use	Gross Floor Area (GFA)	Zoning By-law Minimum Parking Requirement (number of spaces)	Proposed Parking Supply (number of spaces)	Proposed Parking Rate	Difference (number of spaces)	
Building 1	104,660 m ²	572	0.45 spaces/unit 469 (1 space/223 m²)		-103	
D 11 11 0	50.050 2	0.14	000	0.50 spaces/unit	40	
Building 2	59,053 m ²	344	296	(1 space/200 m ²)	-48	
Building 3	18,402 m ²	141	132	0.72 spaces/unit	-9	
				(1 space/139 m²)	-	
Total	182,115 m ²	1,057	897	0.49 spaces/100 m ²	-160	
	1,500		(1 space/203 m²)			
	Proposed Site Parking Rate		0.45 spaces/100 m ²			
Notoo	Based on Building 1 (lowest rate)		(1 space/223 m²)			

Notes:

- 1. Site statistics based on site plans provided by Ware Malcolm November 28, 2023.
- 2. As per Section 5.13 in the Zoning By-law, partial parking spaces must be rounded up to the nearest whole number.
- 3. As per Section 5.2, 10% may be deducted from the GFA for non-residential parking calculations.

3.3 JUSTIFICATION FOR PROPOSED PARKING SUPPLY

As the total proposed parking supply for the site is 897 spaces (equivalent to 0.45 spaces/100 m² GFA or 1 space/223 m² based on Building 1 supply) and the minimum parking requirement of Zoning By-law 016-2014 is a minimum of 1,057 spaces for the entire site (0.58 spaces/100 m² GFA or 1 space/172 m²), the proposed parking supply is 160 spaces less than the Zoning By-law requirement.

To confirm that the proposed parking supply is adequate for the site, a review of parking demand surveys at similar industrial developments was undertaken and is discussed below.

3.3.1 Parking Demand Survey Data

To gain a better understanding of parking demands at industrial warehouses that are similar to what is currently being proposed on the site, weekday parking demand data was recently collected at seven warehouse sites in the Town of Milton and in Bolton (Town of Caledon). The detailed parking demand survey data is provided in **Appendix E.**

As summarized in **Table 4**, the peak parking demand at the proxy sites ranged from 0.12 to 0.22 spaces/100 m² GFA, with an average peak parking demand of 0.17 spaces/100 m² GFA.



It is noted that the average demand of 0.17 spaces/ 100 m^2 GFA is well below the proposed parking supply for the site of 0.45 spaces/ 100 m^2 GFA. The results of the parking demand survey data confirm that the proposed parking supply for the site of 897 spaces is appropriate.

TABLE 4 PARKING DEMAND SURVEY DATA AT INDUSTRIAL WAREHOUSES

Location	Date	Peak Parking Demand (spaces/100 m²)
2200 Yukon Court, Milton	Thursday, February 16, 2023	0.22
8350 Lawson Road, Milton	Thursday, February 16, 2023	0.16
205 Market Drive, Milton	Thursday, February 16, 2023	0.16
100 Pillsworth Road, Bolton	Wednesday, November 8, 2022	0.15
8339 George Bolton Parkway	Thursday, February 16, 2023	0.18
12315 Coleraine Drive	Thursday, February 16, 2023	0.20
12366 Coleraine Drive	Thursday, February 16, 2023	0.12
	Average	0.17

3.4 SUMMARY OF PROPOSED VEHICLE PARKING SUPPLY

3.4.1 Proposed Vehicle Parking Supply

As summarized in **Table 5**, the total proposed parking supply for the site is 897 spaces (equivalent to 0.45 spaces/100 m² GFA or 1 space/223 m² based on Building 1 supply) is slightly less (160 spaces) than the equivalent Zoning By-law minimum parking rate for the entire site of 0.58 spaces/100 m² (1 space/172 m²) and will meet the needs of the site.

TABLE 5 PROPOSED PARKING SUPPLY

Land Use	Gross Floor Area (GFA)	Proposed Parking Supply (number of spaces)
Building 1	104,660 m ²	469
Building 2	59,053 m ²	296
Building 3	18,402 m²	132
Total	182,115 m²	897
Proposed Site Parkin Based on Buil (lowes		0.45 spaces/100 m ² (1 space/223 m ²)

^{1.} Site statistics based on site plans provided by Ware Malcolm November 28, 2023.

^{2.} As per Section 5.13 in the Zoning By-law, partial parking spaces must be rounded up to the nearest whole number.

^{3.} As per Section 5.2, 10% may be deducted from the GFA for non-residential parking calculations.

3.4.2 Accessible Parking

As per By-law 016-2014, as summarized in **Table 6**, the site requires a minimum of 29 accessible parking spaces. The proposed supply of 34 accessible parking spaces meets the requirements of the Zoning By-law.

TABLE 6 ACCESSIBLE PARKING

Land Use	Zoning By-law Required Number of Parking Spaces	Accessible Parking Zoning By-law Requirement Requirement (number of spaces)		Proposed Accessible Parking Supply (number of spaces)
Building 1	572	2 accessible spaces + 2%	14	16
Building 2	344	2 accessible spaces + 2%	9	12
Building 3	141	1 accessible spaces + 3%		6
Total	1,057		29	34

Notes:

In accordance with the By-law, where an even number of accessible parking spaces is required, an equal number of Type A and B accessible parking spaces shall be provided. Where an odd number of accessible parking spaces is required, an equal number of Type A and B accessible parking spaces shall be provided but the last accessible parking space may be Type B.

The architectural drawings for the site include 8 Type A and 8 Type B accessible spaces at Building 1, 6 Type A and 6 Type B accessible spaces and Building 2, while Building 3 includes 3 Type A and 3 Type B spaces.

The designated accessible parking spaces will be located in proximity to the primary entrances to the buildings and have direct access to the entrances by a minimum 1.5 metres wide unobstructed access route.

Site statistics based on site plans provided by Ware Malcolm dated November 28 2023.

^{2.} As per Section 5.13 in the Zoning By-law, partial parking spaces must be rounded up to the nearest whole number.

4.0 BICYCLE PARKING CONSIDERATIONS

As summarized in **Table 7**, Zoning By-law 016-2014 requires a total minimum of 34 bicycle parking spaces. The current architectural drawings provide a total of 34 parking spaces for bicycles. The proposed bicycle parking supply meets the requirements of the Zoning By-law and will meet the needs of the site.

The location of the bicycle parking areas is illustrated in the architectural drawings for the site included in **Appendix A.**

TABLE 7 SUMMARY OF BICYCLE PARKING

Land Use	Zoning By-law Minimum Required Number of Parking Spaces	Bicycle Parking Minimum Zoning By-law Requirement	Bicycle Parking Minimum Zoning By-law Requirement (number of spaces)	Proposed Bicycle Parking Supply (number of spaces)
Building 1	572	3% of minimum	18	18
Building 2	344	required vehicle	11	12
Building 3	141	parking	5	5
Total	1,057		34	34

^{1.} Site statistics based on site plans provided by Ware Malcolm dated November 28, 2023.

As per Section 5.13 in the Zoning By-law, partial parking spaces must be rounded up to the nearest whole number.

5.0 LOADING CONSIDERATIONS

As summarized in **Table 8**, application of Zoning By-law 016-2014 to the site for loading considerations, results in the minimum requirement of 28 loading spaces. As the development proposal includes a total of 315 loading spaces, the requirements of the Zoning By-law are exceeded and the loading supply will meet the practical needs of the site.

TABLE 8 SUMMARY OF LOADING SPACES

Building	Gross Floor Area (GFA)	Zoning By-law 06-2014 Minimum Requirement	Minimum Number of Required Loading Spaces	Proposed Number of Loading Spaces
Building 1	104,660 m ²	3 loading spaces + 1	14	155
Building 2	59,053 m ²	additional loading space for each additional	9	109
Building 3	18,402 m²	9,300m ² or fraction thereof in excess of 7,441m ² .	5	51
Total	182,115 m ²		28	315

Notes:

Vehicle manoeuvring drawings for the site are attached in **Appendix F.**

^{1.} Site statistics based on site plans provided by Ware Malcolm November 28, 2023.

6.0 TRANSPORTATION DEMAND MANAGEMENT PLAN

6.1 OVERVIEW

The Transportation Demand Management (TDM) Plan strives to reduce automobile use through an on-going strategy by supporting and promoting the use of non-auto transportation modes. TDM strategies have been developed to further support the use of non-auto modes of travel. The recommended strategies are summarized in **Table 9.**

6.1.1 Vehicle Parking

Provide an appropriate parking supply for the site (0.49 spaces/100 m² or 1 space/203 m²) that is slightly less than the site equivalent minimum Zoning By-law requirement of 0.58 spaces/100 m² or 1 space/172 m²).

6.1.2 Bicycle Parking Spaces

Although the existing and future area transportation context provides limited facilities for active transportation to/from the site, some employees may choose to cycle to/from the site. Zoning By-law 016-2014 requires a total minimum of 34 spaces. The current architectural drawings for the site illustrate a total of 34 parking spaces for bicycles and meets the minimum parking requirements of the Zoning By-law.

6.1.3 Carpool Program & Emergency Ride Home Program

Through communication and education, employees will be encouraged to carpool to travel to/ from the site. A number of preferred parking spaces will be signed and dedicated to carpool vehicles. The building owner/occupant will consider emergency ride home options.

6.1.4 Employee Information and Education Program

Provide information and education for employees regarding sustainable travel options such as transit and car pooling to/from the site.

6.1.5 Employee Reward Program

Implement an employee reward program for employees that that travel to/from site with sustainable modes of travel, including the car pool program, transit and active transportation.

6.1.6 Monitoring

The developer has plans to undertake employee surveys two years after building occupation, in order to assess employee travel behaviours and monitor the effectiveness of TDM measures.

Due to the nature of the warehouse business, employees would likely be working in shifts such that the number of trips occurring during the street peak periods of the day would be reduced but this will be confirmed as part of the monitoring program.

TABLE 9 RECOMMENDED TDM STRATEGIES

Measure	Description	Cost Estimate	Implementation Strategy
Vehicle Parking Supply	Provide an appropriate parking supply for the site that is slightly less than the minimum Zoning Bylaw requirements.	Integrated into overall development cost.	Construct as part of development.
Bicycle Parking	Provide a supply of bicycle parking spaces that meets the minimum Zoning Bylaw requirement.	Integrated into overall development cost.	Construct as part of development. A total of 34 bicycle parking spaces are proposed on the site.
Bicycle Repair Station	Provision of bicycle repair stations.	Integrated into overall development cost.	Construct as part of development
Carpool Program	Encourage employees to carpool.	Integrated into overall development cost.	Implement at occupancy.
Emergency Ride Home Program	The building owner/occupant will consider emergency ride home options.	Integrated into overall development cost.	Implement at occupancy.
Carpool spaces	Designating preferred parking spaces for carpool users adjacent to the main building entrances is a measure to encourage carpooling by employees.	Integrated into overall development cost.	Construct as part of development.
Information & Education	Provide information & education for employees regarding sustainable travel options to/from the site.	Integrated into overall development cost.	Implement at occupancy.
Employee Reward Program	Reward program for employees that travel to/from site with sustainable modes of travel, including the car pool program, transit and active transportation.	Integrated into overall development cost.	Implement at occupancy.
Monitoring	Undertake surveys to assess employee travel behaviour and TDM measures.	Integrated into overall development cost.	Developer committed to TDM monitoring follow-up surveys with employees 2 years after building occupation.



6.2 TDM PLAN IMPLEMENTATION

It is recommended that the TDM measures be incorporated into the site plan. The cost to implement these measures will be the responsibility of the developer.

Although no specific targets for changes in travel behaviour have been made, the proposed TDM initiatives are expected to support reduced levels of automobile use.

7.0 TRAFFIC VOLUME FORECASTING

7.1 EXISTING TRAFFIC CONDITIONS

Existing traffic volumes were based on 2022 weekday peak hour turning movement counts conducted for the three existing intersections within the study area. Turning movement count information is summarized in **Table 10**.

TABLE 10 TURNING MOVEMENT COUNT SUMMARY

Intersection	Count Date	Peak Hours	Source	
Sixth Line / Derry Road				
Fifth Line / Derry Road	Thursday, June 16 th , 2022	7:30-8:30 AM	Ontario Traffic Inc.	
James Snow Parkway / Derry Road	, , , , , , , , , , , , , , , , , , , ,	4:30-5:30 PM		

Based on background growth assumptions outlined in detail in **Section 7.2.2**, a compounding growth rate of 2% was applied for one year to establish 2023 traffic volumes. These volumes were adopted to represent existing traffic conditions.

Existing traffic volumes are illustrated in **Figure 10**. Detailed turning movement counts are provided in **Appendix G**.

Traffic Signal

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7.2 FUTURE BACKGROUND TRAFFIC CONDITIONS

7.2.1 Background Growth Scenarios

Multiple background growth scenarios were considered in order to account for uncertainties with regard to the buildout of network infrastructure and developments in the site vicinity. Specifically, it is unknown when the portion of Clark Boulevard between Fifth Line and the site boundary will be constructed, and the development of lands west and south of the site is uncertain.

It is understood that the development of parcels adjacent to the site, owned by Remington Group and referred to in this study as "the Remington Lands", requires the extension of Clark Boulevard to be constructed between the site and Fifth Line ("the Clark Boulevard Extension"). However, if these lands are not developed, the extension may still be constructed by the Town. It is unknown whether, in the absence of development on the adjacent parcels, the extension will be constructed by 2028. However, it can be assumed that the extension will be in place by 2033, regardless of the development of the Remington Lands.

Therefore, three possible scenarios were considered for the 2028 horizon, and two scenarios were considered for the 2033 horizon, for a total of five background growth scenarios. The relevant network and development assumptions for these scenarios are summarized in **Table 11**.

TABLE 11 FUTURE BACKGROUND GROWTH SCENARIOS

Scenario	Horizon Year	Anatolia Site	Background Traffic	Road Network Improvements	
Scenario 1			Background traffic as per Derry Green Secondary Plan but no development on Remington lands ³	No extension of Clark Boulevard between Fifth Line and Derry Road ²	
Scenario 2	2027	Full build-out of Anatolia site	Background traffic as per Derry Green Secondary Plan but no development on Remington lands ³ ; background traffic can use Clark Boulevard		
Scenario 3			Background traffic as per Derry Green Secondary Plan with Remington lands built, background traffic can use Clark Boulevard	Clark Boulevard Extended between Fifth	
Scenario 4	2022	5 years post build-out of	Background traffic as per Derry Green Secondary Plan but no development on Remington lands ³ ; background traffic can use Clark Boulevard	Line and Derry Road	
Scenario 5	2032	Anatolia site	Background traffic as per Derry Green Secondary Plan with Remington lands built, background traffic can use Clark Boulevard		
		Sensit	ivity Analysis		
Scenario 6	2032	5 years post build-out of	Background traffic as per Derry Green Secondary Plan but no development on Remington lands ³ ; background traffic can use Clark Boulevard	Clark Boulevard Extended between Fifth	
Scenario 7	2032	Anatolia site	Background traffic as per Derry Green Secondary Plan with Remington lands built, background traffic can use Clark Boulevard	Line and + Derry Road widened to 6 lanes	

The portions of Clark Boulevard west of Fifth Line and north of Derry Road are assumed to be complete in all scenarios, 1. consistent with the Derry Green Secondary Plan and with studies available for developments proposed on those lands.

The portion of Clark Boulevard directly south of Derry Road is to be constructed as part of the development of the site. It is 2. assumed to be present under future total conditions in all scenarios, regardless of the status of the Clark Boulevard extension. Traffic volumes related to Remington lands have been removed from the Derry Green Secondary Plan traffic volumes.

^{3.}

7.2.2 General Corridor Growth

Compounded growth was assumed on all existing corridors within the study area, based on requirements provided by the Town and Region. A growth rate of 2% was applied to all vehicle movements at existing intersections for five years up to the 2027 horizon. A 2% growth rate was maintained up to the 2032 horizon for all movements at existing intersections, with the exception of northbound and southbound movements (including left and right turns) on James Snow Parkway where it intersects with Derry Road. Movements on James Snow Parkway were subject to a 4% growth rate for 5 years between 2027 and 2032. No compounding growth was applied on Clark Boulevard where it intersects with Fifth Line and Derry Road, since these segments do not currently exist and there are no existing traffic volumes.

7.2.3 Background Developments

Additional growth volumes were added to account for specific development proposals in the site vicinity. Developments accounted for include approximately 593,900 m² of industrial GFA, 5,000 m² of commercial GFA, and 16,500 m² of office GFA, and further allowances were included to account for developments anticipated as part of the Derry Green Secondary Plan for which site-specific studies were not available.

Table 12 summarizes the characteristics of background developments included in the study.

TABLE 12 AREA BACKGROUND DEVELOPMENTS

Development	Location	Location Development Sour		Notes
Derry Green Corporate Business Park	Bounded by James Snow Parkway and by Fifth Line, extending north of Clark Boulevard and South of St. Laurent Avenue	294,242 m ² industrial GFA, 16,558 m ² office GFA	Crozier & Associates, October 2021	Includes Clark Boulevard extension to Fifth Line
6712 Fifth Line	Southwest quadrant of Fifth Line / Derry Road intersection	91,574 m ² industrial GFA	LEA, October 2021	
11233 Derry Road	North of Derry Road, between Fifth Line and future Clark Boulevard extension	94,366 m ² industrial GFA	LEA, March 2022	
Remington Lands	Bounded by Derry Road, Fifth Line, and the Anatolia site; includes lands abutting the Clark Boulevard extension	65,400 m ² industrial GFA (potential)	BA Group	Unknown buildout date and development status ¹
Other Secondary Plan Lands	Includes parcels north of Derry Road, and west of Fifth Line or east of future Clark Boulevard extension	Unknown	Read, Voorhees & Associates, February 2016	Traffic estimated based on Secondary Plan and other studies ²
11801 Derry Road	North of Derry Road, between Sixth Line and future Clark Boulevard extension	5070 m ² commercial GFA 34,084 m ² industrial GFA	TYLin, February 2023	Includes Clark Boulevard extension
11319 Derry Road	North of Derry Road, between Fifth Line and future Clark Boulevard extension	14,198 m ² industrial GFA	LEA, June 2023	

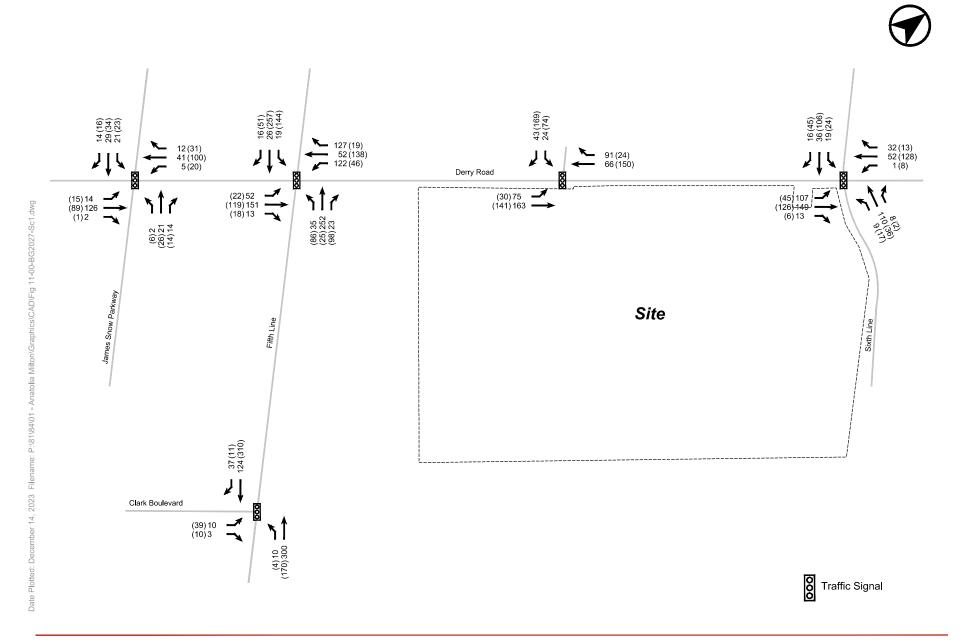
Notes:

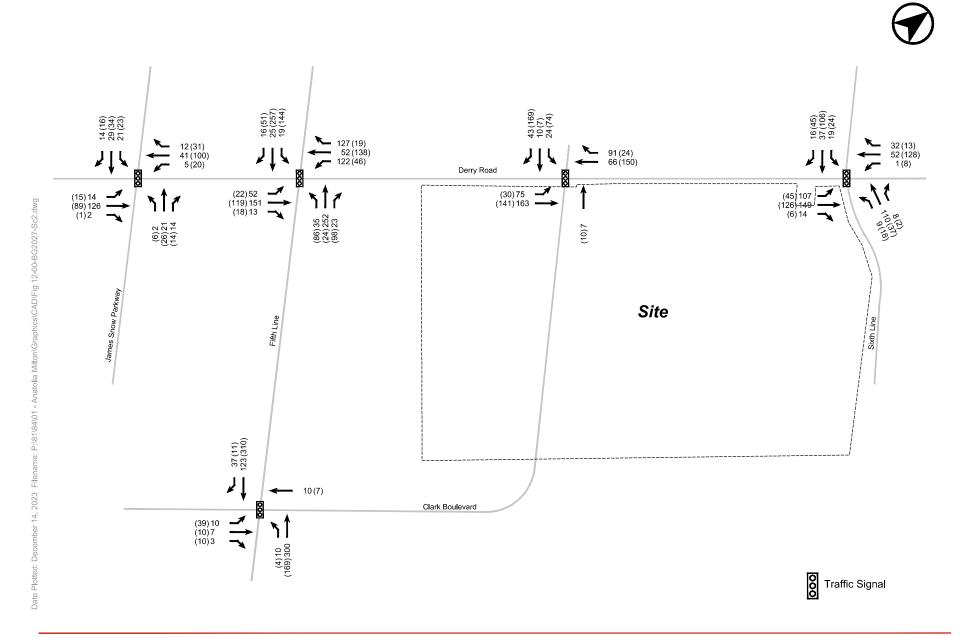
7.2.4 Total Background Growth Traffic Volumes

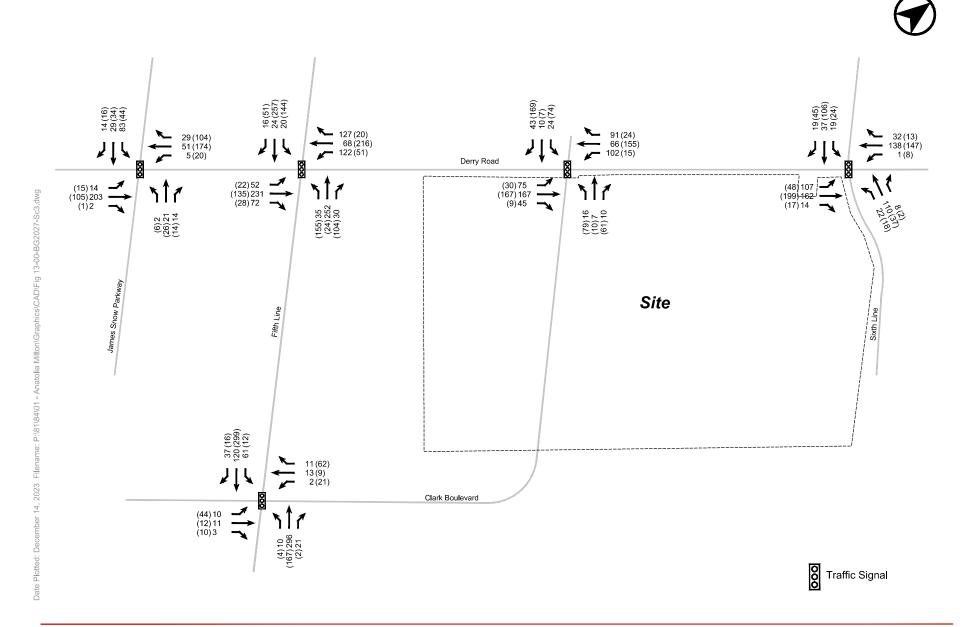
Background growth traffic allowances in each growth scenario include corridor growth appropriate to the horizon year of the scenario (2027 or 2032) and traffic volumes for the specific background developments included in the scenario. Background growth traffic volumes for each scenario are illustrated in **Figure 11** through **Figure 15**.

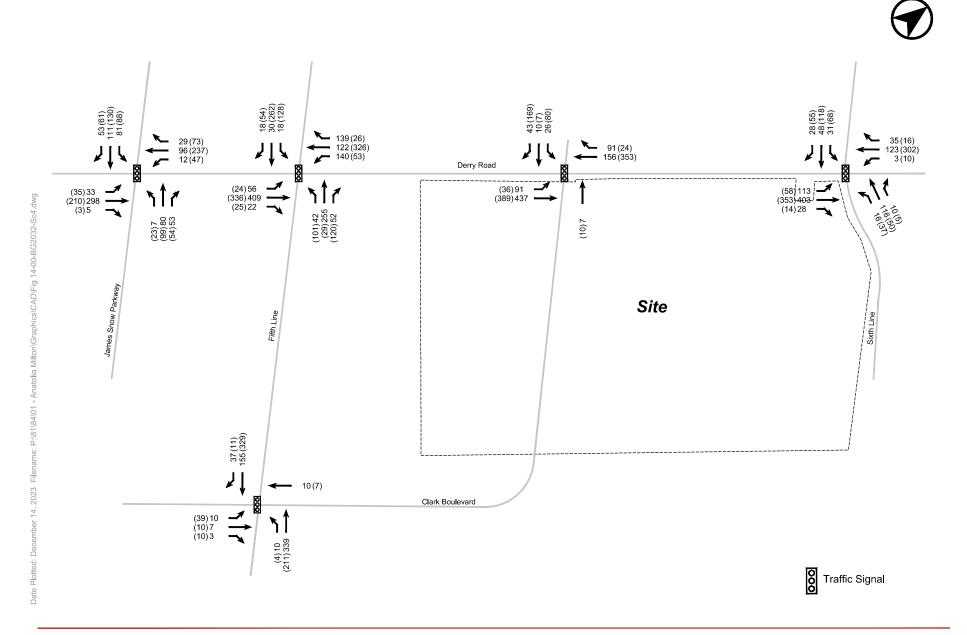
Traffic associated with the development of the Remington Lands (with the statistics provided) is included in Scenarios 3 and 5, and omitted in Scenarios 1, 2 and 4.

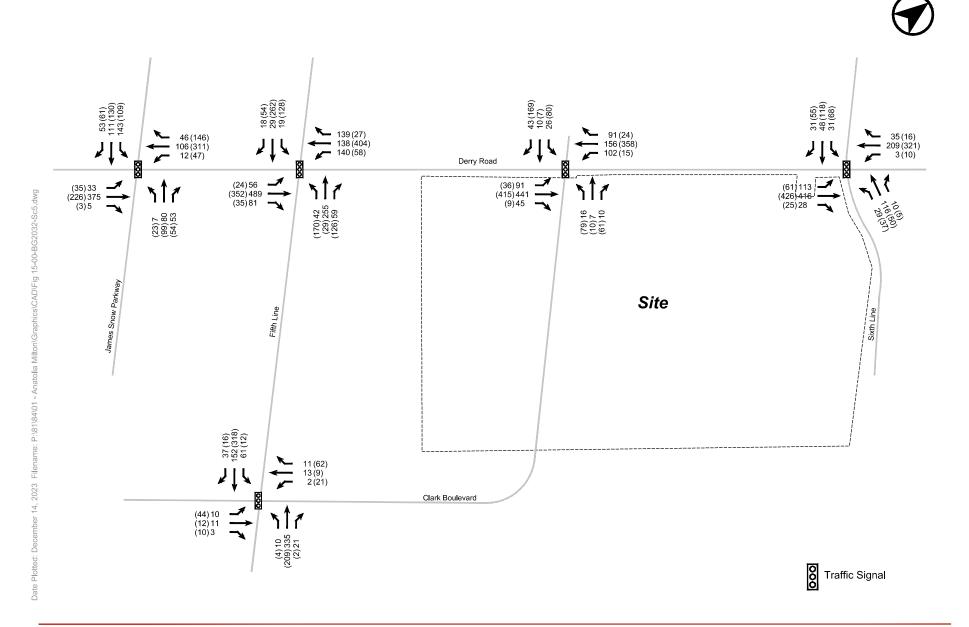
^{2.} Minor adjustments are made to traffic volumes associated with other secondary plan lands in Scenario 1, in order to account for the lack of a connection between the Clark Boulevard extension north of Derry Road and west of Fifth Line.







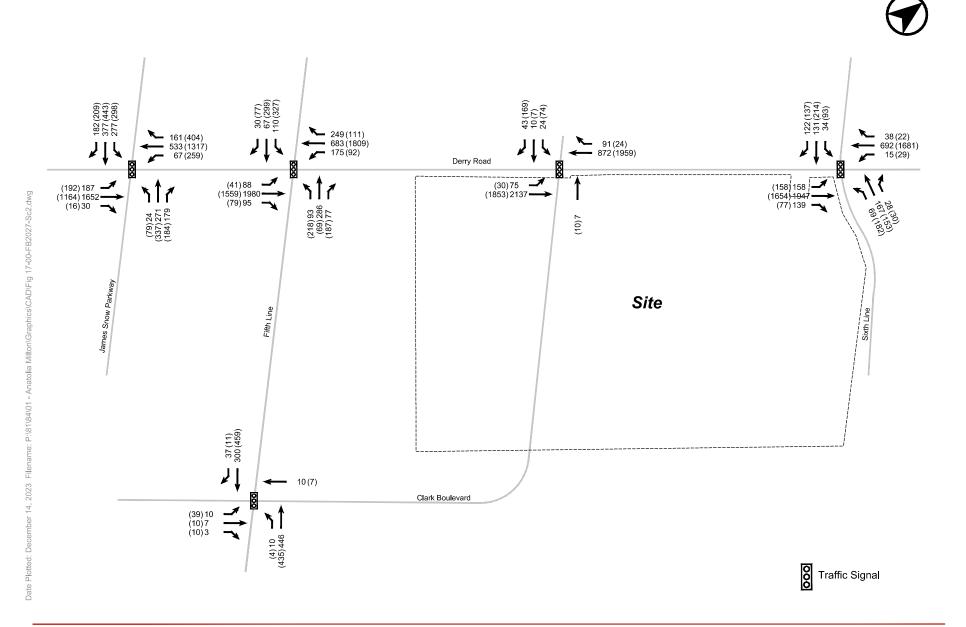


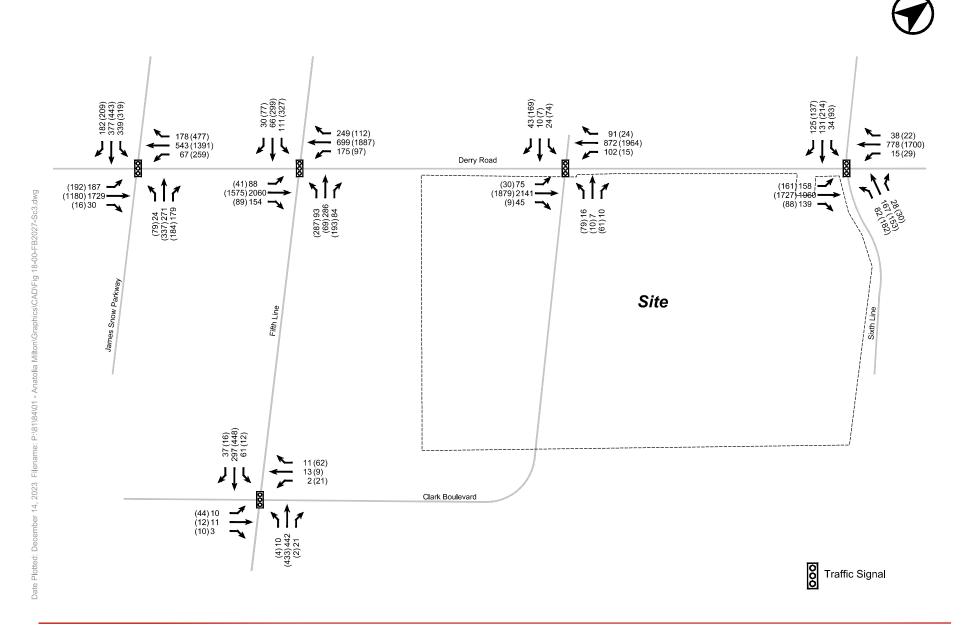


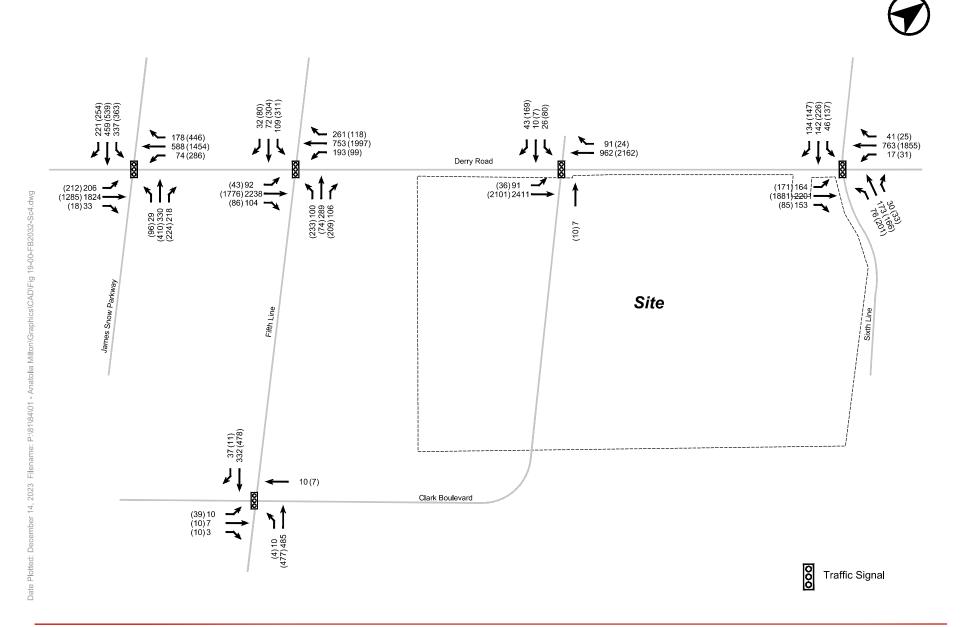
7.2.5 Future Background Traffic Volumes

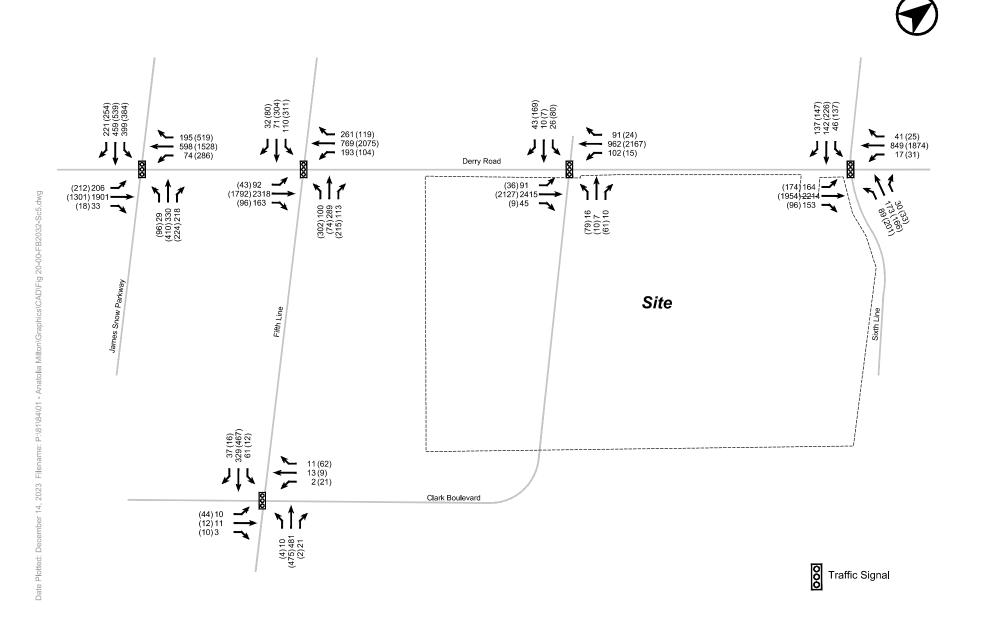
Future background traffic volumes represent the sum of existing traffic volumes and background growth volumes specific to each scenario. Future background traffic volumes for the five background growth scenarios are illustrated in **Figure 16** through **Figure 20**.

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7.3 SITE TRAFFIC

7.3.1 Existing Site Traffic

The site is currently occupied by the Trafalgar Golf and Country Club, consisting of several low-rise recreational buildings and a golf course. The volume of traffic associated with these uses is unknown, but it is expected to be minor. For the traffic analysis, no existing traffic was removed from the network with the redevelopment of the site.

7.3.2 Total Site Trip Generation

The total number of weekday peak hour trips associated with each of the three proposed buildings were forecasted based on ITE 11th Edition trip generation rates for LUC 150 – Warehousing. The adopted ITE trip generation rates and proxy data collected by BA Group are summarized in **Table 13**.

TABLE 13: VEHICLE TRIP GENERATION RATE DATA

		Vehicle Trip Rate (vehicle trips per 1,000 ft²)					
Warehouse Type	Source	Al	M Peak F	lour	Р	M Peak Ho	our
		In	Out	2-Way	In	Out	2-Way
	ITE 10 th Edition + Supplement LUC 150 Warehousing General Urban/Suburban	0.13	0.04	0.17	0.05	0.13	0.18
General Warehousing	Prologis 8020 & 8030 Esquesing Line, Milton, ON Tuesday, February 2, 2016	0.13	0.02	0.15	0.02	0.13	0.15
	Prologis 8020 & 8030 Esquesing Line, Milton, ON Thursday, August 16, 2018	0.16	0.03	0.19	0.03	0.15	0.18
	Average	0.14	0.03	0.17	0.03	0.14	0.17
Adopted Trip Rates	(ITE)	0.13	0.04	0.17	0.05	0.13	0.18

Notes:

Forecasted site trips for each of the three proposed buildings are summarized in Table 14.

This information is property of BA Consulting Group Ltd. It should not be altered, abbreviated, taken out of context, or used for any purpose other than the intended purpose in connection with the Anatolia Milton Lands development application.

TABLE 14 TOTAL SITE VEHICLE TRIP GENERATION

Building	GFA	AM Peak Hour			PM Peak Hour			
		In	Out	2-way	In	Out	2-way	
Trip Generation Rate (LUC 150) (per 1000 ft²)		0.13	0.04	0.17	0.05	0.13	0.18	
Building 1	1,126,550 ft ²	147	44	192	57	146	203	
Building 2	635,635 ft ²	83	25	108	32	82	114	
Building 3	198,078 ft ²	26	8	34	10	26	36	
Total Vehicle Trips	1,960,264 ft ²	256	77	334	99	254	353	

7.3.3 Heavy Vehicle Percentages

The ITE rates summarized in **Table 13** account for both heavy vehicles using the proposed warehouse loading and light vehicles primarily used by warehouse staff. Heavy vehicle percentages for warehouse traffic were adopted from the ITE documentation, as summarized in **Table 15**.

TABLE 15 SITE HEAVY VEHICLE PERCENTAGE

Study	Date	AM Peak Hour			PM Peak Hour		
,	22	In	Out	2-Way	In	Out	2-Way
ITE 150 – Warehousing		8%	24%	12%	31%	10%	16%
Prologis – 8020 & 8030 Esquesing Lane, Milton, ON	Tuesday, February 2 nd , 2016	10%	71%	17%	60%	10%	16%
	Thursday, August 16 th , 2018	9%	35%	13%	31%	5%	10%
Average Heavy Vehicle %		9%	43%	14%	41%	8%	14%
Adopted Heavy Vehicle % (ITE)		8%	24%	12%	31%	10%	16%

This information is property of BA Consulting Group Ltd. It should not be altered, abbreviated, taken out of context, or used for any purpose other than the intended purpose in connection with the Anatolia Milton Lands development application.

7.3.4 Site Traffic Distribution

Site traffic was assigned to the area road network based on the results of the 2016 TTS, prevailing traffic patterns and area turn restrictions. General direction of approach percentages for work/employment traffic was based on the results of the TTS and is summarized in **Table 16**.

TABLE 16 SITE TRAFFIC DISTRIBUTION

Direction	Route	Light V	ehicles ¹	Heavy Vehicles ²		
2	110210	Inbound	Outbound	Inbound	Outbound	
North	James Snow Parkway	20%	26%	50%	50%	
	Fifth Line	1%	2%	0%	0%	
	Clark Boulevard	0%	0%	0%	0%	
	Sixth Line	1%	1%	0%	0%	
South	James Snow Parkway	0%	0%	20%	20%	
	Fifth Line	11%	9%	0%	0%	
	Sixth Line	5%	4%	0%	0%	
East	Derry Road	33%	28%	20%	20%	
West	Derry Road	29%	30%	10%	10%	
	Clark Boulevard	0%	0%	0%	0%	
Total		100%	100%	100%	100%	

^{1.} Light vehicle distribution is based on work trips for TTS Zones 4112, 4116-4118, 4121, 4145, 4147 and 4148. TTC queries and analysis are provided in **Appendix H**.

^{2.} Heavy vehicle distribution is based on area travel patterns for heavy vehicles.

7.3.5 Site Traffic Volumes

As summarized above, vehicle trips associated with the proposed development are forecasted based on ITE 11th Edition trip generation rates for LUC 150 – Warehousing and separated into heavy and light vehicle trips based on ITE data.

Vehicle trips, disaggregated by vehicle type and by building within the proposed development, are summarized in **Table 17**.

TABLE 17 SITE VEHICLE TRIP SUMMARY

Vahiala Tyra	AM Peak Hour			PM Peak Hour				
Vehicle Type	In	Out	2-way	In	Out	2-way		
Building 1								
Light Vehicles	136	33	169	39	131	170		
Heavy Vehicles	12	11	23	18	15	33		
Total	148	44	192	57	146	203		
Building 2								
Light Vehicles	77	19	96	22	74	96		
Heavy Vehicles	7	6	13	10	8	18		
Total	84	25	109	32	82	114		
Building 3								
Light Vehicles	24	6	30	7	23	30		
Heavy Vehicles	2	2	4	3	3	6		
Total	26	8	34	10	26	36		
Total Vehicle Trips	258	77	335	99	254	353		

Site traffic route choices vary depending on the construction of the Clark Boulevard extension between Fifth Line and the site, necessitating a separate assignment for background growth Scenario 1.

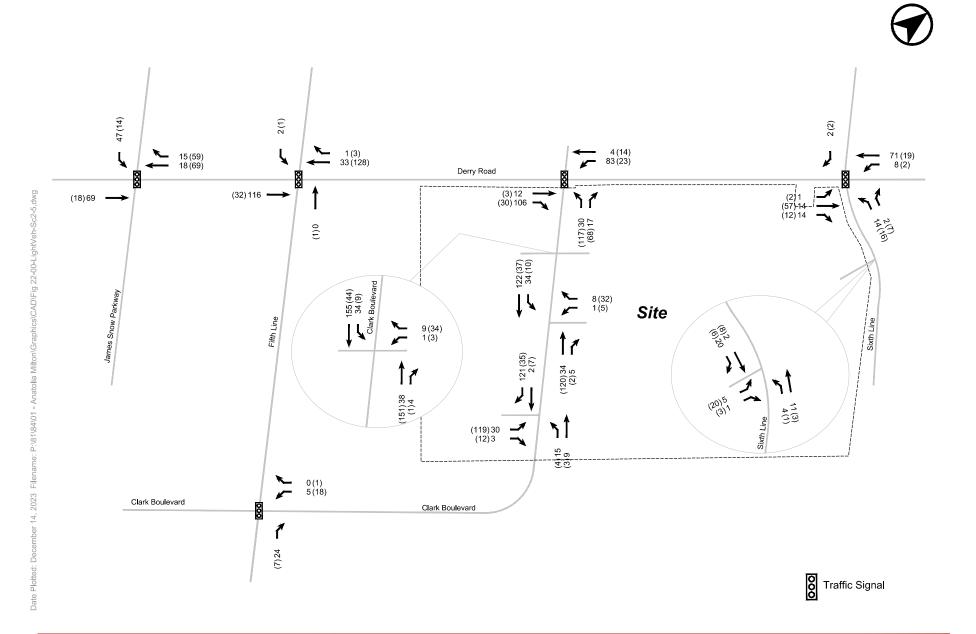
The site is expected to generate a total of 335 and 353 two-way trips, during the morning and afternoon peak period, respectively. Within this total, 40 two-way trips during the morning peak period and 57 two-way trips during the afternoon peak period are expected to be heavy vehicles (trucks).

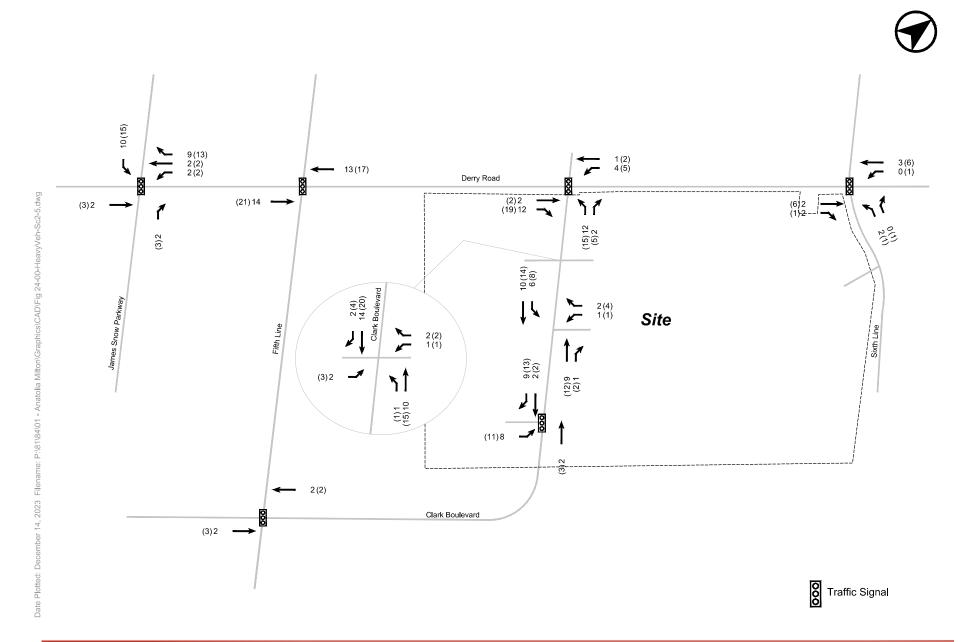
Light vehicle site traffic volumes for Scenario 1 are illustrated in **Figure 21** while light vehicle site volumes for Scenarios 2 through 5 are illustrated in **Figure 22**.

Heavy vehicle site traffic volumes for Scenario 1 are illustrated in **Figure 23** while heavy vehicle site volumes for Scenarios 2 through 5 are illustrated in **Figure 24**

Total vehicle site traffic volumes for Scenario 1 are illustrated in **Figure 25** while total vehicle site volumes for Scenarios 2 through 5 are illustrated in and **Figure 26**.

Date Plotted: December 14, 2023 Filename: P:\81\84\01 - Anatolia Milton\Graphics\CAD\Fig 21-00-LightVeh-Sc1.dwg



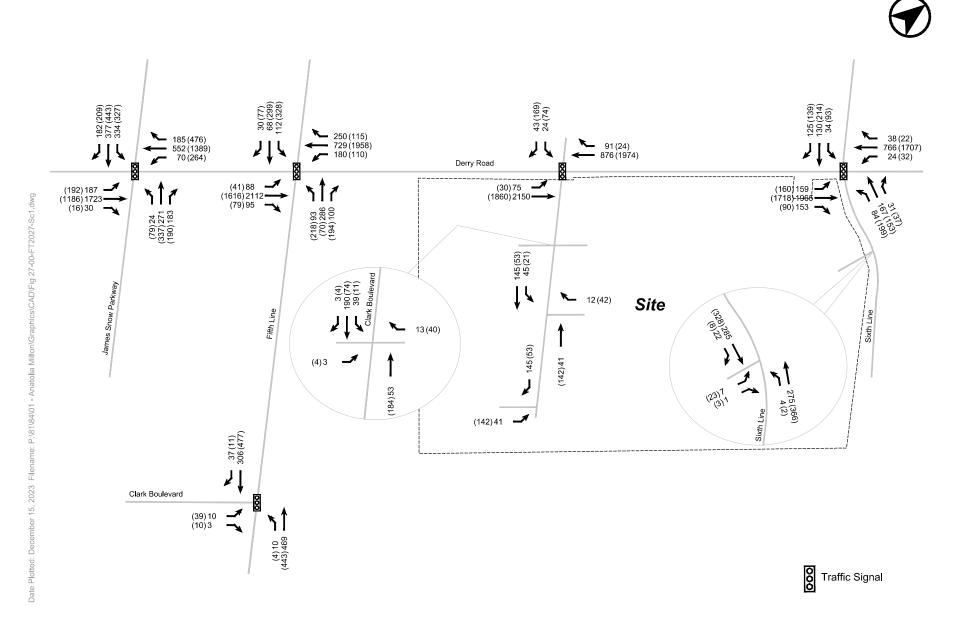


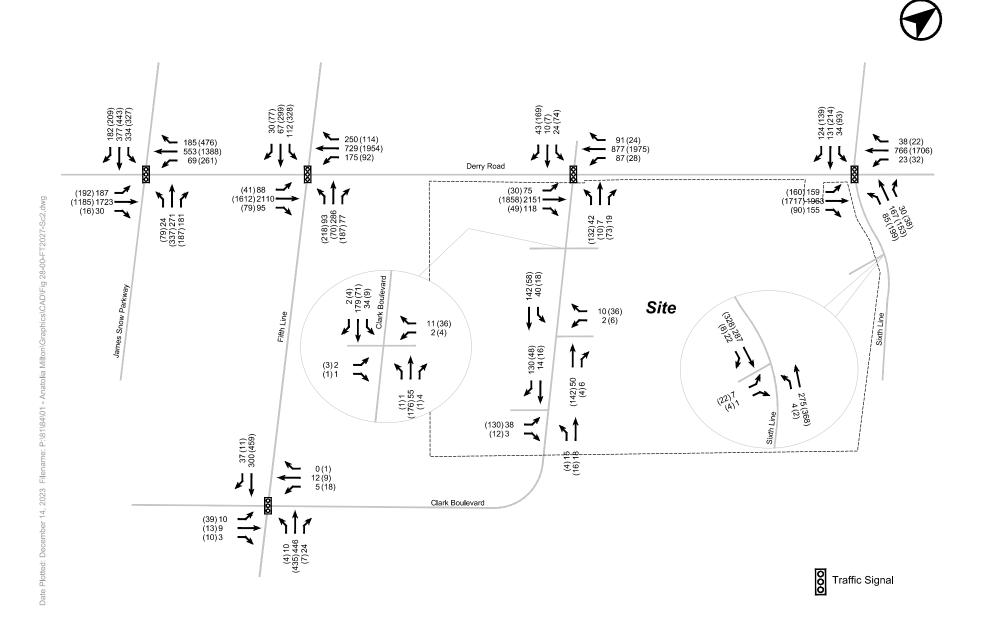
Date Plotted: December 15, 2023 Filename: P:\81\84\01 - Anatolia Milton\Graphics\CAD\Fig 25-00-ST-Sc1.dwg

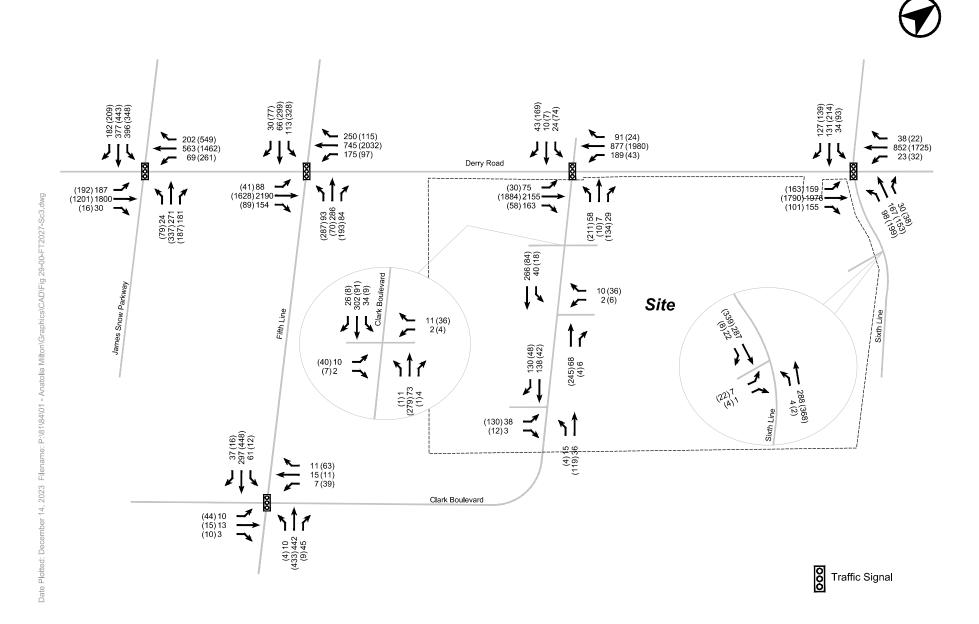
Date Plotted: December 14, 2023 Filename: P:\81\84\01 - Anatolia Milton\Graphics\CAD\Fig 26-00-ST-Sc2-5.dwg

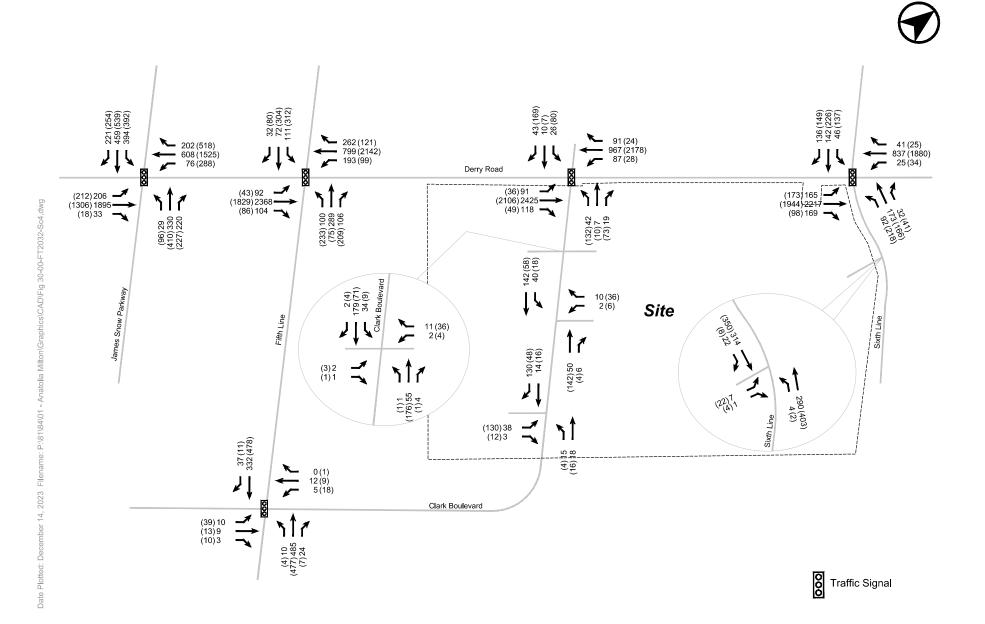
7.4 FUTURE TOTAL TRAFFIC VOLUMES

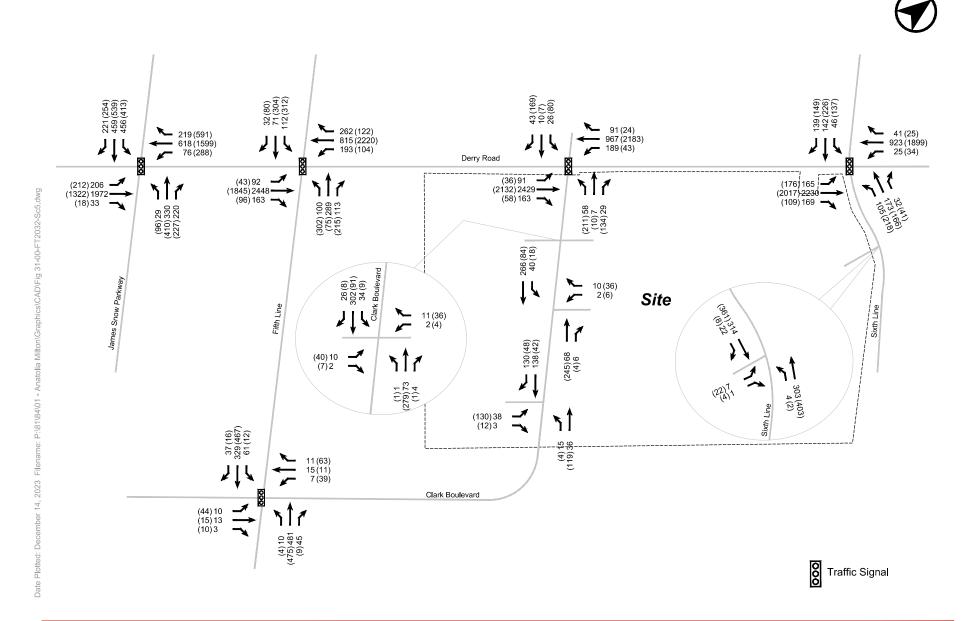
Future total traffic volumes represent the sum of future background traffic volumes and total site traffic volumes for a given scenario. Future total volumes for the five analysis scenarios are illustrated in **Figure 27** through **Figure 31**.











8.0 TRAFFIC OPERATIONS ANALYSIS

8.1 ANALYSIS METHODOLOGY

Synchro Version 11 and the Highway Capacity Manual (HCM) methodology were used to analyze the study area signalized and unsignalized stop-controlled intersections.

For signalized intersections, the volume-to-capacity ratio (v/c) is an indicator of the capacity utilization for the key movements in the intersection. A v/c of 1.00 indicates that a traffic movement through an intersection is operating at or near maximum capacity.

For unsignalized intersections, level of service (LOS) characterizes operational conditions for key movements in terms of average delay experienced by vehicles attempting to complete a manoeuvre through the intersection. LOS 'A' represents a good level of service with short delays, while LOS 'F' represents a poor level of service with extended delays.

8.2 ANALYSIS ASSUMPTION AND PARAMETERS

The Synchro analysis performed conforms to the requirements of the *Halton Regional Guidelines for Using Synchro Version 7.0.*

Existing traffic signal timing plans for study area intersections have been obtained from the Region of Halton and are attached in **Appendix I**. Traffic signal timings for future intersections where Clark Boulevard meets Fifth Line and Derry Road have been assumed based on the timing and cycle characteristics of surrounding intersections.

8.3 TRAFFIC ANALYSIS SUMMARY

Intersection capacity analysis results include the following scenarios:

- 2023 Existing Conditions
- 2027 Future Horizon
 - Scenario 1 Future Background Conditions
 - Scenario 1 Future Total Conditions
 - o Scenario 2 Future Background Conditions
 - Scenario 2 Future Total Conditions
 - Scenario 3 Future Background Conditions
 - Scenario 3 Future Total Conditions
- 2032 Future Horizon
 - Scenario 4 Future Background Conditions
 - Scenario 4 Future Total Conditions
 - Scenario 5 Future Background Conditions
 - Scenario 5 Future Total Conditions
- 2032 Future Horizon Sensitivity Derry Road Expansion
 - Scenario 6 Future Background Conditions
 - o Scenario 6 Future Total Conditions
 - o Scenario 7 Future Background Conditions
 - o Scenario 7 Future Total Conditions

The traffic analysis is provided for signalized and unsignalized intersections. Detailed Synchro analysis sheets are provided in **Appendix J**.

8.3.1 2023 Existing Conditions

Under existing conditions, the study area includes three signalized intersections. Analysis results for these intersections are summarized below.

Sixth Line / Derry Road

The intersection of **Sixth Line / Derry Road** operates with a cycle length of 111 seconds under existing conditions. Analysis results for this intersection are summarized in **Table 18**.



TABLE 18 EXISTING SIXTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Movement	V/C	LOS
EBL	0.10 (0.59)	A (C)
EBTR	0.95 (0.86)	C (C)
WBL	0.15 (0.17)	B (B)
WBTR	0.35 (0.87)	A (C)
NBL	0.62 (0.90)	E (F)
NBTR	0.25 (0.38)	D (D)
SBL	0.12 (0.32)	D (D)
SBTR	0.68 (0.48)	D (D)
Overall	0.88 (0.87)	C (C)

Notes:

This intersection operates acceptably under existing conditions.

 $^{00\ (00)-}AM\ (PM)$ Capacity analysis is carried out using the existing signal timing plan for this intersection.

Fifth Line / Derry Road

The intersection of **Fifth Line / Derry Road** operates with a cycle length of 120 seconds under existing conditions. Analysis results for this intersection are summarized in **Table 19**.

TABLE 19 EXISTING FIFTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Movement	V/C	LOS
EBL	0.09 (0.21)	A (C)
EBTR	0.90 (0.84)	B (C)
WBL	0.47 (0.30)	C (B)
WBTR	0.35 (0.92)	A (C)
NBL	0.39 (0.45)	D (D)
NBTR	0.21 (0.21)	D (D)
SBL	0.68 (0.86)	E (E)
SBTR	0.23 (0.13)	D (D)
Overall	0.84 (0.89)	B (C)

Notes:

This intersection operates acceptably under existing conditions.

^{1. 00 (00) –} AM (PM)

^{2.} Capacity analysis is carried out using the existing signal timing plan for this intersection.

James Snow Parkway / Derry Road

The intersection of **James Snow Parkway / Derry Road** operates with a cycle length of 120 seconds under existing conditions. Analysis results for this intersection are summarized in **Table 20**.

TABLE 20 EXISTING JAMES SNOW PARKWAY / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Movement	V/C	LOS
EBL	0.55 (0.58)	D (D)
EBT	0.86 (1.07)	C (F)
EBR	0.02 (0.01)	B (C)
WBL	1.03 (0.64)	F (C)
WBT	0.39 (0.90)	C (D)
WBR	0.10 (0.40)	E (D)
NBL	0.11 (0.34)	D (D)
NBT	0.56 (0.65)	D (D)
NBR	0.11 (0.12)	D (D)
SBL	0.60 (0.67)	C (C)
SBT	0.36 (0.46)	C (D)
SBR	0.12 (0.13)	C (C)
Overall	0.86 (0.85)	D (D)

Notes:

This intersection operates acceptably under existing conditions.

^{1. 00 (00) –} AM (PM)

^{2.} Capacity analysis is carried out using the existing signal timing plan for this intersection.

8.3.2 2027 Future Horizon

Under future conditions in 2027, the study area includes five signalized intersections and four unsignalized intersections to be considered with the development of the site. The 2027 horizon includes three separate forecasting scenarios. Analysis results for these intersections are summarized below.

Sixth Line / Derry Road

The intersection of **Sixth Line / Derry Road** operates with a cycle length of 111 seconds under future conditions. Analysis results for this intersection are summarized in **Table 21**.

TABLE 21 2027 SIXTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Movement		Scen	ario 1			Scen	ario 2		Scenario 3			
	Fut Backg		Future Total		Future Background		Future Total		Future Background		Future Total	
	V/C	LOS										
EBL	0.35 (0.89)	A (E)	0.38 (0.89)	A (E)	0.35 (0.89)	A (E)	0.38 (0.89)	A (E)	0.36 (0.87)	A (E)	0.39 (0.88)	A (E)
EBTR	1.08 (1.18)	E (F)	1.12 (1.23)	F (F)	1.08 (1.18)	E (F)	1.12 (1.23)	F (F)	1.08 (1.22)	E (F)	1.13 (1.27)	F (F)
WBL	0.14 (0.23)	C (C)	0.19 (0.25)	C (C)	0.14 (0.23)	C (C)	0.18 (0.25)	C (C)	0.14 (0.23)	C (C)	0.18 (0.25)	C (C)
WBTR	0.44 (1.32)	B (F)	0.49 (1.35)	B (F)	0.44 (1.32)	B (F)	0.49 (1.35)	B (F)	0.43 (1.17)	B (F)	0.47 (1.19)	B (F)
NBL	0.70 (1.02)	E (F)	0.86 (1.13)	F (F)	0.71 (1.03)	E (F)	0.87 (1.13)	F (F)	0.81 (0.97)	E (F)	0.96 (1.06)	F (F)
NBTR	0.61 (0.32)	D (C)	0.62 (0.33)	D (C)	0.61 (0.32)	D (C)	0.61 (0.33)	D (C)	0.60 (0.32)	D (C)	0.60 (0.33)	D (C)
SBL	0.34 (0.53)	D (D)	0.34 (0.54)	D (D)	0.34 (0.53)	D (D)	0.34 (0.54)	D (D)	0.23 (0.37)	D (D)	0.23 (0.37)	D (D)
SBTR	0.76 (0.91)	D (E)	0.75 (0.89)	D (E)	0.75 (0.90)	D (E)						
Overall	1.00 (1.21)	D (F)	1.04 (1.26)	E (F)	1.00 (1.21)	D (F)	1.04 (1.26)	E (F)	1.01 (1.17)	D (F)	1.06 (1.23)	E (F)

Notes:

This intersection is forecasted to operate essentially at capacity under 2027 future conditions during the weekday morning peak hour. Eastbound and westbound through movements may be capacity-constrained under 2027 future conditions, especially during the weekday afternoon peak hour. This is primarily due to substantial corridor growth and greatly increased flows on specific turning movements due to background developments. The development of the site is expected to have a modest impact relative to background growth within the study area.

^{1. 00 (00) –} AM (PM)

Capacity analysis is carried out using a signal timing plan adjustments to account for future travel patterns, while maintaining the existing cycle length.

Fifth Line / Derry Road

The intersection of **Fifth Line / Derry Road** operates with a cycle length of 120 seconds under future conditions. Analysis results for this intersection are summarized in **Table 22**.

TABLE 22 2027 FIFTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Movement		Scen	ario 1			Scen	ario 2		Scenario 3			
	Future Background		· LEUTURA LATAL		Future Background		Future Total		Future Background		Future Total	
	V/C	LOS										
EBL	0.27 (0.33)	A (D)	0.28 (0.33)	A (D)	0.27 (0.33)	A (D)	0.28 (0.33)	A (D)	0.24 (0.29)	A (D)	0.25 (0.29)	A (D)
EBTR	1.09 (0.99)	D (D)	1.15 (1.04)	F (D)	1.09 (0.99)	D (D)	1.15 (1.02)	F (D)	1.16 (1.00)	F (D)	1.22 (1.03)	F (D)
WBL	1.16 (0.62)	F (C)	1.19 (0.70)	F (C)	1.16 (0.62)	F (C)	1.16 (0.62)	F (C)	1.01 (0.58)	F (C)	1.01 (0.58)	F (C)
WBTR	0.50 (1.11)	B (F)	0.52 (1.20)	B (F)	0.50 (1.11)	B (F)	0.52 (1.20)	B (F)	0.49 (1.14)	B (F)	0.52 (1.22)	B (F)
NBL	0.43 (1.07)	D (F)	0.43 (1.07)	D (F)	0.43 (1.04)	D (F)	0.43 (1.04)	D (F)	0.43 (1.33)	D (F)	0.43 (1.33)	D (F)
NBTR	0.61 (0.37)	D (D)	0.64 (0.39)	D (D)	0.61 (0.36)	D (D)	0.61 (0.37)	D (D)	0.57 (0.36)	D (D)	0.57 (0.36)	D (D)
SBL	1.09 (1.43)	F (F)	1.21 (1.45)	F (F)	1.09 (1.43)	F (F)	1.11 (1.44)	F (F)	1.14 (1.45)	F (F)	1.16 (1.45)	F (F)
SBTR	0.13 (0.74)	D (D)	0.13 (0.75)	D (D)	0.13 (0.75)	D (D)						
Overall	1.14 (1.19)	D (E)	1.19 (1.26)	E (F)	1.14 (1.19)	D (E)	1.15 (1.24)	E (F)	1.14 (1.20)	E (F)	1.19 (1.26)	F (F)

Notes:

This intersection is forecasted to be pushed over capacity under 2027 future conditions. This is primarily due to substantial corridor growth and greatly increased flows on specific turning movements due to background developments. The development of the site is expected to have a modest impact relative to background growth within the study area.

^{1. 00 (00) –} AM (PM)

Capacity analysis is carried out using a signal timing plan adjustments to account for future travel patterns, while maintaining the existing cycle length.

James Snow Parkway / Derry Road

The intersection of **James Snow Parkway / Derry Road** operates with a cycle length of 120 seconds under future conditions. Analysis results for this intersection are summarized in **Table 23**.

TABLE 23 2027 JAMES SNOW PARKWAY / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Movement		Scen	ario 1			Scen	ario 2		Scenario 3			
		ure round	Future Total			Future Background		e Total	Fut Backg	ure round	Future	e Total
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.56 (0.57)	D (D)	0.56 (0.57)	D (D)	0.56 (0.57)	D (D)	0.56 (0.57)	D (D)	0.56 (0.57)	D (D)	0.56 (0.57)	D (D)
EBT	0.98 (0.88)	D (D)	1.02 (0.90)	E (D)	0.98 (0.88)	D (D)	1.02 (0.90)	E (D)	1.07 (0.95)	E (D)	1.12 (0.97)	F(E)
EBR	0.02 (0.01)	B (C)	0.02 (0.01)	B (C)	0.02 (0.01)	B (C)	0.02 (0.01)	B (C)	0.02 (0.01)	B (C)	0.02 (0.01)	B (C)
WBL	0.44 (0.82)	B (C)	0.46 (0.84)	C (C)	0.44 (0.82)	B (C)	0.45 (0.83)	C (C)	0.44 (0.79)	C (C)	0.45 (0.80)	C (C)
WBT	0.36 (0.93)	B (C)	0.37 (0.98)	B (D)	0.36 (0.93)	B (C)	0.38 (0.98)	C (D)	0.36 (0.96)	C (D)	0.38 (1.01)	C (D)
WBR	0.11 (0.39)	D (D)	0.12 (0.47)	D (D)	0.11 (0.39)	D (D)	0.12 (0.47)	D (D)	0.13 (0.51)	E (D)	0.14 (0.60)	E (D)
NBL	0.11 (0.30)	D (D)	0.11 (0.30)	D (D)	0.11 (0.30)	D (D)	0.11 (0.30)	D (D)	0.13 (0.32)	D (D)	0.13 (0.32)	D (D)
NBT	0.60 (0.67)	D (D)	0.60 (0.67)	D (D)	0.60 (0.67)	D (D)	0.60 (0.67)	D (D)	0.59 (0.66)	D (D)	0.59 (0.66)	D (D)
NBR	0.15 (0.17)	D (D)	0.23 (0.22)	D (D)	0.15 (0.17)	D (D)	0.22 (0.21)	D (D)	0.24 (0.22)	D (D)	0.30 (0.27)	D (D)
SBL	0.82 (0.91)	D (E)	0.99 (1.00)	F (F)	0.82 (0.91)	D (E)	0.99 (1.00)	F (F)	0.94 (0.91)	E (E)	1.10 (1.00)	F (F)
SBT	0.51 (0.63)	D (D)	0.51 (0.63)	D (D)	0.51 (0.63)	D (D)	0.51 (0.63)	D (D)	0.46 (0.58)	D (D)	0.46 (0.58)	D (D)
SBR	0.13 (0.15)	D (D)	0.13 (0.15)	D (D)	0.13 (0.15)	D (D)	0.13 (0.15)	D (D)	0.12 (0.14)	C (D)	0.12 (0.14)	C (D)
Overall	0.93 (0.95)	D (D)	1.02 (1.02)	D (D)	0.93 (0.95)	D (D)	1.02 (1.01)	D (D)	1.03 (0.97)	E (D)	1.12 (1.02)	E (D)

Notes:

This intersection is forecasted to operate essentially at capacity under 2027 future conditions. This is primarily due to substantial corridor growth and greatly increased flows on specific turning movements due to background developments. It is noted that in Scenario 3, due to the additional background traffic volumes added relative to Scenario 2, the southbound left-turn movement is capacity-constrained under future total

^{1. 00 (00) –} AM (PM)

^{2.} Capacity analysis is carried out using a signal timing plan adjustments to account for future travel patterns, while maintaining the existing cycle length.

conditions. The development of the site is expected to have a modest impact relative to background growth within the study area.

Clark Boulevard / Derry Road

The intersection of **Clark Boulevard / Derry Road** is assumed to operate with a cycle length of 120 seconds under future conditions. Analysis results for this intersection are summarized in **Table 24**.

TABLE 24 2027 CLARK BOULEVARD / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Movement		Scen	ario 1		l	Scen	ario 2		Scenario 3			
	Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.20 (0.52)	A (B)	0.22 (0.53)	A (C)	0.20 (0.53)	A (B)	0.22 (0.53)	A (B)	0.22 (0.53)	A (B)	0.27 (0.53)	B (C)
EBTR	0.78 (0.75)	B (B)	0.97 (0.92)	C (C)	0.78 (0.76)	B (B)	0.96 (0.89)	C (C)	0.92 (0.83)	C (C)	1.18 (1.01)	F (D)
WBL	()	()	0.53 (0.30)	D (C)	()	()	0.52 (0.26)	D (C)	0.57 (0.16)	D (B)	0.53 (0.36)	D (C)
WBTR	0.36 (0.81)	A (B)	0.36 (0.87)	A (B)	0.36 (0.81)	A (B)	0.36 (0.85)	A (B)	0.36 (0.81)	A (B)	0.36 (0.93)	A (C)
NBL	()	()	0.50 (0.90)	E (F)	()	()	0.46 (0.91)	E (F)	0.19 (0.70)	D (E)	0.57 (0.97)	E (F)
NBTR	()	()	0.01 (0.05)	D (D)	0.06 (0.04)	D (D)	0.08 (0.09)	D (D)	0.08 (0.08)	D (D)	0.08 (0.22)	D (D)
SBL	0.22 (0.30)	D (D)	0.24 (0.30)	D (D)	0.28 (0.37)	D (D)	0.25 (0.34)	D (D)	0.28 (0.39)	D (D)	0.23 (0.30)	D (D)
SBTR	0.03 (0.71)	D (E)	0.03 (0.43)	D (D)	0.13 (0.72)	D (E)	0.12 (0.62)	D (D)	0.13 (0.72)	D (E)	0.11 (0.47)	D (D)
Overall	0.74 (0.79)	B (B)	0.90 (0.93)	C (C)	0.77 (0.83)	B (B)	0.88 (0.90)	C (C)	0.84 (0.83)	B (C)	0.99 (1.01)	E (D)

Notes:

1. 00 (00) – AM (PM)

This intersection generally operates acceptably under 2027 future conditions. It is noted that in Scenario 3, due to the additional background traffic volumes added relative to Scenario 2, the eastbound through movement is capacity-constrained under future total conditions. The development of the site is expected to have a modest impact relative to background growth within the study area.

Fifth Line / Clark Boulevard

The intersection of **Fifth Line / Clark Boulevard** is assumed to operate with a cycle length of 120 seconds under future conditions. Analysis results for this intersection are summarized in **Table 25**.

TABLE 25 2027 FIFTH LINE / CLARK BOULEVARD CAPACITY ANALYSIS SUMMARY

Movement		Scenario 1				Scenario 2				Scenario 3			
	Future Background		Future Total		Future Background		Future Total		Future Background		Future Total		
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	
EBL	0.20 (0.20)	C (B)	0.20 (0.21)	C (B)	0.16 (0.23)	B (B)	0.14 (0.22)	B (B)	0.14 (0.24)	B (B)	0.07 (0.18)	B (B)	
EBTR	0.00 (0.01)	B (B)	0.00 (0.01)	B (B)	0.12 (0.06)	B (B)	0.14 (0.06)	B (B)	0.16 (0.06)	B (B)	0.09 (0.05)	B (B)	
WBL	()	()	()	()	()	()	0.07 (0.10)	B (B)	0.02 (0.11)	B (B)	0.05 (0.15)	B (B)	
WBTR	()	()	()	()	0.16 (0.03)	B (B)	0.17 (0.04)	B (B)	0.19 (0.08)	B (B)	0.12 (0.08)	B (B)	
NBL	0.02 (0.01)	A (A)	0.02 (0.01)	A (A)	0.02 (0.01)	A (A)	0.02 (0.01)	A (A)	0.02 (0.01)	A (A)	0.02 (0.01)	A (A)	
NBTR	0.37 (0.40)	A (A)	0.39 (0.41)	A (A)	0.38 (0.42)	A (A)	0.41 (0.44)	A (A)	0.40 (0.45)	A (A)	0.45 (0.51)	A (A)	
SBL	()	()	()	()	()	()	()	()	0.11 (0.03)	A (A)	0.12 (0.03)	A (A)	
SBTR	0.28 (0.43)	A (A)	0.29 (0.45)	A (A)	0.29 (0.45)	A (A)	0.29 (0.47)	A (A)	0.29 (0.48)	A (A)	0.31 (0.53)	A (A)	
Overall	0.36 (0.40)	A (A)	0.38 (0.41)	A (A)	0.37 (0.41)	A (A)	0.39 (0.42)	A (A)	0.39 (0.43)	A (A)	0.41 (0.43)	A (A)	

Notes:

1. 00 (00) – AM (PM)

This intersection operates acceptably under 2027 future conditions. The development of the site is expected to have a minor impact relative to background growth within the study area.

Unsignalized Intersections

Analysis results for unsignalized intersections within the study area (where site driveways intersect with public roads) are summarized in **Table 26**.

TABLE 26 2027 UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

	Scei	nario 1	Scen	ario 2	Scer	nario 3
Movement	Futui	e Total	Future	e Total	Futur	e Total
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
		Sixth	Line / Building	3 Access		
EBLR	B (B)	12.9 (14.9)	B (B)	12.9 (14.7)	B (B)	13.1 (14.9)
NBTL	A (A)	0.1 (0.1)	A (A)	0.1 (0.1)	A (A)	0.1 (0.1)
SBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
		Clark Bouleva	rd / Building 1 &	2 North Accesse	es .	
EBTLR	B (B)	11.3 (11.4)	B (B)	10.5 (10.5)	B (B)	12.6 (12.7)
WBTLR	A (A)	8.6 (9.5)	A (A)	9.0 (9.6)	A (B)	9.3 (10.4)
NBTLR	A (A)	0.0 (0.0)	A (A)	0.1 (0.0)	A (A)	0.1 (0.0)
SBTLR	A (A)	1.4 (1.0)	A (A)	1.3 (0.9)	A (A)	0.9 (0.7)
		Clark Boule	vard / Building 2	2 South Access		
WBLR	A (A)	8.6 (9.3)	A (A)	8.9 (9.4)	A (B)	9.2 (10.2)
NBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
SBTL	A (A)	1.9 (2.2)	A (A)	1.8 (1.9)	A (A)	1.2 (1.5)
		Clark Boule	vard / Building	South Access		
EBLR	A (A)	9.1 (9.3)	A (A)	9.4 (9.6)	B (B)	10.5 (10.6)
NBTL	A (A)	0.0 (0.0)	A (A)	3.4 (1.4)	A (A)	2.4 (0.2)
SBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)

Notes:

1. 00 (00) – AM (PM)

These intersections operate acceptably under 2027 future conditions.

8.3.3 2032 Future Horizon

Under future conditions in 2032, the study area includes five signalized intersections and four unsignalized intersections to be included with the development of the Site. The 2032 horizon includes two separate forecasting scenarios. Analysis results for these intersections are summarized below.

Sixth Line / Derry Road

The intersection of **Sixth Line / Derry Road** operates with a cycle length of 111 seconds under future conditions. Analysis results for this intersection are summarized in **Table 27**.

TABLE 27 2032 SIXTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Movement		Scen	ario 4			Scen	ario 5	
	Future Ba	ckground	Future	e Total	Future Ba	ckground	Future	e Total
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.36 (0.85)	A (E)	0.40 (0.86)	A (E)	0.40 (0.86)	A (E)	0.45 (0.87)	A (E)
EBTR	1.14 (1.29)	F (F)	1.20 (1.34)	F (F)	1.17 (1.35)	F (F)	1.23 (1.40)	F (F)
WBL	0.16 (0.24)	C (C)	0.20 (0.26)	C (C)	0.16 (0.24)	C (C)	0.20 (0.26)	C (C)
WBTR	0.45 (1.45)	B (F)	0.51 (1.48)	B (F)	0.51 (1.47)	B (F)	0.56 (1.49)	B (F)
NBL	0.70 (0.80)	E (D)	0.74 (0.87)	E (E)	0.73 (0.80)	E (D)	0.77 (0.87)	E (E)
NBTR	0.43 (0.19)	D (C)	0.40 (0.19)	D (C)	0.40 (0.19)	D (C)	0.36 (0.19)	D (C)
SBL	0.46 (0.87)	D (E)	0.42 (0.88)	D (E)	0.42 (0.87)	D (E)	0.38 (0.88)	D (E)
SBTR	0.39 (0.43)	D (D)	0.36 (0.43)	D (D)	0.36 (0.43)	D (D)	0.33 (0.43)	D (D)
Overall	1.05 (1.20)	E (F)	1.09 (1.24)	E (F)	1.08 (1.22)	E (F)	1.12 (1.26)	F (F)

Notes:

This intersection is forecasted to be pushed over capacity under 2032 future conditions. This is primarily due to substantial corridor growth and greatly increased flows on specific turning movements due to background developments. The development of the site is expected to have a modest impact relative to background growth within the study area.

^{1. 00 (00) –} AM (PM)

Capacity analysis is carried out using a signal timing plan adjustments to account for future travel patterns, while maintaining the existing cycle length.

Fifth Line / Derry Road

The intersection of **Fifth Line / Derry Road** operates with a cycle length of 120 seconds under future conditions. Analysis results for this intersection are summarized in **Table 28**.

TABLE 28 2032 FIFTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Movement		Scen	ario 4			Scen	ario 5	
	Future Ba	ckground	Future	e Total	Future Ba	ckground	Future	Total
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.30 (0.35)	A (E)	0.32 (0.35)	A (D)	0.31 (0.35)	A (E)	0.33 (0.35)	A (D)
EBTR	1.23 (1.13)	F (F)	1.29 (1.16)	F (F)	1.30 (1.15)	F (F)	1.37 (1.18)	F (F)
WBL	1.27 (0.66)	F (C)	1.27 (0.66)	F (C)	1.27 (0.69)	F (C)	1.27 (0.69)	F (C)
WBTR	0.54 (1.23)	B (F)	0.57 (1.31)	B (F)	0.55 (1.27)	B (F)	0.57 (1.36)	B (F)
NBL	0.47 (1.11)	D (F)	0.47 (1.11)	D (F)	0.47 (1.44)	D (F)	0.47 (1.44)	D (F)
NBTR	0.65 (0.43)	D (D)	0.65 (0.43)	D (D)	0.66 (0.45)	D (D)	0.66 (0.45)	D (D)
SBL	1.22 (1.41)	F (F)	1.24 (1.42)	F (F)	1.26 (1.43)	F (F)	1.28 (1.44)	F (F)
SBTR	0.14 (0.75)	D (D)	0.14 (0.75)	D (D)	0.14 (0.75)	D (D)	0.14 (0.75)	D (D)
Overall	1.26 (1.26)	F (F)	1.28 (1.32)	F (F)	1.29 (1.30)	F (F)	1.34 (1.36)	F (F)

Notes:

This intersection is forecasted to be pushed over capacity under 2032 future conditions. This is primarily due to substantial corridor growth and greatly increased flows on specific turning movements due to background developments. The development of the site is expected to have a modest impact relative to background growth within the study area.

^{1. 00 (00) –} AM (PM)

^{2.} Capacity analysis is carried out using a signal timing plan adjustments to account for future travel patterns, while maintaining the existing cycle length.

James Snow Parkway / Derry Road

The intersection of **James Snow Parkway / Derry Road** operates with a cycle length of 120 seconds under future conditions. Analysis results for this intersection are summarized in **Table 29**.

TABLE 29 2032 JAMES SNOW PARKWAY / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Movement		Scen	ario 4		Scenario 5					
	Future Ba	ckground	Future	e Total	Future Ba	ckground	Future	e Total		
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS		
EBL	0.58 (0.59)	D (D)	0.58 (0.59)	D (D)	0.58 (0.59)	D (D)	0.58 (0.59)	D (D)		
EBT	0.80 (0.79)	C (D)	0.84 (0.80)	C (D)	0.90 (0.80)	D (D)	0.94 (0.82)	D (D)		
EBR	0.02 (0.01)	B (C)	0.02 (0.01)	B (C)	0.02 (0.01)	B (C)	0.02 (0.01)	B (C)		
WBL	0.48 (0.81)	B (C)	0.49 (0.83)	C (C)	0.47 (0.82)	C (C)	0.49 (0.84)	C (C)		
WBT	0.30 (0.78)	B (C)	0.31 (0.82)	B (C)	0.33 (0.82)	C (C)	0.34 (0.87)	C (C)		
WBR	0.12 (0.39)	D (D)	0.14 (0.48)	D (D)	0.13 (0.48)	D (D)	0.15 (0.57)	D (D)		
NBL	0.16 (0.38)	D (D)	0.16 (0.38)	D (D)	0.16 (0.38)	D (D)	0.16 (0.38)	D (D)		
NBT	0.55 (0.66)	D (D)	0.55 (0.66)	D (D)	0.55 (0.66)	D (D)	0.55 (0.65)	D (D)		
NBR	0.26 (0.30)	D (D)	0.35 (0.35)	D (D)	0.24 (0.32)	D (D)	0.33 (0.37)	D (D)		
SBL	0.84 (0.90)	D (D)	0.97 (0.95)	E (E)	0.87 (0.94)	D (E)	0.99 (0.99)	E (E)		
SBT	0.37 (0.48)	C (D)	0.37 (0.47)	C (D)	0.33 (0.47)	C (D)	0.33 (0.46)	C (D)		
SBR	0.16 (0.18)	C (D)	0.16 (0.19)	C (C)	0.16 (0.18)	C (C)	0.16 (0.18)	C (C)		
Overall	0.83 (0.89)	C (D)	0.91 (0.93)	D (D)	0.90 (0.92)	D (D)	0.98 (0.97)	D (D)		

Notes:

. 00 (00) – AM (PM)

This intersection operates acceptably under 2032 future conditions. The planned widening of James Snow Parkway and Derry Road to six lanes each, allows substantial background growth to be accommodated. The development of the site is expected to have a modest impact relative to background growth within the study area.

^{2.} Capacity analysis is carried out using a signal timing plan adjustments to account for future travel patterns, while maintaining the existing cycle length.

Clark Boulevard / Derry Road

The intersection of **Clark Boulevard / Derry Road** is assumed to operate with a cycle length of 120 seconds under future conditions. Analysis results for this intersection are summarized in **Table 30**.

TABLE 30 2032 CLARK BOULEVARD / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Movement		Scen	ario 4			Scen	ario 5	
	Future Ba	ckground	Future	e Total	Future Background Future Tota			e Total
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.27 (0.63)	A (B)	0.29 (0.63)	A (C)	0.29 (0.64)	B (C)	0.35 (0.63)	B (C)
EBTR	0.88 (0.86)	B (B)	1.07 (1.00)	E (D)	1.04 (0.95)	D (C)	1.32 (1.14)	F (F)
WBL	()	()	0.52 (0.26)	D (C)	0.57 (0.16)	D (C)	0.53 (0.36)	D (C)
WBTR	0.39 (0.90)	A (B)	0.39 (0.93)	A (C)	0.39 (0.90)	A (B)	0.40 (1.02)	A (D)
NBL	()	()	0.46 (0.91)	E (F)	0.19 (0.68)	D (E)	0.57 (0.97)	E (F)
NBTR	0.06 (0.04)	D (D)	0.08 (0.09)	D (D)	0.08 (0.08)	D (D)	0.08 (0.23)	D (D)
SBL	0.29 (0.39)	D (D)	0.27 (0.37)	D (D)	0.30 (0.41)	D (D)	0.25 (0.33)	D (D)
SBTR	0.13 (0.73)	D (E)	0.12 (0.64)	D (D)	0.13 (0.73)	D (E)	0.11 (0.48)	D (D)
Overall	0.87 (0.90)	B (C)	0.98 (0.99)	D (C)	0.94 (0.92)	C (C)	1.08 (1.10)	F (E)

Notes:

1. 00 (00) – AM (PM)

This intersection generally operates acceptably under 2032 future conditions in Scenario 4, but heavy eastbound through traffic may push the intersection above its theoretical capacity in Scenario 5. Particularly, due to the additional background traffic volumes added relative to Scenario 4, the eastbound through movement in Scenario 5 is capacity-constrained under future total conditions. The development of the site is expected to have a modest impact relative to background growth within the study area.

Fifth Line / Clark Boulevard

The intersection of **Fifth Line / Clark Boulevard** is assumed to operate with a cycle length of 120 seconds under future conditions. Analysis results for this intersection are summarized in **Table 31**.

TABLE 31 2032 FIFTH LINE / CLARK BOULEVARD CAPACITY ANALYSIS SUMMARY

Movement	Scenario 4				l	Scen	ario 5		
	Future Ba	ckground	Future	Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	
EBL	0.17 (0.24)	C (B)	0.16 (0.22)	B (B)	0.14 (0.25)	B (B)	0.07 (0.18)	B (B)	
EBTR	0.13 (0.06)	B (B)	0.15 (0.07)	B (B)	0.16 (0.06)	B (B)	0.09 (0.05)	B (B)	
WBL	()	()	0.07 (0.11)	B (B)	0.03 (0.11)	B (B)	0.05 (0.15)	B (B)	
WBTR	0.17 (0.03)	C (B)	0.19 (0.04)	B (B)	0.20 (0.08)	B (B)	0.12 (0.08)	B (B)	
NBL	0.02 (0.01)	A (A)	0.02 (0.01)	A (A)	0.02 (0.01)	A (A)	0.02 (0.01)	A (A)	
NBTR	0.41 (0.45)	A (A)	0.44 (0.48)	A (A)	0.43 (0.49)	A (A)	0.48 (0.55)	A (A)	
SBL	()	()	()	()	0.11 (0.03)	A (A)	0.13 (0.03)	A (A)	
SBTR	0.31 (0.46)	A (A)	0.32 (0.48)	A (A)	0.32 (0.50)	A (A)	0.33 (0.55)	A (A)	
Overall	0.40 (0.43)	A (A)	0.42 (0.43)	A (A)	0.42 (0.45)	A (A)	0.44 (0.45)	A (A)	

Notes:

1. 00 (00) – AM (PM)

This intersection operates acceptably under 2032 future conditions. The development of the site is expected to have a minor impact relative to background growth within the study area.

Unsignalized Intersections

Analysis results for unsignalized intersections within the study area (where site driveways intersect with public roads) are summarized in **Table 32**.

TABLE 32 2032 UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

	Scen	ario 4	Scen	ario 5				
Movement	Future	e Total	Future Total					
	LOS	Delay (s)	LOS	Delay (s)				
Sixth Line / Building 3 East Access								
EBLR	B (B)	12.2 (13.4)	B (B)	12.3 (13.5)				
NBTL	A (A)	0.3 (0.1)	A (A)	0.3 (0.1)				
SBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)				
	Clark I	Boulevard / Building 1 &	2 North Accesses					
EBTLR	B (B)	10.5 (10.5)	B (B)	12.6 (12.7)				
WBTLR	A (A)	9.0 (9.6)	A (B)	9.3 (10.4)				
NBTLR	A (A)	0.1 (0.0)	A (A)	0.1 (0.0)				
SBTLR	A (A)	1.3 (0.9)	A (A)	0.9 (0.7)				
	Cla	rk Boulevard / Building 2	2 South Access					
WBLR	A (A)	8.9 (9.4)	A (B)	9.2 (10.2)				
NBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)				
SBTL	A (A)	1.8 (1.9)	A (A)	1.2 (1.5)				
	Clark Boulevard / Building 1 South Access							
EBLR	A (A)	9.4 (9.6)	B (B)	10.5 (10.6)				
NBTL	A (A)	3.4 (1.4)	A (A)	2.4 (0.2)				
SBTR Notes:	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)				

Notes:

1. 00 (00) – AM (PM)

These intersections operate acceptably under 2032 future conditions.

8.3.4 Sensitivity Analysis – Derry Road Expansion

Under future conditions, particularly for the 2032 horizon, intersections along Derry Road are forecasted to be pushed beyond their theoretical capacity, primarily due to significant background traffic growth. The only exception to this is the intersection of **James Snow Parkway / Derry Road**, which operates acceptably in 2032 due to the planned increase in the number of through lanes in all directions at the intersection. As the expansion of Derry Road to a six-lane cross-section east, beyond Sixth Line is expected to occur between 2031 and 2041, a sensitivity analysis was conducted to determine the impacts on intersection capacity if the widening is complete by 2032.

Two additional future analysis scenarios were thus included. In Scenario 6, the widening of Derry Road was assumed to be complete, while all other network and traffic assumptions were maintained from Scenario 4. In Scenario 7, all network and traffic assumptions other than the widening of Derry Road, were maintained from Scenario 5. Capacity analysis results for affected signalized intersections are provided below.

A new corridor labelled "5 ½ Line" was identified in between Fifth and Sixth Line in the 2011-2031 Transportation Master Plan, which will extend from Steeles Avenue to Britannia Road with an interchange to Highway 401. The corridor will have six lanes, with three lanes in each direction. The additional road capacity will address the travel demand and alleviate traffic volumes on the existing Derry Road corridor, as existing roads (James Snow Parkway, Trafalgar Road) were already designated to have six lanes, and there are no opportunities to widen local roads in Milton. The location and configuration of the corridor is subject to future study through a future Municipal Class Environmental Assessment 8 (MCEA) study, which has not been started. The need and timing of all corridor level improvement will be monitored by the Region through future updates to the Halton Region Transportation Master Plan.

Sixth Line / Derry Road

The intersection of **Sixth Line / Derry Road** operates with a cycle length of 111 seconds under future conditions. Analysis results for this intersection are summarized in **Table 33**.

TABLE 33 2032 SIXTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY – DERRY ROAD EXPANSION SENSITIVITY

Movement	(With C	lark Bouleva	ario 6 rd but no Rei pment)	mington	Scenario 7 (With Clark Boulevard and Remington Development)			
	Future Ba	ckground	Future	e Total	Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.35 (0.91)	A (E)	0.38 (0.95)	A (E)	0.38 (0.91)	A (E)	0.43 (0.96)	A (F)
EBTR	0.76 (0.81)	B (C)	0.81 (0.86)	B (C)	0.78 (0.84)	B (C)	0.83 (0.90)	B (C)
WBL	0.16 (0.24)	A (B)	0.20 (0.26)	B (B)	0.16 (0.24)	B (B)	0.20 (0.26)	B (B)
WBTR	0.30 (0.89)	A (C)	0.34 (0.92)	B (C)	0.34 (0.90)	B (C)	0.38 (0.93)	B (D)
NBL	0.70 (0.95)	E (F)	0.74 (0.97)	E (F)	0.73 (0.95)	E (F)	0.77 (0.96)	E (F)
NBTR	0.43 (0.21)	D (C)	0.40 (0.21)	D (C)	0.40 (0.21)	D (C)	0.36 (0.20)	D (C)
SBL	0.46 (0.67)	D (D)	0.42 (0.64)	D (D)	0.42 (0.67)	D (D)	0.38 (0.63)	D (D)
SBTR	0.39 (0.34)	D (C)	0.36 (0.33)	D (C)	0.36 (0.34)	D (C)	0.33 (0.32)	D (C)
Overall	0.75 (0.94)	B (C)	0.78 (0.98)	B (C)	0.77 (0.95)	B (C)	0.80 (0.98)	B (D)

Notes:

This intersection operates acceptably under 2032 future conditions if Derry Road is widened to six lanes.

^{1. 00 (00) –} AM (PM)

^{2.} Capacity analysis is carried out using a signal timing plan adjustments to account for future travel patterns, while maintaining the existing cycle length.

Fifth Line / Derry Road

The intersection of **Fifth Line / Derry Road** operates with a cycle length of 120 seconds under future conditions. Analysis results for this intersection are summarized in **Table 34**.

TABLE 34 2032 FIFTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY – DERRY ROAD EXPANSION SENSITIVITY

Movement	Scenario 6					Scen	ario 7		
	Future Ba	ckground	Future	e Total	Future Background		Future	Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	
EBL	0.30 (0.35)	A (D)	0.31 (0.35)	A (D)	0.30 (0.35)	A (D)	0.32 (0.35)	A (D)	
EBTR	0.92 (0.86)	B (C)	0.97 (0.88)	C (C)	0.97 (0.88)	C (C)	1.02 (0.90)	C (C)	
WBL	0.96 (0.65)	F (D)	0.96 (0.65)	F (D)	0.96 (0.68)	F (D)	0.96 (0.68)	F (D)	
WBTR	0.38 (0.94)	B (D)	0.40 (1.00)	B (D)	0.38 (0.98)	B (D)	0.40 (1.04)	B (E)	
NBL	0.41 (0.78)	D (D)	0.41 (0.78)	D (D)	0.41 (1.00)	D (F)	0.41 (1.00)	D (F)	
NBTR	0.57 (0.41)	D (D)	0.57 (0.41)	D (D)	0.58 (0.41)	D (D)	0.58 (0.41)	D (D)	
SBL	0.96 (1.02)	F (F)	1.00 (1.02)	F (F)	1.02 (1.04)	F (F)	1.03 (1.04)	F (F)	
SBTR	0.12 (0.74)	D (D)	0.12 (0.74)	D (D)	0.12 (0.75)	D (D)	0.12 (0.75)	D (D)	
Overall	0.98 (0.98)	C (D)	0.99 (1.02)	C (D)	0.99 (1.00)	C (D)	1.02 (1.04)	C (D)	

Notes:

Although the southbound left-turning movement may be capacity constrained due to particularly heavy volumes, this intersection essentially operates at capacity under 2032 future conditions if Derry Road is widened to six lanes.

^{1. 00 (00) –} AM (PM)

^{2.} Capacity analysis is carried out using a signal timing plan adjustments to account for future travel patterns, while maintaining the existing cycle length.

Clark Boulevard / Derry Road

The intersection of **Clark Boulevard / Derry Road** is assumed to operate with a cycle length of 120 seconds under future conditions. Analysis results for this intersection are summarized in **Table 35**.

TABLE 35 2032 CLARK BOULEVARD / DERRY ROAD CAPACITY ANALYSIS SUMMARY – DERRY ROAD EXPANSION SENSITIVITY

Movement		Scen	ario 6		l.	Scen	ario 7	
	Future Ba	ckground	Future	e Total	Future Background		Future	e Total
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.27 (0.60)	A (C)	0.31 (0.63)	B (D)	0.31 (0.61)	B (C)	0.37 (0.63)	C (D)
EBTR	0.61 (0.60)	B (B)	0.75 (0.70)	B (C)	0.72 (0.66)	B (B)	0.92 (0.80)	D (C)
WBL	()	()	0.52 (0.26)	C (B)	0.56 (0.16)	C (A)	0.53 (0.36)	C (B)
WBTR	0.27 (0.63)	A (A)	0.27 (0.65)	A (A)	0.27 (0.63)	A (A)	0.28 (0.72)	A (B)
NBL	()	()	0.46 (0.91)	E (F)	0.19 (0.68)	D (E)	0.57 (0.93)	E (F)
NBTR	0.06 (0.04)	D (D)	0.08 (0.09)	D (D)	0.08 (0.08)	D (D)	0.08 (0.22)	D (D)
SBL	0.29 (0.39)	D (D)	0.27 (0.37)	D (D)	0.30 (0.41)	D (D)	0.25 (0.32)	D (D)
SBTR	0.13 (0.73)	D (E)	0.12 (0.64)	D (D)	0.13 (0.73)	D (E)	0.11 (0.47)	D (D)
Overall	0.61 (0.67)	A (B)	0.70 (0.75)	B (B)	0.68 (0.68)	B (B)	0.80 (0.84)	C (C)

Notes:

1. 00 (00) – AM (PM)

This intersection operates below capacity under 2032 future conditions if Derry Road is widened to six lanes.

8.3.5 Overall Traffic Analysis Summary

While the area road network operates acceptably under existing conditions, capacity constraints arise in both the 2027 and 2032 future horizons. Specific vehicle movements at intersections along Derry Road are capacity constrained in 2027, and these operational issues are increased due to additional growth in 2032. It is noted, however, that the analysis includes compounding growth for every turning movement at intersections along Derry Road, and this contributes to substantial increases in traffic volumes for movements carrying high volumes under existing conditions. In practice, traffic growth may increase across a broader network with travel patterns reflecting capacity constraints for particular movements and intersections.

The most pronounced capacity issues in the network occur at the intersections of Sixth Line / Derry Road and Fifth Line / Derry Road. In accordance with the study terms of reference and comments provided by the Town and Region, growth for specific background developments is included at these intersections in addition to the

compounding growth applied to all intersections. Because the corridor growth rates adopted by the Region are meant to account for development in the area, the inclusion of site-specific growth on Town roads results in some degree of double-counting for area traffic growth. Furthermore, there is some uncertainty inherent in accounting for sites for which no transportation studies have yet been published, and the use of Secondary Plan traffic volumes to account for such sites may have led to unrealistically high volumes for specific turning movements.

Overall, operational issues in the network under future conditions are primarily caused by the substantial background growth that is assumed to occur, and actual future operations will depend on the extent to which this growth actually materializes. The sensitivity analysis conducted shows that the widening of Derry Road can mitigate the impacts of high growth, and that the necessity of widening Derry Road is also dependent on the extent of actual growth. Furthermore, as highlighted in the 2011-2031 Halton Region Transportation Master Plan, the addition of "5½ Line" will provide additional road capacity to alleviate the impacts of heavy traffic on Derry Road.

8.3.6 DERRY GREEN SECONDARY PLAN TRAFFIC VOLUME COMPARISON

The Derry Green Secondary Plan accounted for development on the site, though it is not clear from available documentation what network and site access configurations were assumed for the Anatolia Lands. The Secondary Plan development traffic can be compared with the proposed development on the basis of inbound and outbound traffic at the south leg of the Clark Boulevard Extension south of Derry Road. This comparison is provided in **Table 36**. The site trips considered for this report for the Anatolia lands are higher than what was estimated within the Derry Green Secondary Plan.

TABLE 36 SECONDARY PLAN COMPARISON – CLARK BOULEVARD / DERRY ROAD

		AM Peak Hour		PM Peak Hour			
	Inbound ¹	Outbound ²	2-Way	Inbound ¹	Outbound ²	2-Way	
Derry Green Secondary Plan	No AM tr	No AM traffic volumes provided			150	197	
Proposed Anatolia Development	232	69	301	89	228	317	
Difference				+42	+78	+120	

Notes:

Represents the sum of eastbound right-turn and westbound left-turn movements at the intersection of Clark Boulevard / Derry Road

Represents the sum of northbound right-turn and left-turn movements at the intersection of Clark Boulevard / Derry Road.

9.0 SAFETY ANALYSIS

9.1 SIGHT DISTANCE ASSESSMENT

A comprehensive sight distance review was completed for the proposed site access for Building 3 at the proposed full movement access along Sixth Line. The sight distance review utilized both the vertical and horizontal profile data obtained from surveys. The horizontal profile data is provided in **Appendix K.**

The site driveway accommodates light vehicles and heavy trucks for the purpose of industrial and commercial uses. The sight distances were evaluated in accordance with the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads. Key parameters include:

- Assumed driver's eye height of 1.08 metres for a passenger vehicle and 2.3 metres for a large truck
- Assumed setback distance of 4.4 metres between minor-road driver's eye to edge of major-road travel way
- Proposed posted 40 km/h curve advisory speed limit (50 km/h design speed) on Sixth Line between the Derry Road / Sixth Line intersection and Sixth Line site access

From a vertical profile perspective, the consultant Stantec will be providing grading plans that demonstrate that no visibility issues from minor road to major road will occur for both passenger vehicles and larger trucks at the proposed site access and have no visibility issues at proposed site driveway. It is important to note that the available sight distance is dependent on the right-of-way being kept clear of vertical obstructions up to the property line.

9.1.1 Site Access at Sixth line

A sight distance review was undertaken for the t-intersection located mid-block along the eastern edge of the site on Sixth Line, for the left-turning sight distances using a proposed reduced design speed of 50 km/h (10 km/h over the proposed posted curve advisory speed limit of 40 km/h) north of the site access and assuming the existing design speed of 90 km/h (20 km/h over the existing posted speed limit of 70 km/h), south of the site access. The sight distance calculations considered that there are curve advisory speed limit signs of 40 km/h posted for both the northbound and southbound directions of travel on Sixth Line. A 40 km/h advisory sign currently exists for the northbound direction of travel only.

Although the current posted speed limit is 70 km/h along Sixth Line south of Derry Road, a reduced posted curve advisory speed limit of 40 km/h is being proposed to address visibility and sight distance concerns along Sixth Line's existing S-curve road segment, between the signalized Derry Road and Sixth Line intersection to the north and the newly proposed site driveway along Sixth Line to the south. This proposed condition matches the existing 40 km/h posted curve advisory signage travelling northbound along Sixth Line as a motorist approaches the curved segment of the road towards Derry Road. The posted speed limit would resume at 70 km/h (design speed of 90 km/h) south of the site access along Sixth Line.

The sight distance calculations considered that there are curve advisory speed limit signs of 40 km/h posted for both the northbound and southbound directions of travel on Sixth Line. A 40 km/h advisory sign currently exists for the northbound direction of travel only.



Additional safety measures, including warning signs are proposed to support the reduced posted curve advisory 40 km/h speed limit heading southbound along the S-curve portion of Sixth Line as illustrated in the sight distance review plan, SD-01 in **Appendix K**.

The minimum required sight distances along Sixth Line at the proposed site access is shown in **Table 37** and are achieved in SD-01. Furthermore, the left-turn sight distance from the site driveway to Sixth Line is similar to the left-turn sight distance from Sixth Line to the site driveway.

It is noted that if vertical profile data is required, it could be provided in a subsequent submission. However, the current submission addresses potential vertical sightline obstructions as the site plan identifies the removal of existing trees within the sight distance triangle and the parking spaces adjacent to Building 3 are located outside of the sight distance triangle.

TABLE 37 SIGHT DISTANCE (SITE ACCESS AT SIXTH LINE)

Movement	TAC Minimum Requirement (metres)	Available Sight Distance (metres)						
Turning Sight Distance from Left – Southbound (Design Speed of 50 km/h)								
Site Access at Sixth Line								
Left-turn from Site Access to Sixth Line ¹	160	>>160						
Turning Sight Distance from Right – Northbound (Design Speed of 90 km/h)								
Site Access at Sixth Line								
Left-turn from Site Access to Sixth Line ¹	290	>>290						

Notes:

Transportation Association of Canada (TAC) Manual, Case B1, Table 9.9.3.

9.1.2 Sight Distance Summary

Further detail regarding the turning sight distance criteria applied to the site access along Sixth Line is shown in **Appendix K.**

Sufficient turning sight distances are available for traffic turning left (considering traffic approaching from either the left or right) and for traffic turning right (considering traffic approaching from the left) to comply with the TAC Geometric Design Guide for Canadian Roads.

Based upon the comprehensive site driveway sight distance review, the site access at Sixth Line is not expected to have sight line restrictions that would affect driveway operations. Specifically, sight lines do not restrict the ability for right-turns and left-turns inbound or outbound. Therefore, the sight lines are sufficient to functionally accommodate the proposed driveway.

9.2 QUEUING ASSESSMENT

Queueing behaviour at intersections within the network was assessed according to Highway Capacity Manual (HCM) methodology using Synchro Version 11.0; 50th and 95th percentile queues are reported for signalized intersection movements.

Queues for key movements under existing conditions, 2027 future conditions, and 2032 future conditions are summarized in **Table 38**, **Table 39** and **Table 40**, respectively.

TABLE 38 QUEUEING SUMMARY – EXISTING CONDITIONS

Key Movement	Available Storage	Existing	Conditions				
	Length (m)	50 th Percentile Queue (m)	95 th Percentile Queue (m)				
Sixth Line / Derry Road							
EBL	150	2.5 (10.4)	7.1 (29.7)				
EBTR	670	154.5 (131.5)	328.6 (245.8)				
Fifth Line / Derry Road							
WBL	115	2.7 (4.2)	15.5 (6.0)				
WBTR	540	37.8 (197.1)	57.7 (228.2)				

Notes:

^{1.} xx (xx) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)

TABLE 39 QUEUEING SUMMARY – 2027 FUTURE CONDITIONS

			Scen	ario 1			Scen	ario 2		Scenario 3			
Key	Available Storage	Fut Backg	ure round	Future	• Total	Fut Backg	ure round	Future	: Total	Fut Backg		Future Total	
Movement	Length (m)	50 th %ile Queue (m)	95 th %ile Queue (m)										
Sixth Line / Derry Road													
EBL	150	10.1 (22.9)	21.1 (66.8)	10.2 (23.4)	21.2 (68.2)	10.1 (22.9)	21.1 (66.8)	10.2 (23.4)	21.2 (68.2)	9.7 (22.7)	20.6 (66.5)	9.8 (23.0)	20.7 (67.2)
EBTR	670	229.8 (280.5)	384.2 (325.8)	325.1 (301.3)	393.2 (346.7)	231.2 (280.5)	384.4 (325.8)	325.0 (301.1)	393.1 (346.5)	225.0 (293.2)	377.0 (338.4)	316.6 (313.2)	385.1 (358.5)
		,			Fifth Liı	ne / Der	ry Road						
WBL	115	39.0 (13.2)	87.8 (19.9)	41.7 (17.9)	90.9 (22.0)	39.2 (13.5)	87.7 (19.7)	39.7 (13.2)	87.9 (17.9)	29.1 (12.8)	79.1 (19.0)	29.4 (13.4)	79.3 (15.0)
WBTR	540	55.1 (306.9)	65.4 (366.7)	56.3 (352.5)	67.8 (411.1)	55.0 (307.1)	64.7 (366.8)	56.1 (351.5)	67.9 (410.0)	54.5 (323.6)	64.4 (381.1)	55.4 (367.0)	65.5 (422.1)
		'		Cla	rk Boul	evard /	Derry R	oad					•
WBL	135	()	()	6.2 (2.3)	24.8 (6.0)	()	()	5.9 (1.8)	24.4 (5.4)	9.9 (0.8)	28.8 (3.2)	29.1 (3.6)	56.8 (7.6)
NBL	85	()	()	12.5 (40.7)	25.2 (74.1)	()	()	11.0 (34.8)	23.0 (62.3)	4.0 (20.4)	11.7 (37.2)	15.1 (56.3)	29.3 (108.1)
				Fif	th Line	/ Clark	Bouleva	ard					
WBL	115	()	()	()	()	()	()	0.2 (1.3)	2.2 (4.7)	0.1 (1.0)	1.2 (5.3)	0.4 (1.9)	2.7 (8.1)
WBTR	>115	()	()	()	()	0.4 (0.6)	3.8 (2.7)	0.4 (0.7)	3.9 (3.1)	0.6 (0.4)	4.9 (7.7)	0.7 (0.5)	5.1 (7.9)
Notes:													

Notes:

^{1.} xx (xx) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)

^{2.} Storage is broken up into a 70m segment north of the proposed site driveways, and an additional 15m south of the driveways.

TABLE 40 QUEUEING SUMMARY – 2032 FUTURE CONDITIONS

			Scen	ario 4		Scenario 5					
Key	Available Storage	Future Ba	ckground	Future	e Total	Future Ba	ckground	Future	Total		
Movement	Length (m)	50 th %ile Queue (m)	95 th %ile Queue (m)	50 th %ile Queue (m)	95 th %ile Queue (m)	50 th %ile Queue (m)	95 th %ile Queue (m)	50 th %ile Queue (m)	95 th %ile Queue (m)		
Sixth Line / Derry Road											
EBL	150	8.0 (29.2)	17.9 (75.2)	8.8 (30.2)	19.8 (76.7)	8.6 (30.7)	19.5 (77.2)	9.5 (31.6)	21.3 (78.6)		
EBTR	670	326.2 (343.9)	436.2 (388.7)	382.3 (364.6)	454.2 (409.5)	335.3 (366.9)	447.6 (411.8)	391.5 (387.7)	464.8 (432.4)		
				Fifth Line /	Derry Road						
WBL	115	49.2 (15.3)	100.2 (19.3)	49.2 (14.2)	100.0 (17.9)	49.2 (15.8)	99.8 (20.3)	49.4 (14.5)	99.2 (16.4)		
WBTR	540	61.0 (366.4)	72.7 (422.6)	62.0 (410.6)	78.1 (465.8)	61.3 (390.1)	75.7 (446.1)	62.2 (434.0)	78.7 (439.6)		
			Cla	rk Boulevar	d / Derry R	oad					
WBL	135	()	()	5.9 (1.8)	24.4 (5.4)	9.9 (0.8)	28.8 (3.2)	29.1 (3.6)	56.8 (7.6)		
NBL	85	()	()	11.0 (34.8)	23.0 (62.3)	4.0 (20.3)	11.6 (36.9)	15.1 (56.3)	29.3 (108.1)		
			Fif	th Line / Cl	ark Bouleva	ırd					
WBL	115	()	()	0.2 (1.3)	2.3 (4.9)	0.1 (1.0)	1.3 (5.5)	0.4 (1.9)	2.9 (8.3)		
WBTR	>115	0.4 (0.6)	3.9 (2.8)	0.4 (0.7)	4.0 (3.3)	0.6 (0.5)	5.1 (7.8)	0.8 (0.5)	5.4 (8.2)		

Notes:

The queuing assessment indicates that queues for the intersection movement most impacted by site traffic can be accommodated by the available storage capacity in most of the scenarios. Storage capacities for key movements used by site traffic are based upon available plans for proposed intersections. 50th percentile and 95th percentile queues can be accommodated and are not expected to cause any safety or operational issues.

^{1.} xx (xx) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)

^{2.} Storage is broken up into a 70m segment north of the proposed site driveways, and an additional 15m south of the driveways.

10.0 CONCLUSIONS AND RECOMMENDATIONS

- The proposed development of the site includes the construction of three industrial buildings, with a total gross floor area (GFA) of approximately 182,115 m². The proposed use of the buildings will be warehouse/logistics facilities. It is estimated that the buildings will be completed and fully leased by the end of 2026. The site is the current location of the Trafalgar Golf & Country Club, and is bounded by Derry Road to the north, future industrial lands to the west and south (Remington Lands) and Sixth Line to the east. The site is north of the future Milton Phase 4 lands and is within the Town's Derry Green Secondary Plan Area.
- The north-south portion of a new public road (Clark Boulevard) is proposed to be constructed as part of the development proposal. In the interim condition, Clark Boulevard is proposed to connect to a new signalized intersection at Derry Road in the north and terminate with a cul-de-sac to the south, adjacent to the Remington lands south of the site. In the future ultimate condition, the remaining east-west segment of Clark Boulevard will connect from the cul-de-sac on the Anatolia property (cul-de-sac to be eliminated in the ultimate condition) to a new signalized intersection at Fifth Line. Access driveways to both Building 1 and 2 are proposed along the new Clark Boulevard while access to Building 3 is proposed via a full access along Sixth Line.
- The TDM strategies incorporated into the development proposal will facilitate a reduction in vehicle trips and encourage a shift to sustainable modes of travel. TDM measures proposed as part of the development include a reduced vehicle parking supply, a bicycle parking supply that exceeds Zoning By-law requirements, carpool parking with an emergency ride home program, information and education for employees that promote sustainable travel and an employee travel monitoring program.
- The site is subject to the Town of Milton Comprehensive Zoning By-law 016-2014 (HUSP Urban Area March 2023) for parking considerations. Application of this By-law to the site results in a total minimum parking requirement of 1,057 spaces (equivalent rate of 0.58 spaces/100 m² or 1 space/172 m²). The total proposed parking supply for the site is 897 spaces (0.49 spaces/100 m² or 1 space/203 m²).
- Application of Zoning By-law 016-2014 to the site requires a total minimum of 34 bicycle parking spaces. The current architectural drawings provide a total of 34 parking spaces for bicycles. The proposed bicycle parking supply meets the requirements of the Zoning By-law and will meet the needs of the site.
- Application of Zoning By-law 016-2014 to the site, results in a minimum requirement of 28 loading spaces. As the development proposal includes a total of 315 loading spaces, the requirements of the Zoning By-law are exceeded and the loading supply will meet the practical needs of the site.
- Travel demand forecasts were established for the near-term (2027) and long-term (2032) horizons. The detailed traffic analysis for both the 2027 and 2032 horizons included a variety of scenarios that considered the status of the Clark Boulevard Extension, as well as the potential development on the adjacent Remington Lands. Background traffic forecasts were based upon recent traffic data, traffic growth rates provided by the Town and Region, and transportation studies completed for nearby developments, in addition to the Derry Green Secondary Plan. The site is expected to generate a

total of 334 and 353 two-way trips, during the morning and afternoon peak period, respectively. Within this total, 40 two-way trips during the morning peak period and approximately 60 two-way trips during the afternoon peak period, are expected to be heavy vehicles (trucks).

- A comprehensive sight distance review was completed for the proposed site access along Sixth Line. The sight distance review utilized both the vertical and horizontal profile data obtained from surveys. The sight distances were evaluated in accordance with the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads. Based upon the comprehensive site driveway sight distance review, the site access at Sixth Line is not expected to have sight line restrictions that would affect driveway operations. Specifically, sight lines do not restrict the ability for right-turns and left-turns inbound or outbound. Therefore, the sight lines are sufficient to functionally accommodate the proposed driveways.
- A queuing analysis of key movements was also undertaken as part of the safety review. Queueing behaviour at intersections within the network was assessed according to Highway Capacity Manual (HCM) methodology using Synchro Version 11.0; 50th and 95th percentile queues were reported for signalized intersection movements. The queue assessment for key movements under existing conditions, 2027 future conditions, and 2032 future conditions indicates that queues can be accommodated by the available storage capacity in all scenarios. Storage capacities for key movements used by site traffic are based upon available plans for proposed intersections; 50th percentile and 95th percentile queues can be accommodated and are not expected to cause any safety or operational issues.
- The traffic analysis indicated that, with consideration for the future widening of Derry Road, the existing and future transportation network can acceptably accommodate the travel demands of the site. While the area road network operates acceptably under existing conditions, capacity constraints arise in both the 2027 and 2032 future horizons. Specific vehicle movements at intersections along Derry Road are capacity constrained in 2027, and these operational issues are increased due to additional growth in 2032. It is noted, however, that the analysis includes compounding growth for every turning movement at intersections along Derry Road, and this contributes to substantial increases in traffic volumes for movements carrying high volumes under existing conditions. In practice, traffic growth may increase across a broader network with travel patterns reflecting capacity constraints for particular movements and intersections.
- The most pronounced capacity issues in the network occur at the intersections of Sixth Line / Derry Road and Fifth Line / Derry Road. Because the corridor growth rates adopted by the Region are meant to account for development in the area, the inclusion of site-specific growth on Town roads results in some degree of double-counting for area traffic growth. Furthermore, there is some uncertainty inherent in accounting for sites for which no transportation studies have yet been published, and the use of Secondary Plan traffic volumes to account for such sites may have led to unrealistically high volumes for specific turning movements.
- A sensitivity analysis was undertaken in which Derry Road is expanded to six lanes beyond Sixth Line
 for the 2032 horizon. The results of the sensitivity analysis suggest that if all forecasted growth
 occurs, the widening of Derry Road would mitigate most capacity issues in the network, leaving all
 intersections essentially at, or below capacity.

Overall, operational issues in the network under future conditions are primarily caused by the
substantial background growth that is assumed to occur, and actual future operations will depend on
the extent to which this growth actually materializes. Furthermore, the sensitivity analysis conducted
shows that the widening of Derry Road can mitigate the impacts of high growth, and that the
necessity of widening Derry Road is also dependent on the extent of actual growth.

10.1 RECOMMENDATIONS

Location of Clark Boulevard Intersection at Derry Road

As part of the development proposal, it is recommended that the location of the intersection of Clark Boulevard on Derry Road be shifted approximately **55 metres east** of the intersection location shown in the Derry Green Secondary Plan. The location of the intersection of Clark Boulevard at Derry Road proposed as part of the development of the site, is deemed to be appropriate for the following reasons:

- The proposed intersection location of Clark Boulevard on Derry Road lessens the impact on the proposed channel boundary along the Broccolini eastern property limit, as the alignment of Clark Boulevard, north of Derry Road would be required to cross a narrower section of the channel, when compared to the alignment of the Secondary Plan that crosses the channel at an angle.
- The proposed location of Clark Boulevard also includes a relatively straight alignment north of Derry Road that follows the east side of the channel. By contrast, the Secondary Plan alignment includes back-to-back sharp curves, until the alignment straightens on the east side of the channel.
- The approach angles of the intersection created at Derry Road and Clark Boulevard, are closer to 90 degrees in the proposed alignment than in the Secondary Plan alignment.
- The proposed alignment location enables the creation of larger rectangular blocks, that facilitate a more efficient development of the site, for a large scale industrial warehouse development.
- The proposed alignment is consistent with the Clark Boulevard alignment and the NHS illustrated within the Subwatershed Impact Study Addendum SIS Area 5A, prepared by MGM Consulting Ltd et al, dated May 2021, as reviewed and approved by the Town, Region and Conservation Halton.
- As the Region requires a minimum distance of 115 metres between a right-in/ right-out access and
 the nearest point of access, the proposed location of Clark Boulevard at Derry Road provides more
 than adequate minimum spacing (and 56 metres more than the Secondary Plan location) for the
 future right-in/ right-out access at the Brocollini property.
- The proposed alignment is consistent with the Town's Derry Green Secondary Plan, without shifting to the west, as noted by the Region in their comments to the Town.

Derry Road Capacity Concerns

It is noted that there are capacity concerns at the intersections of Sixth Line / Derry Road and Fifth Line / Derry Road. As corridor growth rates adopted by the Region are meant to account for development in the area, the inclusion of site-specific growth on Town roads results in some degree of double-counting for area traffic growth. In addition, there is some uncertainty inherent in accounting for sites for which no transportation studies have yet been published, and the use of Secondary Plan traffic volumes to account for such sites may have led to unrealistically high volumes for specific turning movements.

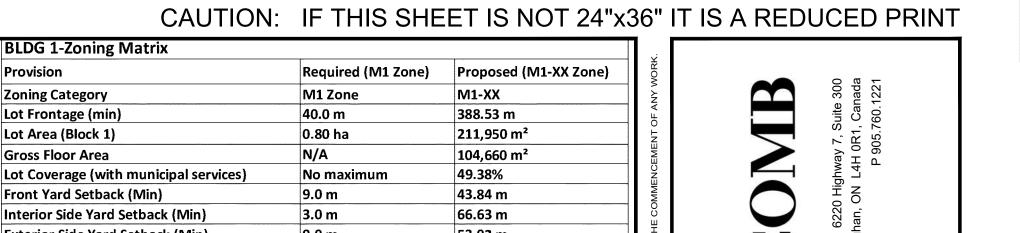
For these reasons, it is recommended that future traffic operations at the intersections of Sixth Line / Derry Road and Fifth Line / Derry Road be monitored to assess the accuracy of the background growth assumptions and to confirm the timing of the widening of Derry Road between Fifth and Sixth Line as the widening of Derry Road can mitigate the impacts of high growth, and that the necessity of widening Derry Road is also dependent on the extent of actual growth.

Sight Distance on Sixth Line & Site Driveway

Although the current posted speed limit is 70 km/h along Sixth Line south of Derry Road, a reduced posted curve advisory speed limit of 40 km/h is being proposed to address visibility and sight distance concerns along Sixth Line's existing S-curve road segment, between the signalized Derry Road and Sixth Line intersection to the north and the newly proposed site driveway along Sixth Line to the south. This proposed condition matches the existing 40 km/h posted curve advisory signage travelling northbound along Sixth Line as a motorist approaches the curved segment of the road towards Derry Road. The posted speed limit would resume at 70 km/h (design speed of 90 km/h) south of the site access along Sixth Line.



Appendix A: Architectural Drawings



49.38%

43.84 m

66.63 m

53.02 m

125.58 m

16.85%

No maximum

9.0 m

3.0 m

9.0 m

12.0 m

10%

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2

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C.R. PA / PM: DRAWN BY: ΗW JOB NO.: TOR21-0016-01

SHEET

Number of Parking Spaces (min) 572 Number of Accessible Parking Space (min) Number of Loading Spaces (min) Bicycle Parking (min) Building Height (max) 15 m 13.716 m **BLDG 2-Zoning Matrix** Required (M1 Zone) Proposed (M1-XX Zone) M1 Zone M1-XX **Zoning Category** Lot Frontage (min) 40.0 m 69.45 Lot Area (Block 2) 0.80 ha 154,107 m² **Gross Floor Area** N/A 59,053 m² Lot Coverage (with municipal services) No maximum 38.32% Front Yard Setback (Min) 9.0 m 100.51 m Interior Side Yard Setback (Min) 3.0 m 39.97 m Exterior Side Yard Setback (Min) 9.0 m 49.23 m Rear Yard Setback (Min) 12.0 m 194.29 m Landscape Open Space (min) 10% 15.26% Number of Parking Spaces (min) 344 Number of Accessible Parking Space (min) Number of Loading Spaces (min) Bicycle Parking (min) 15 m 13.716 m Building Height (max) **BLDG 3-Zoning Matrix** Required (M1 Zone) Proposed (M1-XX Zone) **Zoning Category** M1-XX M1 Zone Lot Frontage (min) 40.0 m 96.51m(66.05+30.51) Lot Area (Block 3) 0.80 ha 60,346 m² **Gross Floor Area** N/A 18,402 m² Lot Coverage (with municipal services) No maximum 30.49% 9.0 m 70.34 m Front Yard Setback (Min) 3.0 m 40.48 m Interior Side Yard Setback (Min) Exterior Side Yard Setback (Min) 9.0 m 14.18 m 12.0 m 304.87 m Rear Yard Setback (Min) 10% 39.60% Landscape Open Space (min) 140 Number of Parking Spaces (min) 132 Number of Accessible Parking Space (min) Number of Loading Spaces (min) Bicycle Parking (min) 15 m 13.716 m Building Height (max) Minimum ZBL Requierments N/A | Warehouse Building GFA- Approx Office 5pace GFA (5% of 5,233 m² 2,953 m² 920 m² warehouse) For the first 1,000m2; 1 parking space per 30m2 of gross floor area For gross floor area between 1,001m2 to 5,000m2 1 parking space per 100 m2 of gross floor area 315 | 296 | 131 | 132 | 966 | 897 Gross floor area greater than 5,000m2; 1 parking space of 200m2 of gross floor area. (As per section 5.2, 10% decucted from GFA) Number of Accessible Parking 16 12 Bicycle Parking 12 % of the required parking spac Loading 5paces 3 Loading space +1 additional 155 109 ading space for each additional | 14 9,300 m2 or fraction thereof in excessof 7,441 m2

VICINITY MAP

Provision

Lot Coverage (with municipal services)

Front Yard Setback (Min)

Rear Yard Setback (Min)

Interior Side Yard Setback (Min)

Exterior Side Yard Setback (Min)

Landscape Open Space (min)

RELINE OF 20.12m WIDE ORIGINAL ${}^\prime au$ OWNSHIP ROAD ALLOWANCE CENTRELINE OF 20.12m WIDE ORIGINAL-TOWNSHIP ROAD ALLOWANCE DERRY ROAD PART 7 FUTURE OFFICE 1 STOREY **PROPOSED** FUTURE INDUSTRIAL BLDG 3 OTAL FOOTPRINT ±18,402.49 SM ±198,082.74 SF FFE = 191.05 CLEAR HEIGHT: 40' 1 STOREY PROPOSED 16764 21806 18288 1 STOREY PROPOSED INDUSTRIAL BLDG 2 **INDUSTRIAL BLDG 1** ±12,376.11 SM TOTAL FOOTPRINT ±133,215.39 SF TOTAL FOOTPRINT: ±59,052.51 SM PHASE 2 FOOTPRINT ±104,659.61 SM ±635,635.87 SF ±6,025.91 SM ±1,126,546.60 SF FFE = 192.10 ±64,862.33 SF FFE = 191.90 CLEAR HEIGHT: 40 CLEAR HEIGHT: 40' 16764 16764 213 PHASE 1 FOOTPRINT ±38,849.70 SM A1.1 ±418,174.69 SF \ A1.2 / PHASE 1 FOOTPRINT ±20,203.61 SM ±70,892.66 SM ±217,469.80 SF ±763,082.20 SF PHASE 2 FOOTPRINT X ±33,766.95 SM A1.5 ±363,464.42 SF S FUTURE (16764 , 21 SWM-ROND

GENERAL NOTES 20 PROPOSED MECHANICAL ROOM

21 CURB RADII AT ENTRANCES WITHIN MUNICIPAL SIDEWALK LIMITS TO CONFORM TO OPSD 350.010. - SEE CIVIL DWGS. 22 1.8M WIDE PAINTED PEDESTRIAN PATHWAY 23 HATCHED AREA DENOTES HEAVY DUTY ASHPHALT. TYPICAL FOR

> 24 15.0m CENTERLINE RADIUS DISTANCE TO FIRE ACCESS ROAD 25 ROAD CURB AND SIDEWALK TO BE CONTINUOUS THROUGH THE DRIVEWAY. DRIVEWAY GRADE TO BE COMPATIBLE WITH EXIST.

SIDEWALK AND A CURB DEPRESSION WILL BE PROVIDED FOR AT EACH ENTRANCE. 26 INVERTED U-SHAPE GALVANIZED BICYCLE RACKS

MIN. 1.8Mx0.6M PER SPACE

38 SCREEN WALL

39 | PROPOSED PYLON SIGNAGE

DRIVE-IN RAMP WITH GALVANIZED GUARDRAIL ON EACH SIDE. SEE CIVIL DWGS FOR SLOPE %

41 RESERVED

42 DETECTIBLE TACTILE WARNING SURFACE, CONFORMING TO 2012 O.B.C.

ACCESSIBLE PARKING GRADE SLOPING UP TO MEET

PROPOSED CURB LEVEL

43 | MIN. 3m WIDE CONCRETE DOLLY PAD AT TRAILER STALLS

FIRE ACCESS ROUTE WITH 12.5M TURNING RADIUS TRUCK LOADING DOCK DOOR KNOCK OUT PANEL

LANDSCAPE AREA DETECTIBLE TACTILE WARNING SURFACE,

SITE LEGEND

CONFORMING TO 2012 O.B.C.

NEW HEAVY DUTY PAVEMENT (HATCHED)

MAN DOOR ENTRY EXIT DOOR LOCATION PARKING SPACE SYMBOL

OVERALL SITE PLAN

BARRIER FREE PARKING SIGN BARRIER FREE PARKING BFPSV SIGN WITH VAN TAB

DRIVE-IN DOOR STOP NEW STOP SIGN

DER NEW FIRE ROUTE SIGN

GAS METER & PRESSURE REGULATING STATION BY GAS COMPANY LIGHT FIXTURES, REFER ELECTRICAL DWG FOR DETAILS

LIGHT POLES, REFER ELECTRICAL DWG FOR DETAILS

CHARGING STATIONS

27 PROPOSED STOP SIGN LOCATION FIRE DEPT CONNECTION (VERIFY 28 PRESSED PATTERNED ASPHALT PEDESTRIAN PATHWAY LOCATION WITH CIVIL DRAWINGS) 29 YELLOW PAINTED LINES FH PROPOSED FIRE HYDRANT (VERIFY PROPOSED LOCATION OF TRANSFORMER C/W CONCRETE PAD 1.8m HIGH BLACK VINYL CHAIN LINK FENĆING OR APPROVED 30 | RETAINING WALL LOCATION WITH CIVIL DRAWINGS) EQUAL ALONG DEVELOPMENT LIMIT BOUNDARY 31 PRECAST SCREEN WALL TO BE INSTALLED ON TOP OF FH EXISTING FIRE HYDRANT (VERIFY 12 CONCRETE APRON RETAINING WALL - REFER TO STRUC. DWGS LOCATION WITH CIVIL DRAWINGS) 1500mm WIDE DEPRESSED CURB FOR ACCESSIBLE PARKING 32 PROPOSED FIRE ROUTE SIGN LOCATION AND PEDESTRIAN ACCESS - REFER TO DETAIL 4/A1.2 33 RESERVED PROPOSED CATCHBASIN GRADE CHANGE GREATER THAN 600mm. PROVIDE CONCRETE-FILLED 34 PROPOSED AMENITY AREA MH DENOTES MANHOLE STEEL BOLLARD AT END OF RETAINING WALL - SEE CIVIL DWGS. WHP/HP EXISTING HYDRO POLE 35 | SNOW STORAGE ON SITE AT 2% TOTAL SITE AREA 15 EXTERIOR STEEL STAIRS W/ TUBE STEEL GUARDRAIL, TYP. 16 | TRUCK LOADING DOCK (TYPICAL) 36 PROPOSED CHAIN-LINK FENCE

2.75m x 5.8m PARKING STALL, PAINTED PARKING STRIPING PER CITY STANDARDS. WITH 6M WIDE DOUBLE LOADED AISLE. 7 PRINCIPAL ENTRY - TENANT FIT-UP SUBJECT TO INTERIOR ALTERATION PERMIT ALL AREAS REQUIRING FIRE TRUCK OR TRACTOR TRUCK ACCESS. 4 TYPICAL SHARED ACCESSIBLE PARKING STALLS, PAINTED PARKING STRIPING PER CITY STANDARDS. TO HAVE TYPE A STALLS (3400X5800), TYPE B (2750x5800), OR ONE OF EACH WITH 1500mm PATH STRIP BETWEEN - REFER TO CITY OF MILTON'S ACCESSIBLE PARKING STANDARDS. 5 | 150mm WIDE CURB TYPICAL 6 MIN. 1500mm WIDE SIDEWALK TYPICAL U.N.O 7 | TRAILER PARKING STALL - 12'-0" X 55'-0" 8 | ACCESSIBLE CURB RAMP AS PER DETAIL 9 | FIRE DEPARTMENT CONNECTION / SIAMESE

13 LANDSCAPE AREA - SEE LANDSCAPE DWGS. 14 PEDESTRIAN RAIL (1070mm HIGH) SET INTO RETAINING WALL WHERE

17 | LOADING SPACE - L.S. (MIN. 12.0m X 3.5m)

18 | FIRE ACCESS ROUTE W/ 12M TURNING RADIUS (****** 19 PROPOSED ELECTRICAL ROOM

37 CONCRETE/STEEL SAFETY BOLLARD

E.V. PROPOSED ELECTRIC VEHICLE

Appendix B: Town & Region Comments for Terms of Reference From: <u>Kavleen.Sachdeva@milton.ca</u>

To: Robin Marinac
Cc: Mark Crockford

Subject: RE: Anatolia Milton Industrial TIS TOR

Date: April 28, 2022 1:46:08 PM

Attachments: <u>image001.png</u>

esig cb7daa72-4770-4979-b68f-eed4c3985ef2.png

Afternoon Robin, Mark,

Please see the Town's comments in green below.



Kavleen Sachdeva, P.Eng

Transportation Planning Technologist 150 Mary Street., Milton ON, L9T 6Z5 905-878-7252 ext. 2363

www.milton.ca

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From: Loro, Darren < Darren.Loro@halton.ca> Sent: Wednesday, April 27, 2022 3:49 PM

To: Robin Marinac < robin.marinac@cghtransportation.com >

Cc: Mark Crockford <mark.crockford@cghtransportation.com>; Krusto, Matt <Matt.Krusto@halton.ca>;

Kavleen Sachdeva < Kavleen. Sachdeva@milton.ca> **Subject:** RE: Anatolia Milton Industrial TIS TOR

Hi Robin,

Please see Transportation Planning's comments in blue on the proposed Anatolia Milton TIS TOR text pasted below. These comments have been provided to promote consistency with other completed studies in the Derry Green Secondary Plan area. Some of these comments are also reminders from our pre-consultation comments regarding access to Derry Road and the Clark Boulevard extension.

Let us know if you wish to discuss further!

Cheers, Darren

We have been asked to undertake a Transportation Impact Study (TIS) to support the proposed industrial development located east of Fifth Line, south of Derry Road, west of Sixth Line and north of the Milton Phase 4 lands (MP4) within the Derry Green Corporate Business Park Secondary Plan, in Milton, Ontario, referred to herein as the 'study area'. Within the study area, there are two landowners, Anatolia Capital Corp, and Neamsby Investments Inc, as illustrated on the attached Figure 1.2 extracted from SIS Area 5A Addendum (SIS) shown in Attachment 1. Combined, the developments will include approximately 1.9 million square feet of industrial space across six building and 145,000 square feet of commercial space

across five buildings, as illustrated on the attached Figure 1.3 extracted from the SIS and shown in Attachment 2. These properties will have direct access to Derry Road, Sixth Line, and Fifth Line via the future extension of Clark Boulevard. Clark Boulevard is a collector road that connects to Fifth Line to the west of the property and Derry Road to the north. This plan includes the conceptual alignment of the Clark Boulevard extension which will be confirmed as part of the TIS.

It is anticipated that a separate TIS will be required for each developer's zoning bylaw amendment and draft plan of subdivision application. As such, this Terms of Reference (TOR) has been prepared to support the Anatolia Capital Corp. Lands. Acceptable.

The Anatolia Capital Corp. site includes three industrial buildings with a total building area of 1.5 million square feet. Access to these buildings will be via Derry Road, Clark Boulevard, and Sixth Line as shown in Attachment 2.

We have prepared the following scope of work for review and endorsement. Please let us know if you have any comments or additions. All data requests are noted in *red* and have also been summarized at the end of the memo.

The Transportation Impact Assessment Report must be stamped, signed, and dated by a Licensed Professional Engineer in the Province of Ontario (P.Eng.).

Transportation Impact Assessment Requirements (TIA):

The study will be in accordance with Halton Region's Transportation Impact Study Guidelines (2015).

Study Area:

- An overview of the transportation system existing conditions will be documented (including transit, cycling, pedestrian and automobile modes).
- A summary of existing transportation policies within the Study Area will be identified.
- An overview of the Study Area road network will be provided including the road classification and descriptions of:
 - o Fifth Line
 - o Sixth Line
 - o Clark Boulevard
 - o Derry Road
 - o James Snow Parkway
- The following intersections will be included in the Transportation Impact Assessment:
 - o Fifth Line at Derry Road
 - o Sixth Line at Derry Road
 - o Clark Boulevard at Derry Road (future) assume four-legged intersection for 2027 beyond
 - o Clark Boulevard at Fifth Line (future)
 - o All proposed future Site Accesses (two accesses on Derry Road, one access on Sixth Line, and proposed accesses on Clark Boulevard)
 - o Given the scale of the proposed development, please add the intersection of Derry Road and James Snow Parkway to the study scope.

Existing Traffic Data:

- Turning Movement Counts (TMCs) at the two existing Study Area intersections of Fifth Line at Derry Road (2019), and Sixth Line at Derry Road (2018) have been received from Halton Region staff. Updated traffic counts can be commissioned and used as existing traffic volumes if preferred. The Town is now accepting new traffic counts to be used existing analysis.
- Signal Timing Plans have been received for the intersections of Fifth Line and Derry Road, and Sixth Line and Derry Road from Halton Region staff.
- The following compound annual growth rates will be assumed at the Study Area intersections to determine the 2022 existing traffic volumes. These growth rates and corresponding application methodology is based on the *Derry Green Corporate Business Park Transportation Impact Study (2021)* prepared by Crozier Consulting Engineers: If historical traffic data is being used as the base traffic data, then please apply a growth rate of 2% compounded annually to all movements at all Regional road intersections to inflate the historical volumes to 2022 "existing" traffic volumes. Agreed.
 - o 2.0% compound annual growth rate for Derry Road. This growth rate will be applied to the eastbound through and westbound through movements at the two Study Area intersections.
 - o 2.0% compound annual growth rate for Fifth Line. This growth rate will be applied to all northbound and southbound movements, as well as the eastbound left-turn, eastbound right-turn, westbound left-turn and westbound right-turn movements at the intersection of Derry Road and Fifth Line.
 - o 2.0% compound annual growth rate for Sixth Line. This growth rate will be applied to all northbound and southbound movements, as well as the eastbound left-turn, eastbound right-turn, westbound left-turn and westbound right-turn movements at the intersection of Derry Road and Sixth Line.
- Collision data (over the past five years) has been received from Halton Region for the intersections of Derry Road at Fifth Line and Derry Road at Sixth Line.

Proposed Development Overview:

- A description of the proposed development and any planned active mode facilities.
- Outline of land use as it relates to the development and site statistics.
- Transportation Demand Management (TDM) supportive elements of the proposed development.

Study Horizon and Peak Periods:

- Base year 2022, followed by a future build-out and occupancy horizon of 2027, and future build-out and occupancy horizon plus five years of 2032. Acceptable. If the proposed development is to be built out in phases, then the horizon year associated with the build-out of each major phase should be evaluated as to quantify impacts associated with interim phases compared to impacts associated with the entire development. Please analyze the anticipated opening year of each major phase (assuming full build-out and occupancy), the anticipated year of complete build-out and occupancy, and 5 years post complete build-out and occupancy.
- AM and PM peak hours for all horizons. Agreed

Background Growth:

• The following compound annual growth rates will be assumed at the Study Area intersections for application to the 2022 existing intersection volumes to determine the Study Area intersection volumes for the future horizon years of 2027 and 2032. These growth rates and corresponding application methodology is based on the *Derry Green Corporate Business Park Transportation*

Impact Study (2021) prepared by Crozier Consulting Engineers:

- o 2.0% compound annual growth rate for Derry Road. This growth rate will be applied to the eastbound through and westbound through movements at the two Study Area intersections. Acceptable. Please apply to the eastbound and westbound through movements on Derry Road at the future Clark Boulevard intersection, and to the eastbound left/through/right and westbound left/through/right movements on Derry Road at James Snow Parkway. Please assume that this growth rate includes background site traffic generated by background developments.
- o Please apply a growth rate of 2% compounded annually to the northbound left/through/right and southbound left/through/right movements on James Snow Parkway at Derry Road up to 2027 future conditions. Please assume that this growth rate <u>includes</u> background site traffic generated by background developments.
- o Please apply a growth rate of 4% compounded annually to the northbound left/through/right and southbound left/through/right movements on James Snow Parkway at Derry Road beyond 2027 future conditions. Please assume that this growth rate <u>includes</u> background site traffic generated by background developments.
- o 2.0% compound annual growth rate for Fifth Line. This growth rate will be applied to all northbound and southbound movements, as well as the eastbound left-turn, eastbound right-turn, westbound left-turn and westbound right-turn movements at the intersection of Derry Road and Fifth Line. This growth rate will be applied to the northbound through and southbound through movements only at the intersection of Fifth Line and Clark Boulevard.
- o 2.0% compound annual growth rate for Sixth Line. This growth rate will be applied to all northbound and southbound movements, as well as the eastbound left-turn, eastbound right-turn, westbound left-turn and westbound right-turn movements at the intersection of Derry Road and Sixth Line. This growth rate will be applied to the northbound through and southbound through movements only at the intersection of Fifth Line and Clark Boulevard as well as all site access intersections on Sixth Line.
- o 2.0% compound annual growth rate for Clark Boulevard. This growth rate will be applied to all intersection movements at Derry Road and Clark Boulevard with the exception of the eastbound and westbound through movements, and all turning movements at the intersection of Clark Boulevard and Fifth Line with the exception of the northbound through and southbound through movements. Additionally, this growth rate will be applied to the through movements on Clark Boulevard only at all site access intersections on Clark Boulevard.
- Surrounding background development traffic projections will be considered on both Town of
 Milton and Halton Region roads despite Town and Region comments made in the *Derry Green*Corporate Business Park Transportation Impact Study (2021) prepared by Crozier Consulting
 Engineers. These comments indicate that background development traffic only be considered on
 Town of Milton roads. This approach will create significant imbalances between future
 intersections and therefore a consolidated approach of considering a compound annual growth
 rate of 2% as well as surrounding background development traffic is proposed for all roadways.
- The following background developments and reports may be considered: Please contact Halton Region Community Planning or the Town of Milton's Planning Department to obtain the latest version of these studies. Some studies will come through in a separate email.
 - o Boyne Secondary Plan Survey Area Road Network Assessment prepared by GHD
 - o Derry Green Secondary Plan Survey Area Transportation Strategy Report (2010) prepared

- by Entra Consultants (Data request) See above.
- o Derry Green Corporate Business Park Secondary Plan Modification (2016) prepared by Read, Voorhees & Associates (Data request) See above.
- o Derry Green Corporate Business Park Transportation Impact Study (2021) prepared by Crozier Consulting Engineers
- o Transportation Impact Study for the Sun Life Broccolini lands (south of Derry Road) within the Derry Green Business Park (*Data request*) See above.
- o Transportation Impact Study for the Orlando Corporation lands within the Derry Green Business Park (*Data request*) See above.
- o Menkes Milton Industrial Inc. Phase 1 lands within the Derry Green Business Park (*Data request*) See above.
- o Broccolini Lands (north of Derry Road) within the Derry Green Business Park (*Data request*) See above.

Please include any other studies to be considered (*Data request*) Background site traffic from the adjacent Neamsby industrial/commercial development must be accounted for in accordance with the background development site traffic and growth rate methodologies listed in this section. Agreed As previously stated, the provided growth rate for all "Region-to-Region" movements at Region-owned intersections (e.g. eastbound and westbound through movements at Derry Road and Sixth Line, or all movements at Derry Road and James Snow Parkway) include background site traffic generated by background developments. For consistency with other studies prepared in the Derry Green Secondary Plan area and to avoid double counting background development traffic on the road network, please follow this growth rate methodology for all "Region-to-Region" movements under all horizon years.

For all "Region-to-Town" or "Town-to-Region" movements at Region-owned intersections (e.g. eastbound left-turn movement or southbound right-turn movement at Derry Road and Sixth Line), please apply a growth rate of 2% compounded annually to these movements <u>plus</u> background site traffic generated by the background developments listed above for all horizon years.

Changes to Area Transportation Network

- The Region's 2022 Budget and Business Plan indicates a construction start date of 2026 for the James Snow Parkway widening to six lanes. Therefore, it is not reasonable to assume that the road widening will be complete by 2027 and thus should only be accounted for under the 2032 horizon year.
 - o For consistency with other studies prepared in the Derry Green Secondary Plan area, an additional eastbound and westbound through lane on Derry Road can be assumed at the intersection of James Snow Parkway (starting upstream the intersection and ending downstream the intersection) as part of the James Snow Parkway widening to be accounted for under the 2032 horizon year.
 - o Assume that all lanes are general use.
- Derry Road widening from four to six lanes within the proposed Study Area. The Region's 2022
 Budget and Business Plan indicates a construction start date of 2031 for the Derry Road widening
 to six lanes. Therefore, it is not reasonable to assume that the road widening will be complete by
 2032 and thus should not be accounted for in the TIS.
 - o As per the Halton Region TMP, Derry Road is classified as a C4 Urban road with a 47 metre cross-section with two standard travel lanes in each direction, and an HOV/RBL lane in both directions. Please indicate if this lane should be assumed to be an RBL or HOV lane. (Data request) See above.
 - o It is assumed that the changes to Derry Road will be present in the 2032 future analysis

horizons.

- o As no further information regarding the anticipated changes to Derry Road are available, it has been assumed that storage lanes at intersections will remain the same with the only changes being additional through lanes, and the posted speed limit will remain as is. Please confirm if there are any available roadway designs, and if not, please confirm if the assumptions above are reasonable. (Data request) See above.
- Fifth Line is indicated to be widened from two to four lanes by 2031 in the Town of Milton Transportation Master Plan. Additionally, Halton Region has indicated that Fifth Line is being protected to be expanded to a six-lane cross-section in lieu of construction of 5 ½ Line.
 - o Please clarify the future plans for Fifth Line as well as the timeline for these changes. It has been assumed that Fifth Line will be widened to a six-lane cross-section. (Data request) Fifth Line is a multi-phased project. The first phase is presently under construction for the widening / realignment from Hwy. 401 to south of Main St. E. with the reconstruction and widening of Main St. E. from JSP to Fifth Line. The second phase of widening from south of Main to south of Derry is presently in detailed design (between 60-90% design level) and will start construction in spring 2023. The third phase from south of Derry to south of Britannia is going to be starting detailed design in June (the RFP for design just closed yesterday) and will start construction in spring 2025. . If Fifth Line does go to 6 lanes, that would fall under a scenario where the Region would assume control of Fifth Line and it would no longer be Town owned. At the present time some preliminary options have been reviewed but the Region would still need to go through an EA study and then detailed design. If it occurs, this won't occur until after 2030.
 - o Please indicate the intent of the additional lanes (general use lane, HOV lane etc.) (Data request)
 - o As no further information regarding the anticipated changes to Fifth Line are available, it has been assumed that storage lanes at intersections will remain the same with the only changes being additional through lanes, and the posted speed limit will remain as is. Please confirm if there are any available roadway designs, and if not, please confirm if the assumptions above are reasonable. (*Data request*) All of the Fifth Line works are being completed in accordance with the EA Studies that were completed in 2015 and 2016 respectively EA study (coming through in a separate email) reports including preliminary designs that were incorporated as part of the studies.
- Future plans for the extension of Clark Boulevard through the subject lands between Derry Road and Fifth Line will be considered.
 - A conceptual design of this extension will be prepared to support the TIS and will include the
 intersections of Clark Boulevard and Fifth Line, and Clark Boulevard and Derry Road. The
 intersection design for Derry Road and Clark Boulevard must consider WB-20 tractor semitrailer swept path maneuverability for turning movements to and from Clark Boulevard.
 Conceptual design for Clark Blvd and Fifth Line can be done as part of the Neamsby
 Industrial Site.
 - o Alignment alternatives for Clark Boulevard will be evaluated as part of the TIS. The Intersection location at Fifth Line is fixed to match the west approach being constructed as part of the Oxford James Snow Business Park works (DM-1063) but alignment and intersection location at Derry Road is subject to review. As stated at pre-consultation, the Secondary Plan illustrates the future Clark Boulevard roadway alignment to be in line with the easterly limit of the 11319 Derry Road property on the north side of Derry Road. Consideration must be given to the location of the future Clark Boulevard alignment through the subject property and intersection location to Derry Road to be consistent with the Secondary Plan. This will result in the slight shifting of the future Clark Boulevard connection to the west to achieve this alignment and meet the intent of the Secondary Plan and Halton Region's overall corridor access plan.

- o This extension will be considered in both the 2027 and 2032 future analysis horizons. If any development phases prior to full build-out are analyzed before 2027, then the Clark Boulevard extension should be considered under any horizon year beyond 2023.
- o Please provide any additional information or drawings of Clark Boulevard west of Fifth Line. (*Data request*) Please contact Halton Region Community Planning or the Town of Milton's Planning Department to obtain the Clark Boulevard and Fifth Line engineering drawings prepared for the Oxford subdivision.
- o Please identify any additional information to be considered. (Data request) The TIS prepared for the Oxford subdivision considered diversions to traffic on James Snow Parkway and Derry Road resulting from the extension of Clark Boulevard from James Snow Parkway to Fifth Line (implemented as part of the Oxford subdivision). These diversions should be considered under future background conditions in this analysis. Diversions to traffic on Derry Road and Fifth Line resulting from the extension of Clark Boulevard from Fifth Line to Derry Road (implemented as part of the proposed development) should be considered under future total conditions in this analysis, with all assumptions, methodologies and calculations clearly documented in the TIS.
- No other changes to the Study Area transportation network are noted. Please provide information on any additional future changes to the Study Area Transportation network to be considered.
 (Data request) At present, Sixth Line is in our forecast for 2028 construction for Hwy. 401 to Derry and 2029 construction for Derry to Britannia. These are partially development driven as well.

Development Site Traffic:

- Trip generation: ITE Trip Generation Manual 11th Edition.
 - o ITE LUC 130 Industrial Park is proposed. The TIS must justify this ITE land use as the most appropriate land use category to apply to the proposed industrial buildings. Agreed with Region.
 - o Site-generated Heavy Vehicle volumes will be determined using ITE Trip Generation Manual 11th Edition Truck Trip Generation Data Plot Appendix. Differentiate between passenger vehicles and trucks in the trip generation, analyze the impacts of the considerable increase in truck traffic to the road network, and review design considerations needed to accommodate the truck traffic.
- Modal Split: No transit, pedestrian, or cycling mode split will be considered.
- The TIS will also need to compare trip generation forecasts between the proposed development and the subject property from the Derry Green Secondary Plan Transportation Study.
- All trip generation assumptions must be clearly documented in the TIS with supporting data appended.
- Trip distribution and assignment of auto trips: Transportation Tomorrow Survey (TTS), existing
 traffic routing patterns and surrounding area characteristics based on an existing proxy zone of
 similar characteristics to the proposed development zone.
- Trip distribution and assignment of heavy vehicle trips: Surrounding area characteristics
- Trip distribution for the proposed development should also consider the trip distribution assumptions from the TIS' prepared for other development applications within the Derry Green Secondary Plan area.
- All trip distribution assumptions must be clearly documented in the TIS with supporting data appended.
- Please ensure the methodology and all engineering judgement is thoroughly documented and explained within the report

Traffic Analysis:

- Traffic analysis to be performed using Synchro 10 on Study Area network intersections to determine the LOS, delay, V / C ratio and the 95th percentile queues for overall intersections as well as individual movements using Highway Capacity Manual (HCM) methodology.
 - o Heavy Vehicle %, Peak Hour Factors, pedestrian volumes, and cyclist volumes will be taken from the collected TMC data. Where information is not available, a pedestrian volume of 5 pedestrians/hour, a cyclist volume of 5 cyclists/hour, and a Heavy Vehicle % of 2%, and the Peak Hour Factor of an adjacent intersection will be applied.
 - o Other Synchro inputs will be based on site observations, Halton Region's Transportation Impact Study Guidelines, as well as Synchro default parameters.
 - o Critical movements and intersections will be identified as defined in Halton Region's Transportation Impact Study Guidelines.
- Qualitative transit, cycling, and pedestrian analysis
- If traffic operations issues are identified under future background or total conditions, then the TIS will need to recommend mitigation measures to address these issues. The TIS should identify who is responsible for each recommended mitigation measure, if required.
- As stated at pre-consultation, Halton Region Access By-law (NO.32-17). Section 6.1 (a) states that "access to a Regional Road from private property shall be permitted only where such access is necessary because access to a local road is not feasible." As access to Derry Road could be provided solely via Sixth Line and future Clark Boulevard, any proposed access to Derry Road will need to be approved by the Region and justified in the TIS. The justification should demonstrate that the proposed access conforms to the Region's Access Management Guideline (spacing, geometrics, sightlines, etc.), demonstrate the benefits of permitting access to Derry Road (e.g. traffic operations, safety, circulation, etc.) and highlight any negative impacts of not permitting access to Derry Road.
 - o Any proposed unsignalized accesses directly to Derry Road must be restricted to a right-in/right-out (RI/RO) operation.
 - o Halton Region must maintain priority and consideration for access requirements for adjacent properties on both the north and south side of Derry Road in the area, in coordination with the approved Derry Green Secondary Plan intersection locations.
 - The TIS must acknowledge that an access easement may be considered for the adjacent Neamsby development.
- The TIS must analyze auxiliary right-turn lane requirements on Derry Road at the proposed accesses and future Clark Boulevard.
- The TIS must analyze traffic safety components associated with the proposed accesses to Derry Road including (but not limited to):
 - o Sightlines along Derry Road;
 - o the proposed clear throat length at the accesses; and
 - o swept path analysis for the largest design vehicle at each access.
- The TIS must also review the proposed corner clearance on Sixth Line between Derry Road and the southerly proposed access to Sixth Line.

Recommendations:

- Any recommended offsite and onsite improvements or mitigation measures, which may include turn lane requirements, pedestrian / cycling / transit amenities, TDM measures, construction impacts, safety measures etc.
- The Region ultimately requires confirmation that the planned Regional Road Network can

accommodate the planned growth in this area as well as the proposed development. As such, if there are intersections where capacity is an issue in the 2032 horizon year (e.g. on Derry Road), please demonstrate how the Derry Road widening to six lanes could mitigate these constraints under the 2032 horizon year.

- The TIS should acknowledge the benefit of the Region's long-term plans as identified in the 2011-2031 Transportation Master Plan. These plans include a new north south six-lane Regional corridor (known as 5 ½ Line) that would connect Britannia Road and Steeles Avenue to Highway 401 and provide additional roadway network capacity. The exact location and configuration will be confirmed through a future Municipal Class Environmental Assessment (MCEA) Study which has not yet been initiated. However, this future corridor (if implemented) would improve connectivity to and from the study area and thus be expected to alleviate traffic volumes on the existing Derry Road and James Snow Parkway corridors.
- If necessary, the report could also mention that the Region will monitor the need and timing of all corridor level improvement through future updates to the Transportation Master Plan.
- Include traffic control signal and roundabout warrants where applicable
- Transportation Demand Management Plan to be included with detailed recommendations.
- Site Circulation. Please provide a detailed review of vehicular and pedestrian circulation.
- Detailed Recommendations regarding on-site/off-site roadway improvements, site access, site circulation, and TDM measures should be made.

Parking & Loading

If the subject site is deficient in parking supply per the Town's ZBL, a parking justification study will be required. A terms of reference will be required to be reviewed and approved by the Town prior to commencing the study.

Traffic Signage & Pavement Marking Plan

Create a traffic signage & pavement marking plan to reinforce the function of the internal circulation systems, encourage the utilization of access drives, and direct the facility user to the desired building or exit so that they can concentrate on safe driving instead of figuring out how to reach a destination point. A significant emphasis must be placed on pedestrian circulation and safety. Signs and pavement markings are to conform to the Ontario Traffic Manual.

Auto-Turn Analysis

As part of a complete application, ensure that truck traffic (garbage/loading/transport truck) can enter/exit the site in a forward motion and access to the garbage and loading areas are functional. On separate plans, illustrate truck turning movements with one continuous path with AutoTURN and insert the design vehicles on the plan. The site must be able to accommodate the largest design vehicles which will be accessing the property.

Site Access Review

Referencing the TAC manual, please conduct a detailed and comprehensive Site Access Review including, but not limited to, the following:

• determine if the proposed site access location meets TAC minimum standards for crossing sight distance, stopping sight distance, decision sight distance, turning sight distance, etc

- corner clearance from adjacent intersections
- spacing between adjacent driveways
- spacing considerations for opposing driveways
- ensure design conformance of the site access(es) to OPSD Rural Entrance standards
- Determination whether the proposed site access is feasible from a safety and traffic operations perspective and why
- A list of any potential or required mitigation measures to support the access (if site access determined to be feasible) OR a proposed new site access location(s)

Darren Loro, C.E.T.

Project Manager I – Transportation Planning Coordination
Infrastructure Planning & Policy
Public Works

Halton Region 905-825-6000, ext. 2694 | 1-866-442-5866



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From: Robin Marinac < robin.marinac@cghtransportation.com >

Sent: Tuesday, April 19, 2022 3:02 PM

To: Loro, Darren <<u>Darren.Loro@halton.ca</u>>; <u>Kavleen.Sachdeva@milton.ca</u>

Cc: Mark Crockford < mark.crockford@cghtransportation.com >

Subject: Anatolia Milton Industrial TIS TOR

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Hi Darren and Kavleen

Please find attached our Anatolia Milton Industrial Transportation Impact Study Terms of Reference (TOR) for your review. As described in a previous email, the Anatolia industrial lands are part of a proposed industrial development with two landowners (Neamsby Investments Inc. and Anatolia Capital Corp.). As it is anticipated that a separate TIS will be required for each developer's zoning by-law amendment and draft plan of subdivision application, two separate TORs have been prepared. Please let us know if you have any comments or questions.

Kind regards, Robin Marinac



Robin Marinac, EIT **CGH Transportation Inc.**

P: 437-242-5183

E: robin.marinac@cghtransportation.com

From: Josh Berry (Anatolia Capital Corp)

To: Deanna Green: William Gates-Crease

Cc: <u>Behnaz Bahrefar</u>

Subject: FW: Anatolia Clark Blvd Intersection Alignment

Date: September 11, 2023 10:46:53 AM

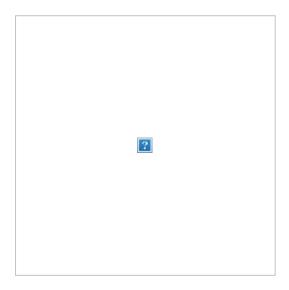
Attachments: 7427e42438cbefc5839a677c83f3caf3 1683889662.jpq

image002.png

FYI

Josh Berry, M.PI, MCIP, RPP Senior Manager - Planning

T +1 905 771 3800 x 5636



From: Natalie.Stopar@milton.ca < Natalie.Stopar@milton.ca >

Sent: September 8, 2023 11:19 AM

To: Josh Berry (Anatolia Capital Corp) < Josh.Berry@anatolia.com>; Colin Chung < colinc@gsai.ca>

Cc: Chris.Toews@milton.ca; christian.lupis@milton.ca; 'Clackett, Robert' <Robert.Clackett@halton.ca>;

Loro, Darren < Darren.Loro@halton.ca>

Subject: Anatolia Clark Blvd Intersection Alignment

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Good afternoon,

I had a meeting with Regional and Town Transportation staff yesterday to discuss the memo dated August 18, 2023. Staff are generally supportive of the proposed Clark Blvd alignment.

To confirm that the alignment is appropriate, please ensure that the TIS includes a discussion of the proposed alignment and intersection. The TIS should also confirm if the proposed location of the intersection will impact future driveway access opportunities to

Derry	Road.
-------	-------

Regards,

Natalie

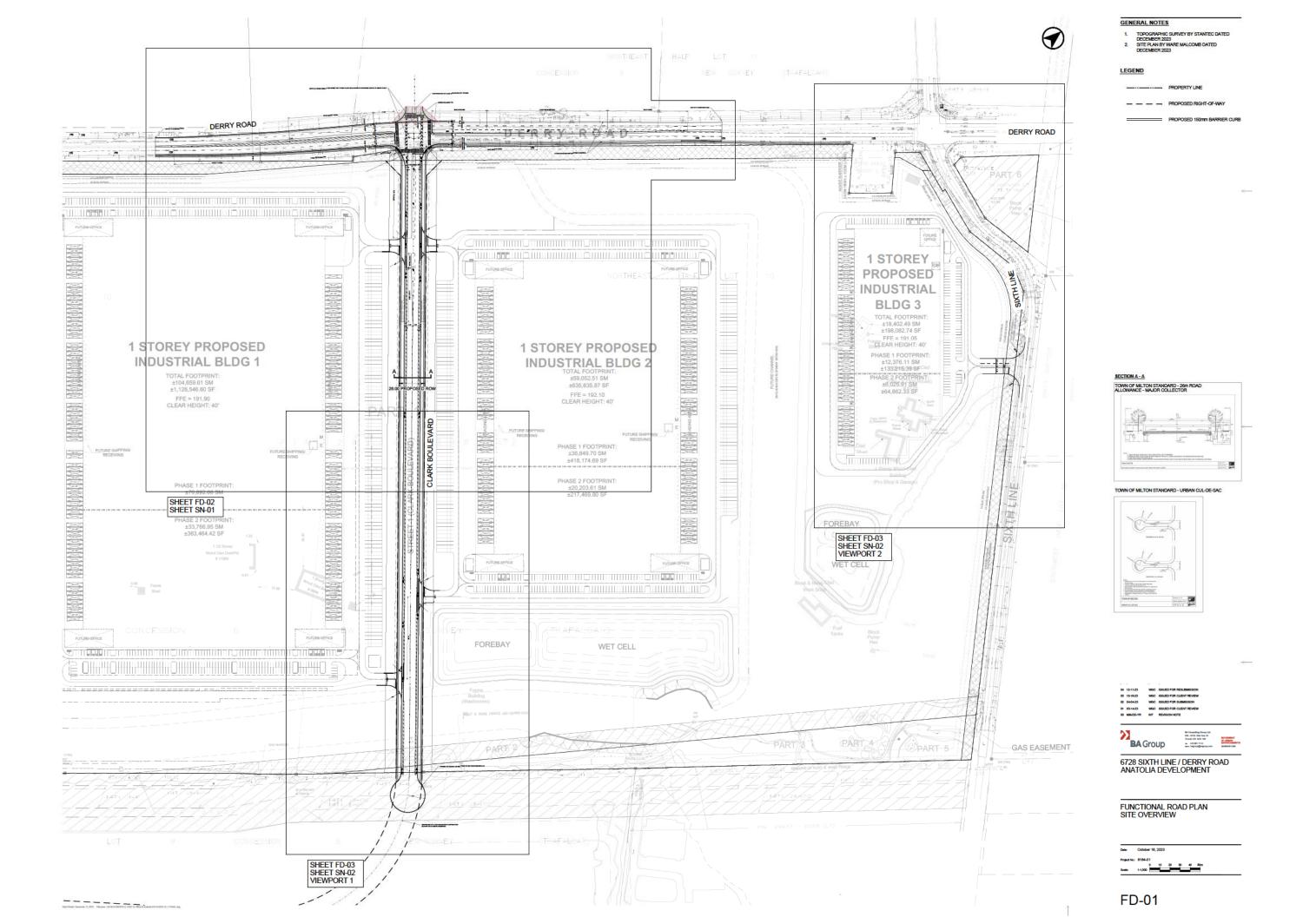


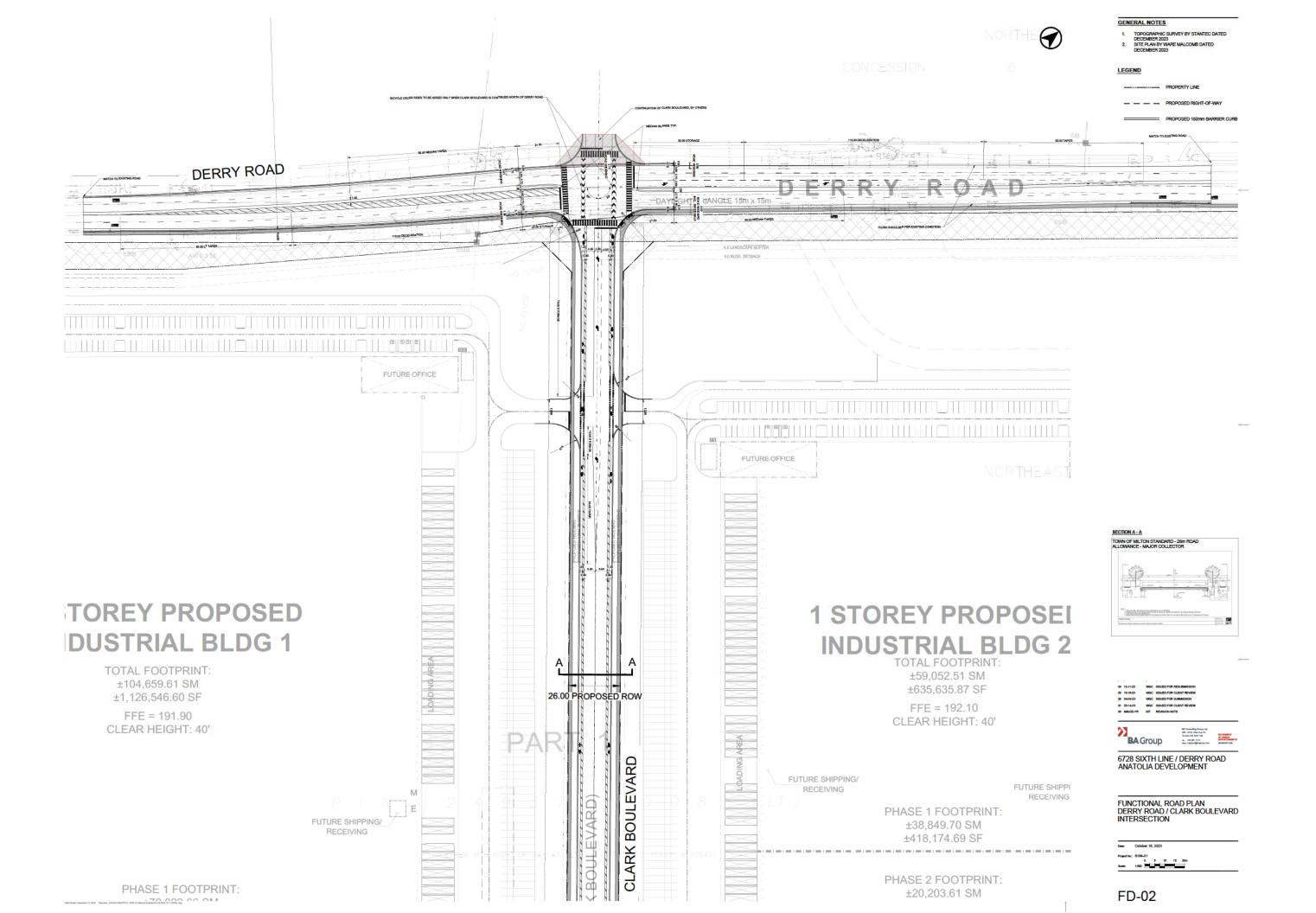
Natalie Stopar, MCIP, RPP

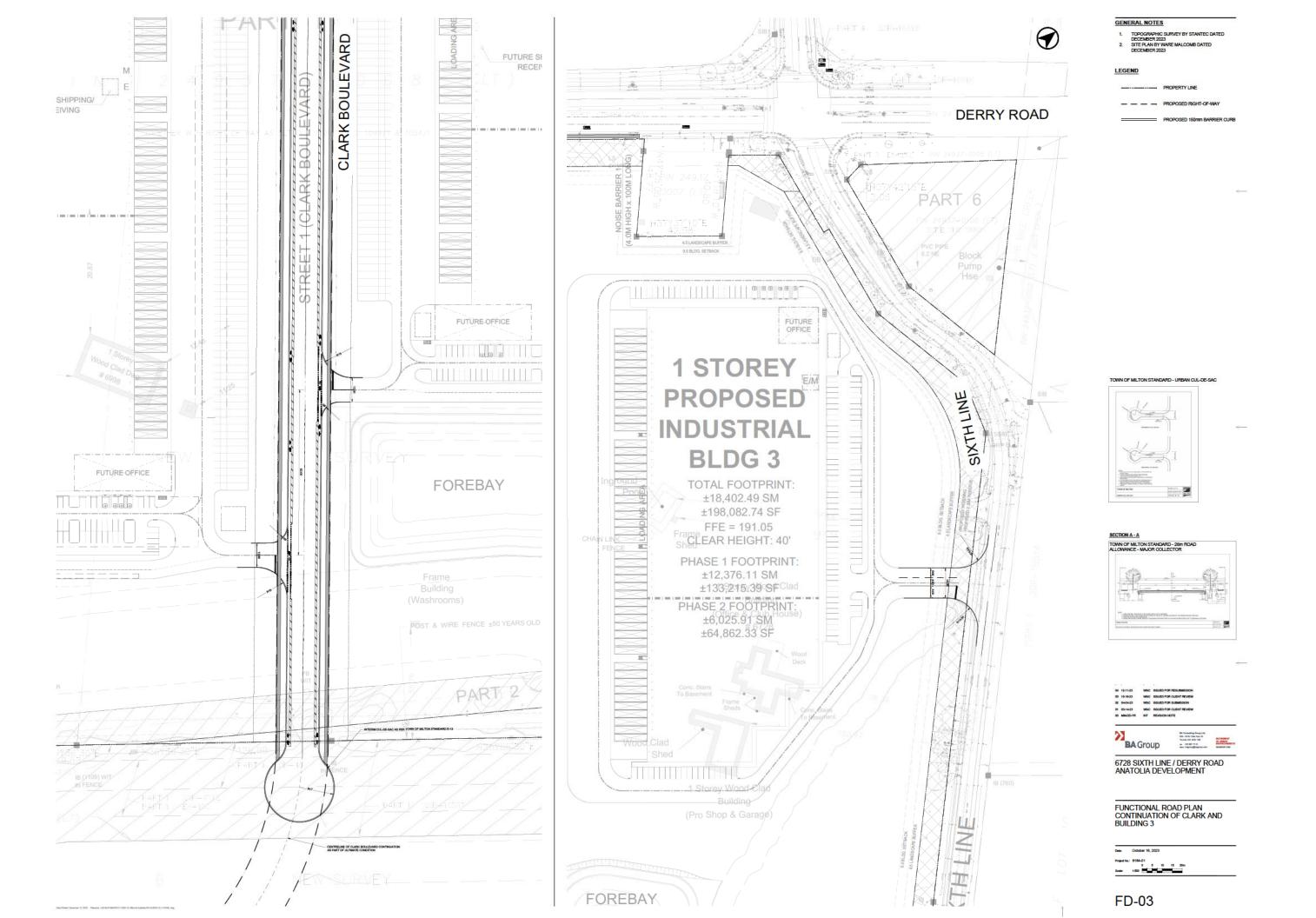
Acting Senior Planner, Development Review 150 Mary Street, Milton ON, L9T 6Z5 905-878-7252 ext. 2297 www.milton.ca

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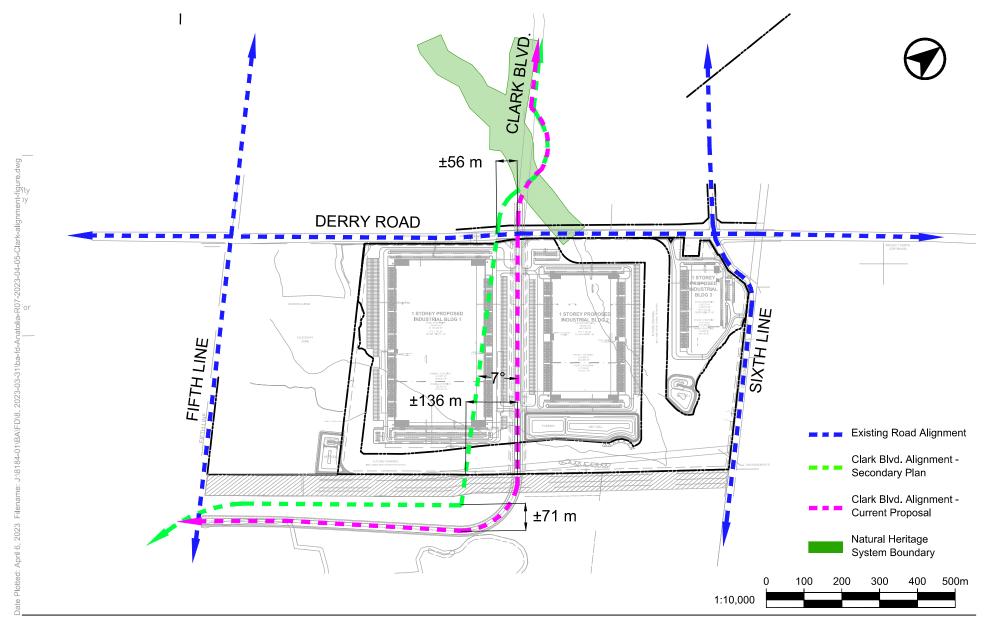
Appendix C: Functional Road Plans







Appendix D: Location of Clark Boulevard at Derry Road



6728 SIXTH LINE / DERRY ROAD ANATOLIA DEVELOPMENT

Comparison Between Secondary Plan alignment of Clark Boulevard and Current Proposed Alignment

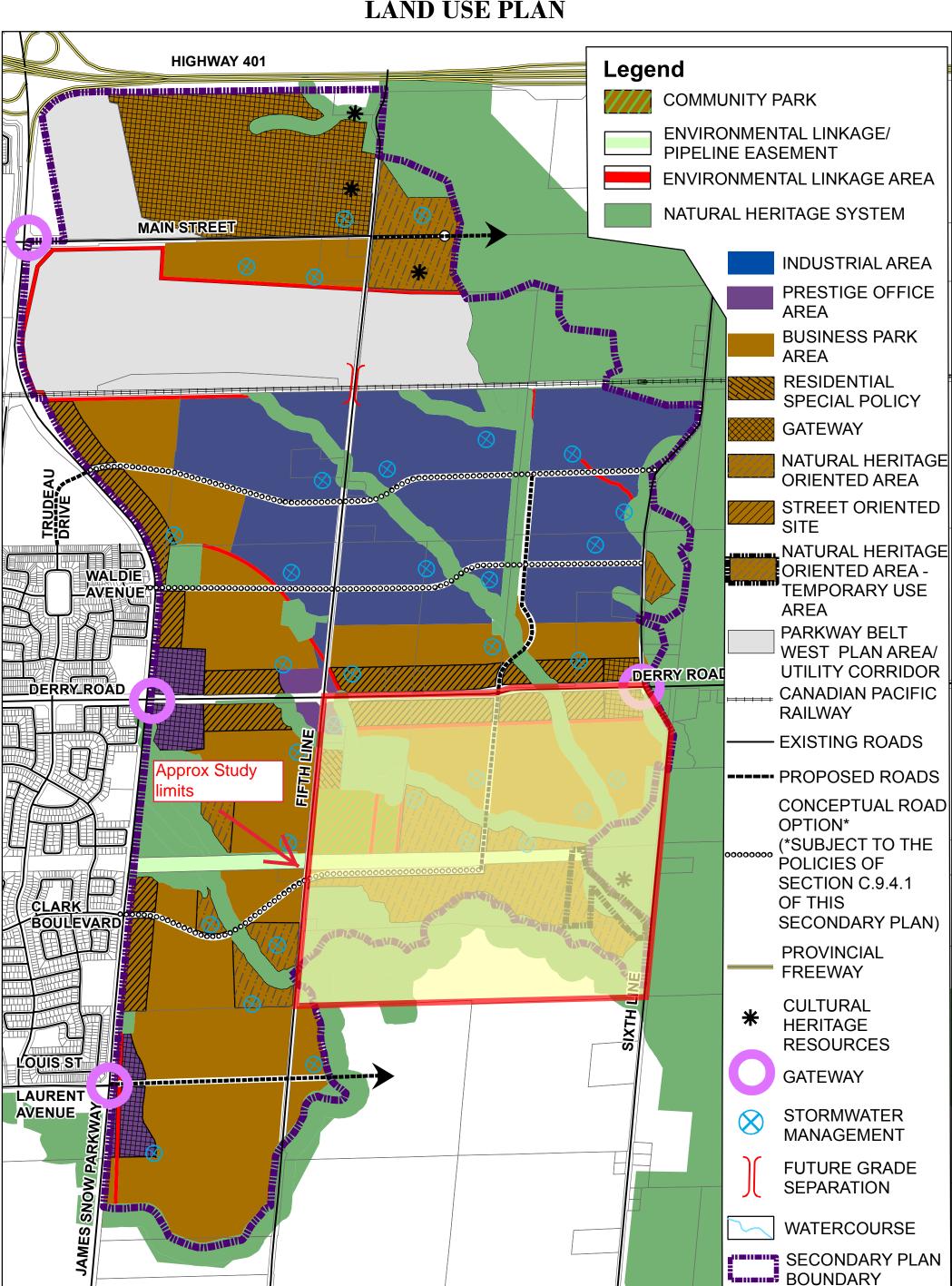




TOWN OF MILTON OFFICIAL PLAN Schedule C-9-B



DERRY GREEN CORPORATE BUSINESS PARK LAND USE PLAN



125

250

500

Appendix E: Parking Demand Survey Data

Project No: 6620-20

Location: Milton Proxy Location - 2200 Yukon

Date: Thursday February 16, 2023

GFA: 96000 m² *from Google Earth

Parking Demand Study

Area	Α	В	С	D	D pool	E	F	F Access	F pool	F eV	Total
Supply	123	126	59	39	23	62	212	17	13	2	676
8:00	2	14	0	13	12	28	83	1	11	0	164
9:00	3	15	0	14	13	28	92	1	10	0	176
10:00	3	16	0	14	13	28	118	1	13	0	206
11:00	3	16	0	14	13	29	110	1	13	1	200
12:00	3	15	0	13	13	28	110	1	10	1	194
13:00	3	16	0	13	12	29	119	1	13	1	207
14:00	3	17	0	14	11	30	109	1	12	1	198
15:00	3	18	0	13	12	26	101	0	7	1	181
16:00	3	15	0	14	5	19	93	1	7	1	158
17:00	3	3	0	5	2	11	50	0	4	1	79
18:00	2	2	0	4	2	8	26	1	4	0	49

Parking Supply Rate: 0.704167 per 100m² Parking Demand Rate: 0.215625 per 100m²

Project No: 6620-20

Location: Milton Proxy Location - 8350 Lawson Rd

Date: Thursday February 16, 2023

GFA: 29600 m² *from Google Earth

Parking Demand Study

Area	Α	A Access	В	С	C Access	Total
Supply	9	3	48	78	4	142
8:00	8	0	2	20	1	31
9:00	8	0	2	28	1	39
10:00	8	0	2	31	1	42
11:00	8	0	3	34	1	46
12:00	8	0	3	31	1	43
13:00	7	0	4	32	1	44
14:00	7	0	3	35	0	45
15:00	0	0	2	32	0	34
16:00	0	0	0	29	0	29
17:00	0	0	0	22	0	22
18:00	0	0	0	22	0	22

Parking Supply Rate: 0.47973 per 100m² Parking Demand Rate: 0.155405 per 100m²

https://www.gwlrealtyadvisors.com/post_news/gwl-realty-advisors-acquires-best-in-class-distribution-facility/

Project No: 8184.01

Project: 6728 6th Line, Milton Study Location: 100 Pillsworth Rd

Municipality: Bolton Study Time: 07:00-19:00

Parking Demand Study 90,103 m² building

Tuesday, November 8, 2022

Area	В	B Access	С	C Access	D	E	F	F Access	G	G Access	Н	Total Regular	Total Accessible	Grand Total	Occupancy
Supply	177	3	125	3	27	15	11	1	30	7	69	454	14	468	
Time															
7:00	5	0	0	0	7	6	0	0	30	1	44	92	1	93	20%
8:00	8	0	0	0	7	7	0	0	29	1	44	95	1	96	21%
9:00	13	0	0	0	7	7	0	0	29	2	47	103	2	105	22%
10:00	14	0	0	0	7	7	0	0	30	2	47	105	2	107	23%
11:00	15	0	0	0	7	7	0	0	30	1	50	109	1	110	24%
12:00	15	0	0	0	8	7	0	0	30	0	51	111	0	111	24%
13:00	18	0	0	0	8	7	0	0	30	1	49	112	1	113	24%
14:00	20	0	0	0	8	7	0	0	29	1	47	111	1	112	24%
15:00	13	0	0	0	8	7	0	0	30	2	49	107	2	109	23%
16:00	7	0	0	0	7	3	0	0	2	1	10	29	1	30	6%
17:00	5	0	0	0	6	0	0	0	10	1	8	29	1	30	6%
18:00	0	0	0	0	3	0	0	0	21	1	18	42	1	43	9%
19:00	0	0	0	0	3	0	0	0	22	1	17	42	1	43	9%

Wednesday, November 9, 2022

Area	В	B Access	С	C Access	D	E	F	F Access	G	G Access	Н	Total Regular	Total Accessible	Grand Total	Occupancy
Supply	177	3	125	3	27	15	11	1	30	7	69	454	14	468	
Time															
7:00	8	0	0	0	10	10	0	0	28	1	49	105	1	106	23%
8:00	13	0	0	0	9	9	0	0	29	1	50	110	1	111	24%
9:00	25	0	0	0	8	9	0	0	30	1	53	125	1	126	27%
10:00	33	0	0	0	8	9	0	0	30	1	54	134	1	135	29%
11:00	32	0	0	0	8	9	0	0	30	1	58	137	1	138	29%
12:00	30	0	0	0	8	9	0	0	30	0	53	130	0	130	28%
13:00	25	0	0	0	8	9	0	0	30	2	51	123	2	125	27%
14:00	24	0	0	0	8	9	0	0	30	1	53	124	1	125	27%
15:00	16	0	0	0	6	6	0	0	30	3	55	113	3	116	25%
16:00	9	0	0	0	6	3	0	0	4	2	13	35	2	37	8%
17:00	5	0	0	0	6	3	0	0	7	1	9	30	1	31	7%
18:00	0	0	0	0	4	2	0	0	19	1	19	44	1	45	10%
19:00	0	0	0	0	2	2	0	0	19	1	17	40	1	41	9%

Note: There were no parking spaces in Area A.

Project No: 6620-20

Location: Milton Proxy Location - 205 Market Dr

Date: Thursday February 16, 2023

GFA: 36000 m² *from Google Earth

Parking Demand Study

Area	Α	A Access	В	Total
Supply	63	6	70	139
8:00	29	0	14	43
9:00	41	0	15	56
10:00	41	0	16	57
11:00	41	0	16	57
12:00	40	0	16	56
13:00	37	0	16	53
14:00	38	0	18	56
15:00	35	0	14	49
16:00	21	0	10	31
17:00	25	0	10	35
18:00	18	0	5	23

Supply Rate: 0.386111 per 100m² ≥mand Rate: 0.158333 per 100m²

Project No: 6620-20

Location: Bolton Proxy Location - 8339 George Bolton Pkwy

Date: Thursday February 16, 2023

GFA: 72250 m² *from Google Earth

Parking Demand Study

Area	Α	A Access	A Ev	В	B EV	С	D	D Access	E	E Access	E Ev	F	G	G Access	Total
Supply	46	3	4	60	6	62	60	3	68	3	10	80	82	3	490
8:00	3	0	1	0	0	0	0	0	32	0	0	4	42	0	82
9:00	4	0	1	0	0	0	0	0	42	0	0	6	55	0	108
10:00	4	0	1	0	0	1	0	0	50	0	0	11	50	0	117
11:00	5	0	1	0	0	0	0	0	50	0	0	11	66	0	133
12:00	4	0	1	0	0	1	0	0	50	0	0	11	57	0	124
13:00	6	0	1	0	0	0	0	0	47	0	0	11	56	0	121
14:00	4	0	1	0	0	0	0	0	48	0	0	10	57	0	120
15:00	3	0	1	0	0	0	0	0	45	0	0	10	45	0	104
16:00	4	0	1	0	0	1	0	0	39	0	0	7	37	0	89
17:00	1	0	1	0	0	0	0	0	24	0	0	5	34	0	65
18:00	2	0	1	0	0	0	0	0	9	0	0	2	13	0	27

^{*}Field crew noted all lights in building appeared to be off

Parking Supply Rate: 0.678201 per 100m2 Parking Demand Rate: 0.184083 per 100m2

Project No: 6620-20

Location: Bolton Proxy Location - 8400 George Bolton Pkwy

Date: Thursday February 16, 2023

GFA: 40750 m² *from Google Earth

Parking Demand Study

Area	Α	A Access	A Ev	В	С	D	D Access	D Ev	Total
Supply	37	8	4	77	74	71	3	2	276
8:00	13	0	2	1	0	12	0	0	28
9:00	14	0	2	1	0	13	0	0	30
10:00	11	0	2	1	0	13	0	0	27
11:00	13	0	2	2	0	15	0	0	32
12:00	14	0	2	1	1	14	0	0	32
13:00	15	0	2	1	0	13	0	0	31
14:00	14	0	2	1	0	12	0	0	29
15:00	10	0	1	1	0	3	0	0	15
16:00	9	0	1	1	0	2	0	0	13
17:00	9	0	1	1	0	0	0	0	11
18:00	10	0	1	1	0	0	0	0	12

Parking Supply I 0.677301 per 100m2 Parking Demand 0.078528 per 100m2 **Project:** Brodie Lands - 9481 Leslie

Project No: 6620-20

Location: Bolton Proxy Location - 12315 Coleraine Dr

Date: Thursday February 16, 2023

GFA: 41800 m² *from Google Earth

Parking Demand Study

Area	Α	A Access	Total
Supply	143	5	148
8:00	64	0	64
9:00	71	0	71
10:00	77	0	77
11:00	79	0	79
12:00	64	0	64
13:00	77	0	77
14:00	80	0	80
15:00	84	0	84
16:00	74	0	74
17:00	64	0	64
18:00	59	0	59

^{*}Field crew noted shift change at 3pm

Supply Rate: 0.354067 per 100m² ≥mand Rate: 0.200957 per 100m² Project: Brodie Lands - 9481 Leslie

Project No: 6620-20

Location: Bolton Proxy Location - 12366 Coleraine

Date: Thursday February 16, 2023

GFA: 21500 m² *from Google Earth

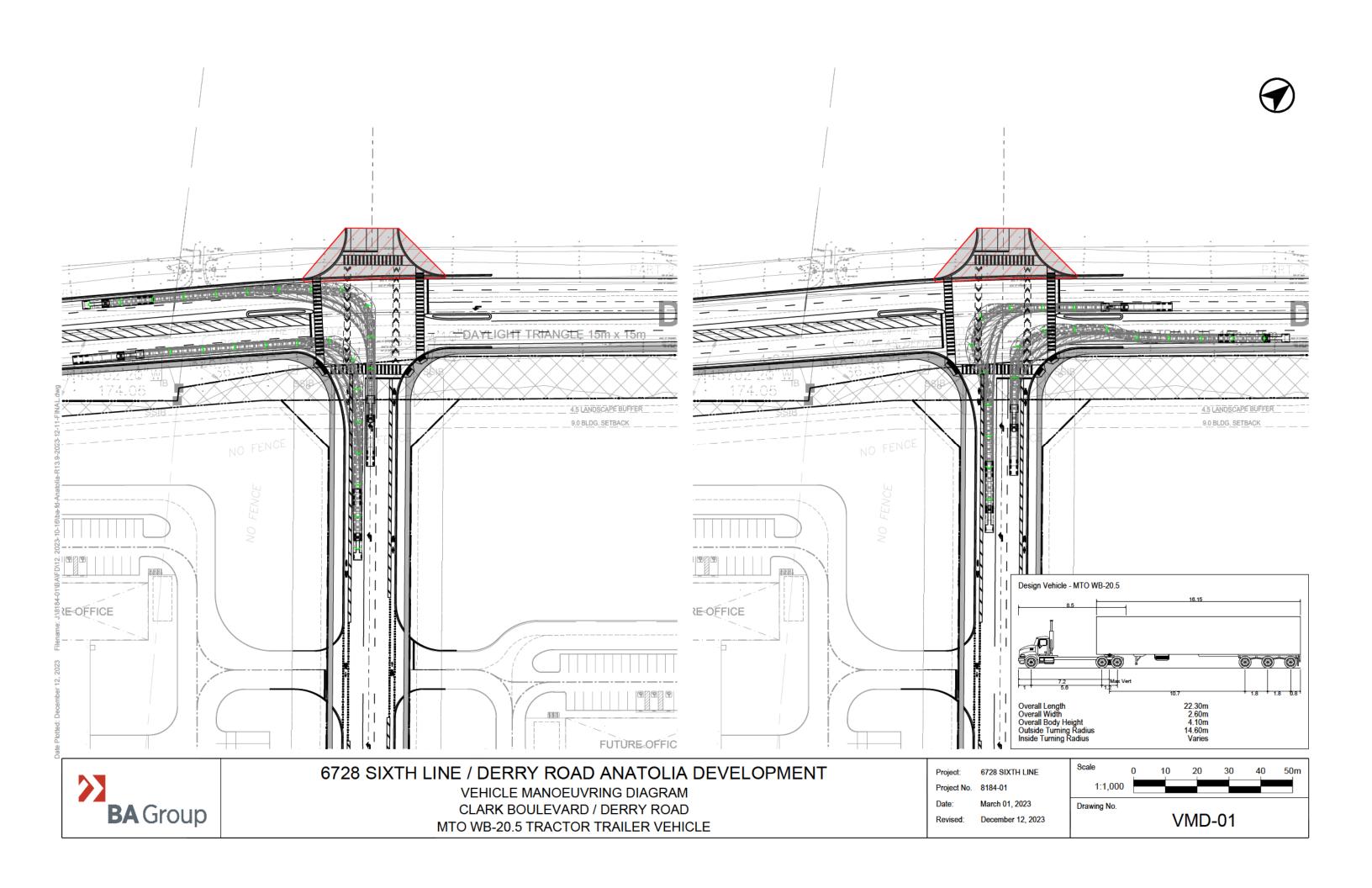
Parking Demand Study

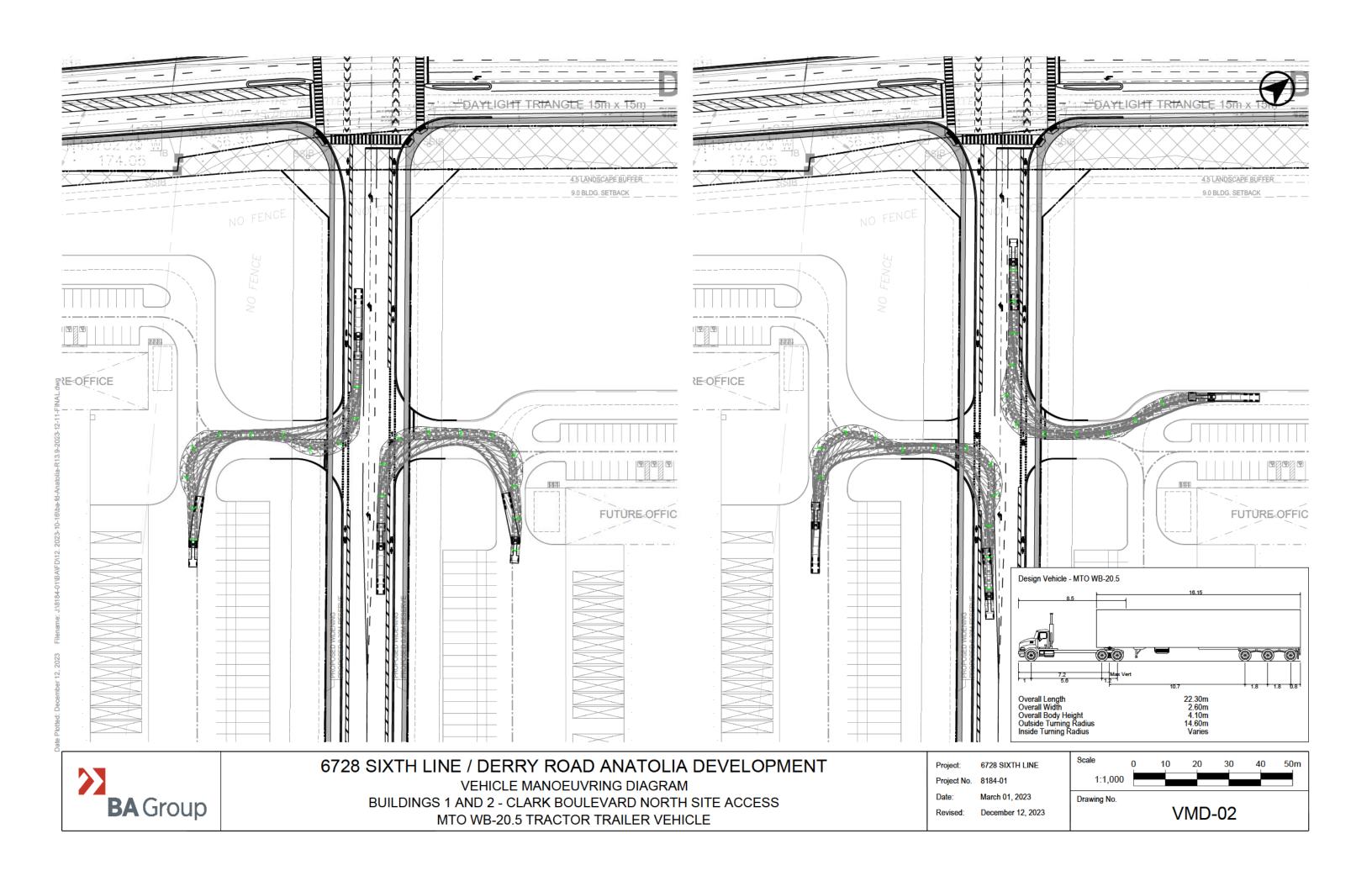
Area	Α	A Access	В	B Access	B Ev	С	D	Total
Supply	82	4	19	4	5	22	69	205
8:00	23	0	0	0	0	0	0	23
9:00	22	0	1	0	0	0	0	23
10:00	24	0	0	0	0	0	0	24
11:00	25	0	0	0	0	0	0	25
12:00	26	0	0	0	0	0	0	26
13:00	26	0	0	0	0	0	0	26
14:00	25	0	0	0	0	0	0	25
15:00	24	0	0	0	0	0	0	24
16:00	20	0	0	0	0	0	0	20
17:00	19	0	0	0	0	0	0	19
18:00	20	0	0	0	0	0	0	20

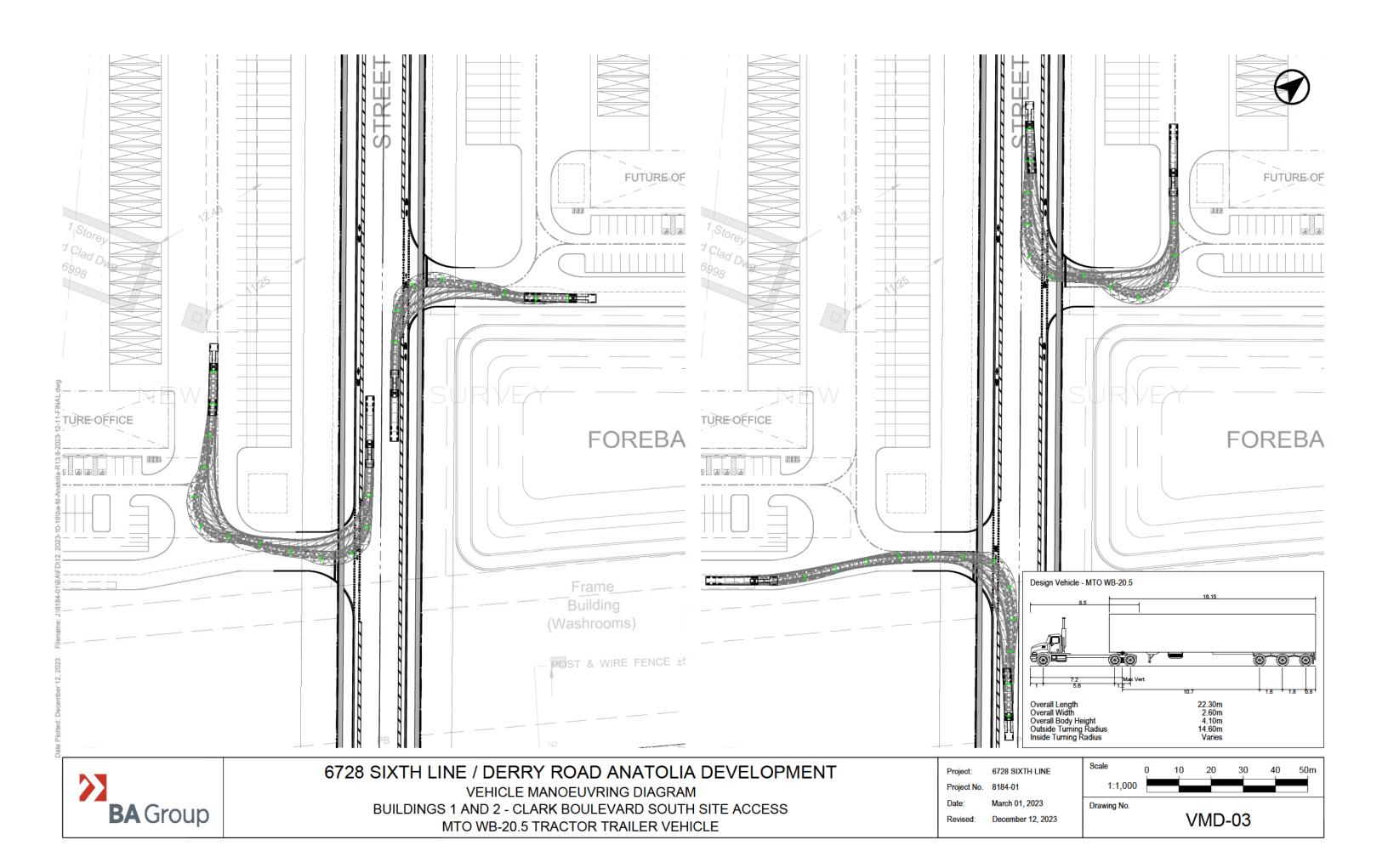
Parking Supply Rate: 0.953488 per 100m² Parking Demand Rate: 0.12093 per 100m²

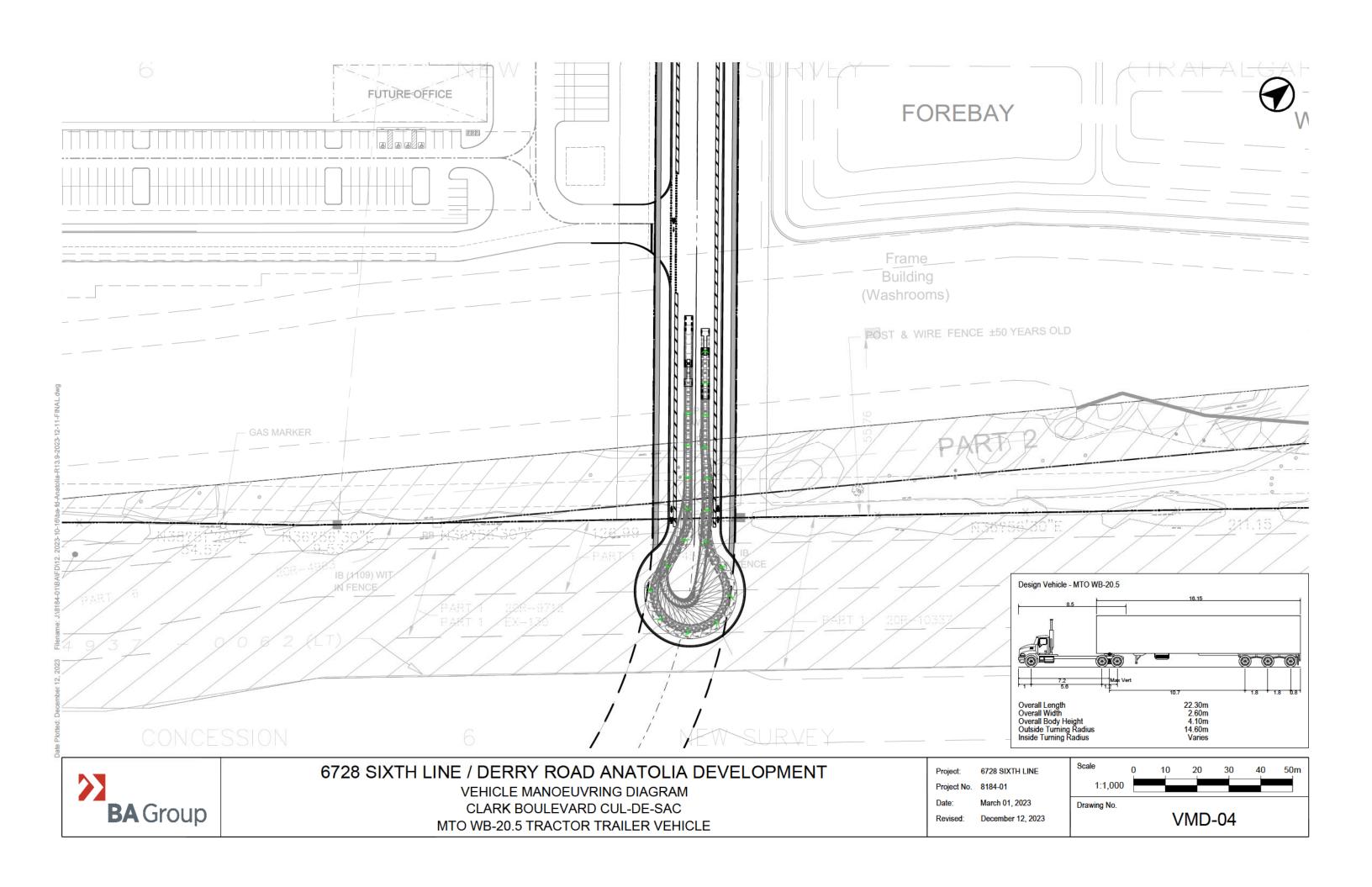
^{*}Field crew noted all lights in building appeared to be off - Those parked in area A seemed to be part of a training course

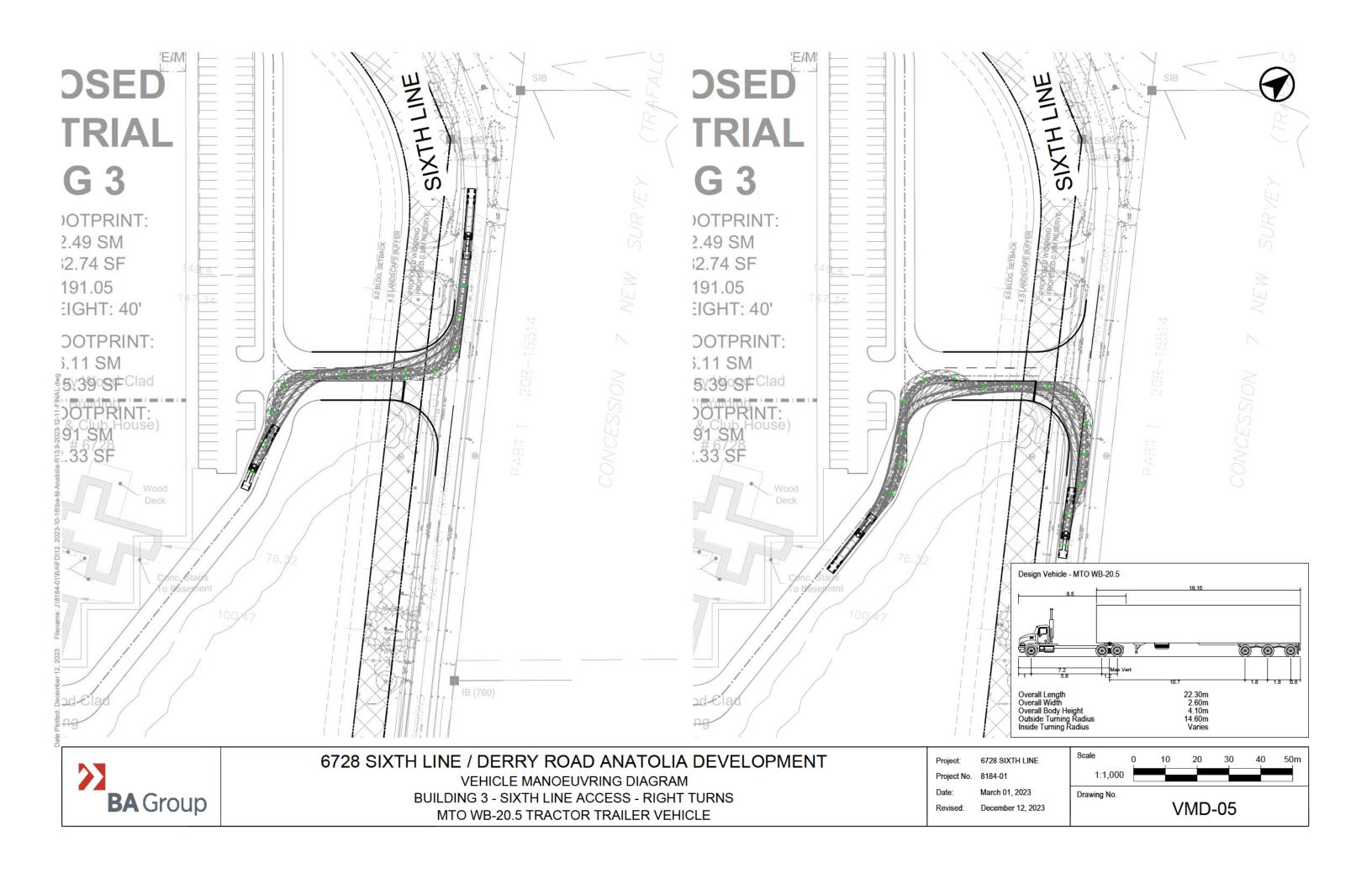
Appendix F: Vehicle Maneuvering Diagrams

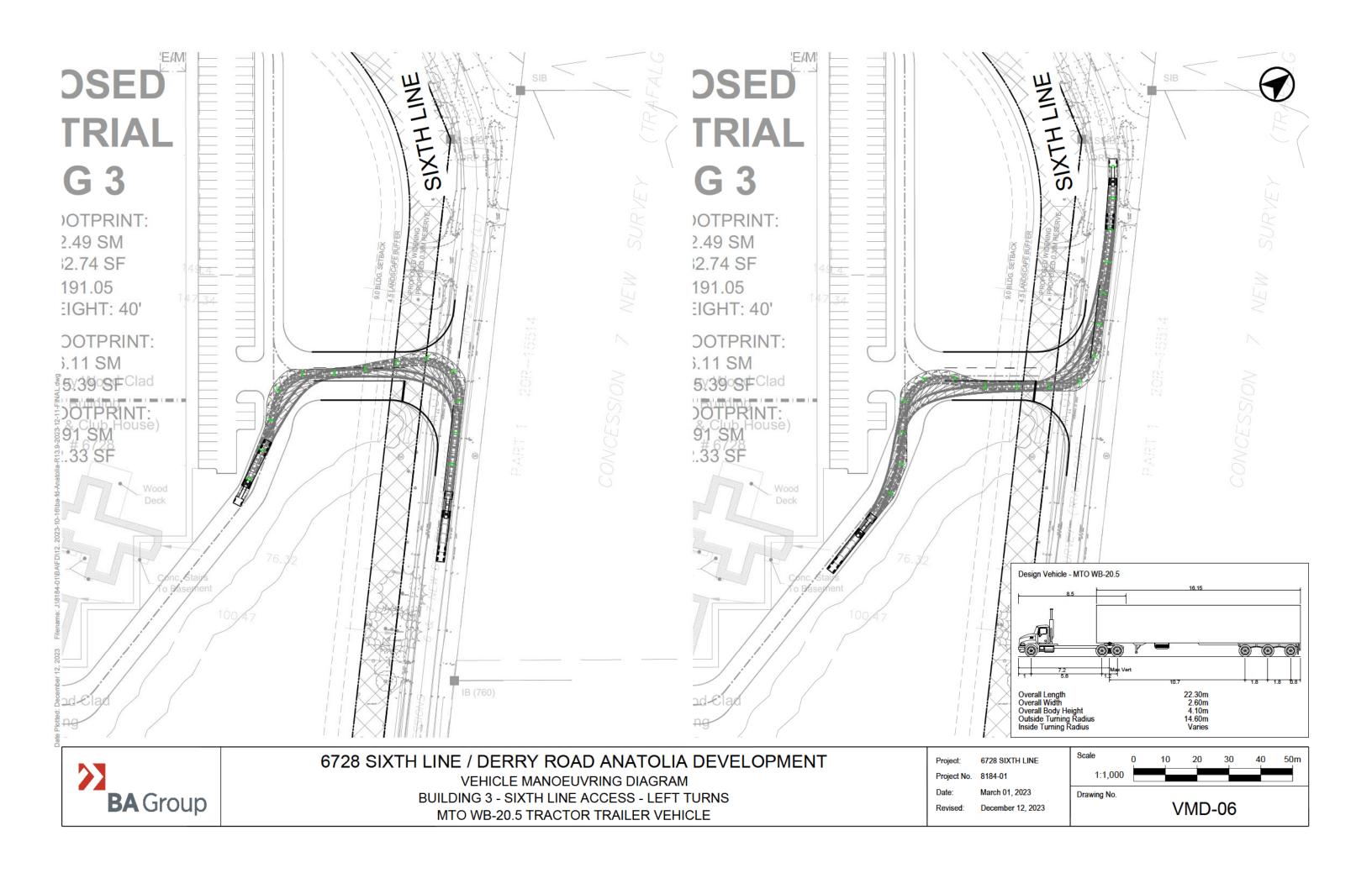


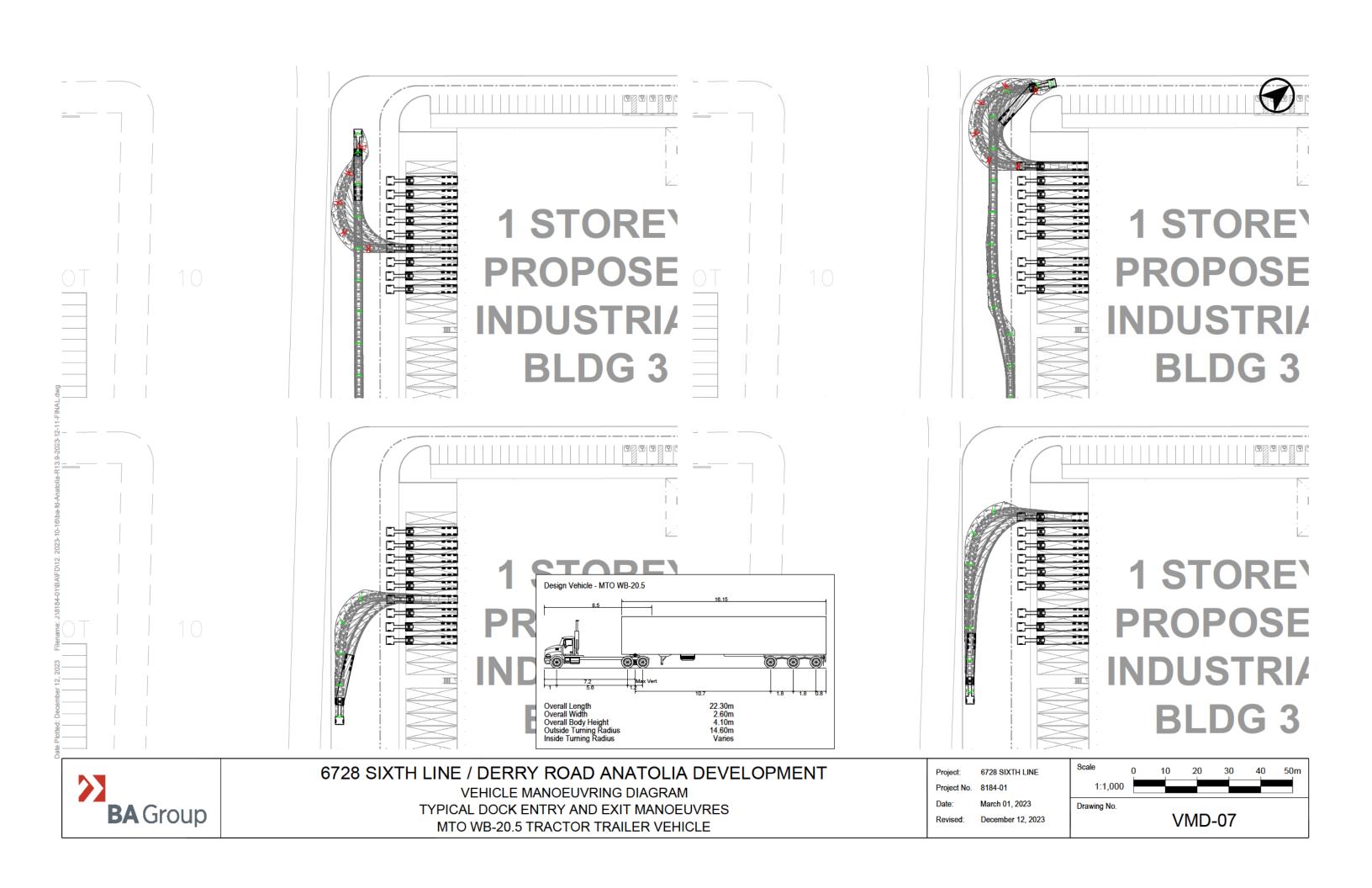












Appendix G: Traffic Count Data



Project #22-199 - CGH Transportation

Intersection Count Report

Intersection: Sixth Line & Derry Rd

Municipality: Milton

Count Date: Thursday, Jun 16, 2022

Site Code: 2219900003

Count Categories: Cars, Trucks, Buses, Bicycles, Pedestrians

Count Period: 07:00-09:00, 15:00-18:00

Weather: Clear

Comments:



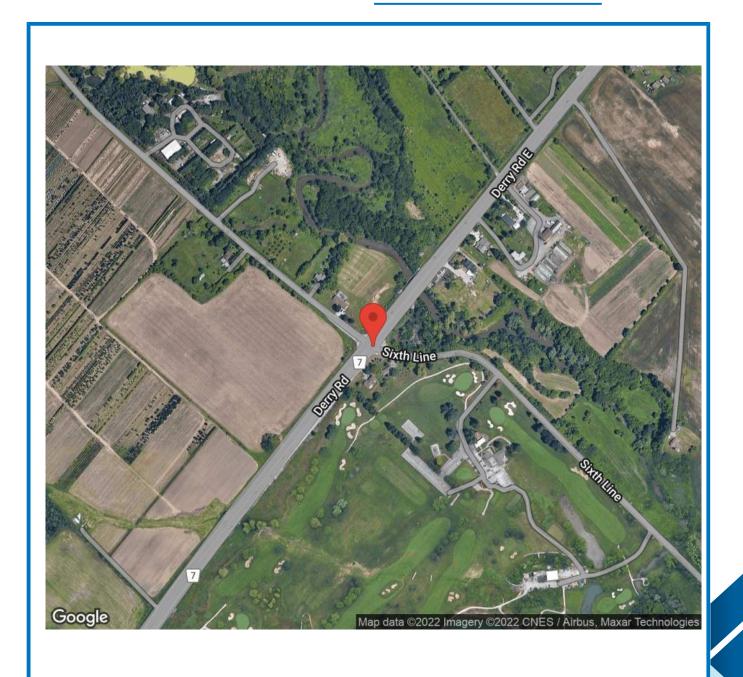
Traffic Count Map

Intersection: Sixth Line & Derry Rd

Site Code: 2219900003

Municipality: Milton

Count Date: Jun 16, 2022





Traffic Count Summary

Intersection: Sixth Line & Derry Rd

Site Code: 2219900003 Municipality: Milton

Count Date: Jun 16, 2022

Sixth Line - Traffic Summary

		North	Appr	oach T	otals			South	Appr	oach T	otals		
	Inc	ludes Ca	rs, Truc	ks, Buses	s, Bicycle	S	Inc	ludes Ca	rs, Truc	ks, Buses	, Bicycle	S	
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	10	80	84	0	174	0	41	53	20	0	114	0	288
08:00 - 09:00	14	99	89	0	202	0	65	55	16	0	136	0	338
					В	REAK							
15:00 - 16:00	53	80	106	0	239	0	170	67	23	0	260	0	499
16:00 - 17:00	51	92	112	0	255	0	166	123	23	0	312	0	567
17:00 - 18:00	58	86	78	0	222	0	131	74	31	0	236	0	458
GRAND TOTAL	186	437	469	0	1092	0	573	372	113	0	1058	0	2150



Traffic Count Summary

Intersection: Sixth Line & Derry Rd

Site Code: 2219900003 Municipality: Milton

Count Date: Jun 16, 2022

Derry Rd - Traffic Summary

		East	Appro	ach To	otals			West	Appro	oach To	otals		
	Inc	cludes Ca	rs, Truc	ks, Buse	s, Bicycle	s	In	cludes Ca	rs, Truc	ks, Buse	s, Bicycle	S	
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	12	502	6	0	520	0	55	1658	104	0	1817	0	2337
08:00 - 09:00	14	655	8	0	677	0	41	1515	113	0	1669	0	2346
					В	REAK						_	
15:00 - 16:00	15	1382	10	0	1407	0	72	1314	68	0	1454	0	2861
16:00 - 17:00	20	1446	10	0	1476	0	110	1436	64	0	1610	0	3086
17:00 - 18:00	17	1424	6	0	1447	0	68	1426	69	0	1563	0	3010
GRAND TOTAL	78	5409	40	0	5527	0	346	7349	418	0	8113	0	13640



Intersection: Sixth Line & Derry Rd

Site Code: 2219900003

Municipality: Milton

Count Date: Jun 16, 2022

North Approach - Sixth Line

			Cars				T	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	J.	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
07:00	1	14	10	0	25	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0
07:15	2	17	11	0	30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
07:30	1	26	41	0	68	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
07:45	2	22	19	0	43	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
08:00	2	20	11	0	33	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
08:15	4	22	31	0	57	2	0	0	0	2	0	1	1	0	2	0	0	0	0	0	0
08:30	3	39	22	0	64	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
08:45	0	17	20	0	37	1	0	3	0	4	0	0	1	0	1	0	0	0	0	0	0
SUBTOTAL	15	177	165	0	357	9	1	6	0	16	0	1	2	0	3	0	0	0	0	0	0



Intersection: Sixth Line & Derry Rd

Site Code: 2219900003

Municipality: Milton

Count Date: Jun 16, 2022

North Approach - Sixth Line

			Cars				T	rucks				В	uses				Bi	icycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
15:00	15	18	28	0	61	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
15:15	14	21	24	0	59	1	1	0	0	2	0	0	1	0	1	0	0	0	0	0	0
15:30	13	19	27	0	59	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
15:45	8	20	23	0	51	1	0	1	0	2	0	0	1	0	1	0	0	0	0	0	0
16:00	12	19	31	0	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	9	21	24	0	54	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0
16:30	19	26	34	0	79	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
16:45	10	26	20	0	56	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17:00	18	26	17	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	20	25	18	0	63	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
17:30	10	22	17	0	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	10	11	26	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	158	254	289	0	701	4	4	3	0	11	0	0	4	0	4	0	0	0	0	0	0
GRAND TOTAL	173	431	454	0	1058	13	5	9	0	27	0	1	6	0	7	0	0	0	0	0	0



Intersection: Sixth Line & Derry Rd

Site Code: 2219900003

Municipality: Milton

Count Date: Jun 16, 2022

South Approach - Sixth Line

			Cars				Ti	rucks				В	Buses				Bi	cycles			Total
Start Time	4	1	•	J	Total	4	1	•	J	Total	4	1	•	J	Total	4	1	•	J	Total	Total Peds
07:00	4	8	5	0	17	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
07:15	4	10	2	0	16	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
07:30	9	19	5	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	24	15	7	0	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	14	16	4	0	34	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
08:15	12	5	3	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	17	16	3	0	36	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
08:45	21	16	5	0	42	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0
SUBTOTAL	105	105	34	0	244	0	3	0	0	3	1	0	2	0	3	0	0	0	0	0	0



Intersection: Sixth Line & Derry Rd

Site Code: 2219900003

Municipality: Milton

Count Date: Jun 16, 2022

South Approach - Sixth Line

			Cars				T	rucks				В	uses				Bi	icycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
15:00	40	17	3	0	60	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
15:15	37	21	8	0	66	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
15:30	48	13	5	0	66	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0
15:45	41	16	5	0	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	36	26	4	0	66	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:15	38	22	5	0	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	33	39	7	0	79	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:45	58	35	7	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	28	18	5	0	51	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17:15	42	20	8	0	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	35	17	9	0	61	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0
17:45	25	16	9	0	50	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	461	260	75	0	796	5	4	2	0	11	1	0	0	0	1	0	0	0	0	0	0
GRAND TOTAL	566	365	109	0	1040	5	7	2	0	14	2	0	2	0	4	0	0	0	0	0	0



Intersection: Sixth Line & Derry Rd

Site Code: 2219900003

Municipality: Milton

Count Date: Jun 16, 2022

East Approach - Derry Rd

			Cars				T	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	-	1	Total	Total Peds
07:00	3	63	1	0	67	0	5	1	0	6	0	0	0	0	0	0	0	0	0	0	0
07:15	3	95	2	0	100	0	8	1	0	9	0	1	0	0	1	0	0	0	0	0	0
07:30	1	144	0	0	145	0	10	0	0	10	0	1	0	0	1	0	0	0	0	0	0
07:45	5	164	0	0	169	0	7	1	0	8	0	4	0	0	4	0	0	0	0	0	0
08:00	5	136	3	0	144	0	16	0	0	16	0	1	0	0	1	0	0	0	0	0	0
08:15	3	145	1	0	149	0	14	1	0	15	0	1	0	0	1	0	0	0	0	0	0
08:30	3	170	3	0	176	0	9	0	0	9	0	1	0	0	1	0	0	0	0	0	0
08:45	3	153	0	0	156	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	26	1070	10	0	1106	0	78	4	0	82	0	9	0	0	9	0	0	0	0	0	0



Intersection: Sixth Line & Derry Rd

Site Code: 2219900003

Municipality: Milton

Count Date: Jun 16, 2022

East Approach - Derry Rd

		(Cars				T	rucks				В	uses				Bi	icycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
15:00	3	304	2	0	309	0	21	0	0	21	0	4	0	0	4	0	0	0	0	0	0
15:15	4	358	3	0	365	0	14	0	0	14	0	0	0	0	0	0	0	0	0	0	0
15:30	6	298	2	0	306	0	13	0	0	13	0	1	0	0	1	0	0	0	0	0	0
15:45	2	361	2	0	365	0	8	1	0	9	0	0	0	0	0	0	0	0	0	0	0
16:00	4	343	1	0	348	0	8	0	0	8	0	2	0	0	2	0	0	0	0	0	0
16:15	3	355	2	0	360	0	5	0	0	5	0	1	0	0	1	0	0	0	0	0	0
16:30	9	360	1	0	370	0	18	0	0	18	0	0	0	0	0	0	0	0	0	0	0
16:45	4	347	5	0	356	0	6	1	0	7	0	1	0	0	1	0	0	0	0	0	0
17:00	3	388	1	0	392	0	5	1	0	6	0	0	0	0	0	0	0	0	0	0	0
17:15	4	386	0	0	390	1	7	0	0	8	0	0	0	0	0	0	0	0	0	0	0
17:30	3	331	0	0	334	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0
17:45	6	295	4	0	305	0	6	0	0	6	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	51	4126	23	0	4200	1	116	3	0	120	0	10	0	0	10	0	0	0	0	0	0
GRAND TOTAL	77	5196	33	0	5306	1	194	7	0	202	0	19	0	0	19	0	0	0	0	0	0



Intersection: Sixth Line & Derry Rd

Site Code: 2219900003

Municipality: Milton

Count Date: Jun 16, 2022

West Approach - Derry Rd

			Cars				Ti	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	J.	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
07:00	5	313	12	0	330	0	5	0	0	5	0	0	1	0	1	0	0	0	0	0	0
07:15	17	420	21	0	458	2	3	0	0	5	0	0	0	0	0	0	0	0	0	0	0
07:30	15	465	38	0	518	0	11	0	0	11	0	1	0	0	1	0	0	0	0	0	0
07:45	15	428	30	0	473	0	11	2	0	13	1	1	0	0	2	0	0	0	0	0	0
08:00	9	419	29	0	457	0	10	0	0	10	0	3	0	0	3	0	0	0	0	0	0
08:15	10	407	24	0	441	0	12	0	0	12	0	0	0	0	0	0	0	0	0	0	0
08:30	16	342	33	0	391	0	15	0	0	15	1	2	1	0	4	0	0	0	0	0	0
08:45	5	298	26	0	329	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	92	3092	213	0	3397	2	74	2	0	78	2	7	2	0	11	0	0	0	0	0	0



Intersection: Sixth Line & Derry Rd

Site Code: 2219900003

Municipality: Milton

Count Date: Jun 16, 2022

West Approach - Derry Rd

			Cars				Ti	rucks				В	uses				Bi	cycles			Takal
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
15:00	18	278	13	0	309	0	19	0	0	19	0	1	0	0	1	0	0	0	0	0	0
15:15	18	300	16	0	334	0	22	0	0	22	1	0	0	0	1	0	0	0	0	0	0
15:30	19	317	18	0	354	0	20	1	0	21	0	7	0	0	7	0	0	0	0	0	0
15:45	16	332	19	0	367	0	16	0	0	16	0	2	1	0	3	0	0	0	0	0	0
16:00	22	298	19	0	339	1	21	0	0	22	0	1	0	0	1	0	0	0	0	0	0
16:15	15	330	18	0	363	0	24	0	0	24	0	1	0	0	1	0	0	0	0	0	0
16:30	27	348	9	0	384	1	19	0	0	20	0	2	0	0	2	0	0	0	0	0	0
16:45	42	381	18	0	441	2	10	0	0	12	0	1	0	0	1	0	0	0	0	0	0
17:00	19	339	19	0	377	0	12	0	0	12	0	0	0	0	0	0	0	0	0	0	0
17:15	20	362	24	0	406	0	14	0	0	14	0	0	0	0	0	0	0	0	0	0	0
17:30	13	359	17	0	389	0	8	0	0	8	0	2	0	0	2	0	0	0	0	0	0
17:45	15	320	9	0	344	1	8	0	0	9	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	244	3964	199	0	4407	5	193	1	0	199	1	19	1	0	21	0	0	0	0	0	0
GRAND TOTAL	336	7056	412	0	7804	7	267	3	0	277	3	26	3	0	32	0	0	0	0	0	0



Peak Hour Diagram

Specified Period

One Hour Peak

From: To: 07:00:00 09:00:00 From: 07:30:00 To: 08:30:00

Intersection: Sixth Line & Derry Rd

 Site Code:
 2219900003

 Count Date:
 Jun 16, 2022

Weather conditions:

Clear

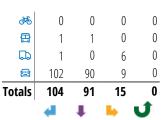
** Signalized Intersection **

Major Road: Derry Rd runs E/W

North Approach

	Out	In	Total
	201	108	309
	7	2	9
	2	1	3
<i>₫</i>	0	0	0
	210	111	321

Sixth Line



East Approach

	Out	ln	Total
	607	1747	2354
	49	50	99
田	7	6	13
₹	0	0	0
	663	1803	2466

Derry Rd

_	Totals				<i>₹</i> 6
7	0	0	0	0	0
4	50	49	0	1	0
\Rightarrow	50 1768	1719	44	5	0
4	123	121	2	0	0





Derry Rd

	Totals				<i>₹</i>
C	0	0	0	0	0
£	6	4	2	0	0
-	643	589	47	7	0
F	14	14	0	0	0

West Approach

	Out	ln	Total
	1889	750	2639
	46	48	94
	6	8	14
<i>₫</i>	0	0	0
	1941	806	2747

	Peds: 0	
4	1	Ì

	1			- +
Totals	59	55	20	0
	59	55	19	0
₽	0	0	0	0
	0	0	1	0
<i>₫</i>	0	0	0	0

Sixth Line

South Approach

	Out	In	Total
	133	225	358
_	0	2	2
	1	1	2
秀	0	0	0
	134	228	362







♣ - Bicycles

Comments



Peak Hour Summary

Intersection: Sixth Line & Derry Rd

Site Code: 2219900003 Count Date: Jun 16, 2022

Period: 07:00 - 09:00

Peak Hour Data (07:30 - 08:30)

		N	lorth A Sixth	pproac Line	h			S	outh A Sixth	pproac Line	h				East A _l Deri	oproach ry Rd	1			١	Nest A _l Derr	oproacl y Rd	h		Total Vehicl
Start Time	4	1	•	J	Peds	Total	4	1	•	J	Peds	Total	4	1	•	J	Peds	Total	4	1	•	J	Peds	Total	es
07:30	2	26	41	0	0	69	9	19	5	0	0	33	1	155	0	0	0	156	15	477	38	0	0	530	788
07:45	4	22	20	0	0	46	24	15	7	0	0	46	5	175	1	0	0	181	16	440	32	0	0	488	761
08:00	3	20	11	0	0	34	14	16	5	0	0	35	5	153	3	0	0	161	9	432	29	0	0	470	700
08:15	6	23	32	0	0	61	12	5	3	0	0	20	3	160	2	0	0	165	10	419	24	0	0	453	699
Grand Total	15	91	104	0	0	210	59	55	20	0	0	134	14	643	6	0	0	663	50	1768	123	0	0	1941	2948
Approach %	7.1	43.3	49.5	0		-	44	41	14.9	0		-	2.1	97	0.9	0		-	2.6	91.1	6.3	0		-	
Totals %	0.5	3.1	3.5	0		7.1	2	1.9	0.7	0		4.5	0.5	21.8	0.2	0		22.5	1.7	60	4.2	0		65.8	
PHF	0.63	0.88	0.63	0		0.76	0.61	0.72	0.71	0		0.73	0.7	0.92	0.5	0		0.92	0.78	0.93	0.81	0		0.92	0.94
Cars	9	90	102	0		201	59	55	19	0		133	14	589	4	0		607	49	1719	121	0		1889	2830
% Cars	60	98.9	98.1	0		95.7	100	100	95	0		99.3	100	91.6	66.7	0		91.6	98	97.2	98.4	0		97.3	96
Trucks	6	0	1	0		7	0	0	0	0		0	0	47	2	0		49	0	44	2	0		46	102
% Trucks	40	0	1	0		3.3	0	0	0	0		0	0	7.3	33.3	0		7.4	0	2.5	1.6	0		2.4	3.5
Buses	0	1	1	0		2	0	0	1	0		1	0	7	0	0		7	1	5	0	0		6	16
% Buses	0	1.1	1	0		1	0	0	5	0		0.7	0	1.1	0	0		1.1	2	0.3	0	0		0.3	0.5
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	



Peak Hour Diagram

Specified Period

One Hour Peak

From: To: 15:00:00 18:00:00

From: To: 16:30:00 17:30:00

Intersection:

Sixth Line & Derry Rd

Site Code: Count Date: 2219900003 Jun 16, 2022 Weather conditions:

Clear

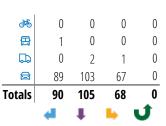
** Signalized Intersection **

Major Road: Derry Rd runs E/W

North Approach

	Out	In	Total
	259	227	486
	3	7	10
	1	0	1
ॐ	0	0	0
	263	234	497

Sixth Line



East Approach

	Out	ln	Total
	1508	1524	3032
	39	56	95
	1	3	4
ॐ	0	0	0
	1548	1583	3131

Derry Rd

<i>₹</i>				Totals	
0	0	0	0	0	7
0	0	3	108 1430	111	4
0	3	55	1430	1488	-
0	0	0	70	70	4

Peds: 0



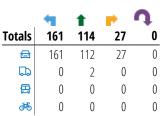
Derry Rd

	Totals				Æ
C	0	0	0	0	0
£	9	7	2	0	0
-	1518	1481	36	1	0
F	21	20	1	0	0

West Approach

	Out	In	Total
	1608	1731	3339
	58	36	94
	3	2	5
<i>₹</i>	0	0	0
	1669	1769	3438

Pe



Peds: 0

Sixth Line

South Approach

	Out	In	Total
	300	193	493
	2	3	5
	0	0	0
₹	0	0	0
	302	196	498







♣ - Bicycles

Comments



Peak Hour Summary

Intersection: Sixth Line & Derry Rd

Site Code: 2219900003 Count Date: Jun 16, 2022

Period: 15:00 - 18:00

Peak Hour Data (16:30 - 17:30)

		N	Iorth A Sixth	pproac Line	ch			S		pproac Line	h				East Ap Derr	proach y Rd	1			'	West A Derr	pproacl y Rd	h		Total Vehicl
Start Time	4	1	•	•	Peds	Total	4	1	•	•	Peds	Total	4	1	•	•	Peds	Total	4	1	•	•	Peds	Total	es
16:30	19	26	35	0	0	80	33	40	7	0	0	80	9	378	1	0	0	388	28	369	9	0	0	406	954
16:45	11	26	20	0	0	57	58	35	7	0	0	100	4	354	6	0	0	364	44	392	18	0	0	454	975
17:00	18	26	17	0	0	61	28	19	5	0	0	52	3	393	2	0	0	398	19	351	19	0	0	389	900
17:15	20	27	18	0	0	65	42	20	8	0	0	70	5	393	0	0	0	398	20	376	24	0	0	420	953
Grand Total	68	105	90	0	0	263	161	114	27	0	0	302	21	1518	9	0	0	1548	111	1488	70	0	0	1669	3782
Approach %	25.9	39.9	34.2	0		-	53.3	37.7	8.9	0		-	1.4	98.1	0.6	0		-	6.7	89.2	4.2	0		-	
Totals %	1.8	2.8	2.4	0		7	4.3	3	0.7	0		8	0.6	40.1	0.2	0		40.9	2.9	39.3	1.9	0		44.1	
PHF	0.85	0.97	0.64	0		0.82	0.69	0.71	0.84	0		0.76	0.58	0.97	0.38	0		0.97	0.63	0.95	0.73	0		0.92	0.97
Cars	67	103	89	0		259	161	112	27	0		300	20	1481	7	0		1508	108	1430	70	0		1608	3675
% Cars	98.5	98.1	98.9	0		98.5	100	98.2	100	0		99.3	95.2	97.6	77.8	0		97.4	97.3	96.1	100	0		96.3	97.2
Trucks	1	2	0	0		3	0	2	0	0		2	1	36	2	0		39	3	55	0	0		58	102
% Trucks	1.5	1.9	0	0		1.1	0	1.8	0	0		0.7	4.8	2.4	22.2	0	,	2.5	2.7	3.7	0	0		3.5	2.7
Buses	0	0	1	0		1	0	0	0	0		0	0	1	0	0		1	0	3	0	0		3	5
% Buses	0	0	1.1	0		0.4	0	0	0	0		0	0	0.1	0	0		0.1	0	0.2	0	0		0.2	0.1
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	



Project #22-199 - CGH Transportation

Intersection Count Report

Intersection: Fifth Line & Derry Rd

Municipality: Milton

Count Date: Thursday, Jun 16, 2022

Site Code: 2219900002

Count Categories: Cars, Trucks, Buses, Bicycles, Pedestrians

Count Period: 07:00-09:00, 15:00-18:00

Weather: Clear

Comments:



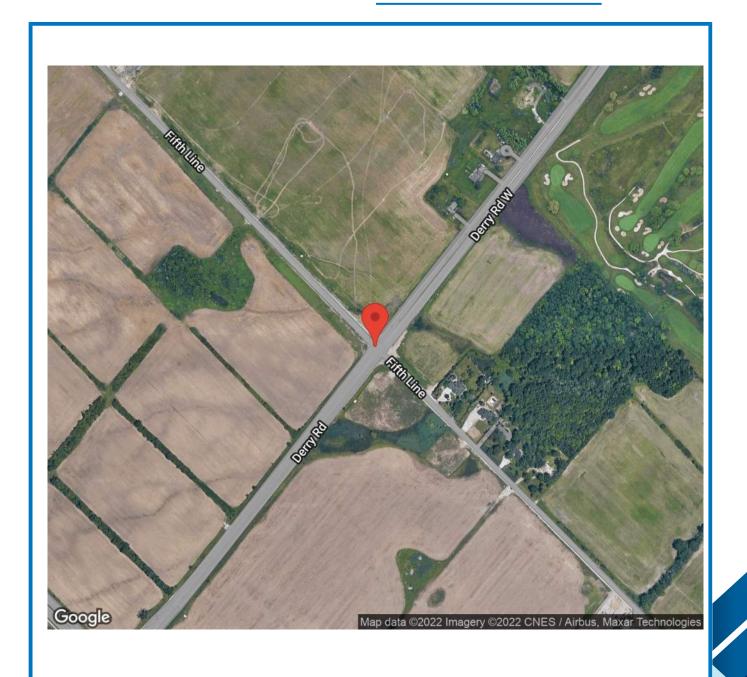
Traffic Count Map

Intersection: Fifth Line & Derry Rd

Site Code: 2219900002

Municipality: Milton

Count Date: Jun 16, 2022





Traffic Count Summary

Intersection: Fifth Line & Derry Rd

Site Code: 2219900002 Municipality: Milton

Count Date: Jun 16, 2022

Fifth Line - Traffic Summary

		North	Appr	oach T	otals			South	Appr	oach T	otals		
	Inc	ludes Ca	rs, Truc	ks, Buses	, Bicycle	s	Inc	ludes Ca	rs, Truc	ks, Buse	s, Bicycle	S	
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	52	34	10	0	96	0	33	30	36	0	99	0	195
08:00 - 09:00	87	36	10	0	133	0	56	33	52	0	141	0	274
					В	REAK							
15:00 - 16:00	112	37	13	0	162	0	127	37	66	0	230	0	392
16:00 - 17:00	151	44	25	0	220	0	121	63	100	0	284	0	504
17:00 - 18:00	139	60	23	0	222	0	125	49	97	0	271	0	493
GRAND TOTAL	541	211	81	0	833	0	462	212	351	0	1025	0	1858



Traffic Count Summary

Intersection: Fifth Line & Derry Rd

Site Code: 2219900002 Municipality: Milton

Count Date: Jun 16, 2022

Derry Rd - Traffic Summary

		East	Appro	ach To	tals			West	Appro	oach To	otals		
	In	cludes Ca	rs, Truc	ks, Buse	s, Bicycle	S	In	cludes Ca	rs, Truc	ks, Buse	s, Bicycle	S	
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	41	486	95	0	622	0	24	1729	70	0	1823	0	2445
08:00 - 09:00	58	668	83	0	809	0	31	1535	66	0	1632	0	2441
					В	REAK							
15:00 - 16:00	43	1541	67	0	1651	0	22	1272	56	0	1350	0	3001
16:00 - 17:00	59	1577	100	0	1736	0	21	1368	64	0	1453	0	3189
17:00 - 18:00	52	1504	71	0	1627	0	36	1329	63	0	1428	0	3055
GRAND TOTAL	253	5776	416	0	6445	0	134	7233	319	0	7686	0	14131



Intersection: Fifth Line & Derry Rd

Site Code: 2219900002

Municipality: Milton

Count Date: Jun 16, 2022

North Approach - Fifth Line

			Cars				Ti	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	-	1	Total	Total Peds
07:00	7	6	0	0	13	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
07:15	8	5	1	0	14	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0
07:30	18	11	6	0	35	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
07:45	14	10	0	0	24	4	1	1	0	6	0	0	0	0	0	0	0	0	0	0	0
08:00	24	10	3	0	37	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0
08:15	20	10	3	0	33	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
08:30	12	5	0	0	17	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0
08:45	12	10	4	0	26	4	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	115	67	17	0	199	24	3	3	0	30	0	0	0	0	0	0	0	0	0	0	0



Intersection: Fifth Line & Derry Rd

Site Code: 2219900002

Municipality: Milton

Count Date: Jun 16, 2022

North Approach - Fifth Line

			Cars				Tı	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	-	1	Total	4	1	•	1	Total	Total Peds
15:00	20	6	3	0	29	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0
15:15	14	9	1	0	24	12	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0
15:30	26	11	3	0	40	12	0	2	0	14	1	0	0	0	1	0	0	0	0	0	0
15:45	15	10	2	0	27	6	1	2	0	9	0	0	0	0	0	0	0	0	0	0	0
16:00	13	8	2	0	23	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0
16:15	25	16	5	0	46	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0
16:30	24	4	10	0	38	10	3	1	0	14	0	0	0	0	0	0	0	0	0	0	0
16:45	62	13	6	0	81	5	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0
17:00	42	12	3	0	57	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
17:15	28	8	4	0	40	4	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0
17:30	27	21	5	0	53	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17:45	32	18	11	0	61	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	328	136	55	0	519	73	5	6	0	84	1	0	0	0	1	0	0	0	0	0	0
GRAND TOTAL	443	203	72	0	718	97	8	9	0	114	1	0	0	0	1	0	0	0	0	0	0



Intersection: Fifth Line & Derry Rd

Site Code: 2219900002

Municipality: Milton

Count Date: Jun 16, 2022

South Approach - Fifth Line

		(Cars				T	rucks				В	uses				Bi	cycles			Tatal
Start Time	4	1	•	1	Total	4	1	•	J.	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
07:00	5	7	3	0	15	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
07:15	6	6	12	0	24	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
07:30	7	6	12	0	25	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
07:45	11	9	9	0	29	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
08:00	25	6	21	0	52	1	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0
08:15	11	9	9	0	29	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
08:30	14	4	13	0	31	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
08:45	4	11	6	0	21	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	83	58	85	0	226	5	5	3	0	13	1	0	0	0	1	0	0	0	0	0	0



Intersection: Fifth Line & Derry Rd

Site Code: 2219900002

Municipality: Milton

Count Date: Jun 16, 2022

South Approach - Fifth Line

			Cars				Tı	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
15:00	30	3	9	0	42	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
15:15	36	7	15	0	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	38	9	17	0	64	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
15:45	20	18	23	0	61	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:00	31	16	29	0	76	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0
16:15	21	27	19	0	67	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
16:30	26	8	22	0	56	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0
16:45	40	12	23	0	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	37	10	20	0	67	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
17:15	20	15	18	0	53	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
17:30	33	14	29	0	76	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17:45	29	10	27	0	66	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	361	149	251	0	761	12	0	12	0	24	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	444	207	336	0	987	17	5	15	0	37	1	0	0	0	1	0	0	0	0	0	0



Intersection: Fifth Line & Derry Rd

Site Code: 2219900002

Municipality: Milton

Count Date: Jun 16, 2022

East Approach - Derry Rd

			Cars				Tı	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
07:00	4	71	6	0	81	0	8	1	0	9	0	1	0	0	1	0	0	0	0	0	0
07:15	10	85	18	0	113	1	5	1	0	7	0	0	0	0	0	0	0	0	0	0	0
07:30	14	143	33	0	190	3	2	3	0	8	0	0	1	0	1	0	0	0	0	0	0
07:45	7	165	28	0	200	2	3	4	0	9	0	3	0	0	3	0	0	0	0	0	0
08:00	12	133	20	0	165	1	5	8	0	14	0	2	0	0	2	0	0	0	0	0	0
08:15	13	155	17	0	185	0	7	6	0	13	0	0	0	0	0	0	0	0	0	0	0
08:30	21	176	11	0	208	2	3	5	0	10	0	2	0	0	2	0	0	0	0	0	0
08:45	9	173	11	0	193	0	9	5	0	14	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	90	1101	144	0	1335	9	42	33	0	84	0	11	1	0	12	0	0	0	0	0	0



Intersection: Fifth Line & Derry Rd

Site Code: 2219900002

Municipality: Milton

Count Date: Jun 16, 2022

East Approach - Derry Rd

			Cars				T	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
15:00	12	346	10	0	368	2	11	9	0	22	0	2	1	0	3	0	0	0	0	0	(
15:15	11	397	15	0	423	1	12	3	0	16	0	1	1	0	2	0	0	0	0	0	(
15:30	11	349	12	0	372	0	11	2	0	13	0	1	0	0	1	0	0	0	0	0	(
15:45	6	402	12	0	420	0	7	2	0	9	0	2	0	0	2	0	0	0	0	0	C
16:00	13	385	16	0	414	1	5	3	0	9	0	1	0	0	1	0	0	0	0	0	(
16:15	12	389	20	0	421	0	2	3	0	5	0	1	0	0	1	0	0	0	0	0	(
16:30	22	378	25	0	425	0	9	10	0	19	0	3	0	0	3	0	0	0	0	0	(
16:45	11	400	20	0	431	0	3	3	0	6	0	1	0	0	1	0	0	0	0	0	C
17:00	4	420	11	0	435	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	(
17:15	8	415	20	0	443	0	5	1	0	6	0	0	0	0	0	0	0	0	0	0	(
17:30	19	351	10	0	380	1	4	1	0	6	0	0	0	0	0	0	0	0	0	0	(
17:45	20	298	28	0	346	0	5	0	0	5	0	1	0	0	1	0	0	0	0	0	(
SUBTOTAL	149	4530	199	0	4878	5	79	37	0	121	0	13	2	0	15	0	0	0	0	0	0
GRAND TOTAL	239	5631	343	0	6213	14	121	70	0	205	0	24	3	0	27	0	0	0	0	0	C



Intersection: Fifth Line & Derry Rd

Site Code: 2219900002

Municipality: Milton

Count Date: Jun 16, 2022

West Approach - Derry Rd

			Cars				Ti	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	-	1	Total	4	1	-	1	Total	Total Peds
07:00	3	321	12	0	336	1	5	0	0	6	0	1	0	0	1	0	0	0	0	0	0
07:15	4	438	16	0	458	1	5	1	0	7	0	0	0	0	0	0	0	0	0	0	0
07:30	5	490	20	0	515	1	10	0	0	11	0	2	0	0	2	0	0	0	0	0	0
07:45	9	447	19	0	475	0	8	2	0	10	0	2	0	0	2	0	0	0	0	0	0
08:00	5	412	20	0	437	1	5	0	0	6	0	3	0	0	3	0	0	0	0	0	0
08:15	12	408	19	0	439	2	6	0	0	8	0	0	0	0	0	0	0	0	0	0	0
08:30	4	370	14	0	388	0	9	3	0	12	0	3	0	0	3	0	0	0	0	0	0
08:45	6	314	10	0	330	1	4	0	0	5	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	48	3200	130	0	3378	7	52	6	0	65	0	12	0	0	12	0	0	0	0	0	0



Intersection: Fifth Line & Derry Rd

Site Code: 2219900002

Municipality: Milton

Count Date: Jun 16, 2022

West Approach - Derry Rd

			Cars				T	rucks				В	uses				Bi	icycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
15:00	5	280	12	0	297	4	13	0	0	17	0	0	0	0	0	0	0	0	0	0	0
15:15	3	308	9	0	320	1	8	0	0	9	0	2	0	0	2	0	0	0	0	0	0
15:30	1	308	17	0	326	2	8	2	0	12	0	4	0	0	4	0	0	0	0	0	0
15:45	3	329	16	0	348	3	10	0	0	13	0	2	0	0	2	0	0	0	0	0	0
16:00	3	300	15	0	318	0	13	1	0	14	0	1	0	0	1	0	0	0	0	0	0
16:15	4	322	17	0	343	3	14	0	0	17	0	2	0	0	2	0	0	0	0	0	0
16:30	7	332	8	0	347	0	10	0	0	10	0	4	0	0	4	0	0	0	0	0	0
16:45	4	362	23	0	389	0	7	0	0	7	0	1	0	0	1	0	0	0	0	0	0
17:00	2	316	15	0	333	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0
17:15	6	363	14	0	383	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	0
17:30	3	325	14	0	342	0	7	0	0	7	0	2	0	0	2	0	0	0	0	0	0
17:45	25	290	20	0	335	0	7	0	0	7	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	66	3835	180	0	4081	13	114	3	0	130	0	20	0	0	20	0	0	0	0	0	0
GRAND TOTAL	114	7035	310	0	7459	20	166	9	0	195	0	32	0	0	32	0	0	0	0	0	0



Peak Hour Diagram

Specified Period

One Hour Peak

From: 07:00:00 To: 09:00:00 From: 07:30:00 To: 08:30:00

Intersection: Fifth Line & Derry Rd

 Site Code:
 2219900002

 Count Date:
 Jun 16, 2022

Weather conditions:

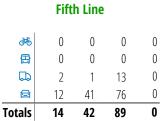
Clear

** Signalized Intersection **

Major Road: Derry Rd runs E/W

North Approach

	Out	In	Total
	129	159	288
	16	28	44
	0	1	1
<i>₫</i>	0	0	0
	145	188	333



Peds: 0

East Approach

	Out	ln	Total
	740	1884	2624
	44	44	88
	6	7	13
ॐ	0	0	0
	790	1935	2725

Derry Rd

	Totals				<i>₫</i>	
7	0	0	0	0	0	
4	35	31	4	0	0	
\rightarrow	1793	1757	29	7	0	
4	80	78	2	0	0	





Derry Rd

	Totals				<i>₫</i>
C	0	0	0	0	0
£	120	98	21	1	0
-	618	596	17	5	0
F	52	46	6	0	0

West Approach

	Out	ln	Total
	1866	662	2528
	35	22	57
	7	5	12
<i>₫</i>	0	0	0
	1908	689	2597

	4	1		L)
Totals	57	33	53	0
	54	30	51	0
₽	3	3	2	0
=	0	0	0	0
Æ	0	0	0	0

Peds: 0

Fifth Line

South Approach

	Out	ln	Total
	135	165	300
	8	9	17
	0	0	0
æ€	0	0	0
	143	174	317







♣ - Bicycles

Comments



Peak Hour Summary

Intersection: Fifth Line & Derry Rd

Site Code: 2219900002 Count Date: Jun 16, 2022

Period: 07:00 - 09:00

Peak Hour Data (07:30 - 08:30)

		N	North A Fifth	pproac Line	:h			S	outh A Fifth	pproac Line	h				East Ap Deri	oproach ry Rd	1			١	Nest A _l Derr	pproacl y Rd	n		Total Vehicl
Start Time	4	1	P	J	Peds	Total	4	1	•	J	Peds	Total	4	1	P	4	Peds	Total	4	1	•	1	Peds	Total	es
07:30	18	11	7	0	0	36	9	6	12	0	0	27	17	145	37	0	0	199	6	502	20	0	0	528	790
07:45	18	11	1	0	0	30	11	11	9	0	0	31	9	171	32	0	0	212	9	457	21	0	0	487	760
08:00	29	10	3	0	0	42	26	7	22	0	0	55	13	140	28	0	0	181	6	420	20	0	0	446	724
08:15	24	10	3	0	0	37	11	9	10	0	0	30	13	162	23	0	0	198	14	414	19	0	0	447	712
Grand Total	89	42	14	0	0	145	57	33	53	0	0	143	52	618	120	0	0	790	35	1793	80	0	0	1908	2986
Approach %	61.4	29	9.7	0		-	39.9	23.1	37.1	0		-	6.6	78.2	15.2	0		-	1.8	94	4.2	0		-	
Totals %	3	1.4	0.5	0		4.9	1.9	1.1	1.8	0		4.8	1.7	20.7	4	0		26.5	1.2	60	2.7	0		63.9	
PHF	0.77	0.95	0.5	0		0.86	0.55	0.75	0.6	0		0.65	0.76	0.9	0.81	0		0.93	0.63	0.89	0.95	0		0.9	0.94
Cars	76	41	12	0		129	54	30	51	0		135	46	596	98	0		740	31	1757	78	0		1866	2870
% Cars	85.4	97.6	85.7	0		89	94.7	90.9	96.2	0		94.4	88.5	96.4	81.7	0		93.7	88.6	98	97.5	0		97.8	96.1
Trucks	13	1	2	0		16	3	3	2	0		8	6	17	21	0		44	4	29	2	0		35	103
% Trucks	14.6	2.4	14.3	0		11	5.3	9.1	3.8	0		5.6	11.5	2.8	17.5	0		5.6	11.4	1.6	2.5	0		1.8	3.4
Buses	0	0	0	0		0	0	0	0	0		0	0	5	1	0		6	0	7	0	0		7	13
% Buses	0	0	0	0		0	0	0	0	0		0	0	0.8	0.8	0		0.8	0	0.4	0	0		0.4	0.4
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	



Peak Hour Diagram

Specified Period

One Hour Peak

From: 15:00:00 To: 18:00:00 From: 16:30:00 To: 17:30:00

Intersection: Fifth Line & Derry Rd

 Site Code:
 2219900002

 Count Date:
 Jun 16, 2022

Weather conditions:

Clear

** Signalized Intersection **

Major Road: Derry Rd runs E/W

North Approach

	Out	In	Total
	216	140	356
	29	14	43
	0	0	0
<i>₫</i>	0	0	0
	245	154	399

Fifth Line

	4	1	L	Û
Totals	25	41	179	0
	23	37	156	0
₽	2	4	23	0
=	0	0	0	0
<i>₫</i>	0	0	0	0

East Approach

	Out	In	Total
	1734	1612	3346
	36	61	97
	4	5	9
ॐ	0	0	0
	1774	1678	3452

Derry Rd

	Totals				<i>₹</i> 6
7	0	0	0	0	0
4	19	19	0	0	0
-	1412	1373	34	5	0
4	60	60	0	0	0





Derry Rd

_,	Totals				<i>₫</i>
C	0	0	0	0	0
£	90	76	14	0	0
-	1639	1613	22	4	0
F	45	45	0	0	0

West Approach

	Out	In	Total
	1452	1759	3211
	34	30	64
	5	4	9
ॐ	0	0	0
	1491	1793	3284

	4	1		J
Totals	129	45	87	0
	123	45	83	0
	6	0	4	0
	0	0	0	0

Peds: 0

Fifth Line

0

0

South Approach

	Out	In	Total
盘	251	142	393
	10	4	14
=	0	0	0
<i>₫</i> 6	0	0	0
	261	146	407







♣ - Bicycles

Comments



Peak Hour Summary

Intersection: Fifth Line & Derry Rd

Site Code: 2219900002 Count Date: Jun 16, 2022

Period: 15:00 - 18:00

Peak Hour Data (16:30 - 17:30)

		N	lorth A Fifth	pproac Line	:h			S	outh A Fifth	pproac Line	h				East Ap Deri	pproach ry Rd	1				Total Vehicl				
Start Time	4	1	P.	4	Peds	Total	4	1	•	J	Peds	Total	4	1	P	1	Peds	Total	4	1	•	1	Peds	Total	es
16:30	34	7	11	0	0	52	29	8	24	0	0	61	22	390	35	0	0	447	7	346	8	0	0	361	921
16:45	67	13	7	0	0	87	40	12	23	0	0	75	11	404	23	0	0	438	4	370	23	0	0	397	997
17:00	46	12	3	0	0	61	38	10	21	0	0	69	4	425	11	0	0	440	2	323	15	0	0	340	910
17:15	32	9	4	0	0	45	22	15	19	0	0	56	8	420	21	0	0	449	6	373	14	0	0	393	943
Grand Total	179	41	25	0	0	245	129	45	87	0	0	261	45	1639	90	0	0	1774	19	1412	60	0	0	1491	3771
Approach %	73.1	16.7	10.2	0		-	49.4	17.2	33.3	0		-	2.5	92.4	5.1	0		-	1.3	94.7	4	0		-	
Totals %	4.7	1.1	0.7	0		6.5	3.4	1.2	2.3	0		6.9	1.2	43.5	2.4	0		47	0.5	37.4	1.6	0		39.5	
PHF	0.67	0.79	0.57	0		0.7	0.81	0.75	0.91	0		0.87	0.51	0.96	0.64	0		0.99	0.68	0.95	0.65	0		0.94	0.95
Cars	156	37	23	0		216	123	45	83	0		251	45	1613	76	0		1734	19	1373	60	0		1452	3653
% Cars	87.2	90.2	92	0		88.2	95.3	100	95.4	0		96.2	100	98.4	84.4	0		97.7	100	97.2	100	0		97.4	96.9
Trucks	23	4	2	0		29	6	0	4	0		10	0	22	14	0		36	0	34	0	0		34	109
% Trucks	12.8	9.8	8	0		11.8	4.7	0	4.6	0		3.8	0	1.3	15.6	0		2	0	2.4	0	0		2.3	2.9
Buses	0	0	0	0		0	0	0	0	0		0	0	4	0	0		4	0	5	0	0		5	9
% Buses	0	0	0	0		0	0	0	0	0		0	0	0.2	0	0		0.2	0	0.4	0	0		0.3	0.2
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds % Peds					0	-					0	-					0	-					0	-	0



Project #22-199 - CGH Transportation

Intersection Count Report

Intersection: James Snow Pkwy S & Derry Rd

Municipality: Milton

Count Date: Thursday, Jun 16, 2022

Site Code: 2219900001

Count Categories: Cars, Trucks, Buses, Bicycles, Pedestrians

Count Period: 07:00-09:00, 15:00-18:00

Weather: Clear

Comments:



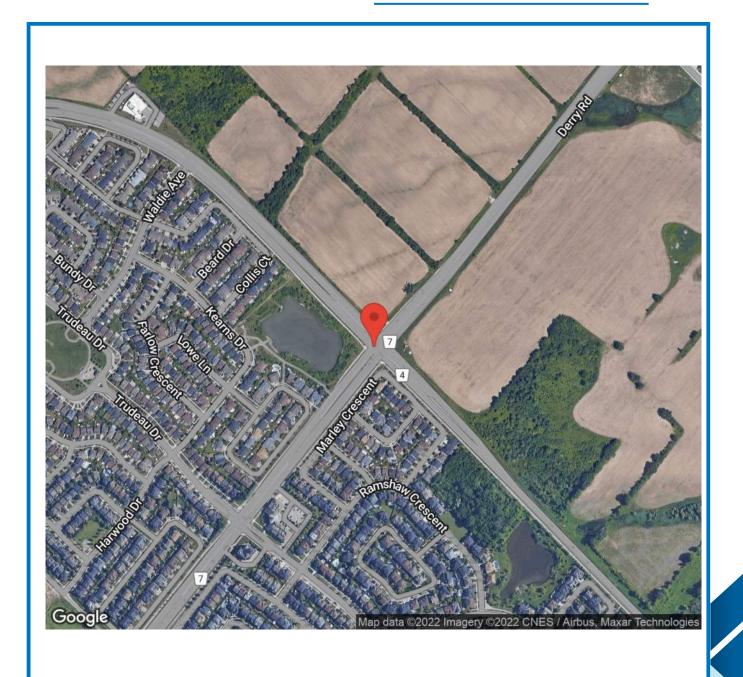
Traffic Count Map

Intersection: James Snow Pkwy S & Derry Rd

Site Code: 2219900001

Municipality: Milton

Count Date: Jun 16, 2022





Traffic Count Summary

Intersection: James Snow Pkwy S & Derry Rd

Site Code: 2219900001 Municipality: Milton

Count Date: Jun 16, 2022

James Snow Pkwy S - Traffic Summary

		North	Appr	oach T	otals			South	Appr	oach T	otals		
	Inc	cludes Ca	rs, Truc	ks, Buse	s, Bicycle	s	Inc	cludes Ca	rs, Truc	ks, Buses	s, Bicycle	S	
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	234	327	111	0	672	0	13	180	143	0	336	0	1008
08:00 - 09:00	234	281	172	0	687	2	25	221	141	0	387	0	1074
					В	REAK .							
15:00 - 16:00	242	393	194	0	829	0	94	332	127	0	553	0	1382
16:00 - 17:00	277	382	176	0	835	0	88	325	163	0	576	0	1411
17:00 - 18:00	255	349	189	0	793	0	59	268	128	0	455	1	1248
GRAND TOTAL	1242	1732	842	0	3816	2	279	1326	702	0	2307	1	6123



Traffic Count Summary

Intersection: James Snow Pkwy S & Derry Rd

Site Code: 2219900001 Municipality: Milton

Count Date: Jun 16, 2022

Derry Rd - Traffic Summary

		East	Appro	ach To	otals								
	Inc	cludes Ca	ars, Truc	ks, Buse	s, Bicycle	s	In	cludes Ca	rs, Truc	ks, Buse	s, Bicycle	S	
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	45	373	110	0	528	0	120	1444	24	0	1588	7	2116
08:00 - 09:00	58	498	178	0	734	0	180	1256	35	0	1471	2	2205
					В	REAK							
15:00 - 16:00	182	1121	375	0	1678	0	223	985	31	0	1239	3	2917
16:00 - 17:00	236	1169	318	0	1723	0	201	1011	23	0	1235	0	2958
17:00 - 18:00	235	1108	312	0	1655	1	168	1039	13	0	1220	1	2875
GRAND TOTAL	756	4269	1293	0	6318	1	892	5735	126	0	6753	13	13071



Intersection: James Snow Pkwy S & Derry Rd

Site Code: 2219900001 Municipality: Milton

Count Date: Jun 16, 2022

North Approach - James Snow Pkwy S

			Cars				Tı	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	J	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
07:00	38	45	13	0	96	5	4	0	0	9	0	0	0	0	0	0	0	0	0	0	0
07:15	64	78	20	0	162	4	7	2	0	13	1	3	0	0	4	0	0	0	0	0	0
07:30	60	96	32	0	188	5	10	5	0	20	1	0	1	0	2	0	0	0	0	0	0
07:45	52	70	34	0	156	4	13	4	0	21	0	1	0	0	1	0	0	0	0	0	0
08:00	54	57	33	0	144	1	7	0	0	8	0	1	0	0	1	0	0	0	0	0	1
08:15	70	82	53	0	205	4	4	3	0	11	0	0	0	0	0	0	0	0	0	0	0
08:30	42	65	43	0	150	7	5	4	0	16	0	1	1	0	2	0	0	0	0	0	0
08:45	54	55	35	0	144	2	4	0	0	6	0	0	0	0	0	0	0	0	0	0	1
SUBTOTAL	434	548	263	0	1245	32	54	18	0	104	2	6	2	0	10	0	0	0	0	0	2



Intersection: James Snow Pkwy S & Derry Rd

Site Code: 2219900001 Municipality: Milton

Count Date:

Jun 16, 2022

North Approach - James Snow Pkwy S

			Cars				Tı	rucks				В	uses				Bi	cycles			
Start Time	4	1	•	1	Total	4	1	•	Q.	Total	4	1	P	1	Total	4	1	•	1	Total	Total Peds
15:00	59	81	51	0	191	6	1	0	0	7	0	0	0	0	0	0	0	0	0	0	0
15:15	65	123	51	0	239	4	3	0	0	7	0	0	1	0	1	0	0	0	0	0	0
15:30	53	82	43	0	178	4	8	0	0	12	0	0	0	0	0	0	0	0	0	0	0
15:45	45	88	48	0	181	6	6	0	0	12	0	1	0	0	1	0	0	0	0	0	0
16:00	48	58	43	0	149	7	5	1	0	13	0	0	1	0	1	0	0	0	0	0	0
16:15	75	100	40	0	215	6	1	0	0	7	0	0	0	0	0	0	0	0	0	0	0
16:30	58	105	38	0	201	2	5	0	0	7	0	0	0	0	0	0	0	0	0	0	0
16:45	81	100	50	0	231	0	8	3	0	11	0	0	0	0	0	0	0	0	0	0	0
17:00	63	70	42	0	175	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0
17:15	62	108	56	0	226	4	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0
17:30	55	72	45	0	172	3	0	1	0	4	0	0	1	0	1	0	0	0	0	0	0
17:45	66	94	43	0	203	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	730	1081	550	0	2361	44	42	6	0	92	0	1	3	0	4	0	0	0	0	0	0
GRAND TOTAL	1164	1629	813	0	3606	76	96	24	0	196	2	7	5	0	14	0	0	0	0	0	2



Intersection: James Snow Pkwy S & Derry Rd

Site Code: 2219900001 Milton

Municipality:

Count Date: Jun 16, 2022

South Approach - James Snow Pkwy S

			Cars				Ti	rucks				В	uses				Bi	cycles			
Start Time	4	1	•	Q	Total	4	1	•	Q.	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
07:00	2	32	16	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	4	36	36	0	76	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0
07:30	3	39	31	0	73	0	2	0	0	2	0	2	0	0	2	0	0	0	0	0	0
07:45	4	64	57	0	125	0	1	1	0	2	0	3	1	0	4	0	0	0	0	0	0
08:00	4	64	36	0	104	0	5	0	0	5	0	1	0	0	1	0	0	0	0	0	0
08:15	11	57	36	0	104	0	6	0	0	6	0	1	0	0	1	0	0	0	0	0	0
08:30	4	38	39	0	81	0	2	1	0	3	0	1	0	0	1	0	0	0	0	0	0
08:45	6	44	28	0	78	0	1	1	0	2	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	38	374	279	0	691	0	18	4	0	22	0	9	1	0	10	0	0	0	0	0	0



Intersection: James Snow Pkwy S & Derry Rd

Site Code: 2219900001 Municipality: Milton

Count Date: Jun 16, 2022

South Approach - James Snow Pkwy S

			Cars				Ti	rucks				В	uses				Bi	icycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
15:00	17	59	22	0	98	0	5	2	0	7	0	1	0	0	1	0	0	0	0	0	0
15:15	30	98	44	0	172	0	3	0	0	3	1	1	0	0	2	0	0	0	0	0	0
15:30	20	69	24	0	113	1	4	4	0	9	0	1	0	0	1	0	0	0	0	0	0
15:45	24	86	28	0	138	1	5	2	0	8	0	0	1	0	1	0	0	0	0	0	0
16:00	15	77	32	0	124	0	4	2	0	6	0	1	1	0	2	0	0	0	0	0	0
16:15	32	72	32	0	136	0	4	2	0	6	0	1	0	0	1	0	0	0	0	0	0
16:30	23	85	46	0	154	0	3	2	0	5	1	0	0	0	1	0	0	0	0	0	0
16:45	17	76	43	0	136	0	2	3	0	5	0	0	0	0	0	0	0	0	0	0	0
17:00	18	59	26	0	103	2	4	1	0	7	0	1	0	0	1	0	0	0	0	0	1
17:15	11	74	45	0	130	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0
17:30	16	53	23	0	92	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0
17:45	11	72	31	0	114	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	234	880	396	0	1510	5	38	20	0	63	2	7	2	0	11	0	0	0	0	0	1
GRAND TOTAL	272	1254	675	0	2201	5	56	24	0	85	2	16	3	0	21	0	0	0	0	0	1



Intersection: James Snow Pkwy S & Derry Rd

Site Code: 2219900001 Municipality: Milton

Count Date: Jun 16, 2022

East Approach - Derry Rd

			Cars				Ti	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	J.	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
07:00	8	58	9	0	75	0	3	3	0	6	0	0	2	0	2	0	0	0	0	0	0
07:15	6	61	27	0	94	0	3	4	0	7	0	1	0	0	1	0	0	0	0	0	0
07:30	14	115	26	0	155	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0
07:45	16	120	38	0	174	1	4	1	0	6	0	3	0	0	3	0	0	0	0	0	0
08:00	15	103	39	0	157	1	3	2	0	6	0	2	0	0	2	0	0	0	0	0	0
08:15	14	120	38	0	172	0	7	1	0	8	0	0	1	0	1	0	0	0	0	0	0
08:30	14	130	44	0	188	1	1	2	0	4	0	1	0	0	1	0	0	0	0	0	0
08:45	12	125	48	0	185	1	5	2	0	8	0	1	1	0	2	0	0	0	0	0	0
SUBTOTAL	99	832	269	0	1200	4	31	15	0	50	0	8	4	0	12	0	0	0	0	0	0



Intersection: James Snow Pkwy S & Derry Rd

Site Code: 2219900001 Municipality: Milton

Count Date: Jun 16, 2022

East Approach - Derry Rd

			Cars				Ti	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
15:00	33	235	115	0	383	0	6	5	0	11	0	2	0	0	2	0	0	0	0	0	0
15:15	44	300	84	0	428	0	4	7	0	11	0	1	1	0	2	0	0	0	0	0	0
15:30	61	244	87	0	392	1	7	7	0	15	0	1	0	0	1	0	0	0	0	0	0
15:45	43	314	64	0	421	0	6	5	0	11	0	1	0	0	1	0	0	0	0	0	0
16:00	60	295	61	0	416	0	2	2	0	4	0	2	0	0	2	0	0	0	0	0	0
16:15	60	283	73	0	416	0	2	0	0	2	0	2	0	0	2	0	0	0	0	0	0
16:30	54	291	71	0	416	0	5	7	0	12	0	1	0	0	1	0	0	0	0	0	0
16:45	62	283	100	0	445	0	3	4	0	7	0	0	0	0	0	0	0	0	0	0	0
17:00	60	314	87	0	461	1	3	1	0	5	0	1	0	0	1	0	0	0	0	0	1
17:15	56	288	93	0	437	1	4	3	0	8	0	0	0	0	0	0	0	0	0	0	0
17:30	60	273	56	0	389	0	4	3	0	7	0	0	0	0	0	0	0	0	0	0	0
17:45	56	220	66	0	342	1	0	3	0	4	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	649	3340	957	0	4946	4	46	47	0	97	0	12	1	0	13	0	0	0	0	0	1
GRAND TOTAL	748	4172	1226	0	6146	8	77	62	0	147	0	20	5	0	25	0	0	0	0	0	1



Intersection: James Snow Pkwy S & Derry Rd

Site Code: 2219900001 Municipality: Milton

Count Date: Jun 16, 2022

West Approach - Derry Rd

			Cars				T	rucks				В	uses				Bi	cycles			Total
Start Time	4	1	•	1	Total	4	1	•	J	Total	4	1	-	1	Total	4	1	•	1	Total	Total Peds
07:00	23	279	4	0	306	0	2	0	0	2	0	1	1	0	2	0	0	0	0	0	0
07:15	31	356	7	0	394	0	4	0	0	4	0	1	0	0	1	0	0	0	0	0	2
07:30	30	423	8	0	461	0	4	1	0	5	0	1	0	0	1	0	0	0	0	0	1
07:45	35	368	3	0	406	1	4	0	0	5	0	1	0	0	1	0	0	0	0	0	4
08:00	51	350	7	0	408	2	4	0	0	6	0	0	0	0	0	0	0	0	0	0	0
08:15	49	335	8	0	392	1	5	0	0	6	1	0	0	0	1	0	0	0	0	0	1
08:30	46	305	8	0	359	0	4	0	0	4	0	4	0	0	4	0	0	0	0	0	1
08:45	28	246	12	0	286	1	2	0	0	3	1	1	0	0	2	0	0	0	0	0	0
SUBTOTAL	293	2662	57	0	3012	5	29	1	0	35	2	9	1	0	12	0	0	0	0	0	9



Intersection: James Snow Pkwy S & Derry Rd

Site Code: 2219900001 Municipality: Milton

Count Date: Jun 16, 2022

West Approach - Derry Rd

			Cars				T	rucks				В	uses				Bi	icycles			Total
Start Time	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	4	1	•	1	Total	Total Peds
15:00	51	215	14	0	280	0	10	0	0	10	1	0	0	0	1	0	0	0	0	0	0
15:15	50	207	7	0	264	0	5	0	0	5	0	1	0	0	1	0	0	0	0	0	0
15:30	61	252	5	0	318	2	4	0	0	6	1	3	0	0	4	0	0	0	0	0	3
15:45	56	280	5	0	341	1	5	0	0	6	0	3	0	0	3	0	0	0	0	0	0
16:00	63	235	1	0	299	1	6	0	0	7	1	0	0	0	1	0	0	0	0	0	0
16:15	40	233	11	0	284	4	9	0	0	13	1	2	0	0	3	0	0	0	0	0	0
16:30	54	240	2	0	296	1	5	1	0	7	0	3	0	0	3	0	0	0	0	0	0
16:45	36	272	8	0	316	0	4	0	0	4	0	2	0	0	2	0	0	0	0	0	0
17:00	40	240	4	0	284	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0
17:15	41	280	0	0	321	2	4	0	0	6	0	0	0	0	0	0	0	0	0	0	0
17:30	43	265	3	0	311	0	4	0	0	4	0	2	0	0	2	0	0	0	0	0	0
17:45	40	232	6	0	278	2	5	0	0	7	0	2	0	0	2	0	0	0	0	0	1
SUBTOTAL	575	2951	66	0	3592	13	66	1	0	80	4	18	0	0	22	0	0	0	0	0	4
GRAND TOTAL	868	5613	123	0	6604	18	95	2	0	115	6	27	1	0	34	0	0	0	0	0	13



Peak Hour Diagram

Specified Period

One Hour Peak

From: To: 07:00:00 09:00:00

From: To:

07:30:00 08:30:00

Intersection:

James Snow Pkwy S & Derry Rd

Site Code: Count Date: 2219900001 Jun 16, 2022 Weather conditions:

Clear

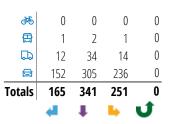
** Signalized Intersection **

Major Road: Derry Rd runs E/W

North Approach

	Out	In	Total
	693	530	1223
	60	22	82
	4	9	13
<i>₹</i>	0	0	0
	757	561	1318

James Snow Pkwy S



East Approach

	Out	In	Total
	658	1872	2530
	25	32	57
田	6	4	10
₹	0	0	0
	689	1908	2597

Derry Rd

<i>₫</i>				Totals	
0	0	0	0	0	7
0	1	4	165	170 1495	4
0	2	17	1476	1495	\Rightarrow
0	0	1	26	27	4





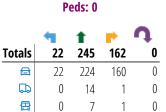
Derry Rd

	Totals				<i>₹</i>
C	0	0	0	0	0
£	146	141	4	1	0
-	482	458	19	5	0
F	61	59	2	0	0

West Approach

	Out	ln	Total
	1667	632	2299
	22	31	53
	3	6	9
<i>₫</i>	0	0	0
	1692	669	2361

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James Snow Pkwy S

South Approach

	Out	ln	Total
	406	390	796
	15	37	52
=	8	2	10
ॐ	0	0	0
	429	429	858







♣ - Bicycles

Comments



Peak Hour Summary

Intersection: James Snow Pkwy S & Derry Rd

 Site Code:
 2219900001

 Count Date:
 Jun 16, 2022

 Period:
 07:00 - 09:00

Peak Hour Data (07:30 - 08:30)

			North A							pproac ow Pkw					East Ap Derr	proach y Rd	1				Total Vehicl									
Start Time	•	1	•	J	Peds	Total	4	1	•	O.	Peds	Total	4	1	•	•	Peds	Total	4	1	•	•	Peds	Total	es					
07:30	66	106	38	0	0	210	3	43	31	0	0	77	14	120	26	0	0	160	30	428	9	0	1	467	914					
07:45	56	84	38	0	0	178	4	68	59	0	0	131	17	127	39	0	0	183	36	373	3	0	4	412	904					
08:00	55	65	33	0	1	153	4	70	36	0	0	110	16	108	41	0	0	165	53	354	7	0	0	414	842					
08:15	74	86	56	0	0	216	11	64	36	0	0	111	14	127	40	0	0	181	51	340	8	0	1	399	907					
Grand Total	251	341	165	0	1	757	22	245	162	0	0	429	61	482	146	0	0	689	170	1495	27	0	6	1692	3567					
Approach %	33.2	45	21.8	0		-	5.1	57.1	37.8	0		-	8.9	70	21.2	0		-	10	88.4	1.6	0		-						
Totals %	7	9.6	4.6	0		21.2	0.6	6.9	4.5	0		12	1.7	13.5	4.1	0		19.3	4.8	41.9	0.8	0		47.4						
PHF	0.85	8.0	0.74	0		0.88	0.5	0.88	0.69	0		0.82	0.9	0.95	0.89	0		0.94	0.8	0.87	0.75	0		0.91	0.98					
Cars	236	305	152	0		693	22	224	160	0		406	59	458	141	0		658	165	1476	26	0		1667	3424					
% Cars	94	89.4	92.1	0		91.5	100	91.4	98.8	0		94.6	96.7	95	96.6	0		95.5	97.1	98.7	96.3	0		98.5	96					
Trucks	14	34	12	0		60	0	14	1	0		15	2	19	4	0		25	4	17	1	0		22	122					
% Trucks	5.6	10	7.3	0		7.9	0	5.7	0.6	0		3.5	3.3	3.9	2.7	0		3.6	2.4	1.1	3.7	0		1.3	3.4					
Buses	1	2	1	0		4	0	7	1	0		8	0	5	1	0		6	1	2	0	0		3	21					
% Buses	0.4	0.6	0.6	0		0.5	0	2.9	0.6	0		1.9	0	1	0.7	0		0.9	0.6	0.1	0	0		0.2	0.6					
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0					
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0					
Peds					1	-					0	-					0	-					6	-	7					
% Peds					14.3	-					0	-	0 -							85.7 -										



Peak Hour Diagram

Specified Period

One Hour Peak

From: 15:00:00 To: 18:00:00 From: 16:30:00 To: 17:30:00

Intersection: James Snow Pkwy S & Derry Rd

 Site Code:
 2219900001

 Count Date:
 Jun 16, 2022

Weather conditions:

Clear

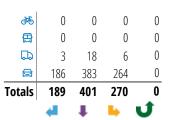
** Signalized Intersection **

Major Road: Derry Rd runs E/W

North Approach

	Out	In	Total
	833	816	1649
	27	27	54
	0	2	2
<i>₫</i>	0	0	0
	860	845	1705

James Snow Pkwy S



East Approach

	Out	In	Total
	1759	1456	3215
	32	31	63
	2	5	7
ॐ	0	0	0
	1793	1492	3285

Derry Rd

	Totals				<i>₹</i>
7	0	0	0	0	0
	174 1055	171	3	0	0
-	1055	1032	18	5	0
4	15	14	1	0	0





Derry Rd

	Totals				₫
C	0	0	0	0	0
£	366	351	15	0	0
-	1193	1176	15	2	0
F	234	232	2	0	0

West Approach

	Out	In	Total
	1217	1431	2648
	22	20	42
	5	3	8
<i>₫</i>	0	0	0
	1244	1454	2698

	4	1	•	J
Totals	72	305	167	0
	69	294	160	0
₽	2	9	7	0
=	1	2	0	0
<i>ĕ</i> %	0	0	0	0

Peds: 1

James Snow Pkwy S

South Approach

	Out	ln	Total
	523	629	1152
	18	21	39
	3	0	3
<i>₫</i>	0	0	0
	544	650	1194







♣ - Bicycles

Comments



Peak Hour Summary

Intersection: James Snow Pkwy S & Derry Rd

 Site Code:
 2219900001

 Count Date:
 Jun 16, 2022

 Period:
 15:00 - 18:00

Peak Hour Data (16:30 - 17:30)

		N Jan	lorth A nes Sno	pproac w Pkv	:h vy S			S Jan	outh A	pproac w Pkw	h ry S				East Ap Derr	proach y Rd	1				Total Vehicl				
Start Time	4	1	•	J	Peds	Total	•	1	P	1	Peds	Total	•	1	•	J	Peds	Total	4	1	•	4	Peds	Total	es
16:30	60	110	38	0	0	208	24	88	48	0	0	160	54	297	78	0	0	429	55	248	3	0	0	306	1103
16:45	81	108	53	0	0	242	17	78	46	0	0	141	62	286	104	0	0	452	36	278	8	0	0	322	1157
17:00	63	74	42	0	0	179	20	64	27	0	1	111	61	318	88	0	1	467	40	245	4	0	0	289	1046
17:15	66	109	56	0	0	231	11	75	46	0	0	132	57	292	96	0	0	445	43	284	0	0	0	327	1135
Grand Total	270	401	189	0	0	860	72	305	167	0	1	544	234	1193	366	0	1	1793	174	1055	15	0	0	1244	4441
Approach %	31.4	46.6	22	0		-	13.2	56.1	30.7	0		-	13.1	66.5	20.4	0		-	14	84.8	1.2	0		-	
Totals %	6.1	9	4.3	0		19.4	1.6	6.9	3.8	0		12.2	5.3	26.9	8.2	0		40.4	3.9	23.8	0.3	0		28	
PHF	0.83	0.91	0.84	0		0.89	0.75	0.87	0.87	0		0.85	0.94	0.94	0.88	0		0.96	0.79	0.93	0.47	0		0.95	0.96
Cars	264	383	186	0		833	69	294	160	0		523	232	1176	351	0		1759	171	1032	14	0		1217	4332
% Cars	97.8	95.5	98.4	0		96.9	95.8	96.4	95.8	0		96.1	99.1	98.6	95.9	0		98.1	98.3	97.8	93.3	0		97.8	97.5
Trucks	6	18	3	0		27	2	9	7	0		18	2	15	15	0		32	3	18	1	0		22	99
% Trucks	2.2	4.5	1.6	0		3.1	2.8	3	4.2	0		3.3	0.9	1.3	4.1	0		1.8	1.7	1.7	6.7	0		1.8	2.2
Buses	0	0	0	0		0	1	2	0	0		3	0	2	0	0		2	0	5	0	0		5	10
% Buses	0	0	0	0		0	1.4	0.7	0	0		0.6	0	0.2	0	0		0.1	0	0.5	0	0		0.4	0.2
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds		0 -		-					1	-					1	-					0	-	2		
% Peds		0									50	-					50	-					0	-	

Appendix H: TTS Data

	SUMMARY		ROU	NDED
	Inbound	Outbound	Inbound	Outbound
North - JSP	20.52%	26.27%	20%	26%
North - 5th Line	1.20%	1.47%	1%	2%
North - 6th Line	0.91%	1.18%	1%	1%
South - JSP	0.00%	0.00%	0%	0%
South - 5th Line	10.55%	9.02%	11%	9%
South - 6th Line	4.65%	4.26%	5%	4%
East - Derry	33.22%	27.41%	33%	28%
West - Derry	28.94%	30.39%	29%	30%
Total	100%	100%	100%	100%

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Thu Nov 10 2022 10:17:34 GMT-0500 (Eastern Standard Time) - Run Time: 2553ms Row: 2006 GTA zone of origin - gta06_orig Column: 2006 GTA zone of destination - gta06_dest RowG: ColG:(4112,4116,4117,4118,4121,4145,4147,4148) TblG: Cross Tabulation Query Form - Trip - 2016 v1.1 INBOUND
Thu Nov 10 2022 10:19:14 GMT-0500 (Eastern Standard Time) - Run Time: 2857ms Row: Planning district of origin - pd_orig Column: 2006 GTA zone of destination - gta06_dest RowG: ColG:(4112,4116,4117,4118,4121,4145,4147,4148) TblG: Cross Tabulation Query Form - Trip - 2016 v1.1

Filters:
Start time of trip - start_time in 600-859
and
and
purpose of destination - purp_dest in W,
and Primary travel mode of trip - mode_prime In D,U,M,P,T,S Trip purpose of destination - purp_dest ln W, and Filters: Start time of trip - start_time In 600-859 and

Primary travel mode of trip - mode_prime In D,U,M,P,T,S and Planning district of origin - pd_orig In 38,

																																													100
		West	Derry	%	%0	%0	%0	%0	%0	%0	%0	%0	%0	2%	4%	1%	3%	%0	%0	2%	5%	2%	3%	%0	1%	%0	%0	%0	1%	3%	%0	%0	%0	%	%0	%0	%0	%0	%0	%0	%0	3%	%0	%0	738%
		East	Derry	%	1%	1%	%0	1%	1%	12%	14%	1%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	1%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	33%
	:	South	om Line	%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	1%	5%	%0	%0	%0	1%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	2%
		South	tn Line t	%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	1%	2%	%0	1%	%	2%	%0	1%	%0	%0	%0	%0	%0	%0	%0	%0	11%
		_ (2 2 2 3																																									%0	%0
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In 38	5			- ~	_	_	_	_	_	_	_	_		`				•	·	•	•	•		•			•	•					•		•		_	_	_	_	•			•	
nd oric		West												100%	100	100	100			70	20	70	100	70	20	30	30		30	30	40	30	30	30	30	30						100	30%	30	
forigin -			Derry	100%	100%	100%	100%	100%	100%	100%	100%	10%																	30%																
and Danning district of origin - pd_orig In 38		South	otn Line																										20%	20%	20%	20%	20%	20%	20%	20%							20%	20%	
and Planning	<u> </u>	South	om Line																										20%	%09	40%	%09	20%	20%	20%	%09							%09	20%	
		South	ר ה																																										
	;	North	oth Line									10%																																	
	:	North	otn Line									10%						20%																											
	:	North	JSC T									%02						20%	100%	30%	20%	30%		30%	30%	%02	%02	100%									100%	100%	100%	100%	100%				
			10/	%	1%	1%	%0	1%	1%	12%	14%	%6		2%	4%	1%	3%	1%	1%	3%	4%	3%	3%	1%	1%	%0	%0	1%	3%	%6	1%	1%	1%	2%	1%	1%	1%	3%	5%	%0	1%	3%	%0	1%	100%
			2	22	39	21	13	30	9	351	401	267		62	106	15	75	17	43	93	108	26	78	15	41	œ	6	32	26	277	23	31	32	133	18	32	23	79	20	4	16	75	9	27	2934 1
			DD 2 of Toronto	PD 8 of Toronto	PD 9 of Toronto	PD 10 of Toronto	PD 12 of Toronto	Oshawa	Vaughan	Brampton	Mississauga	Halton Hills	Milton	4103	4105	4108	4110	4118	4119	4120	4123	4124	4125	4126	4127	4130	4135	4144	Oakville	Burlington	Flamborough	Dundas	Stoney Creek	Hamilton	Lincoln	St. Catharines	Waterloo	Cambridge	City of Guelph	Guelph/Eramosa	Centre Wellington	Shelburne	Brantford	nal	Total
Trin 2016	Table:	,	T,	PD 8 of Toronto.22	PD 9 of Toronto,39	PD 10 of Toronto,21	PD 12 of Toronto, 13	Oshawa,30	Vaughan, 18	Brampton,351	Mississauga,401	Halton Hills, 267	Milton,798	4103,62	4105, 106	4108,15	4110,75	4118,17	4119,43	4120,93	4123, 108	4124,97	4125,78	4126,15	4127,41	4130,8	4135,9	4144,32	Oakville,97	Burlington, 277	Flamborough,23	Dundas,31	Stoney Creek, 35	Hamilton, 133	Lincoln,18	St. Catharines,35	Waterloo,23	Cambridge,79	City of Guelph,70	Guelph/Eramosa,4	Centre Wellington, 16	Shelburne,75	Brantford,6	External,27	

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Thu Nov 10 2022 10:20:40 GMT-0500 (Eastern Standard Time) - Run Time: 2583ms

Thu Nov 10 2022 10:21:24 GMT-0500 (Eastern Standard Time) - Run Time: 2459ms

ColG:(4112,4116,4117,4118,4121,4145,4147,4148) TblG: Row: 2006 GTA zone of destination - gta06_dest Cross Tabulation Query Form - Trip - 2016 v1.1 Column: 2006 GTA zone of origin - gta06_orig RowG: RowG: CoIG:(4112,4116,4117,4118,4121,4145,4147,4148) Cross Tabulation Query Form - Trip - 2016 v1.1 Column: 2006 GTA zone of origin - gta06_orig Row: Planning district of destination - pd_dest

Primary travel mode of trip - mode_prime In D,U,M,P,T,S Start time of trip - start_time In 1500-1759 Trip purpose of origin - purp_orig In W, Filters: and and Primary travel mode of trip - mode_prime In D,U,M,P,T,S Start time of trip - start_time In 1500-1759 rip purpose of origin - purp_orig In W,

Filters:

and

Planning district of destination - pd_dest In 38,

South \$ \cdot \cdo South %%%%%%%%%% %0 5th Line 6th Line North North

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100%

Appendix I: Traffic Signal Timings DB Editor Report Page 1 of 43

Sixth Line & Derry Road

Colorado Springs



MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Configuration Controller Sequence

Phase Ring Sequence and Assignment (MM) 1-1-1

Hardware Alternate Sequence Enable: No

Phase Ring	Se	qu	enc	е	.(Not	e: Se	eque	nces i	identi	ical to	the	prior	one	are n	ot pr	inted))
	0)1	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	В			В	-	3		В	<u> </u>	3							
Sequence 1																	
Ring 1	1	1	2	3	4	9	10	13	14	١.							
Ring 2	į,	5		7	8	11		15	16	•							
Sequence 2	•			•		•		•		•							
Ring 1	1:	2	1	3	4	10	9	13	14	١.							
Ring 2	i,	5	6	7	8	11		15	16								
Sequence 3	•			•		•											
Ring 1		1	2	4	3	9	10	14	13	١.							
Ring 2	Ė	5	6	7	8	11	12	15	16								
Sequence 4				•													
Ring 1	1	2	1	4	3	10	9	14	13	.							
Ring 2	Ĺ	5	6	7	8	11	12	15	16								
Sequence 5																	
Ring 1		1	2	3	4	9	10	13	14	.							
Ring 2		6	5	7	8	12	11	15	16	.							
Sequence 6																	
Ring 1	1	2	1	3	4	10	9	13	14	.							
Ring 2		6	5	7	8	12	11	15	16	.							
Sequence 7																	
Ring 1		1	2	4	3	9	10	14	13								
Ring 2		6	5	7	8	12	11	15	16	.							
Sequence 8																	
Ring 1		2	1	4		10		14	13	•							
Ring 2		6	5	7	8	12	11	15	16	.						•	
Sequence 9																	
Ring 1		1	2	3	4	9		13	14	•			•	•	•	•	
Ring 2		5	6	8	7	11	12	16	15	.				•	•	•	
Sequence 10																	
Ring 1		2		3		10		13	14	•			•	•	•	•	
Ring 2		5	6	8	7	11	12	16	15				•	•	•	•	
Sequence 11		_	_		_												
Ring 1		1	2	4	3	9		14	13	•	•	•	•	•	•	•	
Ring 2		5	6	8	7	11	12	16	15	١.	•	•	•	•	•	•	•
Sequence 12		_			_		_		40								
Ring 1	•	2	1	4	3	10	9	•	13	•	٠	٠	-	•	•	•	
Ring 2		5	6	8	7	11	12	16	15	•	•	•	-	•	•	•	•

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Sequence 13									
Ring 1	1	2 3	4 9	10 13	14 .				
Ring 2	6	5 8	7 12	11 16	15 .				
Sequence 14									
Ring 1	2	1 3	4 10	9 13	14 .				
Ring 2	6	5 8	7 12	11 16	15 .				
Sequence 15									
Ring 1	1	2 4	3 9	10 14	13 .				
Ring 2	6	5 8	7 12	11 16	15 .				
Sequence 16									
Ring 1	2	1 4	3 10	9 14	13 .				
Ring 2	6	5 8	7 12	11 16	15 .				

Phases In Use/Exclusive Ped (MM) 1-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use	Х	Χ		Х	Х	Х		X								
Exclusive Ped																

Phase Compatibility (MM) 1-1-2

Phase	
n/a	Barrier Mode

Phase and Overlap Descriptions

i ilase alle	. ••	Ciiu	P	,301	·puc	,,,,										
Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																
Associated PED																
Overlap	Α	В	С	D	Е	F	G	Н	I	J	K	L	M	N	0	Р
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ν
Movement																

Administration (MM) 1-7-1

Enable Controller/Cabinet Interlock CRC
CRC (16 bit) 32CB
Enable Automatic Backup to Datakey

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Backup Prevent (MM) 1-1-3

Pha	ases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	1																
Phases	2	Χ															
	3																
	4			Х													
	5																
	6					Х											
	7												-				
	8							Χ									
	9		•		•		•	•	•			•		•	•		
	10		•		•		•	•	•			•		•	•		
	11																
	12																
	13																
	14		•											•			
	15		•				•	•	•					•			
	16																

Simultaneous Gap (MM) 1-1-4

Simultaneou	_	- J- [, /··		<u>,</u>	•	•									
Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2																
3																
4																
5																
Phase 6																
Must 7																
Gap 8					l .							١.				
With 9	_															
Phase 10	_															
11																
12																
13						i.		l :	Ė					Ċ		
14				i.			i.			i i	i i					
15		Ė	Ė			i i	Ė	i i	Ė		Ė	l :				
16			i.									<u> </u>				
Disable				Ė					Ė			l :			Ė	

Load Switch Assignments (MM) 1-3

	Phase /	Type		Dimr	ning		Power	Α	uto	Flash
_	Overlap	Type	Red	Yellow	Green	Dark	Up	Red	Yellow	Together
1	1	V				-	Auto	Χ		
2	2	V				-	Auto	Χ		Χ
3	3	V				-	Auto	Χ		
4	4	V				-	Auto	Χ		Χ
5	5	V				+	Auto	Χ		
6	6	V				+	Auto	Χ		Χ
7	7	٧				+	Auto	Χ		
8	8	V	•			+	Auto	Χ		Χ
9	2	Р				-	Auto			

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10	4	P		-	Auto		
11	6	Р		+	Auto		
12	8	Р		+	Auto		
13	1	0		-	Auto	Χ	
14	2	0		+	Auto	Χ	Χ
15	3	0		-	Auto	Χ	
16	4	0		+	Auto	Χ	Х

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Colorado Springs



MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Configuration Port 1 (SDLC)

Port 1 SDLC (MM) 1-4-1

BIU	1	2	3	4	5	6	7	8
Term & Facility	Χ	Χ						
Detector Rack	Х							

Enable TS2/MMU Type Cabinet: No Enable MMU Extended Status: Yes Enable SDLC Stop Time: No Enable 3 Critical RFE's Lockup: Yes

MMU Program (MM) 1-4-2

Channel Ca	an Serve
With Chanr	nel
Channel	Channel
1	2

Color Check Enable (MM) 1-4-3

Enable Color Check: No

MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green																
Yellow																
Red																

Secondary Stations/Tests (MM) 1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

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Colorado Springs



MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Configuration Communications 1 (SDLC)

Ethernet Po	ort Configuration	NTCIP (MM) 1-5-5	
(MM) 1-5-1 DHCP	Na	NTCIP Backup Time (Sec):	0
Enable:	No	NTCIP UDP Port:	501
Controller IP:	10.70.10.51	Ethernet Priority:	1
Subnet Mask: Default	255.255.255.0	Port 2 Priority (Port C50S for 2070):	4
Gateway IP:	10.70.10.1	Port 3A Priority (Port C21S for 2070):	2
Server IP:	10.70.10.1	Port 3B Priority (Port C22S for 2070):	3
		C779 IOL 201(1),	

Port Configuration (MM) 1-5-2 to 1-5-4

Port	2 (C50S)	3A (C21S)	3B (C22S)
Comm Module	FSK	Telem	Telem
Protocol	TERMINAL	NTCIP	ECPIP
Enable	No	No	No
Data Rate (BPS)	9600	19.2K	1200
Data, Parity, Stop	8 N 1	8 N 1	8 N 1
Address	0	0	0
Telemetry Response Delay	0.0	0.0	0.9
Duplex - Half or Full	Half	Full	Full
Flow Control	Yes	Yes	Yes
Group Address	0	0	0
Single Flag Enable	Yes	Yes	Yes
RTS to CTS Delay	n/a	n/a	14.0
RTS Turn Off Delay	n/a	n/a	2.0
Dropout Time	10	10	10
Early RTS	n/a	n/a	No
Telemetry Mode	n/a	n/a	FSK
ATCS Railroad	0	n/a	n/a
ATCS Railroad Line	0	n/a	n/a
ATCS Group	0	n/a	n/a
Wayside Device	0	n/a	n/a
ATC Device	0	n/a	n/a
Wayside Subnode	0	n/a	n/a
ATC Subnode	0	n/a	n/a

ECPIP (MM) 1-5-6

Controller Address: 0 Expanded System Detector Address: 0 DB Editor Report Page 7 of 43

System Detector Assignment

System	Local
Detector	Detector

Wireless Configuration (MM) 1-5-7 Wireless Channel Number: 6

Wireless Access Code: 327723274

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Colorado Springs



MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Configuration Logging / Display

Event Logging (MM) 1-6-1

Critical RFE's (MMU/TF)	Yes	3 Critical Errors Within 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Fault	Yes
Non-Critical RFE's (Det/Test)	Yes	Detector Errors	Yes
Coordination Errors	Yes	Controller Download	Yes
Preemption Events	Yes	TSP Events	Yes
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	Yes
Online / Offline	Yes		

Alarm Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X	Χ	Χ	Χ	Χ	Χ	Х	Χ	Χ	Χ	Χ	X	X	X	X	Χ

Display Options (MM) 1-7-2

Key Click Enable: Yes Switch to Graphics No Mode: LED Mode: Auto Display Mode: Basic Trans Mode Pop-Up No

Disable:

Sign On (MM) 8-5

Sign On Message Line 1: Dual Walk Term & Dual Next Thru Sign On Message Line 2:

Software Modules (MM) 8-7

Application Version: 32.66.10 OS (Boot) Version: 06.07.00 DB Editor Report Page 9 of 43

Colorado Springs



MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Logic Processor Page 1

Logic Statement Control (MM) 1-8-1

Logic # Statement Control

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MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Logic Processor Page 2

Logic Statements (MM) 1-8-2

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Colorado Springs



MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Controller Timing Plan (MM) 2-1

Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	7	25	0	10	7	25	0	10	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	10	0	7	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	14	0	16	0	14	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	5.0	3.0	3.5	3.0	5.0	3.0	3.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	20	65	0	26	20	65	0	26	35	35	35	35	35	35	35	35
Max2	12	50	0	23	12	50	0	23	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	2.2	0.0	2.3	1.0	2.2	0.0	2.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Plan 2 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Plan 3 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Plan 4 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Date: 9-Jul-2018

Intersection: Derry Road & Fifth Line

				8 F	hase Bas	ic Timin	g Sheet					
	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	Х	Х		Х	Х	Х		Х	Х	Х	Х	Х
Direction	WBLT	EB		SB	EBLT	WB		NB				
Min Green	5	20		10	5	20		10				
Veh Ext.	-	3.5		3.5	-	3.5		3.5				
Yellow	3	4.6		4.6	3	4.6		4.6				
Red	1	3		3	1	3		3				
Walk	-	7		7	-	7		7				
Don't Walk	-	15		23	-	15		23				
Max 1	15	40		25	15	40		25				
Max 2												
Max 3												
Veh Recall												
Ped Recall												
Notes:	Check timing	s in controll	er									
	Sync Referer	nce to 3:15										

6:00 120 70% WBLT 1 9 EBLT 5	EB 2 68 WB 6 68	3 0 7 0	SB 4 23 NB 8 23	Pattern 2 Time: Cycle Length: Offset (%): Direction Phase % Direction Phase %	1	2	3 7	<i>4</i> 8
15:15 120 4%		Ī		Pattern 4 Time: Cycle Length: Offset (%):			1	
WBLT 1 9 EBLT 5 9	EB 2 68 WB 6	3 0 7 0	SB 4 23 NB 8 23	Direction Phase % Direction Phase %	1 5	2 6	3 7	8
09:30, 18:30 Local				Pattern 6 Time: Cycle Length: Offset (%):				
WBLT 1 EBLT 5	EB 2 WB 6	3 7	SB 4 NB 8	Direction Phase % Direction Phase %	1 5	2 x 6 x	3 7	4 x 8 x
	120 70% WBLT 1 9 EBLT 5 9 15:15 120 4% WBLT 1 9 EBLT 5 9 09:30, 18:30 Local WBLT 1 EBLT 1	120 70% WBLT EB 1 2 9 68 EBLT WB 5 6 9 68 WBLT EB 1 2 9 68 EBLT WB 5 6 9 68 EBLT WB 5 6 9 68 EBLT WB 5 6 9 68	120 70% WBLT EB 1 2 3 9 68 EBLT WB 5 6 7 9 68 0 WBLT EB 1 2 3 9 68 EBLT WB 5 6 7 9 68 EBLT WB 5 9 68 EBLT WB 5 9 68 EBLT WB 5 6 7 9 68 EBLT WB 5 6 7 9 68 EBLT WB 5 6 7 9 68 EBLT WB 5 6 3 EBLT WB 5 6 3 EBLT WB 5 6 7 9 68 EBLT WB 5 6 7 9 68 EBLT WB 5 6 7 9 68 COS:30, 18:30 Local	120 70% WBLT EB 3 4 9 68 0 23 EBLT WB NB 5 6 7 8 9 68 0 23 15:15 120 4% WBLT EB 3 4 9 68 EBLT WB NB 5 6 7 8 9 68 P 68 0 23 EBLT WB 5 6 7 8 9 68 COST COST COST COST COST COST COST COST	Time: Cycle Length: Offset (%):	Company Comp	Section Time: Cycle Length: Offset (%):	Company



Date: 9-Jul-2018

Intersection: Derry Rd & James Snow Pkwy

				8 P	hase Bas	sic Timine	Sheet					
	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	Χ	X	X	Χ	Х	X	Х	Χ	Х	Х	Х	Х
Direction	WBL	EB	NBL	SB	EBL	WB	SBL	NB				
Min Green	5	20	5	8	10	20	5	8				
Veh Ext.	3.0	3.5	3.0	3.0	3.0	3.5	3.0	3.0				
Yellow	3	3.7	3	4.2	3	3.7	3	4.2				
Red	1	3	1	3	2	3	1	3				
Walk		7		7		7		7				
Don't Walk		29		28		29		28				
Max 1	15	40	15	25	15	40	15	25				
Max 2												
Max 3												
Veh Recall		Х				Х						
Ped Recall												

Notes:

Local Zero Override' in use. Sync Reference to 3:15



Pattern 1 Time: Cycle Length: Offset (%): Direction Phase % Direction Phase %	6:00 120 58% WBL 1 0 EBL 5	EB 2 34 WB 6 20	NBL 3 9 SBL 7 46	SB 4 57 NB 8 20	Pattern 2 Time: 9 Cycle Length: Offset (%): Direction Phase % Direction Phase %	9:30, 18:30 110 59% WBL 1 10 EBL 5 10	EB 2 25 WB 6 25	NBL 3 10 SBL 7 45	SB 4 55 NB 8 20
Pattern 3 Time: Cycle Length: Offset (%): Direction Phase	15:15 120 58% WBL 1	EB 2	NBL 3	SB 4	Cycle Length: Offset (%): Direction Phase	110 59% WBL 1	07:00-19:00 EB 2	NBL 3	SB 4
% Direction Phase %	10 EBL 5 10	36 WB 6 36	12 SBL 7 36	42 NB 8 18	% Direction Phase %	10 EBL 5 10	25 WB 6 25	10 SBL 7 45	55 NB 8 20
Pattern 5 Time: Cycle Length: Offset (%):	21:00 Local				Pattern 6 Time: Cycle Length: Offset (%):				
Direction Phase % Direction Phase %	WBL 1 EBL 5	EB 2 WB 6	NBL 3 SBL 7	SB 4 NB 8	Direction Phase % Direction Phase %	1 5	2 x 6 x	3 7	4 x 8 x

Appendix J: Synchro Worksheets

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

178	Fig. 12 Fig. 14 Fig. 14 Fig. 14 Fig. 15 Fig. 14 Fig. 15 Fig. 14 Fig. 15 Fig. 14 Fig. 15 Fig. 15 Fig. 14 Fig. 16 Fig.	178 178			/	\	↓	4	√	←	•	<u></u>	→ 5	> 8
178 178 125 14 640 6 60 57 20 15 94 1798 125 14 640 6 60 57 20 15 94 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900	178 125 14 640 6 60 57 20 1798 125 14 640 6 60 57 20 1798 125 14 640 6 60 57 20 183 34 35 34 35 35 33 34 35 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 0.95 1.00 0.95 1.00 1.00 1704 3163 1.00 0.95 1.00 0.95 1704 3163 1.00 0.95 1.00 0.95 1704 3163 1.00 0.95 1.00 0.95 1704 3163 1.01 2972 1745 1804 1704 0.94 0.94 0.94 0.94 0.94 1704 0.94 0.94 0.94 0.94 0.94 1704 0.94 0.94 0.94 0.94 0.94 1704 0.94 0.94 0.94 0.94 0.94 1704 0.94 0.94 0.94 0.94 0.94 1704 0.94 0.94 0.94 0.94 0.94 1705 0.05 0.00 0.00 0.00 1707 0.05 0.00 0.23 0.00 1708 0.05 0.00 0.23 0.00 1709 0.04 0.94 0.94 0.94 1705 0.05 0.00 0.23 0.00 1700 0.05 0.00 0.23 0.00 1700 0.05 0.00 0.00 0.00 1700 0.06 0.06 0.00 0.00 1700 0.06 0.00 0.00 0.00 1700 0.06 0.00 0.00 0.00 1700 0.06 0.00 0.00 0.00 1700 0.00	178 178 125 14 640 6 60 57 20 15 94 1790 190	H		EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
51 1798 125 14 640 6 60 57 20 15 94 190	51 1798 125 14 640 6 65 57 20 1900	51 1798 125 14 640 6 60 57 20 15 94 1900 <th< td=""><td></td><td></td><td></td><td><u>r</u>-</td><td>*</td><td></td><td>•</td><td>£</td><td></td><td>r</td><td>£</td><td></td></th<>				<u>r</u> -	*		•	£		r	£	
1900 1900	1798 125 14 640 6 60 57 20 130 1900 1900 1900 1900 1900 1900 131 3.6 3.5 3.3 3.6 3.5 3.3 3.6 1.00 0.95 1.00 0.95 1.00 0.96 1.00 0.95 1.00 1.00 0.96 1.00 1.00 0.95 1.00 1.00 0.96 1.00 1.00 0.95 1.00 1.00 0.96 1.00 1.00 0.95 1.00 0.95 1.00 0.96 1.00 0.95 1.00 0.96 1.00 0.96 1.00 0.95 1.00 0.96 1.00 0.96 1.00 0.95 1.00 0.96 1.00 1.00 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.95 1.00 0.96 0.95 0.96 0.95 0.90 0.91 0.94 0.94 0.94 0.94 0.90 0.91 0.94 0.94 0.94 0.94 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90	51 1798 175 14 640 6 60 50 15 94 1900 <	Δ,	`		14	640	9	09	22	20	15	94	106
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1704 3163	1704 3163	1704 3163	0.0			0.95	1.00		0.95	1.00		0.95	1.00	
0.36 1.00 0.06 1.00 0.38 1.00 0.70 1.00 0.70 1.00 0.41 3163 1.01 2972 696 1804 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.	0.36 1.00 0.06 1.00 0.38 1.00 0.41 0.00 0.38 1.00 0.41 0.00 0.38 1.00 0.41 0.40 0.40 0.40 0.40 0.40 0.40	0.36 1.00 0.06 1.00 0.38 1.00 0.70 1.00 0.70 1.00 0.41 3163 1.01 2972 696 1804 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.	170			1745	2972		1745	1804		1216	1725	
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C A D D 25.5 HCM 2000 Level of Service C 25.6 HCM 2000 Level of Service C 11.0 Sun of lost time (s) 16.5 zation 89.1% ICU Level of Service E 15.	25.5 HCM 2000 Level of Service 26.8 HCM 2000 Level of Service 0.88 21% CU Level of Service 1.11.0 Sum of lost time (s) 2.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25	C A A D 25.5 HCM 2000 Level of Service C 26.6 HCM 2000 Level of Service C 27.7 HCM 2000 Level of Service C 28.1 (CU Level of Service E 15 11.5 HCM 2000 Level of Service E		26.5			9.3			48.4			51.4	
25.5 HCM 2000 Level of Service 0.88 0.111.0 Sum of lost time (s) zation 89.1% ICU Level of Service 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5	25.5 HCM 2000 Level of Service 0.88 Sum of lost time (s) zation 89.1% ICU Level of Service 15	25.5 HCM 2000 Level of Service 0.88 0.00 111.0 Sum of lost time (s) zation 89.1% ICU Level of Service 15		S			⋖			۵			۵	
25.5 HCM 2000 Level of Service 0.88 0.00 111.0 Sum of lost time (s) zation 89.1% ICU Level of Service 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	25.5 HCM 2000 Level of Service 0.88 0.0111.0 Sum of lost time (s) zation 89.1% ICU Level of Service 15	25.5 HCM 2000 Level of Service 0.88 0.111.0 Sum of lost time (s) zation 89.1% ICU Level of Service 15												
aacily ratio 0.88 11.10 Sum of lost time (s) zation 89.1% ICU Level of Service	202 to 1110 Sum of lost time (s) 22 to 1110 Sum of lost time (s) 23 to 1110 Sum of lost time (s) 24 to 1110 Sum of lost time (s) 25 to 1110 Sum of lost time (s) 26 to 1110 Sum of lost time (s)	20ctly ratio 0.88 111.0 Sum of lost time (s) 2ation 89.1% ICU Level of Service 15	NE NE		25.5	ľ	3M 2000	S Jo level	ervice		c			
111.0 Sum of lost time (s) 89.1% ICU Level of Service 15	111.0 Sum of lost time (s) 89.1% ICU Level of Service 15	111.0 Sum of lost time (s) 89.1% ICU Level of Service 15	Capacity rativ	0	0.88									
zation 89.1% ICU Level of Service	zation 89.1% ICU Level of Service 15	zation 89.1% ICU Level of Service 15	(S)		111.0	S	Im of lost	time (s)			16.5			
15	15	15	Utilization		89.1%	0	U Level o	f Service			ш			
	2				7									

Queues 1: Sixth Line & Derry Road

Existing (AM)

Existing (AM)

→	SBT	43	94	94	213	NA	4		4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.72	48.4	0.0	48.4	36.5	58.7	201.7		451	0	0	0	0.47								
٠	SBL	r	15	15	16	Perm		4	4		10.0			29.7% 29	4.0	2.3	0:0	6.3			None N	0.12 (40.3	0.0	40.3		9.3				0	0		0.07								
•	NBT	\$	22	22	82	¥	∞		∞		10.0	32.3		29.7%	4.0	2.3	0.0	6.3			None	0.29	35.3	0.0	35.3	13.7	26.6	211.8		445	0	0	0	0.18								
•	NBL	r	09	09	64	Perm		∞	∞		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.63	69.5	0.0	69.5	13.9	27.7		45.0	167	0	0	0	0.38				Green				
ļ	WBT	₽	640	640	289	AA	9		9		25.0	31.2	28.0	52.3%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.35	10.2	0.0	10.2	35.2	56.4	256.2		1%1	0	0	0	0.35				Start of (oe longer.	
-	WBL	r	14	14	15	pm+pt	-	9	-		7.0	11.0	20.0	18.0%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.08	5.4	0.0	5.4	0.7	2.9		100.0	313	0	0	0	0.05				6:WBTL,			ene may r	
†	EBT	₩.	1798	1798	2046	NA	2		2		25.0	31.2	28.0	52.3%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.92	24.9	0.0	24.9	153.2	#327.7	475.1		2217	0	0	0	0.92				BTL and			acity, que	cycles.
1	EBL	*	21	21	24	pm+pt	വ	2	വ		7.0	11.0	20.0	18.0%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.10	4.6	0.0	4.6		7.2		120.0	639	0	0	0	0.08				o phase 2:E		rdinated	xceeds cap	III ditel two
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 111	Actuated Cycle Length: 111	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 140	Control Type: Actuated-Coordinated	# 95th percentile volume exceeds capacity, queue may be longer	Queue Showins maximum arter two cycles.

Splits and Phases: 1: Sixth Line & Derry Road

₩ 108 **★** Ø6 (R) ₹02 (R) **V**

Synchro 11 Report 12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	₩		r	₩.		F	2,		r	\$	
Fraffic Volume (vph)	36	1829	82	53	631	122	28	34	54	91	42	14
Future Volume (vph)	36	1829	85	23	631	122	28	34	24	91	42	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	33.3	3.6	3.5	3.3	3.6	3.5	ب س	3.6	3.5	33.3	3.6	3.5
Total Lost time (s)	4.0	5.3		4.0	5.3		5.7	2.7		5.7	5.7	
Lane Util. Factor	9.1	0.95		1:00	0.95		00.1	1.00		1.00	1:00	
	1.00	0.99		1.00	0.98		1.00	0.91		1.00	0.96	
Fit Protected	0.95	00.1		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1547	3263		1534	3194		1642	1618		1451	1735	
It Permitted	0.33	1.00		0.02	1.00		0.72	1.00		0.70	1.00	
Satd. Flow (perm)	540	3263		76	3194		1241	1618		1064	1735	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	38	1946	87	29	671	130	62	36	22	46	45	15
ROR Reduction (vph)	0	2	0	0	=	0	0	49	0	0	10	0
-ane Group Flow (vph)	33	2031	0	29	790	0	62	44	0	46	20	0
Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
3us Blockages (#/hr)	4	36	2	9	22	22	က	က	2	13	-	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
Protected Phases	വ	2		.	9			00			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	87.4	83.2		90.2	84.6		16.2	16.2		16.2	16.2	
Effective Green, g (s)	87.4	83.2		90.2	84.6		16.2	16.2		16.2	16.2	
Actuated g/C Ratio	0.73	69:0		0.75	0.70		0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	5.3		4.0	5.3		2.7	5.7		5.7	5.7	
/ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
.ane Grp Cap (vph)	428	2262		125	2251		167	218		143	234	
//s Ratio Prot	0.00	c0.62		c0.02	0.25			0.03			0.03	
//s Ratio Perm	90:0			0.31			0.05			c0.09		
//c Ratio	0.09	0.90		0.45	0.35		0.37	0.20		89.0	0.21	
Jniform Delay, d1	4.6	14.9		18.7	6.9		47.3	46.1		49.4	46.2	
Progression Factor	09:0	0.51		1.00	1.00		1.00	1.00		1.00	1.00	
ncremental Delay, d2	0.1	4.5		2.5	0.4		1.4	0.5		12.1	0.5	
Delay (s)	2.8	12.1		21.3	7.4		48.7	46.6		61.5	46.7	
evel of Service	A	В		S	A		Ω	Ω		ш	Ω	
Approach Delay (s)		12.0			8.3			47.4			25.8	
Approach LOS		В			٧			D			ш	
ntersection Summary												
HCM 2000 Control Delay			14.8	ľ	3M 2000	HCM 2000 Level of Service	ervice		В			
HCM 2000 Volume to Capacity ratio	city ratio		0.84									
Actuated Cycle Length (s)			120.0	S	Sum of lost time (s)	time (s)			15.0			
ntersection Capacity Utilization	tion		74.0%	೦	U Level o	ICU Level of Service						
Analysis Period (min)			15									
Critical Lane Group												

Queues 2: Fifth Line & Derry Road

Existing (AM)

Existing (AM)

Charles Char		1	†	-	Ļ	•	—	۶	→	
1829 53 58 34 91 1829 53 631 58 34 91 1823 56 631 58 34 91 2033 56 801 62 93 97 NA pm+pt NA Perm NA Perm NA Perm NA NA Perm NA	Lane Group	EBF	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
1829 53 631 58 34 91 1829 53 631 58 34 91 1829 53 631 58 34 91 1829 53 631 58 34 91 1823 56 801 68 94 2	Lane Configurations	*	*	K	₩	K	2,	*	43	
1829 53 631 58 34 91 18293 55 801 62 93 97 1 0	Traffic Volume (vph)	36	1829	53	631	28	34	91	42	
NA	Future Volume (vph)	36	1829	53	631	28	34	91	42	
NA pm+pt	Lane Group Flow (vph)	38	2033	26	801	62	93	46	09	
2 1 6 8 8 4 4 2 1 6 8 8 8 4 4 2 1 6 8 8 8 4 4 2 1 1 6 8 8 8 4 4 2 1 1 6 8 8 8 4 4 2 0.0 7.0 20.0 10.0 10.0 10.0 34.3 11.0 81.0 28.0 28.0 28.0 67.5% 9.2% 67.5% 23.3% 23.3% 23.3% 1.6 1.0 1.6 2.0 2.0 2.0 5.3 4.0 5.3 5.7 5.7 5.7 5.7 1.5 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Turn Type	pm+pt	A	pm+pt	Ν	Perm	¥	Perm	M	
20.0 7.0 20.0 10.0 10.0 10.0 34.3 34.7 34.7 34.7 34.7 34.3 34.3 34.3	Protected Phases	2	2	-	9		00		4	
20.0 7.0 20.0 10.0 10.0 10.0 34.3 34.7 34.7 34.7 34.7 34.7 34.7 34.7	Permitted Phases	2		9		∞ ,		4		
20.0 7.0 20.0 10.0 10.0 10.0 10.0 34.3 34.7 34.7 34.7 34.7 34.7 34.7 34.7	Detector Phase	വ	2	-	9	∞	∞	4	4	
200 770 200 100 100 100 1010 1010 1010 1	Switch Phase									
9. 43. 31.10	Minimum Initial (s)	7.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	
810 280 280 280 280 280 280 67.5% 28.3% 23	Minimum Split (s)	11.0	34.3	11.0	34.3	34.7	34.7	34.7	34.7	
6 67.5% 9.2% 67.5% 23.3%	Total Split (s)	11.0	81.0	11.0	81.0	28.0	28.0	28.0	28.0	
3.7 3.0 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7	Total Split (%)	9.5%	67.5%	9.5%	67.5%	23.3%	23.3%	23.3%	23.3%	
116 1.0 1.6 2.0 2.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0	Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	All-Red Time (s)	1.0	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
1.49 Lead Lag 1.49 Lead Lag 1.40 Lag Lead Lag 1.40 Lag Lag 1.40 Lag Lag 1.40 Lag Lag 1.41 Lag Lag 1.42 Lag 1.43 Lag 1.44 Lag 1.45 Lag 1.45 Lag 1.45 Lag 1.46 Lag 1.47 Lag 1.47 Lag 1.48 Lag 1.49 Lag 1.40 Lag 1.40 Lag 1.40 Lag 1.41 Lag 1.42 Lag 1.42 Lag 1.43 Lag 1.44 Lag 1.45 Lag 1.45 Lag 1.46 Lag 1.47 Lag 1.47 Lag 1.48 Lag 1.49 Lag 1.40 Lag 1.40 Lag 1.40 Lag 1.41 Lag 1.41 Lag 1.42 Lag 1.43 Lag 1.44 Lag 1.45 Lag 1.45 Lag 1.46 Lag 1.47 Lag 1.47 Lag 1.48 Lag 1.49 Lag 1.40 Lag	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lag Lead Lag Lag Lead Lag Lead Lag Lead Lag Lead Lag Lead Lag Ves Yes Yes Ves Yes Ves Ves Lag Lead Lag	Total Lost Time (s)	4.0	5.3	4.0	5.3	5.7	5.7	5.7	2.7	
Yes Yes Yes Yes C-Min None None None I None I None C-Min None C-Min None C-Min None C-Min None S-Min None None I I I I I I I I I I I I I I I I I I I	Lead/Lag	Lead	Lag	Lead	Lag					
C-Min None C-Min None None None I	Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
8 0.89 0.39 0.35 0.35 0.68 136 0.68 136 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
136 200 7.7 \$2.1 235 716 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	v/c Ratio	0.08	0.89	0.39	0.35	0.37	0.35	89.0	0.25	
136 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Control Delay	2.5	13.6	20.0	7.7	52.1	23.5	71.6	38.6	
13.6 20.0 7.7 52.1 23.5 71.6 24.2 246.3 2.6 38.1 14.2 28.0 23.2 246.3 2.6 38.1 14.2 2.9 40.4 354.1 4.3 56.2 246.3 3.6 27.1 22.9 40.4 354.1 36.2 246.3 30.3 34.7 197 20.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
246.3 2.6 38.1 14.2 80 23.2 40.4 58.0 27.1 22.9 40.4 35.4 14.4 58.0 27.1 22.9 40.4 35.4 19.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Total Delay	2.5	13.6	20.0	7.7	52.1	23.5	71.6	38.6	
#2345 144 580 27.1 22.9 40.4 354.1 336.2 340.6 3288 143 2306 2330 347 197 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 50th (m)	1.2	246.3	5.6	38.1	14.2	8.0	23.2	10.7	
354.1 336.2 340.6 2288 443 2306 230 347 197 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 10 0 0 0	Queue Length 95th (m)	m1.6	#324.5	14.4	28.0	27.1	22.9	40.4	22.8	
90,0 70,0 50,0 10,0 10,0 10,0 10,0 10,0 10,0 1	Internal Link Dist (m)		354.1		336.2		340.6		275.9	
2288 143 2306 230 347 197 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Turn Bay Length (m)	100.0		0.06		70.0		20.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	468	2288	143	2306	230	347	197	332	
2:EBTL and 6:WBTL, Start of Green vo cycles.	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
\$ 0.89 0.39 0.35 0.27 0.27 0.49 \$ 2.EBTL and 6.WBTL, Start of Green vo cycles.	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
s 0.89 0.39 0.35 0.27 0.27 0.49 2:EBTL and 6:WBTL, Start of Green anacity, queue may be longer. no cycles.	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Oycle Length: 120 Actualed Cycle Length: 120 Actualed Cycle Length: 120 Actualed Cycle Length: 120 Actualed Cycle: 130 Control Type: Actualed-Coordinated Control Type: Actualed-Coordinated Type: Actualed-Coordinated Countrol Type: Actualed-Coordinated Countrol Type: Actualed Cycle: 3 Cueue Shown is maximum after two cycles. Actual Cycle: 3 Cueue Shown is maximum after two cycles. Molume for 95th percentile queue is metered by upstream signal.	Reduced v/c Ratio	0.08	0.89	0.39	0.35	0.27	0.27	0.49	0.18	
Oycle Length: 120 Actualed Cycle Length: 120 Offset: 0 (0%), Referenced to phase 2.EBTL and 6:WBTL, Start of Green Offset: 0 (0%), Referenced to phase 2.EBTL and 6:WBTL, Start of Green Natural Cycle: 130 Control Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. The control of the percentile queue is metered by upstream signal.	Intersection Summary									
Adruated Öycle Length: 120 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 130 Control Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Cycle Length: 120									
Offset: (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Mural Cycle: Actualed-Coordinated Control Type: Actualed-Coordinated # 9sth percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. In Volume for 95th percentile queue is metered by upstream signal.	Actuated Cycle Length: 120	0								
Natural Cycle: 130 Outnot Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. In Volume for 95th percentile queue is metered by upstream signal.	Offset: 0 (0%), Referenced	to phase 2:	EBTL an	d 6:WBTI	., Start of	Green				
Control type: Actual deserve conditions and the control of the con	Natural Cycle: 130									
# 9th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Control Type: Actuated-Coc	orginated								
Ubeue shown is maximum arier two cycles. m. Volume for 95th percentile queue is metered by upstream signal.	# 95th percentile volume (exceeds ca	pacity, qu	eue may	pe longe	ے				
III volume for your percentine quede is mercical by upsuream signar.	Queue shown is maximu	um after two	cycles.	by inct	room ciar	-				
	III volume to 12011 percen	ananh ann	is illegal	nedn fa n	icaiii sigi	<u></u>				

€01 • \$02(R)

2 05 0 € 06 (R)
118 818
12:14-2023
BA Group

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

→ <i>→</i>	SBL SBT SBR	**	256 348 168	348	1900 19	3.6	2.7	0.95	1.00	1.00		00°L	3046	0.40 1.00 1.00 458 3046 1388	0 08	355	0 1	261 355 52		5% 10% 7%	NA Po		4	44.4 36.2 36.2	36.2	0.30 0	2.0 2.0 2.0		0.12		0.39	33.1	77 03 1.00	33.4	- O	32.1	O						
√ ↓	NBT NBR	L	250 165		1900 1900						1.00 0.85	Ì		3202 1569			_	255 23		34 1%	Dorr		8	16.4 16.4			5.7 5.7						1.00 1.00	7		48.3	D		٥		19.0	ш	
√	SR NBL		149 22		12						0.85 1.00	Ì		1.00 0.54 499 988						3% 0%		3 2	8 9	48.8 20.6	48.8 20.6		5.3 4.0			0.04 0.02			2.45 1.00	7					l of Service		(s)	vice	
+	WBT WBR	L		492	1900 19		5.3	0.95	1.00	00.1	00.1	00.1	3305	3305	86 0	502		205	į	4%	_	9		48.8	48.8	0.41	5.3				0.37	24.9	0.97	24.8	20	44.4	Q		HCM 2000 Level of Service		Sum of lost time (s)	ICU Level of Service	
* *	EBR WBL		28 62		1900 1900						1.00	Ì		1544 145				16 63		3% 3%	Dorm Dorm		2 6	64.6 48.8	64.6 48.8	٥	5.3 5.3			0.01 c0.43			1.00 1.00						35.7				2
†	3L EBT	۰	_		_						1.00			0.95 1.00				177 1557		2% 1%	_	5 2		11.8 64.6			4.0 5.3	2	ľ				1.00 1.00			30.5	O			0			
	Movement EBI	figurations		oh)	vphpl) 19		(9)			Fipb, ped/bikes 1.0			rot)	Satd Flow (norm) 3285	PHF			vph)		Heavy Vehicles (%) 2		Phases	Permitted Phases	Actuated Green, G (s) 11	(S)		Clearance Time (s) 4			v/s Ratio Perm			Progression Factor 1.0		ervice	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)

Queues 3: James Snow Parkway & Derry Road

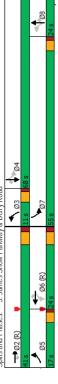
Existing (AM)

Existing (AM)

	1	†	1	>	Ļ	4	•	←	•	۶	→	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	<u> </u>	++	*	F	*	¥.	F	44	*	F	++	*
Traffic Volume (vph)	173	1526	28	62	492	149	22	250	165	256	348	168
Future Volume (vph)	173	1526	28	62	492	149	22	250	165	256	348	168
Lane Group Flow (vph)	177	1557	29	63	205	152	22	255	168	261	322	171
Turn Type	Prot	NA	Perm	Perm	M	Perm	pm+pt	M	Perm	pm+pt	NA	Perm
Protected Phases	2	2			9		3	∞		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	വ	2	2	9	9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	20.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	34.3	34.3	34.3	11.0	34.7	34.7		34.7	34.7
Total Split (s)	17.0	41.0	41.0	24.0	24.0	24.0	11.0	24.0	24.0	22.0	0.89	68.0
Total Split (%)	14.2%	34.2%	34.2%	20.0%	20.0%	20.0%	9.5%	20.0%	20.0%	-	26.7%	26.7%
Yellow Time (s)	3.0	3.7	3.7	3.7	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.6	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	5.3	5.3	5.3	4.0	5.7	2.7	4.0	2.7	2.7
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.55	0.82	0.03	1.03	0.36	0.21	0.09	0.65	0.49	0.62	0.39	0.32
Control Delay	57.8	28.2	0.1	166.0	26.0	12.3	24.1	27.6	12.0	33.9	34.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	28.2	0.1	166.0	26.0	12.3	24.1	97.6	12.0	33.9	34.0	5.7
Queue Length 50th (m)	21.9	156.5	0.0	~15.6	46.2	7.4	3.5	32.1	0.0	49.0	39.0	0.0
Queue Length 95th (m)	32.9	#255.8	0.0	#52.0	76.8	28.9	7.7	45.0	20.0	61.3	46.1	14.9
Internal Link Dist (m)		156.1			305.1			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	367	1897	895	61	1390	718	237	491	382	699	1581	802
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.82	0.03	1.03	0.36	0.21	0.09	0.52	0.44	0.39	0.22	0.21
Intersection Summary												

Cycle Length: 120
Actuated Cycle Length: 120
Actuated Cycle Length: 120
Offset. 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
- Volume executes capacity, queue is theoretically infinite.
- Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: James Snow Parkway & Derry Road



HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

EBL EBI EBR WBL WBL <th></th> <th>•</th> <th>†</th> <th>></th> <th>-</th> <th>Į.</th> <th>4</th> <th>•</th> <th>-</th> <th>•</th> <th>۶</th> <th>-</th> <th>*</th>		•	†	>	-	Į.	4	•	-	•	۶	-	*
1 1 1 1 2 2 1 1 1 1	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
113 1528 71 21 1553 9 164 116 28 69 108 118 1528 71 21 1553 9 164 116 28 69 108 118 1528 71 21 1553 9 164 116 28 69 108 118 1528 71 21 2152 21 21 21 22 21 21	Lane Configurations	*	₩		r	₩		F	2		F	2	
113 15.38 71 21 155.3 9 164 116 28 69 108 109 1900	Traffic Volume (vph)	113	1528	71	21	1553	6	164	116	28	69	108	92
1900 1900	Future Volume (vph)	113	1528	11	21	1553	6	164	116	28	69	108	92
33 36 35 33 36 35 33 36 35 33 36 35 33 36 36 36 63<	Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,00 6,2 4,0 6,2 6,3	Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
1,00 0.95 1,00	Total Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
1.00 0.99	Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
10.95 10.00 10.00 10.00	Fit	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.93	
1690 3082	Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
100 100	Satd. Flow (prot)	1690	3082		1671	3271		1745	1815		1721	1737	
107 3082	Fit Permitted	90.0	1.00		0.08	1.00		0.49	1.00		0.61	1.00	
11 15 15 17 17 17 17 17	Satd. Flow (perm)	107	3082		149	3271		006	1815		1114	1737	
116 1575 73 22 1601 9 169 120 29 71 111 10	Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
1	Adj. Flow (vph)	116	1575	73	22	1601	6	169	120	50	71	111	95
116 1646 0 22 1610 0 169 141 0 71 177 2	RTOR Reduction (vph)	0	2	0	0	0	0	0	∞	0	0	59	0
2% 3% 0% 4% 2% 0% 1% 1% 1% 3 58 0 1 37 2 0 2 0 1 2 5 2 0 2 0 1 2 0 1 2 6 8 0 1 6 8 4 <t< td=""><td>Lane Group Flow (vph)</td><td>116</td><td>1646</td><td>0</td><td>22</td><td>1610</td><td>0</td><td>169</td><td>141</td><td>0</td><td>71</td><td>177</td><td>0</td></t<>	Lane Group Flow (vph)	116	1646	0	22	1610	0	169	141	0	71	177	0
3 58 0 1 37 2 0 2 0 1 1 37 2 0 2 0 1 1 37 2 0 2 0 1 1 4	Heavy Vehicles (%)	7%	3%	%0	4%	7%	22%	%0	1%	%0	1%	1%	1%
pm+pt NA pm+pt NA Perm NA Perm 2 6 4 6 4 8 4 4 2 6 6 3 6.53 6.2.5 23.0 23.0 23.0 7.5.5 68.7 65.3 62.5 23.0 23.0 23.0 7.5.5 68.7 65.3 62.5 23.0 23.0 23.0 7.5.5 68.7 6.5 6.3 6.2 6.3 6.3 6.3 4.0 6.6 0.5 6.3 6.2 6.3 6.3 6.3 6.3 0.05 0.49 0.6 0.3 3.0	Bus Blockages (#/hr)	က	28	0	-	37	2	0	2	0	-	2	_
5 2 1 6 6 8 8 4 4 755 687 653 625 230 230 230 755 687 653 625 230 230 230 230 755 687 653 625 230 230 230 230 755 687 653 625 230 230 230 230 758 0.68 0.62 0.59 0.56 0.21 0.21 0.21 40 6.5 0.53 0.00 0.49 0.08 0.00 0.00 0.00 0.00 0.00 0.00 0.0	Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
1	Protected Phases	വ	2		-	9			∞			4	
75.5 687 65.3 62.5 23.0 23.0 23.0 23.0 75.5 687 65.3 62.5 23.0 23.0 23.0 23.0 75.5 687 65.3 62.5 23.0 23.0 23.0 23.0 76.0 62 6.2 6.3 6.3 6.3 6.3 6.3 23.0 76.0 6.2 4.0 6.2 6.3 6.3 6.3 6.3 3.0 70.0 6.2 1.0 6.2 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Permitted Phases	2			9			∞			4		
755 687 653 625 230 230 230 40 0.68 0.62 0.59 0.56 0.21 0.21 0.21 40 6.62 0.59 0.56 0.59 0.56 0.21 0.21 0.21 30 3.0 3	Actuated Green, G (s)	75.5	68.7		65.3	62.5		23.0	23.0		23.0	23.0	
0.68 0.62 0.59 0.56 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.23 6.3 <td>Effective Green, g (s)</td> <td>75.5</td> <td>68.7</td> <td></td> <td>65.3</td> <td>62.5</td> <td></td> <td>23.0</td> <td>23.0</td> <td></td> <td>23.0</td> <td>23.0</td> <td></td>	Effective Green, g (s)	75.5	68.7		65.3	62.5		23.0	23.0		23.0	23.0	
4.0 6.2 4.0 6.2 6.3 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 6.0 <td>Actuated g/C Ratio</td> <td>89.0</td> <td>0.62</td> <td></td> <td>0.59</td> <td>0.56</td> <td></td> <td>0.21</td> <td>0.21</td> <td></td> <td>0.21</td> <td>0.21</td> <td></td>	Actuated g/C Ratio	89.0	0.62		0.59	0.56		0.21	0.21		0.21	0.21	
30 30 30 30 30 30 30 30	Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
201 1907 126 1841 186 376 230 c) 60.05 c0.33 0.00 0.49 0.08 0.08 0.35 0.86 0.17 0.87 0.91 0.38 0.31 0.31 20.7 17.3 13.1 20.9 43.0 37.8 37.3 3.10 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Color Colo	Lane Grp Cap (vph)	201	1907		126	1841		186	376		230	326	
0.35 0.10 0.004 0.58 0.86 0.17 0.87 0.91 0.38 0.031 2.0.7 17.3 13.1 2.09 43.0 37.8 37.3 1.0.0 1.00 1.00 1.00 1.00 1.00 1.00 1.	v/s Ratio Prot	c0.05	c0.53		0.00	0.49			0.08			0.10	
0.58 0.86	v/s Ratio Perm	0.35			0.10			c0.19			90:0		
207 17.3 13.1 20.9 43.0 37.8 37.3 1.0 1.00 1.00 1.00 1.00 1.00 1.00 1.0	v/c Ratio	0.58	0.86		0.17	0.87		0.91	0.38		0.31	0.49	
1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,0	Uniform Delay, d1	20.7	17.3		13.1	20.9		43.0	37.8		37.3	38.8	
4,0 5,5 0,7 6,1 40,6 0,6 0,8 0,8 24,7 22,8 13,8 27,0 83,6 38,5 38,0 C C C B	Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
24.7 22.8 13.8 27.0 83.6 38.5 38.0 C C B C F D D D C C C C C C C C C C C C C C C C C	Incremental Delay, d2	4.0	5.5		0.7	6.1		40.6	9.0		8.0	1.1	
C C C B C F D D 229 268 62.5 C C E C C E C E C E C E C E C E C E C E	Delay (s)	24.7	22.8		13.8	27.0		83.6	38.5		38.0	39.9	
22.9 26.8 62.5 C C E C E C C C E C C B C C D C C C C C C C C C C C C C C C C C	Level of Service	S	S		В	O		ш.	Ω		Ω	Ω	
C C C E If the control of Service C C Capacity ratio 0.87 HCM 2000 Level of Service C C Capacity ratio 0.87 11.10 Sum of lost time (s) 16.5 Utilization 89.7% ICU Level of Service E 15 D D	Approach Delay (s)		22.9			26.8			62.5			39.4	
lay 28.8 HCM 2000 Level of Service Capacity ratio 0.87 h (s) 111.0 Sum of lost time (s) Ulitzation 89.7% ICU Level of Service 15	Approach LOS		O			O			ш			D	
lay 28.8 HCM 2000 Level of Service Capacity ratio 0.87 0.87 11.1 0 Sun of lost time (s) Ulitzation 89.7% ICU Level of Service 15	Intersection Summary												
Capacity ratio 0.87 h (s) 111.0 Sum of lost time (s) Utilization 89.7% ICU Level of Service 15	HCM 2000 Control Delay			28.8	Ĭ	M 2000	l evel of	Service		C			
h (s) 111.0 Sum of lost time (s) Utilization 89.7% ICU Level of Service 15	HCM 2000 Volume to Capa	icity ratio		0.87						,			
Utilization 89.7% ICU Level of Service 15	Actuated Cycle Length (s)	,		111.0	S	tsol Jo mr	time (s)			16.5			
Q	Intersection Capacity Utiliza	ation		89.7%	೨	U Level o	of Service			ш			
c Critical Lane Group	Analysis Period (min)			15									
	c Critical Lane Group												

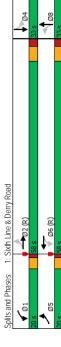
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Queues 1: Sixth Line & Derry Road

Existing (PM)

Existing (PM)

→	SBT	2	108	801	NA	4		4		10.0	32.3	33.0	29.7%	4.0	2.3	0:0	6.3			None	0.53	36.2	0.0	36.2	33.3	56.2	201.7		445	0	0	0 ,	0.46								
۶	SBL	-	69	69	Perm		4	4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.31	39.5	0.0	39.5	13.4	26.7		30.0	267	0	0	0 22	0.77								
←	NBT	42	116	110	NA N	00		∞		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.39	37.3	0.0	37.3	26.6	45.3	211.8		444	0	0	0 0	0.34								
•	NBL	-	164	164	Perm		00	∞		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.91	88.4	0.0	88.4	36.7	#73.2		45.0	216	0	0	0 02 0	0.78				Green				
ļ	WBT	₹	1553	1553	NA	9		9		25.0	31.2	28.0	52.3%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.87	29.0	0.0	29.0	164.0	#245.2	256.2		1841	0	0	0 6	0.87				, Start of			oe longer	
>	WBL	-	21	7.7	77 bm+bt	_	9	-		7.0	11.0	20.0	18.0%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.11	7.8	0.0	7.8	1.5	4.2		100.0	324	0	0	0 6	0.0				6:WBTL			eue may l	
†	EBT	₹	1528	1528	NA NA	2		2		25.0	31.2	28.0	52.3%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.83	22.7	0.0	22.7	132.6	#245.6	475.1		1974	0	0	0	0.83				EBTL and			oacity, qu cycles.	
1	EBL	<i>F</i>	113	113	pm+pt	2	2	2		7.0	11.0	20.0	18.0%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.57	27.7	0.0	27.7	6.7	28.7		120.0	302	0	0	0 00	0.38				to phase 2:		rdinated	exceeds cap m after two	
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Laire Gloup Flow (vpl.)	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 111	Actuated Cycle Length: 111	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 100	Control Type: Actuated-Coordinated	# 95th percentile volume exceeds capacity, queue may be longer Queue shown is maximum after two cycles.	



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HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Controlled Phases Control Phase Control Phases Control Phase Control Phase Control Phase Control Phases Control Phase Co		1	†	<i>></i>	-	Ļ	4	•	←	•	۶	→	•
1	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
19	Lane Configurations	<u></u>	₩.		, -	₩		jr.	æ		F	æ	
19	Traffic Volume (vph)	19	1440	19	46	1671	92	132	45	89	183	42	26
1900 1900	Future Volume (vph)	19	1440	19	46	1671	92	132	42	86	183	42	26
1,00 0.95 1.00 0.95 1.00	Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,00	Lane Width	3.3	3.0	3.5	3.3	3.0	3.5	3.3	3.0	3.5	3.3	3.0	3.5
1,00 0,95	Total Lost time (s)	4.0	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
1,00 0.99 1,00 0.99 1,00 0.90 1,00 0.95 1,00	Lane Util. Factor	1:00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
1745 2346	Fr	1.00	0.99		1.00	0.99		1.00	0.00		1.00	0.94	
1745 2246	Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
0.06 1,00 0,07 1,00 0,77 1,100 0,62 1.05 3246 0.95 3338 0.95 1666 0.95 0.95 0.07 1516 64 48 1759 97 139 47 94 193 0.0 30 0.0 48 1852 0.0 139 86 0.0 193 0.0 39 0.0 26 14 6.0 26 14 6.0 0 4 2.3 1.0 1 188 18 18 2 12.6 29.6 29.6 29.6 1.0 1 188 18 22 12.6 29.6 29.6 29.6 1.0 1 188 18 19 20 10 100 1.0 1 188 19 2 20 100 0.0 0.4 2.1 1 8.1 1.0 1.0 1.00 0.4 2.1 1 8.1 1.1 8.1 1.1 0.3 2 28 27.8 28.9 27.8 39.3 30.1 1.0 1 4.4 1.2 1.2 1.0 1.0 1.0 1.00 0.4 2.1 1.1 8.1 1.1 0.3 24.0 0.4 2.1 1.8 1.1 8.1 1.1 0.3 24.0 0.4 2.1 1.1 8.1 1.1 0.3 37.8 2 2 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	Satd. Flow (prot)	1745	3246		1745	3338		1637	1666		1415	1623	
105 3246 129 3338 1225 1666 927 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.96 0.98 0.98 1228 1228 0.96 0.98 0.98 1226 29.6 29.6 0.96 0.98 138 1226 29.6 29.6 0.96 0.98 138 1226 29.6 29.6 0.96 0.98 138 1226 29.6 29.6 0.96 0.98 138 1226 29.6 29.6 0.96 0.98 138 1226 29.6 29.6 0.96 0.98 138 1226 29.6 29.6 0.96 0.98 138 1226 29.6 29.6 0.96 0.98 139 120 100 0.11 188 1.95 2019 30.2 0.11 188 1.95 2019 30.2 0.11 1.11 1.11 1.11 0.3 0.20 0.49 0.30 0.92 0.46 0.21 0.21 0.21 1.11 8.1 1.11 0.3 0.22 0.84 0.30 0.92 0.46 0.21 0.24 2.1 1.11 8.1 1.11 0.3 0.2 0.84 0.30 0.92 0.46 0.21 0.2 0.38 1.00 1.00 1.00 0.4 2.1 1.11 8.1 1.11 0.3 2.40 0.2 0.84 0.30 0.92 0.46 0.21 0.2 0.84 0.30 0.92 0.46 0.21 0.3 0.3 0.3 0.3 0.3	Fit Permitted	90:0	1.00		0.07	1.00		0.71	1.00		0.62	1.00	
0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95	Satd. Flow (perm)	105	3246		129	3338		1225	1666		927	1623	
20 1516 64 48 1759 97 139 47 94 193 1) 20 177 0 48 1852 0 56 0 0 0 3 0 0 4 0 0 56 0 0 10 0 3 0 0 4 0 0 56 0 0 10 0 3 0 0 4 0 0 56 0 0 10 0 3 0 0 4 0 0 56 0 0 10 0 3 0 0 0 26 14 6 0 4 23 2 6 8 14 6 0 4 23 2 6 8 1852 0 14 6 0 4 23 2 6 8 1852 0 26 296 296 1 22 6 698 782 72.6 296 29.6 29.6 1 20 6 0.88 782 72.6 29.6 29.6 29.6 1 20 6 0.88 782 72.6 29.6 29.6 29.6 1 20 6 0.88 782 72.6 29.6 29.6 29.6 1 20 0 0.89 782 72.6 29.6 29.6 29.6 2 10 0 0 0 49 0.65 0.65 0.60 0.25 0.25 1 2 1 1.44 1.26 1.00 1.00 1.00 1.00 1.00 2 1 1.44 1.26 1.00 1.00 1.00 1.00 1.00 2 2 1 1.44 1.26 1.00 1.00 1.00 1.00 1.00 2 2 1 1.44 1.26 1.00 1.00 1.00 1.00 1.00 2 2 1 1.44 1.26 1.00 1.00 1.00 1.00 1.00 2 2 1 1.44 1.26 1.00 1.00 1.00 1.00 1.00 2 2 1 1.3 1 1.3 1 1.1 8.1 1.1 0.3 2.4.0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
)) 0 3 3 0 0 4 4 0 0 56 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Adj. Flow (vph)	20	1516	64	48	1759	26	139	47	94	193	44	27
1, 20	RTOR Reduction (vph)	0	3	0	0	4	0	0	26	0	0	17	0
0% 2% 0% 1% 15% 4% 0% 4% 12% 0 39 0 0 26 14 6 4 23 pm+p1 NA pm+p1 NA Perm NA Perm 1 6 6 8 8 4 Perm 1 1 6 9	Lane Group Flow (vph)	20	1577	0	48	1852	0	139	82	0	193	24	0
Dm+pl NA Dm+pl NA Perm NA Pe	Heavy Vehicles (%)	%0	7%	%0	%0	1%	15%	4%	%0	4%	12%	%6	8%
pm+pt NA pm+pt NA Perm NA Perm 5 2 1 6 8 4 726 698 782 72.6 29.6 29.6 29.6 726 698 78.2 72.6 29.6 29.6 29.6 29.6 726 698 78.2 72.6 29.6	Bus Blockages (#/hr)	0	39	0	0	79	14	9	0	4	23	4	2
5	Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
2 6 8 8 4 12.6 69.8 72.6 29.6 29.6 29.6 72.6 69.8 78.2 72.6 29.6 29.6 29.6 72.6 0.58 0.65 0.60 0.25 0.25 0.25 29.6 4.0 5.3 0.65 0.60 0.25 0.25 0.25 0.25 4.0 5.3 0.69 0.25	Protected Phases	വ	2		-	9			∞			4	
726 698 782 726 296 <td>Permitted Phases</td> <td>2</td> <td></td> <td></td> <td>9</td> <td></td> <td></td> <td>∞</td> <td></td> <td></td> <td>4</td> <td></td> <td></td>	Permitted Phases	2			9			∞			4		
726 698 782 726 296 <td>Actuated Green, G (s)</td> <td>72.6</td> <td>8.69</td> <td></td> <td>78.2</td> <td>72.6</td> <td></td> <td>29.6</td> <td>29.6</td> <td></td> <td>29.6</td> <td>29.6</td> <td></td>	Actuated Green, G (s)	72.6	8.69		78.2	72.6		29.6	29.6		29.6	29.6	
0.60 0.58 0.65 0.60 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.2	Effective Green, g (s)	72.6	8.69		78.2	72.6		29.6	29.6		29.6	29.6	
4.0 5.3 4.0 5.3 5.7 5.7 5.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 1.0 1.8 1.59 2019 3.0 3.0 3.0 0.00 0.49 0.01 0.05 0.05 0.05 0.05 0.11 0.18 0.10 0.01 0.01 0.01 0.02 1.20 0.84 0.30 0.92 0.46 0.21 0.05 1.44 1.26 1.00 1.00 1.00 1.00 1.00 1.44 1.26 1.00 1.00 1.00 1.00 1.00 1.44 1.26 1.00 1.00 1.00 1.00 1.00 1.44 1.26 1.11 8.1 1.1 0.3 24.0 2.89 2.78 8.2 2.0 D D E 1.5 1.28 1.24 1.24 1.24 1.24 1.24	Actuated g/C Ratio	09:0	0.58		0.65	09.0		0.25	0.25		0.25	0.25	
30 30 30 30 30 30 30 30	Clearance Time (s)	4.0	5.3		4.0	5.3		2.7	5.7		5.7	5.7	
101 1888 159 2019 302 410 228 100 0.49 0.001 0.056 0.05	Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
0.00 0.49 0.056 0.05 0.11	Lane Grp Cap (vph)	101	1888		159	2019		302	410		228	400	
0.11 0.18 0.18 0.11 0.020 0.20 0.84 0.30 0.92 0.44 0.21 0.85 19.7 0.44 1.26 1.00 1.00 1.00 1.00 1.00 1.00 0.4 2.1 1.1 8.1 1.1 0.3 24.0 0.4 2.1 1.1 8.1 1.1 0.3 24.0 0.5 2.8 27.8 1.6 29.2 39.5 36.1 67.1 0.5 C C C C C C C C C C C C C C C C C C C	v/s Ratio Prot	0.00	0.49		c0.01	c0.56			0.02			0.03	
19,2 0,24 0,34 0,30 0,92 0,46 0,21 0,88 19,7 20,4 1,57 21,0 3,84 35,9 43,0 1,44 1,26 1,00 1,00 1,00 1,00 2,89 27,8 1,68 29,2 39,5 36,1 67,1 C	v/s Ratio Perm	0.11			0.18			0.11			c0.21		
19,7 20,4 15,7 21,0 38,4 35,9 43,0 1,44 1,26 1,00 1,00 1,00 1,00 2,89 27,8 1,89 27,8 2,10 C	v/c Ratio	0.20	0.84		0.30	0.92		0.46	0.21		0.85	0.13	
144 126	Uniform Delay, d1	19.7	20.4		15.7	21.0		38.4	35.9		43.0	35.2	
28.9 27.8 16.8 29.2 39.5 36.1 67.1 3 24.0 28.9 27.8 16.8 29.2 39.5 36.1 67.1 3 24.0 27.8 28.9 2 39.5 36.1 67.1 3 2 27.8 28.9 2 37.8 E 2 2 2 2 39.5 36.1 67.1 3 2 2 2 2 39.5 36.1 67.1 3 2 2 2 2 39.5 36.1 67.1 3 2 2 2 2 39.5 36.1 67.1 3 2 2 2 2 39.5 36.1 67.1 3 2 2 2 2 39.5 36.1 3 2 2 2 2 39.5 36.1 3 2 2 2 2 39.5 36.1 3 2 2 2 39.5 36.1 3 2 39.5 36.1 3 2 39.5 3 31.0 3	Progression Factor	1.44	1.26		1.00	1.00		1.00	1.00		1.00	1.00	
289 278 168 292 39.5 36.1 67.1 C C C B C D D E E C D D D E E C D D D E E C D D D E E C D D D E E C D D D E E C D D D E E C D D D E E C D D D D	Incremental Delay, d2	0.4	2.1		1.1	8.1		1.1	0.3		24.0	0.2	
C C C B C D D E C 27.8 28.9 37.8 C C D D D E C C C D D D E D D D E D D D D E D D D D D E D D D D	Delay (s)	28.9	27.8		16.8	29.2		39.5	36.1		67.1	35.4	
27.8 28.9 37.8 C C D C D D D D D D D D D D D D D D D D	Level of Service	S	ပ		В	ပ		۵	Ω		ш	۵	
th control of the con	Approach Delay (s)		27.8			28.9			37.8			58.5	
lay 31.0 HCM 2000 Level of Service capacity ratio 0.89 CD Level of Service Capacity ratio 0.89 Sun of lost time (s) Utilization 81.5% ICU Level of Service 15	Approach LOS		O			ပ			D			ш	
slay 31.0 HCM 2000 Level of Service Capacity ratio 0.89	Intersection Summary												
Capacity ratio 0.89 h (s) 120.0 Sum of lost time (s) Utilization 81.5% ICU Level of Service 15	HCM 2000 Control Delay			31.0	ľ	CM 2000	Level of S	ervice		U			
h (s) 120.0 Sum of lost time (s) Utilization 81.5% ICU Level of Service 15	HCM 2000 Volume to Capa	city ratio		0.89									
Utilization 81.5% ICU Level of Service 15 ICU Level of Service 15	Actuated Cycle Length (s)	,		120.0	S	tsol Jo mr	time (s)			15.0			
G.	Intersection Capacity Utiliza	tion		81.5%	೨	U Level o	of Service			Ω			
Critical Lane Group	Analysis Period (min)			15									
Sport Clark	c Critical Lane Group												

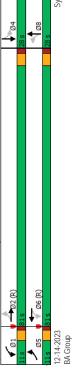
Queues 2: Fifth Line & Derry Road

Existing (PM)

Existing (PM)

Applications		1	†	-	Ļ	•	—	۶	→	
1	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
19	Lane Configurations	<u>"</u>	₹	*	₩	۴	æ	۴	æ	
19	Traffic Volume (vph)	19	1440	46	1671	132	45	183	42	
pm+pt NA pm+pt NA Perm NA Perm NA Perm FS 139 141 193 174 174 174 174 174 174 175 175 175 175 175 175 175 175 175 175	Future Volume (vph)	19	1440	46	1671	132	45	183	42	
pm+pt NA pm+pt NA perm 5 2 1 6 8 4 2 1 6 8 4 4 2 6 1 6 8 4 4 1 5 1 6 8 4 4 4 70 20 7.0 20.0 10.0	Lane Group Flow (vph)	20	1580	48	1856	139	141	193	11	
5	Turn Type	pm+pt	NA	pm+pt	NA	Perm	¥	Perm	M	
2 6 6 8 8 4 4 5 2 1 6 6 8 8 4 4 110 34.3 11.0 34.3 34.7 34.7 34.7 11.0 34.3 11.0 34.3 34.7 34.7 34.7 11.0 34.3 11.0 34.3 34.7 34.7 34.7 11.0 34.3 11.0 34.3 34.7 34.7 34.7 34.7 11.0 34.3 11.0 34.3 34.7 34.7 34.7 34.7 34.7 34.7 34.7	Protected Phases	2	2	_	9		00		4	
5 2 1 6 8 8 4 70 20.0 7.0 20.0 10.0 10.0 11.0 34.3 11.0 34.3 34.7 34.7 34.7 11.0 34.3 11.0 34.3 34.7 34.7 34.7 11.0 81.0 11.0 81.0 28.0 28.0 22% 67.5% 9.2% 67.5% 23.3% 23.3% 23.3% 1.0 1.6 1.0 1.6 2.0 2.0 4.0 0.0 0.0 0.0 0.0 0.0 4.0 0.0 0.0 0.0 0.0 0.0 4.0 0.0 0.0 0.0 0.0 0.0 5.7 0.0 0.0 0.0 0.0 6.0 0.0 0.0 0.0 0.0 6.0 0.0 0.0 0.0 0.0 6.0 0.0 0.0 0.0 0.0 6.0 0.0 0.0 0.0 0.0 7.0 0.0 0.0 0.0 0.0 100.0 0.0 0.0 0.0 0.0 100.0 0.0 0.0 0.0 0.0 100.0 0.0 0.0 0.0 0.0 100.0 0.	Permitted Phases	2		9		∞		4		
7.0 20.0 7.0 20.0 10.0 10.0 10.0 10.0 11.0 34.3 34.7 34	Detector Phase	വ	2	-	9	∞	∞	4	4	
100 100 100 100 100 100 100 100 110 34.3 11.0 34.3 34.7 34.7 110 34.3 11.0 34.3 34.7 34.7 11.0 34.3 11.0 34.3 34.7 34.	Switch Phase									
11.0 34.3 11.0 34.3 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.8 32.8	Minimum Initial (s)	7.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	
110 81.0 11.0 81.0 28.0 28.0 28.0 9.2% 6/15% 9/2% 6/15% 2/3% 2/3.	Minimum Split (s)	11.0	34.3	11.0	34.3	34.7	34.7	34.7	34.7	
9.2% 6/15% 9.2% 6/15% 23.3% 23.3% 23.3% 13.0 3.1 3.1 3.0 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1	Total Split (s)	11.0	81.0	11.0	81.0	28.0	28.0	28.0	28.0	
3.0 3.7 3.0 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7	Total Split (%)	9.5%	67.5%	9.5%	67.5%	23.3%	23.3%	23.3%	23.3%	
1.0 1.6 1.0 1.6 2.0 2.0 2.0 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
100 0.0	All-Red Time (s)	1.0	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
10 10 10 10 10 10 10 10	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lead Lag Lead Lag Ves Ve	Total Lost Time (s)	4.0	5.3	4.0	5.3	5.7	5.7	5.7	5.7	
Yes Yes Ves None No	Lead/Lag	Lead	Lag	Lead	Lag					
None C-Min None C-Min None None None None C-Min None C-Min None C-Min None C-Min None C-Min None None C-Min None None C-Min None C-Min None C-Min None C-Min None None C-Min Non	Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
0.12 0.83 0.27 0.89 0.46 0.30 0.85 8.5 27.2 9.5 25.6 46.5 21.6 75.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
8.5 27.2 9.5 25.6 46.5 21.6 75.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	v/c Ratio	0.12	0.83	0.27	0.89	0.46	0.30	0.85	0.17	
00 00 00 00 00 00 00 00 00 00 00 00 00	Control Delay	8.5	27.2	9.6	25.6	46.5	21.6	75.6	28.5	
8.5 27.2 9.5 25.6 46.5 216 75.6 46.5 214 21.2 42.7 41.3 196.3 27.4 12.2 42.7 41.2 42.7 42.7 41.2 42.7 42.7 42.7 42.7 42.7 42.7 42.7 42	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2.4 136.3 4.3 166.3 27.4 122 42.7 m12 m2 m2.8 6.1 285.5 54.9 339 #103.2 100.0 354.1 36.2 54.9 330 #103.2 100.0 0 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Delay	8.5	27.2	9.5	25.6	46.5	21.6	75.6	28.5	
m12 m82.8 6.1 228.5 54.9 33.9 #103.2 100.0 34.1 336.2 34.0 4.0 50.0 100.0 163.2 205.0 179 2109 302 466 228 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 50th (m)	2.4	136.3	4.3	196.3	27.4	12.2	42.7	8.7	
100.0 354.1 336.2 340.6 100.0 100.0 30.0 100.0 1	Queue Length 95th (m)	m1.2	m82.8	6.1	228.5	54.9	33.9	#103.2	23.9	
100.0 90.0 70.0 50.0 100	Internal Link Dist (m)		354.1		336.2		340.6		275.9	
163 2050 179 2109 302 466 228 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Turn Bay Length (m)	100.0		0.06		70.0		20.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	163	2050	179	2109	302	466	228	417	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
5 0.30 0.85	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
030 082	Storage Cap Reductn	0	0	0	0	0	0	0	0	
hitersection Summary Cycle Length: 120 Actuated Cycle Length: 120 Actuated Cycle Length: 120 Actuated Cycle: 110 Control Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Reduced v/c Ratio	0.12	0.77	0.27	0.88	0.46	0.30	0.85	0.17	
Cycle Length: 120 Aduated Cycle Length: 120 Aduated Cycle Length: 120 Olfset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Slart of Green Natural Cycle: 110 Control Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Intersection Summary									
Actuated Cycle Length: 120 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 110 Control Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Cycle Length: 120									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 100 Control Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Actuated Cycle Length: 120									
Natural Cycle: 110 Control Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Offset: 0 (0%), Referenced to	to phase 2:	EBTL an	d 6:WBTL	, Start of	Green				
County 19th requires County and the County of the County o	Natural Cycle: 110	rdinatod								
	Collina Type: Actuated Coo	naliare.			-					
	# 95th percentile volume e	exceeds cal	oacity, qu	rene may	pe longel					
		m after two	cycles.							
		ille dueue i	s metere	d by upst	eam sign	al.				

Splits and Phases: 2: Fifth Line & Derry Road



HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

Lane Configurations										
1075 1075 1075 1075 1075 1075 1075 1075	BT EBR	WBL	WBT V	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1075 1075 1075 1075 1075 1075 1075 1075		<u>, </u>	+	¥	jr.	\$	*	je-	‡	*-
1075 1075 1100 1100 1100 1100 1100 1100		239	1217	373	73	311	170	275	409	193
1900 11900 11900 1100 1100 1100 1100 11		239		373	73	311	170	275	409	193
3.6 3.6 1.00 1.	<u>~</u>	1900		006	1900	1300	1900	1900	1900	1900
2% 2% 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0		5.5	0.5	5.5	2.5	0.0	3.0	2.3	0.0	3.3
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00		1.00	5.3 0.05	2.3	1.00	7.0	100	1.00	0.05	100
1.00 1 1 1.00 1 1 1 1		100		8.8	8.6	100	0000	100	100	100
1.00 C 1.		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
3376 1 1120 1 1120 1 1120 1 1 1120 1 1 1 1 1		0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
1,00 1,100 1,1120 1,1120 1,1120 1,120	76 1481	1731	3453 1	1443	1658	3428	1473	1669	3346	1562
2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2		0.10		1.00	0.50	1.00	1.00	0.32	1.00	1.00
9% 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	76 1481	177	3453 1	443	879	3428	1473	267	3346	1562
1120 1120 23 23 23 23 23 37.1 30 30 30 30 41.5 41.5 41.5 41.5 41.5 6 85.5 6 85.5 7 100 1 100	96:0 96	96:0		96:0	96.0	96.0	96.0	96.0	96.0	96:0
2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2	20 16	249	1268	389	9/	324	177	286	426	201
2% 23 23 23 24 25 25 25 25 25 25 25 25 25 25 25 25 25	0 11	0	0	158	0	0	151	0	0	145
2% 23 23 23 23 23 21.1 3 37.1 3 37.1 3 37.1 3 30 3.0 0.31 (0.31 0.03) 1.07 (0.33 0.03) 2.0 0.33 0.03 3.0 0.31 (0.33 0.03) 4.1.5 2 4.1.5 2 4.1.0 0.03 0.03 0.03 0.03 0.03 0.03 0.03	20 5	249	1268	231	76	324	26	786	426	26
2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2		-					-	-		
23 23 23 24 25 25 25 25 25 25 25 25 25 25 25 25 25	%9 %	%0	1%	4%	4%	3%	4%	7%	4%	1%
2 2 2 37.1 3 37.1 3 37.1 3 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	23 1	2	17	15	3	11	7	9	18	3
2 37.1 3 37.1 3 37.1 3 37.1 3 3 3.0 1043	NA Perm	pm+pt		Perm p	pm+pt	NA	Perm	pm+pt	NA N	Perm
37.1 3 37.1 3 3 37.1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	2	-	9		e	∞		7	4	
37.1 3 37.1 3 0.31 0 0.33 0 0.033 0 0.033 0 0.033 0 0.04 0 0 1.00 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		9		9	00		8	4		4
37.1 3 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3		0.40		48.5	25.0	17.5	17.5	42.0	33.5	33.5
0.31 0 0.31 0 0.31 0 0.31 0 0.31 0 0.31 0 0 0.31 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		64.0		48.5	25.0	17.5	17.5	45.0	33.5	33.5
5.3 1043 1043 107 107 1100 1100 114 114 114 114 114 114 114 1	_	0.53		0.40	0.21	0.15	0.15	0.38	0.28	0.28
3.0 1043 1.07 1043 1.07 1.07 1.07 1.07 1.07 1.07 1.07 1.07		4.0	5.3	5.3	4.0	2.7	2.7	4.0	2.7	5.7
0.033 1.07 1.00 1.00 1.00 1.00 1.00 1.00 1.00		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
c0.33 1.07 1.00 1.00 1.00 1.00 1.00 1.00 1.00	43 457		1395	583	231	499	214	428	934	436
3 1.07 41.5 1.00 5 49.9 1 91.4 1 91.4 1 85.5 F			c0.37		0.02	0.09		c0.13	0.13	
3 1.07 41.5 41.5 1 91.4 F F 85.5 F		0.22		0.16	0.05		0.02	c0.12		0.04
41.5 1.00 1.00 1.00 1.91.4 1.91.4 1.85.5 F		0.64		0.40	0.33	0.65	0.12	0.67	0.46	0.13
1.00 5 49.9 1 91.4 1 85.5 F		28.4		25.4	39.4	48.4	44.6	28.8	35.7	32.3
85.5 F	_	0.76		1.76	1.00	1.00	1:00	1.00	1.00	1.00
85.5 F		ر 80: و		1.0	8.0	2.9	0.3	3.9	0.4	0.1
85.5 F		23.3		45.6	40.2	51.3	44.8	32.1	36.1	32.5
85.5 F	ی ا	ی	ر ا ا	n	a	O 64	a	2	O 52	ی
±	ر. ا		41.9			8.7			34.2	
	ш.		O			Ω			ပ	
	53.3	HCN	HCM 2000 Level of Service	rel of Se	rvice		۵			
	0.85									
	120.0	Sum	Sum of lost time (s)	e (s)			19.0			
	83.1%	C	ICU Level of Service	envice			ш			
Analysis Period (min)	15									
c Critical Lane Group										

Queues 3: James Snow Parkway & Derry Road

Existing (PM)

Existing (PM)

	1	†	1	-	ţ	4	•	←	*	۶	→	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ř.	‡	¥C.	je-	‡	¥C	<i>y</i> -	‡	*	<i>y-</i>	‡	* _
Traffic Volume (vph)	177	1075	15	239	1217	373	73	311	170	275	409	193
Future Volume (vph)	177	1075	15	239	1217	373	73	311	170	275	409	193
Lane Group Flow (vph)	184	1120	16	249	1268	386	9/	324	17.7	286	426	201
Turn Type	Prot	NA	Perm	pm+pt	¥	Perm	pm+pt	¥	Perm	pm+pt	NA	Perm
Protected Phases	2	2		_	9		c,	∞		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	2	2	2		9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	12.0	43.0	43.0	12.0	43.0	43.0	14.0	22.0	22.0	43.0	51.0	51.0
Total Split (%)	10.0%	35.8%	35.8%	10.0%	35.8%	35.8%	11.7%	18.3%	18.3%	35.8%	42.5%	42.5%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.58	1.05	0.03	0.63	0.89	0.52	0.30	89.0	0.50	99.0	0.46	0.35
Control Delay	59.5	81.7	0.1	26.4	43.9	18.5	26.7	56.4	11.4	34.3	37.0	5.6
Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	81.7	0.1	26.4	43.9	18.5	26.7	56.4	11.4	34.3	37.0	5.6
Queue Length 50th (m)	22.6	~160.1	0.0	43.9	176.5	58.1	12.2	40.8	0.0	52.7	47.7	0.0
Queue Length 95th (m)	35.5	#203.5	0.0	m#79.1	#246.8	m74.3	18.9	54.1	19.7	63.8	22.0	16.0
Internal Link Dist (m)		156.1			305.1			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	319	1067	260	393	1420	749	272	208	369	218	1263	714
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.05	0.03	0.63	0.89	0.52	0.28	0.64	0.48	0.49	0.34	0.28
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 110 (92%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	d to phas	e 2:EBi a	and 6:WE	TL, Start	of Green							

Natural Cycle: 95
Control Type: Actuated-Coordinated
- Volume exceeds capacity, queue is theoretically infinite.
- Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
- Queue shown is maximum after two cycles.
- Wolume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: James Snow Parkway & Derry Road

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HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Background (AM)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	₩		r	₩		F	£,		F	2	
Traffic Volume (vph)	158	1947	138	15	692	38	69	167	28	34	130	122
Future Volume (vph)	158	1947	138	15	692	38	69	167	28	34	130	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.93	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	3163		1805	2924		1805	1846		1258	1737	
Fit Permitted	0.30	1.00		90.0	1.00		0.31	1.00		0.45	1.00	
Satd. Flow (perm)	295	3163		114	2924		285	1846		262	1737	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	168	2071	147	16	736	40	73	178	30	36	138	130
RTOR Reduction (vph)	0	4	0	0	3	0	0	9	0	0	33	0
Lane Group Flow (vph)	168	2214	0	16	773	0	73	202	0	36	235	0
Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
Bus Blockages (#/hr)	1	46	2	0	54	2	0	0	1	9	1	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
Protected Phases	2	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	78.6	71.8		69.4	9.99		19.9	19.9		19.9	19.9	
Effective Green, g (s)	78.6	71.8		69.4	9.99		19.9	19.9		19.9	19.9	
Actuated g/C Ratio	0.71	0.65		0.63	09:0		0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	484	2045		113	1754		104	330		107	311	
v/s Ratio Prot	c0.02	c0.70		0.00	0.26			0.11			c0.14	
v/s Ratio Perm	0.22			0.08			0.13			90:0		
v/c Ratio	0.35	1.08		0.14	0.44		0.70	0.61		0.34	0.76	
Uniform Delay, d1	2.9	19.6		24.8	12.1		42.8	45.0		39.8	43.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	46.5		9.0	0.8		19.2	3.4		1.9	10.0	
Delay (s)	6.4	66.1		25.4	12.9		62.0	45.4		41.6	53.3	
Level of Service	A	ш		ပ	В		ш	٥		٥	٥	
Approach Delay (s)		61.9			13.1			49.7			51.9	
Approach LOS		ш			Ω			Ω			Ω	
Intersection Summary												
HCM 2000 Control Delay			49.9	l H	3M 2000	HCM 2000 Level of Service	ervice		Q			
HCM 2000 Volume to Capacity ratio	ity ratio		1.00									
Actuated Cycle Length (s)	, c	, i	111.0	S ⊆	I level of	Sum of lost time (s)			16.5			
Analysis Period (min)			15	2)			

Analysis Period (min) c Critical Lane Group

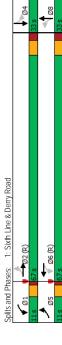
Synchro 11 Report 12-14-2023 BA Group

Queues
1: Sixth Line & Derry Road

Future Background (AM)
2027 Scenario 1

2071 3	
	-
Road	•
Derry	
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→	SBT	43	130	130	268	M	4		4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.78	52.1	0.0	52.1	50.3	74.8	201.7		448	0	0	0	09:0								
۶	SBL	*	34	34	36	Perm		4	4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.34	46.6	0.0	46.6	7.2	16.8		30.0	143	0	0	0	0.25								
←	NBT	Ŷ,	167	167	208	¥	∞		∞		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.62	48.0	0.0	48.0	42.6	63.0	211.8		449	0	0	0	0.46								
•	NBL	F	69	69	73	Perm		∞	∞		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.71	75.6	0.0	75.6	15.7	31.5		45.0	139	0	0	0	0.53				Green				
ţ	WBT	₽	692	692	9//	Ν	9		9		25.0	31.2	0.79	60.4%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.44	13.8	0.0	13.8	48.1	70.2	256.2		1756	0	0	0	0.44				Start of			be longer	
-	WBL	F	15	15	16	pm+pt		9	_		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.09	9.9	0.0	9.9	6.0	3.4		100.0	184	0	0	0	0.09				16:WBTL			eue may	
†	EBT	₩	1947	1947	2218	NA	2		2		25.0	31.2	0.79	60.4%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	1.05	53.8	0.0	53.8	229.8	#384.2	475.1		2118	0	0	0	1.05				EBTL and			pacity, qu	Cycles.
^	EBL	F	158	158	168	pm+pt	2	2	വ		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.34	7.3	0.0	7.3	10.1	21.1		120.0	491	0	0	0	0.34				phase 2:		dinated	ceeds cal	OIG INC
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 111	Actuated Cycle Length: 111	Offset: 0 (0%). Referenced to phase 2:EBTL and 6:WBTL. Start of Green	Natural Cycle: 150	Control Type: Actuated-Coordinated	# 95th percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles.	Quede Showill is theminen



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

1900 3251 1.00 3251 5.7 0.95 0.95 1.00 0.13 22.3 22.3 0.19 5.7 604 0.1 5.7 1.00 1.00 0.95 1.501 0.37 577 22.3 22.3 0.19 5.7 3.0 107 14% 15.0 G 93.94 3% 286 286 286 1900 1900 1009 1000 1009 1000 1009 1000 1009 1000 1009 1000 1009 1000 1009 1000 1009 22.3 22.3 0.19 5.7 3.0 599 D 46.3 0.61 44.9 1.00 1.8 46.7 5.7 1.00 1.00 0.95 1.698 0.69 0.69 99 2% 0 22.3 22.3 0.19 5.7 3.0 228 0.08 0.43 43.3 1.00 1.3 44.6 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 249 249 18% 265 75.2 75.2 0.63 5.3 3.0 1940 0.31 0.50 12.1 0.94 0.9 12.3 1186 161 c0.08 4.0 1.00 0.95 0.95 0.05 89 0.94 186 83.2 83.2 0.69 4.0 3.0 49.8 1.14 120.0 103.4% 95 0 % 101 ↑↑ 1980 1980 1900 5.3 0.99 0.99 1.00 3262 1.00 3262 0.94 74.7 74.7 0.62 5.3 3.0 2030 0.68 1.09 22.6 0.47 44.0 54.7 2204 2% 36 NA t 88 88 4.0 11.00 0.95 1600 0.24 405 0.94 94 82.2 82.2 0.69 4.0 3.0 352 0.02 0.17 0.27 0.53 2000 Volume to Capacity ratio HCM 2000 Control Delay
HCM 2000 Volume to Capacity rati
Actuated Cyde Length (s)
Intersection Capacity Utilization
Analysis Period (min) Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor ane Group Flow (vph Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Actuated Green, G (s) Effective Green, g (s) ncremental Delay, d2 Approach Delay (s) Approach LOS Blockages (#/hr) Heavy Vehicles (%) Turn Type Protected Phases -ane Grp Cap (vph) Jniform Delay, d1 Progression Factor Permitted Phases Delay (s) Level of Service v/s Ratio Perm v/s Ratio Prot Ratio

Critical Lane Group

12-14-2023 Synchro 11 Report
BA Group

Queues 2: Fifth Line & Derry Road

Future Background (AM)

Future Background (AM)
2027 Scenario 1

34.7 28.0 23.3% 3.7 2.0 0.0 5.7 0.17 29.0 0.0 29.0 7.8 16.1 68 68 ¥ ₹ 630 34.7 28.0 23.3% 3.7 2.0 0.0 5.7 1.09 160.8 0.0 160.8 110 117 Perm 50.0 0 0 60. 10.0 34.7 28.0 23.3% 3.7 0.62 47.0 0.0 47.0 43.7 61.1 340.6 286 286 386 NA 2.0 23.3% 3.7 2.0 0.0 5.7 93 99 Perm 34.7 70.0 0.44 50.2 0.0 50.2 22.0 40.2 Referenced to phase 2:EBTL and 6:WBTL, Start of Green Queue shown is maximum after two cycles.

Molume for 95th percentile queue is metered by upstream signal. 95th percentile volume exceeds capacity, queue may be longer 66.7% 1.6 0.0 5.3 Lag Yes C-Min 415 683 683 992 NA 20.0 34.3 80.0 0.50 11.4 0.0 11.4 1971 55.1 65.4 124.7 Volume exceeds capacity, queue is theoretically infinite. 11.0 12.0 10.0% 3.0 0.0 1.0 0.0 4.0 Yes #87.8 pm+pt None 0.06 162 175 186 1980 2207 NA 20.0 34.3 80.0 C-Min 58.0 58.0 %1.99 Lag 0.0 170.5 2032 t m3.4 m#355.5 Queue shown is maximum after two cycles. pm+pt Lead None 100.0 363 0.0 Control Type: Actuated-Coordinated Actuated Cycle Length: 120 Oueue Delay Total Delay Oueue Length 50th (m) Oueue Length 95th (m) Base Capacity (vph) Starvation Cap Reductn .ane Group Flow (vph) Spillback Cap Reducth Storage Cap Reductn Minimum Initial (s)
Minimum Spilt (s)
Total Spilt (s)
Total Spilt (%)
All Red Time (s)
Lost Time Adjust (s)
Total Lost Time (s) Lane Configurations Traffic Volume (vph) Internal Link Dist (m) Turn Bay Length (m) uture Volume (vph) Turn Type Protected Phases Permitted Phases Lead-Lag Optimize? Recall Mode Reduced v/c Ratio Sycle Length: 120 **Detector Phase** Control Delay Lead/Lag Ratio

splits and Phases: 2: Fifth Line & Derry Road

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

Future Background (AM) 2027 Scenario 1

	\	Ť	•	•		,	-	-	_		•	
Aovement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations	K.	‡	¥C	*	‡	¥C.	F	‡	¥C	*	‡	*
raffic Volume (vph)	187	1652	9	19	533	161	24	271	179	277	377	182
- uture Volume (vph)	187	1652	30	19	533	161	24	271	179	277	377	182
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Fotal Lost time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
ane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
rpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98
-Ipb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
# <u>-</u>	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
It Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3399	3438	1562	1738	3305	1516	1801	3202	1586	1616	3046	1403
-It Permitted	0.95	1.00	1.00	0.07	1.00	1.00	0.52	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)	3399	3438	1562	134	3305	1516	993	3202	1586	920	3046	1403
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	191	1686	31	89	544	164	24	277	183	283	382	186
Reduction (vph)	0	0	15	0	0	68	0	0	150	0	0	140
.ane Group Flow (vph)	191	1686	16	89	544	75	24	277	33	283	382	47
Confl. Peds. (#/hr)	-					_	9					9
Heavy Vehicles (%)	7%	1%	3%	3%	4%	3%	%0	%8	1%	2%	10%	7%
3us Blockages (#/hr)	2	19	_	2	24	2	0	21	2	15	36	13
Furn Type	Prot	A	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	¥	Perm
Protected Phases	വ	2		-	9		က	∞		7	4	
Permitted Phases			2	9		9	∞		00	4		4
Actuated Green, G (s)	12.0	60.2	60.2	61.0	54.6	54.6	21.8	17.4	17.4	38.4	30.0	30.0
Effective Green, g (s)	12.0	60.2	60.2	61.0	54.6	54.6	21.8	17.4	17.4	38.4	30.0	30.0
Actuated g/C Ratio	0.10	0.50	0.50	0.51	0.46	0.46	0.18	0.14	0.14	0.32	0.25	0.25
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	2.7	5.7
/ehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
ane Grp Cap (vph.)	336	1724	783	153	1503	689	210	464	229	344	761	320
//s Ratio Prot	90.00	c0.49		0.02	0.16		0.00	0.09		c0.12	0.13	
//s Ratio Perm			0.01	0.20		0.02	0.05		0.02	c0.15		0.03
//c Ratio	0.56	0.98	0.05	0.44	0.36	0.11	0.11	09.0	0.15	0.82	0.51	0.13
Jniform Delay, d1	51.5	29.3	12.1	25.1	21.3	18.7	40.7	48.0	44.8	34.1	38.6	34.9
Progression Factor	1.00	1.00	1.00	0.68	0.00	2.37	1.00	1.00	1.00	1.00	1.00	1.00
ncremental Delay, d2	2.1	17.0	0.0	1.8	9.0	0.3	0.2	2.1	0.3	14.6	0.5	0.2
Delay (s)	53.6	46.3	15.1	19.0	19.8	44.7	41.0	50.1	45.1	48.7	39.2	35.1
evel of Service			В	В	В	Ω	Ω	Ω			Ω	
Approach Delay (s)		46.5			25.0			47.7			41.4	
Approach LOS		Ω			ပ			٥			O	
ntersection Summary												
HCM 2000 Control Delay			41.4	Ĭ	CM 2000	HCM 2000 Level of Service	Service		۵			
HCM 2000 Volume to Capacity ratio	ity ratio		0.93									
Actuated Cycle Length (s)			120.0	S	Sum of lost time (s)	time (s)			19.0			
ntersection Capacity Utilization	on		91.0%	೨	U Level o	ICU Level of Service			ш.			

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Background (AM) 2027 Scenario 1

	1	1	~	>	ļ.	4	•	←	•	•	-	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	F	‡	¥C.	r	‡	*-	×	‡	*	<u>, , , , , , , , , , , , , , , , , , , </u>	‡	*
Traffic Volume (vph)	187	1652	30	. 67	533	161	24	27.1	179	277	377	182
Future Volume (vph)	187	1652	30	19	533	161	24	271	179	277	377	182
Lane Group Flow (vph)	191	1686	31	89	544	164	24	277	183	283	382	186
Turn Type	Prot	NA	Perm	pm+pt	M	Perm	pm+pt	M	Perm	pm+pt	NA	Perm
Protected Phases	2	2		-	9		က	∞		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	വ	2	2	-	9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	53.0	53.0	11.0	47.0	47.0	21.0	35.0	35.0	21.0	35.0	35.0
Total Split (%)	14.2%	44.2%	44.2%	9.5%	39.2%	39.2%	17.5%	29.2%	29.2%	17.5%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	2.7	5.7	4.0	2.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.56	0.94	0.04	0.38	0.35	0.21	0.09	99.0	0.51	0.82	0.51	0.38
Control Delay	97.6	40.0	0.1	14.7	19.9	9.8	28.1	29.7	12.7	53.4	41.8	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	40.0	0.1	14.7	19.9	9.8	28.1	29.7	12.7	53.4	41.8	7.6
Queue Length 50th (m)	23.6	205.0	0.0	8.9	48.5	7.1	4.1	34.8	1.8	57.7	45.5	0.0
Queue Length 95th (m)	35.0	#294.1	0.0	14.0	71.6	26.3	6.6	47.5	22.2	#87.2	9.69	18.4
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	383	1791	860	177	1545	96/	400	781	519	345	790	201
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.94	0.04	0.38	0.35	0.21	90:0	0.35	0.35	0.82	0.49	0.37
Intersection Summary												
Cycle Length: 120												

Actuated Cycle Length: 120
Actuated Cycle Length: 120
Offset: 103 (66%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 115
Confort Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

80₄ Splits and Phases: 3: James Snow Parkway & Derry Road 🕴 💠 Ø6 (R) **→9**2 (R) **₹**

12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Derry Road & Clark Boulevard

Future Background (AM) 2027 Scenario 1

																																					В		11.0	D		
•	SBR	¥C.	43	43	1900	5.7	1.00	0.85	1.00	1583	1.00	1583	0.92	47	44	33	Perm		4	8.0	8.0	0.07	5.7	3.0	105		0.00	0.03	52.4	1.00	0.1	52.5	D				HCM 2000 Level of Service		Sum of lost time (s)	of Service		
) J	WBR SBL	<i>y-</i>			1900 1900	5.7	1.00	1.00	0.95	1770	0.95	1770	0	99 26	0 0	0 26	Perm		4	8.0	8.0	0.07	5.7	3.0	118		c0.01	0.22	53.0	1.00	0.0	54.0	ח	53.0	D		HCM 2000		Sum of los	ICU Level		
ţ	WBT	₹.	872		_		0.95				1:00			948		1044	NA	9			_	_		3.0		0.30				Ì	0.3			2	A		10.2	0.74	120.0	%9.9/	15	
†	EBT	*	2137	2137	1900	5.3	0.95	1.00	1.00	3539	1.00		0.92		0	2323	AA	2		101.0	101.0	0.84	5.3	3.0	2978	c0.66		0.78		``	0.5	12.5	2	12.2	В							
1	EBL	*	75	75	1900	5.3	1.00	1.00	0.95	1770	0.27	494	0.92	82	0	82	Perm		2	101.0	101.0	0.84	5.3	3.0	415		0.17	0.20	7.0	1.69	0.1		¥					pacity ratio		ization		
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Frt	Fit Protected	Satd. Flow (prot)	Fit Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)	c Critical Lane Group

12-14-2023 Synchro 11 Report BA Group

Queues 4: Derry Road & Clark Boulevard

Future Background (AM) 2027 Scenario 1

SBR	¥.	43	43	47	Perm	,	4 4		10.0	34.7	35.0	29.5%	3.7	2.0	0.0	2.7			None	0.27	18.7	0.0	18.7	0.0	12.2			422	0 0	0 0	0.11			of Green	
SBL	r	24	24	26	Perm	,	4 4		10.0	34.7	32.0	29.2%	3.7	2.0	0.0	2.7			None	0.18	54.3	0.0	54.3	6.1	15.6	313.3	40.0	432	0	0 0	90:0			3T, Start o	
WBT	₩\$	872	872	1047	AA	9	9	•	10.0	34.3	85.0	70.8%	3.7	1.6	0.0	5.3			C-Min	0.35	7.5	0.0	7.5	25.6	31.5	475.1		3004	0	0 0	0.35			and 6:WE	
EBT	‡	2137	2137	2323	A	2	0	1	10.0	34.3	82.0	70.8%	3.7	1.6	0.0	5.3			C-Min	0.76	14.1	0.0	14.1	259.7	m229.4	336.0		3043	0	0 0	0.76			2:EBTL	
EBL	<i>y</i> -	75	75	82	Perm	c	7	1	10.0	34.3	82.0	70.8%	3.7	1.6	0.0	5.3			C-Min	0.19	3.9	0.0	3.9	5.2	m5.0 r		70.0	424	0		0.19		0	ced to phase	ordinatod
Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Pelilliteu Filases Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	ost Time Adjust (s)	Fotal Lost Time (s)	-ead/Lag	ead-Lag Optimize?	Recall Mode	//c Ratio	control Delay	Queue Delay	lotal Delay	Queue Length 50th (m)	Queue Length 95th (m)	nternal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductin	Spillback Cap Reductin	Reduced v/c Ratio	Intersection Summary	Sycle Length: 120 Actuated Cycle Length: 120	Offset: 110 (92%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	Natural Cycle: 110

Splits and Phases: 4: Derry Road & Clark Boulevard



85.8

12-14-2023 Syndrio 11 Report BA Group

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Background (AM) 2027 Scenario 1

																																					A		11.0	Α		
•	SBR		37	37	1900								0.92	40	0	0																					HCM 2000 Level of Service		time (s)	f Service		
→	SBT	æ	301	301	1900	2.7	1.00	0.99	1.00	1832	1:00	1835	0.92	327	က	364	NA	4		28.5	28.5	0.70	2.7	3.0	1281	0.20		0.28	2.3	1:00	0.1	2.4	V	2.4	A		ICM 2000		Sum of lost time (s)	ICU Level of Service		
—	NBT	*	446	446	1900	5.7	1.00	1.00	1.00	1863	1.00	1863	0.92	482	0	485	NA	80		28.5	28.5	0.70	2.7	3.0	1301	c0.26		0.37	2.5	1.00	0.2	2.7	V	2.7	A		=		S	2		
•	NBL	<i>y</i> -	10		1900		1.00		0.95				0.92	=	0	11	Perm		∞			_	5.7		706							1.9	V				2.9	0.36	40.8	41.0%	15	
/	EBR	¥C	3	3	1900	5.3	1.00	0.85	1.00	1583	1.00	1583	0.92	3	က	0	Perm		2	1.3	1.3	0.03	5.3	3.0	20		0.00	0.00				19	В									
1	EBL	<i>F</i>	10	10	1900	5.3	1.00	1.00	0.95	1770	0.95	0//L	0.92	=	0	11	Perm		2	1.3	1.3	0.03	5.3	3.0	26		c0.01	0.20	19.2	1:00	1.7	21.0	S	20.6	O			city ratio		ion		
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Frt	Fit Protected	Satd. Flow (prot)	Fit Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)	c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Quenes

Future Background (AM) 2027 Scenario 1

5: Fifth Line & Clark Boulevard	

→	SBT	æ	301	301	367	M	4		4		10.0	34.7	82.0	70.8%	3.7	2.0	0.0	2.7			Min	0.22	2.1	0.0	2.1	0.0	26.2	372.1		1835	0	0	0	0.20					
—	NBT	*	446	446	485	Ν	∞		00		10.0	34.7	82.0	70.8%	3.7	2.0	0.0	5.7			Min	0.28	2.4	0.0	2.4	0.0	37.5	156.9		1863	0	0	0	0.26					
•	NBL	r	10	10	1	Perm		∞	∞		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.01	2.3	0.0	2.3	0.0	1.8		32.0	1011	0	0	0	0.01					
<u> </u>	EBR	*	က	3	3	Perm		2	2		10.0	34.3	32.0	29.2%	3.7	1.6	0.0	5.3			None	0.01	11.7	0.0	11.7	0.0	1.7			1353	0	0	0	0.00					
1	EBL	<i>y</i> -	10	10	1	Perm		2	2		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	14.2	0.0	14.2	0.4	4.4	204.0	35.0	1512	0	0	0	0.01					ordinated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 36.5	Natural Cycle: 70	Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard ***** 04

Synchro 11 Report 12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Background (PM) 2027 Scenario 1

EBL 158 158 1900 100 100 100 105 1763 0.95 1763 0.95 1763 0.94 168 0.94 168 168 1 168 1 16	77 77 77 77 77 77 77 77 77 77 77 77 77	WBL W WBL W 1900 15 16 16 16 16 16 16 16 16 16 16 16 16 16	WBT WBR ↑↑↑ 1681 22 1681 22 1900 1900 62 095 1.00 100 22967 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	NBL 181 1900 1,000	NBT 152 152 1900 6.3 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	30 30 30 30 1900 1900 1900 1900 1900 190	SBL 93 93 93 93 93 11:00 0.95 11:258 0.64 842 842 0.94 99 0 99 99 40% 6 6	SBT 214 214 214 214 214 214 214 1900 6.3 1.00 1764 1.00	137 137 146 0 0 0 0 0 2 2
158 158 168 1900 100 100 100 109 1763 1763 1763 1763 1763 1764 168 168 178 168 178 178 178 178 178 178 178 178 178 17			333	181 181 1900 4.00 1.00 0.95 1805 0.16 295 0.16 0.94 193 0 0 0,94 193 8	152 152 1900 6.3 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	30 30 30 1900 1900 1900 1900 1900 1900 1	93 93 93 1900 6,3 100 100 100 100 99 99 99 99 99 99 99 99 99 99 99 99 9	214 214 214 1900 6.3 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	137 137 146 0 0 0 0 0 2 2
158 158 1900 400 1000 1000 1000 1000 1000 1000			33	181 1900 4 0.0 1.00 1.00 0.95 1805 295 295 295 0 0.16 193 0 0 193 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	152 152 1700 6.3 1.00 0.94 1.00 1.838 1.00 1.00 1.00 1.00 1.00 0.94 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	30 30 30 1900 0 0 0 0 0 0 0 17 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	93 93 1900 6.3 1.00 1.00 0.95 0.64 842 0.94 99 0 0 99 40% 6	214 214 1900 6.3 1.00 1.00 1.764 1.00 1.764 1.00 2.28 2.28 2.28 2.1 3.53 1.8	137 137 146 0 0 0 0 2 2
158 1900 100 1.00 1.00 1.00 1.00 1.00 1.00			33	181 1900 4.0 1.00 1.00 1.00 0.95 1805 0.16 295 0.94 193 0.94 193 0.94 193 0.94 193 8	152 1900 6.3 1.00 0.98 1.00 1.838 1.00 1.838 1.00 7 7 1 187 8	30 1900 0.94 32 0 0 0 0 0 17 17	93 6.3 1.00 1.00 0.95 0.64 842 842 0.94 99 40% 6 Perm	214 1900 6.3 1.00 0.94 1.00 1764 0.94 228 228 21 353 1%	137 1900 0 0 0 17%
1900 4.0 1.00 1.00 0.95 136 0.94 168 1 168 1 168 1 2%			33	1900 1.00 1.00 1.00 0.95 1805 295 295 0.16 0.94 193 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.098 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	0.94 3.2 0 0 0 5% 1	6.3 1.00 1.00 0.95 0.95 0.64 842 0.94 99 40% 6 Perm	1900 6.3 6.3 1.00 0.94 1.00 1764 1.00 228 228 23 353 1%	0.94 146 0 0 0 17%
4.0 1.00 1.00 0.95 1763 0.94 168 0.94 168 1 168 1 168 1 168 1 168 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	, la		33	1.00 1.00 0.95 1805 0.16 0.94 0.94 193 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6.3 1.00 0.98 1.00 1.00 1.00 1.00 1.00 7 1.00 0.94 1.00 0.94 1.00 0.94 1.00 0.94 1.00 0.94 1.00 0.94 1.00 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0	0.94 32 0 0 5% 1	6.3 1.00 1.00 0.05 1258 1258 0.64 842 0.94 0 99 0 99 0 99 40% 6 6 6 40% 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	6.3 1.00 1.00 1.00 1.00 1.00 1.00 2.28 2.1 2.38 3.53 1.8 1.8 4	0.94 146 0 0 17%
1.00 1.00 1.00 0.95 1.00 0.04 1.08 1.08 1.08 1.00 1.00 1.00 1.00 1.00	, la		33	1.00 0.95 1805 0.16 295 0.094 193 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00 0.98 1.00 1.00 1.00 1.00 1.00 7 1.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.94 32 0 0 5% 1	1.00 1.00 0.095 11258 0.64 842 0.94 0 99 0 99 0 99 40% 6 6 6 6	1.00 0.94 1.00 1.00 1.00 1.00 2.28 2.1 2.1 35.3 1.8 4	0.94 146 0 0 0 17%
100 0.07 1763 1763 0.07 168 168 1 168 1 168 1 168 1 168 1 2%	,		33	1.00 1.00 1.160 1.160 2.295 0.094 1.93 0.09% 0.09% 0.09% 1.93 1.93 1.93 1.93 1.93 1.93 1.93 1.93	0.98 1.00 1.00 1.00 1.00 1.00 1.00 7 7 7 7 1.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.94 32 0 0 5% 1	1.00 0.95 1258 0.64 842 0.94 99 0 0 99 40% 6 6	0.94 1.00 1.00 1.00 1.00 1.00 228 228 21 21 1,00 1.00 4 4 4	0.94 0 0 0 0 0 2 2 2 2
0.95 1763 136 0.94 168 1 168 1 pm+pt	,		33	0.95 1805 0.16 295 295 0.94 193 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00 1.00 1.00 1.00 1.00 7 7 7 1.87 0.94 0.94 0.94 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	0.94 32 0 0 0 1 1	0.95 1258 0.64 842 0.94 99 0 0 99 40% 6	1.00 1.764 1.00 1.00 2.28 2.28 2.3 3.53 1.8 1.0	0.094 146 0 0 0 2
1763 0.04 0.04 0.04 0.04 0.04 0.04 0.0 0.04 0.0	,		333	1805 0.16 295 0.94 193 0 193 0% 0 0 pm+pt 8	1838 1.00 1.00 162 7 7 187 0% 0 0 0 0 0 8 8	0.94 0 0 5% 1	1258 0.64 842 0.94 99 0 99 40% 6	1764 1.00 1.764 0.94 228 21 353 17% NA	0.94 0 0 0 17%
0 007 136 0.94 168 0 0 0 168 1 168 1 pm+pt	Id.		33	0.16 295 295 0.94 1193 0 0 0 0 0 0 0 0 0 m+pt	1.00 1838 0.94 162 7 7 187 0% 0	0 0 0 5% 1	0.64 842 0.94 99 0 99 40% 6 6	1.00 1764 0.94 228 21 353 1% 1 NA	0.94 146 0 0 0 17%
136 (0.94 168 168 168 168 168 168 168 168 168 168	I d		33	295 0.94 193 0 0 0 0 0 pm+pt 3 8	1838 0.94 162 7 7 187 0 0 0 NA 8	0.94 32 0 0 5%	842 0.94 99 0 99 40% 6 6	1764 0.94 228 21 353 1% NA	0 0 0 17%
0.94 168 10 10 2% 1 1 1 1 1 1 1 5	Į d.		33	0.94 193 0 193 0% 0 0 pm+pt 3	0.94 162 7 187 0% 0 0 NA	0.94 0 0 0 5%	0.94 99 0 99 40% 6 6 Perm	0.94 228 21 353 1% NA	0 0 17%
168 (vph) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5		33	193 0 193 0% 0 0 pm+pt 3	162 7 187 0 0 0 NA 8	32 0 0 5% 1	99 0 99 40% 6 6 Perm	228 21 353 17% NA 4	146
(vph) 0 0 (vph) 168 (vph) 2% hr) pm+pt 5 2			33	193 0% 0 0 0 m+pt	187 00% 0 NA 8	0 0 2%	0 99 40% 6 6	21 353 1% NA 4	1%
(vph) 168 (vph) 2% hr) 1 hr) pm+pt 5		`	33	193 0% 0 pm+pt 3	187 0% NA 8	2%	99 40% 6 Perm	353 1% 1 NA 4	1%
h) 2% hr) 1 hr) pm+pt 5				0% 0 0 3 3 8	0% NA 8	72%	40% 6 Perm 4	1% NA 4	1%
hr) 1 pm+pt P 5				0 pm+pt 3	0 N 8	-	6 Perm	L A A	2
pm+pt 5 2	nd		NA 6	pm+pt 3 8	¥ ®		Perm 4	N 4	
5 2			1,0	ന യ	∞		4	4	
2			1)	∞			4		
7 ()			1.)						
67.4			7:1	35.6	35.6		24.6	24.6	
s) 62.4			51.2	35.6	35.6		24.6	24.6	
0.56			0.46	0.32	0.32		0.22	0.22	
4.0			6.2	4.0	6.3		6.3	6.3	
s) 3.0			3.0	3.0	3.0		3.0	3.0	
. (vph) 189			1368	189	289		186	390	
			c0.61	c0.06	0.10			0.20	
				c0.26			0.12		
0.89			1.32	1.02	0.32		0.53	0.91	
29.6			29.9	34.5	28.5		38.1	42.1	
1:00			1.00	1:00	1.00		1.00	1:00	
ital Delay, d2 35.9			150.7	71.1	0.3		2.9	23.8	
Jelay (s) 65.4 114.6		25.2 18	180.6	105.6	28.8		41.0	65.8	
ш		ပ	_	_	ی		a	ш	
Approach Delay (s) 110.5		17	178.0		67.1			9.09	
Approach LOS			ш		ш			ш	
ntersection Summary									
HCM 2000 Control Delay	128.3	HCM	HCM 2000 Level of Service	Service		ш			
HCM 2000 Volume to Capacity ratio	1.21								
Actuated Cycle Length (s)	111.0	Sumo	Sum of lost time (s)			20.5			
ntersection Capacity Utilization	102.7%	ICU Le	ICU Level of Service	a		ŋ			
Analysis Period (min)	15								

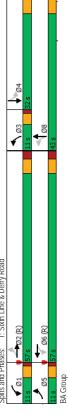
Synchro 11 Report 12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Background (PM) 2027 Scenario 1

Heli Well Well NBL NBL NBL SBL 1654 29 1461 181 152 93 1654 29 1681 181 152 93 1654 29 1681 181 152 93 1654 29 1681 181 152 93 1654 29 1681 181 152 93 1654 29 1681 181 152 93 1654 29 1681 181 152 93 1654 29 1681 181 152 93 1654 29	(į				•	-	į	. !	
152 93 152 93 179 99 179 99 179 99 170 100 100 100 170	e Group	EBL	EBI	WBL	WBI	NBL	NBI	SBL	SBI	
152 93 152 93 1794 99 1794 99 1700 100 100 100 100 100 100 00 100	e Configurations	<i>y</i>	+	۴	+	۴	2	۴	4	
152 93 194 99 194 99 100 100 32.3 32.3 32.3 32.3 32.3 32.3 32.3 4.0 4.0 4.0 0.0 6.3 6.3 6.3 6.3 6.3 1.1 19.8 2.8 5.94 2.1 49.4 2.1 49.4 2.1 49.4 2.1 49.4 2.1 49.4 2.1 49.4 2.1 50.6 0.0 0.0 0.0 0.0	fic Volume (vph)	158	1654	29	1681	181	152	93	214	
194 99 NA Perm 8 4 4 100 100 100 32, 32, 32, 32, 32, 32, 32, 32, 32, 32,	ure Volume (vph)	158	1654	29	1681	181	152	93	214	
NA Perm B 4 4 8 4 4 8 4 4 6 6 6 6 6 6 6 6	e Group Flow (vph)	168	1842	31	1811	193	194	66	374	
8 4 4 8 8 4 4 8 8 9 9 9 9 9 9 9 9 9 9 9	n Type	pm+pt	NA	pm+pt	NA	pm+pt	MA	Perm	M	
100 100 100 100 100 100 100 100 100 100	tected Phases	2	2	_	9	3	∞		4	
10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0	mitted Phases	2		9		00		4		
100 100 323 323 430 320 44.0 4.0 2.3 2.3 2.3 6.3 6.3 6.3 6.3 6.3 6.3 8.5 49.4 0.0 0.0 0.0 0.0	ector Phase	2	2	-	9	က	∞	4	4	
100 100 32.3 32.3 32.3 32.3 43.0 32.0 2.3 32.3 2.3 2.3 0.0 0.0 0.3 0.54 0.0 0.0 2.8 49.4 2.85 49	tch Phase									
32.3 32.3 32.3 32.3 32.3 32.3 32.3 32.3	imum Initial (s)	7.0	25.0	7.0	25.0	7.0	10.0	10.0	10.0	
430 320 38.7% 28.8% 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 6.3 6.9 None None None 0.0 0.0 0.0 0.0 0	imum Split (s)	11.0	31.2	11.0	31.2	11.0	32.3	32.3	32.3	
38.7% 28.8% 40.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	al Split (s)	11.0	57.0	11.0	57.0	11.0	43.0	32.0	32.0	
4.0 4.0 2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	al Split (%)	%6.6	51.4%	%6.6	51.4%	%6.6	38.7%	28.8%	28.8%	
2.3 2.3 2.3 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	low Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Red Time (s)	1.0	2.2	1.0	2.2	1.0	2.3	2.3	2.3	
6.3 6.3 F. Compose None None None None None None None Non	st Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lag None None Notes 0.033 0.54 0.0 0.0 0.0 2.85 49.4 31.1 19.8 31.1 19.8 50.8 38.4 #1 211.8 30.0 0	al Lost Time (s)	4.0	6.2	4.0	6.2	4.0	6.3	6.3	6.3	
Yes 8 None None None None O.33 0.53 0.54 0.00 0.00 0.00 0.00 0.00 0.00 0.00	ad/Lag	Lead	Lag	Lead	Lag	Lead		Lag	Lag	
None None 0.33 0.54 0.54 0.00 0.00 0.00 0.00 0.00 0.00	id-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
0.33 0.54 0 0.0 0.0 0 28.5 49.4 0 31.1 19.8 31.1 19.8 31.1 19.8 31.0 2 0.0 0 0 0 0 0 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	call Mode	None	C-Min	None	C-Min	None	None	None	None	
28.5 49.4 0 0.0 0.0 0.0 2.85 49.4 0 31.1 19.8 31.1 19.8 30.0 0 614 194 0	Ratio	0.89	1.14	0.17	1.32	0.99	0.33	0.54	0.91	
28.5 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	itrol Delay	9.99	6.66	12.3	178.8	94.0	28.5	49.4	66.5	
28.5 49,4 631.1 19.8 31.1 19.8 30.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	eue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
31.1 19.8 50.8 38.4 #17.2 21.8 30.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	al Delay	9.99	6.66	12.3	178.8	94.0	28.5	49.4	999	
508 384 #11 211.8 20 614 194 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	eue Length 50th (m)	22.9	~280.5	2.9	~285.4	31.7	31.1	19.8	77.2	
211.8 30.0 614 194 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	eue Length 95th (m)	#99#	#325.8	7.1	#330.8	#70.0	50.8	38.4	#131.4	
30.0 614 194 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	rnal Link Dist (m)		475.1		256.2		211.8		201.7	
0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	n Bay Length (m)	120.0		100.0		45.0		30.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	e Capacity (vph)	189	1612	185	1369	195	614	194	428	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	rvation Cap Reductn	0	0	0	0	0	0	0	0	
0.32 0.51	lback Cap Reductn	0	0	0	0	0	0	0	0	
0.32 0.51	rage Cap Reductn	0	0	0	0	0	0	0	0	
arsection Summary le Lenghr. 111 uated Cycle Lengthr. 111 uated Cycle Lengthr. 111 ural Cycle: 150 urul Cycle: 150 urul Cycle: 50 urul Cycle:	duced v/c Ratio	0.89	1.14	0.17	1.32	0.99	0.32	0.51	0.87	
Lie Length: 111 uated Cycle Length: 111 uated Cycle Length: 111 uated Cycle Length: 110 urial Cycle: 150 ntrol Type: Actuated-Condinated ntrol Type: Actuated-Condinated Oueue shown is maximum after two cycles. 95th percentile volume exceeds capacity, queue may be longer.	ersection Summary									
uated Cycle Length: 111 Sext. 0 (70%) Exferenced to phase 2:EBTL and 6:WBTL, Start of Green Lural Cycle: 150 Introl Type: Actualed-Coordinated Introl Type: Actualed-Coordinated Oueue shown is maximum after two cycles. Other shown is maximum after two cycles. Ship page recentle volume exceeds capacity, queue may be longer.	cle Length: 111									
SET, U (Woy, Neterinkal to plasse Z.E.B.T. and o.w.p.t., Start of oreer trust Cyber 150 and the Cyber	uated Cycle Length: 11	1 to shoot 2.	ITOL	TOW.7	Ctort	8000				
information of section and the section of the secti	set. U (U%), Referenceu tiiral Cycle: 150	ID pildse 2.	EDIL A	u o.vvD	, stall of	5				
Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. 95th percentile volume exceeds capacity, queue may be longer.	ntrol Type: Actuated-Co	ordinated								
Oueue shown is maximum after two cydes. 95th percentile volume exceeds capacity, queue may be longer.	Volume exceeds capac	city, queue is	theoreti	cally infin	je.					
95th percentile volume exceeds capacity, queue may be longer.	Queue shown is maxim	um after two	cycles.	,						
	95th percentile volume	exceeds cal	nacity, or	Jem alla	and ad					

Splits and Phases: 1: Sixth Line & Derry Road



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Main Heading Main Head M		1	†	<i>></i>	>	Ļ	4	•	←	•	۶	-	*
1 1 1 1 1 1 1 1 1 1	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1559 79 92 1809 111 218 70 187 327 299 1900	ane Configurations	-	₩		K	₩1,		F	4		je.	₩	
1559 79 92 1809 111 218 70 187 327 299 1900	raffic Volume (vph)	41	1559	79	92	1809	111	218	0/	187	327	299	77
1900 1900	uture Volume (vph)	41	1559	79	92	1809	111	218	70	187	327	599	77
10	deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,00 0,95	Fotal Lost time (s)	4.0	5.3		4.0	5.3		4.5	5.7		4.0	5.7	
100 0.99	ane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
1,000 0.95 1,000 0.95 1,000 0.95 1,000 0.95 1,000 0.95 1,000 0.95 1,000 0.95 1,000 0.95 1,000 0.95 1,000 0.95 1,000 0.95 1,000 0.95 1,000 0.95 0.000 0.95 0.000 0.95 0.000 0.95 0.000 0.95 0.000 0.95 0.000 0.95 0.	int.	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.97	
1600 3261 1587 3294 1698 3055 1501 3343 104 3261 100 0.06 1.00 0.30 1.00 0.04 1.00 104 3261 100 3294 597 3055 768 3343 108 3264 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 109 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 109 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 109 0.8 0.9 0.9 0.9 0.9 0.9 0.9 0.9 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 2% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 2% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 2% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 2% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 2% 2	It Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
100 0.06 1.00 0.08 1.00 0.04 1.00 0.04 1.00 0.04 1.00 0.04 1.00 0.04 1.00 0.04 1.00 0.04 1.00 0.04 0	satd. Flow (prot)	1600	3261		1587	3294		1698	3055		1501	3343	
104 2261 100 3294 537 3055 768 3343 44 1659 84 904 094 094 094 094 094 44 1659 8 90 94 094 094 094 094 094 11% 2% 2% 1% 3% 18 23 17 0 0 38 381 11% 2% 2% 2% 18 23 3 3 3 3 3 11% 2% 2% 2% 18 2% 3% 14% 2% 2% 11% 2% 2% 2% 18 2% 3% 14% 2% 3% 11% 2% 2% 2% 18 2% 3% 14% 2% 3% 11% 2% 2% 2% 18 2% 3% 14% 2% 3% 12% 2	It Permitted	90.0	1.00		90:0	1.00		0.30	1.00		0.49	1.00	
0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94	satd. Flow (perm)	104	3261		100	3294		537	3055		768	3343	
1659 84 98 1924 118 222 74 199 348 318 1	Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
1740	Adj. Flow (vph)	44	1659	84	86	1924	118	232	74	199	348	318	82
1740 0 98 2038 0 222 172 0 348 381 28 28 18 58 98 38 14% 28 28 148 28 148 28 148 28 148 28 148 28 148 28 148 28 148 28 14 <	RIOR Reduction (vph)	0	က	0	0	4	0	0	101	0	0	19	0
5 2% 2% 1% 3% 18% 5% 9% 3% 1% 2% 1 36 2 2 2 2 2 3 3 1 <	ane Group Flow (vph)	44	1740	0	86	2038	0	232	172	0	348	381	0
1	Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
NA	dus Blockages (#/hr)	4	36	2	9	22	22	m	m	2	13	-	2
2 1 6 3 8 7 647 74 668 280 185 28.5 1 647 74 668 280 18.5 28.5 1 647 74 668 280 18.5 28.5 1 647 74 668 280 18.5 28.5 1 647 74 668 280 18.5 28.5 1 647 76 668 280 18.5 28.5 28.5 1 647 76 653 0.23 0.15 0.24 4.0 0.24 4.0 0.24 4.0 24.3 24.3 24.3 0.0	urn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	¥	
647 746 688 88 84 4 647 746 668 280 18.5 28.5 647 746 668 280 18.5 28.5 654 746 668 280 18.5 28.5 654 0.62 0.56 0.23 0.15 0.24 553 40 5.3 4.5 5.7 4.0 753 240 2.64 0.08 0.06 0.012 754 755 798 710 710 710 755 758 758 758 758 755 758 758 758 758 756 758 758 758 758 757 100 0.99 1.00 1.00 1.00 758 758 758 758 758 759 758 758 758 751 1.19 1.07 2000 Level of Service 751 1.19 1.07 0.05 752 1.19 1.05 1.05 753 1.00 258 258 754 1.00 258 258 755 1.00 258 258 755 755 758 758 755 758 758 758 757 758 758 758 758 758 758 758 758 758 758 758 759 758 758 758 759 758 758 758 759 758 758 758 750 758 758 758 750 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758 758	Protected Phases	2	2		-	9		3	8		7	4	
647 746 668 280 185 285 1 647 746 668 280 185 285 1 647 746 668 280 185 285 2 3 40 5.3 4.5 5.7 4.0 2 30 30 30 30 30 30 2 1758 138 183 2.17 470 243 2 0.53 0.04 0.05 0.06 0.01 0.01 3 0.73 2.42 0.06 0.06 0.01 1.0 3 0.73 2.42 0.09 1.00 1.00 1.00 1 4.6 4.5 5.5 80.6 0.5 2.16.5 2 0.78 1.09 0.99 1.00 1.00 1.00 1.00 1 4.6 4.5 5.5 80.6 0.5 2.16.5 2.0.6 2 0.78 1.00 1.00 1.00 1.00 1.00 1.00 2 0.78	Permitted Phases	2			9			∞			4		
647 746 668 280 185 285 285	Actuated Green, G (s)	70.4	64.7		74.6	8.99		28.0	18.5		28.5	18.5	
0.054 0.62 0.56 0.23 0.15 0.24 0.53 4.0 5.3 4.5 5.7 4.0 0.53 0.004 0.02 0.08 0.06 0.012 0.053 0.004 0.02 0.08 0.06 0.012 0.078 0.09 0.02 1.11 0.07 0.37 14.3 0.078 1.09 0.09 0.00 1.00 0.00 0.78 1.09 0.09 0.00 1.00 0.00 0.78 1.09 0.09 0.00 1.00 0.00 0.78 1.09 0.09 1.00 1.00 0.00 0.78 1.09 0.09 1.00 1.00 1.00 0.78 1.09 0.09 1.00 1.00 1.00 0.78 1.09 0.09 1.00 1.00 0.00 0.78 1.09 0.09 1.00 1.00 0.00 0.78 1.09 0.09 1.00 1.00 0.00 0.78 1.09 0.09 1.00 1.00 0.00 0.78 1.09 0.09 1.00 1.00 0.00 0.78 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	:ffective Green, g (s)	70.4	64.7		74.6	8.99		28.0	18.5		28.5	18.5	
5.3 4.0 5.3 4.5 5.7 4.0 1758 3.0 3.0 3.0 3.0 3.0 1758 158 183 2.17 470 243 2 0.53 0.04 0.06 0.06 0.012 3 0.34 0.16 0.06 0.012 8 2.73 2.42 2.6 44.2 9 0.76 1.09 0.99 1.00 1.00 1.46 4.5 55.7 80.6 0.5 2.6.5 9 0.78 1.09 0.99 1.00 1.00 1.00 1.46 4.5 55.7 80.6 0.5 2.6.5 5.6.5 9 0.78 2.7 4.0 7.6.5 5.6.5 5.6.5 1.5 7.9 8 8.1 7 8.1 7.6.5 3.6 7 8 7.9 8 8.1 7 7.6.5 1.19 8 <td>Actuated g/C Ratio</td> <td>0.59</td> <td>0.54</td> <td></td> <td>0.62</td> <td>0.56</td> <td></td> <td>0.23</td> <td>0.15</td> <td></td> <td>0.24</td> <td>0.15</td> <td></td>	Actuated g/C Ratio	0.59	0.54		0.62	0.56		0.23	0.15		0.24	0.15	
3.0 3.0	Slearance Time (s)	4.0	5.3		4.0	5.3		4.5	2.7		4.0	2.7	
1758 158 1833 217 470 243	/ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
9 0.53	.ane Grp Cap (vph)	132	1758		158	1833		217	470		243	515	
8 0.99 0.34 0.16 0.70 0.37 0.72 0.37 0.70 0.37 0.37	/s Ratio Prot	0.02	0.53		c0.04	c0.62		0.08	90.0		c0.12	0.11	
8 27.3 24.2 26.6 43.5 45.5 44.2 9 27.3 24.2 26.6 43.5 45.5 44.2 9 0.78 1.09 6.57 80.6 0.5 216.5 9 35.9 30.8 82.1 124.2 46.0 260.6 9 D C F F D F D F T D F T D F T D D F T D D T D D T D D T D D T D D T D D T D D D T D	/s Ratio Perm	0.18			0.34			0.16			c0.22		
3 27.3 24.2 26.6 43.5 45.5 44.2 0 0.78 1.09 0.99 1.00 1.00 1.00 0 0.78 1.09 0.99 1.00 1.00 1.00 1 4.6 4.5 5.7 80.6 0.5 26.6 2 3.6 7.8 82.1 1.24.2 46.0 260.6 3.6 7.9 8 81.9 7 F 1 7.5 1 HCM 2000 Level of Service F 1.19 1.19 1.19 1.19 1.19 1.10 Num of lost time (s) 1.9 6 1.5 1.0 1.0 1.0 6	//c Ratio	0.33	0.99		0.62	1.1		1.07	0.37		1.43	0.74	
0.78 1.09 0.99 1.00 1.00 1.00 1.00 1.46 4.5 55.7 80.6 0.5 216.5 2.05 2.05 2.05 2.05 2.05 2.05 2.05 2.	Jniform Delay, d1	26.3	27.3		24.2	56.6		43.5	45.5		44.2	48.4	
146 45 557 806 05 2165 2 359 308 82.1 124.2 46.0 260.6 0 36.2 79.8 81.9 F F F F F F I I I I I I I I I I I I I	Progression Factor	1.80	0.78		1.09	0.99		1.00	1.00		1.00	1.00	
2 35.9 30.8 82.1 124.2 46.0 260.6 10.0 10.0 10.0 10.0 10.0 10.0 10.0	ncremental Delay, d2	6.0	14.6		4.5	22.7		9.08	0.5		216.5	5.5	
36.2 79.8 81.9 F 36.2 79.8 81.9 D 75.1 HCM 2000 Level of Service E 1.19 Sum of lost time (s) 19.5 101.7% ICU Level of Service G	Jelay (s)	48.2	35.9		30.8	82.1		124.2	46.0		260.6	53.9	
36.2 79.8 81.9 7.5 F F F F F F F F F F F F F F F F F F F	evel of Service	Ω	۵		ပ	ட		ഥ	۵		ட	Ω	
75.1 HCM 2000 Level of Service 1.19 Sum of lost time (s) 101.7% ICU Level of Service 15.0 Sum of 105 time (s)	Approach Delay (s)		36.2			79.8			81.9			150.1	
75.1 HCM 2000 Level of Service 1.19 1200 Sum of lost time (s) 101.7% ICU Level of Service 15	Approach LOS		Ω			ш			ш			ш	
75.1 HCM 2000 Level of Service 1.19 Sum of lost time (s) 10.17% ICU Level of Service 15.17 In HCM 2000 Level of Service	ntersection Summary												
1.19 Sum of lost time (s) 1.20 Sum of lost time (s) 10.17% ICU Level of Service 15.75 15.7	ACM 2000 Control Delay			75.1	Ĭ	000C M	o yol of 0	arvice		ш			
120.0 Sum of lost time (s) 101.7% ICU Level of Service 15	HCM 2000 Volume to Capa	acity ratio		1.19	Í		5			ı			
101.7% ICU Level of Service 15	Actuated Cycle Length (s)	,		120.0	S	m of lost	time (s)			19.5			
15	ntersection Capacity Utiliza	ation	ľ	101.7%	ੁ	U Level o	f Service			G			
	Analysis Period (min)			15									

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Background (PM) 2027 Scenario 1

Future Background (PM) 2027 Scenario 1

Lanc Group	Lane Group									
1		EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
1 1559 92 1809 218 70 327 41 1559 92 1809 218 70 327 44 1153 92 1809 218 70 327 45 14 143 98 2042 222 273 348 5 2 1 6 3 8 7 70 200 70 200 50 100 70 110 34.3 110 34.3 95 34.7 110 110 34.3 110 34.3 95 34.7 110 110 34.3 110 34.3 95 34.7 110 110 34.3 110 37.0 140 280 140 92.8 55.88 92.8 55.88 11.78 23.3 1.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0 0	Lane Configurations	*	₩	*	₩	*	₩	r	₩.	
March Marc	raffic Volume (vph)	41	1559	92	1809	218	70	327	299	
Phin-pt NA Phin-pt	-uture Volume (vph)	41	1559	92	1809	218	70	327	299	
pm+pt NA pm+pt NA pm+pt NA pm+pt NA pm+pt S 2 6 1 6 3 8 7 7 6 2 1 6 6 3 8 7 7 7 0 20 0 5 0 100 70 110 34.3 11.0 34.3	-ane Group Flow (vph)	44	1743	86	2042	232	273	348	400	
5	Turn Type	pm+pt	A	pm+pt	NA	pm+pt	¥	pm+pt	NA	
2 6 6 8 8 4 4 2 10 200 7.0 200 5.0 100 7.0 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 3.5 3.4 11.0 11.0 11.0 1.0 1.0 1.0 1.0 1.0 1.0	Protected Phases	2	2	_	9	c,	∞	7	4	
5 2 1 6 3 8 7 70 20.0 7.0 20.0 50 10.0 7.0 11.0 34.3 11.0 34.3 9.5 34.7 11.0 11.0 67.0 11.0 67.0 14.0 12.8 58.8 9.2 58.8 11.7 23.3 11.7 10 10 10 10 10 10 10 10 10	Permitted Phases	2		9		∞		4		
7.0 20.0 7.0 20.0 5.0 10.0 7.0 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.0% 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Detector Phase	2	2		9	3	00	7	4	
10 34.3 11.0 34.3 11.0 11.0 11.0 11.0 34.3 11.10 34.3 11.0 34.3 11.76 28.0 14.0 9.2% 55.8% 9.2% 55.8% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 23.0 23.0 20.0	Switch Phase									
110 34.3 110 34.3 9.5 34.7 110 92% 55.8% 92% 55.8% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 2	Minimum Initial (s)	7.0	20.0	7.0	20.0	2.0	10.0	7.0	10.0	
110 670 110 670 140 280 140 92% 558% 92% 558% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 20.00 00 00 00 00 00 00 00 00 00 00 00 00	Minimum Split (s)	11.0	34.3	11.0	34.3	9.5	34.7	11.0	34.7	
92% 558% 92% 558% 11.7% 23.3% 11.7% 2 3.0 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.0 3.7 3.0 3.7 3.0 3.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Fotal Split (s)	11.0	0.79	11.0	0.79	14.0	28.0	14.0	28.0	
30 37 30 37 35 37 30 10 1.6 1.0 1.6 1.0 20 1.0 10 1.6 1.0 1.6 1.0 20 1.0 40 5.3 4.0 5.3 4.5 5.7 4.0 Lead	Total Split (%)	9.5%	22.8%	9.5%	25.8%	11.7%	23.3%	11.7%	23.3%	
10 16 10 16 10 20 110 0 00 00 01 01 00 010 0 01 010 010	rellow Time (s)	3.0	3.7	3.0	3.7	3.5	3.7	3.0	3.7	
100 0.0	All-Red Time (s)	1.0	1.6	1.0	1.6	1.0	2.0	1.0	2.0	
100 100	ost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lead Lag Lead Lead Lag	Total Lost Time (s)	4.0	5.3	4.0	5.3	4.5	5.7	4.0	5.7	
Ves	-ead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	
None C-Min Nane C-Min Nane Nane Nane Nane Nane Nane Nane 0.29 0.99 0.99 0.62 1.10 1.05 0.48 1.37 0.11.5 280 222.9 0.90 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0	-ead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
0.29 0.99 0.62 1.10 1.05 0.48 1.37 1.90 37.4 31.2 77.0 111.5 28.0 22.29 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
19,0 37.4 31.2 77.0 111.5 280 2229 19,0 37.4 31.2 77.0 111.5 280 2229 19,0 37.4 31.2 77.0 111.5 280 2229 3.4 -116.7 13.2 -306.9 -50.2 180 -1100 m5.4 #288.7 m19.9 #366.7 #81.6 31.0 #161.5 100.0 90.0 124.7 70.0 50.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	/c Ratio	0.29	0.99	0.62	1.10	1.05	0.48	1.37	0.75	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Control Delay	19.0	37.4	31.2	77.0	111.5	28.0	222.9	54.6	
190 37.4 31.2 77.0 111.5 280 222.9 18.4 16.7 13.2 -306.9 -50.2 180 -1010.0 18.4 283.7 m19.9 \$366.7 \$181.6 31.0 \$110.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.	Jueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3.4 -116.7 13.2 -30.9 -50.2 18.0 -110.0 4 m.5.4 +283.7 m19.9 #366.7 #81.6 31.0 #167.5 6 100.0 90.0 12.7 70.0 50.0 2 100.1 170.5 90.0 12.7 70.0 50.0 2 0	otal Delay		37.4	31.2	77.0	111.5	28.0	222.9	54.6	
m6.4 #283.7 m19.9 #366.7 #81.6 31.0 #167.5 or 1705.0 m6.4 #283.7 m19.9 #366.7 #81.6 31.0 #167.5 or 1700.0 m6.0 m6.0 m6.0 m6.0 m6.0 m6.0 m6.0	Jueue Length 50th (m)		~116.7	13.2	~306.9	~50.2	18.0	~110.0	47.4	
100.0 170.5 124.7 340.6 2.0 100.0 170.5 90.0 124.7 70.0 50.0 50.0 150.0	Jueue Length 95th (m)		#283.7	m19.9	#366.7	#81.6	31.0	#167.5	63.2	
100.0 90.0 70.0 50.0 10.0 10.0 10.0 10.0 10.0 10.0 1	nternal Link Dist (m)		170.5		124.7		340.6		275.9	
151 1760 159 1899 222 664 254 0	urn Bay Length (m)	100.0		0.06		70.0		20.0		
120 ced to phase 2:EBTL and 6:WBTL, Start of Green Coordinated pacify, queue is theoretically infinite. minum after two cydes. minum after two cydes.	Sase Capacity (vph)	151	1760	159	1859	222	999	254	639	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	starvation Cap Reductn	0	0	0	0	0	0	0	0	
1.120 1.120	spillback Cap Reductn	0	0	0	0	0	0	0	0	
0.41 1.37	storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary yole Length: 120 Akutaled Ocycle Length: 120 Misst. 0 (0%). Referenced to phase 2:EBTL and 6:WBTL, Start of Green Misst. 0 (0%). Referenced to phase 2:EBTL and 6:WBTL, Start of Green Misstual Cycle: 148 Countrol Type: Actualed-Coordinated Volume exceeds capacity, queue is theoretically infinite. Oueue shown is maximum after two cycles. Oueue shown is maximum after two cycles. Oueue shown is maximum after two cycles.	Reduced v/c Ratio	0.29	0.99	0.62	1.10	1.05	0.41	1.37	0.63	
ycle Length: 120 Aduated Cycle Length: 120 Alfasta (Cycle), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Alfasta (Cycle), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Control Type: Actuated-Coordinated Control Type: Actuated-Coordinated Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. 9 Sish percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	ntersection Summary									
Actuated Cycle Length: 120 Tifset (O'G), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Alara Cycle: 145 Andraid Cycle: 145 Andraid Cycle: 45 Andraid Cycle: 46 - Volume exceeds capacity, queue its theoretically infinite. Acueue shown is maximum after wor cycles. 9 Sith percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum differ two cycles.	Sycle Length: 120									
Misse: (0%), Referenced to phase 2:EBIT, and 6:WBTL, Start of Green Aletural Cycle: 145 Outlor I Type: Actualed-Coordinated Volume exceeds capacity, queue is theoretically infinite. Outlore shown is maximum after two cycles. 9 Sith percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles. Oueue shown is maximum after two cycles.	Actuated Cycle Length: 12,	0								
Natural Cycle: 145 Control Type: Actualed-Coordinated Volume exceeds capacity, queue is theoretically infinite. Volume exceeds rapacity, queue is theoretically infinite. PSIh percentili is maximum affert tho cycles. Queue shown is maximum affert wo cycles.	Offset: 0 (0%), Referenced	to phase 2:	EBTL an	d 6:WBTL	, Start of	Green				
Control Type: Actualed-Coordinated Value exceeds capacity, queue is theoretically infinite. Oueue shown is maximum after two cycles. Oueue shown is maximum after two cycles. Oueue shown is maximum after two cycles.	Vatural Cycle: 145									
volume exceeds capacity, queue is indonetically minne. Queue shown is maximum affer two cycles. Sth percentile volume exceeds capacity, queue may be longer. Queue shown is maximum affer two cycles.	Control Type: Actuated-Co	ordinated								
. Ucuera snown is maximum after wor cycles. 9 Sih percentile volume exceeds capacity, queue may be longer. Ocueue shown is maximum after two cycles.	- Volume exceeds capac	ony, queue is	theoretic	ally infini	aj.					
From the contine volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Queue shown is maxim	um after two	cycles.	1	9					
Queue Stown Is maximum after two cycles.	95th percentile volume	exceeds cal	oacity, qu	eue may	pe longe	٠				
Value for Orth consequently account to an about the complete and the compl		um alter two	cycles.	The second lies	-	-				

Splits and Phases: 2: Fifth Line & Derry Road

€03 - DOZ (R)

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

Future Background (PM)

209 209 5.7 1.00 0.98 1.00 1.403 0.98 213 50 60 7% 28.3 28.3 0.24 5.7 330 0.04 0.15 36.3 1.00 0.2 36.6 5.7 0.95 1.00 1.00 1.00 3046 1.00 3046 0.98 452 10% ₹ 1.00 D 17.4 pm+pt 298 298 1900 4.0 1.00 1.00 1.00 0.95 0.32 545 0.98 304 2% Perm 0.98 188 145 43 0.03 43.5 1.00 0.3 43.8 D 19.0 184 184 900 5.7 5.7 1.00 1.00 0.85 1.00 1.86 1.00 1.586 1% 253 344 D 47.1 337 337 337 1900 5.7 0.95 1.00 1.00 1.00 1.00 1.00 344 ¥ 19.2 19.2 0.16 0.67 3.5 % 7 4.0 1.00 1.00 1.00 0.95 0.49 931 0.98 0 18 pm+pt 4.0 3.0 267 0.02 0.05 0.30 0.6 % HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service Perm 404 404 404 1900 5.3 5.3 1.00 0.99 1.00 1.00 1.00 1.00 0.98 412 156 256 3% 52.6 52.6 0.44 664 22.8 1.56 0.2 35.6 1317 1900 5.3 0.95 1.00 1.00 1.00 1.00 1.00 3305 3305 ¥ 52.6 52.6 0.44 1344 1344 4% 1.03 320 320 c0.12 pm+pt 0.35 0.82 34.2 0.81 259 259 1900 1.00 1.00 1.00 1.00 0.95 0.08 0.98 264 3% 68.8 68.8 0.57 41.0 0.95 120.0 88.2% Perm 9 46.9 46.9 0.39 5.3 0.85 1.00 1.00 1.00 1562 9 6 3% 610 0.00 0.01 22.4 1.00 0.0 1164 11164 11164 1100 11.00 11.00 11.00 11.00 11.00 11.00 11.00 11.00 1188 Š 46.9 0.39 5.3 3.0 1343 0.35 44.1 0.98 2 % 34.0 1.00 8.8 42.8 192 192 1900 4.0 0.97 1.00 1.00 1.00 0.95 3399 3399 0.98 196 2% Prot 12.2 12.2 0.10 3.0 3.45 0.06 0.57 1.00 2.1 53.5 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp., pedbikes
Said. Flow (perm)
Fit Portected
Said. Flow (perm)
Peak-hour factor, PHF
Peak-hour factor, PHF
Red., Flow (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Actuated Green, G (s) Clearance Time (s) Vehicle Extension (s) Incremental Delay, d2 Effective Green, g (s) Actuated g/C Ratio Bus Blockages (#/hr) Turn Type Protected Phases Permitted Phases Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Background (PM) 2027 Scenario 1

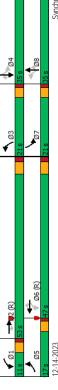
	\	Ť	<u> </u>	*	,	/	-	-	_	ı.	+	,
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	++	W.	F	++	¥C.	F	++	*	F	++	*
Traffic Volume (vph)	192	1164	16	259	1317	404	79	337	184	298	443	209
Future Volume (vph)	192	1164	16	259	1317	404	79	337	184	298	443	209
Lane Group Flow (vph)	196	1188	16	264	1344	412	81	344	188	304	452	213
Turn Type	Prot	NA	Perm	pm+pt	¥	Perm	pm+pt	M	Perm	pm+pt	NA	Perm
Protected Phases	2	2		_	9		3	00		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	വ	2	2	-	9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	53.0	53.0	11.0	47.0	47.0	21.0	35.0	35.0	21.0	35.0	35.0
Total Split (%)	14.2%	44.2%	44.2%	9.5%	39.2%	39.2%	17.5%	29.5%	29.5%	17.5%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	2.7	2.7	4.0	2.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.57	0.87	0.02	0.82	0.91	0.50	0.27	0.70	0.48	06.0	0.63	0.43
Control Delay	27.6	41.5	0.1	29.4	34.5	13.2	29.0	22.7	12.3	62.4	46.0	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	41.5	0.1	29.4	34.5	13.2	29.0	55.7	12.3	62.4	46.0	7.8
Queue Length 50th (m)	24.2	140.8	0.0	40.9	177.4	48.6	13.8	43.2	3.2	6.09	54.6	0.0
Queue Length 95th (m)	35.7	172.2	0.0	m#51.5 m#174.5	#174.5	m54.1	23.7	56.4	23.4	#84.4	71.0	19.8
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	386	1366	619	320	1470	828	411	781	518	338	169	513
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.87	0.02	0.82	0.91	0.50	0.20	0.44	0.36	0.00	0.59	0.42
Intersection Summary												
000												

Actuated Cycle Length: 120 Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Natural Cycle: 105

Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Modume for 95th percentile queue is metered by upstream signal.





12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Derry Road & Clark Boulevard

Future Background (PM) 2027 Scenario 1

	SBR	R.	691	169	0061	5.7	1.00	0.85	1.00	1583	1.00	1583	0.92	184	12	172	Perm		4	18.3	18.3	0.15	5.7	3.0	241		c0.11	0.71	48.4	1.00	9.6	58.0	Ш				el of Service B		11	ervice D	
* •	SBL SI	*	74 1		•		1.00			ľ				80 1			Perm Pe						5.7		269 2		0.05 c0.				9.0		O	54.3	O		HCM 2000 Level of Service		Sum of lost time (s)	ICU Level of Service	
4	WBR		24	24	1900								0.92	56	0	0																					-		S	2	
ţ	WBT	₩	1959	1959	1900	5.3	0.95	1.00	1.00	3533	1.00	3533	0.92	2129	0	2155	NA	9		7.06	7.06	0.76	5.3	3.0	2670	c0.61		0.81	9.2	1:00	2.7	11.9	В	11.9	В		15.6	0.79	120.0	74.5%	
†	EBT	*	1853	1853	1900	5.3	0.95	1.00	1.00	3539	1.00	3539	0.92	2014	0	2014	Ϋ́	2		90.7	90.7	0.76	5.3	3.0	2674	0.57		0.75	8.3	1.70	0.5	14.5	В	14.6	В						
1	EBL	*	30	30	1900	5.3	1.00	1.00	0.95	1770	0.04	84	0.92	33	0	33	Perm		2	7.06	7.06	97.0	5.3	3.0	63		0.39	0.52	5.9	1.75	7.0	17.3	В					pacity ratio		ization	
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Frt	Fit Protected	Satd. Flow (prot)	Fit Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	

Synchro 11 Report 12-14-2023 BA Group

Queues 4: Derry Road & Clark Boulevard

Future Background (PM) 2027 Scenario 1

Lane Group Lane Configurations Traffic Volume (uph) Traffic Volume (uph) Lane Group Flow (uph) Trun Type Protected Phases Permitted Phases Detector Phase Switch Phase		1853 1853 2014 1853 2014 NA 2 2 2 2 2 3 10.0 34.3 85.0 1.6 0.0 0.0 5.3	MBT WBT 1959 11959 11959 2155 NA 6 6 6 6 70.0 34.3 85.0 37.0 8% 170.8% 1	74 74 74 80 80 80 90 4 4 4 4 4 4 4 34.7 35.0 29.2% 3.7 2.0 0.0 0.0	SBR 169 1169 1184 1184 1184 4 4 4 4 4 4 4 4 4 4 20 20 20 5.7	
Lane Configurations Traffic Volume (yph) Future Volume (yph) Lane Group Flow (yph) Turn Type Profected Phases Permitted Phases Detector Phase				74 74 74 80 80 80 10.0 34.7 35.0 2.9.2% 3.7 2.0 0.0 6.0	169 1169 1184 1184 4 4 4 4 4 4 110.0 33.0 33.0 29.2% 2.0 2.0 0.0 5.7	
Traffic Volume (yph) Teature Volume (yph) Teuture Volume (yph) Turn Type Protected Phases Permitted Phases Detector Phase				74 80 80 80 4 4 4 4 4 4 34.7 35.0 29.2% 3.7 2.0 0.0	169 184 184 9 Perm 4 4 4 4 4 4 4 4 29,2% 33,5 2,0 0.0 0.0	
Future Volume (vph) Lane Group Flow (vph) Protected Phases Permitted Phases Detector Phase Switch Phase				74 80 80 4 4 4 4 10.0 34.7 35.0 29.2% 3.7 2.0 0.0 6.0	169 184 Perm 4 4 4 4 4 35.0 29.2% 3.7 2.0 0.0 5.7	
Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase				80 4 4 4 4 4 4 4 34.7 35.0 29.2% 2.0 0.0 6.7	184 Perm 4 4 4 4 4 4 7 10.0 33.0 33.0 35.0 20 2.0 5.7	
Turn Type Protected Phases Permitted Phases Detector Phase				10.0 34.7 35.0 29.2% 3.7 2.0 0.0 5.7	Perm 4 4 4 4 4 7 10.0 34.7 35.0 29.2% 3.7 2.0 0.0 5.7	
Protected Phases Permitted Phases Detector Phase Switch Phase				10.0 10.0 34.7 35.0 29.2% 3.7 2.0 0.0	4 4 4 4 4 4 4 4 34.7 35.0 35.0 2.0 0.0 5.7	
Permitted Phases Detector Phase Switch Phase				10.0 34.7 35.0 29.2% 2.0 2.0 0.0	4 4 4 4 4 4 4 34.7 33.0 33.0 3.7 3.7 3.7 3.7 3.7 3.7 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	
Detector Phase Switch Phase				10.0 34.7 35.0 35.0 3.7 2.0 0.0 5.7	10.0 34.7 35.0 35.0 3.7 3.7 5.7	
Switch Phase				34.7 35.0 29.2% 3.7 2.0 0.0 5.7	10.0 34.7 35.0 29.2% 3.7 2.0 0.0 5.7	
				10.0 34.7 35.0 29.2% 3.7 2.0 0.0	10.0 34.7 35.0 29.2% 3.7 2.0 0.0 5.7	
Minimum Initial (s)				34.7 35.0 29.2% 3.7 2.0 0.0 5.7	34.7 35.0 29.2% 3.7 2.0 0.0 5.7	
Minimum Split (s)				35.0 29.2% 3.7 2.0 0.0 5.7	35.0 29.2% 3.7 2.0 0.0 5.7	
Total Split (s)				29.2% 3.7 2.0 0.0 5.7	29.2% 3.7 2.0 0.0 5.7	
Total Split (%)	3.7	3.7 1.6 0.0 5.3	3.7 1.6 0.0 5.3	3.7 2.0 0.0 5.7	3.7 2.0 0.0 5.7	
Yellow Time (s)	1.6	1.6 0.0 5.3	1.6	2.0	2.0 0.0 5.7	
All-Red Time (s)		0.0 5.3 Min	0.0	5.7	5.7 Next	
-ost Time Adjust (s)	0:0	5.3 Min	5.3	2.7	5.7	
Fotal Lost Time (s)	5.3	Mis			Mono	
-ead/Lag		Mis			Nego	
-ead-Lag Optimize?		Min			Mono	
Recall Mode	C-Min		C-Min	None	NOIR	
//c Ratio	0.52	0.75	0.81	0.30	0.73	
Control Delay	30.7	9.91	13.4	46.3	9.09	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Fotal Delay	30.7	16.6	13.4	46.3	9.09	
Queue Length 50th (m)	2.8	232.2	150.7	17.8	40.7	
Queue Length 95th (m)	m6.5 m	m216.7	239.2	31.1	62.0	
nternal Link Dist (m)		336.0	475.1	313.3		
Furn Bay Length (m)	70.0			40.0		
Sase Capacity (vph)	63	2676	2671	432	397	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.52	0.75	0.81	0.19	0.46	
Intersection Summary						
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 110 (92%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	d to phase	2:EBTL a	and 6:WB	3T, Start	if Green	
Vatural Cycle: 100						
Control Type: Actuated-Coordinated	linated					
 Volume for 95th percentile queue is metered by upstream signal. 	e duene is	metered	by upstre	am sign		

4: Derry Road & Clark Boulevard Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Background (PM) 2027 Scenario 1

																																				А		11.0	А		
•	SBR		11	11	1900							0.92	12	0	0																					HCM 2000 Level of Service		time (s)	* Service		
→	- SBT				~						1857			_	510	NA	4				0				c0.27						4		4	A I		HCM 2000 I		Sum of lost time (s)	ICU Level of		
←	L NBT	*	4 436		_					1 00	,			0 0	4 474	n NA	00	∞			0			Ì	0.25						7	¥ .	4.2	¥		6	0	6	9	2	
√	R NBI		0		_				0 0.95		3 864			10	1	n Perm		2			O		0 3.0	3 547							v)					4.9	0.40	43.9	42.3%	15	
/	EBR.				<u>~</u>						1583				٥.	n Perm		01			_			5 183							-			~							
1	EBI	Ĺ	39	36	1900	5.3	1.00	1.00	0.95	0//	1770	0.92	42	0	42	Perm		. ,	5.1	5.1	0.12	5.3	3.(205		c0.02	0.20	17.6	00.1	0.5	- œ	1	6.71	a			city ratio		tion		
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Frt	Fit Protected	Sata. Flow (prot)	Satd Flow (nerm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, dz	Delay (s)	Level UI Selvice	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)	c Critical Lane Group

12-14-2023 Synchro 11 Report BA Group

Queues 5: Fifth Line & Clark Boulevard

Future Background (PM) 2027 Scenario 1

→	SBT	ţ	459	459	511	¥.	4		4		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.37	6.1	0.0	6.1	23.4	43.0	372.1		1857	0	0	0	0.28					
—	NBT	+	436	436	474	NA	∞		∞		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.34	2.8	0.0	2.8	21.2	38.9	156.9		1863	0	0	0	0.25					
•	NBL	F	4	4	4	Perm		00	∞		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.01	4.8	0.0	4.8	0.2	1:1		32.0	864	0	0	0	0.00					
>	EBR	R _	10	10	1	Perm		2	2		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.03	9.2	0.0	9.5	0.0	2.8			1194	0	0	0	0.01					
1	EBL	<i>y</i> -	39	39	42	Perm		2	2		10.0	34.3	35.0	29.5%	3.7	1.6	0:0	5.3			None	0.09	15.8	0.0	15.8	3.3	8.5	204.0	32.0	1332	0	0	0	0.03			2		coordinated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 41.6	Natural Cycle: 70	Control Type: Actuated-Uncoordinated

12-14-2023 Synchro 11 Report BA Group

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

125 125 1900 6.3 1.00 0.93 1.00 1736 1.00 1736 0.94 138 34 237 0.76 1.00 0.06 0.34 39.7 1.00 1.9 6.3 1.00 1.00 0.95 1258 0.44 589 0.94 36 36 36 40% 20.0 20.0 0.18 6.3 3.0 106 16.5 G 33 0.62 42.0 1.00 3.4 45.4 D D 204 0% NA 6.3 11.00 0.95 0.95 0.30 0.30 0.94 89 0 88 20.0 20.0 0.18 6.3 3.0 0.86 44.2 1.00 48.2 92.4 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 33% 852 8% 54 766 766 766 1900 6.2 6.2 0.99 0.99 1.00 2929 1.00 2929 1.00 1.00 1.00 1.00 66.4 66.4 0.60 6.2 3.0 3.0 1752 0.29 0.49 12.6 1.00 1.00 13.6 B B 14.0 B 4.0 1.00 0.95 1805 0.06 114 70.6 0.64 4.0 3.0 3.0 1.36 0.01 0.11 0.19 25.2 1.00 0.7 0 % % 0 60.1 1.04 111.0 106.8% 153 153 1900 0 %1 0.94 70.3 70.3 0.63 6.2 3.0 2001 c0.71 2249 2% 49 NA ↑↑ 1965 1965 1900 6.2 6.2 0.99 0.99 1.00 3160 1.00 3160 0.94 1 HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cyde Length (s)
Intersection Capacity Utilization
Analysis Period (min) 159 159 1700 1.00 1.00 0.95 1763 0.27 504 0.94 78.4 0.71 4.0 3.0 3.0 447 0.24 0.24 0.38 6.3 1.00 0.5 169 Frt Fit Protected Sard. Flow (prot) Fit Permitted Sard. Flow (perm) Pask-hour factor, PHF Adj. Flow (vph) RTOR Reduction (vph) Actuated Green, G (s) Effective Green, g (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Lane Group Flow (vph) Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS 3us Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) Lane Grp Cap (vph) Uniform Delay, d1 Progression Factor Permitted Phases v/s Ratio Perm v/s Ratio Prot v/c Ratio

Critical Lane Group

Synchro 11 Report

12-14-2023 BA Group

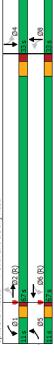
Queues 1: Sixth Line & Derry Road

Future Total (AM) 2027 Scenario 1

Future Total (AM) 2027 Scenario 1

me (uph) 199 1965 24 766 84 167 34 130 ne (uph) 159 1965 24 766 84 167 34 130 ne (uph) 159 2233 26 855 89 211 36 271 nesess 5 2 1 6 8 4 4 neses 5 2 1 6 8 8 4 4 neses 5 2 1 6 8 8 4 4 neses 5 2 1 6 8 8 4 4 neses 5 2 1 6 8 8 4 4 see 5 2 1 6 8 8 4 4 see 7 25.0 1.0 2.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0	159 1965 24 766 84 167 34 159 1965 24 766 84 167 34 159 1965 24 766 84 167 34 169 2253 26 855 89 211 36 25 2 1 6 8 8 4 6 2 2 2 1 6 8 8 4 6 2 2 2 1 6 8 8 4 6 2 2 2 1 6 8 8 4 4 6 2 2 1 6 2 2 2 2 2 2 2 2 2	19	159 1965 24 766 844 167 34 159 1965 24 766 844 167 34 159 1965 24 766 844 167 34 169 2253 26 885 89 211 36 88 21 36 2253 26 885 89 211 36 88 4 5 2 1 6 88 8 4 6 2 2 2 1 6 88 8 4 6 2 2 2 1 6 8 8 4 6 2 2 2 2 2 2 2 2 2	159 1965 24 766 844 167 34 159 1965 24 766 844 167 34 159 1965 24 766 845 849 167 34 169 2253 26 885 899 211 36 21 36 2253 25 2 1 6 8 8 4 4 5 2 1 6 8 8 4 4 5 2 1 6 8 8 4 4 5 2 1 6 8 8 4 4 5 2 1 6 8 8 4 4 5 2 1 6 8 8 4 4 5 2 1 6 2 2 3 3 3 3 3 3 3 3	ane Group	√ ≅	† EB∃	WBL	WBT	NBL	- NBT	SBL	▶	
159 1965 24 766 84 167 34 169 2253 26 855 84 167 34 169 2253 26 855 84 167 34 169 2253 26 855 87 84 167 34 2	159 1965 24 766 84 167 34 169 34 34 34 34 34 34 34 3	159 1965	159 1965	159 1965	ane Configurations	*	₹	-	₹	_	÷	_	43	
159 1965 24 766 84 167 34 169 2253 24 766 84 167 34 170 25 2 6 8 8 8 4 170 25 2 1 6 8 8 4 170 25 3 1 6 8 8 4 170 25 3 1 6 8 8 4 170 25 3 1 6 8 8 4 170 25 3 1 6 8 8 4 170 25 3 1 6 8 8 8 170 25 3 1 6 3 3 3 3 170 27 3 1 6 3 3 3 3 170 27 3 1 1 0 3 3 3 170 27 3 3 3 3 3 170 27 3 3 3 3 3 170 27 3 3 3 3 170 27 3 4 4 4 170 27 3 4 4 170 27 3 4 170 27 3 170 27 3 170 27 3 170 27 3 170 27 3 170 3 4 170 4 4 170 6 170 7 170 7 170 7 170 7 170 7 170 7 170 7 170 7 170 7	159 1965 24 766 84 167 34 169 2253 26 855 894 167 34 16 2253 26 865 894 167 34 2 6 8 8 4 5 2 1 6 8 8 4 5 2 1 6 8 8 8 70 25,0 7,0 25,0 10,0 10,0 110 31,2 31,3 32,3 32,3 110 67,0 11,0 67,0 33,0 33,0 30 4,0 3,0 4,0 4,0 4,0 10 2,0 2,0 2,0 2,0 10 2,0 3,0 4,0 4,0 10 2,0 3,0 4,0 4,0 10 4,0 5,0 6,2 6,3 6,3 10 6,0 0,0 0,0 0,0 10 6,0 0,0 0,0 0,0 10 7,0 14,5 10,2 4,3 10 7,0 14,5 10,2 4,3 10 7,0 1,4 1,5 1,4 10 7,0 1,4 1,5 1,4 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 1,4 1,5 10 7,0 7,0 1,4 10 7,0 7,0 1	159 1965 24 766 84 167 34 169 2253 24 766 84 167 34 169 2253 24 766 84 167 34 170 25 2 1 6 8 8 4 170 25 2 1 6 8 8 4 170 25 2 1 6 8 8 4 170 25 3 1 1 3 1 3 3 3 3 170 25 3 1 1 0 3 1 3 3 3 170 25 3 1 1 0 3 1 3 3 3 170 25 3 1 0 3 0 0 170 30 30 4 0 4 0 4 170 30 4 0 3 0 0 170 30 30 3 3 170 40 5 4 0 4 0 170 40 5 4 0 170 40 5 4 0 170 40 5 6 170 40 5 6 170 40 6 6 6 170 40 6 6 170 6 6 6 170 6 7 6 170 7 7 7 170 7 7 7 170 7 7 7 170 7 7 170 7 7 170 7 7 170 7 7 170 7 7 170 7 7 170 7 7 170 7 7 170 7 7 170 7 7 170 7 7 170 7	159 1965 24 766 84 167 34 169 223 26 855 895 895 895 211 36 81 167 34 167 34 167 34 167 34 167 34 167 34 167 34 167 34 167 34 36 36 36 36 36 36 36	159 1965 24 766 84 167 34 169 2253 24 766 84 167 34 170 25 1 6 8 8 4 170 25 1 6 8 8 4 170 25 1 6 8 8 4 170 25 1 6 8 8 4 170 25 1 6 70 320 323 170 25 1 10 67 330 330 170 25 1 10 67 330 330 170 25 1 10 67 330 330 170 27 11 21 22 32 323 170 27 30 20 00 00 170 27 30 30 30 170 27 30 30 30 170 27 30 40 40 40 170 27 30 40 40 170 27 30 40 40 170 27 37 37 170 27 37 37 170 27 37 37 170 27 37 37 170 27 37 37 170 27 37 37 170 27 37 170 37 37 170 37 37 38 39 39 30 30 30 30 30 30 30	raffic Volume (vph)	159	1965	24	766	84	167	34	130	
10y 2253 26 855 89 211 36 2	Dec. 109 2253 26 855 89 211 36 10	109 2253 89 211 36 109 2253 89 211 36 2	109 2253 89 211 30 109 2253 89 211 30 2	Part	me (vph)	159	1965	24	766	84	167	34	130	
Dility Na pility Na Penil	Name	Dility Na pility Na Felli Na Felli	10 10 10 10 10 10 10 10	Property	riow (vpn)	601	5677	07	822	68	TIZ	30	7/7	
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1.0 2.2 1.0 2.2 2.3 2.3 2.3 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1.0 2.2 1.0 2.2 2.3 2.3 2.3 2.4 4.0 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	1.0 2.2 1.0 2.2 2.3 2.3 2.3 4.0 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	1.0 2.2 1.0 2.2 2.3 2.3 2.3 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1.0 2.2 1.0 2.2 2.3 2.3 2.3 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	e (s)	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	
0.0 0.0	10	10	Lead 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	10	All-Red Time (s)	1.0	2.2	1.0	2.2	2.3	2.3	2.3	2.3	
4.0 6.2 4.0 6.2 6.3	4.0 6.2 4.0 6.2 6.3 6.3 6.3 Lead	10	100 100	10	ost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lead Lag Lead Lag Yes	Lead Lag Lead Lag Yes Yes Yes Yes Nos Vone None CAMin None None None None None None None Non	Lead Lag Lead Lag Ves Yes Yes Yes Vos Vos Vos Vos Vos Vos Vos Vos Vos Vo	Lead Lag Lead Lag Ves Yes Yes Yes Yes Vos Vos Vos Vos Vos Vos Vos Vos Vos Vo	Lead Lag Lead Lag Yes Yes Yes Yes Yes Vos Vos Vos Vos Vos Vos Vos Vos Vos Vo	otal Lost Time (s)	4.0	6.2	4.0	6.2	6.3	6.3	6.3	6.3	
Ves Ves Ves Ves Ves None Color None Color None Color None N	Ves Ves Ves Ves Ves None Colfn None Colfn None Colfn None N	Ves Ves Ves Ves Ves None	Ves Ves Ves Ves Ves None	Ves		Lead	Lag	Lead	Lag					
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78 74.9 72 14.5 102.2 478 46.7 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	78 74.9 7.2 14.5 102.2 47.8 46.7 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	78 74.9 7.2 14.5 102.2 47.8 46.7 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	78 749 72 14.5 102.2 478 467 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	78 74.9 7.2 14.5 102.2 47.8 46.7 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.		0.37	1.10	0.14	0.49	0.86	0.62	0.34	0.78	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	elay	7.8	74.9	7.2	14.5	102.2	47.8	46.7	52.2	
78 74.9 7.2 14.5 102.2 47.8 46.7 10.2 47.8 10.	78 74.9 72 14.5 102.2 47.8 46.7 10.2 -325.1 1.5 55.2 19.9 43.0 7.2 12.2 43.0 7.2 12.2 43.0 7.2 12.2 43.0 7.2 12.2 43.0 7.2 12.0 4.8 75.1 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	78 749 7.2 14.5 102.2 47.8 46.7 11.0	78 749 72 14.5 102.2 478 467 110.2 -325.1 1.5 55.2 19.9 43.0 71.2 110.2 12.2 478.2 4.8 10.2 19.9 43.0 71.2 12.2 478.1 1.5 55.2 19.9 43.0 71.2 12.0 475.1 100.0 45.0 2 11.8 20.0 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	78 74.9 72 14.5 102.2 47.8 46.7 10.2 -325.1 10.2 -325.1 10.2 43.0 7.2 10.2 42.0 10.2 42.0 10.2 42.0 10.2 42.0 10.2 42.0 10.2 42.0 10.2 42.0 10.2 42.0 10.2 42.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 1	lay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
102 -325.1 1.5 55.2 19.9 43.0 72 12 12 43932 4.8 79.8 #42.9 63.6 16.8 120.0 475.1 256.2 2 11.8 20.0 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10.2 -3.55.1 1.5 55.2 19.9 43.0 7.2 12 12 #393.2 4.8 79.8 #42.9 63.6 16.8 16.8 120.0 475.1 10.0 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10.2 -3.55.1 1.5 55.2 19.9 43.0 7.2 12.2 #393.2 4.8 79.8 #42.9 63.6 16.8 120.0 475.1 256.2 2 11.8 20.0 120.0 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 -325.1 1.5 55.2 19.9 43.0 72 12 12 #393.2 4.8 79.8 #42.9 63.6 16.8 120.0 475.1 100.0 256.2 2 45.0 211.8 20.0 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 -325.1 1.5 55.2 19.9 43.0 72 12 12 #393.2 4.8 79.8 #42.9 63.6 16.8 120.0 475.1 100.0 256.2 2 11.8 30.0 45.0 11.8 120.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	otal Delay	7.8	74.9	7.2	14.5	102.2	47.8	46.7	52.2	
212 #3932 4.8 79.8 #42.9 63.6 16.8 475.0 12.0 26.2 21.8 20 27.0 12.0 20 20 20 20 20 20 20 20 20 20 20 20 20	21.2 #3892 4.8 79.8 #42.9 63.6 16.8 475.1 26.2 211.8 20 475.1 20.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21.2 #3892 4.8 79.8 #42.9 63.6 16.8 475.0 12.0 475.1 26.2 2 211.8 20 45.0 12.0 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21.2 #3892 4.8 79.8 #42.9 63.6 16.8 475.1 20.0 26.2 211.8 20.0 20.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21.2 #3892 4.8 79.8 #42.9 63.6 16.8 120.0 475.1 256.2 45.0 211.8 20 45.1 120.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ngth 50th (m)	10.2	~325.1	1.5	55.2	19.9	43.0	7.2	20.7	
475.1 256.2 211.8 20 120.0 100.0 45.0 30.0 451 2049 184 1756 137 449 141 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	120.0	120.0 475.1 256.2 211.8 20 120.0 100.0 45.0 30.0 30.0 30.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	120.0 475.1 256.2 211.8 20 120.0 100.0 45.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 3	120.0 475.1 256.2 211.8 20 120.0 45.0 45.0 45.0 30.0 45.0 45.0 30.0 45.0 45.0 30.0 30.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ngth 95th (m)	21.2	#393.2	4.8	79.8	#42.9	9.89	16.8	75.7	
120.0 100.0 45.0 30.0 100.0 45.0 100	120.0 100.0 45.0 30.0 100.0 45.0 30.0 100.	120.0 100.0 45.0 30.0 100.0 45.0 30.0 100.0 100.0 100.0 100.0 0 0 0 0 0 0	120.0 100.0 45.0 30.0 100.0 45.0 30.0 100.0 100.0 100.0 0 0 0 0 0 0 0 0 0	120.0 100.0 45.0 30.0 45.0 30.0 45.1 20.0 45.1 20.0 45.1 20.0 45.1 20.0 45.1 20.0 5.	ık Dist (m)		475.1		256.2		211.8		201.7	
451 2049 184 1756 137 449 141 0.37 1.10 0.14 0.49 0.65 0.47 0.26 (451 2049 184 1756 137 449 141 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	451 2049 184 1756 137 449 141 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 110 0.14 0.49 0.65 0.47 0.26 (1) 111 ccd to bhase 2-EBTL and 6:WBTL. Slart of Green	451 2049 184 1756 137 449 141 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 37 1.10 0.14 0.49 0.65 0.47 0.26 (1) 111 ced to phase 2:EBTL and 6:WBTL, Start of Green	451 2049 184 1756 137 449 141 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 111 ced to phase 2:EBTL and 6:WBTL, Start of Green Coordinated Coordinated first wo cycles.	ength (m)	120.0		100.0		45.0		30.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	11 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	11 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	111 111 110 111 110 111 111 111 111 111	icity (vph)	451	2049	184	1756	137	449	141	448	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1	Cap Reductn	0	0	0	0	0	0	0	0	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.37 1.10 0.14 0.49 0.65 0.47 0.26 0.11 0.14 0.49 0.65 0.47 0.26 0.47 0.26 0.47 0.26 0.47 0.26 0.47 0.26 0.47 0.26 0.47 0.26 0.47 0.26 0.25 0.47 0.26 0.25 0.47 0.26 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25	1.10 0.14 0.49 0.65 0.47 0.26 2.EBTL and 6:WBTL, Slart of Green	1.10 0.14 0.49 0.65 0.47 0.26 2.EBTL and &WBTL, Start of Green is theoretically infinite. wo cycles.	ap Reductn	0	0	0	0	0	0	0	0	
0.37 1.10 0.14 0.49 0.65 0.47 0.26	0.37 1.10 0.14 0.49 0.65 0.47 0.26 any	0.37 1.10 0.14 0.49 0.65 0.47 0.26 any any ight: 111 serviced to thase 2-EBTL and 6:WBTL. Start of Green	1.10 0.14 0.49 0.65 0.47 0.26 2.EBTL and 6.WBTL, Slart of Green	1.10 0.14 0.49 0.65 0.47 0.26 2.EBTL and 6.WBTL, Slart of Green is theoretically infinite. wo cycles.	ap Reductn	0	0	0	0	0	0	0	0	
	n Summary	in Summany ghr 111 Sycle Lengthr 111 Start of Green	n Summary ghr. 111 2yde Length: 111 2y3), Referenced to phase 2:EBTL and 6:WBTL, Start of Green ccle: 150	n Summary ghr. 111 396, Referenced to phase 2:EBTL and 6:WBTL, Start of Green cle: 150 pe: Activated-Coordinated. Coordinated the recent set of the coordinated the coordinate	//c Ratio	0.37	1.10	0.14	0.49	0.65	0.47	0.26	09.0	
aph: 111 Sycle Length: 111 Sy, Referenced to phase 2:EBTL and 6:WBTL, Start of Green pe: Actualed-Coordinated	cite: 150 pe: Actualed-Coordinated	pe: Actualed-Coordinated		shown is maximum after two cycles. exceptile volume exceeds capacity, queue may be longer.	e exceeds capaci	ty, queue is	theoretiv	cally infin	ite.					
uptr. 111 yole Length: 111 yole Length: 111 Start of Green de: 18d ce: 18d ce: Actualed-Coordinated exceeds capacity, queue is theoretically infinite.	cle: 150 pe: Actualed-Coordinated e exceeds capacity, queue is theoretically infinite.	pe: Actualed-Cordinated e exceeds capacity, queue is theoretically infinite.	e exceeds capacity, queue is theoretically infinite.	arcentile volume exceeds capacity, queue may be longer.	shown is maximu	m after two	cycles.							
gth: 111 3ycle Length: 111 3yd, Referenced to phase 2:EBTL and 6:WBTL, Start of Green rice: 150 100: 1	rcie. 150 pe: Actualed-Coordinated e exceeds capacity, queue is theoretically infinite. shown is maximum after two cycles.	pe: Actualeg-Coorinated e exceeds capacity, queue is theoretically infinite. shown is maximum after two cycles.	e exceeds capacity, queue is theoretically infinite. shown is maximum after two cycles.		ercentile volume e	exceeds ca	pacity, qu	rene may	pe longe	ے				

1: Sixth Line & Derry Road Splits and Phases:



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

	1	†	<u> </u>	-	ļ	4	✓	—	4	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	-	₩		F	₩		r	₽		r	₩	
Traffic Volume (vph)	88	2112	95	180	729	250	93	286	100	112	89	30
Future Volume (vph)	88	2112	95	180	729	250	93	286	100	112	89	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	96:0		1.00	96.0		1.00	0.95	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1600	3263		1587	3107		1698	3210		1501	3251	
Fit Permitted	0.22	1.00		0.02	1.00		69.0	1.00		0.34	1.00	
Satd. Flow (perm)	377	3263		86	3107		1227	3210		532	3251	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	94	2247	101	191	776	566	66	304	106	119	72	32
RTOR Reduction (vph)	0	က	0	0	78	0	0	59	0	0	26	0
Lane Group Flow (vph)	94	2345	0	191	1014	0	66	381	0	119	78	0
Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
Bus Blockages (#/hr)	4	36	2	9	22	22	3	3	2	13	1	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
Protected Phases	വ	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	82.2	74.7		83.2	75.2		22.3	22.3		22.3	22.3	
Effective Green, g (s)	82.2	74.7		83.2	75.2		22.3	22.3		22.3	22.3	
Actuated g/C Ratio	69:0	0.62		69.0	0.63		0.19	0.19		0.19	0.19	
Clearance Time (s)	4.0	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	334	2031		161	1947		228	969		86	604	
v/s Ratio Prot	0.02	0.72		c0.08	0.33			0.12			0.02	
v/s Ratio Perm	0.17			c0.74			0.08			c0.22		
v/c Ratio	0.28	1.15		1.19	0.52		0.43	0.64		1.21	0.13	
Uniform Delay, d1	7.3	22.6		41.2	12.4		43.3	45.1		48.9	40.7	
Progression Factor	0.55	0.49		0.99	0.91		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	72.6		128.9	1.0		1.3	2.3		159.4	0.1	
Delay (s)	4.2	83.7		169.5	12.3		44.6	47.4		208.2	40.8	
Level of Service	A	ш		ı	В		٥	٥		ш	۵	
Approach Delay (s)		90.8			36.6			46.8			130.2	
Approach LOS		<u>ı</u>			Ω			Ω			<u>ı</u>	
Intersection Summary												
HCM 2000 Control Delay			6.99	¥	3M 2000	HCM 2000 Level of Service	ervice		ш			
HCM 2000 Volume to Capacity ratio	acity ratio		1.19									
Actuated Cycle Length (s)			120.0	S.	Sum of lost time (s)	time (s)			15.0			
Intersection Capacity Utilization	ation		108.1%	೦	U Level o	ICU Level of Service			G			
Analysis Period (min)			15									
All disperse concerns,			2									

c Critical Lane Group

Queues 2: Fifth Line & Derry Road

Future Total (AM) 2027 Scenario 1

Future Total (AM) 2027 Scenario 1

	SBT	4	89	89	104	NA	4		4		10.0	34.7	28.0	%	3.7	2.0	0.0	5.7			ne	0.17	29.0	0.0	29.0	7.8	16.1	5.9		630	0	0 0	0 17	2										
→	S													23.							None							275.9																
•	SBL	ľ	112	112	119	Perm		4	4		10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7			None	1.21	201.7	0.0	201.7	~35.9	#75.1		50.0	86	0	0	1 21	7:1										
←	NBT	₩	286	286	410	M	∞		∞		10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7			None	99.0	46.8	0.0	46.8	45.6	9.89	340.6		625	0	0	0 66	0.00										
•	NBL	F	93	93	66	Perm		∞	∞		10.0	34.7			3.7	2.0	0.0	5.7			None	0.44	50.2	0.0	50.2	22.0	40.2		70.0	227	0	0	0 44	t +				Green						.
ļ	WBT	₩	729	729	1042	NA	9		9		20.0	34.3	80.0	96.7%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.53	11.6	0.0	11.6	56.3	8.79	124.7		1976	0	0	0.53	5				Start of (ı	ne longer	2	eam signa
•	WBL	r	180	180	191	pm+pt	-	9	-		7.0	11.0	12.0	10.0%	3.0	1.0	0.0	4.0	Lead	Yes	None	1.18	155.3	0.0	155.3	~41.7	6.06#		0.06	162	0	0	1 18	0			İ	6:WBIL		ally infinit	ally IIIIII	vem elle	con conc	by upstr
†	EBT	₽	2112	2112	2348	NA	2		2		20.0	34.3	80.0	92.99	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.15	87.5	0.0	87.5	~356.8	m3.4 m#370.4	170.5		2035	0	0	1 15	2			i	EBIL and		thoorotic	ovelor .	cycles.	cycles.	s meterec
1	EBL	F	88	88	94	pm+pt	2	2	2		7.0	11.0	12.0	10.0%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.28	3.5	0.0	3.5	3.5	m3.4 m		100.0	345	0	0	0 77 0	0.27			-	phase 2:	1	ilnated	, queue is	reeds ca	after two	e queue i
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductin	Neddoca We hallo	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Offset: 0 (0%), Referenced to phase 2:EB1L and 6:WB1L, Start of Green	Natural Cycle: 150	Control Type: Actuated-Coordinated Volume exceeds capacity, guard is theoretically infinite	Outline exceeds capacity, queue is inequer	# 95th percentile volume exceeds capacity a percentile volume.	Queue shown is maximum after two cycles.	m Volume for 95th percentile queue is metered by upstream signal

Splits and Phases: 2: Fifth Line & Derry Road

25 05 05 (R) - P02 (R) Ø1

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

182 182 1900 5.7 1.00 0.98 1.00 0.85 1.00 1.00 1.00 1.00 1.403 1.403 1.403 1.403 30.0 30.0 0.25 5.7 3.0 350 0.03 0.13 34.9 1.00 0.2 35.1 5.7 0.95 1.00 1.00 1.00 3046 1.00 3046 385 385 10% ₹ 3.0 00. D 6.4.9 pm+pt 334 1900 4.0 1.00 1.00 1.00 0.95 650 650 650 341 2% 341 Perm 0.03 0.23 45.4 1.00 0.5 45.9 19.0 183 183 900 5.7 5.7 1.00 1.00 0.85 1.00 1.586 1.00 1.586 0.98 187 135 52 1% 3.0 277 0.60 44 271 271 1900 1900 1.00 1.00 1.00 3202 1.00 1.00 1.00 1.00 2.098 ¥ 17.4 3.0 464 0.09 % 7 4.0 1.00 1.00 1.00 1.00 0.95 993 0.98 24 24 6 6 pm+pt 4.0 3.0 210 0.00 0.02 0.11 1.00 0.2 41.0 HCM 2000 Level of Service 40.7 Sum of lost time (s) ICU Level of Service Perm 0.98 1189 103 86 3% 54.6 54.6 0.46 0.06 689 18.9 2.52 0.3 47.9 0.90 552 552 1900 1900 1.00 1.00 1.00 1.00 3305 3305 563 ¥ 54.6 54.6 0.46 B 26.8 0.98 4% pm+pt 07 0061 4.0 1.00 1.00 1.00 0.95 0.95 0.07 7 3% 61.1 61.1 0.51 3.0 1155 0.02 0.21 0.46 26.2 0.87 1.9 49.2 1.02 120.0 96.1% Perm 60.1 30 30 1900 1.00 1.00 0.85 1.00 1.00 1.00 1562 31 15 3% 5.3 3.0 782 0.02 15.1 1.00 0.0 1723 1900 5.3 0.95 1.00 1.00 1.00 1.00 3438 3438 Š 60.1 60.1 0.50 5.3 3.0 1721 c0.51 29.9 1.00 27.3 57.2 56.2 0.98 1758 1% 1.02 12.0 12.0 0.10 4.0 3.0 3.39 c0.06 187 187 1900 4.0 0.97 1.00 1.00 1.00 0.95 3399 3399 0.98 191 2% Prot 51.5 1.00 2.1 53.6 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp., pedbikes
Said. Flow (perm)
Fit Portected
Said. Flow (perm)
Peak-hour factor, PHF
Peak-hour factor, PHF
Red., Flow (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Actuated Green, G (s) ncremental Delay, d2 Bus Blockages (#/hr) Effective Green, g (s) Actuated g/C Ratio Turn Type Protected Phases Permitted Phases Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Total (AM)

Future Total (AM) 2027 Scenario 1

	1	†	1	-	↓	4	•	←	*	۶	-	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	‡	¥C	<i>y</i> -	‡	*	*	‡	*	*	‡	*
Traffic Volume (vph)	187	1723	30	70	552	185	24	27.1	183	334	377	182
Future Volume (vph)	187	1723	30	70	552	185	24	271	183	334	377	182
Lane Group Flow (vph)	191	1758	31	71	263	189	24	277	187	341	382	186
Turn Type	Prot	N	Perm	pm+pt	¥	Perm	pm+pt	¥	Perm	pm+pt	NA	Perm
Protected Phases	2	2		-	9		က	00		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	2	2	2	τ_	9	9	က	8	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	53.0	53.0	11.0	47.0	47.0	21.0	35.0	35.0	21.0	35.0	35.0
Total Split (%)	14.2%	44.2%	44.2%	9.5%	39.2%	39.2%	17.5%	29.5%	29.2%	17.5%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.56	0.98	0.04	0.40	0.36	0.23	0.09	99.0	0.54	0.99	0.51	0.38
Control Delay	27.6	47.2	0.1	17.6	20.1	8.7	28.1	29.7	16.7	82.4	41.8	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	47.2	0.1	17.6	20.1	8.7	28.1	29.7	16.7	82.4	41.8	7.6
Queue Length 50th (m)	23.6	~227.1	0.0	7.6	52.0	9.5	4.1	34.8	6.5	72.6	45.5	0.0
Queue Length 95th (m)	35.0	#314.4	0.0	17.2	75.4	30.6	6.6	47.5	27.8	#127.9	9.69	18.4
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	383	1789	829	178	1545	809	400	781	206	345	790	501
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.98	0.04	0.40	0.36	0.23	90.0	0.35	0.37	66.0	0.49	0.37
Intersection Summary												

Actuated Cycle Length: 120

Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated

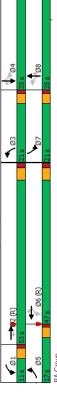
Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer

Queue shown is maximum after two cycles.

3: James Snow Parkway & Derry Road Splits and Phases:



HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Total (AM) 2027 Scenario 1

Maintenant		1	†	/	\	ļ	4	•	←	•	۶	→	•
National Parameters	ement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
h) 75 2150 144 88 876 91 48 0 21 24 0 100 1900 1900 1900 1900 1900 1900 19	e Configurations	<u>, </u>	₩		r	₩.		F	£,		r	2,	
Harmonia	fic Volume (vph)	75	2150	144	88	876	91	48	0	21	24	0	43
1900 1900	rre Volume (vph)	75	2150	144	88	876	91	48	0	21	24	0	43
1,00 0.95 1.00 0.95 1.00	il Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,00 0,95 1,00	I Lost time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
1,00 0,99 1,00 0,95 1,00 0,85 1,00 0,85 1,00 0,95 1,00	e Utill. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
1770 3506 1770 3489 1770 1583 1700 1583 1700 1583 1700 1700 1700 1803 1700 1700 1803 1700		1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
1770 3506 1770 3489 1770 1583 1770 1783	Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Secondary Color 1,000	d. Flow (prot)	1770	3506		1770	3489		1770	1583		1770	1583	
Signature Sign	Permitted	0.27	1.00		0.04	1.00		0.73	1.00		0.74	1.00	
PHF 099 099 099 099 099 099 099 099 099 09	 Flow (perm) 	507	3506		83	3489		1353	1583		1383	1583	
(c) 82 2337 157 96 952 99 52 0 23 26 0 0 43 (vph) 82 2491 0 96 1048 0 52 2 0 26 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	k-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
(vph) 0 3 0 0 3 0 0 24 0 26 26 26 26 26 27 0 26 26 28 27 0 26 26 28 27 0 26 26 26 26 26 26 26 26 26 26 26 26 26 26 26 26 26 27 26 26 27 26 26 26 27 26 26 27 26 26 26 27 26 27 26 27 26 27 26 27 26 27 26 27 26 27	Flow (vph)	82	2337	157	96	952	66	25	0	23	26	0	47
(yph) 82 2491 0 96 1048 0 52 2 0 26 (yph) Perm NA printpl NA Perm NA	OR Reduction (vph)	0	က	0	0	က	0	0	21	0	0	43	0
Perm NA pm+pti NA Perm NA Perm 2 2 6 8 4 4 2 6 8 8 4 4 2 6 8 8 4 4 4 5 875 875 99.7 99.7 9.3	e Group Flow (vph)	82	2491	0	96	1048	0	25	2	0	26	4	0
(s) 87.5 87.5 97.7 97.7 98.8 4 (s) 87.5 87.5 99.7 99.7 9.3 9.3 9.3 (s) 87.5 87.5 97.7 99.7 9.3 9.3 9.3 (s) 87.5 87.5 97.7 99.7 9.3 9.3 9.3 (s) 87.5 87.5 97.7 97.7 97.3 9.3 (s) 87.5 87.5 97.7 97.7 97.7 97.3 (s) 87.5 87.5 87.5 97.7 97.7 97.7 97.7 97.7 97.7 97.7 9	η Type	Perm	NA		pm+pt	NA		Perm	Ν		Perm	¥	
2 6 8 4 4 81.5 81.5 99.7 99.7 9.3 9.0	ected Phases		2		_	9			∞			4	
87.5 87.5 997 997 993 993 993 993 87.5 87.5 87.5 997 997 997 997 997 997 993 993 993 993	nitted Phases	2			9			∞			4		
875 875 875 997 997 993 993 993 993 993 993 993 993	lated Green, G (s)	87.5	87.5		7.66	7.66		9.3	9.3		9.3	9.3	
0.73 0.73 0.83 0.83 0.08 0.08 0.08 0.08 0.08 0.0	ctive Green, g (s)	87.5	87.5		7.66	7.66		9.3	9.3		9.3	9.3	
5.3 5.3 4.0 5.3 5.7 5.7 5.7 3.0 3.0 3.0 3.0 3.0 3.0 3.6 3.6 1.0 3.0 3.0 3.0 3.6 3.0 3.0 3.0 3.0 3.0 3.6 3.0 3.0 3.0 3.0 3.0 3.6 3.0 3.0 3.0 3.0 3.0 3.2 0.4 0.30 0.50 0.02 0.24 0.24 3.1 1.7 1.00 1.00 1.00 1.00 1.00 1.00 1.6 1.7 1.0 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.1 2.1 2.1 3.7 0.4 3.7 0.0 1.2 5.3 5.2 5.1 5.1 5.3 5.2 5.1 5.3 5.2 5.1 5.2 5.1 5.2 5.1 5.2 5.1 5.2 5.2 <td>iated g/C Ratio</td> <td>0.73</td> <td>0.73</td> <td></td> <td>0.83</td> <td>0.83</td> <td></td> <td>0.08</td> <td>0.08</td> <td></td> <td>0.08</td> <td>0.08</td> <td></td>	iated g/C Ratio	0.73	0.73		0.83	0.83		0.08	0.08		0.08	0.08	
30 30 30 30 30 30 30 30	rance Time (s)	5.3	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
369 2556 182 2898 104 122 107 0.071 0.034 0.30 0.00 0.00 0.16 0.09 0.53 0.36 0.50 0.01 0.24 5.3 15.2 37.5 2.5 53.1 51.1 52.0 1.67 1.76 1.00 1.00 1.00 1.00 1.00 1.00 0.1 2.2 4 5.3 6.9 51.2 52.0 2.8 2 8 40.3 2.8 56.9 51.2 52.0 2.8 4 C D A B E D D D 2.8 5.9 55.1 5.0 2.8 40.3 2.8 56.9 51.2 53.2 A C D A B E D D D 2.2 A B E C D C C 3.0 0.90 Sum of lost time (s) 15.0 1.5 0.90 Sum of lost time (s) 15.0	cle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
C0.71 C0.004 0.30 0.00 0.00 0.16 0.004 0.30 0.000 0.002 0.22 0.97 0.004 0.30 0.000 0.002 1.67 1.76 1.00 1.00 1.00 1.00 1.00 1.70 1.76 1.00 1.00 1.00 1.00 1.00 2.10 2.1 2.7 0.4 3.7 0.0 1.00 2.10 2.1 2.7 0.4 3.7 0.0 1.00 2.10 A E D D D 2.10 A E D D 2.10 A E D D 2.10 A C D A E D 3.10 A C D 4.10 A C D 5.0 A C	e Grp Cap (vph)	369	2556		182	2898		104	122		107	122	
0.16 0.40 0.00 0.00 0.00 0.00 0.00 0.00 0.0	Ratio Prot		c0.71		c0.04	0.30			0.00			0.00	
0.22 0.97 0.53 0.36 0.050 0.01 0.24 5.3 15.2 37.5 2.5 53.1 51.1 52.0 0.1 2.1 2.7 0.4 3.7 0.0 1.00 0.1 2.1 2.7 0.4 3.7 0.0 1.00 0.1 2.1 2.7 0.4 3.7 0.0 0.1 2.1 2.7 0.4 3.7 0.0 0.1 2.1 2.7 0.4 3.7 0.0 0.1 2.1 2.7 0.4 3.7 0.0 0.1 2.1 2.2 8 5.9 51.2 53.2 0.2 A E D D 0.2 Sum of lost time (\$) 15.0 0.90 Sum of lost time (\$) 15.0 0.80 Sum of lost time (\$) 15.0	Ratio Perm	0.16			0.40			c0.04			0.02		
5.3 15.2 37.5 2.5 53.1 51.1 52.0 1.67 1.76 1.00 1.00 1.00 1.00 1.00 1.00 0.1 2.7 0.4 3.7 0.0 1.2 8.9 28.8 40.3 2.8 56.9 51.2 53.2 A C D A E D D 28.2 5.9 55.1 C A E 22.6 HCM 2000 Level of Service 1.20 Sum of lost time (s) 15.0 90.8% ICU Level of Service 1.50 Sum of Service	Ratio	0.22	0.97		0.53	0.36		0.50	0.01		0.24	0.03	
1.67 1.76 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	orm Delay, d1	5.3	15.2		37.5	2.5		53.1	51.1		52.0	51.2	
89 288 40.3 2.8 56.9 51.2 53.2 A 28.2	ression Factor	1.67	1.76		1.00	1.00		1.00	1.00		1.00	1.00	
89 288 40.3 2.8 56.9 51.2 53.2 A C D A E D D 28.2 5.9 55.1 C A E D D 35.1 atio 0.90 122.6 HCM 2000 Level of Service C 90.8% ICU Level of Service E 15.0	emental Delay, d2	0.1	2.1		2.7	0.4		3.7	0.0		1.2	0.1	
A C D A E D D D 28.2 5.9 55.1 C A E 22.6 HCM 2000 Level of Service C 12.0 Sum of lost time (s) 15.0 90.8% ICU Level of Service E 15.0	ıy (s)	8.9	28.8		40.3	2.8		56.9	51.2		53.2	51.3	
28.2 5.9 55.1 C A E E 22.6 HCM 2000 Level of Service C 30.90 Sum of lost time (s) 15.0 90.8% ICU Level of Service E 15	el of Service	V	O		۵	⋖		ш	۵		۵	۵	
22.6 HCM 2000 Level of Service atio 0.90 Sum of lost time (s) 90.8% ICU Level of Service 15	oach Delay (s)		28.2			5.9			55.1			52.0	
22.6 HCM 2000 Level of Service 0.90 Sum of lost time (s) 90.8% ICU Level of Service 15	roach LOS		O			A			ш			D	
22.6 HCM 2000 Level of Service 0.90 Sum of lost time (s) 90.8% ICU Level of Service 15	rsection Summary												
atio 0.90 Sum of lost time (s)	A 2000 Control Delay			22.6	ĭ	:M 2000 I	Level of S	ervice		ပ			
120.0 Sum of lost time (s) 9.8% ICU Level of Service 15	A 2000 Volume to Capacit	by ratio		06:0									
90.8% ICU Level of Service 15	lated Cycle Length (s)			120.0	วร	m of lost	time (s)			15.0			
ysis Period (min) 15 Citical Lane Group 15	section Capacity Utilization	u		%8.06	೨	U Level o	f Service			ш			
Critical Lane Group	ysis Period (min)			15									
	Critical Lane Group												

Synchro 11 Report 12-14-2023 BA Group

Queues 4: Clark Boulevard & Derry Road

Future Total (AM) 2027 Scenario 1

Lanc Group		1	†	-	ļ	•	—	۶	→	
100 100	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
75 2150 88 876 48 0 24 82 2494 96 1061 52 23 26 82 2494 96 1061 52 23 26 83 2494 96 1061 52 23 26 94 2 2 2 3 2 10 10 6 10 10 10 10 343 343 10 34.3 34.7 34.7 10 10 6 0 10 10 10 10 343 343 343 34.7 34.7 34.7 15 75 75 10 85 35 35 35 16 16 16 16 2 2 2 17 16 10 16 2 2 2 18 17 16 10 10 0 0 19 25 8.3% 70.8% 29.2% 29.2% 10 10 0 0 0 0 0 10 10	Lane Configurations	*	₩	*	₩	*	£,	r	£3,	
75 2150 88 876 48 0 24 82 2494 96 1051 52 23 26 8	Traffic Volume (vph)	75	2150	88	876	48	0	24	0	
82 2494 96 1051 52 23 26 2 6 6 8 8 4 2 6 6 10 100 100 34.3 34.3 34.3 34.7 34.7 34.7 10.0 10.0 6.0 10.0 10.0 10.0 10.0 34.3 34.3 34.3 34.7	Future Volume (vph)	75	2150	88	876	48	0	24	0	
Perm NA pm+pl NA Perm NA Perm 2 1 6 8 8 4 4 8 6 8 6 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Lane Group Flow (vph)	85	2494	96	1021	25	23	26	47	
2 1 6 8 8 4 2 2 1 6 8 8 4 4 10.0 10.0 6.0 10.0 10.0 10.0 10.0 34.3 34.3 10.0 34.3 34.7 34.7 34.7 75.0 75.0 10.0 85.0 35.0 35.0 35.0 62.5% 62.5% 83.% 70.8% 29.2% 29.2% 3.7 1.6 1.6 1.0 1.6 2.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 5.3 5.3 4.0 5.3 5.7 5.7 5.7 1.4 1.4 1.0 1.6 2.0 2.0 2.0 1.9 Lead Yes Yes Yes Yes Yes O.0 0.0 0.0 0.0 0.2 0.9 0.0 0.0 0.0 0.0 11.9 27.9 26.8 3.0 60.8 0.9 53.2 0.0 0.0 0.0 0.0 0.0 0.0 11.9 27.9 26.8 3.0 60.8 0.9 53.2 0.0 0.0 0.0 0.0 0.0 0.0 11.9 27.9 26.8 3.0 60.8 0.9 53.2 0.0 0.0 0.0 0.0 0.0 0.0 11.9 27.9 26.8 3.0 60.8 0.9 53.2 0.0 0.0 0.0 0.0 0.0 0.0 11.9 27.9 26.8 3.0 60.8 0.9 53.2 0.0 0.0 0.0 0.0 0.0 0.0 11.9 27.9 26.8 3.0 60.8 0.9 53.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Turn Type	Perm	NA	pm+pt	NA	Perm	M	Perm	¥	
2 6 6 8 8 4 4 100 10.0 6.0 10.0 10.0 10.0 10.0 34.3 34.3 14.3 34.7 34.7 34.7 75.0 75.0 10.0 85.0 35.0 35.0 35.0 62.5% 62.5% 83% 70.8% 29.2% 29.2% 2 3.7 3.7 3.0 3.7 3.7 3.7 3.7 3.7 1.0 1.0 1.0 0.0 0.0 0.0 0.0 5.3 5.3 4.0 5.3 5.7 5.7 5.7 C-Min C-Min None C-Min None None None 0.22 0.90 0.0 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 0.0 11.9 27.9 26.8 3.0 60.8 0.9 53.2 11.9 27.9 26.8 3.0 60.8 0.9 0.0 11.9 27.9 26.8 3.0 60.8 0.9 0.0 12.0 0.0 0.0 0.0 0.0 13.8 25.0 18.4 2.9 2.7 33.0 45.4 33.7 14.5 25.9 184 2.9 2.7 33.0 45.4 33.7 15.0 0.0 0.0 0.0 0.0 15.1 2.5 0.0 0.0 0.0 16.1 2.5 0.0 0.0 0.0 0.0 17.1 2.5 0.0 0.0 0.0 0.0 18.1 2.5 0.0 0.0 0.0 0.0 19.2 0.0 0.0 0.0 0.0 0.0 10.2 0.0 0.0 0.0 0.0 0.0 10.2 0.0 0.0 0.0 0.0 0.0 10.2 0.0 0.0 0.0 0.0 0.0 10.3 0.0 0.0 0.0 0.0 0.0 10.4 0.0 0.0 0.0 0.0 0.0 10.5 0.0 0.0 0.0 0.0 0.0 10.5 0.0 0.0 0.0 0.0 0.0 10.5 0.0 0.0 0.0 0.0 0.0 10.5 0.0 0.0 0.0 0.0 0.0 10.5 0.0 0.0 0.0 0.0 0.0 0.0 10.5 0.0 0.0 0.0 0.0 0.0 0.0 10.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 10.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 10.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 10.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Protected Phases		2	-	9		∞		4	
2 2 1 6 8 8 4 10.0 10.0 10.0 10.0 10.0 10.0 34.3 34.3 10.0 34.3 34.7 34.7 34.7 75.0 75.0 10.0 38.3 34.7 34.7 34.7 5.5 2.5% 2.5% 2.9% 2.92% 29.2% 35.0 1.6 1.6 1.6 2.0 2.0 2.0 2.0 5.3 5.3 4.0 5.3 5.7 3.7 3.7 3.7 1.6 1.0 0.0 <td>Permitted Phases</td> <td>2</td> <td></td> <td>9</td> <td></td> <td>∞</td> <td></td> <td>4</td> <td></td> <td></td>	Permitted Phases	2		9		∞		4		
10.0 10.0 6.0 10.0 10.0 10.0 10.0 10.0 34.3 34.3 10.0 34.3 34.3 10.0 34.3 34.7 34.7 34.7 75.0 75.0 10.0 85.0 35.0 35.0 35.0 35.0 35.0 35.0 35.0 3	Detector Phase	2	2	-	9	∞	∞	4	4	
100 100 6.0 100 100 100 100 100 100 100 100 100 1	Switch Phase									
34.3 34.7 10.0 34.3 34.7 34.7 34.7 75.0 10.0 85.0 35.0 35.0 35.0 35.0 35.0 35.0 35.0 3	Minimum Initial (s)	10.0	10.0	0.9	10.0	10.0	10.0	10.0	10.0	
750 750 100 850 350 350 62.3% 62.5% 62.5% 83.7 108 29.2% 29.2% 29.2% 1.6 1.6 1.0 1.6 20 20 20 1.6 1.0 1.6 20 20 20 20 1.6 1.0 1.0 0.0 0.0 0.0 0.0 0.0 1.9 1.9 4.0 5.3 5.7 5.7 5.7 5.7 1.9 1.9 Lead Yes Yes Yes Yes Yes Yes Yes 7.7 5.7	Minimum Split (s)	34.3	34.3	10.0	34.3	34.7	34.7	34.7	34.7	
625% 625% 83% 708% 292% 292% 37 37 11 1.0 1.0 2.0 2.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0	Total Split (s)	75.0	75.0	10.0	85.0	35.0	35.0	35.0	35.0	
3.7 3.7 3.0 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7	Total Split (%)	62.5%	62.5%	8.3%	70.8%	29.2%	29.2%	29.2%	29.5%	
1.6 1.6 1.0 1.6 2.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Yellow Time (s)	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	All-Red Time (s)	1.6	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
5.3 5.3 4.0 5.3 5.7 5.2 5.3 0.0 0.1 1.5 1.5 0.0 5.3 2.2 2.2 1.5 1.5 0.0 6.1 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 <td>Lost Time Adjust (s)</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td></td>	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lag Lead L	Total Lost Time (s)	5.3	5.3	4.0	5.3	5.7	2.7	5.7	5.7	
Yes Yes Yes C-Min C-Min None C-Min None None 0.22 0.96 0.52 0.35 0.41 0.10 0.20 11.9 27.9 26.8 3.0 60.8 0.9 53.2 10.0 0.0 0.0 0.0 0.0 0.0 0.0 11.9 27.9 26.8 3.0 60.8 0.9 53.2 9.0 29.15 6.2 25.7 12.5 0.0 6.1 6.1 m10.9 m255.5 24.8 41.3 25.2 0.0 15.1 70.0 40.0 70.0 70.0 475.1 25.4 40.0 70.0 0	Lead/Lag	Lag	Lag	Lead						
C-Min C-Min None C-Min None None None O.22 0.96 0.52 0.35 0.41 0.10 0.20 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Lead-Lag Optimize?	Yes	Yes	Yes						
0.22 0.96 0.52 0.35 0.41 0.10 0.20 1.9 27.9 26.8 3.0 6.08 0.9 53.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None	
11.9 27.9 26.8 3.0 60.8 0.9 53.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	v/c Ratio	0.22	96.0	0.52	0.35	0.41	0.10	0.20	0.16	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Control Delay	11.9	27.9	26.8	3.0	8.09	0.9	53.2	Ξ	
11.9 27.9 26.8 3.0 60.8 0.9 53.2 20.2 2015 6.2 25.7 12.5 0.0 6.1 20.1 20.2 2015 2.2 20.2 20.2 20.2 20.2 20.2 20.2 20.2	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9.0 291.5 6.2 25.7 12.5 0.0 6.1 m109 m255.5 24.8 41.3 25.2 0.0 15.1 336.0 70.0 475.1 26.4 40.0 374 2595 184 2967 330 454 337 0	Total Delay	11.9	27.9	26.8	3.0	8.09	6.0	53.2	1.	
M10.9 m255.5 24.8 41.3 25.2 0.0 15.1 38.0 70.0 475.1 56.4 40.0 374 2595 184 2967 330 45.4 337 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 50th (m)		291.5	6.2	25.7	12.5	0.0	6.1	0.0	
336.0 475.1 56.4 70.0 70.0 70.0 70.0 374 2595 184 2967 330 454 337 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 95th (m)		m255.5	24.8	41.3	25.2	0.0	15.1	0.0	
700 700 700 400 400 400 400 400 400 400	Internal Link Dist (m)		336.0		475.1		56.4		313.3	
374 2595 184 2967 330 454 337 0	Turn Bay Length (m)	70.0		70.0				40.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	374	2595	184	2967	330	454	337	511	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
0.22 0.96 0.52 0.35 0.16 0.05 0.08	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Inersection Summary Ovele Lennin 120	Reduced v/c Ratio	0.22	96.0	0.52	0.35	0.16	0.05	0.08	60.0	
Cycle Length: 120	Intersection Summary									
	Cycle Length: 120									

4: Clark Boulevard & Derry Road Splits and Phases:

Aduated Öycle Length: 120
Offset: (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actualed-Coordinated
m. Volume for 95th percentile queue is metered by upstream signal.

₽Ø4 € Ø1 • € Ø2(R) ₩ 06 (R

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HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Total (AM) 2027 Scenario 1

Scenario 1

																																					A		11.0	A		
•	SBR		37	37	1900								0.92	40	0	0																					HCM 2000 Level of Service		time (s)	f Service		
→	T SBT				_							Ì	Ī	0 333	0 3	0 370	NA NA	8 4					5.7 5.7		5 1286						0.2 0.1			2.7 2.4	A A		HCM 2000		Sum of lost	ICU Level of Service		
<u> </u>	NBL NBT		10 469		1900 1900							1005 1863	0.92 0.92	11 510		11 510	Perm N		∞			_			704 1305	c0.27							⋖	2			2.9	0.38	41.1	42.2%	15	
>	EBR	*-	က	33	1900	5.3	1.00	0.85	1.00	1583	1.00	1583	0.92	3	က	0	Perm		2	1.3	1.3	0.03	5.3	3.0	20		0.00	0.00	19.3	1.00	0.0	19.3	B							4		
1	EBL	*	10	10	1900	2.3	1.00	1.00	0.95	1770	0.95	1770	0.92	1	0	11	Perm		2	1.3	1.3	0.03	5.3	3.0	22		00.01	0.20	19.4	1:00	1.8	21.2	O	20.8	ပ			acity ratio		ation		
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Ft	Fit Protected	Satd. Flow (prot)	Fit Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)	

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Queues 5: Fifth Line & Clark Boulevard

Future Total (AM)

2027 Scenario 1

1837 0 0 0 0.20 34.7 85.0 70.8% 3.7 2.0 0.0 Min 0.22 2.1 0.0 2.1 0.0 26.6 372.1 306 306 373 NA 4 34.7 34.7 85.0 70.8% 3.7 2.0 0.0 469 469 510 NA Min 0.30 2.4 0.0 2.4 0.0 39.9 156.9 1863 10.0 34.7 85.0 70.8% 3.7 2.0 0.0 Min 0.01 2.2 0.0 2.2 0.0 1.8 35.0 Perm Perm 34.3 35.0 29.2% 3.7 1.6 0.0 None 0.01 12.0 0.0 12.0 0.0 Natural Cycle: 70 Control Type: Actuated-Uncoordinated Perm 10.0 34.3 35.0 29.2% 3.7 1.6 0.0 None 0.02 0.02 14.5 0.0 14.5 0.4 4.5 204.0 35.0 1503 Cycle Length: 120 Actuated Cycle Length: 36.9 Turn Type
Profected Phases
Permitted Phases
Permitted Phases
Defector Phase
Switch Phase
Switch Phase
Minimum Spit (s)
Total Spit (s)
Total Spit (s)
Loas Time (s)
Loas Time (s)
Lost Time (s)
Leadu ag
L Future Volume (vph) Lane Group Flow (vph) Lane Configurations Traffic Volume (vph)

Splits and Phases. 5: Fifth Line & Clark Boulevard

202

355

558

885

885

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HCM Unsignalized Intersection Capacity Analysis 10: Clark Boulevard & Anatolia Building 1 North Access/Anatolia Building 2 North Aଉଞ୍ଚେଞ୍ଜକାର୍ଥୀତୀ

American Hell EBN WBI Novement Lane Configurations 44	WBI				-		1
3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			NBI	NBR	SBL	SBT	SBR
3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	÷°	13 0	23	0	39	\$ 6	co
Stop 0.92 0.92 0.92 0.92 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			53	0	39	190	3
3 0 092 092 092 092 092 092 092 092 092 0	Stop		Free			Free	
3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00	000	%00	0.00	0 00	%0	000
364 350 208 350 364 350 208 350 7.1 6.5 6.2 7.1 7.1 6.5 6.2 7.1 3.5 4.0 3.3 3.5 99 100 100 100 571 88 252 3 0 0 42 3 14 58 252 3 0 0 42 0 11 000 100 0.01 0.01 0.00 0.03 0.1 0.3 0.0 0.03 11.3 8.6 0.0 1.4 B A A A 11.3 8.6 0.0 1.4 B A A A			289	0	42	207	3 6
364 350 208 350 364 350 208 350 7.1 6.5 6.2 7.1 3.5 4.0 3.3 3.5 99 100 100 100 571 558 832 592 99 100 100 100 571 154 88 22 3 0 0 42 1 1 98 20 0 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0 1 1 3 8.6 0.0 14 1 1 3 8.6 0.0 14 8 A A A			3	,	!	i	
364 350 208 350 364 350 208 350 7.1 6.5 6.2 7.1 3.5 4.0 3.3 3.5 99 100 100 100 571 558 832 592 9 100 100 100 571 0.8 832 592 3 14 58 282 3 0 0 42 0 14 00 3 0 1 0.3 0.0 0.7 11.3 8.6 0.0 14 B A A A B							
364 350 208 350 364 350 208 350 7.1 6.5 6.2 7.1 3.5 4.0 33 3.5 99 100 100 100 97 100 100 100 14 58 1 14 58 252 3 0 0 42 6 71 000 100 0.1 0.01 0.01 0.01 0.1 0.01 0.0							
364 350 208 350 364 350 208 350 7.1 6.5 6.2 7.1 3.5 4.0 3.3 3.5 99 100 100 100 571 88 252 3 0 0 42 3 14 88 252 3 0 0 42 571 1008 130 0.03 0.01 0.01 0.00 0.03 0.11 3 8.6 0.0 1.4 B A A A 11.3 8.6 0.							
364 350 208 350 364 350 208 350 7.1 6.5 6.2 7.1 3.5 4.0 3.3 3.5 99 100 100 100 571 558 832 592 99 10 10 100 101 88 22 3 0 0 42 3 14 58 22 3 0 0 42 11.3 86 0.0 14 B A A A 11.3 86 0.0 14 C A A							
364 350 208 350 364 350 208 350 7.1 6.5 6.2 7.1 3.5 4.0 33 3.5 99 100 100 100 97 100 100 100 0.1 4 58 3 0 0 42 3 0 0 42 57 108 136 1546 0.01 0.01 0.01 0.07 11.3 86 0.0 14 B A A A A B A A B B A 11.3 B A A A A A B A A B A A B A A B A A B A A A B A A B A A A B A A B A A B A A B A B A A B B A B B A B			None			None	
364 350 208 350 364 350 208 350 7.1 6.5 6.2 711 35 40 33 35 99 100 100 100 571 558 82 59 9 100 100 100 571 1008 161 154 0.01 0.01 0.00 0.03 0.01 0.01 0.00 0.03 11.3 8.6 0.0 1.4 B A A 11.3 8.6 0.0 1.4 B A A 11.3							
364 350 208 350 364 350 208 350 7.1 6.5 6.2 7.1 3.5 4.0 3.3 3.5 99 100 100 100 571 558 832 592 97 100 100 100 0.1 0.0 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.3 0.0 0.0 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0						80	
364 350 208 350 364 350 208 350 7.1 6.5 6.2 7.1 3.5 4.0 3.3 3.5 99 100 100 100 571 588 832 592 9 100 100 100 14 58 222 3 0 0 42 57 108 134 184 60 1 0.3 0.0 0.7 11.3 8.6 0.0 14 B A A A A A B A B A A B A B A B A B A							
364 350 208 350 7.1 6.5 6.2 7.1 3.5 4.0 33 3.5 99 100 100 100 577 558 832 592 3 14 58 252 3 0 0 42 0 11 0 0 100 000 0.1 0.01 0.00 0.03 0.1 0.01 0.00 0.03 1113 86 0.0 17 113 86 0.0 14 B A A A A B III.3 113 86 0.0 14 B A A A A A A A A B A A A A A A A A A A	352	58 210			28		
364 350 208 350 7.1 6.5 6.2 7.1 3.5 4.0 3.3 3.5 9.9 100 100 100 5.71 5.88 822 5.92 3 14 58 252 3 0 0 42 0 1 0.01 0.00 0.03 0.01 0.01 0.00 0.03 11.3 8.6 0.0 1.4 B A A A A A H 11.3 8.6 0.0 1.4 B A A A 11.3 8.6 0.0 1.4 B A A A A A H 11.3 8.6 0.0 1.4 B A A A A A A A A A A A A A A A A A A A							
364 350 208 350 7.1 6.5 6.2 7.1 8.5 4.0 3.3 3.5 99 100 100 100 100 100 100 100 100 100 100 100							
25 4.0 3.3 3.5 7.1 8.5 8.2 7.1 8.5 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2	352	58 210			28		
3.5 4.0 3.3 3.5 99 100 100 100 571 558 832 592 83 14 58 252 3 10 0 42 0 0 1 0.01 0.00 0.03 0.01 0.01 0.00 0.03 11.3 8.6 0.0 1.4 B A A A A A III.3 8.6 0.0 174 B A A A A A III.3 8.6 0.0 174 B A A A A A A A A A A A A A A A A A A A	6.5	2 4.1			4.1		
35 40 33 35 5 90 100 100 100 100 100 100 100 100 100							
99 100 100 100 100 100 100 100 100 100 1					2.2		
EB1 WB1 NB1 SB1 3 14 58 252 3 14 58 252 0 14 0 32 0 17 1008 1361 1546 0.01 0.01 0.00 0.03 0.1 3 86 0.0 1.4 B A A A A A A III.3 8.6 0.0 1.4 B A A A A A III.3 8.6 0.0 1.4 B A A A A A A A A A A A A A A A A A A A		99 100			4		
EB1 WB1 NB1 SB1 3 14 58 252 3 0 0 42 0 1 0 3 577 1008 1361 1546 0.01 0.01 0.00 0.03 11.3 86 0.0 1.4 B A A A A 11.3 86 0.0 1.4 B A A A A 11.3 86 0.0 1.4 B A A A A A A A A A A A A A A A A A A A	557 1008	1361			1546		
3 14 58 252 0 1 0 42 0 1 0 3 571 1008 1361 1546 0.01 0.01 0.00 0.03 0.1 0.3 0.0 0.7 11.3 86 0.0 1.4 B A A A A 11.3 86 0.0 1.4 B A A A A 1 11.3 86 0.0 1.4							
3 0 0 42 0 14 0 1008 1361 1546 0.01 0.01 0.00 0.03 0.1 0.3 0.0 0.7 11.3 86 0.0 14 B A A A A A A A A A A A A A A A A A A A							
0 14 0 3 571 1098 1361 1546 0.01 0.01 0.00 0.03 0.1 0.3 0.0 0.7 11.3 8.6 0.0 1.4 B A A A A A A A A A A A A A A A A A A A							
571 1008 1361 1546 0.01 0.01 0.00 0.03 0.1 0.3 0.0 0.7 11.3 86 0.0 1.4 B A A 11.3 86 0.0 1.4 B A 1.6 1.6 1.6							
0.01 0.01 0.00 0.03 0.1 0.3 0.0 0.7 11.3 86 0.0 1.4 B A A A 11.3 86 0.0 1.4 B A 1.4 11.3 8.6 0.0 1.4 B A 7.000							
11.3 86 00 17 B A A A 11.3 86 00 14 B A 14.3 16 B A 16.00 14							
11.3 86 0.0 14 B A A A 11.3 86 0.0 14 B A 11.3 B A 10 B A 116 B A 116 B A 100							
B A A A 11.3 8.6 0.0 1.4 B A 11.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.							
11.3 8.6 0.0 1.4 B A 10.0 1.4 B A 1.6 B A 1.6 B A 1.6 B A 1.6 B A A 1.6 B A A A A A A A A A A A A A A A A A A							
B A 1.6							
1.6							
1.6							
30 0%							
27.070	ICU Level of Service	/ice		A			
Analysis Period (min)							

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HCM Unsignalized Intersection Capacity Analysis 9: Sixth Line & Anatolia Building 3 East Access

Future Total (AM) 2027 Scenario 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	>			€	£		
raffic Volume (veh/h)	7	_	4	275	285	22	
-uture Volume (Veh/h)	7	-	4	275	282	22	
Sign Control	Stop			Free	Free		
Grade	%0			%0	%0		
Peak Hour Factor	0.92	0.92	0.92	760	0.92	26.0	
Hourly flow rate (vpn)	œ	-	4	667	310	74	
Suidils Width (m)							
ane widin (m)							
Nalking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type				None	None		
Median storage veh)							
Instream signal (m)					236		
ox platoon unblocked					200		
on conflicting volume	620	333	33.4				
vC1. stage 1 conf vol	770	770	3				
AC2, stage 2 confivol							
vCu. unblocked vol	629	322	334				
IC, single (s)	6.4	6.2	4.1				
IC, 2 stage (s)							
IF (s)	3.5	3.3	2.2				
% eauf enenb 0d	86	100	100				
cM capacity (veh/h)	445	719	1225				
Direction, Lane #	EB 1	NB 1	SB 1				
Volume Total	6	303	334				
/olume Left	∞	4	0				
/olume Right	-	0	24				
CSH	464	1225	1700				
Volume to Capacity	0.05	0.00	0.20				
Queue Length 95th (m)	0.5	0.1	0.0				
Control Delay (s)	12.9	0.1	0.0				
Lane LOS	В	⋖					
Approach Delay (s)	12.9	0.1	0.0				
Approach LOS	В						
Intersection Summary							
Average Delay			0.2				
Intersection Capacity Utilization	noite		%L LC	_	O lava	ICLI Level of Service	A
				2			

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HCM Unsignalized Intersection Capacity Analysis 12: Clark Boulevard & Anatolia Building 1 South Access

	4	>	•	←	→	*	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	>-			₩	\$		
Traffic Volume (veh/h)	41	0	0	0	0	145	
Future Volume (Veh/h)	41	0	0	0	0	145	
Sign Control	Stop			Pree.	Pree		
Grade Doak Hour Factor	%0	0 00	0 00	%00	0 0%	000	
Fear Floai Factor	0.72 A5	2.0	27.0	2 0	2.0	158	
Pedestrians	2	>		>	>		
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type				None	None		
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	79	79	158				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	79	6/	158				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	95	100	100				
cM capacity (veh/h)	924	981	1422				
Direction, Lane #	EB 1	NB 1	SB1				
Volume Total	45	0	158				
Volume Left	45	0	0				
Volume Right	0	0	158				
CSH	924	1700	1700				
Volume to Capacity	0.05	0.00	0.09				
Queue Length 95th (m)	1.2	0.0	0.0				
Control Delay (s)	9.1	0.0	0.0				
Lane LOS	A						
Approach Delay (s)	9.1	0.0	0.0				
Approach LOS	A						
Intersection Summary							
Average Delay			2.0				
Intersection Capacity Utilization			19.0%	J)	ICU Level of Service	Service A	
Analysis Period (min)			15				

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HCM Unsignalized Intersection Capacity Analysis 11: Clark Boulevard & Anatolia Building 2 South Access

Future Total (AM) 2027 Scenario 1

→ 丿 乀 ←	NBT NBR SBL SBT		41 0 45 145	41 0 45 145			0.92 0.92 (45 0 49 158						None None				45			45	4.1	ć	7.7	4/	1503	SB 1	207	49	0	1563	0.03	1.9	×	1.9			
1	WBR		12	12			0.92	13						_				45			45	6.2	0	5.3	1001	6701	NB 1	45	0			0.03	0.0		0.0			l
-	WBL	>	.0	0	Stop	%0	0.92	0										301			301	6.4	L	3.5	3	600	WB 1	13	0	13	1025	0.01	8 6	A	9.8	A		
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	IF (S)	pu queue li ee %	civi capacity (ven/n)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	

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HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

139 6.3 1.00 0.94 1.00 1763 1.00 1763 0.94 228 21 21 355 0.91 24.6 24.6 0.22 6.3 3.0 390 1.00 6.3 1.00 1.00 0.95 1.258 0.63 836 0.94 0.54 38.2 1.00 3.0 66 40% 24.6 24.6 0.22 6.3 3.0 185 20.5 G 39 0.33 28.7 1.00 0.3 29.0 194 0% NA 35.6 35.6 0.32 6.3 3.0 585 0.11 1990 1900 4.0 11.00 11.00 0.95 1805 0.15 289 0.94 35.6 35.6 0.32 4.0 3.0 1.18 0.0.07 0.0.29 1.13 34.5 1.00 1.00 212 0% HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 22 22 1900 33% 51.1 51.1 0.46 6.2 3.0 1365 c0.62 477 1707 1707 1900 6.2 0.95 1.00 1.00 2967 1.00 2967 1.00 1.00 1838 54 NA 1.35 29.9 1.00 161.0 4.0 1.00 1.00 0.95 1805 0.08 0.08 34 55.3 0.50 4.0 3.0 1.36 0.01 0.01 0.25 24.4 1.00 1.00 34 0% 142.6 1.26 111.0 104.6% 90 1900 96 9 % 1921 2% 49 NA 1.23 28.1 1.00 109.3 137.4 6.2 0.95 0.99 1.00 3170 3170 0.94 54.7 54.7 0.49 6.2 3.0 1562 0.61 Ť HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 160 160 1900 1.00 1.00 0.95 1763 0.07 136 62.5 62.5 0.56 4.0 3.0 190 c0.06 0.44 0.89 29.8 1.00 3.7.2 67.0 170 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Permitted Phases
Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor -ane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS Bus Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) -ane Grp Cap (vph) Uniform Delay, d1 Progression Factor v/s Ratio Perm v/s Ratio Prot v/c Ratio

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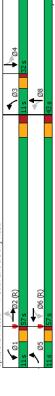
Queues 1: Sixth Line & Derry Road

Future Total (PM) 2027 Scenario 1

Future Total (PM) 2027 Scenario 1

_	SBT	2	214	214	376	NA	4		4		10.0	32.3	32.0	28.8%	4.0	2.3	0.0	6.3	Lag	Yes	None	0.91	8.99	0.0	8.99	7.77	#132.3	201.7		428	0	0	0	0.88											
٠	SBL	ĸ-			66	Perm		4	4		10.01			28.8% 28	4.0	2.3	0.0	6.3	Lag	Yes	None N		49.5	0.0	49.5	19.8	38.4 #13		30.0	193	0	0	0	0.51											
—	NBT	£	153	153	202	¥	∞		∞		10.0	32.3		38.7%	4.0	2.3	0.0	6.3			None	0.34	28.5	0:0	28.5	32.3	52.6	211.8		612	0	0	0	0.33											
•	NBL	r	199	199	212	pm+pt	3	80	က		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	1.09	122.4	0.0	122.4	~39.1	#82.5		45.0	194	0	0	0	1.09				Green					ے		
ţ	WBT	₩	1707	1707	1839	NA	9		9		25.0	31.2	57.0	51.4%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	1.35	188.7	0.0	188.7	~292.5	#338.0	256.2		1366	0	0	0	1.35				-, Start of			ite.		pe longe		
•	WBL	F	32	32	34	pm+pt	_	9	_		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.18	12.6	0.0	12.6	3.2	7.6		100.0	184	0	0	0	0.18				d 6:WBTI			cally infin		nene may		
1	EBT	₩	1718	1718	1924	NA	2		2		25.0	31.2	57.0	51.4%		2.2	0.0	6.2	Lag	Yes	C-Min	1.20	121.6	0.0	121.6	~301.3	#346.7	475.1		1610	0	0	0	1.20				EBTL an			is theoreti	o cycles.	apacity, qu	o cycles.	
1	EBL	×	160	160	170	pm+pt	2	2	2		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.89	68.2	0.0	68.2	23.4	#68.2		120.0	190	0	0	0	0.89				to phase 2		rdinated	ly, queue	m after tw	sxceeds cs	m after tw	
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Oueue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Lenath: 111	Actuated Cycle Length: 111	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 150	Control Type: Actuated-Coordinated	 Volume exceeds capacity, queue is theoretically infinite. 	Queue shown is maximum after two cycles.	# 95th percentile volume exceeds capacity, queue may be longer	Queue shown is maximum after two cycles.	

Splits and Phases: 1: Sixth Line & Derry Road



Critical Lane Group

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

	1	†	<i>></i>	-	ļ	4	€	←	4	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	₩		r	₩₽		F	₩		r	₩	
Traffic Volume (vph)	41	1616	79	110	1958	115	218	2	194	328	299	77
Future Volume (vph)	41	1616	79	110	1958	115	218	70	194	328	299	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.5	5.7		4.0	5.7	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.97	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1600	3261		1587	3296		1698	3052		1501	3343	
Fit Permitted	90.0	1.00		90:0	1.00		0.30	1.00		0.47	1.00	
Satd. Flow (perm)	105	3261		100	32%		537	3052	- 1	750	3343	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	_	0.94	0.94	0.94
Adj. Flow (vph)	44	1719	84	117	2083	122	232	74	~	349	318	82
RTOR Reduction (vph)	0	က	0	0	3	0	0	66	0	0	19	0
Lane Group Flow (vph)	44	1800	0	117	2202	0	232	181	0	349	381	0
Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
Bus Blockages (#/hr)	4	36	2	9	22	22	3	3	2	13	1	2
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	M	
Protected Phases	വ	2		-	9		က	∞		7	4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	69.7	64.0		75.3	8.99		28.0	18.5		28.5	18.5	
Effective Green, g (s)	69.7	64.0		75.3	8.99		28.0	18.5		28.5	18.5	
Actuated g/C Ratio	0.58	0.53		0.63	0.56		0.23	0.15		0.24	0.15	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.5	2.7		4.0	2.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	132	1739		168	1834		217	470		240	515	
v/s Ratio Prot	0.02	0.55		c0.05	c0.67		0.08	90.0		c0.12	0.11	
v/s Ratio Perm	0.18			0.39			0.16			c0.22		
v/c Ratio	0.33	1.04		0.70	1.20		1.07	0.39		1.45	0.74	
Uniform Delay, d1	26.2	28.0		29.9	56.6		43.5	45.6		44.1	48.4	
Progression Factor	1.74	0.78		0.91	1.17		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	26.4		6.5	93.3		9.08	0.5		226.1	5.5	
Delay (s)	46.5	48.2		33.8	124.3		124.2	46.2		270.2	53.9	
Level of Service	٥			O	ıL		ш	۵		ш	۵	
Approach Delay (s)		48.1			119.8			81.5			154.7	
Approach LOS		D			ı.			ш			Œ.	
Intersection Summary												
HCM 2000 Control Delay			9 96	Ĭ	HCM 2000 Level of Service	P Jo love	Pervice		ш			
HCM 2000 Volume to Capacity ratio	city ratio		1.26									
Actuated Cycle Length (s)	,		120.0	S	Sum of lost time (s)	time (s)			19.5			
Intersection Capacity Utilization	tion		106.0%	<u>∪</u>	ICU Level of Service	f Service			G			
Analysis Period (min)			15									

Analysis Period (min) c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (PM) 2027 Scenario 1

Future Total (PM) 2027 Scenario 1

Lane Group		1	†	-	ţ	•	—	۶	→	
1616 110 1958 218 70 328 1616 110 1958 218 70 328 1803 117 2205 222 280 349 70 328 1803 117 2205 222 280 349 70 328 170 2205 222 280 349 70 220 220 243 110 243 243 110 243 243 110 243 243 240 250 200	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
1616 110 1958 218 70 328 1610 110 1958 218 70 328 1810 317 2205 22 280 339 349 18	Lane Configurations	*	4	k	*	K	*	k	₩	
1616 110 1958 218 70 328 1803 117 2205 232 280 349 349 177 2050 232 280 349 218 219 22 239 349 22 239 24	Traffic Volume (vph)	41	1616	110	1958	218	70	328	299	
1803 117 2205 232 280 349 1 NA pm-pt N	Future Volume (vph)	41	1616	110	1958	218	70	328	299	
NA PINEP	Lane Group Flow (vph)	44	1803	117	2205	232	280	349	400	
2	Turn Type	pm+pt	NA C	pm+pt	NA A	pm+pt	ĕ °	pm+pt	≨ ₹	
200 7.0 20.0 5.0 10.0 7.0 34.3 9.5 34.7 11.0 47.0 14.0 280 14.0 280 14.0 5.5 10.0 7.0 5.6 10.0 7.0 5.6 10.0 7.0 5.6 11.0 280 14.0 5.5 8% 12.9 5.3 3.7 11.0 3.3 3.7 3.0 3.7 3.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Permitted Phases	2 2	7	9	0	0 00	0	4	r	
20.0 7.0 20.0 5.0 10.0 7.0 34.3 11.0 34.3 95.347 11.0 67.0 14.0 280 14.0 280 14.0 28.0 11.0 67.0 14.0 280 14.0 28.0 11.0 67.0 14.0 280 14.0 28.0 12.0 12.0 12.0 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Detector Phase	2	2	· -	9	co	∞	7	4	
200 7.0 20.0 5.0 10.0 7.0 84.0 11.0 84.0 11.0 87.0 11.0 87.0 14.0 280 14.0 26.8 4.7 11.0 87.0 11.0 87.0 14.0 280 14.0 28.0 11.0 87.0 14.0 280 14.0 28.0 11.0 87.0 14.0 28.0 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 20.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Switch Phase									
34.3 11.0 34.3 9.5 34.7 11.0 67.0 11.0 65.0 14.0 28.0 14.0 28.6 5.8 7.7 3.2 3.2 11.7 2.3 3.2 3.7 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2	Minimum Initial (s)	7.0	20.0	7.0	20.0	2.0	10.0	7.0	10.0	
67.0 11.0 67.0 14.0 28.0 14.0 5.58% 9.2% 55.8% 11.7% 23.3% 11.7% 23.0 1.6 1.0 1.0 20 0.0 0.0 0.0 1.6 1.0 1.0 2.0 1.0 0.0 0.0 1.6 1.0 1.0 2.0 0.0 <t< td=""><td>Minimum Split (s)</td><td>11.0</td><td>34.3</td><td>11.0</td><td>34.3</td><td>9.5</td><td>34.7</td><td>11.0</td><td>34.7</td><td></td></t<>	Minimum Split (s)	11.0	34.3	11.0	34.3	9.5	34.7	11.0	34.7	
55.6% 9.2% 55.8% 11.7% 23.3 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.0 0.0	Total Split (s)	11.0	0.79	11.0	0.79	14.0	28.0	14.0	28.0	
3.7 3.0 3.7 3.5 3.7 3.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1	Total Split (%)	9.5%	25.8%	9.2%	25.8%	11.7%	23.3%	11.7%	23.3%	
16 10 16 10 00 00 00 00 00 00 00 00 00 00 00 00	Yellow Time (s)	3.0	3.7	3.0	3.7	3.5	3.7	3.0	3.7	
1.00	All-Red Time (s)	1.0	1.6	1.0	1.6	1.0	2.0	1.0	2.0	
5.3 4.0 5.3 4.5 5.7 4.0 Lag Lead Lag Lead Lag Lead Yes	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lag Lead Lag La	Total Lost Time (s)	4.0	5.3	4.0	5.3	4.5	2.7	4.0	2.7	
Yes	Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	
2.C-Min With Carlot With With With With With With With Wit	Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
498 33.7 116.0 11.5 29.1 231.2 1.4 49.8 33.1 116.0 11.5 29.1 231.2	Kecali Mode	None	- C-IMIN	None	C-IMIN	None	None	1 20	None	
170.5 90.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Ontrol Delay	18.4	40.8	33.1	116.0	111 5	20.49	231	54.6	
49.8 33.1 116.0 111.5 29.1 231.2 -253.8 17.9 -352.5 -552 19.1 -111.7 m#293.6 m22.0 #411.1 #81.6 32.3 #168.9 170.0 6.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
-253.8 17.9 -352.5 -50.2 19.1 -111.7 m#293.6 m22.0 #411.1 #816. 32.3 #168.9 17.0 -50.2 19.1 -111.7 9.0 m293.6 m22.0 #411.1 #816. 32.3 #168.9 17.0 9.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Delay	18.4	49.8	33.1	116.0	111.5	29.1	231.2	546	
170.5 6 m22.0 #411.1 #81.6 32.3 #168.9 170.5 0.0 #124.7 340.6 20.0 170.1 #81.6 25.0 251.0 #81.1 #81.0 22.0 #82.0 #	Queue Lenath 50th (m)		~253.8	17.9	~352.5	~50.2	19.1	~111.7	47.4	
170.5 124.7 340.6 50.0 170.1 340.6 50.0 170.1 340.6 50.0 170.1 340.6 50.0 170.1 340.6 50.0 170.1 340.6 170.1 340.6 170.1 340.6 170.1 340.6 170.1 340.6 170.1 340.1	Queue Length 95th (m)	m5.3 m	1#293.6	m22.0	#411.1	9.18#	32.3	#168.9	63.2	
2.EBTL and 6.WBTL, Start of Green six not cycles.	Internal Link Dist (m)		170.5		124.7		340.6		275.9	
1741 168 1860 222 662 251 10 0 0 0 0 0 10 0 0 0 0 0 10 0 0 0 0 0	Turn Bay Length (m)	100.0		0.06		70.0		20.0		
2.EBTL and 6:WBTL, Start of Green is theoretically infinite. No cycles. 1.04 by the longer. 2.EBTL and 6:WBTL, Start of Green is theoretically infinite.	Base Capacity (vph)	120	1741	168	1860	222	662	251	639	
2:EBTL and 6:WBTL, Start of Green sis theoretically infinite. No cycles.	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
2:EBTL and 6:WBTL, Start of Green is theoretically infinite. wo cycles. short of oxycles.	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
1.04 0.70 1.19 1.05 0.42 1.39 2.EBTL and 6:WBTL, Slart of Green is theoretically infinite. wo cycles. capacity, queue may be longer. capacity, queue may be longer. wo cycles is malared by inverteam cinnal.	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary Cycle Length: 120 Actuated Cycle Length: 120 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 145 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 145 Once exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 98th percentile volume exceeds capacity, queue may be longer. Once es shown is maximum after two cycles. # Once es shown is maximum after two cycles.	Reduced v/c Ratio	0.29	1.04	0.70	1.19	1.05	0.42	1.39	0.63	
Cycle Length: 120 Office Length: 120 Office to (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 145 Control Type: Actualed-Coordinated Control Type: Actualed-Coordinated Control Type: Actualed-Coordinated Couleus shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Oucues shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Moucus shown is maximum after two cycles.	Intersection Summary									
Offset Length: 120 Offset, 0 (%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cyber, 145 Control Type: Actualed-Coordinated Control Type: Actualed-Coordinated Couled shown is maximum after two cydes. # 95th percentile volume exceeds capacity, queue may be longer. Ouches shown is maximum after two cydes. # Ouches shown is maximum after two cydes. * Valume rice of the percentile reference to the percent of	Cycle Length: 120									
Oriset? U(Vs), Keterenced to phase 2'EB1L and evive1t, start of Green Natural Cycle: Actualed-Coordinated Control Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. A 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. Queue shown is maximum after two cycles.	Actuated Cycle Length: 120	-	Ē	TOTAL	0					
Control Type: Actualed-Condinated Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycle.	Offset: U (U%), Referenced to Natural Cycle: 145	o pnase 2:	EBIL and	1 6:WB IL	, Start or	creen				
Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Control Type: Actuated-Con	rdinated								
Oueue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles. The volume for other percentile volume is marked to be unchanged by unchanged.	 Volume exceeds capacit 	b, queue is	theoretic	ally infini	<u>e</u>					
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. *** Volume for other necessarile areas is mediated by unchanam cinnal.	Queue shown is maximur	m after two	cycles.							
Cuedes shown is Indianium later two Cyducs. W. Voltume for Bith normalistic meterad by instram signal.	# 95th percentile volume e	exceeds cal	oacity, qu	eue may	be longe	ے				
	Cueue Showii is maximul	ili altel two	cycles.	4 by inctr	upio moo	-				

Splits and Phases: 2: Fifth Line & Derry Road

€01 + 402 (R)

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

1389 476 77 337 190 227 443 209 1900 1900 1900 1900 1900 1900 1900	476 79 337 190 1900 1900 1900 1900 1900 1900 1900
1900 1900 1900 1900 1900 1900 1900 1900	1900 1900 1900 1900 1900 1900 1900 1900
0.95 1.00 1.00 0.95 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	1.00 1.00 0.95 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
1.00 1.00 0.95 1.00 1.00 0.32 1.00 0.43 0.30 0.43 0.30 0.43 0.43 0.43 0	100 0.95 1.00 1.005 1.00 1.005 1.00 0.49 1.00 1.005 1.00 1.00 1.00 1.00 1.00 1.0
3202 1586 1616 3046 3100 1100 032 100 3202 1886 645 3046 0.98 0.98 0.98 0.98 0.98 344 194 334 452 0 138 0 0 0 21 188 0 0 0 34 194 334 452 8% 1% 5% 10% 21 2 15 10 36 192 19.2 40.2 28.3 192 19.2 40.2 28.3 192 19.2 40.2 28.3 192 19.2 40.2 28.3 192 19.2 40.2 28.3 192 19.2 40.2 28.3 194 40.2 40.2 20 512 25.3 334 718 0.14 43.9 36.1 41.1 0.67 0.22 1.00 0.63 0.67 0.22 1.00 0.63 0.67 0.22 1.00 0.63 0.67 0.22 1.00 0.63 0.67 0.22 1.00 1.00 0.67 0.22 1.00 0.63 0.67 0.22 1.00 1.00 0.67 0.22 1.00 1.00 0.67 0.22 1.00 1.00 0.67 0.22 1.00 1.00 0.67 0.22 1.00 1.00 0.67 0.22 1.00 1.00 0.67 0.22 1.00 0.67 0.22 1.00 0.67 0.22 1.00 0.67 0.22 1.00 0.68 0.88 0.4 4.2 0.9 0.69 0.98 0.98 0.98 0.99 0.99 0.99 0.99 0.90 0.90 0.90 0.90	1516 1802 3202 1586 1100 0.49 1.00 0.49 1.00 1.00 0.49 1.00 1.00 0.88 0.98 0.98 0.98 0.98 0.98 1.34 1.94 1.94 1.95 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98
100 100 0.32 1.00 0.32 1.00 0.38 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.9	1516 0 0.44 1.00 1.00 0.64 1.00 0.68 0.98 0.98 0.98 0.98 0.98 0.98 1.175 0 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.
27. 2.00 0.00 0.00 0.00 0.00 0.00 0.00 0	0.98 0.98 0.98 0.98 0.98 1.75 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98
344 194 334 452 3 44 5 6 334 452 3 8% 1% 5% 10% 2 1 2 1 5 3 6 3 8	486 81 344 194 115 0 0 138 116 0 0 138 117 0 0 0 138 118 344 56 118 346 56 119 1 24 119 1 192 192 6 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 192 192 192 119 1 193 193 193 193 119 1 193 193 193 193 119 1 193 193 193 193 119 1 193 193 193 193 119 1 193 193 193 193
8% 1% 5% 10% 20 8% 1% 5% 10% 21 15 36 10% 21 12 2 15 36 10% 21 19.2 19.2 40.2 28.3 19.2 19.2 40.2 28.3 30.3 6.1 6.1 6.1 6.1 6.1 6.1 6.1 6.1 6.1 6.1	175 0 0 138 37 0% 8% 1% 5 0 21 2 Perm pm+pt NA Perm pm 6 8 8 8 5 2.6 27.1 192 192 4 5.2.6 27.1 192 192 2 6.44 0.23 0.16 0.16 0.16 6.3 4.0 5.7 5.7 5.7 6.44 0.30 0.04 0.00 0.01 2.38 3.7 474 43.9 3 1.55 1.00 1.00 1.00 1.00 1.55 0.05 0.05 0.01 2.38 3.7 474 43.9 3 1.55 1.00 1.00 1.00 1.00 1.55 1.00 1.00 1.00 1.00 1.55 1.00 1.00 1.00
8% 1% 5% 10% 2 1 1 2 15 36 NA Perm pm+pt NA 8 8 4 4 7 4 8 19	311 81 344 56 38 0% 8% 1% 5 0 21 2 2 Perm pm+pl NA Perm pm 6 8 8 52.6 27.1 192 19.2 4 52.6 27.1 192 19.2 4 53.4 0 5.7 5.7 53.4 0 5.7 5.7 644 0.23 0.16 0.16 0.16 0.21 0.05 0.11 0.02 0.21 0.05 0.04 0.0 0.21 0.05 0.04 0.0 0.21 0.05 0.10 0.10 0.21 0.05 0.04 0.0 0.22 0.11 0.05 0.0 0.23 8 37 47 44 43 9 0.23 8 37.1 83.3 6.9 44.3 8 0.2 0.0 0.0 0.0 0.2 0.1 0.0 0.0 0.0 0.2 0.1 0.0 0.0 0.0 0.0 0.2 0.1 0.0 0.0 0.0 0.0 0.2 0.1 0.0 0.0 0.0 0.0 0.2 0.1 0.0 0.0 0.0 0.0 0.0 0.2 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.2 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
8% 1% 5% 10% 21 2 15 36 NA Perm pript NA Perm 2 19.2 40.2 28.3 19.2 19.2 40.2 28.3 19.2 19.2 40.2 28.3 0.16 0.16 0.34 0.24 3.0 3.0 3.0 3.0 3.0 51.2 5.7 4.0 5.7 3.0 3.0 3.0 3.0 51.2 0.04 40.2 0.15 0.04 43.9 36.1 41.1 1.00 1.00 1.00 0.63 0.5 4.3 85.4 42.9 D F G D F D F D F D F D F D F F D F F D F D F	3% 0% 8% 1% 5 6 6 6 6 6 6 7 1 6 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
21 2 15 36 NA Perm pm-pt NA 4 192 19.2 40.2 28.3 192 19.2 40.2 28.3 192 19.2 40.2 28.3 192 19.2 40.2 28.3 192 19.2 40.2 28.3 192 19.2 40.2 28.3 104 0.34 0.24 5.7 5.7 4.0 5.7 5.0 1.0 0.04 0.15 0.07 0.22 1.00 0.63 1.00 1.00 1.00 1.00 3.5 0.4 49.2 1.7 50.9 44.3 85.4 42.9 D D F D 47.2 50.9 19.0	5 0 21 2 2
NA Perm pm+pt NA 8	Perm pm+pt NA Perm pm 3 8 6 8 6 8 52.6 27.1 19.2 19.2 4.2 6.44 0.23 0.16 0.16 0.16 6.43 26.7 57.7 19.2 4.3 0.21 0.05 0.10 0.04 0.04 0.21 0.05 0.04 0.04 0.04 0.21 0.05 0.04 0.04 0.00 0.21 0.05 0.04 0.00 0.21 0.05 0.04 0.00 0.21 0.05 0.04 0.00 0.21 0.05 0.04 0.00 0.21 0.05 0.04 0.00 0.21 0.05 0.04 0.00 0.21 0.05 0.04 0.00 0.22 0.05 0.00 0.23 8 37.7 47.4 43.9 37.1 38.3 0.04 4.3 0.21 0.00 0.00 0.00 0.22 0.00 0.00 0.00 0.23 0.00 0.00 0.00 0.24 0.00 0.00 0.00 0.25 0.00 0.00 0.00 0.25 0.00 0.00 0.00 0.25 0.00 0.00 0.00 0.25 0.00 0.00 0.00 0.25 0.00 0.00 0.00 0.25 0.00 0.00 0.00 0.25 0.00 0.00 0.00 0.25 0.00 0.00 0.00 0.25 0.00 0.00 0.00 0.25 0.00 0.00 0.00 0.25 0.00 0.00 0.00 0.25 0.00 0.
8	6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
192 192 40.2 28.3 24.0 28.3 24.0 28.3 24.0 28.3 24.0 24	5.6 2.71 19.2 19.2 5.2.6 27.1 19.2 19.2 6.2.6 27.1 19.2 19.2 6.2.6 27.1 19.2 19.2 6.2.6 27.1 19.2 19.2 19.2 6.2.6 27.1 19.2 19.2 19.2 19.2 19.2 19.2 19.2 19
1972 1972 28.3 2 10.1 6.0 1.0 6.3 4 0.2 28.3 2 10.1 6.0 1.0 6.3 4 0.2 4 0.2 28.3 2 10.1 6.0 1.0 6.7 2 10.1 6.0 1.0 6.1 6.0 1.0 6.1 6.0 1.0 6.1 6.0 1.0 6.1 6.0 1.0 6.1 6.0 1.0 6.1 6.0 1.0 6.3 6.1 6.0 1.0 6.3 6.1 6.0 1.0 6.3 6.1 6.0 1.0 6.3 6.1 6.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1	22.6 27.1 1972 1972 19.2 2.2 2.2 2.2 19.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2
0.16 0.16 0.34 0.24 0.25 0.25 0.25 0.24 0.25 0.25 0.24 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25	0.44 0.23 0.16 0.16 5.3 4.0 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7
5.7 5.7 4.0 5.7 3.0 3.0 3.0 5.1 253 334 718 0.11 2.014 0.15 0.04 0.02 1.09 0.63 0.05 0.22 1.09 0.63 1.00 1.00 1.00 1.00 1.00 3.5 0.4 43.9 36.1 41.1 3 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 2.5 0.4 43.8 85.4 42.9 5.0 D F D F D D F D D F D D F D D F D D F D D F D D F D D F D D F D D F D D F D D D F D D D F D D D D F D	5.3 4.0 5.7 5.7 6.7 6.4 6.4 6.4 6.4 6.4 6.4 6.4 6.4 6.4 6.4
512 253 334 718 0.11 0.04 0.15 0.67 0.22 1.00 0.63 0 47.4 43.9 36.1 41.1 3 1.00 1.00 1.00 1.00 1.00 3.5 0.4 49.3 88.4 42.9 3 D D F D F D 47.2 E B D D F D F D T D F D T D F D T D F D T D F D T D F D T D F D T D F D T D F D T D T	664 267 512 253 002 0.11 26 0.21 0.05 0.11 26 0.38 3.77 47.4 43.9 1.55 1.00 1.00 1.00 0.2 0.6 3.5 0.4 4.3 D D D D D D
0.11	0.02 0.11 0.47 0.05 0.04 0.47 0.05 0.67 0.22 23.8 377 47.4 43.9 1.55 1.00 1.00 1.00 0.2 0.6 3.5 0.4 37.1 38.3 50.9 44.3 D D D D
0.04 (0.19 0.04 (0.19 0.04 0.04 0.04 0.04 0.04 0.04 0.04 0.0	0.27 0.05 0.04 0.47 0.30 0.67 0.22 23.8 37.7 47.4 43.9 1.55 1.00 1.00 1.00 0.2 0.6 3.5 0.4 37.1 38.3 50.9 44.3 D D D D
0.64 0.22 1.00 0.63 0.64 43.9 36.1 41.1 1.00 1.00 3.5 0.4 49.2 1.7 0.90 44.3 88.4 42.9 0.90 44.3 88.4 42.9 0.90 44.3 88.4 42.9 0.90 6.90 6.90 6.90 6.90 6.90 6.90 6.90	0.47 0.30 0.65 0.22 23.8 37.7 47.4 43.9 1.55 1.00 1.00 1.00 0.2 0.6 3.5 0.4 37.1 38.3 50.9 44.3 D D D D A 77.2
1.00 1.00 1.00 1.00 3.5 0.4 49.2 1.7 85.4 42.9 D F S5.7 D	1.55 1.00 1.00 1.00 0.2 0.6 3.5 0.4 41.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0
3.5 0.4 49.2 1.7 5.9 44.3 88.4 42.9 D F E D F S5.7 D F F S5.7	0.2 0.6 3.5 0.4 37.1 38.3 50.9 44.3 D D D D 47.2
50.9 44.3 85.4 42.9 D D F D 47.2 85.7 D E D D E E 19.0	37.1 38.3 50.9 44.3 D D D D D D D D D D D D D D D D D D D
47.2 F 47.2 D F 19.0 E E	D D D 47.2
47.2 D D 19.0 E	
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Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

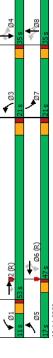
Future Total (PM) 2027 Scenario 1

Future Total (PM) 2027 Scenario 1

	4	†	1	•	ţ	4	•	+	*	۶	→	*
Lane Group	표	FBT	FBR	. MB	WBT	WBR	. IN	. NBT	NBR	SS	SBT	SBR
Lane Configurations	5	\$	*	*	\$	*-	-	\$	*	-	\$	*-
Traffic Volume (vph)	192	1186	16	264	1389	476	79	337	190	327	443	209
Future Volume (vph)	192	1186	16	264	1389	476	79	337	190	327	443	209
Lane Group Flow (vph)	196	1210	16	569	1417	486	81	344	194	334	452	213
Turn Type	Prot	Ν	Perm	pm+pt	¥	Perm	pm+pt	¥	Perm	pm+pt	NA	Perm
Protected Phases	വ	2		-	9		က	∞		7	4	
Permitted Phases			2	9		9	∞		00	4		4
Detector Phase	വ	2	2	,	9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	53.0	53.0	11.0	47.0	47.0	21.0	35.0	35.0	21.0	35.0	35.0
Total Split (%)	14.2%	44.2%	44.2%	9.5%	39.2%	39.2%	17.5%	29.2%	29.2%	17.5%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.57	0.89	0.02	0.84	96.0	0.57	0.27	0.70	0.51	0.99	0.63	0.43
Control Delay	97.6	42.8	0.1	29.8	36.6	14.9	29.0	22.7	14.8	81.0	46.0	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	42.8	0.1	29.8	36.6	14.9	29.0	22.7	14.8	81.0	46.0	7.8
Queue Length 50th (m)	24.2	144.8	0.0	42.3	190.0	71.6	13.8	43.2	6.5	68.5	54.6	0.0
Queue Length 95th (m)	35.7	#178.0	0.0	m#42.7 m#168.7	#168.7	m63.6	23.7	56.4	27.3	#101.7	71.0	19.8
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	386	1366	619	320	1470	847	411	781	511	338	697	513
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.89	0.02	0.84	96.0	0.57	0.20	0.44	0.38	66.0	0.59	0.42
Intersection Summary												

Actual Cycle Length: 120
Actual Cycle Length: 120
Actual Cycle Length: 120
Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Matural Cycle: 115
Control Type: Actualed-Coordinated
Control Type: Actualed-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Oueue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: James Snow Parkway & Derry Road



17.5 12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

169 169 1900 5.7 1.00 0.85 1.00 1.583 1.00 1.583 0.20 0.0 5.7 1.00 1.00 0.95 0.71 1316 0.92 80 0 08 Perm 24.2 24.2 0.20 5.7 3.0 265 0.06 0.30 1.00 0.6 0.6 D 15.0 0.92 24.2 24.2 0.20 5.7 3.0 3.19 0.01 0.05 38.6 1.00 0.1 38.7 D 156 1900 5.7 1.00 1.00 0.95 938 0.92 1.70 0.90 1.00 38.1 84.8 Perm 24.2 24.2 0.20 5.7 3.0 170 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 26 0.87 13.4 1.00 4.5 17.9 B 1974 5.3 0.95 1.00 1.00 3533 3533 0.92 2146 84.8 84.8 0.71 5.3 3.0 2496 c0.61 Ä 4.0 1.00 1.00 0.95 0.95 0.05 84.8 84.8 0.71 4.0 3.0 3.0 0.20 0.20 0.30 24.5 1.00 1.4 26.0 26.1 0.93 120.0 88.4% 58 1900 0.92 77.2 77.2 0.64 5.3 3.0 2266 50.59 1860 1860 1860 1900 1.00 1.00 3523 3523 0.92 2022 2084 NA 0.92 118.7 11.42 0.8 27.4 C HEAD 2000 Control Delay
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (finit)
C Critical Lane Group 5.3 1.00 1.00 1.770 0.05 97 97 33 30 30 Serm 77.2 77.2 0.64 5.3 3.0 0.34 0.53 11.6 1.51 2.9 20.4 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Turn Type
Protected Phases
Permitted Phases
Actuated Green, G (s) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot ane Group Flow (vph-Effective Green, g (s) Delay (s) Level of Service Approach Delay (s) Approach LOS v/s Ratio Perm v/c Ratio

12-14-2023 Synchro 11 Report BA Group

Queues 4: Clark Boulevard & Derry Road

Future Total (PM) 2027 Scenario 1

Future Total (PM) 2027 Scenario 1

→	SBT	43	.00	184	NA	4		4	0	10.0	34.7	35.0	3.7	2:0	0.0	5.7			None	0.50	32.8	0.0	32.8	27.3	48.8	313.3		429	0	0 0	0 42	0.43								
۶	SBL	-	74	8	Perm		4	4	4	10.0	34.7	30.00	3.7	2.0	0.0	2.7			None	0.30	45.0	0.0	45.0	16.7	30.7		40.0	321	0	0	0 10	0.23								
←	NBT	¢\$	00	78	M	8		∞	6	10.0	34.7	20.00	3.7	2.0	0.0	5.7			None	0.20	5.9	0.0	5.9	0.0	9.1	56.4		458	0	0	0 17	0.0								
•	NBL	r	156	170	Perm		∞	∞	6	10.0	34.7	20.00		2.0	0.0	5.7			None	0.00	90.1	0.0	90.1	40.7	#74.1			228	0	0	0 75	0.73			roon	5				- i
ļ	WBT	₩	1974	2172	NA	9		9	6	0.01	24.3	70.68	3.7	1.6	0.0	5.3			C-Min	0.87	19.7	0.0	19.7	203.7	275.8	475.1		2495	0	0	0 0	0.0			Start of (be longer.		sam signs
-	WBL	r	31	34	pm+pt	-	9	-		0.0	10.0	0.01	30	1.0	0.0	4.0	Lead	Yes	None	0.23	9.6	0.0	9.6	2.3	0.9		70.0	149	0	0	0 00	0.23			6-WRTI	1		eue may k		by upstre
†	EBT	₩	1860	2085	NA	2		2	6	0.01	24.3	75.0	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.00	28.1	0.0	28.1	240.9	m226.3	336.0		2312	0	0	0	0.90			RTI and	2		acity, que	cycles.	metered
•	EBL	r	90 90	33	Perm		2	2	0	10:0	54.5	75.0	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.52	35.1	0.0	35.1	6.4	m7.1 n		70.0	63	0	0	0 0	0.32			Phase 2-F	didoc 2:r	dinated	ceeds cap	after two	e queue is
	Lane Group	Lane Configurations	Traffic Volume (vph) Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (S)	Minimum Spili (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spiliback Cap Reducin	Storage Cap Reductin	Reduced We Railo	Intersection Summary	Cycle Lengin: 120	Addated Cycle Let 1911: 120 Offset: 0 (0%) Referenced to phase 2-FBTI and 6-WBTI. Start of Green	Natural Cycle: 120	Control Type: Actuated-Coordinated	# 95th percentile volume exceeds capacity, queue may be longer.	Queue shown is maximum after two cycles.	 Volume for 95th percentile queue is metered by upstream signal

Splits and Phases: 4: Clark Boulevard & Derry Road



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

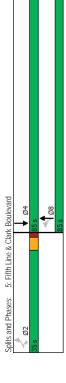
Future Total (PM)

																																					4		11.0	A		
•	SBR		11	11	1900								0.92	12	0	0																					HCM 2000 Level of Service		time (s)	f Service		
→		4			~							3 1857		2 518	0	2 529	A NA	8 4		4 28.4				0 3.0	8 1185	6 c0.29				`	2 0.3			4	A A		HCM 2000		Sum of lost time (s)	ICU Level of Service		
←	NBL NBT	, k	4 443		<u>~</u>		1.00 1.00		0.95 1.00		0.45 1.00	Ì	0.92 0.92	4 482	0	4 482	Perm NA			28.4 28.4		0.64 0.64	5.7 5.7		535 1188	0.26					0.0 0.2	7	A	4.1			4.9	0.41	44.5	43.3%	15	
· /*	EBR	ĸ	10									1583	0.92	11	10	1	Perm P		2				5.3	3.0	181						0.0	17.5	В							43		
1	EBL	y -	36	36	1900	5.3	1.00	1.00	0.95	1770	0.95	1770	0.92	45	0	42	Perm		2	5.1	5.1	0.11	5.3	3.0	202		c0.02	0.21	17.9	1.00	0.5	18.4	œ	18.2	В			city ratio	,	tion		
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Frt	Fit Protected	Satd. Flow (prot)	Flt Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)	c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Future Total (PM) Queues 5: Fifth Line & Clark Boulevard

→	SBT	æ	477	477	230	M	4		4		10.0	34.7	82.0	70.8%	3.7	2.0	0.0	2.7			Min	0.38	0.9	0.0	0.9	24.6	44.6	372.1	100	182/	0	0	0	0.29					
←	NBT	*	443	443	482	Ν	8		∞		10.0	34.7	82.0	70.8%	3.7	2.0	0.0	5.7			Min	0.35	2.8	0.0	2.8	21.7	39.1	156.9		1863	0	0	0	0.26					
•	NBL	×	4	4	4	Perm		∞	∞		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.01	4.8	0.0	4.8	0.1	1.0		35.0	838	0	0	0	0.00					
1	EBR	¥C.	10	10	=	Perm		2	2		10.0	34.3	32.0	29.2%	3.7	1.6	0.0	5.3			None	0.03	9.4	0.0	9.4	0.0	2.9			1182	0	0	0	0.01					
1	EBL	*	36	36	42	Perm		2	2		10.0	34.3	32.0	29.5%	3.7	1.6	0.0	5.3			None	0.09	16.4	0.0	16.4	3.3	8.9	204.0	35.0	1319	0	0	0	0.03					ordinated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 42.2	Natural Cycle: 70	Control Type: Actuated-Uncoordinated



HCM Unsignalized Intersection Capacity Analysis 10: Clark Boulevard & Anatolia Building 1 North Access/Anatolia Building 2 North Accesseกาก

	4	†	<u> </u>	\	↓	4	•	←	•	۶	→	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4			4	
raffic Volume (veh/h)	4	0	0	0	0	40	0	184	0	=	74	4
Future Volume (Veh/h)	4	0	0	0	0	40	0	184	0	11	74	4
Sign Control		Stop			Stop			Free			Free	
		%0			%0			%			%0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	0	0	0	43	0	200	0	12	80	4
Pedestrians												
-ane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Jpstream signal (m)											80	
X, platoon unblocked												
C, conflicting volume	349	306	85	306	308	200	84			200		
/C1, stage 1 conf vol												
vC2, stage 2 conf vol												
Cu, unblocked vol	349	306	85	306	308	200	84			200		
C, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
C, 2 stage (s)												
	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
oo dnene free %	66	100	100	100	100	95	100			66		
cM capacity (veh/h)	571	602	876	642	109	841	1513			1372		
Direction, Lane #	EB 1	WB1	NB 1	SB1								
/olume Total	4	43	200	96								
/olume Left	4	0	0	12								
/olume Right	0	43	0	4								
	571	841	1513	1372								
Volume to Capacity	0.01	0.02	0.00	0.01								
Queue Length 95th (m)	0.2	1.3	0.0	0.2								
Control Delay (s)	11.4	9.5	0.0	1.0								
ane LOS	В	V		V								
Approach Delay (s)	11.4	9.5	0.0	1.0								
Approach LOS	В	V										
ntersection Summary												
Average Delay			1.6									
ntersection Capacity Utilization	_		23.5%	⊴	ICU Level of Service	f Service			A			
Analysis Period (min)			15									

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HCM Unsignalized 9: Sixth Line & An

Future Total (PM)	2027 Scenario 1	
Inalized Intersection Capacity Analysis	e & Anatolia Building 3 East Access	

		•					
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	>			4	2		
Traffic Volume (veh/h)	23	က	2	366	328	8	
Future Volume (Veh/h)	23	3	2	366	328	8	
Sign Control	Stop			Free	Free		
Grade	%0			%0	%0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	22	3	2	398	357	6	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type				None	None		
Median storage veh)							
Upstream signal (m)					236		
pX, platoon unblocked	0.92	0.92	0.92				
vC, conflicting volume	764	362	366				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	269	259	264				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)							
fF (s)	3.5	3.3	2.2				
po dueue free %	93	100	100				
cM capacity (veh/h)	373	715	1193				
Direction, Lane #	EB 1	NB 1	SB 1				
Volume Total	28	400	366				
Volume Left	25	2	0				
Volume Right	co	0	6				
cSH	393	1193	1700				
Volume to Capacity	0.07	0.00	0.22				
Queue Length 95th (m)	1.8	0.0	0.0				
Control Delay (s)	14.9	0.1	0.0				
Lane LOS	В	A					
Approach Delay (s)	14.9	0.1	0.0				
Approach LOS	В						
Intersection Summary							
Average Delay			9.0				
Intersection Capacity Utilization	tion		30.9%	2	ICU Level of Service	f Service	А

Future Total (PM) 2027 Scenario 1 HCM Unsignalized Intersection Capacity Analysis 12: Clark Boulevard & Anatolia Building 1 South Access

ICU Level of Service 0.92 23 0 0% 0.92 0 None None 0 0% 0.92 0 6.8 0.92 2.2 100 1546 58 0 0 58 1700 0.03 0.0 22 0.0 4.1 0.92 3.3 100 1046 0.00 29 29 0.0 FBL 142 142 Stop 0.92 154 154 0 0 986 0.16 4.4 9.3 A A A 29 6.4 3.5 Average Delay Intersection Capacity Utilization Analysis Period (min) Direction, Lane #
Volume Total
Volume Bight
cSH
Volume Bight
CSH
Volume Bight
CBH
Capacity
Current Delay (s)
Lane LOS Lane Configurations
Traffic Volume (veh/h)
Future Volume (veh/h)
Sign Control
Grade
Peak Hour Factor
Hourly flow rate (vph)
Pedestrians Median type
Median storage weh)
Upstream signal (m)
Upstream signal (m)
Dx, platoon unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
tC, single (s)
tC, single (s)
tC, stage (s) Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right turn flare (veh) Approach Delay (s) Approach LOS

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HCM Unsignalized Intersection Capacity Analysis 11: Clark Boulevard & Anatolia Building 2 South Access

WBL WBR P P Slop	11: Clark Boulevard & Anatolia Building 2 South Access	d & Anat	olla o	ullding	2 Sout	II ACC	SSS	2027 Scenario 1
ordiguiations		•	4	←	•	۶	→	
outligurations of 42 142 0 21 53 Volume (vehN) 0 42 142 0 21 53 Volume (vehN) 0 0 42 142 0 21 53 mutcal (vehN) 0 0 46 154 0 21 53 mutcal (vehN) 0 0 46 154 0 23 58 mutcal (vehN) 0 0 46 154 0 23 58 mutcal (vehN) 0 0 46 154 0 23 58 mutcal (vehN) 0 0 46 154 0 23 mutcal (vehN) 0 0 46 154 0 1426 mutcal (vehN) 0 0 55 0 092 mutcan 4 0 0 0 23 mutcan 4 0 0 0 24 mutcan 6 0 0 0 24 mutcan 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Volume (verlyr) 0 42 142 0 21 53 Volume (verlyr) 0 42 142 0 21 53 Our Factor 0% 0% 0% 0% 0% 0% Our Factor 0% 0% 0% 0% 0% 0% Our Factor 0% 0% 0% 0% 0% 0% Our Factor 0% 0 20 0 20 0 0% Our Factor 0 46 154 0 23 58 154	Lane Configurations	>		æ			₩	
Volume (Verkit) 0 42 142 0 21 53 Juntol Sop Free Free Pree Ow Ow Ow Ow Ow Carden (wh) 0 46 154 0 23 58 Juntol (wh) 0 46 154 154 Juntol (wh) 0 46 154 154 Juntol (wh) 0 46 154 154 Juntol (wh) 0 45 98 Juntol (wh) 0 45 98 Juntol (wh) 0 46 154 81 Juntol (wh) 0 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Traffic Volume (veh/h)	0	42	142	0	21	53	
Our Factor Slop Free Free our Factor 0% 0% 0% our Factor 0,92 0,92 0,92 0,92 flains (m) 46 154 0 23 58 flains (m) 46 154 0 23 58 flains (m) 46 154 0 23 58 no ckage mr flare (veh) None None None None no ckage mr flare (veh) None 154 4.1 4.1 m signal (m) non signal (m) None 154 4.1 4.1 m signal (m) non signal (m) None 4.1 4.1 4.1 age 1 conf vol 258 154 4.1 4.1 4.1 age 2 conf vol 6.4 6.2 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1	Future Volume (Veh/h)	0	42	142	0	21	53	
our Factor 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Sign Control	Stop		Free			Free	
Hour Factor 092 092 092 092 092 092 092 092 092 092	Grade	%0		%0			%0	
flow rale (vph) 0 46 154 0 23 58 strains strains 0 46 154 0 23 58 strains	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Width (m) Width (m) Width (m) Width (m) Width (m) None None Int Blockage Int Blockage None None am slorage veh) Int Blockage None None am slorage veh) Int Blockage Int Blockage Int Blockage am sloral (m) Int Blockage Int Blockage Int Blockage am sloral (m) Int Blockage Int Blockage Int Blockage and Int Blockage (s) Int Blockage Int Blockage Int Blockage and Delay (s) Int Blockage Int Blockage Int Blockage Int Blockage Int Blockage (s) Int Blockage Int Blockage Int Blockage Int Blockage Int Blockage (s) Int Blockage Int Blockage Int Blockage Int Blockage Int Blockage (s) Int Blockage Int Blockage Int Blockage Int Blockage Int Blockage (s) Int Blockage Int Blockage Int Blockage Int Blockage Int Blockage (s) Int Blockage Int Blockage Int Blockage	Hourly flow rate (vph)	0	46	154	0	23	58	
Width (m) Width (m) Na Speed (m/s) None None In type None None In type None None In type None None In the Cockage veh) 154 154 sam signal (m) 158 154 154 shape (s) 158 154 154 shape (s) 64 62 4.1 stage (s) 64 62 4.1 stage (s) 3.5 3.3 2.2 ene free % 100 95 98 pacify (vehh) 719 892 1426 pacify (vehh) 719 892 1426 pacify (vehh) 719 892 1426 pacific (s) 6 0 0 0 pacific (sehh) 13 00 0.4 0 pacific (sehh) 13 0.0 2.2 0.0 2.2 pacific (seh) A A A <td< td=""><td>Pedestrians</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Pedestrians							
in Speed (m/s) In Blockage In Blockage In In Indiace (verb) In Storage verb) aem signal (m)	Lane Width (m)							
In Blockage tun flaee (veh) In vige ann signal (in) ann signal (in) ann signal (in) ann signal (in) and signal (in) and signal (in) and on unblocked and unblo	Walking Speed (m/s)							
un flare (veh) None None nn type None None am signal (m) 154 None am signal (m) 154 154 about unblooked 158 154 154 and control or 158 154 154 sigge Lonf vol 258 154 4.1 sigge Conf vol 25 4.1 4.1 sigge (s) 3.5 3.3 2.2 en for sigge (s) 3.6 2.3 9.3 pack (s) 4 154 81 81 pack (s) 4 154 81 82 pack (s) 4 <t< td=""><td>Percent Blockage</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Percent Blockage							
In style be an in signate with a monage with a manage with a monage with	Right turn flare (veh)							
am signal (in) aem signal (in) arge (s) arge 1 conf vol arge 2 conf vol arge (s) ar	Median type			None			None	
adm signal (m) abour unblacked abour unblacked abour unblacked along 1 cont vol stage 2 cont vol stage 6 3.5 3.3 2.2 and 6.4 6.2 4.1 5.8 1.3 2.2 and 6.4 6.2 4.1 5.8 3.5 3.3 2.2 and 6.4 6.2 4.1 5.8 3.6 3.3 2.2 and 6.4 6.2 4.1 5.8 3.6 3.3 2.2 and 6.4 6.2 8.1 and 6.4 154 8.1 and 6.4 154 8.1 and 6.4 6.5 and 7.4 8.2 and 6.4 6.2 and 7.4 8.2 and 6.4 6.2 and	Median storage veh)							
alton unblocked and unblocked and unblocked stage 2 cord vol stage 2 cord vol stage 2 cord vol stage 2 cord vol stage 4 cord vol stage 5 cord vol stage 6 s 5 4 6.2 4.1 stage 6 s 3.5 3.3 2.2 stage 6 s 3.5 3.3 3.3 2.2 stage 6 s 3.5 3.3 3.3 2.2 stage 6 s 3.5 3.3 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 stage 7 s 3.5 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 3.3 3.3 stage 6 s 3.5 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3	Upstream signal (m)							
stage (con' vol and a stage (s) 258 154 154 154 154 154 154 154 154 154 154	pX, platoon unblocked							
stage 1 cont vol 1848 1 54 154 stage 2 cont vol 258 154 154 stage (s) 6.4 6.2 4.1 stage (s) 3.5 3.3 2.2 sue free % 100 95 98 pacity (veh/h) 719 892 1426 pacity (veh/h) 719 892 1700 pacity (veh/h) 719 892 1700 pacity (veh/h) 719 892 1700 pacity (veh/h) 719 892 1426 pacity (veh/h) 719 892 1426 pacity (veh/h) 719 892 1426 pacity (s) 72 8 8 pacity (s) 73 0.0 2.2 pacity (s) 7 7 8 pacity (s) 7 8 100 pacity (s) 8 7 8 pacity (s) 8 100 2.2 pacity (s) 9 0 2.2 pacity (s) 8	vC, conflicting volume	258	154			154		
stage 2 conf vol 258 154 154 nublocked vol 258 154 154 stage (s) 6.4 6.2 4.1 stage (s) 3.5 3.3 2.2 stage (s) 3.6 3.8 3.8 stage (s) 3.6 3.8 1.2 pacity (verly) 719 892 1426 pacity (verly) 719 892 1426 ne Tall 46 1.5 81 ne Left 0 2.3 0.0 ne Right 46 0 0.0 ne Left 0 0.0 0.0 ne Capacity 0.0 0.0 0.2 LOS 1.3 0.0 0.2 LOS A A A A A A A act LOS A A A A A A A A A A A A A A A A A A A A <td>vC1, stage 1 conf vol</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	vC1, stage 1 conf vol							
rablocked val 258 154 154 stage (s) 6.4 6.2 4.1 stage (s) 710 95 98 spacify (vehr) 719 892 1426 set (s) 6.0 0 2.2 stage (s) 6.0 0.02 set (s) 7.0 0.02 set (s) 6.0 0	vC2, stage 2 conf vol							
ligite (s) 6.4 6.2 4.11 Islage (s) 3.5 3.3 2.2 Islage (s) 3.5 3.3 2.2 Islage (s) 3.6 3.3 2.2 Islage (s) 3.6 3.3 2.2 Islage (s) 4.6 9.8 Islage (s) 4.6 10.0 Islage (s) 4.6 10.0 Islage (s) 4.6 10.0 Islage (s) 4.6 10.0 Islage (s) 4.700 Isl	vCu, unblocked vol	258	154			154		
stage (s) stage (s) as 3.3 as 3.3 as 3.3 as 2.2 by 89 pacify (vehh) 719 892 1426 98 pacify (vehh) 719 892 1426	tC, single (s)	6.4	6.2			4.1		
see free % 3.5 3.3 2.2 packly (verlh) 719 95 98 packly (verlh) 719 89.2 1426 more Late WB 1 NB 1 1 ne Fortal 46 15.4 81 ne Edit 0 23 0 ne Right 46 0 0 ne IC capacity 0.05 0.02 ne IC capacity 0.05 0.02 LOS 1.3 0.0 0.2 LOS A A A Acarb Dealsy (s) 9.3 0.0 2.2 act LOS A A A Act LOS A A A act LOS A A A Act LOS A Company (s) Company (s) Benned (min) A A A Benned (min) A A A Act Decided (min) A A A Benned (mi	tC, 2 stage (s)							
100 95 98 98 1426	fF (s)	3.5	3.3			2.2		
MB 892 1426 MB 881 MB 881 MB 881 MB 881 MB 882 MB MB 882 MB MB MB MB MB MB MB M	b0 due ue free %	100	96			86		
WB1 NB1 SB1 46 154 81 6 0 23 6 0 0 23 6 0 0 0 892 1700 1426 (m) 1.3 0.0 0.4 9.3 0.0 2.2 A A A 9.3 0.0 2.2	cM capacity (veh/h)	719	892			1426		
46 154 81 0 0 23 46 0 0 0 892 1700 1426 0.05 0.09 0.02 (m) 1.3 0.0 0.4 A A A 9.3 0.0 2.2 A A A 9.3 0.0 2.2 A A A 9.3 0.0 2.2 A A A A 9.3 0.0 2.2 A A A A 9.3 0.0 2.2 A A A A A A A A A A A A A A A A A A A	Direction, Lane #	WB 1	NB 1	SB 1				
(m) 1.3 0.0 2.2 (m) 1.3 0.0 0.4 A A A 9.3 0.0 2.2 A A A A 9.3 0.0 2.2 A A A A A A A A A A A A A A A A A A A	Volume Total	46	154	81				
(m) 1.3 0.0 0.4 9.3 0.0 2.2 A A A A A A A A A A A A A A A A A A A	Volume Left	0	0	23				
(m) 130 1426 (m) 130 002 (m) 13 0.0 2.4 9.3 0.0 2.2 A A A A 9.3 0.0 2.2 A 2.2 1.7 2.2 1.9 1.0 Level of Service	Volume Right	46	0	0				
(m) 1.3 0.00 0.02 9.3 0.0 0.4 A A 9.3 0.0 2.2 A 1.5 Iny 2.2 In 1.5 In 1.5 I	CSH	892	1700	1426				
(m) 1.3 0.0 0.4 9.3 0.0 2.2 A A A 9.3 0.0 2.2 A 9.3 0.0 2.2 A 2.2 ITY 2.8 ITY 2.8 ITY 2.8 ITY 1.8	Volume to Capacity	0.05	0.09	0.02				
9.3 0.0 2.2 A A A A A A A A A A A A A A A A A A A	Queue Length 95th (m)	1.3	0.0	0.4				
A A 9.3 0.0 2.2 A 2 2 A 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Control Delay (s)	9.3	0.0	2.2				
9.3 0.0 2.2 My 2.2 YUllization 2.4.8% ICU Level of Service	Lane LOS	A		A				
A 2.2 2.2 2.0 Level of Service 1.0 fmin 1.5	Approach Delay (s)	9.3	0.0	2.2				
2.2 24.8% IOU Level of Service 15.00	Approach LOS	Α						
2.2 24.8% ICU Level of Service 15.	Intersection Summary							
24.8% ICU Level of Service	Average Delay			2.2				
T T T T T T T T T T T T T T T T T T T	Intersection Capacity Utiliza	tion		24.8%	<u> </u>	I Level of	Servine	A
	Analysis Period (min)			15	į	5		

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Background (AM)

122 122 1900 6.3 1.00 0.93 1.00 1738 1738 1738 0.94 139 0.76 33 236 1.00 53.5 D 6.3 1.00 1.00 0.95 0.45 597 0.94 36 36 19.9 0.18 6.3 3.0 107 0.06 0.34 39.8 1.00 1.9 16.5 G 28 28 1900 30 0.61 42.0 1.00 3.4 45.4 D D 167 167 167 1900 6.3 1.00 0.98 1.00 0.98 1.00 0.94 0.94 0.94 0.94 0.94 0.94 0.94 19.9 0.18 6.3 3.0 330 0.11 69 69 1900 6.3 11.00 11.00 0.95 11805 0.30 0.30 5.78 19.9 0.18 6.3 3.0 0% 0.71 42.8 1.00 19.9 62.8 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 33% 692 692 692 1900 6.2 6.2 0.95 0.99 11.00 2924 2924 0.94 773 8% NA 66.6 66.6 0.60 0.60 3.0 3.0 1754 0.26 0.44 12.1 1.00 0.8 12.9 69.4 69.4 0.63 4.0 3.0 3.0 0.00 0.08 0.08 0.14 24.8 1.00 1.00 4.0 1.00 0.95 0.95 0.06 114 16 % 50.1 1.00 111.0 105.8% 139 0.94 0 % 71.8 71.8 0.65 6.2 3.0 2045 c0.70 ↑↑ 1947 1947 1900 6.2 6.2 0.99 1.00 1.00 3163 3163 0.94 0.94 2215 2% 49 NA 1.08 19.6 1.00 46.7 66.3 Ť 62.1 HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 158 158 1900 4.0 1.00 1.00 0.95 0.30 562 0.94 168 168 78.6 0.71 4.0 3.0 3.0 0.22 0.22 0.35 5.9 1.00 0.4 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Permitted Phases
Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor -ane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS Bus Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) -ane Grp Cap (vph) Uniform Delay, d1 Progression Factor v/s Ratio Perm v/s Ratio Prot v/c Ratio

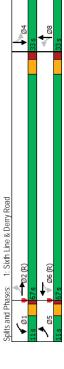
Critical Lane Group

12-14-2023 Synchro 11 Report BA Group

Queues 1: Sixth Line & Derry Road

Future Background (AM) 2027 Scenario 2

158 1947 15 692 69 167 34 158 1947 15 692 69 167 34 158 1947 15 692 69 167 34 158 1947 15 692 69 167 34 2	1947 15 692 69 167 34 1947 15 692 69 167 34 2219 16 776 73 208 36 NA perm NA p	158 1947 15 692 69 167 34 168 2219 16 776 269 167 34 168 2219 16 776 268 36 2	h	1947 15 2219 16 2219 16 2 21 2 2 1 2 25.0 7.0			3/	ęŤ.
168 2219 16 776 73 208 38 38 38 38 38 38 38	168 2219 16 716 713 208 38 38 38 38 38 38 38	166 2219 16 776 73 208 38 38 38 38 38 38 38	25.0 16 776 73 208 36 4	2219 16 NA pm+pt 2 1 2 1 25.0 7.0 31.2 11.0			34	131 131
5 2 1 6 8 4 2 6 8 8 4 5 2 6 8 8 4 5 2 6 8 8 4 70 25 10 100 100 100 110 31.2 17 25 10 10 100 110 31.2 31.2 32.3	5 2 1 6 8 8 4 4 2 2 6 6 8 8 8 4 4 2 2 6 6 8 8 8 4 4 2 2 6 6 8 8 8 4 4 3 2 170 31.2 31.2 32.3 32.3 32.3 32.3 32.3 32.3	5 2 1 6 8 4 2 6 8 8 4 5 2 6 8 8 4 5 2 6 8 8 4 70 5 70 50 100 100 110 31.2 13.2 3.23 3.23 3.23 110 6.0 11.0 6.0 33.0 33.0 33.0 33.0 110 6.0 11.0 6.0 33.0 33.0 33.2 33.2 10 2.0 11.0 3.2 2.2 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 3.3 4.0	25 1 6 8 8 4 25 6 8 8 8 4 25 1 6 8 8 8 4 25 1 1 6 8 8 8 4 25 1 70 25 0 100 100 100 31.2 11.0 31.2 33.3 32.3 32.3 60.4% 99% 60.4% 29.7% 29.	2 1 6 6 7 0 7.0 31.2 11.0			36 Perm	269 NA
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9,9% 60,4% 9,9% 60,4% 29,7% 29,7% 29,7% 29,7% 3.0 4.0 3.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4	9.9% 60.4% 9.9% 60.4% 29.7% 29.7% 29.7% 29.7% 3.0 4.0 3.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4	99% 60.4% 99% 60.4% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.2% 20.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	6.4% 9.9% 6.0.4% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.7% 29.2% 29.2 23.2 23.2 23.2% 29.2	0.11			33.0	33.0
3.0 4,0 3.0 4,0 4,0 4,0 4,0 4,0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	3.0 4.0 3.0 4.0 4.0 4.0 4.0 4.0 4.0 1.0 2.2 1.0 2.2 2.3 2.3 2.3 1.0 2.2 2.3 2.3 2.3 1.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	3.0 4,0 3.0 4,0 4,0 4,0 4,0 4,0 4,0 1,0 2.2 1.0 2.2 2.3 2.3 2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	40 3.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 2.2 1.0 2.2 2.3 2.3 2.3 2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	60.4% 9.9%			29.7%	29.7%
10 22 10 22 23 23 23 24 40 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	10 22 10 22 23 23 23 24 40 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	10 22 10 22 23 23 23 24 40 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	22 1.0 2.2 2.3 2.3 2.3 2.4 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	4.0			4.0	4.0
(m) 10.1 231.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	(m) 100 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0	6.2 4.0 6.2 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3	2.2			2.3	2.3
40 62 40 62 6.3 6.3 6.3 6.3 6.3 Lead Lag Lead Lag Ves Yes Yes Yes Yes You None C-Min None C-Min None None None O.3 4 1.05 0.09 0.44 0.71 0.62 0.34 7.3 54.2 6.6 13.8 75.6 47.9 46.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	40 62 40 62 6.3 6.3 6.3 6.3 Lead Lag Lead Lag Ves Yes Yes Yes Yes You None C-Min None C-Min None None None 0.34 1.05 0.09 0.44 0.71 0.62 0.34 0.35 54.2 6.6 13.8 75.6 47.9 46.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.31 54.2 6.6 13.8 75.6 47.9 46.5 1.32 54.2 6.6 13.8 75.6 47.9 46.5 1.32 54.2 6.6 13.8 75.6 47.9 46.5 1.34 75.1 6.9 48.2 15.7 42.6 7.2 1.35 74.2 6.6 13.8 75.6 47.9 46.5 1.36 74.1 84.4 3.4 70.2 31.6 63.0 16.9 16.9 1.30 0 11	40 62 40 6.2 6.3 6.3 6.3 6.3 6.3 lead Lead Lead Leag Lead Lag	6.2 4.0 6.2 6.3 6.3 6.3 6.3 7 Feb Lag Lead Lag Yes Yes Yes Yes Yes 1.05 0.09 0.44 0.71 0.62 0.34 1.05 0.00 0.0 0.0 0.0 54.2 6.6 13.8 75.6 47.9 46.5 0.0 0.0 0.0 0.0 0.0 0.0 54.2 6.6 13.8 75.6 47.9 46.5 23.1 0.9 48.2 15.7 42.6 72 475.1 256.2 11.8 30.0 2117 184 7755 139 449 143 0.0 0 0 0 0 0 1.05 0.09 0.44 0.53 0.46 0.25 2.EBTL and 6.WBTL, Slart of Green	0.0			0.0	0:0
Lead Lag Lead Lag Yes	Lead Lag Lead Lag Ves Ve	Lead Lead Lead Lead Lead Yes	Lag Lead Lag Ves Yes Yes Yes C-Min None CMin None	6.2			6.3	6.3
Yes Yes Yes Yes None Anne Ann	Yes Yes Yes Yes None C-Min None C-Min None	Ves Yes Ves None Anne An	Yes Yes Yes Yes C-Min None None None None C-Min None C-Min None C-Min None C-Min None None None None None None None Non	Lag	Lag			
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(m) 10.1 36.42 6.6 138 75.6 47.9 46.5 (m) 10.1 231.2 6.6 138 75.6 47.9 46.5 (m) 10.1 231.2 6.6 13.8 75.6 47.9 46.5 (m) 20.1 331.2 6.6 13.8 75.6 47.9 46.5 (m) 20.1 331.1 334.2 30.0 31.6 63.0 16.9 (m) 20.1 138.4 3.4 70.2 31.6 63.0 16.9 (m) 47.5 13.9 44.9 14.3 (m) 6.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.34 1.05 0.09 0.44 0.71 0.62 0.34 7.3 54.2 6.6 138 75.6 47.9 46.5 (m) 21.1 534.2 6.6 13.8 75.6 47.9 46.5 (m) 21.1 534.2 6.6 13.8 75.6 47.9 46.5 (m) 21.1 534.2 6.6 13.8 75.6 47.9 46.5 (m) 21.1 334.4 3.4 70.2 31.6 63.0 16.9 120.0 173.4 1.00 0 3.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.34 1.05 0.09 0.44 0.71 0.62 0.34 7.3 54.2 6.6 138 75.6 47.9 46.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 7.3 54.2 6.6 13.8 75.6 47.9 46.5 0.0 10.1 23.1.2 0.9 48.2 15.7 42.6 7.2 0.0 10.0 2.1.2 48.2 15.7 42.6 7.2 0.0 2.1.4 #384.4 3.4 70.2 31.6 6.30 18.6 0.1 120.0 17.1 #384.1 3.4 70.2 31.6 6.30 18.6 0.1 120.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1.05 0.09 0.44 0.71 0.62 0.34 54.2 6.6 13.8 75.6 47.9 46.5 23.1 6.6 13.8 75.6 47.9 46.5 23.1 0.9 48.2 15.7 42.6 72 478.1 256.2 11.8 30.0 21.17 184 1755 139 449 143 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	C-Min None			None	None
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(m) 21.1 #384.4 3.4 70.2 31.6 63.0 16.8 (m) 21.1 #384.4 3.4 70.2 31.6 63.0 16.8 (m) 10.1 231.2 0.9 48.2 15.7 42.6 72 19.1 12.0 475.1 256.2 211.8 20.0 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	(m) 21.1 #384.4 3.4 70.2 31.6 63.0 16.8 (m) 20.0 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	(m) 21.1 #384.4 3.4 70.2 31.6 63.0 16.8 (m) 20.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	54.2 6.6 13.8 75.6 47.9 46.5 12.31.2 0.9 48.2 15.7 42.6 7.2 13.8 72.3 15.6 47.9 1.0 10.0 10.0 10.0 10.0 10.0 10.0 10.	54.2	-		46.5	52.1
(m) 10.1 231.2 6.6 13.8 75.6 47.9 46.5 18.0 (m) 10.1 231.2 0.9 48.2 15.7 4.6 7.2 17.2 17.2 17.2 17.2 17.2 17.2 17.2	(m) 7.3 54.2 6.6 13.8 75.6 47.9 46.5 17.0 (m) 10.1 231.2 0.9 48.2 15.7 4.2 7.2 17.2 (m) 21.1 #884 3.4 70.2 31.6 63.0 16.8 2.0 1.1 #884 3.4 70.2 31.6 63.0 16.8 2.0 1.0 120.0 1.1	(m) 7.3 54.2 6.6 13.8 75.6 47.9 46.5 13.0 10.1 231.2 0.9 48.2 15.7 42.6 77.2 17.2 17.2 17.2 17.2 17.2 17.2 17.2	542 66 138 756 479 465 123 231.2 0.9 48.2 15.7 426 7.2 47.2 15.7 426 7.2 47.2 17.2 475.1 100.0 45.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0			0.0	0.0
(m) 10.1 23.1.2 0.9 48.2 15.7 42.6 72 13.1.2 13.1.2 14.3.4 3.4 70.2 31.6 63.0 16.8 2.1.2 12.0 475.1 256.2 211.8 20.4 490 211.7 184 1755 139 449 143 140 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	(m) 10.1 23.12 0.9 48.2 15.7 42.6 72 13.7 13.8 13.4 2.0 2.3 16.6 30.0 16.8 13.0 16.8 1	(m) 10.1 23.1.2 0.9 48.2 15.7 42.6 72 15.7 15.7 42.6 72 15.7 15.7 15.7 15.7 15.7 15.7 15.7 15.7	231.2 0.9 48.2 15.7 42.6 72 13.4 475.1 256.2 31.6 63.0 16.8 3.0 16	54.2			46.5	52.1
(m) 21.1 #8844 3.4 70.2 31.6 63.0 16.8 1 17.0 475.1 256.2 211.8 20 17.0 170.0 100.0 45.0 10.0 17.0 17.0 17.0 17.0 17.0 17.0 17	(m) 21.1 #8844 3.4 70.2 31.6 63.0 16.8 1 1 #8844 3.4 70.2 31.6 63.0 16.8 21.1 20.0 45.0 100.0 45.0 10.0 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	(m) 21.1 #3844 3.4 70.2 31.6 63.0 16.8 21.0 475.1 256.2 211.8 22 21.0 475.1 120.0 100.0 45.0 211.8 30.0 20.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#384.4 3.4 702 31.6 63.0 16.8 475.1 26.2 211.8 22.2 11.7 184 1755 139 449 143 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	231.2			7.2	50.4
120.0 475.1 256.2 211.8 20 120.0 100	120.0 475.1 256.2 211.8 20 120.0 100.0 156.2 211.8 20 45.0 45.0 143 449 143 Inch 0 0 0 0 0 0 0 0 In 0 0 0 0 0 0 0 0 0 In 0 0 0 0 0 0 0 0 0 In 0.34 1.05 0.09 0.44 0.53 0.46 0.25 (3	120.0 475.1 256.2 211.8 20 120.0 100.1 455.1 30.0 30.0 0 ctn 0 0 0 0 0 0 0 0 0 0 0 0 cn 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	475.1 256.2 211.8 20 2117 184 1755 45.0 211.8 30.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#384.4 3.4			16.8	75.3
120.0 170.0 45.0 30.0 10.0 10.0 10.0 10.0 10.0 10.0 10	120.0 190.0 45.0 30.0 10.0 10.0 10.0 10.0 10.0 10.0 10	120.0 100.0 45.0 30.0 40.0 40.0 40.0 40.0 40.0 40.0 40	1117 184 1755 139 449 143 100 100 100 100 100 100 100 100 100 10	475.1				201.7
490 2117 184 1755 139 449 143 con 0 0 0 0 0 0 0 n 0 0 0 0 0 0 0 0 0 0 0	A90 2117 184 1755 139 449 143 cin 0 0 0 0 0 0 0 n 0 0 0 0 0 0 0 0 0 0 0	Licin 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2117 184 1755 139 449 143 0 0 0 0 0 0 0 1.05 0.09 0.44 0.53 0.46 0.25 (2.EBTL and 6.WBTL, Start of Green	100.0	7		30.0	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.05 0.09 0.44 0.53 0.46 0.25	211/ 184			143	448
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.34 1.05 0.09 0.44 0.53 0.46 0.25	1.05 0.09 0.44 0.53 0.46 0.25	0 0			> 0	0 0
0.34 1.05 0.09 0.44 0.53 0.46 0.25	0.34 1.05 0.09 0.44 0.53 0.46 0.25	0.34 1.05 0.09 0.44 0.53 0.46 0.25	1.05 0.09 0.44 0.53 0.46 0.25 2.EBTL and 6:WBTL, Slart of Green	0 0			0	0 0
22	y	y th: 111	y ith: 111 enced to phase 2:EBTL and 6:WBTL, Start of Green	1.05			0.25	09:0
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ith: 111 enced to phase 2:EBTL and 6:WBTL, Start of Green	enced to phase 2:EBTL and 6:WBTL, Start of Green							



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

1900 5.7 0.95 0.95 1.00 3249 1.00 3249 22.3 22.3 0.19 5.7 3.0 0.13 603 0.1 5.7 1.00 1.00 0.95 501 577 22.3 22.3 0.19 5.7 3.0 107 117 15.0 G 0.94 82 0 22.3 22.3 0.19 5.7 3.0 5.9 5.9 0.61 1.00 1.8 46.7 D 46.3 D 5.7 11.00 0.95 0.69 0.69 0.69 0.94 0 66 28 22.3 22.3 0.19 5.7 3.0 228 0.08 0.43 43.3 1.00 1.3 44.6 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 249 249 265 18% 75.2 75.2 0.63 5.3 3.0 1940 0.31 0.50 12.1 0.94 0.9 12.3 B B 35.3 83.2 0.69 4.0 3.0 3.0 161 0.07 1.16 41.2 0.97 4.0 1.00 0.95 0.05 89 89 186 186 49.8 1.14 120.0 103.4% 0 2% 0.94 ↑↑ 1980 1980 1900 5.3 0.99 0.99 1.00 3262 1.00 3262 0.94 74.7 74.7 0.62 5.3 3.0 2030 0.68 1.09 22.6 0.47 44.0 54.7 2204 2% 36 NA Ť HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 4.0 1.00 0.95 1.600 0.24 405 0.94 88 88 94 82.2 82.2 0.69 4.0 3.0 3.0 3.0 0.02 0.17 0.27 7.1 0.53 0.05 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Critical Lane Group Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor -ane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS Bus Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) Lane Grp Cap (vph) Uniform Delay, d1 Progression Factor Permitted Phases v/s Ratio Perm v/s Ratio Prot v/c Ratio

12-14-2023 BA Group

Synchro 11 Report

Queues 2: Fifth Line & Derry Road

Future Background (AM)

Future Background (AM) 2027 Scenario 2

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	*	₩	F	₩	۳	₩	F	₩.	
Traffic Volume (vph)	88	1980	175	683	93	286	110	19	
Future Volume (vph)	88	1980	175	683	93	286	110	19	
Lane Group Flow (vph)	94	2207	186	992	66	386	117	103	
Turn Type	bm+pt	¥	pm+pt	A	Perm	¥	Perm	¥	
Protected Phases	2	2	_	9		∞		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	_	9	∞	∞	4	4	
Switch Phase									
Minimum Initial (s)	7.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.0	34.3	11.0	34.3	34.7	34.7	34.7	34.7	
Total Split (s)	12.0	80.0	12.0	80.0	28.0	28.0	28.0	28.0	
Total Split (%)	10.0%	%2.99	10.0%	94.99	23.3%	23.3%	23.3%	23.3%	
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.0	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.3	4.0	5.3	5.7	5.7	5.7	2.7	
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
v/c Ratio	0.26	1.09	1.15	0.50	0.43	0.62	1.09	0.16	
Control Delay	3.5	58.0	144.3	11.5	50.1	47.0	160.8	28.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		28.0	144.3	11.5	20.1	47.0	160.8	28.9	
Queue Length 50th (m)	3.5	~324.4	~39.2	55.0	22.0	43.7	~32.7	7.7	
Queue Length 95th (m)	m3.4 m	m3.4 m#355.5	#87.7	64.7	40.2	61.1	#71.9	16.0	
Internal Link Dist (m)		170.5		124.7		340.6		275.9	
Turn Bay Length (m)	100.0		0.06		70.0		50.0		
Base Capacity (vph)	363	2032	162	1971	228	619	107	679	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.26	1.09	1.15	0.50	0.43	0.62	1.09	0.16	
Intersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 120	0								
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Ovelo-150	to phase 2:	EBTL an	d 6:WBTI	., Start of	Green				
Central Tymo: Actuated Co.	potonibao								
Control Type: Actualed-Coordinated	ordinated	the consti	aller ladie	4					
 volume exceeds capacity, queue is theoretically infinite 	iry, queue is	ineoretik	cally Infin	<u>e</u>					
Queue shown is maximum after two cycles.	um after two	cycles.							
# 95th percentile volume exceeds capacity, queue may be longer	exceeds cal	oacity, qu	rene may	pe longe	ے				
Queue shown is maximum after two cycles.	um after two	cycles.							
 Wolume for 95th percentile queue is metered by upstream signal 	ntile queue i	s metere	d by upst	eam sign	lal.				

Splits and Phases: 2: Fifth Line & Derry Road

80 04 **▼** Ø6 (R) 402 (R) 02

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

Future Background (AM) 2027 Scenario 2

### FBR F	WBL WBI 67 533 67 533 1900 1900 1900 1900 100 1.00 1.00 1.0	MBR 161 161 161 161 161 161 161 161 161 16	NBL 24 24 24 1900 1 100 1100 1100 1100 0.95 993 24 0.98 6 6 6 6 0 0%	NBT N T	NBR SI 1779 2 1779 2 1779 2 1770 11900 1990 1770 11900 11900 1780 11900 0 1780 11900 0 1780 11900 0 1780 11900 0 1780 11900 0 1780 11900 1		SBR 182 182 182 182 182 1900 0.98 1900 0.98 1403 1.00 0.98 1403 1.00 0.98 186 140 140 190 190 190 190 190 190 190 190 190 19
14 14 17 1652 30 187 1652 30 187 1652 30 187 1652 30 187 1652 30 187 1		161 161 1900 0.99 1.00 0.85 1.00 1516 1100 1516 0.98 1.00 1516 1.00 1516 1.00 1516 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.					182 1900 1900 1900 1900 100 100 100 100 1908 1908
187 1652 30 1907 1907 1900 1907 1907 1900 100 1900 1900 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00		161 161 1900 1.00 0.99 1.00 1.100 1.000 1.					182 182 1900 5.7 1.00 0.98 1.00 1403 1403 1403 1403 1403 1403 1403 14
187 1652 30 1900 1900 1900 1900 1000 1000 1000 1000 1000		161 1900 5.3 1.00 0.09 1.00 1.00 1.00 1.00 1.00 1.00					182 1900 5.7 1.00 0.98 1.00 1403 1.103 0.98 180 47 47 6 6 7%
1900 1900 1900 1900 1900 1900 1900 1900		1900 6.3 1.00 0.99 1.00 1.00 1.00 1.00 1.00 1.00					1900 5.7 1.00 0.98 1.00 1.403 1.403 1.403 1.403 1.404 4.7 6 6 7%
4,0 5,3 5,3 10,0 1,00 1,00 1,00 1,00 1,00 1,00 1,		5.3 1.00 0.99 1.00 1.00 1.00 1.00 1.00 1.00					5.7 1.00 0.98 1.00 1.00 1.403 1.00 1.403 1.40 1.40 4.7 4.7 6 6 7%
0.97 0.95 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00		1,00 0,99 1,00 0,85 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,0					1.00 0.98 1.00 0.85 1.00 1.403 1.00 1.403 1.40 4.7 4.7 6 6 7%
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00		0.09 0.85 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0					0.98 1.00 0.85 1.00 1403 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.
100 1.00 1.00 1.00 1.00 1.00 1.00 1.00		1.00 0.85 1.00 1516 1.00 1.00 1.00 1.00 89 75 75 1 1 3%					1.00 0.85 1.00 1403 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.
100 1.00 0.85 0.95 1.00 1.00 3399 3438 1562 0.95 1.00 1.00 0.95 1.00 1.00 0.98 0.98 0.98 1.91 1686 31 1 1 1 1686 31 1 1 1 1686 31 1 1 1 1686 31 1 1 1 1686 31 1 1 1 1686 31 1 1 1 1686 31 1 1 1 1686 31 1 1 1 1 1686 31 1 1 1 1686 31 1 1 1 1 1686 31 1 1 1 1 1686 31 1 1 1 1 1686 31 1 1 1 1 1686 31 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							0.85 1.00 1403 1.00 1.00 0.98 186 140 47 47 6 6 7%
0.95 1.00 1.00 3.399 3.38 1562 0.98 0.98 0.98 1562 0.98 0.98 0.98 1562 1.01 1.66 31 1.01 1.66 31 1.01 1.66 11 1.01 1.66 0.02 1.20 6.02 6.02 1	- X - X - X - X - X - X - X - X - X - X						1.00 1403 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.
339 343 1562 0.95 1.00 1.00 3399 3438 1562 0.98 0.98 0.98 191 1686 31 1 1686 16 1 2% 1% 3% 5 19 1 Prot NA Perm 5 2 2 2 12.0 60.2 60.2 12.0 60.2 60.2 13.0 5.3 5.3 3.0 3.0 0.06 60.49 783 0.01 6.56 0.56 4.0 5.3 5.3 3.0 0.02 6.1 784 783 6.2 60.2 1.2 60.2 1.2 60.2 1.2 60.2 1.3 60.2 1.4 783 1.5 60.2 1.5 60.2 1.5 60.2 1.6 60.2 1.7 60.2 1.8 60.2 1.8 60.2 1.9 60.2 1.0	K - K 0 2 2						1403 1403 0.98 186 140 47 47 6 7% Perm
0.95 1.00 1.00 3.399 0.98 1.562 0.98 0.98 0.98 1.562 0.98 1.91 1.686 31 1 1 1.686 1.6 1 1 1.686 1.6 1 1 1.686 1.6 1 1 1.686 1.6 1 1 1.686 1.6 1 1 1.686 1.6 1 1 1.686 1.6 1 1 1 1.686 1.6 1 1 1 1.686 1.6 1 1 1 1 1.686 1.6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- 8 0 - 3						1.00 1403 0.98 186 140 47 47 6 7% 7% 13
339 348 1562 0.98 0.98 0.98 0.98 1 91 1686 11 1 1 168 11 2% 1% 3% 5 19 17 1 10 602 602 120 602 602 120 602 602 120 602 602 120 603 603 120 603 603 120 604 78 30 30 30 30 30 0.02 615 698 617 698 618 608 619 608 619 608 619 608 619 619 619 br>619 619 619 619 61	8 0 2 2						0.98 186 140 47 6 7% 78 Perm
0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	8 27 27						0.98 186 140 47 6 7% 78 Perm
h) 191 1686 31 h) 191 1686 16 1 2% 1% 3% 2 18 3% 5 2 2 2 2 2 2 2 2 2 2 2 2 2 12.0 60.2 60.2 1.2.0 60.2 60.2 1.2.0 60.2 60.2 1.2.0 60.2 60.2 1.2.0 60.2 60.2 1.3.0 5.3 5.3 1.3.0 5.3 5.3 1.3.0 17.4 783 6.0.6 6.49 00.2 6.16 6.49 00.2 6.17 6.6 6.49 00.2 6.18 6.6 6.49 00.2 6.18 6.6 6.49 00.2 6.18 6.6 6.49 00.2 6.18 6.6 6.49 00.2			24 0 24 6 0% 0 0m+pt				186 140 47 6 7% 13 Perm
(h) 0 0 0 15 11 1686 16 2% 1% 18 3% 5 19 1 1 Fro 1 NA Perm 5 2 2 2 2 3 12.0 60.2 60.2 0.10 0.50 0.50 4.0 5.3 5.3 17.4 783 0.06 0.08			24 6 0% 0 0m+pt				140 47 6 7% 13 Perm
h) 191 1686 16 2 18 38 5 19 1 Prot NA Perm 5 2 2 2 2 120 602 602 120 602 602 120 602 602 120 6049 339 1724 783 0.06 0.049 0.16 0.56 0.98 0.00 0.16 0.98 0.00 0.16 0.98 0.00			24 6 0% 0 0m+pt				47 7% 13 Perm
1 18 3% 5 19 1 7 19 3% 6 19 1 10 10 10 10 10 10 10 10 10 10 10 10 1			6 0% 0 0 0 0 0 0 0		Δ,		7% 13 Perm
2% 1% 3% 5 19 1 3% 5 19 1 1 20 60.2 60.2 60.2 60.2 60.2 60.2 60.2 6			0% om+pt		_,		7% 13 Perm
5 19 1 Pot NA Perm 5 2 2 2 2 2 3 12.0 60.2 60.2 0.10 0.50 0.50 4.0 5.3 5.3 1.2 3.3 17.4 783 0.06 0.09 0.15 0.98 0.00 1.2 0.00 0.16 0.98 0.00 1.2 0.00 0.16 0.98 0.00 1.2 0.			0 m+pt	21		~	13 Perm
(s) 120 602 602 (s) 120 602 602 603 603 603 603 603 603 603 603 603 603			m+pt		2	15 36	Perm
(s) 120 602 (s) 120 602 (s) 120 602 (s) 30 150 (s) 30 30 (s) 339 1724 (s) 606 6049 (s) 615 293				NA Pe	Perm pm+pt	tpt NA	
(s) 120 602 (s) 120 602 (s) 0.10 0.50 (s) 30 30 (s) 339 1724 (c) 0.06 0.049 (c) 0.56 0.98	4		က	8		7 4	
an, G (s) 12.0 60.2 an, g (s) 12.0 60.2 Ratio 0.10 0.50 Realio 0.30 3.0 sion (s) 3.0 3.0 (vph) 339 1724 n 0.56 0.49 n 0.56 29.3	0	9	00		∞		4
n. g (s) 12.0 60.2 Reatio 0.10 0.50 ne (s) 4.0 5.3 sion (s) 3.0 3.0 (vph) 339 1724 n 0.56 0.49 n 0.56 0.88	61.0 54.6	54.6	21.8	17.4 1	17.4 38	38.4 30.0	30.0
Ratio 0.10 0.50 C ne (s) 4.0 5.3 Sion (s) 3.0 3.0 Sion (s) 3.0 3.0 C (ph) 3.39 1724 O 0.06 0.09 C C 0.49 C C C C C C C C C C C C C C C C C C C			21.8				30.0
ne (s) 4.0 5.3 slon (s) 3.0 3.0 3.0 (kph) 339 1724 724 724 724 724 724 724 724 724 724	O	0.46	0.18		_	O	0.25
sion (s) 3.0 3.0 (ph) 339 1724 (c) 6.0.06 co.49 (n) 0.56 0.98 (d) 6.0.15 29.3 (d) 6.0.15 (d) 6.0.15 (e) 6.0.15			4.0				5.7
(vph) 339 1724 0.06 c0.49 n 0.56 0.98 (7,d1 51.5 29.3			3.0				3.0
n 0.56 c0.49 0.56 0.98 7,d1 51.5 29.3	`	689	210		229 3		320
0.56 0.98 51.5 29.3	0.02 0.16		0.00	60.0		12 0.13	
0.56 0.98 51.5 29.3			0.02				0.03
51.5 29.3			0.11				0.13
			40.7				34.9
1.00 1.00	_	•	1.00			`	1.00
ital Delay, d2 2.1 17.0			0.2				0.2
53.6 46	19	44	41.0	50.1 4		48.7 39.2	35.1
Q	ВВ	D	D	D	О	D D	О
y (s) 46.	24.9			47.7		41.4	
Approach LOS D	O			D		O	
Intersection Summary							
HCM 2000 Control Delay 41.4	HCM 200	HCM 2000 Level of Service	grvice		۵		
HCM 2000 Volume to Capacity ratio 0.93							
	Sum of lo	Sum of lost time (s)		-	19.0		
Intersection Capacity Utilization 91.0%	ICU Leve	ICU Level of Service			ı		
Analysis Period (min) 15							

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Background (AM) 2027 Scenario 2

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	F	‡	¥	*	‡	*	F	‡	¥	r	‡	¥C.
Traffic Volume (vph)	187	1652	30	19	533	161	24	27.1	179	27.7	377	182
Future Volume (vph)	187	1652	30	49	533	161	24	271	179	277	377	182
Lane Group Flow (vph)	191	1686	31	89	244	164	24	277	183	283	382	186
Turn Type	Prot	NA	Perm	pm+pt	M	Perm	pm+pt	M	Perm	pm+pt	NA	Perm
Protected Phases	2	2		_	9		3	∞		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	2	2	2	-	9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	53.0	53.0	11.0	47.0	47.0	21.0	35.0	35.0	21.0	35.0	35.0
Total Split (%)	14.2%	44.2%	44.2%	9.5%	39.2%	39.2%	17.5%	29.2%	29.2%	17.5%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	2.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.56	0.94	0.04	0.38	0.35	0.21	0.09	99.0	0.51	0.82	0.51	0.38
Control Delay	97.79	40.0	0.1	15.1	19.8	8.5	28.1	29.7	12.7	53.4	41.8	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	40.0	0.1	15.1	19.8	8.5	28.1	29.7	12.7	53.4	41.8	7.6
Queue Length 50th (m)	23.6	205.0	0.0	6.9	48.6	7.3	4.1	34.8	9.	57.7	45.5	0.0
Queue Length 95th (m)	35.0	#294.1	0.0	14.2	71.6	26.3	6.6	47.5	22.2	#87.2	9.69	18.4
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	383	1791	860	177	1545	96/	400	781	519	345	790	201
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.94	0.04	0.38	0.35	0.21	90:0	0.35	0.35	0.82	0.49	0.37
Intersection Summary												

Cycle Length: 120
Aduated Cycle Length: 120
Aduated Cycle Length: 120
Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 115
Confroi Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

80₄ Splits and Phases: 3: James Snow Parkway & Derry Road 🕴 💠 Ø6 (R) **→4**2 (R) **→** ØS

12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Moderment EBI EBI WBI WBI WBI NBI NBI NBI NBI SBI SBI SBI SBI SBI SBI SBI SBI SBI S	EBI EBI WBI WBI WBI WBR WBR WBR WBR WBR WBR WBI WBR				
1	May	- NBT		SBT	SBR
10	75 2137 0 0 872 91 705 2137 0 0 872 91 706 7900 7900 7900 7900 7900 1.00 0.95 0.95 0.95 1.00 0.95 1.00 0.99 1.00 0.95 1.00 0.99 1.00 0.95 1.00 0.94 99 1.00 0.92 0.92 0.92 0.92 1.00 0.92 0.92 0.92 0.92 1.00 0.92 0.92 0.92 0.92 1.00 0.94 0.99 1.00 0.92 0.92 0.92 0.92 1.00 0.94 0.99 1.00 0.94 0.94 0.99 1.00 0.94 0.99 1.00 0.94 0.94 0.99 1.00 0.94 0.94 0.99 1.00 0.94 0.94 0.99 1.00 0.94 0.94 0.99 1.00 0.92 0.92 0.92 1.00 0.94 0.94 0.99 1.00 0.94 0.94 0.99 1.00 0.95 0.95 0.92 1.00 0.95 0.95 0.92 1.00 0.94 0.94 0.94 1.00 0.95 0.95 0.92 1.00 0.94 0.94 0.94 1.00 0.95 0.94 0.94 1.00 0.95 0.95 0.92 1.00 0.79 0.36 0.36 1.00 0.79 0.36 0.36 1.00 0.70 0.70 0.36 1.00 0.71 0.72 0.35 1.00 0.71 0.72 0.34 1.00 0.72 0.78 0.35 1.00 0.74 0.75 0.35 1.00 0.75 0.76 0.35 1.00 0.75 0.76 0.35 1.00 0.70 0.70 0.70 1.00 0.70 0.70 1.00 0.70 0.70 0.70 1.00 0.70 0.70 1.00 0.70 0.	42	*	2	
100 100 100 100 1900	1900 1000 1000	7 0		10	43
1900 1900	1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1000	7 0		10	43
5.3 5.3 5.3 5.3 5.7 6.00 0.09 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.09 1.00 1.00 1.00 1.00 0.09 1.00 1.00 0.09 1.00 0.09 1.00 1.00 0.09 1.00 0.09 1.00 0.09 1.00 0.09 1.00 0.09 1.00 0.09 1.00 0.09 0.09 0.09 1.00 0.09 1.00 0.09	5.3	1900	_	1900	1900
1,00 0.95 0.95 1,00 1,00 1,00 1,00 1,00 0.95 1,00 1,00 0.95 1,00 1,00 0.95 1,00 1,00 0.95 1,00 1,00 0.95 1,00 1,00 0.95 1,00 1,00 0.95 1,00 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 0.92	1,00 0.95 0.95 1,00 0.95 1.00 0.99 1.00 0.95 1.00 0.95 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0	5.7	5.7	5.7	
1.00 1.00 0.99 1.00 1.00 0.88 1.00 1.00 0.88 1.00 1.00 1.00 0.88 1.00 1.00 1.00 0.88 1.00 1.00 1.00 0.88 1.00 1.00 1.00 0.75 1.00 0.27 1.00 0.92	1.00 1.00 0.99 1.170 3539 3489 1.00 0.27 1.00 1.00 0.27 1.00 1.00 0.27 1.00 1.00 0.27 0.92 0.92 0.92 0.92 0.94 3539 3489 0.0 0 0 3 0.94 0.0 0 0 0 3 0.94 0.0 0 0 0 3 0.94 0.0 0 0 0 3 0.94 0.0 0 0 0 0 3 0.94 0.0 0 0 0 0 3 0.94 0.0 0 0 0 0 3 0.94 0.0 0 0 0 0 0 3 0.94 0.0 0 0 0 0 0 0 0 0 0 0.94 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00	1.00	1.00	
0.95 1.00 <th< td=""><td> 100 100</td><td>1.00</td><td>1.00</td><td>0.88</td><td></td></th<>	100 100	1.00	1.00	0.88	
1770 35.39 3489 186.3 1770 16.6 94 35.39 3489 186.3 1770 16.9 94 35.39 3489 186.3 1770 16.9 94 35.39 0.92 <td> 1770 3539 3489 3489 1770 3539 1000 </td> <td>1.00</td> <td>0.95</td> <td>1.00</td> <td></td>	1770 3539 3489 3489 1770 3539 1000	1.00	0.95	1.00	
0.27 1.00 1.00 0.75 1.00 4.94 35.39 3.889 192 192 163 9.2 0.92 0.92 0.92 0.92 0.92 163 8.2 23.23 0 0 948 99 0 0 0 26 11 9.8 23.23 0 0 948 99 0 0 0 0 102 0 0 14 0	100	1863	1770	1636	
1863 1402 1636 1864 5539 3489 1863 1402 1636 1862 0.92 0.92 0.92 0.92 0.92 0.92 0.92 1862 0.92 0.92 0.92 0.92 0.92 0.92 0.92 1863 0.03 0.0 0.0 0.0 0.0 0.0 0.0 1863 0.03 0.0 0.044 0.0 0.0 0.0 0.0 0.0 1864 0.04 0.04 0.04 0.0 0.0 0.0 1865 0.03 0.03 0.03 0.00 0.00 1865 0.03 0.03 0.00 0.00 0.00 1865 0.03 0.03 0.00 0.00 1866 0.03 0.03 0.00 0.00 1867 0.03 0.03 0.00 0.00 1868 0.04 0.05 0.00 1869 0.03 0.03 0.00 0.00 1860 0.03 0.03 0.00 0.00 1860 0.03 0.03 0.00 0.00 1860 0.03 0.03 0.00 0.00 1860 0.03 0.03 0.03 1860 0.03 0.03 0.03 1860	100	1.00	0.75	1.00	
1009	1009	1863	1402	1636	
National State Nati	National State Nati	0.92		0.92	0.92
No. 10)) 0 0 0 0 3 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1			1	47
National	Perm NA pm+pt NA 0 1044 0 1044 0			44	0
Perm NA pm+pt NA Perm NA Perm 2 1 6 8 4 2 6 8 8 4 100.9 100.9 100.9 8.1 8.1 8.1 100.9 100.9 100.9 8.1 8.1 8.1 0.84 0.84 0.07 0.07 0.07 0.07 0.07 0.07 0.07 0.07 0.07 0.07 0.07 0.07 0.08 0.00 0.00 0.08<	Perm NA pm+pt NA 2 1 0 6 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			14	0
2 1 6 8 8 4 100.9 100.9 100.9 100.9 100.9 100.9 100.9 100.9 100.9 100.9 8.1 8.1 8.1 100.9 100.9 100.9 100.9 100.9 8.1 8.1 8.1 8.1 100.9 100.9 100.9 8.1 8.1 8.1 8.1 10.0 10.0 10.0 10.0 10.	2 2 1 100.9 100.9 100.9 100.9 100.9 100.9 100.9 100.9 100.9 100.9 10.84 0.84 5.3 5.3 3.0 3.0 415 2975 0.06 0.17 2975 0.20 0.78 0.20 0.78 1.69 2.73 0.1 0.2 3.2 12.3 A B B B A 12.0 B B A 12.0 B B A 12.0 B B A 12.0 B B B B A 12.0 B B A 12.0 B B B B B B B B B B B B B B B B B B B		Perm	A	
100,9 100,	2 100.9 100.	∞		4	
100.9 100.9 100.9 8.1 8.1 100.9 100.9 100.9 8.1 8.1 100.9 100.9 100.9 8.1 8.1 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.7 5.3 5.3 5.3 5.7 5.4 5.5 5.7 5.5 5.7 5.5 5.7 5.7 5.5	100.9 100.9	8	4		
100.9 100.9 100.9 8.1 8.1 0.84 0.84 0.84 0.07 0.07 0.84 0.84 0.84 0.07 0.07 0.84 0.84 0.84 0.07 0.07 0.83 3.0 3.0 3.0 3.0 0.17 0.06 0.30 0.00 0.00 0.20 0.78 0.36 0.06 0.28 0.20 0.78 0.36 0.06 0.28 0.20 0.78 0.36 0.06 0.28 0.20 0.71 0.3 0.3 0.2 0.20 0.71 0.3 0.3 0.2 0.20 0.71 0.3 0.3 0.2 0.20 0.71 0.3 0.3 0.2 0.20 0.71 0.3 0.3 0.2 0.20 0.71 0.3 0.3 0.20 0.71 0.3 0.3 0.20 0.71 0.3 0.3 0.20 0.71 0.3 0.3 0.20 0.71 0.3 0.3 0.20 0.71 0.3 0.3 0.20 0.71 0.3 0.3 0.20 0.71 0.3 0.3 0.20 0.71 0.3 0.3 0.20 0.71 0.71 0.3 0.71 0.72 0.3 0.3 0.72 0.73 0.3 0.3 0.73 0.74 0.3 0.3 0.74 0.75 0.3 0.3 0.75 0.75 0.3 0.75	s) 100.9 100.9 6.84 0.84 5.3 5.3 5.3 5.0 3.0 3.0 1.4 415 29.75 0.20 0.78 1.18 4.4 1.18 4.4 1.18 4.4 1.19 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.3 1	8.1	8.1	8.1	
0.84 0.84 0.84 0.07	0.84 0.84 5.3 5.3 5.3 3.0 3.0 3.0 3.0 0.7 0.07 0.0 0.78 1.8 4.4 1.69 2.73 d2 0.1 0.2 3.2 12.3 A B A B A B B A B B A B B A B B A B B A B B A B B A B B B A B B B A B B B A B B B A B B B B	8.1	8.1	8.1	
5.3 5.3 5.3 5.3 5.3 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7	s) 5.3 5.3 10.3 5.3 10.006 10.17 10.007 1	0.07	0.07	0.07	
10	s) 3.0 3.0 1 415 2975 0.17	5.7	5.7	2.7	
15 415 2975 2933 125 94 16 17 18 18 18 17 18 18 18 18 18 18 19 10 19 2.73 1.00 1.00 1.00 10 2.73 1.00 1.00 1.00 10 2.73 1.00 1.00 1.00 10 2.73 2.5 52.6 54.8 10 2 2.5 52.6 54.8 10 3 4 4 5 10 4 4 5 5 10 5 5 5 10 5 6 6 10 10 10 10 10 10 10 10	415 2975 0.06 0.17 0.20 0.78 1.8 4.4 1.69 2.73 42 0.1 0.2 3.2 12.3 A B B NY 10.3 10.3 10.0 9 Utilization 79 8%	3.0	3.0	3.0	
Color Colo	C0.66 0.17 0.20 0.20 0.78 1.8 4.4 1.69 2.73 4.2 1.69 2.73 4.2 1.23 A B A B 1.2.0 B M 1	125	94	110	
0.17 0.007 0.006 0.006 0.002 0.008 0.006 0.008	0.17 0.17 1.8 4.4 1.69 2.73 0.1 0.2 3.2 12.3 A B A B 12.0 B IVA IVA IO.3	0.00		0.01	
0.20 0.78 0.36 0.06 0.28 1.8	1.8 4.4 1.8 4.4 4.4 1.8 4.4 1.8 4.4 1.8 4.4 1.8 4.4 1.8 4.4 1.8 4.4 1.2 3.2 12.3 4.4 1.2 3.2 12.3 4.4 1.2 3.4		c0.02		
1.8 4.4 2.2 52.4 53.2 1.69 2.73 1.00 1.00 1.00 1.00 20 0.1 0.2 0.3 0.2 1.00 3.2 12.3 2.5 52.6 54.8 A B A A B A D D Delay A D Delay A D Delay A D Delay 10.0 1.00 1.00 1.00 1.00 1.00 2.0 2.0 2.0 1.0	1.69 2.73 1.69 2.73 1.69 2.73 1.00 0.2 3.2 12.3 A B B 1.20 B 12.0 B 10.3 to Capacity ratio 0.77 gth (s) 120.0 yt Utilization 79 8%	90:0	0.28	0.13	
1.69 2.73 1.00	1 69 2.73 1 0.2 3 1 123 A B A 12.0 B 12.0 B 10.3 Incapacity ratio 0,77 ght (s) 120.0 Multization 79 8%	52.4	53.2	52.6	
0.2	12.0 12.0 12.0 12.0 10.3 0.77 120.0 79.8%	1.00	1.00	1.00	
123 2.5 52.6 54.8 1	12.3 B 12.0 B 10.3 0.77 120.0 79.8%	0.2	1.6	0.5	
12.0 2.5 52.6 57.6 57.8 57.0 57.9 57.9 58.	12.0 B 10.3 0.77 120.0 77.8%	52.6	54.8	53.2	
120 2.5 52.6 B A D 10.3 HCM 2000 Level of Service B 0.77 1200 Sum of lost time (s) 15.0 79.8% ICU Level of Service D 15	12.0 B 10.3 0.77 120.0 79.8%	۵	٥	٥	
B A D 10.3 HCM 2000 Level of Service B 0.77 12.00 Sum of lost time (s) 15.0 79.8% ICU Level of Service D 15	10.3 0.77 120.0 77.8%	52.6		53.7	
10.3 HCM 2000 Level of Service 0.77 120.0 Sum of lost time (s) 79.8% ICU Level of Service 15	10.3 0.77 120.0 72.8%	O		O	
10.3 HCM 2000 Level of Service 0.77 120.0 Sum of lost time (s) 79.8% ICU Level of Service 15.17 15.00 Service	10.3 0.77 120.0 79.8%				
0.77 120.0 Sum of lost time (s) 79.8% ICU Level of Service 15.	0.77 120.0 79.8%	ce	В		
120.0 Sum of lost time (s) 79.8% ICU Level of Service 15	120.0 79.8%				
79.8% ICU Level of Service 15	79.8%		15.0		
od (min) 15	L 7		۵		
	CI (IIIII) DO				

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Queues 4: Clark Boulevard & Derry Road

Future Background (AM)

Future Background (AM) 2027 Scenario 2

→	BL SBT Ø1	42	24 10			rm NA	4 1	4	4 4	10.0 10.0 6.0	34.7	35.0 35.0 10.0	29.2%				5.7 5.7	Lead				. ~		. 7		15.7 16.0	313.3		342 434			0.1				Ti.				2
←	NBT SBI	2				NA Perm	œ		∞	10.0 10		35.0 35	29				5.7 5			_			١	-/		•	56.4			>	0 0					Start of Green		am signal.		
ļ	WBT	₩	872	872	1047	NA	9		9	10.0	34.3	85.0		3.7	1.6	0.0	5.3			C-Min	0.35	5.6	0.0	5.6	25.6	33.1	475.1	0000	3000	>	0 0	0.35				d 6:WBTL,		by upstre	/ Road	
†	EBT	₩	2137	2137	2323	NA	2		2	10.0	34.3	75.0	62.5%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.76	14.0	0.0	14.0	258.2	m230.7	336.0	0000	3039	0	0 0	0.76				EBTL and		is metere	ard & Derr	
1	EBL	K	75	75	82	Perm		2	2	10.0	34.3	75.0	62.5%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.19	4.0	0.0	4.0	5.2	m5.2	0	0.0/	474			0.19			0	to phase 2	ordinated	intile queue	4: Clark Boulevard & Derry Road	
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vpn)	Spallyanon Cap Reducin	Spilipack Cap Reducin	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 140	with the control of t	Splits and Phases: 4: Cl	



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Background (AM)

1900 300 300 5.7 1.00 0.98 1.00 832 1.00 832 326 5.7 3.0 2.5 2.5 1.00 0.1 Perm 11.0 ⋖ 0.38 2.7 1.00 0.2 2.9 A A A 2.8 27.1 27.1 0.68 5.7 3.0 1274 c0.26 485 NA 5.7 1.00 0.95 0.95 0.54 1012 0.92 0.02 2.0 1.00 0.0 2.0 1000 Perm 27.1 27.1 0.68 5.7 3.0 692 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service Ϋ́ 9 1.5 1.5 0.04 5.3 3.0 70 70 0.16 18.4 1.00 1.1 19.5 B Perm 1900 3.3 0.37 39.6 41.0% 5.3 1.00 0.96 1.00 1.00 1.00 1.00 0.92 1.5 0.04 5.3 3.0 67 0.00 0.12 118.4 1.00 0.8 0.8 B 1900 Ä 1 HEM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
C Critical Lane Group 10 10 5.3 11.00 11.00 0.95 11.00 11.00 11.00 11.00 Serm 1.5 1.5 0.04 5.3 3.0 70 0.16 18.4 1.00 1.1 0.00 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot Group Flow (vph Actuated Green, G (s) Effective Green, g (s) Delay (s) Level of Service Approach Delay (s) Approach LOS Turn Type Protected Phases Permitted Phases v/s Ratio Perm v/c Ratio

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Queues 5: Fifth Line & Clark Boulevard

Future Background (AM) 2027 Scenario 2

34.7 85.0 70.8% 3.7 2.0 0.0 Min 0.22 2.4 0.0 2.4 0.0 0.0 27.1 372.1 0 0 0 0 0.20 300 300 AN Min 0.29 2.7 0.0 2.7 0.0 39.0 0 0 0.26 34.7 85.0 70.8% 3.7 2.0 0.0 5.7 ¥46 ₩85 NA 1863 Perm 0.01 2.7 0.0 2.7 0.0 35.0 10.0 34.7 85.0 70.8% 3.7 2.0 0.0 5.7 34.3 35.0 29.2% 3.7 1.6 0.0 0.02 12.6 0.0 0.4 0.4 3.8 86.5 1619 29.2% 34.3 35.0 1.6 3.6 Ž 0.0 1552 Natural Cycle: 70 Control Type: Actuated-Uncoordinated 10.0 34.3 35.0 29.2% 3.7 1.6 0.0 Perm 0.02 12.6 0.0 12.6 0.4 35.0 619 Cycle Length: 120 Actuated Cycle Length: 35.2 Oueue Delay Total Delay Oueue Length 50th (m) Oueue Length 95th (m) Base Capacity (vph) Starvation Cap Reductn .ane Group Flow (vph) Internal Link Dist (m) Turn Bay Length (m) Spillback Cap Reducth Storage Cap Reductn Minimum Initial (s)
Minimum Spilt (s)
Total Spilt (s)
Total Spilt (%)
All Red Time (s)
Lost Time Adjust (s)
Total Lost Time (s) Lane Configurations Traffic Volume (vph) Lead-Lag Optimize? Recall Mode uture Volume (vph) Turn Type Protected Phases Permitted Phases Reduced v/c Ratio **Detector Phase** Control Delay Lead/Lag Ratio

9

5: Fifth Line & Clark Boulevard 80 Splits and Phases: 1 1/8

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

137 137 1900 6.3 1.00 0.94 1.00 1.00 1.00 1.00 2.28 2.28 2.28 2.28 2.28 2.38 2.38 6.3 1.00 0.95 0.64 841 0.94 99 40% 30 32 182 1900 4.0 1.00 1.00 0.95 1805 0.16 295 0.94 0 194 0% 22 22 1900 33% 1681 1681 1681 1900 6.2 0.95 1.00 2967 2967 0.94 1810 8% 54 NA 31 0% 0 0 pm+pt 4.0 1.00 1.00 0.95 0.08 148 0.94 31 0 % 0.94 475 1654 1654 1654 1900 6.2 0.95 0.99 1.00 3172 1.00 3172 1.00 3 2% 49 NA 1 158 158 1900 4.0 1.00 1.00 0.95 1763 0.07 136 0.94 168 2% Frt Fit Protected Satt Flow (prot) Fit Permitted Satd Flow (perm) Peak-hour factor, PHF Adj. Flow (vph) RTOR Reduction (vph) Permitted Phases Actuated Green, G (s) Effective Green, g (s) Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Lane Group Flow (vph) Heavy Vehicles (%)
Bus Blockages (#/hr)
Turn Type
Protected Phases

							0			0	
Incremental Delay, d2	35.9	86.5		6.0	150.7	72.5	0.3		5.9	23.8	
Delay (s)	65.4	114.6		25.2	180.6	107.1	28.8		41.0	8.59	
Level of Service	ш	ட		ပ	LL.	ட	ပ		۵	ш	
Approach Delay (s)		110.5			178.0		67.9			9.09	
Approach LOS		ш			Ŀ		ш			ш	
Intersection Summary											
HCM 2000 Control Delay		•	128.4	오	HCM 2000 Level of Service	Service		ч			
HCM 2000 Volume to Capacity ratio	ratio		1.21								
Actuated Cycle Length (s)			111.0	Su	Sum of lost time (s)			20.5			
Intersection Capacity Utilization	_	10	102.7%	ਹ	CU Level of Service			G			
Analysis Period (min)			15								
c Critical Lane Group											

0.91 42.1 1.00 23.8

0.12 0.53 38.1 1.00 2.9 41.0

1.32 29.9 1.00 150.7 180.6

Uniform Delay, d1 Progression Factor

390

35.6 35.6 0.32 4.0 3.0 189 0.0.06 0.0.26 1.03 34.5 1.00 1.00

55.4 0.50 0.50 4.0 3.0 136 0.01 0.01 0.23 24.4 1.00 1.00

62.4 62.4 0.56 4.0 3.0 3.0 189 c0.06 0.44 0.89 29.6 1.00 3.5 65.4

Lane Grp Cap (vph) v/s Ratio Perm v/s Ratio Prot

24.6 24.6 0.22 6.3 3.0

35.6 35.6 0.32 6.3 3.0 589 0.10

51.2 51.2 0.46 6.2 3.0 3.0 1368 c0.61

54.7 54.7 0.49 6.2 3.0 1563 0.58

Synchro 11 Report 12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Background (PM)

Future Background (PM) 2027 Scenario 2

Lane Group		1	†	/	Ļ	•	←	۶	→	
1 153 93 11 195 99 99 99 99 99 99 99 99 99 99 99 99 9	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
153 93 173 93 174 94 175 99 170 100 170 100 17	Lane Configurations	*	₽ ₽	F	₩.	*	£,	r	2	
153 93 195 99 105 99 107 100 100 10	Traffic Volume (vph)	158	1654	29	1681	182	153	93	214	
1 195 99 1 100 100 1 100 100 1 32.3 32.3 32.3 1 32.3 32.3 32.3 1 32.3 32.3 32.3 1 32.3 32.3 32.3 1 32.3 32.3 32.3 1 32.3 32.3 32.3 1 32.3 32.3 32.3 1 32.3 32.3 6.3 1 32.3 6.3 6.3 1 32.3 6.3 6.3 1 32.3 6.3 6.3 1 32.3 6.3 6.3 1 32.3 6.3 6.3 1 32.3 6.3 6.3 1 32.3 6.3 6.3 1 33.3	Future Volume (vph)	158	1654	29	1681	182	153	93	214	
8 8 4 4 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9	Lane Group Flow (vph)	168	1842	31	1811	194	195	66	374	
8 8 4 4 4 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	M	Perm	M	
8 8 4 4 8 100 100 100 100 100 100 100 100 100 10	Protected Phases	2	2		9	m	∞		4	
100 100 100 100 100 100 100 100 100 100	Permitted Phases	2		9		∞		4		
100 100 100 32.3 32.3 32.3 32.3 32.3 32.3 32.3 32	Detector Phase	2	2	-	9	က	00	4	4	
100 100 13.23 32.3 3.32 32.3 3.32 32.3 3.37 28.8% 4.0 4.0 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 1.4 6.3 1.4 6.3 1.	Switch Phase									
32.3 32.3 32.3 32.3 32.3 32.3 32.3 32.3	Minimum Initial (s)	7.0	25.0	7.0	25.0	7.0	10.0	10.0	10.0	
430 320 431 387% 288% 40 40 40 40 00 00 63 6.3 6.3 63 6.3 63 6.3 64 00 65 6.4 70 00 71 38.4 71.8	Minimum Split (s)	11.0	31.2	11.0	31.2	11.0	32.3	32.3	32.3	
3.87% 28.8% 4.0 4.0 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3	Total Split (s)	11.0	57.0	11.0	57.0	11.0	43.0	32.0	32.0	
4.0 4.0 4.0 2.3 2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Total Split (%)	%6.6	51.4%	%6.6	51.4%	%6.6	38.7%	28.8%	28.8%	
2.3 2.3 2.3 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	All-Red Time (s)	1.0	2.2	1.0	2.2	1.0	2.3	2.3	2.3	
6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
None Noes Noes No. 28.5 49.4 4 28.5 49.4 4 28.5 49.4 4 28.5 51.0 38.4 #11.8 30.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Lost Time (s)	4.0	6.2	4.0	6.2	4.0	6.3	6.3	6.3	
Yes None None None None None None None None	Lead/Lag	Lead	Lag	Lead	Lag	Lead		Lag	Lag	
None None None None None None None None	Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
9 033 054 0 1 285 494 0 0 0 0 1 285 494 0 1 285 494 0 2 113 198 1 2 118 30 0	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
28.5 49.4 0 28.5 49.4 0 28.5 49.4 0 31.3 19.8 3 21.8 30.0 0	//c Ratio	0.89	1.14	0.17	1.32	0.99	0.33	0.54	0.91	
28.5 49.4 43.3 49.4 43.1 30.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Control Delay	9.99	6.66	12.3	178.8	95.4	28.5	49.4	6.65	
31.3 49.4 63.1 31.3 19.8 73.0 73.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21.3 19.8 1.2 19.8 1.2 1.8 20.0 1.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Delay		6.66	12.3	178.8	95.4	28.5	49.4	66.5	
5 510 384 #11 211.8 20 5 614 194 0 0 0 0 0 0	Queue Length 50th (m)		~280.5	2.9	~285.4	31.9	31.3	19.8	77.2	
211.8 20 30.0 30 0	Queue Length 95th (m)		#325.8	7.1	#330.8	#70.5	51.0	38.4	#131.4	
30.0 614 194 0	Internal Link Dist (m)		475.1		256.2		211.8		201.7	
6 614 194 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Turn Bay Length (m)	120.0		100.0		45.0		30.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	189	1612	185	1369	195	614	194	428	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
9 032 051	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary Cycle Length: 111 Cycle Length: 110 Cycle Length: 110 Cycle Length: 110 Control Type: Actualed-Coordinated Control Type: Actualed-Coordinated Control Type: Actualed-Coordinated Countrol Type: Actualed-Cycle is a maximum after two cycles. Queue shown is maximum after two cycles. # 95th parcentile volcine exceeds capacity, queue may be longer.	Reduced v/c Ratio	0.89	1.14	0.17	1.32	0.99	0.32	0.51	0.87	
Oycle Length: 111 Offset. 0 (%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Offset. 0 (%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Oycle: 150 Control Type: Actualed-Coordinated Control Type: Actualed-Coordinated - Volume sexceeds capacity, queue is heroretically infinite Yolume working maximum after two cycles. # 95th percentiles volume exceeds capacity, queue may be longer.	Intersection Summary									
Adutated Cycle Inoght: 111 Offset 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 150 Control Type: Actuated-Coordinated Control Type: Actuated-Coordinated Countrol Type: Actuated cycles apacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer.	Cycle Length: 111									
Natural Cyole: 150 Control Type: Actuated-Coordinated Control Type: Actuated-Coordinated Control Type: Actuated Coordinated Control Type: Actuated Coordinated E. Volume exceeds capacity queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer.	Actuated Cycle Length: 11	1	E	I LOWE Y	de treet	3				
Natura to yote: 10. Control Type: Actuated-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer.	Oliset: U (U%), Releienced	10 pridse 2:1	EBIL all	1 0:WB [-, Stall 01	eell				
Outrion type: Adutated-Lootoninated Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer.	Natural Cycle: 150									
 Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. 	Control Type: Actuated-Co	ordinated								
Oueue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer.	 Volume exceeds capac 	city, queue is	theoretic	ally infin	ite.					
# 95th percentile volume exceeds capacity, queue may be longer.	Queue shown is maxim	um after two	cycles.							
	# 95th percentile volume	exceeds cap	pacity, dr	eue may	be longe	ے				
			,							

94 **№** ₩ ₩ Splits and Phases: 1: Sixth Line & Derry Road • * Ø6 (R) - B02 (R) **→**

Future Background (PM) 2027 Scenario 2 HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

	1	†	~	>	↓	4	•	←	•	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	₩		r	₽		F	₩		F	₽	
Traffic Volume (vph)	41	1559	79	92	1809	111	218	69	187	327	299	77
Future Volume (vph)	41	1559	79	92	1809	111	218	69	187	327	299	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	2.7		4.0	2.7	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.97	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1600	3261		1587	3294		1698	3054		1501	3343	
Fit Permitted	90:0	1.00		90:0	1.00		0.30	1.00		0.49	1.00	
Satd. Flow (perm)	104	3261		100	3294		537	3054		770	3343	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	44	1659	84	8	1924	118	232	73	199	348	318	82
RTOR Reduction (vph)	0	3	0	0	4	0	0	101	0	0	19	0
Lane Group Flow (vph)	44	1740	0	86	2038	0	232	171	0	348	381	0
Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
Bus Blockages (#/hr)	4	36	2	9	22	22	co	33	2	13	-	2
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	MA	
Protected Phases	വ	2		-	9		co	∞		7	4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	70.4	64.7		74.6	8.99		28.5	18.5		28.5	18.5	
Effective Green, g (s)	70.4	64.7		74.6	8.99		28.5	18.5		28.5	18.5	
Actuated g/C Ratio	0.59	0.54		0.62	0.56		0.24	0.15		0.24	0.15	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	2.7		4.0	2.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	132	1758		158	1833		224	470		243	515	
v/s Ratio Prot	0.02	0.53		c0.04	c0.62		0.09	90.0		c0.12	0.11	
v/s Ratio Perm	0.18			0.34			0.16			c0.22		
v/c Ratio	0.33	0.99		0.62	1.11		1.04	0.36		1.43	0.74	
Uniform Delay, d1	26.3	27.3		24.2	56.6		43.2	45.5		44.1	48.4	
Progression Factor	1.80	0.78		1.09	1.02		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.0	14.6		4.4	55.7		8.69	0.5		216.5	5.5	
Delay (s)	48.2	35.9		30.7	87.8		112.9	46.0		260.6	53.9	
Level of Service	O	D		O	ш		ш	D		ш	O	
Approach Delay (s)		36.2			80.4			76.8			150.1	
Approach LOS		٥			ш.			ш			ш.	
Intersection Summary												
HCM 2000 Control Delay			74.9	H	HCM 2000 Level of Service	evel of S	service		Е			
HCM 2000 Volume to Capacity ratio	city ratio		1.19									
Actuated Cycle Length (s)			120.0	S	Sum of lost time (s)	time (s)			19.0			
Intersection Capacity Utilization	tion		101.7%	⊇	ICU Level of Service	f Service			G			
Analysis Period (min)			15									

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Background (PM) 2027 Scenario 2

Application		1	†	-	Ļ	•	←	۶	→	
1	-ane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
1559 92 1899 28 69 327 41 1559 92 1899 218 69 327 41 1559 92 1899 218 69 327 41 11559 92 1899 218 69 327 44 1143 98 2042 232 272 348 71 8	-ane Configurations	*	₩.	۴	₩.	۴	₩	F	₩	
Purple NA Purple	Traffic Volume (vph)	41	1559	92	1809	218	69	327	299	
Purple NA	-uture Volume (vph)	41	1559	92	1809	218	69	327	599	
pm+pt NA pm+pt NA pm+pt NA pm+pt NA pm+pt S 2 1 6 3 8 7 7 2 6 1 6 3 8 7 7 7 2 20 0 7.0 10.0 7.0 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.7 11.0 11.0 34.3 11.0 34.3 11.0 34.7 11.0 11.0 34.3 11.0 34.7 11.0 11.0 1.0 1.0 1.0 1.0 20 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.0% 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Lane Group Flow (vph)	44	1743	86	2042	232	272	348	400	
5	Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	M	pm+pt	M	
2 6 8 8 4 4 5 2 1 6 6 8 8 4 4 7 0 20.0 7.0 20.0 7.0 100 7.0 11.0 34.3 11.0 34.3 11.0 34.7 11.0 11.0 67.0 11.0 67.0 14.0 28.0 14.0 9 2% 55.8% 9 2% 55.8% 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 23.8 11.7% 24.0 5.7 4.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Protected Phases	വ	2		9	က	00	7	4	
5 2 1 6 3 8 7 70 20.0 7.0 20.0 7.0 10.0 7.0 11.0 34.3 11.0 34.3 11.0 34.7 11.0 11.0 34.3 11.0 34.3 11.0 34.7 11.0 11.0 34.3 11.0 34.3 11.0 34.7 11.0 12.8 3.7 3.0 3.7 3.3 3.3 3.3 10 10 10 10 10 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.29 0.99 0.62 1.10 0.48 1.37 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Permitted Phases	2		9		∞		4		
7.0 20.0 7.0 20.0 7.0 10.0 7.0 11.0 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.7 11.0 11.0 67.0 11.0 67.0 14.0 28.0 14.0 92.8 55.8% 9.2% 55.8% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.0 3.7 3.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Detector Phase	2	2	_	9	က	∞	7	4	
10 200 70 200 70 100 70 110 110 110 110 110 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.4 11.0 34.0 34.0 37	Switch Phase									
11.0 34.3 11.0 34.3 11.0 34.7 11.0 11.0 66.0 11.0 66.0 14.0 14.0 22% 55.8% 9.2% 55.8% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.2% 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Winimum Initial (s)	7.0	20.0	7.0	20.0	7.0	10.0	7.0	10.0	
110 670 110 670 140 280 140 280 140 92.8 55.8% 92% 55.8% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.7% 23.3% 11.2% 21.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Vinimum Split (s)	11.0	34.3	11.0	34.3	11.0	34.7	11.0	34.7	
9.2% 55.8% 9.2% 55.8% 11.7% 23.3% 11.7% 2 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Fotal Split (s)	11.0	0.79	11.0	0.79	14.0	28.0	14.0	28.0	
3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 1.0 1.0 1.0 1.6 1.0 1.6 1.0 20 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Fotal Split (%)	9.5%	55.8%	9.2%	55.8%	11.7%	23.3%	11.7%	23.3%	
1.0 1.6 1.0 1.6 1.0 20 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(ellow Time (s)	3.0	3.7	3.0	3.7	3.0	3.7	3.0	3.7	
100 0.0	All-Red Time (s)	1.0	1.6	1.0	1.6	1.0	2.0	1.0	2.0	
100 100	ost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lead Lag Lead Lag Lead Lag Lead Aves Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	Fotal Lost Time (s)	4.0	5.3	4.0	5.3	4.0	5.7	4.0	2.7	
Ves	-ead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	
None C-Min None C-Min Nane Nane O.29 0.99 0.62 1.110 1.00 0.48 1.37 1.90 37.4 31.1 77.5 98.8 27.9 222.5 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	ead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
19.0 37.4 31.1 77.5 98.8 13.7 12.25 19.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
19.0 37.4 31.1 77.5 98.8 27.9 222.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	/c Ratio	0.29	0.99	0.62	1.10	1.00	0.48	1.37	0.75	
19.0 37.4 31.1 77.5 98.8 279 2225 19.0 37.4 31.1 77.5 98.8 279 2225 19.0 37.4 31.1 77.5 98.8 279 2225 19.0 37.4 71.5 17.9 19.0 37.4 71.5 17.9 19.0 37.4 71.5 17.9 19.0 37.4 71.5 17.9 19.0 37.4 71.5 17.9 19.0 37.4 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10	Control Delay	19.0	37.4	31.1	77.5	8.86	27.9	222.5	54.6	
19.0 37.4 31.1 77.5 98.8 27.9 222.5 3.4 - 116.7 13.5 - 30.7.1 47.5 17.9 - 109.9 m.5.4 + 218.7 m.19.7 + 336.8 #78.6 m.5.4 + 2109.9 m.5.4 + 218.7 m.19.7 + 336.8 #78.6 m.5.4 170.5 m.5.4 170.5 124.7 340.6 50.0 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Dueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3.4 -116.7 13.5 -30.71 47.5 17.9 -109.9 m5.4 #283.7 m19.7 #36.8 #78.6 30.8 #167.4 100.0 170.5 90.0 124.7 70.0 30.8 #167.4 50.0 151 1760 159 1899 232 664 254 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	otal Delay	19.0	37.4	31.1	77.5	8.86	27.9	222.5	54.6	
m5.4 #283.7 m19.7 #346.8 #78.6 30.8 #167.4 170.5 124.7 340.6 100.0 90.0 151 170.5 124.7 0.0 90.0 151 176.0 90.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Jueue Length 50th (m)	3.4	~116.7	13.5	~307.1	47.5	17.9	~109.9	47.4	
100.0 170.5 124.7 340.6 100.0	Jueue Length 95th (m)	m5.4	#283.7	m19.7	#366.8	#78.6	30.8	#167.4	63.2	
100.0 90.0 70.0 50.0 100	nternal Link Dist (m)		170.5		124.7		340.6		275.9	
151 1760 159 1889 232 664 254 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Furn Bay Length (m)	100.0		0.06		70.0		20.0		
120 Coordinated pacity, queue is theoretically infinite. from seeds capacity, queue may be longer. from affer two cycles.	Sase Capacity (vph)	151	1760	159	1859	232	664	254	639	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
2.EBTL and 6:WBTL, Start of Green sis theoretically infinite. 2.epacity, quoue may be longer.	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
2:EBTL and 6:WBTL, Start of Green is theoretically infinite. sapacity queue may be longer. sno cycles.	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary ycle Length: 120 ycle Length: 120 Jifset. 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Jifset. 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Joint of Type: Actualed-Coordinated Volume exceeds capacity, queue is theoretically infinite. Oueues shown is maximum after two cycles. Oueues shown is maximum after two cycles. Oueues shown is maximum after two cycles.	Reduced v/c Ratio	0.29	0.99	0.62	1.10	1.00	0.41	1.37	0.63	
ycle Length: 120 Affaulated Oyde, Referenced to phase 2:EBTL and 6:WBTL, Start of Green Affaulated Oyde, Referenced to phase 2:EBTL and 6:WBTL, Start of Green Altural Cycle: 145 Control Type: Actuated-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Oueue shown is maximum after two cycles. A 9th percentil volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles.	ntersection Summary									
Aduated Cycle Length: 120 Tylest. 0 (096), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Altural Cycle: 145 Control Type: Actuated-Coordinated Volume exceeds capacity, queue its theoretically infinite. Volume exceeds capacity, queue its theoretically infinite. Yes the precentile volume exceeds capacity, queue may be longer. Oueues shown is maximum after two cycles. Oueues shown is maximum after two cycles.	Sycle Length: 120									
inservo (volgo, reservo de prose 2. Lo fil and o volgo fil, soar de caracteristica de la filoso 2. Lo fil and o volgo fil and de caracteristica de caracteri	Actuated Cycle Length: 120) to phace 2:	FDTI any	ITG/W/-9	Chart of	r con				
acioral cycles. Actualed-Coordinated Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. Queue shown is maximum after two cycles. Queue shown is maximum after two cycles.	Matural Cycle: 145	to pridate 2.	בטור מוני	0.00	, otalio	555				
 Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after livo cycles. A 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after livo cycles. 	Control Type: Actuated-Coc	ordinated								
Oueue shown is maximum after two cycles. 95th percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles.	 Volume exceeds capac 	ily, queue is	theoretic	ally infini	<u>a</u>					
 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. 	Queue shown is maximu	um after two	cycles.							
Queue shown is maximum after two cycles.	95th percentile volume	exceeds ca	oacity, qu	eue may	be longer	, .				
	Queue shown is maximu	um after two	cycles.							

Splits and Phases: 2: Fifth Line & Derry Road

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

Future Background (PM)

209 209 5.7 1.00 0.98 1.403 0.98 213 50 60 7% 28.3 28.3 0.24 5.7 330 0.04 0.15 36.3 1.00 0.2 36.6 443 1900 5.7 0.95 1.00 1.00 1.00 1.00 3046 3046 0.98 452 10% ₹ 0.15 1.00 D 17.4 pm+pt 298 298 1900 4.0 1.00 1.00 1.00 0.95 0.32 545 0.98 304 2% Perm 0.03 43.5 1.00 0.3 43.8 D 19.0 184 184 900 5.7 5.7 1.00 1.00 1% 3.0 344 D 47.1 337 337 337 1900 5.7 0.95 1.00 1.00 1.00 1.00 1.00 0.98 ¥ 19.2 19.2 0.16 0.67 3.5 % 7 79 79 79 70 1.00 1.00 1.00 1.00 1.00 1.00 931 0.98 0 18 % pm+pt 4.0 3.0 267 0.02 0.05 0.30 0.6 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service Perm 404 404 404 1900 5.3 5.3 1.00 0.99 1.00 1.00 1.00 1.00 0.98 52.6 52.6 0.44 412 156 256 3% 664 22.8 1.56 0.2 35.6 1317 1900 5.3 0.95 1.00 1.00 1.00 1.00 1.00 3305 3305 ¥ 52.6 52.6 0.44 1344 1344 4% 1.03 320 320 c0.12 pm+pt 0.35 0.82 34.2 0.81 259 259 1900 1.00 1.00 1.00 1.00 0.95 0.08 0.98 264 3% 68.8 68.8 0.57 41.0 0.95 120.0 88.2% Perm 46.9 9 0.00 0.01 22.4 1.00 0.0 5.3 0.85 1.00 1.00 1.00 1562 0.98 3% 610 1164 11164 11164 1100 11.00 11.00 11.00 11.00 11.00 11.00 11.00 11.00 1188 Š 46.9 0.39 5.3 3.0 1343 0.35 44.1 0.98 1% 34.0 1.00 8.8 42.8 13% 12.2 12.2 0.10 4.0 3.0 3.45 0.06 192 192 1900 4.0 0.97 1.00 1.00 1.00 0.95 3399 3399 0.98 2% Prot 0.57 1.00 2.1 53.5 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Actuated Cycle Length (s) Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp., pedbikes
Said. Flow (perm)
Fit Portected
Said. Flow (perm)
Peak-hour factor, PHF
Peak-hour factor, PHF
Red., Flow (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Actuated Green, G (s) Clearance Time (s) Vehicle Extension (s) Incremental Delay, d2 Effective Green, g (s) Actuated g/C Ratio Bus Blockages (#/hr) Turn Type Protected Phases Permitted Phases Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Background (PM) 2027 Scenario 2

	1	†	/	-	↓	4	•	←	*	۶	→	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	K.	‡	*	<i>y-</i>	‡	¥C.	r	‡	*-	<i>y</i> -	‡	¥.
Traffic Volume (vph)	192	1164	16	259	1317	404	79	337	184	298	443	209
Future Volume (vph)	192	1164	16	259	1317	404	79	337	184	298	443	209
Lane Group Flow (vph)	196	1188	16	264	1344	412	81	344	188	304	452	213
Turn Type	Prot	NA	Perm	pm+pt	M	Perm	pm+pt	¥	Perm	pm+pt	NA	Perm
Protected Phases	2	2		_	9		က	00		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	2	2	2	-	9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	53.0	53.0	11.0	47.0	47.0	21.0	35.0	35.0	21.0	35.0	35.0
Total Split (%)	14.2%	44.2%	44.2%	9.5%	39.2%	39.2%	17.5%	29.2%	29.2%	17.5%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.57	0.87	0.02	0.82	0.91	0.50	0.27	0.70	0.48	06:0	0.63	0.43
Control Delay	97.6	41.5	0.1	29.3	34.5	13.2	29.0	55.7	12.3	62.4	46.0	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	41.5	0.1	29.3	34.5	13.2	29.0	55.7	12.3	62.4	46.0	7.8
Queue Length 50th (m)	24.2	140.8		40.9	177.6	48.6	13.8	43.2	3.2	6.09	54.6	0.0
Queue Length 95th (m)	35.7	172.2	0.0	m#52.1 m#1	#176.1	m54.9	23.7	56.4	23.4	#84.4	71.0	19.8
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	386	1366	619	320	1470	828	411	781	518	338	497	513
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.87	0.02	0.82	0.91	0.50	0.20	0.44	0.36	0.00	0.59	0.42
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	ed to phas	e 2:EBT a	and 6:WE	TL, Start	of Green							

Vatural Cycle: 105

Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Ø3 3: James Snow Parkway & Derry Road Splits and Phases: 01

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12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Background (PM) 2027 Scenario 2

	1	†	<u> </u>	\	Ļ	1	•	←	•	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
-ane Configurations	<i>K</i>	₩		K	₩		F	¢\$		K	£	
raffic Volume (vph)	9	1853	0	0	1959	24	0	9	0	74		169
uture Volume (vph)	30	1853	0	0	1959	24	0	10	0	74	7	169
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Fotal Lost time (s)	5.3	5.3			5.3			5.7		5.7	5.7	
-ane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	
=	1.00	1.00			1.00			1.00		1.00	98.0	
-It Protected	0.95	1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539			3533			1863		1770	1595	
It Permitted	0.04	1.00			1.00			1.00		0.75	1.00	
Satd. Flow (perm)	83	3539			3533			1863		1398	1595	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	2014	0	0	2129	56	0	=	0	80	∞	184
ROR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	12	0
ane Group Flow (vph)	33	2014	0	0	2155	0	0	7	0	80	180	0
urn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	¥	
Protected Phases		2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	90.2	90.2			90.2			18.8		18.8	18.8	
Effective Green, g (s)	90.2	90.2			90.2			18.8		18.8	18.8	
Actuated g/C Ratio	0.75	0.75			0.75			0.16		0.16	0.16	
Clearance Time (s)	5.3	5.3			5.3			2.7		2.7	2.7	
/ehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
ane Grp Cap (vph)	62	2660			2655			291		219	249	
//s Ratio Prot		0.57			c0.61			0.01			c0.11	
/s Ratio Perm	0.40									90.0		
//c Ratio	0.53	97.0			0.81			0.04		0.37	0.72	
Jniform Delay, d1	6.2	9.8			9.5			42.9		45.3	48.1	
Progression Factor	1.74	1.78			1.00			1.00		1.00	1.00	
ncremental Delay, d2	7.4	0.5			2.8			0.1		1.0	10.0	
Delay (s)	18.1	15.8			12.3			43.0		46.3	58.1	
evel of Service	<u>B</u>	В			В			۵		۵	ш	
Approach Delay (s)		15.8			12.3			43.0			54.6	
pproach LOS		В			В			Ω			٥	
ntersection Summary												
ICM 2000 Control Delay			16.6	ĭ	HCM 2000 Level of Service	evel of S	ervice		В			
HCM 2000 Volume to Capacity ratio	city ratio		0.83									
ctuated Cycle Length (s)			120.0	S	Sum of lost time (s)	time (s)			15.0			
ntersection Capacity Utilization	tion		74.9%	೨	ICU Level of Service	f Service			D			
Analysis Period (min)			15									
: Critical Lane Group												

12-14-2023 BA Group

Queues 4: Clark Boulevard & Derry Road

Future Background (PM) 2027 Scenario 2

Lead Yes None 6.0 10.0 10.0 8% 3.0 1.0 34.7 35.0 29.2% 3.7 2.0 0.0 None 0.74 60.5 0.0 60.5 42.6 64.3 313.3 7 NA 400 74 74 80 Perm 34.7 35.0 29.2% 3.7 2.0 0.0 None 0.37 48.4 0.0 48.4 18.0 31.6 40.0 Cycle Length: 120
Actuated Cycle Length: 120
Actuated Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 110
Control Type: Actuated-Coordinated

Wolume for 95th percentile queue is metered by upstream signal. None 0.04 39.7 0.0 39.7 2.4 7.4 56.4 34.7 35.0 29.2% 3.7 2.0 0.0 **☆**2955 1959 1959 2155 NA 2656 2660 ## 1853 1853 2014 NA Perm Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced v/c Ratio Leading Lead-Lag Optimize? Recall Mode W Ratio Control Delay Queue Length Soft (m) Deuere Length Soft (m) Internal Link Dist (m) Internal Link Dist (m) Turn Bay Length (m) -ane Group Flow (vph) Detector Phase
Switch Phase
Minimum Initial (s)
Minimum Split (s)
Total Split (s)
Yellow Time (s)
Lost Time Adjust (s)
Total Lost Time (s) ntersection Summary Lane Configurations Traffic Volume (vph) -uture Volume (vph) Turn Type Protected Phases Permitted Phases

Splits and Phases: 4: Clark Boulevard & Derry Road

12-14-2023 BA Group

Synchro 11 Report

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Background (PM)

1900 0.45 4.4 1.00 0.3 0.61 459 5.7 1.00 1.00 1856 0.92 Perm 11.0 ⋖ 0.42 4.3 1.00 0.2 4.5 A 25.7 25.7 0.61 5.7 3.0 3.0 113.7 0.25 473 5.7 1.00 1.00 0.95 1770 0.46 858 858 0.00 0.01 3.2 1.00 0.0 3.2 A Perm 25.7 25.7 0.61 5.7 3.0 523 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 1900 5.4 5.4 0.13 5.3 3.0 238 0.00 5.3 1.00 1.00 1.00 1863 1863 0.92 Ϋ́ 9 0.03 1.00 0.1 16.1 1900 Perm 5.4 0.41 42.1 42.8% 01 0061 **₹** 0 0 0 **1** 5.3 11.00 0.93 17.23 17.23 17.23 17.23 12 NA NA 5.4 0.13 5.3 3.0 221 0.01 0.06 11.00 0.1 16.2 B B 16.8 1 5.3 1.00 1.00 0.95 0.75 1402 0.92 42 39 39 1900 Serm 5.4 5.4 0.13 5.3 3.0 0.23 0.23 16.5 1.00 0.7 17.2 B Intersection Summary
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio Actuated Cycle Length (s) Intersection Capacity Utilization Analysis Period (min) C Critical Lane Group Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Turn Type
Protected Phases
Permitted Phases
Actuated Green, G (s) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot -ane Group Flow (vph Effective Green, g (s) Delay (s) Level of Service Approach Delay (s) Approach LOS v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 5: Fifth Line & Clark Boulevard

Future Background (PM) 2027 Scenario 2

→	SBT	æ	459	459	211	NA	4		4		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	2.7			Min	0.38	8.9	0.0	8.9	23.4	44.3	372.1		1855	0	0	0	0.28					
—	NBT	÷	435	435	473	M	∞		∞		10.0	34.7	82.0	70.8%	3.7	2.0	0.0	5.7			Min	0.35	6.5	0.0	6.5	21.2	39.9	156.9		1863	0	0	0	0.25					
•	NBL	<i>y</i> -	4	4	4	Perm		∞	∞		10.0	34.7	82.0	70.8%	3.7	2.0	0.0	2.7			Min	0.01	5.5	0.0	5.5	0.2			35.0	857	0	0	0	0.00					
Ļ	WBT	æ	7	7	∞	Ν	9		9		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	12.7	0.0	12.7	9.0	2.7	86.5		1436	0	0	0	0.01					
†	EBT	æ	10	10	22	NA	2		2		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	10.1	0.0	10.1	6:0	4.3	204.0		1330	0	0	0	0.02					
1	EBL	<i>y</i> -	36	36	42	Perm		2	2		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.12	14.1	0.0	14.1	3.3	7.7		32.0	1080	0	0	0	0.04					oordinated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 39.8	Natural Cycle: 70	Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard 9 **₽ 1**

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

	1	Ť	<u> </u>	/	Ļ	1	•	—	4	٠	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	r	₩		r	₩		F	£		r	2	
Traffic Volume (vph)	159	1963	155	23	991	38	82	167	30	34	131	124
Future Volume (vph)	159	1963	155	23	997	38	82	167	30	34	131	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	3160		1805	2929		1805	1843		1258	1737	
FIt Permitted	0.27	1.00		90:0	1.00		0.30	1.00		0.45	1.00	
Satd. Flow (perm)	504	3160		114	2929		573	1843		593	1737	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	169	2088	165	24	815	40	06	178	32	36	139	132
RTOR Reduction (vph)	0	4	0	0	က	0	0	7	0	0	34	0
Lane Group Flow (vph)	169	2249	0	24	852	0	06	203	0	36	237	0
Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
Bus Blockages (#/hr)	1	49	2	0	54	2	0	0	1	9	1	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	78.4	70.3		9.07	66.4		20.0	20.0		20.0	20.0	
Effective Green, g (s)	78.4	70.3		9.07	66.4		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.71	0.63		0.64	09.0		0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	447	2001		136	1752		103	332		106	312	
v/s Ratio Prot	c0.03	c0.71		0.01	0.29			0.11			0.14	
v/s Ratio Perm	0.24			0.10			c0.16			90.0		
v/c Ratio	0.38	1.12		0.18	0.49		0.87	0.61		0.34	0.76	
Uniform Delay, d1	6.3	20.4		25.2	12.6		44.3	41.9		39.7	43.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	65.6		9.0	1.0		20.7	3.3		1.9	10.4	
Delay (s)	9.9	83.3		25.8	13.6		94.9	45.3		41.6	53.7	
Level of Service	V	ш		ပ	В		ш	۵		۵	۵	
Approach Delay (s)		77.9			13.9			60.2			52.3	
Approach LOS		ш			В			ш			D	
Intersection Summary												
HCM 2000 Control Delay			60.2	I 보	M 2000 I	HCM 2000 Level of Service	ervice		ш			
HCM 2000 Volume to Capacity ratio	y ratio		1.04									
Actuated Cycle Length (s)			111.0	S	Sum of lost time (s)	time (s)			16.5			
Intersection Capacity Utilization	u		106.8%	⊇	CU Level of Service	f Service			G			
Analysis Period (min)			15									

Analysis Period (min) c Critical Lane Group

Synchro 11 Report

12-14-2023 BA Group

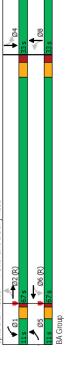
Queues 1: Sixth Line & Derry Road

Future Total (AM) 2027 Scenario 2

Future Total (AM) 2027 Scenario 2

Control Columnic Co									
167 34 1		EBT	WBL	WBT	NBL	NBT	SBL	SBT	
167 34 167 34 167 34 167 34 167 34 168 170 36 18 4 18 8 4 18 8 4 19 323 170 29,7% 29,7% 29,7% 29,7% 29,7% 29,7% 20,000 170 00 00 00 00 00 00 00 00 00 00 00 00 0	ane Configurations	₩.	<i>y</i> -	₩.	r	÷	r-	\$	
167 34 NA Perm 8 4 14 4 18 8 4 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.		1963	23	99/	82	167	34	131	
210 36 NA Perm 8 4 4 8 8 4 4 8 8 4 4 8 8 4 4 8 10.0 10.0 10.0 10.0 3 32.3 32.3 3 32.3 32.3 3 32.3 32.3 3 32.3 32.		1963	23	99/	82	167	34	131	
NA Perm 8 8 4 4 8 8 4 4 8 8 4 4 8 8 4 4 7 8 7 8		2253	24	855	06	210	36	27.1	
8 4 4 3 8 4 4 3 10.0 10.0 3 32.3 32.3 32.3 3 32.3 32.3 32.3 3 32.3 32.		¥	bm+pt	¥	Perm	≨	Perm	≨	
8 8 4 100 1000 1001 1001 1001 1003 1003 1003		2	_	9		∞		4	
3 8 4 4 3 10.0 10.0 3 2.3 32.3 3 32.3 32.3 3 32.3 32.3 3 32.3 32.			9		∞		4		
10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0	a	2	_	9	∞	∞	4	4	
10.0 10.0 3.2 3.3 3.2 3.3 3.3 3.3 3.3 3.3 3.3 3.3									
33.23 33.23 33.23 33.0 33.0 33.0 4.0 4.0 4.0 4.0 6.0 6.0 6.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9	•	25.0	7.0	25.0	10.0	10.0	10.0	10.0	
330 330 330 330 330 330 330 330 330 330		31.2	11.0	31.2	32.3	32.3	32.3	32.3	
29,7% 29,7%		0.79	11.0	0.79	33.0	33.0	33.0	33.0	
40 40 40 40 40 63 63 63 63 63 63 63 63 63 63 63 63 63		60.4%	%6.6	60.4%	29.7%	29.7%	29.7%	29.7%	
2.3 2.3 2.3 2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0		4.0	3.0	4.0	4.0	4.0	4.0	4.0	
9 6.3 6.3 None None None No 6.0 2 47.7 46.6 5 2 17.8 7 6 3.3 16.8 7 6 3.3 16.8 7 6 449 142 0		2.2	1.0	2.2	2.3	2.3	2.3	2.3	
8 6.3 6.3 None None 7 0.52 0.34 7 0.62 0.34 8 47.7 46.6 1 42.8 16.8 211.8 2 211.8 30.0 9 0 0 0 0 0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
None None P 0.02 0.34 4.7 46.6 0.00 0.00 0.00 0.00 0.00 0.00 0.00	Time (s)	6.2	4.0	6.2	6.3	6.3	6.3	6.3	
None None P	_	Lag	Lead	Lag					
None None 7 7 0.52 0.34 7.5 0.		Yes	Yes	Yes					
7 0.62 0.34 2 47.7 46.6 0 0.0 2 47.7 46.6 1 42.8 7.2 211.8 30.0 7 449 142 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		C-Min	None	C-Min	None	None	None	None	
2 47.7 466 9 2 0.0 0 2 47.7 466 9 42.8 7.2 8 42.8 7.2 8 44.9 142 30.0 7 44.9 142 30.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	1.10	0.13	0.49	0.87	0.62	0.34	0.78	
2 47.7 46.6 E 47.7 E 57.7 E 57.		74.6	7.1	14.5	104.2	47.7	46.6	52.1	
2 47.7 46.6 1 1 42.8 1 42.8 20 211.8 20 211.8 30.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
63.3 16.8 7.2 11.8 30.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.8	74.6	7.1	14.5	104.2	47.7	46.6	52.1	
211.8 20 211.8 20 7 449 142 0 0 0 0 0 0 0 0 0 5 0.47 0.25 (10.2	-325.0	1.3	55.2	20.1	42.8	7.2	20.7	
211.8 30.0 7 449 142 0 0 0 0 0 0 0 0 0 5 0.47 0.25 (21.2	#393.1	4.5	79.8	#43.9	63.3	16.8	75.6	
30.0 7 449 142 0 0 0 0 0 0 0 0 0 5 0.47 0.25 (475.1		256.2		211.8		201.7	
7 449 142 0 0 0 0 0 0 0 0 0 5 0.47 0.25 (100.0		45.0		30.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		2050	184	1756	137	449	142	448	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0	0	0	0	0	0	0	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0	0	0	0	0	0	0	
5 0.47 0.25		0	0	0	0	0	0	0	
Intersection Summary Cycle Lenght: 111 Actuated Cycle Lenght: 111 Actuated Cycle Lenght: 111 Oxidise to (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 150 Control Type: Actuated-Coordinated Control Type: Actuated-Coordinated		1.10	0.13	0.49	99.0	0.47	0.25	09.0	
Cycle Length: 111 Actuated Cycle Length: 111 Actuated Cycle Length: 111 Natural Cycle: 150 Control Type: Actuated Coordinated Control Type: Actuated Coordinated	ntersection Summary								
Aduated Cycle Length: 111 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 150 Control Type: Aduated-Coordinated Control Type: Aduated-Coordinated	Sycle Length: 111								
Values to (U.V.), Neterences to phase 2.LB1c and 0.WB1c, start of street Collection (1.15). Out of the Collection of the	ctuated Cycle Length: 111	Dac	F.M.DTI	Chartof	200				
Control Type: Actuated-Coordinated	atural Cycle: 150	2 2 2	0.00	o da co	5				
Well-man account a consolity action to the constitution in the constitution	control Type: Actuated-Coordinated								
 Volume exceeds capacily, queue is irredietically fillinitie. 	Volume exceeds capacity, queue is theoretically infinite	theoretic	ally infini:	<u>е</u>					
Queue shown is maximum after two cycles.	Queue shown is maximum after two	cycles.							
# 95th percentile volume exceeds capacity, queue may be longer.	95th percentile volume exceeds cap	acity, our	Trow one	A OPPOR					
volume exceeds capacity, queue is indentically finnine. Oubue shown is maximum after two cycles. 95th percentile volume exceeds capacity, queue may be longer.	Iural Cycle: 150 Introl Type: Actuated-Coordinated Volume exceeds capacity, queue is Queue shown is maximum after two 95th percentile volume exceeds cap	theoretic sydes.	ally infini	he le					

Splits and Phases: 1: Sixth Line & Derry Road



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

1900 5.7 0.95 0.95 1.00 3249 1.00 3249 22.3 22.3 0.19 5.7 3.0 0.13 603 0.1 112 5.7 1.00 1.00 0.95 1501 0.37 577 577 119 22.3 22.3 0.19 5.7 3.0 107 15.0 G 0.94 82 0 44 286 286 286 1900 5.7 0.95 3225 3225 334 20 3366 9% 0.61 1.00 1.8 46.7 93 93 1900 5.7 1.00 1.00 0.95 1698 0.69 99 0 66 22.3 22.3 0.19 5.7 3.0 228 0.08 0.43 43.3 1.00 1.3 44.6 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 266 250 250 1900 18% 75.2 75.2 0.63 5.3 3.0 1947 0.33 0.52 12.4 0.91 1.0 12.2 B 34.4 4.0 1.00 0.95 0.05 89 89 1.86 83.2 0.69 4.0 3.0 3.0 1.16 1.16 41.2 0.99 117.9 0 186 11% 65.1 1.15 120.0 107.0% 0 2% 0.94 475 2110 2110 1900 5.3 0.95 0.99 1.00 3263 3263 0.94 2245 2343 2% 36 NA 74.7 74.7 0.62 5.3 3.0 2031 0.72 1.15 22.6 0.49 72.1 83.2 Ť HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 88 88 88 88 4.0 11.00 11.00 1600 00.95 377 377 82.2 82.2 0.69 4.0 3.34 0.02 0.02 7.3 0.28 7.3 94 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor -ane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS 3us Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) -ane Grp Cap (vph) Uniform Delay, d1 Progression Factor Permitted Phases v/s Ratio Perm v/s Ratio Prot v/c Ratio

Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (AM) 2027 Scenario 2

Future Total (AM) 2027 Scenario 2

Lane Group						-			
	R	FRT	WRI	WRT	NRI	NRT	SB	CRT	
and Configurations	LDL MA	3	W DL	ow A	NDL ME	ON C	JUL M	100	
Traffic Volume (vnh)	æ	7 170 2110	175	4 L	63	1 286	112	4 ⊢	
Future Volume (vph)	8 88	2110	175	729	93	286	112	67	
Lane Group Flow (vph)	94	2346	186	1042	66	386	119	103	
Turn Type	pm+pt	NA	pm+pt	NA	Perm	M	Perm	M	
Protected Phases	വ	2	-	9		∞		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2		9	∞	∞	4	4	
Switch Phase									
Minimum Initial (s)	7.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.0	34.3	11.0	34.3	34.7	34.7	34.7	34.7	
Total Split (s)	12.0	80.0	12.0	80.0	28.0	28.0	28.0	28.0	
Total Split (%)	10.0%	%2.99	10.0%	%2.99	23.3%	23.3%	23.3%	23.3%	
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.0	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.3	4.0	5.3	5.7	5.7	5.7	5.7	
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
v/c Ratio	0.28	1.15	1.15	0.53	0.43	0.62	1.11	0.16	
Control Delay	3.5	87.0	144.7	11.5	50.1	47.0	166.1	28.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0:0	
Total Delay	3.5	87.0	144.7	11.5	50.1	47.0	166.1	28.9	
Queue Length 50th (m)		~356.5	~39.7	26.1	22.0	43.7	~33.7	7.7	
Queue Length 95th (m)	m3.4 m	m3.4 m#369.8	#87.9	6.79	40.2	61.1	#72.9	16.0	
Internal Link Dist (m)		170.5		124.7		340.6		275.9	
Turn Bay Length (m)	100.0		0.06		70.0		50.0		
Base Capacity (vph)	345	2035	162	1976	228	619	107	679	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.27	1.15	1.15	0.53	0.43	0.62	1.11	0.16	
Intersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 120									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	to phase 2:1	EBTL and	16:WBTL	, Start of	Green				
Natural Cycle: 150									
Control Type: Actuated-Coordinated	rdinated								
 Volume exceeds capacity, queue is theoretically infinite. 	ly, queue is	theoretic	ally infini	je.					
Queue shown is maximum after two cycles.	m after two	cycles.							
# 95th percentile volume exceeds capacity, queue may be longer.	exceeds car	oacity, qu	eue may	be longer					
	m after two	cycles.							
m Volume for 95th percentile queue is metered by upstream signal	tile queue n	s metere	i by upsir	eam sıgn	<u>a</u> .				

Splits and Phases: 2: Fifth Line & Derry Road

402 (R) 01

₩ ₩ ₹ Ø6 (R) **→** Ø5

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

182 182 1900 5.7 1.00 0.98 1.00 0.85 1.00 1.00 1403 1403 1403 1403 30.0 30.0 0.25 5.7 3.0 350 0.03 0.13 34.9 1.00 0.2 35.1 5.7 0.95 1.00 1.00 1.00 3046 1.00 3046 385 385 10% ¥ 3.0 00. D 6.4.9 pm+pt 334 1900 4.0 1.00 1.00 1.00 0.95 650 650 650 341 2% 341 Perm 19.0 181 181 900 5.7 5.7 1.00 1.00 0.85 1.00 1.586 1.00 1.586 0.98 1.85 1.85 1.35 1% 3.0 45.3 1.00 0.5 45.8 277 0.60 ¥ 17.4 3.0 464 0.09 % 7 4.0 1.00 1.00 1.00 1.00 0.95 993 0.98 24 24 6 6 pm+pt 4.0 3.0 210 0.00 0.02 0.11 1.00 0.2 41.0 HCM 2000 Level of Service 40.7 Sum of lost time (s) ICU Level of Service Perm 0.98 1189 103 86 3% 54.6 54.6 0.46 0.06 689 18.9 2.56 0.3 48.8 0.90 553 553 1900 5.3 0.95 1.00 1.00 1.00 1.00 3305 3305 ¥ 54.6 54.6 0.46 0.98 564 4% 3.0 155 0.02 0.21 0.45 26.2 26.2 0.82 0 % pm+pt 69 4.0 1.00 1.00 1.00 0.95 0.95 0.07 3% 61.1 61.1 0.51 49.3 1.02 120.0 96.1% Perm 60.1 30 30 1900 1.00 1.00 0.85 1.00 1.00 1.00 1562 0.98 31 15 16 3% 5.3 3.0 782 0.02 15.1 1.00 0.0 1723 1900 5.3 0.95 1.00 1.00 1.00 1.00 3438 3438 Š 60.1 60.1 0.50 5.3 3.0 1721 c0.51 29.9 1.00 27.3 57.2 56.2 0.98 1758 1% 1.02 12.0 12.0 0.10 4.0 3.0 3.39 c0.06 187 1187 1187 1180 11.00 11.00 11.00 11.00 11.00 11.00 11.00 11.00 11.00 11.00 0.98 191 2% Prot 51.5 1.00 2.1 53.6 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp., pedbikes
Said. Flow (perm)
Fit Portected
Said. Flow (perm)
Peak-hour factor, PHF
Peak-hour factor, PHF
Red., Flow (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Actuated Green, G (s) ncremental Delay, d2 Bus Blockages (#/hr) Effective Green, g (s) Actuated g/C Ratio Turn Type Protected Phases Permitted Phases Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Total (AM)

Future Total (AM) 2027 Scenario 2

	1	†	<i>></i>	>	ţ	4	•	←	*	۶	-	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	‡	*-	<i>y</i> -	‡	*-	je-	‡	*	<i>y</i> -	‡	¥.
Traffic Volume (vph)	187	1723	30	69	553	185	24	27.1	181	334	377	182
Future Volume (vph)	187	1723	30	69	553	185	24	271	181	334	377	182
Lane Group Flow (vph)	191	1758	31	70	564	189	24	277	185	341	382	186
Turn Type	Prot	Ν	Perm	pm+pt	M	Perm	pm+pt	¥	Perm	pm+pt	NA	Perm
Protected Phases	2	2		-	9		3	00		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	2	2	2	τ-	9	9	3	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7		11.0	34.7	34.7
Total Split (s)	17.0	53.0	53.0	11.0	47.0	47.0	21.0	35.0		21.0	35.0	35.0
Total Split (%)	14.2%	44.2%	44.2%	9.5%	39.2%	39.2%	17.5%	29.2%	29.5%	17.5%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.56	0.98	0.04	0.39	0.37	0.23	0.09	99:0	0.53	0.99	0.51	0.38
Control Delay	27.6	47.2	0.1	16.8	20.2	8.8	28.1	29.7	16.4	82.4	41.8	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	47.2	0.1	16.8	20.2	8.8	28.1	29.7	16.4	82.4	41.8	7.6
Queue Length 50th (m)	23.6	~227.1	0.0	7.5	52.2	9.6	4.1	34.8	0.9	72.6	45.5	0.0
Queue Length 95th (m)	35.0	#314.4	0.0	16.7	75.7	30.9	6.6	47.5	27.3	#127.9	29.6	18.4
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	383	1789	826	178	1545	809	400	781	206	345	790	501
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.98	0.04	0.39	0.37	0.23	90:0	0.35	0.37	0.99	0.49	0.37
Intersection Summary												

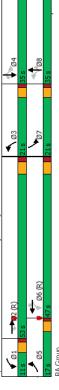
Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Actuated Cycle Length: 120

Control Type: Actuated-Coordinated

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer Queue shown is maximum after two cycles. 3: James Snow Parkway & Derry Road Splits and Phases:



HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Total (AM)

Novement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations	-	₩		r	₽		F	2		r	£,	
raffic Volume (vph)	75	2151	118	87	877	16	42	7	19	24	10	43
Jh)	72	2151	118	87	877	91	42	7	19	24	10	43
	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
8)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
ane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.88	
	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
rot)	1770	3512		1770	3489		1770	1660		1770	1636	
	0.27	1.00		0.04	1.00		0.72	1.00		0.74	1.00	
satd. Flow (perm)	207	3512		81	3489		1340	1660		1375	1636	
Jr, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
	85	2338	128	95	953	66	46	00	21	26	=	47
TOR Reduction (vph)	0	7	0	0	က	0	0	19	0	0	43	0
ane Group Flow (vph)	82	2464	0	95	1049	0	46	10	0	26	15	0
	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		-	9			∞			4	
ermitted Phases	2			9			∞			4		
octuated Green, G (s)	87.9	87.9		100.0	100.0		0.6	0.6		0.6	0.6	
s)	87.9	87.9		100.0	100.0		0.6	0.6		0.6	0.6	
	0.73	0.73		0.83	0.83		0.08	0.08		0.08	0.08	
Slearance Time (s)	5.3	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
'ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
ane Grp Cap (vph)	371	2572		181	2907		100	124		103	122	
		c0.70		c0.04	0.30			0.01			0.01	
Perm	0.16			0.40			c0.03			0.02		
	0.22	96:0		0.52	0.36		0.46	0.08		0.25	0.12	
Iniform Delay, d1	5.1	14.4		36.0	2.4		53.2	51.6		52.3	51.8	
rogression Factor	1.70	1.79		1.00	1.00		1.00	1.00		1.00	1.00	
ncremental Delay, d2	0.1	1.3		2.7	0.3		3.3	0.3		1.3	0.4	
Delay (s)	89	27.2		38.8	2.7		26.5	51.9		53.6	52.2	
evel of Service	∢	ပ		۵	⋖		ш	٥		٥	٥	
pproach Delay (s)		26.6			5.7			54.7			52.7	
pproach LOS		ပ			A			O			٥	
ntersection Summary												
HCM 2000 Control Delay			21.5) 보	M 2000	HCM 2000 Level of Service	service		U			
HCM 2000 Volume to Capacity ratio	ratio		0.88									
ctuated Cycle Length (s)			120.0	S	Sum of lost time (s)	time (s)			15.0			
ntersection Capacity Utilization			89.7%	⊇	J Level o	ICU Level of Service			ш			
Analysis Period (min)			4									

12.14-2023 Synchro 11 Report BA Group

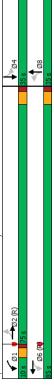
Queues 4: Clark Boulevard & Derry Road

Future Total (AM) 2027 Scenario 2

Lane Configurations	Apple Apple Apple		42 42 46 Perm	2	*	43	
75 2151 87 42 7 24 75 2151 87 87 42 7 24 8 2 246 95 1052 46 29 26 Perm NA pm+pl NA Perm NA Perm 1 1 1 6 8 8 4 2 2 6 8 8 4 1 1 6 8 8 4 2 6 8 8 4 4 2 6 1 0 10 8 8 4 10.0 10.0 10.0 10.0 10.0 10.0 10	e (vph) 75 2151 low (vph) 75 2151 low (vph) 75 2151 sses 2 sse 2 sse 2 low (sph) 76 2151 low (sph) 76 2151 low (sph) 82 2466 low (sph) 100 100 low (sph) 100 100 low (sph) 100 100 low (sph) 1100 100 low (sph) 1117 27.2 low (sph) 117 27.2 low (sph) 117 27.2 low (sph) 117 27.2 low (sph) 1		42 42 46 Perm				
75 2151 87 877 42 7 24 86 95 1052 466 29 26 87 2466 95 1052 46 29 26 8 1	low (vph) 75 2151 sees 2 2 see 2 2 see 2 2 see 2 2 see 2 2 (s) 343 343 (s) 750 750 (s) 750 100 (c) 750 100 (d) 100 (e) 750 100 (e) 750 100 (e) 750 100 (f) 750 100 (f) 750 100 (g) 1.6 1.6 (h) 1.7 27.2 (h) 1. 27.2		42 46 Perm	7	24	10	
82 2466 95 1052 46 29 26 Perm NA pm+pl NA Perm NA Perm 2 6 8 8 4 2 6 8 8 4 2 1 6 8 8 4 100 10.0 10.0 10.0 10.0 10.0 10.0 34.3 34.3 34.3 34.7	low (vph)		46 Perm	7	24	10	
Perm NA pm+pt NA Perm NA Perm 2 1 6 8 8 4 4 4 2 2 6 6 8 8 8 4 4 4 4 2 2 1 6 6 8 8 8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Sees 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		Perm	29	26	28	
2 1 6 8 8 4 4 2 2 2 1 6 8 8 8 4 10.0 10.0 6.0 10.0 10.0 10.0 10.0 10.0 1	sees 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			M	Perm	¥	
2 6 6 8 8 4 4 100 100 6.0 100 100 100 100 100 100 100 100 100 1	see 2 2 2 2 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4			∞		4	
2 2 1 6 8 8 4 4 100 100 6.0 100 100 100 100 100 100 100 100 100 1	se 2 2 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		∞		4		
100 100 6.0 100 100 100 100 100 100 100 34.3 34.3 10.0 34.3 34.7 34.7 34.7 34.7 35.0 75.0 75.0 10.0 85.0 85.0 85.0 85.0 85.0 85.0 85.0 8	(s) 100		∞	∞	4	4	
100 100 6.0 100 100 100 100 100 100 100 100 100 1	(\$) 100 100 100 100 100 100 100 100 100 10						
34.3 34.3 10.0 34.3 34.7 34.7 34.7 34.7 34.7 34.5 6.25% 6.25% 8.3% 70.8% 29.2%	(\$) 34.3 34.3 34.3 (\$) (\$) 75.0 75.0 75.0 75.0 75.0 75.0 75.0 75.0		10.0	10.0	10.0	10.0	
750 750 100 850 350 350 350 350 350 350 350 350 350 3	75.0 75.0 75.0 75.0 75.0 75.0 75.0 75.0		34.7	34.7	34.7	34.7	
62.5% 62.5% 8.3% 70.8% 29.2% 29.2% 29.2% 29.2% 29.2% 3.3 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1	(s) 62.5% 62.5% (s) 3.7 3.7 (s) 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6		35.0	35.0	35.0	35.0	
3.7 3.7 3.0 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7	s) 3.7 3.7 (s) 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6		29.2%	29.2%	29.2%	29.2%	
1.6 1.6 1.0 1.6 2.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	(s) 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0		3.7	3.7	3.7	3.7	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Let (s) 0.0 0.0 Let (s) 5.3 5.3 Lag Lag Lag Lag C-Min C-M		2.0	2.0	2.0	2.0	
5.3 5.3 4.0 5.3 5.7 5.2 5.9 5.9 5.9 5.9 5.0 6.0 0.0 <td>in (s) 5.3 5.3 Ing Lag Lag Lag Lag Lag Common Comm</td> <td></td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>0:0</td> <td></td>	in (s) 5.3 5.3 Ing Lag Lag Lag Lag Lag Common Comm		0.0	0.0	0.0	0:0	
Lag Lead C-Min C-Min None None None C-Min C-Min None C-Min None None 0.22 0.95 0.52 0.35 0.38 0.17 0.21 11.7 27.2 26.5 2.9 59.9 26.7 53.9 0.0 0.0 0.0 0.0 0.0 0.0 0.0 11.7 27.2 26.5 2.9 59.9 26.7 53.9 91 287.7 5 25.7 11.0 1.9 6.1 m108 m28.5 24.4 40.0 23.0 11.3 15.2 70.0 70.0 475.1 26.4 40.0 35.6 40.0 35.6 70.0 70.0 475.1 35.6 4.1 33.5 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <td< td=""><td> Lag Lag</td><td></td><td>5.7</td><td>5.7</td><td>5.7</td><td>5.7</td><td></td></td<>	Lag		5.7	5.7	5.7	5.7	
Ves Ves Ves C-Min C-Min None None None 0.20 0.95 0.52 0.35 0.38 0.77 0.21 11.7 27.2 26.5 2.9 59.9 26.7 53.9 0.0 0.0 0.0 0.0 0.0 0.0 0.0 11.7 27.2 26.5 2.9 59.9 26.7 53.9 9.1 287.7 5.9 55.7 11.0 19 6.1 m108 m25.5 24.4 40.0 28.7 15.3 40.0 700 475.1 56.4 40.0 335.0 40.0 335.0 40.0 30.0 0	(m)ze? Yes Yes C-Min C-M	ad					
C-Min C-Min None C-Min Nane None None O.2 0.95 0.52 0.35 0.38 0.17 0.21 11.7 27.2 26.5 2.9 5.94 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	C-Min C-Min C-Min C-Min C-Min 0.22 0.95 11.7 27.2 0.0 0.0 0.0 11.7 27.2 11.7 27.2 150th (m) certa (m) cert						
0.22 0.95 0.52 0.35 0.38 0.17 0.21 1.17 27.2 26.5 2.9 59.9 26.7 53.9 0.10 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	0.22 0.95 11.7 27.2 0.0 0.0 11.7 27.2 11.7 27.2 11.050lh (m) 9.1 287.7 06th (m) m31.9 m31.2 5.2		None	None	None	None	
11.7 27.2 26.5 2.9 59.9 26.7 53.9 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	11.7 27.2 0.0 0.0 11.7 27.2 11.7 27.2 0.01h (m) 9.1 287.7 0.01ch (m) m.10 9 m.25 5		0.38	0.17	0.21	0.30	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 11.7 27.2 150th (m) 9.1 287.7 505th (m) 9.10 2052 E		59.9	26.7	53.9	22.4	
11.7 27.2 26.5 2.9 56.9 26.7 53.9 m10.8 m225.5 24.4 40.0 23 11.3 15.2 36.6 26.7 110.0 1.9 6.1 336.0 26.7 183 2974 326 421 335 36.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	11.7 27.2 9.1 287.7 m10.9 m252.5		0.0	0.0	0.0	0.0	
91 2877 5.9 25.7 11.0 11.9 6.1 m108 m262.5 24.4 40.0 23.0 11.3 15.2 336.0 70.0 475.1 56.4 40.0 376 260.7 183 2974 326 421 335 0	9.1 287.7 m10.9 m25.2 E		6'69	26.7	53.9	22.4	
m10.8 m252.5 24.4 40.0 23.0 11.3 15.2 336.0 70.0 70.0 70.0 475.1 56.4 70.0 376 2077 183 2974 326 421 335 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	m10.9 m252.5		11.0	1.9	6.1	5.6	
336.0 475.1 56.4 70.0 70.0 40.0 376 2607 183 2974 326 421 335 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.767111 0.01111		23.0	11.3	15.2	15.6	
70.0 70.0 40.0 37.6 26.07 183 2974 32.6 421 33.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <td< td=""><td>336.0</td><td></td><td></td><td>56.4</td><td></td><td>313.3</td><td></td></td<>	336.0			56.4		313.3	
376 2607 183 2974 326 421 335 0.22 0.95 0.52 0.35 0.14 0.07 0.08	70.0	0.0			40.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	376 2607		326	421	335	434	
uch 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0		0	0	0	0	
ctn 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	0 0	0	0	0	0	
0.22 0.95 0.52 0.35 0.14 0.07 0.08 aary	0 0		0	0	0	0	
Intersection Summary Ovela Landh 120	0.22 0.95		0.14	0.07	0.08	0.13	
Ovrla Landh 120	Intersection Summary						
	Cycle Length: 120						

Adulated Cycle Length: 120
Offset (10%). Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Clark Boulevard & Derry Road



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Total (AM) 2027 Scenario 2

Movement FBI FBI FBI WBI	EBL EBI EBR WBB 10 9 3 5 10 9 3 5 10 9 3 5 10 9 3 5 10 9 10 9 3 5 10 9 9 3 5 10 9 9 9 9 9 9 9 9 9	FBT FBR WBL 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				SBT 300 300 1900 6.7 100 6.7 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.
1	1	100 100	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				300 300 1900 5.7 1.00 0.98 1.100 1.100 1.832 1.00 1.100 1.832 4 4 4 4 3.26
10 9 3 5 12 0 10 446 24 0 300 10 9 3 5 12 0 10 446 24 0 300 10 9 3 5 12 0 10 446 24 0 300 10 10 100 1900 1900 1900 1900 1900 1900 10 10 10 10 10 10 10	10 9 3 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	9 3 5 5 9 9 3 5 5 9 9 3 5 9 9 9 3 9 5 9 9 9 9	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				300 300 300 1900 1.00 0.98 1.00 1.832 1.00 1.832 0.92 326 4 4
10 9 3 5 12 0 146 24 0 300 19	100 9 3 5 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1	9 9 3 5 5 1 1900 1900 1900 1900 1900 1000 100	0 0 0 0 0 0 0 0				300 1900 5.7 1.00 0.98 1.00 1.00 1.832 326 4 4
1900 1900	1900 1900 1900 1900 1900 1900 1900 1900	1900 1900 1900 1900 1900 1900 1900 1900	0000				1900 5.7 1.00 0.98 1.00 1.00 1.832 1.00 0.92 326 4
5.3 5.3 5.3 5.3 5.7 5.7 5.7 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.95 1.00 1.00 1.00 1.00 1.00 1.70 1.79 1.70 1.863 1.00 1.00 1.00 1.00 1.70 1.79 1.70 1.863 1.863 1.01 1.849 1.832 1.70 1.79 1.70 1.863 1.863 1.863 1.00 1.00 1.863 1.79 1.863 1.863 1.012 1.849 1.832 1.70 1.79 1.863 1.863 1.012 1.849 1.832 1.70 1.00 1.00 0.92	5.3 5.3 5.3 5.3 5.3 1.00 1.00 1.00 1.00 0.97 1.00 0.97 1.00 0.99 1.00 1	5.3 5.3 1.00 0.09 0.09 1.00 0.09 1.00 1.00 1.00	760 0 0 0 0				5.7 1.00 0.98 1.00 1.00 1.00 0.92 326 4
1,00	1.00 1.00 1.00 1.00 1.00 0.097 1.00 0.095 1.	100 100 100 100 100 100 100 100 100 100	0.92 0 0 0 0 0 0 0 0				1.00 0.98 1.00 1.00 1.00 1.00 3.26 4 3.62 3.63 3.64 3.63 3.64
1,00 0,97	1.00 0.97 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	0.97 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.92 0.92 1.0 3 5 1.0 0 5 1.0 0 5 1.0 0 5 1.0 1.6 1.6 1.6 1.6 1.6 0.04 0.04 5.3 5.3 3.0 0.01 0.01	0.92				0.98 1.00 1.00 1.00 1.00 326 4 4
1,00	0.95 1,000 0.95 1,700 1,700 1,700 1,700 1,700 1,700 1,700 1,000 1,	1100 0.05 1708 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0 0.92 0.92 1.0 0.04 1.6 1.6 1.6 1.6 1.6 0.04 2.3 5.3 3.0 2.0 0.01 7.3 7.6 0.01	0.0000000000000000000000000000000000000				1.00 1.00 1.00 1.832 0.92 326 4 4
1770 1798 1770 1863 1770 1849 1832 1833 1863 1790 1949 1832 1960	1770 1798 1770 1770 1770 1770 1770 1770 1770 177	1798 1770 1700 1700 1700 1700 1700 1700 170	0 0 0 0 0				1832 1.00 1832 0.92 326 4 362
1,00	1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00	1100 1100 1100 1109 11092 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0	0.92				1.00 1832 0.92 326 4 4 362
1863 1798	1863 1798 1863 1798 1863 1798 1863 1798 1863 1798 1863 1798 179 179 179 179 179 179 179 179 179 179	1798 1863 1902 092 092 092 092 092 092 092 092 092	0.92			L L	1832 0.92 326 4 4 362
0.92 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 <td< td=""><td>0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92</td><td>0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92</td><td>0.92</td><td></td><td></td><td></td><td>0.92 326 4 362</td></td<>	0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	0.92				0.92 326 4 362
11 10 3 5 13 0 11 485 26 0 326 11 10 3 5 13 0 11 485 26 0 326 11 11 10 3 5 13 0 11 485 26 0 34 4 4 4 4 4 4 4 4	11 10 3 5 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10 3 5 3 0 0 10 0 5 NA Perm 2 6 1.6 1.6 1.6 0.04 0.04 5.3 5.3 3.0 7.8	0 0 0				326 4 362
1 0 3 0 0 0 0 0 0 0 0	0 3 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3 0 0 0 10 0 5 NA Perm 2 6 1.6 1.6 1.6 1.6 0.04 0.04 5.3 5.3 5.3 3.0 73 0.01 0.01	0 0				362
11 10 0 5 13 0 11 509 0 0	Perm NA Perm NA 11 10 0 5 5 10 10 10 10 10 10 10 10 10 10 10 10 10	NA Perm 2 6 1.6 1.6 1.6 0.04 0.04 0.01 3.0 3.0 3.0 3.0 0.01	0				362
Perm NA Perm NA Perm Perm NA Perm 1 1 6 8 4 4 1 1 1 1 8 4 1 1 1 1 8 8 4 1 1 1 1 6 8 3 4 1 1 1 1 1 6 3 2 3 4 1 1 1 1 1 6 8 6 8 8 4 4 2 1 1 1 1 6 6 8 8 4 4 8 8 4 4 8 4 4 8 4 4 8 8 4 4 8 8 4 8 8 4 8 8 8 8 8 8 8 8 8 8 8	Perm NA Perm 2 2 2 6 6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6	NA Perm 2 6 16 1.6 1.6 1.6 0.04 5.3 5.3 3.0 3.0 7.3 76 0.01			NA 8	Perm 4	
2 6 6 8 8 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 2 6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 0.04 0.04 0.04 0.04 0.04 0.04 0.04 0.04	2 6 1.6 1.6 1.6 1.6 0.04 0.04 0.04 0.04 5.3 5.3 5.3 7.0 7.3 7.6 0.01	6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.		2 00	4	¥
1.6 1.6 1.6 2.8 8 4 1.6 1.6 1.6 2.63 2.63 1.6 1.6 1.6 2.63 2.63 1.6 1.6 1.6 2.63 2.63 2.0 0.04 0.04 0.04 0.68 0.68 2.1 2.3 2.3 2.3 2.3 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	2 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6	1.6 1.6 1.6 1.6 0.04 0.04 0.04 0.04 0.04 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	1.6 1.6			4	4
1.6 1.6 1.6 1.6 26.3	1.6 1.6 1.6 1.6 1.6 0.04 0.04 0.04 0.04 0.04 0.04 0.01 0.01	1.6 1.6 1.6 1.6 0.04 0.04 0.04 0.04 0.04 3.3 5.3 3.0 3.0 7.3 7.6 0.01	1.6 1.6		٠ / ٢		
1.6 1.6 1.6 1.6 26.3 26.3 (20.4) (20.	1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6	1.6 1.6 0.04 0.04 0.04 0.04 0.03 0.3 0.3 0.04 73 76 0.01	97.0		20.3		26.3
0.04 0.04 0.04 0.04 0.04 0.06 0.68 5.3 5.3 5.3 5.3 5.3 5.3 5.7 5.7 5.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1	0.04 0.04 0.04 0.04 0.04 0.04 0.04 0.04	0.04 0.04 5.3 5.3 5.3 3.0 3.0 73 76 0.01	DA		26.3		26.3
5.3 5.3 5.3 5.3 5.7 5.7 3.0 3.0 3.0 3.0 3.0 7.0 7.1 7.0 7.0 64 1250 0.01 0.01 0.00 0.01 0.02 0.1 0.1 0.00 0.01 0.01 0.1 1.00 1.00 1.00 0.41 1.00 1.00 1.00 1.00 0.2 1.00 1.00 1.00 1.00 0.2 1.00 1.00 1.00 1.00 0.2 1.00 1.00 1.00 1.00 0.2 1.00 1.00 1.00 0.2 0.2 1.00 1.00 1.00 0.2 0.2 1.00 1.00 1.00 0.2 0.2 1.00 1.00 1.00 0.2 0.2 1.00 1.00 1.00 0.2 0.2 1.00 1.00 0.2 0.2	5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3	5.3 5.3 3.0 3.0 73 76 0.01	5		89.0		89.0
3.0 3.0	30 30 30 30 30 30 30 30 30 30 30 30 30 3	3.0 3.0 73 76 0.01	5.3		5.7		2.7
76 73 76 76 684 1250 0.01 0.00 0.01 0.028 0.014 0.14 0.14 0.07 0.17 0.02 0.41 180 180 179 180 2.1 28 1.00 1.00 1.00 1.00 1.00 2 0.9 189 183 19.1 2.1 3.0 8 B B B A A A 18.9 18.9 18.9 18.9 18.9 18.9 18.9 18.9 18.9 18.9 18.9 A A A A Capacity ratio 0.39 CUL Level of Service A 15 15 10 1 1.00 A A A A A A A A A A A A	76 73 76 70 70 70 70 70 70 70 70 70 70 70 70 70	73 76	3.0		3.0		3.0
0.01	0.01 0.00 0.14 0.14 0.07 0.14 0.14 0.17 18.0 18.0 17.9 0.2 0.9 0.9 0.4 18.9 18.9 18.3 18.9 B B B		76		1250		1238
0.01 0.00 0.00 0.01 0.01 0.01 0.01 0.01	0.00 0.14 0.14 0.07 1.00 1.00 1.00 1.00 1.00 1.00 0.2 0.9 0.9 0.4 18.9 18.9 18.3 18.9 18.9 18.3 18.9 18.9		.01		0.28		0.20
0.14 0.14 0.07 0.17 0.02 0.41 180 180 17.9 180 2.1 2.8 180 180 17.9 180 2.1 2.8 2 0.9 0.9 0.4 1.1 0.0 0.2 18.9 18.9 18.3 19.1 2.1 3.0 18.9 18.9 18.9 18.9 A A 18.9 18.9 18.9 A A 18.9 B B A A 18.9 B B A A 18.9 A A 18.9 B B A A 18.9 A A 18.9 B B A 18.9 A A 18.9 A A 18.9 B B A 18.9 A A 18.9 A A 18.9 B B A 18.9 A	0.14 0.14 0.07 180 18.0 17.9 1.00 1.00 1.00 42 0.9 0.9 0.4 18.9 18.9 18.3 B B B B 18.9 18.9	0.00		0.01			
180 180 179 180 2.1 2.8 1.00 1.00 1.00 1.00 1.00 2 0.9 0.9 0.4 1.1 0.0 0.0 1 18.9 18.9 18.3 19.1 2.1 3.0 1 18.9 18.9 18.9 18.9 18.9 1 18.9 18.9 18.9 A A 1 18.9 18.9 A A 1 18.9	180 180 179 120 1.00 1.00 12 0.9 0.9 0.4 18.9 18.9 18.3 18.9 18.9	0.14 0.07	.17		0.41		0.29
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	d2 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	18.0 17.9	8.0		2.8		2.5
2 0.9 0.9 0.4 1.1 0.0 0.2 18.9 18.3 19.1 2.1 3.0 B B B B A A A A A B B B B A A A A A A A	d2 0.9 0.9 0.4 18.3 18.3 18.3 18.3 18.3 18.3 18.3 18.3	1.00 1.00	00.		1.00		1.00
18.9 18.9 18.3 19.1 2.1 3.0 B B B A A A 18.9 18.9 18.9 3.0 18.9 B A A 18.9 B B A A 18.9 A A 19.0 Constraint 10.3 Sum of lost time (s) 10.0 Level of Service 10.1 CU Level of Service 10.1 A A 11.0 A A 11.0 A A 12.1 A A 13.0 A A 14.1 A A 15.0 Level of Service 16.0 A A 17.0 A A 18.0 A A 19.0 A A 19.0 A A 10.0 A 10.0 A A 10.	18.9 18.9 18.3 B B B B 18.9 B	0.9 0.4	1.1	0.0	0.2		0.1
B B B A A A A A A A A A	B B B B B 18.9 B B B B B B B B B B B B B B B B B B B	18.9 18.3	9.1	2.1	3.0		2.7
18.9 18.9 3.0 B B A V V Salay 1.0 Utilization 42.4% (CU Level of Service A 1.0 1.0 1.0 1.0 1.0	18.9 B	В	В	A	Α		⋖
y y y alay 3.6 HCM 2000 Level of Service Capacity ratio 0.39 0.39 0.99 0.00 Sum of lost time (s) 1,5 1,5 1,5 1,5 1,5 1,5 1,5 1,5 1,5 1,5	B mmary		8.9		3.0		2.7
### 3.6 HCM 2000 Level of Service Capacity ratio 0.39 Sum of lost time (s) 1 1 1 1 1 1 1 1 1		В	В		A		⋖
alay 3.6 HCM 2000 Level of Service Capacity ratio 0.39 Sum of lost time (s) 1 In (s) 38.9 Sum of lost time (s) 1 Utilization 42.4% ICU Level of Service 1 15 15 1 1							
Capacity ratio 0.39 Sum of lost time (s) 16 (s) 38.9 Sum of lost time (s) 10 Utilization 42.4% ICU Level of Service 15	3.6		2000 Level of Ser	vice	_	A	
h (s) 38.9 Sum of lost time (s) 1 Utilization 42.4% ICU Level of Service 15		0.39					
Utilization 42.4% ICU Level of Service 15	38.9		f lost time (s)		11.	0	
Analysis Period (min) 15	42.4%		evel of Service		_	۷	
	Analysis Period (min)	15					

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Queues 5: Fifth Line & Clark Boulevard

Future Total (AM) 2027 Scenario 2

	П	٤	300	300	366	M	4		4		0.	.7	0.	%	3.7	0.	0.0	5.7			Min	.2	2.6	0.	2.6	0.	0.	_		33	0	0	0	0.					
→	SBT	ľ	8	90	36	Z					10.0	34.7	85.0	70.8%	cr)	2	0	5			≥	0.22	2	0	2	o	28.0	372		1833				0.20					
—	NBT	æ	446	446	211	M	8		∞		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.31	3.1	0.0	3.1	0.0	42.9	156.9		1848	0	0	0	0.28					
•	NBL	<i>y</i> -	10	10	=	Perm		∞	∞		10.0	34.7	82.0	70.8%	3.7	2.0	0.0	5.7			Min	0.01	3.0	0.0	3.0	0.0	1.9		32.0	1011	0	0	0	0.01					
Ļ	WBT	\$	12	12	13	NA	9		9		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	11.6	0.0	11.6	0.4	3.9	86.5		1635	0	0	0	0.01					
-	WBL	je-	22	2	2	Perm		9	9		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.01	11.6	0.0	11.6	0.2	2.2		32.0	1635	0	0	0	0.00					
†	EBT	÷	6	6	13	NA	2		2		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	10.7	0.0	10.7	0.4	3.7	204.0		1578	0	0	0	0.01					
1	EBL	<i>y</i> -	10	10	Ξ	Perm		2	2		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	11.6	0.0	11.6	0.4	3.5		32.0	1635	0	0	0	0.01					ordinated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Oueue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 34.5	Natural Cycle: 70	Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

9 **1**005 35 s ♣

HCM Unsignalized Intersection Capacity Analysis Future Total (AM) 10: Clark Boulevard & Anatolia Building 1 North Access/Anatolia Building 2 North Accessenario 2

Movement EB1 EB1 WB1 WB1 WB1 WB1 NB1 NB1 SB1		4	†	<i>></i>	\	Ļ	4	•	←	•	۶	→	•
## Order of the control of the contr	Novement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
h) 2 0 1 2 0 11 1 55 4 34 179 No. 2 00 1 2 0 11 1 1 55 4 34 179 No. 2 0.92 0.92 0.92 0.92 0.92 0.92 0.92 No. 2 0.92 0.92 0.92 0.92 0.92 0.92 0.92 No. 2 0.92 0.92 0.92 0.92 0.92 0.92 0.92 No. 2 0.93 0.93 0.93 0.93 0.93 0.93 0.93 No. 3 3 196 0.93 0.93 0.94 0.99 No. 3 3 196 0.93 0.93 0.99 0.99 No. 3 196 0.94 0.99 0.99 No. 0 100 0.00 0.00 No. 0 100 0.00 0.00 No. 0 0 0 0.00 No. 0 0 0 0 0 0 0.00 No. 0 0 0 0 0 0 0.00 No. 0 0 0 0 0 0 0 0.00 No. 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lane Configurations		4			4			4			4	
None	raffic Volume (veh/h)	2	0	-	2	0	Ξ	-	22	4	34	179	2
Stop	Future Volume (Veh/h)	2	0	-	2	0	1	-	22	4	34	179	2
0,92 0,92 0,92 0,92 0,92 0,92 0,92 0,92	Control		Stop			Stop			Free			Free	
1) 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Grade		%0			%0			%0			%0	
1) 2 0 1 2 0 12 1 60 4 37)) None ed 346 336 196 335 335 62 197 1) 346 336 196 335 335 62 197 1) 10 100 100 100 100 99 100 98 550 570 845 606 571 1003 1376 1538 EB 1 WB 1 NB 1 SB 1 2 2 2 1 37 1 1 2 4 2 2 2 1 37 (m) 0.1 0.4 0.0 0.02 (m) 0.1 0.4 0.0 0.02 (m) 0.1 0.4 0.0 0.02 Ry A Milization 10 10 10 10 10 10 10 10 10 10 10 10 10	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
None	Hourly flow rate (vph)	2	0	-	2	0	12	-	09	4	37	195	2
None None None None None None	Pedestrians												
None	-ane Width (m)												
None None None None None	Walking Speed (m/s)												
None None None None None	Percent Blockage												
eed 346 336 196 335 335 62 197 64 91 91 91 91 91 91 91 91 91 91 91 91 91	turn flare (veh)												
ed 346 336 196 335 335 62 197 64 le 346 336 196 335 335 62 197 64 lo 346 336 196 335 335 62 197 64 7.1 6.5 6.2 7.1 6.5 6.2 4.1 4.1 3.5 4.0 3.3 3.5 4.0 33 2.2 100 100 100 100 100 100 99 100 98 590 570 845 606 571 1003 1376 1538 EB 1 WB 1 NB 1 SB 1 2 2 1 37 2 2 1 37 1 12 4 2 666 917 1376 1538 (m) 0.1 0.4 0.0 0.02 (m) 0.1 0.4 0.0 0.02 (m) 0.1 0.4 0.0 0.02 (m) 0.1 0.3 0.0 0.02 (m) 0.1 0.3 0.0 0.02 (m) 0.1 0.3 0.0 0.02 (m) 10.5 9.0 0.1 1.3 B A A A A A A A I 10.5 9.0 0.1 1.3 B A A A A I 10.5 9.0 0.1 1.3 B A A A A I 10.5 9.0 0.1 1.3 B A A A A I 10.5 9.0 0.1 1.3 B A A A A I 10.5 9.0 0.1 1.3 B A A A A A I 10.5 9.0 0.1 1.3 B A A A A A I 10.5 9.0 0.1 1.3 B A A A A A I 10.5 9.0 0.1 1.3 B A A A A A I 10.5 9.0 0.1 1.3 B A A A A A I 10.5 9.0 0.1 1.3 B A A A A A I 10.5 9.0 0.1 1.3 B A A A A A I 10.5 9.0 0.1 1.3 B A A A A A I 10.5 9.0 0.1 1.3 B A A A A A I 10.5 9.0 0.1 1.3 B A A A A A I 10.5 9.0 0.1 1.3 I 1.5 0.0 0.1	an type								None			None	
ed 346 336 196 335 335 62 197 64 346 336 196 335 335 62 197 64 346 336 196 335 335 62 197 64 7.1 6.5 6.2 7.1 6.5 6.2 4.1 4.1 35 4.0 3.3 3.5 4.0 3.3 2.2 100 100 100 100 100 99 100 98 590 590 850 845 606 571 1003 1376 1538 EB1 WB1 NB1 SB1	an storage veh)												
ed 346 336 196 335 62 197 In 346 338 196 335 62 197 In 6.5 6.2 7.1 6.5 6.2 4.1 In 6.5 6.2 7.1 6.5 6.2 4.1 In 100 100 100 100 99 100 In 100 100 100 100 99 100 EB1 WB1 NB1 SB1 2 2 1 33 1 4 65 234 2 2 1 37 1 5 62 91 In 37 In 6.5 90 0.0 In 1.3 12 In 6.5 90 0.0 In 1.3 14 In 6.5 90 0.1 In 6.5 90 0.1 In 6.5 90 0.1 In 7 12 In 6.5 90 0.1 In 7 12 In 8 A A A In 105 90 0.1 In 1.3 In 8 A A In 1.3 In 1.4 In 1.5	eam signal (m)											80	
Pe 346 336 196 335 335 62 197 346 336 196 335 335 62 197 7.1 6.5 6.2 7.1 6.5 6.2 4.1 35 4.0 33 3.5 4.0 33 2.2 100 100 100 100 100 99 100 590 570 845 606 571 1003 1376 11 EB1 WB1 NB1 SB1 2 2 1 37 1 12 4 2 2 2 1 37 1 12 4 2 656 917 1376 1538 0.00 0.02 0.00 0.02 (m) 0.1 0.4 0.0 0.6 B A A A 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3	latoon unblocked												
346 336 196 335 335 62 197 7.1 6.5 6.2 7.1 6.5 6.2 4.1 3.5 4.0 3.3 3.5 4.0 3.3 2.2 100 100 100 100 100 99 100 590 570 845 606 571 1003 1376 1 1 2 2 1 37 1 1 2 2 1 37 (m) 0.10 0.4 0.0 0.6 (m) 0.10 0.4 0.0 0.6 May a A A A A A A A A A A A A A A A A A A	onflicting volume	346	336	196	335	335	62	197			64		
346 336 196 335 335 62 197 7.1 6.5 6.2 7.1 6.5 6.2 4.1 3.5 4.0 3.3 3.5 4.0 3.3 2.2 100 100 100 100 99 100 590 570 845 606 571 1003 1376 11 2 2 1 37 2 2 1 37 6.56 917 1376 1538 (m) 0.1 0.4 0.0 0.6 (m) 0.1 0.4 0.0 0.6 B A A 10.5 9.0 0.1 1.3 B A 11.5 9.0 0.1 1.3	stage 1 conf vol												
346 336 196 335 335 62 197 7.1 6.5 6.2 7.1 6.5 6.2 4.1 3.5 4.0 3.3 3.5 4.0 3.3 2.2 100 100 100 100 100 99 100 590 570 845 606 571 1003 1376 1 1 2 2 1 37 2 2 1 37 6 6 917 1376 1538 (m) 0.1 0.4 0.0 0.0 10.5 9.0 0.1 1.3 B A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3 10.5 9.0 0.1 1.3	stage 2 conf vol												
7.1 6.5 6.2 7.1 6.5 6.2 4.1 3.5 4.0 3.3 3.5 4.0 3.3 2.2 100 100 100 100 100 99 100 590 570 845 606 571 1003 1376 11 EB1 WB1 NB1 SB1 2 2 1 37 1 1 4 2 2 2 1 37 6.56 917 1376 1538 0.00 0.02 0.00 0.02 (m) 0.1 0.4 0.0 0.6 10.5 9.0 0.1 1.3 B A A A A A A A A A A A A A A A A A A A	unblocked vol	346	336	196	332	332	62	197			64		
3.5 4.0 3.3 3.5 4.0 3.3 2.2 100 100 100 100 99 100 590 570 845 606 571 1003 1376 11 EB1 WB1 NB1 SB1 2 2 1 37 1 1 2 2 1 37 656 977 1376 1538 0.00 0.02 0.00 0.02 (m) 0.11 0.4 0.0 0.6 B A A A A A A A A A A A A A A A A A A	ngle (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
35 40 33 35 40 33 22 100 100 100 100 99 100 100 100 100 100 99 100 111 EB1 WB1 NB1 SB1 2 2 1 37 2 2 1 37 656 917 1376 1538 0.00 0.02 0.00 0.02 (m) 0.1 0.4 0.0 0.6 10.5 9.0 0.1 1.3 B A A 10.5 9.0 0.1 1.3 B A A 10.5 9.0 0.1 1.3 B A A 10.5 9.0 0.1 1.3 B A 11.5 9.0 0.1 1.3 B A 10.5 9.0 0.1 1.3	stage (s)												
100 100 100 100 99 100 590 570 845 606 571 1003 1376 EB 1 WB1 NB1 SB1 3 14 65 334 1 12 4 2 66 917 1376 100 0.02 0.00 0.02 (m) 0.1 0.4 0.0 0.6 B A A A A A A 10.5 B A A A A A A A A A A A A A A A A A A		3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
EB1 WB1 NB1 SB1 3 14 65 234 1 2 1 37 1 12 4 2 656 917 1376 1538 (m) 0.00 0.02 0.00 0.02 (m) 0.1 0.4 0.0 0.6 B A A A A A A A 10.5 B A A A A A A A A 10.5 Cy Villization 28.1% ICU Level of Service A 15.1% ICU Level OI Service A 15.1% ICU Leve	neue free %	100	100	100	100	100	66	100			86		
EB 1 WB 1 NB 1 SB 1 3 14 65 234 1 2 2 1 37 1 1 37 2 656 917 1376 1538 0.00 0.02 0.00 0.02 0.02 0.00 0.02 0.05 0.06 1.13 8 A A A A A 1.13 A A 1.13 B A<	apacity (veh/h)	260	220	845	909	571	1003	1376			1538		
3 14 65 234 1 2 1 37 1 1 2 4 2 1 37 1 1 37 1 2 1 37 1 2 1 37 1 2 1 37 1 37 656 917 1376 1538 0.00 0.02 0.00 0.02 0.1 0.4 0.0 0.6 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3	tion, Lane #	EB 1	WB1	NB 1	SB 1								
2 2 1 37 656 917 1376 1538 0.00 0.02 0.00 0.02 0.1 0.4 0.0 0.6 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A 1.5 1.5 P.0 0.1 1.3 1.5 P.0 0.1 1.3 1.5 P.0 0.1 1.3	ne Total	8	14	92	234								
656 917 1376 1538 0.00 0.02 0.00 0.02 0.1 0.4 0.0 0.6 10.5 9.0 0.1 1.3 B A A A A A 10.5 9.0 0.1 1.3 B A I I.3 B A I I.3 1.5 Powel of Service	ne Left	2	2	-	37								
656 917 1376 1538 0.00 0.02 0.00 0.02 0.11 0.4 0.0 0.6 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 1.1 1.3 B A 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.6 1.6 1.7 1.7 1.8 1.8 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9	ne Right	-	12	4	2								
0.00 0.02 0.00 0.02 0.1 0.4 0.0 0.6 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 B A A A A 10.5 9.0 0.1 1.3 1.5 CU Level of Service		929	917	1376	1538								
01 04 00 06 105 90 0.1 1.3 B A A A A 105 90 0.1 1.3 B A II.3 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	ne to Capacity	0.00	0.02	0.00	0.02								
10.5 9.0 0.1 1.3 B A A A 10.5 9.0 0.1 1.3 B A 1.5 Ilization 28.1% CU Level of Service	e Length 95th (m)	0.1	0.4	0.0	9.0								
B A A A 10.5 9.0 0.1 1.3 B A 1.5 Ullizalion 28.1% ICU Level of Service 15	ol Delay (s)	10.5	0.6	0.1	1.3								
10.5 9.0 0.1 1.3 B A / / // // // // // // // // // // //	SOT	В	V	⋖	V								
V 1.5 ICU Level of Service 1.5 1.5 ICU Level of Service 1.5 IS IS IN	pach Delay (s)	10.5	0.6	0.1	1.3								
1.5 1.15 ICU Level of Service 15	oach LOS	В	4										
1.5 Utilization 28.1% ICU Level of Service 15	section Summary												
Utilization 28.1% ICU Level of Service	ne Delav			1.5									
15	ection Capacity Utilization			28.1%	⊇	J Level o	f Service			⋖			
	rsis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 9: Sixth Line & Anatolia Building 3 East Access

Future Total (AM)

0.92 22 None 287 287 287 60.92 312 236 275 275 275 Free 0% 0.92 299 None 0.92 2.2 100 1223 336 0 24 24 1700 0.20 0.0 336 • 0.92 3.3 0.00 0.10 0.1 0.1 324 0.92 463 0.02 0.5 12.9 B 12.9 B 631 3.5 98 444 631 cSH CSH Volume to Capacity Queue Length 95th (m) Control Delay (s) Lane LOS Grade
Peak Hour Factor
Peak Hour Factor
Peux Houry flow rate (vph)
Pedeskirans
Lane Width (m)
Walking Speed (m/s)
Walking Speed (m/s)
Walking Speed (m/s)
Walking Type
Median type
Median type
Right turn flare (veh)
Walking Speed (m/s)
Percon Blockage
Right turn flare (veh)
Walking Speed (m/s)
C, Siage 1 conf vol
CC, siage 2 conf vol
CC, siage 2 conf vol
CC, siage 5 conf vol
CC, siage 5 conf vol
CC, siage 6 conf vol
CC, siage 6 conf vol
CC, siage 8 Lane Configurations Traffic Volume (veh/h) -uture Volume (Veh/h) Direction, Lane #
Volume Total
Volume Left
Volume Right Sign Control

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ICU Level of Service

0.2 27.7% 15

Intersection Summary
Average Delay
Intersection Capacity Utilization
Analysis Period (min)

0.0

Approach Delay (s) Approach LOS

Future Total (AM) 2027 Scenario 2 HCM Unsignalized Intersection Capacity Analysis 12: Clark Boulevard & Anatolia Building 1 South Access

ICU Level of Service 130 0.92 14 60.92 15 None None 18 18 0.92 0.92 24.3% 0.92 2.2 156 0 141 1700 0.09 0.0 0.0 75 156 36 16 0 1424 0.01 0.03 3.4 A 0.92 3.3 100 973 98 86 Stop 0.92 41 3 854 0.05 1.3 9.4 A 138 138 3.5 95 846 4 4 Average Delay Intersection Capacity Utilization Analysis Period (min) Direction, Lane #
Volume Total
Volume Left
CSH
Volume Right
CSH
Volume In Sink (m)
Queue Length 95ink (m)
Lane LOS Lane Configurations
Traffic Volume (veh/h)
Future Volume (veh/h)
Sign Control
Grade
Peak Hour Factor
Hourly flow rate (vph)
Pedestrians Median type
Median storage weh)
Upstream signal (m)
Upstream signal (m)
Dx, platoon unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
tC, single (s)
tC, single (s)
tC, stage (s) Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right tum flare (veh) Approach Delay (s) Approach LOS

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HCM Unsignalized Intersection Capacity Analysis

0							
	-	4	←	•	۶	→	
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	>		£			€	
Traffic Volume (veh/h)	2	10	20	9	40	142	
Future Volume (Veh/h)	2	10	20	9	40	142	
Sign Control	Stop		Free			Free	
Grade	%0		%0			%0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	2	11	24	7	43	154	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type			None			None	
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	298	28			61		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	298	28			61		
tC, single (s)	6.4	6.2			4.1		
tC, 2 stage (s)							
fF (s)	3.5	3.3			2.2		
% eauf enenb 0d	100	66			16		
cM capacity (veh/h)	674	1009			1542		
Direction, Lane #	WB 1	NB 1	SB 1				
Volume Total	13	61	197				
Volume Left	2	0	43				
Volume Right	11	7	0				
CSH	937	1700	1542				
Volume to Capacity	0.01	0.04	0.03				
Queue Length 95th (m)	0.3	0.0	0.7				
Control Delay (s)	8.9	0.0	∞.				
Lane LOS	∀ 0		∀ ,				
Approach Delay (s)	8.9	0.0	 				
Approach LOS	A						
Intersection Summary							
Average Delay			1.7				
Intersection Capacity Utilization	ıtion		26.4%	⊇	U Level o	ICU Level of Service	А
Analysis Period (min)			2				

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

139 6.3 1.00 0.94 1.00 0.91 1763 1.00 1763 0.94 228 24.6 24.6 0.22 6.3 3.0 390 0.20 1.00 0.54 38.2 1.00 3.0 6.3 1.00 1.00 0.95 258 258 0.63 835 99 0 66 40% 24.6 24.6 0.22 6.3 3.0 185 20.5 G 38 40 35.6 35.6 0.32 6.3 3.0 585 0.11 8 0% 0 0.33 28.7 1.00 0.3 29.0 1990 1900 4.0 11.00 11.00 0.95 1805 0.15 289 0.94 35.6 35.6 0.32 4.0 3.0 3.0 1.18 1.13 34.5 1.00 1.00 1.00 1.38.6 212 0% HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 22 22 1900 33% 1837 8% 54 NA 51.1 51.1 0.46 6.2 3.0 1365 c0.62 1.35 29.9 1.00 160.7 44 1706 1706 1900 6.2 6.2 6.2 1.00 1.00 2967 1.00 2967 1.00 32 32 1900 4.0 1.00 0.95 0.08 0.08 149 0.94 34 55.3 0.50 0.50 3.0 1.36 0.01 0.01 0.25 24.4 1.00 1.00 34 142.3 1.26 111.0 104.6% 8 8 1900 96 9 % 1920 2% 49 NA 6.2 0.95 0.99 11.00 3170 3170 0.94 54.7 54.7 0.49 6.2 3.0 1562 0.61 1.23 28.1 1.00 109.0 137.1 Ť HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 160 160 1900 1.00 1.00 0.95 1763 0.07 136 62.5 62.5 0.56 4.0 3.0 190 c0.06 0.44 0.89 29.8 1.00 3.7.2 67.0 170 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Actuated Green, G (s) Effective Green, g (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor -ane Group Flow (vph) Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS Bus Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) -ane Grp Cap (vph) Uniform Delay, d1 Progression Factor Permitted Phases v/s Ratio Perm v/s Ratio Prot v/c Ratio

Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

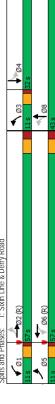
Future Total (PM)

Future Total (PM) 2027 Scenario 2

	1	1	-	ţ	•	←	۶	→	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	*	+ 13	*	+ 13	K	2,	*	2,	
Traffic Volume (vph)	160	1717	32	1706	199	153	93	214	
Future Volume (vph)	160	1717	32	1706	199	153	93	214	
Lane Group Flow (vph)	170	1923	34	1838	212	203	66	376	
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	M	Perm	M	
Protected Phases	2	2	_	9	3	00		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	_	9	က	∞	4	4	
Switch Phase									
Minimum Initial (s)	7.0	25.0	7.0	25.0	7.0	10.0	10.0	10.0	
Minimum Split (s)	11.0	31.2	11.0	31.2	11.0	32.3	32.3	32.3	
Total Split (s)	11.0	57.0	11.0	57.0	11.0	43.0	32.0	32.0	
Total Split (%)	%6.6	51.4%	%6.6	51.4%	%6.6	38.7%	28.8%	28.8%	
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	2.2	1.0	2.2	1.0	2.3	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.2	4.0	6.2	4.0	6.3	6.3	6.3	
Lead/Lag	Lead	Lag	Lead	Lag	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
v/c Ratio	0.89	1.19	0.18	1.35	1.09	0.34	0.54	0.91	
Control Delay	68.2	121.3	12.6	188.4	122.4	28.5	49.5	8.99	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	68.2	121.3	12.6	188.4	122.4	28.5	49.5	8.99	
Queue Length 50th (m)	23.4	~301.1	3.2	~292.3	~39.1	32.5	19.8	77.7	
Queue Length 95th (m)	#68.2	#346.5	9.7	#337.7	#82.5	52.6	38.5	#132.3	
Internal Link Dist (m)		475.1		256.2		211.8		201.7	
Turn Bay Length (m)	120.0		100.0		45.0		30.0		
Base Capacity (vph)	190	1610	184	1366	194	611	193	428	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.89	1.19	0.18	1.35	1.09	0.33	0.51	0.88	
Intersection Summary									
Cycle Length: 111									
Actuated Cycle Length: 111									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	to phase 2:	EBTL and	16:WBTL	, Start of	Green				
Natural Cycle: 150									
Control Type: Actuated-Coordinated	rdinated								
 Volume exceeds capacity, queue is theoretically infinite. 	ty, queue is	theoretic	ally infini	te.					
Queue shown is maximum after two cycles.	m after two	cycles.							
# OEth porcoptilo volumo ovcoode capacity	ien abaanv	in thio	and advious and a	Conclod					

1: Sixth Line & Derry Road Splits and Phases:

95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

1900 3343 1.00 3343 1.00 243 C0.12 C0.22 1.44 44.2 1.00 218.2 262.4 328 328 328 1900 1.00 1.00 0.95 1501 0.49 349 349 349 14% 13 19.0 G 187 0.94 3% 18.5 0.15 5.7 3.0 470 0.06 445 70 70 70 1900 1900 5.7 6.0.85 8055 8055 8055 74 74 74 74 74 74 74 74 76 8055 0.37 1.00 0.5 0.5 0.5 D D 218 218 1900 4.0 11.00 0.95 1698 0.30 537 0.94 232 0.94 5% 28.5 28.5 0.24 4.0 3.0 224 0.09 0.16 1.04 43.2 1.00 69.8 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 114 0 22 0.94 2197 3% 22 NA 66.8 66.8 0.56 5.3 3.0 1835 c0.67 ↑↑ 1954 1954 1900 5.3 0.95 0.99 1.00 3297 1.00 3297 2079 1.20 26.6 1.11 91.9 92 92 1900 4.0 1.00 1.00 0.95 1587 0.06 100 74.6 0.62 4.0 3.0 3.0 158 0.34 0.62 25.3 0.96 4.2 0 98 11% 93.3 1.24 120.0 105.8% 0 2% 1612 1612 1612 1612 5.3 0.95 0.95 0.99 1.00 3261 1.00 3261 1.00 36 38 NA NA 64.7 64.7 0.54 5.3 3.0 3.0 1758 0.55 1.02 27.6 0.80 22.1 44.1 Ť HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 4.0 11.00 0.95 1600 0.06 104 44 70.4 70.4 0.59 4.0 3.0 3.0 0.02 0.02 0.18 0.33 26.3 1.76 0.9 41 44 Frt Fit Protected Sard. Flow (prot) Fit Permitted Sard. Flow (perm) Pask-hour factor, PHF Adj. Flow (vph) RTOR Reduction (vph) Permitted Phases
Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor -ane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS 3us Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) -ane Grp Cap (vph) Uniform Delay, d1 Progression Factor v/s Ratio Perm v/s Ratio Prot v/c Ratio

Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (PM) 2027 Scenario 2

Future Total (PM) 2027 Scenario 2

Lane Group Lane Configurations Traffic Volume (vph)	/ FBL	EBT 1612	WBL WBL	WBT 1954	NBL 218	→ NBT OF	SBI SBI €	SBT SBT 299	
-uure Volune (ypn) -ane Group Flow (yph) Furn Type	44 pm+pt 5	1799 NA	98 pm+pt	2200 NA 6	232 pm+pt 3	273 NA 8	328 349 pm+pt 7	400 AA	
Permitted Phases Detector Phase Switch Phase	5 5	2 000	1 1	9 0	3 8	8 0	4 7	4	
Vinimum Initial (s) Vinimum Split (s) Total Split (s) Total Split (%)	11.0	20.0 34.3 67.0 55.8%	11.0	34.3 67.0 55.8%	11.0	34.7 28.0 23.3%	7.0 11.0 14.0 11.7%	34.7 28.0 23.3%	
rellow Time (s) All-Red Time (s) Lost Time Adjust (s)	3.0	3.7	3.0	3.7	3.0	3.7 2.0 0.0	3.0	3.7 2.0 0.0	
ead/Lag ead-Lag Optimize? Recall Mode //c Ratio	Yes None 0.29	Lag Yes C-Min 1.02 45.5	Yes None 0.62 28.4	Lag Yes C-Min 1.18	Yes None 1.00 98.8	Lag Yes None 0.48 28.4	Yes None 1.37 224.5	Lag Yes None 0.75 54.6	
Oueue Delay Total Delay Oueue Length 50th (m) Oueue Length 95th (m) nternal Link Dist (m)		0.0 0.0 18.4 45.5 3.4 ~245.6 m5.3 m#292.1	0.0 28.4 13.2 m17.9	0.0 114.1 ~351.5 #410.0 124.7	0.0 98.8 47.5 #78.6	0.0 28.4 18.3 31.2 340.6	0.0 224.5 ~110.7 #168.0	0.0 54.6 47.4 63.2 275.9	
Turn Bay Length (m) Base Capacity (vph) Sianvalion Cap Reduch Spillback Cap Reduch Storage Cap Reducth Reduced vic Ratio	100.0 151 0 0 0 0	1760 0 0 0 0	90.0 159 0 0 0 0	1860	70.0 232 0 0 0 0 1.00	663 0 0 0 0	50.0 254 0 0 0 0	639	
Intersection Summary Cycle Length. 120 Actuated Cycle Length. 120 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Matural Cycle. 145 Control Type: Actuated-Coordinated - Volume shown is maximum after two cycles. Queue shown is maximum after two cycles.	o phase 2:: dinated y, queue is n after two kceeds cap n after two	EBTL and theoretic cycles. cycles. cycles. cycles. cycles. cycles. symptometric cycles.	d 6:WBTL ally infinite eue may	, Start of te. be longe	Green Green				

Splits and Phases: 2: Fifth Line & Derry Road

€ ₹ Ø6 (R) - 02 (R) 200

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

pm+pt 4.0 1.00 1.00 1.00 0.95 0.95 0.32 545 0.98 334 2% Perm 0.03 0.21 43.8 1.00 0.4 44.2 19.0 187 187 900 5.7 5.7 1.00 1.00 0.85 1.00 1.00 1.00 1.586 0.98 191 138 53 1% 253 344 337 337 337 1900 5.7 0.95 1.00 1.00 1.00 1.00 1.00 0.98 ¥ 19.2 19.2 0.16 0.67 3.5 % 7 4.0 1.00 1.00 1.00 0.95 0.49 931 0.98 0 18 % pm+pt 4.0 3.0 267 0.02 0.05 0.30 0.6 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service Perm 476 1900 5.3 1.00 0.99 1.00 1.00 1.00 0.98 486 175 3% 52.6 52.6 0.44 664 23.8 1.55 0.2 37.2 0.21 1388 5.3 0.95 1.00 1.00 1.00 1.00 1.00 3305 3305 1416 4% ¥ 52.6 52.6 0.44 0.98 D 36.6 D 1416 33.1 1.03 3.6 37.7 320 320 c0.12 0.35 0.83 34.5 0.80 1.8 pm+pt 261 261 1900 4.0 1.00 1.00 1.00 1.00 0.95 0.08 0.98 266 3% 68.8 68.8 0.57 43.9 1.01 120.0 90.5% Perm 9 46.9 46.9 0.39 5.3 0.85 1.00 1.00 1.00 1562 0.98 3% 610 0.00 0.01 22.4 1.00 0.0 45.3 D 1185 1185 1185 1900 5.3 0.95 1.00 1.00 1.00 1.00 3438 3438 0.98 Ν 46.9 0.39 5.3 3.0 1343 0.35 44.3 1209 1% 0.90 9.9 192 192 1900 4.0 0.97 1.00 1.00 1.00 0.95 3399 3399 0.98 196 2% Prot 12.2 12.2 0.10 3.0 3.45 0.06 0.57 1.00 2.1 53.5 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp., pedbikes
Said. Flow (perm)
Fit Portected
Said. Flow (perm)
Peak-hour factor, PHF
Peak-hour factor, PHF
Red., Flow (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Actuated Green, G (s) Clearance Time (s) Vehicle Extension (s) Incremental Delay, d2 Bus Blockages (#/hr) Effective Green, g (s) Actuated g/C Ratio Turn Type Protected Phases Permitted Phases Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

28.3 28.3 0.24 5.7 330

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Total (PM)

Future Total (PM) 2027 Scenario 2

Lane Group		1	†	1	-	ļ	1	•	—	*	۶	→	*
192 1185 16 261 1388 476 79 337 187 327 443 196 1209 16 266 1416 486 81 344 191 337 443 196 1209 16 266 1416 486 81 344 191 337 443 452 185 16 261 1388 476 79 337 187 327 443 196 1209 16 266 1416 486 81 344 191 334 452 443 1209 16 266 8 8 4 45 452 1209 16 266 8 8 4 45 452 1209 16 260 200 2	Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
192 1185 16 261 1388 476 79 337 187 327 443 192 1185 16 261 1388 476 79 337 187 327 443 192 1185 16 266 1416 88 8 7 443 10 2 6 6 8 8 8 7 4 10 2 1 6 6 3 8 8 7 4 10 2 1 6 6 3 8 8 7 4 11 34.3 11.0 4.0 10.0 </td <td>Lane Configurations</td> <td>ř.</td> <td>‡</td> <td>¥C</td> <td>*</td> <td>‡</td> <td>*</td> <td><u>r</u></td> <td>‡</td> <td>*</td> <td><i>y</i>_</td> <td>‡</td> <td>*</td>	Lane Configurations	ř.	‡	¥C	*	‡	*	<u>r</u>	‡	*	<i>y</i> _	‡	*
192 1185 16 264 118 416 74 337 187 327 443 196 1209 116 264 1416 486 81 344 191 334 452 452 2 2 6 6 8 8 3 4 191 344 191 NA	Traffic Volume (vph)	192	1185	16	261	1388	476	79	337	187	327	443	209
196 1209 16 266 1416 486 81 344 191 334 452 5	Future Volume (vph)	192	1185	16	261	1388	476	79	337	187	327	443	209
Prof NA Perm Pm+pt NA Perm pm+pt NA Perm pm+pt A	Lane Group Flow (vph)	196	1209	16	266	1416	486	81	344	191	334	452	213
5 2 1 6 8 8 8 7 4 5 2 6 6 8 8 8 7 4 5 2 6 8 8 8 7 4 1 5 2 6 8 8 8 7 4 1 5 2 6 8 8 8 7 4 1 5 2 6 6 8 8 7 4 1 5 2 6 3 8 8 7 4 1 5 6 2 0 10 0 0 10 10 10 34.3 31.1 34.7 31.1 34.7 31.1 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7	Turn Type	Prot	NA	Perm	pm+pt	M	Perm	pm+pt	M	Perm	pm+pt	NA	Perm
5 2 6 8 8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 6 8 8 8 7 4 4 4 6 6 8 8 8 7 4 4 6 6 8 8 8 7 4 4 4 6 6 8 8 8 7 4 4 6 6 8 8 8 7 4 4 7 1 10	Protected Phases	വ	2		τ-	9		က	∞		7	4	
5 2 2 1 6 6 3 8 8 7 4 7.0 20.0 20.0 7.0 20.0 7.0 10.0 10.0 7.0 10.0 11.0 34.3 34.3 11.0 34.3 34.3 11.0 34.7 34.7 34.7 11.0 34.7 11.0 34.3 11.0 34.3 34.3 11.0 34.7 34.7 34.7 11.0 34.7 11.0 42.8 34.2 34.2 11.0 34.3 34.7	Permitted Phases			2	9		9	∞		∞	4		4
7.0 20.0 20.0 7.0 20.0 7.0 10.0 23.7 34.7 34.7 11.0 34.7 3	Detector Phase	2	2	2		9	9	m	00	∞	7	4	4
7.0 20.0 20.0 7.0 20.0 20.0 7.0 20.0 20.0 7.0 20.0 20.0 7.0 10.0 7.0 10.0 7.0 10.0 7.0 10.0 7.0 10.0 7.0 10.0 7.0 10.0 7.0 10.0 34.7	Switch Phase												
11.0 34.3 34.3 11.0 34.3 34.3 11.0 34.7 34.7 11.0 34.7 34.7 11.0 34.7 34.2 34.2 11.0 34.2 34.8	Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
17.0 53.0 53.0 11.0 47.0 21.0 35.0 35.0 35.0 21.0 35.0 11.2 44.2% 44.2% 42.8 39.2% 17.5% 29.2% 29.2% 17.5% 29.2% 29.2% 29.2% 29.2% 3.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
14.2% 44.2% 44.2% 34.2% 39.2% 17.5% 29.2% 17.5% 29.2% 37.3	Total Split (s)	17.0	53.0	53.0	11.0	47.0	47.0	21.0	35.0	35.0	21.0	35.0	35.0
3.0 3.7 3.7 3.0 3.7 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	Total Split (%)	14.2%	44.2%	44.2%	9.5%	39.2%	39.2%	17.5%	29.2%	29.2%	17.5%	29.2%	29.2%
1.0 1.6 1.6 1.0 1.0 1.6 1.0 20 20 1.0 20 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
1.5 1.5	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead Lag Lag Lead Lag Lead Lag Lead Lag Lead Lag Lead Lag Yes	Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Ves Ves <td>Lead/Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td>	Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
None C-Min C-Min None C-Min None	Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
057 089 002 083 096 057 027 070 050 099 0.63 57.6 42.8 0.1 29.3 36.8 14.9 29.0 55.7 14.4 81.0 46.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
57.6 42.8 0.1 29.3 36.8 14.9 29.0 55.7 14.4 81.0 46.0 0.0 <td< td=""><td>v/c Ratio</td><td>0.57</td><td>0.89</td><td>0.02</td><td>0.83</td><td>96.0</td><td>0.57</td><td>0.27</td><td>0.70</td><td>0.50</td><td>0.99</td><td>0.63</td><td>0.43</td></td<>	v/c Ratio	0.57	0.89	0.02	0.83	96.0	0.57	0.27	0.70	0.50	0.99	0.63	0.43
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Control Delay	27.6	42.8	0.1	29.3	36.8	14.9	29.0	55.7	14.4	81.0	46.0	7.8
57.6 42.8 0.1 29.3 36.8 14.9 29.0 55.7 14.4 81.0 46.0 24.2 14.7 0.0 41.4 180.9 71.6 13.8 43.2 5.9 68.5 54.6 35.7 #777.5 0.0 m#41.9m#172.3 m64.2 23.7 56.4 26.6 #101.7 71.0 100.0 70.0 110.0 75.0 100.0 75.0 95.0 713.2 100.0 0 </td <td>Queue Delay</td> <td>0.0</td>	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24.2 144.7 0.0 m#41.9m#172.3 m64.2 23.7 56.4 26.6 #101.7 71.0 156.1 26.4 26.6 #101.7 71.0 156.1 26.4 26.6 #101.7 71.0 156.1 26.4 26.6 #101.7 71.0 156.1 26.4 26.6 #101.7 71.0 156.1 26.4 26.6 #101.7 71.0 156.1 26.4 26.6 #101.7 71.0 156.1 26.4 26.6 #101.7 71.0 156.1 26.4 26.6 #101.7 71.0 21.3 2 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Delay	97.6	42.8	0.1	29.3	36.8	14.9	29.0	22.7	14.4	81.0	46.0	7.8
35.7 #177.5 0.0 m#41.9 m#172.3 m64.2 23.7 \$6.4 26.6 #101.7 710 100.0 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 50th (m)	24.2	144.7	0.0	41.4	189.9	71.6	13.8	43.2	5.9	68.5	54.6	0.0
156.1 488.7 213.2 213.	Queue Length 95th (m)	35.7	#177.5	0.0	m#41.9 m	n#172.3	m64.2	23.7	56.4	26.6	#101.7	71.0	19.8
100.0 70.0 110.0 75.0 100.0 75.0 95.0 1 386 13.66 679 320 14.70 847 411 781 511 338 769 769 0	Internal Link Dist (m)		156.1			488.7			381.6			213.2	
386 1366 679 320 1470 847 411 781 511 338 769 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	386	1366	619	320	1470	847	411	781	511	338	697	513
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
0.51 0.89 0.02 0.83 0.96 0.57 0.20 0.44 0.37 0.99 0.59	Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
0.51 0.89 0.02 0.83 0.96 0.57 0.20 0.44 0.37 0.99 0.59	Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Summary	Reduced v/c Ratio	0.51	0.89	0.02	0.83	96.0	0.57	0.20	0.44	0.37	66:0	0.59	0.42
	Intersection Summary												

209 209 5.7 1.00 0.98 1.00 1.403 0.98 50 60 7%

0.98

452 10% ₹

5.7 0.95 1.00 1.00 1.00 3046 1.00 3046

443

Sycle Length: 120 Actuated Cycle Length: 120

0.04 0.15 36.3 1.00 0.2 36.6

1.00

D 55.7

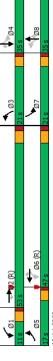
Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 115

Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

M Volume for 95th percentile queue is metered by upstream signal.

3: James Snow Parkway & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

169 169 1900 5.7 1.00 0.86 1.00 1.00 1.00 1.595 0.18 1.00 5.7 1.00 1.00 0.95 0.70 0.70 0.92 80 0 08 Perm 22.0 22.0 0.18 0.18 5.7 3.0 238 0.34 42.6 1.00 0.8 43.5 15.0 79 10 10 10 5.7 1.00 0.87 1.00 22.0 22.0 0.18 5.7 3.0 296 0.02 0.09 1.00 0.1 40.8 D 0.92 11 65 25 NA 132 1900 5.7 1.00 1.00 0.95 1770 0.95 863 22.0 22.0 0.18 5.7 3.0 158 0.91 48.0 1.00 44.6 92.6 Perm 143 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 26. 0.72 5.3 3.0 2561 0.061 1975 5.3 0.95 1.00 1.00 1.00 3533 3533 0.92 Ϋ́ 11.8 3.7 15.5 B 0.85 4.0 1.00 1.00 0.95 89 89 30 0.72 4.0 3.0 3.0 0.11 0.18 0.26 21.8 1.00 1.2 23.0 28 1900 24.0 0.90 120.0 88.4% 49 53 79.3 79.3 0.66 5.3 3.0 23.30 c0.59 2072 NA 0.89 1.43 0.6 C 474 1858 1858 1900 5.3 0.95 1.00 1.00 3526 1.00 3526 0.92 2020 Intersection control Delay
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
C. Critical Lane Group 5.3 1.00 1.00 1.00 0.95 0.05 94 0.92 30 30 Serm 79.3 0.66 5.3 3.0 62 0.35 0.53 10.6 1.50 2.9 18.9 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Turn Type
Protected Phases
Permitted Phases
Actuated Green, G (s) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot ane Group Flow (vph-Effective Green, g (s) Delay (s) Level of Service Approach Delay (s) Approach LOS v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 4: Clark Boulevard & Derry Road

Future Total (PM) 2027 Scenario 2

Future Total (PM) 2027 Scenario 2

Lane Group				•		-	-		•	
me (vph) 30 1858 28 1975 132 10 74 me (vph) 30 1858 28 1975 132 10 74 me (vph) 33 2073 30 2173 43 90 80 me (vph) 33 2073 30 2173 43 90 80 me (vph) 32 2073 30 2173 43 90 80 me (vph) 32 2073 30 2173 43 90 80 messes 2 6 8 8 4 8 4 8 8 8 4 8 8 8 8 8 8 8 8 8 8	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
me (vph) 30 1856 28 1975 132 10 74 me (vph) 30 1858 28 1975 132 10 74 me (vph) 30 1858 28 1975 132 10 74 me (vph) 30 1858 28 1975 132 10 74 me (vph) 30 1858 28 1975 132 10 74 me (vph) 30 1858 2 1973 49 90 80 40 meses 2 1 6 8 8 8 4 4 88 4 488 2 2 1 6 8 8 8 4 4 88 88 4 3 43 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.	Lane Configurations	<i>y</i> -	₩	*	₩	F	2,	r	43	
How (phh) 33 1939 3 1939 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Traffic Volume (vph)	8 8	1858	28	1975	132	10,	74		
hases 2 1 6 8 8 4 4 hases 2 2 1 6 8 8 4 4 sages 2 2 1 6 8 8 8 4 sages 2 2 1 6 8 8 8 4 sages 2 2 1 6 8 8 8 4 sages 2 2 1 6 8 8 8 4 sages 2 2 1 6 8 8 8 4 sages 2 2 1 6 8 8 8 4 sages 2 3 34.3 10.0 10.0 10.0 10.0 10.0 10.0 hilal(s) 10.0 10.0 6.0 10.0 10.0 10.0 10.0 10.0 hilal(s) 24.3 34.3 10.0 34.3 34.7 34.7 34.7 34.7 34.7 34.7 34.7	l ane Group Flow (vnh)	33 29	2073	30	2173	143	00	80	100	
hases 2 1 6 8 8 4 hases 2 2 1 6 8 8 4 ase 2 2 1 6 8 8 4 see 4 see 6 8 8 8 4 see 6 8 8 8 4 see 10 10 10 10 10 10 10 10 10 10 10 10 10	Turn Type	Perm	NA	pm+pt	NA	Perm	₹ \	Perm	Z Z	
2 6 6 8 8 4 100 100 6.0 10.0 10.0 10.0 10.0 100 10.0 6.0 10.0 10.0 10.0 10.0 55.0 5.5 6.25% 8.3% 70.8% 29.2% 29	Protected Phases		2	-	9		00		4	
2 2 1 6 8 8 4 4 100 100 6.0 100 100 100 100 100 34.3 34.7 34.7 34.7 34.7 34.7 34.7 34.7	Permitted Phases	2		9		8		4		
100 10.0 6.0 10.0 10.0 10.0 10.0 10.0 10	Detector Phase	2	2	-	9	∞	∞	4	4	
100 100 100 100 100 100 100 100 100 100	Switch Phase	000	5		5	5	5	5	000	
75.0 75.0 10.0 85.0 35.0 35.0 35.0 15.0 15.0 15.0 15.0 15.0 15.0 15.0 1	Minimum Solff (s)	24.3	34.3	10.0	34.3	34.7	3.4.7	34.7	3.4.7	
62.5% 62.5% 83% 70.8% 29.2% 29.2% 29.2% 21.4 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1	Total Split (s)	75.0	75.0	10.0	85.0	35.0	35.0	35.0	35.0	
3.7 3.7 3.0 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 1.0 1.6 1.6 1.6 1.6 2.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Total Split (%)	62.5%	62.5%	8.3%	70.8%	29.2%	29.2%	29.2%	29.2%	
1.6 1.6 1.0 1.6 2.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Yellow Time (s)	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
100 0.0	All-Red Time (s)	1.6	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
5.3 5.3 4.0 5.3 5.7 5.7 Lag La	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lag Lag Lead Lag Ves Yes Yes S C-Min C-Min None C-Min None None None None C-Min C-Min None C-Min None None C-Min None None C-Min None None None C-Min None C-Min None None None None C-Min None C-Min None None None C-Min None C-Min None None C-Min None C-Min None None C-	Total Lost Time (s)	5.3	5.3	4.0	5.3	5.7	5.7	5.7	5.7	
Ves Ves C-Min C-Min None C-Min 0.53 0.87 0.20 0.85 0.91 0.25 0.34 0.53 0.87 0.20 0.85 0.91 0.25 0.34 1.20 44.4 0.0	Lead/Lag	Lag	Lag	Lead						
Condinated Condin	Lead-Lag Optimize?	Yes	Yes	Yes						
0.53 0.87 0.20 0.85 0.91 0.25 0.34 34.5 25.9 8.6 17.5 97.4 12.0 44.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None	
34.5 25.9 8.6 17.5 97.4 12.0 44.4 12.0 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	v/c Ratio	0.53	0.87	0.20	0.85	0.91	0.25	0.34	0.63	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Control Delay	34.5	25.9	9.8	17.5	97.4	12.0	44.4	9.09	
34.5 25.9 8 6 17.5 97.4 120 44.4 5.8 234.1 1.8 183.5 34.8 2.2 17.3 m7.3 m227.5 5.4 276.3 #62.3 15.6 30.7 33.0 70.0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5.8 234.1 18 183.5 34.8 2.2 17.3 m/3 m/221.5 5.4 276.3 #62.3 15.6 30.7 36.0 475.1 5.4 476.1 5.6 4 40.0 6.2 23.7 150 25.6 210 45.4 31.7 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Delay	34.5	25.9	9.8	17.5	97.4	12.0	44.4	9.09	
m7.3 m227.5 5.4 276.3 #62.3 15.6 30.7 3.8.0 4.75.1 5.4 4.00 6.2 2377 15.0 256.0 210 45.4 317 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 50th (m)	2.8	234.1	1.8	183.5	34.8	2.2	17.3	41.1	
70.0 336.0 475.1 56.4 40.0 6.2 237 70.0 0 26.0 210 45.4 317 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 95th (m)		m227.5	5.4	276.3	#62.3	15.6	30.7	62.2	
70.0 70.0 40.0 40.0 40.0 40.0 40.0 40.0	Internal Link Dist (m)		336.0		475.1		56.4		313.3	
62 2377 150 2560 210 454 317 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Turn Bay Length (m)	70.0		70.0				40.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	62	2377	150	2560	210	454	317	366	
0 0 0 0 0 0 0 0 0 0 8 020 025 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
9 020 025 0 8 020 025 0	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
8 020 025 0	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary Cycle Length: 120 Actuated Cycle Length: 120 Greate (190%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 120 Control Type: Actuated-Coordinated A 9th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum affer two cycles.	Reduced v/c Ratio	0.53	0.87	0.20	0.85	0.68	0.20	0.25	0.48	
Cycle Length: 120 Aduated Cycle Length: 120 Aduated Cycle Length: 120 Offise: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 120 Control Type: Actuated-Coordinated ## 95th percentile volume exceeds capacitly queue may be longer. Queue shown is maximum affer two cycles.	Intersection Summary									
Actuated Cycle Length: 120 Offset 0 (0%), Reterenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 120 Control Type: Actualed-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles.	Cycle Length: 120									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Ocycle: 120 Control Type: Actualed-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Actuated Cycle Length: 120									
Natural arcycle: L2d Control Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Offset: 0 (0%), Referenced to	to phase 2:	EBTL an	d 6:WBTL	, Start of	Green				
Sub percentile volume exceeds capacity, queue may be longer. Subh percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles.	Natural Cycle: 120 Control Type: Actuated Coor	rdinatod								
# 9sth percentile volume exceeds capacify, queue may be longer. Queue shown is maximum after two cycles.	culling Type, Actualeu-coo.	nalalini nama								
Cacac Showing in maximum and two cycles.	# 95th percentile volume e	exceeds ca	pacity, qi	rene may	pe longe	ے				
//-/ 6 OT 14	Cueue SHOWILIS III AAIII III	III altel twe	Lycics.							

Splits and Phases: 4: Clark Boulevard & Derry Road

104 ₹ Ø2 (R)

₩ 12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Total (PM) 2027 Scenario 2

	SBR		11	=1	1900								0.92	12	0	0																										
*	S				19								0																													
→	SBT	4	459	459	1900	5.7	1.00	1.00	1.00	1856	1.00	1856	0.92	499		510	¥	4		23.2	23.2	0.58	5.7	3.0	1084	c0.27		0.47	4.7	1.00	0.3	2.1	A	5.1	A							
۶	SBL	<u>, , , , , , , , , , , , , , , , , , , </u>	0	0	1900								0.92	0	0	0	Perm		4																							
•	NBR		7	7	1900								0.92	∞	0	0																					⋖		11.0	⋖		
←	NBT	ţ	435	435	1900	2.7	1.00	1.00	1.00	1858	1.00	1858	0.92	473	0	481	ΝA	∞		23.2	23.2	0.58	2.7	3.0	1085	0.26		0.44	4.6	1.00	0.3	4.9	Υ	4.9	V							
•	NBL	F	4	4	1900	2.7	1.00	1.00	0.95	1770	0.46	853	0.92	4	0	4	Perm		∞	23.2	23.2	0.58	2.7	3.0	498		0.00	0.01	3.4	1.00	0.0	3.5	V				ervice					
4	WBR		-	-	1900								0.92	-	0	0																					HCM 2000 Level of Service		time (s)	Service		
Ļ	WBT	¢	6	6	1900	5.3	1.00	0.99	1.00	1837	1.00	1837	0.92	10	-	10	NA	9		5.5	5.5	0.14	5.3	3.0	254	0.01		0.04	14.8	1.00	0.1	14.9	В	15.1	В		M 2000 L		Sum of lost time (s)	J Level of		
>	WBL	r	18	18	1900	2.3	1.00	1.00	0.95	1770	0.74	1380	0.92	70	0	20	Perm		9	5.5	5.5	0.14	5.3	3.0	191		0.01	0.10	14.9	1.00	0.2	15.2	Ω				<u>¥</u>		Su	⊇		
<u> </u>	EBR		10	10	1900								0.92	11	0	0																					5.9	0.42	39.7	42.8%	15	
†	EBT	¢	13	13	1900	5.3	1.00	0.93	1.00	1740	1.00	1740	0.92	14	6	16	Ν	2		5.5	5.5	0.14	5.3	3.0	241	0.01		90:0	14.9	1.00	0.1	15.0	В	15.5	В							
1	EBL	F	36	36	1900	5.3	1.00	1.00	0.95	1770	0.75	1398	0.92	42	0	42	Perm		2	5.5	5.5	0.14	5.3	3.0	193		c0.03	0.22	15.2	1.00	9.0	15.8	В					y ratio		=		
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Frt	Flt Protected	Satd. Flow (prot)	Flt Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)	c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 5: Fifth Line & Clark Boulevard

Future Total (PM) 2027 Scenario 2

																																		~					
→	SBT	4	459	459	511	¥	4		4		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.40	7.3	0.0	7.3	23.4	44.3	372.1		1855	0	0	0	0.28					
—	NBT	æ,	435	435	481	M	∞		∞		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.37	7.1	0.0	7.1	21.6	40.9	156.9		1859	0	0	0	0.26					
•	NBL	*	4	4	4	Perm		∞	∞		10.0	34.7	82.0	70.8%	3.7	2.0	0.0	5.7			Min	0.01	2.8	0.0	2.8	0.2	1.1		32.0	823	0	0	0	0.00					
Ļ	WBT	÷	6	6	=	NA	9		9		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	11.2	0.0	11.2	0.7	3.1	86.5		1482	0	0	0	0.01					
-	WBL	je-	18	18	20	Perm		9	9		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	12.1	0.0	12.1	1.3	4.7		32.0	1113	0	0	0	0.02					
Ť	EBT	æ	13	13	22	NA	2		2		10.0	34.3	32.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	9.2	0.0	9.2	6.0	4.7	204.0		1406	0	0	0	0.02					
1	EBL	*	36	36	42	Perm		2	2		10.0	34.3	32.0	29.2%	3.7	1.6	0.0	5.3			None	0.11	12.7	0.0	12.7	2.8	7.7		32.0	1127	0	0	0	0.04					oordinated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 37.5	Natural Cycle: 70	Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

HCM Unsignalized Intersection Capacity Analysis 10: Clark Boulevard & Anatolia Building 1 North Access/Anatolia Building 2 North Aൽങ്ങ്ലേദ്നമ

Movement EBL and Configurations Traffic Volume (vehrly) Traffic Volume (vehrly) Sign Control Si		EBT	EBR	WBI	TOW		-		NDD	-	F	SRR
G G G				101	WBI	WBR	NBL	NBT	NDM	SBL	SBT	5
€		4			4			4			4	
Volume (Vehrh) onitol cour Factor flow rate (vph) rians g Speed (m/s) g Speed (m/s) min flare (veh)		0	_	4	0	36	_	176	-	6	71	4
ontrol flow rate (vph) flow rate (vph) flans Aidth (m) Aidth (m) Blockage In flave (veh)	0,	0	-	4	0	36	-	176	-	6	71	4
lour Factor flow rate (vph) flow rate (vph) flidth (m) g Speed (m/s) t Bockage in flare (veh)		Stop			Stop			Free			Free	
ph) /s)		%0			%0			%0			%0	
y flow rate (vph) strians Width (m) ing Speed (m's) ent Blockage it fum flare (veh)		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
strians Width (m) Ing Speed (m/s) ant Blockage turn flare (veh) an type	3	0	-	4	0	36	-	191	-	10	77	4
Width (m) ing Speed (m/s) ent Blockage tum flare (veh)												
ing Speed (m/s) ent Blockage turn flare (veh) an type												
ent Blockage tum flare (veh) an type												
turn flare (veh) an type												
an type												
								None			None	
Median storage veh)												
Jpstream signal (m)											80	
X, platoon unblocked												
C, conflicting volume 332		293	79	294	294	192	81			192		
/C1, stage 1 conf vol												
lo.												
ed vol		293	79	294	294	192	8			192		
		6.5	6.2	7.1	6.5	6.2	4.1			4.1		
stage (s)												
		4.0	3.3	3.5	4.0	3.3	2.2			2.2		
on due of free %		100	100	66	100	95	100			66		
cM capacity (veh/h) 59		613	981	654	612	820	1517			1381		
Direction, Lane # EB	_	WB1 I	NB 1	SB1								
Volume Total	4	43	193	16								
Jolume Left	3	4	-	10								
Volume Right		39	-	4								
655		827	1517	1381								
Volume to Capacity 0.01		0.05	0.00	0.01								
Queue Length 95th (m) 0.1		1.3	0.0	0.2								
Control Delay (s) 10.5		9.6	0.0	6:0								
-ane LOS	В	V	V	A								
Approach Delay (s) 10.5		9.6	0.0	6:0								
Approach LOS	В	V										
ntersection Summary												
Average Delay			1.6									
ntersection Capacity Utilization		7	%9 02	S	l evel o	CU Level of Service			⋖			
Analysis Period (min)			15	2								

12-14-2023 Synchro 11 Report BA Group

HCM Unsignalized Intersection Capacity Analysis 9: Sixth Line & Anatolia Building 3 East Access

on Capacity Analysis Future Total (PMI) 3027 Scenario 2

																																								A	
*	SBR		œ	8			0.92	6																																ICU Level of Service	
→	SBT	2	328	328	Free	%0	0.92	357						None		236																								J Level o	
←	NBT	₩	368	368	Free	%0	0.92	400						None																										⊇ ⊇	
•	NBL		2	2			0.92	7									0.92	366			264	4.1		2.2	100	1193	SB 1	366	0	6	1700	0.22	0.0	0.0		0.0			0.5	31.0%	15
>	EBR		4	4			0.92	4									0.92	362			259	6.2		3.3	66	715	NB 1	402	2	0	1193	0.00	0.0	0.1	V	0.1					
4	EBL	>	77	22	Stop	%0	0.92	24									0.92	992			669	6.4		3.5	94	372	EB 1	28	24	4	366	0.07	2.8	14.7	В	14.7	В			_	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	IF (s)	po dueue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	CSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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HCM Unsignalized Intersection Capacity Analysis
12: Clark Boulevard & Anatolia Building 1 South Access

																																								A	
•	SBR		48	48			0.92	25																																of Service	
-	SBT		16		Free		0.92	17						None																										ICU Level of Service	
—	NBT	₩	16	16	Free	%0	0.92	17						None																											
•	NBL		4	4			0.92	4										69			69	4.1	22	7.7	100	1532	SB 1	69	0	25	1700	0.04	0.0	0.0		0.0			6.2	18.9%	2
*	EBR		12	12			0.92	13										43			43	6.2	2.2	o. 6	4007	102/	NB 1	21	4	0	1532	0.00	0.1	1.4	V	1.4					
1	EBL	>	130	130	Stop	%0	0.92	141										89			89	6.4	2 2	U.0	8 8	934	EB 1	154	141	13	942	0.16	4.7	9.6	V	9.6	A			<u>_</u>	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	(C, 2 stage (s)	IF (5)	pu queue rree %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	CSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

12-14-2023 Synchro 11 Report

HCM Unsignalized Intersection Capacity Analysis 11: Clark Boulevard & Anatolia Building 2 South Access

Future Total (PM) 2027 Scenario 2

NBT NBR SBL 142 4 18 142 4 18 142 4 18 154 4 20 092 092 092 092 092 154 4 20 158 4.1 142 22 22 22 22 22 23 20 01 142 03 03 19 19 19 19 19 10 11 11 11 12 13 14 14 17 17 17 17 17 17 17 17 17 17		-	/	-	•	۶	•	
yuations	Movement	WBL	WBR	NBT	NBR	SBL	SBT	
me (verly) 6 36 142 4 18 58 me (verly) 6 36 142 4 18 58 me (verly) 5 69 6 36 142 4 18 58 me (verly) 7 39 154 4 20 63 rate (vph) 7 39 154 4 20 63 rate (vph) 7 39 154 4 20 63 rate (vph) 7 39 154 4 20 63 me (verly) 8 156 158 read (ms) 6 4 6.2 read (ms) 6 6 6 7 6 7 6 read (ms) 6 6 7 6 7 6 read (ms) 6 7 6 7 6 read (ms) 6 7 7 7 0 0 0.3 read (ms) 6 7 7 0 0.3 read (ms) 7 8 7 7 0 0.3 read (ms) 7 8 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Lane Configurations	>		æ			₩	
me (Vehth) 6 36 142 4 18 58 me (Vehth) 6 36 142 4 18 58 me (Vehth) 7 39 154 4 20 63 rate (veht) 8 3 15 3 3 3 22 rece % 99 96 96 record vol 259 156 158 record vol 259 156 141 record vol 259 156 158 rece % 99 96 90 rece % 99 90 rece % 99 90 rece % 99 90 rece % 90 90 re	Traffic Volume (veh/h)	9	36	142	4	18	58	
Free (vph) 7 39 154 4 20 63 Factor 0.82 0.82 0.92 0.92 0.92 Factor 0.82 0.82 0.92 0.92 0.92 Factor 0.82 0.82 0.92 0.92 Factor 0.82 0.82 0.92 0.92 Factor 0.82 0.82 0.82 0.92 Factor 0.82 0.83 0.83 Factor 0.83 0.83 0.83	Future Volume (Veh/h)	9	36	142	4	18	58	
Factor 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Sign Control	Stop		Free			Free	
Factor 092 092 092 092 092 (m) (m) (m) (m) (m) (m) (m) (m)	Grade	%0		%			%0	
rate (vph) 7 39 154 4 20 63 (m) eed (m/s) ced (m/s) ced (m/s) ced (m/s) ced (m/s) are (veh) are (veh) are (veh) by olume 259 156 158 are # WB1 NB1 SB1 are # WB1 NB1 SB1 are # WB1 NB1 SB1 by 0 0 0 0 0 1 cen's y 0 0 0 0 0 1 are # A 0 0 0 0 0 0 3 by 0 0 0 0 1 19 cost y 0 0 0 0 0 1 19 cost y 0 0 0 0 0 1 19 cost y 0 0 0 0 0 1 19 cost y 0 0 0 0 0 1 19 cost y 0 0 0 0 0 1 19 cost y 0 0 0 0 0 0 1 19 cost y 0 0 0 0 0 0 1 19 cost y 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
(m) (ctra) (ctra	Hourly flow rate (vph)	7	39	154	4	20	63	
(m) se are (veh) ccage are (veh) signal (m) unblocked age veh) unblocked signal (m) unblocked signal (m) signa	Pedestrians							
eed (mix) ckage are (veh) are (veh) are (veh) by groutin and exert of service sign veh groutin are exert of service sign veh and exert of service sign sign sign sign sign sign sign sign	Lane Width (m)							
are (veh) are (veh) are (veh) age veh) age veh) age veh) age veh) by add (m) unblocked 158 158 158 158 158 158 158 15	Walking Speed (m/s)							
are (verh) Saeveth Torrivol Torrivol Signal (m) Torrivol Signal (m) Torrivol Signal (m) Torrivol Signal (m) Signal	Percent Blockage							
age veh) annocked unblocked unblocked an order of service age veh order of service age veh) age veh order of service age veh) age veh order of service age veh) age veh order	Right turn flare (veh)							
age veh) age veh) age veh) unblocked unblocked ag veldume 259 156 158 1 conf vol 2 conf vol 3 conf vol 4 6.2 4.1 (s) 6.4 6.2 4.1 (s) 8.9 96 99 (vehh) 720 890 1422 an # 46 158 83 al # 46 158 83 th	Median type			None			None	
ignal (m) unblocked unblocked unblocked unblocked unblocked unblocked unblocked 1 conf vol 2 conf vol 2 conf vol 3 conf vol 3 conf vol 4 conf vol 6 conf vol 6 conf vol 6 conf vol 8 con 8 conf vol 8 con 8 c	Median storage veh)							
unblocked unblocked tond volume 259 156 158 see % 99 96 99 to volume 259 166 158 ane # WB1 NB1 SB1 1422 ane # WB1 NB1 SB1 1422 tr	Upstream signal (m)							
rig volume 259 156 158 To control 259 156 158 To control 259 156 158 To control 259 156 158 Solution 259 156 4.1 (s) 3.5 3.3 2.2 ee % 99 96 99 Fig. 1422 ane # WB1 NB1 SB1 al 46 158 al 46 158 an 46 158 an 46 158 an 46 158 an 40 142 an 50 001 an 50 001 an 64 100 0.3 an 7 19 A A A A A A A A A A A A A A A A A A A	pX, platoon unblocked							
1 confivol 2 confivol 2 confivol 3 confivol 3 confivol 4 confivol 3 confivol 6 confivol 6 confivol 6 confivol 6 confirming 8 confirming 9 confirming 9 confirming 1 confirming	vC, conflicting volume	259	156			158		
2 conf vol 259 156 158 158	vC1, stage 1 conf vol							
Ked vol 259 156 158 (s) 6.4 6.2 4.1 (s) 3.5 3.3 2.2 ee% 99 96 99 ee% 99 96 99 f (vehn) 720 890 1422 ame # WB I NB I 83 f I 7 0 20 fri P 7 0 20 fri Bsprift 39 4 0 sprift 859 170 142 appendix 0.0 0.3 3 ay (s) 9.4 0.0 0.3 about (s) A A A A condition 1.9 A A A condition 1.9 <td>vC2, stage 2 conf vol</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	vC2, stage 2 conf vol							
(\$) 6.4 6.2 4.1 (\$) 8.5 3.3 2.2 ee % 99 96 99 (Vehh) 720 890 1422 ane # WB1 NB1 SB1 1422 al	vCu, unblocked vol	259	156			158		
(\$) 3.5 3.3 2.2 ee% 99 66 99 1422 ane # WB1 NB1 SB1 1422 t1 7 0 20 htt 899 1700 1422 capacity 0.05 0.09 0.01 by \$(\$)\$ 9.4 0.0 1.9 capacity tilization 2.51% ICU Level of Service 1.59 capacity tilization 2.51% ICU Level of Service 1.59 capacity tilization 1.55.1% ICU Level of Service 1.55.1% ICU Level of Service 1.55.1% Incomparison 1.55.1% ICU Level of Service 1.55.1% ICU	tC, single (s)	6.4	6.2			4.1		
ee % 99 96 99 99 99 96 99 99 96 99 96 99 99	tC, 2 stage (s)							
ee % 99 96 96 99 f (eehn) 720 890 1422 ane # WB 1 NB 1 SB 1 al	tF (s)	3.5	3.3			2.2		
ane # WB1 NB1 SB1 1422 al	p0 queue free %	66	96			66		
ane # WB1 NB1 SB1 al	cM capacity (veh/h)	720	830			1422		
al 46 158 83 It 7 0 20 Int 39 4 0 Sep 1700 1422 Sepacity 0.05 0.09 0.01 Jth 95lth (m) 1.4 0.0 0.3 Sy (s) 9.4 0.0 1.9 OS A A A Summary 2.1 CDacity Utilization 25.1% ICU Level of Service ride (fmin) 15	Direction, Lane #	WB 1	NB 1	SB 1				
t 1 7 0 20 Int 39 4 0 889 1700 1422 3apacity 0.05 0.09 0.01 91h 95th (m) 1.4 0.0 0.3 A A A A Islands Copacity Utilization 25.1% ICU Level of Service rided (min) 15	Volume Total	46	158	83				
hit 39 4 0 859 1700 1422 Apacity 0.05 0.09 0.01 3y (s) 9,4 0.0 0.3 A A A A A Summary A Summary 2,1 A Capacity Utilization 25.1% ICU Level of Service	Volume Left	7	0	20				
889 1700 1422 3gh 95th(m) 0.05 0.09 0.01 3yl 95th(m) 1.4 0.0 0.3 3yl(s) A A A A A A A A A A A A A A A A A A A	Volume Right	39	4	0				
Jamesily 0.05 0.09 0.01 Jamesily (S) 0.4 0.0 0.3 Jamesily (S) 0.4 0.0 1.9 A A A A A A A A A A A A A A A A A A A	cSH	826	1700	1422				
July 95th (m) 14 0.0 0.3 ay (s) 9.4 0.0 1.9 A A A OS A Summary Loacity Utilization 25.1% ICU Level of Service 15 mind of 15 min	Volume to Capacity	0.02	0.09	0.01				
ay (s) 9.4 0.0 1.9 A A A A A A A A A A A A A A A A A A A	Queue Length 95th (m)	1.4	0.0	0.3				
A A A A	Control Delay (s)	9.4	0.0	1.9				
9.4 0.0 1.9 A A 2.1 2.1 CU Level of Service n)	Lane LOS	A		⋖				
any 2.1 CU Level of Service 15 15 15 10 Level of Service 15 15 15 15 15 15 15 15 15 15 15 15 15	Approach Delay (s)	9.4	0.0	1.9				
7. 2.1 2.1 2.1 2.1 2.1 CU Level of Service (min) 15	Approach LOS	V						
2.1 2.1 2.1 2.1 2.1 icU Level of Service (min) 15	Intersection Summary							
(min) 25.1% ICU Level of Service 15	Average Delay			2.1				
	Intersection Capacity Utiliza	rtion		25.1%	⊇	U Level o		
	Analysis Period (min)			15				

12-14-2023 Synchro 11 Report BA Group

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Background (AM)

125 125 1900 6.3 1.00 0.93 1.00 1729 1729 0.97 135 34 230 1% 0.75 0.18 306 0.13 10.00 53.3 D 51.8 D 6.3 1.00 1.00 0.95 1780 0.47 872 872 0.97 35 35 19.7 0.18 6.3 3.0 154 16.5 G 28 28 1900 297 167 167 16.3 6.3 6.3 11.00 11.00 11.00 11.00 11.00 17.2 0.60 42.0 1.00 3.1 45.2 D 19.7 19.7 0.18 6.3 3.0 3.2 3.2 0.11 6 195 1% 6.3 1.00 1.00 0.95 1805 0.31 593 85 19.7 19.7 0.18 6.3 3.0 0% 0.81 43.8 1.00 35.1 79.0 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 22% 778 778 778 1900 6.2 6.2 6.2 0.99 11.00 32.25 11.00 32.25 10.97 838 2% 37 NA 66.8 66.8 0.60 6.2 3.0 3.0 1940 0.26 0.43 11.9 11.00 0.7 12.6 B 12.8 B 4.0 1.00 0.95 1729 0.06 109 15 69.6 69.6 69.6 0.63 3.0 3.0 1.09 0.08 0.14 22.1 1.00 0.06 15 49.8 1.01 111.0 106.3% 139 0 % 0 0.97 72.0 72.0 0.65 6.2 3.0 1993 c0.70 ↑↑ 1960 1960 1900 6.2 6.2 0.99 0.99 1.00 3073 3073 2021 2160 3% 58 NA 1.08 19.5 1.00 47.2 66.7 Ť 62.4 HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 158 158 1900 4.0 11.00 11.00 0.95 0.28 163 163 2% 78.8 0.71 4.0 3.0 3.0 0.23 0.23 0.36 6.1 1.00 0.5 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Permitted Phases
Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor -ane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS Bus Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) -ane Grp Cap (vph) Uniform Delay, d1 Progression Factor v/s Ratio Perm v/s Ratio Prot v/c Ratio

Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Background (AM) 2027 Scenario 3

→	SBT	÷	131	131	264	NA	4		4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.78	51.6	0:0	51.6	49.1	73.3	201.7	7447) †	0 0	0	0.59							
۶	SBL	r	34	34	35	Perm		4	4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.23	40.4	0.0	40.4	6.9	15.5		30.0	607	0 0	0	0.17							
←	NBT	2,	167	167	201	¥	∞		∞		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.61	47.7	0.0	47.7	41.1	61.1	211.8	445	c +4 C C	0 0	0	0.45							
•	NBL	r	82	82	82	Perm		80	∞		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.81	6.06	0.0	6:06	18.8	#39.3	ŗ	45.0	747	0 0	0	09:0				Green			
Į.	WBT	₩	778	778	841	NA	9		9		25.0	31.2	0.79	60.4%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.43	13.5	0.0	13.5	51.4	74.5	256.2	1044	1944	0 0	0	0.43				Start of (oe longer
>	WBL	r	15	15	15	pm+pt	_	9	_		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.09	9.9	0.0	9.9	0.8	3.3	0	0.001	0/-	0 0	0	0.09				6:WBTL			eue may r
†	EBT	₩	1960	1960	2164	NA	2		2		25.0	31.2	0.79	60.4%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	1.05	54.7	0.0	54.7	225.0	#377.0	475.1	200	7007	0 0	0	1.05				BTL and			cycles.
1	EBL	*	158	158	163	pm+pt	വ	2	2		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.36	7.5	0.0	7.5	6.7	20.6	000	120.0	42/	0 0	0	0.36				bhase 2:F		dinated	xceeds cap n after two
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Starvation Can Beductin	Spillhack Can Reducti	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 111	Actuated Cycle Length: 111	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 150	Control Type: Actuated-Coordinated	# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

1: Sixth Line & Derry Road

P04 ₩ ₩ **★** Ø6 (R) - 02 (R) **30**

12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

5.7 0.95 0.95 1.00 3138 1.00 3138 22.3 22.3 0.19 5.7 3.0 0.13 583 0.02 0.1 900 5.7 1.00 1.00 0.95 0.36 5.57 5.7 117 117 12% 23 Perm 22.3 22.3 0.19 5.7 3.0 103 15.0 G 84 84 0 4% 0.95 88 0 286 286 288 288 1900 1900 1007 3456 1.00 3456 0.95 331 23 336 0.0% 0.57 44.5 1.00 1.2 45.7 93 93 1900 5.7 1.00 1.00 0.95 1694 0.69 98 0 8 % 22.3 22.3 0.19 5.7 3.0 228 0.08 0.43 43.2 1.00 1.3 44.5 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 249 249 0.95 262 0 15% 75.3 75.3 0.63 5.3 3.0 1970 0.31 456 699 699 1900 699 0.49 12.0 0.93 0.9 12.1 B B 27.0 C 83.3 0.69 4.0 3.0 3.0 1.01 41.2 0.63 1.01 41.2 0.99 67.0 4.0 1.00 0.95 1805 0.05 0.05 101 184 184 63.9 1.14 120.0 107.7% 154 154 1900 0 % 0 0.95 2325 2% 39 NA 445 2060 2060 1900 5.3 0.95 0.99 1.00 3234 1.00 3234 0.95 2168 74.7 74.7 0.62 5.3 3.0 2013 co.72 1.16 22.6 0.53 72.1 84.1 Ť HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 88 88 88 88 1.00 1.00 1.00 0.95 0.24 454 454 93 82.1 82.1 0.68 4.0 3.0 3.0 3.0 0.01 7.1 0.72 0.72 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Permitted Phases
Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor -ane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS Bus Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) -ane Grp Cap (vph) Uniform Delay, d1 Progression Factor v/s Ratio Perm v/s Ratio Prot v/c Ratio

Critical Lane Group

12-14-2023 Synchro 11 Report BA Group

Queues 2: Fifth Line & Derry Road

Future Background (AM)

Future Background (AM) 2027 Scenario 3

→	SBT	₽ ₽	99	99	101	NA.	4		4		10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7			None	0.17	28.8	0.0	28.8	7.5	15.8	275.9		609	0	0	0	0.17										
۶	SBL	<u>_</u>	111	11	117	Perm		4	4		10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7			None	1.14	174.8	0.0	174.8	~33.6	#72.8		20.0	103	0	0	0	1.14										
+	NBT	₽ ₽	286	286	386	¥,	∞		∞		10.0	34.7			3.7	2.0	0.0	2.7			None	0.58	45.3	0.0	45.3	43.4	60.4	340.6		999	0	0	0	0.58										
•	NBL	r	93	93	86	Perm		00	∞		10.0	34.7		23.3%	3.7	2.0	0.0	5.7			None	0.43	20.0	0.0	20.0	21.7	39.7		0.07	228	0	0	0	0.43				reen						_
ļ	WBT	₩	669	669	866	NA.	9		9		20.0	34.3	0.08	. %1.99	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.50	11.3	0.0	11.3	54.5	64.4	124.7		2001	0	0	0	0.50				Start of G			. :		e longer.	am signa
\	WBL	r	175	175	184	pm+pt	_	9	-		7.0	11.0	12.0	10.0%	3.0	1.0	0.0	4.0	Lead			1.00	95.3	0.0	95.3	29.1	#79.1		0.06	184	0	0	0	1.00				6:WBTL,			any infinite		ue may b	by upstre
†	EBT	₩	2060	2060		Z Y	2		2		20.0	34.3	0.08	92.99	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.15	87.8	0.0	87.8	.353.7	f348.2	170.5		2018	0	0	0	1.15				BTL and			Ineoretica	cycles.	acity, que	metered
*	EBL	y -	88	88	93	bm+pt	2	2	2		7.0	11.0	12.0	10.0%	3.0	1.0	0:0	4.0	Lead	Yes	None	0.23	3.8			4.3	m4.2 m#348.2		100.0	407	0	0	0	0.23				to phase 2:E		ordinated	ily, queue is	im after two	exceeds cap	itile queue is
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	lurn lype	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Oueue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 150	Control Type: Actuated-Coordinated	 Volume exceeds capacity, queue is theoretically infinite. 	Oueue shown is maximum after two cycles.	# 95th percentile volume exceeds capacity, queue may be longer	Queue snown is maximum after two cycles. — Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Fifth Line & Derry Road

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

Future Background (AM) 2027 Scenario 3

	\	Ť	-	*	,	/		-		k.	+	*
Novement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations	K.	\$	*	r	‡	*-	je.	\$	*	r	‡	*-
raffic Volume (vph)	187	1729	30	. 67	543	178	24	271	179	339	377	182
uture Volume (vph)	187	1729	30	19	543	178	24	271	179	339	377	182
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Fotal Lost time (s)	4.0	2.3	5.3	4.0	2.3	5.3	4.0	2.7	5.7	4.0	5.7	5.7
ane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
rpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
-lpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
T.	1.00	1.00	0.85	1.00	1.00	0.85	1:00	1.00	0.85	1.00	1.00	0.85
It Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
satd. Flow (prot)	3446	3376	1497	1791	3453	1460	1715	3428	1489	1727	3346	1580
It Permitted	0.95	1.00	1.00	0.07	1.00	1.00	0.52	1.00	1.00	0.37	1.00	1.00
satd. Flow (perm)	3446	3376	1497	140	3453	1460	938	3428	1489	671	3346	1580
Peak-hour factor, PHF	96:0	96.0	96:0	96.0	96.0	96.0	96.0	96.0	96:0	96.0	96.0	96.0
Adj. Flow (vph)	195	1801	31	0/	266	185	22	282	186	353	393	190
RTOR Reduction (vph)	0	0	16	0	0	102	0	0	137	0	0	142
-ane Group Flow (vph)	195	1801	15	20	299	83	22	282	49	353	393	48
Confl. Peds. (#/hr)				-					_	_		
Heavy Vehicles (%)	1%	7%	%9	%0	1%	4%	4%	3%	4%	7%	4%	1%
3us Blockages (#/hr)	က	23	_	2	17	15	က	11	7	9	18	co
Turn Type	Prot	A	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	M	Perm
Protected Phases	2	2		-	9		3	∞		7	4	
Permitted Phases			2	9		9	80		∞	4		4
Actuated Green, G (s)	12.1	59.7	26.7	60.4	54.0	54.0	21.4	16.9	16.9	38.9	30.4	30.4
Effective Green, g (s)	12.1	59.7	26.7	60.4	54.0	54.0	21.4	16.9	16.9	38.9	30.4	30.4
Actuated g/C Ratio	0.10	0.50	0.50	0.50	0.45	0.45	0.18	0.14	0.14	0.32	0.25	0.25
Slearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	2.7	4.0	2.7	5.7
/ehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
ane Grp Cap (vph.	347	1679	744	158	1553	657	1%	482	209	375	847	400
//s Ratio Prot	90:00	c0.53	3	0.02	0.16		0.00	0.08		c0.14	0.12	
//s Ratio Perm	į		0.01	0.20		90:0	0.02		0.03	c0.16		0.03
//c Ratio	0.56	1.07	0.02	0.44	0.36	0.13	0.13	0.59	0.24	0.94	0.46	0.12
Jniform Delay, d1	51.4	30.1	15.3	26.2	21.7	19.2	41.1	48.3	42.8	36.0	37.9	34.5
Progression Factor	00.1	00.1	00.1	0.73	0.1	2.91	00.5	00.1	1.00	1.00	00.1	1.00
ncremental Delay, d2	2.1	44.4	0.1	8. 6	9.0	0.4	0.3	E	0.0	31.7	0.4	0.1
Jelay (s)	53.5	74.5	15.4	6.02	4.77	50.3	4.4	20.1	40.4	0.70	38.3	34.6
evel of Service	۵	ш ;	20	ی	ی و	ш	۵	O 5.	۵	ш	<u>ا</u>	ی
Approach Delay (s)		71.6			29.9			48.3			48.6	
Approach LOS		ш			ပ			Ω			٥	
ntersection Summary												
HCM 2000 Control Delay			55.9	Ĭ	CM 2000	HCM 2000 Level of Service	service		П			
HCM 2000 Volume to Capacity ratio	/ ratio		1.03									
Actuated Cycle Length (s)			120.0	S	Sum of lost time (s)	time (s)			19.0			
Intersection Capacity Utilization Analysis Period (min)	_		97.1%	<u>○</u>	U Level o	ICU Level of Service			ш.			

Synchro 11 Report 12-14-2023 BA Group

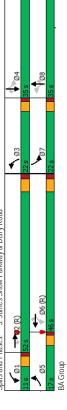
Queues 3: James Snow Parkway & Derry Road

Future Background (AM) 2027 Scenario 3

	4	†	1	-	↓	4	•	—	•	•	-	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	K.	‡	¥C.	r	‡	¥C	*	‡	*	*	‡	*-
Traffic Volume (vph)	187	1729	30	19	543	178	24	271	179	339	377	182
Future Volume (vph)	187	1729	30	19	543	178	24	271	179	339	377	182
Lane Group Flow (vph)	195	1801	31	70	266	185	25	282	186	353	393	190
Turn Type	Prot	NA	Perm	pm+pt	¥	Perm	pm+pt	¥	Perm	pm+pt	N	Perm
Protected Phases	2	2		-	9		က	∞		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	2	2	2	-	9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	52.0	52.0	11.0	46.0	46.0	22.0	35.0	35.0	22.0	35.0	35.0
Total Split (%)	14.2%	43.3%	43.3%	9.5%	38.3%	38.3%	18.3%	29.2%	29.2%	18.3%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.56	1.03	0.04	0.38	0.35	0.24	0.11	0.64	0.57	0.94	0.46	0.35
Control Delay	97.6	60.2	0.1	15.2	22.5	10.2	28.2	56.3	17.6	69.1	40.5	7.0
Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	60.2	0.1	15.2	22.5	10.2	28.2	56.3	17.6	69.1	40.5	7.0
Queue Length 50th (m)	24.1	~258.2	0.0	7.2	53.5	8.9	4.2	35.5	0.9	74.1	45.7	0.0
Queue Length 95th (m)	35.6	#329.5	0.0	14.8	76.0	30.0	10.2	48.3	27.9	#100.4	59.9	18.5
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	386	1745	820	182	1599	775	390	837	483	376	875	553
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	1.03	0.04	0.38	0.35	0.24	90:0	0.34	0.39	0.94	0.45	0.34
Intersection Summary												

Cycle Length: 120
Actuated Cycle Length: 120
Actuated Cycle Length: 120
Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated Coordinated
Volume exceeds expacitly, queue is theoretically infinite.
Oueue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Oueue shown is maximum after two cycles.

Splits and Phases: 3: James Snow Parkway & Derry Road



HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

1900 5.7 1.00 0.88 1.00 1.00 5.7 0.5 53.2 D 5.7 1.00 1.00 0.95 1770 0.75 0.92 26 Perm 8.1 8.1 0.07 5.7 3.0 0.28 53.2 1.00 15.0 5.7 1.00 0.91 1.00 1.00 1.00 1.00 0.92 8.1 8.1 0.07 5.7 3.0 1114 0.01 0.08 52.4 1.00 0.3 52.7 D ¥ 5.7 1.00 1.00 0.95 1770 0.72 1340 0.92 Perm 8.1 0.07 5.7 3.0 0.19 52.8 1.00 1.0 53.9 0.01 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 99 16 100.9 100.9 0.84 5.3 3.0 2933 0.30 872 872 872 1900 5.3 0.95 0.99 1.00 1.00 3489 948 0.36 2.2 1.00 0.3 2.5 A A 6.0 1044 Ϋ́ 100.9 0.84 4.0 3.0 196 0.043 0.57 35.6 1.00 3.7 39.3 102 4.0 1.00 0.95 0.95 0.04 81 19.2 0.84 120.0 87.1% 45 0.92 44 2141 2141 11900 5.3 0.95 1.00 1.00 3528 1.00 3528 0.92 2327 87.8 87.8 0.73 5.3 3.0 2581 0.92 13.2 1.78 0.7 24.2 C 2375 NA necedent Carrier and Part Manager Activation Capacity Talio Actuated Cyde Length (\$) Intersection Capacity Utilization Analysis Period (min) 75 75 1900 5.3 11.00 11.00 0.95 11770 0.27 509 82 82 Serm 87.8 87.8 0.73 5.3 3.0 372 0.22 5.2 1.68 0.1 8.8 Peak-hour factor, PHF Adj. Flow (vph) RTOR Reduction (vph) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Peak-hour factor, PHF Critical Lane Group Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Group Flow (vph Actuated Green, G (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot Effective Green, g (s) Approach Delay (s) Approach LOS Turn Type Protected Phases Permitted Phases Actuated g/C Ratio Clearance Time (s) Delay (s) Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

4: Clark Boulevard & Derry Road Queues

Future Background (AM)

Future Background (AM) 2027 Scenario 3

4 0 0 0 **8 8 4** 34.7 35.0 29.2% 3.7 2.0 0.0 5.7 None 0.32 23.8 0.0 23.8 2.6 2.6 16.0 313.3 434 34.7 35.0 29.2% 3.7 2.0 0.0 24 24 26 Perm 0.22 56.2 0.0 56.2 6.1 15.7 40.0 338 0 0 0 0.08 34.7 35.0 29.2% 3.7 2.0 0.0 0.12 34.0 0.0 34.0 1.9 9.6 56.4 ₹ 3 423 34.7 35.0 29.2% 3.7 2.0 0.0 5.7 Perm 0.15 54.2 0.0 54.2 34.3 34.3 85.0 70.8% 3.7 1.6 0.0 0.35 0.0 2.6 25.6 33.1 475.1 872 872 872 1047 NA 6.0 10.0 10.0 3.0 1.0 0.0 4.0 4.0 4.0 4.0 7 ks None 0.56 229.9 9.9 pm+pt 28.8 70.0 198 102 102 2141 2376 NA 0.22 0.91 11.4 25.7 0.0 0.0 11.4 25.7 9.6 276.0 m10.3 m242.9 10.0 34.3 75.0 C-Min 62.5% Lag 336.0 2615 C-Min 10.0 34.3 75.0 62.5% 1.6 Perm Lag Yes 70.0 5.3 Oueue Delay Total Delay Oueue Length 50th (m) Oueue Length 95th (m) Base Capacity (vph) Starvation Cap Reductn .ane Group Flow (vph) Spillback Cap Reducth Storage Cap Reductn Minimum Initial (s)
Minimum Spilt (s)
Total Spilt (s)
Total Spilt (%)
All Red Time (s)
Lost Time Adjust (s)
Total Lost Time (s) Lane Configurations Traffic Volume (vph) Internal Link Dist (m) Turn Bay Length (m) uture Volume (vph) Lead-Lag Optimize? Recall Mode Turn Type Protected Phases Permitted Phases Reduced v/c Ratio **Detector Phase** Control Delay Lead/Lag Ratio

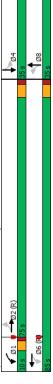
4: Clark Boulevard & Derry Road splits and Phases:

Referenced to phase 2:EBTL and 6:WBTL, Start of Green Control Type: Actuated-Coordinated

Notume for 95th percentile queue is metered by upstream signal.

Actuated Cycle Length: 120

Sycle Length: 120



HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Background (AM)

1900 5.7 1.00 0.98 1.00 1832 1.00 1832 5.7 0.29 2.6 5.7 1.00 1.00 0.95 1770 0.48 892 892 66 99 Perm 26.4 26.4 0.68 5.7 3.0 602 0.07 0.11 2.2 1.00 0.1 2.3 A 11.0 B 23 26.4 26.4 0.68 5.7 3.0 1249 c0.27 442 442 1900 5.7 1.00 0.99 1.00 1.00 1.850 1.00 1.850 1.00 1.00 1.850 1.00 1.00 1.00 0.40 2.8 1.00 0.2 3.0 A 3.0 N ₹ 0.07 2.1 1.00 0.0 2.1 1000 5.7 1.00 0.95 0.95 0.54 1015 0.92 26.4 26.4 0.68 5.7 3.0 685 Perm HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 1900 1.7 0.04 5.3 3.0 75 co.01 13 5.3 5.3 1.00 0.93 1.00 1.00 1.00 Ϋ́ 18.0 1.3 19.3 B 5.3 1.00 1.00 0.95 1770 1.00 1.00 0.92 1.7 0.04 5.3 3.0 Perm 0.00 0.02 17.9 1.00 0.1 18.0 B 3.7 0.39 39.1 55.1% 1900 5.3 1.00 0.97 1.00 1.00 1.00 1.00 0.92 ¹2 ¥ 1.7 1.7 0.04 5.3 3.0 78 78 0.16 118.0 1.00 0.9 18.9 B 1 Intersection Summary
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
C. Critical Lane Group 5.3 11.00 11.00 0.95 11.00 11.00 11.00 11.00 1000 Serm 5.3 3.0 81 0.14 18.0 1.00 0.8 18.8 0.01 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Turn Type
Protected Phases
Permitted Phases
Actuated Green, G (s) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot -ane Group Flow (vph Effective Green, g (s) Delay (s) Level of Service Approach Delay (s) Approach LOS v/s Ratio Perm

12-14-2023 BA Group

Synchro 11 Report

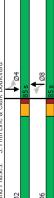
Queues 5: Fifth Line & Clark Boulevard

Future Background (AM) 2027 Scenario 3

Lane Group Lane Configurations	FBI	-							
Lane Configurations	רטר	EBI	WBL	WBT	NBL	NBT	SBL	SBT	
	F	\$	<i>y</i> -	æ,	r	43	je-	÷	
Traffic Volume (vph)	10	1	2	13	10	442	61	297	
Future Volume (vph)	10	11	2	13	10	442	19	297	
Lane Group Flow (vph)	=	15	2	26	1	203	99	363	
Turn Type	Perm	NA	Perm	NA	Perm	M	Perm	M	
Protected Phases		2		9		∞		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	9	9	∞	∞	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	34.3	34.3	34.3	34.3	34.7	34.7	34.7	34.7	
Total Split (s)	32.0	32.0	32.0	35.0	82.0	85.0	85.0	85.0	
Total Split (%)	29.2%	29.2%	29.2%	29.2%	70.8%	70.8%	70.8%	70.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0:0	0.0	0.0	0.0	0.0	0.0	0.0	0:0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.7	5.7	5.7	5.7	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Min	Min	Min	Min	
v/c Ratio	0.02	0.03	0.00	0.02	0.01	0.30	0.08	0.22	
Control Delay	11.0	10.2	11.0	8.9	3.2	3.3	3.1	2.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	11.0	10.2	11.0	8.9	3.2	3.3	3.1	2.8	
Queue Length 50th (m)	0.5	0.5	0.1	9.0	0.0	0.0	0.0	0:0	
Queue Length 95th (m)	3.2	3.8	1.2	4.9	2.0	43.0	7.1	28.3	
Internal Link Dist (m)		204.0		86.5		156.9		372.1	
Turn Bay Length (m)	35.0		35.0		35.0		35.0		
Base Capacity (vph)	1610	1562	1610	1500	1015	1850	892	1831	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.01	0.01	0.00	0.02	0.01	0.27	0.07	0.20	
Intersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 34.8									
Natural Cycle: 70									
Control Type: Actuated-Uncoordinated	ordinated								

5: Fifth Line & Clark Boulevard Splits and Phases:

9 **₽ 1**000



HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Background (PM)
2027 Scenario 3

	1	†	~	>	ţ	4	•	•	4	۶	→	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	<u></u>	₩		je-	₩		jr.	æ		r	æ	
Traffic Volume (vph)	161	1727	88	59	1700	22	182	153	30	93	214	137
Future Volume (vph)	191	1727	88	59	1700	22	182	153	30	93	214	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.2		4.0	6.2		4.0	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Ft	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.94	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1748	3080		1729	3263		1805	1823		1780	1757	
FIt Permitted	0.07	1.00		0.08	1.00		0.17	1.00		0.64	1.00	
Satd. Flow (perm)	133	3080		141	3263		314	1823		1196	1757	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	166	1780	16	30	1753	23	188	158	31	96	221	141
RTOR Reduction (vph)	0	m	0	0	_	0	0	7	0	0	21	0
Lane Group Flow (vph)	166	1868	0	30	17.75	0	188	182	0	96	341	0
Heavy Vehicles (%)	7%	3%	%0	4%	7%	22%	%0	1%	%0	1%	1%	1%
Bus Blockages (#/hr)	3	28	0	1	37	2	0	2	0	1	2	_
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	MA	
Protected Phases	വ	2		-	9		m	∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	63.1	55.2		55.7	51.5		35.1	35.1		24.1	24.1	
Effective Green, g (s)	63.1	55.2		22.7	51.5		35.1	35.1		24.1	24.1	
Actuated g/C Ratio	0.57	0.50		0.50	0.46		0.32	0.32		0.22	0.22	
Clearance Time (s)	4.0	6.2		4.0	6.2		4.0	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	190	1531		130	1513		193	9/5		259	381	
v/s Ratio Prot	c0.06	c0.61		0.01	0.54		c0.06	0.10			0.19	
v/s Ratio Perm	0.43			0.11			c0.25			0.08		
v/c Ratio	0.87	1.22		0.23	1.17		0.97	0.32		0.37	0.89	
Uniform Delay, d1	29.6	27.9		24.4	29.8		34.6	28.8		37.0	42.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.9	105.2		6.0	85.3		26.8	0.3		6.0	22.4	
Delay (s)	62.5	133.1		25.3	115.0		91.4	29.5		37.9	64.7	
Level of Service	ш	L.		O	ı.		ш	ပ		۵	ш	
Approach Delay (s)		127.3			113.5			60.2			29.0	
Approach LOS		ı			ш.			ш			ш	
Intersection Summary												
HCM 2000 Control Delay			109.9	ĭ	CM 2000	HCM 2000 Level of Service	service		ш			
HCM 2000 Volume to Capacity ratio	city ratio		1.17									
Actuated Cycle Length (s)			111.0	S	Sum of lost time (s)	time (s)			20.5			
Intersection Capacity Utilization	ition		103.4%	೦	U Level c	ICU Level of Service			G			
Analysis Period (min)			15									

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

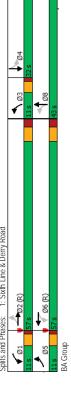
Queues 1: Sixth Line & Derry Road

Future Background (PM) 2027 Scenario 3

Jame Group Feb Fei Wel Wei Nei Nei Se Se		1	†	-	ţ	•	—	۶	→	
153 93 189 96 189 96 96 189 96 96 96 96 96 96 96 96 96 96 96 96 96	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
153 93 183 189 96 189 96 96 96 96 96 96 96 96 96 96 96 96 96	Lane Configurations	<i>y</i> -	₹	<u>,-</u>	₹	F	æ	F	æ	
153 93 189 96 189 96 189 96 189 96 190 100 100 100 23 323 323 323 323 323 323 323 323 323 323 323 323 323 323 430 189 96 100 00 100 00 1286 409 128	Traffic Volume (vph)	161	1727	29	1700	182	153	93	214	
189 96 18 189 96 10 NA Perm 8 8 4 8 8 4 8 8 4 8 10 100 100 100 100 13.3 32.3 32.3 32.3 32.3 32.3 32.3 43.0 32.0 0	Future Volume (vph)	161	1727	29	1700	182	153	93	214	
8 8 4 4 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9	Lane Group Flow (vph)	166	1871	30	1776	188	189	96	362	
8 8 4 4 8 8 4 4 10.0 10.0 10.0 32.3 32.3 32.3 32.3 32.3 32.3 32.3 3	Turn Type	pm+pt	Ν	pm+pt	NA	pm+pt	¥	Perm	M	
8 8 4 10 100 100 32.3 32.3 32.3 32.3 32.3 32.3 32.3 32.3 32.3 32.3 4.0 4.0 4.0 4.0 0.0	Protected Phases	2	2	_	9	3	∞		4	
100 100 100 100 100 100 100 100 100 100	Permitted Phases	2		9		∞		4		
100 100 100 100 100 100 100 100 100 100	Detector Phase	2	2	_	9	က	∞	4	4	
100 100 323 323 430 320 430 320 43 323 40 40 40 00 63 63 80 00 100 00	Switch Phase									
32.3 32.3 32.3 32.3 32.3 32.3 32.3 32.0 32.0	Minimum Initial (s)	7.0	25.0	7.0	25.0	7.0	10.0	10.0	10.0	
3.20 3.20 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.	Minimum Split (s)	11.0	31.2	11.0	31.2	11.0	32.3	32.3	32.3	
38.7% 28.8% 24.0 40.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Total Split (s)	11.0	27.0	11.0	27.0	11.0	43.0	32.0	32.0	
40 40 40 40 63 63 63 63 63 63 63 63 63 63 63 63 63	Total Split (%)	%6.6	51.4%	%6.6	51.4%	%6.6	38.7%	28.8%	28.8%	
23 23 23 23 23 23 23 23 23 23 23 23 23 2	Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	
6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3	All-Red Time (s)	1.0	2.2	1.0	2.2	1.0	2.3	2.3	2.3	
6.3 6.3 6.3 1.29 1.29 1.29 1.29 1.29 1.29 1.29 1.29	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lag Ves Ves	Total Lost Time (s)	4.0	6.2	4.0	6.2	4.0	6.3	6.3	6.3	
Yes None None 1 0.32 286 40.9 286 40.9 286 40.9 3 30.2 3 18.4 49.6 3 40.9 5 11.8 3 0.0 0 0 0 0 0 0 0 0 1 0.31 0.35	Lead/Lag	Lead	Lag	Lead	Lag	Lead		Lag	Lag	
None None (132 0.37 1 0.32 0.37 1 0.32 0.37 1 0.40 0.00 0.00 0.00 0.00 0.00 0.00 0.	Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
1 0.32 0.37 2.86 40.9 0.0 0.0 2.86 40.9 3.30.2 18.4 #1 211.8 30.0 6.09 277 0 0 0 0 0 0 1 0.31 0.35	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
28.6 40.9 0.0 0.0 2.86 40.9 2.86 40.9 3.30.2 18.4 2.11.8 30.0 0.0 0 0.0 0 1 0.31 0.35	v/c Ratio	0.87	1.18	0.17	1.17	0.94	0.32	0.37	06:0	
28.6 40.9 28.6 40.9 3 30.2 31.8 4 211.8 2 211.8 30.0 0	Control Delay	63.5	117.4	12.4	115.2	82.0	28.6	40.9	92.0	
286 40.9 3 30.2 49.6 34.7 #1 211.8 30.0 609 277 0 0 0 0 0 0 0 1 0.31 0.35	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3 30.2 18.4 211.8 2 211.8 30.0 0 0 0 0 0 0 1 0.31 0.35	Total Delay	63.5	117.4	12.4	115.2	82.0	28.6	40.9	92.0	
211.8 2 211.8 2 211.8 0.0 6.09 277 0 0 0 0 0 0 1 0.31 0.35	Queue Length 50th (m)	22.7	~293.2	2.8	~258.8	30.8	30.2	18.4	73.9	
211.8 30.0 30.0 0 0 0 0 0 0 0 0 0 1 0.31 0.35	Queue Length 95th (m)	#66.5	#338.4	6.9	#304.2	#64.0	49.6	34.7	#124.9	
30.0 9 6.09 277 0 0 0 0 0 0 1 0.31 0.35	Internal Link Dist (m)		475.1		256.2		211.8		201.7	
609 277 0 0 0 0 0 0 0 0 0 1 0.35	Turn Bay Length (m)	120.0		100.0		45.0		30.0		
0.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	191	1579	177	1512	199	609	277	427	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
4 0.31 0.35	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary Cycle Length: 111 Cycle Length: 111 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 140 Control Type: Actualed-Condinated Control Type: Actualed-Condinated Outle shown is maximum after two cycles. Outle seconds capacity, queue is theoretically infinite. Use a shown is maximum after two cycles.	Reduced v/c Ratio	0.87	1.18	0.17	1.17	0.94	0.31	0.35	0.85	
Cycle Length: 111 Offset length: 111 Offset length: 111 Offset of (%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle; 140 Control Type: Actualed-Coordinated Control Type: Actualed-Coordinated ■ Youtune weckes capacity, queue is theoretically infinite. Ouele shown is maximum after two cycles. # 95th parcentile volume exceeds capacity, queue may be longer.	Intersection Summary									
Actuated Cycle Length: 111 Offset: 0 (10%) Exferenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 140 Control Type: Actuated-Coordinated Control Type: Actuated-Coordinated Outeue shown is maximum after two cycles. Outeue shown is maximum after two cycles.	Cycle Length: 111									
Offset: 0 (0%), Referenced to phase 2:EBTL and &WBTL, Start of Green Natural Cytel: 410 Control Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer.	Actuated Cycle Length: 111									
Natural Cycle: 140 Control Type: Actuated-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer.	Offset: 0 (0%), Referenced to	to phase 2:	EBTL and	i 6:WBTL	, Start of	Green				
Control Type: Artualead-Coordinated	Natural Cycle: 140									
 Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. 95th percentile volume exceeds capacity, queue may be longer. 	Control Type: Actuated-Coo	ordinated								
Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer.	 Volume exceeds capaci 	ity, queue is	s theoretic	ally infini	e.					
# 95th percentile volume exceeds capacity, queue may be longer.	Queue shown is maximu	ım after two	cycles.							
	# 95th percentile volume 6	exceeds ca	pacity, qu	eue may	be longe					



Queue shown is maximum after two cycles.



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

3191 1.00 3191 0.95 315 20 20 376 9% 18.8 18.8 0.16 5.7 3.0 344 12% 23 pm+pt 28.8 0.24 4.0 3.0 238 0.0.12 0.0.12 1.45 44.0 1.00 2.22.5 266.5 327 327 327 1900 1.00 1.00 0.95 0.95 344 193 0.95 18.8 0.16 5.7 3.0 488 0.06 287 287 1900 4.0 11.00 0.95 1694 0.31 553 302 0 9 28.8 28.8 0.24 4.0 3.0 227 227 0.21 1.33 43.1 1.00 1.00 112 0.95 0 15% 14 3 2101 1% 26 NA 66.6 66.6 0.55 5.3 3.0 3.0 1850 1887 1887 1900 5.3 0.95 0.99 1.00 3334 1.00 1.00 1.00 97 4.0 1.00 1.00 0.95 0.06 1.14 1.02 74.1 74.1 0.62 4.0 3.0 1.76 0.32 0.58 0.58 24.1 1.01 2.8 27.1 0 102 0% 0 0 pm+pt 89 89 0 % 0 94 3 2% 39 NA 1575 11575 11900 5.3 0.95 0.95 0.99 11.00 3240 1.00 3240 0.95 64.7 64.7 0.54 5.3 3.0 3.0 1746 0.54 Ť 41 40 4.0 4.0 1.00 0.95 1805 0.06 117 43 43 70.3 70.3 0.59 4.0 3.0 1.47 0.01 0.16 0.29 26.3 1.71 Frt Fit Protected Satt Flow (prot) Fit Permitted Satd Flow (perm) Peak-hour factor, PHF Adj. Flow (vph) RTOR Reduction (vph) Permitted Phases Actuated Green, G (s) Effective Green, g (s) Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Lane Group Flow (vph) Heavy Vehicles (%)
Bus Blockages (#/hr)
Turn Type
Protected Phases

0.75 48.4 1.00 6.3 54.7

0.36 45.2 1.00 0.5 45.7 D

1.00 27.6 0.98 15.6 42.5 D

Uniform Delay, d1 Progression Factor

Lane Grp Cap (vph) v/s Ratio Perm Critical Lane Group

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Queues 2: Fifth Line & Derry Road

Future Background (PM)

Future Background (PM) 2027 Scenario 3

→ ﴾ ← /	BL NBT SBL SBT	7 45 Y 45	327	327	302 276 344 396	+pt NA pm+pt NA	3 8 7 4	8	3 8 7 4		7.0 10.0 7.0 10.0	34.7 11.0	28.0 14.0	23.3% 11.7% 23.	3.0	2.0 1.0	0.0 0.0	5.7 4.0	Lag Lead	Yes Yes	None None I	0.47 1.38	27.9 228.3	0.0 0.0	27.9 228.3	18.3 ~109.1	31.3 #167.5	340.6	20.0	676 249 61	0 0	0 0	0 0	1.29 0.41 1.38 0.65			q	-				
√	WBT NBI	₩\$	1887 28		2104 30;	NA pm+pt	9		9		20.0 7.0			1	3.7 3.0				_		_				87.6 189.6		#381.1 #118.3	124.7		1874 23				1.12 1.2			Start of Green	Start Or Green				
\	WBL	<u>, </u>	16	45	102	pm+pt	-	9	-		7.0	11.0			3.0	1.0	0.0	4.0	Lead			0.58	25.7	0.0			m19.0 #		0.06	176	0	0	0	0.58			4 6-WRTI	0.WD1L,		ally infinite		
†	EBT	₩.	1575	1575	1752	NA	2		2		20.0	34.3	0.79	25.8%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.00	43.2	0.0	43.2	~131.0	m5.5 m#279.2	170.5		1750	0	0	0	1:00			FRTI and	LDIL all		theoretic	cycles.	
1	EBL	*	41	41	43	pm+pt	വ	2	വ		7.0	11.0	11.0	9.2%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.25	16.8	0.0	16.8	4.4	m5.5 m		100.0	170	0	0	0	0.25			to phase 2.	to pilase 2.	ordinated	ty, queue is	m after two	
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Chief Section Summary	Actuated Ovela Length: 120	Offset: 0 (0%) Referenced to phase 2-ERTI and 6:WBTI Start of Green	Natural Cycle: 145	Control Type: Actuated-Coordinated	 Volume exceeds capacity, queue is theoretically infinite 	Queue shown is maximum after two cycles.	

Splits and Phases: 2: Fifth Line & Derry Road

0 **€**03 ₹ Ø6 (R)

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

28.4 28.4 0.24 5.7 3.0 373 0.03 0.14 36.1 1.00 0.2 36.3 5.7 0.95 1.00 1.00 1.00 1.00 3346 3346 0.96 461 4% ≨ 1.00 D 46.7 pm+pt 4.0 1.00 1.00 1.00 0.95 0.95 0.30 0.30 0.96 332 2% Perm 0.03 0.22 44.4 1.00 0.5 19.0 184 184 1900 5.7 5.7 1.00 0.99 0.85 1.00 1.00 1.00 1489 0.96 192 140 52 4% 18.6 3.0 18.6 18.6 0.16 337 337 337 1900 5.7 0.95 1.00 1.00 1.00 1.00 1.00 3428 0.96 Ž 99.0 351 3% 4.0 11.00 11.00 11.00 0.95 17.15 0.49 879 0.96 82 0 82 4.0 3.0 253 0.02 0.05 0.32 4% pm+pt 0.7 26.8 26.8 0.22 38.0 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service Perm 477 1900 5.3 1.00 11.00 0.85 1.00 1460 1460 0.96 497 173 324 4% 7 52.2 52.2 0.44 3.0 0.22 24.6 1.62 0.3 40.1 1391 1900 5.3 0.95 1.00 1.00 1.00 1.00 3453 1449 % Š 52.2 52.2 0.44 0.96 37.3 D 1449 1.09 2.5 38.4 3.0 340 c0.12 270 pm+pt 0.33 259 259 1900 4.0 1.00 1.00 1.00 1.00 0.95 1791 151 270 % 68.4 68.4 0.57 44.4 0.97 120.0 90.3% Perm 0.00 0.01 23.0 1.00 0.0 1600 1.00 1.00 1.00 1.00 0.85 1.00 1497 1497 %9 45.8 45.8 0.38 5.3 3.0 571 52.2 D 1180 1180 1180 1900 5.3 0.95 1.00 1.00 1.00 1.00 3376 3376 0.96 1229 ξ 45.8 45.8 0.38 2% 36.1 1.00 16.3 52.3 5.3 3.0 1288 0.36 0.95 12.2 12.2 0.10 4.0 3.0 350 0.06 192 192 1900 4.0 0.97 1.00 1.00 1.00 0.95 3446 3446 3446 0.96 200 1% Prot 0.57 1.00 2.3 53.7 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Future Volume (vph)
Total Lost time (s)
Lane Ulli Fador
Frip, pedfibites
Fig. pedfibites
Fif.
Fill Protected
Sard Flow (pro)
Fill Protected
Fill Protected Actuated Green, G (s) Clearance Time (s) Vehicle Extension (s) Incremental Delay, d2 Bus Blockages (#/hr) Effective Green, g (s) Actuated g/C Ratio Turn Type Protected Phases Permitted Phases Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Background (PM) 2027 Scenario 3

Fig.		1	†	*	-	Ļ	4	•	—	•	۶	→	*
172 148 16 259 1391 477 79 337 184 319 443 443 192 188 16 259 1391 477 79 337 184 319 443 443 200 1229 17 200 1391 477 79 337 184 319 443 443 200 1229 17 200 1449 497 82 351 192 332 461 443 200 1229 17 200 1449 497 82 351 192 332 461 443 200 1229 17 200 200 2 2 2 1 6 6 8 8 7 4 4 4 4 4 4 4 4 4	ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
192 1180 16 259 1391 477 79 337 184 319 443 443 200 1229 17 270 1449 497 823 192 331 394 443 200 1229 17 270 1449 497 82 351 192 332 461 249 200 1229 17 270 1449 497 82 83 184 319 443 443 200 1229 17 270	-ane Configurations	K	*	¥.	je.	*	¥C.	r	*	¥C.	je.	*	₩.
192 1180 16 259 1391 477 79 337 184 319 443 200 1229 117 270 1449 497 82 351 192 332 461 250 1229 117 270 1449 497 82 351 192 332 461 24	Fraffic Volume (vph)	192	1180	16	259	1391	477	79	337	184	319	443	209
200 1229 17 270 1449 497 82 351 192 332 461 Fod NA Perd NA Perd MA Perd NA Perd Fod NA Perd Perd NA Perd NA Perd Fod NA Perd Perd NA Perd NA Perd Fod NA Perd Perd NA Perd NA Perd 110 34.3 34.3 11.0 34.3 34.3 11.0 34.7 14 4 14.2% 43.3% 20.0 20.0 7.0 10.0	-uture Volume (vph)	192	1180	16	259	1391	477	79	337	184	319	443	209
Prof. NA Perm pm+pl NA Perm pm-pl A <th< td=""><td>-ane Group Flow (vph)</td><td>200</td><td>1229</td><td>17</td><td>270</td><td>1449</td><td>497</td><td>82</td><td>351</td><td>192</td><td>332</td><td>461</td><td>218</td></th<>	-ane Group Flow (vph)	200	1229	17	270	1449	497	82	351	192	332	461	218
5 2 1 6 8 8 7 4 5 2 6 6 8 8 7 4 5 2 6 6 8 8 7 4 7 2 6 6 8 8 7 4 7 2 2 1 6 6 8 8 7 4 7 3 2 1 6 6 8 8 7 4 7 4 2 1 6 8 8 7 4 170 200 200 70 200 200 70 100 <t< td=""><td>Turn Type</td><td>Prot</td><td>NA</td><td>Perm</td><td>pm+pt</td><td>¥</td><td>Perm</td><td>pm+pt</td><td>M</td><td>Perm</td><td>pm+pt</td><td>N</td><td>Perm</td></t<>	Turn Type	Prot	NA	Perm	pm+pt	¥	Perm	pm+pt	M	Perm	pm+pt	N	Perm
5 2 6 6 8 8 4 4 4 70 20.0 2 1 6 6 8 8 4 4 70 20.0 2 0 70 100 70 100 110 20.0 20.0 7.0 20.0 70 100 70 100 110 20.3 3.3 3.3 3.4 3.7 3.8 3.8 3.8 3.8 3.7 3.7 3.8 3.8 3.8	Protected Phases	വ	2		-	9		က	∞		7	4	
5 2 2 1 6 6 3 8 8 7 4 70 200 200 70 200 70 100 70 100 110 34.3 34.3 11.0 34.3 34.3 11.0 34.7 11.0 34.7 110 34.3 34.3 11.0 34.3 34.3 11.0 34.7 11.0 34.7 14.2% 43.3% 92.8 38.3% 18.3% 92.2% 92.8 13.7 31.0 34.7 34.7 11.0 34.7 11.0 34.7 34.7 11.0 34.7 34.0	Permitted Phases			2	9		9	∞		∞	4		4
7.0 20.0 20.0 7.0 10.0	Detector Phase	വ	2	2	-	9	9	က	∞	∞	7	4	4
110 200 200 70 200 70 100 110	Switch Phase												
110 34.3 34.3 11.0 34.3 34.3 11.0 34.7 34.7 11.0 34.7 34.7 11.0 34.7 34.7 11.0 34.7 34.7 11.0 34.7 3	Winimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
170 52.0 52.0 11.0 46.0 46.0 22.0 35.0 22.0 35.0 22.0 35.0 14.2% 43.3% 43.3% 43.3% 83.3% 18.3% 92.2% 92.% 92.% 18.3% 92.% 92.% 14.2% 43.3% 43.3% 92.8 18.3% 92.9% 92.% 92.% 92.% 92.% 92.% 92.% 92	Vinimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
14.2% 43.3% 43.3% 92.8% 38.3% 18.3% 292.8% 292.8% 183.8 292.8%	Fotal Split (s)	17.0	52.0	52.0	11.0	46.0	46.0	22.0	35.0	35.0	22.0	35.0	35.0
30 37 37 37 37 37 37 37	Fotal Split (%)	14.2%	43.3%	43.3%	9.5%	38.3%	38.3%	18.3%	29.2%	29.2%	18.3%	29.2%	29.2%
1.0 1.6 1.6 1.0 1.6 1.0 2.0 2.0 1.0 2.0 4.0 5.3 2.3 4.0 0.0 0.0 0.0 0.0 0.0 0.0 4.0 5.3 2.3 4.0 5.3 2.3 4.0 5.7 4.0 5.7 Lead Lag Lead Lag Lead Lag Lead Lag Lag Lead Lag Ves Yes Yes Yes Yes Yes Yes Yes Yes Yes None C-Min C-Mi	rellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
4.0 0.0	All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
1.00	ost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead Lag Lead <	Fotal Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Ves Yes Yes <td>-ead/Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td>	-ead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
None C-Min C-Min C-Min C-Min None	_ead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
057 094 003 079 095 061 029 069 053 091 058 57.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
57.5 49.3 0.1 26.2 37.7 17.0 29.5 56.7 15.3 61.5 44.5 0.0 <td< td=""><td>/c Ratio</td><td>0.57</td><td>0.94</td><td>0.03</td><td>0.79</td><td>0.95</td><td>0.61</td><td>0.29</td><td>69.0</td><td>0.53</td><td>0.91</td><td>0.58</td><td>0.40</td></td<>	/c Ratio	0.57	0.94	0.03	0.79	0.95	0.61	0.29	69.0	0.53	0.91	0.58	0.40
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Control Delay	57.5	49.3	0.1	26.2	37.7	17.0	29.5	55.7	15.3	61.5	44.5	7.3
57.5 49.3 0.1 26.2 37.7 17.0 29.5 55.7 15.3 61.5 44.5 24.7 12.1 0.0 41.4 194.1 78.6 13.9 44.0 5.7 66.4 54.9 36.2 #199.2 0.0 m41.2mm/15.0 m62.2 24.3 57.7 27.0 #94.4 71.4 100.0 70.0 110.0 75.0 100.0 75.0 #94.4 71.3 100.0 70.0 110.0 75.0 100.0 75.0 #94.4 71.3 100.0 0.0	Dueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24.7 152.1 0.0 41.4 194.1 78.6 13.9 44.0 5.7 66.4 54.9 54.9 36.2 #1992 0.0 m41.2 m#175.0 m62.2 24.3 57.7 27.0 #94.4 711.4 196.1 100.0 70.0 110.0 75.0 100.0 75.0 95.0 713.3 64.1 34.0 15.2 816 39.9 83.7 48.9 36.6 84.8 1.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	otal Delay	57.5	49.3	0.1	26.2	37.7	17.0	29.5	55.7	15.3	61.5	44.5	7.3
36.2 #1992 0.0 m41.2m#175.0 m62.2 24.3 57.7 27.0 #94.4 714 714 16.1 100.0 10.0 10.0 10.0 10.0 10.0 10.0	Jueue Length 50th (m)	24.7	152.1	0.0	41.4	194.1	78.6	13.9	44.0	5.7	66.4	54.9	0.0
156.1 488.7 381.6 213.2 130.0 156.1 100.0 10.0	Jueue Length 95th (m)	36.2	#199.2	0.0	m41.2 m	#175.0	m62.2	24.3	57.7	27.0	#94.4	71.4	19.9
100.0 70.0 110.0 75.0 100.0 75.0 95.0 1	nternal Link Dist (m)		156.1			488.7			381.6			213.2	
391 1313 641 340 1525 816 399 837 489 366 848 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Furn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sase Capacity (vph)	391	1313	641	340	1525	816	366	837	489	366	848	563
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
0.51 0.94 0.03 0.79 0.95 0.61 0.21 0.42 0.39 0.91 0.54	Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
0.51 0.94 0.03 0.79 0.95 0.61 0.21 0.42 0.39 0.91 0.54	Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
ntersection Summary	Reduced v/c Ratio	0.51	0.94	0.03	0.79	0.95	0.61	0.21	0.42	0.39	0.91	0.54	0.39
	ntersection Summary												

Cycle Length: 120 Actuated Cycle Length: 120

Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

M. Volume for 95th percentile queue is metered by upstream signal.

3: James Snow Parkway & Derry Road Splits and Phases:

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604 - 80 - 80

12-14-2023 BA Group

02

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

2027 Scenario 3

_	SBR	1	169	169	0061								0.92	184	0	0																										
*	SBT S	æ	7		_	2.7	1.00	98.0	1.00	1595	1.00	1595	0.92 0	∞	=	181	NA	4		18.9	18.9	0.16	2.7	3.0	251	c0.11		0.72	48.0	1.00	8.6	57.8	ш	54.5	O							
۶	SBL	<u>, -</u>	74	74	1900	2.7	1.00	1.00	0.95	1770	0.71	1317	0.92	80	0	80	Perm		4	18.9	18.9	0.16	2.7	3.0	207		90.0	0.39	45.3	1.00	1.2	46.5	_									
•	NBR		61	61	1900								0.92	99	0	0																					U		15.0	ш		
←	NBT	æ	9	10	1900	5.7	1.00	0.87	1.00	1623	1.00	1623	0.92	1	29	21	NA	00		18.9	18.9	0.16	2.7	3.0	255	0.01		0.08	43.2	1.00	0.1	43.3	۵	54.1	O							
•	NBL	F	79	79	1900	5.7	1.00	1.00	0.95	1770	0.42	786	0.92	88	0	98	Perm		00	18.9	18.9	0.16	5.7	3.0	123		0.11	0.70	47.9	1.00	15.9	63.8	ш				Service			Ф		
4	WBR		24		1900								0	26	0																						HCM 2000 Level of Service		Sum of lost time (s)	CU Level of Service		
ţ	WBT	₩.	1964		_		0.95		1.00	3533		. ,		2135	0	2161	NA	9		90.1	90.1	0.75	5.3		2652	c0.61		0.81				12	Ω.	12.5	В		HCM 200		Sum of lo	ICU Leve		
-	S WBL	_	9 15		1900	4.0	1.00	1.00	0.95	1770	0.02	82	0.) 16) 16	pm+pt	_	9	90.1	90.1	0.75	4.0	3.0	86	0.00	0.12	0.16	16.5	1.00	0.8	17.3	<u> </u>						_	.0		
/	r EBR				1900	~			_	_	0	7	2 0.92	2 10	0		+	2		٠,	,C		~)	-	~		~	_	٠,	~			~	S		20.1	0.83	120.0	88.1%	==	
Ť	L EBT	۲ ۴	30 187		_		0 0.95		5 1.00	0 3537	5 1.00	9 3537		3 2042	0	33 2052	n NA		2	6 83.6	6 83.6	0.70			62 2464	0.58		3 0.83		_		4 20.9	<u> </u>	20.8	0							
1	EBI		æ	S.	1900	5	1.00	1.00	0.95	1770	0.02	ĆΟ	0.92	κi		3	Perm			83.6	83.6	0.70	5.3	3.	9		0.37	0.53	8.8	1.54	2.9	16.4	Ī					acity ratio		zation		
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Frt	Fit Protected	Satd. Flow (prot)	Fit Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)	c Critical Lane Group

12-14-2023 Synchro 11 Report BA Group

Queues 4: Clark Boulevard & Derry Road

Future Background (PM) 2027 Scenario 3

0.74 0.0 0.0 60.8 42.8 64.6 313.3 34.7 35.0 29.2% 3.7 2.0 0.0 192 NA 399 74 74 80 Perm 34.7 35.0 29.2% 3.7 2.0 0.0 5.7 0.39 49.2 0.0 49.2 18.0 40.0 34.7 35.0 29.2% 3.7 2.0 0.0 None 0.25 14.3 0.0 14.3 2.3 15.2 56.4 **4**2955 79 79 86 Perm 34.7 35.0 29.2% 3.7 2.0 0.0 None 0.70 75.2 0.0 75.2 20.4 37.2 1964 1964 2161 NA 10.0 34.3 85.0 70.8% 3.7 1.6 0.0 0.81 14.0 0.0 14.0 155.7 245.8 475.1 2653 6.0 10.0 10.0 8.3% 3.0 1.0 0.0 4.0 4.0 4.0 4.0 7 Ves None 0.11 6.0 0.0 pm+pt 70.0 0.52 0.81 30.8 21.8 0.0 0.0 30.8 21.8 5.1 215.4 m7.4 m229.1 10.0 10.0 34.3 34.3 75.0 62.5% 62.5% 62.5% 62.5% 62.5% 62.5% 62.5% 62.5% 60.0 1.6 1.6 1.6 0.0 5.3 5.3 5.3 5.3 5.3 6.3 6.0 Nes Yes C-Min 0.52 0.81 30.8 21.8 21.8 5.1 215.4 5.1 215.4 1879 2052 NA 63 63 0 0 0 0 0.52 Control Delay
Control Delay
Cueue Delay
Toal Delay
Cueue Length 50th (m)
Cueue Length 95th (m)
Internal Link Dis (m)
Itun Bay Length (m)
Base Capacity (ph)
Starvation Cap Reductn
Storlage Cap Reductn
Reduced vtc Ratio -ane Group Flow (vph) Turn Type
Protected Phases
Perentided Phases
Detector Phases
Switch Phase
Minimum Initial (s)
Minimum Init ntersection Summary Lane Configurations Traffic Volume (vph) -uture Volume (vph)

Control Type: Actuated-Coordinated m Volume for 95th percentile queue is metered by upstream signal. Spitis and Phases. 4: Clark Boulevard & Derry Road

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 120

Cycle Length: 120 Actuated Cycle Length: 120

12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

1900 5.7 1.00 0.99 1.00 0.56 1.00 1.00 1853 3.92 ₹ 0.48 1.00 5.7 1.00 1.00 0.95 1770 0.49 908 0.92 Perm 21.2 21.2 21.2 0.56 5.7 3.0 509 0.03 3.7 3.7 1.00 0.0 3.7 A 11.0 ⋖ 0.45 4.9 1.00 0.3 5.2 A 433 5.7 5.7 1.00 1.00 1.00 1.00 1.00 1.00 471 21.2 21.2 21.2 0.56 5.7 3.0 1044 0.25 473 NA 5.7 1.00 1.00 0.95 1770 0.46 859 0.92 Perm 21.2 21.2 21.2 0.56 5.7 3.0 481 0.00 3.7 1.00 0.0 3.7 A HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 62 92 (97 9 5.6 0.15 0.15 3.0 240 0.01 0.08 13.9 1.00 0.1 14.0 B 5.6 5.6 0.15 5.3 3.0 204 5.3 1.00 1.00 0.95 0.74 0.74 0.74 23 Perm 0.02 0.11 13.9 1.00 0.2 14.2 B 6.6 0.43 37.8 42.8% 10 10 8 9 NA 5.3 1.00 0.93 1.00 1735 1735 0.92 13 5.6 5.6 0.15 5.3 3.0 257 0.01 0.06 1.00 1.00 0.1 13.9 B 12 12 Ť necedent Carrier and Part Manager Activation Capacity Talio Actuated Cyde Length (\$) Intersection Capacity Utilization Analysis Period (min) 0.24 14.2 1.00 0.6 14.9 44 5.3 1.00 1.00 0.95 0.71 1331 48 48 Serm 5.6 5.6 0.15 5.3 3.0 197 50.04 Peak-hour factor, PHF Adj. Flow (vph) RTOR Reduction (vph) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Peak-hour factor, PHF Critical Lane Group Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot Group Flow (vph Actuated Green, G (s) Effective Green, g (s) Approach Delay (s) Approach LOS Turn Type Protected Phases Permitted Phases Delay (s) Level of Service v/s Ratio Perm v/c Ratio

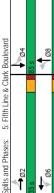
12-14-2023 Synchio 11 Report
BA Group

Queues 5: Fifth Line & Clark Boulevard

Future Background (PM) 2027 Scenario 3

34.7 85.0 70.8% 3.7 2.0 0.0 Min 0.41 7.6 0.0 7.6 7.6 22.9 42.9 372.1 VA 448 1853 Min 0.02 5.9 0.0 5.9 0.5 2.2 0.01 12 13 Perm 34.7 85.0 70.8% 3.7 2.0 0.0 5.7 35.0 Min 0.38 7.4 0.0 7.4 21.2 39.7 34.7 85.0 70.8% 3.7 2.0 0.0 433 473 NA 1861 0.00 34.7 85.0 70.8% 3.7 2.0 0.0 5.7 35.0 Perm Min 0.01 0.0 0.0 5.8 0.2 L AN 10.0 34.3 35.0 29.2% 3.7 None 0.15 5.8 0.0 5.8 0.4 7.7 86.5 0.06 1.6 1377 21 21 23 Perm 0.06 0.0 11.8 11.8 34.3 35.0 29.2% 3.7 1.6 35.0 1166 5.3 29.2% 34.3 35.0 1.6 9.2 9.2 9.2 0.6 4.7 204.0 12 24 NA 1465 10.0 34.3 35.0 29.2% 3.7 1.6 0.0 Perm 44 8 0.13 0.0 12.3 2.1 2.1 35.0 122 Actuated Cycle Length: 35.6 Oueue Delay Total Delay Oueue Length 50th (m) Oueue Length 95th (m) Base Capacity (vph) Starvation Cap Reductn .ane Group Flow (vph) Spillback Cap Reducth Storage Cap Reductn Minimum Initial (s)
Minimum Spilt (s)
Total Spilt (s)
Total Spilt (%)
All Red Time (s)
Lost Time Adjust (s)
Total Lost Time (s) Lane Configurations Traffic Volume (vph) Internal Link Dist (m) Turn Bay Length (m) uture Volume (vph) Lead-Lag Optimize? Recall Mode Turn Type Protected Phases Permitted Phases Reduced v/c Ratio Sycle Length: 120 **Detector Phase** Control Delay Lead/Lag Ratio

Natural Cycle: 70 Control Type: Actuated-Uncoordinated Solits and Phases: F. Fifth Tine & Clark Routley



12-14-2023 Synchro 11 Report BA Group

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

127 127 1900 6.3 1.00 0.93 1.00 1728 1728 1728 0.97 135 34 232 1% 0.75 0.13 9.9 51.5 D 6.3 1.00 1.00 0.95 1780 0.46 868 868 868 0.97 35 35 19.9 0.18 6.3 3.0 155 16.5 G 30 0.60 41.9 1.00 3.1 45.0 D 19.9 0.18 6.3 3.0 327 0.11 196 98 98 98 6.3 6.3 11.00 0.95 11805 0.31 591 101 19.9 0.18 6.3 3.0 0 101 % HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 22% 915 2% 37 NA 852 852 1900 6.2 6.2 0.99 0.99 11.00 3229 11.00 11.00 11.00 66.6 66.6 0.60 6.2 3.0 3.0 1937 0.28 0.47 12.4 1.00 0.8 0.8 13.2 B B 13.5 4.0 11.00 0.95 1729 0.06 0.06 24 70.8 70.8 0.64 4.0 3.0 1.30 0.01 0.11 0.18 25.3 1.00 0.7 24 60.4 1.06 111.0 107.4% 155 155 1900 0 % 0 160 70.4 70.4 0.63 6.2 3.0 1947 c0.71 474 1976 1976 1900 6.2 0.99 0.99 11.00 3071 1.00 3071 2037 2193 3% 58 NA 1 HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 164 2% 78.4 0.71 4.0 3.0 3.0 0.25 0.25 0.39 6.5 1.00 0.6 Frt Fit Protected Sard. Flow (prot) Fit Permitted Sard Flow (perm) Pask-hour factor, PHF Adj. Flow (vph) RTOR Reduction (vph) Permitted Phases
Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Lane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS 3us Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) Lane Grp Cap (vph) Uniform Delay, d1 Progression Factor v/s Ratio Perm v/s Ratio Prot v/c Ratio

Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Total (AM) 2027 Scenario 3

Future Total (AM) 2027 Scenario 3

→	SBT	, 2	13.1	131	266	NA	4		4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.78	51.4	0.0	51.4	49.6	74.1	201.7		446	0	0	0	09:0									
۶	SBL	r	34	34	35	Perm		4	4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.23	40.1	0.0	40.1	6.9	15.5		30.0	208	0	0	0	0.17									
←	NBT	2,	167	167	203	M	∞		∞		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.61	47.2	0.0	47.2	41.4	61.2	211.8		445	0	0	0	0.46									
•	NBL	r	86	86	101	Perm		∞	∞		10.0	32.3		29.7%	4.0	2.3	0.0	6.3			None	0.95	121.4	0.0	121.4	23.0	#49.9		45.0	142	0	0	0	0.71				Green					
Ļ	WBT	₩	852	852	417	NA	9		9		25.0	31.2		60.4%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.47	14.2	0.0	14.2	58.2	83.5	256.2		1939	0	0	0	0.47				Start of (ai		be longer.
>	WBL	r	23	23	24	pm+pt	-	9	-		7.0	11.0			3.0	1.0	0.0	4.0	Lead	Yes	None	0.14	7.3	0.0	7.3	1.3	4.5		100.0	176	0	0	0	0.14				6:WBTL,			ally infinit		eue may t
†	EBT	₩	1976	1976	2197	NA	2		2		25.0	31.2	0.79	60.4%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	1.10	75.8	0.0	75.8	~316.6	#385.1	475.1		1995	0	0	0	1.10				BTL and			theoretica	cycles.	acity, que
1	EBL	*	159	159	164	pm+pt	2	2	2		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.39	8.1	0.0	8.1		20.7		120.0	421	0	0	0	0.39				o phase 2:E		rdinated	ly, queue is	m after two	xceeds cap
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 111	Actuated Cycle Length: 111	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 150	Control Type: Actuated-Coordinated	 Volume exceeds capacity, queue is theoretically infinite. 	Queue shown is maximum after two cycles.	# 95th percentile volume exceeds capacity, queue may be longer

Splits and Phases: 1: Sixth Line & Derry Road



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

5.7 0.95 0.95 1.00 3138 1.00 3138 22.3 22.3 0.19 5.7 3.0 0.13 583 0.02 0.1 119 12% 23 Perm 113 5.7 5.7 11.00 0.95 0.95 0.36 557 557 0.95 22.3 22.3 0.19 5.7 3.0 103 84 84 900 0 4% 0.95 88 0 0.57 44.5 1.00 1.2 45.7 93 93 1900 5.7 1.00 1.00 0.95 1694 0.69 98 0 8 % 22.3 22.3 0.19 5.7 3.0 228 0.08 0.43 43.2 1.00 1.3 44.5 HCM 2000 Level of Service 250 250 1900 0.95 263 0 15% 75.3 0.63 5.3 3.0 1977 0.32 475 745 745 1900 5.3 0.95 0.95 11.00 3151 1.00 27 27 27 28 1020 1020 1020 1020 1020 0.52 0.88 0.9 11.8 B 26.3 83.3 0.69 4.0 3.0 1.01 1.01 41.2 1.01 67.0 4.0 1.00 0.95 0.05 0.05 101 184 184 80.7 1.19 120.0 111.3% 154 154 1900 0 % 0 0.95 74.7 74.7 0.62 5.3 3.0 2013 c0.76 1.22 22.6 0.55 101.7 114.3 44 2190 2190 1900 1900 6.95 0.99 1.00 3235 1.00 3235 2305 2463 2% 39 NA Ť HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 88 88 88 88 4.0 11.00 11.00 00.95 1805 423 00.95 93 82.1 82.1 0.68 4.0 3.0 3.74 0.02 0.02 0.15 7.3 0.75 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor -ane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS 3us Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) -ane Grp Cap (vph) Uniform Delay, d1 Progression Factor Permitted Phases v/s Ratio Perm v/s Ratio Prot v/c Ratio

Critical Lane Group

15.0 H

Sum of lost time (s) ICU Level of Service

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (AM) 2027 Scenario 3

Future Total (AM) 2027 Scenario 3

→	SBT	₩₽	99	99	101	NA.	4	-		10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7			None	0.17	28.8	0.0	28.8	7.5	15.8	275.9		609	0	0	0.17										
•	SBL	r	113	113	119	Ferm		+ <	٠	10.0	34.7	28.0	23.3%	3.7	2.0	0.0	2.7			None	1.16	180.7	0.0	180.7	~34.6	#73.8		20.0	103	0	0	1.16										
-	NBT	₩	286	286	386	ĕ.	œ	α	0	10.0	34.7	28.0	23.3%	3.7	2.0	0.0	2.7			None	0.58	45.3	0.0	45.3	43.4	60.4	340.6		999	0	0	0.58										
€	NBL	۴	93	93	86	Hem	0	οα	0	10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7			None	0.43	20.0	0.0	20.0	21.7	39.7		70.0	228	0	0	0.43				Green					<u>.</u>	lal.
Į.	WBT	₩	745	745	1047	NA ,	0	4	0	20.0	34.3	80.0	92.99	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.52	11.2	0.0	11.2	55.4	62.5	124.7		2004	0	0	0.52				., Start of		4	<u>1</u>	apud od	a no indicate	eam sigr
>	WBL	۴	175	175	184	pm+pt	- 4	o -	-	7.0	11.0	12.0	10.0%	3.0	1:0	0.0	4.0	Lead	Yes	None	1.00	92.6	0.0	92.6	29.4	#79.3		0.06	184	0	0	1.00				d 6:WBTL		idjai vilo	ally lullu	vem on o	cac iliay	d by upsti
1	EBT	₩	2190	2190	2467	NA C	7	C	7	20.0	34.3	80.0	92.99	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.22	118.9	0.0	118.9	~391.6	m4.3 m#350.7	170.5		2017	0	0	1.22				EBTL an		itoroott.	s medien	cycles.	cvcles.	s metere
1	EBL	*	88	88	33	pm+pt	2 2	4 ц	2	7.0	11.0	12.0	10.0%	3.0	1:0	0.0	4.0	Lead	Yes	None	0.25	3.9	0.0	3.9	4.3	m4.3 n		100.0	388	0	0	0.24			50	d to phase 2:		oordinated	cily, queue is	num alter two	um after two	entile queue i
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	lurn lype	Protected Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductin Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 150	Control Type: Actuated-Coordinated	 Volume exceeds capacity, queue is medically minne. 	Uneue Shown Is maximum after two cycles. # 05th parcentile volume exceeds canacity after may be longer	Queue shown is maximum after two cycles.	m Volume for 95th percentile queue is metered by upstream signal

Splits and Phases: 2: Fifth Line & Derry Road

₹ Ø6 (R) 402 (R) **→** Ø5 01

₩ ₩ 04

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

30.4 30.4 0.25 5.7 3.0 400 0.03 0.12 34.5 1.00 0.1 34.6 5.7 0.95 1.00 1.00 1.00 1.00 3346 1.00 3346 393 393 4% ₹ 0.12 00. D 269.0 pm+pt 396 396 1900 1.00 1.00 1.00 0.95 0.37 0.96 413 2% Perm 0.04 1.00 0.8 0.8 19.0 181 181 1900 5.7 5.7 1.00 1.00 0.85 1.00 1.00 1.00 1489 0.96 189 125 64 4% 16.9 16.9 0.14 3.0 282 16.9 16.9 0.14 0.59 0.96 Ž 1.00 1.8 50.1 3% 5.7 3.0 482 0.08 4.0 1.00 1.00 1.00 1.00 0.95 1715 0.52 938 25 25 25 4% pm+pt 4.0 3.0 196 0.00 0.02 0.13 0.3 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service Perm 54.0 54.0 0.45 202 202 202 1900 5.3 1.00 1.00 1.00 1460 1460 0.96 210 116 95 4% 7 0.06 3.0 19.4 3.08 0.4 60.2 54.0 563 563 1900 5.3 0.95 1.00 1.00 1.00 1.00 3453 3453 586 1% ¥ 0.96 0.17 1.01 0.6 22.7 3.0 160 0.02 0.20 0.45 26.2 26.2 0.83 4.0 1.00 1.00 1.00 0.95 0.95 0.07 pm+pt 0 27 % 60.5 4.0 68.2 1.12 120.0 102.2% Perm 59.6 59.6 0.50 30 30 1900 1.00 1.00 0.85 1.00 1497 1.00 15 %9 5.3 3.0 743 0.01 15.4 1.00 0.1 15.4 5.3 3.0 1676 c0.56 1800 1800 1900 5.3 0.95 1.00 1.00 1.00 1.00 3376 3376 1875 Ν 59.6 59.6 0.50 2% 1875 30.2 1.00 62.1 92.3 187 187 1900 4.0 0.97 1.00 1.00 1.00 0.95 3446 3446 3446 0.96 195 % Prot 12.1 4.0 3.0 347 c0.06 1.00 2.1 53.5 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp. pedbikes
Said. Flow (pem)
Fit Portected
Said. Flow (pem)
Reak-hour factor, PHF
Peak-hour factor, PHF
Regulation (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Actuated Green, G (s) Incremental Delay, d2 Effective Green, g (s) Actuated g/C Ratio Bus Blockages (#/hr) Turn Type Protected Phases Permitted Phases Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Total (AM)

Future Total (AM) 2027 Scenario 3

	1	1	<i>></i>	>	Į.	4	•	←	*	۶	→	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	K	₩	¥C	F	₩	¥	F	₩	¥C	<u></u>	44	¥C.
Traffic Volume (vph)	187	1800	30	69	563	202	24	27.1	181	396	377	182
Future Volume (vph)	187	1800	30	69	263	202	24	271	181	366	377	182
Lane Group Flow (vph)	195	1875	31	72	286	210	25	282	189	413	393	190
Turn Type	Prot	NA	Perm	pm+pt	M	Perm	pm+pt	M	Perm	pm+pt	NA	Perm
Protected Phases	2	2			9		m	∞		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	2	2	2		9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	52.0	52.0	11.0	46.0	46.0	22.0	35.0	35.0	22.0	35.0	35.0
Total Split (%)	14.2%	43.3%	43.3%	9.5%	38.3%	38.3%	18.3%	29.2%	29.2%	18.3%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	2.7	5.7	4.0	2.7	2.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.56	1.08	0.04	0.39	0.37	0.27	0.11	0.64	0.59	1.10	0.46	0.35
Control Delay	97.6	74.7	0.1	16.9	22.8	10.3	28.2	56.3	21.3	110.5	40.5	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	74.7	0.1	16.9	22.8	10.3	28.2	56.3	21.3	110.5	40.5	7.0
Queue Length 50th (m)	24.1	~278.3	0.0	7.9	57.0	11.4	4.2	35.5	6.7	~102.7	45.7	0.0
Queue Length 95th (m)	35.6	#350.3	0.0	15.7	80.1	34.9	10.2	48.3	32.6	#134.1	59.9	18.5
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	386	1743	820	183	1599	788	330	837	473	376	875	553
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	1.08	0.04	0.39	0.37	0.27	90.0	0.34	0.40	1.10	0.45	0.34
Intersection Summary									ı			

Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Actuated Cycle Length: 120

Control Type: Actuated-Coordinated

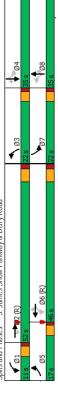
Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer

Queue shown is maximum after two cycles.

3: James Snow Parkway & Derry Road Splits and Phases:



HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

1900 5.7 1.00 0.88 1.00 1636 1.00 1636 5.7 1.00 5.7 1.00 1.00 0.95 1.770 0.73 26 26 0.92 Perm 10.0 10.0 0.08 5.7 3.0 113 0.23 51.4 1.00 1.0 15.0 32 5.7 5.7 1.00 0.88 0.88 1.00 1.00 1.00 10.0 10.0 0.08 5.7 3.0 136 0.01 0.08 1.00 0.2 51.0 D Ä 5.7 1.00 1.00 0.95 0.95 0.72 1.340 0.92 63 Perm 10.0 10.0 0.08 5.7 3.0 c0.05 0.57 52.9 1.00 6.5 59.4 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 1900 99 91 877 1900 5.3 0.95 0.99 1.00 3489 1.00 3489 0.92 Ϋ́ 99.0 99.0 0.82 5.3 3.0 3.0 2878 0.30 0.36 2.6 1.00 0.4 3.0 A A B.5 1049 99.0 0.82 4.0 3.0 3.0 3.0 0.34 0.53 35.1 1.00 1.4 36.5 189 4.0 1.00 1.00 0.95 17.70 0.05 97 0.92 205 78.7 0.99 120.0 97.6% 163 73.0 73.0 0.61 5.3 3.0 2130 c0.72 475 2155 2155 2155 1900 5.3 0.95 0.99 1.00 3502 1.00 3502 2342 2515 NA Intersection Summers
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
C Critical Lane Group 5.3 11.00 11.00 0.95 0.27 0.27 507 82 73.0 73.0 0.61 5.3 3.0 3.0 0.27 75 75 1900 82 Serm 1.63 0.2 18.1 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Turn Type
Protected Phases
Permitted Phases
Actuated Green, G (s) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot Lane Group Flow (vph Effective Green, g (s) Delay (s) Level of Service Approach Delay (s) Approach LOS v/s Ratio Perm

12-14-2023 Synchro 11 Report BA Group

Queues 4: Clark Boulevard & Derry Road

Future Total (AM)

Future Total (AM)

SBT	÷	10	10	58	NA	4		4		10.0	34.7	35.0	29.2%	3.7	2.0	0:0	5.7		Mana	None	21.2	0.0	21.2	5.6	15.2	313.3	į	434	0 0	0	0.13									
SBL	۳	24	24	26	Perm		4	4		10.0	34.7			3.7	2.0	0.0	2.7		N .	None 0.10	51.0 51.0	0.0	51.8	6.1	14.9		40.0	332	0 0	0	0.08									
NBT	æ	7	7	40	M	∞		∞		10.0	34.7			3.7	2.0	0.0	2.7		N I	None 0.21	22.0	0.0	22.4	1.8	12.4	56.4		424	0	0	60:0									
NBL	۳	28	28	63	Perm		∞	∞		10.0	34.7			3.7	2.0	0.0	2.7		N - I A	None	60.47	0.00	62.2	15.1	29.3			326	0 0	0	0.19				reen					
WBT	4₽	877	877	1052	NA	9		9		10.0	34.3			3.7	1.6	0.0	5.3		1	C-IMIN 0.34	3.3	0.0	3.3	27.6	44.6	475.1		2946	0 0	0	0.36				Start of C			.:	P longer	
WBL	r	189	189	205	pm+pt	_	9	_		0.9	10.0			3.0	1.0	0.0	4.0	Lead		None	30.00	0.00	30.8	29.1	26.8	4	0.0/	888	0 0	0	0.53				6:WBTL,		Aller indinite	any mane	d vem en	
EBT	4₽	2155	2155	2519	NA	2		2		10.0	34.3	75.0	62.5%	3.7	1.6	0.0	5.3	Lag	Yes	C-MIII	104.0	0.00	106.0	~386.0	£291.3	336.0		2167	0 0	0	1.16				BTL and		Postorior	Medie	acity and	and it in
EBL	je.	75	75	82	Perm		2	2		10.0	34.3			3.7	1.6	0:0	2.3	Lag		UIWI-2	20.20	0.0	20.1		m12.9 m#291.3		0.0/	313	0 0	0	0.26				o phase 2:E		dinated	y, queue is in	xreeds can	- Carolina
Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Kecali Mode	Control Delay	Onene Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	I urn Bay Length (m)	Base Capacity (vph)	Spillback Cap Reductin	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 150	Control Type: Actuated-Coordinated	Ouerie chown is maximim affective cycles	# 95th percentile volume exceeds canacity guere may be longer	Output of services of services of output of ou

Splits and Phases: 4: Clark Boulevard & Derry Road

| ← 01 | ← 02 (R) | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ← 04 | ←

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Total (AM) 2027 Scenario 3

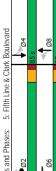
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Oueue Delay	Total Delay	Queue Length Softh (m)	Queue Lengin 95in (m)	Tirro Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 3	Natural Cycle: 70	Control Type: Actuated-U		Splits and Phases: 5: F	→ Ø2
•	SBR		37	37	1900								0.92	40	0	0																									
→	SBT	æ	297	297	1900	5.7	1.00	0.98	1.00	1832	1.00	1832	0.92	323	4	326	¥	4		25.5	25.5	0.64	2.7	3.0	1170	0.20		0.31	3.2	0.1	3.4	⋖	3.3	A							
٠	SBL	×	61	61	1900	2.7	1.00	1.00	0.95	1770	0.46	861	0.92	99	0	99	Perm		4	25.5	25.5	0.64	2.7	3.0	220		0.08	0.12	7.00	0.1	2.9	A									
•	NBR		45	45	1900								0.92	46	0	0																				A		11.0	В		
—	NBT	æ	442	442	1900	5.7	1.00	0.99	1.00	1837	1.00	1837	0.92	480	က	526	Ν	∞		25.5	25.5	0.64	2.7	3.0	1174	c0.29		0.45	3.0	0.3	3.9	V	3.9	A							
•	NBL	je.	10	10	1900	5.7	1.00	1.00	0.95	1770	0.54	1015	0.92	=	0	11	Perm		80	25.5	25.5	0.64	2.7	3.0	648		0.01	0.02	1.00	0.0	2.6	V				ervice					
1	WBR		7	11	1900								0.92	12	0	0																				evel of S		time (s)	f Service		
Ļ	WBT	¢Ŷ	15	15	1900	5.3	1.00	0.94	1.00	1743	1.00	1743	0.92	16	Ξ	17	NA	9		3.4	3.4	0.09	5.3	3.0	148	c0.01		0.12	100	0.3	17.2	В	17.1	В		HCM 2000 Level of Service		Sum of lost time (s)	ICU Level of Service		
>	WBL	×	7	7	1900	5.3	1.00	1.00	0.95	1770	1.00	1863	0.92	∞	0	00	Perm		9	3.4	3.4	0.09	5.3	3.0	158		0.00	0.05	20.0	0.1	16.9	В				H		Su	Ö		
>	EBR		က	3	1900								0.92	co	0	0																				4.5	0.41	39.9	%9.99	15	
†	EBT	æ	13	13	1900	5.3	1.00	0.97	1.00	1813	1.00	1813	0.92	14	က	14	NA	2		3.4	3.4	0.09	5.3	3.0	154	0.01		0.09	9.0	0.3	17.1	В	17.0	В							
4	EBL	je-	10	10	1900	5.3	1.00	1.00	0.95	1770	1.00	1863	0.92	1	0	11	Perm		2	3.4	3.4	0.09	5.3	3.0	158		0.01	0.07	200	0.2	17.0	В					y ratio		=		
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Frt	Flt Protected	Satd. Flow (prot)	Flt Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d I	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)	c Critical Lane Group

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Queues 5: Fifth Line & Clark Boulevard

Future Total (AM) 2027 Scenario 3

→	SBT	÷	297	297	363	NA	4		4		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.25	4.5	0.0	4.5	0.0	28.3	372.1		1831	0	0	0	0.20					
٠	SBL	F	61	61	99	Perm		4	4		10.0	34.7	85.0	70.8%	3.7	2.0	0:0	5.7			Min	0.10	4.9	0:0	4.9	0:0	7.2		35.0	861	0	0	0	0.08					
—	NBT	£,	442	442		¥	∞		∞		10.0	34.7	85.0		3.7	2.0	0.0	5.7			Min	0.36	5.3	0.0	5.3	0.0	46.1	156.9		1837	0	0	0	0.29					
•	NBL	r	10	10	Ξ	Perm		œ	∞		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.01	4.8	0.0	4.8	0.0	2.0		35.0	1015	0	0	0	0.01					
Ļ	WBT	\$	15	15	28	NA	9		9		10.0	34.3	35.0		3.7	1.6	0.0	5.3			None	90.0	10.0	0.0	10.0	0.7	5.1	86.5		1452	0	0	0	0.02					
-	WBL	r	7	7	∞	Perm		9	9		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	12.3	0.0	12.3	0.4	2.7		32.0	1549	0	0	0	0.01					
†	EBT	£,	13	13	17	Ν	2		2		10.0	34.3	35.0		3.7	1.6	0.0	5.3			None	0.03	11.5	0.0	11.5	9.0	4.1	204.0		1509	0	0	0	0.01					
4	EBL	*	10	10	=	Perm		2	2		10.0	34.3	32.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	12.3	0.0	12.3	0.5	3.3		35.0	1549	0	0	0	0.01					ordinated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Oueue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 36.5	Natural Cycle: 70	Control Type: Actuated-Uncoordinated



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HCM Unsignalized Intersection Capacity Analysis 10: Clark Boulevard & Anatolia Building 1 North Access/Anatolia Building 2 North Addess รายกาก

	•	†	<i>></i>	\	ļ	4	•	←	•	۶	→	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4			4	
raffic Volume (veh/h)	10	0	2	2	0	=======================================	-	73	4	34	302	26
Future Volume (Veh/h)	9	0	2	2	0	1	-	73	4	34	302	26
Sign Control		Stop			Stop			Free			Free	
		%0			%0			%0			%0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	Ξ	0	7	2	0	12	-	79	4	37	328	28
Pedestrians												
-ane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Jpstream signal (m)											80	
X, platoon unblocked	0.99	0.99	0.99	0.99	0.99		0.99					
C, conflicting volume	511	501	342	501	513	81	356			83		
C1, stage 1 conf vol												
vC2, stage 2 conf vol												
/Cu, unblocked vol	497	487	326	487	466	8	340			83		
C, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
C, 2 stage (s)												
	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
oo dueue free %	86	100	100	100	100	66	100			86		
cM capacity (veh/h)	462	462	705	473	455	616	1202			1514		
Direction, Lane #	EB 1	WB1	NB 1	SB 1								
/olume Total	13	14	84	393								
/olume Left	1	2	_	37								
/olume Right	2	12	4	28								
	488	849	1202	1514								
/olume to Capacity	0.03	0.02	0.00	0.02								
Queue Length 95th (m)	0.7	0.4	0.0	9.0								
Control Delay (s)	12.6	9.3	0.1	6:0								
ane LOS	В	A	⋖	A								
Approach Delay (s)	12.6	9.3	0.1	6:0								
Approach LOS	В	A										
ntersection Summary												
Average Delay			1.3									
ntersection Capacity Utilization			36.0%	Ö	ICU Level of Service	f Service			⋖			
Analysis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 9: Sixth Line & Anatolia Building 3 East Access

EBL EBR N 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								
ent EBL EBR NBL NBT SBT SBR Driftgurations		4	<u> </u>	•	—	→	•	
our Factor (vehVh) 7 1 4 288 287 22 √olume (vehVh) 8 1 4 313 312 24 √olume (vehVh) 8 1 24 336 √olume (vehVh) 8 324 336 √olume (vehVh) 8 32 32 32 √olume (vehVh) 8 32 32 32 √olume (vehVh) 8 32 32 32 ✓olume (vehVh) 8 32 32 32 ✓olume (vehVh) 8 32 32 32 ✓olume (vehVh) 8 32 32 ✓olume (vehVh) 8 32 32 ✓olume (vehVh) 9 317 336 ✓olume (vehVh) 9 326	Movement	EBL	EBR	NBL	NBT	SBT	SBR	
You'me (verly) 7 1 4 288 287 22 You'me (verly) 7 1 4 288 287 22 You'me (verly) 8 1 4 388 287 22 Ow rate (verly) 8 1 4 313 312 24 Since and (ms) 8 1 4 313 312 24 Sinck age 1 4 313 312 24 Signal (ms) 8 1 4 313 312 24 None with a control (ms) 8 3 32 32 32 32 Storage (ms) 8 3 32	Lane Configurations	>			₩	£		
low rate (verly) 7 1 4 288 287 22 Initial (verly) 8 1 4 318 312 24 Iow rate (vph) 8 1 4 313 312 24 Iow rate (vph) 8 1 4 313 312 24 Idth (m) Ispeed (m/s) Isp	Traffic Volume (veh/h)	7	-	4	288	287	22	
our Factor 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Future Volume (Veh/h)	7	-	4	288	287	22	
our Factor 09% 09% 09% 09% 09% 10% 14ms (veh) 8 1 4 313 312 24 idens (veh) 8 idens (veh) 9 idens (veh) 8 idens (veh) 9 idens	Sign Control	Stop			Free	Free		
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Grade	%0			%	%0		
8 1 4 313 312 24 None None Sas 236 645 324 336 6.4 6.2 4.1 3.5 3.3 2.2 98 100 100 435 717 1223 EB1 NB1 SB1 9 317 336 9 317 336 9 317 0.2 00 0.20 00	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
645 324 336 236 644 5 324 336 64 6.2 4.1 3.5 3.3 2.2 98 100 100 435 717 1223 EB1 NB1 SB1 9 317 336 9 317 336 9 317 336 1 0 24 455 1223 1700 0.02 0.00 0.20 0.02 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20	Hourly flow rate (vph)	∞	-	4	313	312	24	
645 324 336 645 645 324 336 645 324 336 645 64 6.2 4.1 3.5 646 6.4 6.2 4.1 3.5 6.7 17 1223 6.9 317 336 6.9 317 336 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Pedestrians							
645 324 336 645 324 336 645 324 336 645 64 62 4.1 3.5 3.3 2.2 98 100 100 435 717 1223 6 8 4 0 0 1 1 2 2 4 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lane Width (m)							
645 324 336 645 324 336 64 6.2 4.1 64 6.2 4.1 3.5 3.3 2.2 98 100 100 435 717 1223 EB1 NB1 SB1 9 317 336 9 317 336 9 317 0.2 0.0 0.0 0.2 0.0 0.0 0.2 0.0 0.0 0.2 0.0 0.0 0.2 0.0 0.0 0.2 0.0 0.0 0.2 0.0 0.0 0.2 0.0 0.0 0.2 0.13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 14.5 12.8 14.5 12.8 15.8 16.8 17.8 18.8 18.8 19.8 19.8 19.8 19.8 19.8 19	Walking Speed (m/s)							
645 324 336 236 645 324 336 64 6.2 4.1 3.5 3.3 2.2 98 100 100 435 717 1223 EB1 NB1 SB1 9 317 336 9 317 336 9 317 336 1 0 24 455 1223 1700 0.02 0.00 0.20 0.02 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20 0.00 0.20	Percent Blockage							
Hone None Sas 236 645 324 336 645 324 336 645 6.4 6.2 4.1 3.5 3.3 2.2 98 100 100 98 110 1223 645 1223 1700 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0	Right turn flare (veh)					:		
645 324 336 645 324 336 64 6.2 4.1 65 4 6.2 4.1 3.5 3.3 2.2 98 100 100 435 717 1223 EB 1 NB 1 SB 1 9 317 336 8 4 0 1 0 24 455 1223 1700 0.2 0.00 0.20 0.5 0.0 0.20 0.0 0.0 0.20 0.0 0.0 0.20 0.0 0.0 0.20 0.0 0.0 0.20 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.0 0.20 0.0 0.0 0.0 0.0 0.0 0.0 0.20 0.0 0.0 0.	Median type				None	None		
645 324 336 645 64 6.2 4.1 336 6.4 6.2 4.1 3.2 98 100 100 100 435 717 1223 6.8 1 0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	Median storage veh)							
645 324 336 645 324 336 64 6.2 4.1 3.5 3.3 2.2 98 100 100 435 717 1223 EB1 NB1 SB1 9 317 336 8 4 0 1 0 24 455 1223 1700 0.02 0.00 0.20 0.02 0.00 0.20 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 14.5 1223 1700 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 14.5 1223 1700 13.1 0.1 0.0 13.1 0.1 0.0	Upstream signal (m)					236		
645 324 336 646 324 336 64 6.2 4.1 3.5 3.3 2.2 98 100 100 435 717 1223 EB1 NB1 SB1 9 317 336 8 4 0 1 0 24 455 1223 1700 0.22 0.00 0.20 0.02 0.00 0.20 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 14.5 ICU Level of Service	pX, platoon unblocked							
645 324 336 6.4 6.2 4.1 3.5 3.3 2.2 98 100 100 435 717 1223 EB1 NB1 SB1 9 317 336 8 4 0 1 0 24 445 1223 1700 0.02 0.00 0.20 0.02 0.00 0.20 0.05 0.00 0.20 0.05 0.00 0.20 0.0 0.0 0.00 13.1 0.1 0.0 B A 13.1 13.1 0.1 0.0 13.1 0.1 0.0	vC, conflicting volume	645	324	336				
645 324 336 64 6.2 4.1 3.5 3.3 2.2 98 100 100 100 435 717 1223 EB 1 88 1 0 24 9 317 336 8 4 0 0 20 0.20 0.20 0.20 0.20 0.20 0.50 0.5	vC1, stage 1 conf vol							
645 324 336 64 6.2 4.1 3.5 3.3 2.2 8 100 100 8 170 1223 EB1 NB1 SB1 9 314 336 8 4 0 1 0 24 455 1223 1700 0.02 0.02 0.02 0.05 0.1 0.0 13.1 0.1 0.0 B A COLURNO Service 0.2 8.4% ICU Level of Service 15.4% ICU Level of Service	vC2, stage 2 conf vol							
6.4 6.2 4.1 3.5 3.3 2.2 98 100 100 435 717 1223 EB1 NB1 SB1 9 317 336 8 4 0 1 0 24 455 1223 1700 0.22 0.00 0.20 0.5 0.1 0.0 13.1 0.1 0.0 B A 13.1 0.1 0.0 C 0.2 C	vcu, unblocked vol	645	324	336				
3.5 3.3 2.2 98 100 100 100 100 100 100 100 100 100 10	tC, single (s)	6.4	6.2	4.1				
3.5 3.3 2.2 3.8 10 100 3.8 100 100 3.8 100 100 3.1 1223 4.8 1 1223 4.9 131 336 6.0 24 4.5 1223 1700 0.02 0.02 0.020 0.05 0.1 0.0 0.131 0.1 0.0 B A 13.1 0.0 C B B A 14.5 ICU Level of Service 14.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1	tC, 2 stage (s)							
98 100 100 435 717 1223 EB1 NB1 SB1 9 317 336 8 4 0 1 0 24 455 1223 1700 0.02 0.020 0.03 0.020 0.5 0.1 0.0 13.1 0.1 0.0 B A 13.1 0.1 0.0 C 28.4% ICU Level of Service	F (S)	3.5	3.3	2.2				
435 717 1223 EB 1 NB 1 SB 1 9 317 336 8 4 0 1 0 24 455 1223 1700 0.02 0.00 0.20 0.05 0.00 0.20 0.05 0.0 0.00 13.1 0.1 0.0 B A 13.1 0.1 0.0 B A 13.1 0.1 0.0 C B 13.2 0.2 C C C C C C C C C C C C C C C C C C C	po dueue free %	86	100	100				
EB1 NB1 SB1 9 317 336 8 4 0 1 0 24 455 1223 1700 0.02 0.00 0.20 0.03 0.00 0.20 13.1 0.1 0.0 B A 13.1 0.1 0.0 B A 14.5 ICU Level of Service 1.8 4% ICU Level of Service	cM capacity (veh/h)	435	717	1223				
9 317 336 8 4 0 1 0 24 455 1223 1700 0.02 0.00 0.20 0.5 0.1 0.0 13.1 0.1 0.0 B A A 13.1 0.1 0.0 B A A 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 0.0	Direction, Lane #	EB 1	NB 1	SB 1				
8 4 0 455 123 1700 0.02 0.00 0.20 0.5 0.1 0.0 13.1 0.1 0.0 B A 0 13.1 0.1 0.0 B 13.1 0.1 0.0 13.1 0.1 0.0 13.1 0.1 1.0 0.0 14.1 0.0 1.0 0.0 15.1 0.0 1.0 0.0 0	Volume Total	6	317	336				
1 0 24 455 1223 1700 0.02 0.02 0.020 0.5 0.1 0.0 13.1 0.1 0.0 B A B A B A B A B A B A B A B A B A B A	Volume Left	00	4	0				
455 1223 1700 002 0.00 0.20 0.5 0.1 0.0 13.1 0.1 0.0 B A 13.1 0.1 0.0 B A 0.2 28.4% ICU Level of Service	Volume Right	_	0	24				
0.02 0.00 0.20 0.5 0.1 0.0 13.1 0.1 0.0 B A I 13.1 0.1 0.0 B A A I 13.1 0.1 0.0 0.2 28.4% ICU Level of Service	CSH	455	1223	1700				
05 0.1 0.0 13.1 0.1 0.0 B A A 13.1 0.1 0.0 B 0.2 0.2 13.4% ICU Level of Service	Volume to Capacity	0.05	0.00	0.20				
13.1 0.1 0.0 B A 13.1 0.1 0.0 B 0.2 0.2 28.4% ICU Level of Service	Queue Length 95th (m)	0.5	0.1	0.0				
13.1 0.1 0.0 B 0.2 0.2 28.4% ICU Level of Service	Control Delay (s)	13.1	0.1	0.0				
13.1 0.1 0.0 B 0.2 0.2 28.4% ICU Level of Service	Lane LOS	В	∢					
9.2 0.2 28.4% ICU Level of Service 16.2	Approach Delay (s)	13.1	0.1	0.0				
0.2 28.4% ICU Level of Service 15.	Approach LOS	В						
0.2 28.4% ICU Level of Service 15.	Intersection Summary							
28.4% ICU Level of Service	Average Delay			0.2				
71	Intersection Capacity Utiliza	tion		28.4%	2	III evel o	Service	A
	Analysis Period (min)			15				

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HCM Unsignalized Intersection Capacity Analysis 12: Clark Boulevard & Anatolia Building 1 South Access

ICU Level of Service 130 0.92 138 138 138 0.92 150 None None 7. Free 38 36 0.92 39 39 39 39 1.5 25.2% 15 0.92 291 0 141 1700 0.0 0.0 2.2 99 1271 0.0 75 291 3.3 0.92 220 220 55 16 0 0 0.01 0.03 2.4 A A A Stop 0.92 41 3 698 0.06 1.6 10.5 B B 292 292 3.5 44 Average Delay Intersection Capacity Utilization Analysis Period (min) Direction, Lane #
Volume Total
Volume Left
CSH
Volume Right
CSH
Volume In Sink (m)
Queue Length 95ink (m)
Lane LOS Lane Configurations
Traffic Volume (veh/h)
Future Volume (veh/h)
Sign Control
Grade
Peak Hour Factor
Hourly flow rate (vph)
Pedestrians Maddan storage veh)
Upstream signal (m)
Upstream signal (m)
Dx, Databoan unblocked
VC, conflicting volume
VC1, stage 1 conf vol
VC2, stage 2 conf vol
VC2, stage 2 conf vol
CC, stage (s)
CC, 2 stage (s)
IC, 5 stage (s)
IC, 5 dage (s)
CC, 6 dage (volume)
CC, 6 dage (volume)
CC, 7 dage (volume)
CC, 8 dage (volume)
CC, 8 dage (volume)
CC, 9 dage (v Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right turn flare (veh) Approach Delay (s) Approach LOS

12-14-2023 Synchro 11 Report BA Group

HCM Unsignalized Intersection Capacity Analysis 11: Clark Boulevard & Anatolia Building 2 South Access

Future Total (AM) 2027 Scenario 3

																																								A	
→	SBT	÷∓	266	266	Free	%0	0.92	289						None																										f Service	
۶	SBL		40	40			0.92	43										81			81	4.1		2.2	6	1517														ICU Level of Service	
•	NBR		9	9			0.92	7																																2	
—	NBT	2	89	89	Free	%0	0.92	74						None													SB 1	332	43	0	1517	0.03	0.7	1.2	V	1.2			1.2	32.9%	15
4	WBR		10	10			0.92	=										78			78	6.2		3.3	66	983	NB 1	81	0	7	1700	0.02	0.0	0.0		0.0					
-	WBL	>-	2	2	Stop	%0	0.92	2										452			452	6.4		3.5	100	249	WB 1	13	2	=	877	0.01	0.4	9.2	A	9.2	V			lization	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	F (S)	bo dnene tree %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

139 0.90 6.3 1.00 0.94 1.00 1.00 1.00 1.756 0.97 221 24.2 24.2 0.22 6.3 3.0 382 1.00 6.3 1.00 1.00 0.95 1780 0.63 0.63 96 9% 1% 24.2 24.2 0.22 6.3 3.0 259 0.37 36.9 1.00 0.9 37.8 20.5 G 38 0.97 39 0 0.33 28.9 1.00 0.3 29.2 C 153 153 1900 6.3 1.00 1.00 1.00 1814 1.00 1.00 1.00 1.00 35.2 35.2 0.32 6.3 3.0 575 0.10 189 1990 1900 4.0 11.00 11.00 0.95 1805 0.16 3312 0.97 35.2 35.2 0.32 4.0 3.0 1.03 1.06 35.1 1.06 82.2 117.3 205 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 22 22 1900 22% 1800 2% 37 NA 1.19 29.9 1.00 94.1 ↑↑ 1725 1725 1725 1900 6.2 0.95 1.00 1.00 3263 0.97 1778 51.3 51.3 0.46 6.2 3.0 3.0 1508 0.55 4.0 11.00 0.95 1729 0.08 0.08 33 55.5 55.5 0.50 4.0 3.0 1.31 0.01 0.12 0.25 24.4 1.00 1.00 25.4 33 4% 124.0 1.23 111.0 106.4% 101 0 % 0 0.97 1.27 27.9 1.00 128.6 156.5 6.2 0.95 0.99 1.00 3078 3078 0.97 3% 58 NA 55.1 55.1 0.50 6.2 3.0 1527 c0.63 1 HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 163 163 1900 4.0 1.00 1.00 0.95 1748 0.07 134 168 2% 63.1 6.3.1 0.57 4.0 3.0 3.0 0.043 0.88 2.9.8 1.00 1.00 Frt Fit Protected Sard. Flow (prot) Fit Permitted Sard Flow (perm) Pask-hour factor, PHF Adj. Flow (vph) RTOR Reduction (vph) Permitted Phases
Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Lane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS Bus Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) Lane Grp Cap (vph) Uniform Delay, d1 Progression Factor v/s Ratio Perm v/s Ratio Prot v/c Ratio

Critical Lane Group

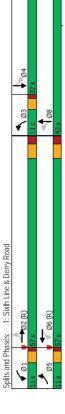
Synchro 11 Report 12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Total (PM) 2027 Scenario 3

Future Total (PM) 2027 Scenario 3

Lane Group Lane Croup Lane Group	Lane Group Fell Fell Tane Group Fell Fell Tane Group Fell Fell Tane Group Tanific Volume (wph) 163 1790 Tanific Volume (wph) 164 1790 Tanific Volume (wph) 164 1790 Tanific Volume (wph) 164 1790 Tanific Volume (wph) 170 1				93 93 93 93 94 4 4 10.0 28.8% 4.0 2.3 0.0 6.3 None 0.037	214 214 364 364 364 364 323 32.3 32.0 28.8% 4.0 6.3 6.3 6.3 None None
18	nne Configurations				93 93 96 96 97 98 98 98 92 93 93 93 93 90 90 90 90 90 90 90 90 90 90 90 90 90	214 214 364 NA NA 10.0 32.3 32.0 28.8% 4.0 2.3 6.3 6.3 None 0.00
163 1790 32 1725 199 153 93 163 1790 32 1725 199 153 93 168 1449 33 1801 205 197 96 168 1449 33 1801 205 197 96 2	affic Volume (vph) 163 1790 In Type I				93 93 96 97 98 98 98 98 98 98 98 98 90 90 90 90 90 90 90	214 364 NA NA 100 32.3 32.0 28.8% 4.0 2.3 0.0 6.3 None 0.90
163 1790 32 1725 199 153 93 168 1949 33 1801 205 197 96 168 1949 33 1801 205 197 96 2	Inter Volume (vph) 163 1790 Inter Volume (vph) 168 1949 Inter Volume (vph) 170 25 0 Inter Volume (vph) 170 0 Inter Volume (vph)				93 96 96 96 4 4 4 10.0 32.3 32.0 28.8% 4.0 2.3 0.0 6.3 None	214 NA
148 1949 33 1801 205 197 96	me Group Flow (vph) 168 1949 In Type pm+pt NA proceeded Phases 5 2 2 armitled Phases 5 2 2 armitled Phases 5 2 2 armitled Phase 5 2 2 armitled Phase 5 2 3 armitled Phase 5 2 4 armitled Phase 5 2 110 31.2 110 31.2 110 31.2 110 31.2 110 31.2 110 31.2 110 31.2 110 31.2 110 31.2 110 2.2 110 2.2 110 2.2 110 2.2 110 2.2 110 2.2 110 2.2 110 3.3 110 3.3 110 2.2 110 3.3				96 Perm 4 4 4 4 4 4 4 4 4 4 4 4 9 9 9 9 9 9 9	364 NA 4 4 4 10.0 32.3 32.0 28.8% 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
pm+pt NA Pm-mpt NA	otected Phases 5 2 amilted Phases 2 2 find the hase pinkin the phase 2 2 find the phase 2 3 2 amilted Phase 2 3 2 find the phase 2 3 2 find the phase 2 3 2 find Split (s) 11.0 31.2 find Split (s) 3.0 4.0 find Split (s) 3.0 4.0 find Split (s) 3.0 4.0 find Split (s) 3.0 0.0 find Split (s) 3.0 4.0 find Split (s) 3.0 0.0 find Split (s) 3.0 0.0 find Split (s) 3.0 4.0 find Split (s) 4.0 6.2 find Split (s) 4.0 0.0 find Split (s) 4.0 1.3 find Split (s) 4.0 find Split (s) 4.0 find Split (s) 4.0 find Split (s) 6.0 find				4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6	NA 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
10	armited Phases 5 2 stector Phase 5 2 stector Phase 5 2 stector Phase 5 2 witch Phase 7 0 25.0 inimum Initial (\$\$) 110 31.2 atal Spilt (\$\$) 99% 51.4% 5				10.0 10.0 32.3 32.0 28.8% 4.0 2.3 0.0 6.3 None 0.37	4 4 10.0 32.3 32.0 28.8% 4.0 2.3 2.0 0.0 6.3 Lag Yes None
2 6 6 8 8 4 4 2 5 2 6 6 8 8 4 4 110 31.2 11.0 57.0 100 1000 110 31.2 11.0 37.2 11.0 32.3 32.3 110 57.0 11.0 57.0 11.0 32.3 32.3 110 57.0 11.0 57.0 11.0 23.3 32.3 1.0 22 1.4 30 4.0 30 4.0 0.0 0.0 4.0 6.2 4.0 6.2 4.0 6.3 6.3 1.0 2.2 1.0 2.2 1.0 2.3 2.3 1.0 8 1.24 0.0 0.0 0.0 0.0 0.0 0.0 6.4 6 139.3 12.7 123.0 133 0.34 0.37 6.4 6 139.3 12.7 123.0 139 28.6 41.0 6.4 6 139.3 12.7 123.0 139 28.6 41.0 6.4 6 139.3 12.7 123.0 139 0.0 0.0 6.4 6 139.3 1.2 12.3 0.0 0.0 0.0 6.4 6 139.3 1.2 12.3 0.0 0.0 0.0 6.4 6 139.3 1.2 123.0 139 28.6 41.0 120.0 0.0 0.0 0.0 0.0 0.0 6.4 6 139.3 1.2 123.0 139 28.6 41.0 120.0 0.0 0.0 0.0 0.0 0.0 6.4 6 139.3 1.2 123.0 139 28.6 41.0 120.0 0.0 0.0 0.0 0.0 0.0 111	Action A				10.0 32.3 32.0 28.8% 4.0 2.3 0.0 6.3 None 0.37	10.0 32.3 32.3 32.0 28.8% 4.0 6.3 0.0 6.3 Ves None 0.90
5	Airth Phase 5 2 Airth Phase 5 2 Airth Phase 7.0 25.0 Inimum Spilt (s) 11.0 31.2 Inimum Spilt (s) 11.0 31.2 Allow Time (s) 3.0 4.0 5.0 Allow Time (s) 1.0 2.2 2.2 Red Time (s) 1.0 2.2 2.2 And Lag (pilmize? Ves Ves Ves acall Lag Iran Air (a) 6.4 139.3 Ves And Lag (pilmize? Ves Ves Ves Ves And College (a) Anne Call (a) Anne Call (a) Anne Call (a) Anne Call (a)<				10.0 32.3 32.0 28.8% 4.0 2.3 0.0 6.3 None	10.0 32.3 32.0 28.8% 4.0 2.3 0.0 6.3 None 0.90
7.0 25.0 7.0 25.0 7.0 10.0 10.0 10.0 11.0 31.2 11.0 31.2 11.0 31.2 11.0 31.2 11.0 32.3 32.3 11.0 32.0 9.9% 51.4% 99% 51.4% 99% 81.7% 288% 3.0 4.0 4.0 10.0 2.2 1.0 2.2 1.0 2.3 2.3 3.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	width Phase 7.0 25.0 inimum Initial (s) 7.0 25.0 inimum Initial (s) 11.0 37.2 Jala Split (s) 17.0 37.2 Jala Split (s) 3.0 4.0 Jedar Time (s) 1.0 2.2 Jedar Time (s) 1.0 2.2 Jala Lost Time (s) 4.0 0.0 Jala Lost Time (s) 4.0 6.2 sadLag Ves Ves sadLag Ves Ves rad-Lag Optimize? Ves Ves read-Lag Optimize? Ves Ves read-Lag Optimize? Ves Ves re Ratio 0.0 0.0 naueue Delay 0.0 0.0 acueue Length Goth (m) #672 #388.5 renae Length Will Goth (m) #672 #388.5 </td <td></td> <td></td> <td></td> <td>10.0 32.3 32.0 28.8% 4.0 2.3 0.0 6.3 None</td> <td>10.0 32.3 32.0 28.8% 4.0 2.3 0.0 6.3 Ves None</td>				10.0 32.3 32.0 28.8% 4.0 2.3 0.0 6.3 None	10.0 32.3 32.0 28.8% 4.0 2.3 0.0 6.3 Ves None
10 10 10 10 10 10 10 10	infimum initial (s) 7.0 25.0 infimum initial (s) 7.0 25.0 infimum Split (s) 11.0 31.2 infimum Split (s) 11.0 31.2 infimum Split (s) 11.0 31.2 infimum (s) 1.0 2.2 infimum (s) 1.0 2.3 infimum (s) 1.0 2 infimum (s) 1.0 2 infimum (s) 1.0 (s) 1.0 2 infimum (s)				10.0 32.3 32.0 28.8% 4.0 2.3 0.0 6.3 Lag Yes None	10.0 32.3 32.0 28.8% 4.0 4.0 2.3 0.0 6.3 Ves None
110 31.2 11.0 31.2 11.0 32.3 32.3 32.3 32.3 32.4 32.4 32.5 3	Jal Split (s) 11.0 31.2 Jal Split (s) 11.0 57.0 Jal Split (s) 3.0 4.0 Split (s) 3.0 4.0 St Time (s) 1.0 2.2 Jal Lost Time (s) 4.0 6.2 Jabl Lost Time (s) 4.0 6.2 Jabl Lost Time (s) 4.0 6.2 Jabl Lost Time (s) 1.0 2.2 sadL ag Ves Ves ecall Mode 0.88 1.24 ontro Delay 6.4 139.3 aucue Delay 6.4 139.3 ucue Englih Schit (m) 23.0 -313.2 naue Lengih Schit (m) #67.2 #388.5 ternal Link Dist (m) 120.0 0 ase Capacity (uph) 191 1575 ase Capacity (uph) 191 157.5 marvation Cap Reductin 0 0 polilaack Cap Reductin 0 0 cell cength: 111 0 0 resection Summary				32.3 32.0 28.8% 4.0 2.3 0.0 6.3 Lag Yes None	32.3 32.0 28.8% 4.0 2.3 0.0 6.3 None 0.90
110 57.0 110 57.0 110 43.0 32.0 9.9% 514% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 9.9% 51.4% 9.9% 51.4% 9.9% 9.9% 9.9% 9.9% 9.9% 9.9% 9.9% 9	anal Spilit (s) 11.0 57.0 12.1 21.0 12.0 12.0 12.0 12.0 12.0 12				32.0 28.8% 4.0 2.3 0.0 6.3 Lag Yes None	32.0 28.8% 4.0 2.3 0.0 6.3 Lag Yes None
9.9% 51.4% 9.9% 51.4% 9.9% 38.7% 28.8% 38.0 4.0 3.0 4.0 4.0 4.0 1.0 2.2 1.0 2.2 1.3 2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	and Split (%) 99% 514% 5 slow Time (s) 3.0 4.0 2.2 sst Time Adjust (s) 0.0 0.0 sst Time Adjust (s) 0.0 0.0 sad. ag 0.0 0.0 0.0 and. ag 2.2 Lead 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2				28.8% 4.0 2.3 0.0 6.3 Lag Yes None	28.8% 4.0 2.3 0.0 6.3 Lag Yes None 0.90
3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	New Time (s) 3.0 4.0		3.0 1.0 0.0 4.0 Lead Yes None 1.03 103.9	4.0 2.3 0.0 6.3 6.3 None 0.34	4.0 2.3 0.0 6.3 Lag Yes None	4.0 2.3 0.0 6.3 Lag Yes None 0.90
1.0 2.2 1.0 2.2 1.0 2.3 2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	HRed Time (s) 1.0 2.2 Color of time (s) 1.0 2.2 Color of time (s) 0.0 0.0 Color of time (s) 4.0 6.2 Color of time (s) 4.0 6.2 Color of time (s) 1.24 Color of time (s) 1.		1.0 0.0 4.0 Lead Yes None 1.03 103.9	2.3 0.0 6.3 6.3 None 0.34 28.6	2.3 0.0 6.3 Lag Yes None 0.37	2.3 0.0 6.3 Lag Yes None 0.90
10	otal Lost Time (s) 6.0 0.0 0.0 otal Lost Time (s) 4.0 6.2 each Lag Oplinize? Yes Yes Ceal Mode Call Call Call Call Call Call Call Cal		0.0 4.0 Lead Yes None 1.03 103.9	0.0 6.3 None 0.34 28.6	0.0 6.3 Lag Yes None 0.37	0.0 6.3 Lag Yes None 0.90
10	adal Lost Time (s) 40 6.2 adal Lag Time (s) Lead Lag 1 ada-Lag Oplinize? Yes Yes ecall Mode C-Min N ontro Delay 0.0 0.8 8 1.24 ontro Delay 0.0 0.0 ada Delay		4.0 Lead Yes None 1.03 103.9	6.3 None 0.34 28.6	6.3 Lag Yes None 0.37	6.3 Lag Yes None 0.90
Lead Nores Ves	add. ag Lead Lag I Lead Lag I Lead. Ayes Ayes Ares Area Mode Cahin None Call None Call I Log I Lead Lag I Lead Lag Optimize? Yes Yes Ayes Leal I Lead I Like Like Like Like Like Like Like Like		Yes None 1.03 103.9 0.0	None 0.34 28.6	Yes None 0.37	Lag Yes None 0.90
Ves Yes Yes Yes Yes None C-Min None C-Min None None None None None O-Min None None O-Min None None O-Min None O-Min None O-Min O-M	ad-Lag Optimize? Yes Yes Areal Mode Mone C-Min None C-M		Yes None 1.03 103.9 0.0	None 0.34 28.6	Yes None 0.37	Yes None 0.90
None C-Min None C-Min None None None None C-Min None C-	None C-Min None C-Min None C-Min None C-Min Note Not		1.03 1.03.9 0.0	None 0.34 28.6	None 0.37	None 0.90
0.88 1.24 0.19 1.19 1.03 0.34 0.37 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Ratio 0.88 1.24		1.03	0.34	0.37	06:0
64 6 139.3 12.7 123.0 103.9 28 6 41.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	rueu Delay 64,6 139,3 aueu Delay 0,0 0,0 aueu Length Soth (m) 23,0 -313,2 aueu Length Soth (m) 23,0 -313,2 aueu Length Soth (m) 457,2 #388.5 arrandon Cap Reducth 0,0 and and an		0.0	28.6		C L .
00 00 00 00 00 00 00 00 00 00 00 00 00	Leube Delay 0.0 0.0 All Delay 646 139:3 Leue Length Softh (m) 23.0 -313.2 Leue Length Softh (m) #67.2 #38.8.5 Leue Length Poth (m) 47.1 #38.8.5 Leue Length Robin (m) 120.0 17.1 Arn Bay Length (m) 191 1575 Arvaion Cap Reductn 0 0 Coduced Vic Ratio 0.088 1.2.4 (cleared Cycle Length: 111 Fise: C (0%), Referenced to phase 2:EBTL and 6: All All Cycle 150.0		0.0		41.0	65.3
64.6 139.3 12.7 123.0 103.9 28.6 41.0 22.0 -313.2 3.1 -256.3 -34.2 31.4 18.4 #672 #3858 7.5 #310.6 #74.1 51.1 34.7 120.0 10.0 45.0 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	belay 64.6 139.3 ueue Length Soft (m) 23.0 -313.2 ueue Length Soft (m) #67.2 #388.5 ternal Link Dist (m) 475.1 and Bay Length (m) 120.0 and Bay Length (m) 191 1575 anvation Cap Reductn 0 0 orage Cap Reductn 0 0 orage Cap Reductn 0 0 eta Section Summary yole Length: 111 first C (0%), Referenced to phase 2:EBTL and 6: aural Cycle: 150		103 0	0.0	0.0	0.0
23.0 - 313.2	Leue Length BOth (m) 23.0 ~-313.2 Leue Length Soft (m) #67.2 #38.6.5 Lernal Link Dist (m) 475.1 #38.6.5 Lernal Link Dist (m) 475.1 157.5 Lernal Link Dist (m) 120.0 17.5 Lernal Cycle Length: 17.1 17.5 Let Length: 17.1 17.5 Let Length: 17.1 17.5 Livated Cycle: Length: 17.1		100.7	28.6	41.0	65.3
#672 #386.5 7.5 #310.6 #74.1 51.1 34.7 120.0 475.1 256.2 21.8 30.0 191 1575 177 1509 199 607 275 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Leaue Length 95th (m) #67.2 #388.5 Letral Lirk Dist (m) 475.1 #388.5 Letral Lirk Dist (m) 120.0 11 130		~34.2	31.4	18.4	74.5
120.0 475.1 256.2 211.8 210.0 120.0 45.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 3	remalLink Dist (m) 475.1 rn Bay Length (m) 120.0 10.0 see Capacity (ph) 191 1575 arvation Cap Reductn 0 0 orage Cap Reductn 0 0 oduced v/c Ratio 0 oduced v/c Ratio 088 1.24 rcle Length: 111 fise: 0 (0%). Referenced to phase 2:EBTL and 6: attract O/cle. 150		#74.1	51.1	34.7	#126.4
120.0 150.0 45.0 30.0 17	The Bay Length (m) 120.0 11 See Capacity (ph) 191 1575 anvaino Cap Reductn 0 0 orage Cap Reductn 0 0 orage Cap Reductn 0 0 educed v/c Ratio 0 88 1,24 resection Summary let section Summary free Length: 111 free (0 (%), Referenced to phase 2:EBT, and 6: altural Cycle: 150			211.8		201.7
191 1575 177 1509 199 607 275 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	avaelor (yeh) 191 1575 avaelor (yeh) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		45.0		30.0	
0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0	Analon Cap Reductin 0 0 0 1 1 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2		199	607	275	427
3 0.32 0.35	librack Cap Reductin 0 0 0 0 orage Cap Reductin 0 0 0 oraduced v/C Ratio 0 88 1.24 vice Length: 111 vice Length: 111 fise: 0 (0%). Referenced to phase 2:EBTL and 6: atural crycle: 150		0	0	0	0
3 0.32 0.35	orage Cap Reducin 0 0 0 educed vic Ratio 0.88 1.24 v educed vic Ratio 0.88 1.24 v ycle Length: 111 tutated Cycle Length: 111 fiset: 0 (0%), Referenced to phase 2:EBTL and 6: attrait Cycle: 150		0	0	0 (0
3 0.32 0.35	educed v/c Railo 0.88 1.24 resection Summary Lustel Engith: 111 Titaled Cycle Length: 111 Tifset 0 (0%), Referenced to phase 2.EBTL and 6: attral Cycle: 150		0	0	0	0
tersection Summary yorle Length: 111 trained Opte Length: 111 free! 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green atural Oycle: 150 ontrol Type: Actualed-Coordinated you'me exceeds capacity, queue is theoretically infinite. Oueue shown is maximum after two cycles. 95th percentile volume exceeds capacity, queue may be longar.	tersection Summary Velle Length: 111 trusted Cycle Length: 111 fffset: 0 (0%), Referenced to phase 2:EBTL and 6: atural Cycle: 150		1.03	0.32	0.35	0.85
ycle Length: 111 Island WBTL, Start of Green Tifset. O (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green atural Cycle: 150 ontrol Type: Actualed-Coordinated Volume exceeds capacity, queue is theoretically infinite. Oueue shown is maximum after two cycles. 95th percentile volume exceeds capacity, queue may be longer.	ycle Length: 111 ctuated Cycle Length: 111 ffset: 0 (0%), Referenced to phase 2:EBTL and 6: atural Cycle: 150					
ctuated Cycle Length: 111 attract Cycle Length: 112 attract Cycle State (190, Referenced to phase 2:EBTL and &WBTL, Start of Green attract Cycle: 150 ontrol Type: Actuated-Coordinated Volume exceeds capacity, queue is theoretically infinite. Oueue shown is maximum after two cycles. 95th percentile volume exceeds capacity, queue may be longer.	ctuated Cycle Length: 111 ffset: 0 (0%), Referenced to phase 2:EBTL and 6: atural Cycle: 150					
ffset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green thruid (0%). Referenced to phase 2:EBTL and 6:WBTL, Start of Green thruid 0%ee: 150 control Type: Actualed-Coordinated Volume exceeds capacity, queue is theoretically infinite. Oueue shown is maximum after two cycles. Other exceeds capacity, queue may be longer.	ffset: 0 (0%), Referenced to phase 2:EBTL and 6: atural Cycle: 150					
afural Cycle: 150 antion 1 yep. Actualed-Coordinated Volume exceeds capacity, queue is theoretically infinite. Ouene shown is maximum affer two cycles. 95th percentile volume exceeds capacity, queue may be longer.	atural Cycle: 150	WBTL, Start of	· Green			
nitror Type. Actuated-Coordinated Volume exceeds capacity, queue is theoretically infinite. Oueue shown is maximum after two cycles. 95th percentile volume exceeds capacity, queue may be longer.						
Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. 95th percentile volume exceeds capacity, queue may be longer.	ontrol Type: Actuated-Coordinated					
Oueue shown is maximum after two cycles. 95th percentile volume exceeds capacity, queue may be longer.	Volume exceeds capacity, queue is theoretically	/ infinite.				
95th percentile volume exceeds capacity, queue may be longer.	Queue shown is maximum after two cycles.					
	95th percentile volume exceeds capacity, queue	may be longer	<u></u>			



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

WBI 1900 97 97 97 97 97 97 97 97 97 97 97 97 97				-	-			
100 100	EBR	Ĺ.	WBR NBL	NBT	NBR	SBL	SBT	SBR
41 1628 89 97 41 1628 89 97 1100 1900 1900 1900 1900 4.0 5.3 4.0 1900 1.00 0.95 1.00 1900 0.05 1.00 0.95 1.00 0.06 1.00 0.95 0.05 0.06 1.00 0.95 0.95 0.06 1.00 0.95 0.95 0.06 1.00 0.95 0.95 0.07 0.08 0.95 0.95 0.09 0.95 0.95 0.95 0.09 0.95 0.95 0.95 0.00 0.95 0.95 0.95 0.00 0.95 0.95 0.95 0.00 0.95 0.95 0.95 0.00 0.95 0.95 0.95 0.00 0.95 0.95 0.95 0.00 0.95 0.95 0.95 0.00 0.95 0.95 0.95 0.00 0.95 0.95 0.95 0.00 0.95 0.95 0.95 0.00 0.95 0.95 0.95 0.00 0.95 0			jr.	₩₽		<u>, </u>	₽ ₽	
1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1000	68		115 287	20	193	328	299	77
1900 1900 1900 1900 1900 1900 1900 1900 1900 1000	68			20	193	328	299	77
100 0.95	1900 18	_	1900 1900	1900	1900	1900	1900	1900
100 0.95 1.00 100 0.95 1.00 100 0.95 1.00 1006 1.00 0.06 1.00 0.06 1.00 0.06 1.00 0.06 1.00 0.06 1.00 0.09 0.01 0.06 0.02 0.02 0.03 0.04 0.06 0.06 0.07 0.08 0.08 0.08 0.08 0.09 0.09 0.09 0.00 0.00 0.00 0.00			4.0	2.7		4.0	5.7	
100 099 100 100 100 100 100 100 100 100 100 100 100 100 100 100 1117 3241 1180 114 94 102 117 324 095 096 100 00 00 100 0	•		1.00	0.95		1.00	0.95	
10.95 10.0 0.95 10.0 0.95 10.0 0.95 10.0 0.06 10.0			1.00	0.89		1.00	0.97	
1805 3241 1805 0.06 1.00 0.00 0.00 0.00 0.00 0.00 0.00			0.95	1.00		0.95	1.00	
100 0.06 1.00 0.06 1.11 3.24 0.95 0			1694	3122		1463	3191	
117 3241 114			0.31	1.00		0.48	1.00	
F 0.95 0.95 0.95 0.95 A			553	3122		742	3191	
h) 43 1714 94 102 h) 43 1805 0 10 0 82 0% 0% 0% 0 39 0 0 0 39 0 0 0 39 0 0 0 39 0 0 1 0 0 3 1 0 0 3 2 2 6 6 4 7 74.1 1 147 1747 741 0 0.59 0.54 0.62 0 0.70 0.56 0.62 0 0.10 0.56 0.02 0 0.10 0.56 0.03 0 0.10 0.03 0 0.	0.95			0.95	0.95	0.95	0.95	0.95
h) 0 3 0 0 h) 43 1805 0% 0% 0 39 0 0 0 39 0 0 0 39 0 0 0 0 0 0 10 0 1 1	94		121 302	74	203	345	315	8
hh) 43 1805 0 102 0% 2% 0% 0% 0 8 2% 0% 0% 0 102 0 103 0 102 0 103 64.7 74.1 0 105 0.54 0.62 0 103 0.04 0.62 0 104 0.56 0.04 0 10 0.56 0.04 0 10 0.56 0.00 0 1 0.00 0 1 0.00 0 1 0.00 0 1 0.00 0 1 0.00 0 1 0.00 0 1 0.00 0 1 0.00		3		66	0	0	20	0
0% 2% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	0	2		178	0	345	376	0
December	%0		15% 4%	%0	4%	12%	%6	%
(s) 70.3 64.7 74.1 (s) 70.3 (s)	0		14 6	0	4	23	4	2
(s) 70.3 64.7 74.11 (s) 6.5 0.54 0.62 (s) 3.0 3.0 3.0 (s) 3.0 3.0 3.0 (s) 4.0 5.3 3.0 (s) 6.0 6.0 6.0 (s) 7.0 6.0 6.0 (s) 8.0 6.0 6.0 (s) 8.0 6.0 (s) 8.0 6.0 (s) 8.0 6.0 (s) 8.0 6.0 (s) 9.0 6.0			td+md	NA		pm+pt	M	
(s) 703 64.7 74.1 (s) 703 64.7 74.1 (s) 703 64.7 74.1 703 64.7 74.1 703 64.7 74.1 704 5.3 3.0 3.0 8.3 3.0 3.0 3.0 9.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1	2	1 6	3	80		7	4	
(s) 70.3 64.7 74.1 (s) 70.3 64.7 74.1 (s) 70.3 64.7 74.1 (s) 70.3 64.7 74.1 74.1 74.1 75.1 (s) 70.3 64.7 74.1 74.1 75.1 (s) 70.3 6.1 (s) 70.3 (s) 7		2	00			4		
S 70.3 64.7 74.1 C S C S C S S S S S S S S S			28.8	18.8		28.8	18.8	
0.59 0.54 0.62 4.0 5.3 4.0 6.73 1.147 1747 176 0.01 0.56 0.004 0.29 1.03 0.58 26.3 27.6 25.3 24.0 5.29 0.98 d2 0.5 23.9 1.99 d2 0.5 23.9 1.99 Delay 107.7 1 Delay 10.7 1 Delay 10.7 10.004			28.8	18.8		28.8	18.8	
10	J		0.24	0.16		0.24	0.16	
S S S S S S S			4.0	2.7		4.0	2.7	
147 1747 176 0 0 10 0.56 0.004 0 0 16 0.29 1.03 0.58 0 28 1.03 0.58 0 29 1.03 0.58 0 0 9 0.96 0 0 5 23.9 1.09 0 0 5 23.9 1.09 0 0 5 0.98 0 0 5 0.99 0 0 5 0.99 0 0 6 0.99 0 1 0 7 0 0.99 0 0 0 0 0 0.99 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			3.0	3.0		3.0	3.0	
0.01 0.56 0.004 0.16 0.29 1.03 0.58 26.3 27.6 25.3 24.2 0.58 0.98 0.5 23.9 1.9 1.6 0.98 0.95 0.5 23.9 1.9 0.5 23.9 1.9 0.6 20.9 0.7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			227	489		238	466	
d2 0.16 0.32 0.32 0.32 0.32 0.32 0.32 0.32 0.32			0.11	90:0		c0.12	0.12	
0.29 1.03 0.58 26.3 27.6 25.3 42 0.5 23.9 0.58 42 0.5 23.9 1.9 44.6 50.9 25.9 Delay 0.00 may 0.			0.21			c0.23		
26.3 27.6 25.3 d2 0.98 0.95 d2 0.5 23.9 19 44.6 50.9 25.9 Delay 107.7 10 to Capacity ratio 1.26			1.33	0.36		1.45	0.75	
d2 0.98 0.99 d2 0.5 23.9 1.99 d4.6 50.9 25.9 D D C C 50.8 50.8 Delay 107.7 10 10.Capacity ratio 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26			43.1	45.3		44.0	48.4	
5 23.9 1.9 5 50.9 25.9 50.8 C C D C C 107.7 1 1.26 1.20 8			1.00	1.00		1.00	1.00	
509 259 D C C 508 D D 120 1707 1			175.7	0.5		224.3	6.3	
50.8 D D 107.7 1.26 1.20			218.8	45.7		268.3	54.7	
50.8 D 107.7 1.26 1.20 1.00 1.00 1.00	0	L C	ш	٥		Ŀ	Ω	
107.7 1.26 1.20.0 1.00.10.10.10.10.10.10.10.10.10.10.10.10	50.8	130.7		136.0			154.2	
107.7 1.26 1.20.0	D	<u>ı. </u>		ıL			ı.	
107.7 1.26 1.20.0								
1.26	107.7	HCM 2000 I	HCM 2000 Level of Service		1			
120.0	1.26							
100 10/	120.0	Sum of lost time (s)	time (s)		19.0			
100.1%	108.1%	ICU Level of Service	Service		G			
Analysis Period (min) 15	15							

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (PM) 2027 Scenario 3

Future Total (PM) 2027 Scenario 3

→	SBT	₽ ₽	299	299	396	¥.	4	,	4	10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7	Lag	Yes	None	92.0	55.2	0:0	55.2	46.8	63.0	275.9		612	0	0	0	0.65										
۶	SBL	r	328	328	345	pm+pt		4 1	_	7.0	11.0	14.0	11.7%	3.0	1.0	0.0	4.0	Lead	Yes	None	1.39	230.8	0.0	230.8	~109.9	#168.1		20.0	248	0	0	0	1.39										
←	NBT	₩	70	70	277	ĕ °	∞	c	Ö	10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7	Lag	Yes	None	0.47	28.3	0.0				340.6		675	0	0	0	0.41										
•	NBL	F	287	287	302	pm+pt	m 0	ю г	က	7.0	11.0	14.0	11.7%	3.0	1.0	0.0	4.0	Lead	Yes	None	1.29	189.6	0.0	189.6	~68.8	#118.3		70.0	235	0	0	0	1.29				Green]
Į.	WBT	₩	2032	2032	2260	NA.	9	7	0	20.0	34.3	0.79	25.8%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.21	126.2	0.0	126.2	~367.0	#422.1	124.7		1875	0	0	0	1.21				Start of		a	ı.	no longer	ne ionide	eam sign
>	WBL	r	46	46	102	pm+pt	- \	0 5	-	7.0	11.0	11.0	9.5%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.58	22.2	0.0		13.4	m15.0 m#422.1		0.06	176	0	0	0	0.58				6:WBTL		infini vile	ally IIIIIII	vem one	ene may	by upstr
1	EBT	₩	1628	1628	1808	NA NA	7	c	7	20.0	34.3	0.79	25.8%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.03	91.6	0.0	51.6	~250.1	m5.5 m#282.2	170.5		1750	0	0	0	1.03				BTL and		theoretic	medical	cycles.	cycles.	metered
4	EBL	F	41	41	43	pm+pt	ഹ	7	C	7.0	11.0	11.0	9.5%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.25	16.4	0.0		4.3	m5.5 m		100.0	170	0	0	0	0.25				phase 2:F		Inated	ducture 13	alter two	after two	e queue is
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	lurn lype	Protected Phases	Permitted Phases	Switch Dhase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 145	Control Type: Actuated-Coordinated Volume exceeds canacity quare is theoretically infinite	Volume exceeds capacity,	# O5th percentile volume exceeds capacity atteins may be longer	One ue shown is maximum after two cycles.	m Volume for 95th percentile queue is metered by upstream signal

Splits and Phases: 2: Fifth Line & Derry Road

€01 + 402 (R)

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

28.4 28.4 0.24 5.7 3.0 373 0.03 0.14 36.1 1.00 0.2 36.3 5.7 0.95 1.00 1.00 1.00 1.00 3346 3346 0.96 461 4% ≨ 00. pm+pt c0.19 348 348 348 1900 1.00 1.00 1.00 0.95 0.30 553 362 363 2% Perm 18.6 18.6 0.16 0.04 0.27 44.7 1.00 0.6 0.6 D 19.0 187 187 1900 1.00 1.00 1.00 0.85 1.00 1489 1.00 1489 0.96 195 134 4% 3.0 18.6 18.6 0.16 337 337 337 1900 5.7 0.95 1.00 1.00 1.00 1.00 1.00 3428 0.96 Ž 99.0 351 3% 0.96 82 0 82 4.0 3.0 253 0.02 0.05 0.32 4% pm+pt 0.7 26.8 26.8 0.22 38.0 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service Perm 5.3 5.3 1.00 1.00 1.00 1.00 1.460 1.460 1.460 1.00 1.00 4% 7 52.2 52.2 0.44 3.0 0.26 572 190 382 25.9 1.62 0.4 42.5 1462 1900 5.3 0.95 1.00 1.00 1.00 1.00 3453 3453 1523 1% Š 52.2 52.2 0.44 1.01 D 44.2 D 1523 3.0 340 c0.12 pm+pt 0.33 4.0 1.00 1.00 1.00 1.00 0.95 1791 0.08 0.08 272 272 % 68.4 68.4 0.57 49.5 1.02 120.0 92.6% Perm 0.00 0.01 23.0 1.00 0.0 1600 1.00 1.00 1.00 1.00 0.85 1.00 1497 1.00 %9 45.8 45.8 0.38 5.3 3.0 571 54.9 D 1201 1201 1201 1900 5.3 0.95 1.00 1.00 1.00 1.00 3376 3376 3376 ξ 45.8 45.8 0.38 36.5 1.00 19.1 55.5 2% 0.96 1251 5.3 3.0 1288 0.37 192 192 1900 4.0 0.97 1.00 1.00 1.00 0.95 3446 3446 3446 0.96 200 1% Prot 12.2 12.2 0.10 4.0 3.0 3.50 0.06 0.57 1.00 2.3 53.7 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp. pedbikes
Said. Flow (pem)
Fit Portected
Said. Flow (pem)
Reak-hour factor, PHF
Peak-hour factor, PHF
Regulation (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Actuated Green, G (s) Clearance Time (s) Vehicle Extension (s) Incremental Delay, d2 Bus Blockages (#/hr) Effective Green, g (s) Actuated g/C Ratio Turn Type Protected Phases Permitted Phases Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Total (PM)

Future Total (PM) 2027 Scenario 3

Lane Group		4	†	<u> </u>	-	ļ	4	•	—	•	۶	→	*
172 1201 16 261 1462 549 79 337 187 348 443 192 1201 16 261 1462 549 79 337 187 348 443 192 1201 16 261 1462 549 79 337 187 348 443 443 200 1251 17 212 1523 512 82 351 187 348 443 443 200 1251 17 212 1523 512 82 351 185 363 461 200	Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
192 1201 16 261 1462 549 79 337 187 348 443 200 1201 16 261 1462 549 79 337 187 348 443 200 1251 17 272 25 2 6 6 8 8 8 7 4 4 4 4 4 4 5 2 2 2 6 6 8 8 8 7 4 4 4 4 4 4 4 4 4	Lane Configurations	K	‡	*	r	‡	*	r	‡	*	×	*	*-
192 1201 16 261 1462 549 79 337 187 348 443 200 1251 17 272 1523 512 8 251 195 363 461 Fro 1A Pro 1 6 6 8 8 4 461 5 2 2 6 6 8 8 8 4 461 70 200 200 200 200 100 <td>Traffic Volume (vph)</td> <td>192</td> <td>1201</td> <td>16</td> <td>261</td> <td>1462</td> <td>549</td> <td>79</td> <td>337</td> <td>187</td> <td>348</td> <td>443</td> <td>209</td>	Traffic Volume (vph)	192	1201	16	261	1462	549	79	337	187	348	443	209
200 1251 17 272 1523 572 82 351 195 364 461 Ford NA Perd NA NA Perd NA NA<	Future Volume (vph)	192	1201	16	261	1462	549	79	337	187	348	443	209
Prof. NA Perm pm+pl NA Perm pm-pl NA Perm	Lane Group Flow (vph)	200	1251	17	272	1523	572	82	351	195	363	461	218
5 2 1 6 8 8 7 4 5 2 6 6 8 8 7 4 5 2 6 6 8 8 7 4 7 2 6 6 8 8 7 4 7 2 2 1 6 6 8 8 7 4 7 3 3 3 3 3 3 3 4 1 4 170 20 20 20 70 100 100 100 100 110 34.3 34.3 34.3 34.3 34.7 34.7 11.0 34.7 110 4.0 5.0 20 20 20 30 30 37.3 34.3 34.3 34.0 37.7 34.0 37.0 30 30 37.0 30 30 30 37.0 30 3	Turn Type	Prot	N	Perm	pm+pt	¥	Perm	pm+pt	¥	Perm	pm+pt	NA	Perm
5 2 6 6 8 8 4 4 4 70 20.0 2 1 6 6 8 8 4 4 70 20.0 20.0 7.0 10.0 7.0 10.0 7.0 10.0 110 34.3 34.3 34.3 34.3 34.3 34.7 3	Protected Phases	2	2		τ-	9		က	00		7	4	
5 2 2 1 6 6 3 8 8 7 4 70 200 200 7.0 200 7.0 100 100 7.0 100 11.0 34.3 34.3 11.0 34.3 34.3 11.0 34.7 34.7 11.0 34.7 11.0 34.3 34.3 11.0 34.3 11.0 34.7 34.7 11.0 34.7 14.2% 43.3% 92.8 38.3% 18.3% 92.2% 92.8 </td <td>Permitted Phases</td> <td></td> <td></td> <td>2</td> <td>9</td> <td></td> <td>9</td> <td>∞</td> <td></td> <td>00</td> <td>4</td> <td></td> <td>4</td>	Permitted Phases			2	9		9	∞		00	4		4
7.0 20.0 20.0 7.0 10.0 1	Detector Phase	2	2	2	.	9	9	က	8	∞	7	4	4
70 200 200 70 200 70 100 110 347 110 30 10 00	Switch Phase												
11.0 34.3 34.3 11.0 34.3 34.3 11.0 34.7 34.7 11.0 34.7 11.0 34.7 11.0 34.7 11.0 34.7 11.0 34.7 11.0 34.7 11.0 34.7 34.3	Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
17.0 22.0 32.0	Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
14.2% 43.3% 43.3% 92.8% 38.3% 183.8 292.8% 292.8% 183.8 292.8%	Total Split (s)	17.0	52.0	52.0	11.0	46.0	46.0	22.0	35.0	35.0	22.0	35.0	35.0
3.0 3.7 3.7 3.0 3.7 3.7 3.0 3.7 3.7 3.0 3.7 3.7 3.0 3.7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Total Split (%)	14.2%	43.3%	43.3%	9.5%	38.3%	38.3%	18.3%	29.2%	29.2%	18.3%	29.2%	29.2%
1.0 1.6 1.6 1.0 1.6 1.6 1.0 20 20 1.0 20 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
10	All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lead	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead Lag Nes Yes	Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Ves Yes Yes <td>Lead/Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td>	Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
None C-Min None C-Min None C-Min None	Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
057 095 003 080 100 069 029 069 055 099 088 875 871 873 794 44.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
57.5 51.8 0.1 26.2 43.6 19.4 29.5 55.7 17.3 79.4 44.5 0.0 <td< td=""><td>v/c Ratio</td><td>0.57</td><td>0.95</td><td>0.03</td><td>0.80</td><td>1.00</td><td>69.0</td><td>0.29</td><td>69.0</td><td>0.55</td><td>0.99</td><td>0.58</td><td>0.40</td></td<>	v/c Ratio	0.57	0.95	0.03	0.80	1.00	69.0	0.29	69.0	0.55	0.99	0.58	0.40
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Control Delay	57.5	51.8	0.1	26.2	43.6	19.4	29.5	55.7	17.3	79.4	44.5	7.3
57.5 51.8 0.1 26.2 43.6 19.4 29.5 55.7 17.3 79.4 45.5 24.7 51.6.4 0.0 41.7 207.8 94.6 13.9 44.0 8.1 74.3 54.9 36.2 #206.2 0.0 m86.9 m172.8 m70.3 24.3 57.7 30.4 #11.7 71.4 35.9 100.0 70.0 110.0 75.0 100.0 75.0 95.0 113.2 413.2 713.2 713.2 1 0	Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24.7 156.4 0.0 41.7 207.8 94.6 13.9 44.0 8.1 74.3 54.9 36.2 #205.2 0.0 m36.9 m172.8 m703 24.3 57.7 30.4 #112.7 71.4 113.4 156.1 70.0 110.0 75.0 100.0 75.0 95.0 713.3 64.1 340 15.2 632 399 837 482 366 848 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Delay	57.5	51.8	0.1	26.2	43.6	19.4	29.5	22.7	17.3	79.4	44.5	7.3
36.2 #205.2 0.0 m36.9 m172.8 m70.3 24.3 57.7 30.4 #112.7 71.4 116.1 16.1 16.1 16.1 17.0 110.0 17.5 100.0 17.5 100.0 17.5 100.0 17.5 100.0 17.5 100.0 17.5 17.5 17.5 17.5 17.5 17.5 17.5 17.5	Queue Length 50th (m)	24.7	156.4	0.0	41.7	207.8	94.6	13.9	44.0	8.1	74.3	54.9	0.0
156.1 488.7 381.6 213.2 131.2 100.0 148.7 100.0 170.0 110.0 170.0 110.0 125.0 139.0 125.0 139.0 131.3 41.1 34.0 125.2 339.0 837 422. 346.8 488.0 10.0 0.0	Queue Length 95th (m)	36.2	#205.2	0.0	m36.9	m172.8	m70.3	24.3	57.7	30.4	#112.7	71.4	19.9
100.0 70.0 110.0 75.0 100.0 75.0 95.0 1	Internal Link Dist (m)		156.1			488.7			381.6			213.2	
391 1313 641 340 1525 832 399 837 482 366 848 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	391	1313	641	340	1525	832	366	837	482	366	848	563
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
0.51 0.95 0.03 0.80 1.00 0.69 0.21 0.42 0.40 0.99 0.54	Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
0.51 0.95 0.03 0.80 1.00 0.69 0.21 0.42 0.40 0.99 0.54	Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Summary	Reduced v/c Ratio	0.51	0.95	0.03	0.80	1.00	69.0	0.21	0.42	0.40	66:0	0.54	0.39
	Intersection Summary												

Cycle Length: 120 Actuated Cycle Length: 120

Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Natural Cycle: 115

Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

M. Volume for 95th percentile queue is metered by upstream signal.

3: James Snow Parkway & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Total (PM) 2027 Scenario 3

Mayoraneart		1	†	<i>></i>	-	Ļ	1	•	—	•	۶	→	•
Nation N	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1, 3, 1, 1, 1, 1, 1, 1,	Lane Configurations	*	₹		-	₩		-	¢\$		-	43	
1,000 1,00	Traffic Volume (vph)	30	1884	28	43	1980	24	211	9	134	74	7	169
1500 1900	Future Volume (vph)	30	1884	28	43	1980	24	211	10	134	74	7	169
1,00 0.95 1.00 0.95 1.00	Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,00 0.95 1,00 0.95 1,00	Total Lost time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	2.7	
1,00 1,00 1,00 1,00 1,00 1,00 0,06 1,00 0,06 1,00 0,05 1,00	Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
1,00 0.95 1,00 1,00	Ft	1.00	1.00		1.00	1.00		1.00	98.0		1.00	98.0	
1770 35.23 1770 35.33 1770 16.03 1770 1565 10.65 1.000 0.056 1.000 0.052 1.000 0.059 1.000 10.65 35.23 99.2 0.92 0.92 0.92 0.92 0.92 0.92 0.92 10.65 35.23 99.2 0.92 0.92 0.92 0.92 0.92 0.92 0.92 10.67 31.2 20.48 6.3 47 2152 26 229 11 146 80 8 8 8 10 10.67 31.2 20.0 1 0 0 0 1 0 0 0 1 0 10.67 31.2	Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
OLOGO 1,000 OLOGO OLOG	Satd. Flow (prot)	1770	3523		1770	3533		1770	1603		1770	1595	
106 3523 99 3533 977 1603 1100 1595 33 2048 6 29 092 092 092 092 092 092 092 092 092	Fit Permitted	90:0	1.00		0.02	1.00		0.52	1.00		0.59	1.00	
PHF 0.92 <th< td=""><td>Satd. Flow (perm)</td><td>105</td><td>3523</td><td></td><td>66</td><td>3533</td><td></td><td>716</td><td>1603</td><td></td><td>1100</td><td>1595</td><td></td></th<>	Satd. Flow (perm)	105	3523		66	3533		716	1603		1100	1595	
National State Color National State National Stat	Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
vgh) 0 2 0 0 1 0 0 71 0 0 vph) Perm NA pm+pl NA Perm NA Perm vph) Perm NA pm+pl NA Perm Perm Perm (s) 710 710 798 798 292 292 292 (s) 710 710 798 798 292 292 292 (s) 710 710 798 798 292 292 292 (s) 710 798 798 292 292 292 292 (s) 710 798 798 292 292 292 292 (s) 730 66 66 66 66 66 69 80 30 (s) 310 323 30 30 30 30 30 30 (s) 414 32	Adj. Flow (vph)	33	2048	63	47	2152	56	229	11	146	80	∞	184
Vgh) 33 2109 0 47 2177 0 229 86 0 80 Vgh Perm NA Pm+pl NA Perm NA Perm 1 2 6 6 8 8 4 1 1 7 7 6 8 4 4 1 1 7 7 7 8 78 8 2	RTOR Reduction (vph)	0	2	0	0	-	0	0	71	0	0	10	0
Perm NA Pm+pt NA Perm NA Per	Lane Group Flow (vph)	33	2109	0	47	2177	0	229	98	0	80	182	0
(s) 710 710 798 798 8 4 4 4 7 710 710 710 798 798 292 292 292 292 292 292 292 292 292 2	Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
12 6 6 8 8 9 9 9 4 4 4 1 7 1	Protected Phases		2		-	9			00			4	
710 710 798 798 292	Permitted Phases	2			9			00			4		
s) 71.0 71.0 71.0 71.0 71.0 71.0 71.0 71.0 71.0 71.0 71.0 71.0 71.0 71.0 71.0 72.4 22.2 29.2 30.2 30.2 30.2 30.2 30.2 30.2 30.2 30.2 30.2 30.2 30.2 30.2 30.2 30.3 30.1 30.2 30.2 30.3 30.1 30.2 30.3 30.1 30.2 30.3 30.1 30.2 30.3 30.1 30.2 30.3 30.1 30.2 30.3 30.1 30.3 30.3 30.3 30.3 30.3 30.3 30.3 30.3 30.3 30.3 30.3 30.3 30.3 30.3 30.3 30.3 3	Actuated Green, G (s)	71.0	71.0		79.8	79.8		29.2	29.5		29.5	29.2	
0.59	Effective Green, g (s)	71.0	71.0		8.67	79.8		29.5	29.5		29.5	29.2	
53 53 53 60 00 00 00 00 00 00 00 00 00 00 00 00	Actuated g/C Ratio	0.59	0.59		99:0	99:0		0.24	0.24		0.24	0.24	
S S S S S S S S S S	Clearance Time (s)	5.3	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
62 2084 132 2349 237 390 267 10	Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Color Colo	Lane Grp Cap (vph)	62	2084		132	2349		237	390		267	388	
0.31 0.22 0.02 0.02 1.63 1.01 0.25 0.03 0.07 1.64 24.5 28.5 17.6 44.9 36.3 1.74 1.32 1.00 1.00 1.00 1.00 2.9 9.3 1.6 7.8 48.5 0.3 0.6 2.4 41.6 30.1 25.4 93.4 36.6 37.7 2.7 41.6 30.1 25.4 93.4 36.6 37.7 2.8 24.7 41.6 30.1 25.5 70.3 3.9 25.5 1.00 1.00 3.0 25.5 1.00 3.0 41.0 20.0 20.0 41.0 20.0 20.0 5.0 20.0 20.0 5.0 20.0 20.0 6.0 20.0 20.0 6.0 20.0 20.0 7.0 20.0 20.0 8.0 20.0 20.0 9.0 20.0 20.0 9.0 20.0 20.0 1.0 20.0 20.0 20.0 20.0	v/s Ratio Prot		09:00		0.01	c0.62			0.05			0.11	
1.46 24.5 28.5 17.6 49.9 69.7 60.2 60.30 1.46 24.5 28.5 17.6 49.9 36.3 37.1 1.47 1.2. 2.9 9.3 1.6 7.8 48.5 0.3 0.6 2.47 41.6 30.1 25.4 93.4 36.6 37.7 C	v/s Ratio Perm	0.31			0.22			c0.23			0.07		
146 245 285 176 449 36.3 37.1 149 1.32 1.00 1.00 1.00 1.00 29 91.32 1.00 1.00 1.00 1.00 24.7 41.6 30.1 25.4 93.4 36.6 37.7 C D C C C F F D D Delay 25.5 70.3 My	v/c Ratio	0.53	1.01		0.36	0.93		0.97	0.22		0.30	0.47	
149 132 100	Uniform Delay, d1	14.6	24.5		28.5	17.6		44.9	36.3		37.1	38.8	
d2 29 9.3 1.6 7.8 48.5 0.3 0.6 C L C C F D	Progression Factor	1.49	1.32		1.00	1.00		1.00	1.00		1.00	1.00	
24.7 41.6 30.1 25.4 93.4 36.6 37.7 C D C C F D D 41.4 25.5 F D D C D C C F D D Anny anny belay 36.4 HCM 2000 Level of Service D to Capacity ratio 1.01 Sum of lost time (s) 15.0 P ity Utilization 15.0 Sum of Service F F D 15.0 Sum of lost time (s) 15.0 F F D 15.0 Sum of lost time (s) 15.0 F F F F D 15.0 Sum of lost time (s) 15.0 F F F F D 15.0 Sum of lost time (s) 15.0 F F F F D 15.0 Sum of lost time (s) 15.0 F F F F D 15.0 Sum of lost time (s) 15.0 F F F F D 15.0 Sum of lost time (s) 15.0 F F F F D 15.0 Sum of lost time (s) 15.0 F F F F D 15.0 Sum of lost time (s) 15.0 F F F F D 15.0 Sum of lost time (s) 15.0 F F F F D 16.0 Sum of lost time (s) 15.0 F F F F F F F F F F F F F F F F F F F	Incremental Delay, d2	2.9	9.3		1.6	7.8		48.5	0.3		9.0	6.0	
C D C C F D D 41.4 25.5 70.3 any any belay 36.4 HCM 2000 Level of Service D 10.0 Sum of lost time (s) 15.0 yr Utilization 91.9% ICU Level of Service F in)	Delay (s)	24.7	41.6		30.1	25.4		93.4	36.6		37.7	39.7	
any Delay 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.00 Sum of lost time (s) 1.01 1.01 1.00 Sum of lost time (s) 1.01 1.00 1.01 1.00	Level of Service	ပ	Ω		ပ	O		ш	Ω		Ω	Ω	
36.4 HCM 2000 Level of Service 36.4 HCM 2000 Level of Service 310, 1.00 Sum of lost time (s) 91.9% ICU Level of Service 15	Approach Delay (s)		41.4			25.5			70.3			39.1	
36.4 HCM 2000 Level of Service 1.01 1.00 Sum of lost time (s) 91.9% ICU Level of Service 15	Approach LOS		D			O			ш			O	
36.4 HCM 2000 Level of Service 1.01 1.00 Sum of lost time (s) 91.9% ICU Level of Service 15	Intersection Summary												
atio 1.01 Sum of lost time (s) 91.9% ICU Level of Service 15	HCM 2000 Control Delay			36.4	Ĭ	3M 2000	Level of 5	Service		۵			
120.0 Sum of lost time (s) 91.9% ICU Level of Service 15	HCM 2000 Volume to Capac	city ratio		1.01									
91.9% 15	Actuated Cycle Length (s)			120.0	S	im of lost	time (s)			15.0			
Analysis Period (min) 15	Intersection Capacity Utilizat	ion		91.9%	೦	U Level o	f Service			ш			
	Analysis Period (min)			15									

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Queues 4: Clark Boulevard & Derry Road

Future Total (PM) 2027 Scenario 3

→	SBT	23	7	7	192	¥	4		4		10.0	34.7	35.0	29.2%	3.7	2.0	0.0	ò		None	0.48	40.9	0:0	40.9	38.1	62.2	313.3		366	0	0	0	0.48											
۶	SBL	r	74	74	80	Perm		4	4		10.0	34.7	35.0	29.2%	3.7	2.0	0.0	3		None	0.30	40.7	0.0	40.7	16.3	31.4		40.0	268	0	0	0	0.30											
←	NBT	2,	10	10	157	¥	00		∞		10.0	34.7	35.0	29.2%	3.7	2.0	0.0	3		None	0.34	18.0	0.0	18.0	12.3	31.6	56.4		462	0	0	0	0.34											
•	NBL	*	211	211	229	Perm		00	∞		10.0	34.7	35.0	29.2%	3.7	2.0	0.0	5		None	0.97	626	0.0	626	56.3	#108.1			238	0	0	0	96.0				Green						77	i
Ļ	WBT	*	1980	1980	2178	NA	9		9		10.0	34.3	85.0	70.8%	3.7	9.	0.0	5		C-Min	0.93	26.1	0.0	26.1	227.7	277.8	475.1		2349	0	0	0	0.93			i	, Start of		9	ı.	ho longor	ne loriger	nois med	
-	WBL	r	43	43	47	pm+pt	_	9	-		0.9	10.0	10.0	8.3%	3.0	0.1	0.0	Pad	Yes	None	0.31	12.0	0.0	12.0	3.6	7.6		70.0	150	0	0	0	0.31				6:WBTL		ally infinit	ally IIIIII	wom one	ene may i	hy instr	of about
†	EBT	*	1884	1884	2111	NA	2		2		10.0	34.3	75.0	62.5%	3.7	9.	0.0	2.5	Yes	C-Min	1.00	37.7	0.0	37.7	~291.1	m229.7	336.0		2111	0	0	0	1.00				EBTL and		thoorotic	CVCIPS	cycles.	ovelos	cycles. s metered	
1	EBL	*	9	30	33	Perm		2	2		10.0	34.3	75.0	62.5%	3.7	9.	0.0		Yes Leg	C-Min	0.53	35.2	0.0	35.2		m6.8		70.0	62	0	0	0	0.53				phase 2:	dinated	oi oi oi oi	n, queue is	rande car	ceeds cap	l alter two	-
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	loan Eost IIIIc (3)	Lead-Lad Ontimize?	Recall Mode	v/c Ratio	Control Delay	Oueue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Control Type: Actuated-Coordinated	Volume exceeds consultated	One is shown is maximin after two cycles	# OEth porcontilo volumo ox	Soft percentile volume exceeds capacity, queue may be longer. Output chosin is maximum after two evoles.	m. Volume for 95th percentile gueine is metered by instream signal	

Splits and Phases: 4: Clark Boulevard & Derry Road

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HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Total (PM) 2027 Scenario 3 1900 5.7 1.00 0.99 1.00 1.00 1.00 1.853 0.92 5.7 6.3 5.7 1.00 1.00 0.95 1770 0.46 857 0.92 13 Perm 19.3 0.51 5.7 3.0 435 0.03 4.7 4.7 1.00 0.0 4.7 A 11.0 ⋖ 10 0.51 6.2 1.00 0.4 6.6 A 6.6 433 433 1900 5.7 5.7 1.00 1.00 1.00 1.00 1857 0.92 471 19.3 19.3 0.51 5.7 3.0 943 0.26 88 ¥ 5.7 1.00 1.00 0.95 1770 0.44 819 0.00 0.01 1.00 0.0 4.6 A Perm 19.3 19.3 0.51 5.7 3.0 415 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 63 1900 92 9 7.7 7.7 0.20 5.3 3.0 3.29 0.02 0.08 12.3 1.00 0.1 12.4 B 5.3 1.00 1.00 0.95 1770 0.74 1378 42 39 Perm 7.7 7.7 0.20 5.3 3.0 279 0.03 0.15 12.5 1.00 0.3 12.7 B 42 7.7 0.43 38.0 42.8% 01 0061 15 15 1900 5.3 1.00 0.94 1749 1749 0.92 M ≥ 7.7 7.7 0.20 5.3 3.0 3.54 0.01 0.05 12.2 1.00 0.1 12.3 B 1 Intersection control Delay
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
C. Critical Lane Group 5.3 1.00 1.00 0.95 1770 0.70 44 48 Serm 7.7 7.7 0.20 5.3 3.0 266 0.18 12.5 1.00 0.3 12.9 c0.04 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Turn Type Protected Phases Permitted Phases Actuated Green, G (s) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot -ane Group Flow (vph Effective Green, g (s) Delay (s) Level of Service Approach Delay (s) Approach LOS

v/s Ratio Perm

v/c Ratio

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Queues 5: Fifth Line & Clark Boulevard

Future Total (PM) 2027 Scenario 3

→ → → ← ✓ → →	WBL WBT NBL NBT SBL SBT	* 4	39 11 4 433 12 448	11 4 433 12	42 80 4 481 13 504	Perm NA Perm NA	6 8 4	6 8 4	6 6 8 8 4 4		10.0	34.3 34.7 34.7 34.7	35.0 85.0 85.0 85.0	29.2% 70.8% 70.8% 70.8% 70	3.7 3.7	1.6 2.0 2.0 2.0	0.0 0.0 0.0 0.0 0.0 0.0	5.3 5.7 5.7 5.7			Min	0.16 0.01 0.46 0.03 (6.0 5.8 9.1 6.0	0.0 0.0 0.0 0.0	5.8 9.1	0.5 0.1 21.6 0.5	8.1 7.9 1.1 40.3 2.2 42.9	86.5 156.9	35.0 35.0	1124 1337 818 1857 857 1853	0 0 0	0 0 0	0 0 0 0	0.04 0.06 0.00 0.26 0.02 0.27			
\ ↑	EBT WBL	÷	15 39			NA Perm	2	9	2 6					29			0.0 0.0				None None		_		9.4 12.3			204.0		1429 1124	0 0			0.02 0.04			
4	EBL	*	44	44	48	Perm		2	2		10.0	34.3			3.7	1.6	0.0	5.3			None	0.13	12.5	0.0	12.5	2.1	0.6		35.0	1071	0	0	0	0.04			0
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Agricated Cicle Length, 24 0

5: Fifth Line & Clark Boulevard 9 Splits and Phases: **₽ 1**000

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HCM Unsignalized Intersection Capacity Analysis 10: Clark Boulevard & Anatolia Building 1 North Access/Anatolia Building 2 North Addess รายกาก

Movement EBL EBT WB1 WB1 WB1 WB1 WB1 WB1 Tarilic Volume (velvh) 40 0 7 4 0 36 1 1 Tarilic Volume (velvh) 40 0 7 4 0 36 1 1 Tarilic Volume (velvh) 40 0 7 4 0 36 1 1 Tarilic Volume (velvh) 40 0 7 4 0 36 1 1 Tarilic Volume (velvh) 40 0 7 4 0 36 1 1 Tarilic Volume (velvh) 40 0 7 4 0 36 1 1 Tarilic Volume (velvh) 43 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0				
tree (velht) 40 0 7 4 0 36 The (velht) 40 0 7 4 0 0 36 The (velht) 40 0 7 4 0 0 36 The (velht) 40 0 7 4 0 0 36 The (velht) 40 0 7 4 0 0 36 The (velht) 40 0 8 4 0 0 39 The (velht) 40 0 8 4 0 0 39 The (velht) 468 430 104 437 434 304 The 48 430 104 437 434 304 The 48 430 104 437 434 304 The 48 43 104 437 434 304 The 51 43 305 118 The 43 305 118 The 43 305 118 The 51 43 305 118 The 51 43 305 118 The 51 709 1483 1257 The 51 709 100 00 00 00 00 00 00 00 00 00 00 00 00	L WBT WBR	IL NBT	NBR SBL	SBT SBR
Trace (verhit) 40 0 7 4 0 36 Trace (verhit) 43 0 8 4 0 39 Trace (verhit) 43 0 8 4 0 39 Trace (verhit) 48 430 104 437 434 304 Trace (verhit) 48 430 104 437 434 304 Trace (verhit) 48 43 104 437 434 304 Trace (verhit) 47 5 14 33 35 40 33 Eas & 91 100 95 Trace (verhit) 47 5 14 3 305 118 Trace (verhit) 47 5 14 3 305 118 Trace (verhit) 48 43 100 95 Trace (verhit) 48 43 100 95 Trace (verhit) 48 43 100 001 Trace (verhit) 48 100 001 Trace (verhit) 48 100 001 Trace (verhit) 47 5 14 3 305 118 Trace (verhit) 48 100 001 Trace (verhit) 48 100		4		€\$
me (Vehlr) 40 0 7 4 0 36 me (Vehlr) 40 0 7 4 0 36 me (Vehlr) 43 0 8 4 0 39 rate (veh) 43 0 8 4 0 39 rate (veh) 43 0 8 4 0 39 rate (veh) 48 430 104 437 434 304 cordinate (vehla) 48 430 104 437 434 304 rate (vehla) 3.5 4.0 3.3 3.5 4.0 3.3 respectfold 468 430 104 437 434 304 respectfold 468 430 104 33 3.5 4.0 3.3 respectfold 48 43 100 95 respectfold 48 43 100 95 respectfold 48 100 000 001 respectfold 51 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1 279	1 9	91
Stop	0	1 279	1 9	91
Factor 0.92 0.92 0.92 0.92 0.92 (m) rate (vph) 43 0 8 4 0 39 rate (vph) 43 0 8 4 0 39 rate (vph) 43 0 8 4 0 39 rate (veh) sage veh) gage veh) gage veh) gage veh) gage veh) rothocked rotho	Stop	Free		Free
Tate (vph) 43 0 8 4 0 39 (m)	%0			
rate (vph) 43 0 8 4 0 39 (m) eed (ms) ced (ms)	0.92 0.92	_	0.92 0.92	0.92 0.92
(m) ed (m/s) e	0	1 303	1 10	66
(m) (m) are (ns) ckage are (veh) age veh) grad (m) unblocked unblocked unblocked unblocked unblocked 1 0 0 48 430 104 437 434 304 1 conf vol 2 conf vol 2 conf vol 3 3 40 33 35 40 33 4 1 65 62 7.1 65 62 (veh/n) 475 514 951 522 511 736 1 an				
ead (ints) c (stage age veh) age veh) grad (int) grad (int) unblocked 468 430 104 437 434 304 and veh) grad (int) unblocked 468 430 104 437 434 304 and veh and				
ckage are (veh) age veh) graft (m) g				
age (veh) grael (m) grael (m) grael (m) grael (m) grael (m) grael (m) unblocked 1 conf vol 2 conf vol 2 conf vol 3 conf vol 468 430 104 437 434 304 1 conf vol 5 conf vol 6 conf vol 8 430 104 437 434 304 1 conf vol 8 6 2 7.1 6.5 6.2 1 6 6 2 7.1 6.5 6.2 1 7.1 6.5 6.2 7.1 6.5 6.2 1 8 6 9 9 9 100 95 1 100 100 09 9 9 100 95 1 100 100 100 100 1 100 100 100 100 1 100 100				
geaveh) grad (m) unblocked unblocked unblocked grad (vider) grad (m) grad (
age veh) age veh) age veh) age veh) agrad (m) unblocked agrad (m) 1 confivol 1 confivol 2 confivol 2 confivol 3 3 3 40 437 434 304 2 confivol 3 3 40 437 434 304 3 1 6 6 2 7.1 6 5 6 2 (s) 3 2 40 3.3 35 40 3.3 8 8 9 100 99 99 100 95 (vehrln) 475 514 951 522 511 736 1 ane # EB 1 WB 1 NB 1 SB 1 ane # 6 11 000 001 ane # 7 10 4 305 118 al		None		None
ginal (m) unblocked unbloc				
unblocked yoldrine 468 430 104 437 434 304 Lond voldrine 468 430 104 437 434 304 Lond voldrine 468 430 104 437 434 304 2 cord vol 2 cord vol 3 43 304 y) 7.1 6.5 6.2 7.1 6.5 6.2 (s) 3.5 4.0 3.3 3.5 4.0 3.3 ee-% 91 100 95 (veh/h) 475 514 951 552 511 736 1 an 51 43 305 118 it 43 4 1 10 it 516 709 148 1257 capacity 0.10 0.06 0.00 0.01 y(s) 12.7 10.4 0.0 0.7 Summary Capacity Utilization 31.0% ICU Level of Service Capacity Utilization 31.0% ICU Level of Service				80
ng volume 468 430 104 437 434 304 L conf vol L con				
Conf vol	434 304	8	304	
Confivol 468 430 104 437 434 304 ked vol 7.1 6.5 6.2 7.1 6.5 6.2 \$(s) 3.5 4.0 3.3 3.5 4.0 3.3 se-& 91 100 99 99 100 98 se-& 91 100 99 99 100 3.3 se-& 91 10 99 99 10 99 (velvln) 475 514 951 522 511 736 1 inne# EB1 WB1 SB1 7 7 1 7 1 1 7 1 1 1 1 1 1 1 1 1 1 1 4 1 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 4 4 4 4				
ked vol 468 430 104 437 434 304 3) 7.1 6.5 6.2 7.1 6.5 6.2 (\$) 3.5 4.0 3.3 3.5 4.0 3.3 ee/S 71 0.0 99 99 100 95 (vehrh) 475 514 951 52 511 736 1 1 43 4 1 10 95 10 95 1				
(ke) 7.1 6.5 6.2 7.1 6.5 6.2 (kg) (kg) 3.3 3.5 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.5 4.1 3.1 3.5 4.1 3.1 3.5 4.1 3.1 3.5 4.1 3.1 3.5 4.1 3.1 3.5 4.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3	434 304	8	304	
(s) 3.5 4.0 3.3 3.5 4.0 3.3 3.6 (veh/h) 475 514 951 522 511 736 1.1 man # EB 1 WB 1 NB 1 SB 1	6.5 6.2	-	4.1	
ee% 91 100 93 3.5 4.0 3.3 (veh/h) 475 514 951 522 511 736 1.1 me# EB1 WB1 NB1 SB1 118 11				
ee% 91 100 99 99 100 95 100 95 (Veh/h) 475 514 951 522 511 736 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4.0 3.3	2	2.2	
(vehrln) 475 514 951 522 511 736 ane # EB 1 WB 1 NB 1 SB 1 736 736 all 51 43 305 118 736 736 736 736 736 736 736 736 736 736 736 737 736 736 737 73	100 95	0	66	
al 51 WB1 NB1 SB1 al 51 43 305 118 bit 8 39 1 9 bit 8 19 1 90 capacity 010 0.06 0.00 0.01 grow (s) 127 10.4 0.0 0.7 Summary 2.3 capacity Utilization 31.0%	511 736	23	1257	
al 51 43 305 118 ht 43 4 1 10 ht 8 3 4 1 10 sapacity 516 709 1483 1257 sapacity 0.10 0.06 0.00 0.01 jtr 95ih (m) 2.6 1.15 0.0 0.2 y (s) B B A A A Summary 2.8 Lay (s) B B B A A Summary 2.3 lay (a) B B B A A Summary 2.3 Lay (b) Utilization 31.0%	_			
ht 43 4 1 10 ht 8 39 4 1 9 8 39 18 128 capacity 0.10 0.06 0.00 0.01 by (s) 127 10,4 0.0 0.7 by (s) 12.7 10,4	8			
ht 8 39 1 9 9 1483 1257 259 26 1483 1257 26 10.0 0.01 0.01 0.01 0.01 0.01 0.01 0.0	0			
516 709 1483 1257 2apacily 0.10 0.06 0.00 0.01 3yl 95th (m) 2.6 1.5 0.0 0.2 3yl (s) B B A A A B B A A A B B B B A A A B B B B A A A B B B B A A A B B B B B A A A B B B B B B A A A B B B B B B A A B	6			
Japacity 0.10 0.06 0.00 0.01 10 5 0.00 0.01 0.00 0.01 0.00 0.00	1.5			
y (s) 2.6 1.5 0.0 0.2 y (s) 12.7 10.4 0.0 0.7 y (s) 12.3 y	=			
ay (s) 12.7 10.4 0.0 0.7 12.7 10.4 0.0 0.7 12.7 10.4 0.0 0.7 0.7 0.5 B B A A A Summary 2.3 2.3 Capacity Utilization 31.0%	.2			
elay (s) 12.7 10.4 0.0 0.7 OSS B B A A A Summary 2.3 Capacity Utilization 31.0%	7.			
elay (s) 12.7 10.4 0.0 0.7 OS B B 0.7 Summary 2.3 Isymmetry 2.3 31.0%	A			
B B mmary 2.3 pacity Utilization 31.0%	7.			
mmary 2.3 pacity Utilization 31.0%				
2.3 pacity Utilization 31.0%				
pacity Utilization 31.0%				
	ICU Level of Service		A	
15				

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HCM Unsignalized Intersection Capacity Analysis 9: Sixth Line & Anatolia Building 3 East Access

Future Total (PM) 2027 Scenario 3

EBL EBR N 22 4 7) 22 4 7) 22 4 Stop	^	1	—	→	*	
Part Part Part	EBL	NBL	NBT	SBT	SBR	
me (Veh/h) 22 4 2 368 me (Veh/h) 22 4 2 368 me (Veh/h) 24 2 368 actor 0.92 0.92 0.92 0.92 ced (ms) 24 4 2 368 me (Veh) 24 4 2 400 (m) 25 0.92 0.92 0.92 ced (ms) 2 2 0.92 0.93 actor (veh) 3 3 3 3 2 3 3 2 3 3 2 3 3 3 3 3 3 3 3			4	£3,		
me (Vehrh) 22 4 2 868 I Slop Free O% 30,000 0,92 0,92 0,92 0,92 0,92 0,92 0,92	22 (ا	2	368	339	8	
Slop Free	ne (Veh/h) 22	2	368	339	8	
actor 0,95 0.92 0.92 0.92 0.92 (in) 24 4 2 400 (in) 24 2 400 (in) 24 2 400 (in) 24 2 400 (in) 24 2 2 400 (in) 24 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			Free	Free		
(m)	%0		%0	%0		
(m) eed (mks) eed (mks) (ckage are (veh) age veh) graal (m) unblocked age veh) graal (m) age veh) graal (m) age veh) graal (m) age veh) (graal (m) age veh) age veh) (graal (m) age veh) (graal (m) age veh) age veh) (graal (m) age veh) age veh) age veh) (graal (m) age veh)	0.92	0.92	0.92	0.92	0.92	
(m) ckage are (veh) gage veh) gyal (m) gyal (m) gyal (m) gyal (m) gyal (m) ccorrivol 2 conf vol 2 conf vol 3 3 3 2 2 3 3 3 2 2 3 3 3 3 3 3 3 3 3	24	2	400	368	6	
(m) sed (m/s) se	SI					
ead (m/s) ckage are (veh) are (veh) age with) grad (m) gr	h (m)					
ckage are (veh) age veh) graf (m) unblocked graf (m) graf (m) graf (m) 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93	peed (m/s)					
are (veh) grad (wh) grad (m) unblocked 0,93 0,93 0,93 grad (m) unblocked 0,93 0,93 0,93 grad (ordune 776 372 377 grad ordune 776 372 377 conf vol 6.4 6.2 4.1 (s)) 6.4 6.2 4.1 (s)) 8.5 3.3 2.2 e.e. 93 99 100 (vehh) 365 700 1180 (vehh) 365 700 1180 (vehh) 365 700 1180 (vehh) 4 6.2 4.1 0.0 anne # EB1 NB1 SB1 al 28 402 377 tt 4 0 9 tt 4 0 0 0.0 capacity 0,07 0,00 0.22 grad (s) B A A Summary Capacity Utilization 31.0%	ockage					
age veh) agral (m) agral (m) agral (m) agral (m) be veh be veh be veh control	flare (veh)					
age veh) grad (m) uptocked grad (m) gra	ec.			None		
gyal (m) unblocked 0.93 0.93 0.93 unblocked 776 372 377 Lconf vol 776 372 377 Lconf vol 779 283 288 ked vol 719 283 288 left 6.4 6.2 4.1 ked vol 7180 1180 (vehh) 365 700 1180 location of 28 402 377 location of 28 402 3	orage veh)					
nublocked 0.93 0.93 0.93 gyolulune 776 372 377 2 conf vol 776 372 377 2 conf vol 779 283 288 ked vol 6.4 6.2 4.1 (s) 3.5 3.3 2.2 e.8 93 91 100 (vehh) 365 700 1180 ane # EB1 NB1 SB1 ii 28 402 377 ii 4 0 0 0.2 apacity 0.07 0.00 0.22 iii 950 114.9 0.1 0.0 Summary 6.8 Summary 6.8 Capacity Utilization 31.0%				236		
recurrived 776 372 377 recurrived 779 283 288 ked vol 6.4 6.2 4.1 (\$\sqrt{s}\) (\$\s	0.93	0.93				
Confivol	776	377				
2 confivol 719 283 288 (ked vol 719 283 288 (s) 5) 6.4 6.2 4.1 (s) 6.4 6.2 4.1 (s) 6.5 3.3 2.2 8.8 93 99 100 (veh/h) 365 700 1180 (veh/h) 365 700 1180 111	e 1 conf vol					
ked vol 719 288 288 5) 6.4 6.2 4.1 6.8 5.3 3.22 ee % 93 99 100 werhin) 365 700 1180 nne # EB 1 NB 1 SB 1 in 24 0 9 in 40 0.07 in 4 0 0.02 apacity 0.07 0.00 0.0 by (s) B A cleay (s) B A Summary Capacity Utilization 31.0% Capacity Utilization 6.0 0.5 Capacity Utilization 7.10 0.6 Capacity Utiliz						
(\$) (\$) (\$(*) = 6.4 6.2 4.1) (\$(*) = 3.5 3.3 2.2 es % 93 99 100 (\text{veh}\tau) = 365 700 1180 ene # EB1 NB1 SB1 ell 28 402 377 ell 2 4 2 0 fut 34 0 0 02 capacity 0.07 0.00 0.22 ety(s) B A elay (\$(*) = 14.9 0.1 0.0 elay (\$(*)	ed vol 719	288				
(%) 80 % 80 % 91 99 100 (ver\n) 80 5 700 1180 ane # EB 1 NB 1 SB 1 11 28 402 377 11 4 0 9 11 90 0.1 12 90 0.0 13 149 9.1 18 0.1 19 0.1 10 0.0 1	6.4	4.1				
be % 93 5.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2						
ee % 93 99 100 (veh/h) 365 700 1180 an EB 1 NB 1 SB 1 al 28 402 377 4 2 0 9 ht 4 2 0 capacity 0.07 0.00 0.22 y(s) B A Summary capacity Utilization 31.0%	3.5	2.2				
(veh.h) 365 700 1180 ane # EB1 NB1 SB1 all 28 402 377 ti 4 0 37 th 4 0 0 apacity 0.07 0.00 0.22 ph 5th (m) 18 0.0 0.22 ph 5th (m) 18 0.0 0.0 y(s) B A 0.0 eday (s) B A 0.0 Summary B A 0.5 Capacity Utilization 31.0%	93	100				
ane # EB1 NB1 SB1 al 28 402 377 bt 24 2 0 bt 4 0 39 bt 4 0 0 bt 392 1180 1700 capacity 0.07 0.00 0.22 gth 95th (m) 18 0.0 0.0 ay (s) B A 0 Summary by Capacity Utilization 31.0%	365	1180				
al 28 402 377 11 24 2 0 11 4 0 0 29 21 180 1700 29 21 180 1700 29 21 180 1700 31 (5) B A Summary Capacity Utilization 12 4 2 0 9 0 0 9 0 0 0 14 9 0.1 0.0 Summary Capacity Utilization 31 0%	EB 1	SB 1				
hit 24 2 0 4 2 0 4 0 9 10 9 1180 1700 1700 0.22 119 5th (m) 1.8 0.0 0.2 14,9 0.1 0.0 14,9 0.1 0.0 14,9 0.1 0.0 14,9 0.1 0.0 14,9 0.1 0.0 14,9 0.1 0.0 14,9 0.1 0.0 15,0 16,0 16,0 17,0 18,	28	377				
htt 4 0 9 392 1180 1700 392 1180 1700 392 1180 1700 39(5) 149 0.1 0.0 39(5) 149 0.1 0.0 30(5) 149 0.1 0.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0	24	0				
392 1180 1700 392 1180 1700 392 392 1180 1700 39(\$) 14,9 0.1 0.0 8 A elay (\$) B A elay (\$) B Summary Capacity Utilization 31.0%	4	6				
July 5th (m) 1.8 0.0 0.2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	392	1700				
yth 95th (m) 18 0.0 0.0 y (s) 14,9 0.1 0.0 B A A Elay (s) 14,9 0.1 0.0 OS B Commany 0.5 Capacity Utilization 31.0%	0.07	0.22				
3y (s) 14.9 0.1 0.0 B A B A Color (s) B A Color (s) B B B A Color (s) B B Color (s) Co	1.8	0.0				
elay (s) B A O.0 O.8 B Summary 0.5 Capacity Utilization 31.0%	ay (s) 14.9	0.0				
149 0.1 0.0 B 0.5 31,0%	В					
0.5 31.0%	14.9	0.0				
31.0%						
31.0%	n Summary					
31.0%	helay	0.5				
		1.0%	no.	Level of	Service A	
Analysis Period (min)	eriod (min)	15				

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Future Total (PM) 2027 Scenario 3 HCM Unsignalized Intersection Capacity Analysis 12: Clark Boulevard & Anatolia Building 1 South Access

																																								A	
•	SBR		48	48			0.92	25																																ervice	
· →	SBT :	æ	42	42	Free			46						None																										ICU Level of Service	
—	NBT	÷∓	119	119	Free	%0	0.92	129						None																										noi	
•	NBL		4	4			0.92	4										86			86	4.1		2.2	100	1495	SB 1	86	0	25	1700	90:0	0.0	0.0		0.0			4.3	24.1%	15
/	EBR		12	12			0.92	13										72			72	6.2		3.3	66	066	NB 1	133	4	0	1495	0.00	0.1	0.7	∢	0.2					
1	EBL	>	130	130	Stop	%0	0.92	141										209			209	6.4		3.5	82	777	EB 1	154	141	13	792	0.19	2.7	10.6	Ω	10.6	В			lon	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	b0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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HCM Unsignalized Intersection Capacity Analysis 11: Clark Boulevard & Anatolia Building 2 South Access

Future Total (PM) 2027 Scenario 3 84 84 84 84 0% 0.92 91 None 0.92 2.2 98 1293 8 8 270 270 0.92 0.02 0.02 0.4 1.5 A 245 245 245 0% 0.92 266 None 0.92 1700 268 268 3.3 95 771 0.0 6 Stop 0% 0.92 399 46 7 39 738 0.06 1.6 10.2 B 3.5 99 597 399 Direction, Lane #
Volume Total
Volume Eight
cSH
Volume Right
cSH
Volume to Capacity
Outure to Capacity
Lane Los
Lane LoS Grade
Peak Hour Factor
Peak Hour Factor
Peak Hour Factor
Peak Hour Factor
Lane Width (m)
Walking Speed (m)s
Walking Speed (m)s
Wedian ype
Right turn flare (veh)
Wedian ype
Median ype
Right turn flare (veh)
Wedian storage veh)
Upstream signal (m)
Wedian storage veh)
Upstream signal (m)
Wedian storage veh)
Upstream signal (m)
(C. c. C. Shage 1 confrol
CC. single (s)
(C. Stage 5)
(C. Stage 6)
(C. Stage 8) Lane Configurations Traffic Volume (veh/h) -uture Volume (Veh/h) Sign Control

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ICU Level of Service

1.5 29.9% 15

Intersection Summary
Average Delay
Intersection Capacity Utilization
Analysis Period (min)

0.0

Approach Delay (s) Approach LOS

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

	1	†	<u> </u>	\	Ļ	1	•	←	4	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	*		K	₩ ‡		F	₩		r	₩	
Traffic Volume (vph)	164	2201	153	17	763	41	9/	173	30	46	142	134
Future Volume (vph)	164	2201	153	17	763	41	9/	173	30	46	142	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Ft	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.93	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	3163		1805	2924		1805	3504		1258	3307	
FIt Permitted	0.28	1.00		90:0	1.00		0.46	1.00		0.61	1.00	
Satd. Flow (perm)	523	3163		107	2924		883	3504		908	3307	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	174	2341	163	18	812	44	81	184	32	46	151	143
RTOR Reduction (vph)	0	co	0	0	က	0	0	15	0	0	124	0
Lane Group Flow (vph)	174	2501	0	18	853	0	81	201	0	46	170	0
Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
Bus Blockages (#/hr)	-	46	2	0	24	2	0	0	-	9	-	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	MA	
Protected Phases	2	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	83.8	77.0		74.1	71.3		14.7	14.7		14.7	14.7	
Effective Green, g (s)	83.8	77.0		74.1	71.3		14.7	14.7		14.7	14.7	
Actuated g/C Ratio	0.75	69.0		19:0	0.64		0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	489	2194		114	1878		116	464		106	437	
v/s Ratio Prot	c0.03	c0.79		0.00	0.29			90.0			0.02	
v/s Ratio Perm	0.24			0.10			c0.09			90.0		
v/c Ratio	0.36	1.14		0.16	0.45		0.70	0.43		0.46	0.39	
Uniform Delay, d1	4.5	17.0		26.8	10.0		46.0	44.3		44.5	44.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.69		0.7	0.8		16.8	0.7		3.2	9.0	
Delay (s)	4.9	86.0		27.4	10.8		62.8	45.0		47.7	44.6	
Level of Service	A	ш		ပ	В		ш	۵		٥	۵	
Approach Delay (s)		80.8			11.2			49.8			45.1	
Approach LOS		ш			В			Q			Q	
Intersection Summary												
HCM 2000 Control Delay			61.1	H	3M 2000	HCM 2000 Level of Service	service		ш			
HCM 2000 Volume to Capacity ratio	city ratio		1.05									
Actuated Cycle Length (s)			111.0	S	ım of lost	Sum of lost time (s)			16.5			
Intersection Capacity Utilization	ıtion		107.2%	2	U Level o	f Service			G			
Analysis Period (min)			15									

Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Background (AM) 2032 Scenario 4

→ •	SBL SBT	7 ★5	46 142			Perm NA	4	4	4 4		10.0 10.0	32.3 32.3	33.0 33.0	29.7% 29.7%			0.0 0.0	6.3 6.3			_		•	0.0 0.0	57.0 25.3		22.2 28.7	201.7		194 904				0.25 0.33						
←	NBT	₩	173	173		M P	∞		∞					29.7% 29	4.0	2.3	0.0	6.3			_			0.0				211.8		826	0	0 0		0.25						
•	NBL	*				Perm		∞	∞		10.0		33.0	29.7%		2.3					_			0.0			33.4		~	71	0	0		0.38				f Green		
ţ	WBT	4	763			NA	9		9		25.0		0.79	60.4%			0.0		Lag		O			0.0				256.2		187				0.46				FL, Start o		
•	. WBL		17			td+md		9	_		0.7		11.0	6	3.0		0.0			Yes	_	0					3.1		\cong	ω				0.10				nd 6:WB		
†	EBT	44			2	NA	2		2		25.0		0.79	60.4%	4.0		0.0		Lag		S						#	475.1		2264				1.11				2:EBTL a		
1	EBL	-	164	164	174	pm+pt	5	2	2		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.35	5.6	0.0	9.6	7.9	17.9		120.0	498	0	0	0	0.35			1	ed to phase		coordinated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductin	Storage Cap Reducth	Reduced v/c Ratio	Intersection Summary	Cycle Length: 111	Actuated Cycle Length: 111	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 150	Control Type: Actuated-Coordinated

Splits and Phases: 1: Sixth Line & Derry Road

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

EBL EBT EB 1		1	†	<u> </u>	\	Ļ	1	•	←	•	۶	→	*
10	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
92 2238 104 193 753 261 100 289 106 109 92 2238 104 193 753 261 100 289 106 109 40 1900<	Lane Configurations	*	*		r	*		F	₩		K	₩	
92 2238 104 193 753 261 100 289 106 109 400 1900 1900 1900 1900 1900 1900 1	Traffic Volume (vph)	92	2238	104	193	753	261	100	289	106	109	72	32
1900 1900	Future Volume (vph)	92	2238	104	193	753	261	100	589	106	109	72	32
1,00 0.53 4,0 5.3 5.7 5.7 5.7 1.00 0.95 0.95	Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
100 0.95	Total Lost time (s)	4.0	5.3		4.0	5.3		2.7	5.7		5.7	5.7	
100 0.99	Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
1600 250 100	Frt	1.00	0.99		1.00	96:0		1.00	96.0		1.00	0.95	
1500 2362 1587 3105 1698 3207 1501 1500 2362 98 3105 1219 3207 514 1501 1300 0.08 1.09 0.094 0.94 0.94 1501 1302 0.094 0.94 0.94 0.94 0.94 0.94 1502 2362 98 3105 1.219 3207 131 1503 2362 98 3105 1.219 3207 131 116 1603 2381 111 2.05 801 2.78 106 320 0.0 1704 296 2381 111 2.05 801 2.78 106 320 0.0 1705 296 1196 396 296 396 396 116 1706 296 207 207 207 307 307 1707 207 207 207 207 207 1707 207 207 207 207 207 1707 207 207 207 207 207 1707 207 207 207 207 207 1707 207 207 207 207 1707 207 207 207 207 1707 207 207 207 207 1707 207 207 207 207 1707 207 207 207 207 1707 207 207 207 207 1707 207 207 207 1707 207 207 207 1707 207 207 207 1707 207 207 207 1707 207 207 207 1707 207 207 207 1707 207 207 207 1707 207 207 207 1707 207 207 1707 207 207 207 1707 207 207 1707 207 207 207 1707 207 207 1	Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
0.21 1.00 0.05 1.00 0.05 1.00 0.05 1.00 0.05 1.00 0.04 0.94 <th< td=""><td>Satd. Flow (prot)</td><td>1600</td><td>3262</td><td></td><td>1587</td><td>3105</td><td></td><td>1698</td><td>3207</td><td></td><td>1501</td><td>3253</td><td></td></th<>	Satd. Flow (prot)	1600	3262		1587	3105		1698	3207		1501	3253	
357 3262 89 3105 1299 3207 514 319 3207 3207 3514 320 32 0.094 0.94	FIt Permitted	0.21	1.00		0.02	1.00		0.68	1.00		0.33	1.00	
194 0.94 0	Satd. Flow (perm)	357	3262		68	3105		1219	3207		514	3253	
98 2381 111 205 801 278 106 307 113 116 9 1 28 22 28 117 3 36 10 0 32 0 0 0 111% 2% 2% 11% 3% 18% 5% 9% 3% 14% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 11% 2% 2% 11% 18% 5% 9% 3% 14% 11% 2% 2% 11% 18% 5% 9% 3% 14% 11% 2% 2% 11% 18% 5% 9% 3% 14% 11% 2% 2% 11% 19% 19% 19% 19% 19% 11% 2% 11% 19% 19% 19% 19% 11% 11% 10% 11% 19% 19% 11% 11% 11% 10% 11% 19% 11% 11% 11% 10% 11% 19% 11% 11% 11% 11% 10% 11% 19% 11% 11% 11% 10% 11% 19% 11% 11% 11% 11% 10% 11% 19% 11% 11% 11% 11% 10% 11% 19% 11% 11% 11% 11% 11% 11% 11% 11% 11% 11% 11%	Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
19	Adj. Flow (vph)	8	2381	1	202	801	278	106	307	113	116	77	34
11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 4% 2% 2% 11% 3% 18% 5% 9% 3% 14% 4% 2% 2% 11% 3% 18% 5% 9% 3% 14% 4% 2% 2 6 2 3 3 2 3 3 3 4 14% 4% 2 2 4 3 2 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 3 2 3 3 3 2 3	RTOR Reduction (vph)	0	3	0	0	78	0	0	32	0	0	28	0
11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 4 36 2 6 22 22 3 3 2 113 5 2 1 1 NA	Lane Group Flow (vph)	86	2489	0	205	1051	0	106	388	0	116	83	0
pm+pt A 36 2 22 22 3 3 2 13 pm+pt NA pm+pt NA perm NA perm 5 2 6 6 8 8 4 2 4 6 8 8 4 4 82 747 83 75 223 223 223 223 0.69 0.69 0.63 0.19<	Heavy Vehicles (%)	11%	2%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
pm+pt NA pm+pt NA Perm NA Perm 5 2 1 6 8 4 4 2 6 6 8 3 4 4 82.2 74.7 83.2 75.2 22.3 22.3 22.3 0.69 0.65 0.65 0.63 0.19 0.19 0.19 4.0 5.3 4.0 5.3 2.3 22.3 22.3 0.69 0.65 0.69 0.63 0.19 0.19 0.19 4.0 5.3 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 0.02 0.76 0.08 0.34 0.09 0.09 0.02 0.13 1.23 1.2 1.0 1.0 1.0 1.0 0.14 1.5 1.2 0.4 4.0 4.0 4.0	Bus Blockages (#/hr)	4	36	2	9	22	22	3	3	2	13	1	2
5 2 1 6 8 8 4 2 6 6 8 8 4 4 822 747 832 752 223 22.3 22.3 822 747 832 752 22.3 22.3 22.3 22.3 822 747 832 752 22.3	Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
2 6 6 8 8 4 82.2 74.7 83.2 75.2 22.3 22.3 82.2 74.7 83.2 75.2 22.3 22.3 82.2 74.7 83.2 75.2 22.3 22.3 82.2 74.7 83.2 75.2 22.3 22.3 0.69 0.62 0.63 0.19 0.19 0.19 0.19 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.	Protected Phases	2	2		-	9			∞			4	
822 747 832 752 223 223 822 747 832 752 223 223 0.69 0.69 0.69 0.69 0.79 0.19 0.19 4.0 5.3 4.0 5.3 5.7 5.7 5.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.2 2.03 1.6 1.94 5.7 5.7 5.7 0.02 0.7 0.08 3.0 3.0 3.0 3.0 0.02 0.7 0.08 3.0 3.0 3.0 3.0 0.12 0.7 0.08 0.34 0.09 0.12 0.02 0.19 0.17 0.54 0.47 0.65 9.5 0.6 0.6 0.96 0.93 1.00 1.00 0.6 0.6 0.96 0.93 1.00 1.00 0.1 1.0 1.6 1.0 1.00 <t< td=""><td>Permitted Phases</td><td>2</td><td></td><td></td><td>9</td><td></td><td></td><td>∞</td><td></td><td></td><td>4</td><td></td><td></td></t<>	Permitted Phases	2			9			∞			4		
822 747 882 752 223 223 223 223 40 669 0.65 0.65 0.65 0.65 0.65 0.65 0.65 0.65	Actuated Green, G (s)	82.2	74.7		83.2	75.2		22.3	22.3		22.3	22.3	
0.69 0.62 0.69 0.63 0.19 0.19 0.19 0.19 0.19 0.19 0.19 0.19	Effective Green, g (s)	82.2	74.7		83.2	75.2		22.3	22.3		22.3	22.3	
40 5.3 4.0 5.3 5.7 5.7 5.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.2 2.0 0.7 0.7 0.7 0.7 0.7 0.7 0.30 1.23 0.2 0.34 0.09 1.22 0.23 0.30 1.23 0.2 0.09 1.00 1.00 1.02 0.30 1.2 1.2 0.5 0.93 1.00 1.00 1.00 1.00 0.4 105.1 1.0 1.0 1.0 1.00 1.00 1.00 0.4 105.1 1.0 1.0 1.0 1.0 1.0 1.0 0.4 105.1 1.0 <	Actuated g/C Ratio	69.0	0.62		69.0	0.63		0.19	0.19		0.19	0.19	
3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	Clearance Time (s)	4.0	5.3		4.0	5.3		2.7	5.7		2.7	2.7	
322 2030 161 1945 226 595 95 002 0.02 0.76 0.008 0.34 0.09 0.12 0.02 0.70 0.008 0.34 0.09 0.12 0.02 0.70 0.008 0.34 0.09 0.12 0.02 0.30 0.30 0.30 0.30 0.20 0.12 0.20 0.30 0.30 0.30 0.30 0.30 0.60 0.90 0.93 0.00 1.00 0.10 0.10 0.00 0.00 0.00 0.0	Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
0.02 0.76 0.008 0.34 0.012 0.02 0.03 0.019	Lane Grp Cap (vph)	322	2030		161	1945		226	262		66	604	
0.19	v/s Ratio Prot	0.05	0.76		c0.08	0.34			0.12			0.03	
0.30 1.23 1.27 0.54 0.47 0.65 1.22 1.22 0.56 4.05 1.22 1.22 1.25 1.26 1.25 1.25 1.25 1.26 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25	v/s Ratio Perm	0.19			c0.80			0.09			c0.23		
75 226 412 126 436 453 489 0.63 0.66 0.93 1.00 1.00 1.00 0.4 415.1 20.1 20.08 12.8 45.1 47.8 212.1 A F F B D D F F 115.7 42.8 45.1 47.8 12.1 B B D D F F 115.7 42.8 47.3 1.1 B B D D F F 115.7 42.8 47.3 1.1 B B D D F F 115.7 42.8 47.3 1.1 B B D D F F 115.7 42.8 47.3 1.1 B B D D F F 115.7 42.8 47.3 1.1 B B A HCM 2000 Level of Service F 112.80 Sum of lost time (\$\$) 15.0 1.1 112.80 ICU Level of Service H 112.80 ICU Level of Service H	v/c Ratio	0.30	1.23		1.27	0.54		0.47	0.65		1.22	0.14	
0.63 0.66 0.96 0.93 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	Uniform Delay, d1	7.5	22.6		41.2	12.6		43.6	45.3		48.9	40.8	
6.4 105.1 161.3 1.0 1.5 2.6 163.2 5.1 120.1 20.08 1.2.8 45.1 47.8 212.1 A 115.7 42.8 D P F 115.7 42.8 D P F 120.0 Sum of lost time (s) 15.0 120.0 Sum of lost time (s) 15.0 12.0 Sum of lost time (s) 15.0	Progression Factor	0.63	99.0		96:0	0.93		1.00	1.00		1.00	1.00	
5.1 120.1 200.8 12.8 45.1 47.8 212.1 A F F B D D F F 115.7 42.8 47.3 1 R8.4 HCM 2000 Level of Service F 120.0 Sum of lost time (s) 15.0 112.8% ICU Level of Service H	Incremental Delay, d2	0.4	105.1		161.3	1.0		1.5	5.6		163.2	0.1	
115.7	Delay (s)	5.1	120.1		200.8	12.8		45.1	47.8		212.1	40.9	
115.7 4.2.8 47.3 F D D D D D D D D D D D D D D D D D D D	Level of Service	A	ш		ш	В		٥	٥		ш	٥	
## D D D ### HCM 2000 Level of Service ### ### HCM 2000 Level of Service #### 1.26 Sum of lost time (\$) ###################################	Approach Delay (s)		115.7			42.8			47.3			128.4	
atio 1.26 Sum of lost time (s) 1.28 IT 2.00 Sum of lost time (s) 112.8% ICU Level of Service 15.50 Sum of service	Approach LOS		Ŀ			Ω			Ω			ட	
atio 1.26 HCM 2000 Level of Service 1.26 Sum of lost time (s) 1.28% ICU Level of Service 1.28% ICU Lev	Intersection Summary												
atio 1.26 Sum of lost time (s) '1.28% ICU Level of Service 1.28% ICU Level	HCM 2000 Control Delay			88.4	I 王	M 2000	evel of S	ervice		ш			
120.0 Sum of lost time (s) 112.8% ICU Level of Service	HCM 2000 Volume to Capa	icity ratio		1.26									
12.0% ICO LEVEL OF SEIVICE	Actuated Cycle Length (s)	rija Si		120.0	S ⊆	m of lost	time (s)			15.0			
	Analysis Period (min)	IIOII		15.0%	2	ח דבאבו ח	2014100			=			

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Background (AM)

2032 Scenario 4

Future Background (AM) 2032 Scenario 4

34.7 28.0 23.3% 3.7 3.0 0.0 47 72 72 111 NA None 0.18 29.2 0.0 29.2 8.4 17.0 275.9 632 None None 0.67 1.22 47.0 205.4 0.0 0.0 47.0 205.4 46.7 -35.3 65.0 #74.4 34.7 28.0 23.3% 3.7 3.0 0.0 5.7 109 109 116 Perm 50.0 95 0 0 0 0 1.22 10.0 34.7 28.0 23.3% 3.7 2.0 0.0 NA NBT 627 34.7 28.0 23.3% 3.7 2.0 0.0 None 0.47 51.4 0.0 51.4 23.7 100 100 Perm 70.0 Cycle Length: 120 Actuated Cycle Length: 120 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green - Volume exceeds capacity, queue is theoretically infinite.

Oueus shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Oueus shown is maximum after two cycles.

In Volume for 95th percentile queue is metered by upstream signal. 20.0 34.3 80.0 66.7% 66.7% 1.1 6.0 0.0 0.0 0.5 12.1 0.0 12.1 61.0 **MBT**753
753
753
NA 7.0 20.0 7.0 11.0 34.3 11.0 12.0 80.0 12.0 10.0% 66.7% 10.0% 63.3 3.0 3.7 3.0 1.0 1.6 1.0 0.0 0.0 0.0 1.2 1.2 1.27 0.0 0.0 0.0 4.7 124.1 186.2 0.0 0.0 0.0 4.7 124.1 186.2 3.8 -47.2 -49.2 m4.6 #457.1 #100.2 90.0 pm+pt 193 193 205 2238 2492 NA 100.0 Control Type: Actuated-Coordinated Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced v/c Ratio Control Delay
Control Delay
Queue Delay
Total Delay
Queue Length 50th (m)
Queue Length 95th (m)
Internal Link Dist (m)
Turn Bay Length (m) -ane Group Flow (vph) Detector Phase
Switch Phase
Minimum Initial (s)
Minimum Split (s)
Total Split (s)
Yellow Time (s)
Lost Time Adjust (s)
Total Lost Time (s) ntersection Summary Lane Configurations Traffic Volume (vph) Lead/Lag Lead-Lag Optimize? Recall Mode v/c Ratio Turn Type Protected Phases Permitted Phases -uture Volume (vph)

Splits and Phases: 2: Fifth Line & Derry Road

₹ Ø6 (R) 402 (R) 02 01

80 9

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

221 221 11900 5.7 1.00 0.98 1.00 0.85 1.00 0.98 1.00 0.98 1.403 0.98 64 64 64 13 33.9 0.28 5.7 3.0 396 0.05 0.16 32.4 1.00 0.2 32.6 5.7 0.91 1.00 1.00 1.00 1.00 4489 4489 0.98 468 10% ₹ 3.0 0.10 1.00 pm+pt 337 4.0 4.0 1.00 1.00 1.00 0.95 1616 643 0.98 344 2% 42.5 42.5 0.35 Perm 0.85 1.00 1.00 1.00 1.00 0.98 222 222 168 0.03 0.26 46.8 1.00 0.7 0.7 D ပ 19.0 218 1900 5.7 1.00 1.00 54 1% 15.8 15.8 0.13 3.0 337 ¥ 15.8 15.8 0.13 % 7 3.0 614 0.07 0% 9 % 29 29 1900 11.00 10.00 1 4.0 3.0 1187 0.01 0.02 0.16 pm+pt 42.0 1.00 0.4 42.4 20.4 20.4 0.17 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service Perm 178 1900 5.3 1.00 0.99 1.00 1.00 1.00 1.00 0.98 182 106 76 3% 629 0.05 49.8 2.04 0.3 5.3 5.3 0.91 1.00 1.00 1.00 1.00 1.00 4828 4828 009 4% ¥ 49.8 49.8 9 0 29 pm+pt 3.0 1159 0.03 0.20 0.48 74 4.0 1.00 1.00 1.00 1.00 0.95 0.095 0.08 0.98 3% 56.6 56.6 4.0 34.3 0.83 120.0 83.9% Perm 0.98 34 18 0.01 0.02 17.4 1.00 0.1 17.5 B 5.3 0.85 1.00 1562 1.00 1562 3% 55.7 55.7 0.46 725 1824 1824 1900 5.3 0.91 1.00 1.00 1.00 5006 5006 Š 55.7 55.7 0.46 32.5 1% 5.3 3.0 2323 c0.37 30.4 1861 1861 206 206 206 1900 4.0 0.97 1.00 1.00 0.95 3399 3399 210 2% Prot 12.7 4.0 3.0 359 c0.06 51.1 1.00 2.4 53.6 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp. pedbikes
Said. Flow (pem)
Fit Portected
Said. Flow (pem)
Reak-hour factor, PHF
Peak-hour factor, PHF
Regulation (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Actuated Green, G (s) Clearance Time (s) Vehicle Extension (s) Incremental Delay, d2 Effective Green, g (s) Actuated g/C Ratio Bus Blockages (#/hr) Turn Type Protected Phases Permitted Phases Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Background (AM) 2032 Scenario 4

	1	Ť	r	-	Ļ	4	•	←	•	۶	→	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	E.	444	*	*	444	*	F	***	*-	*	444	*-
Traffic Volume (vph)	206	1824	33	74	288	178	29	330	218	337	459	221
Future Volume (vph)	206	1824	33	74	288	178	29	330	218	337	459	221
Lane Group Flow (vph)	210	1861	34	76	009	182	30	337	222	344	468	226
Turn Type	Prot	A	Perm	bm+pt	¥	Perm	pm+pt	¥	Perm	pm+pt	A	Perm
Protected Phases	2	2			9		3	00		7	4	
Permitted Phases			2	9		9	∞		00	4		4
Detector Phase	2	2	2		9	9	3	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	47.0	47.0	11.0	41.0	41.0	27.0	35.0	35.0	27.0	35.0	35.0
Total Split (%)	14.2%	39.2%	39.2%	9.5%	34.2%	34.2%	22.5%	29.2%	29.2%	22.5%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.58	0.77	0.04	0.42	0.29	0.24	0.13	0.61	0.62	0.83	0.37	0.41
Control Delay	97.6	29.5	0.1	17.5	19.5	8.1	27.0	54.9	17.8	50.2	36.0	6.7
Oueue Delay	0.0	0.0	0.0	0.0	0.0	0:0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	29.5	0.1	17.5	19.5	8.1	27.0	54.9	17.8	50.2	36.0	6.7
Queue Length 50th (m)	25.9	139.4	0.0	7.5	37.4	8.3	4.8	29.5	6.3	69.3	35.7	0.0
Queue Length 95th (m)	37.8	178.6	0.0	m18.3	54.8	29.1	11.0	39.0	30.4	#103.5	45.5	19.4
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	392	2425	908	182	2068	753	464	1139	533	414	1268	228
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.77	0.04	0.42	0.29	0.24	90.0	0.30	0.42	0.83	0.37	0.41
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120	0											
Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	ced to phas	e 2:EBT a	and 6:WE	3TL, Start	of Green							
Natural Cycle: 95												

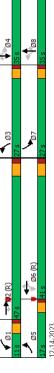
Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

€ 3: James Snow Parkway & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

1900 5.7 1.00 0.88 1.00 1636 5.7 0.5 5.7 1.00 1.00 0.95 1.770 0.75 0.92 28 Perm 8.2 8.2 0.07 5.7 3.0 0.29 53.2 1.00 1.7 15.0 5.7 1.00 1.00 1.00 1.00 1.00 1.00 0.92 8.2 8.2 0.07 5.7 3.0 127 0.00 0.06 52.3 1.00 0.2 52.5 D Ä Perm HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 1900 99 91 ♦62 962 962 1900 5.3 0.95 0.99 1.00 3493 1.00 0.92 Ϋ́ 100.8 100.8 0.84 5.3 3.0 3.0 2934 0.33 0.39 2.3 1.00 0.4 2.7 1142 1900 12.5 0.87 120.0 92.5% 1900 2621 NA 5.3 5.3 0.95 1.00 1.00 1.00 3539 3539 0.92 2621 100.8 100.8 0.84 5.3 3.0 2972 c0.74 0.88 5.9 2.57 0.4 15.6 Intersection control Delay
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
C. Critical Lane Group 91 5.3 11.00 11.00 0.95 0.24 442 442 0.92 66 -Serm 100.8 100.8 0.84 5.3 3.0 3.7 0.27 2.0 2.0 1.84 0.2 3.8 A Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Turn Type
Protected Phases
Permitted Phases
Actuated Green, G (s) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot -ane Group Flow (vph Effective Green, g (s) Delay (s) Level of Service Approach Delay (s) Approach LOS v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 4: Clark Boulevard & Derry Road

Future Background (AM) 2032 Scenario 4

l and Croun	<u> </u>	† E	↓	← IM	<u>*</u> 8	→ Las	190	
Laire Gloup	CDL	I GDI	MDI	IQN	SDL	Igc	- Q	
Lane Configurations		<u>*</u>	<u>+</u>	Ť.	-	Ž,		
Traffic Volume (vph)	91	2411	962	7	26	10		
Future Volume (vph)	91	2411	962	7	26	10		
Lane Group Flow (vph)	66	2621	1145	∞	28	28		
Turn Type	Perm	NA	NA	NA	Perm	M		
Protected Phases		2	9	∞		4	_	
Permitted Phases	2				4			
Detector Phase	2	2	9	∞	4	4		
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	0.9	
Minimum Split (s)	34.3	34.3	34.3	34.7	34.7	34.7	10.0	
Total Split (s)	75.0	75.0	82.0	32.0	35.0	35.0	10.0	
Total Split (%)	62.5%	62.5%	70.8%	29.2%	29.2%	29.2%	%8	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	
All-Red Time (s)	1.6	1.6	1.6	2.0	2.0	2.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.3	5.3	5.3	5.7	5.7	5.7		
-ead/Lag	Lag	Lag					Lead	
_ead-Lag Optimize?	Yes	Yes					Yes	
Recall Mode	C-Min	C-Min	C-Min	None	None	None	None	
//c Ratio	0.26	0.86	0.38	0.02	0.24	0.32		
Control Delay	4.8	18.1	2.8	51.1	299	23.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	4.8	18.1	2.8	51.1	26.5	23.8		
Queue Length 50th (m)		308.1	29.2	1.9	9.9	5.6		
Queue Length 95th (m)	m6.2	m234.4	38.1	7.0	16.4	16.0		
Internal Link Dist (m)		336.0	475.1	56.4		313.3		
Turn Bay Length (m)	70.0				40.0			
Base Capacity (vph)	378	3038	3001	454	342	434		
Starvation Cap Reductn	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.26	0.86	0.38	0.02	0.08	0.13		
Intersection Summary								
Cycle Length: 120								
Actuated Cycle Length: 120								
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	to phase 2:	EBTL and	16:WBTL	., Start of	Green			
Natural Cycle: 150								
Control Type: Actuated-Coordinated	rdinated							
 Wolume for 95th percentile queue is metered by upstream signal. 	tile queue i	s metered	i by upsti	eam sigr	lal.			

4: Clark Boulevard & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

	4	†	*	-	Ļ	1	•	—	•	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	2		K	£		F	2,		r	£	
Traffic Volume (vph)	10	7	က	0	10	0	10	485	0	0	332	37
Future Volume (vph)	10	7	33	0	10	0	10	485	0	0	332	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3			5.3		5.7	5.7			5.7	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Fit	1.00	96:0			1.00		1.00	1.00			0.99	
Fit Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1787			1863		1770	1863			1835	
Fit Permitted	1.00	1.00			1.00		0.53	1.00			1.00	
Satd. Flow (perm)	1863	1787			1863		086	1863			1835	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	=	∞	c	0	Ξ	0	Ξ	527	0	0	361	40
RTOR Reduction (vph)	0	က	0	0	0	0	0	0	0	0	က	0
Lane Group Flow (vph)	11	∞	0	0	=	0	Ξ	527	0	0	398	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	¥	
Protected Phases		2			9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	1.4	1.4			1.4		7.72	7.72			27.7	
Effective Green, g (s)	1.4	1.4			1.4		27.7	7.72			27.7	
Actuated g/C Ratio	0.03	0.03			0.03		69.0	69.0			69.0	
Clearance Time (s)	5.3	5.3			5.3		2.7	2.7			2.7	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
-ane Grp Cap (vph)	99	62			99		9/9	1286			1267	
//s Ratio Prot		0.00			0.01			c0.28			0.22	
//s Ratio Perm	0.01						0.01					
v/c Ratio	0.17	0.13			0.17		0.02	0.41			0.31	
Uniform Delay, d1	18.8	18.8			18.8		1.9	2.7			2.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	1.2	1.0			1.2		0.0	0.2			0.1	
Delay (s)	20.0	19.7			20.0		1.9	2.9			5.6	
Level of Service	S	В			ပ		⋖	A			A	
Approach Delay (s)		19.9			20.0			2.9			5.6	
Approach LOS		В			O			V			A	
Intersection Summary												
HCM 2000 Control Delay			3.3	Ĭ	HCM 2000 Level of Service	Level of S	service		⋖			
HCM 2000 Volume to Capacity ratio	icity ratio		0.40									
Actuated Cycle Length (s)			40.1	S	Sum of lost time (s)	time (s)			11.0			
Intersection Capacity Utilization	ation		43.0%	೨	CU Level of Service	f Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

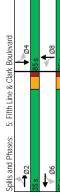
Synchro 11 Report 12-14-2023 BA Group

Queues 5: Fifth Line & Clark Boulevard

Future Background (AM) 2032 Scenario 4

→	SBT	÷	332	332	401	M	4		4		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	2.7			Min	0.24	2.4	0.0	2.4	0.0	30.0	372.1		1835	0	0	0	0.22					
←	NBT	2,	485	485	527	¥	∞		∞		10.0	34.7	82.0	70.8%	3.7	2.0	0.0	5.7			Min	0.31	2.7	0.0	2.7	0.0	43.2	156.9		1863	0	0	0	0.28					
•	NBL	<u>r</u>	10	10	=	Perm		∞	∞		10.0	34.7	82.0	70.8%	3.7	2.0	0.0	5.7			Min	0.01	5.6	0.0	5.6	0.0	1.8		35.0	086	0	0	0	0.01					
Į.	WBT	2,	10	10	Ξ	NA	9		9		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	13.1	0.0	13.1	0.4	3.9	86.5		1602	0	0	0	0.01					
†	EBT	\$	7	7	=	NA	2		2		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	11.9	0.0	11.9	0.4	3.7	204.0		1536	0	0	0	0.01					
4	EBL	<u>, </u>	10	10	Ξ	Perm		2	2		10.0	34.3	32.0	29.5%	3.7	1.6	0.0	5.3			None	0.02	13.1	0.0	13.1	0.4	3.9		32.0	1602	0	0	0	0.01					oordinated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 35.8	Natural Cycle: 70	Control Type: Actuated-Uncoordinated

9 **1**005



Synchro 11 Report 12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

	4	†	<u> </u>	/	Ļ	4	€	←	4	٠	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	r	₩		r	₽		F	₩		r	₩	
Traffic Volume (vph)	171	1881	82	31	1855	22	201	166	33	137	226	147
Future Volume (vph)	171	1881	82	31	1855	22	201	166	33	137	226	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.2		4.0	6.2		4.0	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
F	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.94	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	3173		1805	2966		1805	3492		1258	3356	
Fit Permitted	0.07	1.00		0.08	1.00		0.34	1.00		0.62	1.00	
Satd. Flow (perm)	134	3173		148	2966		645	3492		820	3356	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	182	2001	06	33	1973	27	214	177	35	146	240	156
RTOR Reduction (vph)	0	2	0	0	-	0	0	15	0	0	101	0
Lane Group Flow (vph)	182	2089	0	33	1999	0	214	197	0	146	295	0
Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
Bus Blockages (#/hr)	1	46	2	0	24	2	0	0	1	9	1	2
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	M	
Protected Phases	2	2		-	9		3	∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	64.7	29.5		55.7	51.5		33.8	33.8		22.8	22.8	
Effective Green, g (s)	64.7	299		22.7	51.5		33.8	33.8		22.8	22.8	
Actuated g/C Ratio	0.58	0.51		0.50	0.46		0.30	0.30		0.21	0.21	
Clearance Time (s)	4.0	6.2		4.0	6.2		4.0	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	213	1615		136	1376		569	1063		168	689	
v/s Ratio Prot	c0.02	c0.66		0.01	c0.67		c0.05	90.0			0.09	
v/s Ratio Perm	0.43			0.11			c0.19			0.18		
v/c Ratio	0.85	1.29		0.24	1.45		0.80	0.19		0.87	0.43	
Uniform Delay, d1	30.9	27.2		24.4	29.8		34.0	28.4		42.7	38.4	
Progression Factor	1.00	1:00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	26.8	136.7		6.0	207.8		14.9	0.1		34.7	0.4	
Delay (s)	27.6	163.9		25.3	237.6		49.0	28.5		77.4	38.9	
Level of Service	ш	ш		O	ш		۵	ပ		ш	۵	
Approach Delay (s)		155.4			234.1			38.8			49.2	
Approach LOS		ш			ш.			٥			Ω	
Intersection Summary												
HCM 2000 Control Delay			165.4	主	HCM 2000 Level of Service	Level of S	ervice		ı.			
HCM 2000 Volume to Capacity ratio	ty ratio		1.20									
Actuated Cycle Length (s)			111.0	S	Sum of lost time (s)	time (s)			20.5			
Intersection Capacity Utilization	no	_	100.7%	2	ICU Level of Service	f Service			G			

Analysis Period (min) c Critical Lane Group

12-14-2023 BA Group

Synchro 11 Report

Queues 1: Sixth Line & Derry Road

Future Background (PM) 2032 Scenario 4

ane Configurations † † † † † † † † † † † † † † † † † † †		4/4 1855 1855	1 - 5				
(h) 1881 171 1881 171 1881 182 2091 2 2 5 2 5 2 7 0 25.0 110 31.2 110 31.2 110 37.0 9.9% 51.4% 3.0 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0		855	100	\$	r	₩	
(ii) 1881 (iii) 1882 2091 (iii) 28 2 (iii) 28 2 (iii) 28 2 (iii) 28 2 (iii) 28 2 (iii) 312 (iii) 312		855	701	166	137	226	
(vph) 182 2091 pm+pl NA 5 2 2 2 2 2 2 2 110 31.2 110 31.2 110 31.2 110 37.0 9.9% 51.4% 3.0 4.0 5) 6.0		000	201	166	137	226	
pm+pt NA 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		200	214	212	146	396	
5 2 2 2 5 2 7.0 25.0 11.0 31.2 11.0 31.2 11.0 32.0 30 4.0 1.0 2.2 5) 00 00 1.0 6.2		NA p	pm+pt	¥	Perm	¥	
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		9	m	∞		4	
5 2 70 250 11.0 31.2 11.0 31.2 11.0 31.2 10.9% 51.4% 3.0 4.0 1.0 2.2 (\$) 0.0 0.0			∞		4		
) 7.0 25.0 11.0 31.2 11.0 57.0 9.9% 51.4% 1.3 4.0 1.0 2.2 (s) 0.0 0.0		9	က	∞	4	4	
) 7.0 25.0 11.0 31.2 11.0 57.0 9.9% 51.4% 3.0 4.0 1.0 2.2 (s) 0.0 0.0							
11.0 31.2 11.0 31.2 57.0 97% 51.4% 3.0 4.0 1.0 2.2 (s) 0.0 0.0		52.0	7.0	10.0	10.0	10.0	
11.0 57.0 9.9% 514% 3.0 4.0 1.0 2.2 (\$) 0.0 (\$)		31.2	11.0	32.3	32.3	32.3	
9.9% 51.4% 3.0 4.0 1.0 2.2 1.0 0.0 0.0 0.0 (s) 4.0 6.2	0	57.0	11.0	43.0	32.0	32.0	
3.0 1.0 1.0 (s) 4.0	2	51.4%		38.7%	28.8%	28.8%	
1.0 1.0 (s) 0.0 (s) 4.0	3.0	4.0	3.0	4.0	4.0	4.0	
0.0	1.0	2.2	1.0	2.3	2.3	2.3	
4.0	0.0	0.0	0.0	0.0	0.0	0.0	
	4.0	6.2	4.0	6.3	6.3	6.3	
	Lead	Lag	Lead		Lag	Lag	
-ead-Lag Optimize? Yes Yes	Yes	Yes	Yes		Yes	Yes	
C-Min		C-Min	None	None	None	None	
0.86 1.26		1.45	0.76	0.20	0.87	0.50	
, 60.1		234.1	47.9	25.2	85.1	27.8	
Queue Delay 0.0 0.0		0.0	0.0	0.0	0.0	0.0	
		234.1	47.9	25.2	85.1	27.8	
~29.2	3.1 ~3.		35.6	16.0	31.3	27.2	
#75.2	7.4 #3		4.09#	25.3	#65.7	42.5	
nternal Link Dist (m) 475.1		2.90		211.8		201.7	
	0.001		45.0		30.0		
Base Capacity (vph) 212 1665	185 1	1378	282	1168	189	874	
Starvation Cap Reductn 0 0	0	0	0	0	0	0	
Spillback Cap Reductn 0 0	0	0	0	0	0	0	
ctn 0		0	0	0	0	0	
Reduced v/c Ratio 0.86 1.26	0.18	1.45	0.76	0.18	0.77	0.45	
ntersection Summary							
Sycle Length: 111							
Actuated Cycle Length: 111							
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	WBTL, St	art of Gi	een				
Vatural Cycle: 150							

Control Type: Actualed-Coordinated
Control Type: Actualed-Coordinated
Coulome exceeds capacity, queue is theoretically infinite.
Oueue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Oueue shown is maximum after two cycles.

→ Ø3 **→** Ø4 ₩ ₩ Splits and Phases: 1: Sixth Line & Derry Road - DO2 (R) BA Group **√**Ø1

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

↑↑ 304 304 311 311 209 233 118 **F** 8 8 **98** 98 1 43 🚣 Lane Configurations Traffic Volume (vph) Future Volume (vph)

80 80

0 0 0 2 2

74 209 311 304	4.0		1.00	0.95	1501	0.44	702	0.94 0.94 0.94 0.94 0	222 331	0 0	0 331	3% 14%	2 13	NA pm+pt NA	7	4	28.7	28.7	0.24	4.0	3.0	475 234 520	c0.12	c0.22	1.41		1.00		509.9	209.9	209.9 253.8 F	209.9 253.8 F
110 233		1.00	1.00	0.95	1698	0.29	523	0.94 0.94			0 248		22 3	pm+pt	3	8	28.7	28.7	0.24	4.0	3.0	223	0.09	0.17	1.11	43.0	1.00	93.6		136.6	136.6 F	136.6 F
	1900 1900 4.0 5.3						100 3296	0.94 0.94			2		6 22	pm+pt NA		9	74.5 66.6			4.0 5.3		159 1829	c0.04 c0.68			27.9 26.7		4.8 105.2			33.1 135.3 C F	`
	1900 1900 5.3	0.95	0.99	1.00	3262	1.00	3262	0.94 0.94						NA	2		64.4	64.4	0.54	5.3	3.0	1750	0.61		1.13	27.8	0.92	64.0	7 00	0.4.0	03.0 F	03.0 F
2	1900	1.00	1.00	0.95	1600	90:0	105	0.94	46	0	46	11%	4	pm+pt	2	2	70.1	70.1	0.58	4.0	3.0	132	0.02	0.19	0.35	26.3	2.12	1:1	26.7		ш	ш
ruide voidine (vpri)	Ideal Flow (vphpl) Total Lost time (s)	Lane Util. Factor	Fr	Fit Protected	Satd. Flow (prot)	Fit Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Heavy Vehicles (%)	Bus Blockages (#/hr)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)		Level of Service	Level of Service

Critical Lane Group Analysis Period (min) c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Background (PM)

Future Background (PM) 2032 Scenario 4

10.0 34.7 28.0 23.3% 3.7 2.0 0.0 0.0 5.7 64.7 48.4 48.4 64.4 64.4 640 0 0 0 0.64 304 304 408 NA A 0.53 1.36 31.5 218.5 0.0 0.0 31.5 218.5 22.1 ~75.0 35.8 #161.6 7.0 11.0 11.7% 3.0 1.0 0.0 0.0 0.0 0.0 1.0 Ves None 1.36 218.5 0.0 218.5 311 311 331 pm+pt 50.0 244 0 0 0 0 1.36 10.0 34.7 28.0 23.3% 3.7 2.0 0.0 5.7 Lag Yes 74 74 301 NA 230 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal. WBT 1997 1997 2250 NA Volume exceeds capacity, queue is theoretically infinite. 99 pm+pt 90.0 100.0 pm+pt Control Type: Actuated-Coordinated Cycle Length: 120 Actuated Cycle Length: 120 Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced v/c Ratio Control Delay
Control Delay
Queue Delay
Total Delay
Queue Length 50th (m)
Queue Length 95th (m)
Internal Link Dist (m)
Turn Bay Length (m) -ane Group Flow (vph) Detector Phase
Switch Phase
Minimum Initial (s)
Minimum Split (s)
Total Split (s)
Yellow Time (s)
Lost Time Adjust (s)
Total Lost Time (s) Lane Configurations Traffic Volume (vph) Lead/Lag Lead-Lag Optimize? Recall Mode -uture Volume (vph) Turn Type Protected Phases Permitted Phases

Splits and Phases: 2: Fifth Line & Derry Road

80 04 **€**03 ₹ Ø6 (R) 92

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

254 254 11900 5.7 1.00 0.98 0.85 11403 0.98 0.98 193 66 66 66 66 7% 30.8 30.8 0.26 5.7 3.0 360 0.05 0.18 34.8 1.00 0.2 35.1 5.7 5.7 0.91 1.00 1.00 1.00 1.00 1.00 1.00 0.98 550 10% ¥ 0.12 1.00 D 11.9 c0.15 pm+pt 3.0 413 c0.18 363 1900 4.0 1.00 1.00 1.00 0.95 0.30 518 370 370 2% Perm 0.04 19.0 224 1900 5.7 1.00 1.00 0.85 1.00 1.00 1.00 1.586 0.98 229 229 165 1% 16.4 16.4 0.14 46.6 1.00 0.8 0.8 D 48.7 418 1.00 2.4 51.6 410 5.7 0.91 1.00 1.00 1.00 1.00 1.00 4668 4668 0.98 ¥ 16.4 16.4 0.14 3.0 637 0.09 99.0 % 7 4.0 1.00 1.00 1.00 0.95 0.95 0.44 827 96.0 0 8 9 % pm+pt 4.0 3.0 260 0.03 0.05 0.38 0.9 26.2 26.2 0.22 88.8 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service Perm 4446 1900 5.3 1.00 0.99 1.00 1.00 1.00 1.00 455 219 236 009 0.98 3% 25.9 1.56 0.2 40.6 1454 1900 5.3 0.91 1.00 1.00 1.00 1.00 4828 4828 ¥ 1484 1484 4% 0.31 0.87 0.3 27.8 pm+pt 3.0 360 c0.14 0.81 32.5 0.80 0.80 4.0 1.00 1.00 1.00 1.00 0.95 0.09 167 167 292 292 3% 64.4 64.4 0.54 38.3 0.89 120.0 85.0% Perm 9 39.7 39.7 0.33 0.00 0.01 27.0 1.00 0.0 27.0 5.3 0.85 1.00 1.00 1.00 0.98 3% 5.3 3.0 516 1285 1285 1900 5.3 0.91 1.00 1.00 1.00 1.00 5006 5006 Š 42.1 1311 1% 39.7 36.4 1.00 4.0 40.4 0.98 5.3 3.0 1656 0.26 12.9 212 212 212 1900 4.0 0.97 1.00 1.00 0.95 3399 3399 216 2% Prot 3.0 3.0 3.65 0.06 0.59 51.0 1.00 2.6 53.6 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp. pedbikes
Said. Flow (pem)
Fit Portected
Said. Flow (pem)
Reak-hour factor, PHF
Peak-hour factor, PHF
Regulation (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Actuated Green, G (s) Incremental Delay, d2 Bus Blockages (#/hr) Effective Green, g (s) Actuated g/C Ratio Turn Type Protected Phases Permitted Phases Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Background (PM) 2032 Scenario 4

	4	†	>	>	ţ	4	•	←	*	•	-	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	K.	444	*-	*	444	*	F	**	*	*	**	*-
Traffic Volume (vph)	212	1285	18	286	1454	446	96	410	224	363	539	254
Future Volume (vph)	212	1285	18	286	1454	446	96	410	224	363	539	254
Lane Group Flow (vph)	216	1311	18	292	1484	455	86	418	229	370	220	259
Turn Type	Prot	NA	Perm	pm+pt	¥	Perm	pm+pt	¥	Perm	pm+pt	NA	Perm
Protected Phases	വ	2		_	9		co	∞		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	വ	2	2	τ-	9	9	3	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	45.0	45.0	11.0	39.0	39.0	29.0	35.0	35.0	29.0	35.0	35.0
Total Split (%)	14.2%	37.5%	37.5%	9.5%	32.5%	32.5%	24.2%	29.5%	29.5%	24.2%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.59	0.79	0.03	0.81	0.78	0.56	0.36	99.0	09.0	0.88	0.48	0.47
Control Delay	27.6	40.7	0.1	28.2	29.3	11.0	28.2	53.9	17.4	51.8	39.0	7.1
Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	40.7	0.1	28.2	29.3	11.0	28.2	53.9	17.4	51.8	39.0	7.1
Queue Length 50th (m)	26.7	107.3	0.0	46.5	133.0	47.2	15.5	36.5	8.5	71.7	42.1	0.0
Queue Length 95th (m)	38.5	126.1	0.0	m41.0	m115.7	m37.5	25.8	46.6	33.0	#105.7	53.2	20.8
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	395	1656	281	360	1911	818	200	1139	531	428	1174	228
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.79	0.03	0.81	0.78	0.56	0.20	0.37	0.43	0.86	0.47	0.46
Intersection Summary												

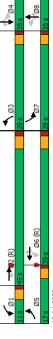
Actuated Cycle Length: 120

Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. Control Type: Actuated-Coordinated

M. Volume for 95th percentile queue is metered by upstream signal.

3: James Snow Parkway & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

169 169 1900 5.7 1.00 0.86 1.00 1.00 1.00 1595 185 ¥ 5.7 9.9 5.7 1.00 1.00 0.95 0.75 0.75 0.92 87 Perm 0.16 5.7 3.0 223 0.06 0.39 45.2 1.00 1.1 15.0 D **₹**00 00 5.7 11.00 11.00 11.00 11.00 11.00 11.00 11.00 19.2 19.2 0.16 5.7 3.0 298 0.01 0.04 42.6 1.00 0.1 42.6 D ¥ Perm HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 26. 89.8 89.8 0.75 5.3 3.0 2643 c0.67 2162 1900 5.3 0.95 1.00 1.00 35.33 1.00 35.33 0.92 2350 Ϋ́ 9 0.90 11.00 5.4 17.0 B B 17.0 B pm+pt 1900 20.2 0.90 120.0 80.8% 1900 2101 2101 2101 1900 5.3 0.95 1.00 1.00 3539 1.00 3539 20.92 2284 89.8 89.8 0.75 5.3 3.0 2648 0.65 0.86 10.7 1.77 0.4 19.4 2284 NA Intersection control Delay
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
C. Critical Lane Group 5.3 1.00 1.00 1.00 1.00 83 83 39 0.47 0.63 7.2 1.77 4.3 17.0 B 36 -Serm 89.8 89.8 0.75 5.3 3.0 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Turn Type
Protected Phases
Permitted Phases
Actuated Green, G (s) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot -ane Group Flow (vph Effective Green, g (s) Delay (s) Level of Service Approach Delay (s) Approach LOS v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 4: Clark Boulevard & Derry Road

Future Background (PM)

Future Background (PM) 2032 Scenario 4

	1	†	ţ	←	۶	→	
Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	Ø1
Lane Configurations	*	₽	₩	43	۴	æ	
Traffic Volume (vph)	36	2101	2162	10	80	7	
Future Volume (vph)	36	2101	2162	10	80	7	
Lane Group Flow (vph)	39	2284	2376	=	87	192	
Turn Type	Perm	NA	Ν	NA	Perm	¥	
Protected Phases		2	9	00		4	_
Permitted Phases	2				4		
Detector Phase	2	2	9	∞	4	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	0.9
Minimum Split (s)	34.3	34.3	34.3	34.7	34.7	34.7	10.0
Total Split (s)	75.0	75.0	85.0	35.0	35.0	35.0	10.0
	62.5%	62.5%	70.8%	29.2%	29.5%	29.2%	8%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0
All-Red Time (s)	1.6	1.6	1.6	2.0	2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.7	5.7	5.7	
Lead/Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes					Yes
Recall Mode	C-Min	C-Min	C-Min	None	None	None	None
v/c Ratio	0.63	98.0	06.0	0.04	0.39	0.74	
Control Delay	31.6	21.7	18.8	39.4	48.8	61.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	31.6	21.7	18.8	39.4	48.8	61.9	
Queue Length 50th (m)	6.9	257.7	205.7	2.3	19.5	44.0	
Queue Length 95th (m)	m7.4	m226.7	#357.7	7.4	33.8	9:59	
Internal Link Dist (m)		336.0	475.1	56.4		313.3	
Turn Bay Length (m)	70.0				40.0		
Base Capacity (vph)	62	2649	2644	454	341	395	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.63	0.86	0.90	0.02	0.26	0.49	
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	phase 2:	EBTL and	d 6:WBTL	, Start of	Green		
Natural Cycle: 140							
Control Type: Actuated-Coordinated	inated						
# 95th percentile volume exceeds capacity, queue may be longer.	ceeds cal	pacity, qu	ieue may	be longer			
Queue shown is maximum after two cycles.	after two	cycles.					
 Wolume for 95th percentile queue is metered by upstream signal 	e queue i	s metere	d by upsti	eam sign.	al.		
Culting and Discount A. Alleria	Porton of A	0 0	7000				

Splits and Phases: 4: Clark Boulevard & Derry Road



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Background (PM) 2032 Scenario 4

EBL EBT EBR 39 10 10 39 10 10 1900 1900 1900 5.3 5.3 1.00 1.00 1.00 0.93 0.75 1.00 1770 1723 0.75 1.00 42 11 11 0 0 10 0 0.92 0.93 0.93 0.93 0.93 0.94 0.06 0.95 0.93 0.94 0.06 0.95 0.93 0.95 0.93 0.95 0.93 0.95 0.93		WBT WBR ↑ 7 0 7 7 0 1900 1900 1900 1.	NBL 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 1900 5.7 1.00 1.00 1.00 0.95 0.95 8.31 8.4 4 4 4 4 4 4 4 4 4 8 8 8 8 8 8 8 8 8	NBT N 477 477 477 477 1900 19 5.7 100 11.0	NBR SBL 0 0 0 0 1900 1900 1900 0.92 0.92 0 0 0 Perm	SBT 478 478 478 478 478 1900 1.100 1.100 1.100 1.00 1.00 2.2 5.20 5.20 5.20 5.20 6.31 6.41 6.41 6.41 6.41 6.41 6.41 6.41 6.4	111 111 1200 0 0 0 0
10 10 10 10 10 10 10 10	10 10 1900 0 0 0	0.0				478 478 1900 5.7 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	111 11000 1250 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
39 10 10 39 10 10 1900 1900 1900 5.3 5.3 1.00 1.00 1.00 0.93 0.95 1.00 1770 1723 0.95 1.00 1 42 11 11 0 0 10 0 10 0 0 0 2 10 0 0 2 10 0 0 2 10 0 0 0 10 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0 0 0 0 10 0	10 1000 0.92 0 0 0	0.6				478 1900 5.7 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	111 111 11900 125 0 0 0 0
39 10 10 1900 1900 1900 5.3 5.3 1.00 1.00 1.00 0.93 0.95 1.00 1.770 1723 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.93 0.92 0.93 0.92 0.94 0.05 0.10 0.01 0.02 0.01 0.01 0.00 0.0	10 0.82 11 0 0	0.6				478 1900 1900 1.00 1.00 1.00 1.00 1.00 1.00	0.92 0.92 0 0
1900 1900 1900 1900 1900 1900 1900 1900	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.6				1900 5.7 1.00 1.00 1.00 1.856 0.92 520 1 531 NA	0.92
5.3 5.3 1.00 1.00 1.00 0.93 0.75 1.00 1.70 1.723 0.75 1.00 1406 1723 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 10 10 0 42 12 0 2 2 2 2 2 3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 0.12 0.12 0.12 0.12 0.12 0.12 0.13 0.13 0.14 2.13 0.01 0.00	0,92 0 0	5:0				5.7 1.00 1.00 1.00 1.00 1.856 1.00 1.856 1.00 5.20 5.20 5.20 5.31 4	0000
1.00 1.00 1.00 0.93 0.05 1.00 1.00 0.93 0.05 1.00 1.00 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 1.0 0 0.10 0 0.10 0 0.12 0.12 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 6.12 0.12 6.14 2.13 1.14 2.13 1.14 2.13 1.16 0.01 0.03 0.04 0.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	050				1.00 1.00 1.00 1.856 1.00 1.856 0.92 5.20 5.20 5.31 4	0000
1.00 0.93 1.00 1.00 1.07 1.23 1.00 1.723 1.00	0.92	0.0				1.00 1.00 1.856 1.00 1.856 0.92 520 520 520 4	0.92
0.95 1.00 1.72 0.75 1.00 1.00 1723 0.75 1.00 1.00 0.02 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.10 0.10 0.0 0.12 0.12 0.13 5.3 5.3 0.14 2.13 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0	0 0 0	0.6				1.00 1856 1.00 1856 0.92 520 531 NA	0000
1770 1723 1770 1723 1776 1723 1785 1.00 1792 0.92 0.92 42 11 11 0 10 0 0 10 0 0 2 12 0 2 2 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 6.3 5.3 6.3 5.4 6.5 1.70 1.00 0.01 0.03 0.04 0.04 0.043	0.92 0 0 0	0.6	,			1856 1.00 1856 0.92 520 531 NA 4	0000
0.75 1.00 1406 1723 0.92 0.92 0.92 0.92 0.92 0.92 0.10 0 0.10 0 0.10 0 0.12 0.12 0.12 0.12 0.12 0.12 0.13 5.3 3.0 3.0 1.10 0.01 0.01 0.01 0.01 0.01 0.01 0.	0.92	0.6	<u> </u>			1.00 1856 0.92 520 531 NA	0.92
1406 1723 0.92 0.92 0.92 0.92 0.94 11 11 0 10 0 1 42 12 0 2 2 2 3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 6.12 0.12 1.74 2.13 0.01 0.01 0.01 0.01 0.01 1.00 1.00 0.10 1.00	0.92	0.6				0.92 520 1 531 NA 4	0000
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	0.92 11 0 0	0.0				0.92 520 1 531 NA	0.92
42 11 11			4	518 0 518 NA 8		520 1 531 NA 4	12
0 10 0 42 12 0 Perm NA 2 2 5.3 5.3 5.3 5.3 5.4 2.13 0.01	0 0		4	0 518 NA 8		531 NA	0 0
9) 42 12 0 Perm NA 2 2 2 3 53 5.3 5.3 5.3 6.12 0.12 5.3 5.3 0.12 0.12 5.3 5.3 0.01 0.01 0.03 0.04 0.04 1.00 1.00 0.07 0.01 1.00 1.00 1.00 1.00 1.0	0		4	518 NA 8		531 NA 4	0
Perm NA 2 2 2 5.3 5.3 5.3 5.3 6.12 0.12 5.3 5.3 3.0 3.0 1.74 2.13 0.01 0.00 0.7 0.1 17.6 16.6 B B B B B B B B B B B B B B B B B B B		NA 6	Perm 8	NA 8	Perm	AN 4	
2 2 5.3 5.3 6.3 5.3 6.3 5.3 3.0 3.0 1.74 213 0.01 0.01 0.24 0.06 1.69 16.5 1.00 0.01 1.76 16.5 1.8 B B B B B B B B B B B	5.3 6	53 6	8 8	∞		4	
2 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3	5.3	7.3	8 8				
5.3 5.3 5.3 5.3 0.12 5.3 5.3 3.0 3.0 174 213 0.01 0.01 0.04 0.04 0.04 0.04 0.06 1.69 1.6.5 1.00 0.7 0.1 17.6 1.6.5 17.8 B B B B B B B B B B B B B B	5.3	5.3	1 40		4		
5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3	5.3	9	50.4	26.4		26.4	
2 0.12 3 3.0 3 0.0 1 2.13 0 0.01 1 0.06 1 1.00 0 1.00 1 16.6 1 16.6		5.3	26.4	26.4		26.4	
5.3 2.13 2.13 0.01 1.00 1	0.12	0.12	0.62	0.62		0.62	
3.0 1 213 0.01 8 0.01 1.00 1.00 1.00 1.00 1.00 1.00 1.00	5.3	5.3	2.7	2.7		2.7	
213 213 3 0.01 1.00 1.00 1.00 1.00 1.00 1.00 1.00	3.0	3.0	3.0	3.0		3.0	
0.01 0.06 1.00	213	231	513	1151		1147	
1006 16.5 16.5 1.00 0.1 16.6 17.3 B	0.01	0.00		0.28		c0.29	
1 0.06 16.5 1.00 0.1 0.1 16.6 17.3 B			0.00				
16.5 1.00 1.00 1.00 16.6 3 B B 17.3 B	90:0	0.03	0.01	0.45		0.46	
1.00 7 0.1 8 16.6 8 17.3 B	16.5	16.4	3.1	4.3		4.4	
0.1 16.6 17.3 B	1.00	1.00	1.00	1.00		1.00	
17.3 B B 17.3 B B	0.1	0.1	0.0	0.3		0.3	
17.3 B	16.6	16.5	3.1	4.6		4.7	
17.3 B	В	В	V	A		A	
ω	17.3	16.5		4.6		4.7	
П	В	В		Α		V	
		HCM 2000 Level of Service	of Service		Ø		
Actuated Cycle Length (s) 42.7	42.7 S	sum of lost time (s		<u></u>	1.0		
Intersection Capacity Utilization 43.8%		ICU Level of Service	ce		A		
Analysis Period (min) 15	15						
c Critical Lane Group							

Synchro 11 Report 12-14-2023 BA Group

Queues 5: Fifth Line & Clark Boulevard

Future Background (PM) 2032 Scenario 4

→	NBT SBT				518 532 NA MA	NA NA 4		8 4					70.	3.7 3.7			5.7 5.7			Min Min	_	6.6 6.7					156.9 372.1		1863 1857				0.28 0.29				
•	NBL	<u></u>	4	4 -		Fei	∞	8				82.0	70.8%	3.7			5.7				_	5.2				1.1			831				0.00				
ļ.	r wbt	*	7 (NA NA		2 6					29				3 5.3			e None		_					96.5		141				2 0.01				
Ť	L EBI		39 10		77 7		2	2		0.01 0.0			29				3 5.3			_		_					204.0		133				4 0.02				pa
^	EBI					Leil				10.0	34.3	35.0	29.2%	3.7			5.3		5	None	0.12	14.6	0.0	_		(m) 8.1			106				0.04	ary		igth: 40.4	ated-Uncoordinat
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vpr) Ture Ture	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 40.4	Natural Cycle: 70 Control Type: Actuated-Uncoordinated

9 **1**005 35 s ♣

Splits and Phases: 5: Fifth Line & Clark Boulevard

Synchro 11 Report 12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Total (AM) 2032 Scenario 4

	1	†	<u> </u>	\	Ļ	4	•	—	4	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	₩.		r	₩₽		F	₽		۴	₩	
Traffic Volume (vph)	165	2217	169	25	837	41	92	173	32	46	142	136
Future Volume (vph)	165	2217	169	22	837	41	92	173	32	46	142	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Ft	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.93	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	3161		1805	2929		1805	3498		1258	3305	
Flt Permitted	0.25	1.00		90:0	1.00		0.48	1.00		0.61	1.00	
Satd. Flow (perm)	465	3161		109	2929		406	3498		808	3305	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	176	2359	180	27	890	44	86	184	34	46	151	145
RTOR Reduction (vph)	0	4	0	0	c	0	0	15	0	0	124	0
Lane Group Flow (vph)	176	2535	0	27	931	0	86	203	0	46	172	0
Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
Bus Blockages (#/hr)	-	46	2	0	24	2	0	0	-	9	-	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
Protected Phases	2	2			9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	82.2	74.0		73.9	1.69		16.3	16.3		16.3	16.3	
Effective Green, g (s)	82.2	74.0		73.9	1.69		16.3	16.3		16.3	16.3	
Actuated g/C Ratio	0.74	0.67		0.67	0.63		0.15	0.15		0.15	0.15	
Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	443	2107		136	1839		133	513		118	485	
v/s Ratio Prot	c0.03	c0.80		0.01	0.32			90.0			0.05	
v/s Ratio Perm	0.26			0.12			c0.11			90.0		
v/c Ratio	0.40	1.20		0.20	0.51		0.74	0.40		0.42	0.36	
Uniform Delay, d1	5.3	18.5		26.0	11.3		45.3	42.9		43.0	42.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.0	96.3		0.7	1.0		19.0	0.5		2.4	0.4	
Delay (s)	5.9	114.8		26.7	12.3		64.3	43.4		45.4	43.1	
Level of Service	A	ш		O	В		ш	۵		O	D	
Approach Delay (s)		107.7			12.7			49.9			43.4	
Approach LOS		ı			മ			D			Ω	
Intersection Summary												
HCM 2000 Control Delay			77.3	H	3M 2000	HCM 2000 Level of Service	Service		П			
HCM 2000 Volume to Capacity ratio	acity ratio		1.09									
Actuated Cycle Length (s)			111.0	S	Sum of lost time (s)	time (s)			16.5			
Intersection Capacity Utilization	ation		108.2%	೨	U Level c	ICU Level of Service			g			
Analysis Period (min)			15									

c Critical Lane Group

12-14-2023 BA Group

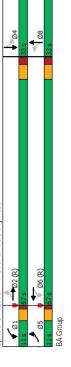
Synchro 11 Report

Queues 1: Sixth Line & Derry Road

Future Total (AM) 2032 Scenario 4

Lane Group Feb Wel Wel Set Set Lane Group		1	†	-	ļ	•	←	۶	→	
165 2217 25 837 92 173 46	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
165 2217 25 837 92 173 46 106 2217 25 837 92 173 46 107 2539 27 924 92 18 49 pm+pt NA pm+pt NA Perm NA Perm 2 6 8 8 8 4 5 2 1 6 8 8 8 4 4 8 8 4 110 312 11.0 57.0 110 110 100 100 99% 604% 99% 604% 29.7% 29.7% 29.7% 110 67.0 11.0 67.0 33.0 33.0 33.0 33.0 99% 604% 99% 604% 29.7% 29.7% 29.7% 10 22 1.0 22 3 23 23 23 110 67.0 11.0 67.0 0.0 0.0 0.0 0.0 10 22 1.0 2.2 3 23 23 23 10 60 0.0 0.0 0.0 0.0 0.0 0.0 0.0 10 8 8 -382 7 85 7 85 7 85 7 85 7 85 7 85 7 85 7	Lane Configurations	*	*	*	₩	r	+ 13	*	₩	
1165 2217 25 837 92 713 46 176	Traffic Volume (vph)	165	2217	25	837	92	173	46	142	
176 2539 27 934 98 218 49 176 2539 27 934 98 218 49 176 253 2 6 8 8 8 4 4 176 253 2 6 8 8 8 4 4 176 253 2 1 6 8 8 8 4 4 176 253 2 1 6 6 8 8 8 4 4 176 253 2 1 10 670 312 323 323 323 323 323 323 323 323 323	Future Volume (vph)	165	2217	25	837	92	173	46	142	
pm+pt NA pm+pt NA Perm NA Perm NA Perm S 2 1 6 8 8 4 4 5 2 1 6 8 8 4 4 5 2 1 6 6 8 8 8 4 4 6 5 2 1 6 6 8 8 8 4 4 6 6 8 8 8 4 4 6 6 8 8 8 4 4 6 6 8 8 8 8	Lane Group Flow (vph)	176	2539	27	934	86	218	46	596	
10	Turn Type	pm+pt	ΝA	pm+pt	NA	Perm	¥	Perm	M	
2 6 6 8 8 4 4 5 2 1 6 6 8 8 4 70 25.0 7.0 25.0 10.0 10.0 10.0 110 31.2 32.3 32.3 32.3 32.3 110 67.0 11 2 2 2.3 32.3 32.3 32.3 110 67.0 11 2 2 2 3.3 32.3 32.3 32.3 10 2 2 1.0 2 2 2 2 3 2.3 2.3 2.3 2.3 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Protected Phases	2	2	-	9		∞		4	
5	Permitted Phases	2		9		∞		4		
770 255 770 255 100 100 100 100 100 100 110 3112 3123 323 323 323 1110 3112 110 312 312 323 323 323 310 330 40.0 4% 99% 60.4% 29.7%	Detector Phase	2	2	<u></u>	9	∞	∞	4	4	
100 100	Switch Phase									
110 31.2 11.0 31.2 32.3 32.3 32.3 11.0 31.2 11.0 31.2 32.3 32.3 32.3 11.0 67.0 11.0 67.0 33.0 60.4% 29% 60.4% 29% 29% 29% 29% 29% 29% 29% 29% 29% 29	Minimum Initial (s)	7.0	25.0	7.0	25.0	10.0	10.0	10.0	10.0	
110 670 111 670 330 330 330 330 99% 604% 297% 297% 297% 297% 297% 297% 297% 297	Minimum Split (s)	11.0	31.2	11.0	31.2	32.3	32.3	32.3	32.3	
9.9% 60.4% 9.9% 60.4% 29.7% 29.2% 29	Total Split (s)	11.0	0.79	11.0	0.79	33.0	33.0	33.0	33.0	
3.0 4.0 3.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4	Total Split (%)	%6.6	60.4%	%6.6	60.4%	29.7%	29.7%	29.7%	29.7%	
1.0 2.2 1.0 2.2 2.3 2.3 2.3 2.4 4.0 6.2 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3	Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	All-Red Time (s)	1.0	2.2	1.0	2.2	2.3	2.3	2.3	2.3	
140 62 40 62 63 63 63 63 64 64 65 64 64 64 64 64 64 64 64 64 64 64 64 64	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lead Lag Lead Lag Lead Lag Lead Lag Ves Yes	Total Lost Time (s)	4.0	6.2	4.0	6.2	6.3	6.3	6.3	6.3	
Ves Yes Yes None C-Min None C-Min 0.09 1.18 0.15 0.4 0.4 0.4 0.09 1.18 0.15 0.7 0.0 0	Lead/Lag	Lead	Lag	Lead	Lag					
None C-Min None C-Min None None None None O.39 1.18 0.15 0.51 0.74 0.41 0.42 0.4 0.39 1.18 0.15 0.51 0.74 0.41 0.42 0.4 0.49 0.16 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
0.39 118 0.15 0.51 0.74 0.41 0.42 0.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0 8 - 382.3 1.2 55.2 21.7 22.0 10.3 16 1.0 198 #454.2 4.4 9.0 3 38.4 31.4 216 1.20.0 1.00.0 3.8 4.3 1.4 216 1.20.0 1.00.0 0.0 0.0 0.0 1.20.0 0.0 0.0 0.0 0.0 0.0 1.20.0 0.0 0.0 0.0 0.0 0.0 0.0 1.20.0 0.0 0.0 0.0 0.0 0.0 0.0 1.20.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
6.9 106.3 6.4 13.4 74.7 40.5 51.7 23 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	v/c Ratio	0.39	1.18	0.15	0.51	0.74	0.41	0.42	0.49	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Control Delay	6.9	106.3	6.4	13.4	74.7	40.5	51.7	23.5	
6.9 106.3 6.4 13.4 74.7 40.5 51.7 23 18.8 -382.3 1.2 55.5 21.7 22.0 10.3 16 19.8 #454.2 4.4 90.3 38.4 31.4 21.6 27 120.0 10.0 2 21.8 30.0 0 120.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1) 88 -382,3 1,2 55,5 21,7 22,0 10,3 16 198 #4542 44 90,3 38 4 31,4 21,6 27 475,1 256,2 21,1 8 201 120,0 100,0 26,0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Delay	6.9	106.3	6.4	13.4	74.7	40.5	51.7	23.5	
19) 19.8 #4542 4.4 90.3 38.4 31.4 21.6 27 17.0 17.0 17.0 17.0 17.0 17.0 17.0 17.	Queue Length 50th (m)	8.8	~382.3	1.2	55.5	21.7	22.0	10.3	16.4	
1200 475.1 256.2 211.8 201 1200 1000 45.0 201.8 201 448 2153 183 1841 217 855 194 90 10 0 0 0 0 0 0 0 10 0 0 0 0 0 0 0 10 0 0 0	Queue Length 95th (m)	19.8	#454.2	4.4	90.3	38.4	31.4	21.6	27.7	
120.0 100.0 45.0 30.0 148 2153 183 1841 217 855 194 90 1 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 0	Internal Link Dist (m)		475.1		256.2		211.8		201.7	
th 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Turn Bay Length (m)	120.0		100.0		45.0		30.0		
th 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	448	2153	183	1841	217	822	194	902	
1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
0.39 1.18 0.15 0.51 0.45 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.2	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
5 0.25 0.25	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Cycle Length: 111 Cycle Length: 111 Offset: 0 (0%), Referenced to phase 2:EBTL and c.WBTL, Start of Green Matural Cycle: 150 Control Type: Actualed-Coordinated Control Type: Actualed-Coordinated Countrol Type: Actualed-Coordinated-Coordinated Countrol Type: Actualed-Coordinated	Reduced v/c Ratio	0.39	1.18	0.15	0.51	0.45	0.25	0.25	0.33	
Cycle Length: 111 Offset: 0 (Cyc), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Matural Cycle, Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 150 Control Type: Actualed-Coordinated Control Type: Actualed-Coordinated Council Type: Actualed-Coordinated Council Shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Intersection Summary									
Actuated Öycle Length: 111 Offset: 0 (0%), Referenced to phase 2:EBT, and 6:WBTL, Start of Green Natural Cycle: 150 Control Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Cycle Length: 111									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 1130 Control Type: Red Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Actuated Cycle Length: 111	_								
Natural Cycle: 150 Control Type: Attaled-Coordinated - Volume exceeds capacity, queue is theoretically infinite Volume shown is maximum after two cycles. # 95th per centile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Offset: 0 (0%), Referenced	to phase 2:	EBTL and	16:WBTL	, Start of	Green				
Control Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Natural Cycle: 150									
 Volume exceeds capacify, queue is theoretically infinite. Queue shown is maximum affer two cycles. # 95th percentile volume exceeds capacify, queue may be longer. Queue shown is maximum after two cycles. 	Control Type: Actuated-Coc	ordinated								
Oueue shown is maximum affer two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	 Volume exceeds capac 	ity, queue is	s theoretic	ally infini	e e					
# 9an percentile volume exceds capacity, queue may be longer. Queue shown is maximum after two cycles.	Queue shown is maximu	um after two	cycles.							
Queue shown is maximum arien two cycles.	# 95th percentile volume	exceeds ca	pacity, qu	ene may	pe longer					
	Queue snown is maximu	um arter two	cycles.							

Splits and Phases: 1: Sixth Line & Derry Road



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Future Total (AM) 2032 Scenario 4

	4	†	<i>></i>	>	ţ	4	•	←	4	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations	r	₩		r	₩		F	₽ ₽		r	₩	
raffic Volume (vph)	92	2368	104	193	199	262	100	586	106	111	72	32
uture Volume (vph)	92	2368	104	193	799	262	100	289	106	111	72	32
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Fotal Lost time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
ane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Į.	1.00	0.99		1.00	96.0		1.00	96:0		1.00	0.95	
It Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1600	3264		1587	3114		1698	3207		1501	3253	
-It Permitted	0.20	1.00		0.02	1.00		89.0	1.00		0.33	1.00	
satd. Flow (perm)	332	3264		68	3114		1219	3207		514	3253	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	86	2519	111	205	820	279	106	307	113	118	77	34
RTOR Reduction (vph)	0	3	0	0	79	0	0	32	0	0	28	0
.ane Group Flow (vph)	86	2627	0	205	1103	0	106	388	0	118	83	0
Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
3us Blockages (#/hr)	4	36	2	9	22	22	co	33	2	13	-	2
urn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
ctuated Green, G (s)	82.2	74.7		83.2	75.2		22.3	22.3		22.3	22.3	
Effective Green, g (s)	82.2	74.7		83.2	75.2		22.3	22.3		22.3	22.3	
Actuated g/C Ratio	69.0	0.62		69.0	0.63		0.19	0.19		0.19	0.19	
Slearance Time (s)	4.0	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
ane Grp Cap (vph)	306	2031		161	1951		226	262		95	604	
/s Ratio Prot	0.02	c0.81		c0.08	0.35			0.12			0.03	
/s Ratio Perm	0.20			0.80			0.09			c0.23		
/c Ratio	0.32	1.29		1.27	0.57		0.47	0.65		1.24	0.14	
Jniform Delay, d1	7.8	22.6		41.2	13.0		43.6	45.3		48.9	40.8	
Progression Factor	0.65	0.67		0.99	0.00		1.00	1.00		1.00	1.00	
ncremental Delay, d2	0.4	134.6		161.3	1.2		1.5	2.6		170.9	0.1	
Delay (s)	5.5	149.7		202.0	12.8		45.1	47.8		219.8	40.9	
evel of Service	A	ட		ш	В		٥	۵		ш	۵	
Approach Delay (s)		144.5			41.9			47.3			133.1	
Approach LOS		Œ.			٥			D			Œ.	
ntersection Summary												
ICM 2000 Control Delay			104.9	Ĭ	CM 2000	HCM 2000 Level of Service	ervice		ш			
1CM 2000 Volume to Capacity ratio	ity ratio		1.28									
Actuated Cycle Length (s)		Ì	120.0	S 9	Sum of lost time (s)	time (s)			15.0			
ntersection Capacity Utilization	uo		110.4%	٥	n Level o	ICU Level of Service			I			
nalvsis Period (min)			15									

Analysis Period (min) c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (AM) 2032 Scenario 4

→	SBT	₽ ₽	72	72	111	NA	4		4		10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7			None	0.18	29.2	0.0	29.2	8.4	17.0	275.9		632	0	0	0	0.18										
۶	SBL	۴	111	111	118	Perm		4	4		10.0	34.7	28.0		3.7	2.0	0.0	5.7			None	1.24	212.5	0.0	212.5	~36.3	#75.5		20.0	95	0	0	0	1.24										
←	NBT	₩	289	289	420	₹	00		∞		10.0	34.7			3.7	2.0	0.0	5.7			None	19:0	47.0	0.0	47.0	46.7	65.0	340.6		627	0	0	0	19.0										
•	NBL	۴	100	100	106	Perm		∞	∞		10.0	34.7			3.7	2.0	0.0	5.7			None	0.47	51.4	0.0	51.4	23.7	45.8		70.0	226	0	0	0	0.47				een						
ţ	WBT	₩	661	799	1129	A	9		9		20.0	34.3		96.7%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.57	12.2	0.0	12.2	62.0	78.1	124.7		1978	0	0	0	0.57				Start of (11		e longer.	am signa
>	WBL	r	193	193	205	bm+pt	-	9	-		7.0	11.0		10.0%	3.0	1.0	0.0	4.0	Lead	Yes	None	1.27	186.6	0.0	186.6	~49.2	#100.0		0.06	162	0	0	0	1.27				6:WBTL,		Aller indinite	ally minim		eue may r	by upstre
†	EBT	₽	2368	2368	2630	A A	2		2		20.0	34.3	80.0	92.99	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.29	153.6	0.0	153.6			170.5		2035	0	0	0	1.29				BTL and		- itorocat	lineorelic	cycles.	acity, que	metered
4	EBL	*	92	92	86	pm+pt	2	2	2		7.0	11.0	12.0	10.0%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.32	4.8	0.0		4.0	m4.7 m#491.8		100.0	316	0	0	0	0.31				phase 2:E		inated	dnene is	after two	ceeds cap	e queue is
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 150	Control Type: Actuated-Coordinated	 Volume exceeds capacity, queue is medically infinite. 	Queue shown is maximum after two cycles.	Sucus chang is maximum after two cycles.	Wolume for 95th percentile queue is metered by upstream signal

Splits and Phases: 2: Fifth Line & Derry Road

25 05 05 (R) - P02 (R) Ø1

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

221 1900 5.7 1.00 0.98 1.00 0.85 1.100 1.100 0.98 226 64 64 64 64 13 34.2 34.2 0.29 5.7 3.0 399 0.05 0.16 32.2 1.00 0.2 32.3 5.7 0.91 1.00 1.00 1.00 1.00 4489 4489 0.98 468 10% ₹ 0.10 1.00 pm+pt c0.16 394 394 4.0 4.0 1.00 1.00 0.95 643 6643 402 402 2% Perm 0.85 1.00 1.86 1.00 1.586 0.98 224 224 152 72 0.05 0.35 47.4 Ω 19.0 220 220 900 900 1.00 1.00 1% 15.8 15.8 0.13 3.0 337 ¥ 15.8 15.8 0.13 % 7 3.0 614 0.07 0% 9 % 4.0 3.0 1187 0.01 0.02 0.16 29 29 1900 1.00 1.00 1.00 1.00 0.95 899 30 pm+pt 42.0 1.00 0.4 42.4 20.4 20.4 0.17 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 3% Perm 202 202 202 1900 5.3 1.00 0.99 1.00 1.00 1.00 206 121 85 49.5 5.3 3.0 625 0.06 0.4 0.98 608 1900 5.3 0.91 1.00 1.00 1.00 1.00 4828 4828 620 4% ¥ 49.5 620 0.82 0.3 19.8 4.0 1.00 1.00 1.00 0.95 0.08 0.08 0 82 pm+pt 4.0 3.0 1159 0.03 0.20 0.49 9/2 3% 56.3 56.3 0.47 22.6 0.82 2.0 20.7 37.4 0.91 120.0 88.4% Perm 0.98 34 18 5.3 0.85 1.00 1.00 1.00 1562 3% 55.4 55.4 0.46 5.3 3.0 721 0.01 0.02 17.6 1.00 0.1 1895 5.3 0.91 1.00 1.00 1.00 1.00 5006 5006 Š 5.3 3.0 2311 c0.39 34.0 1934 1% 28.3 1.00 3.8 32.1 1934 55.4 55.4 0.46 206 206 206 1900 4.0 0.97 1.00 1.00 0.95 3399 3399 210 2% Prot 12.7 4.0 3.0 359 c0.06 51.1 1.00 2.4 53.6 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp. pedbikes
Said. Flow (pem)
Fit Portected
Said. Flow (pem)
Reak-hour factor, PHF
Peak-hour factor, PHF
Regulation (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Actuated Green, G (s) Clearance Time (s) Vehicle Extension (s) Incremental Delay, d2 Bus Blockages (#/hr) Effective Green, g (s) Actuated g/C Ratio Turn Type Protected Phases Permitted Phases Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Total (AM)

Future Total (AM) 2032 Scenario 4

	1	†	<i>></i>	>	¥	4	•	←	*	۶	-	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	F	444	¥C	<i>y</i> -	444	¥C	<i>y</i> -	444	*	<i>y-</i>	444	*
Traffic Volume (vph)	206	1895	33	9/	809	202	29	330	220	394	459	221
Future Volume (vph)	206	1895	33	76	809	202	29	330	220	394	459	221
Lane Group Flow (vph)	210	1934	34	78	620	206	30	337	224	402	468	226
Turn Type	Prot	NA	Perm	pm+pt	¥	Perm	pm+pt	¥	Perm	pm+pt	NA	Perm
Protected Phases	2	2		_	9		3	∞		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	വ	2	2	-	9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	47.0	47.0	11.0	41.0	41.0	27.0	35.0	35.0	27.0	35.0	35.0
Total Split (%)	14.2%	39.5%	39.5%	9.5%	34.2%	34.2%	22.5%	29.5%	29.5%	22.5%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	2.7	2.7	4.0	5.7	2.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.58	0.80	0.04	0.43	0.30	0.27	0.13	0.61	99.0	0.97	0.37	0.40
Control Delay	57.6	30.8	0.1	18.6	19.7	8.3	27.0	54.9	22.5	71.3	35.8	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.9	30.8	0.1	18.6	19.7	8.3	27.0	54.9	22.5	71.3	35.8	6.7
Queue Length 50th (m)	25.9	148.2	0.0	7.4	39.7	10.6	4.8	29.5	11.3	84.8	35.7	0.0
Queue Length 95th (m)	37.8	#201.9	0.0	m18.3	57.3	33.1	11.0	39.0	36.7	#123.8	45.5	19.4
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	392	2412	802	183	2057	764	464	1139	519	416	1279	561
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.80	0.04	0.43	0.30	0.27	90.0	0.30	0.43	16.0	0.37	0.40
Intersection Summary												

Actuated Cycle Length: 120

Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Natural Cycle: 105

95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. Control Type: Actuated-Coordinated

M. Volume for 95th percentile queue is metered by upstream signal.

3: James Snow Parkway & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Total (AM) 2032 Scenario 4

Queues 4: Clark Boulevard & Derry Road

Future Total (AM) 2032 Scenario 4

-	↑ ⊞	EBR	WBL	↑ WBT	₩	√ NBL	← NBT	MBR A	≯ BS	→ SBT	→ SBR
₹			-	₹		-	æ		-	÷£	
2425 2425		118	87	196	16	42	7	10	26	10	43
1900	-	006	1900	1900	1900	1900	1900	1900	1900	1900	1900
5.3			4.0	5.3		5.7	5.7		5.7	5.7	
0.95			1.00	0.95		1.00	1.00		1.00	1.00	
0.99			00.1	0.99		1.00	0.89		1.00	0.88	
1.00 25.15			0.75	00.1		1770	1660		0.77	1626	
100			0.04	1.00		0.72	1.00		0.74	1.00	
3515			8	3494		1340	1660		1375	1636	
0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
2636		128	95	1051	66	46	00	21	28	=	47
2		0	0	က	0	0	19	0	0	43	0
2762		0	95	1147	0	46	10	0	28	15	0
N		d	pm+pt	NA		Perm	NA		Perm	¥	
2			-	9			80			4	
			9			∞			4		
87.9			0.00	100.0		0.6	0.6		0.6	0.6	
87.9			0.001	100.0		0.6	0.6		0.6	0.6	
0.73			0.83	0.83		80.0	0.08		0.08	0.08	
5.3			4.0	5.3		2.7	2.7		2.7	2.7	
3.0			3.0	3.0		3.0	3.0		3.0	3.0	
2574			181	2911		100	124		103	122	
c0.79		J	c0.04	0.33			0.01			0.01	
			0.40			c0.03			0.02		
1.07			0.52	0.39		0.46	0.08		0.27	0.12	
16.0			38.1	2.5		53.2	51.6		52.4	51.8	
22.0			00.1	00.		00.1	0.00		1.00	00.1	
62.5			40.8	0.4		5,5	51.0		53 B	50.4	
ш				V		ш	٥			0	
9.09				2.8			54.7			52.8	
ш				А			Q			Q	
		44.4	모	HCM 2000 Level of Service	evel of S	ervice		۵			
		0.98									
	-	120.0	Sur	Sum of lost time (s)	ime (s)			15.0			
	93	93.8%	noi	CU Level of Service	Service			ш			
		15									

12-14-2023 Synchro 11 Report BA Group

Figure Group Fig.		^	†	-	Ļ	•	—	۶	→	
7 7 26 7 26 7 26 7 26 7 26 7 26 7 26 8 4 8 4 8 4 8 4 8 4 100 100 1 7 34,7 34,7 3 35,0 35,0 3 20,2% 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 20,00 00 0 0 0 0 0 1,6 54,3 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
2 7 26 2 29 28 1 26 2 29 28 3 4 4 8 8 4 4 8 8 4 4 9 35.0 35.0 3 35.0 35.0 3 35.0 35.0 3 35.0 35.0 3 35.0 35.0 3 35.0 35.0 3 37 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3	Lane Configurations	*	*	r	*	F	£3	K	£3	
2	Traffic Volume (vph)	91	2425	87	296	42	_	26	10	
8 8 4 4 8 8 4 4 8 8 8 4 4 8 8 8 4 4 8 9 7347 3 8 10.0 10.0 1 8 10.0 10.0 1 8 10.0 10.0 1 8 10.0 10.0 1 8 10.0 10.0 1 8 10.0 10.0 1 8 10.0 1 8 10.0 1 8 10.0 1 8 10.0 1 9 10.0	Future Volume (vph)	16	2425	87	296	42	7	26	10	
NA Perm 8	Lane Group Flow (vph)	66	2764	95	1150	46	29	28	58	
8 8 4 4 8 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9	Turn Type	Perm	NA	pm+pt	NA	Perm	¥	Perm	M	
8 8 4 4 10 100 100 100 100 100 100 100 100 100	Protected Phases		2	_	9		8		4	
8 8 4 4 100 100 1 101 100 1 102 1350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 3 10350 350 30 10350 350 30 10350 350 30 10350 350 30 10350 350 30 10350 350 30 10350 350 350 30 10350 350 350 30 10350 350 350 30 10350 350 350 30 10350 350 350 350 30 10350 350 350 350 30 10350 350 350 350 30 10350 350 350 350 350 30 10350 350 350 350 350 30 10350 350 350 350 350 350 30 10350 350 350 350 350 350 350 350 350 350	Permitted Phases	2		9		∞		4		
10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0	Detector Phase	2	2	_	9	∞	∞	4	4	
29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 29.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Switch Phase									
34.7 34.7 3 34.7 34.7 3 35.0 35.0 3 37.8 29.2 20 20 20 00 0.0 00	Minimum Initial (s)	10.0	10.0	0.9	10.0	10.0	10.0	10.0	10.0	
350 350 3 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 29,2% 20,000 00 00 00 00 00 00 00 00 00 00 00 0	Minimum Split (s)	34.3	34.3	10.0	34.3	34.7	34.7	34.7	34.7	
29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 20.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Total Split (s)	75.0	75.0	10.0	85.0	35.0	35.0	35.0	35.0	
7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.	Total Split (%)	62.5%	62.5%	8.3%	70.8%	29.2%	29.2%	29.2%	29.2%	
2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Yellow Time (s)	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	All-Red Time (s)	1.6	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
None None None None None None None None	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
None None None None None None None None	Total Lost Time (s)	5.3	5.3	4.0	5.3	5.7	5.7	5.7	5.7	
8 None None None None None None None None	Lead/Lag	Lag	Lag	Lead						
None None None None None None None None	Lead-Lag Optimize?	Yes	Yes	Yes						
8 0.17 0.22 (9 26.7 54.3 2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None	
26.7 54.3 2 0.0 0.0 0.0 0.0 1.9 6.6 1.19 6.6 0.113 15.9 1 56.4 40.0 0.0 0 0.0 0 0 0.0 0 0.0 0 0 0.0 0 0.0 0 0 0	v/c Ratio	0.29	1.06	0.52	0.39	0.38	0.17	0.22	0.30	
26.7 54.3 2 26.7 54.3 2 1.1 56.4 3 56.4 40.0 56.4 40.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Control Delay	13.2	9299	26.5	3.1	6'69	26.7	54.3	22.4	
9 26.7 54.3 2 1.9 6.6 1.13 15.9 56.4 33 6 421 33.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1.9 6.6 1.1.3 15.9 1 56.4 40.0 2 421 335 0 0 0 0 0 0 0 0 0 0 0	Total Delay	13.2	929	26.5	3.1	6.69	26.7	54.3	22.4	
56.4 35 56.4 40.0 6 421 335 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 50th (m)		~396.6	5.9	29.5	11.0	1.9	9.9	2.6	
56.4 400 4 400 5 421 335 0	Queue Length 95th (m)		m255.8	24.4	45.4	23.0	11.3	15.9	15.6	
400 400 0 0 0 0 0 0 0 0 4 0.07 0.08 (Internal Link Dist (m)		336.0		475.1		56.4		313.3	
5 421 335 0 0 0 0 0 0 0 0 0 4 0.07 0.08 (Turn Bay Length (m)	70.0		70.0				40.0		
000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	341	2609	183	2976	326	421	335	434	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
4 0.07 0.08	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
4 0.07 0.08	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary Oyole Length: 120 Aduated Cycle Length: 120 Aduated Cycle Length: 120 Control Oyles: 10 (0%), Referenced to phase 2:EBTL and 6:WBTL, Slart of Green Natural Cycle: 150 Control Type: Aduated-Coordinated - Volume exceedes capacity, queue is theoretically infinite. Oueue shown is maximum after two cycles. m. Volume for 95th percentile queue is metered by upstream signal.	Reduced v/c Ratio	0.29	1.06	0.52	0.39	0.14	0.07	0.08	0.13	
Oycle Length: 120 Actuated Cycle Length: 120 Actuated Cycle Length: 120 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 150 Confrol Type: Actuated-Coordinated - Volume exceedes capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Intersection Summary									
Actuated Cycle Length: 120 Offiset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 150 Control Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. m. Volume for 95th percentile queue is metered by upstream signal.	Cycle Length: 120									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 150 Control Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. m. Volume for 95th percentile queue is metered by upstream signal.	Actuated Cycle Length: 120									
Natural Cypie: 150 Control Type: Actuated-Coordinated Control Type: Actuated-Coordinated Couloure exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. The Molume for 95th percentile queue is metered by upstream signal.	Offset: 0 (0%), Referenced to	to phase 2:	EBTL an	d 6:WBTL	, Start of	Green				
- Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. m. Volume for 95th percentile queue is metered by upstream signal.	Natural Cycle: 150	rdinated								
 Volume exceeds capacity, queue is ineoretically infinite. Queue shown is maximum affer two cycles. m Volume for 95th percentile queue is metered by upstream signal. 	collinal type: Actuated coo	nalliate.								
Oueue shown is maximum arien two cycles. m. Volume for 95th percentile queue is metered by upstream signal.	 Volume exceeds capacil 	ty, queue it	s theoretiv	cally intini	je.					
m Volume for 95th percentile queue is metered by upstream signal.	Queue snown is maximu	im after two	cycles.			-				
	m Volume for 95th percen	anend eme	is metere	a by upstr	eam sign	al.				

Splits and Phases: 4: Clark Boulevard & Derry Road

12-14-2023 BA Group

35.s

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Total (AM) 2032 Scenario 4

9 7 9 5.3
1.00 0.97 1.00 17.98 1.00
0.92 0.92 10 3 3 0 10 0
NA 2
1.5 1.5 0.04 5.3 3.0
68 0.01 0.15
1.00 1.0 19.3
19.4 B
3.6 0.42 39.4 44.5%

12-14-2023 BA Group

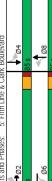
Synchro 11 Report

Queues 5: Fifth Line & Clark Boulevard

Future Total (AM) 2032 Scenario 4

	١	Ť	-	ļ	•	-	→	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	
Lane Configurations	*	2	F	2	<i>F</i>	2	2	
Traffic Volume (vph)	10	6	2	12	10	485	332	
Future Volume (vph)	10	6	2	12	10	485	332	
Lane Group Flow (vph)	=	13	5	13	=	553	401	
Turn Type	Perm	NA	Perm	NA	Perm	M	M	
Protected Phases		2		9		∞	4	
Permitted Phases	2		9		8			
Detector Phase	2	2	9	9	∞	∞	4	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	34.3	34.3	34.3	34.3	34.7	34.7	34.7	
Total Split (s)	35.0	35.0	35.0	35.0	85.0	85.0	85.0	
Total Split (%)	29.5%	29.2%	29.2%	29.2%	70.8%	70.8%	70.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.6	1.6	1.6	1.6	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.7	5.7	2.7	
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	ΜĒ	Min	Min	
v/c Ratio	0.02	0.02	0.01	0.05	0.01	0.33	0.24	
Control Delay	12.2	11.2	12.2	12.2	2.9	3.1	5.6	
Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.2	11.2	12.2	12.2	2.9	3.1	5.6	
Queue Length 50th (m)	0.4	0.4	0.2	0.4	0.0	0.0	0.0	
Queue Length 95th (m)	3.6	3.8	2.3	4.0	1.9	47.4	31.0	
Internal Link Dist (m)		204.0		86.5		156.9	372.1	
Turn Bay Length (m)	35.0		35.0	,	35.0	1	0	
Base Capacity (vpn)	9191	1560	9191	9191	086	0081	1835	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.01	0.01	0.00	0.01	0.01	0.30	0.22	
Intersection Summary								
Cycle Length: 120								
Actuated Cycle Length: 35.1	_							
Natural Cycle: 70								
Control Type: Actuated-Uncoordinated	coordinated							
Onlite and Discoss	F. Lifth Line o Clock Dealerman	oly Dough	Par Cir					
		JIN DOULE	valu					

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Synchro 11 Report 12-14-2023 BA Group

HCM Unsignalized Intersection Capacity Analysis 10: Clark Boulevard & Anatolia Building 1 North Access/Anatolia Building 2 North Aଉଞ୍ଚେକ୍ତ enario 4

2 0 11 1 55 4 34 179 2 2 0 11 1 55 4 34 179 2 2 0 11 1 55 4 34 179 2 2 0 11 1 55 4 34 179 2 2 0 0 12 0 092 092 092 092 092 2 0 12 1 60 4 37 195 2 335 335 62 197 64 33 22 2 22 100 100 99 100 98 606 571 1003 1376 1538 81 3 3 4 0 3 3 2 2 2 2 2 2 1538 0002 0 6 6 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 0 11 1 55 4 34 179 2 0 11 1 55 4 34 179 2 0 11 1 55 4 34 179 2 0 0 11 1 55 4 34 179 2 0 0 11 1 55 4 34 179 2 0 0 12 0 92 092 092 092 2 0 12 1 60 4 37 195 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 40 33 2.2 2.2 100 100 99 100 98 100 09 1100 99 100 100 99 100 98 100 100 99 100 098 113 7 1 13 7 1 13 8 113 8 113 8 113 8 114 9 115 8 115 8 115 8 116 117 117 117 117 117 117 117 117 117	
2 0 11 1 55 4 34 179 Stope	2 0 11 1 55 4 34 179 Stop	‡ 0
Signo Hree Pree Pree Pree Pree Pree Pree Pree	Sign Hree Pree Processing Sign Hree Processing Sign	2 0
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	092 092 092 092 092 092 092 092 092 092	ostop 0%
2 0 12 1 60 4 37 None 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 3.3 2.2 2.2 100 100 99 100 98 606 571 1003 1376 1538 SB1 234 37 21538 0.02 0.6 0.6 1.3	2 0 12 1 60 4 37 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 35 4.0 3.3 2.2 2.2 100 100 99 100 98 606 571 1003 1376 1538 234 31 234 31 41 41 41 41 41 41 41 41	0.92 0.92 0.92
335 335 62 197 64 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 3.3 2.2 2.2 100 100 99 100 98 606 571 1003 1376 1538 SB1 234 37 2 1538 0.02 0.6 1.3 A A	335 335 62 197 64 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 3.3 2.2 2.2 100 100 99 100 98 606 571 1003 1376 1538 SB1 234 37 24 37 4 1.3 6.5 6.2 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1	2 0
335 335 62 197 64 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 3.3 2.2 2.2 100 99 100 99 606 571 1003 1376 1538 SB1 234 37 21538 0.02 0.6 1.3 A A 1.3	335 335 62 197 64 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 3.3 2.2 2.2 100 100 99 100 98 606 571 1003 1376 1538 SB1 234 37 2158 0.02 0.6 1.3 A 1.3	
335 335 62 197 64 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 3.3 2.2 2.2 100 100 99 100 98 606 571 1003 1376 1538 SB1 2 113 0.02 0.6 1.3 A 1.3	335 335 62 197 64 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 3.3 2.2 2.2 100 100 99 100 98 606 571 1003 1376 1538 234 37 15.8 0.02 0.6 1.3 A ICU Level of Service A	
335 335 62 197 64 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 3.3 2.2 2.2 100 100 99 100 98 6.06 571 1003 1376 1538 SB.1 2.34 2.3 1.3 1.3 A A 1.3	335 335 62 197 64 338 338 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 33 2.2 2.2 100 99 100 99 100 98 606 571 1003 1376 1538 234 37 1538 0.02 0.02 0.04 1.3 A ICU Level of Service A	
335 335 62 197 64 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 33 2.2 2.2 100 100 99 100 98 6.06 571 1003 1376 1538 SB.1 2 3.4 3.7 2 1538 0.02 1638 1.3	335 335 62 197 64 335 336 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 3.3 2.2 2.2 100 100 99 100 98 606 571 1003 1376 1538 234 234 37 234 37 1.3 A 1.3 A 1.3 A 1.3 A 1.3 A 1.3 A	
335 335 62 197 64 335 335 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 40 33 2.2 2.2 100 100 99 100 98 606 571 1003 1376 1538 234 37 2 1538 0.02 0.6 1.3 A	335 335 62 197 64 335 336 62 197 64 7.1 6.5 6.2 4.1 4.1 3.5 4.0 3.3 2.2 2.2 100 100 99 100 98 606 571 1003 1376 1538 SB1 234 37 37 1.3 A 1.3 A 1.3 A 1.3 A ICU Level of Service A	
335 335 62 197 336 335 62 197 7.1 6.5 6.2 4.1 3.5 4.0 3.3 2.2 100 100 99 100 6.06 571 1003 1376 11 2.34 2.34 3.7 2.3 15.88 0.02 0.02 0.6 1.3 A A A A A A A A A A A A A A A A A A A	335 335 62 197 335 335 62 197 7.1 6.5 6.2 4.1 3.5 4.0 3.3 2.2 100 100 99 100 606 571 1003 1376 11 234 37 234 37 15.88 0.02 0.6 1.3 A IUSHING Service A	
335 335 62 197 7.1 6.5 6.2 4.1 3.5 4.0 3.3 2.2 100 100 99 100 6.06 571 1003 1376 11 2.34 3.7 2.34 3.7 2.8B.1 2.34 3.7 2.8 0.02 0.02 0.6 1.3 A A A A A A A A A A A A A A A A A A A	335 335 62 197 7.1 6.5 6.2 4.1 3.5 4.0 3.3 2.2 100 100 99 100 6.06 577 1003 1376 11 2.34 2.4 2.34 2.4 2.4 3.7 2.4 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7	346 336 196
335 335 62 197 7.1 6.5 6.2 4.1 3.5 4.0 3.3 2.2 100 100 99 100 6.06 571 1003 1376 11 2.34 3.7 2.1538 0.02 0.6 1.3 A A	335 335 62 197 7.1 6.5 6.2 4.1 3.5 4.0 3.3 2.2 100 100 99 100 606 571 1003 1376 11 SB1 2 2 1538 0.02 0.6 1.3 A 1.3 A ICU Level of Service A	
7.1 6.5 6.2 4.1 3.5 4.0 3.3 2.2 100 99 100 6.06 571 1003 1376 11 2.34 3.7 2.34 3.7 2.8 15.38 0.02 0.6 1.3 A A A A A A A	7.1 6.5 6.2 4.1 3.5 4.0 3.3 2.2 100 100 99 100 606 571 1003 1376 11 234 37 234 37 15.88 0.02 0.6 1.3 A I.3 A ICU Level of Service A	346 336 196
3.5 4.0 3.3 2.2 100 99 100 606 571 1003 1376 11 234 37 238 0.02 0.02 0.6 1.3 A A	3.5 4.0 3.3 2.2 100 100 99 100 606 571 1003 1376 11 234 234 37 235 0.02 0.02 0.6 1.3 A 1.3 A ICU Level of Service A	6.5
5.5 4.0 5.2 2.2 100 100 99 100 606 571 1003 1376 11 234 37 2 15.8 0.02 0.6 1.3 A A A	3.3 2.2 100 100 99 100 606 571 1003 1376 11 234 37 234 234 234 15.88 0.02 0.6 1.3 1.3 A ICU Level of Service A	400
606 571 1003 1376 11 SB1 234 37 2 1538 0.02 0.6 1.3 A A A	606 571 1003 1376 11 SB1 234 37 2 1538 0.02 0.6 1.3 A 1.3 A 1.3 A ICU Level of Service A	100
	SB1 234 37 2 1538 0.02 0.6 1.3 A 1.3 ICU Level of Service	590 570 845
	234 37 2 1588 0.02 0.6 1.3 A 1.3	EB1 WB1 NB1
	37 2 15.88 0.02 0.6 1.3 A 1.3 A 1.3	
	1538 0.02 0.6 1.3 A A 1.3 ICU Level of Service	
	0.02 0.6 1.3 A 1.3 1.3 ICU Level of Service	1 12 4 656 917 1376
	0.6 1.3 A A 1.3 ICU Level of Service	0.02
	13 A 1.3 ICU Level of Service	0.4
	1.3 ICU Level of Service	0.6
	1.3 ICU Level of Service	V
	ICU Level of Service	10.5 9.0 0.1
	ICU Level of Service	A A
	ICU Level of Service	1.5
		28.1%

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HCM Unsignalized Intersection Capacity Analysis 9: Sixth Line & Anatolia Building 3 East Access

n Capacity Analysis Future Total (AM) ag 3 East Access

Movement EBL EBR NBL NBT SBR Movement Lane Childran (Vehh) 7 1 4 290 314 22 Faulure Volume (Vehh) 7 1 4 290 314 22 Faulure Volume (Vehh) 7 1 4 290 314 22 Faulure Volume (Vehh) 8 1 4 290 314 22 Faulure Volume (Vehh) 8 1 4 315 311 24 Peack Haur Factor 0,92 0,92 0,92 0,92 0,92 0,92 Peack Haur Factor 0,92 0,92 0,92 0,92 0,92 0,92 Peack Haur Factor 0,92 0,92 0,92 0,92 0,92 0,92 Peack Haur Factor 0,92 0,92 0,92 0,92 0,92 0,92 Peack Haur Factor 0,92 0,92 0,92 0,92 0,92 0,92 Peack Haur Factor 0,92 0,92 0,92 0,92 0,92 0,92 Peack Haur Factor 0,92 0,93 0,9		4	>	•	←	→	*
Hy) 7 1 4 290 314 22 My) 7 1 4 290 314 22 My) 8 1 4 290 314 22 My 6 0% 0% 0% My 6 0% 0% 0% Mone None Mone None Mon	Movement	EBL	EBR	NBL	NBT	SBT	SBR
hh) 7 1 4 290 314 22 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 1 4 315 341 24 0 92 0,92 0,92 0,92 0,92 0,92 0 0 0 0,92 0,92 0,92 0,92 1 8 18 345 345 68 6.9 4.1 68 6.9 4.1 68 6.9 4.1 68 6.9 4.1 68 6.9 4.1 68 6.9 4.1 69 100 100 0 0 0 0 60 0 0 0 0 0 60 0 0 0 60 0 0	Lane Configurations	>			₩.₽	₩	
(m) 50p	Traffic Volume (veh/h)			4	290	314	22
Slop Free Free Free O% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Future Volume (Veh/h)	7	-	4	290	314	22
0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0	Sign Control	Stop			Free	Free	
9 092 092 092 092 092 092 092 092 092 09	Grade	%0			%0	%0	
9) 8 1 4 315 341 24 9) None None None ed 518 182 365 ed 518 182 365 8 6.9 4.1 518 182 385 6 8 6.9 4.1 6 8 8 9 100 100 98 100 100 485 829 1190 98 100 100 100 24 1 0 0 0 24 509 1190 1700 1700 1700 12.2 0.3 0.0 0.0 0.0 8 A 12.2 0.3 0.0 0.0 0.0 8 B 12.2 0.3 0.0 0.0 0.0 9 12.2 0.3 0.0 0.0 0.0 9 12.2 0.3 0.0 0.0 0.0 9 12.2 0.3 0.0 0.0 0.0 9 12.2 0.3 0.0 0.0 0.0 9 12.2 0.3 0.0 0.0 0.0 9 12.2 0.3 0.0 0.0 0.0 0.0 0.0 9 12.2 0.3 0.0 0.0 0.0 0.0 0.0 9 12.2 0.3 0.0 0.0 0.0 0.0 0.0 0.0 9 12.2 0.3 0.0 0.0 0.0 0.0 0.0 0.0 9 12.2 0.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
None	Hourly flow rate (vph)	80	-	4	315	341	24
ed 518 182 365 236 ed 6.9 4.1 6.8 182 365 8 18	Pedestrians						
ed 518 182 365 Since Since None None Since	Lane Width (m)						
None	Walking Speed (m/s)						
ed 518 182 365 236 ed 518 182 365 236 ed 6,9 4.1 518 182 365 8 6 8 6,9 4.1 6 8 6,9 4.1 6 8 100 100 6 8 100 100 6 8 100 100 6 1	Percent Blockage						
ed 518 182 365 236 ed 236	Right turn flare (veh)						
Per S18 182 365 236 Per S18 182 365 Per S18	Median type				None	None	
eed 518 182 365 236 eed 518 182 365 6 6 9 18 182 365 6 9 4.1 6.8 6.9 4.1 6.8 6.9 4.1 6.8 6.9 170 100 100 100 100 100 100 100 100 100	Median storage veh)						
ed 518 182 365 la 518 182 365 6.8 6.9 4.1 6.8 100 100 485 100 100 485 100 100 6 100 277 138 8 4 0 0 0 24 9 1190 1700 1700 0.02 0.00 0.12 0.13 0.08 (m) 0.4 0.1 0.0 0.0 0.0 1.2 0.3 0.0 0.0 0.0 B A 122 0.1 0.0 134 0.0 0.0 0.0 145 0.0 0.0 0.0 157 0.0 0.0 0.0 158 0.1 0.0 0.0 0.0 169 0.0 0.0 0.0 170 0.1 0.0 0.0 180 0.0 0.0 0.0 181 0.0 0.0 0.0 182 0.1 0.0 0.0 0.0 183 0.0 0.0 0.0 184 0.0 0.0 0.0 185 0.1 0.0 0.0 0.0 185 0.1 0.0 0.0 0.0 187 0.0 0.0 0.0 0.0 188 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199 0.0 0.0 0.0 0.0 199	Upstream signal (m)					236	
Pe 518 182 365 182 365 6.8 6.9 4.1 3.5 3.3 2.2 9 100 100 485 829 1190 8 4 0 0 0 1 0 27 138 8 4 0 0 0 1 0 0 0 12 509 1190 1700 1700 1700 0.02 0.00 0.12 0.13 0.08 0.04 0.1 0.0 0.0 0.0 12.2 0.3 0.0 0.0 0.0 B A 12.2 0.1 0.0 0.0 0.0 0.0 1 A	pX, platoon unblocked						
518 182 365 6.8 6.9 4.1 6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 485 829 1190 8 4 0 0 24 1 0 0 24 509 1190 1700 1700 1700 0.02 0.01 0.1 0.08 (m) 0.4 0.1 0.0 0.0 0.0 12.2 0.1 0.0 0.0 0.0 B A 0 0 0.0 1.2 0.1 0.0 0.0 0.0 1.2 0.1 0.0 0.0 0.0 B A 0 0.0 0.0 1.2 0.1 0.0 0.0 0.0 1.3 0.0 0.0 0.0 1.4 0.0 0.0 0.0 1.5 0.0 0.0 0.0 0.0 0.0 1.5 0.0 0.0 0.0 0.0 0.0 1.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	vC, conflicting volume	518	182	365			
518 182 365 6 8 69 4.1 6 8 69 4.1 3.5 3.3 2.2 98 100 100 485 829 1190 7100 270 277 138 8 4 0 0 0 24 1 0 0 0 0 24 509 1190 7700 1700 7700 0.2 0.00 0.12 0.13 0.08 (m) 0.4 0.1 0.0 0.0 0.0 B A A 122 0.1 0.0 0.0 0.0 B A A 122 0.1 0.0 1.0 1 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	vC1, stage 1 conf vol						
518 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 485 100 100 486 4 0 0 0 9 1109 210 227 138 8 4 0 0 0 24 1 0 1700 1700 1700 0.02 0.00 0.12 0.13 0.08 (m) 0.4 0.1 0.0 0.0 0.0 1.2 0.3 0.0 0.0 0.0 B A 122 0.1 0.0 0.0 0.0 122 0.1 0.0 10 0.0 0.0 123 0.1 0.0 10 0.0 0.0 124 0.1 0.0 0.0 0.0 125 0.1 0.0 0.0 0.0 127 0.1 0.0 0.0 0.0 128 A 100 0.0 0.0 129 0.1 0.0 0.0 0.0 120 0.1 0.0 0.0 0.0 121 0.1 0.0 0.0 0.0 122 0.1 0.0 0.0 0.0 0.0	vC2, stage 2 conf vol						
6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 485 829 1190 EB1 NB1 NB2 SB1 SB2 9 109 210 227 138 8 4 0 0 0 24 509 1190 7700 1700 1700 1700 0.02 0.02 0.00 0.12 0.13 0.08 (m) 0.4 0.1 0.0 0.0 0.0 0.0 12.2 0.3 0.0 0.0 0.0 B A 12.2 0.3 0.0 0.0 0.0 B A 12.2 0.3 0.0 0.0 0.0 C B C B C C C C C C C C C C C C C C C C	vCu, unblocked vol	218	182	365			
3.5 3.3 2.2 98 100 100 485 829 1190 EB1 NB1 NB2 SB1 SB2 9 109 210 227 138 8 4 0 0 0 24 509 1190 1700 1700 1700 0.02 0.00 0.12 0.13 0.08 (m) 0.4 0.1 0.0 0.0 0.0 1.22 0.1 0.0 0.0 0.0 B A 122 0.1 0.0 0.0 B A A 122 0.1 0.0 100 CO 0.0 0.0 0.0 0.0 B A A 122 0.1 0.0 0.0 0.0	tC, single (s)	8.9	6.9	4.1			
3.5 3.3 2.2 98 100 100 485 829 1190 9 109 210 227 138 8 4 0 0 0 24 509 1190 1700 1700 1700 0.02 0.00 0.12 0.13 0.08 (m) 0.4 0.1 0.0 0.0 0.0 B A 122 0.1 0.0 0.0 0.0 9 1122 0.1 0.0 100 0.0 122 0.1 0.0 100 0.0 122 0.1 0.0 100 0.0 123 0.1 0.0 100 0.0 124 0.1 0.0 100 0.0 125 0.1 0.0 100 0.0	tC, 2 stage (s)						
98 100 100 EB1 NB1 NB2 SB1 SB2 9 109 210 227 138 8 4 0 0 0 24 1 0 0 0 0 24 509 1190 7700 1700 1700 000 0.02 0.00 0.12 0.13 0.08 (m) 0.44 0.1 0.0 0.0 0.0 12.2 0.3 0.0 0.0 0.0 B A A 12.2 0.3 0.0 0.0 0.0 B A A 12.2 0.1 0.0 100 12.3 0.1 0.0 100 12.4 0.1 0.0 100 12.5 0.1 0.0 100 13.5 0.1 0.0 100 14.5 0.1 0.0 100 15.5 0.1 0.0 100 16.5 0.1 0.0 100 17.5 0.1 0.0 100 18.5 0.1 0.0 100 19.5 0.1 0.0 100 10.5 0.1	tF (s)	3.5	3.3	2.2			
(m) 6.0 (m) 190	po dueue free %	86	100	100			
# EB1 NB1 NB2 SB1 SB2 9 109 210 227 138 8 4 0 0 0 1 1 0 0 0 24 509 1190 1700 1700 1700 sylvitication 1 2 0.1 0.0 0.0 0.0 sylvitication 1 208% ICU Level of Service (min) 1 208% ICU Level of Service (min) 1 208% ICU Level of Service	cM capacity (veh/h)	485	829	1190			
9 109 210 227 138 8 4 0 0 0 1 0 0 0 24 509 1190 1700 1700 1700 sight (m) 0.02 0.00 0.12 0.13 0.08 sylv(s) 122 0.1 0.0 0.0 0.0 spacify Utilization 2.08% ICU Level of Service (min) 15	Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
acity 0.02 0.00 0.24 509 1190 1700 1700 1700 \$509 1700 1700 1700 \$509 1700 1700 1700 \$509 172 0.13 0.08 \$7 (\$\$ 122 0.1 0.0 0.0 0.0 \$8 A A 0.0 0.0 0.0 \$9 (\$\$ 122 0.1 0.0 \$0 0.0 0.0 \$1 0.0 0.0 \$1 0.0 0.0 \$1 0.0 0.0 \$1 0.0 0.0 \$2 0.0 0.0 \$3 0.0 0.0 \$4 (\$\$ 0.0 0.0 \$5 0.	Volume Total	6	109	210	227	138	
1 0 0 24 script 569 1190 1700 1700 1700 1700 script 0.02 0.00 0.12 0.13 0.08 script 0.04 0.1 0.0 0.0 0.0 y (s) 12.2 0.3 0.0 0.0 0.0 y (s) 8 A O O O O O O O O O O O O O O O O O O	Volume Left	∞	4	0	0	0	
acity 0.02 0.00 1700 1700 1700 5509 1190 1700 1700 1700 1700 1700 1700 17	Volume Right	-	0	0	0	24	
acily 0.02 0.00 0.12 0.13 0.08 95th (m) 0.4 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	CSH	209	1190	1700	1700	1700	
95th (m) 0.4 0.1 0.0 0.0 0.0 5) 12.2 0.3 0.0 0.0 0.0 7 (s) 12.2 0.1 0.0 8 A 0.0 9 (s) 12.2 0.1 0.0 9 acity Utilization 20.8% ICU Level of Service (min) 15	Volume to Capacity	0.02	0.00	0.12	0.13	0.08	
s) 12.2 0.3 0.0 0.0 0.0 0.0 (v.s) B A 0.0 0.0 In a A 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Queue Length 95th (m)	0.4	0.1	0.0	0.0	0.0	
y (s) 12.2 0.1 0.0 mmary 0.2 pacity Utilization 20.8% ICU Level of Service (finin) 15	Control Delay (s)	12.2	0.3	0.0	0.0	0.0	
y (s) 12.2 0.1 0.0 mmary 0.2 pacity Utilization 2.0.8% ICU Level of Service (min) 15	Lane LOS	В	⋖				
B	Approach Delay (s)	12.2	0.1		0.0		
nmary 0.2 0.2 activities of Service (min) 15	Approach LOS	В					
0.2 0.2 0.2 0.2 0.2 0.2 0.0 0.2 0.0 0.0	Intersection Summary						
20.8% ICU Level of Service (min) 15	Average Delay			0.2			
15	Intersection Capacity Utilization	E		20.8%	⊇	U Level of	
	Analysis Period (min)			15			

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HCM Unsignalized Intersection Capacity Analysis 12: Clark Boulevard & Anatolia Building 1 South Ac

Future Total (AM)

HCM Unsignalized Intersection Capacity Analysis 11: Clark Boulevard & Anatolia Building 2 South Access

Future Total (AM) 2032 Scenario 4

	•			4	_	•	
	١	>	•	-	+	*	
Movement	ם	FRP	IAN	NRT	CRT	SBP	
l ane Configurations	>		2	4	4		
Traffic Volume (veh/h)	- 82	cc	15	28	74	130	
Future Volume (Veh/h)	88	co	12	92	14	130	
Sign Control	Stop			Free	Free		
Grade	%0			%0	%0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	41	3	16	20	15	141	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type				None	None		
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	138	98	156				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	138	98	156				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	95	100	66				
cM capacity (veh/h)	846	973	1424				
Direction, Lane #	EB 1	NB 1	SB 1				
Volume Total	44	36	156				
Volume Left	41	16	0				
Volume Right	co	0	141				
cSH	854	1424	1700				
Volume to Capacity	0.02	0.01	0.0				
Queue Length 95th (m)	1.3	0.3	0.0				
Control Delay (s)	9.4	3.4	0.0				
Lane LOS	V	V					
Approach Delay (s)	9.4	3.4	0.0				
Approach LOS	A						
Intersection Summary							
Average Delay			2.3				
Intersection Capacity Utilization	tion		24 3%	2	ICIT Level of Service	Service	A
Analysis Period (min)			15				

																																							∢	
SBI	' ∓	142	142	Free	%0	0.92	154						None																										of Service	
SBL		40	40			0.92	43										61			61	4.1		2.2	4	1542														U Level o	
NBK		9	9			0.92	7																																2	
INDI	\$	20	20	Free	%0	0.92	54						None													SB 1	197	43	0	1542	0.03	0.7	8.	V	1.8			1.7	26.4%	15
WBK		10	10			0.92	11										28			28	6.2		3.3	66	1009	NB 1	61	0	7	1700	0.04	0.0	0.0		0.0					
WBL	>	2	2	Stop	%0	0.92	2										298			298	6.4		3.5	100	674	WB 1	13	2	7	937	0.01	0.3	8.9	A	8.9	A			ation	
Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (S)	b0 dueue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utiliz	Analysis Period (min)
	WDL WDR NDI NDR 3DL	igurations 🗡 🕩	(1) 2 10 50 6 40 11	Well Work No	well work Noi Now Sp. 1) 2 10 50 6 40 h) 2 10 50 6 40 Slop Free	(1) 1 10 50 6 40 10 10 10 10 10 10 10 10 10 10 10 10 10	(1) 2 10 50 6 40 (1) 20 C (1)	(1) 2 10 50 6 40 (1) 2 10 50 6 40 (1) 2 10 50 6 40 (1) 2 10 50 6 40 (1) 2 10 50 6 40 (1) 2 10 50 6 40 (1) 2 11 54 7 43	(1) 2 10 50 6 40 1) 2 10 50 6 40 1) 2 10 50 6 40 10 10 10 10 10 10 10 10 10 10 10 10 10	Well work Not Not Not Spire (1) 2 10 50 6 40 (1) 2 10 50 6 40 (1) 2 10 50 6 40 (1) 2 10 50 6 40 (1) 2 10 50 6 40 (1) 2 10 50 6 40 (1) 2 10 50 6 40 (1) 2 11 54 7 43	(1) 2 10 50 6 40 (1) 2 10 50 6 6 40 (1) 2 10 50 6 6 40 (1) 2 10 50 6 6 40 (1) 2 10 50 6 6 40 (1) 2 10 50 6 6 40 (1) 2 10 50 6 6 40 (1) 2 10 50	(v) 2 10 50 6 40 (v) 2 10 50 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Well work Not Not Not Spire 1) 2 10 50 6 40 1) 2 10 50 6 40 1) 5lop Free 0% 092 092 092 092 1 54 7 43	Well work Not	1) 2 10 50 6 40 1) 2 10 50 6 40 1) 50p Free 0% 092 092 092 092 1) 54 7 43	Well work Noi None Noi Noise N	WDL WOR NOT NOT SOLUTION SOLUT	WOL WOR NOI NON SDL Y 10 50 6 40 Stop Free 0% 092 092 092 092 2 11 54 7 43 None P	WALL WORK NOT INDIX SOLUTION OF SOLUTION O	WDL WDK NB1 NBN 3DL 2 10 50 6 40 2 10 50 6 40 Slop Fee 0% 0% 0%2 0%2 092 092 2 11 54 7 43 Nane Nane Nane	WDL WOR NOT NOT SOLO OF A 10 SO 6 40 SOP COS 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	WOLL WORK NOT INDIX SOLL NOT S	WDL WOK NOT NOT SOLUTION SOLUT	WALL WORK NOT INDIX 3DL 2 10 50 6 40 Slop	WOLL WORK NOT NOT SOLUTION SOL	MAL WORK NOT NOT SOLUTION MAL WORK NOT MAL	WART NRS ABLANCE OF A 10 10 10 10 10 10 10 10 10 10 10 10 10	WELL WORK NOT NOT SOLUTION OF	MAL WORK NOT NOT SOLUTION SOLU	MAL WORK NOT NOT SOLUTION SOLU	WELL WORK NOT NOT SOLUTION SOL	Well Work Note 1 Note 3 DL	WHEN WORK NOT NOT SOLUTION SOL	7	MAD WOR NOT	MADE WORK NOT	298 58 61 640 67 692 692 692 692 692 692 692 692 692 692	WOLL WORK NOT	MAD WOR NOT	Mone Work Work Not Note 1)

Synchro 11 Report 12-14-2023 BA Group

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HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SRR
												5
Lane Configurations	*	₩		*	₩		F	*		-	₩	
Traffic Volume (vph)	173	1944	86	34	1880	25	218	166	41	137	226	149
Future Volume (vph)	173	1944	86	34	1880	22	218	166	41	137	226	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.2		4.0	6.2		4.0	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Ft	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.94	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	3171		1805	2966		1805	3468		1258	3354	
Fit Permitted	0.07	1.00		0.08	1.00		0.34	1.00		0.61	1.00	
Satd. Flow (perm)	134	3171		148	2966		639	3468		813	3354	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	184	2068	104	36	2000	27	232	177	44	146	240	159
RTOR Reduction (vph)	0	က	0	0	-	0	0	21	0	0	105	0
-ane Group Flow (vph)	184	2169	0	36	2026	0	232	200	0	146	294	0
Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
3us Blockages (#/hr)	1	46	2	0	54	2	0	0	_	9	1	2
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	M	
Protected Phases	2	2		-	9		3	∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	64.7	56.5		92.9	51.4		33.8	33.8		22.8	22.8	
Effective Green, g (s)	64.7	299		929	51.4		33.8	33.8		22.8	22.8	
Actuated g/C Ratio	0.58	0.51		0.50	0.46		0.30	0.30		0.21	0.21	
Clearance Time (s)	4.0	6.2		4.0	6.2		4.0	6.3		6.3	6.3	
/ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
-ane Grp Cap (vph)	214	1614		136	1373		268	1056		166	889	
//s Ratio Prot	c0.07	c0.68		0.01	c0.68		c0.05	90:0			0.09	
//s Ratio Perm	0.43			0.12			c0.21			0.18		
//c Ratio	0.86	1.34		0.26	1.48		0.87	0.19		0.88	0.43	
Jniform Delay, d1	31.0	27.2		24.4	29.8		35.2	28.5		42.8	38.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
ncremental Delay, d2	27.3	159.0		1.0	218.0		24.0	0.1		37.2	0.4	
Delay (s)	58.4	186.2		25.5	247.8		59.3	28.6		80.0	38.8	
evel of Service	ш	ш		O	ш		ш	O		ш	D	
Approach Delay (s)		176.3			243.9			44.3			49.9	
Approach LOS		ш.			ш.			Ω			Ω	
Intersection Summary												
HCM 2000 Control Delay			178.3	¥	SM 2000	HCM 2000 Level of Service	service		ب			
HCM 2000 Volume to Capacity ratio	acity ratio		1.24									
Actuated Cycle Length (s)			111.0	S	Sum of lost time (s)	time (s)			20.5			
Intersection Capacity Utilization	noite		102.9%	೨	U Level o	ICU Level of Service			G			
Analysis Period (min)			15									

c Critical Lane Group

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Queues 1: Sixth Line & Derry Road

Future Total (PM) 2032 Scenario 4

Future Total (PM) 2032 Scenario 4

173 194 180 181	173 194 180 18 166 137 173 1944 34 1800 218 166 137 137 1944 34 1800 218 166 137 137 1944 34 1800 218 166 137 137 134 34 1800 218 166 137 137 134 34 1800 218 166 137 137 137 137 25 2	FAI FAI TAIL NAIL AAIL A	144 145 146 147			1		ŀ	-	- !	ā	. i	
173 1944 34 1880 218 166 137 194 34 1880 218 166 137 194 34 1880 218 166 137 194 34 1880 218 166 137 194 34 1880 218 166 137 194 34 1880 232 221 146 32 32 32 32 32 32 32 3	173 194 34 1880 218 166 137 134 34 1880 218 166 137 134 34 1880 218 166 137 134 34 1880 218 166 137 134 34 1880 218 166 137 134 34 1880 232 221 146 38 4 5 2 6 8 3 8 4 4 5 2 1 6 3 8 4 4 6 2 1 6 3 8 4 4 6 2 2 1 6 3 8 4 4 6 2 2 1 6 3 3 3 3 3 3 3 3 3	173 1944 34 1880 218 166 137 144 34 1880 218 166 137 144 34 1880 218 166 137 144 34 1880 218 166 137 144 34 1880 218 166 137 144 34 1880 218 166 137 146 38 4 4 5 2 2 2 2 146 2 2 2 2 2 2 2 2 2	1944 34 1880 218 166 137 1944 34 1880 218 166 137 2172 221 146 137 2172 222 221 146 2172 222 221 146 22 222 222 223 233 223 233)	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
173 1944 34 1880 218 166 137 184 34 1880 218 166 137 184 2172 36 2027 2221 146 137 1944 24 28 2027 2221 146 22 24 25 24 25 24 25 24 25 24 25 24 25 24 25 24 25 24 25 24 25 25	173 1944 34 1880 218 166 137 184 34 1880 218 166 137 184 2172 36 2027 232 221 146 137 1944 34 1880 218 166 137 184 2172 36 2027 232 221 146 22 2 6 8 8 4 4 2 2 6 8 8 4 4 2 2 6 6 3 8 4 4 2 2 6 6 3 2 2 2 6 6 3 2 2 2 2 2 2 2 2 2	173 1944 34 1880 218 166 137 184 34 1880 218 166 137 184 2172 36 2027 232 221 146 137 1944 34 1880 218 166 137 184 2172 36 2027 232 221 146 22 1 6 3 8 4 4 2 2 2 6 8 8 4 4 2 2 2 6 8 8 4 4 4 2 2 2 2 2 2 2	1944 34 1880 218 166 137 1944 34 1880 218 166 137 1742 3 2007 222 221 146 137 2 1 1 6 3 8 8 4 4 2 2 1 1 6 3 3 8 8 4 4 4 2 2 1 6 6 137 17 17 17 17 17 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	gurations	*	₩	F	₹	<u></u>	₹	<u></u>	₩	
173	173 1944 34 1880 218 166 137	173	1944 34 1880 218 166 137 1944 34 1880 218 146 10	nme (vph)	173	1944	34	1880	218	166	137	226	
184 2172 36 2027 232 221 146 5	184 2172 36 2027 232 221 146 5	184 2172 36 2027 232 221 146	250 7.0 250 7.0 100 100 250 2.1 146 Perm R 2 1 1 6 3 8 4 4 4 2 1 1 6 3 8 8 4 4 4 2 1 1 6 3 1 8 8 4 4 4 2 1 1 6 3 1 8 1 8 4 4 4 2 1 1 6 3 1 8 1 8 1 8 1 4 4 1 1 1 1 1 1 1 1 1 1 1	ume (vph)	173	1944	34	1880	218	166	137	226	
pm+pt NA pm+pt NA pm+pt NA pm m m m m m m m m m 5 2 1 6 3 8 4 5 2 1 6 3 8 4 70 25.0 7.0 5.0 7.0 10.0 10.0 110 31.2 11.0 32.3 32.3 3.3 3.2 110 57.0 11.0 37.2 11.0 4.0	pm+pt NA pm+pt NA pm+pt NA pm+pt NA pm+pt NA pmm pt A Perm 2 6 3 8 4	pm+pt NA pm+pt NA pm+pt NA pm+pt NA perm 5 2 1 6 3 8 4 2 6 8 3 8 4 5 1 6 3 8 4 70 25.0 7.0 10.0 10.0 110 31.2 11.0 31.2 11.0 32.3 32.3 110 31.2 11.0 31.2 11.0 32.3 32.3 32.0 9.9% 51.4% 9.9% 51.4% 9.9% 38.7% 28.8% 28.2 1.0 57.0 11.0 32.3 3.2 </td <td>NA pm+pt NA pm+pt NA Perm 2 1 6 3 8 4 4 4 4 6 2 1 6 3 8 8 4 4 4 6 2 1 6 6 3 8 8 4 4 6 2 1 6 6 3 8 8 4 4 6 2 1 6 6 3 8 8 7 9 8 9 8 9 8 9 8 9 8 9 9 8 9 9 9 9</td> <td>the Flow (vph)</td> <td>184</td> <td>2172</td> <td>36</td> <td>2027</td> <td>232</td> <td>221</td> <td>146</td> <td>399</td> <td></td>	NA pm+pt NA pm+pt NA Perm 2 1 6 3 8 4 4 4 4 6 2 1 6 3 8 8 4 4 4 6 2 1 6 6 3 8 8 4 4 6 2 1 6 6 3 8 8 4 4 6 2 1 6 6 3 8 8 7 9 8 9 8 9 8 9 8 9 8 9 9 8 9 9 9 9	the Flow (vph)	184	2172	36	2027	232	221	146	399	
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5 2 1 6 3 8 4 70 25.0 7.0 25.0 7.0 10.0 10.0 110 31.2 11.0 31.2 11.0 32.3 32.3 110 57.0 11.0 31.2 11.0 32.3 32.3 3.0 51.4% 9.9% 31.4% 9.9% 38.7% 88.8% 28 3.0 4.0 3.0 4.0 3.0 4.0 <td>5 2 1 6 3 8 4 70 25.0 70 25.0 70 100 100 110 31.2 11.0 31.2 11.0 32.3 32.3 9.9% 51.4% 9.9% 51.4% 9.9% 38.7% 28.8% 28 3.0 4.0 3.0 4.0 3.0 4.0 4.0 4.0 4.0 1.0 2.2 1.0 2.2 1.0 2.3 2.3 2.3 4.0 6.2 4.0 6.2 4.0 6.3 6.3 6.3 Ves Yes Yes Yes Yes Yes Yes Yes None C-Min None C-Min None None</td> <td>5 2 1 6 3 8 4 70 25.0 7.0 25.0 7.0 100 100 110 31.2 11.0 31.2 11.0 32.3 32.3 9.9% 51.4% 9.9% 51.4% 9.9% 38.7% 38.8% 28 9.9% 51.4% 9.9% 51.4% 9.9% 38.7% 38.8% 28 1.0 2.2 1.0 2.2 1.0 2.3 2.3 2.3 1.0 2.2 1.0 2.2 1.0 2.3 2.3 2.3 1.0 6.2 4.0 6.2 4.0 6.3 6.3 4.3 None C-Min None None</td> <td>2 1 6 3 8 4 25.0 7.0 25.0 7.0 100 100 31.2 11.0 31.2 11.0 32.3 32.3 51.4% 99% 51.4% 99% 387% 288% 28 51.4% 99% 51.4% 99% 387% 288% 28 6.0 0.0 0.0 0.0 0.0 0.0 6.2 4.0 6.2 4.0 6.3 6.3 1.29 Lead Lead Lead Lead 1.31 0.19 1.47 0.83 0.21 0.87 1.48 C. Alin None None None 1.31 0.19 1.47 0.83 0.21 0.87 1.66 12.6 244.3 54.8 24.3 86.0 1.68 12.6 244.3 54.8 24.3 86.0 1.66 12.6 244.3 54.8 24.3 86.0 1.65 34 3404 39.1 16.1 188 1.60 0 0 0 0 0 1.61 100 0 0 0 0 1.62 185 1375 281 1166 188 1.62 185 1375 281 1166 188 2.EEBTL and 6.WBTL, Start of Green 2.EEBTL and 6.WBTL, Start of Green 2.EEBTL and 6.WBTL, Start of Green</td> <td>Phases</td> <td>2</td> <td></td> <td>9</td> <td></td> <td>∞</td> <td></td> <td>4</td> <td></td> <td></td>	5 2 1 6 3 8 4 70 25.0 70 25.0 70 100 100 110 31.2 11.0 31.2 11.0 32.3 32.3 9.9% 51.4% 9.9% 51.4% 9.9% 38.7% 28.8% 28 3.0 4.0 3.0 4.0 3.0 4.0 4.0 4.0 4.0 1.0 2.2 1.0 2.2 1.0 2.3 2.3 2.3 4.0 6.2 4.0 6.2 4.0 6.3 6.3 6.3 Ves Yes Yes Yes Yes Yes Yes Yes None C-Min None C-Min None	5 2 1 6 3 8 4 70 25.0 7.0 25.0 7.0 100 100 110 31.2 11.0 31.2 11.0 32.3 32.3 9.9% 51.4% 9.9% 51.4% 9.9% 38.7% 38.8% 28 9.9% 51.4% 9.9% 51.4% 9.9% 38.7% 38.8% 28 1.0 2.2 1.0 2.2 1.0 2.3 2.3 2.3 1.0 2.2 1.0 2.2 1.0 2.3 2.3 2.3 1.0 6.2 4.0 6.2 4.0 6.3 6.3 4.3 None C-Min None	2 1 6 3 8 4 25.0 7.0 25.0 7.0 100 100 31.2 11.0 31.2 11.0 32.3 32.3 51.4% 99% 51.4% 99% 387% 288% 28 51.4% 99% 51.4% 99% 387% 288% 28 6.0 0.0 0.0 0.0 0.0 0.0 6.2 4.0 6.2 4.0 6.3 6.3 1.29 Lead Lead Lead Lead 1.31 0.19 1.47 0.83 0.21 0.87 1.48 C. Alin None None None 1.31 0.19 1.47 0.83 0.21 0.87 1.66 12.6 244.3 54.8 24.3 86.0 1.68 12.6 244.3 54.8 24.3 86.0 1.66 12.6 244.3 54.8 24.3 86.0 1.65 34 3404 39.1 16.1 188 1.60 0 0 0 0 0 1.61 100 0 0 0 0 1.62 185 1375 281 1166 188 1.62 185 1375 281 1166 188 2.EEBTL and 6.WBTL, Start of Green 2.EEBTL and 6.WBTL, Start of Green 2.EEBTL and 6.WBTL, Start of Green	Phases	2		9		∞		4		
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70 25.0 7.0 25.0 7.0 10.0 10.0 11.0 31.2 11.0 31.2 11.0 31.2 11.0 31.2 32.3 32.3 11.0 57.0 11.0 40.0 32.0 32.0 11.0 57.0 11.0 40.0 32.0 32.0 32.0 11.0 2.2 10 2.2 10 2.2 10 2.3 2.3 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	70 25.0 7.0 25.0 7.0 10.0 10.0 11.0 31.2 11.0 31.2 11.0 31.2 32.3 32.3 11.0 57.0 11.0 57.0 11.0 43.0 32.3 32.3 1.0 2.2 1.0 2.2 1.0 4.0 40 <t< td=""><td>70 25.0 7.0 25.0 7.0 100 100 101 110 31.2 11.0 31.2 11.0 31.2 11.0 31.3 32.3 31.3 11.0 57.0 11.0 43.0 32.0 32.0 32.0 11.0 2.2 1.0 2.2 1.0 2.3 2.3 3.0 4.0 4.0 6.2 4.0 6.2 4.0 6.3 6.3 6.3 6.3 6.3 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0</td><td>25.0 7.0 25.0 7.0 10.0 10.0 21.1 21.0 31.3 32.3 32.3 37.0 11.0 37.0 11.0 31.3 32.3 32.0 32.0 32.0 32.0 32.0 32.0 32</td><td>iase</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	70 25.0 7.0 25.0 7.0 100 100 101 110 31.2 11.0 31.2 11.0 31.2 11.0 31.3 32.3 31.3 11.0 57.0 11.0 43.0 32.0 32.0 32.0 11.0 2.2 1.0 2.2 1.0 2.3 2.3 3.0 4.0 4.0 6.2 4.0 6.2 4.0 6.3 6.3 6.3 6.3 6.3 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	25.0 7.0 25.0 7.0 10.0 10.0 21.1 21.0 31.3 32.3 32.3 37.0 11.0 37.0 11.0 31.3 32.3 32.0 32.0 32.0 32.0 32.0 32.0 32	iase									
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110 570 110 570 110 430 320 390 397 514% 99% 114% 99% 99% 114% 99%	110 57.0 11.0 57.0 11.0 43.0 32.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5	110 57.0 11.0 57.0 11.0 43.0 32.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5	57.0 11.0 57.0 11.0 43.0 32.0 5.14% 99% 51.4% 99% 51.4% 99% 81.7% 188.8 28 23 2.2 1.0 2.2 1.0 2.2 1.0 2.3 2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Split (s)	11.0	31.2	11.0	31.2	11.0	32.3	32.3	32.3	
9.9% 51.4% 9.9% 51.4% 9.9% 38.7% 28.8% 28 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4	9.9% 51.4% 9.9% 51.4% 9.9% 38.7% 28.8% 28 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4	9.9% 51.4% 9.9% 51.4% 9.9% 38.7% 28.8% 28 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 3.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4	514% 99% 514% 99% 387% 288% 28 40 40 30 40 40 40 30 40 4	t(s)	11.0	57.0	11.0	57.0	11.0	43.0	32.0	32.0	
3.0 4.0 3.0 4.0 3.0 4.0 4.0 1.0 1.0 2.2 1.0 2.2 1.0 2.2 1.0 2.3 1.3 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	3.0 4.0 3.0 4.0 3.0 4.0 4.0 1.0 1.0 2.2 1.0 2.2 1.0 2.3 2.3 1.0 2.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	3.0 4,0 3.0 4,0 3.0 4,0 3.0 4,0 4,0 1.0 2.2 1.0 2.2 1.0 2.3 2.3 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	40 3.0 4.0 3.0 4.0 3.0 4.0 4.0 2.2 1.0 2.2 1.0 2.3 2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	it (%)	%6.6	51.4%	%6.6	51.4%	%6.6	38.7%	28.8%	28.8%	
1.0 2.2 1.0 2.2 1.0 2.3 2.3 2.4 4.0 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	1.0 2.2 1.0 2.2 1.0 2.3 2.3 2.3 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1.0 2.2 1.0 2.2 1.0 2.3 2.3 2.3 4.0 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	2.2 1.0 2.2 1.0 2.3 2.3 2.3 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	me (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	
00 00 00 00 00 00 00 00 00 00 00 00 00	00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00 00 00	0.0	All-Red Time (s)	1.0	2.2	1.0	2.2	1.0	2.3	2.3	2.3	
40 6.2 4.0 6.2 4.0 6.3 6.3 6.3 Lead Lead Lag Lead A Lag Lead Lag	4.0 6.2 4.0 6.2 4.0 6.3 6.3 Lead Lag Lead Lag Lead Lag Yes Yes Yes Yes Yes Yes None C-Min None C-Min None None None 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	40 6.2 4.0 6.2 4.0 6.3 6.3 Lead Lag L	6.2 4.0 6.2 4.0 6.3 6.3 6.3 1.49 Lead Lead Lead Lead Lead Lead Lead Lead	e Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lead Lag Yes Xe Yes	Lead Lag Lead Lag Lead Lag Ses Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	Lead Lag Lead Lag Lead Lag Ses Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	Lag Lead Lag Lead Lag Lead Lag Ves Yes Y	otal Lost Time (s)	4.0	6.2	4.0	6.2	4.0	6.3	6.3	6.3	
Yes Yes <td>Yes Yes Yes<td>Yes Yes Yes<td>Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes</td><td></td><td>Lead</td><td>Lag</td><td>Lead</td><td>Lag</td><td>Lead</td><td></td><td>Lag</td><td>Lag</td><td></td></td></td>	Yes Yes <td>Yes Yes Yes<td>Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes</td><td></td><td>Lead</td><td>Lag</td><td>Lead</td><td>Lag</td><td>Lead</td><td></td><td>Lag</td><td>Lag</td><td></td></td>	Yes Yes <td>Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes</td> <td></td> <td>Lead</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lead</td> <td></td> <td>Lag</td> <td>Lag</td> <td></td>	Yes		Lead	Lag	Lead	Lag	Lead		Lag	Lag	
None C-Min None C-Min None C-Min None None 0.86 1.31 0.19 1.47 0.83 0.21 0.87 0.0 1.66 1.66 1.26 2.44.3 54.8 24.3 86.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 60.9 1.66.6 12.6 244.3 54.8 24.3 86.0 -30.2 -3.64.6 3.4 -3.04 39.1 16.1 31.4 #76.7 #409.5 7.9 #385.5 #72.0 25.6 #66.1 120.0 100.0 256.2 7.0 #67.1 18 30.0 213 166.2 185 1375 281 116 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <t< td=""><td>None C-Min None C-Min None C-Min None None 60.9 1.86 1.2 2.44.3 5.48 2.43 86.0 60.9 1.86.6 1.2 2.44.3 5.48 2.43 86.0 60.9 0.0 0.0 0.0 0.0 0.0 0.0 60.9 1.86.6 1.2 2.44.3 5.48 2.43 86.0 -30.2 -3.64.6 3.4 -3.04.4 39.1 16.1 31.4 7.9 7.9 7.9 7.9 7.9 7.9 7.0 7.0 120.0 7.9 7.9 7.9 7.0 7.0 7.0 7.0 7.0 213 1.62 1.85 1.35 2.81 11.6 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>None C-Min None C-Min None C-Min None None</td><td>C-Min Nane C-Min Nane Nane Nane Nane 1.31 0.19 1.47 0.83 0.21 0.87 0.00 0.00 0.00 0.00 0.00 0.00 0.00</td><td>) Optimize?</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td><td></td><td>Yes</td><td>Yes</td><td></td></t<>	None C-Min None C-Min None C-Min None None 60.9 1.86 1.2 2.44.3 5.48 2.43 86.0 60.9 1.86.6 1.2 2.44.3 5.48 2.43 86.0 60.9 0.0 0.0 0.0 0.0 0.0 0.0 60.9 1.86.6 1.2 2.44.3 5.48 2.43 86.0 -30.2 -3.64.6 3.4 -3.04.4 39.1 16.1 31.4 7.9 7.9 7.9 7.9 7.9 7.9 7.0 7.0 120.0 7.9 7.9 7.9 7.0 7.0 7.0 7.0 7.0 213 1.62 1.85 1.35 2.81 11.6 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	None C-Min None C-Min None C-Min None	C-Min Nane C-Min Nane Nane Nane Nane 1.31 0.19 1.47 0.83 0.21 0.87 0.00 0.00 0.00 0.00 0.00 0.00 0.00) Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
0.86 1.31 0.19 1.47 0.83 0.21 0.87 0.09 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	0.86 1.31 0.19 1.47 0.83 0.21 0.87 0.09 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	0.86 131 0.19 1.47 0.83 0.21 0.87 0.09 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	1.31 0.19 1.47 0.83 0.21 0.87 1.86 1.26 2.44.3 54.8 86.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	ode	None	C-Min	None	C-Min	None	None	None	None	
60.9 168.6 12.6 244.3 54.8 24.3 86.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	60.9 168.6 12.6 244.3 54.8 24.3 86.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	60.9 168.6 12.6 244.3 54.8 24.3 86.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1 68 6 12 6 244.3 548 243 860 00 00 00 00 00 00 00 00 00 00 00 00 0		0.86	1.31	0.19	1.47	0.83	0.21	0.87	0.50	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1686 12.6 244.3 54.8 24.3 86.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	telay	6.09	168.6	12.6	244.3	54.8	24.3	86.0	27.4	
60.9 168.6 12.6 244.3 54.8 24.3 86.0 -30.2 -364.6 3.4 -30.4 39.1 16.1 31.4 #76.7 #409.5 7.9 #385.5 #72.0 25.6 #66.1 120.0 100.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	60.9 168.6 12.6 244.3 54.8 24.3 86.0 -30.2 -364.6 3.4 -30.4 39.1 16.1 31.4 #76.7 #409.5 7.9 #385.5 #72.0 25.6 #66.1 475.1 100.0 25.2 28.1 116.6 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	60.9 188.6 12.6 244.3 54.8 24.3 86.0 -30.2 -364.6 3.4 -340.4 39.1 16.1 31.4 #76.7 #409.5 7.9 #385.5 #72.0 25.6 #66.1 120.0 10.0 45.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 188 6 12 6 244.3 54.8 24.3 86.0 240.4 31.1 16.1 31.4 31.4 475.1 256.2 211.8 31.0 16.1 31.4 475.1 100.0 45.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	elay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
-30.2 -364.6 3.4 -340.4 39.1 16.1 31.4 #76.7 #4095.5 7.9 #3885.5 #72.0 25.6 #66.1 475.1 100.0 256.2 211.8 30.0 213 166.2 185 1375 281 1166 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-30.2 -364.6 3.4 -340.4 39.1 16.1 31.4 #76.7 #4095.5 7.9 #385.5 #72.0 25.6 #66.1 475.1 256.2 21.8 30.0 213 166.2 185 1375 281 1166 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-30.2 -364.6 3.4 -340.4 39.1 16.1 31.4 #76.7 #4095.5 7.9 #385.5 #72.0 25.6 #66.1 120.0 100.0 256.2 281 116.6 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-364.6 3.4 -340.4 39.1 16.1 31.4 #409.5 7.9 #88.5 #72.0 25.6 #66.1 475.1 100.0 45.0 11.8 30.0 16.2 11.8 11.8 11.8 11.8 11.8 11.8 11.8 11	lay	6.09	168.6	12.6	244.3	54.8	24.3	86.0	27.4	
#76.7 #409.5 7.9 #385.5 #72.0 25.6 #66.1 475.1 256.2 2 2118 20 100.0 100.0 45.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 3	#76.7 #409.5 7.9 #385.5 #72.0 25.6 #66.1 475.1 256.2 45.0 2118 2 120.0 710.0 256.2 45.0 2118 30.0 213 166.2 185 1375 281 1166 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#76.7 #409.5 7.9 #385.5 #72.0 25.6 #66.1 475.1 256.2 120.0 100.0 256.2 2118 30.0 213 166.2 185 1375 281 1166 1188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#76.7 #409.5 7.9 #385.5 #72.0 25.6 #66.1 475.1 256.2 21.8 21.8 2 120.0 21.8 120.0 21.8 120.0 21.8 120.0 21.8 120.0 21.8 120.0 21.8 120.0 21.8 120.0 21.8 120.0 20.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ength 50th (m)		~364.6	3.4	~340.4	39.1	16.1	31.4	27.1	
475.1 256.2 211.8 2 120.0 100.0 45.0 30.0 213 1662 185 1375 281 1166 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <td>475.1 256.2 211.8 2 120.0 100.0 45.0 30.0 30.0 213 166.2 185 1375 281 116 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>475.1 256.2 211.8 2 120.0 45.0 45.0 30.0 213 166.2 185 1375 281 1166 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>475.1 256.2 211.8 2 100.0 45.0 1166 188 1 166.2 188 1375 281 1166 188 1 0 0 0 0 0 0 0 1.31 0.19 1.47 0.83 0.19 0.78 2:EBTL and 6:WBTL, Start of Green sis theoretically infinite.</td> <td>ength 95th (m)</td> <td></td> <td>#409.5</td> <td>7.9</td> <td>#385.5</td> <td>#72.0</td> <td>25.6</td> <td>#66.1</td> <td>42.4</td> <td></td>	475.1 256.2 211.8 2 120.0 100.0 45.0 30.0 30.0 213 166.2 185 1375 281 116 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	475.1 256.2 211.8 2 120.0 45.0 45.0 30.0 213 166.2 185 1375 281 1166 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	475.1 256.2 211.8 2 100.0 45.0 1166 188 1 166.2 188 1375 281 1166 188 1 0 0 0 0 0 0 0 1.31 0.19 1.47 0.83 0.19 0.78 2:EBTL and 6:WBTL, Start of Green sis theoretically infinite.	ength 95th (m)		#409.5	7.9	#385.5	#72.0	25.6	#66.1	42.4	
120.0 100.0 45.0 30.0 2/3 1662 185 1375 281 1166 188 0 0 0 0 0 0 0 0 0 0 <	120.0 100.0 45.0 30.0 213 1662 185 1375 281 1166 188 0 0 0 0 0 0 0 0 0 0 <	120.0 100.0 45.0 30.0 213 1662 185 1375 281 1166 188 0 <	1662 185 1375 281 1166 188 189 189 190 190 190 190 190 190 190 190 190 19	ink Dist (m)		475.1		256.2		211.8		201.7	
213 1662 185 1375 281 1166 188 0	213 1662 185 1375 281 1166 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0.86 1.31 0.19 1.47 0.83 0.19 0.78	213 1662 185 1375 281 1166 188 0.86 1.31 0.19 1.47 0.83 0.19 0.78	1662 188 1375 281 1166 188 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Length (m)	120.0		100.0		45.0		30.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2:EBTL and 6:WBTL, Start of Green vo cycles.	pacity (vph)	213	1662	185	1375	281	1166	188	877	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	n Cap Reductn	0	0	0	0	0	0	0	0	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ctn 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2.EBTL and 6.WBTL, Slart of Green vo cycles.	Cap Reductn	0	0	0	0	0	0	0	0	
0.86 1.31 0.19 1.47 0.83 0.19 0.78	0.86 1.31 0.19 1.47 0.83 0.19 0.78 any	0.86 1.31 0.19 1.47 0.83 0.19 0.78 any	, 1.31 0.19 1.47 0.83 0.19 0.78 2:EBTL and 6:WBTL, Start of Green vo cycles. sis theoretically infinite.	Cap Reductn	0	0	0	0	0	0	0	0	
	ion Summary	on Summary ngth: 111	ion Summary right. 111 Cycle tength: 111 Cycle tength: 117 Spele: 150 Yiels Actualed-Coordinated me exceeds capacity, queue is theoretically infinite. e shown is maximum after two cycles.	l v/c Ratio	0.86	1.31	0.19	1.47	0.83	0.19	0.78	0.45	
ngth: 111 Oycle Length: 111	Cycle Length: 111		yele: 150 ype: Actuated-Coordinated ne exceeds capacity, queue is theoretically infinite. es shown is maximum after two cycles. percentile volume exceeds capacity, queue may be longer.	(0%), Referenced to	o phase 2:	EBTL and	d 6:WBTL	, Start of	Green				
ngth: 111 Cycle Length: 111 (0%), Referenced to phase 2:£BTL and 6:WBTL, Start of Green	Cycle Length: 111 (0%), Referenced to phase 2:£BTL and 6:WBTL, Start of Green	(0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	ype: Actualed-Coordinaled The exceeds capacity queue is theoretically infinite. e shown is maximum after two cycles.	Sycle: 150									
ngth: 111 Cycle Length: 111 (VR), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Cycle Length: 111 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green 3ycle: 150	(0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green ypte: 150	ne exceeds capacity, queue is theoretically infinite. 5 shown is maximum after two cycles.	ype: Actuated-Coo	rdinated								
ngth: 111 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green type: 150 ype: Actuated-Coordinated	Oycle Length: 111 (0%), Referenced to phase 2.EBTL and 6.WBTL, Start of Green ype: Actualed-Coordinated	(0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green ydel: 150 ype: Actuated-Coordinated	e shown is maximum after two cycles. percentile volume exceeds capacity, queue may be longer.	ne exceeds capacit	y, queue is	theoretic	ally infini	te.					
right: 111 Cycle Length: 111 (0%), Reterenced to phase 2:EBTL and 6:WBTL, Start of Green yels: 108 Pyle: Actualed-Coordinated ne exceeds capacity, queue is theoretically infinite.	Öycle Length: 111 (0%), Retirenticed to phase 2:EBTL and 6:WBTL, Start of Green sycle: 150 Pre: Actualred-Coordinated pre exceeds capacity, queue is theoretically infinite.	(0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green yate; Its provides to the condinated by the state of Coordinated by the success capacity, queue is theoretically infinite.	oercentile volume exceeds capacity, queue may be longer.	shown is maximul	m after two	cycles.							
ngth: 111 Cycle Length: 111 (Cycle Length: 110 (Cyc	Öycle Length: 111 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green yole: 180 Coordinated ype: Actuated-Coordinated ne exceeds capacity, queue is theoretically infinite. s shown is maximum after two cycles.	(0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green yele: 150 byte: 150 byte: 150 byte: 150 byte: 3 byte: Actuated-Coordinated heoretically infinite. The exceeds capacity, queue is theoretically infinite. a shown is maximum after two cycles.		percentile volume e	xreeds rai	nacity an	VEM 919	he longel	_				

Splits and Phases: 1: Sixth Line & Derry Road

→ Ø2 (R) **√** Ø1

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

3340 1.00 3340 0.94 323 20 20 388 0.75 18.7 18.7 0.16 5.7 3.0 1.00 28.7 0.24 4.0 3.0 234 c0.12 c0.22 4.0 1.00 1.00 0.95 501 0.44 700 0.94 332 332 14% 13 19.0 H 209 0.94 75 75 75 76 1900 5.7 6.0.95 6.0.89 11.00 8053 80 80 95 80 97 80 97 80 97 80 97 18.7 118.7 0.16 5.7 3.0 475 0.07 0.43 45.9 1.00 0.6 46.5 D 233 233 1900 4.0 1.00 1.00 0.95 523 523 248 28.7 28.7 0.24 4.0 3.0 223 3.0 0.09 0.17 1.11 43.0 1.00 93.6 248 5% HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 121 129 0 18% 22 121 66.6 66.6 0.55 5.3 3.0 1830 c0.73 2405 3% 22 NA 1.31 26.7 1.13 143.1 5.3 5.3 0.95 0.99 1.00 1.00 3298 3298 0.94 0.94 74.5 0.62 4.0 3.0 159 0.00 0.36 0.66 27.9 0.92 4.4 4.0 1.00 1.00 0.95 1.00 1.00 0.94 99 105 133.7 1.32 120.0 110.8% 86 86 1900 0 2% 474 1829 11829 11900 5.3 0.95 0.99 11.00 3262 1.00 3262 1.00 2034 2% 36 NA 64.4 64.4 0.54 5.3 3.0 3.0 1750 0.62 1.16 27.8 0.91 77.6 102.8 Ť HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 46 70.1 0.58 4.0 3.0 132 0.02 0.02 0.19 0.35 26.3 2.05 1.0 4.0 11.00 0.95 1600 0.06 105 46 43 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Permitted Phases
Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor -ane Group Flow (vph) Progression Factor Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS Bus Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) Lane Grp Cap (vph) Uniform Delay, d1 v/s Ratio Perm v/s Ratio Prot v/c Ratio

Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (PM)

Future Total (PM) 2032 Scenario 4

	1	†	-	ţ	•	←	۶	→	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	*	₩	*	₩	*	₩	F	₩	
Traffic Volume (vph)	43	1829	66	2142	233	75	312	304	
Future Volume (vph)	43	1829	66	2142	233	75	312	304	
Lane Group Flow (vph)	46	2037	105	2408	248	302	332	408	
Turn Type	pm+pt	ΑN	pm+pt	Ν	pm+pt	≨	pm+pt	≨	
Protected Phases	2	2	_	9	3	8	7	4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	_	9	3	∞	7	4	
Switch Phase									
Minimum Initial (s)	7.0	20.0	7.0	20.0	7.0	10.0	7.0	10.0	
Minimum Split (s)	11.0	34.3	11.0	34.3	11.0	34.7	11.0	34.7	
Total Split (s)	11.0	0.79	11.0	0.79	14.0	28.0	14.0	28.0	
Total Split (%)	9.5%	25.8%	9.2%	25.8%	11.7%	23.3%	11.7%	23.3%	
Yellow Time (s)	3.0	3.7	3.0	3.7	3.0	3.7	3.0	3.7	
All-Red Time (s)	1.0	1.6	1.0	1.6	1.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.3	4.0	5.3	4.0	5.7	4.0	5.7	
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
v/c Ratio	0.30	1.16	0.65	1.30	1.08	0.53	1.36	0.76	
Control Delay	21.9	103.9	28.1	163.7	118.5	31.7	220.2	54.7	
Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	21.9	103.9	28.1	163.7	118.5	31.7	220.2	54.7	
Queue Length 50th (m)	2.9	~325.6	14.2	~410.6	~55.7	22.4	~75.7	48.4	
Queue Length 95th (m)	m6.9 n	m6.9 m#359.6	m17.9	#465.8	9.68#	36.3	#161.7	64.4	
Internal Link Dist (m)		170.5		124.7		340.6		275.9	
Turn Bay Length (m)	100.0		0.06		70.0		20.0		
Base Capacity (vph)	151	1751	161	1856	230	629	244	640	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.30	1.16	0.65	1.30	1.08	0.46	1.36	0.64	
Intersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 120	_								
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	to phase 2:	EBTL an	d 6:WBTI	., Start of	Green				
Natural Cycle: 145									
Control Type: Actuated-Coordinated	ordinated								
 Volume exceeds capacity, queue is theoretically infinite. 	ity, queue is	s theoretic	ally infin	le.					
Queue shown is maximum after two cycles.	um after two	cycles.							
# 95th percentile volume exceeds capacity, queue may be longer.	exceeds ca	pacity, qu	ieue may	pe longe	ے				
Queue shown is maximum after two cycles.	ım after two	cycles.							
 Wolume for 95th percentile queue is metered by upstream signal 	ntile queue i	s metere	d by upst	ream sigr	nal.				

Splits and Phases: 2: Fifth Line & Derry Road

€03 ₹ Ø6 (R)

04

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

	\	Ť	<u> </u>	-	Ļ	4	€	—	•	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	F	444	*	r	***	¥.	F	444	*	r	+++	*
Traffic Volume (vph)	212	1306	18	288	1525	518	%	410	727	392	539	254
Future Volume (vph)	212	1306	18	288	1525	518	%	410	227	392	539	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	2.7	2.7	4.0	2.7	2.7
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3399	2009	1562	1738	4828	1516	1802	4668	1586	1616	4489	1403
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.44	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	3399	2009	1562	167	4828	1516	827	4668	1586	218	4489	1403
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	216	1333	18	294	1556	529	86	418	232	400	220	259
RTOR Reduction (vph)	0	0	12	0	0	245	0	0	156	0	0	191
Lane Group Flow (vph)	216	1333	9	294	1556	284	86	418	76	400	220	89
Confl. Peds. (#/hr)						_	9					9
Heavy Vehicles (%)	7%	1%	3%	3%	4%	3%	%0	%8	1%	2%	10%	7%
Bus Blockages (#/hr)	2	19	-	2	24	വ	0	21	2	15	36	13
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	2	2		-	9		3	∞		7	4	
Permitted Phases			2	9		9	00		∞	4		4
Actuated Green, G (s)	12.9	39.7	39.7	63.9	47.0	47.0	26.2	16.4	16.4	45.1	31.3	31.3
Effective Green, g (s)	12.9	39.7	39.7	63.9	47.0	47.0	26.2	16.4	16.4	45.1	31.3	31.3
Actuated g/C Ratio	0.11	0.33	0.33	0.53	0.39	0.39	0.22	0.14	0.14	0.38	0.26	0.26
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	2.7	2.7	4.0	2.7	2.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	365	1656	516	353	1890	593	260	637	216	420	1170	365
//s Ratio Prot	90:0	0.27		c0.14	0.32		0.03	0.09	1	c0.20	0.12	
//s Ratio Perm	C	000	0.00	c0.30	000	0.19	0.05		0.05	c0.16		0.05
v/c Ratio	0.59	0.80	0.01	0.83	0.87	0.48	0.38	0.66	0.35	0.95	0.47	0.19
Uniform Delay, dT	51.0	36.6	27.0	33.1	32.8	27.3	38.8	49.1	4/.0	31.6	37.4	34.4
Progression Factor	3.5	3.5	3.9	0.79	0.87	/0.1	3.5	3.5	0.1	0.10	00.1	00.1
Incremental Delay, dz	0.7	4.3	0.0	0.1	90.4	0.3	6.00	4.7	0	31.8	5.0	2.0
Delay (s)	0.00	40.4	0.12	1.12	1.72	7.04	1.40	0.0	40.0	 	1.10	7.4.
Level of Service	۵	ם י	ر	ر	٥	۵	۵	ם פ	۵	ш	ם ו	ر
Approach Delay (s)		42.5			32.0			48.9			45.5	
Approach LOS		۵			O			Ω			Ω	
Intersection Summary												
HCM 2000 Control Delay			39.7	H	HCM 2000 Level of Service	Level of 5	service		Q			
HCM 2000 Volume to Capacity ratio	ty ratio		0.93									
Actuated Cycle Length (s)			120.0	nS	Sum of lost time (s)	time (s)			19.0			
Intersection Capacity Utilization	nc		87.1%	⊡	ICU Level of Service	f Service			ш			
Analysis Period (min)			15									
c Critical Lane Group												

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Queues 3: James Snow Parkway & Derry Road

Future Total (PM) 2032 Scenario 4

Future Total (PM) 2032 Scenario 4

A					ı	ı	ı		ı	ı			
WEL WEL NEL NEL NEL NEL NEL NEL SEL SEL <th></th> <th>1</th> <th>†</th> <th>*</th> <th>-</th> <th>ļ</th> <th>4</th> <th>•</th> <th>←</th> <th>•</th> <th>۶</th> <th>→</th> <th>\searrow</th>		1	†	*	-	ļ	4	•	←	•	۶	→	\searrow
	ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
288 1525 518 96 410 227 392 539 284 1525 518 96 410 227 392 539 284 1525 518 96 410 227 392 539 284 1525 518 96 410 227 392 539 284 1556 528 98 448 22 400 550 240 550	ane Configurations	K.	444	*-	r	***	*	r	444	*-	r	***	*-
28 1525 518 96 410 227 392 539 74 1856 529 98 418 223 400 550 71 6 6 8 8 4 4 4 6 6 8 8 8 7 4 4 7 6 6 8 8 8 7 4 4 7 6 6 3 8 8 7 4 4 7 6 6 3 8 8 7 4 4 7 6 6 3 8 8 7 4 4 4 110 34	Fraffic Volume (vph)	212	1306	9.	288	1525	518	96	410	227	392	539	254
294 1556 529 98 418 232 400 550 m-pt NA Pem pm-pt NA Pem pm-pt NA Pem 1 6 8 8 4 4 4 6 8 8 8 4 4 1 6 8 8 8 4 4 1 6 8 8 8 4 4 4 1 6 8 8 8 7 4 4 4 1 6 6 3 8 8 7 4	-uture Volume (vph)	212	1306	18	288	1525	518	96	410	227	392	539	254
NA Perm pm+pt NA Perm pm+pt NA Fe	-ane Group Flow (vph)	216	1333	18	294	1556	529	86	418	232	400	220	259
1	Furn Type	Prot	N	Perm	pm+pt	M	Perm	pm+pt	M	Perm	pm+pt	NA	Perm
6 6 8 8 4 4 1 6 6 8 8 8 4 1 0 200 200 70 100 100 70 100 11.0 34.3 34.3 34.3 34.7 34.7 110 34.7 11.0 39.0 39.0 35.0 35.0 35.0 35.0 25.0 25.0 35.0 35.0 35.0 35.0 25.0 25.0 35.0 35.0 35.0 35.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0	Protected Phases	വ	2		-	9		က	∞		7	4	
1 6 6 3 8 7 4 7.0 20.0 20.0 7.0 10.0 10.0 7.0 10.0 11.0 34.3 34.3 11.0 34.7 34.7 11.0 34.7 2.6 3.0 39.0 39.0 29.0 35.0 35.0 35.0 2.6 3.2 3.2 3.2 3.2 3.4 3.7 3.0 3.7 3.0 3.7 3.0	Permitted Phases			2	9		9	∞		∞	4		4
11.0 34.3 34.3 11.0 34.7 34.7 11.0 34.7 34.0 34.0 35.0 35.0 35.0 35.0 35.0 35.0 35.0 35	Detector Phase	വ	2	2	-	9	9	က	∞	∞	7	4	4
7.0 200 200 7.0 100 100 7.0 100 11.1 1.0 34.3 34.3 14.1 34.7 14.0 39.0 39.0 39.0 35.0 35.0 35.0 35.0 35.0 35.0 35.0 35	Switch Phase												
11.0 34.3 34.3 11.0 34.7 34.7 11.0 34.7 11.1 11.0 39.8 38.9 39.0 39.0 39.0 39.0 39.0 39.0 39.0 39	Winimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
11.0 39.0 39.0 29.0 35.0 35.0 29.0 35.0 29.8 35.0 29.8 32.8 32.8 32.8 32.8 24.2 29.8 29.8 24.8 29.2 29.8 32.8 31.3 31.3 31.3 31.0 31.0 31.0 31.0 31.0	Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
92% 325% 325% 242% 292% 292% 242% 292% 2 30 31 31 31 30 31 31 30 31 31 30 31 31 30 31 31 31 31 31 31 31 31 31 31 31 31 31	Fotal Split (s)	17.0	45.0	45.0	11.0	39.0	39.0	29.0	35.0	35.0	29.0	35.0	35.0
3.0 3.7 3.7 3.0 3.7 3.7 3.0 3.7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Fotal Split (%)	14.2%	37.5%	37.5%	9.5%	32.5%	32.5%	24.2%	29.2%	29.2%	24.2%	29.2%	29.2%
10 16 16 10 20 20 10 20 20 10 20 20 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	(ellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
10	All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
4.0 5.3 5.3 4.0 5.7 5.7 4.0 5.7 Head Leg Leag Leag Leag Lead Leg Leg Acs Yes Yes<	ost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead Leag Lead Leag	Fotal Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Yes Yes <td>-ead/Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td> <td>Lead</td> <td>Lag</td> <td>Lag</td>	-ead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Vome C-Min C-Min Name Name None <	-ead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
0.83 0.82 0.63 0.36 0.66 0.62 0.04 0.47 0.47 0.00 0.00 0.0 0.00 0.0 0.0 0.0 0.0 0.0	Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
285 304 127 282 539 200 610 387 00 00 00 00 00 00 00 00 00 00 00 00 00	/c Ratio	0.59	0.80	0.03	0.83	0.82	0.63	0.36	99.0	0.62	0.94	0.47	0.46
90 00 00 00 00 00 00 00 00 00 00 00 00 0	Sontrol Delay	97.6	41.2	0.1	28.5	30.4	12.7	28.2	53.9	20.0	61.0	38.7	7.0
28.5 30.4 12.7 28.2 53.9 20.0 61.0 38.7 47.1 141.9 70.2 15.5 36.5 11.5 79.4 42.1 37.5 40.1 40.2 15.5 36.5 11.5 79.4 42.1 110.0 75.0 10.0 75.0 95.0 13.2 35.4 1893 838 50.0 175.0 95.0 175.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0.83 0.82 0.63 0.20 0.37 0.47 0.47	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
47.1 141.9 70.2 15.5 36.5 11.5 79.4 42.1 137.5 m14.0 75.0 25.8 46.6 36.6 #123.4 53.2 110.0 48.8.7 75.0 100.0 381.6 213.2 113.2 110.0 75.0 95.0 1139 52.4 430 1175 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0<	Fotal Delay	97.6	41.2	0.1	28.5	30.4	12.7	28.2	53.9	20.0	61.0	38.7	7.0
1375 m1144 m450 258 466 366 #1234 53.2 488.7 381.6 100.0 139 524 430 1175 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Jueue Length 50th (m)	26.7	109.8	0.0	47.1	141.9	70.2	15.5	36.5	11.5	79.4	42.1	0.0
488.7 381.6 213.2 10.0 75.0 100.0 75.0 354 1893 838 500 1139 524 430 1175 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0.83 0.82 0.63 0.20 0.37 0.44 0.93 0.47	Jueue Length 95th (m)	38.5	129.1	0.0	m37.5	m114.4	m45.0	25.8	46.6	36.6	#123.4	53.2	20.8
1100 750 1000 750 950 11 354 1893 838 500 1139 524 430 1175 0	nternal Link Dist (m)		156.1			488.7			381.6			213.2	
354 1893 838 500 1139 524 430 1175 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0.83 0.82 0.63 0.20 0.37 0.44 0.93 0.47	Furn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sase Capacity (vph)	395	1656	281	354	1893	838	200	1139	524	430	1175	228
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
083 0.82 0.63 0.20 0.37 0.44 0.93 0.47	Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
	Reduced v/c Ratio	0.55	0.80	0.03	0.83	0.82	0.63	0.20	0.37	0.44	0.93	0.47	0.46
	ntersection Summary												
	Sycle Length: 120												
	Actuated Cycle Length: 120												

Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Natural Cycle: 95
Control Type: Actualed-Coordinated
95th percentill volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentille queue is metered by upstream signal.

Splits and Phases: 3: James Snow Parkway & Derry Road

№ ↑ ↑ 06 (R) **√** 01

12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Total (PM) 2032 Scenario 4

→	SBT SBR	١.	7 169	7 169	1900 1900	5.7	1.00	0.86	1.00	1595	1.00		0.92 0.92	8 184	7 0	185 0	NA	4		22.0	22.0	0.18	5.7	3.0	292	0.12		0.64	45.3	1.00	4.5	49.8	۵	47.9	D						
۶	SBL	*	80		-	5.7	1.00	1.00	0.95	1770	0.70	Ì	Ö	87		87	Perm		4	22.0	22.0	0.18	2.7	3.0	238		0.07	0.37	42.9	1.00	1.0	43.8	٥								
•	NBR		73	73	1900								0.92	79	0	0																					O		15.0	ш.	
—	NBT	2,	10	10	1900	5.7	1.00	0.87	1.00	1617	1.00	1617	0.92	=	99	22	NA	80		22.0			5.7	3.0	296	0.02		0.09	40.7	1.00	0.1	40.8		72.6	Ш						
•	NBL	F	132	132	1900	5.7	1.00	1.00	0.95	1770	0.46	863	0.92	143	0	143	Perm		00	22.0	22.0	0.18	5.7	3.0	158		c0.17	0.91	48.0	1.00	44.6	92.6	ш.				Service			Ф	
4	WBR		24	24	1900								0.92	26	0	0																					HCM 2000 Level of Service		st time (s)	ICU Level of Service	
ţ	WBT	₩.	2178	2178						. ,	1.00			2367	_	2392	NA	9								c0.68				Ì		21.9	O	22.1	S		HCM 200		Sum of lo	CU Level	
-	WBL	-	28	28	1900	4.0	1.00	1.00	0.95	1770	0.02		0.92		0	30	pm+pt	_	9	87.0	87.0	0.72	4.0	3.0	116	0.01	0.18	0.26	31.2	1.00	1.2	32.4	O				-		0,		
/	EBR			49	1900								0.92	53	0	0																					32.3	0.99	120.0	94.0%	15
†	EBT	₩	2106	2106				1.00				3527	0.92		_	2341	NA	2			79.3				2330	c0.66						37.3		37.0	D						
1	EBL	-	36	36	1900	5.3	1.00	1.00	0.95	1770	0.02	94	0.92	39	0	39	Perm		2	79.3	79.3	99.0	5.3	3.0	62		0.42	0.63	11.8	1.50	4.3	22.1	S					pacity ratio	,	ization	
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	F	Fit Protected	Satd. Flow (prot)	Fit Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)

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Queues 4: Clark Boulevard & Derry Road

Future Total (PM) 2032 Scenario 4

## EBI FBI WBI WBI NBI SBI SBI SBI 36 2106 28 2178 132 10 80 7 3 8 2106 28 2178 132 10 80 7 7 3 6 2106 28 2178 132 10 80 7 7 3 6 2106 28 2178 132 10 80 7 7 3 6 2106 28 2178 132 10 80 7 7 3 6 2106 28 2178 132 10 80 7 7 3 6 2106 28 21 8 8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	rations e (vph) e (vph) flow (vph	EBT 2106 2106 2206 23042 NA 2 2 23042 NA 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			NBL 132 132 132 143 Perm 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	10 10 NA NA 8	SBL 80 80 87 87 Perm	SBT 4
36 2106 28 2178 132 10 80 36 2106 28 2178 132 10 80 39 2342 30 2393 143 90 87 19 39 2342 30 2393 143 90 87 19 2	rations rations (cybril) (cybr	2342 2106 2342 NA 2342 NA 10.0 62.5% 62.5% 62.5% 75.0 62.5% 75.0 62.5% 75.0 62.5% 75.0 62.5% 75.0 63.2% 76.0 76.0 76.0 76.0 76.0 76.0 76.0 76.0			132 132 143 Perm 8 8 8 8 8 10.0 34.7 35.0 29.2% 3.7 2.0 0.0 0.0	40 00 00 NA 8 8	80 80 87 87 Perm	☆
36 2106 28 2178 132 10 80 36 23106 28 2178 132 10 80 37 23106 28 2178 132 10 80 38 23106 28 2178 132 10 80 39 2342 30 2333 143 90 87 19 8	e (vph) low (vph) sases sases sases sases loses sases	2106 2342 NA NA 10.0 34.3 75.0 62.5% 75.0 62.5% 75.0 62.5% 75.0 62.5% 75.0 62.5% 75.0 62.5% 75.0 62.5% 75.0 63.37 75.0 63.37 75.0 63.37 75.0 75.0 75.0 75.0 75.0 75.0 75.0 75.			132 132 143 Perm 8 8 8 8 8 8 10.0 34.7 35.0 29.2% 3.7 2.0 0.0 0.0	10 10 NA 8	80 80 87 Perm	
36 2106 28 2178 132 10 80 99 2342 30 2393 143 90 87 19 Perm NA Perm	iow (vph) iow (vph) P sases sases sases sase (s)	2106 2342 NA NA 10.0 34.3 34.3 34.3 1.6 0.0 5.3 6.25% 5.3 1.6 0.0 5.3 32.1 32.1 32.1 32.1 32.1 32.1 32.1 32			132 143 143 8 8 8 8 8 34.7 35.0 29.2% 3.7 2.0 0.0 0.0	00 NA 8 8	80 87 Perm	7
39 2342 30 2393 143 90 87 19 Perm NA pm+pl NA Perm NA	How (vph) Passes sees see (s)	2342 NA 100 100 34.3 34.3 5.5 62.5% 3.7 1.6 0.0 5.3 C-Min 0.9 32.1 32.1 32.1 32.1 32.1 32.1 32.1 32.1			143 8 8 8 8 8 34.7 35.0 29.2% 3.7 2.0 0.0 0.0	08 NA 8	87 Perm	
Perm NA pm+pt NA Perm NA Perm N NA N N N N N N N N N N N N N N N N N	P P Sees See See See See See See See See Se	NA 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			8 8 8 8 8 34.7 35.0 29.2% 3.7 2.0 0.0 0.0 5.7	W 8	Perm	192
2 1 6 8 8 4 2 2 2 6 6 8 8 4 10 10 10 10 10 10 10 10 10 10 10 10 10 1	sses sses see see (s) (s) (s) (s) (s) (s) (s) (s) (s) (s)	2 10.0 34.3 75.0 62.5% 3.7 1.6 0.0 5.3 7 ks C-Min 0.98 32.1 32.1 32.1 32.1			10.0 10.0 34.7 35.0 29.2% 3.7 2.0 0.0 5.7	∞ ∞		¥
2 6 6 8 8 4 4 100 10.0 6.0 10.0 10.0 10.0 10.0 10.0 10	sees see see see see see see see see se	62 62 63 63 63 63 63 63 63 63 63 63 63 63 63			8 8 8 34.7 35.0 29.2% 3.7 2.0 0.0	∞		4
100 100 6.0 10.0 10.0 10.0 10.0 10.0 10.	se (s) (1 (s)	33.33			10.0 34.7 35.0 29.2% 3.7 2.0 0.0	∞	4	
100 10.0 6.0 10.0 10.0 10.0 10.0 10.0 10	(s)	627			10.0 34.7 35.0 29.2% 3.7 2.0 0.0 5.7		4	4
100 100 100 100 100 100 100 100 100 100	1 (s) (1 (s)	62,73			34.7 35.0 29.2% 3.7 2.0 0.0			
34.3 34.3 34.7 34.7 34.7 34.7 34.7 34.7	((s) (2) (2) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4				34.7 35.0 29.2% 3.7 2.0 0.0 5.7	10.0	10.0	10.0
750 750 850 350 350 350 350 350 350 350 350 350 3	(s)	62,			35.0 29.2% 3.7 2.0 0.0 5.7	34.7	34.7	34.7
62.5% 62.5% 8.3% 70.8% 29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 23.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7	(s)	62 -32			29.2% 3.7 2.0 0.0 5.7	35.0	35.0	35.0
3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7	(s) (s) (s) (s) (n) (s) (s) (s) (s) (s) (s) (s) (s	2008		3.7 1.6 0.0 5.3 5.3 0.93 24.0 0.0	3.7 2.0 0.0 5.7	29.2%	29.2%	29.2%
1.6 1.6 1.0 1.6 2.0 2.0 2.0 2.0 5.3 5.1 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3	(s) Iust (s) In (s) Imize? C C C C C C S S S S S S S S S S S S S	-328		1.6 0.0 0.0 5.3 5.3 0.93 24.0 0.0	2.0	3.7	3.7	3.7
15.3 5.3 4.0 5.3 5.7 5.7 5.7 5.7 5.1 Lag Lag Lead A C-Min None C-Min None None None None C-Min None None None None None None None Non	inize? C.			5.3 5.3 5.3 0.93 24.0 0.0	5.7	2.0	2.0	2.0
5.3 5.3 4.0 5.3 5.7 5.7 5.7 5.7 5.7 5.4 149 Lead Ves Yes Yes Yes Yes C-Min None C-Min None None None None None O.643 0.98 0.20 0.93 0.91 0.25 0.37 0.6 3 0.9 0.20 0.09 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0	imize? C. C. I. Soth (m) P. Soth (m) P. Soth (m) P. Soth (m) Other C.			5.3 C-Min 0.93 24.0 0.0	2.7	0.0	0.0	0.0
Lag Lead Ves Yes Yes C-Min C-Min None C-Min None None None None 0.63 0.98 0.20 0.93 0.91 0.25 0.37 0.6 38.2 32.1 8.6 24.0 97.4 12.0 45.3 52. 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 38.2 32.1 8.6 24.0 97.4 12.0 45.3 52. 7.9 -326.4 1.8 241.3 34.8 2.2 18.9 42. 7.9 -326.4 1.8 241.3 34.8 2.2 18.9 42. 7.9 -326.4 1.8 241.3 34.8 2.2 18.9 42. 7.0 -326.4 1.8 241.3 34.8 1.20 18.9 42. 7.0 -326.7 70.0 475.1 56.4 40.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	imize? C.			C-Min 0.93 24.0 0.0		5.7	5.7	5.7
Ves Yes Yes C-Min None None None None None O.63 63 698 0.20 6.93 0.91 0.25 6.37 0.6 0.63 6.98 0.20 6.93 0.91 0.25 6.37 0.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	imize? C. C. Soth (m) n obst (m) n obst (m) oth (m)			C-Min 0.93 24.0 0.0				
C-Min C-Min None C-Min None None None None None None None Non	C- C- C () () () () () () () () () (C-Min 0.93 24.0 0.0				
0.63 0.98 0.20 0.93 0.91 0.25 0.37 0.6 0.63 0.98 0.20 0.93 0.91 0.25 0.37 0.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 38.2 32.1 8.6 24.0 97.4 12.0 45.3 52. 7.9 -326.4 18 241.3 34.8 2.2 18.9 42. 7.9 -326.4 18 241.3 34.8 2.2 18.9 42. 7.0 70 70 70 70 70 70 70 70 70 70 70 70 70	5 5 50th (m) 7 05th (m) 7 (m)			0.93	None	None	None	None
38.2 32.1 8.6 24,0 97,4 120 45,3 52,0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	7 (m) HD (m) 195th (m) m 195th (m) m 201st (m) dth (m) 7 (dth (m) 47) fth (m) 7 (dth (m) 47)			0.0	0.91	0.25	0.37	0.64
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	3 50th (m) 195th (m) m Dist (m)			0.0	97.4	12.0	45.3	52.4
38.2 32.1 8.6 24.0 97.4 12.0 45.3 52. 77.9 -326.4 1.8 241.3 34.8 2.2 18.9 42. 77.9 -326.4 1.8 241.3 34.8 2.2 18.9 42. 70.0 70.0 475.1 56.4 371.3 31.8 6.2 32.9 63.3 13.3 36.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 4 7			0 // C	0.0	0.0	0.0	0.0
3 2.2 18.9 42. 15.6 3.9 63. 56.4 40.0 31. 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ε			74.0	97.4	12.0	45.3	52.4
m7.9 m222.6 5.4 #374.8 #62.3 15.6 32.9 63. 700 700 62 2379 700 700 700 700 700 700 700 700 700 7				241.3	34.8	2.2	18.9	42.3
700 336.0 475.1 56.4 313. 700 62 2379 750.0 2560 210 454 417 399 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				#374.8	#62.3	15.6	32.9	63.3
700 700 700 700 700 700 700 700 700 700				475.1		56.4		313.3
62 2379 150 2560 210 454 317 39 0			70.0				40.0	
20 0.05 0.09 0.00 0.05 0.00 0.00 0.05 0.00 0.00 0.05 0.00 0.00			150	2560	210	454	317	395
1. 120 1.			0	0	0	0	0	0
1. 120 1. 120	_		0	0	0	0	0	0
gith: 120 trenced to phase 2:EBTL and 6:WBTL, Start of Green let-Coordinated scapacity, queue is theoretically infinite. maximum after two cycles. volume exceeds capacity, queue may be longer. maximum after two cycles. tectorial queue is metered by upstream signal. 4: Clark Boulevard & Derry Road			0	0	0	0	0	0
gth. 120 gth. 120 see 2:EBTL and 6:WBTL, Start of Green led-Coordinated scapacity, queue is theoretically infinite. maximum after two cycles. navimum after two cycles. n percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road			0.20	0.93	0.68	0.20	0.27	0.49
gth. 120 stenced to phase 2:EBTL and 6:WBTL, Start of Green lted-Coordinated scapacity, queue is theoretically infinite. maximum after two cycles. maximum after two cycles. maximum after two cycles. The percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 4: Clark Boulevard & Derry Road	Intersection Summary							
gth: 120 srenced to phase 2:EBTL and 6:WBTL, Start of Green ted-Coordinated s capacity, queue is theoretically infinite. maximum after two cycles. maximum after two cycles. naximum after two cycles. The percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 4: Clark Boulevard & Derry Road	Cycle Length: 120							
irenced to phase 2:EBTL and 6:WBTL, Start of Green lted-Coordinated s capacity, queue is theoretically infinite. maximum after two cycles. maximum after two cycles. remain after two cycles. newimum after two cycles. The percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 4: Clark Boulevard & Derry Road 4: Clark Boulevard & Derry Road 4: Clark Boulevard & Derry Road	Actuated Cycle Length: 120							
led-Coordinated s capacity, queue is theoretically infinite. maximum after two cycles. volume acveds capacity, queue may be longer. maximum after two cycles. representite queue is metered by upstream signal. 4: Clark Boulevard & Derry Road	Offset: 0 (0%), Referenced to phase 2	2:EBTL and	6:WBTL	Start of C	reen			
rear-Coordinated s capacity, queue is theoretically infinite. maximum after two cycles. recentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road	Natural Cycle: 150							
s capacity, queue in tructurally minitie. maximum after two cycles. necrentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road	Control Type: Actuated-Coordinated	oitoroodi oi	sicilari vilo					
volume exceeds capacity, queue may be longer. maximum after two cycles. percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 2 (R)	 Volume exceeds capacity, queue Ouerre shown is maximim after tw 	Is ineoretic	ally infinit	ni				
maximum after two cycles. n percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 2 (R)	# 95th percentile volume exceeds ca	apacity, que	eue may l	be longer.				
4: Clark Boulevard & Derry Road		vo cycles. e is metered	by upstre	eam signa	=			
(8)		ard & Derry	Road					
→ D2 (R) 55 s								_
358	1							₩
	10s 75s							35 s
	**************************************							**************************************

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Total (PM) 2032 Scenario 4

Queues 5: Fifth Line & Clark Boulevard

Future Total (PM) 2032 Scenario 4

Synchro 11 Report 12-14-2023 BA Group

→	SBT	4	478	478	532	NA	4		4		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.41	7.2	0.0	7.2	24.8	46.2	372.1		1857	0	0	0	0.29					
-	NBT	¢	477	477	276	¥	∞		∞		10.0	34.7	85.0	70.8%	3.7	2.0	0.0	5.7			Min	0.41	7.2	0.0	7.2	24.5	45.5	156.9		1859	0	0	0	0.28					
•	NBL	y -	4	4	4	Perm		00	∞		10.0	34.7	82.0	70.8%	3.7	2.0	0.0	5.7			Min	0.01	5.5	0.0	5.5	0.1	1.1		35.0	823	0	0	0	0.00					
ļ	WBT	\$	6	6	1	NA	9		9		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.02	11.8	0.0	11.8	0.7	3.3	86.5		1460	0	0	0	0.01					
-	WBL	r	18	18	20	Perm		9	9		10.0	34.3			3.7	1.6	0.0	5.3			None	0.05	12.7	0.0	12.7	1.3	4.9		35.0	1096	0	0	0	0.02					
Ť	EBT	÷	13	13	25	NA	2		2		10.0	34.3			3.7	1.6	0.0	5.3			None	0.05	10.0	0.0	10.0	6.0	4.9	204.0		1385	0	0	0	0.02					
1	EBL	<i>y</i> -	36	36	42	Perm		2	2		10.0	34.3	35.0	29.2%	3.7	1.6	0.0	5.3			None	0.11	13.3	0.0	13.3	2.9	8.1		35.0	1110	0	0	0	0.04					ordinated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 38.1	Natural Cycle: 70	Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard 9 **1**005 35 s 4 Ø6

HCM Unsignalized Intersection Capacity Analysis 10: Clark Boulevard & Anatolia Building 1 North Access/Anatolia Building 2 North Aଉଞ୍ଜେକ୍ତ କଟାବୀଦ

FBL FBT FBR WBL WBT WBR NBL NBT NBR SBL 3 40		4	†	<i>></i>	>	ļ	4	•	←	•	۶	→	•
Particle	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
The (verbit) 3 0 1 4 0 36 1 176 1 9 me (verbit) 3 0 1 4 0 36 1 176 1 9 me (verbit) 3 0 1 4 4 0 36 1 176 1 9 9 me (verbit) 3 0 1 4 4 0 36 1 176 1 9 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ane Configurations		4			4			4			4	
None Stop Stop Free 1 9	raffic Volume (veh/h)	က	0	-	4	0	36	-	176	-	6	71	4
Stop Stop Stop Free I	uture Volume (Veh/h)	co	0	-	4	0	36	-	176	-	6	71	4
10	ign Control		Stop			Stop			Free			Free	
Factor (by) 3 0 17 4 0 39 17 191 1 10 (m) (m) (m) (m) (m) (m) (m) (m	srade		%0			%0			%0			%0	
rate (rph) 3 0 1 4 0 39 1 191 1 10 (m) ead (ms) ead (eak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
(m) (ckage are (veh) are (veh) age veh) graft (m) unbocked age veh) graft (m) unbocked age veh) age veh) graft (m) unbocked aga veh) by 294 294 192 81 192 and aga veh) by 294 294 192 81 192 aga veh) by 294 294 192 81 192 aga veh) by 294 294 192 81 192 aga veh) by 295 and aga veh) by 294 294 192 aga veh) by 294 294 192 aga veh) by 295 and aga veh) by 294 294 192 aga veh) by 295 and aga veh) by 295 and aga veh) by 295 and aga veh) by 296 and aga veh) by 297 and aga veh)	Hourly flow rate (vph)	23	0	-	4	0	36	-	191	-	10	77	4
(m) ccage (mes) ccan (mes) ccage (mes) cca	edestrians												
eed (m/s) actoriage atter (veh) atter (veh) atter (veh) atter (veh) atter (veh) by (volume and atter (veh) atter (veh) atter (veh) by (veh) atter (veh) atter (veh) by (veh) b	.ane Width (m)												
are (veh) are (veh) are (veh) age veh) age veh age veh) age veh age ve	Valking Speed (m/s)												
are (veh) age veh) grad (m) grad (m) grad (m) honding age veh) And Ag Ag 294 192 81 192 age veh) And veh me 332 293 79 294 294 192 81 192 And veh me 332 293 79 294 294 192 81 192 B	Percent Blockage												
Segment) grad (m) grad (Right turn flare (veh)												
age veh) age veh) age veh) agrad (m) unblocked 332 293 79 294 192 81 1 conf vol 1 conf vol 2 conf vol 332 293 79 294 192 81 1 conf vol 332 293 79 294 294 192 81 2 conf vol 332 293 79 294 294 192 81 34 0 33 3.5 40 3.3 22 8e % 99 100 100 99 100 95 100 99 100 100 99 100 95 100 99 100 100 99 100 95 100 99 100 100 100 99 100 95 100 91 1 3 91 4 1 1 1 4 3 91 Int	Aedian type								None			None	
ginal (m) unblocked unblocked a 32 293 79 294 192 81 a volume 3 2 293 79 294 192 81 b conf vol 2 conf vol 2 conf vol 3 2 293 79 294 192 81 b conf vol 3 3 2 293 79 294 192 81 conf vol 3 3 3 4 1 65 62 4.1 conf vol 3 3 3 4 1 65 62 4.1 conf vol 3 3 4 1 00 99 100 95 100 conf vol 4 43 193 91 b conf vol 5 0 0 0 0 0 0 0 conf vol 6 0 0 0 0 0 0 conf vol 8 0 0 0 0 0 0 conf vol 9 (s) 10.5 9.6 0.0 0.9 conf vol 9 (s) 10.5 9.6 0.0 0.9 conf vol 8 A A A A A A A A A A A B A A A B A A A B A A B A A B A A B A A B A B	(ledian storage veh)												
unblocked aya 293 79 294 192 81 conf vol con conf vol conf vol con	lpstream signal (m)											80	
ng volume 332 293 79 294 192 81 1 conf vol 2 conf vol 332 293 79 294 192 81 2 conf vol 332 293 79 294 192 81 (s) 3.5 4.0 3.3 3.5 4.0 3.3 2.2 ee % 99 100 100 99 100 95 100 (vehth) 590 613 981 654 612 850 1517 1 an 4 3 193 91 ht 39 1 4 4 1 1 1 39 1 4 th 1 39 1 4 th 39 1 4 A A B B A A A A A Submission 0.1 1.3 0.0 0.0 Summary 1.5 96 0.0 0.9 Summary 1.6 Capacity utilization 2.0.6.8 ICU Level of Service A Conditional and A B B A Conditional and B B A A A A A A A A A A A A A A A A A	X, platoon unblocked												
Conflicted Con	C, conflicting volume	332	293	79	294	294	192	81			192		
2 conf vol 332 293 79 294 294 192 81 5 (s) 7.1 6.5 6.2 7.1 6.5 6.2 4.1 (s) 3.3 3.5 4.0 3.3 2.2 2.2 ee-8% 99 100 99 100 95 100 (veh/h) 590 613 981 654 612 850 1517 11 ane # EB1 WB1 NB1 SB1 1 1 1 in 3 4 1 10 9 1517 11 1 in 4 43 193 91 4 4 1	C1, stage 1 conf vol												
ked vol 332 293 79 294 192 81 (s) 7.1 6.5 6.2 7.1 6.5 6.2 4.1 (s) 3.5 4.0 3.3 3.5 4.0 3.3 2.2 ee/S 99 100 100 99 100 95 100 r(vehrh) 590 6.13 981 6.5 6.12 850 1517 11 rane # EB 1 WB 1 NB 1 SB 1 8.1 1 1 1 rane # EB 1 WB 1 NB 1 SB 1 8.1 1 <t< td=""><td>C2, stage 2 conf vol</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	C2, stage 2 conf vol												
(\$) (\$) (\$) (\$) (\$) (\$) (\$) (\$) (\$) (\$)	Cu, unblocked vol	332	293	79	294	294	192	8			192		
(vehrh) 550 613 981 654 612 850 1517 11 ane # EB1 WB1 NB1 SB1 al	C, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
8.8 4.0 3.3 3.5 4.0 3.3 2.2 8.8 99 100 100 99 100 99 100 8.9 100 100 99 100 99 100 8.9 100 100 99 100 99 100 8.9 100 100 99 100 99 8.9 100 100 99 100 99 8.9 100 100 00 100 9.8 100 100 00 10 9.8 100 100 00 10 9.8 100 9.8 100 00 9.8 100 9.8 100 00 9.8 100 9.8 100 00 9.8 100 9.8 100 00 9.8 100 9.8 100 00 9.8 100 9.8 100 00 9.8 100 9.8 100 00 9.8 100 00 00 9.8 100 00 00 9.8 100 00 00 00 9.8 100 00 00 00 9.8 100 00 00 00 9.8 100 00 00 00 9.8 100 00 00 00 9.8 100 00 00 00 9.8 100 00 00 00 9.8 100 00 00 00 00 9.8 100 00 00 00 00 9.8 100 00 00 00 00 00 9.8 100 00 00 00 00 00 00 00 00 00 00 00 00	5, 2 stage (s)												
ee% 99 100 100 99 100 95 100 ((vehrl) 590 613 981 654 612 850 1517 11 and 4 3 193 91 ht 39 1 4 10 ht 655 827 1517 1381 2pacity 0.01 0.05 0.00 0.01 ght 95th (m) 0.1 1.3 0.0 0.2 y (s) 10.5 9.6 0.0 0.9 seley (s) 10.5 9.6 0.0 0.9 Summary 1.6 A A A A A A A A A A A A A A A A A A A	(s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
(vehrlin) 590 613 981 654 612 850 1517 sine # EB1 WB1 NB1 SB1 all 4 43 193 91 hit 655 827 1517 1381 apacity 0.01 0.05 0.00 0.01 apy (s) 105 9.6 0.0 0.9 seley (s) 105 9.6 0.0 0.9 seley (s) 10 9.6 0.0 0.9 Summary 1.6 9.6 0.0 0.9 All A A A A All A A A A Assummary 1.6 0.0 0.9 COUL Level of Service A Assummary 1.6 0.0 0.9 COUL Level of Service A	0 dueue free %	66	100	100	66	100	95	100			66		
al 4 43 193 91 It 1 4 43 193 91 Int 1 3 9 1 4 An analysis of the color of the co	M capacity (veh/h)	260	613	981	654	612	820	1517			1381		
al 4 43 193 91 It 1 3 4 1 10 Int 655 827 1517 138 Sapacity 0.01 0.05 0.00 0.01 Int 95lh (m) 0.11 13 0.0 0.2 Int 95lh (m) 0.11 13 0.0 0.9 Int 95lh (m) 0.1 0.5 9.6 0.0 0.9 Int 96 0.0 0.9 Summary 16 Summary 16 Int 17 Int 18 Int 1	irection, Lane #	EB 1	WB1	NB 1	SB 1								
hit 33 4 1 10 hit 656 8 1 4 -apacity 0.01 0.05 0.00 0.01 y(s) 10.5 9.6 0.0 0.9 B A A A A Summary 1.6 Summary 1.6 Summary 1.6 Howel of Service 1.6 Summary 1.6 Summar	'olume Total	4	43	193	16								
hit 655 827 1517 1381 Appendix 0.01 0.05 0.00 0.01 Jth 95th (m) 0.1 1.3 0.0 0.2 y (s) 10.5 9.6 0.0 0.9 B A A A A Summary 1.6 Summary 1.6 Capacity Unitization 1.5 A 1.6 Summary 1.6 A 1.6 A 2.6 A 3.6 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 5 A 7 A 7 A 7 A 7 A 7 A 7 A 8 A 7 A 7	olume Left	က	4	-	10								
Apacity 0.01 0.05 0.00 0.01 10 0.05 0.00 0.01 10 0.05 0.00 0.02 10 0.00 0.09 10 0.00 0.09 10 0.00 0.09 10 0.00 0.09 10 0.00 0.09 10 0.00 0.09 10 0.00 0.09 10 0.00 0.09 10 0.00 0.00 10 0.00 0.00 10 0.00 0.0	olume Right	_	36	_	4								
Apacity 0.01 0.05 0.00 0.01 In State (1) 0.1 1.3 0.0 0.2 ay (s) 10.5 9.6 0.0 0.9 OS B A A A OS B	SH	929	827	1517	1381								
yt (s) 0.1 1.3 0.0 0.2 yt (s) 10.5 9.6 0.0 0.9 elay (s) 10.5 9.6 0.0 0.9 Summary 1.6 Summary 1.6 Capacity Utilization 20.6% ICU Level of Service 1.0 114 155 115 115 115 115 115 11	olume to Capacity	0.01	0.02	0.00	0.01								
9y (s) 10.5 9,6 0.0 0.9 Elay (s) 10.5 9,6 0.0 0.9 Summary 1,6 Capacity Unitization 20,6% ICU Level of Service icolorium in 15	ueue Length 95th (m)	0.1	1.3	0.0	0.2								
B A A A A A A A A A A A A A A A A A A	ontrol Delay (s)	10.5	9.6	0.0	6:0								
elay (s) 10.5 9.6 0.0 0.9 OS B A Summary Isy Capacity Utilization 20.6% ICU Level of Service 16 of Minni 15	ane LOS	В	A	V	A								
B A 100	pproach Delay (s)	10.5	9.6	0.0	6:0								
y 1.6 1.0 Level of Service 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	pproach LOS	В	⋖										
1.6 Initiation 20.6% ICU Level of Service 15	ntersection Summary												
Utilization 20.6% ICU Level of Service	verage Delay			1.6									
	tersection Capacity Utilizati	on		20.6%	⊇	J Level of	Service			⋖			
	Analysis Period (min)			15									

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							4 2022 3031 al
	1	<i>></i>	•	—	→	*	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	<u>></u>			₩₽	4₽		
Traffic Volume (veh/h)	22	4	2	403	320	œ	
Future Volume (Veh/h)	22	4	2	403	320	80	
Sign Control	Stop			Free	Free		
Grade	%0			%0	%0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	24	4	2	438	380	6	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type				None	None		
Median storage veh)							
Jpstream signal (m)					236		
oX, platoon unblocked							
vC, conflicting volume	809	194	386				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	809	194	386				
.C, single (s)	9.9	6.9	4.1				
C, 2 stage (s)							
F (s)	3.5	3.3	2.2				
on due one free %	94	100	100				
cM capacity (veh/h)	427	814	1166				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2		
Volume Total	78	148	292	253	136		
Volume Left	24	2	0	0	0		
Volume Right	4	0	0	0	6		
SSH	458	1166	1700	1700	1700		
Volume to Capacity	90:0	0.00	0.17	0.15	0.08		
Queue Length 95th (m)	1.6	0.0	0.0	0.0	0.0		
Control Delay (s)	13.4	0.1	0.0	0.0	0:0		
Lane LOS	ω ;	< 9					
Approach Delay (s) Annroach LOS	13.4 R	0.0		0:0			
	2						
Intersection Summary							
Average Delay Intersection Capacity Utilization	ıtion		0.5	⊇	ICU Level of Service	Service	A
Analyzic Doriod (min)			7.0				

Future Total (PM) 2032 Scenario 4 HCM Unsignalized Intersection Capacity Analysis 12: Clark Boulevard & Anatolia Building 1 South Access

																																								A	
																																								a)	
•	SBR		48	48			0.92	25																																ICU Level of Service	
→	SBT	\$	16	16	Free	%0	0.92	17						None																										:U Level	
←	NBT	₩	16	16	Free	%0	0.92	17						None																										೨	
•	NBL		4	4			0.92	4										69			69	4.1	ć	7.7	100	1532	SB1	69	0	25	1700	0.04	0.0	0.0		0.0			6.2	18.9%	15
<i>></i>	EBR		12	12			0.92	13										43			43	6.2	c	3.3	66	1027	NB 1	21	4	0	1532	0.00	0.1	1.4	A	1.4					
•	EBL	>	130	130	Stop	%0	0.92	141										89			89	6.4	L	3.5	82	934	EB 1	154	141	13	942	0.16	4.7	9.6	A	9.6	V				
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tr (s)	b0 dueue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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HCM Unsignalized Intersection Capacity Analysis 11: Clark Boulevard & Anatolia Building 2 South Access

Future Total (PM) 2032 Scenario 4 58 58 58 0% 0.92 63 None 0.92 2.2 99 8 8 158 4.1 0.92 142 142 Free 0% 0.92 154 0.01 0.3 1.9 A 1.9 None 0.92 0.09 156 156 3.3 96 890 6 Stop 0% 0.92 259 3.5 46 39 39 0.05 0.05 9.4 A A 259 Direction, Lane #
Volume Total
Volume Eight
cSH
Volume Right
cSH
Volume to Capacity
Outure to Capacity
Lane Los
Lane LoS Grade
Peak Hour Factor
Peak Hour Factor
Peux Houry flow rate (vph)
Pedeskirans
Lane Width (m)
Walking Speed (m/s)
Walking Speed (m/s)
Walking Speed (m/s)
Walking Type
Median type
Median type
Right turn flare (veh)
Walking Speed (m/s)
Percoral Blockage
Walking Speed (m/s)
Percoral Blockage
Walking Speed (m/s)
Percoral Blockage
Walking (m/s)
Percoral Lane Configurations Traffic Volume (veh/h) -uture Volume (Veh/h) Sign Control

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ICU Level of Service

25.1%

Intersection Summary
Average Delay
Intersection Capacity Utilization
Analysis Period (min)

0.0

Approach Delay (s) Approach LOS

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Background (AM) 2032 Scenario 5

Applications EBI EBI EBI WBI WBI <t< th=""><th> FET FER WBL WBT NBL NBT NBR SBL SBT FAP 1</th><th></th><th>1</th><th>†</th><th>/</th><th>></th><th>Ļ</th><th>1</th><th>•</th><th>←</th><th>•</th><th>٠</th><th>→</th><th>*</th></t<>	FET FER WBL WBT NBL NBT NBR SBL SBT FAP 1		1	†	/	>	Ļ	1	•	←	•	٠	→	*
1,00 1,00	10	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1,2714 153 17 849 41 89 173 30 46 142 1,2714 153 17 849 41 89 173 30 46 142 1,2714 153 17 849 41 89 173 30 46 142 1,2714 153 17 849 41 89 173 30 46 142 1,2714 153 17 849 41 89 173 30 46 142 1,2714 153 1,00 0.95 1.00 1.900 1.900 1.900 1,00 0.95 1.00 0.95 1.00 0.95 1,100 0.99 1.00 0.99 1.00 0.95 1,100 0.99 1.00 0.99 1.00 0.95 1,00 0.99 1.00 0.99 1.00 0.95 1,00 0.99 1.00 0.99 1.00 0.95 1,00 0.99 1.00 0.99 1.00 0.95 1,00 0.99 1.00 0.99 1.00 0.95 1,00 0.99 1.00 0.99 1.00 0.95 1,00 0.99 1.00 0.99 1.00 0.95 1,00 0.99 1.00 0.99 1.00 1,00 0.99 1.00 0.99 1.00 1,00 0.99 1.00 1.00 1.00 1,00 0.90 1.00 1.00 1.00 1,00 0.02 0.03 0.05 0.05 1,00 0.03 0.03 0.05 1,00 0.00 0.03 0.05 1,00 0.00 0.03 0.05 1,00 0.00 0.00	1,2714 153 17 849 41 89 173 30 46 142 1,214 153 17 849 41 89 173 30 46 142 1,214 153 17 849 41 89 173 30 46 142 1,214 153 17 849 41 89 173 30 46 142 1,224 1,00 0,90 1,00 1,900 1,900 1,900 1,900 1,00 0,99 1,00 0,99 1,00 0,95 1,00 0,99 1,00 0,99 1,00 0,99 1,00 0,96 1,00 0,99 1,00 0,99 1,00 0,96 1,00 0,99 1,00 0,99 1,00 0,96 1,00 0,99 1,00 0,99 1,00 0,96 1,00 0,99 1,00 0,99 1,00 1,00 0,96 1,00 0,99 1,00 0,99 1,00 1,00 0,96 1,00 0,99 1,00 0,99 1,00 1,00 0,96 1,00 0,99 1,00 0,99 1,00 1,00 0,96 0,94 0,94 0,94 0,94 0,94 0,94 0,94 1,00 0,96 1,00 0,90 1,00 1,00 1,00 1,00 0,96 0,96 0,96 0,96 0,96 1,00 1,00 0,96 0,96 0,96 0,96 0,96 1,00 1,00 0,00 0,22 0,10 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00	Lane Configurations	r	₩		r	₩		F	₩		F	₩	
1214 153 17 849 41 84 41 142 1900	100 100	Traffic Volume (vph)	164	2214	153	17	849	41	68	173	30	46	142	137
1900 1900	1900 1900	Future Volume (vph)	164	2214	153	17	849	41	68	173	30	46	142	137
6.2 4.0 6.2 6.3 6.3 6.3 6.3 0.95	6.2 4.0 6.2 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3	Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,000 0.95 1,000 1,0	0.95 1.00 0.95 1.00 0.95 1.00 0.99 1.00 0.99 1.00 0.95 1.100 0.09 1.00 0.99 1.00 0.95 3.163 1.00 0.99 1.00 0.95 1.00 0.95 3.163 1.00 0.09 1.00 0.95 1.00 0.95 1.00 0.93 1.00 0.95 1.00 0.94 0.94 0.94 <td>Total Lost time (s)</td> <td>4.0</td> <td>6.2</td> <td></td> <td>4.0</td> <td>6.2</td> <td></td> <td>6.3</td> <td>6.3</td> <td></td> <td>6.3</td> <td>6.3</td> <td></td>	Total Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
1,00 0.99 1,00 0.99 1,00 0.93 1,00 0.93 1,00 0.95 1,00	1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.99 1,000 0.91 1,000 0.94 0.9	Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
1,00	1,00	Frt	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.93	
3163 1805 2929 1805 3504 1758 3304 3163 100 0.066 1.000 0.47 1.000 3163 109 2929 900 3504 812 3304 2355 163 18 903 44 95 184 32 49 151 2355 163 18 904 0.94 0.94 0.94 0.94 0.94 2355 163 18 904 0.95 151 0.04 22% 1% 0.0% 8% 33% 0.0% 0.0% 5% 40% 1% 49 2 0 54 2 0 0 15 0 0 175 28 1% 0.0% 8% 33% 0.0% 0.0% 5% 40% 1% 1	3163 1805 2929 1805 3504 1758 3304 3163 1805 2929 1805 3504 1758 3304 1004 0.094	Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
1,00	1,00	Satd. Flow (prot)	1763	3163		1805	2929		1805	3504		1258	3304	
3163	3163	FIt Permitted	0.25	1.00		90.0	1.00		0.47	1.00		0.61	1.00	
0.94 0.95 0.95	1,094 0,94	Satd. Flow (perm)	458	3163		109	2929		006	3504		812	3304	
1255 163 18 903 44 95 184 32 49 151 286 163 18 904 9 15 0 15 0 0 125 286 196 186 944 95 184 32 49 151 286 196 186 944 95 201 0 49 172 49 2 0 54 2 0 0 1 6 1 10	1, 2355 163 18 903 44 95 84 32 49 151 3 0 0 3 0 0 15 0 0 125 49 2 0 84 32 201 0 49 172 5 2% 1% 0% 8% 33% 0% 0% 5% 40% 172 1 NA	Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
2515 3 0 0 3 4 0 0 15 0 0 2516 196 896 33% 0 % 5% 40% 49	1, 2515 0 0 0 0 0 0 0 0 0	Adj. Flow (vph)	174	2355	163	18	903	44	95	184	32	46	151	146
1, 2515	1, 2515	RTOR Reduction (vph)	0	က	0	0	က	0	0	15	0	0	125	0
2.2% 1% 0% 8% 33% 0% 0% 5% 40%	2. 2% 1% 0% 8% 33% 0% 0% 5% 4	Lane Group Flow (vph)	174	2515	0	18	944	0	95	201	0	46	172	0
A 9	NA	Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
NA	NA	Bus Blockages (#/hr)	-	46	2	0	24	2	0	0	-	9	-	2
1	2 1 6 8 8 4 4 75.6 72.7 69.9 16.1 16.1 16.1 75.6 72.7 69.9 16.1 16.1 16.1 75.6 72.7 69.9 16.1 16.1 16.1 75.6 72.7 69.9 16.1 16.1 16.1 75.6 72.7 69.9 16.1 16.1 16.1 75.6 72.7 69.9 16.1 16.1 16.1 75.6 72.7 69.9 16.1 16.1 16.1 75.6 72.7 69.9 16.1 16.1 16.1 75.6 72.7 69.9 16.1 16.1 16.1 75.6 72.7 69.9 16.1 16.1 16.1 75.6 72.7 11.2 13.0 508 75.7 11.2 10.1 10.1 10.1 10.1 10.1 10.1 10.1	Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	N	
15.6 6.9 8 16.1	1,56	Protected Phases	2	2		-	9			∞			4	
756 727 699 161 161 161 161 161 161 161 162 163 163 163 163 161 161 161 161 161 161 161 161 162 163	756 727 699 16.1 16.	Permitted Phases	2			9			∞			4		
1,56	1756 727 699 161 162	Actuated Green, G (s)	82.4	75.6		72.7	6.69		16.1	16.1		16.1	16.1	
0.68	0.68	Effective Green, g (s)	82.4	75.6		72.7	6.69		16.1	16.1		16.1	16.1	
6.2 40 6.2 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3	6.2 40 6.2 6.3 6.3 6.3 6.3 8.3 8.3 8.3 8.3 8.3 8.3 8.3 8.3 8.3 8	Actuated g/C Ratio	0.74	0.68		0.65	0.63		0.15	0.15		0.15	0.15	
3.0 3.0 3.0 3.0 3.0 3.0 2.154 114 1844 130 5.08 117 2.079 0.00 0.32 0.06 1.17 0.16 0.51 0.73 0.40 0.42 1.17 2.64 11.2 45.4 43.0 43.2 1.17 2.64 11.2 45.4 43.0 43.2 1.10 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.01 1.23 64.3 43.6 45.6 1.02 1.05 1.05 1.00 1.08 1.10 1.00 1.00 1.08 1.00 1.00 1.00 1.09 1.00 1.00 1.00 1.00 1.0	3.0 3.0 3.0 3.0 3.0 3.0 2.154 114 1844 130 508 117 2.079 0.00 0.32 0.00 1.17 0.16 0.51 0.74 0.00 1.17 0.16 0.51 0.74 0.00 0.42 1.17 2.64 11.2 45.4 43.0 43.2 1.00 1.00 1.00 1.00 1.00 1.00 80.8 0.7 1.0 18.9 0.5 2.4 98.5 27.1 12.3 64.3 43.6 45.6 45.6 F C B E D D 92.5 12.5 B D D 1.08 1.09 1.00 1.00 1.09 1.00 1.00 1.00 1.00 2.4 49.9 D 1.01 Sum of lost time (s) 16.5 1.07 6% ICU Level of Service G	Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
2154 114 1844 130 508 117 117 117 117 117 118 117 117 118 11	2154 114 1844 130 508 117 2 c0.79 0.00 0.32 0.06 2 1.17 0.16 0.51 0.73 0.40 0.42 2 1.17 2.64 11.2 45.4 43.0 43.2 2 1.17 2.64 11.2 45.4 43.0 1.00 2 80.8 0.7 1.0 100 1.00 1.00 2 80.8 27.1 12.3 64.3 43.6 45.6 2 80.8 27.1 12.5 64.3 43.6 45.6 2 80.8 0.7 1.0 189 0.5 2.4 2 8 67.8 11.2 8 64.3 43.6 45.6 2 1.00 1.00 1.00 1.00 1.00 1.00 2 8 77 1 12.5 8 10 0 2 8 10.0 1.00 1.00 1.00 1.00 2 9 2.5 1.00 1.00 1.00 1.00 1.00 2 1.00 1.00 1.00 1.00 1.00 1.00 1.00 2 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
8 C0.79 0.00 0.32 C0.11 0.06 0.006 0.006 0.11 0.11 0.16 0.11 0.12 0.14 0.12 0.10 0.00 0.11 0.11 0.12 0.14 0.12 0.14 0.12 0.14 0.14 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15	8 C0.79 0.00 0.32 C0.11 0.06 0.006 0.006 0.007 0.117 0.16 0.51 0.73 0.40 0.43 0.006 0.006 0.117 0.16 0.51 0.73 0.40 0.43 0.100	Lane Grp Cap (vph)	439	2154		114	1844		130	208		117	479	
1.17	1.17	v/s Ratio Prot	c0.03	c0.79		0.00	0.32			90:0			0.02	
117	1,17	v/s Ratio Perm	0.26			0.10			c0.11			90:0		
3 17.7 26.4 11.2 45.4 43.0 43.2 1.00 1.00 1.00 1.00 1.00 1.00 8.08 0.7 1.0 1.0 1.0 1.0 98.5 27.1 12.3 64.3 43.6 45.6 7 F C B E D D 92.5 12.5 R 49.9 D 67.6 HCM 2000 Level of Service E E 1.08 1.0 Sum of lost time (s) 16.5 15 15 G G	3 17.7 26.4 11.2 45.4 43.0 43.2 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.01 1.00 1.00 1.00 1.00 27.1 1.23 64.3 43.6 45.6 1.00 27.1 1.23 64.3 43.6 45.6 1.00 27.5 1.25 49.9 D D 1.08 HCM 2000 Level of Service E F F 1.08 Sum of lost time (s) 16.5 1.07 6% ICU Level of Service G	v/c Ratio	0.40	1.17		0.16	0.51		0.73	0.40		0.42	0.36	
100 100 100 100 100 100 100 100 100 100	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Uniform Delay, d1	5.3	17.7		26.4	11.2		45.4	43.0		43.2	42.8	
808 0.7 1.0 189 0.5 2.4 98.5 27.1 12.3 64.3 43.6 45.6 4 92.5 12.5 49.9 D D D 92.5 12.5 B E D D 67.6 HCM 2000 Level of Service E 11.0 Sum of lost time (s) 16.5 15.6 15.6 15.6 15.6 15.6 15.6 15.6	808 07 10 189 0.5 2.4 98.5 27.1 12.3 64.3 43.6 45.6 45.6 92.5 12.5 49.9 D D D D D D D D D D D D D D D D D D	Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
98.5 27.1 12.3 64.3 43.6 45.6 7.6 9.5 27.1 12.3 64.3 43.6 45.6 9.5 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	98.5 27.1 12.3 64.3 43.6 45.6 92.5 12.5 49.9 P D D D D D D D D D D D D D D D D D D	Incremental Delay, d2	9.0	80.8		0.7	1.0		18.9	0.5		2.4	0.5	
7 F C B E E D D D C C C B E E D D D C C C C C C C C C C C C C C C	92.5 (2.8 E D D D P C B E D D D D C C B E D D D D C C C B E D D D D C C C C C C C C C C C C C C C	Delay (s)	2.9	98.5		27.1	12.3		64.3	43.6		42.6	43.3	
92.5 12.5 49.9 F B D D	925 125 49.9 F B D D D D D D D D D D D D D D D D D D	Level of Service	⋖	_		ی	a		ш	a		<u></u>	<u></u>	
F B B D 67.6 HCM 2000 Level of Service 1.08 111.0 Sum of lost time (s) 107.6% ICU Level of Service 15	67.6 HCM 2000 Level of Service 1.08 Sum of lost time (s) 107.6% ICU Level of Service 15	Approach Delay (s)		92.5			12.5			49.9			43.6	
67.6 HCM 2000 Level of Service 1.08 111.0 Sum of lost time (s) 107.6% ICU Level of Service 15	67.6 HCM 2000 Level of Service 1.08 111.0 Sum of lost time (s) 107.6% ICU Level of Service 15	Approach LOS		ı.			a			٥			٥	
67.6 HCM 2000 Level of Service 1.08 1110 Sum of lost time (s) 107.6% ICU Level of Service 15	67.6 HCM 2000 Level of Service 1.08 Sum of lost time (s) 107.6% ICU Level of Service 15	Intersection Summary												
1.08 111.0 Sum of lost time (s) 107.6% ICU Level of Service 15	1.08 111.0 Sum of lost time (s) 107.6% ICU Level of Service 15	HCM 2000 Control Delay			9.79) 보	M 2000 I	Level of S	service		ш			
h (s) 111.0 Sum of lost time (s) Utilization 107.6% ICU Level of Service 15	h (s) 111.0 Sum of lost time (s) Utilization 107.6% ICU Level of Service 15	HCM 2000 Volume to Capaci	ty ratio		1.08									
Utilization 107.6% ICU Level of Service 15	Utilization 107.6% ICU Level of Service 15 ICU Level of Service 15	Actuated Cycle Length (s)			111.0	S	m of lost	time (s)			16.5			
	a	Intersection Capacity Utilizati	uo		%9'.00	⊇	U Level o	f Service			G			
	c. Critical Lane Group	Analysis Period (min)			15									

Synchro 11 Report

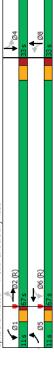
12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Background (AM) 2032 Scenario 5

rations e (vph) low (vph) ph ph sses sse sse sse (s)		EBT	WBL	WBT	NBI	FOIN		H	
su (hu)			,		NUL	INDI	SBL	SBT	
(ha))		<u>+</u>	-	₩	¥	₩.	*	₩.	
(vph)		2214	17	849	86	173	46	142	
(vph)		2214	17	849	86	173	46	142	
		2518	18	947	96	216	46	297	
	td	Ä	pm+pt	NA	Perm	M	Perm	M	
	2	7	_	9		∞		4	
e (s)	2		9		∞		4		
(s)	2	7	-	9	∞	∞	4	4	
		25.0	7.0	25.0	10.0	10.0	10.0	10.0	
		31.2	11.0	31.2	32.3	32.3	32.3	32.3	
	11.0	0.79	11.0	0.79	33.0	33.0	33.0	33.0	
otal Split (%) 9.9%		60.4%	%6.6	60.4%	29.7%	29.7%	29.7%	29.7%	
Yellow Time (s) 3.0	0.	4.0	3.0	4.0	4.0	4.0	4.0	4.0	
	0.	2.2	1.0	2.2	2.3	2.3	2.3	2.3	
ost Time Adjust (s) 0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fotal Lost Time (s) 4.0	0	6.2	4.0	6.2	6.3	6.3	6.3	6.3	
.ead/Lag Lead	p	Lag	Lead	Lag					
-ead-Lag Optimize? Yes		Yes	Yes	Yes					
Recall Mode None		C-Min	None	C-Min	None	None	None	None	
//c Ratio 0.39		1.13	0.10	0.51	0.73	0.41	0.42	0.49	
		84.6	2.7	13.4	74.6	41.0	52.3	23.7	
y		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		84.6	2.7	13.4	74.6	41.0	52.3	23.7	
		~335.3	0.8	56.1	21.1	22.0	10.3	16.5	
Queue Length 95th (m) 19.4		#447.2	3.3	92.1	37.2	31.6	21.6	27.8	
		475.1		256.2		211.8		201.7	
-			100.0		45.0		30.0		
Base Capacity (vph) 447		2226	184	1848	216	826	195	902	
_	0	0	0	0	0	0	0	0	
_	0	0	0	0	0	0	0	0	
ctn		0	0	0	0	0	0	0	
Reduced v/c Ratio 0.39		1.13	0.10	0.51	0.44	0.25	0.25	0.33	
ntersection Summary									
Sycle Length: 111									
Actuated Cycle Length: 111 Offset: 0 (0%) Referenced to phase 2:FBTI and 6:WBTI Start of Green	3.7.FB	Il and	6:WBTI	Start of	Green				
Vatural Cycle: 150									
Control Type: Actuated-Coordinated	-								
Volume exceeds capacity, queue is theoretically infinite.	e is th	eoretica	ally infini	ė.					
Queue shown is maximum after two cycles.	two cy	cles.							
95th percentile volume exceeds capacity, queue may be longer	capac	ity, que	ene may	oe longer					

Splits and Phases: 1: Sixth Line & Derry Road



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Future Background (AM) 2032 Scenario 5

Adversariation EBI	BR WBL 163 193 163 193 163 193 100 1900 100	₩BT WBR ₩BT WBR 169 261 1769 261 1769 261 1900 1900 1909 1009 11.00 1	NBI 100 100 100 100 100 1120 1688 0.68 0.68 0.68 0.68 0.68 0.68 0.68 0	NBT	113 113 113 120 0 0 0 3% 2	SBL 110 1100 1900 5,7 1.00 1.00 0.95 501 0.94 117 117 117 118 118 118 118 118 118 118	\$\frac{\psi_0}{1}\$\$ \$71\$ \$71\$ \$71\$ \$71\$ \$71\$ \$71\$ \$71\$	32 32 34 34 34 34 34 2
100 100				++++++++++++++++++++++++++++++++++++++	113 113 120 0 0 0 0 0 3% 2	110 110 110 5.7 1.00 0.95 1.10 0.32 501 0.94 117 117 117 118 13 Perm	444 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	32 32 32 34 34 0 0 0 0 0 0
92 2318 92 2318 1900 1900 4.0 5.3 1.00 0.95 1.00 0.95 1.00 0.95 1.00 325 1.00 325 0.94 0.94 98 2466 h) 0 8 246 h) 98 2466 h) 0 9 8 2466 h) 0 0 8 246 h) 0 0 8 246 h) 0 0 8 2635 h) 98 22 74.7 5 82.2 74.7 6 82.2 74.7 1 83.0 0.00				289 289 1900 5.7 0.95 0.96 0.96 1.00 3203 3203 34 393 9% 8 8	113 113 1900 0 0 0 0 0 3% 2	110 1900 5.7 1.00 1.00 0.95 11501 0.32 501 117 117 117 14% 13	71 1900 5.7 0.95 0.95 0.095 1.00 3.250 0.94 76 28 28 28 28 28 27 4 4 4	32 32 32 34 00.94 0 0 0 0 0 0
92 2318 1900 1900 1900 1900 1900 1900 1900 1900				289 1900 5.7 0.95 0.95 0.96 1.00 3203 3203 3203 34 34 34 37 37 37 37 37 37 37 37 37 37 37 37 37	113 1900 0.94 120 0 0 0 3% 2	110 1900 5.7 1.00 1.00 0.95 501 0.94 117 117 14% 13	71 1900 0.95 0.95 0.95 1.00 3.250 0.94 76 28 28 28 28 27 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	32 34 00.94 0 0 0 0 0 0 2 2
1900 1900 1900 1900 1900 1900 1900 1900				1900 5.7 0.95 0.96 1.00 3203 1.00 3203 3203 337 34 393 9% 8	0.94 120 0 0 3% 2	1900 1.00 1.00 0.95 1501 0.32 501 0.94 117 117 14% 13	1900 5.7 0.95 0.95 1.00 1.00 1.00 76 76 78 82 82 82 82 84 10 10 10 10 10 10 10 10 10 10 10 10 10	0.94 34 34 0 0 0 2 2
4,0 5,3 1,00 0,95 1,00 0,95 1,00 0,95 1,00 1,00 1,00,1 1,00 1,00				5.7 0.95 0.96 1.00 3203 1.00 3203 307 34 34 37 37 8	0.94 120 0 0 3% 2	5.7 1.00 1.00 0.95 0.95 501 0.94 117 117 14% 13	5.7 0.95 1.00 3.250 3.250 0.94 76 28 82 82 82 82 4 4	0.94 34 0 0 0 2 2
1.00 0.99 1.00 0.99 1.00 0.95 1.00 3252 0.21 1.00 349 3252 0.24 0.94 0.98 2466 h) 98 2466 h) 98 2466 h) 98 2466 h) 98 2466 h) 0.98 2466 h) 98 2466 h) 98 2466 h) 98 246 5 36 5 36 6 0.62 1 30 1 30 1 30 1 30 1 30 1 30 1 30 1 30				0.96 0.96 0.06 1.00 3203 3.03 3.03 3.03 3.03 3.03 3.03 3	0.94 120 0 0 0 3% 2	1.00 0.95 1.501 0.32 501 0.94 117 0 117 14% 13	0.95 0.095 1.00 3.250 1.00 3.250 0.94 76 28 82 82 82 82 4 4	0.94 34 0 0 0 2 2
1.00 0.99 0.50 1.00 1.00 3252 0.21 1.00 3.49 3252 0.21 1.00 4 0.94 0.94 0.98 2466 0.98 2466 0.98 2635 0.11% 2% 0.4 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.95 3.26 0.06 0.62 0.06 0.62 0.03 138.1 0.19 0.31 1.30 0.31 1.30 0.31 1.30 0.31 1.45 0.9				0.96 1.00 3.203 1.00 3.203 3.203 3.203 3.4 3.4 3.7 3.7 8 8	0.94 120 0 0 0 3% 2	1.00 0.95 1.501 0.32 501 0.94 117 0 117 14% 13	0.95 1.00 3.250 1.00 1.00 0.94 76 28 28 28 28 1 1 1 NA	0.94 34 0 0 0 2 2
(a) 1.00 (b) 1.00 (c)				1.00 3203 1.00 3203 3203 307 34 34 393 9% 8	0.94 120 0 0 3% 2	0.95 1501 0.32 501 0.94 117 118 118 Perm	1.00 3250 1.00 3250 0.94 76 28 28 28 2% 1	0.94 34 0 0 114%
1600 3252 349 3252 1004 094 98 2466 h) 98 2635 h) 98 2635 h) 98 22 2 5 8 22 74.7 8 82.2 74.7 9 82.2 74.7 1 90.9 1 1.30 1 1.30 1 1.30 1 1.30 1 1.30 1 1.46 1 146,9 1 146,9	Transport of the state of the s			3203 1.00 3203 0.94 307 383 9% NA 8	0.94 120 0 0 3% 2	1501 0.32 501 0.94 117 117 14% Perm	3250 1.00 3250 0.94 76 28 82 28 1 1 NA	34 34 0 0 114%
(b) 0.21 1.00 349 3252 98 2466 (c) 0.94 4 98 2466 (d) 0.98 2.35 11% 2.88 4 36 5 2 5 2 5 2 6 3 8 2.2 74.7 1 8 2.2 74.7 1 8 2.2 74.7 1 8 2.2 74.7 1 0.62 2 0.62 4.0 6.2 4.0 6.2 1 0.04 0.03 138.1 0.19 0.31 1.30 7.6 22.6 0.60 0.62 1 4.9 152.2 A 16.9 A 16.9	la l			1.00 3203 0.94 307 34 393 9% NA	0.94 120 0 0 0 3% 2	0.32 501 0.94 117 0 117 14% 13 Perm	1.00 3250 0.94 76 28 82 2% 1 1 NA	0.94 34 0 0 114%
349 3282 64 094 094 67 4 098 2466 67 4 098 2635 68 2635 69 2635 69 2635 60 2 62 74 7 76 226 76 226 77 226 78 226 78 226 78 226 79 3138.1 71 49 152.2 71 49 152.2 71 49 152.2 72 49 152.2 73 49 152.2 74 146.9			_	3203 0.94 307 34 393 9% NA 8	0.94 120 0 0 3% 2	501 0.94 117 0 117 14% 13 Perm	3250 0.94 76 28 82 2% 1 1 NA	0.94 34 0 0 14%
(h) 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94	la l			0.94 307 34 393 9% 8 8	0.94 120 0 0 3% 2	0.94 117 117 14% 13 Perm	0.94 76 28 82 82 2% 1 NA A	0 0 0 14% 2 2
h) 0 8 2466 h) 98 2466 h) 98 2635 h 36 h 36 h 36 h 36 h 36 h 36 h 36 h 30 h 31 h 2024 h 0.02 h 0.03 h 0.03 h 31 h 2024 h 0.02 h 0.03 h 31 h 31 h 32 h 31 h 32 h 4.0 h 32 h 4.0 h 31 h 32 h 4.0 h 32 h 4.0 h 31 h 32 h 31 h 32 h 32 h 32 h 32 h 32 h 32 h 32 h 32	IQ.			307 34 393 9% 8 8	120 0 0 3% 2 2	117 0 117 14% Perm	76 28 82 82 2% 1 1 NA 4	34 0 0 0 14%
h) 98 2635 h) 98 2635 11% 2% 4 36 pm+pt NA 5 2 2 2 5 2 6 3 82.2 74.7 0.69 0.62 4.0 5.3 3.0 3.0 3.0 3.0 3.1 2024 0.31 1.30 7.6 22.6 0.60 0.60 0.31 1.30 7.6 22.6 0.60 0.62 4.0 5.3 1.30 7.6 22.6 0.60 0.60 7.7 22.6 0.60 0.60 7.8 22.6 0.60 0.60 7.8 22.6 0.60 0.60 7.8 22.6 0.7 138.1 7.8 22.6 7.8 138.1 4.9 152.2 7.8 146.9	<u>a</u>			393 393 393 393 8 8 8	3%	117 14% 13 Perm	28 82 82 7 NA NA	0 0 14%
hh) 98 2635 11% 2% 2 4 4 8 2 5 2 2 2 2 2 14.7 9 82.2 74.7 9 82.2 74.7 1 82.2 83.0 1 83.0 1 83.0 1 83.0 1 83.0 1 83.0 1 84.0 1 85.2 1 85.2	Įg.	8 1		393 9% 3 3 NA 8	3%	117 14% 13 Perm	82 2% 1 1 NA 4	0 14%
11% 2% 4 36 4 36 5 2 2 2 47 7 2 2 4 0 5 3 0 3 0 3 0 0 6 2 2 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	P. Land			NA 3 %	3%	14% 13 Perm	2% NA 4	14%
9	ng .			NA 8 55	2	13 Perm	L NA 20	2
(s) 82.2 (s) 82.2 (s) 82.2 (d) 82.2 (d) 93.7 (d) 93.7 (e) 93.7 (e) 93.7 (f) 6.7 (f) 6.7 (f) 6.7 (f) 7 (f) 7	pm+pt 1 6 83.2 83.2 83.2 0.69	NA 6 75.2 75.2	Perm 8 8 22.3	NA 8		Perm 4	NA 4	
(s) 82.2 s) 82.2 0.69 0.69 10 0.05 0.02 0.03 0.19 0.19 0.31 7.6 0.33 4.9 1.4 0.31	83.2 83.2 83.2 0.69	6 75.2 75.2	8 22.3	20 00		4	4 0	
(s) 82.2 s) 82.2 82.2 82.2 0.69 1 31.0 0.19 0.19 0.19 0.31 7.6 0.60 0.60 0.31 7.6 1.9 1.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	83.2 83.2 83.2 0.69	75.2	8 22.3	27.2		4	6	
(s) 82.2 s) 82.2 82.2 6.0 4.0 6.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1	83.2 83.2 0.69 4.0	75.2 75.2	22.3	22.2			0	
s) 82.2 0.69 4.0 1.00 4.0 1.00 0.31 0.31 0.31 0.30 0.31 4.9 1.6 1.00 0.60 4.9 1.00 0.31	83.2 0.69 4.0	75.2		6.77		22.3	22.3	
9, 2,0 4,0 4,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1	0.69	-	22.3	22.3		22.3	22.3	
s) 4.0 3.0 3.0 0.02 0.19 0.31 7.6 0.60 d2 0.60 4.9 T A	4.0	0.63	0.19	0.19		0.19	0.19	
s) 3.0 1317 0.02 0.19 0.19 0.19 7.6 0.31 4.9 1 A A		5.3	2.7	2.7		2.7	2.7	
317 0.02 0.09 0.19 0.31 7.6 0.3 1.0 4.9 1.9 1.0	3.0	3.0	3.0	3.0		3.0	3.0	
0.02 (0.19 (161	1947	226	262		63	603	
0.19 0.31 7.6 0.60 0.8 1 4.9 1 A A 1	c0.08	0.34		0.12			0.03	
0.31 7.6 0.60 0.50 4.9 1 A A	0.80		0.09			c0.23		
7.6 0.60 0.81 4.9 A A	1.27	0.55	0.47	99.0		1.26	0.14	
0.60 d2 0.3 1 4.9 1 A A	41.2	12.7	43.6	45.3		48.9	40.8	
0.3 4.9 A	0.97	0.92	1.00	1.00		1.00	1.00	
4.9 A	161.3	1:1	1.5	2.7		177.8	0.1	
A	201.2	12.8	45.1	48.1		226.6	40.9	
	L	В	O	D		ш	D	
F nmary		42.5		47.5			136.6	
nmary		O		٥			ı	
ICM 2000 Control Delay 107.1		HCM 2000 Level of Service	of Service		ш			
ICM 2000 Volume to Capacity ratio 1.29								
		Sum of lost time (s)	(6		15.0			
ntersection Capacity Utilization 117.1%		Level of Serv	ce		Ŧ			
nalysis Period (min)	15							

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Background (AM) 2032 Scenario 5

	\	t	•		-	-		+	
ane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	*	₩	r	₩	r	₩	r	₩	
Fraffic Volume (vph)	92	2318	193	69/	100	289	110	11	
-uture Volume (vph)	92	2318	193	69/	100	289	110	71	
ane Group Flow (vph)	86	2639	202	1096	106	427	117	110	
urn Type	pm+pt	NA	pm+pt	NA	Perm	M	Perm	M	
Protected Phases	2	2	_	9		00		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	-	9	∞	∞	4	4	
Switch Phase									
Viinimum Initial (s)	7.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	
Viinimum Split (s)	11.0	34.3	11.0	34.3	34.7	34.7	34.7	34.7	
otal Split (s)	12.0	80.0	12.0	80.0	28.0	28.0	28.0	28.0	
otal Split (%)	10.0%	92.99	10.0%	92.99	23.3%	23.3%	23.3%	23.3%	
rellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.0	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
ost Time Adjust (s)	0:0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
otal Lost Time (s)	4.0	5.3	4.0	5.3	5.7	2.7	5.7	2.7	
-ead/Lag	Lead	Lag	Lead	Lag					
-ead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
//c Ratio	0.31	1.30	1.27	0.55	0.47	89.0	1.26	0.17	
Control Delay	4.3	156.8	186.3	12.2	51.4	47.1	218.9	29.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fotal Delay	4.3	156.8	186.3	12.2	51.4	47.1	218.9	29.0	
Queue Length 50th (m)	3.7	~447.0	~49.2	61.3	23.7	47.3	~36.3	8.3	
Queue Length 95th (m)	m4.1	#491.0	#66.8	75.7	42.8	65.7	#75.5	16.8	
nternal Link Dist (m)		170.5		124.7		340.6		275.9	
Furn Bay Length (m)	100.0		0.06		70.0		20.0		
Base Capacity (vph)	327	2028	162	1975	226	629	93	631	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0 0	0 0	0 1	0 !	0 0	0 2	0 1	
reduced v/c Katio	0.30	1.30	1.27	0.55	0.4/	0.68	1.26	0.17	
ntersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 120 Office: 0 (0%) Deferenced to phase 3:ERTI and 4:WRTI Start of Green	10 phase 2.	FRTI	4 6-WRTI	Start of	roon				
Oliser. U (U%), Relejenceu Natiiral Cycle: 150	ı io pildse z.		0. WD	, stalt of	5				
Control Type: Actuated-Coordinated	oordinated								
 Volume exceeds capacity, queue is theoretically infinite. 	city, queue is	theoreti	cally infini	te.					
Queue shown is maximum after two cycles.	um after two	cycles.							
95th percentile volume exceeds capacity, queue may be longer.	exceeds cal	oacity, qu	rene may	be longer					
Queue shown is maximum after two cycles.	num after two	CVCles							

Splits and Phases: 2: Fifth Line & Derry Road

₹02 (R) 01

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

Future Background (AM) 2032 Scenario 5

	`	Ť	>	*		/	1	-	Ļ	*	•	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	K.	444	*-	<u>, </u>	###	*	F	+++	*	*	444	*-
Traffic Volume (vph)	206	1901	33	74	298	195	29	330	218	399	459	221
Future Volume (vph)	206	1901	33	74	298	195	29	330	218	366	429	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	2.3	4.0	2.3	2.3	4.0	2.7	2.7	4.0	2.7	5.7
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1:00	9.	1:00	9.1	0.99	1.00	1:00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
F.t	1.00	1:00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Filt Protected	0.75	0.1	00.1	0.75	00.1	00.1	0.95	00.1	00.1	0.95	00.1	00.1
Satd. Flow (prot)	3336	2009	1562	1738	4828	1516	1802	4668	1586	1616	4489	1403
Fit Permitted	0.95	1.00	1.00	0.00	1.00	1.00	0.47	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)	3399	2009	1562	09L	4828	1516	866	4668	1586	643	4489	1403
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	210	1940	34	76	610	199	30	337	222	407	468	226
RTOR Reduction (vph)	0	0	19	0	0	123	0	0	173	0	0	154
Lane Group Flow (vph)	210	1940	15	9/	610	76	8	337	49	407	468	72
Collii. Peds. (#/III)	- 200	70,7	ò	ò	404	- 200	0 8	òò	707	ò	7007	0 0
Heavy venicles (%)	0,7	<u>%</u> 5	3%	3%	4%	3%	%	8%	<u>e</u> °	2%	10%	1%
Bus Blockages (#/nr)	2	6	-	7	74	2	0	17	7	12	36	13
Turn Type	Prot	A	Perm	bm+pt	Y N	Perm	bm+pt	A	Perm	bm+pt	≨	Perm
Protected Phases	2	2		_	9		က	00		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Actuated Green, G (s)	12.7	51.5	51.5	52.6	45.7	45.7	20.3	15.8	15.8	46.6	38.1	38.1
Effective Green, g (s)	12.7	51.5	51.5	52.6	45.7	45.7	20.3	15.8	15.8	46.6	38.1	38.1
Actuated g/C Ratio	0.11	0.43	0.43	0.44	0.38	0.38	0.17	0.13	0.13	0.39	0.32	0.32
Clearance Time (s)	4.0	2.3	2.3	4.0	5.3	2.3	4.0	2.7	2.7	4.0	2.7	5.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	326	2148	670	160	1838	577	185	614	208	467	1425	445
v/s Ratio Prot	00.00	c0.39		0.03	0.13		0.01	0.07		c0.19	0.10	
v/s Ratio Perm			0.01	0.18		0.02	0.02		0.03	c0.14		0.05
v/c Ratio	0.58	0.90	0.02	0.47	0.33	0.13	0.16	0.55	0.24	0.87	0.33	0.16
Uniform Delay, d1	21.1	31.9	19.7	25.2	26.3	24.2	42.1	48.8	46.7	30.3	31.2	29.5
Progression Factor	1.00	1.00	1.00	0.76	0.85	1.98	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	9.9	0.1	1.9	0.4	0.4	0.4	1:0	9.0	16.2	0.1	0.2
Delay (s)	53.6	38.7	19.8	21.0	22.8	48.3	42.5	49.8	47.3	46.5	31.3	29.6
Level of Service	۵	0.00	20	ပ	ی و	۵	۵	O !	۵	۵	ر ا ا	S
Approach Delay (s)		39.8			28.3			48.5			36.6	
Approach LOS		Ω			O			Ω			D	
Intersection Summary												
HCM 2000 Control Delay			38.0	Ĭ	HCM 2000 Level of Service	Level of	Service		٥			
HCM 2000 Volume to Capacity ratio	ity ratio		0.90									
Actuated Cycle Length (s)	,		120.0	S	Sum of lost time (s)	time (s)			19.0			
Intersection Capacity Utilization	ion		88.8%	2	ICU Level of Service	of Service	0.1		ш			
Analysis Period (min)			15									
()												

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

	1	†	<i>></i>	>	ţ	4	•	←	4	۶	→	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	F	444	¥C	je-	444	¥C	<i>y</i> -	444	¥	je-	444	*
Traffic Volume (vph)	206	1901	33	74	298	195	29	330	218	366	459	221
Future Volume (vph)	206	1901	33	74	298	195	29	330	218	366	459	221
Lane Group Flow (vph)	210	1940	34	9/	610	199	30	337	222	407	468	226
Turn Type	Prot	NA	Perm	pm+pt	¥	Perm	pm+pt	¥	Perm	pm+pt	NA	Perm
Protected Phases	2	2		_	9		က	∞		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	2	2	2		9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	43.0	43.0	11.0	37.0	37.0	31.0	35.0	35.0	31.0	35.0	35.0
Total Split (%)	14.2%	35.8%	35.8%	9.2%	30.8%	30.8%	25.8%	29.2%	29.2%	25.8%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.58	0.86	0.02	0.41	0.32	0.28	0.13	0.61	0.61	0.87	0.33	0.38
Control Delay	27.6	36.0	0.1	17.7	22.7	8.5	25.3	54.9	16.9	50.1	32.5	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	36.0	0.1	17.7	22.7	8.5	25.3	54.9	16.9	50.1	32.5	0.9
Queue Length 50th (m)	25.9	159.8	0.0	8.4	41.5	9.5	4.6	29.5	5.2	81.4	34.0	0.0
Queue Length 95th (m)	37.8	#218.7	0.0	m17.8	58.8	31.3	10.4	39.0	29.0	#112.6	43.1	18.2
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	392	2247	754	185	1903	718	524	1139	537	469	1425	266
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.86	0.02	0.41	0.32	0.28	90:0	0:30	0.41	0.87	0.33	0.38
Intersection Summary												
Cycle Length: 120												
Actuated Ovela Length: 120												

Aduated Cycle Length: 120
Offset: 103 (69%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Matural Cycle: 105
Control Type: Actuated-Coordinated
Osth percentile volume exceeds capacity, queue may be longer.
Oueue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: James Snow Parkway & Derry Road



17.5 12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

1900 5.7 1.00 0.88 1.00 1636 1.00 1636 5.7 0.5 5.7 1.00 1.00 0.95 1770 0.75 0.92 28 Perm 8.2 8.2 0.07 5.7 3.0 c0.02 15.0 5.7 1.00 0.91 1.00 1.701 1.00 1.701 8.2 8.2 0.07 5.7 3.0 116 0.01 0.08 52.4 1.00 0.3 52.6 D Ä 5.7 1.00 0.95 0.72 0.72 1340 1.740 0.19 52.8 1.00 1.0 53.8 Perm 8.2 8.2 0.07 5.7 3.0 91 0.01 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 99 91 100.8 100.8 0.84 5.3 3.0 2934 0.33 962 962 962 1900 5.3 0.99 0.99 1.00 3493 1.00 1.00 1.00 Ϋ́ 0.39 2.3 1.00 0.4 2.7 1142 4.0 1.00 1.00 0.95 0.04 81 100.8 0.84 4.0 3.0 196 0.004 0.43 0.57 39.9 1.00 3.7 43.6 102 33.8 0.94 120.0 94.7% 45 0.92 2415 1900 5.3 0.95 1.00 1.00 3529 3529 1.00 3.92 2625 2673 NA 87.7 87.7 0.73 5.3 3.0 2579 c0.76 1.04 1.77 1.77 18.1 46.7 5.3 11.00 11.00 0.95 1770 0.25 462 0.92 91 66 Serm 87.7 87.7 0.73 5.3 3.0 0.21 0.29 1.78 0.2 10.0 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Actuated Cycle Length (s) Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Fil Protected
Satd. Flow (prof)
Fil Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot ane Group Flow (vph-Actuated Green, G (s) Effective Green, g (s) Delay (s) Level of Service Approach Delay (s) Approach LOS Turn Type Protected Phases Permitted Phases Uniform Delay, d1 v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 4: Clark Boulevard & Derry Road

Future Background (AM)

Future Background (AM) 2032 Scenario 5

→	SBT	42	10	10	58	¥	4		4		10.0	34.7	35.0	29.2%	3.7	2.0	0.0	5.7			None	0.32	23.7	0.0	23.7	2.6	16.0	313.3		434	0	0	0	0.13	
۶	SBL	۳	26	26	28	Perm		4	4		10.0	34.7	35.0	29.2%	3.7	2.0	0.0	5.7			None	0.24	299	0.0	299	9.9	16.4		40.0	338	0	0	0	0.08	
—	NBT	¢	7	7	19	M	00		∞							2.0	0.0	5.7			None	0.12	33.9	0.0	33.9	1.9	9.6	56.4		423	0	0	0	0.04	
€	NBL	r	16	16	17	Perm		∞	∞							2.0	0.0	2.7			None	0.15	54.1	0.0	54.1	4.0	11.6			326	0	0	0	0.02	
Ļ	WBT	4₽	396	362	1145	NA	9		9								0.0				C-Min	0.38	2.8	0.0	2.8	29.2	38.3	475.1		3000	0	0	0	0.38	
/	WBL	F	102	102	11	pm+pt	-	9	-								0.0		Lead	Yes	None	0.56	30.0	0.0	30.0	6.6	28.8		70.0	198	0	0	0	0.56	
†	EBT	4₽	2415	2415	2674	NA	2		2		10.0	34.3	75.0	62.5%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.02	40.7	0.0	40.7	-376.4	m245.1	336.0		2613	0	0	0	1.02	
1	EBL	J	91	91	66	Perm		2	2					_		1.6	0.0	5.3	Lag	Yes	C-Min	0.29	13.1	0.0			m11.6 n		70.0	341	0	0	0	0.29	
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Oueue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intercontion Summary

Additional Systems of State of Green Order of State of Green Officer: 0 (0%), Referenced to phase 2.EBTL and 6.WBTL, Start of Green Natural Cycle: 150

Control Type: Natural-Coordinated

Volume exceeds capacity, queue is theoretically infinite.

Oueue shown is maximum after two cycles.

M. Volume for 95th percentile queue is metered by upstream signal.

4: Clark Boulevard & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Background (AM)

ABS TAS BAS BAN TAN	NBK SBL SBI		21 61 329	1900 1900 1900 19	5.7		1.00	0.95	1770	0.46	85/ 1835	0.92 0.92 0.92 0.	000	0 0 3 0	00 0	-	Perm	Perm	Perm 4	Perm 4 4 27.2	Perm 4 4 27.2 27.2	Perm 4 27.2 27.2 27.2 0.68	Perm 4 27.2 27.2 0.68 5.7	Perm 4 27.2 27.2 0.68 5.7 3.0	Perm 4 4 27.2 27.2 27.2 0.68 5.7 3.0 584 1	Perm 4 27.2 27.2 27.2 0.68 5.7 3.0	Perm 4 27.2 27.2 27.2 27.2 27.2 6.68 6.7 5.7 5.0 6.8 6.0 6.0 6.0 6.0 6.0	Perm 4 4 77.2 27.2 27.2 27.2 27.2 37.2 3.0 3.0 3.0 0.08	Perm 4 4 27.2 27.2 27.2 0.68 5.7 3.0 3.0 0.08 0.01	Perm 4 4 27.2 27.2 27.2 27.2 27.2 3.0 3.0 5.7 1.00 1.100 0.11	Perm 4 4 27.2 27.2 27.2 27.2 5.68 5.7 3.0 5.84 1 1.00 1.100 0.11 2.3 2.3 2.3	Perm 4 4 77.2 27.2 27.2 27.2 27.2 3.0 6.8 6.0 6.0 6.0 11.0 6.1 2.3 7.4 A. A	Perm 4 4 7.2 27.2 27.2 27.2 27.2 3.0 6.8 6.7 6.01 1.00 1.00 1.01 2.3 A	Perm 4 4 27.2 27.2 27.2 27.2 0.68 5.7 3.0 0.08 0.01 0.11 2.2 1.00 0.1 2.3 A	Perm 4 4 77.2 77.2 77.2 77.2 0.68 5.7 8.0 0.08 0.11 2.2 1.00 0.1 2.3 7.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8	Perm 4 4 4 77.2 27.2 27.2 27.2 2.3 3.0 6.8 884 1 1.00 0.11 2.3 4 A A A A	Perm 4 27.2 27.2 27.2 27.2 27.2 27.2 0.68 0.08 0.08 0.01 0.11 2.2 1.00 0.1 2.3 A	Perm 4 4 27.2 27.2 27.2 27.2 27.2 3.0 68 601 100 100 1.00 1.00 1.00 1.00 1.00 1.
√ IN	NBL *	- 6	2 6	1900					_		783	0.92	= <	0 ;	=			2																				
↑ WRT			13 11	19	5.3	1.00	0.93	1.00	1734	1.00		Ö.		11 7	0.4	ΝA																				6 6 6 1.7 1.7 1.7 1.7 1.7 1.3 2.0.01 1.8.4 1.3 1.9.8 8 1.9.7 8		6 1.7 1.7 1.7 0.04 5.3 3.0 7.3 0.20 18.4 1.00 1.3 19.8 8 19.7 8 19.7 Sum of lost time (s)
FRP WRI			3 2	•	5.3	1.00	1.00	0.95	1770	1.00		0.92 0.92		0 0		Perm			9	6 1.7	6 7.1 7.1	6 1.7 1.7 0.04	6 1.7 1.7 0.04 5.3	6 1.7 1.7 0.04 5.3 3.0	6 1.7 1.7 0.04 5.3 3.0 79	6 1.7 1.7 0.04 5.3 3.0 79	6 11.7 11.7 11.7 0.004 5.3 3.0 79	6 1.7 1.7 1.7 1.7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	6 17.7 17.7 10.04 5.33 30 000 000 003 118.3	17.7 1.7.7 1.7.7 1.7.9 1.7.9 1.8.3 1.0.0 1.0.0 1.0.0 1.1.8 1.8	6 1.7.7 1.7.7 1.7.7 5.3 3.0 0.0 0.0 0.03 1.00 1.00 1.00 1.00	6 1.77 1.77 1.77 1.00 0.00 0.00 0.00 1.00 1	6 1.7 1.7 1.7 0.04 5.3 3.0 0.00 0.00 0.00 1.00 0.1 1.00 0.1 1.00 1	17.7 1.7.7 1.7.7 0.00 0.00 0.03 1.8.3 1.8.3 1.8.3 1.8.3 1.8.3 1.8.3 1.8.3 1.8.3 1.8.4 1.8.	0.00 0.03 1.07 1.07 1.00 0.03 1.00 1.00 0.03 1.00 1.00 0.01 1.84 1.84	6 1.77 1.77 1.77 1.00 0.00 0.03 0.03 0.03 0.03 0.03 0.03	1.7.7 1.7.7 1.0.04 1.00 0.00 0.03 1.18.3 1.18.4 1.10 0.01 0.01 0.01	6 1.7 1.7 1.7 0.04 5.3 3.0 0.00 0.03 1.8 1.00 0.1 1.00 0.1
† =		.	10 11	19		1.00 1.00			Ì			Ö		2, 2, 2,				2																				
±	novement	.ane configurations	Tallic Volume (vph)	deal Flow (vphpl)	otal Lost time (s)	ane Util. Factor		It Protected	satd. Flow (prot)	It Permitted	satd. Flow (perm)	Peak-hour factor, PHF	adj. Flow (vpri)	KIOK Keducilon (vpn)	arie Group Flow (vpir)	urn iype	T. Director	d Phases	d Phases d Phases	d Phases d Phases Green, G (s)	d Phases 1 Phases Green, G (s) Green, g (s)	J Phases J Phases Green, G (s) Green, g (s) g/C Ratio	Phases Phases Green, G (s) Green, g (s) g/C Ratio	Phases Phases Green, G (s) Green, g (s) g/C Ratio s Time (s) xtension (s)	Phases Phases Green, G (s) Green, g (s) Green, g (s) Filme (s) Xtension (s) Cap (vph)	Phases I Phases Green, G (s) Green, G (s) Green, g (s) g/C Ratio e Time (s) xtension (s) Prod (vph)	Phases Thrases Green, G (s) Green, G (s) Green, G (s) Green, G (s) CRatio e Time (s) e Time (s) cap (wth) Prott	If Phases The Phases Green, G (s) Con (s) Port Perm	If Phases I Phases Green, G (s) F (s	d Phases d Phases Green, G (s)	d Phases Green, G (s) Front Pront Pront Perm Delay, d1 Intel Delay, d2	If Phases The Phases Green, G (s) Frot Prot Prot Prot Prot Prot Altal Delay, d 1 Jon Factor Altal Delay, d 2 Service	d Phases d Phases Green, G (s) Alterial (s) Cap (kph) Cap (kph) Perm Perm Perm Perm Ital Delay, d 1 ion Factor Tal Delay, d 2 Service Service Delay, (s)	If Phases I Phases Green, G (s)	d Phases d Phases Green, G (s)	d Phases d Phases Green, G (s) Frod Prod Prod Prod Prod Prod Prod Prod P	d Phases Green, G (s) Fort Prot Prot Prot Prot Prot Prot Prot P	orlocted Phases controlled Phases chulted Phases chulted Phases 1.3 Actualed Green, G (s) 1.3 Heative Green, G (s) 1.3 Heative Green, G (s) 2.3 Actualed Gr. Ratio 0.00 Searance Time (s) 5.3 Actual Prof. Ratio Prof. 1.3 Ratio Perm 0.01 Milliam Delay, d1 118 Milliam Delay, d1 118 Actual Prof. 1.0 Controlled Green

Synchro 11 Report 12-14-2023 BA Group

Queues 5: Fifth Line & Clark Boulevard

Future Background (AM) 2032 Scenario 5

	FB	FBT	WBI	WBT	NBI	NBT	SBI	SBT	
ane Configurations	*	£\$	*	2,	k	2,	×	23	
raffic Volume (vph)	10	- ;=	2	13	10	481	61	329	
-uture Volume (vph)	10	=	2	13	10	481	61	329	
ane Group Flow (vph)	=	15	2	26	=	546	99	398	
Furn Type	Perm	NA	Perm	NA	Perm	M	Perm	M	
Protected Phases		2		9		∞		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	9	9	∞	∞	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	34.3	34.3	34.3	34.3	34.7	34.7	34.7	34.7	
otal Split (s)	35.0	35.0	35.0	35.0	85.0	85.0	85.0	85.0	
otal Split (%)	29.5%	29.2%	29.5%	29.2%	70.8%	70.8%	70.8%	70.8%	
rellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	
ost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
otal Lost Time (s)	5.3	5.3	5.3	5.3	5.7	2.7	2.7	2.7	
-ead/Lag									
-ead-Lag Optimize?									
Recall Mode	None	None	None	None	Min	Min	Min	Min	
//c Ratio	0.02	0.03	0.00	0.05	0.01	0.33	0.09	0.24	
Control Delay	11.7	10.9	11.5	9.4	3.1	3.3	3.1	2.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fotal Delay	11.7	10.9	11.5	9.4	3.1	3.3	3.1	2.8	
Queue Length 50th (m)	0.5	0.5	0.1	9.0	0.0	0.0	0.0	0:0	
Jueue Length 95th (m)	3.4	3.9	1.3	5.1	2.0	47.7	7.1	31.2	
nternal Link Dist (m)		204.0		86.5		156.9		372.1	
Furn Bay Length (m)	35.0		35.0		35.0		35.0		
Base Capacity (vph)	1581	1534	1581	1473	982	1852	857	1835	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.01	0.01	0.00	0.02	0.01	0.29	0.08	0.22	
ntersection Summary									
Ovele Length: 120									
Actuated Cycle Length: 35 5	ıc								
Natural Cycle: 70									
2000									

Splits and Phases: 5: Fifth Line & Clark Boulevard

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Background (PM) 2032 Scenario 5

	1	†	~	-	Ļ	1	•	←	4	٠	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	-	₩.		<u>r</u>	₩		F	₩		<u>, </u>	₩.	
Traffic Volume (vph)	174	1954	%	31	1874	22	201	166	33	137	226	147
Future Volume (vph)	174	1954	96	31	1874	22	201	166	33	137	226	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.2		4.0	6.2		4.0	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.94	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	3171		1805	2966		1805	3492		1258	3326	
Fit Permitted	0.07	1.00		0.08	1.00		0.34	1.00		0.62	1.00	
Satd. Flow (perm)	134	3171		148	2966		645	3492		820	3356	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	182	2079	102	33	1994	27	214	177	32	146	240	156
RTOR Reduction (vph)	0	m	0	0	-	0	0	15	0	0	101	0
Lane Group Flow (vph)	185	2178	0	33	2020	0	214	197	0	146	295	0
Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
Bus Blockages (#/hr)	1	46	2	0	54	2	0	0	1	9	1	2
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	AN	
Protected Phases	2	2		-	9		3	00			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	64.7	29.5		55.5	51.3		33.8	33.8		22.8	22.8	
Effective Green, g (s)	64.7	299		55.5	51.3		33.8	33.8		22.8	22.8	
Actuated g/C Ratio	0.58	0.51		0.50	0.46		0.30	0.30		0.21	0.21	
Clearance Time (s)	4.0	6.2		4.0	6.2		4.0	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	216	1614		136	1370		569	1063		168	689	
v/s Ratio Prot	c0.02	c0.69		0.01	c0.68		c0.05	90:0			60:0	
v/s Ratio Perm	0.43			0.11			c0.19			0.18		
v/c Ratio	0.86	1.35		0.24	1.47		0.80	0.19		0.87	0.43	
Uniform Delay, d1	31.0	27.2		24.4	29.9		34.0	28.4		42.7	38.4	
Progression Factor	1.00	1:00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	26.7	161.5		0.0	217.5		14.9	0.1		34.7	0.4	
Delay (s)	57.8	188.7		25.3	247.3		49.0	28.5		77.4	38.9	
Level of Service	ш	ш		ပ	ш		۵	ပ		ш	٥	
Approach Delay (s)		178.5			243.8			38.8			49.2	
Approach LOS		ıL			ш			٥			Ω	
Intersection Summary												
HCM 2000 Control Delay			179.3	Ĭ	HCM 2000 Level of Service	evel of S	ervice		ш			
HCM 2000 Volume to Capacity ratio	ity ratio		1.22									
Actuated Cycle Length (s)			111.0	S	Sum of lost time (s)	time (s)			20.5			
Intersection Capacity Utilization	on		102.1%	೨	ICU Level of Service	f Service			9			
mensecion capacity ounzain	5		02.170	2	O Level O	2017100			9			

Analysis Period (min) c Critical Lane Group

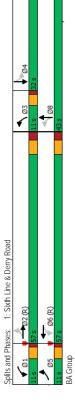
Synchro 11 Report

12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Background (PM) 2032 Scenario 5

	1	†	-	ļ	•	←	۶	→	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	#	₩.	<i>y</i> -	₩.	*	₩.	*	₩.	
Traffic Volume (vph)	174	1954	31	1874	201	166	137	226	
Future Volume (vph)	174	1954	31	1874	201	166	137	226	
Lane Group Flow (vph)	185	2181	33	2021	214	212	146	396	
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	¥	Perm	¥	
Protected Phases	2	2	-	9	3	∞		4	
Permitted Phases	2		9		∞		4		
Detector Phase	വ	2	-	9	က	∞	4	4	
Switch Phase									
Minimum Initial (s)	7.0	25.0	7.0	25.0	7.0	10.0	10.0	10.0	
Minimum Split (s)	11.0	31.2	11.0	31.2	11.0	32.3	32.3	32.3	
Total Split (s)	11.0	57.0	11.0	22.0	11.0	43.0	32.0	32.0	
Total Split (%)	%6.6	51.4%	%6.6	51.4%	%6.6	38.7%	28.8%	28.8%	
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	2.2	1.0	2.2	1.0	2.3	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.2	4.0	6.2	4.0	6.3	6.3	6.3	
Lead/Lag	Lead	Lag	Lead	Lag	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
v/c Ratio	0.86	1.31	0.18	1.47	0.76	0.20	0.87	0.50	
Control Delay	60.7	170.4	12.4	243.0	47.9	25.2	85.1	27.8	
Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	4.09	170.4	12.4	243.0	47.9	25.2	85.1	27.8	
Queue Length 50th (m)	~30.7	~366.9	3.1	~338.8	35.6	16.0	31.3	27.2	
Queue Length 95th (m)	#77.2	#411.8	7.4	#384.0	#60.7	25.3	#65.7	42.5	
Internal Link Dist (m)		475.1		256.2		211.8		201.7	
Turn Bay Length (m)	120.0		100.0		45.0		30.0		
Base Capacity (vph)	215	1663	185	1373	282	1168	189	874	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.86	1.31	0.18	1.47	0.76	0.18	0.77	0.45	
Intersection Summary									
Ovela Lanoth: 111									



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Lane Configurations FBL FBI Team Configurations 1792 1793 1792	Mb 96 1992 96 1992 96 1992 96 1993	R WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
43 43 43 43 43 43 43 43 43 43 43 43 43 4	5	*	₩.		ļ			r		
43 43 40 40 40 1.00 1.00 1.00 1.00 1.00 1.00	,		1100		je-	<u>*</u>			<u>1</u>	
43 1900 40 1.00 1.00 0.95 1600 0.94 46 46 46 117% 117% 118% 118% 119% 119% 119% 119% 119% 119	5	6 104	20/2	119	302	74	215	311	304	80
1900 1.00 1.00 1.00 1.00 0.05 0.04 46 0.04 46 0.04 11% 5 5 699 699 699 699 699 699 699 699 699	•		2075		302	74	215	311	304	80
40 1.00 1.00 1.00 0.05 0.04 46 0.04 46 0.04 0.04 0.04 0.05 0.02 0.02 0.02 0.02 0.02 0.03 0.03 0.03		7	1900	1900 19	006	1900	1900	1900	1900	1900
1.00 1.00 0.95 1.00 0.06 1.00 0.04 4 4 4 4 4 4 11% 5 2 2 3 0 0.35 0.35 0.35 0.35 0.35 0.35 0.35	5.3	4.0	5.3		4.0	2.7		4.0	2.7	
1.00 1.00 1.00 1.00 1.05	.95	1.00	0.95	_	1.00	0.95		1.00	0.95	
10.95 10.00 0.06 0.06 10.94 46 11.8 46 11.8 11.8 11.8 12.0 13.0 13.0 13.0 13.0 13.0 13.0 13.0 13	66:	1.00	0.99	_	1.00	0.89		1.00	0.97	
1600 1006 1006 1007 46 117% 4 4 117% 117% 117% 117% 1130 10.058 40 10.02 10.02 10.02 10.03	00:	0.95	1.00	J	0.95	1.00		0.95	1.00	
0.00 0.94 46 46 0.94 44 4 4 4 4 4 4 4 6 6 6 9 6 6 9 6 6 9 6 6 9 6 6 9 6 6 9 6 6 9 6 6 6 6 6 6 6 6 6 6 6 6 6	529	1587	3297	_	1698	3050		1501	3340	
0.94 0.94 4.6 0.94 4.6 0.19 0.58 4.0 0.58 4.0 0.02 0.02 0.02 0.02 0.03	00:	90:0	1.00	J	0.29	1.00		0.43	1.00	
0.94 46 11% 46 11% 4 4 4 699 699 699 699 699 699	559	100	3297		523	3050		982	3340	
11% 46 0 0 46 0 0 46 0 0 0 0 0 0 0 0 0 0 0	Ĭ	Ĭ	0.94	0.94 0	0.94	0.94	0.94	0.94	0.94	0.94
0 0 46 46 47 47 47 47 47 47 47 47 47 47 47 47 47	306 102		2207		321	79	229	331	323	82
11% 14% 14% 14% 14% 14% 14% 14% 14% 14%		0 0	က		0	95	0	0	20	0
11% pm+pt 4 pm+pt 5 5 69.9 68.9 68.9 68.9 69.9 69.9 69.9 69.9		0 111	2331		321	213	0	331	388	0
4 pm+pt 5 5 69.9 68.9 68.9 68.9 68.9 68.9 68.9 68.9	2% 2%	% 11%	3%	18%	2%	%6	3%	14%	7%	14%
pm+pt 5 62,9 68,9 68,9 68,9 4,0 3.0 3.0 0.02 0.02 0.02 0.35 2.63		2 6	22	22	3	3	2	13	1	2
5 69.9 69.9 0.58 4.0 3.0 0.2 0.35 2.0 2.3 2.6 3.0 2.6 3.0 2.6 3.0 2.6 3.0 2.6 3.0 2.6 3.0 2.0 2.0 3.0 2.0 3.0 2.0 3.0 2.0 3.0 2.0 3.0 2.0 3.0 2.0 3.0 2.0 3.0 2.0 3.0 2.0 3.0 2.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	NA	pm+pt	NA	md	pm+pt	NA		pm+pt	MA	
2 69.9 69.9 0.58 4.0 3.0 1.32 0.13 0.35 0.35	2	-	9		3	œ		7	4	
69.9 69.9 0.58 4.0 3.0 0.02 0.02 0.03 0.35 0.35		9			∞			4		
(s) 69.9 0.58 4.0 3.0 3.0 0.02 0.19 0.35 2.63	4.2	74.7	9.99	. 7	28.7	18.7		28.7	18.7	
(5) (4.0 (4.0 (4.0 (4.0 (4.0 (4.0 (4.0 (4.0	4.2	74.7	9.99	. ~	28.7	18.7		28.7	18.7	
s) 4.0 132 7 0.02 0.02 0.19 0.35 2.63	.54	0.62	0.55	J	0.24	0.16		0.24	0.16	
s) 3.0 132 7 0.02 0.19 0.35 26.3	5.3	4.0	5.3		4.0	2.7		4.0	2.7	
) 132 · 0.02 0.02 0.19 0.35 26.3	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
0.02 0.19 0.35 26.3	743	162	1829		223	475		231	250	
0.19 0.35 26.3	.62	c0.05	c0.71	J	c0.12	0.07		0.12	0.12	
26.3		0.38		ಶ	c0.22			0.22		
26.3	.15	69:0	1.27	_	1.44	0.45		1.43	0.75	
00 0	7.9	29.3	26.7	ď	43.0	46.0		43.8	48.4	
2.00	0.91	0.94	1.09	,-	1.00	1.00		1.00	1.00	
	2.4	5.8	125.7	22	221.4	0.7		217.9	5.8	
Delay (s) 55.6 97.8	7.8	33.3	154.9	26	264.4	46.6		261.7	54.1	
ш	L.	S	ш		ш	D		ш	۵	
Approach Delay (s) 96.8	8.9		149.3			157.8			147.1	
Approach LOS	L.		ш.			ш			ш.	
Intersection Summary										
HCM 2000 Control Delay	131.6		2M 2000 L	HCM 2000 Level of Service	vice		4			
HCM 2000 Volume to Capacity ratio	1.30	0								
Actuated Cycle Length (s)	120.0		Sum of lost time (s)	ime (s)			19.0			
Intersection Capacity Utilization	110.5%		ICU Level of Service	Service			I			
Analysis Period (min)	_	2								

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Background (PM)

Future Background (PM) 2032 Scenario 5

43 43 44 46 bm+bt	1792 1792 2008 NA	104 111 pm+pt	2075 2075 2075 2334 NA	302 302 321 321 pm+pt	14 74 74 308 NA	SBL 311 311 331 pm+pt	304 304 408 NA
2 2 2	2 2	- 9 -	9	_ m	ω ω	L 4 L	4 4
7.0 11.0 11.0 9.2%	20.0 34.3 67.0 55.8%	7.0	20.0 34.3 67.0	7.0 11.0 14.0	10.0 34.7 28.0 28.0	7.0 11.0 14.0	10.0 34.7 28.0
3.0	3.7 3.7 1.6 0.0	3.0 3.0 1.0 0.0	3.7	3.0 3.0 1.0 0.0 4 0	3.7 2.0 2.0 0.0	3.0	3.7 2.0 2.0 0.0
	Yes C-Min 1.15	Yes None 0.68	Lag Yes C-Min 1.26	Yes None 1.40	Yes None 0.54	Yes None 1.37	Lag Yes None 0.76
	98.8 0.0 98.8 ~320.0 #352.3 170.5	31.4 0.0 31.4 15.8 m20.3	0.0 146.0 ~390.1 #446.1 124.7	233.0 0.0 233.0 ~81.5 #131.9	32.3 0.0 32.3 23.1 37.1 340.6	225.0 0.0 225.0 ~76.5 #162.4	54.7 0.0 54.7 48.4 64.4 275.9
	1745	163	1856	230	658	241	0 0 0
	<u>-</u>	0.08	07:1	0.40	0.47	15.1	0.04
	Difset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 145 Sontrol Type: Actualed-Coordinated Volume exceeds capacity, queue is theoretically infinite. Oueue shown is maximum after two cycles. # 98th percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles. Would not on 58th percentile queue is metered by upstream signal.	I 6:WBTL ally infini eue may	r, Start of te. be longe	Green ".			

Splits and Phases: 2: Fifth Line & Derry Road

- P02 (R)

HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

Future Background (PM)

254 254 11900 5.7 5.7 1.00 0.98 0.85 1100 0.85 1100 0.98 259 67 67 67 0.05 0.18 34.6 1.00 0.2 34.8 31.1 31.1 0.26 5.7 3.0 363 5.7 5.7 0.91 1.00 1.00 1.00 1.00 1.00 1.00 0.98 550 10% ₹ 0.12 1.00 D 14.7 pm+pt c0.19 384 384 1900 4.0 1.00 1.00 1.00 0.95 0.30 518 392 392 2% Perm 0.85 1.00 1.00 1.00 1.586 0.98 229 70 0.04 0.32 46.8 1.00 0.9 19.0 224 1900 5.7 1.00 1.00 1% 16.4 16.4 0.14 418 1.00 2.4 51.6 410 5.7 0.91 1.00 1.00 1.00 1.00 1.00 4668 4668 0.98 ¥ 16.4 16.4 0.14 3.0 637 0.09 99.0 % 7 4.0 1.00 1.00 1.00 0.95 1802 0.44 827 96.0 0 % 9 % pm+pt 4.0 3.0 260 0.03 0.05 0.38 0.9 26.2 26.2 0.22 88.8 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service Perm 519 5.3 1.00 0.99 1.00 0.85 1.00 1.00 1.00 969 1.45 0.98 530 244 286 3% 1528 1900 5.3 0.91 1.00 1.00 1.00 1.00 4828 4828 1559 ¥ 47.2 1559 4% 0.87 3.0 356 c0.14 pm+pt 64.1 64.1 0.53 4.0 1.00 1.00 1.00 1.00 0.95 0.09 167 167 292 292 3% 0.30 0.82 32.7 39.1 0.92 120.0 86.4% Perm 9 39.7 39.7 0.33 0.00 0.01 27.0 1.00 0.0 27.0 5.3 0.85 1.00 1.00 1.00 1562 0.98 3% 5.3 3.0 516 D 42.4 D 1301 1301 1900 5.3 0.91 1.00 1.00 1.00 5006 5006 1328 Š 4.2 0.98 1% 39.7 36.6 5.3 3.0 1656 0.27 12.9 212 212 212 1900 4.0 0.97 1.00 1.00 0.95 3399 3399 216 2% Prot 3.0 3.0 3.65 0.06 0.59 51.0 1.00 2.6 53.6 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp., pedbikes
Said. Flow (perm)
Fit Portected
Said. Flow (perm)
Peak-hour factor, PHF
Peak-hour factor, PHF
Red., Flow (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Heavy Vehicles (%) Actuated Green, G (s) Incremental Delay, d2 Bus Blockages (#/hr) Effective Green, g (s) Actuated g/C Ratio Turn Type Protected Phases Permitted Phases Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Background (PM) 2032 Scenario 5

	1	†	1	-	↓	4	•	-	*	۶	-	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	<u> </u>	444	×.	۳	444	*	۳	444	*_	F	444	W.
Traffic Volume (vph)	212	1301	18	286	1528	519	96	410	224	384	539	254
Future Volume (vph)	212	1301	18	286	1528	519	96	410	224	384	539	254
Lane Group Flow (vph)	216	1328	18	292	1559	530	86	418	229	392	220	259
Turn Type	Prot	NA	Perm	pm+pt	¥	Perm	pm+pt	M	Perm	pm+pt	N	Perm
Protected Phases	2	2		_	9		3	∞		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	2	2	2	_	9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	45.0	45.0	11.0	39.0	39.0	29.0	35.0	35.0	29.0	35.0	35.0
Total Split (%)	14.2%	37.5%	37.5%	9.5%	32.5%	32.5%	24.2%	29.2%	29.2%	24.2%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	2.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.59	0.80	0.03	0.82	0.82	0.63	0.36	99.0	0.61	0.92	0.47	0.47
Control Delay	27.6	41.1	0.1	28.8	30.2	11.8	28.2	53.9	18.7	58.4	38.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	41.1	0.1	28.8	30.2	11.8	28.2	53.9	18.7	58.4	38.8	7.0
Queue Length 50th (m)	26.7	109.2	0.0	46.9	138.8	63.6	15.5	36.5	10.1	77.3	42.1	0.0
Queue Length 95th (m)	38.5	128.3	0.0	m37.3	m112.4	m39.9	25.8	46.6	34.9	#118.0	53.2	20.8
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	395	1656	581	326	1899	840	200	1139	526	430	1174	228
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.80	0.03	0.82	0.82	0.63	0.20	0.37	0.44	0.91	0.47	0.46
C and the control of												

Sycle Length: 120

Actuated Cycle Length: 120

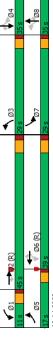
Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated Vatural Cycle: 95

95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

M. Volume for 95th percentile queue is metered by upstream signal.

3: James Snow Parkway & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

169 169 1900 5.7 1.00 0.86 1.00 1.00 185 ₹ 0.16 9.9 5.7 1.00 1.00 0.95 1770 0.71 80 80 Perm 0.16 5.7 3.0 210 0.41 45.3 1.00 15.0 3.92 19.2 19.2 0.16 5.7 3.0 259 0.01 0.08 1.00 0.1 43.0 5.7 1.00 1.00 0.95 1770 0.43 795 86 88 Perm 19.2 0.16 5.7 3.0 127 0.68 47.5 1.00 13.4 60.9 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 267 0.75 3.0 2643 c0.67 2167 1900 5.3 0.95 1.00 1.00 35.33 1.00 35.33 0.92 23.55 2380 NA 89.8 89.8 0.90 11.7 1.00 5.5 17.2 B 98 0.00 0.12 0.14 0.16 28.7 1.00 0.8 4.0 1.00 1.00 0.95 0.05 85 0.92 16 24.9 0.92 120.0 93.7% 0.92 4127 2127 2127 2127 1900 5.3 0.95 1.00 1.00 3537 1.00 3537 20.92 83.3 83.3 0.69 5.3 3.0 2455 50.66 0.95 16.3 1.62 1.1 27.5 C 2322 NA necedent Carrier and Part Manager Activation Capacity Talio Actuated Cyde Length (\$) Intersection Capacity Utilization Analysis Period (min) 5.3 11.00 11.00 0.95 0.05 89 89 39 38 38 Serm 83.3 83.3 0.69 5.3 3.0 0.64 10.1 1.54 4.6 20.2 0.44 Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Peak-hour factor, PHF Critical Lane Group Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Adj. Flow (vph) RTOR Reduction (vph) Group Flow (vph Actuated Green, G (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot Effective Green, g (s) Turn Type Protected Phases Permitted Phases Actuated g/C Ratio Clearance Time (s) Approach Delay (s) Uniform Delay, d1 Delay (s) Level of Service v/s Ratio Perm Approach LOS

12-14-2023 Synchio 11 Report
BA Group

Queues 4: Clark Boulevard & Derry Road

Future Background (PM)

Future Background (PM) 2032 Scenario 5

34.7 35.0 29.2% 3.7 2.0 0.0 5.7 None 0.74 61.9 0.0 0.0 61.9 44.0 65.6 813.3 192 NA 395 0.41 0.0 49.9 19.6 34.7 35.0 29.2% 3.7 2.0 0.0 80 87 87 Perm 40.0 34.7 35.0 29.2% 3.7 2.0 0.0 **☆**225≥ 0.25 14.2 0.0 14.2 2.3 2.3 15.1 445 29.2% 3.7 2.0 0.0 5.7 0.44 Perm 34.7 35.0 0.68 0.0 20.3 Referenced to phase 2:EBTL and 6:WBTL, Start of Green 0.90 18.9 0.0 18.9 207.0 #359.1 34.3 34.3 85.0 70.8% 3.7 1.6 0.0 415 2167 2167 2381 NA 2644 6.0 10.0 10.0 8.3% 3.0 1.0 0.0 4.0 Yes pm+pt 6.1 6.1 6.1 0.0 0.8 70.0 150 0.62 0.92 34.8 25.7 0.0 0.0 34.8 25.7 6.6 266.1 m7.9 m232.6 2127 2322 NA Lag 336.0 **↑↑** 34.3 75.0 2527 C-Min 10.0 34.3 75.0 62.5% 3.7 Perm 0 Lag Yes 5.3 Actuated Cycle Length: 120 Oueue Delay Total Delay Oueue Length 50th (m) Oueue Length 95th (m) Base Capacity (vph) Starvation Cap Reductn .ane Group Flow (vph) Spillback Cap Reducth Storage Cap Reductn Minimum Initial (s)
Minimum Spilt (s)
Total Spilt (s)
Total Spilt (%)
All Red Time (s)
Lost Time Adjust (s)
Total Lost Time (s) Internal Link Dist (m) Turn Bay Length (m) -ane Configurations Fraffic Volume (vph) uture Volume (vph) Lead-Lag Optimize? Recall Mode Protected Phases Permitted Phases Reduced v/c Ratio Sycle Length: 120 **Detector Phase** Control Delay Lead/Lag Ratio

Additional Cycle Length: 120 Offset: 0 (0%), Referenced to phase 2.EBTL and 6:WBTL, Start of G Natural Cycle: 140 Control Type: ActualGed-Coordinated # 95th percentile volume excests capacity, queue may be longer. Queue shown is maximum after two cycles.

Splits and Phases: 4: Clark Boulevard & Derry Road

Wolume for 95th percentile queue is metered by upstream signal.

12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Background (PM)

Movement EBI EBI EBI EBI WBI		4	†	<i>></i>	-	ţ	1	•	—	•	۶	→	•
1	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
44 12 10 21 9 62 4 475 2 12 467 144 12 10 21 9 62 4 475 2 12 467 1900 </td <td>Lane Configurations</td> <td>*</td> <td>¢\$</td> <td></td> <td>-</td> <td>ęŝ.</td> <td></td> <td>-</td> <td>¢\$</td> <td></td> <td>-</td> <td>ę\$</td> <td></td>	Lane Configurations	*	¢\$		-	ęŝ.		-	¢\$		-	ę\$	
14 12 10 21 9 62 475 5 12 467 150 1900 1900 1900 1900 1900 1900 1900 53 53 53 53 53 53 57 57	Fraffic Volume (vph)	44	12	10	21	6	62	4	475	2	12	467	16
1900 1900	Future Volume (vph)	44	12	10	21	6	62	4	475	2	12	467	16
1,00 1,00	Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,00	Total Lost time (s)	5.3	5.3		5.3	5.3		2.7	5.7		2.7	2.7	
1,00 0,93	Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 1,00 0.95 0.92 <th< td=""><td>Fit</td><td>1.00</td><td>0.93</td><td></td><td>1.00</td><td>0.87</td><td></td><td>1.00</td><td>1.00</td><td></td><td>1.00</td><td>1.00</td><td></td></th<>	Fit	1.00	0.93		1.00	0.87		1.00	1.00		1.00	1.00	
1770 1735 1770 1620 1770 1862 1770 1854 1371 1735 1381 1620 828 1862 839 1854 1371 1735 1381 1620 828 1862 839 1854 1381 1381 1620 828 828 1862 839 1854 48 13 11 23 10 67 4 516 2 13 508 48 13 11 23 10 67 4 516 2 13 508 48 13 11 23 20 0 0 0 0 0 0 48 15 10 23 20 0 0 0 0 0 0 5 5 5 5 5 5 5 5 5	Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
131 130 0.74 100 0.44 1.00 0.45 1.00 1331 1735 1381 16.20 8.28 1862 8.54 1864 48	Satd. Flow (prot)	1770	1735		1770	1620		1770	1862		1770	1854	
133 1735 1381 1620 828 1862 839 1854 48 13 14 12 1620 692 692 692 692 692 48 13 14 12 17 17 17 17 17 17 48 15 0 23 20 0 4 516 0 0 0 1 5 6 5 6 5 6 8 8 4 5 5 5 5 5 5 5 5 17 17	Fit Permitted	0.71	1.00		0.74	1.00		0.44	1.00		0.45	1.00	
092 13 508 1 48 15 0 23 20 0	Satd. Flow (perm)	1331	1735		1381	1620		828	1862		839	1854	
48 13 11 23 10 67 4 516 2 13 48 13 11 23 10 67 4 516 2 13 48 13 11 23 10 67 4 516 2 13 48 13 14 23 0 0 0 0 0 56 56 56 56 56 217 217 217 56 56 56 56 57 217 217 217 51 53 53 53 53 53 53 30 30	Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
National Control of the Control of	Adj. Flow (vph)	48	13	Ξ	23	10	19	4	516	2	13	208	17
Nation N	RTOR Reduction (vph)	0	6	0	0	22	0	0	0	0	0	.	0
Perm NA Perm NA Perm NA Perm 2 6 6 8 4 2 6 56 56 56 17 21.7 21.7 56 56 56 56 21.7 21.7 21.7 21.7 0.15 0.15 0.15 0.17 21.7 21.7 21.7 0.15 0.15 0.15 0.17 21.7 21.7 21.7 0.15 0.15 0.15 0.57 0.57 0.57 0.57 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 4.0 1.0 2.0 3.0 3.0 3.0 3.0 3.0 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.1 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Lane Group Flow (vph)	48	15	0	23	70	0	4	518	0	13	524	0
2 6 6 8 8 4 2 5 6 5 6 5 6 5 6 21,7 21,7 21,7 5 6 5 6 5 6 5 6 21,7 21,7 21,7 5 6 5 6 5 6 5 6 21,7 21,7 21,7 5 6 5 6 5 6 5 6 21,7 21,7 21,7 5 7 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2	Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	A	
2 6 6 6 8 4 4 5.6 5.6 5.6 5.7 21.7<	Protected Phases		2			9			∞			4	
56 56 56 56 57 21.7 21.7 21.7 6.5 56 56 56 56 57 21.7 2	Permitted Phases	2			9			00			4		
56 56 56 56 56 57 217 217 217 6.15 0.15 0.15 0.15 0.15 0.57 0.58 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03	Actuated Green, G (s)	9.9	9.9		9.9	9.6		21.7	21.7		21.7	21.7	
0.15 0.15 0.15 0.15 0.15 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.5	Effective Green, g (s)	9.9	9.9		9.9	9.9		21.7	21.7		21.7	21.7	
5.3	Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.57	0.57		0.57	0.57	
30 30 30 30 30 30 30 30	Clearance Time (s)	5.3	5.3		5.3	5.3		2.7	2.7		2.7	2.7	
194 253 201 236 469 1054 475 0.01	Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR COOR CO	-ane Grp Cap (vph)	194	253		201	236		469	1054		475	1050	
0.004 0.002 0.000 0.002 0.25 0.06 0.11 0.08 0.01 0.49 0.03 1.00 1.00 1.00 1.00 1.00 1.00 1.00 2 0.7 0.1 0.3 0.2 0.0 0.4 0.0 1.52 14.2 14.5 14.3 3.6 5.3 3.7 1.8 B B B A A A A A A A A A A A A A A A A	//s Ratio Prot		0.01			0.01			0.28			c0.28	
0.25 0.06 0.11 0.08 0.01 0.49 0.03 1.45 14.1 14.2 14.1 3.6 5.0 3.7 1.00 1.00 1.00 1.00 1.00 1.00 1.00 2 0.7 0.1 0.3 0.2 0.0 0.4 0.0 15.2 14.2 14.5 14.3 3.6 5.3 3.7 8 B B A A A A A A A A A A A A A A A A A	//s Ratio Perm	c0.04			0.02			0.00			0.02		
145 141 142 141 36 50 37 100 1.00 1.00 1.00 1.00 1.00 101 152 142 145 143 3.6 5.3 3.7 152 142 145 143 3.6 5.3 3.7 152 142 145 143 3.6 5.3 3.7 14.8 B B A A A A A A A A A A A A A A A A A	v/c Ratio	0.25	90:0		0.11	0.08		0.01	0.49		0.03	0.50	
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Uniform Delay, d1	14.5	14.1		14.2	14.1		3.6	2.0		3.7	2.0	
2 07 01 03 02 00 04 00 04 00 04 15.2 14.2 14.5 14.3 3.6 5.3 3.7 14.8 B B A A A A A A A A A A A A A A A A A	Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
15.2 14.2 14.5 14.3 3.6 5.3 3.7 14.8 B B B A A A A A A A A A A A A A A A A	Incremental Delay, d2	0.7	0.1		0.3	0.2		0.0	0.4		0.0	0.4	
B B B B A A A A A A A A A A A A A A A	Delay (s)	15.2	14.2		14.5	14.3		3.6	5.3		3.7	5.4	
14.8 14.3 5.3 B B A B A Islay 6.6 HCM 2000 Level of Service A 10.0 Ulization 43.8% ICU Level of Service A 15	evel of Service	മ	В		Ф	Ф		V	A		⋖	V	
M B B B A A A A A A A A A A A A A A A A	Approach Delay (s)		14.8			14.3			5.3			5.3	
6.6 HCM 2000 Level of Service Capacity ratio 0.45 Sum of lost time (s) In (s) 38.3 Sum of lost time (s) Ullization 43.89% ICU Level of Service 15	Approach LOS		В			В			A			V	
Holy 2000 Level of Service Capacity ratio 0.45 HOM 2000 Level of Service 0.45 Sun of lost time (s) 1.83 Sun of lost time (s) 1.83 1.84 CU Level of Service 1.85	Intersection Summary												
Capacity ratio 0.45 Sum of lost time (s) 38.3 Sum of lost time (s) Utilization 43.8% ICU Level of Service 15	HCM 2000 Control Delay			9.9	Ĭ	3M 2000	Level of S	Service		⋖			
h (s) 38.3 Sum of lost time (s) Utilization 43.8% ICU Level of Service 15 15	HCM 2000 Volume to Capa	city ratio		0.45									
Utilization 43.8% ICU Level of Service 15	Actuated Cycle Length (s)			38.3	S	im of lost	time (s)			11.0			
Analysis Period (min) 15	ntersection Capacity Utiliza	tion		43.8%	೨	U Level o	f Service			A			
	Analysis Period (min)			15									

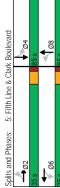
Synchro 11 Report 12-14-2023 BA Group

Queues 5: Fifth Line & Clark Boulevard

Future Background (PM) 2032 Scenario 5

	١.	†	-	ļ	•	—	۶	→	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	*	\$	<i>y</i> -	÷	<u>r</u>	æ	y -	£	
Traffic Volume (vph)	44	12	21	6	4	475	12	467	
Future Volume (vph)	44	12	21	6	4	475	12	467	
Lane Group Flow (vph)	48	24	23	77	4	518	13	525	
Turn Type	Perm	AA	Perm	Ν	Perm	¥	Perm	¥	
Protected Phases		2		9		∞		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	9	9	∞	∞	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	34.3	34.3	34.3	34.3	34.7	34.7	34.7	34.7	
Total Split (s)	32.0	35.0	32.0	35.0	85.0	85.0	85.0	85.0	
Total Split (%)	29.2%	29.2%	29.2%	29.2%	70.8%	70.8%	70.8%	70.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.7	5.7	2.7	2.7	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Ψ	Min	Min	Min	
v/c Ratio	0.13	0.05	90:0	0.15	0.01	0.41	0.02	0.42	
Control Delay	12.6	9.5	12.1	0.9	5.5	7.6	2.8	7.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.6	9.5	12.1	0.9	5.5	7.6	2.8	7.7	
Queue Length 50th (m)	2.2	9.0	1.0	0.5	0.1	23.9	0.5	24.3	
Queue Length 95th (m)	9.2	4.8	5.5	7.8	1.	44.4	2.2	45.3	
Internal Link Dist (m)		204.0		86.5		156.9		372.1	
Turn Bay Length (m)	32.0		35.0		35.0		35.0		
Base Capacity (vph)	1109	1448	1153	1362	829	1861	838	1853	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.02	0.02	90.0	0.00	0.28	0.02	0.28	
Intersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 36									
Natural Cycle: 70									
Control Type: Actuated-Uncoordinated	oordinated								

90 -100



HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Movement EBL EBI EBR WBI WBT WBR NBI Lane Configurations 1 40 2 2 3 41 105 Future (Volume (vph)) 166 2230 169 25 923 41 105 Include (Volume (vph)) 1900 </th <th></th> <th>^</th> <th>†</th> <th><u> </u></th> <th>-</th> <th>Ļ</th> <th>1</th> <th>•</th> <th>—</th> <th>•</th> <th>۶</th> <th>→</th> <th>*</th>		^	†	<u> </u>	-	Ļ	1	•	—	•	۶	→	*
165 2230 169 25 923 41 165 2230 169 25 923 41 166 2230 169 25 923 41 167 2230 169 25 923 41 160 1900 1900 1900 1900 1900 1900 1900	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
165 2230 169 25 923 41 1900 1900 1900 1900 1900 1900 40 6.2 40 6.2 100 0.95 100 1900 1900 1900 100 0.95 100 0.95 100 100 0.95 100 0.95 100 102 1.00 0.95 1.00 0.95 103 216 210 22 23 104 216 210 22 24 105 2372 180 27 982 44 107 2372 180 27 982 44 107 2372 180 27 982 44 107 2372 180 27 982 44 107 2372 180 27 982 44 108 226 27 102 0.94 109 226 226 226 109 226 226 109 226 226 109 226 226 109 226 226 109 226 226 110 1.00 1.00 110 1.00 1.00 110 1.00 1.01 110 1.00 1.11 110 1.11 1110 1.11 11110 1.11 11110 1.11 11110 1.11 111110 2.01 1.01 1111 2.01 1.01	Lane Configurations	*	₩		×	₩₽		F	₩		F	₩	
166 2230 169 25 923 41 1900 1900 1900 1900 1900 4 0 6.2 4.0 6.2 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.02 1.00 0.99 1.00 1.03 3161 180 2933 180 1.04 0.94 0.94 0.94 0.94 1.05 2372 180 27 982 44 1.05 2372 180 27 982 44 1.00 2,4 0.94 0.94 0.94 1.00 2,4 0.94 0.94 0.94 1.00 2,8 8,8 8,8 2,8 2,8 2,9 2,9 3,0 2,8 2,8 2,9 4,0 6,2 2,0 6,6 5,0 3,0 3,0 3,0 3,0 3,0 3,0 3,0 4,0 6,2 4,0 6,2 5,1 3,0 3,0 3,0 5,2 3,4 3,0 3,0 5,2 3,4 3,0 3,0 5,2 3,4 3,0 3,0 5,3 3,4 3,0 3,0 5,3 3,4 3,0 3,0 5,4 2,5 1,24 5,5 1,24 2,5 7,1 1,24 2,5 1,14 7,1 1,24 2,5 1,14 7,1 1,24 2,5 1,14 7,1 1,24 2,5 1,14 7,1 1,24 2,5 1,14 7,1 1,24 2,5 1,14 7,2 3,4 3,4 7,1 1,24 2,5 1,14 7,1 1,24 3,4 7,1 1,24 3,5 7,1 1,24 3,5 7,1 1,24 3,5 7,1 1,24 3,5 7,1 1,24 3,5 7,1 1,24 3,5 7,1 1,24 3,5 7,1 1,24 3,5 7,1 1,24 3,5 7,1 1,24 3,5 7,1 1,24 3,5 8,1 1,4 3,5 8,1 1,4 3,5 8,1 1,4 3,5 1,1 3,1 3,1 1,1	Traffic Volume (vph)	165	2230	169	25	923	41	105	173	32	46	142	139
1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 100	Future Volume (vph)	165	2230	169	25	923	41	105	173	32	46	142	139
1,00 0.95	Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,000 0.95 1,0	Total Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
100 0.99	Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
1763 1.00 0.95 1.00 1763 3161 1.805 2933 1.00 1763 3161 1.805 2933 1.00 1763 3161 1.805 2933 1.00 176 2372 1.00 0.06 1.00 176 2372 1.00 2 0.94 0.94 176 2372 1.00 2 0.94 0.94 176 2372 1.00 2 0.94 0.94 176 2372 1.00 2 0.04 176 2372 1.00 0.05 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 170 1.00 1.00 1.00 180 1.00 1.00 1.00 180 1.00 1.00 1.00 180 1.00 1.00 1.00 180 1.00 1.00 1.00 180 1.00 1.00 1.00 180 1.00 1.00 1.00 180 1.00 1.00 1.00 180 1.00 1.00 1.00 180 1.00 1.00 1.00 180 1.00 1.00 1.00 180 1.00 1.00	Frt	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.93	
1763 3161 1805 2933 1763 3161 1805 2933 1764 3161 1810 2933 1764 3161 1810 2933 1764 3161 1811 2933 1764 3161 1811 2933 1764 3161 1811 2933 1764 3161 1812 2933 1764 3161 1812 2933 1812 1812 1812 1812 1812 1813 1812 1813 1813 1813 1813 1813 1813 1813 1813 1814 1	Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Name	Satd. Flow (prot)	1763	3161		1805	2933		1805	3498		1258	3302	
Heat Add 3161 111 2933 11 2933 11 2933 11 2933 11 2933 11 2933 12 23 24 24 24 24 24 24 2	Fit Permitted	0.22	1.00		90:0	1.00		0.48	1.00		0.61	1.00	
F 0,94 0,9	Satd. Flow (perm)	404	3161		111	2933		920	3498		813	3302	
176 2372 180 27 982 44 176 2548 0 2 0 176 2548 0 27 1024 0 176 2548 0 27 1024 0 176 2548 0 27 1024 0 1	Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
hh) 0 4 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Adj. Flow (vph)	176	2372	180	27	982	44	112	184	34	46	151	148
h) 176 2548 0 27 1024 0 2 2 1024 2 0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	RTOR Reduction (vph)	0	4	0	0	2	0	0	15	0	0	124	0
2% 2% 1% 0% 8% 33% 1	Lane Group Flow (vph)	176	2548	0	27	1024	0	112	203	0	46	175	0
Name	Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	%	1%
Section	Bus Blockages (#/hr)	1	46	2	0	54	2	0	0	_	9	1	2
5 2 1 6 6 2 2 6 6 6 5) 80.8 72.6 72.8 68.6 6.0.73 0.65 0.65 0.62 7.0.3 0.65 0.62 7.0.3 0.65 0.62 7.0.3 0.67 0.02 7.0 0.29 0.12 7.1 128.4 0.65 7.1 128.4 0.65 8.8 199.2 0.7 13.4 1.00 1.00 1.00 2 0.8 199.2 0.7 13.4 F F C B 9.9 9.9 9.9 9.9 1.10 0.10 0.10 1.20 0.20 1.21 0.00 1.20 0.20 1.21 0.00 1.20 0.20 1.21 0.00 1.20 0.20 1.21 0.00 1.20 0.20 1.21 0.00 1.20 0.20 1.21 0.00 1.20 0.20 0.20	Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
s) 80.8 72.6 68.6 90.73 0.65 72.8 68.6 1.73 0.65 0.66 0.62 1.40 6.2 4.0 6.2 1.40 6.2 4.0 6.2 1.40 6.2 4.0 6.2 1.40 1.03 0.01 0.35 1.40 1.00 1.00 0.56 1.40 1.00 1.00 0.56 1.40 1.00 1.00 1.00 2 0.8 109.2 0.7 1.3 2 0.45 1.24 0.20 2 1.00 1.00 1.00 0.56 6.3 19.2 25.7 12.4 1.00 1.00 1.00 1.00 2 0.8 109.2 0.7 1.3 1.10 1.28 4 26.5 13.7 A F C B 1.20 6 14.1 F B 1.20 8 11.1 1.20 8 1	Protected Phases	2	2		-	9			∞			4	
s) 808 726 728 686 908 726 728 686 1073 065 066 062 40 62 40 62 40 62 40 62 20 394 2067 136 1812 c0 03 c081 0011 035 0.29 0.10 0.35 6.3 192 257 124 2 0.8 1092 0.7 13 7.1 1284 265 13.7 84.1 HCM 2000 Level of Sere of Charlication 1.00 1.00 1.12 Sum of lost time (\$) time (Permitted Phases	2			9			∞			4		
808 726 728 686 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Actuated Green, G (s)	80.8	72.6		72.8	9.89		17.7	17.7		17.7	17.7	
0,73 0,65 0,66 0,62 4,0 6,2 4,0 6,2 3,0 30 30 30 30 30 0,29 0,1 36 1812 0,29 0,1 0,35 0,45 1,23 0,20 0,56 6,3 19,2 25,7 12,4 1,00 1,00 1,00 1,00 2 0,8 10,9 0,7 1,3 2 0,8 10,9 0,7 1,3 1,1 128,4 26,5 13,7 A F C B A F C B 1,20 6 1,20 6 1,112 8 1,20 6 1,4,1 F B 1,20 6 1,4,1 F C B 1,10 1,00 1,00 1,11 28,4 26,5 13,7 F B 1,20 6 1,4,1 F C B 1,4,1 F C C C C C C C C C C C C C C C C C C C	Effective Green, g (s)	80.8	72.6		72.8	9.89		17.7	17.7		17.7	17.7	
40 62 40 62 30 30 30 30 30 30 30 30 30 4 2067 136 1812 c0.03 c081 0.01 0.35 0.45 1.23 0.20 0.56 6.3 19.2 25.7 12.4 1.00 1.00 1.00 1.00 2 0.8 109.2 0.7 13 7.1 128.4 26.5 13.7 A F C B 120.6 11.12 y y y y (c) abcolly ratio 1.112	Actuated g/C Ratio	0.73	0.65		99.0	0.62		0.16	0.16		0.16	0.16	
30 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
394 2067 136 1812 0.03 c081 0.01 0.35 0.29 0.12 0.45 1.23 0.20 0.56 6.3 19.2 25.7 12.4 1.00 1.00 1.00 1.00 2 0.8 109.2 0.7 1.3 7.1 128.4 26.5 13.7 A F C B B y y m (s) 1.12 Sum of lost time (s) m (s) Unitization 1.08 Service	Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
C0.03 C0.81 0.01 0.35 0.29 0.12 0.45 1.23 0.20 0.45 1.23 0.20 0.45 1.23 0.20 0.45 1.23 0.20 0.46 1.00 1.00 0.71 1.00 1.00 0.71 1.28 0.7 1.3 0.71 1.28 4 2.6.5 13.7 0.71 1.28 4 2.6.5 13.7 0.72 1.30 0.73 1.30 0.74 1.30	Lane Grp Cap (vph)	394	2067		136	1812		146	222		129	526	
0.29 0.45 1.23 0.20 0.45 6.3 19.2 2.57 12.4 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	v/s Ratio Prot	c0.03	c0.81		0.01	0.35			90.0			0.02	
0.45 1.23 0.20 0.56 6.3 19.2 25.7 12.4 1.00 1.00 1.00 1.00 2 0.8 109.2 0.7 1.3 7.1 128.4 26.5 13.7 A F C B 120.6 19.7 F C B 120.6 B 11.1 B 11.1 Sum of lost time (\$) or (\$	v/s Ratio Perm	0.29			0.12			c0.12			90:0		
100 1.00 1.00 1.00 1.00 1.00 1.00 1.00	v/c Ratio	0.45	1.23		0.20	0.56		0.77	0.36		0.38	0.33	
2 0.8 109.2 0.7 1.00 2 0.8 109.2 0.7 1.3 3.1 128.4 26.5 13.7 4 F C B 120.6 14.1 F B Y Y Y (C) Decidy ratio 1.112 Sum of lost time (s) int	Uniform Delay, d1	6.3	19.2		25.7	12.4		44.7	41.6		41.7	41.4	
2 0.8 109.2 0.7 1.3 7.1 128.4 26.5 13.7 A F C B 120.6 14.1 F B	Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
7.1 128.4 26.5 13.7 A F C B T20.6 B 14.1 F B N Y Y HCM 2000 Level of Service (Littlization 108.6% ICU Level of Service)	Incremental Delay, d2	0.8	109.2		0.7	1.3		21.1	0.4		1.9	0.4	
A F C C 120.6 F C Y S C C C C C C C C C C C C C C C C C	Delay (s)	7.1	128.4		26.5	13.7		65.8	42.0		43.6	41.8	
120.6 Y Y B4.1 10.0 (S) Utilization 120.6 110.1 110.1 1110.1 1110.1 1110.1 1110.1 1110.1 1110.1 1110.1 1110.1	Level of Service	A	ı.		O	В		ш	۵		٥	٥	
P F F F F F F F F F F F F F F F F F F F	Approach Delay (s)		120.6			14.1			50.1			45.0	
84.1 1.12 1.11.0 108.6%	Approach LOS		ш			8			O			O	
84.1 1.12 111.0 108.6%	Intersection Summary												
1.12 111.0 108.6%	HCM 2000 Control Delay			84.1	H	3M 2000	Level of S	ervice		4			
111.0 108.6%	HCM 2000 Volume to Capa	city ratio		1.12									
108.6%	Actuated Cycle Length (s)			111.0	Su	im of lost	time (s)			16.5			
75	Intersection Capacity Utiliza	tion		108.6%	Ö	U Level o	f Service			G			
Analysis Pendu (min)	Analysis Period (min)			15									

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

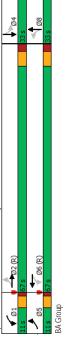
Queues 1: Sixth Line & Derry Road

Future Total (AM) 2032 Scenario 5

Future Total (AM) 2032 Scenario 5

Lane Configurations		1	†	-	ļ	•	←	۶	→	
173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 47 1	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 46 173 123 173 123 173 123 173 123 173 124 173 126	Lane Configurations	*	₩	r	₩	F	₽	r	₩	
173 46 174 46 175 478 49 18 4 49 18 32.3 32.3 32.3 32.3 32.3 32.3 32.3 32.	Traffic Volume (vph)	165	2230	25	923	105	173	46	142	
2 218 49 NA Perm 8 4 4 8 8 4 4 8 10.0 10.0 10.0	Future Volume (vph)	165	2230	25	923	105	173	46	142	
NA Perm R	Lane Group Flow (vph)	176	2552	27	1026	112	218	46	566	
8 4 4 3 8 8 4 4 100 100 100 100 100 100 100 100 100 10	Turn Type	pm+pt	NA	pm+pt	NA	Perm	M	Perm	¥	
3 8 4 4 3 100 100 100 100 100 100 100 100 100 10	Protected Phases	2	2	-	9		∞		4	
100 100 100 100 100 100 100 100 100 100	Permitted Phases	2		9		∞		4		
100 100 100 100 100 100 100 100 100 100	Detector Phase	2	2	-	9	∞	∞	4	4	
100 100 100 100 100 100 100 100 100 100	Switch Phase									
32.3 32.3 32.3 32.3 32.3 32.3 32.3 32.3	Minimum Initial (s)	7.0	25.0	7.0	25.0	10.0	10.0	10.0	10.0	
330 330 330 330 330 330 330 330 330 330	Minimum Split (s)	11.0	31.2	11.0	31.2	32.3	32.3	32.3	32.3	
29,7% 29,7%	Total Split (s)	11.0	0.79	11.0	0.79	33.0	33.0	33.0	33.0	
4,0 4,0 4,0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Split (%)	%6.6	60.4%	%6.6	60.4%	29.7%	29.7%	29.7%	29.7%	
23 2.3 2.3 2.3 2.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6	Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	
8 6.3 6.3 8.3 6.3 8.3 6.3 8.3 8.3 8.48 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	All-Red Time (s)	1.0	2.2	1.0	2.2	2.3	2.3	2.3	2.3	
None None I None	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
None None 1 0.38 0.38 0.38 0.38 0.00 0.00 0.00 0.00	Total Lost Time (s)	4.0	6.2	4.0	6.2	6.3	6.3	6.3	6.3	
None None 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2	Lead/Lag	Lead	Lag	Lead	Lag					
None None 1 0.38 0.38 48.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
7 0.38 0.38 8.8 48.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
388 480 0.0 0.0 0.0 388 480 321.6 10.1 330.7 21.0 211.8 30.0 0 0 0 0 0 0 0 0 0 0 0 0	v/c Ratio	0.44	1.21	0.15	0.56	0.77	0.38	0.38	0.46	
0.00 0.00 3.88 48.0 3.21.6 10.1 2.11.8 30.0 1.855 195 0.00 0 0.00 0 0.0	Control Delay	8.4	118.7	8.9	14.9	74.9	38.8	48.0	22.1	
3 88 48.0 3 21.6 10.1 3 30.7 21.0 211.8 30.0 0 0 0 0 0 0	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3 21.6 10.1 3 30.7 21.0 211.8 30.0 0 0 0 0 0 0	Total Delay	8.4	118.7	8.9	14.9	74.9	38.8	48.0	22.1	
3 30.7 21.0 211.8 30.0 1 855 195 0 0 0 0 0 0 1 0.25 0.25	Queue Length 50th (m)	9.5	~391.5	1.3	67.1	24.8	21.6	10.1	16.1	
211.8 30.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 95th (m)	21.3	#464.8	4.7	103.4	42.3	30.7	21.0	27.1	
30.0 1 855 195 0 0 0 0 0 0 0 0 0 1 0.25 0.25	Internal Link Dist (m)		475.1		256.2		211.8		201.7	
1 855 195 0 0 0 0 0 0 0 0 0 1 0.25 0.25	Turn Bay Length (m)	120.0		100.0		45.0		30.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	397	2115	184	1817	221	822	195	906	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
0.025 0.25	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
0.25 0.25	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary Cycle Length: 111 Actuated Cycle Length: 111 Ciffset of (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 150 Control Type: Naturaled-Coordinated Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Reduced v/c Ratio	0.44	1.21	0.15	0.56	0.51	0.25	0.25	0.33	
Cycle Length: 111 Offset of Offset Part 111 Offset of Offset of Offset	Intersection Summary									
Actualed Cycle Length: 111 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 150 Control Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Cycle Length: 111									
Offset: (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 150 Control Type: Actualed-Coordinated Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Actuated Cycle Length: 111	_								
Valuar Lyde: 19U Confort Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cydes. # 98th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cydes.	Offset: 0 (0%), Referenced	to phase 2:	EBTL and	16:WBTL	, Start of	Green				
ordinicy types: Nutrated-Voordinated Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Natural Cycle: 150									
 Voulne exceeds sepacify, queue is utedentcaily infinite. Queue shown is maximum after two cydes. \$5th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cydes. 	Control Type: Actuated-Coc	ordinated	office of the	ladin ladin	3					
Cueue shown is maximum after two cydes. # 95th percentite volume exceeds capacity, queue may be longer. Queue shown is maximum after two cydes.	~ volume exceeds capac	ily, queue is	uneoretic	ally Infin	aj.					
Queue shown is maximum after two cydes.	# 05th percentile volume	owreeds ca	cycles.	vem one	he longer					
בכסכם פוסודון בי וומצווומון מוכן נוס ליכים.	One to shown is maximi	im after two	oucity, qu	cacinay	ne loringa					
	CCCCC SHOWILLS INCOME.	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	cycles.							

Splits and Phases: 1: Sixth Line & Derry Road



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Future Total (AM) 2032 Scenario 5

	1	†	<u> </u>	>	ţ	4	•	←	•	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	₩.		je-	₩.		F	₩		×	₩	
Traffic Volume (vph)	92	2448	163	193	815	262	100	789	113	112	71	32
Future Volume (vph)	92	2448	163	193	815	262	100	589	113	112	71	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1:00	0.96		1.00	96.0		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1600	3254		1587	3118		1698	3203		1501	3250	
Fit Permitted	0.19	1.00		0.02	1.00		89.0	1.00		0.32	1.00	
Satd. Flow (perm)	324	3254		68	3118		1220	3203		201	3250	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	86	2604	173	205	298	279	106	307	120	119	76	34
RTOR Reduction (vph)	0	4	0	0	22	0	0	34	0	0	28	0
Lane Group Flow (vph)	86	2773	0	205	1121	0	106	393	0	119	82	0
Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
Bus Blockages (#/hr)	4	36	2	9	22	22	3	3	2	13	-	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
Protected Phases	2	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	82.2	74.7		83.2	75.2		22.3	22.3		22.3	22.3	
Effective Green, g (s)	82.2	74.7		83.2	75.2		22.3	22.3		22.3	22.3	
Actuated g/C Ratio	69.0	0.62		69.0	0.63		0.19	0.19		0.19	0.19	
Clearance Time (s)	4.0	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	301	2025		161	1953		226	262		93	603	
v/s Ratio Prot	0.05	c0.85		c0.08	0.36			0.12			0.03	
v/s Ratio Perm	0.20			0.80			0.00			c0.24		
v/c Ratio	0.33	1.37		1.27	0.57		0.47	99.0		1.28	0.14	
Uniform Delay, d1	7.9	22.6		41.2	13.1		43.6	45.3		48.9	40.8	
Progression Factor	0.65	0.63		1.01	88.0		1:00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	168.0		161.3	1.2		1.5	2.7		185.8	0.1	
Delay (s)	5.4	182.2		202.7	12.7		45.1	48.1		234.6	40.9	
Level of Service	V	ш		ш	В		۵	٥		ш	٥	
Approach Delay (s)		176.2			41.5			47.5			141.6	
Approach LOS		ш.									ш	
Intersection Summary												
HCM 2000 Control Delay			124.4	H	3M 2000	HCM 2000 Level of Service	ervice		4			
HCM 2000 Volume to Capacity ratio	ity ratio		1.34									
Actuated Cycle Length (s)			120.0	S.	Sum of lost time (s)	time (s)			15.0			
Intersection Capacity Utilization	on		120.7%	2	ICU Level of Service	f Service			Ξ			
Analysis Period (min)			15									

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (AM) 2032 Scenario 5

→	SBT	₽ ₽	71	71	110	¥.	4		4	10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7			None	0.17	29.0	0.0	29.0	8.3	16.8	275.9		631	0	0	0	0.17										
۶	SBL	F	112	112	119	Perm		4 .	4	10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7			None	1.28	226.3	0.0	226.3	~37.4	9.92#		20.0	93	0	0	0	178										
←	NBT	₩.	289	289	427	≦ '	∞	c	œ	10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7			None	89.0	47.1	0.0	47.1	47.3	65.7	340.6		629	0	0	0	89.0										
•	NBL	r	100	100	106	Perm		∞ α	œ	10.0	34.7	28.0		3.7	2.0	0.0	5.7			None	0.47	51.4	0.0	51.4	23.7	42.8		70.0	226	0	0	0	0.47			Green						=	
ţ	WBT	₩	815	815	1146	Y Y	9		9	0 00	34.3	80.0		3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.58	12.2	0.0	12.2	62.2	78.7	124.7		1978	0	0	0	0.58			Start of (ai	-	e longer.	am signa	
>	WBL	r	193	193	205	bm+pt		۰ ,	-	7.0	11.0	12.0	10.0%	3.0	1.0	0.0	4.0	Lead	Yes	None	1.27	186.9	0.0	186.9	~49.4	#99.2		0.06	162	0	0	0	1.27			6:WBTL,			ally intinite	-	ene may r	by upstre	
†	EBT	₽	2448	2448	2777	NA.	2	c	7	20.0	34.3	80.0	92.99	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.37	186.7	0.0	186.7	~486.0	#522.5	170.5		2030	0	0	0	1.37			BTL and		:	theoretic	cycles.	acity, que	cycles.	
4	EBL	F	92	92	86	pm+pt	ഹ	7 1	2	7.0	11.0	12.0	10.0%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.32	4.6	0.0		3.8	m4.1 m#522.5		100.0	311	0	0	0	0.32			phase 2:E		inated	dnene is	after two	seeds cap	alter two	
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	o Flow (vph)		Protected Phases	Permitted Phases	Defector Phase	Minimum Initial (c)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Oueue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Ovele Longth: 120	Actuated Ovele Length: 120	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 150	Control Type: Actuated-Coordinated	 Volume exceeds capacity, queue is theoretically infinite. 	Queue shown is maximum after two cycles.	# 95th percentile volume exceeds capacity, queue may be longer	Quede Stown 13 maximum and two cycles. M. Volume for 95th percentile queue is metered by upstream signal	

Splits and Phases: 2: Fifth Line & Derry Road



HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

221 221 1900 5.7 5.7 1.00 0.98 1.00 0.85 1.100 1.00 1.00 2.26 2.26 7.78 7.78 0.05 0.16 29.3 1.00 0.2 29.5 38.3 38.3 0.32 5.7 5.7 447 459 1900 5.7 0.91 1.00 1.00 1.00 1.00 1.00 0.98 468 10% ₹ 0.10 00. pm+pt 3.0 469 c0.22 456 900 4.0 1.00 1.00 1.00 616 616 643 0.98 465 2% Perm 0.04 0.33 47.3 1.00 0.9 0.9 D 19.0 220 220 900 900 5.7 5.7 0.85 1.00 1.586 1.00 1.586 0.98 224 224 1.56 68 1% 15.8 15.8 0.13 3.0 337 333 330 1900 5.7 5.7 6.9 1.00 1.00 4.668 4.668 337 337 ¥ 15.8 15.8 0.13 % 7 3.0 614 0.07 0% 9 % 4.0 3.0 1185 0.01 0.02 0.16 29 29 1900 1.00 1.00 1.00 1.00 0.95 899 30 pm+pt 1.00 1.00 0.4 42.5 20.3 20.3 0.17 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service Perm 219 1900 5.3 1.00 0.99 1.00 1.00 1.00 1.00 223 138 85 3% 45.5 45.5 0.38 5.3 3.0 574 0.06 0.98 24.5 2.04 0.5 50.4 618 1900 5.3 0.91 1.00 1.00 1.00 1.00 4828 4828 ¥ 45.5 45.5 0.38 631 631 4% 0.83 0.4 22.6 0 82 pm+pt 52.4 52.4 0.44 0.18 9/2 4.0 1.00 1.00 1.00 0.95 0.95 0.09 3% 3.0 26.1 42.2 0.98 120.0 93.4% Perm 51.3 51.3 0.43 5.3 0.85 1.00 1.00 1.00 1562 0.98 34 19 15 3% 0.01 0.02 19.9 1.00 0.1 199 43.3 D 1972 5.3 0.91 1.00 1.00 1.00 1.00 5006 5006 2012 Š 51.3 51.3 0.43 3.0 2140 c0.40 42.6 1% 0.94 32.9 1.00 9.7 2012 206 206 206 1900 4.0 0.97 1.00 1.00 0.95 3399 3399 210 2% Prot 12.7 4.0 3.0 359 c0.06 1.00 2.4 53.6 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp., pedbikes
Said. Flow (perm)
Fit Portected
Said. Flow (perm)
Peak-hour factor, PHF
Peak-hour factor, PHF
Red., Flow (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Actuated Green, G (s) Incremental Delay, d2 Effective Green, g (s) Actuated g/C Ratio Bus Blockages (#/hr) Turn Type Protected Phases Permitted Phases Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Heavy Vehicles (%) Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Total (AM)

Future Total (AM) 2032 Scenario 5

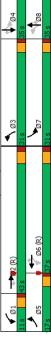
Lane Group Lane Configurations Traffic Volume (kph) Future Volume (kph) Lane Group Flow (kph) Turn Type Profected Phases Permitted Phases	BB 🗲	EBT	FRD									
Lane Configurations Traffic Volume (vph) Future Volume (vph) Lane Group Flow (vph) Turn Type Profected Phases	F		LDN	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph) Future Volume (vph) Lane Group Flow (vph) Turn Type Protected Phases	, 00	444	*	r	444	*	F	444	*	je.	***	*-
Future Volume (vph) Lane Group Flow (vph) Turn Type Protected Phases	700	1972	33	9/	618	219	29	330	220	456	459	221
Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases	206	1972	33	9/	618	219	29	330	220	456	459	221
Turn Type Protected Phases Permitted Phases	210	2012	34	78	631	223	30	337	224	465	468	226
Protected Phases	Prot	NA	Perm	pm+pt	M	Perm	pm+pt	¥	Perm	pm+pt	Ν	Perm
Dermitted Phases	2	2		-	9		m	∞		7	4	
Commission Indoor			2	9		9	∞		∞	4		4
Detector Phase	2	2	2	-	9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	43.0	43.0	11.0	37.0	37.0	31.0	35.0	35.0	31.0	35.0	35.0
Total Split (%)	14.2%	35.8%	35.8%	9.5%	30.8%	30.8%	25.8%	29.2%	29.2%	25.8%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.58	0.00	0.02	0.42	0.33	0.31	0.13	0.61	0.65	0.99	0.33	0.38
Control Delay	97.79	38.4	0.1	20.1	22.4	8.5	25.3	54.9	21.2	72.1	32.4	5.9
ıy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	38.4	0.1	20.1	22.4	8.5	25.3	54.9	21.2	72.1	32.4	5.9
Queue Length 50th (m)	25.9	169.7	0.0	8.3	43.8	11.6	4.6	29.5	10.1	7.76	34.0	0.0
Queue Length 95th (m)	37.8	#232.6	0.0	m19.0	61.2	34.8	10.4	39.0	35.3	#144.8	43.1	18.2
		156.1			488.7			381.6			213.2	
_	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	392	2239	752	185	1896	730	524	1139	523	470	1431	601
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	06:0	0.05	0.42	0.33	0.31	90.0	0.30	0.43	66:0	0.33	0.38
Intersection Summary												
Ovela Lanath: 120												

Actuated Cycle Length: 120 Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Natural Cycle: 115

Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

M. Volume for 95th percentile queue is metered by upstream signal.

3: James Snow Parkway & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Total (AM) 2032 Scenario 5

Queues 4: Clark Boulevard & Derry Road

Future Total (AM) 2032 Scenario 5

•	SBR		43	43	1900								0.92	47	0	0																										
→	SBT	æ	10	10	1900	2.7	1.00	0.88	1.00	1636	1.00	1636	0.92	1	43	12	¥	4		10.0	10.0	0.08	2.7	3.0	136	0.01		0.11	50.9	1.00	0.4	51.2	Ω	51.7	D							
۶	SBL	r	26	26	1900	2.7	1.00	1.00	0.95	1770	0.73	1362	0.92	28	0	28	Perm		4	10.0	10.0	0.08	2.7	3.0	113		0.02	0.25	51.5	1.00	1.2	52.6	Ω									
•	NBR		29	29	1900								0.92	32	0	0																					ш		15.0	G		
←	NBT	ţ	7	7	1900	2.7	1.00	0.88	1.00	1639	1.00	1639	0.92	∞	29	1	NA	∞		10.0	10.0	0.08	2.7	3.0	136	0.01		0.08	20.7	1.00	0.2	21.0	Ω	56.2	ш							
•	NBL	jr-	28	28	1900	2.7	1.00	1.00	0.95	1770	0.72	1340	0.92	63	0	63	Perm		∞	10.0	10.0	0.08	2.7	3.0	111		c0.05	0.57	52.9	1.00	6.5	59.4	ш				ervice					
4	WBR		91	16	1900								0.92	66	0	0																					evel of S		time (s)	* Service		
ļ	WBT	₩	196	196	1900	5.3	0.95	0.99	1.00	3494	1.00	3494	0.92	1051	3	1147	NA	9		0.66	0.66	0.82	5.3	3.0	2882	0.33		0.40	2.7	1.00	0.4	3.1	A	8.2	A		HCM 2000 Level of Service		Sum of lost time (s)	ICU Level of Service		
>	WBL	je-	189	189	1900	4.0	1.00	1.00	0.95	1770	0.02	4	0.92	205	0	205	pm+pt	-	9	0.66	0.66	0.82	4.0	3.0	386	c0.10	0.34	0.53	35.1	1.00	1.4	36.5							Su	O		
<u> </u>	EBR		163	163	1900								0.92	177	0	0																					118.6	1.08	120.0	105.2%	15	
†	EBT	₩	2429	2429	1900	5.3	0.95	0.99	1.00	3206	1.00	3506	0.92	2640	4	2813	NA	2		73.0	73.0	0.61	5.3	3.0	2132	c0.80		1.32	23.5	1.51	144.1	179.5	_	174.1	ш					1		
4	EBL	<u>r</u>	91	91	1900	5.3	1.00	1.00	0.95	1770	0.25	460	0.92	66	0	66	Perm		2	73.0	73.0	0.61	5.3	3.0	279		0.22	0.35	11.7	1.66	0.3	19.8	В					/ ratio		u		
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Frt	Fit Protected	Satd. Flow (prot)	Fit Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)	c Critical Lane Group

12-14-2023 Synchro 11 Report BA Group

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	je.	₩.	<i>y</i> -	₩	r	æ,	<i>y</i> -	42	
Traffic Volume (vph)	91	2429	189	196	28	7	26	10	
Future Volume (vph)	91	2429	189	196	28	7	26	10	
Lane Group Flow (vph)	66	2817	202	1150	63	40	28	58	
Turn Type	Perm	¥	pm+pt	Ϋ́	Perm	Ź	Perm	NA	
Protected Phases		2	_	9		∞		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	-	9	∞	8	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	0.9	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	34.3	34.3	10.0	34.3	34.7	34.7	34.7	34.7	
Total Split (s)	75.0	75.0	10.0	82.0	35.0	35.0	35.0	35.0	
Total Split (%)	62.5%	62.5%	8.3%	70.8%	29.2%	29.2%	29.2%	29.2%	
Yellow Time (s)	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.6	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	4.0	5.3	2.7	2.7	2.7	5.7	
Lead/Lag	Lag	Lag	Lead						
Lead-Lag Optimize?	Yes	Yes	Yes						
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None	
v/c Ratio	0.35	1.30	0.53	0.39	0.47	0.21	0.21	0.28	
Control Delay	22.2	165.1	30.8	3.4	62.2	22.4	52.2	21.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		165.1	30.8	3.4	62.2	22.4	52.2	21.2	
Queue Length 50th (m)	18.6	~467.2	29.1	31.5	15.1	1.8	9.9	2.6	
Queue Length 95th (m)	m14.9 m#295.2	1#295.2	26.8	20.7	29.3	12.4	15.6	15.2	
Internal Link Dist (m)		336.0		475.1		56.4		313.3	
Turn Bay Length (m)	70.0	1	70.0	0	ì	,	40.0	7 07	
Base Capacity (vpn)	784	1/17	388	2948	970	474	332	434	
Stallyalloll Cap Reductil	0	0	> 0	0	0	> 0	0	0 0	
Spilipack Cap Reductin	0	0	0	0	0 0	0	0	0	
Reduced v/c Ratio	0.35	1.30	0.53	0.39	0.19	0.09	0.08	0.13	
Intersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 120									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	phase 2:	EBTL an	d 6:WBTL	, Start of	Green				
Natural Cycle: 150	-								
Control Type: Actuated-Coordinated	dinated								
 Volume exceeds capacity, queue is theoretically infinite. 	, queue is	theoretic	cally infinit	je.					
Queue shown is maximum after two cycles.	n after two	cycles.							
# 95th percentile volume exceeds capacity, queue may be longer.	ceeds cal	oacity, qu	reue may	be longer					
Queue shown is maximum after two cycles.	n after two	cycles.							
 Wolume for 95th percentile queue is metered by upstream signal 	le dnene i	s metere	d by upstr	eam sign					
	o o	0 0	0000						
Splits and Phases: 4: Clark	 Clark Boulevard & Derry Road 	d & Derr	у коаа						

HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

Future Total (AM) 2032 Scenario 5

Movement -ane Configurations Fraffic Volume (vph)	2											
ne Configurations affic Volume (vph) tture Volume (vph)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
affic Volume (vph)	-	2		F	2,		F	£		F	£3	
iture Volume (vph)	10	13	က	7	15	Ξ	10	481	45	61	329	37
	10	13	æ	7	15	=	10	481	45	61	329	37
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
8)	5.3	5.3		5.3	5.3		2.7	5.7		5.7	5.7	
ane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
	1.00	0.97		1.00	0.94		1.00	0.99		1.00	0.98	
It Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
rot)	1770	1813		1770	1743		1770	1839		1770	1835	
	1.00	1.00		1.00	1.00		0.53	1.00		0.43	1.00	
Satd. Flow (perm)	1863	1813		1863	1743		983	1839		802	1835	
Jr, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	14	m	∞	16	12	1	523	46	99	358	40
RTOR Reduction (vph)	0	က	0	0	1	0	0	က	0	0	4	0
ane Group Flow (vph)	11	14	0	∞	17	0	11	269	0	99	394	0
urn Type F	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		7			9			∞			4	
ermitted Phases	2			9			∞			4		
Actuated Green, G (s)	3.4	3.4		3.4	3.4		26.4	26.4		26.4	26.4	
	3.4	3.4		3.4	3.4		26.4	26.4		26.4	26.4	
	80:0	0.08		0.08	0.08		0.65	0.65		0.65	0.65	
	5.3	5.3		5.3	5.3		2.7	2.7		2.7	2.7	
(ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
ane Grp Cap (vph)	155	151		155	145		929	1189		520	1187	
/s Ratio Prot		0.01			c0.01			c0.31			0.22	
/s Ratio Perm	0.01			0.00			0.01			0.08		
//c Ratio	0.07	60.0		0.05	0.12		0.05	0.48		0.13	0.33	
Iniform Delay, d1	17.2	17.3		17.2	17.3		2.6	3.7		2.8	3.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
ncremental Delay, d2	0.2	0.3		0.1	0.4		0.0	0.3		0.1	0.2	
Delay (s)	17.4	17.6		17.4	17.7		2.6	4.0		2.9	3.4	
evel of Service	В	В		В	В		⋖	A		A	A	
proach Delay (s)		17.5			17.6			4.0			3.3	
Approach LOS		В			B			∢			⋖	
ntersection Summary												
HCM 2000 Control Delay			4.5	H	:M 2000	HCM 2000 Level of Service	service		Α			
HCM 2000 Volume to Capacity ratio	ratio		0.44									
Actuated Cycle Length (s)			40.8	Su	Sum of lost time (s)	time (s)			11.0			
ntersection Capacity Utilization			28.6%	0	J Level o	ICU Level of Service			В			
Analysis Period (min)			15									

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Queues 5: Fifth Line & Clark Boulevard

Future Total (AM) 2032 Scenario 5

→ → → → → → →	VBL WBT NBL NBT SBL SBT	**	7 15 10 481 61 329	10 481 61	8 28 11 572 66 398	erm NA Perm NA Perm NA	6 8 4	6 8 4	6 6 8 8 4 4		10.0 10.0	34.3 34.7 34.7 34.7	35.0 85.0 85.0 85.0	29.2% 70.8% 70.8% 70.8% 70	3.7 3.7 3.7 3.7 3.7	2.0 2.0 2.0	0.0 0.0 0.0 0.0	5.3 5.7 5.7 5.7			one None Min Min Min Min	0.06 0.01 0	10.5 4.6	0.0 0.0 0.0 0.0	10.5 4.6 5.4 4.8	0.0 0.0 0.0 8.0	2.9 5.4 2.0 50.8 7.2 31.1	86.5 156.9	35.0 35.0	1426 982 1839 805 18:	0	0 0 0 0 0 0	0 0 0 0 0 0	0.01 0.02 0.01 0.31 0.08 0.22				
†	EBT WBI	43	13	13	17 8	NA Perm	2		2 (10.0 10.0			29.2% 29.2%	3.7 3.7	1.6 1.0	0.0	5.3 5.3			None None	_	12.1 13.0					204.0		1482 1521	0	0	0	0.01 0.0				
4	EBL	F	10	10	=	Perm		2	2		10.0	34.3			3.7	1.6	0.0	5.3			None	0.02	13.1	0.0	13.1	0.5			35.0	1521	0	0	0	0.01				
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 37.4	

Splits and Phases: 5: Fifth Line & Clark Boulevard

HCM Unsignalized Intersection Capacity Analysis 10: Clark Boulevard & Anatolia Building 1 North Access/Anatolia Building 2 North Aଉଞ୍ଚେକ୍ଷମକାସୀ 5

→ →	SBL SBT SBR	4	34 302 26	302	Free	%0	0.92 0.	37 328 28						None		80		83			83	4.1	2.2	2:3	1514														
•	NBR		4	4			0.92	4																															
←	NBL NBT	4	1 73	1 73	Free		0.92 0.92	1 79						None			0.99	356			340	4.1	2.2	100	1202														
4	r wbr			0 11	0		0	0 12									•	3 81			9 81	5 6.2	33		6														
<i>\</i>	WBL WBT	4	2 0		Stop		0.92 0.92	2										501 513			487 499	7.1 6.5	35 40		473 455	SB1	393	37	28	1514	0.02	9.0	6:0	Α	6:0				
<i>></i>	EBR		2				0.92	2									0.99	342			326	6.2	3.3			NB 1						0.0			0.1			1.3	.00.
↑ •	EBL EBT	4	10 0		Stop		0.92 0.92	11 0									60.00 66.00	511 501			497 487	7.1 6.5	35 40			EB1 WB1	13 14						12.6 9.3		12.6 9.3	В А			
1	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control		Peak Hour Factor 0.	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	70.		vC1, stage 1 conf vol	lo	vCu, unblocked vol 4	tC, single (s)		% daile free %	(H)	Direction, Lane # EF	Volume Total	Volume Left	ne Right			ith (m)	lay (s)		/ (s)	Approach LOS	Intersection Summary	Average Delay	

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HCM Unsignalized Intersection Capacity Analysis 9: Sixth Line & Anatolia Building 3 East Access

Future Total (AM)

HERL EBR NBL NBT SBT SBT SBT SBT SBT SBT SBT SBT SBT S		\	~	•	ь	•	*	
Stop 7 1 4 303 314 22 7 1 1 4 303 314 22 8 10 4 7 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Movement	EBL	EBR	NBL	NBT	SBT	SBR	
526 182 365 874 22 Slop	Lane Configurations	>			44	4₽		
Stop Free Free Free Free Free Free Free Fre	raffic Volume (veh/h)	7		4	303	314	22	
Slop Free Free 0'08 0'8 0'8 0'8 0'092 0'92 0'92 0'92 8 1 4 329 341 24 A	-uture Volume (Veh/h)	7	-	4	303	314	22	
09% 09% 09% 09% 09% 09% 092 092 092 092 092 092 092 092 092 092	Sign Control	Stop			Free	Free		
992 992 992 992 8 1 4 329 341 24 8 1 4 329 341 24 8 1 4 329 341 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 8 1 24 1 24	Grade	%0			%0	%0		
8 1 4 329 341 24 None None 526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 480 829 1190 480 829 1190 480 829 1190 700 100 000 002 002 013 004 01 00 01700 1700 002 003 013 013 004 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 12.3 0.1 0.0 100 12.3 0.3 0.0 0.0 0.0 12.3 0.1 0.0 100 12.3 0.3 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 12.3 0.1 0.0 100 12.3 0.1 0.0 100 12.3 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
526 182 365 526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 480 829 1190 FB 1 NB 1 SB 1 SB 2 9 114 219 227 138 8 4 0 0 24 504 1190 1700 1700 0.02 0.00 0.01 0.00 0.04 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 B A 123 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.1 0.0 0.0 0.0 0.1 0.0 0.0 0.0 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Hourly flow rate (vph)	∞		4	329	341	24	
526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 480 820 100 480 820 100 480 8 4 0 0 0 9 114 219 227 138 9 4 0 0 0 24 9 114 219 0 0 0 0 1 0.04 0.1 0.0 0.0 0.0 1 12.3 0.3 0.0 0.0 0.0 1 12.3 0.1 0.0 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0 1 12.3 0.1 0.0	Pedestrians							
S26 182 365 526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 480 829 1190 480 829 1190 68 110 0 0 24 9 11 219 227 138 9 14 0 0 24 9 11 0 0 0 0 0 0 0.02 0.013 0.13 0.08 0.04 0.0 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 12.3 0.1 0.0 1.0 12.3 0.1 0.0 1.0 12.3 0.1 0.0 1.0 12.3 0.1 0.0 1.0 12.3 0.1 0.0 1.0 12.3 0.1 0.0 1.0 12.3 0.1 0.0 1.0 12.3 0.1 0.0 1.0 12.3 0.1 0.0 1.0 12.3 0.1 0.0 1.0 12.3 0.1 0.0 1.0 12.3 0.1 0.0 1.0 12.3 0.1 1.	ane Width (m)							
None None None None S26 S27 S26 S27	Walking Speed (m/s)							
526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 480 80 1100 480 100 480 100 0 0 0 0 0 1 12.3 0.3 0.0 0.0 0 0 0 0 0 1 12.3 0.1 0.0 0	Percent Blockage							
S26 182 365 526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 480 829 1190 480 829 1190 9 1114 219 227 138 9 4 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 1 12.3 0.3 0.0 0.0 0.0 B B A 12.3 0.1 0.0 0.0 0.0 B B A 12.3 0.1 0.0 0.0 0.0 B B A 12.3 0.1 0.0 0.0 0.0 B B B A 12.3 0.1 0.0 0.0 0.0 B B B COLU Level of Service 1522 0.1 153 0.1 154 0.1 155 0.1 156 0.1 157 0.1 158 0.1 159 0.1 150 0.0 15	Right turn flare (veh)							
526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 480 829 1190 480 829 1190 100 100 002 0002 0013 0138 004 1190 1700 1700 1700 002 002 013 013 008 004 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Median type				None	None		
526 182 365 526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 480 829 1190 480 829 1190 6 114 219 227 138 9 4 0 0 0 24 11 219 0 1700 1700 0.02 0.00 0.13 0.13 0.08 0.04 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 12.3 0.1 0.0 12.3 0.1 0.0 12.3 0.1 0.0 12.3 0.1 0.0 15.0 0.0 16.0 0.0 17.3 0.1 0.0 18	Median storage veh)							
526 182 365 526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 480 829 1190 480 829 1190 480 84 0 0 0 9 114 219 227 138 9 4 0 0 0 24 1 0 0 0 0 24 1 0 0 0 0 0 0 0 1 12.3 0.3 0.0 0.0 0.0 B B A 12.3 0.1 0.0 0.0 0.0	Jpstream signal (m)					236		
526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 480 829 1190 EB1 NB1 NB2 SB1 SB2 9 114 219 227 138 9 14 0 0 0 24 11 0 0 0 24 504 1190 1700 1700 1700 0.02 0.013 0.13 0.08 0.04 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 B 12.3 0.1 0.0 0.0 0.0 B 12.3 0.1 0.0 1.0	X, platoon unblocked							
526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 480 829 1190 EB 1 NB 1 NB 2 SB 1 SB 2 9 114 219 227 138 8 4 0 0 0 0 1 0 0 24 504 1190 1700 1700 1700 0.02 0.00 0.13 0.13 0.08 0.02 0.00 0.13 0.13 0.08 B A 0 0 0 0.0 12.3 0.1 0.0 0.0 B A 0 0.0 0.0 12.3 0.1 0.0	C, conflicting volume	526	182	365				
6.8 6.9 4.1 6.8 6.9 4.1 3.5 3.3 2.2 96 100 100 480 229 1190 480 229 1190 6 114 219 227 138 8 4 0 0 0 0 554 1190 1700 1700 1700 1700 0.02 0.00 0.13 0.13 0.08 0.4 0.1 0.0 0.0 0.0 0.5 0.0 0.13 0.13 0.08 0.4 0.1 0.0 0.0 0.0 0.5 0.0 0.1 0.0 0.0 0.5 0.0 0.1 0.0 0.0 0.5 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	C1, stage 1 conf vol							
526 182 365 6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 480 829 1190 EB1 NB1 NB2 SB1 SB2 9 110 0 0 0 0 11 0 0 0 0 0 10 0 0 0 0 11 0 0 0 0 0 12.3 0.3 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0	C2, stage 2 conf vol							
6.8 6.9 4.1 3.5 3.3 2.2 98 100 100 480 829 1190 EB 1 NB 1 NB 2 SB 1 SB 2 9 114 219 227 138 8 4 0 0 0 24 50 0 1190 1700 1700 1700 0.02 0.02 0.03 0.13 0.13 0.03 (m) 0.4 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 B A 0.0 0.0 0.0 ID 3 0.1 0.0 0.0 0.0 ID 4 0.1 0.0 0.0 0.0 ID 5 0.1 0.0 0.0 0.0 ID 5 0.1 0.0 0.0 0.0 ID 5 0.1 0.0 0.0	Cu, unblocked vol	279	182	365				
3.5 3.3 2.2 98 100 100 480 829 1190 EB1 NB1 NB2 SB1 SB2 9 114 219 227 138 8 4 0 0 0 1 0 0 24 504 1190 1700 1700 1700 0.02 0.00 0.13 0.13 0.08 (m) 0.4 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 B A 12.3 0.1 0.0 12.3 0.1 0.0 15.3 0.1 0.0	C, single (s)	8.9	6.9	4.1				
3.5 3.3 2.2 480 100 480 100 480 100 480 190 100 480 190 100 9 114 219 227 138 8 4 0 0 0 24 1 0 0 0 24 504 1190 1700 1700 1700 0.02 0.00 0.13 0.08 (m) 0.4 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 B A A 12.3 0.1 0.0 12.3 0.1 0.0 15.3 0.1 10.0 16.4 0.1 10.0 17.3 0.1 10.0 18.4 0.1 10.0	C, 2 stage (s)							
98 100 100 480 829 1190 EB1 NB1 NB2 SB1 SB2 9 114 219 227 138 8 4 0 0 0 24 504 1190 1700 1700 1700 0.02 0.00 0.13 0.08 (m) 0.4 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 B A 0.0 12.3 0.1 0.0 0.0 0.0 B A 112.3 0.1 0.0 0.0 B A 12.2% ICU Level of Service 15 22% ICU Level of Service	F (s)	3.5	3.3	2.2				
## 480 829 1190 FB NB NB 2 8B 1 8B 2 188 2	no queue free %	86	100	100				
EB 1 NB 1 NB 2 SB 1 SB 2 9 114 219 227 138 8 4 0 0 0 1 0 0 24 504 1190 1700 1700 1700 0.02 0.00 0.13 0.13 0.00 12.3 0.1 0.0 0.0 0.0 B A 12.3 0.1 0.0 B 0.1 0.0 0.0 0.0 12.3 0.1 0.0 0.0 0.0 B 12.2% ICU Level of Service 15.2%	:M capacity (veh/h)	480	829	1190				
9 114 219 227 138 8 4 0 0 0 1 0 0 24 504 1190 1700 1700 1700 0.02 0.00 0.13 0.13 0.08 0.4 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 B A 12.3 0.1 0.0 B A 12.3 0.1 0.0 12.3 0.1 0.0	Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2		
8 4 0 0 0 1 10 0 0 24 504 1190 1700 1700 1700 0.02 0.00 0.13 0.13 0.08 0.4 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 B A 12.3 0.1 0.0 B A 12.3 0.1 0.0 12.3 0.1 0.0	/olume Total	6	114	219	227	138		
1 0 0 0 24 504 1190 1700 1700 0.02 0.00 0.13 0.08 0.4 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 B A 0.0 12.3 0.1 0.0 B A 12.3 0.1 0.0 B 12.3 0.1 0.0	olume Left	∞	4	0	0	0		
504 1190 1700 1700 1700 002 0.02 0.00 0.13 0.13 0.08 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	/olume Right	-	0	0	0	24		
0.02 0.00 0.13 0.13 0.08 0.4 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	SH	204	1190	1700	1700	1700		
0.4 0.1 0.0 0.0 0.0 12.3 0.3 0.0 0.0 0.0 B A 0.0 B A 0.0 B 0.	folume to Capacity	0.02	0.00	0.13	0.13	0.08		
12.3 0.3 0.0 0.0 0.0 B A 0.0 I 2.3 0.1 0.0 B 0.2 Utilization 21.2% ICU Level of Service	Jueue Length 95th (m)	0.4	0.1	0.0	0.0	0.0		
12.3 0.1 0.0 B	Control Delay (s)	12.3	0.3	0.0	0.0	0.0		
12.3 0.1 0.0 B 0.2 Utilization 21.2% ICU Level of Service 15.	ane LOS	Ω	⋖					
9 0.2 0.1 Utilization 21.2% ICU Level of Service 16	Approach Delay (s)	12.3	0.1		0.0			
7 0.2 0.2 Utilization 21.2% ICU Level of Service 15.	Approach LOS	Ω						
0.2 Utilization 21.2% ICU Level of Service 15	ntersection Summary							
Utilization 21.2% ICU Level of Service 15	Average Delay			0.2				
15	ntersection Capacity Utilizat	tion		21.2%	⊇	U Level o	Service	⋖
	Analysis Period (min)			15				

12-14-2023 Synchro 11 Report BA Group

Future Total (AM) 2032 Scenario 5 HCM Unsignalized Intersection Capacity Analysis 12: Clark Boulevard & Anatolia Building 1 South Access

																																								A	
*	SBR			130			_	141																																ICU Level of Service	
→	NBT SBT		36	36	_	%0	0.92							None None																											
* *	EBR NBL		3 15				0	3 16										220 291				6.2 4.1				819 1271	NB 1 SB 1	55 291	16 0				0.3 0.0			2.4 0.0			1.5	25.2%	1
4	EBL	>	38		Stop	%0	o.	41									-	292			292	6.4		3.5	94	069	EB 1	44	41	3	869		n) 1.6	10.5	В	10.5	В			Utilization	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	b0 dueue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	

Synchro 11 Report 12-14-2023 BA Group

HCM Unsignalized Intersection Capacity Analysis 11: Clark Boulevard & Anatolia Building 2 South Access

Future Total (AM)

266 266 266 0.92 0.92 289 None 0.92 2.2 97 1517 40 8 4.1 0.92 68 68 68 0% 0.92 0.03 0.7 1.2 A A None 0.92 78 0.05 10 10 78 6.2 3.3 99 983 2 Stop 0% 0.92 /B1 13 2 2 2 11 11 877 0.01 9.2 A 3.5 452 452 Direction, Lane #
Volume Total
Volume Eight
cSH
Volume Right
cSH
Volume to Capacity
Outure to Capacity
Lane Los
Lane LoS Grade
Peak Hour Factor
Peak Hour Factor
Peux Houry flow rate (vph)
Pedeskirans
Lane Width (m)
Walking Speed (m/s)
Walking Speed (m/s)
Walking Speed (m/s)
Walking Type
Median type
Median type
Right turn flare (veh)
Walking Speed (m/s)
Percoral Blockage
Walking Speed (m/s)
Percoral Blockage
Walking Speed (m/s)
Percoral Blockage
Walking (m/s)
Percoral Lane Configurations Traffic Volume (veh/h) -uture Volume (Veh/h) Sign Control

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ICU Level of Service

1.2 32.9% 15

Intersection Summary
Average Delay
Intersection Capacity Utilization
Analysis Period (min)

0.0

Approach Delay (s) Approach LOS

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

			2	IMA	HOW	00//	2	-	NRR	CDI		CDD
Movement	EBL	EBI	EBK	VVDL	WBI	WBK	NBL	NBT		SDL	SBT	SDR
-ane Configurations	*	₩		r	₽		F	₽		*	₩	
raffic Volume (vph)	176	2017	109	34	1899	22	218	166	41	137	226	149
uture Volume (vph)	176	2017	109	34	1899	22	218	166	41	137	226	149
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Fotal Lost time (s)	4.0	6.2		4.0	6.2		4.0	6.3		6.3	6.3	
ane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Į.	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.94	
It Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
satd. Flow (prot)	1763	3169		1805	2967		1805	3468		1258	3354	
It Permitted	0.07	1.00		0.08	1.00		0.34	1.00		0.61	1.00	
Satd. Flow (perm)	134	3169		148	2967		639	3468		813	3354	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
(dj. Flow (vph)	187	2146	116	36	2020	27	232	177	44	146	240	159
REDICTION (vph)	0	က	0	0	-	0	0	21	0	0	105	0
ane Group Flow (vph)	187	2259	0	36	2046	0	232	200	0	146	294	0
leavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
3us Blockages (#/hr)	1	46	2	0	54	2	0	0	1	9	1	2
urn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	M	
Protected Phases	2	7		-	9		m	∞			4	
ermitted Phases	2			9			∞			4		
Actuated Green, G (s)	64.7	299		52.5	51.3		33.8	33.8		22.8	22.8	
Effective Green, g (s)	64.7	56.5		52.5	51.3		33.8	33.8		22.8	22.8	
Actuated g/C Ratio	0.58	0.51		0.50	0.46		0.30	0.30		0.21	0.21	
clearance Time (s)	4.0	6.2		4.0	6.2		4.0	6.3		6.3	6.3	
ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
ane Grp Cap (vph)	216	1613		136	1371		268	1056		166	889	
/s Ratio Prot	c0.07	c0.71		0.01	c0.69		c0.05	90:0			0.09	
/s Ratio Perm	0.43			0.12			c0.21			0.18		
/c Ratio	0.87	1.40		0.26	1.49		0.87	0.19		0.88	0.43	
Jniform Delay, d1	31.3	27.2		24.4	29.9		35.2	28.5		42.8	38.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
ncremental Delay, d2	28.4	184.1		1.0	225.4		24.0	0.1		37.2	0.4	
Delay (s)	59.7	211.3		25.5	255.3		59.3	28.6		80.0	38.8	
evel of Service	ш	ш		O	ш		ш	O		ш	۵	
approach Delay (s)		199.7			251.3			44.3			49.9	
Approach LOS		ட			ш.			Ω			Ω	
ntersection Summary												
ICM 2000 Control Delay			191.7	土	HCM 2000 Level of Service	Level of S	Service		Ь			
HCM 2000 Volume to Capacity ratio	acity ratio		1.26									
ctuated Cycle Length (s)			111.0	Š	Sum of lost time (s)	time (s)			20.5			
ntersection Capacity Utilization	ation	ľ	105.2%	೨	ICU Level of Service	of Service			G			
Analysis Period (min)			15									

c Critical Lane Group

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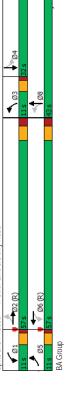
Queues 1: Sixth Line & Derry Road

Future Total (PM) 2032 Scenario 5

Future Total (PM) 2032 Scenario 5

## Group FBI FBI WBI WBI NBI SBI SBI ## Pack Group FBI FBI WBI WBI NBI NBI SBI SBI ## Pack Group FBI Configurations	sr (ha) (hay)	EBT	WBL	WBT	NBL	1	ē	F	
19	sr (h) (hdv)	4	ŀ			NBI	SBL	SBI	
2017 34 1899 218 166 137 2017 34 1899 218 166 137 2017 34 1899 218 166 137 2 11 6 3 8 4 2 1 6 8 8 4 4 2 1 6 8 8 4 4 25 0 7.0 25.0 7.0 10.0 10.0 31.2 11.0 31.2 11.0 32.3 32.3 57.0 11.0 57.0 11.0 43.0 32.0 57.0 11.0 57.0 11.0 43.0 32.0 57.0 11.0 57.0 11.0 43.0 32.0 57.0 11.0 57.0 11.0 43.0 32.0 57.0 12.0 2.2 10.0 2.3 23 57.0 12.0 2.2 4.0 6.3 6.3 62 4.0 6.2 4.0 6.3 6.3 62 4.0 6.2 4.0 6.3 6.3 62 4.0 6.2 4.0 6.3 6.3 62 1.0 2.2 1.0 2.2 1.0 2.3 62 1.0 2.2 1.0 2.2 1.0 62 2 4.0 6.3 6.3 63 24.3 88.0 64 2 4.0 6.3 6.3 64 3 8 24.3 88.0 65 2 4.0 6.3 6.3 65 2 4.0 6.3 6.3 67 12.6 253.0 54.8 24.3 88.0 60 0 0 0 0 0 0 60 0 0 0 0 60 0 0 0 0 60 0 0 0 60 0 0 0	h) h) (vph)		-	₩	*	₩	r	₩.	
2262 36 2017 33 1899 218 166 137 2262 36 2017 232 221 146	oh) (vph)	2017	34	1899	218	166	137	226	
25.0 36 2047 232 221 146 NA pm+pt NA pm+pt NA Perm 2 6 8 8 4 2 1 6 8 8 4 2 1 6 8 8 4 2 1 6 9 8 8 4 25.0 7.0 25.0 7.0 10.0 10.0 31.2 11.0 31.2 11.0 32.3 32.3 51.4% 99% 51.4% 99% 387% 888% 26 51.4% 99% 51.4% 99% 387 888% 26 51.4% 99% 51.4% 99% 38.7 888% 26 51.4% 99% 51.4% 99% 38.0 0.0 6.2 1.0 2.2 1.0 2.3 2.3 1.0 0.0 0.0 0.0 0.0 0.0 1.0 0.0 0.0 0.0 0.0 1.0 0.0 0.0 0.0 0.0 1.0 0.0 0.0 0.0 2.2 2 1.3 3.0 2.2 2 1.3 3.0 2.2 2 1.3 3.0 2.2 3.0 3.0 3.0 0.0 0.0 0.0 1.3 0.0 0.0 0.0 0.0 1.3 0.0 0.0 0.0 0.0 1.3 0.0 0.0 0.0 0.0 2.2 2 1.3 0.0 0.0 0.0 2.3 0.0 0.0 0.0 0.0 2.4 0.0 0.0 0.0 0.0 2.5 0.0 0.0 0.0 0.0 2.5 0.0 0.0 0.0 0.0 2.5 0.0 0.0 0.0 0.0 2.5 0.0 0.0 0.0 0.0 2.5 0.0 0.0 0.0 0.0 2.5 0.0 0.0 0.0 0.0 2.5 0.0 0.0 0.0 0.0 2.5 0.0 0.0 0.0 0.0 2.5 0.0 0.0 0.0 0.0 2.5 0.0 0.0 0.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 0.0	(vph)	2017	34	1899	218	166	137	226	
NA pm+pt		2262	36	2047	232	221	146	399	
2 1 6 8 8 4 2 1 6 8 8 4 2 1 1 6 3 8 8 4 2 1 1 6 3 8 8 4 2 1 1 6 3 8 8 4 2 1 1 6 3 8 8 4 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		NA	pm+pt	NA	pm+pt	¥	Perm	¥	
25.0 7.0 25.0 7.0 10.0 10.0 13.1.2 11.0 31.2 11.0 31.2 11.0 31.2 11.0 31.2 11.0 31.2 11.0 31.2 11.0 31.2 11.0 31.2 11.0 31.2 31.2 31.2 31.2 31.2 31.2 31.2 31.2		2	_	9	က	∞		4	
2 1 6 3 8 4 3 12 11.0 31.2 11.0 32.3 32.3 33.3 31.2 11.0 31.2 11.0 32.3 32.3 32.3 33.2 11.0 31.2 11.0 32.3 32.3 32.3 32.4 4.0 3.0 11.0 57.0 11.0 43.0 32.3 32.3 32.4 4.0 3.0 4.0 3.0 4.0 4.0 3.0 4.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5			9		∞		4		
25.0 7.0 25.0 7.0 10.0 10.0 13.3 31.2 31.2 31.2 31.2 31.2 11.0 31.2 11.0 32.3 32.3 32.3 32.4 32.0 11.0 57.0 11.0 43.0 32.3 32.3 32.3 32.4 32.0 11.0 57.0 11.0 43.0 32.0 32.0 32.0 30.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0		2		9	က	∞	4	4	
25.0 7.0 25.0 7.0 100 100 131.2 131.2 11.0 31.2 31.3 32.3 32.3 32.3 32.3 32.3 32.3	itch Phase								
STATE 11.0 31.2 11.0 32.3 32.3 32.4 STATE 11.0 STATE 11.0 32.3 32.3 STATE 11.0 STATE 11.0 32.0 STATE 11.0 STATE 12.0 STATE 12.0 30 4.0 STATE 12.0 30 4.0 STATE 12.0 30 4.0 STATE 12.0 30 30 STATE 12.0 30 STATE 12.0 30 STATE 12.0 30 STATE 12.0 32.0 STATE 12.0 S	7.0 7.0	25.0	7.0	25.0	7.0	10.0	10.0	10.0	
57.0 11.0 57.0 11.0 43.0 32.0 3 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 51.4% 9.9% 28.87% 28.8% 28.2 2.3 1.0 2.2 1.0 2.2 1.0 2.3 2.3 2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0		31.2	11.0	31.2	11.0	32.3	32.3	32.3	
1514% 9,9% 51.4% 9,9% 38.7% 28.8% 28 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0		57.0	11.0	57.0	11.0	43.0	32.0	32.0	
1 40 3.0 4.0 3.0 4.0 4.0 2.2 2.3 2.3 2.3 2.2 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0		51.4%	%6.6	51.4%	%6.6	38.7%	28.8%	28.8%	
2.2 1.0 2.2 1.0 2.3 2.3 (a) 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0		4.0	3.0	4.0	3.0	4.0	4.0	4.0	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0		2.2	1.0	2.2	1.0	2.3	2.3	2.3	
Lag Lead Lead Lead Lead Lead Lead Lead Lead		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lag Lead Lag Lead Lag Ves Yes Yes Yes Yes Yes Yes Yes Yes Yes Y		6.2	4.0	6.2	4.0	6.3	6.3	6.3	
Yes	_	Lag	Lead	Lag	Lead		Lag	Lag	
C-Min Nane C-Min Nane Nane Nane Nane 1.35 0.19 1.49 0.83 0.21 0.87 1.26 253.0 548 2.43 86.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0		Yes	Yes	Yes	Yes		Yes	Yes	
1.36 0.19 1.49 0.83 0.21 0.87 1.26 2.83 0.54 2.43 86.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0		C-Min	None	C-Min	None	None	None	None	
1927 126 2830 548 243 860 00 00 00 00 00 00 00 00 00 00 00 00 0		1.36	0.19	1.49	0.83	0.21	0.87	0.50	
1927 12.6 253.0 54.8 24.3 86.0 -387.7 12.6 253.0 54.8 24.3 86.0 -387.7 3.4 -345.4 39.1 16.1 31.4 475.1 256.2 11.8 30.0 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		192.7	12.6	253.0	54.8	24.3	86.0	27.4	
192.7 12.6 283.0 54.8 24.3 86.0 5-38.7 3.4 -345.4 39.1 16.1 31.4 475.1 256.2 211.8 30.0 16.0 185 1370 281 1166 188 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2.EBTL and 6.WBTL, Slart of Green		192.7	12.6	253.0	54.8	24.3	86.0	27.4	
#433.4 7.9 #399.6 #72.0 256 #66.1 475.1 256.2 211.8 2.0 20.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.		~387.7	3.4	~345.4	39.1	16.1	31.4	27.1	
475.1 100 256.2 211.8 200 1000 185 1370 281 1166 188 189 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		#432.4	7.9	#390.6	#72.0	25.6	#66.1	42.4	
100.0 45.0 30.0 16.0 18.5 17.0 281 1166 188 18.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ernal Link Dist (m)	475.1		256.2		211.8		201.7	
1660 188 1370 281 1166 188 100 0 0 0 0 0 100 0 0 0 0 0 1.36 0.19 1.49 0.83 0.19 0.78 2:EBTL and 6:WBTL, Slart of Green	_		100.0		45.0		30.0		
2.EBTL and 6:WBTL, Start of Green		1660	185	1370	281	1166	188	877	
2.EBTL and 6.WBTL, Start of Green		0	0	0	0	0	0	0	
1.36 0.19 1.49 0.83 0.19 0.78 2.EBTL and 6:WBTL, Slart of Green	_	0	0	0	0	0	0	0	
1.36 0.19 1.49 0.83 0.19 0.78 2:EBTL and 6:WBTL, Slart of Green in thinking		0	0	0	0	0	0	0	
cersection Summary cicle Length: 111 tuated Cycle Length: 111 tuated Cycle Length: 111 tuated Cycles That the Control of the Cycles That Green tuated Cycles: 100 tuated Cycles: 150 tuated Cycles: 150 tuated Cycles: 150		1.36	0.19	1.49	0.83	0.19	0.78	0.45	
ycle Length: 111 studied Cycle Length: 111 studied Cycle Length: 111 studied Cycle: 10 (%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green stural Cycle: 150 mind Tycle: 150 mind Tycle	ersection Summary								
Stuated Cycle Length: 111 Set: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green sturar Cycle: 150 Intra Royles: 150 Intra Royles: Coordinated Coor	cle Length: 111								
Statt U (V%), Referenced to phase 2:EB1L and o.WB1L, Staff of Green thurst Oyole; 150 Introl Type: Actuated-Coordinated among the phase among the control in the control of the coordinated among the control in the control of the coordinated among th	tuated Cycle Length: 111	i	i						
studing of yells. 130 John Type: Actualed-Coordinated	set: 0 (0%), Referenced to phase 2.	EBIL and	1 6:WB L	, start or	creen				
Molima avecade capacita austra in thomstinally infinite	ntrol Type: Actuated-Coordinated								
Volume exceeds capacity, queue is interiencally liminate.	Volume exceeds capacity, queue is theoretically infinite.	s theoretic	ally infini	je.					
Queue shown is maximum after two cycles.	Queue shown is maximum after two	cycles.							
95th percentile volume exceeds capacity, queue may be longer.	95th percentile volume exceeds ca	pacity, qu	eue may	be longer					

Splits and Phases: 1: Sixth Line & Derry Road



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

3340 1.00 3340 0.94 323 20 20 388 2% 0.75 18.7 18.7 0.16 5.7 3.0 1.00 231 0.12 0.22 1.44 43.9 1.00 1.00 219.7 4.0 1.00 0.95 0.95 1501 0.43 683 683 332 332 14% 13 19.0 H 0.94 0.45 46.0 1.00 0.7 46.7 18.7 118.7 0.16 5.7 3.0 475 0.07 302 302 1900 4.0 11.00 11.00 0.95 1698 0.29 523 321 28.7 28.7 0.24 4.0 3.0 3.0 223 0.0.12 0.0.22 1.44 43.0 1.00 2.21.4 0 321 5% HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 122 122 1900 0.94 0 22 66.6 66.6 0.55 5.3 3.0 1830 c0.75 1.36 26.7 1.30 163.0 197.7 ↑↑ 2220 2220 2220 1900 5.3 0.99 0.99 1.00 3299 0.94 0.94 3% 22 NA 104 104 100 4.0 1.00 1.00 0.95 100 0.06 100 74.7 74.7 0.62 4.0 3.0 162 0.038 0.69 29.3 0.87 3.2 28.6 11% 153.9 1.36 120.0 114.6% 0 2% 0.94 445 1845 11845 11900 5.3 0.95 0.99 11.00 3260 1.00 3260 1.00 2062 2% 36 NA 64.2 64.2 0.54 5.3 3.0 1744 0.63 1.18 27.9 0.89 86.1 111.0 Ť HCM 2000 Control Delay
HCM 2000 Volume to Capacily ratio
Actuated Cyde Length (s)
Intersection Capacily Utilization
Analysis Period (min) 46 4.0 11.00 0.95 1600 0.06 105 46 69.9 69.9 0.58 4.0 3.0 1.32 0.02 0.02 0.19 0.35 2.6.3 43 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Permitted Phases
Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor -ane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS 3us Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) -ane Grp Cap (vph) Uniform Delay, d1 Progression Factor v/s Ratio Perm v/s Ratio Prot v/c Ratio

Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (PM) 2032 Scenario 5

Future Total (PM) 2032 Scenario 5

→	SBT	₩.	304	304	408	NA N	4	4		10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7	Lag	Yes	None	97.0	54.7	0.0	54.7	48.4	64.4	275.9		640	0	0	0	0.64									
•	SBL	r	312	312	332	pm+pi	- 4			7.0	11.0	14.0	11.7%	3.0	1.0	0.0	4.0	Lead	Yes	None	1.38	227.6	0.0	227.6	~77.2	#162.6		20.0	241	0	0	0	1.38									
-	NBT	₩	75	75	309	¥ °	×	00		10.0	34.7	28.0	23.3%	3.7	2.0	0.0	2.7	Lag	Yes	None	0.54	32.6	0.0	32.6	23.4	37.4	340.6		658	0	0	0	0.47									
€	NBL	F	302	302	321	pm+pt	~ œ	, m		7.0	11.0	14.0	11.7%	3.0	1.0	0.0	4.0	Lead	Yes	None	1.40	233.0	0.0	233.0	~81.5	#131.9		70.0	230	0	0	0	1.40			2002	פונים					_
Į.	WBT	₩	2220	2220	2492	NA A	0	9		20.0	34.3	0.79	25.8%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.34	185.1	0.0	185.1			124.7		1856	0	0	0	1.34			Chartof	Stall Of		a;		oe longer	am Sign
>	WBL	F	104	104	= 1	pm+pt	- <	· —		7.0	11.0	11.0	9.5%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.68	25.4	0.0		14.5	m16.4 m#439.6		0.06	163	0	0	0	0.68			TG/W/7	O.WDIL		ally infinit		ene may l	hy upstr
t	EBT	₽	1845	1845	2065	NA C	7	2		20.0	34.3	0.79	25.8%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.18	111.9	0.0	111.9	~335.8	#362.3	170.5		1746	0	0	0	1.18			IT O	DIL AIR		theoretic	cycles.	acity, qu	cycles.
1	EBL	*	43	43	46	Id+md	0 0	2 12		7.0	11.0	11.0	9.5%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.30	21.6	0.0		2.8	m6.2 m#362.3		100.0	151	0	0	0	0:30			J.C oppda of	D pildse z.r	rdinated	ly, queue is	m after two	exceeds cab	m arter two
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Oliset, 0 (0%), referenced to phase z.cbilc and o.wbilc, start of dream Natural Cycle: 145	Control Type: Actuated-Coordinated	 Volume exceeds capacity, queue is theoretically infinite. 	Queue shown is maximum after two cycles.	# 95th percentile volume exceeds capacity, queue may be longer	Queue shown is maximum after two cycles. Wolume for 95th percentile queue is metered by upstream signal

Splits and Phases: 2: Fifth Line & Derry Road

₹ Ø6 (R) - 02 (R) 200

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HCM Signalized Intersection Capacity Analysis 3: James Snow Parkway & Derry Road

254 254 11900 5.7 5.7 1.00 0.85 11403 0.98 0.98 68 68 68 68 7% 0.05 0.18 34.2 1.00 0.2 34.4 5.7 0.91 1.00 1.00 1.00 4489 4489 0.98 550 10% ₹ 0.12 1.00 D 61 pm+pt 3.0 425 c0.21 413 900 4.0 11.00 11.00 11.00 00.95 616 616 618 618 618 421 2% 421 Perm 0.05 0.37 47.0 19.0 227 1900 5.7 1.00 1.00 0.85 1.00 1.00 1.00 1.586 0.98 232 232 151 151 1% 418 16.5 16.5 0.14 410 410 1900 5.7 5.7 6.91 1.00 1.00 1.00 4668 4668 4668 1.00 1.00 1.00 1.00 1.00 1.00 ¥ 5.7 3.0 641 0.09 % 7 96 96 1900 1.00 1.00 1.00 1.00 0.95 1802 0.44 0.98 0 % 9 % pm+pt 4.0 3.0 260 0.03 0.05 0.38 0.00 HCM 2000 Level of Service 26.3 26.3 0.22 Sum of lost time (s) ICU Level of Service Perm 5.3 5.3 1.00 0.99 1.00 0.85 1.00 1.00 1.00 603 267 336 46.6 3.0 0.22 0.57 28.9 1.51 0.4 43.8 0.98 3% 1599 1900 5.3 0.91 1.00 1.00 1.00 1.00 4828 4828 1632 4% ¥ 46.6 0.39 pm+pt 4.0 1.00 1.00 1.00 1.00 0.95 0.09 168 0.09 294 294 3% 63.5 63.5 0.53 0.31 0.84 33.3 0.80 1.8 40.9 0.97 120.0 88.5% Perm 9 39.6 39.6 0.33 0.00 0.01 27.0 1.00 0.0 5.3 0.85 1.00 1.00 1.00 1562 0.98 3% 5.3 3.0 515 43.0 D 1322 1322 1900 5.3 0.91 1.00 1.00 1.00 5006 5006 0.98 1349 Š 39.6 39.6 0.33 1% 36.9 5.3 3.0 1651 0.27 12.9 212 212 212 1900 4.0 0.97 1.00 1.00 0.95 3399 3399 216 2% Prot 3.0 3.0 3.65 0.06 0.59 51.0 1.00 2.6 53.6 HCM 2000 Control Delay HCM 2000 Volume to Capacity ratio Intersection Capacity Utilization Analysis Period (min) c Critical Lane Group Actuated Cycle Length (s) Lane Configurations
Traffic Volume (vph)
Ideal Four Volume (vph)
Ideal Fow (vphp)
Total Lost time (s)
Lane Utl. Factor
Frp., pedbikes
Frp., pedbikes
Frt.
Frp., pedbikes
Said. Flow (perm)
Fit Portected
Said. Flow (perm)
Peak-hour factor, PHF
Peak-hour factor, PHF
Red., Flow (vph)
RTOR Reduction (vph) Lane Group Flow (vph) Confl. Peds. (#/hr) Heavy Vehicles (%) Actuated Green, G (s) Clearance Time (s) Vehicle Extension (s) Incremental Delay, d2 Bus Blockages (#/hr) Effective Green, g (s) Actuated g/C Ratio Turn Type Protected Phases Permitted Phases Lane Grp Cap (vph) v/s Ratio Prot Approach Delay (s) Approach LOS Progression Factor Uniform Delay, d1 Level of Service v/s Ratio Perm

Synchro 11 Report 12-14-2023 BA Group

Queues 3: James Snow Parkway & Derry Road

Future Total (PM)

Future Total (PM) 2032 Scenario 5

	1	1	1	\	ţ	4	*	+	*	و	-	-
ane Group	표	FBT	FBR	WBI	WBT	WBR	- NB	- NBT	, NBR	SB	- SBT	SBR
Lane Configurations	K.	+++	¥.	*	***	K.	*	444	¥.	*	***	Mr.
Traffic Volume (vph)	212	1322	9.	288	1599	591	96	410	227	413	539	254
Future Volume (vph)	212	1322	18	288	1599	591	96	410	227	413	539	254
Lane Group Flow (vph)	216	1349	18	294	1632	603	86	418	232	421	220	259
Turn Type	Prot	NA	Perm	pm+pt	¥	Perm	pm+pt	M	Perm	pm+pt	Ν	Perm
Protected Phases	വ	2		_	9		က	∞		7	4	
Permitted Phases			2	9		9	∞		∞	4		4
Detector Phase	2	2	2		9	9	က	∞	∞	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	34.3	34.3	11.0	34.3	34.3	11.0	34.7	34.7	11.0	34.7	34.7
Total Split (s)	17.0	45.0	45.0	11.0	39.0	39.0	29.0	35.0	35.0	29.0	35.0	35.0
Total Split (%)	14.2%	37.5%	37.5%	9.5%	32.5%	32.5%	24.2%	29.2%	29.2%	24.2%	29.2%	29.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
//c Ratio	0.59	0.81	0.03	0.84	0.87	0.70	0.36	99.0	0.63	0.97	0.46	0.46
Control Delay	27.6	41.6	0.1	29.5	31.6	14.2	28.2	53.9	21.4	8.89	38.4	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	41.6	0.1	29.2	31.6	14.2	28.2	53.9	21.4	8.89	38.4	7.0
Queue Length 50th (m)	26.7	111.7	0.0	47.3	149.0	94.9	15.5	36.5	12.9	85.1	42.1	0.0
Queue Length 95th (m)	38.5	131.0	0.0	m34.1	m111.7	m46.6	25.8	46.6	38.3	#135.3	53.2	20.8
Internal Link Dist (m)		156.1			488.7			381.6			213.2	
Turn Bay Length (m)	100.0		70.0	110.0		75.0	100.0		75.0	95.0		115.0
Base Capacity (vph)	395	1656	281	349	1879	856	200	1139	519	432	1184	290
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.81	0.03	0.84	0.87	0.70	0.20	0.37	0.45	0.97	0.46	0.46
Intersection Summary												

Actuated Cycle Length: 120

Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated Vatural Cycle: 95

95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

M. Volume for 95th percentile queue is metered by upstream signal.

3: James Snow Parkway & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

S S S S S S S S S S S S S S S S S S S	WBR NB1. 24 2111 24 2111 24 2111 1900 1900 1.00 1.00 1.00 0.052 0.052 0.022 0.022 0.0234		NBR 134 134 1300 146 0		SBT SBR 7 169 7 169 7 169 1100 1900 1900 15.7 169 11.00 1995 11.00
36 2132 58 43 36 2132 58 43 36 2132 58 43 36 2132 58 43 36 2132 58 43 36 2132 58 43 36 36 36 36 36 36 36 36 36 36 36 36 36			134 134 1900 0.92 146 0		
36 2132 58 43 36 1900 1900 1900 1900 1900 1900 1900 190			134 134 1900 1900 0 0		
36 2132 58 43 2132 58 143 59 1900 1900 1900 1900 1900 1900 1900 1			134 1900 0.92 146 0 0		
1900 1900 1900 1900 1900 1900 1900 1900			0.92 146 0 0		
5.3 5.3 4.0 1.00 0.95 1.00 1.00 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.93 2377 6.3 47 20 0.94 23.45 2.85 0.55 0.56 0.57 0.66 0.59 0.59 0.69 0.59 0.59 0.69 0.59 0.59 0.69 0.50 0.59 0.69 0.50 0.50 0.69 0.50 0.50 0.69 0.50 0.60 0.60 0.60 0.60 0.60 0.60 0.60 0.6			0.92 146 0		
100 0.95 100 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.06 1.00 0.09 1.770 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92			0.92 146 0 0		
1.00 1.30 1.00 1.30 1			0.92 0 0		
0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 0.00 0.00 0.00 0.00 0.00 0.00 0			0.92 146 0 0		
1770 35.25 1770 35.26 1770 35.26 1770 35.26 1770 35.27		16.00	0.92 146 0 0		
106 1.00 0.05 1.		1. 1. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	0.92 146 0 0		
105 3525 99 3 9 20 092 092 9 21 092 092 9 21 0 0 0 10 0 2 0 0 10 0 2 0 0 10 0 2 0 0 10 0 2 0 0 10 0 2 0 0 10 0 2 0 0 10 0 2 0 0 11 0 0 10 0 12 0 0 0 13 0 0 0 14 0 0 0 15 0 0 0 16 0 0 0 0 17 0 0 0 0 18 0 0 0 0 19 0 0 0 0 10 0 0 0		16	0.92 146 0 0		
92 0.92 0.92 0.92 0.92 0.92 0.92 0.93 0.93 0.93 0.94 0.94 0.99 0.99 0.99 0.99 0.99 0.99		0. 26	0.92 146 0 0		
39 2317 63 47 2 0 2 0 0 1 99 2378 0 0 0 0 0 1 0 0 2 0 0 0 1 0 0 0 1		28	146 0 0		
0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			00		6 186 NA 4
) 39 2378 0 47 2 Perm NA pm+pt 2 1 1 2 6 6 1 1 2 1 1 2 6 6 1 1 2 1 1 2 1 1 2 1 1 2 1 2	<u> </u>	7 28	0		186 NA 4
Perm NA pm+pt 2 1 2 1 6 6 6 71.0 71.0 79.8 71.0 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.8 71.0 79.9 71.0 79.	Perm 8 29.2 29.2 29.2 29.2 2.3 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7				AN 4
2 1 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	29.2 29.2 29.2 0.24 5.7				4
2 71.0 71.9 79.8 71.0 71.0 79.8 71.0 71.0 79.8 71.0 71.0 79.8 71.0 71.0 79.8 71.0 71.0 71.0 71.0 71.0 71.0 71.0 71.0	29.2 29.2 29.2 0.24 5.7				
71.0 71.0 79.8 71.0 71.0 79.8 71.0 71.0 79.8 6.3 6.3 6.3 4.0 8.3 3.0 3.0 3.0 6.2 2085 132 3 6.6 7.0 1.3 0.0 1 6.6 7.0 1.3 0.0 1 6.7 1.3 0.3 1.0 6.8 1.1 0.3 1.0 6.8 1.1 0.3 1.0 6.8 1.1 0.3 1.0 6.8 1.3 0.3 1.0	29.2 29.2 0.24 5.7				
710 710 798 610 659 0.656 620 0.659 0.666 62 2085 132 3 62 2085 132 3 62 2085 132 3 63 1.14 0.36 1.59 24.5 28.5 1.50 1.39 1.60 2.81 97.9 30.1 C. F. C.	29.2 0.24 5.7				29.2
6) 6) 6) 6) 6) 60 6 6) 1 6) 2 2086 132 7 6) 2 2086 132 7 6) 3 1.14 0.02 6) 63 1.14 0.36 15,9 24,5 28,5 15,0 1.39 1.00 4.3 6,39 1.6 6,21 97,9 30.1 C F C	0.24				29.2
5.3 5.3 4.0 5.0 3.0 3.0 5.0 2.085 1.3 5.0 2.085 1.3 5.0 2.085 1.3 5.0 2.45 2.85 2.85 5.0 4.3 6.39 1.6 5.0 4.3 6.39 1.6 5.0 7.0 7.0	5.7				0.24
s) 3.0 3.0 3.0 62 2085 132 2 2067 001 cf 0.37 0.22 0.63 1.14 0.36 15.9 24.5 28.5 2 15.9 24.5 28.5 2 15.9 1.39 1.6 16.0 1.39 1.6 2.81 97.9 30.1 4	0	2.7		2.7	5.7
0.37	5.0				3.0
C067 0001 C 0.37 0.02 0.63 1.14 0.36 1.59 24.5 28.5 1.50 1.39 1.00 4.3 63.9 1.6 2.81 97.9 30.1 C F C	237			267	388
0.37 0.22 0.63 1.14 0.28 0.63 1.14 0.38 1.59 24.5 28.5 1.50 1.39 1.00 4.3 63.9 1.6 2.8.1 97.9 30.1 C F C		90:0			0.12
0.63 1.14 0.36 1159 24.5 28.5 1150 1.39 1.00 42 4.3 63.9 1.6 28.1 97.9 30.1 C F C	c0.23				
15.9 24.5 28.5 1.50 1.39 1.00 4.3 63.9 1.6 28.1 97.9 30.1 C F C	0.97				0.48
1.50 1.39 1.00 d2 4.3 63.9 1.6 28.1 97.9 30.1 C F C	44.9				38.9
d2 4.3 63.9 1.6 28.1 97.9 30.1 C F C	1.00	,		_	1.00
28.1 97.9 30.1 C F C	48.5				6.0
C F C	93.4	ñ			39.8
L 70	LL.			۵	_
(3)		70.3		(*)	39.3
pproach LOS F D		ш			D
ntersection Summary					
ICM 2000 Control Delay 68.6 HCM 2000	HCM 2000 Level of Service		ш		
4CM 2000 Volume to Capacity ratio 1.10					
ctuated Cycle Length (s) 120.0 Sum of lost time (s)	st time (s)		15.0		
ntersection Capacity Utilization 97.5% ICU Level	ICU Level of Service		ட		
Analysis Period (min)					

Synchro 11 Report 12-14-2023 BA Group

Queues 4: Clark Boulevard & Derry Road

Future Total (PM) 2032 Scenario 5

Future Total (PM) 2032 Scenario 5

Lane Group									
	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	*	+	F	*	F	2	r	2	
Traffic Volume (vph)	36	2132	43	2183	211	10	80	_	
Future Volume (vph)	36	2132	43	2183	211	10	80	7	
Lane Group Flow (vph)	36	2380	47	2399	229	157	87	192	
Turn Type	Perm	NA	pm+pt	NA	Perm	¥	Perm	¥	
Protected Phases		2	_	9		8		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	<u></u>	9	∞	∞	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	0.9	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	34.3	34.3	10.0	34.3	34.7	34.7	34.7	34.7	
Total Split (s)	75.0	75.0	10.0	85.0	32.0	35.0	35.0	35.0	
Total Split (%)	62.5%	62.5%	8.3%	70.8%	29.2%	29.2%	29.2%	29.2%	
Yellow Time (s)	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.6	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	4.0	5.3	5.7	2.7	2.7	2.7	
Lead/Lag	Lag	Lag	Lead						
Lead-Lag Optimize?	Yes	Yes	Yes						
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None	
v/c Ratio	0.63	1.13	0.31	1.02	0.97	0.34	0.33	0.49	
Control Delay	39.4	90.1	12.0	45.0	95.9	18.8	41.4	42.2	
Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	39.4	90.1	12.0	45.0	62.6	18.8	41.4	42.2	
Queue Length 50th (m)		~364.0	3.6	~332.8	56.3	13.2	17.8	39.3	
Queue Length 95th (m)		m232.8	7.6	#376.2	#108.1	32.5	33.7	63.3	
Internal Link Dist (m)		336.0		475.1		56.4		313.3	
Turn Bay Length (m)	70.0		70.0				40.0		
Base Capacity (vph)	62	2111	150	2349	238	459	268	395	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.63	1.13	0.31	1.02	0.96	0.34	0.32	0.49	
Intersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 120	0								
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	to phase 2:	BTL an	16:WBTL	, Start of	Green				
Natural Cycle: 150									
Control Type: Actuated-Coordinated Volume exceeds capacity arising is theoretically infinite	ordinated the greated is	thoorotic	inijui vilo	2					
Outline shown is maximum afforting cycles	ily, queue is	Cyclos	ally IIIIII	ij					
■ OEth separational maximum area (we cycles.	un altel two	cycles.	Tow of o	0000					
Some percentile volume exceeds capacity, q One to shown is maximim after two cycles.	exceeds cap	ourly, qu	ene may	afiini an	_				
CACAC SHOWING HIGAIING		2							

Splits and Phases: 4: Clark Boulevard & Derry Road

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HCM Signalized Intersection Capacity Analysis 5: Fifth Line & Clark Boulevard

1900 1.00 1.00 1.854 5.7 1.00 1.00 1.00 5.7 6.3 5.7 1.00 0.95 1.770 0.42 784 0.92 Perm 19.8 19.8 0.51 5.7 3.0 403 0.03 4.6 4.6 1.00 0.0 4.7 A 0.92 11.0 ⋖ 0.55 6.3 1.00 7.0 7.0 A A 475 475 1900 5.7 1.00 1.00 1.00 1.00 1.857 1.857 1.857 1.857 19.8 19.8 5.7 3.0 955 00.28 Ä 5.7 1.00 1.00 0.95 1770 0.42 786 0.01 4.6 1.00 0.0 4.6 A Perm 19.8 19.8 0.51 5.7 3.0 404 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 0.92 63 63 9 7.7 7.7 0.20 5.3 3.0 3.25 0.02 0.08 12.5 1.00 0.1 12.6 B 39 39 1900 1.00 1.00 0.95 0.95 0.92 42 42 Perm 7.7 7.7 0.20 5.3 3.0 275 0.03 0.15 12.7 1.00 0.3 13.0 B 7.9 0.45 38.5 43.8% 01 0061 0.05 112.4 11.00 0.1 12.5 B B 12.9 B 15 15 1900 5.3 1.00 0.94 1749 1749 1.00 1.00 1.00 9 AN 7.7 7.7 0.20 5.3 3.0 3.49 0.01 Intersection control Delay
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
C. Critical Lane Group 5.3 1.00 1.00 0.95 1770 0.70 44 48 Serm 7.7 7.7 0.20 5.3 3.0 0.18 12.8 1.00 0.3 c0.04 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Turn Type Protected Phases Permitted Phases Actuated Green, G (s) Uniform Delay, d1 Progression Factor Incremental Delay, d2 Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Grp Cap (vph) v/s Ratio Prot -ane Group Flow (vph Effective Green, g (s) Delay (s) Level of Service Approach Delay (s) Approach LOS

v/s Ratio Perm

v/c Ratio

Synchro 11 Report 12-14-2023 BA Group

Queues 5: Fifth Line & Clark Boulevard

Future Total (PM) 2032 Scenario 5

Future Total (PM) 2032 Scenario 5

	1	†	-	Ļ	•	←	۶	→	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	je.	2	F	2	r	£,	r	, \$	
Traffic Volume (vph)	44	15	39	=	4	475	12	467	
Future Volume (vph)	44	15	39	11	4	475	12	467	
Lane Group Flow (vph)	48	27	42	80	4	526	13	525	
Turn Type	Perm	NA	Perm	NA	Perm	M	Perm	NA	
Protected Phases		2		9		∞		4	
Permitted Phases	2		9		00		4		
Detector Phase	2	2	9	9	∞	∞	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	34.3	34.3	34.3	34.3	34.7	34.7	34.7	34.7	
Total Split (s)	32.0	32.0	35.0	35.0	82.0	85.0	85.0	85.0	
Total Split (%)	29.2%	29.2%	29.2%	29.2%	70.8%	70.8%	70.8%	70.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.7	5.7	5.7	5.7	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Min	Min	Min	Min	
v/c Ratio	0.13	90.0	0.11	0.16	0.01	0.50	0.03	0.50	
Control Delay	12.9	6.7	12.6	6.1	5.5	9.4	5.9	9.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.9	6.7	12.6	6.1	5.5	9.4	5.9	9.4	
Queue Length 50th (m)	2.2	0.7	1.9	0.5	0.1	24.4	0.5	24.3	
Queue Length 95th (m)	9.1	5.3	8.3	8.2	1.1	45.4	2.2	45.2	
Internal Link Dist (m)		204.0		86.5		156.9		372.1	
Turn Bay Length (m)	35.0		35.0		35.0		35.0		
Base Capacity (vph)	1058	1412	1111	1322	786	1857	784	1853	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.05	0.02	0.04	90.0	0.01	0.28	0.02	0.28	
Intersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 37.3									
Natural Cycle: 70									
Control Type: Actuated-Uncoordinated	ordinated								

9 **₽ 1**000

5: Fifth Line & Clark Boulevard Splits and Phases:

HCM Unsignalized Intersection Capacity Analysis 10: Clark Boulevard & Anatolia Building 1 North Access/Anatolia Building 2 North Aଉଞ୍ଚେକ୍ଷମକାସୀ

Movement EBI		9 3	WBR NBL 36 1 36 1 39 0,92 39 1 304 108 6.2 4.1 108	None None	NBR 0.92	SBL S 9 9 9 9 9 10 0092 0 00000000	SBT SBR 45 91 91 8 10% 10% 10% 10% 10% 10% 10% 10%
(m) 40 (47) (m) 40 (90 (90 (90 (90 (90 (90 (90 (90 (90 (9					0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
(m) 40 0 10) 40 0 10,000		00			0 0 0 2 5 1		
(m) 40 0 000 000 000 000 000 000 000 000 0					1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Slop		0 0			0.92		
(m) 2.6 (m) 4.8 (m) 2.6 (m) 6.15 (m) 6.		0			0.92		
(m) 2.67 (m) 43 0 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.		0.			0.92		
(m) 2.6 (m) 6.15 (m)					-		99 one 80
(m) 2.6 (m) 2.							80 80
ed 468 430 ol 468 430 ol 468 430 ol 468 430 7.1 6.5 3.5 4.0 91 100 475 514 EB1 WB1 1 51 43 51 43 616 709 0.10 0.06 (m) 2.6 1.5 12.7 10.4 B B B							80 80
ed 468 430 ol 468 430 ol 468 430 ol 468 430 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 0.0 7.1 0.0 7.1 0.0 7.1 0.0 8 39 8 39 8 39 8 18 39 8 18 39 8 18 39 8 18 39 8 18 39 8 18 39 8 18 39 8 18 39 8 18 39 8 18 39 8 10.1 0.06 8 12.7 10.4 8 8 8 8							90 80
(m) 2.6 (m) 2.							S0 80
ed 468 430 ol 468 430 ol 468 430 7.1 6.5 3.5 4.0 91 100 475 514 EB1 WB1 1 51 43 43 4 8 39 516 709 0.10 0.06 (m) 2.6 1.5 12.7 10.4 B B B							80 80
ed 468 430 od 468 430 od 468 430 od 468 430 od 475 514 en 475 516 709 od 675 616 709 od 675 616 709 en 475 616 700 en 475 616 70							900 80
ed 468 430 lod 468 430 od 468 430 od 468 430 7.1 6.5 8 39 8 39 8 39 8 39 8 39 8 10.0 0.06 12.7 10.4 12.7 10.4 8 8 8 8 8 8 8 8 8 8 8 8 8 9 8 12.7 10.4				ω ω,		304	08
eed 468 430 ol 468 430 ol 468 430 7.1 6.5 3.5 4.0 91 100 475 514 EB1 WB1 1 51 43 4 3 4 8 39 6.16 709 0.10 0.06 (m) 2.6 1.5 12.7 10.4 B B B				φ φ.		304	08
ed 468 430 ol 468 430 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.5 7.1 6.1 8 39 8 39 8 10.0 7.1 10.1 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8				ω ω _τ		304	
ne 468 430 ol 468 430 7.1 6.5 7.1 6.5 3.5 4.0 91 100 91 100 61 43				∞ ∞ -		304	
ol 468 430 7.1 6.5 7.1 6.5 3.5 4.0 91 100 475 514 EB1 WB1 1 51 43 43 4 8 39 516 709 7 0.00 0.06 (m) 2.6 1.5 12.7 10.4 B B B				2 7			
6) 468 430 7.1 6.5 7.1 6.5 91 100 91	~			æ -			
468 430 7.1 6.5 3.5 4.0 91 100 475 514 EB1 WB1 1 51 43 4 8 39 516 709 0.10 0.06 (m) 2.6 1.5 12.7 10.4 12.7 10.4 B B B	7			∞ ₇			
7.1 6.5 3.5 4.0 91 100 475 514 EB1 WB1 I 51 43 43 4 8 39 516 709 0.06 (m) 2.6 1.5 12.7 10.4 B B B				-		304	
3.5 4.0 91 100 475 514 EB1 WB1 1 51 43 43 4 8 39 516 709 0.10 0.06 (m) 2.6 1.5 12.7 10.4 12.7 10.4 B B B		9 2.9				4.1	
3.5 4.0 91 100 475 514 EB1 WB1 1 51 43 43 4 8 39 516 709 0.10 0.06 (m) 2.6 1.5 12.7 10.4 12.7 10.4 B B B							
(m) 2.6 1.57 (m) 2.6 1.57 (m) 2.8 1.57 (m) 2				2		2.2	
EB1 WB1 1 EB1 WB1 1 51 43 8 39 516 709 0.10 0.06 (m) 2.6 1.5 12.7 10.4 12.7 10.4 B B B	66 60			0		66	
EB1 WB1 1 51 43 43 4 8 39 516 709 0.00 2.0 0.00 2.0 1.5 10.4 12.7 10.4 B B B		511 7	736 1483	33		1257	
51 43 43 4 8 8 4 516 709 0.00 0.10 0.06 2.6 1.5 12.7 10.4 B B B	1 SB1						
43 4 8 39 516 709 0.10 0.06 2.6 1.5 12.7 10.4 B B B	118						
8 39 516 709 0.10 0.06 2.6 1.5 12.7 10.4 B B B	1 10						
516 709 . 0.10 0.06 2.6 1.5 12.7 10.4 B B B B B							
0.10 0.06 2.6 1.5 12.7 10.4 B B 12.7 10.4 B B	1257						
2.6 1.5 12.7 10.4 B B 12.7 10.4 B B							
12.7 10.4 B B 12.7 10.4 B B	.0 0.2						
B B 12.7 10.4 C B B	7.0 0.7						
12.7 10.4 B B	A A						
В	7.0 0.7						
ntersection Summary							
4verage Delay 2.3							
Utilization 31.0		ICU Level of Service	nvice		⋖		
Analysis Period (min)	2						

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HCM Unsignalized Intersection Capacity Analysis 9: Sixth Line & Anatolia Building 3 East Access

Future Total (PM) 2032 Scenario 5

																																								A	
•	SBR		∞	80			0.92	6																																Service	
→	SBT	₽	361	361	Free	%0	0.92	392						None		236											SB 2	140	0	6	1/00	0.08	0.0	0.0						ICU Level of Service	
←	NBT	₩.	403	403	Free	%0	0.92	438						None													SB 1	261	0	0	1/00	0.15	0.0	0.0		0.0				0	
•	NBL		2	2			0.92	2										401			401	4.1		2.2	100	1154	NB 2	292	0	0	1/00	0.17	0.0	0.0					0.5	22.5%	15
-	EBR		4	4			0.92	4										200			200	6.9		3.3	100	807	NB 1	148	2	0	1154	0.00	0.0	0.1	A	0.0					
4	EBL	>	22	22	Stop	%0	0.92	24										620			970	9.9		3.5	94	420	EB 1	28	24	4	420	90:0	1.6	13.5	B	13.5	В			tion	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	po dueue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	CSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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Future Total (PM) HCM Unsignalized Intersection Capacity Analysis 12: Clark Boulevard & Anatolia Building 1 South Access

ICU Level of Service 8 48 0.92 42 42 0% 0.92 46 None None 119 119 0% 0.92 129 4.3 24.1% 15 0.92 2.2 98 0 52 1700 0.06 0.0 86 4.1 0.0 0.92 12 72 6.2 3.3 133 133 0 0.00 0.1 0.2 A A EBL 130 130 0% 0% 0.92 154 141 13 792 0.19 5.7 5.7 B 209 6.4 3.5 82 777 Average Delay Intersection Capacity Utilization Analysis Period (min) Queue Length 95th (m) Control Delay (s) Lane LOS Lane Configurations Traffic Volume (veh/h) Future Volume (Veh/h) Median storage veh) Upstream signal (m) pX, platoon unblocked vC, conflicting volume vC1, stage 1 conf vol Sign Control Grade Peak Hour Factor Hourly flow rate (vph) Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right tum flare (veh) tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h) Direction, Lane #
Volume Total
Volume Left
Volume Right
cSH
Volume to Capacity vC2, stage 2 conf vol vCu, unblocked vol Approach Delay (s) Approach LOS

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HCM Unsignalized Intersection Capacity Analysis 11: Clark Boulevard & Anatolia Building 2 South Access

Future Total (PM) Ø ICU Level of Service 84 84 84 0% 0.92 91 None 0.92 œ 270 270 2.2 98 293 0.92 1.5 29.9% 15 245 245 245 0.92 266 0.02 0.04 0.4 1.5 A 1.5 None 0.92 268 268 6.2 3.3 95 771 1700 0.0 0.0 6 Stop 0% 0.92 399 3.5 99 597 46 7 39 39 738 0.06 1.6 10.2 B B 399 Average Delay Intersection Capacity Utilization Analysis Period (min) cSH Volume to Capacity Queue Length 95th (m) Control Delay (s) Median type
Median storage veh)
Upstream signal (m)
Px, Palation unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol Grade Peak Hour Factor Hourly flow rate (vph) Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right turn flare (veh) -uture Volume (Veh/h) -ane Configurations Fraffic Volume (veh/h) p0 queue free % cM capacity (veh/h) Approach Delay (s) Approach LOS tC, single (s) tC, 2 stage (s) tF (s) Volume Total Volume Left Volume Right Sign Control

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Background (AM) 2032 Scenario 6 (Sensitivity)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
-ane Configurations	*	4413		r	4413		F	₩		F	₽	
Fraffic Volume (vph)	164	2201	153	17	763	41	9/	173	30	46	142	134
-uture Volume (vph)	164	2201	153	17	763	41	9/	173	30	46	142	134
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Fotal Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
ane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
±-	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.93	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	4710		1805	4371		1805	3504		1258	3307	
-It Permitted	0.29	1.00		90:0	1.00		0.46	1.00		0.61	1.00	
Satd. Flow (perm)	542	4710		107	4371		883	3504		908	3307	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	174	2341	163	18	812	44	81	184	32	46	151	143
RTOR Reduction (vph)	0	2	0	0	4	0	0	15	0	0	124	0
ane Group Flow (vph)	174	2499	0	18	852	0	81	201	0	46	170	0
Heavy Vehicles (%)	7%	7%	%	%0	%8	33%	%0	%0	2%	40%	1%	1%
3us Blockages (#/hr)	-	46	2	0	24	2	0	0	-	9	_	2
urn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	83.8	77.0		74.1	71.3		14.7	14.7		14.7	14.7	
Effective Green, g (s)	83.8	77.0		74.1	71.3		14.7	14.7		14.7	14.7	
Actuated g/C Ratio	0.75	69.0		0.67	0.64		0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
/ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
.ane Grp Cap (vph)	205	3267		114	2807		116	464		106	437	
//s Ratio Prot	c0.03	c0.53		0.00	0.19			90:0			0.05	
/s Ratio Perm	0.23			0.10			c0.09			90.0		
//c Ratio	0.35	0.76		0.16	0.30		0.70	0.43		0.46	0.39	
Jniform Delay, d1	3.9	11.1		0.6	8.8		46.0	44.3		44.5	44.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
ncremental Delay, d2	0.4	1.8		0.7	0.3		16.8	0.7		3.2	9.0	
Delay (s)	4.4	12.9		9.6	9.1		62.8	45.0		47.7	44.6	
evel of Service	V	В		V	V		ш	٥		۵	۵	
Approach Delay (s)		12.3			9.1			49.8			45.1	
Approach LOS		В			A			D			O	
ntersection Summary												
HCM 2000 Control Delay			17.0	兰	CM 2000	HCM 2000 Level of Service	ervice		В			
HCM 2000 Volume to Capacity ratio	ity ratio		0.75									
Actuated Cycle Length (s)			111.0	S	Sum of lost time (s)	time (s)			16.5			
ntersection Capacity Utilization	on		87.4%	೨	U Level o	ICU Level of Service			ш			
			L									

12-14-2023 BA Group

Synchro 11 Report

Queues 1: Sixth Line & Derry Road

Future Background (AM) 2032 Scenario 6 (Sensilivity)

	\	Ť	•		-	-		•	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	*	4413	×	441	je-	₩	<u></u>	₩	
Traffic Volume (vph)	164	2201	17	763	9/	173	46	142	
Future Volume (vph)	164	2201	17	763	76	173	46	142	
Lane Group Flow (vph)	174	2504	18	826	81	216	46	294	
Turn Type	pm+pt	NA	pm+pt	NA	Perm	M	Perm	¥	
Protected Phases	2	2	_	9		∞		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	_	9	∞	∞	4	4	
Switch Phase									
Minimum Initial (s)	7.0	25.0	7.0	25.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.0	31.2	11.0	31.2	32.3	32.3	32.3	32.3	
Total Split (s)	11.0	0.79	11.0	0.79	33.0	33.0	33.0	33.0	
Total Split (%)	%6.6	60.4%	%6.6	60.4%	29.7%	29.7%	29.7%	29.7%	
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	2.2	1.0	2.2	2.3	2.3	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.2	4.0	6.2	6.3	6.3	6.3	6.3	
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
v/c Ratio	0.34	0.74	0.10	0.30	0.69	0.45	0.46	0.52	
Control Delay	5.5	13.3	5.2	6.7	74.3	43.0	57.0	25.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	5.5	13.3	5.2	6.7	74.3	43.0	57.0	25.3	
Queue Length 50th (m)	7.9	89.0	0.8	27.8	18.0	22.4	10.5	16.8	
Queue Length 95th (m)	17.9	194.0	3.1	45.6	33.4	32.4	22.2	28.7	
Internal Link Dist (m)		475.1		256.2		211.8		201.7	
Turn Bay Length (m)	120.0		100.0		45.0		30.0		
Base Capacity (vph)	511	3372	183	2809	212	826	194	904	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.34	0.74	0.10	0.30	0.38	0.25	0.25	0.33	
Intersection Summary									

Splits and Phases: 1: Sixth Line & Derry Road

Actuated Cycle Length: 111
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

★ Ø6 (R) - W2 (R) 200 × 01

80

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Future Background (AM) 2032 Scenario 6 (Sensitivity)

Queues 2: Fifth Line & Derry Road

Future Background (AM) 2032 Scenario 6 (Sensitivity)

	1	†	<i>></i>	-	Ļ	4	•	←	•	۶	→	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	4413		<u>r</u>	4413		F	₽ ₽		r	₩	
Traffic Volume (vph)	92	2238	104	193	753	261	100	586	106	109	72	32
Future Volume (vph)	92	2238	104	193	753	261	100	289	106	109	72	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.96		1.00	96.0		1.00	0.95	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1600	4809		1587	4529		1698	3207		1501	3253	
Fit Permitted	0.24	1.00		90.0	1.00		89.0	1.00		0.36	1.00	
Satd. Flow (perm)	401	4809		94	4529		1219	3207		292	3253	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	86	2381	111	202	801	278	106	307	113	116	77	34
RTOR Reduction (vph)	0	4	0	0	25	0	0	31	0	0	27	0
Lane Group Flow (vph)	86	2488	0	205	1027	0	106	386	0	116	84	0
Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
Bus Blockages (#/hr)	4	36	2	9	22	22	e	33	2	13	-	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	വ	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	74.9	67.3		83.3	71.7		25.7	25.7		25.7	25.7	
Effective Green, g (s)	74.9	67.3		83.3	71.7		25.7	25.7		25.7	25.7	
Actuated g/C Ratio	0.62	0.56		69.0	09:0		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	326	2697		214	2706		261	989		121	969	
v/s Ratio Prot	0.02	0.52		c0.10	0.23			0.12			0.03	
v/s Ratio Perm	0.17			c0.57			0.00			c0.20		
v/c Ratio	0.30	0.92		96.0	0.38		0.41	0.57		96.0	0.12	
Uniform Delay, d1	9.1	24.0		39.6	12.6		40.6	42.2		46.6	38.0	
Progression Factor	0.51	0.48		1.14	0.93		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	4.9		48.7	0.4		1.0	1.1		68.1	0.1	
Delay (s)	2.0	16.3		93.7	12.1		41.6	43.2		114.7	38.1	
Level of Service	A	В		ш	В		۵	٥		ш	۵	
Approach Delay (s)		15.9			25.1			42.9			77.3	
Approach LOS		В			O			О			ш	
Intersection Summary												
HCM 2000 Control Delay			24.5	Ĭ	3M 2000	HCM 2000 Level of Service	Service		ပ			
HCM 2000 Volume to Capacity ratio	city ratio		0.98									
Actuated Cycle Length (s)			120.0	S.	Sum of lost time (s)	time (s)			15.0			
Intersection Capacity Utilization	tion		93.2%	2	U Level o	ICU Level of Service			ш			
Analysis Period (min)			15									

12-14-2023 BA Group

c Critical Lane Group

25		\	†	*			_	•	•	
100 100	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
289 109 289 109 289 109 289 109 38 4 4 38 8 4 4 31.0 10.0 10.0 31.0 0.	Lane Configurations	*	4413	*	4413	r	₽ ₽	*	₩13	
289 109 420 116 NA Perm 8	Traffic Volume (vph)	92	2238	193	753	100	289	109	72	
8 4 4 8 8 4 4 8 8 8 8 4 9 9 110 100 100 100 100 100 100 100 100	Future Volume (vph)	92	2238	193	753	100	289	109	72	
NA Perm 8 8 4 4 4 8 8 8 4 4 6 10.0	Lane Group Flow (vph)	86	2492	205	1079	106	420	116	111	
8 8 4 8 8 4 8 100	Turn Type	pm+pt	Ν	pm+pt	NA	Perm	¥	Perm	NA	
8 8 4 4 8 10.0 10.0 10.0 10.0 10.0 3.10 31.0 31.0 3.10 3.10 3.0 2.0 2.0 2.0 3.7 3.7 3.7 3.7 5.7 5.7 8 42.0 119.7 8 42.0 119.7 8 42.0 119.7 8 42.0 119.7 9 0.0 0.0 0 0.0 0.0 0 0.0 0.0 0 0.0 0.0 0 0.0 0.	Protected Phases	2	2	-	9		∞		4	
9 8 4 10.0 10.0 10.0 10.0 34.7 34.7 34.7 34.7 3.10 31.0 25.8% 25.8% 3.7 3.7 2.0 0.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 0.0 2.	Permitted Phases	2		9		∞		4		
100 100 100 100 100 100 100 100 100 100	Detector Phase	2	2	-	9	∞	∞	4	4	
100 100 100 134.7 34.7 34.7 34.7 34.7 34.7 34.7 37.7 37	Switch Phase									
34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7	Minimum Initial (s)	7.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	
25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.9%	Minimum Split (s)	11.0	34.3	11.0	34.3	34.7	34.7	34.7	34.7	
25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.0 20.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Total Split (s)	12.0	73.0	16.0	77.0	31.0	31.0	31.0	31.0	
37 37 37 37 37 37 37 37 37 37 37 37 37 3	Total Split (%)	10.0%	%8.09	13.3%	64.2%	25.8%	25.8%	25.8%	25.8%	
20 20 20 20 20 20 20 20 20 20 20 20 20 2	Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
00 00 00 00 00 00 00 00 00 00 00 00 00	All-Red Time (s)	1.0	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
None None 1 0.58 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0:0	
None None 1 0.58 0.96 420 1197 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Total Lost Time (s)	4.0	5.3	4.0	5.3	5.7	5.7	5.7	5.7	
None None I O58 0.96 0.96 0.96 0.96 0.97 0.97 0.97 0.97 0.97 0.97 0.97 0.97	Lead/Lag	Lead	Lag	Lead	Lag					
None None 7 197 197 197 197 197 197 197 197 197 1	Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
0.58 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
420 119.7 2 0.0 0.0 45.0 28.8 45.0 28.8 46.2 340.6 2 340.6 50.0 0 0 0 0 0 0	v/c Ratio	0.30	0.92	0.95	0.39	0.41	0.58	96:0	0.15	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Control Delay	4.7	16.9	86.4	10.6	46.3	42.0	119.7	27.3	
420 119.7 450 28.8 46.2 48.2 340.6 50.0 719 12.1 0 0 0 0 0 0	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
450 288 4 627 #68.2 340.6 50.0 719 121 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Delay	4.7	16.9	86.4	10.6	46.3	42.0	119.7	27.3	
340.6 340.6 50.0 1 719 121 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 50th (m)	3.9	54.1	40.1	33.1	22.9	45.0	28.8	8.1	
3406 500 719 121 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 95th (m)	m4.7	70.2	9.58#	50.1	41.4	62.7	#68.2	16.4	
50.0 1719 121 0	Internal Link Dist (m)		170.5		124.7		340.6		275.9	
719 121 0 0 0 0 0 0 0 0 0 1 0.58 0.96 (Turn Bay Length (m)	100.0		0.06		70.0		20.0		
0.58 0.96	Base Capacity (vph)	335	2716	215	2766	261	719	121	724	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
0.088 0.96	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
0.58 0.96	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Notes Length: 120 Aduated Cycle Length: 120 Aduated Cycle Length: 120 Aduated Cycle Length: 120 Aduated Cycle Length: 120 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 110 Control Type: Actualed-Coordinated # 9th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Reduced v/c Ratio	0.29	0.92	0.95	0.39	0.41	0.58	96.0	0.15	
Oycle Length: 120 Actuated Cycle Length: 120 Actuated Cycle Length: 120 Nortest: 0 (0%), Referenced to phase 2.EBTL and 6:WBTL, Start of Green Nortest: 0 (0%), Referenced to phase 2.EBTL and 6:WBTL, Start of Green Nortest: 110 Control Types: Actuated-Coordinated # 95th precentile volume exposeds capacity, queue may be longer. Oueue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Intersection Summary									
Aduated Cycle Length: 120 Offset: O (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 110 Natural Cycle: 110 Natural Cycle: 110 Apper Actualed-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Cycle Length: 120									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 110 For the state of Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Actuated Cycle Length: 120									
Natural Cycle: 110 Confriol Type: Actuated-Coordinated # 18th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Offset: 0 (0%), Referenced to	phase 2:	EBTL an	d 6:WBTL	, Start of	Green				
Confor Type: Artitated-Coordinated # 9th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Natural Cycle: 110									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. The control of 95th percentile queue is metered by upstream signal.	Control Type: Actuated-Coor	dinated								
Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	# 95th percentile volume ex	kceeds cal	oacity, qu	nene may	be longe					
m Volume for 95th percentile queue is metered by upstream signal.	Queue shown is maximur	n after two	cycles.		-	-				
	m Volume for 95th percent	lle dnene I	s metere	a by upsti	eam sign	al.				

Splits and Phases: 2: Fifth Line & Derry Road

- **→** Ø2 (R)

₹ Ø6 (R) 200

12 s 12-14-2023 BA Group

Synchro 11 Report

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Background (AM) 2032 Scenario 6 (Sensitivity)

Queues 4: Clark Boulevard & Derry Road

Future Background (AM) 2032 Scenario 6 (Sensitivity)

•	SBR		43	43	1900								0.92	47	0	0																										
→	SBT	2	10	10	1900	2.7	1.00	0.88	1.00	1636	1.00	1636	0.92	Ξ	44	14	¥	4		8.2	8.2	0.07	2.7	3.0	111	0.01		0.13	52.5	1.00	0.5	53.1		53.7	Ω							
۶	SBL	F	26	26	1900	2.7	1.00	1.00	0.95	1770	0.75	1402	0.92	28	0	28	Perm		4	8.2	8.2	0.07	2.7	3.0	95		c0.02	0.29	53.2	1.00	1.7	54.9										
4	NBR		0	0	1900								0.92	0	0	0																					A		15.0	ပ		
←	NBT	æ.	7	7	1900	2.7	1.00	1.00	1.00	1863	1.00	1863	0.92	00	0	8	NA	∞		8.2	8.2	0.07	2.7	3.0	127	0.00		90:0	52.3	1.00	0.5	52.5	۵	52.5	D							
•	NBL	F	0	0	1900								0.92	0	0	0	Perm		00																		ervice					
4	WBR		16	91	1900								0.92	66	0	0																					HCM 2000 Level of Service		time (s)	f Service		
ļ	WBT	444	396	362	1900	5.3	0.91	0.99	1.00	5019	1.00	5019	0.92	1046	4	1141	NA	9		100.8	100.8	0.84	5.3	3.0	4215	0.23		0.27	2.0	1.00	0.2	2.1	A	2.1	A		M 2000 I		Sum of lost time (s)	ICU Level of Service		
>	WBL	r	0	0	1900								0.92	0	0	0	pm+pt	-	9																		Ξ		S	⊇		
<i>></i>	EBR		0	0	1900								0.92	0	0	0																					8.8	0.61	120.0	72.4%	15	
†	EBT	444	2411	2411	1900	5.3	0.91	1.00	1.00	2082	1.00	5085	0.92	2621	0	2621	NA	2		100.8	100.8	0.84	5.3	3.0	4271	c0.52		0.61	3.2	3.11	0.3	10.2	B	10.0	A							
•	EBL	r	16	91	1900	5.3	1.00	1.00	0.95	1770	0.23	437	0.92	66	0	66	Perm		2	100.8	100.8	0.84	5.3	3.0	367		0.23	0.27	2.0	5.06	0.8	4.9	A					ratio		_		
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Frt	Fit Protected	Satd. Flow (prot)	Flt Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)	c Critical Lane Group

Synchro 11 Report

12-14-2023 BA Group

91 2411 962 7 26 10 99 2421 145 8 28 58 Perm NA NA Perm NA 1 2 2 6 8 8 4 4 4 100 10.0 10.0 10.0 10.0 10.0 60 34.3 34.3 34.3 34.3 34.3 34.3 34.3 34.3	10 10 58 NA 4 4 4 4 4 4 10 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7	10 10 10 10 10 10 10 10 10 10 10 10 10 1	2411 962 7 26 10 2621 1495 8 28 NA NA NA Perm NA 2 6 8 8 4 4 4 2 6 8 4 4 4 4 2 6 8 8 4 4 4 4 10.0 10.0 10.0 10.0 10.0 34.3 34.3 34.7 34.7 34.7 75.0 85.0 35.0 35.0 35.0 6.2.5% 70.8% 29.2% 29.2% 3.7 3.7 3.7 3.7 3.7 3.7 1.6 1.6 2.0 20 0.0 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.8 230.4 17.5 1.9 6.6 2.6 10.8 2.2 51.1 56.5 23.8 230.4 17.5 1.9 6.6 2.0 10.8 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	→ ■	↑ la	↑ WBT	→ NBT ←	♪ SBL	→ SBI ←	01	
2411 962 7 26 10 2621 1145 8 28 58 NA NA NA Perm NA 2 6 8 4 4 2 6 8 4 4 4 4 100 34.3 34.3 34.7 34.7 34.7 75.0 85.0 35.0 35.0 35.0 62.5% 70.8% 29.2% 29.2% 1.6 1.6 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.8 230.4 175. 1.9 6.6 2.6 M199. 22.1 7 1 6.6 2.6 M195. 22.1 7 1 6.4 20 336.0 475.1 56.4 400 336.0 475.1 56.4 400 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10 10 10 10 10 10 10 10 10 10	10 10 10 10 10 10 10 10 10 10	10 58 NA 4 4 4 4 4 4 4 4 4 7 6 6 7 8 7 8 7 8 8 7 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9	91	2411	362	_	26	9.4		
NA NA PEM NA A PEM NA A PEM NA A B PEM NA B	NA 4 4 4 4 10.0 34.7 34.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3	NA 4 4 4 4 4 10.0 34.7 34.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3	NA 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	93	2411	962	<u>~</u> «	26	10		
2 6 8 4 4 4 10.0 10.0 10.0 10.0 34.3 34.3 34.7 34.7 34.7 75.0 88.0 35.0 35.0 35.0 35.0 62.5% 70.8% 29.2% 29.2% 29.2% 3.7 3.7 3.7 3.7 3.7 1.6 1.6 2.0 2.0 5.3 5.3 5.3 5.7 5.7 5.7 1.9 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	10.0 34.7 34.7 35.0 20 20 20 20 0.0 5.7 16.0 116.0 313.3 434 434 60 10 10 10 10 10 10 10 10 10 1	10.0 34.7 34.7 35.0 20 20 20 20 0.0 5.7 16.0 116.0 313.3 434 434 60 10 10 10 10 10 10 10 10 10 1	10.0 34.7 34.7 35.0 20 20 20 0.0 5.7 16.0 16.0 16.0 16.0 17.0 18.0 19	Perm	NA C	NA 4	PΑ	Perm	NA A	-	
2 6 8 4 4 4 10.0 10.0 10.0 10.0 10.0 34.3 34.3 34.7 34.7 34.7 34.7 75.0 85.0 35.0 35.0 35.0 6.25% 70.8% 29.2% 29.2% 29.2% 3.7 3.7 3.7 3.7 3.7 3.7 1.6 1.6 2.0 2.0 2.0 6.0 0.0 0.0 0.0 0.0 0.0 5.3 5.3 5.3 5.7 5.7 5.7 Lag Ves C-Min None None None None None None None Non	10.0 34.7 35.0 35.0 3.7 2.0 2.0 0.0 2.3 2.3 2.3 2.3 2.3 1.6.0 3.13.3 4.34 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	10.0 34.7 35.0 35.0 3.7 3.7 2.0 0.0 2.3 2.3 2.3 2.3 2.3 1.6.0 3.13.3 4.34 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	10.0 34.7 35.0 35.0 29.8 3.7 2.0 5.7 1 0.3 2.3 2.3 2.3 2.3 2.3 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6	2	1		•	4			
10.0 10.0 10.0 10.0 10.0 34.3 34.7 34.7 34.7 34.7 34.7 34.7 34.7	10.0 34.7 35.0 37 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	10.0 34.7 35.0 3.7 2.0 0.0 0.0 0.32 0.0 0.0 2.8 2.8 2.8 2.8 2.8 1.6.0 3.13.3 4.34 4.34 0.13	10.0 34.7 35.0 37 2.0 0.0 0.0 0.0 0.0 2.8 2.8 2.8 2.8 2.8 1.60 313.3 434 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	2	2	9	00	4	4		
10. 10. 10. 10. 10. 10. 10. 10. 10. 10.	10.0 10.0	10.0 10.0	34.7 35.0 34.7 37 3.7 3.7 3.7 3.7 0.0 0.0 0.3 23.8 0.0 0.0 0.0 313.3 434 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.								
75.0 85.0 35.0 35.0 35.0 35.0 35.0 35.0 35.0 3	34.7 35.0 3.7 3.7 3.7 2.0 0.0 0.0 0.32 0.0 23.8 0.0 23.8 0.0 313.3 113.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	34.7 34.7 3.7 3.7 3.7 2.0 0.0 0.0 0.32 0.0 23.8 0.0 23.8 0.0 1.60 313.3 313.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	34.7 34.7 3.7 3.7 3.7 2.0 0.0 0.3 2.3.8 0.0 2.3.8 0.0 3.3 2.6 1.6 0.0 3.13.3 3.13.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	10.0	10.0	10.0	10.0	10.0	10.0	0.9	
75.0 88.0 35.0 38.0 38.0 38.0 38.0 38.0 38.0 38.0 38	29.2% 20.2% 20.00 20.00 23.8 23.8 23.8 23.8 2.6 1.6.0 313.3 43.4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	29.2% 20.27 20.00 20.00 23.8 23.8 23.8 23.8 23.8 24.4 16.0 313.3 43.4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	29.2% 20.2% 20.00 5.7 1 0.32 23.8 23.8 23.8 2.4 24.9 1.6 0 313.3 43.4 0 0 0 0 0 0 0 0	34.3	34.3	34.3	34.7	34.7	34.7	10.0	
0.55% 10.8% 24.2%	2.0 2.0 3.7 2.0 0.0 0.0 0.0 0.0 0.0 3.13.3 43.4 43.4 0.13	2.0 2.0 3.7 2.0 0.0 0.0 0.0 0.0 0.0 0.0 116.0 313.3 434 434 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2.7.2% 3.7.7 2.0 0.0 0.0 0.0 2.3.8 2.6 1.6.0 313.3 43.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	75.0	75.0	85.0	35.0	35.0	35.0	10.0	
1.6 1.6 20 20 20 20 20 20 20 20 20 20 20 20 20	2.0 0.0 0.0 0.0 0.0 0.32 2.38 2.38 2.38 2.4 1.60 3.13.3 4.34 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	2.0 0.0 0.0 0.0 0.3 2.3 2.3 2.4 2.6 1.6 1.6 0.0 313.3 43.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	2.0 0.0 0.0 0.0 0.0 0.0 2.38 2.38 2.6 2.8 2.6 3.13.3 4.34 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	3.7	3.7	3.7	3.7	3.7	3.7	3.0	
6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.3 0.32 0.3 2.3.8 0.0 0.0 3.13.3 434 0 0 0 0 0 0 0 0 0 0 0 0 0	0.0 0.0 0.3 0.3 2.3.8 0.0 0.0 3.3.8 1.60 3.3.8 4.34 0 0 0 0 0 0 0 0 0 0 0 0 0	0.0 0.0 0.3 0.3 0.0 0.0 0.0 3.3.8 0.0 3.3.8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	1,6	1.6	1.6	2.0	2.0	2.0	10	
F.3 5.3 5.7 5.7 5.7 Ves Ves C-Min C-Min None None None None None None 10.8 2.2 51.1 56.5 23.8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	5.7 None P 0.32 2.38 2.08 2.38 2.08 2.46 1.16.0 313.3 313.3 0.013	5.7 None P 0.32 23.8 0.0 23.8 2.6 2.6 1.16.0 313.3 313.3 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5.7 None P 0.32 23.8 0.0 23.8 2.6 2.6 1.6 0.0 313.3 313.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Lag Yes C-Min None None None None O.60 0.27 0.05 0.24 0.32 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	None None None None None None None None	None None 0.32 2.38 2.38 2.60 2.88 2.6 1.60 313.3 434 0.00 0.00 0.00 0.00 0.00 0.00 0.	None None 0.32 2.38 2.38 2.58 2.58 2.60 2.60 3.13.3 3.13.3 0.00 0.00 0.00 0.00 0.00	5.3	5.3	5.3	5.7	5.7	5.7		
Yes C-Min C-Min None None None None None None None Non	None None No.32 23.8 23.8 2.6 23.8 2.6 24.4 43.4 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	None P 0.32 23.8 23.8 26.0 1.16.0 313.3 0.13	None P 0.32 23.8 23.8 24.3	Lag	Lag					Lead	
C-Min C-Min None None None None Octo 0.27 0.05 0.24 0.32 0.04 0.32 0.04 0.32 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	None 0.32 0.32 0.00 0.00 1.160 3.13.3 0.00 0.00 0.00	None 0.32 0.03 0.00 0.00 3.13.3 1.16.0 0.00 0.00 0.00 0.00	None 0.32 0.32 0.30 0.00 0.00 0.00 0.00 0.00	Yes	Yes					Yes	
0.66 0.27 0.05 0.24 10.8 2.2 51.1 56.5 0.0 0.0 0.0 0.0 10.8 2.2 51.1 56.5 23.4 17.5 1.9 6.6 33.6.0 475.1 56.4 40 4465 4312 454 342 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				C-Min	C-Min	C-Min	None	None	None	None	
108 22 511 565 108 22 511 565 108 22 511 565 230.4 77.5 1.9 6.6 m199.2 22.1 7.0 16.4 336.0 475.1 56.4 40.0 4365 4312 454 40.0 0				0.26	09.0	0.27	0.02	0.24	0.32		
10.8 2.2 51.1 56.5 2.2 230.4 17.5 1.9 6.6 3.3 33.0 475.1 56.4 3.3 33.0 475.1 56.4 400 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				6.1	10.8	2.2	51.1	56.5	23.8		
230.4 17.5 1.9 6.6 m199.2 22.1 7.0 16.4 336.0 475.1 56.4 40.0 4365 4312 454 342 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				6.1	10.8	2.2	51.1	56.5	23.8		
33.6. 475.1 56.4 33.6. 475.1 6.4 40.0 6.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	m			7.5	230.4	17.5	1.9	9.9	5.6		
336.0 475.1 56.4 4365 4312 454 342 0 0 0 0 0 0 0 0 0.60 0.27 0.02					n199.2	22.1	7.0	16.4	16.0		
4365 4312 454 440 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0					336.0	475.1	56.4		313.3		
4365 4312 454 342 0 0 0 0 0 0 0 0 0.60 0.27 0.02 0.08 (70.0				40.0			
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				376	4365	4312	454	342	434		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				0	0	0	0	0	0		
0.60 0.27 0.02 0.08				0	0	0	0	0	0		
0.60 0.27 0.02 0.08				0	0	0	0	0	0		
) Io phase 2.EBTL and 6.WBTL, Slart of Green) to phase 2:EBTL and 6:WBTL, Start of Green ordinated	to phase 2:EBTL and 6:WBTL, Start of Green ordinated his metered by upstream signal.	0.26	0.60	0.27	0.02	0.08	0.13		
) Io phase 2.EBTL and 6.WBTL, Slart of Green) To phase 2.EBTL, and 6:WBTL, Start of Green ordinated) to phase 2:EBTL and 6:WBTL, Start of Green ordinated title queue is metered by upstream signal.								
) Io phase 2,EBTL and 6:WBTL, Start of Green) Io phase 2:EBTL and 6:WBTL, Start of Green ordinated) Io phase 2:EBTL and 6:WBTL, Start of Green ordinated								
d-Coordinated becontile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road	itile queue is metered by upstream signal. wrk Boulevard & Derry Road	ırk Boulevard & Derry Road									200
e is metered by upstream signal. vard & Derry Road	e is metered by upstream signal.		200								35 s
ordinated substanced by upstream signal. sink Boulevard & Derry Road sink Boulevard & Derry Road sink Boulevard & Derry Road	e is metered by upstream signal.		\$5 s								880
e is metered by upstream signal.	e is metered by upstream signal.		35.8		ı						25.0

12-14-2023 Synchro 11 Report

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Background (PM) 2032 Scenario 6 (Sensitivity)

Queues 1: Sixth Line & Derry Road

Future Background (PM) 2032 Scenario 6 (Sensitivity)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	4413		r	4413		F	*		K	₩	
Traffic Volume (vph)	171	1881	82	31	1855	25	201	166	33	137	226	147
Future Volume (vph)	171	1881	82	31	1855	22	201	166	33	137	226	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.94	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	4724		1805	4434		1805	3492		1258	3326	
Fit Permitted	0.07	1.00		0.07	1.00		0.44	1.00		0.62	1.00	
Satd. Flow (perm)	123	4724		135	4434		840	3492		820	3356	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	182	2001	06	33	1973	27	214	177	32	146	240	156
RTOR Reduction (vph)	0	4	0	0	-	0	0	15	0	0	92	0
Lane Group Flow (vph)	182	2087	0	33	1999	0	214	197	0	146	304	0
Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
Bus Blockages (#/hr)	-	49	2	0	24	2	0	0	-	9	-	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	N	
Protected Phases	2	2		-	9			00			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	689	60.7		9.09	56.4		29.6	29.6		29.6	29.6	
Effective Green, g (s)	6.89	60.7		9.09	56.4		29.6	29.6		29.6	29.6	
Actuated g/C Ratio	0.62	0.55		0.55	0.51		0.27	0.27		0.27	0.27	
Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	201	2583		136	2252		224	931		218	894	
v/s Ratio Prot	c0.07	0.44		0.01	0.45			90.0			0.09	
v/s Ratio Perm	c0.49			0.12			c0.25			0.18		
v/c Ratio	0.91	0.81		0.24	0.89		96:0	0.21		0.67	0.34	
Uniform Delay, d1	29.5	20.4		15.4	24.5		40.0	31.6		36.3	32.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	38.0	2.8		6:0	2.7		47.2	0.1		7.6	0.2	
Delay (s)	67.3	23.3		16.3	30.1		87.3	31.7		43.9	33.0	
Level of Service	ш	S		В	O		ıL	O		Ω	ပ	
Approach Delay (s)		26.8			29.9			9.69			36.0	
Approach LOS		S			S			ш			Ω	
Intersection Summary												
HCM 2000 Control Delay			31.6	H	3M 2000	HCM 2000 Level of Service	service		ပ			
HCM 2000 Volume to Capacity ratio	acity ratio		0.94									
Actuated Cycle Length (s)			111.0	S	Sum of lost time (s)	time (s)			16.5			
Intersection Capacity Utilization	ation		87.0%	Ō	U Level o	ICU Level of Service			ш			
Analysis Period (min)			15									

c Critical Lane Group

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_	SBT	₽ Ъ	226	226	396	NA	4		4		10.0	32.3	37.0	33.3%	4.0	2.3	0.0	6.3			None	0.40	23.4	0.0	23.4	25.6	39.9	71.7		1019	0	0	0	0.39								
٠	SBL	r	137	137	146	Perm		4	4						4.0	2.3	0:0	6.3			None N	0.67	52.6				#26.9				0	0		0.65								
←	NBT	41	166	166	212	M	8		∞		10.0	32.3	37.0	33.3%	4.0	2.3	0.0	6.3			None	0.22	29.0	0.0	29.0	17.6	27.8	211.8		626	0	0	0	0.22								
•	NBL	r	201	201	214	Perm		∞	∞		10.0	32.3	37.0	33.3%	4.0	2.3	0.0	6.3			None	96.0	91.4	0.0	91.4	47.4	#95.1		45.0	232	0	0	0	0.92				Green				
ļ	WBT	4413	1855	1855	2000	NA	9		9		25.0	31.2	62.0	25.9%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.89	30.7	0.0	30.7	145.8	171.1	256.2		2255	0	0	0	0.89				, Start of		ropaci od	ne louge	
-	WBL	*	31	31	33	pm+pt	_	9	_		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.18	10.1	0.0	10.1	5.6	6.4		100.0	182	0	0	0	0.18				d 6:WBTL		Trom office	Jeune IIIay	
†	EBT	441	1881	1881	2091	NA	2		2		25.0	31.2	63.0	26.8%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.79	23.1	0.0	23.1	146.5	170.2	475.1		2657	0	0	0	0.79				EBTL an		is alloca	pacity, qu	
1	EBL	*	171	171	182	pm+pt	2	2	2		7.0	11.0	12.0	10.8%	3.0	1.0	0:0	4.0	Lead	Yes	None	0.91	9.69	0.0	9.69	25.9	#70.9		120.0	201	0	0	0	0.91			_	to phase 2:		ordinated	exceeds ca	CHILL LAW
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 111	Actuated Cycle Length: 111	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 90	Control Type: Actuated-Coordinated	Onote sharing maximum after two cycles	CURCUS SHOWILLS HIGHER

 12-14-2023 Synchro 11 Report BA Group

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Future Background (PM) 2032 Scenario 6 (Sensitivity)

	1	†	<i>></i>	>	ţ	4	•	←	•	۶	→	\searrow
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	444		<i>y</i> -	4413		F	₩		r	₩	
Traffic Volume (vph)	43	1776	98	66	1997	118	233	74	209	311	304	80
Future Volume (vph)	43	1776	86	60	1997	118	233	74	200	311	304	80
Total Lost time (s)	40	53	1400	4 0	53	300	4.0	5.7	0061	4 0	5.7	004
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.97	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1600	4808		1587	4808		1698	3052		1501	3340	
Fit Permitted	0.07	1.00		0.07	1.00		0.32	1.00		0.40	1.00	
Satd. Flow (perm)	117	4808		112	4808		268	3052		637	3340	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	46	1889	91	105	2124	126	248	79	222	331	323	82
RTOR Reduction (vph)	0	4	0	0	2	0	0	118	0	0	70	0
Lane Group Flow (vph)	46	1976	0	105	2245	0	248	183	0	331	388	0
Heavy Vehicles (%)	11%	2%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
Bus Blockages (#/hr)	4	36	2	9	22	22	3	3	2	13	-	2
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	¥	
Protected Phases	2	2		-	9		m	∞		7	4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	63.1	57.4		1.79	26.7		34.3	17.6		36.9	18.9	
Effective Green, g (s)	63.1	57.4		1.79	26.7		34.3	17.6		36.9	18.9	
Actuated g/C Ratio	0.53	0.48		0.56	0.50		0.29	0.15		0.31	0.16	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	2.7		4.0	2.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	131	2299		161	2391		319	447		325	526	
v/s Ratio Prot	0.05	0.41		c0.04	c0.47		0.11	90.0		c0.15	0.12	
v/s Ratio Perm	0.17			0.32			0.11			c0.16		
v/c Ratio	0.35	98.0		0.65	0.94		0.78	0.41		1.02	0.74	
Uniform Delay, d1	22.5	27.7		21.7	28.4		36.1	46.5		38.6	48.2	
Progression Factor	1.74	0.80		1.38	1.04		1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.1		7.3	7.2		11.3	9.0		54.7	5.3	
Delay (s)	40.3	25.2		37.2	36.7		47.4	47.1		93.3	53.5	
Level of Service	Ω	ပ		۵	Ω			Ω		ш	٥	
Approach Delay (s)		25.5			36.7			47.2			71.3	
Approach LOS		S			Ω			Ω			ш	
Intersection Summary												
HCM 2000 Control Delay			38.2	王	HCM 2000 Level of Service	Level of S	Service		O			
HCM 2000 Volume to Capacity ratio	icity ratio		0.98									
Actuated Cycle Length (s)			120.0	Ñ	Sum of lost time (s)	time (s)			19.0			
Intersection Capacity Utilization	tion		88.9%	೨	ICU Level of Service	of Service			ш			
Analysis Period (min)			15									

c Critical Lane Group

Synchro 11 Report

12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Background (PM) 2032 Scenario 6 (Sensitivity)

traine Group EBI EBI WBI WBI NBI SBI SBI Traine Group Tange (yph) 43 1776 99 1997 233 74 311 304 Tange Group Flow (ych) 43 1776 99 1997 233 74 311 304 Tange Group Flow (ych) 46 1980 105 226 248 301 331 408 Tange Group Flow (ych) 46 1980 105 226 248 301 331 408 Tange Group Flow (ych) 46 1980 105 226 248 301 331 408 Tange Group Flow (ych) 46 1980 105 226 248 301 331 408 Tange Group Flow (ych) 46 1980 105 226 2 1 6 6 8 8 7 4 4 4 4 8 4 4 4 4 4 4 4 4 4 4 4 4		`	Ť	•		-	-		۰	
10 10 10 10 10 10 10 10	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
1	Lane Configurations	<i>y</i> -	₩	۳	441	۴	₩	۴	₩	
3 74 311 1	Traffic Volume (vph)	43	1776	66	1997	233	74	311	304	
331 331 331 331 331 331 331 331 331 331	Future Volume (vph)	43	1776	66	1997	233	74	311	304	
1 NA pm+pt 8 8 7 8 8 7 1 10.0 7.0 1 10.0 7.0 2 28.0 22.0 2 28.0 22.0 2 20.0 0.0 5 7 4.0 1 Lag Lead 5 7 7 83.5 7 7 83.5 7 83.5 7 83.5 8 8 7 7 1 1.0 7 8 18.5 8 8 7 7 1 1.0 7 8 10.0 8 10.0 9 10.0	Lane Group Flow (vph)	46	1980	105	2250	248	301	331	408	
8 8 7 8 8 7 10.0 7.0 28.0 22.0 28.0 22.0 28.0 22.0 3.7 3.0 0.0 0.0 0.0 0.0	Turn Type	pm+pt	A	pm+pt	NA	pm+pt	¥	pm+pt	¥	
8 8 7 100 7.0 100 7.0 100 7.0 100 7.0 100 28.0 100 28.0 100 0.0 100	Protected Phases	2	2	_	9	3	∞	7	4	
8 8 7 7 11.0 7.0 11.0 7.0 11.0 28.0 23.3% 18.3% 23.3% 18.3% 23.3% 18.3% 23.3% 18.3% 23.3% 18.3% 23.3% 18.3% 20.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Permitted Phases	2		9		∞		4		
10.0 7.0 28.0 22.0 28.0 22.0 28.0 22.0 2.0 2.0 1.0 2.0 1.0 2.0 1.0 2.0 1.0 2.0 1.0 2.0 1.0 2.0 1.0 2.0 2.0 2.0 2.0 2.0 2.7 9 83.5 2.7 9 8 83.5 2.7 9 8 83.5 2.7 9 8 83.5 2.7 9 8 83.5 2.7 9	Detector Phase	2	2		9	3	∞	7	4	
3.47 100 7.0 3.47 10.0 3.47 10.0 3.47 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	Switch Phase									
347 11.0 280.283.8 18.3% 23.3 3.7 3.0 2.0 1.0 0.0 0.0 0.0 0.0 0.5.7 4.0 0.5.7 4.0 0.5.7 4.0 0.0	Minimum Initial (s)	7.0	20.0	7.0	20.0	7.0	10.0	7.0	10.0	
280 220 233% 183% 25 33.3% 183% 25 30.00 0.0 5.7 4.0 1 Lag Lead Ves Yes Yes None None None None None None None None	Minimum Split (s)	11.0	34.3	11.0	34.3	11.0	34.7	11.0	34.7	
23.3% 18.3% 23 3.7 3.0 2.0 1.0 0.0 0.0 0.0 0.0 0.5.7 4.0 1.40 Lad 1.40 None None None None None None None None	Total Split (s)	11.0	29.0	11.0	29.0	22.0	28.0	22.0	28.0	
3.7 3.0 2.0 1.0 0.0 0.0 5.7 4.0 1.4g Lead Ves Yes None None N 0.53 0.99 0.53 0.99 2.7.9 83.5 2.7.9 83.5	Total Split (%)	9.5%	49.2%	9.5%	49.2%	18.3%	23.3%	18.3%	23.3%	
2.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Yellow Time (s)	3.0	3.7	3.0	3.7	3.0	3.7	3.0	3.7	
9.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	All-Red Time (s)	1.0	1.6	1.0	1.6	1.0	2.0	1.0	2.0	
5.7 4.0 1 Legg Lead 1 Ves Yes 1 Ves Yes None None None 2.7 83.5 2.7.9 83.5 2.7.0 83	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1 Lag Lead 1 Ves Yes 2 Ves Yes 2 None 2 0.53 0.99 2 7.9 83.5 2 7.0 83.5 2 7.0	Total Lost Time (s)	4.0	5.3	4.0	5.3	4.0	5.7	4.0	2.7	
Yes Yes Yes None None None None None None None None	Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	
None None (1976) 10.0	Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
5 0.53 0.99 2 27.9 83.5 2 27.9 83.5 2 27.9 83.5 3 2.7 #165.2 3 3.2 7 #105.2 3 3.2 7 #105.2 0	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
27.9 83.5 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	v/c Ratio	0.30	0.86	0.65	0.93	0.76	0.53	0.99	0.75	
2 27.9 63.5 5 2 27.9 63.5 5 3 22.7 #105.2 6 3 3 4 6 5 6 6 6 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Control Delay	24.6	26.2	42.1	36.5	45.2	27.9	83.5	54.2	
279 835 171 67.2 340.6 50.0 60.0 00.0	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19.1 67.2 3.2.7 #105.2 340.6 50.0 6.79 33.3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Delay	24.6	26.2	42.1	36.5	45.2	27.9	83.5	54.2	
32.7 #105.2 340.6 5.679 333 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 50th (m)	3.9	89.2	15.8	198.6	46.0	19.1	67.2	48.4	
340.6 50.7 50.7 50.7 50.0	Queue Length 95th (m)	m8.4	109.0	m#36.6	#246.0	6.99	32.7	#105.2	64.4	
500 507 507 500 000 000 000 000 000 000	Internal Link Dist (m)		170.5		124.7		340.6		275.9	
679 333 0 0 0 0 0 0 0 0 0 0 0 0 2 0.44 0.99 0	Turn Bay Length (m)	100.0		0.06		70.0		20.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	152	2301	162	2428	345	619	333	640	
0 0 0 0 0 0 2 0.44 0.99	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
2 0.44 0.99	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary Cycle Length: 120 Actualed Cycle Length: 120 Offiset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 135 Control Type: Artualed-Coordinated # 9fith percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Reduced v/c Ratio	0.30	0.86	0.65	0.93	0.72	0.44	0.99	0.64	
Oycle Length: 120 Adduated Cycle Length: 120 Offiset, Oyle, Neferenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 135 Control Type: Actualed-Coordinated E Shit precentally volume sexeeds capacity, queue may be longer. Oueue shown is maximum after two cycles. In Volume for 95th percentile queue is metered by upstream signal.	Intersection Summary									
Advaled Cycle Length: 120 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Matural Cycle: 135 Control Type: Actuated-Coordinated # 95th percentile variety and expects capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Cycle Length: 120									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 135 Confroit Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Actuated Cycle Length: 120	0								
Natural Cycle: 135 Control Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.	Offset: 0 (0%), Referenced	to phase 2:	EBTL an	d 6:WBTL	., Start of	Green				
Suh percental volume apacity, queue may be longer. Sub percentile volume apacity, queue may be longer. Queue shown is maximum after two cycles. Moune shown is maximum after two cycles. Moune for 95th percentile queue is metered by upstream signal.	Natural Cycle: 135	potonibao								
# 9sh percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. The control of the percentile queue is metered by upstream signal.	Collinal Type: Actualeu-Col	nalialeu								
Oueue shown is maximum after two cycles. m. Volume for 95th percentile queue is metered by upstream signal.	# 95th percentile volume	exceeds cal	oacity, qu	ieue may	pe longe	ني				
m volume for 95th percentile queue is metered by upstream signal.	Queue shown is maximu	um after two	cycles.		-	-				
	m volume for 95th percel	ntile dueue i	s metere	nsdn ƙa r	eam sigr	<u>a.</u>				

Splits and Phases: 2: Fifth Line & Derry Road

√01 + 402(R)

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Background (PM) 2032 Scenario 6 (Sensitivity)

FB1 FB1 FBR WBL WBT WBR NBL NBT NBR SBL SBT	1	†	<u> </u>	/	Ļ	1	€	←	•	۶	→	•	
	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
38 2101 0 0 2162 24 0 10 0 80 7 100 1900 1900 1900 1900 1900 1900 1900 100 1900 1900 1900 1900 1900 1900 1900 100 0.91 0.091 0.091 0.091 1.00 1.00 100 0.95 1.00 1.00 1.00 1.00 1.00 170 5085 5077 1863 1.30 1.595 170 2085 5077 1863 1.30 1.595 170 2085 5077 1863 1.30 1.595 170 2085 5077 1863 1.30 1.595 170 2085 5077 1863 1.30 1.595 170 2085 5077 1863 1.30 1.595 170 2085 5077 1863 1.30 1.595 170 2085 5077 1863 1.30 1.595 170 2085 2092 0.92 0.92 0.92 0.92 170 2085 2085 2085 2085 2085 2085 180 898	ane Configurations	K	441		K	441		×	41		K	41	
1900 1900	raffic Volume (vph)	36	2101	0	-0	2162	24	0	9	0	80	_	169
1900 1900	uture Volume (vph)	39	2101	0	0	2162	24	0	10	0	80	7	169
1.00	deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
100 091 100	Total Lost time (s)	5.3	5.3			5.3			5.7		5.7	5.7	
1.00 1.00	.ane Util. Factor	1.00	0.91			0.91			1.00		1.00	1.00	
1,00 0.95 1.00 1.00 1.00 1.00 1.00 1.95 1.00 1.00 1.00 1.00 1.95 1.00 1.00 0.05 0.05	Frt	1.00	1.00			1.00			1.00		1.00	98.0	
1770 5085 5077 1863 1770 1595 1863 1770 1595 1700 1700 1863 1770 1595 1700 1700 1863 1770 1595 1700 1700 1863 1784 1863 1398 1398 1398 1398 1398 1864 1294 1294 1294 1904 1904 1864 1864 1864 1864 1864 1864 1865 1866 1866 1866 1866 1866 1866 1866 1866 1866 1866 1866 1866 1866 1866 1866 1866 1866 1866 1866 1867 1868 1868 1868 1868 1868 1868 1868 1868 1868 1868 1868 1868 1868 1868 1868 1868 1868 1869 1868 1868 1868 1868 1868 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860 1860	Fit Protected	0.95	1.00			1.00			1.00		0.95	1.00	
100 0.05 1.00 1	satd. Flow (prot)	1770	2082			2077			1863		1770	1595	
1863 1865	It Permitted	0.02	1.00			1.00			1.00		0.75	1.00	
HF 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	atd. Flow (perm)	87	5085			5077			1863		1398	1595	
39 2284 0 0 2350 26 0 11 0 87 8 2h) 39 2284 0 0 1 0 0 7 2h) 39 2284 0 0 1 0 0 7 2h) 39 2284 0 0 1 0 0 0 7 2h 1h 1h 0 <	eak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
ph) 0	dj. Flow (vph)	36	2284	0	0	2350	56	0	=	0	87	∞	184
bh) 39 2284 0 0 2375 0 0 11 0 87 Main Main Main Main Main Main Main Main	TOR Reduction (vph)	0	0	0	0		0	0	0	0	0	7	0
Perm NA Perm NA Perm NA Perm NA 2	ane Group Flow (vph)	36	2284	0	0	2375	0	0	Ξ	0	87	185	0
2	urn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	N	
S S S S S S S S S S	rotected Phases		2		-	9			∞			4	
s) 898 898 192 192 j 898 898 192 192 j 898 898 192 192 j 63 53 53 192 192 j 53 53 53 192 192 j 53 53 57 57 57 j 63 3805 3799 298 233 j 64 64 64 67 60 j 65 69 69 71 426 45.2 j 7 7 42.6 46.3 100 100 j 12,9 A D D D D j 130 A D A D A j 12,0 12,0 12,0 12,0 12,0 12,0 12,0 j 130 20 A D D D <td>ermitted Phases</td> <td>2</td> <td></td> <td></td> <td>9</td> <td></td> <td></td> <td>8</td> <td></td> <td></td> <td>4</td> <td></td> <td></td>	ermitted Phases	2			9			8			4		
989 898 898 898 19.2 19.2 19.3 19.3	ctuated Green, G (s)	868	868			868			19.2		19.2	19.2	
0.75 0.75 0.75 0.75 0.16 0.16 0.16 0.16 0.25 0.23 0.23 0.20 0.45 0.45 0.45 0.45 0.45 0.45 0.45 0.4	ffective Green, g (s)	868	868			8.68			19.2		19.2	19.2	
3.0	ctuated g/C Ratio	0.75	0.75			0.75			0.16		0.16	0.16	
3.0 3.0 3.0 3.0 3.0 3.0 3.0 65 3805 3799 298 223 0.45 0.047 0.01 0.06 0.60 0.60 0.63 0.04 0.39 1.60 0.60 0.63 0.04 0.39 1.60 0.60 0.63 0.04 0.39 1.60 0.60 0.63 0.04 0.39 1.60 0.63 0.04 0.39 1.60 0.63 0.04 0.39 1.71 1.00 1.00 1.00 1.00 0.11 1.10 1.00 0.11 0.10 1.00 0.11 0.10 1.00 0.11 0.10 1.00 0.11 0.10 1.00 0.11 0.10 1.00 0.11 0.10 1.00 0.11 0.10 1.00 0.11 0.10 1.00 0.11 0.10 1.00 0.11 0.10 1.00 0.11 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 1.00 0.10 0.10 0.10 0.10 1.00 0.10 0.10 0.10 0.10 1.00 0.10 0.10 0.10 0.10 1.00 0.10 0.10 0.10 0.10 1.00 0.10 0.10 0.10 0.10 0.10 1.00 0.10 0.10 0.10 0.10 0.10 0.10 1.00 0.10 0.10 0.10 0.10 0.10 0.10 0.10 1.00 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10	learance Time (s)	5.3	5.3			5.3			2.7		2.7	2.7	
65 3805 3799 298 223 0.45 0.45 0.047 0.01 0.06 0.60 0.60 0.63 0.04 0.39 6.9 6.9 7.1 42.6 45.2 1.9 1.78 1.00 1.00 1.00 12 1.9 0.04 0.39 0.39 12 1.26 7.9 42.6 46.3 13 7.9 42.6 46.3 130 7.9 42.6 46.3 130 7.9 42.6 A 130 7.9 42.6 A 130 A D D 130 A D D 140 A D D 150 A D	ehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
0.45 0.45 0.047 0.01 0.06 0.46 0.60 0.63 0.63 0.04 0.39 6.9 6.9 7.11 42.6 45.2 1.96 1.78 1.00 1.00 1.00 1.00 1.2 12.04 0.88 0.1 1.01 1.01 2. 12.04 7.9 42.6 45.3 C B A A D D D D D A A D D D D D A B A D D D D D D A B A D D D D D D D D D D D D D D D D	ane Grp Cap (vph)	99	3805			3799			298		223	255	
0.45 0.46 0.60 0.60 0.60 0.63 0.63 0.64 0.71 0.60 0.71 0.70 0.70 0.71 0.70 0.71 0.70 0.71 0.70 0.70	's Ratio Prot		0.45			c0.47			0.01			c0.12	
0.60 0.60 0.63 0.04 0.39 1.64 6.9 7.1 42.6 45.2 1.65 1.92 0.4 0.8 0.1 1.07 1.26 7.9 42.6 46.3 1.08 0.1 1.00 1.00 1.09 0.1 1.0 1.00 1.00 0.1 0.1 1.1 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 1.00 0.00	's Ratio Perm	0.45									90.0		
6.9 6.9 7.1 42.6 45.2	'c Ratio	09:0	09:0			0.63			0.04		0.39	0.73	
196 178 100	Iniform Delay, d1	6.9	6.9			7.1			42.6		45.2	47.9	
192 0.4 0.8 0.1 1.1 32.7 12.6 7.9 42.6 46.3 C B B A D D D D D D D D D D D D D D D D D	rogression Factor	1.96	1.78			1.00			1.00		1.00	1.00	
32.7 12.6 7.9 42.6 46.3 C B A A D D 13.0 7.9 42.6 46.3 Py A 42.6 B Ny B A 42.6 B Delay 12.9 HCM 2000 Level of Service B 14.6 S Sum of lost time (s) 15.0 15.0 Sum of lost time (s) 15.0 15.0 Sum of lost time (s) 15.0 15.0 Sum of lost time (s) 15.0	icremental Delay, d2	19.2	0.4			8.0			0.1		1.1	6.6	
C B A D D 13.0 7.9 42.6 B A D Dy Dy 12.9 HCM 2000 Level of Service B This is 12.0 Sum of lost time (s) 15.0 This is 15.0	elay (s)	32.7	12.6			7.9			42.6		46.3	57.8	
13.0 7.9 42.6 B A D D Oy Delay 12.9 HCM 2000 Level of Service B of Capacity ratio 0.67 20m of lost time (s) 15.0 Jift (s) 120.0 Sum of lost time (s) 15.0 15.0 15.0 B	evel of Service	S	В			A			۵		۵	ш	
7y A D D 12.9 HCM 2000 Level of Service B o Capacity ratio 0.67 Sum of lost time (s) 15.0 15.0 Sum of Level of Service B 17.0 Sum of lost time (s) 15.0 18.0 Sum of lost time (s) 15.0	pproach Delay (s)		13.0			7.9			42.6			54.2	
12.9 HCM 2000 Level of Service ratio 0.67 Sum of lost time (s) 6.2% ICU Level of Service 15	pproach LOS		В			V			D			O	
12.9 HCM 2000 Level of Service 12.0 Sum of lost time (s) 62.6% ICU Level of Service 15.15	itersection Summary												
ratio 0.67 Sum of lost time (s) 1200 Sum of lost time (s) 62.6% ICU Level of Service 15	ICM 2000 Control Delay			12.9	 	CM 2000	Level of S	service		В			
120.0 Sum of lost time (s) 62.6% ICU Level of Service 15	ICM 2000 Volume to Capac	city ratio		0.67									
62.6% ICU Level of Service 15	ctuated Cycle Length (s)	,		120.0	S	am of lost	time (s)			15.0			
nalysis Period (min) 15	itersection Capacity Utilizat	lion		62.6%	೦	U Level o	f Service			В			
	nalysis Period (min)			15									

Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 4: Clark Boulevard & Derry Road

Future Background (PM) 2032 Scenario 6 (Sensitivity)

	01						_				0.9	10.0	10.0	%8	3.0	1.0			Lead	Yes	None																			
→	SBT	\$	7	7	192	¥	4		4		10.0	34.7	35.0	29.2%	3.7	2.0	0.0	5.7			None	0.74	61.9	0.0	61.9	44.0	9.59	313.3		395	0	0	0	0.49						
۶	SBL	r	80	80	87	Perm		4	4		10.0	34.7	35.0	29.2%	3.7	2.0	0.0	5.7			None	0.39	48.8	0.0	48.8	19.5	33.8		40.0	341	0	0	0	0.26				Sreen		le.
—	NBT	£,	10	10	Ξ	NA	∞		∞		10.0	34.7	35.0	29.2%	3.7	2.0	0.0	5.7			None	0.04	39.4	0.0	39.4	2.3	7.4	56.4		454	0	0	0	0.02				Start of (eam sign
Ļ	WBT	4413	2162	2162	2376	NA	9		9		10.0	34.3	85.0	70.8%	3.7	1.6	0.0	5.3			C-Min	0.63	9.8	0.0	9.8	88.0	128.9	475.1		3800	0	0	0	0.63				6:WBTL		by upstre
†	EBT	4413	2101	2101	2284	NA	2		2		10.0	34.3	75.0	62.5%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	09:0	13.9	0.0	13.9	178.7	m169.1	336.0		3807	0	0	0	09:0				BTL and		smetered
1	EBL	*	36	36	33	Perm		2	2		10.0	34.3	75.0	62.5%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	09:0	47.0	0.0	47.0	8.3	m9.8 r		70.0	99	0	0	0	09:0				to phase 2:F	potodipos	ntile queue is
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 90	Control 1 yes, Actualizated To Control 1 yes, Actualizated To Volume for 95th percentile queue is metered by upstream signal

4: Clark Boulevard & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Total (AM) 2032 Scenario 6 (Sensitivity)

Movement	2	FRT	במם	MRI	TOW	9		-	NRR	SBI	FOO	
	בפר	רה	LDR	VVDL	MDI	WBR	NBL	NBT		,	SBI	SBR
Lane Configurations	<u>_</u>	4413		r	4413		F	₩		r	₩	
Traffic Volume (vph)	165	2217	169	25	837	41	92	173	32	46	142	136
Future Volume (vph)	165	2217	169	22	837	41	45	173	32	46	142	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Fit	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.93	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	4706		1805	4378		1805	3498		1258	3305	
FIt Permitted	0.26	1.00		90.0	1.00		0.48	1.00		0.61	1.00	
Satd. Flow (perm)	490	4706		109	4378		406	3498		808	3305	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
۲dj. Flow (vph)	176	2359	180	27	830	44	86	184	34	46	121	145
REDITION (Vph)	0	9	0	0	4	0	0	15	0	0	124	0
-ane Group Flow (vph)	176	2533	0	27	930	0	86	203	0	46	172	0
Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
3us Blockages (#/hr)	1	46	2	0	54	2	0	0	1	9	1	2
Furn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
Protected Phases	വ	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	82.2	74.0		73.9	1.69		16.3	16.3		16.3	16.3	
Effective Green, g (s)	82.2	74.0		73.9	2.69		16.3	16.3		16.3	16.3	
Actuated g/C Ratio	0.74	0.67		0.67	0.63		0.15	0.15		0.15	0.15	
Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
/ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
-ane Grp Cap (vph)	460	3137		136	2749		133	513		118	485	
//s Ratio Prot	c0.03	c0.54		0.01	0.21			90.0			0.02	
//s Ratio Perm	0.25			0.12			c0.11			90.0		
//c Ratio	0.38	0.81		0.20	0.34		0.74	0.40		0.42	0.36	
Jniform Delay, d1	4.5	13.4		10.7	8.6		45.3	45.9		43.0	42.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
ncremental Delay, d2	0.5	2.3		0.7	0.3		19.0	0.5		2.4	0.4	
Delay (s)	5.1	15.7		11.5	10.1		64.3	43.4		45.4	43.1	
evel of Service	⋖	В		В	В		ш	۵		۵	٥	
Approach Delay (s)		15.0			10.1			49.9			43.4	
Approach LOS		Ω			В			Ω			Ω	
ntersection Summary												
HCM 2000 Control Delay			18.7	H	M 2000 I	HCM 2000 Level of Service	ervice		В			
HCM 2000 Volume to Capacity ratio	city ratio		0.78									
Actuated Cycle Length (s)			111.0	Su	Sum of lost time (s)	time (s)			16.5			
ntersection Capacity Utilization	ion		88.1%	⊇	ICU Level of Service	f Service			ш			
Analysis Period (min)			15									

c Critical Lane Group

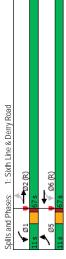
Synchro 11 Report 12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Total (AM) 2032 Scenario 6 (Sensitivity)

Lane Group EBI EBT WBI Lane Configurations ↑		NBL 92 92 98 98 8 8 8 8 33.0 29.7% 29.7% 2.3 6.3	NBT 173 173 173 173 218 8 8 8 8 8 32.3 33.0 4.0 4.0 4.0 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3	SBL 46 46 49 49 4 4 4 4 4 4 4 4 4 4 4 4 4 4	SBT 142 296 NA 4 4 4 4 4 4 4 4 4 4 6 6 6 6 6 6 6 6 6
tions		92 92 92 92 98 Perm 8 8 8 8 8 8 33.0 32.3 33.0 29.7% 2.77 6.00 0.0 6.3		46 46 49 Perm 4 4 4 4 10.0 32.3 33.0 29.7% 29.7% 2.3	142 142 296 142 142 142 142 143 143 143 143 143 143 143 143 143 143
(vph) 165 2217 (vph) 176 2217 (vph) 176 2239 es 5 5 2 es 5 5 2 es 5 70 25.0 (s) 70 25.0 110 67.0 9.9% 604% 4.0 1 10 2.2 st (s) 0.0 0.0 (s) Lead 1.9 11ce? Ves Ves Pes 11ce? None C.Min P 16.9 6.6 6.6 16.9	9	92 92 98 98 8 8 8 10.0 32.3 33.0 4.0 4.0 4.0 29.7% 4.0 6.3		46 49 Perm 4 4 4 4 10.0 32.3 33.0 29.7% 4.0 2.3 0.0	142 296 NA 4 4 4 10.0 32.3 33.0 29.7% 2.9 2.3
(vph) 165 2217 w (vph) 165 2217 es 5 5 2 es 5 5 2 es 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	9	92 98 8 8 8 8 10.0 32.3 33.0 4.0 4.0 4.0 29.7% 4.0 6.3		46 49 4 4 4 4 10.0 32.3 33.0 29.7% 4.0 2.3 0.0	142 296 NA NA 4 4 4 10.0 32.3 33.0 29.7% 4.0 2.3 0.0
w (vph) 176 2539 es 5 2 es 2 2 es 2 2 es 70 250 110 670 5) 110 31.2 110 670 9,9% 60.4% 9,9% 60.4% 110 670 110 670 110 670 110 70 110 670 110 670 110 670 110 670 110 670 110 670 110 70 110 670 110 670 110 70 110 670 110 70 110	9	Perm 8 8 8 8 8 8 8 8 8 40 22.7% 4.0 2.3 6.3		44 4 4 4 4 4 4 32.3 33.0 29.7% 4.0 2.3 0.0	296 NA 4 4 4 10.0 32.3 33.0 29.7% 4.0 2.3
es 5 2 2 2 6 2 5 2 6 5 2 6 5 2 6 6 6 6 6 6	9	Perm 8 8 8 8 8 32.3 33.0 29.7% 4.0 2.3 0.0 6.3		Perm 4 4 4 4 4 4 4 4 32.3 32.3 33.0 29.7% 4.0 2.3 2.3 0.0	NA 4 4 10.0 32.3 33.0 29.7% 4.0 2.3 0.0 0.0
es 5 2 2 6 2 6 5 2 7 6 6 6 6 6 6 9 6 9 6 6 6 6 6 6 6 6 6 6	9	10.0 32.3 33.0 29.7% 4.0 2.3 0.0 6.3		10.0 32.3 33.0 29.7% 4.0 2.3 0.0	10.0 10.0 32.3 33.0 29.7% 4.0 2.3
(\$) 7.0 25.0 (\$) 1.10 31.2 (\$) 1.10 31.2 (\$) 1.10 31.2 (\$) 1.10 31.2 (\$) 1.10 2.2 (9	10.0 32.3 33.0 29.7% 4.0 2.3 0.0 6.3		10.0 32.3 33.0 29.7% 4.0 2.3	10.0 32.3 33.0 29.7% 4.0 2.3
(\$) 7.0 25.0 (\$) 11.0 31.2 (\$) 11.0 31.2 (\$) 11.0 67.0 (\$) 9.9% 60.4% 4.0 (\$) 1.0 2.2 (\$) 1.0 2.2 (\$) 4.0 0.0 (\$) 4.0	9	10.0 32.3 33.0 29.7% 4.0 2.3 0.0 6.3		10.0 32.3 33.0 29.7% 4.0 2.3 0.0	10.0 32.3 33.0 29.7% 4.0 2.3
(s) 7.0 25.0 11.0 31.2 11.0 67.0 9.9% 60.4% 67.0 9.9% 60.4% 4.0 1.0 2.2 1.0 3.0 (s) 4.0 6.2 1.0 4.0 (s) 6.2 1.0 7.9 1.0 6.2 1.0 7.0 1.0 6.2 1.0 6.2 1.0 7.0 1.0 6.2 1.0 7.0 1.0 7.0 1.0 8.2 1.0 8.2 1.	9	10.0 32.3 33.0 29.7% 4.0 2.3 0.0		10.0 32.3 33.0 29.7% 4.0 2.3 0.0	10.0 32.3 33.0 29.7% 4.0 2.3 0.0
(\$) 7.0 25.0 \$) 11.0 31.2 11.0 31.2 11.0 9.9% 60.4%	9	10.0 32.3 33.0 29.7% 4.0 2.3 0.0 6.3		10.0 32.3 33.0 29.7% 4.0 4.0 2.3	10.0 32.3 33.0 29.7% 4.0 2.3 0.0
s) 110 31.2 110 67.0 9.9% 60.4% 9.3 3.0 4.0 2.2 11.0 2.2 11.0 2.2 11.0 2.2 11.0 2.2 11.0 0.0 11.0 0.0 10.0 0.0	9	32.3 33.0 29.7% 4.0 2.3 0.0 6.3		32.3 33.0 29.7% 4.0 2.3 2.3	32.3 33.0 29.7% 4.0 2.3 0.0
110 67.0 9.9% 60.4% 4.0 1.0 2.2 1.0 2.2 1.0 0.0 0.0 (s) 4.0 1.0 (s) 4.0 1.0 1.2 4.0 (s) 4.0 1.0 1.2 7 8 1.0 1.0 1.0 8 1.0 1.0 8 1.0 1.	9	33.0 29.7% 4.0 2.3 0.0 6.3		33.0 29.7% 4.0 2.3 0.0	33.0 29.7% 4.0 2.3 0.0
9.9% 604% 6 10 2.2 1.0 2.2 1.0 2.2 1.0 2.2 1.0 0.0 (s) 4.0 6.2 Lead Lag II Ize? Yes Yes None C-Min Non	9	29.7% 4.0 2.3 0.0 6.3		29.7% 4.0 2.3 0.0	29.7% 4.0 2.3 0.0
(s) 3.0 4.0 (s) 1.0 2.2 1.0 2.2 1.0 2.2 1.0 2.2 1.0 2.2 1.0 6.2 (s) 4.0 6.2 (s) 4.0 6.2 (s) 7.9 (s) 7		4.0 2.3 0.0 6.3	2.3	2.3	2.3
(s) 1.0 2.2 (e) (c) (e) (c) (e) (e) (e) (e) (e) (e) (e) (e) (e) (e		2.3	2.3	2.3	2.3
e (s) 00 00 00 00 00 (e (s) 40 6.5 1 20 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		0.0	0.0	0.0	0.0
e (s) 4.0 6.2 Lead Lag I mize? Yes Yes None C-Min P 0.38 0.79 6.6 16.9		6.3	6.3		
Lead Lag I Mize? Yes Yes None C-Min P 0.38 0.79 6.6 16.9				6.3	6.3
mize? Yes Yes None C-Min N 0.38 0.79 6.6 16.9					
None C-Min N 0.38 0.79 6.6 16.9					
0.38 0.79 6.6 16.9	_	None	None	None	None
6.6 16.9		0.74	0.41	0.42	0.49
	4 10.8	74.7	40.5	51.7	23.5
у 0.0 0.0		0.0	0.0	0.0	0.0
9.9	4 10.8	74.7	40.5	21.7	23.5
8.8 149.4		21.7	22.0	10.3	16.4
m) 19.8	4 52.1	38.4	31.4	21.6	27.7
475.1			211.8		201.7
=		45.0		30.0	
Base Capacity (vph) 465 3207 183	3 2752	217	822	194	902
Starvation Cap Reductn 0 0 0	0 0	0	0	0	0
Spillback Cap Reducth 0 0	0 0	0	0	0	0
0		0	0	0	0
Reduced v/c Ratio 0.38 0.79 0.15	5 0.34	0.45	0.25	0.25	0.33
ntersection Summary					
Oxcle Lenath: 111					

Actuated Cycle Length: 111
Notes: 0 (%), Referenced to phase 2.EBTL and 6.WBTL, Start of Green Natural Cycle: 100
Control Type: Actuated-Coordinated



HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Future Total (AM) 2032 Scenario 6 (Sensitivity)

Movement												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations	r	4413		r	4413		F	₩		F	₽ ₽	
raffic Volume (vph)	92	2368	104	193	799	262	100	289	106	111	72	32
uture Volume (vph)	92	2368	104	193	799	262	100	589	106	111	72	32
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
otal Lost time (s)	4.0	5.3		4.0	5.3		2.7	5.7		5.7	5.7	
ane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
T.	1.00	0.99		1.00	96.0		1.00	96.0		1.00	0.95	
It Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1600	4811		1587	4543		1698	3207		1501	3253	
It Permitted	0.22	1.00		90:0	1.00		0.68	1.00		0.36	1.00	
Satd. Flow (perm)	377	4811		93	4543		1219	3207		261	3253	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	86	2519	11	205	820	279	106	307	113	118	77	34
RTOR Reduction (vph)	0	4	0	0	46	0	0	32	0	0	27	0
ane Group Flow (vph)	86	2626	0	205	1080	0	106	388	0	118	84	0
leavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
3us Blockages (#/hr)	4	36	2	9	22	22	m	m	2	13	-	2
urn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
Protected Phases	2	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	75.3	67.7		83.7	72.1		25.3	25.3		25.3	25.3	
Effective Green, g (s)	75.3	67.7		83.7	72.1		25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.63	0.56		0.70	09.0		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
'ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
ane Grp Cap (vph)	314	2714		214	2729		257	919		118	989	
/s Ratio Prot	0.02	0.55		c0.10	0.24			0.12			0.03	
's Ratio Perm	0.18			c0.57			0.0			c0.21		
/c Ratio	0.31	0.97		0.96	0.40		0.41	0.57		1.00	0.12	
niform Delay, d1	0.6	25.1		40.5	12.5		40.9	42.5		47.4	38.4	
Progression Factor	0.52	0.49		1.01	0.94		1.00	1.00		1.00	1.00	
ncremental Delay, d2	0.4	8.2		48.7	0.4		1.1	1.2		82.9	0.1	
Delay (s)	2.0	20.6		89.4	12.2		42.0	43.7		130.2	38.4	
evel of Service	A	ပ		ш	B		٥	٥		ıL	۵	
Approach Delay (s)		20.1			24.1			43.4			85.7	
Approach LOS		O			O			D			ш	
ntersection Summary												
ICM 2000 Control Delay			26.8	Ĭ	HCM 2000 Level of Service	Level of S	service		ပ			
HCM 2000 Volume to Capacity ratio	ty ratio		0.99									
ctuated Cycle Length (s)			120.0	S	Sum of lost time (s)	time (s)			15.0			
ntersection Capacity Utilization	nc		95.7%	2	ICU Level of Service	f Service			ш			
Analysis Doriod (min)			7									

12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (AM) 2032 Scenario 6 (Sensitivity)

Lane Group										
289 111 289 111 289 111 8 4 4 8 8 4 100 100 100 100	lane Group	E	FRT	WBI	WRT	NRI	NRT	SB	SRT	
289 111 289 111 289 111 8 8 4 8 8 4 10.0 10.0 10.0 10.0	Lane Configurations	-	441	1	441	1	4	1	*	
289 111 8 420 118 8 4 4 8 8 4 4 8 100 1000 9 34,7 34,7 34,7 3 37 3,7 3,7 9 0.00 0.00 10 0.57 5,7 10 0.59 1100 10 0.59 1100 10 0.59 1100	Traffic Volume (vph)	92	2368	193	799	100	289	111	72	
8 420 118 8 4 4 8 8 4 4 8 8 8 4 4 8 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0	Future Volume (vph)	92	2368	193	799	100	289	111	72	
8 8 4 4 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9	Lane Group Flow (vph)	86	2630	202	1129	106	420	118	111	
8 4 4 4 4 10.0 10.0 10.0 10.0 10.0 10.0 1	Turn Type	pm+pt	NA	pm+pt	NA	Perm	¥	Perm	¥	
8 8 4 4 8 100 100 100 100 100 100 100 100 100 10	Protected Phases	2	2	_	9		∞		4	
9 8 4 9 100 100 1 34.7 34.7 9 34.7 34.7 9 31.0 31.0 2 25.8% 25.8% 9 20.0 0.0 0	Permitted Phases	2		9		∞		4		
100 100 100 100 100 100 100 100 100 100	Detector Phase	വ	2	-	9	∞	∞	4	4	
100 100 100 100 100 100 100 100 100 100	Switch Phase									
34.7 34.7 34.7 34.7 34.7 34.7 34.7 34.7	Minimum Initial (s)	7.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	
2.5.8% 25.8%	Minimum Split (s)	11.0	34.3	11.0	34.3	34.7	34.7	34.7	34.7	
25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.8% 25.00 20.00	Total Split (s)	12.0	73.0	16.0	0.77	31.0	31.0	31.0	31.0	
7 3.7 3.7 3.7 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Total Split (%)	10.0%	%8.09	13.3%	64.2%	25.8%	25.8%	25.8%	25.8%	
2.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	All-Red Time (s)	1.0	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
None None None None None None None None	Lost Time Adjust (s)	0:0	0.0	0.0	0.0	0.0	0.0	0.0	0:0	
None None None None None None None None	Total Lost Time (s)	4.0	5.3	4.0	5.3	5.7	5.7	5.7	5.7	
None None None None None None None None	Lead/Lag	Lead	Lag	Lead	Lag					
Mone None None None None None None None N	Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
0.59 100 0 4.25 31.5 3 4.25 3	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
42.5 131.5	v/c Ratio	0.31	0.97	0.95	0.41	0.41	0.59	1.00	0.16	
9 00 00 4 42.5 131.5 5 4 42.5 131.5 5 4 62.7 #69.6 7 340.6 50.0 0 0 0 0 0	Control Delay	4.7	21.5	82.8	10.9	46.6	42.5	131.5	27.3	
5 425 1315 5 4 45.0 29.5 4 62.7 #69.6 340.6 20 7 707 118 0 0 0 0 0 0 0 0 0 1 0.59 1.00 (Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4 45.0 29.5 4 62.7 #69.6 340.6 50.0 7 707 118 0 0 0 0 0 0 0 0 0 1 0.59 1.00 (Total Delay	4.7	21.5	87.8	10.9	46.6	42.5	131.5	27.3	
4 62.7 #69.6 7 340.6 20 7 707 118 0 0 0 0 0 0 1 0.59 1.00 0	Queue Length 50th (m)		61.8	36.1	42.6	22.9	45.0	29.5	8.1	
340.6 50.0 707 118 0 0 0 0 0 0 1 0.59 1.00 0	Queue Length 95th (m)		m#78.8	#82.8	50.9	41.4	62.7	9.69#	16.4	
50.0 707 118 0 0 0 0 0 0 0 0 0 1 0.59 1.00 (Internal Link Dist (m)		170.5		124.7		340.6		275.9	
7 707 118 0 0 0 0 0 0 0 0 0 1 0.59 1.00 (Turn Bay Length (m)	100.0		0.06		70.0		20.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	323	2718	215	2780	257	707	118	712	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
0.59 1.00	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
0.59 1.00	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary Cycle Length: 120 Actualed Cycle Length: 120 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 120 Control Type: Actualed-Coordinated C	Reduced v/c Ratio	0.30	0.97	0.95	0.41	0.41	0.59	1.00	0.16	
Cycle Length: 120 Cycle Length: 120 Offiset 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 120 Control Type: Actualest-Coordinated Systy recordinated worther sectors capacity, queue may be tonger. Other shown is maximum after two cycles.	Intersection Summary									
Actuated Cycle Length: 120 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 120 Control Type: Actuated-Coordinated Control Type: Actuated-Coordinated The Start of Control Type Actuated Coordinated Other styces actuated to Coordinated Other styces actuated to Coordinated Other styces actuated to Coordinate to Coordinate to Coordinate to Coordinate actuated to Coordinate	Cycle Length: 120									
Offset 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Oyde: 120 Control Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Onese shown is maximum after two cycles.	Actuated Cycle Length: 12	0.								
Natural Cyte: 120 Control Type: Actuated-Coordinated # 95th percentile volume exceeds capacity, queue may be longer. Otene shown is maximum aflet two cycles.	Offset: 0 (0%), Referenced	to phase 2:	EBTL an	d 6:WBTI	., Start of	Green				
# Online in Yipc - neutract-continuous capacity, queue may be longer. # Shit percental volume excepts capacity, queue may be longer. Online shown is maximum affer two cycles.	Natural Cycle: 120 Control Type: Actuated Co	ordinatod								
Oueue shown is maximum after two cycles.	# 95th nercentile volume	Pyrophy Ca	nacity or	vem alla	anuol ad	_				
	One ie shown is maxim	IIIII after two	CVCIPS	rene may	afinoi an	<u>.</u>				
m Volume for 95th percentile cueue is metered by unstream signal	Molecule for OF the morror	111-								





12 s 12-14-2023 BA Group

Synchro 11 Report

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Total (AM) 2032 Scenario 6 (Sensitivity)

FBL FBT FBR WBL WBT WBR NBL NBT FBT	VBT NBR SBI SBT	
	NUN JUL	3T SBR
1		2
190 91 24.25 118 87 96.7 91 42 7 7 7 7 7 7 7 7 7	7 19 26	10 43
1900 1000 1900		10 43
5.3 5.3 4.0 5.3 5.7 5.7 1.00 0.94 1.00 0.94 1.00 0.89 1.00 0.95 1.00 0.94 1.00 0.89 1.00 0.95 1.00 0.99 1.00 0.89 1.00 0.95 1.00 0.95 1.00 1.70 50.50 1.70 50.20 1.70 1660 1.71 50.50 1.70 50.20 1.70 1660 1.72 0.92 0.92 0.92 0.92 0.92 1.73 0.93 0.95 0.95 0.92 0.92 1.74 0.92 0.92 0.92 0.92 0.92 1.75 0.87 0.93 0.95 0.90 1.75 0.87 0.93 0.90 0.90 1.75 0.73 0.73 0.83 0.83 0.08 1.75 0.73 0.73 0.83 0.83 0.08 1.75 0.73 0.73 0.83 0.83 0.08 1.75 0.73 0.74 0.75 0.75 0.75 1.75 0.75 0.75 0.75 0.75 0.75 1.75 0.75 0.75 0.75 0.75 0.75 1.75 0.75 0.75 0.75 0.75 0.75 1.75 0.75 0.75 0.75 0.75 0.75 1.7	1900 1900 1	900 1900
100 0.91 1.00 0.91 1.00 1.00 1.00 1.00 1.00 0.95 1.00 0.05 0.95 0	2.7	5.7
1,00 0,99 1,00 0,99 1,00 0,89	1.00 1.00 1.00	00
(c) 87.0 (c)	1.00	38
1770 5050 1770 5020 1770 1660 437 5050 81 5020 1770 1660 437 5050 81 5020 1340 1660 437 5050 81 5020 1340 1660 437 5050 81 5020 1340 1660 437 5050 81 5020 1340 1660 437 5050 81 5020 1340 1660 437 5050 81 5020 1340 146 8 449 2636 128 95 1051 99 46 8 440 95 1446 0 46 19 450 879 879 1000 1000 90 90 51 879 879 1000 1000 90 90 52 873 873 1000 1000 90 90 53 30 30 30 30 30 54 320 349 181 4183 100 124 55 95 524 22 532 516 56 95 224 22 532 516 57 10 0.65 27 0.46 0.08 58 95 224 22 532 516 59 90 27 0.04 0.23 50 90 90 70 90 90 70 90	0.95	1.00
100 100	1770	98
He 1975 5050 81 5020 1340 1660 HF 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	0.74	1.00
HF 092 092 092 092 092 092 092 092 092 091 092 093 092 093 092 093 093 093 093 093 093 093 093 093 093	1375	36
ph) 99 2636 128 95 1051 99 46 8 8 97 1051 99 46 18 97 2614 0 95 1146 0 19 19 19 19 19 19 19 19 19 19 19 19 19		92 0.92
ph) 0 3 0 0 5 1146 0 19 Perm NA pm+pt NA Perm NA RA Perm NA RA Perm NA	21 28	11 47
Political Poli	0 0	43 0
Perm NA pm+pt NA Perm NA 2	0 28	15 0
(5) 87.9 87.9 10.00 100.0 9.0 9.0 8.8 8.8 8.7 8.8 8.7 9.8 8.7 9.8 9.7 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0	Perm	NA
(s) 87.9 100 6 0 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	80	4
(s) 87.9 87.9 100.0 100.0 9.0 9.0 9.0 8.1 87.9 100.0 100.0 9.0 9.0 9.0 9.0 0.73 0.73 0.73 0.83 0.83 0.83 0.83 0.83 0.83 0.83 0.8	4	
S	0.6	0.6
0.73 0.73 0.83 0.83 0.08 0.08 5.3 5.3 5.3 0.08 0.08 5.3 3.0 3.0 3.0 3.0 5.3 3.0 3.0 3.0 3.0 5.3 3.0 3.0 3.0 3.0 5.5 5.5 5.0 5.0 0.01 5.5 5.5 5.2 2.2 2.2 5.1 5.5 5.5 5.2 2.2 5.2 5.1 5.5 5.5 5.5 5.2 5.1 5.5 5.5 5.1 5.1 5.5 5.5 5.1 5.1 5.5 5.5 5.1 5.1 5.5 5.5 5.1 5.5	0.6	0.6
Si Si Si Si Si Si Si Si	0.08	0.08
s) 3.0	5.7	5.7
320 3699	3.0	3.0
CO 55 CO 04 CO 23 CO 07 CO 23 CO 04 CO 23 CO 07 CO 24 CO 24 CO 08 CO 25 CO 27 CO 27 CO 08 CO 2 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 20 CO 27 CO 27 CO 27 CO 27 CO 27 CO 27 CO 27 CO 27 CO 27 CO 27 CO 27 CO 27 CO	124 103 122	22
0.23 0.40 0.003 0.31 0.75 0.52 0.27 0.04 0.08 5.6 9.5 22.4 2.2 53.2 51.6 1.0 0.6 2.7 0.2 3.3 0.3 1.0 1.00 1.00 1.00 1.00 1.2 19.8 25.1 2.3 56.5 51.9 B B C A A E B D Delay 19.5 A HOM 2000 Level of Service of Consolidation (Coopacity ratio and Coopacity ratio and Coo)1
0.31 0.75 0.52 0.27 0.46 0.08 (5.6 9/5 2.24 2.2 53.2 51.6 (5.6 9/5 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	0.02	
25 95 224 22 532 516 20 2.03 1.00 1.00 1.00 1.00 d2 1.0 0.6 2.7 0.2 3.3 0.3 1.2 198 25.1 2.3 56.5 51.9 B B C A F E D B M A 11 5 54.7 B B A A 11 54.7 Delay 15.3 HCM 2000 Level of Service 10 Capacity ratio 0.70 1.00 1.00 1.00 1.00 1.00 1.00 1.00	0.27	0.12
d2 2.02 2.03 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1	52.4	51.8
d2 10 0.6 2.7 0.2 3.3 0.3 1.2 1.2 19.8 25.1 2.3 56.5 51.9 E. D. B. C. A. F. D. D. B. A. D.	1.00	1.00
12.2 19.8 25.1 2.3 56.5 51.9 B B C A E D 4.1 E D 19.5 A E D A Delay 10.3 HCM 2000 Level of Service of Construction of 20 C	1.4	0.4
B B C A E D 19.5 4.1 54.7 B A D 10.0 A B B D 10.0 Capacity atio 0.70 Simplified time (s)	53.8	52.2
19.5 4.1 54.7 B A D B A Delay 16.3 HCM 2000 Level of Service 170.0 Capacity ratio 0.70 Sum of lost time (s)	۵	٥
16.3 HCM 2000 Level of Service 0.70 Sum of local time (s)		52.8
16.3 HCM 2000 Level of Service 0.70 1.300 Sum of lost time (s)	D	D
16.3 HCM 2000 Level of Service 0.70 Sm of lost time (s)		
0.70 120 0 Sum of lost time (s)	В	
120.0 Sum of lost time (s)		
(6) 2000 2000 2003	15.0	
ntersection Capacity Utilization 76.0% ICU Level of Service	O	
Analysis Period (min) 15		

12-14-2023 Synchro 11 Report BA Group

Queues 4: Clark Boulevard & Derry Road

Future Total (AM) 2032 Scenario 6 (Sensitivity)

Hell (cybr) 97 2425 87 967 42 7 26 100 (cybr) 97 2425 87 967 42 7 26 100 (cybr) 97 2425 87 967 42 7 26 100 (cybr) 97 2425 87 967 42 7 26 100 (cybr) 97 2425 87 967 42 7 26 100 (cybr) 97 2425 87 967 42 7 26 100 (cybr) 97 2425 87 967 42 7 26 100 (cybr) 97 2425 87 967 42 7 26 100 (cybr) 98 2764 95 1150 46 8 8 4 4 8 8 8 8 8 8 8 8 8 8 8 8 8 8										
91 2426 87 967 42 7 26 1 9 9 1 2426 87 967 42 7 26 1 9 9 1 2426 87 967 42 7 7 26 1 9 9 1 2426 87 967 42 7 7 26 1 9 9 1 2426 87 967 42 7 7 26 1 9 9 1 2426 87 967 42 7 7 26 1 9 9 2 26 2 8 5 1 150 46 29 28 5 5 1 150 46 29 28 5 5 1 1 6 6 8 8 8 4 4 8 4 4 8 1 1 6 1 6 1 0 0 85 0 35 0 35 0 35 0 35 0 35 0 35 0	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
91 2425 87 967 42 7 26 1 9 9 9 2425 87 967 42 7 26 1 9 9 9 2744 95 1196 46 29 2 7 26 1 9 9 9 2744 95 1196 46 29 2 7 26 1 9 9 9 2744 95 1196 46 29 2 7 26 1 9 9 2 744 95 1196 46 29 2 2 1 6 8 8 4 4 2 2 2 1 6 8 8 8 4 4 2 2 2 1 6 8 8 8 4 4 3 34.3 34.3 10.0 85.0 35.0 35.0 35.0 35.0 35.0 35.0 35.0 3	Lane Configurations	#	4413	F	4413	r	43	r	\$	
91 2425 87 967 42 7 26 1 1 6 8 8 8 4 8 8 4 8 8 8 4 8 8 8 4 8 8 8 8	Traffic Volume (vph)	91	2425	87	196	42	7	26	10	
Perm NA pm.pt NA Perm	Future Volume (vph)	16	2425	87	196	42	7	26	10	
Perm NA pm+pt NA Perm NA	Lane Group Flow (vph)	66	2764	96	1150	46	29	28	28	
2	Turn Type	Perm	Ν	pm+pt	Ν	Perm	¥	Perm	NA	
2 6 6 8 8 4 4 2 2 1 6 6 8 8 4 4 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.	Protected Phases		2	-	9		∞		4	
100 10.0 6.0 10.0 10.0 10.0 10.0 10.0 10	Permitted Phases	2		9		∞		4		
10.0 10.0 6.0 10.0 10.0 10.0 10.0 10.0 1	Detector Phase	2	2	-	9	∞	∞	4	4	
100 100 60 100 100 100 100 100 100 100 1	Switch Phase									
34.3 34.3 34.7 34.7 34.7 34.7 34.7 34.7	Minimum Initial (s)	10.0	10.0	0.9	10.0	10.0	10.0	10.0	10.0	
750 750 100 850 350 350 350 350 350 350 350 350 350 3	Minimum Split (s)	34.3	34.3	10.0	34.3	34.7	34.7	34.7	34.7	
62.5% 62.5% 8.3% 70.8% 29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 29.2% 20.2% 2	Total Split (s)	75.0	75.0	10.0	82.0	32.0	35.0	35.0	35.0	
3.7 3.0 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7	Total Split (%)	62.5%	62.5%	8.3%	70.8%	29.2%	29.2%	29.2%	29.2%	
1.6 1.6 1.0 1.6 2.0 2.0 2.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0	Yellow Time (s)	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
15.3 5.3 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	All-Red Time (s)	1.6	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
Lag Lead Vess Yes Vess Yes Vess Yes Vess Yes Vess Yes Vess O'14 0.52 0.27 0.38 0.17 0.22 0.3 0.00 0.00 0.00 0.00 0.00 0.00	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0:0	
Lag Lead Ves Yes Yes C-Min C-Min None C-Min None None None None 0.30 0.74 0.52 0.27 0.38 0.17 0.22 0.3 16.2 21.7 26.5 2.4 59.9 26.7 54.3 22 16.2 21.7 26.5 2.4 59.9 26.7 54.3 22 15.2 21.8 5.9 17.6 11.0 1.9 6.6 2 15.2 21.8 5.9 17.6 11.0 1.9 6.6 2 15.2 21.8 5.9 17.6 11.0 1.9 6.6 2 15.2 21.8 3.5 0.0 0 0 0 0 16.2 21.7 26.5 2.4 59.9 26.7 54.3 22 15.2 21.8 3.9 17.6 11.0 1.9 6.6 2 15.2 21.8 3.9 4.7 32.6 421 335 43 25.3 3750 183 4277 32.6 421 335 43 26.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 Coordinated Coordinated Coordinated Condinated Cond	Total Lost Time (s)	5.3	2.3	4.0	5.3	2.7	2.7	2.7	5.7	
Ves Yes Yes Order C-Min C-Min None C-Min None None None None O.33	Lead/Lag	Lag	Lag	Lead						
Comin C-Min None C-Min None None None None None None None Non	Lead-Lag Optimize?	Yes	Yes	Yes						
0.30 0.74 0.52 0.27 0.38 0.17 0.22 0.3 16.2 2.17 26.5 2.4 59.9 26.7 54.3 22 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None	
16.2 21.7 26.5 2.4 59.9 26.7 54.3 22. 16.2 21.7 26.5 2.4 59.9 26.7 54.3 22. 16.2 21.7 26.5 2.4 59.9 26.7 54.3 22. 16.2 21.7 26.5 2.4 59.9 26.7 54.3 22. 15.2 21.8 5.9 17.6 11.0 1.9 6.6 2. 2. 17.5 336.0 70.0 1.3 15.9 15. 43. 70.0 336.0 70.0 475.1 35.6 4.2 11.3 15.9 15. 43. 70.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	v/c Ratio	0.30	0.74	0.52	0.27	0.38	0.17	0.22	0:30	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Control Delay	16.2	21.7	26.5	2.4	6.65	26.7	54.3	22.4	
16.2 21.7 26.5 2.4 59,9 26.7 54,3 22,2 m20.6 m225.4 21.8 5.9 17.6 11.0 1.9 6.6 12 m20.6 m225.4 24.4 26.3 23.0 11.1 1.9 6.6 12 m20.6 m225.4 24.4 26.3 23.0 11.1 1.9 6.6 13.3 33.0 70.0 70.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0:0	
15.2 211.8 5.9 17.6 11.0 1.9 6.6 2 2 m20.6 m225.4 24.4 26.3 23.0 11.3 15.9 15.9 15.0 20.0 20.0 25.4 4.0 26.3 23.0 11.3 15.9 15.0 20.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0	Total Delay	16.2	21.7	26.5	2.4	29.9	26.7	54.3	22.4	
m20.6 m225.4 24.4 26.3 23.0 11.3 15.9 15. 336.0 475.1 56.4 40.0 326.3750 183 4277 326 421 335 43 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0.30 0.74 0.52 0.27 0.14 0.07 0.08 0.1 Coordinated Cedit Boulevard & Derry Road	Queue Length 50th (m)		211.8	5.9	17.6	11.0	1.9	9.9	2.6	
70.0 336.0 475.1 56.4 313. 70.0 336.0 70.0 9.2 40.0 33.5 43.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Queue Length 95th (m)		m225.4	24.4	26.3	23.0	11.3	15.9	15.6	
700.0 700.0	Internal Link Dist (m)		336.0		475.1		56.4		313.3	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Turn Bay Length (m) Base Capacity (vph)	325	3750	70.0	4277	326	421	335	434	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
sth 0.30 0.74 0.52 0.27 0.14 0.07 0.08 0.1 any gith: 120 senced to phase 2:EBTL and 6:WBTL, Start of Green hercondinated h percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 2 (R)	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
any 10.30 0.74 0.52 0.27 0.14 0.07 0.08 0.1 10.120 10.20 0.74 0.52 0.27 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.08 0.1 10.20 0.14 0.07 0.1 10.20 0.14 0.07 0.1 10.20 0.14 0.10 0.1 10.20 0.14 0.10 0.1 10.20 0.14 0.10 0.1 10.20 0.14 0.10 0.1 10.20 0.14 0.10 0.1 10.20 0.14 0.10 0.1 10.20 0.14 0.10 0.1 10.20 0.14 0.1 10.20 0	Storage Cap Reductn	0	0	0	0	0	0	0	0	
any gth: 120 seroced to phase 2:EBTL and 6:WBTL, Start of Green sled-Coordinated h percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 2 (R)	Reduced v/c Ratio	0.30	0.74	0.52	0.27	0.14	0.07	0.08	0.13	
gth: 120 stenced to phase 2.EBTL and 6:WBTL, Start of Green sted-Coordinated h percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 2 (R)	Intersection Summary									
gth: 120 serced to phase 2.EBTL and 6.WBTL, Start of Green sted-Coordinated h percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 2 (R)	Cycle Length: 120									
srenced to phase 2.1.E.1.L. and c.W.B.1.L., Start of Green lated-Coordinated h percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 2.(R)	Actuated Cycle Length: 12	0	Ē	İ						
ited-Coordinated h percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 2 (R)	Offset: 0 (0%), Referenced	to phase 2:	EBIL an	d 6:WB	, Start of	Creen				
h percentile queue is metered by upstream signal. 4: Clark Boulevard & Derry Road 2 (R.)	Control Type: Actuated-Co	ordinated								
4: Clark Boulevard & Derry Road	m Volume for 95th perce	ntile queue i	s metere	d by upst	eam sign	al.				
4: Clark Boulevard & Derry Road				-	,					
- 一		ark Bouleva	d & Derr	y Road					-	
75.5	-								₩	
	10 s 75 s								35.8	
	↓								- S	

12-14-2023 Synchro 11 Report

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Total (PM) 2032 Scenario 6 (Sensitivity)

	1	†	<i>></i>	/	Ļ	1	•	←	•	۶	→	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	444		F	4413		F	₩		F	₩₽	
Traffic Volume (vph)	173	1944	86	34	1880	25	218	166	41	137	226	149
Future Volume (vph)	173	1944	86	34	1880	22	218	166	41	137	226	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Ft	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.94	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	4721		1805	4434		1805	3468		1258	3354	
Flt Permitted	0.07	1.00		0.07	1.00		0.45	1.00		0.61	1.00	
Satd. Flow (perm)	126	4721		138	4434		849	3468		813	3354	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	184	2068	104	36	2000	27	232	177	44	146	240	159
RTOR Reduction (vph)	0	2	0	0	-	0	0	19	0	0	06	0
Lane Group Flow (vph)	184	2167	0	36	2026	0	232	202	0	146	309	0
Heavy Vehicles (%)	2%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
Bus Blockages (#/hr)	-	46	2	0	24	2	0	0	-	9	-	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2			9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	67.0	29.0		59.4	55.2		31.3	31.3		31.3	31.3	
Effective Green, g (s)	67.0	29.0		59.4	55.2		31.3	31.3		31.3	31.3	
Actuated g/C Ratio	09:0	0.53		0.54	0.50		0.28	0.28		0.28	0.28	
Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	194	2509		136	2205		239	116		229	945	
v/s Ratio Prot	c0.07	0.46		0.01	0.46			90.0			0.09	
v/s Ratio Perm	00.50			0.13			c0.27			0.18		
v/c Ratio	0.95	0.86		0.26	0.92		0.97	0.21		0.64	0.33	
Uniform Delay, d1	29.8	22.5		17.2	25.8		39.4	30.4		34.9	31.5	
Progression Factor	1.00	1.00		1.00	1:00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	49.3	4.3		1.0	7.6		49.8	0.1		2.7	0.2	
Delay (s)	79.2	26.8		18.2	33.5		89.2	30.5		40.6	31.7	
Level of Service	ш	ပ		В	ပ		ıL	ပ		۵	ပ	
Approach Delay (s)		30.9			33.2			60.5			34.1	
Approach LOS		S			O			ш			ပ	
Intersection Summary												
HCM 2000 Control Delay			34.6	Ĭ	HCM 2000 Level of Service	Level of S	service		O			
HCM 2000 Volume to Capacity ratio	city ratio		0.98									
Actuated Cycle Length (s)			111.0	S	Sum of lost time (s)	time (s)			16.5			
Intersection Capacity Utilization	tion		%9.88	೨	CU Level of Service	of Service			ш			
Analysis Period (min)			7									

Analysis Period (min) c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Total (PM) 2032 Scenario 6 (Sensitivity)

→	SBT	4₩	226	226	399	NA	4		4		10.0	32.3	37.0	33.3%	4.0	2.3	0.0	6.3			None	0.39	23.0	0.0	23.0	26.0	40.4	201.7		1033	0	0	0	0.39							
۶	SBL	-	137	137	146	Perm		4	4		10.0	32.3	37.0	33.3%	4.0	2.3	0.0	6.3			None	0.64	49.9	0.0	49.9	29.4	#57.4		30.0	228	0	0	0	0.64							
←	NBT	₹	166	166	221	¥	∞		∞		10.0	32.3	37.0	33.3%	4.0	2.3	0.0	6.3			None	0.22	27.6	0.0	27.6	17.8	28.2	211.8		995	0	0	0	0.22							
•	NBL	-	218	218	232	Perm		∞	∞		10.0	32.3	37.0	33.3%	4.0	2.3	0.0	6.3			None	0.97	93.1	0.0	93.1	52.7	#105.0		45.0	238	0	0	0	0.97				Green			
ļ	WBT	444	1880	1880	2027	NA	9		9		25.0	31.2	62.0	25.9%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.92	33.7	0.0	33.7			256.2		2229	0	0	0	0.91				Start of (on longer
>	WBL	r	34	34	36	pm+pt	-	9	-		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.20	10.4	0.0	10.4	2.9	8.9		100.0	184	0	0	0	0.20				6:WBTL			A MOOR OIL
†	EBT	444	1944	1944	2172	NA	2		2		25.0	31.2	63.0	26.8%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.84	25.7	0.0	25.7	157.1	182.5	475.1		2584	0	0	0	0.84				BTL and			or in ordina
1	EBL	*	173	173	184	pm+pt	2	2	വ		7.0	11.0	12.0	10.8%	3.0	1.0	0:0	4.0	Lead	Yes	None	0.94	78.1	0.0	78.1	25.8	#71.3		120.0	195	0	0	0	0.94				to phase 2:E		ordinated	and about
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Oueue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 111	Actuated Cycle Length: 111	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 90	Control Type: Actuated-Coordinated	ropadi od yom origina ydioddag oboccyc omilian olifaceth didd a

8Ø ↓ √ Splits and Phases: 1: Sixth Line & Derry Road **★** Ø6 (R) ₩ 82 (R) - SS

12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Future Total (PM) 2032 Scenario 6 (Sensitivity)

EBI EBI WBL WBT WBR NBL NBT NBR NBL NBT NBR S NBL NBT NBR S NBL NBT NBR NBL NBT NBR NBL NBT NBR S NBL NBT NBT NBT NBT NBT NBT NBT NBT NBT NBT		1	†	1	-	ţ	4	•	—	•	۶	-	•
1900 1900	Aovement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
43 1829 86 99 2142 121 233 75 209 1400 1900 1900 1900 1900 1900 1900 1900	ane Configurations	-	4413		r	444		F	₽		F	₽	
1829 86 99 2142 121 233 75 209 100 1900 1900 1900 1900 1900 1900 1900 100 0.91 1.00 0.91 1.00 0.95 1.00 100 0.93 1.00 0.94 1.00 0.95 1.00 100 0.94 1.00 0.95 1.00 0.95 1.00 100 0.94 1.00 0.95 1.00 0.95 1.00 100 0.94 1.00 0.94 1.00 0.95 1.00 100 0.94 0.94 0.94 0.94 0.94 0.94 110 0.94 0.94 0.94 0.94 0.94 0.94 111 0.94 0.94 0.94 0.94 0.94 0.94 112 0.94 0.94 0.94 0.94 0.94 0.94 113 286 286 2279 129 248 80 222 114 286 2876 116 2279 129 248 80 222 115 286 0.95 1.00 0.95 1.00 116 287 287 118 287 287 287 117 287 287 118 287 287 287 118 287 287 118 287 287 287 119 287 287 287 287 287 287 110 287 287 287 287 287 111 280 281 287 287 287 112 280 281 287 287 287 113 280 281 287 287 287 114 287 287 287 287 287 115 280 281 287 287 287 116 287 287 287 287 117 280 281 287 287 118 280 287 287 287 119 287 287 287 287 110 287 287 287 287 110 287 287 287 287 110 287 287 287 287 110 287 287 287 287 110 287 287 110 287 287 110 287 287 110 287 287 110 287 287 110 287 287 110 287 2	raffic Volume (vph)	43	1829	98	66	2142	121	233	75	500	312	304	80
1900 1900	uture Volume (vph)	43	1829	98	66	2142	121	233	75	209	312	304	80
1,000 0,91	deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,000 0,91 1,000 0,95	otal Lost time (s)	4.0	5.3		4.0	5.3		4.0	2.7		4.0	2.7	
1 100 0.99 100 0.99 100 0.89 100 0.89 100 0.95 1.00 0.99 1.00 0.95 1.00 0.99	ane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
1,000	Æ	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.97	
1600	It Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
F 0,07 1,00 0,07 1,00 0,32 1,00 0,44 1,17 4809 1,12 4811 5.68 3,053 1,00 0,44 0,94 0,94 0,94 0,94 0,94 0,94 0	atd. Flow (prot)	1600	4809		1587	4811		1698	3053		1501	3340	
F 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94	It Permitted	0.07	1.00		0.07	1.00		0.32	1.00		0.40	1.00	
F 094 094 094 094 094 094 094 094 094 094	atd. Flow (perm)	117	4809		112	4811		298	3053		635	3340	
Mathematical Control of the contro	eak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
h) 0 4 2033 0 105 2403 0 248 184 0 0 105 2403 0 248 184 0 0 105 2403 0 248 184 0 0 105 2403 0 248 184 0 0 248 184 184 2 2 2 2 2 3 3 2 2 2 2 2 2 2 2 3 3 2	dj. Flow (vph)	46	1946	16	105	22.79	129	248	8	222	332	323	82
h) 46 2033 0 105 2403 0 248 184 0 0 111% 22% 22% 11% 3% 18% 5% 9% 3% 3% 18% 5% 9% 3% 2% 11% 22% 22 2 2 2 3 3 2 2 2 3 3 3 2 2 2 2 2	TOR Reduction (vph)	0	4	0	0	2	0	0	118	0	0	20	0
11% 2% 2% 11% 3% 18% 5% 9% 3% 3% 14% 3% 3% 3% 3% 3% 3% 3%	ane Group Flow (vph)	46	2033	0	105	2403	0	248	184	0	332	388	0
March Market Ma	eavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
pm+pt NA pm+pt NA pm+pt NA pm+pt NA pm 5 2 1 6 6 3 3 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9	us Blockages (#/hr)	4	36	2	9	22	22	co	co	2	13	-	2
5 2 1 6 3 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	urn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	M	
5.1 57.4 67.7 59.7 34.3 17.6 6.3.1 57.4 67.7 59.7 34.3 17.6 6.3.2 6.48 6.75 6.97 34.3 17.6 6.0.53 0.48 0.56 0.50 0.29 0.15 4.0 5.3 4.0 5.3 4.0 5.7 1.3 2.300 16.1 2.393 3.19 4.47 0.02 0.42 0.04 0.05 0.11 0.06 0.03 0.42 0.04 0.05 0.11 0.06 0.04 0.02 0.42 0.04 0.07 0.01 0.05 0.42 0.05 1.00 0.10 0.07 0.83 2.22 30.1 36.1 46.5 1.69 0.81 1.26 1.08 1.00 1.00 0.0 0.81 1.26 1.08 47.1 47.1 0.0 0.81 2.50 49.6 47.1 0.0 0.81 43.9 HCM 2000 Level of Service F 0.01 0.02 0.03 1.00 1.00 0.03 0.03 0.03 1.00 0.04 0.04 0.05 0.05 0.05 0.05 0.05 0.05 0.06 0.05 0.05 0.05 0.07 0.08 0.09 0.05 0.08 0.09 0.00 0.00 0.09 0.09 0.00 0.00 0.09 0.09 0.00 0.00 0.09 0.09 0.00 0.00 0.09 0.09 0.00 0.00 0.09 0.09 0.00 0.00 0.09 0.09 0.00 0.00 0.09 0.09 0.00 0.00 0.09 0.00 0.00 0.00 0.00	rotected Phases	2	2		-	9		က	00		7	4	
(a) 63.1 57.4 67.7 59.7 34.3 17.6 (b) 63.1 57.4 67.7 59.7 34.3 17.6 (c) 63.1 57.4 67.7 59.7 34.3 17.6 (c) 63.3 0.48 0.56 0.50 0.29 0.15 (c) 63.3 0.40 0.32 0.42 0.03 0.32 0.32 0.41 0.06 0.17 0.03 0.32 0.41 0.06 0.17 0.03 0.41 0.06 0.10 0.35 0.88 0.65 1.00 0.78 0.11 0.06 0.10 0.35 0.81 0.65 1.00 0.78 0.11 0.06 0.10 0.10 0.10 0.10 0.10 0.10	ermitted Phases	2			9			8			4		
6.8.1 57.4 67.7 59.7 34.3 17.6 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6	ctuated Green, G (s)	63.1	57.4		1.79	26.7		34.3	17.6		36.9	18.9	
0.53 0.48 0.56 0.50 0.29 0.15 0.15 0.10 0.29 0.15 0.10 0.29 0.15 0.10 0.29 0.15 0.10 0.29 0.15 0.10 0.29 0.15 0.10 0.20 0.29 0.15 0.20 0.29 0.15 0.20 0.20 0.20 0.20 0.20 0.20 0.20 0.2	ffective Green, g (s)	63.1	57.4		1.79	26.7		34.3	17.6		36.9	18.9	
40 53	ctuated g/C Ratio	0.53	0.48		0.56	0.50		0.29	0.15		0.31	0.16	
30 30 30 30 30 30 30 30	learance Time (s)	4.0	5.3		4.0	5.3		4.0	2.7		4.0	2.7	
131 2300 161 2393 319 447 0.02 0.42 0.044 0.050 0.11 0.06 0.03 0.88 0.65 1.00 0.78 0.41 0.03 0.83 0.88 0.65 1.00 0.78 0.41 0.03 0.83 0.22 30.1 36.1 46.5 0.04 0.83 1.26 1.08 1.00 1.00 0.05 0.83 2.22 30.1 36.1 46.5 0.05 0.83 2.22 30.1 36.1 46.5 0.05 0.83 2.22 30.1 36.1 46.5 0.05 0.83 2.22 30.1 36.1 46.5 0.05 0.83 0.84 1.06 1.00 1.00 0.05 0.84 1.00 0.00 0.00 0.00 0.05 0.84 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
0.02 0.42	ane Grp Cap (vph)	131	2300		161	2393		319	447		325	526	
0.17 0.32 0.32 0.11 0.05 0.11 0.05 0.38 0.65 1.00 0.78 0.41 0.45 0.81 1.26 1.08 1.00 1.00 1.00 1.00 0.78 0.41 0.45 0.81 1.26 1.08 1.00 1.00 1.00 1.00 0.8 0.8 0.81 0.45 0.81 0.41 0.45 0.81 1.26 1.08 1.00 1.00 1.00 0.8 0.8 0.81 0.45 0.81 0.41 0.45 0.81 0.45 0.81 0.45 0.45 0.45 0.45 0.45 0.45 0.45 0.45	s Ratio Prot	0.02	0.42		c0.04	c0.50		0.11	90:0		c0.15	0.12	
0.35 0.88 0.65 1.00 0.78 0.41 250 28.3 22.2 30.1 36.1 46.5 1.69 0.81 1.26 1.08 1.00 1.00 2 1.1 3.6 7.1 17.1 11.3 0.6 2 2.5 35.0 49.6 47.4 47.1 2 26.9 6.9 6.9 49.0 D D D 2 26.9 49.0 D D 2 26.9 49.0 D D 2 26.9 1.03 43.9 HCM 2000 Level of Service D I 1.02 2 2.0	's Ratio Perm	0.17			0.32			0.11			c0.16		
25.0 28.3 22.2 30.1 36.1 46.5 1.69 0.81 1.26 1.08 1.00 1.00 1.00 1.00 1.00 1.00 1.00	c Ratio	0.35	0.88		0.65	1.00		0.78	0.41		1.02	0.74	
1.69	niform Delay, d1	25.0	28.3		22.2	30.1		36.1	46.5		38.6	48.2	
2 11 36 71 171 113 0.6 43.2 26.5 35.0 49.6 47.4 47.1 D C D D D D D D D C D D D D D D D O D D D D D D D D D D D D	rogression Factor	1.69	0.81		1.26	1.08		1.00	1.00		1.00	1.00	
43.2 26.5 35.0 49.6 47.4 47.1 D C D D D D D D 26.9 49.0 47.2 D D D D 47.2 V V V V V V V V V V V V V	cremental Delay, d2	1.	3.6		7.1	17.1		11.3	9:0		52.5	5.3	
D C D D D D D D D D D D D D D D D D D D	elay (s)	43.2	26.5		35.0	49.6		47.4	47.1		94.1	53.5	
y y y Y Y Y Y Y Y Y Y Y Y Y	evel of Service	O	O		۵	۵		٥	۵		ш	۵	
y y 43.9 HCM 2000 Level of Service elay 1.02 Sum of lost time (s) Utilization 91.9% ICU Level of Service 1.5	pproach Delay (s)		26.9			49.0			47.2			71.8	
9	pproach LOS		ပ			O			D			ш	
HCM 2000 Level of Service 1.02 1.02 1.02 1.02 1.02 1.03 1.00	itersection Summary												
0. Capacity ratio 1.02 In (s) 1200 Sum of lost time (s) Utilization 91.9% ICU Level of Service	ICM 2000 Control Delay			43.9	Ĭ	CM 2000	Level of S	service		۵			
h (s) 120.0 Sum of lost time (s) Utilization 91.9% ICU Level of Service	ICM 2000 Volume to Capa	city ratio		1.02									
Utilization 91.9% ICU Level of Service	ctuated Cycle Length (s)			120.0	S	um of lost	time (s)			19.0			
	nersection Capacity Utilizar	tion		91.9%	2	U Level o	of Service			ш			
	Analysis Period (min)			15									

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (PM) 2032 Scenario 6 (Sensitivity)

	1	1	\	Į.	•	←	۶	→	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	<i>K</i>	443	*	444	-	₩	-	₩₽	
Traffic Volume (vph)	43	1829	66	2142	233	75	312	304	
Future Volume (vph)	43	1829	66	2142	233	75	312	304	
Lane Group Flow (vph)	46	2037	105	2408	248	302	332	408	
Drotocted Dhases	1d+111d	NA C	piii+pi	NA 4	piii+pi	ğα	piii+pi	¥ <	
Permitted Phases	2 2	7	- 9	>	200	0	4	r	
Detector Phase	2	2	_	9	က	∞	7	4	
Switch Phase									
Minimum Initial (s)	7.0	20.0	7.0	20.0	7.0	10.0	7.0	10.0	
Minimum Split (s)	11.0	34.3	11.0	34.3	11.0	34.7	11.0	34.7	
Total Split (s)	11.0	29.0	11.0	29.0	22.0	28.0	22.0	28.0	
Total Split (%)	9.5%	49.2%	9.5%	49.2%	18.3%	23.3%	18.3%	23.3%	
Yellow Time (s)	3.0	3.7	3.0	3.7	3.0	3.7	3.0	3.7	
All-Red Time (s)	1.0	1.6	1.0	1.6	1.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.3	4.0	5.3	4.0	5.7	4.0	5.7	
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
v/c Ratio	0.30	0.89	0.65	0.99	0.76	0.53	1.00	0.75	
Control Delay	23.8	27.7	39.7	46.9	45.2	28.0	84.4	54.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	23.8	27.7	39.7	46.9	45.2	28.0	84.4	54.2	
Queue Length 50th (m)	3.9		15.9	~232.5	46.0	19.2	67.5	48.4	
Queue Length 95th (m)	m7.9 m		m#32.8	#276.5	6.99	33.0	#105.4	64.4	
Internal Link Dist (m)		170.5		124.7		340.6		275.9	
Turn Bay Length (m)	100.0		0.06		70.0		20.0		
Base Capacity (vph)	152	2301	162	2428	345	619	333	640	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.30	0.89	0.65	0.99	0.72	0.44	1.00	0.64	
Intersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 120									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	to phase 2:	EBTL and	16:WBTL	, Start of	Green				
Natural Cycle: 145									
Control Type: Actuated-Coordinated	rdinated								
 Volume exceeds capacity, queue is theoretically infinite. 	ly, queue is	s theoretic	ally infini	e.					
Queue shown is maximum after two cycles.	m after two	cycles.		-					
# 95th percentile volume exceeds capacity, queue may be longer	exceeds cal	pacity, qu	eue may	pe longe					
Queue snown is maximum after two cycles.	m arter two	cycles.	4000		-				
m volume for you percentile queue is metered by upstream signal	ille dnene i	S Meterer	nedn far	eam sign	al.				

Splits and Phases: 2: Fifth Line & Derry Road

- P02 (R)

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Total (PM) 2032 Scenario 6 (Sensitivity)

Pro Pro Pro Pro Pro Pro Pro Pro Pro Pro	WBT 7 1788 2178 2178 2178 1900 651 700 100 5077 100 5077 100 5077 1 1 2392 2367 7 1 87.0 87.0 87.0 87.0 97.0 97.0 97.0 97.0 97.0 97.0 97.0 9	WBR NBL 24 132 24 132 24 132 24 132 26 132 26 132 27 100 20 0 26 143 27 143 28 143 28 143 28 143 28 143 28 143 28 143 28 143 28 143 28 143 28 143 28 143 28 143 28 143 28 143 28 143 28 143 29 0 0 20 0 20 0 20 0 20 0 20 0 20 0 20		NBR SBL 73 8 80 73 8 80 1900 1900 1900 5.7 1.00 0.95 1770 0.95 79 87 79 87 79 87 79 87 79 87 79 87 79 87 79 87 79 87	SBL SBT P P P P P P P P P	SBR 169 169 1900 0 0 0 0
F 170	178 2178 2178 2178 2178 2178 2178 2178 2					169 169 1900 00 0
(c) 100 (c) 10	2178 1900 5.3 1000 1.00 1.00 5.077 0.92 2367 1.23 87.0 87.0 87.0 87.0					1900 1900 1900 0 0 0
(vph) 36 2106 49 1100 1900 1900 1900 1900 1900 1900 1	2178 1900 5.3 0.91 1.00 1.00 5.07 1.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00					169 1900 0.92 0 0
1900 1900 11 5.3 5.3 1.00 0.91 1.00 0.91 1.00 0.91 1.00 0.91 1.00 0.91 1.00 0.91 1.00 0.91 1.00 0.91 1.00 0.92 1.00 0.92	1900 5.3 0.91 1.00 5.077 1.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00					1900
F.3 5.3 1.00 0.91 1.00 1.00 1.00 1.00 0.95 1.00 0 0.05 1.00 0 94 5068 1.00 0.92 0 94 5068 1.00 0.92 0 97 289 53 (vph) 0 2 0 (vph) 0 2 0 (vph) 39 2340 0 2 2 289 53 2 240 0 2 0 2 0 2 2 2 2 2 2 2 2 2 3 2340 0 2 0 0 3 0 0 6 0 0	5.3 0.91 1.00 1.00 1.00 5.077 0.92 2.367 1 2.392 NA 6 6 87.0 87.0					0 0 0
1.00 0.91 1.00 0.91 1.00 0.95 1.00 0.95 1.00 0.92 0.92 1.00 0.93 0.93 1.00 0.93 0	0.91 1.00 1.00 1.00 5077 0.92 2367 1 2392 NA 6 87.0 87.0					184 0 0
(c) (c) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	1.00 1.00 5077 1.00 5077 2367 2367 2367 1 2392 NA 6 6	, I I I I I I I I I I I I I I I I I I I				184
(vph) 29 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	1.00 5077 1.00 5077 0.92 2367 1 2392 NA 6 6 87.0 87.0					0.92 0 0
1770 5068 11 005 1.00 94 5068 94 5068 94 5068 97 289 53 (wph) 39 2289 53 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 39 2340 0 (wph) 43 79 3 63 63 63 63 63 63 63 63 63 63 63 63 6	5077 1.00 5077 0.92 2367 1 1 2392 NA 6 6 87.0					0.92
PHF 0.92 0.92 (vph) 0.92 (vph) 0.92 (vph) 0.2 0.92 (vph) 0.2 0.92 (vph) 0.2 0.02 (vph) 0.92 (vph) 0.93 (vph) 0.93 (vph) 0.93 (vph) 0.93 (vph) 0.93 (vph) 0.93 (vph) 0.93 (vph) 0.93 (vph) 0.93 (vph) 0.93 (vph) 0.93 (vph) 0.94 (vph) 0.94 (vph) 0.94 (vph) 0.95 (vph) 0.95 (vph) 0.94 (vph) 0.95 (vph) 0	1.00 5077 0.92 2367 2392 NA 6 6 87.0 87.0			,		184
PHF 0.92 0.92 (vph) 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5077 0.92 2367 2392 NA 6 6 87.0 87.0					184
x, PHF 092 092 092 092 092 092 092 092 092 092	0.92 2367 2392 NA 6 87.0 87.0					184
m (vph) 39 2289 53 w (vph) 39 2240 0 w (vph) 39 2340 0 es 2 2 2 es 2 2 2 2 es 3 79,3 79,3 19,3 19,3 19,3 19,3 19,3 19,3 19,3 1	2367 1 2392 NA 6 6 87.0 87.0	<u>"</u>				184
) 0 2 0) 39 2340 0 Perm NA pm 2 2 2 2 79.3 79.3 19 79.3 79.3 19 79.3 79.3 19 79.3 79.3 19 79.3 79.3 19 6.66 0.66 0.66 5.3 5.3 3.49 62 3349 62 3349 63 3349 64 0.42 10.46 1	1 2392 NA 6 87.0 87.0					0 0
) 39 2340 0 Perm NA pm 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			25 NA 8 8 22.0			0
Perm NA principle of the principle of th		Perm 8 22.0 22.0 0.18	NA 8 22.0	Per 22		
2 2 2 2 79.3 79.3 79.3 79.3 79.3 79.3 79.3 79.3		22.0 22.0 22.0 0.18	22.0	22		
2 79.3 79.3 6.6 0.66 0.66 5.3 5.3 3.0 62 3349 0.42 0.70		22.0	22.0	22		
79.3 79.3 79.3 79.3 79.3 79.3 79.3 79.3		22.0	22.0	22		
s) 79.3 79.3 6.66 6.66 6.65 6.3 5.3 5.3 5.3 6.2 33.40 6.2 6.42 6.42 6.43 6.43 6.43 6.43 6.43 6.43 6.43 6.43		22.0	22.0			
s) 0.66 0.66 5.3 5.3 5.3 5.3 5.3 6.2 5.3 6.2 5.3 6.2 5.3 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2		0.18	U. 77	22.0		
ne (s) 5.3 5.3 5.3 sinch (c) (ph) 6.2 3349 c.0.46 c.0.45 c			0.18	0.1		
sion (s) 3.0 3.0 (vipt) 62 3349 (c) 6.046 (c) 6.42 (c) 6.42 (c) 6.42 (c) 6.43 (c) 6.	.0 5.3	2.7	2.7	2		
(vph) 62 3349 0.46 0.42 0.63 0.70		3.0	3.0	33		
0.42 0.046	16 3680	158	796	23	238 292	
Perm 0.42 0.70 0.63 0.70			0.02			
0.63 0.70		c0.17		0.07		
000	_	0.91	60:0	0.37		
11.8 12.8		48.0	40.7	42		
1.64		1.00	1.00	1.0	-	
ital Delay, d2 21.0 0.6		44.6	0.1	_		
Jelay (s) 40.3 21.8 12.4	.4 9.5	92.6	40.8	43	43.8 49.8	
evel of Service D C I	В	ш	_		D D	
Approach Delay (s) 22.1	9.5		72.6		47.9	
pproach LOS C	V		ш		O	
ntersection Summary						
ICM 2000 Control Delay 19.9	HCM 2000 Level of Service	el of Service		В		
HCM 2000 Volume to Capacity ratio 0.75						
Actuated Cycle Length (s) 120.0	Sum of lost time (s)	e (s)	_	15.0		
ntersection Capacity Utilization 75.7%	ICU Level of Service	ervice		۵		
Analysis Period (min) 15						

12.14-2023 Synchro 11 Report BA Group

Queues 4: Clark Boulevard & Derry Road

Future Total (PM) 2032 Scenario 6 (Sensitivity)

→	SBT	43	7	7	192	M	4		4		10.0	34.7	35.0	29.2%	3.7	2.0	0.0	2.7			None	0.64	52.4	0.0	52.4	42.3	63.3	313.3	395	0	0	0 0	0.49							
۶	SBL	<u>, </u>	80	80	87	Perm		4	4		10.0	34.7	35.0	29.2%	3.7	2.0	0.0	5.7			None	0.37	45.3	0.0	45.3	18.9	32.9		317	0	0	0 5	0.27							
←	NBT	2	10	10	06	M	∞		∞		10.0	34.7	32.0	29.2%	3.7	2.0	0.0	2.7			None	0.25	12.0	0.0	12.0	2.2	15.6	20.4	454	0	0	0 0	0.20							
•	NBL	F	132	132	143	Perm		80	∞		10.0	34.7	32.0	29.2%	3.7	2.0	0.0	5.7			None	0.91	97.4	0.0	97.4	34.8	#62.3		210	0	0	0 9	0.68			Green				
↓	WBT	4413	2178	2178	2393	NA	9		9		10.0	34.3	82.0	70.8%	3.7	1.6	0.0	5.3			C-Min	0.65	10.5	0.0	10.5	102.4	143.0	4/2.1	3678	0	0	0 1	0.65			. Start of			be longer	
-	WBL	<u>_</u>	28	28	30	pm+pt	-	9	-		0.9	10.0	10.0	8.3%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.20	9.8	0.0	9.8	8	5.4		150	0	0	0 0	0.20			16:WBTL			eue may	
†	EBT	444	2106	2106	2342	Ν	2		2		10.0	34.3	75.0	62.5%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.69	23.6	0.0	23.6	207.5	m191.5	330.0	3418	0	0	0 0	69.0			EBTL and			pacity, qu	cycles.
4	EBL	*	36	36	39	Perm		2	2		10.0	34.3	75.0	62.5%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.63	26.8	0.0	26.8		m9.9		70.0	0	0	0	0.63			to phase 2:		ordinated	exceeds ca	um after two
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal LINK DIST (m)	Turn Bay Length (m) Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120 Offset: 0 (0%). Referenced to phase 2:EBTL and 6:WBTL. Start of Green	Natural Cycle: 90	Control Type: Actuated-Coordinated	# 95th percentile volume exceeds capacity, queue may be longer.	Queue shown is maximum after two cycles.

Splits and Phases: 4: Clark Boulevard & Derry Road



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Background (AM) 2032 Scenario 7 (Sensitivity)

Queues 1: Sixth Line & Derry Road

Future Background (AM) 2032 Scenario 7 (Sensitivity)

Lane Configurations FBL EBI EBR	153 153 1500 1900 0 0 1 1% 2	WBL WBT 17 849 177 849 1900 1900 4.0 6.2 1.00 0.99 100 0.95 100 109 109 4379 0.94 0.94 118 943 0 4 0 0 54 0 54 0 54 0 54 0 64 0 66 0 66 0 70 0 70 0 70 0 70 0 70 0 70	Mark 148	NBL 89 89 89 89 89 1900 0.95 1.00 0.94 0.94 0.94 0.95 0.94 0.95 0.04 0.95 0.04 0.95 0.04 0.95 0.04 0.95 0.04 0.95 0.04 0.95 0.04 0.04 0.04 0.04 0.04 0.04 0.04 0.0	173 173 173 1900 6.3 0.95 0.98 1.00 3504 1.00 3504 1.00 3504 1.00 3504 1.00 3504 0.94 1.00	30 30 30 1900 1900 0.94	SBL 46 46 1900 6.3 1.00 1.00 0.95 1.258	SBT 142 142 1900 6.3	137 137 1900
164 2214 164 2214 164 2214 164 2214 160 1900 1900 1900 1900 1900 1900 1900	153 153 1900 0 0 0 0 0 0 2 2			98 89 89 1900 6.3 1.00 1.00 1.00 9.04 90.04 90.04 95 0 95 0 95 0 95	173 173 1900 6.3 6.3 0.95 0.98 1.00 3504 1.00 3504 1.00 3504 1.00 3504 1.00 0.94 184 15	30 30 1900 0.94 0.94	46 46 46 1900 6.3 1.00 1.00 0.95 1.258	47 142 1900 6.3	137 137 1900
164 2214 164 2214 1900 1910 1910 1910 1910 1910 1910 19	153 1900 0.94 0 0 0 0 1 1% 2 2			89 89 1900 6.3 1.00 1.00 0.95 1805 0.047 90 0.94 95 0 0 95 0 0 95 0 0 95 0 0 0 0 0 0 0 0	173 1900 6.3 6.3 0.95 0.98 1.00 3504 1.00 3504 1.00 1.4 1.00 0.94 1.5 0.94 1.0 0.94 1.0 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.	30 30 1900 1900 0.94 0 0	46 46 1900 6.3 1.00 1.00 0.95 1.258	142 142 1900 6.3	137
164 2214 1900 1900 1900 1900 1900 1900 1900 19	153 1900 0.94 0 0 0 0 2 2			89 1900 6.3 1.00 1.00 0.47 900 0.47 95 0 95 0 95 0 95	173 1900 6.3 6.3 0.95 1.00 3504 1.00 3504 0.94 115 201 0%	30 1900 0.94 32 0	46 1900 6.3 1.00 1.00 0.95 1258	142 1900 6.3	137
1900 1900 11 1.00 0.91 1.00 0.97 1.00 0.99 1.00 0.88 4.0 6.2 2 2 2 2 2 2 2 2 2 2 3.0 3.0 455 3207 6.038 0.78 6.038	0.94 163 0 0 0 17% 2			1900 6.3 1.00 1.00 0.47 900 0.95 0.04 95 0 0 95 0 0 95	6.3 6.3 0.95 0.98 1.00 3504 1.00 3554 0.94 115 201 0%	0.94 32 0 0	6.3 1.00 1.00 0.95 1258 0.61	1900	1900
4.0 6.2 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 482 4710 0.94 0.94 C 1.04 2.054 1.0 5.13 1.0 6.8 82.4 75.6 82.4 75.6 83.0 78 84.5 12.1 1.00 0.5 2.0 14.1 8 8 8	0.94 0 0 0 0 2 2			6.3 1.00 0.95 1805 0.47 9.00 0.94 95 0 0 0 Perm	6.3 0.95 0.98 1.00 3504 1.00 3504 0.94 15 0.94 0.96	0.94	6.3 1.00 1.00 0.95 1258 0.61	6.3	
1.00 0.91 1.00 0.91 1.00 0.95 0.95 1.00 0.26 1.00 0.24 0.94 0 174 2513 0 5 5 0 78 82.4 75.6 82.4 75.6 82.7	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			1.00 0.95 1805 0.47 9.00 0.94 95 0 95 0 0 Perm	0.95 0.98 1.00 3504 1.00 3504 0.94 184 15 201 0%	0.94 32 0	1.00 1.00 0.95 1258 0.61	-	
1.00 0.99 0.96 1.00 0.96 1.00 0.96 1.00 0.26 1.00 0.26 1.00 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0	0.94 0 0 0 0 17% 2 2			1.00 0.95 1.805 0.47 900 0.94 95 0 95 0 0 Perm	0.98 1.00 3504 1.00 3504 0.94 15 201 0%	0.94 32 0 0	1.00 0.95 1258 0.61	0.95	
1763 1.00 1764 1.00 1764 1.00 1764 1.00 1764 1.00 1774 1.2513 1774 1.2513 1774 1.2513 1774 1.2513 1774 1.2513 1774 1.2513 1774 1.2513 1774 1.2513 1774 1.2513 1774 1.2513 1774 1.2513 1774 1.00 1775 1.2513 1776 1.00 1776 1.00 1777 1.00 17	0.94 163 0 0 0 17% 2			0.95 1805 0.47 900 0.94 95 0 95 0 0 0 0 Perm	1.00 3504 1.00 3504 0.94 184 15 201 0%	0.94 32 0	0.95 1258 0.61	0.93	
1763 4710 0.26 4710 0.26 4710 0.94 0.94 0 174 2355 0 5 5 28 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2	0.94 163 0 0 178 2			1805 0.47 900 0.94 95 0 95 0% 0	3504 1.00 3504 0.94 184 15 201 0%	0.94	1258	1.00	
0.26 1.00 482 470 0.94 094 0 174 2355 0 5 2 2% 22 2% 22 2% 1 49 pm+pt NA 2513 2 2 2 2 2 2 2 2 82.4 75.6 82.4 75.6 82.4 75.6 82.4 75.6 82.4 75.6 82.4 75.6 82.4 75.6 82.4 75.6 82.4 75.6 82.4 75.6 9.78 62 4.0 62 4.0 62 4.0 62 4.0 62 4.0 62 4.0 62 4.0 62 6.0 38 0.78 4.5 1.21 1.00 1.00 0.5 2.0 6.5 2.0 6.5 2.0 6.5 2.0 8.6 1.21 1.01 1.00 1.02 1.03 8.7 1.03 8.7 1.03 8.7 1.03 8.7 1.03 8.7 1.03 8.8 1.03 8.9 1.03 8.03	0.94 163 0 0 17%			0.47 900 0.94 95 0 95 0% 0	1.00 3504 0.94 184 15 201 0%	0.94	0.61	3304	
482 4710 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.98 0.78 0.78 0.28 0.78 0.28 0.78 0.28 0.28 0.28 0.28 0.28 0.28 0.28 0.2	0.94 163 0 0 1%			900 0.94 95 95 0% 0	3504 0.94 184 15 201 0%	0.94 32 0		1.00	_
0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94	0.94 163 0 0 1% 2			0.94 95 0 95 0% 0	0.94 184 15 201 0%	0.94	812	3304	
174 2355 0 15 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2%	163 0 0 1% 2			95 0 0% 0 Perm	184 15 201 0% 0	32 0	0.94	0.94	0.94
) 0 5 174 2513 2% 2% 1 49 pm+pt NA 5 2 2 2 2 2 2 2 2 2 2 4 6 0.74 40 6.2 3.0 3.0 455 3207 6.038 0.78 6.25 6.38 0.78 6.25 6.38 0.78 6.39 0.78 6.45 1.2.1 1.00 1.00 6.5 2.0 6.5 3.0 6.5 2.0 6.5 3.0 6.5 4.0 6.5 4.0 6.5 4.0 6.5 5.0 6.5 6.0 6.5 br>6.0 6.0 6.0 6.0 6.0 6.0	7% 0 0 0 7%			95 0% 0 Perm	15 201 0% 0	0 0	49	151	146
) 174 2513 2% 2% 1 49 pm+pt NA 5 2 2 2 2 2 82.4 75.6 82.4 75.6 0.74 0.68 4.0 6.2 3.0 3.0 455 3207 0.25 0.38 0.78 0.38 0.78 1.00 0.5 2.0 0.5 2.0 1.00 0.5 2.0 1.10 1.00 1.	1% 7			95 0% Perm	201	0	0	125	0
2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2	1%			0% 0 Perm	%0		49	172	0
1 49 pm+pt NA 2 2 2 2 2 2 82.4 75.6 82.4 75.6 0.74 0.68 4.0 6.2 3.0 3.0 455 3207 0.25 0.78 0.25 0.78 4.5 1.21 1.00 1.00 0.5 2.0 5.0 14.1 A B B	2			0 Perm	0	2%	40%	1%	1%
pm+pt 5 82.4 82.4 4.0 4.0 9.25 0.25 0.25 0.25 0.5 6.0 9.5 6.0			A 6	Perm		-	9	_	2
5 82.4 82.4 82.4 9.74 4.5 0.38 0.38 0.38 6.50 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	2 6		9		ΑA		Perm	NA	
2 82.4 82.4 82.4 7.0 7.7 8.5 6.03 6.03 6.25 6.38 7.0 1.00 1.00 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0	9	7			∞			4	
82.4 82.4 0.74 4.0 4.0 3.0 0.03 0.25 0.25 0.38 4.5 1.00 0.5 5.0	9	0		∞			4		
82.4 0.74 4.0 3.0 3.0 0.25 0.25 0.38 4.5 1.00 2 5.0 5.0		72.7 69.9	6	16.1	16.1		16.1	16.1	
0.74 4.0 3.0 3.0 60.03 0.25 0.28 4.5 1.00 2 5.0 A A	9	72.7 69.9	6	16.1	16.1		16.1	16.1	
s) 3.0 1.0 60.03 0.25 0.28 4.5 1.00 4.5 A.5 A.5 A.5	82	0.65 0.63	33	0.15	0.15		0.15	0.15	
30 1 455 1 60 33 0.28 0.38 4.5 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	2		2	6.3	6.3		6.3	6.3	
455 : 003 c 003 c 0 25	0	3.0 3.0	0	3.0	3.0		3.0	3.0	
0.25 0.25 0.38 4.5 1.00 d2 0.5 A A	7	114 2757	7	130	208		117	479	
0.25 0.38 4.5 1.00 d2 0.5 A	3		2		90:0			0.05	
0.38 4.5 1.00 d2 0.5 A				c0.11			90:0		
4.5 1.00 d2 0.5 5.0 A	8	٥	4	0.73	0.40		0.42	0.36	
1.00 d2 0.5 5.0 A	1		7	45.4	43.0		43.2	42.8	
d2 0.5 5.0 A	0	,	0	1.00	1.00		1.00	1.00	
5.0 A	0		3	18.9	0.5		2.4	0.5	
A	_	10.5 10.0	0	64.3	43.6		45.6	43.3	
	В	В	В	ш	O		٥	٥	
	5	10.0	0		49.9			43.6	
	В		В		D			O	
Intersection Summary									
HCM 2000 Control Delay 17.8	17.8	HCM 20	HCM 2000 Level of Service	Service		В			
pacity ratio	0.77								
Actuated Cycle Length (s) 111.0	111.0	Sum of	Sum of lost time (s)			16.5			
Intersection Capacity Utilization 87.7%	87.7%	ICU Lev	ICU Level of Service			ш			
Analysis Period (min) 15	15								

c Critical Lane Group

Synchro 11 Report

12-14-2023 BA Group

→	SBT	₩	142	142	297	¥	4		4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.49	23.7	0.0	23.7	16.5	27.8	201.7		902	0	0	0	0.33						
۶	SBL	, -	46	46	46	Perm		4	4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.42	52.3	0.0	52.3	10.3	21.6		30.0	195	0	0	0	0.25						
←	NBT	₹	173	173	216	M	∞		∞		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.41	41.0	0.0	41.0	22.0	31.6	211.8		826	0	0	0	0.25						
•	NBL	F	89	88	95	Perm		∞	∞		10.0	32.3		29.7%	4.0	2.3	0.0	6.3			None	0.73	74.6	0.0	74.6	21.1	37.2		45.0	216	0	0	0	0.44				reen		
Ļ	WBT	444	849	846	947	NA	9		9		25.0	31.2		60.4%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.34	10.8	0.0	10.8	33.5	53.1	256.2		2763	0	0	0	0.34				Start of C		
\	WBL	<u>,-</u>	17	17	18	pm+pt	-	9	-		7.0	11.0	11.0		3.0	1.0	0.0	4.0	Lead	Yes	None	0.10	2.7	0.0	2.7	0.8	3.3		100.0	184	0	0	0	0.10				6:WBTL,		
†	EBT	441	2214	2214	2518	NA	2		2		25.0	31.2	0.79	60.4%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.76	14.7	0.0	14.7	97.3	207.0	475.1		3315	0	0	0	0.76				BTL and		
1	EBL	je-	164	164	174	pm+pt	2	2	വ		7.0	11.0			3.0	1.0	0.0	4.0	Lead	Yes	None	0.38	6.5	0.0	6.5	9.8	19.4		120.0	463	0	0	0	0.38				phase 2:E		linated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 111	Actuated Cycle Length: 111	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 100	Control Type: Actuated-Coordinated

Splits and Phases: 1: Sixth Line & Derry Road - B02 (R) 01

▼ Ø6 (R) 111s

Synchro 11 Report 12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Future Background (AM) 2032 Scenario 7 (Sensitivity)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	-	4413		K.	4413		F	+ 13		je.	₩	
Traffic Volume (vph)	92	2318	163	193	697	261	100	289	113	110	71	32
Future Volume (vph)	92	2318	163	193	697	261	100	289	113	110	71	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	96:0		1.00	96.0		1.00	0.95	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1600	4794		1587	4535		1698	3203		1501	3250	
Fit Permitted	0.23	1.00		90:0	1.00		89.0	1.00		0.35	1.00	
Satd. Flow (perm)	393	4794		93	4535		1220	3203		549	3250	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	86	2466	173	205	818	278	106	307	120	117	76	34
RTOR Reduction (vph)	0	7	0	0	21	0	0	34	0	0	27	0
Lane Group Flow (vph)	86	2632	0	205	1045	0	106	393	0	117	83	0
Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
Bus Blockages (#/hr)	4	36	2	9	22	22	co	co	2	13	-	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	M	
Protected Phases	2	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	75.3	67.7		83.7	72.1		25.3	25.3		25.3	25.3	
Effective Green, g (s)	75.3	67.7		83.7	72.1		25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.63	0.56		0.70	09:0		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	323	2704		214	2724		257	675		115	989	
v/s Ratio Prot	0.02	0.55		c0.10	0.23			0.12			0.03	
v/s Ratio Perm	0.17			c0.57			0.00			c0.21		
v/c Ratio	0.30	0.97		96:0	0.38		0.41	0.58		1.02	0.12	
Uniform Delay, d1	0.6	25.3		40.6	12.4		40.9	42.6		47.4	38.3	
Progression Factor	0.56	0.49		1.01	96:0		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	9.8		48.7	0.4		1.7	1.3		88.7	0.1	
Delay (s)	5.3	21.1		89.7	12.3		42.0	43.9		136.0	38.4	
Level of Service	⋖	ပ		ш	В		۵	۵		ш	۵	
Approach Delay (s)		20.6			24.5			43.5			88.7	
Approach LOS		ပ			S			Ω			ш.	
Intersection Summary												
HCM 2000 Control Delay			27.4	¥	:M 2000	HCM 2000 Level of Service	service		ပ			
HCM 2000 Volume to Capacity ratio	icity ratio		0.99									
Actuated Cycle Length (s)			120.0	S	Sum of lost time (s)	time (s)			15.0			
Intersection Capacity Utilization	tion		%8:96	೨	U Level o	ICU Level of Service			ш			
Analysis Period (min)			15									

C Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Background (AM) 2032 Scenario 7 (Sensitivity)

→	SBT	₽ ₽	11	71	110	NA	4		4		10.0	34.7	31.0	25.8%	3.7	2.0	0.0	5.7			None	0.15	27.2	0.0	27.2	8.0	16.3	275.9		712	0	0	0	0.15										
•	SBL	۴	110	110	117	Perm		4	4		10.0	34.7	31.0		3.7	2.0	0.0	5.7			None	1.02	136.6	0.0	136.6	~29.6	#69.7		20.0	115	0	0	0	1.02										
-	NBT	₩	289	289	427	¥	∞		∞		10.0	34.7	31.0	25.8%	3.7	2.0	0.0	5.7			None	09.0	42.4	0.0	42.4	45.6	63.4	340.6		709	0	0	0	09:0										
€	NBL	r	100	100	106	Perm		∞	∞		10.0	34.7	31.0	25.8%	3.7	2.0	0.0	5.7			None	0.41	46.6	0.0	46.6	22.9	41.4		70.0	257	0	0	0	0.41				Green						=
Į.	WBT	4413	69/	69/	1096	ΑA	9		9		20.0	34.3	0.77	64.2%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.39	10.9	0.0	10.9	41.7	50.2	124.7		2776	0	0	0	0.39				Start of (ai	-	oe longer	eam signs
\	WBL	F	193	193	202	pm+pt	-	9	-		7.0	11.0	16.0	13.3%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.95	82.9	0.0	82.9	35.9	#85.4		0.06	215	0	0	0	0.95				6:WBTL		911	ally infinit		eue may t	by upstre
1	EBT	4413	2318	2318	2639	Ν	2		2		20.0	34.3	73.0	%8.09	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.97	22.1	0.0	22.1	57.4	#94.2	170.5		2710	0	0	0	0.97				BTL and			theoretic	cycles.	acity, qui	cycles. s metered
1	EBL	*	92	92	86	pm+pt	2	2	2		7.0	11.0	12.0	10.0%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.30	4.8	0.0	4.8	4.2	m4.5		100.0	332	0	0	0	0.30				phase 2:E		dinated	y, queue is	n after two	xceeds cap	n arrer two lle queue is
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 120	Control Type: Actuated-Coordinated	 Volume exceeds capacity, queue is theoretically infinite 	Queue shown is maximum after two cycles.	# 95th percentile volume exceeds capacity, queue may be longer	Queue shown is maximum after two cycles. m. Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Fifth Line & Derry Road

→ Ø2 (R) 01

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Background (AM) 2032 Scenario 7 (Sensitivity)

Movement	EBL	TOT	0									
Configurations		LDI	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	F	4413		r	4413		F	£		F	£,	
Traffic Volume (vph)	91	2415	45	102	962	16	16		10	26	10	43
oh)	16	2415	42	102	396	91	16	7	10	56	10	43
	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
(2)	5.3	5.3		4.0	5.3		2.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
	1.00	1.00		1.00	0.99		1.00	0.91		1.00	0.88	
	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
rot)	17.70	5071		1770	5019		1770	1701		1770	1636	
	0.24	1.00		0.04	1.00		0.72	1.00		0.75	1.00	
	439	5071		81	5019		1340	1701		1388	1636	
or, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
	66	2625	46	1	1046	66	17	00	=	28	=	47
	0	-	0	0	4	0	0	10	0	0	44	0
Lane Group Flow (vph)	66	2673	0	111	1141	0	17	6	0	28	14	0
	Perm	NA		pm+pt	Ν		Perm	NA		Perm	¥	
Protected Phases		2		_	9			8			4	
Permitted Phases	7			9			∞			4		
~	97.6	97.6		100.8	100.8		8.2	8.2		8.2	8.2	
()	97.6	97.8		100.8	100.8		8.2	8.2		8.2	8.2	
	0.73	0.73		0.84	0.84		0.07	0.07		0.07	0.07	
	5.3	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	320	3701		197	4215		91	116		94	111	
//s Ratio Prot		c0.53		c0.04	0.23			0.01			0.01	
//s Ratio Perm (0.23			0.43			0.01			c0.02		
	0.31	0.72		0.56	0.27		0.19	0.08		0.30	0.13	
	2.7	9.3		25.8	2.0		52.8	52.4		53.2	52.5	
	2.04	2.11		1.00	1.00		1.00	1.00		1.00	1.00	
ıtal Delay, d2	6.0	0.4		3.7	0.2		1.0	0.3		7.8	0.5	
	12.4	19.9		29.4	2.1		23.8	52.6		54.9	53.1	
Level of Service	B	m		ပ	A		D	Ω		Ω	Ω	
Approach Delay (s)		19.7			4.6			53.2			53.7	
Approach LOS		æ			⋖			Ω			٥	
Intersection Summary												
HCM 2000 Control Delay			16.1	H	HCM 2000 Level of Service	evel of S	ervice		В			
HCM 2000 Volume to Capacity ratio	atio		0.68									
Actuated Cycle Length (s)			120.0	S	Sum of lost time (s)	time (s)			15.0			
Intersection Capacity Utilization			74.1%	೦	ICU Level of Service	Service			۵			
Analysis Period (min)			15									

Synchro 11 Report 12-14-2023 BA Group

Queues 4: Clark Boulevard & Derry Road

Future Background (AM) 2032 Scenario 7 (Sensitivity)

4: Clark Boulevard & Derry Road Splits and Phases:

Intersection sufficients
Cycle Length: 120
Actualed Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actualed-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.



Synchro 11 Report 12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Background (PM) 2032 Scenario 7 (Sensitivity)

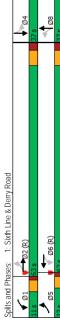
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
-ane Configurations	<i>y-</i>	4413		r	4413		je-	₩.		<i>y</i> -	₩	
raffic Volume (vph)	174	1954	%	31	1874	22	201	166	33	137	226	147
- uture Volume (vph)	174	1954	%	31	1874	22	201	166	33	137	226	147
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
otal Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
ane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
±-	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.94	
It Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	4722		1805	4434		1805	3492		1258	3326	
-It Permitted	0.07	1.00		0.07	1.00		0.44	1.00		0.62	1.00	
Satd. Flow (perm)	123	4722		135	4434		840	3492		820	3326	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	185	2079	102	33	1994	27	214	177	32	146	240	156
REDICTION (Vph)	0	2	0	0	-	0	0	15	0	0	92	0
ane Group Flow (vph)	185	2176	0	33	2020	0	214	197	0	146	304	0
leavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	1%	1%
3us Blockages (#/hr)	-	46	2	0	24	2	0	0	-	9	.	2
urn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	68.9	60.7		9.09	56.3		29.6	29.6		29.6	29.6	
Effective Green, g (s)	68.9	60.7		9.09	56.3		29.6	29.6		29.6	29.6	
Actuated g/C Ratio	0.62	0.55		0.55	0.51		0.27	0.27		0.27	0.27	
Slearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
'ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
ane Grp Cap (vph)	203	2582		136	2248		224	931		218	894	
/s Ratio Prot	c0.07	0.46		0.01	0.46			90.0			0.09	
/s Ratio Perm	c0.49			0.12			c0.25			0.18		
/c Ratio	0.91	0.84		0.24	0.00		96.0	0.21		0.67	0.34	
niform Delay, d1	29.7	21.1		16.1	24.8		40.0	31.6		36.3	32.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
ncremental Delay, d2	39.3	3.6		6.0	6.2		47.2	0.1		9.7	0.7	
Delay (s)	0.69	24.7		17.1	31.0		87.3	31.7		43.9	33.1	
evel of Service	ш	O		В	ပ		ш	ပ		۵	ပ	
Approach Delay (s)		28.2			30.8			9.69			36.0	
pproach LOS		O			O			ш			D	
ntersection Summary												
ICM 2000 Control Delay			32.4	Ĭ	HCM 2000 Level of Service	Level of S	ervice		ပ			
HCM 2000 Volume to Capacity ratio	ty ratio		0.95									
ctuated Cycle Length (s)			111.0	S	Sum of lost time (s)	time (s)			16.5			
ntersection Capacity Utilization	uo		87.5%	2	ICU Level of Service	f Service			ш			
			,									

Synchro 11 Report 12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Background (PM) 2032 Scenario 7 (Sensitivity)

Lane Grogue										
166 137 166 137 166 137 166 137 166 137 166 137 166 137 166 137 166 137 166 137 166	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
1 166 137 1 166 137 1 166 137 1 106 137 8 4 4 8 8 4 4 8 8 4 4 8 9 70 37.0 37.0 0.0 37.0 0.0 38.0 0.0 39.0	Lane Configurations	*	4413	r	4413	F	₩	*	₩	
1 100 14 146 146 147 146 146 147 146 146 147 146 147 147 147 147 147 147 147 147 147 147	Traffic Volume (vph)	174	1954	31	1874	201	166	137	226	
NA Perm 8	Future Volume (vpn)	185	1954	3.1	2021	107	212	137	306	
8 8 4 8 8 4 100 100 3 12.3 32.3 3 32.3 32.3 3 33.3 33.8 33.8 4.0 4.0 4.0 2 33.3 33.8 33.8 33.8 6 3 6.3 6.3 6 0.0 0.0 1 20.0 52.6 1 27.8 #56.9 2 11.8 30.0 2 979 226 2 0 0 0 2 0 0 0 2 0 0 0 3 0 0 0 4 29.0 52.6 5 0 22 0.65	Turn Type	ta+ma	N N	ta+ma	NA	Perm	¥.	Perm	8	
8 8 4 4 8 8 4 4 8 10.0 10.0 9 32.3 32.3 32.3 9 32.3 32.3 37.0 9 33.6 3 6.3 6.3 9 6.3 6.3 6.3 9 6.3 6.3 6.3 17.6 29.0 52.6 9 0.0 0.0 9 0.0 0	Protected Phases	2	2	- 	9		8		4	
8 8 4 4 10.0 10.0 10.0 10.0 3 32.3 32.3 32.3 33.3% 33.3% 33.3% 2 3.3.3% 33.3% 33.3% 3 6.3 6.3 6.3 6 0.2 0.0 0.0 0	Permitted Phases	2		9		00		4		
100 100 100 100 100 100 100 100 100 100	Detector Phase	വ	2	τ-	9	∞	00	4	4	
3 3.3% 3.3% 3.3% 3.3% 3.3% 3.3% 3.3% 3.	Switch Phase									
3 32.3 32.3 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37	Minimum Initial (s)	7.0	25.0	7.0	25.0	10.0	10.0	10.0	10.0	
3.370 370 3.33% 33.3% 3.33% 33.3% 3.33% 33.3% 3.00 00 0.00 00	Minimum Split (s)	11.0	31.2	11.0	31.2	32.3	32.3	32.3	32.3	
8 333% 333% 333% 333% 333% 333% 333% 33	Total Split (s)	12.0	63.0	11.0	62.0	37.0	37.0	37.0	37.0	
4.0 4.0 4.0 4.0 0.0 0.0 0.0 0.0 0.0 0.0	Total Split (%)	10.8%	26.8%	%6.6	22.9%	33.3%	33.3%	33.3%	33.3%	
3 2.3 2.3 2.3 2.3 2.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6	Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	
3 6.3 6.3 6.3 6.3 6.3 6.3 6.022 0.67 0 6 0.22 0.65 0 7 0.0 0 8 17.6 29.3 2 1 27.8 #56.9 4 211.8 30.0 2 0	All-Red Time (s)	1.0	2.2	1.0	2.2	2.3	2.3	2.3	2.3	
8 63 63 8 None None 8 022 067 4 290 526 4 290 526 4 176 293 1 27.8 #56.9 2 11.8 300 0 0 0 0 0 0 2 0.22 0.65	Lost Time Adjust (s)	0:0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
None None 5 0.22 0.67 4 290 526 0.0 0.0 0.0 526 1.16 29.3 1.17 #56.9 21.18 #56.9 21.18 #56.9 0 0 0 0 0 0 0	Total Lost Time (s)	4.0	6.2	4.0	6.2	6.3	6.3	6.3	6.3	
None None 5 0.22 0.67 6 0.22 0.62 7 0.0 0.0 8 0.0 0.0 1 27.8 #56.9 2 11.8 1 27.8 #56.9 2 979 226 0 0 0 0 0 0 0	Lead/Lag	Lead	Lag	Lead	Lag					
None None None (20, 20, 20, 20, 20, 20, 20, 20, 20, 20,	Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
5 0.22 0.67 4 29.0 52.6 0 0 0.0 4 29.0 52.6 1 27.8 #56.9 21.8 30.0 2 979 226 0 0 0 0 0 0 2 0.22 0.65	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
2 0.22 0.65	v/c Ratio	0.92	0.82	0.18	0.90	96.0	0.22	19.0	0.40	
290 00 00 00 00 00 00 00 00 00 00 00 00 0	Control Delay	71.2	24.4	10.1	31.5	91.4	29.0	52.6	23.5	
4 290 526 4 17.6 29.3 1 27.8 #56.9 2 979 226 2 979 226 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4 17.6 29.3 1 27.8 #56.9 21.8 30.0 2 979 226 0 0 0 0 0 0 0 0 0 2 0.22 0.65	Total Delay	71.2	24.4	10.1	31.5	91.4	29.0	52.6	23.5	
211.8 #56.9 211.8 30.0 2 979 226 0 0 0 0 0 0 2 0.22 0.65	Queue Length 50th (m)	26.7	158.3	2.6	148.5	47.4	17.6	29.3	25.6	
2118 300 300 300 300 300 300 300 300 300 30	Queue Length 95th (m)	#72.8	183.8	6.4	174.4	#95.1	27.8	#26.9	40.1	
300 2 310 3 0 0 0 0 0 0 0 0 2 0.22 0.65	Internal Link Dist (m)		475.1		256.2		211.8		201.7	
2 979 226 0 0 0 0 0 0 0 0 0 2 0.22 0.65	Turn Bay Length (m)	120.0		100.0		45.0		30.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Base Capacity (vph)	202	2655	185	2251	232	626	226		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
2 0.22 0.65	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary O/cle Length: 111 Actuated Cycle Length: 111 Offset: 0 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 90 Natural Cycle: 90 Start and 90 Start and 90 Start and 90 Start and 90 Start and 90 Start and	Reduced v/c Ratio	0.92	0.82	0.18	0.90	0.92	0.22	0.65	0.39	
Cycle Length: 111 Offset Length: 111 Offset Unique Cycle Length: 111 And own WBTL, Start of Green Natural Cycle: 90 Natural Cycle: 90 Startused-Coordinated # Osth noncontilus volume average symptomic may be funner	Intersection Summary									
Adualed Cycle Length: 111 Offset 0 (0%), Referenced to phase 2:EBTL and & WBTL, Start of Green Natural cycle: Actualed-Coordinated Control Type: Actualed-Coordinated # Ofth nacronalist unlines expends capacity relief and the binger	Cycle Length: 111									
oriset. V. (V.W.), Retretined to priase z	Actuated Cycle Length: 11	11 4 to phoco 2-1	TDT .	TGWY P	Chartof	2002				
watu ali uybue. Yu Control Type: Juuteled-Coordinated	Virginia (1%), Releience	n to pridse 2:	EBIL an	u o:wb il	, Start OI	cleen				
omeous processing and an analysis of the longer of the processing	Control Type: Actuated-Co	pordinated								
	# 05th porcontilo volumo	overode co	in reliance	01101	to leave					



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Future Background (PM) 2032 Scenario 7 (Sensitivity)

Queues 2: Fifth Line & Derry Road

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Future Background (PM) 2032 Scenario 7 (Sensitivity)

Movement EBL EBL WBL		1	1	1	-	ļ	4	•	←	•	۶	→	*
	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1792 96 104 2075 119 302 74 215 311 304 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1000 0.91 1.00 0.91 1.00 0.95 1.00 0.95 1.00 0.93 1.00 0.94 1.00 0.95 1.00 0.95 1.00 0.94 0.94 0.94 0.94 0.94 0.94 0.94 110 0.94 0.94 0.94 0.94 0.94 0.94 0.94 110 0.94 0.94 0.94 0.94 0.94 0.94 0.94 111 220 1.11 220 1.15 220 1.15 0.95 111 220 1.11 220 1.15 220 1.15 0.94 112 228 1.11 2329 0.32 1.19 0.34 0.94 113 228 1.10 2.20 1.11 2.20 2.0 114 220 2.0 1.11 2.20 2.0 2.0 115 228 1.00 2.0 2.0 2.0 116 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 117 2.2 2.2 1.0 2.0 2.0 2.0 118 2.2 2.2 1.0 2.0 2.0 2.0 119 2.2 2.2 2.4 2.4 2.3 3.2 3.2 3.2 110 2.2 2.3 3.0 3.0 3.0 3.0 3.0 3.0 111 2.2 2.2 2.4 3.0 3.0 3.0 3.0 3.0 112 2.2 2.2 2.4 3.0 3.0 3.0 3.0 3.0 113 2.2 2.2 3.0 3.0 3.0 3.0 3.0 3.0 3.0 114 2.2 2.2 3.0 3.0 3.0 3.0 3.0 3.0 3.0 115 2.2 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 117 2.2 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 118 2.2 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 119 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 110 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 110 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 110 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 110 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 110 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 110 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 110 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 110 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 110 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 110 3.5 3.5 3.5 3.5 3.5 3	Lane Configurations	*	4413		r	4413		F	₽		F	₩	
43 1792 96 104 2075 119 302 74 215 311 304 400 1900	Traffic Volume (vph)	43	1792	96	104	2075	119	302	74	215	311	304	80
1900 1900	Future Volume (vph)	43	1792	%	104	2075	119	302	74	215	311	304	8
40 5.3 40 5.3 40 5.7 40 5.7 1.00 0.94 1.00 0.94 1.00 0.95 1.00 0.95 1.00 0.99 1.00 0.99 1.00 0.95 1.00 0.95 1.00 0.95 <t< td=""><td>Ideal Flow (vphpl)</td><td>1900</td><td>1900</td><td>1900</td><td>1900</td><td>1900</td><td>1900</td><td>1900</td><td>1900</td><td>1900</td><td>1900</td><td>1900</td><td>1900</td></t<>	Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,00	Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.7		4.0	5.7	
1,00 0.99	Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
180 100 0.95 100 0.95 100 0.95 100 0.95 100 0.95 100 0.95 100 0.95 100 0.95 100 0.95 100 0.95 100 0.95 100 0.94	Frt	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.97	
1600 4804 1587 4810 1698 3050 1501 3340 108 4804 112 4810 1698 3050 1501 3340 108 4804 112 4810 523 3050 685 3340 109 46 904 0.94 0.94 0.94 0.94 0.94 0.94 109 102 111 2307 127 321 79 229 331 323 100 20 111 2329 198 58 98 38 148 28 118 28 28 118 38 188 58 98 38 148 28 118 28 28 118 38 188 58 98 38 148 28 118 28 29 111 2329 33 33 38 119 29 20 20 20 321 34 119 29 20 20 20 321 34 119 29 20 20 20 321 34 119 29 20 31 31 38 119 20 20 32 32 33 34 110 21 21 21 22 33 34 110 21 21 21 21 21 110 21 21 21 21 110 21 21 21 21 110 21 21 21 21 110 21 21 21 21 110 21 21 21 21 110 21 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 110 21 21 21 110 21 21 110 21 21 110 21 21 110 21 21 110 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 110 21 21 21 210 210 210	Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
118 4804 112 4810 629 100 643 1,00 648 340 648 6484 6	Satd. Flow (prot)	1600	4804		1587	4810		1698	3050		1501	3340	
118 4804 112 4810 523 3050 685 3340 4	Flt Permitted	0.07	1.00		0.07	1.00		0.29	1.00		0.43	1.00	
194 0.94 0	Satd. Flow (perm)	118	4804		112	4810		523	3050		982	3340	
March Marc	Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
1	Adj. Flow (vph)	46	1906	102	111	2207	127	321	79	229	331	323	82
11% 22% 2% 11% 38% 18% 5% 9% 3% 14% 2% 2% 14% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2%	RTOR Reduction (vph)	0	2	0	0	2	0	0	115	0	0	20	0
11% 2% 2% 11% 3% 18% 5% 9% 3% 14% 2% 2% 14% 2% 2% 14% 2% 2% 14% 2% 2% 2% 2% 2% 2% 2%	Lane Group Flow (vph)	46	2003	0	111	2329	0	321	193	0	331	388	0
March Marc	Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
pm+pt NA pm+pt NA pm+pt NA pm+pt NA pm+pt A B A <th< td=""><td>Bus Blockages (#/hr)</td><td>4</td><td>36</td><td>2</td><td>9</td><td>22</td><td>22</td><td>co</td><td>co</td><td>2</td><td>13</td><td>-</td><td>2</td></th<>	Bus Blockages (#/hr)	4	36	2	9	22	22	co	co	2	13	-	2
5 2 1 6 3 8 7 2 6 8 8 4 4 628 57.1 678 59.6 35.7 18.7 35.7 628 57.1 678 59.6 35.7 18.7 35.7 628 57.1 67.8 59.6 35.7 18.7 35.7 60.5 0.48 0.56 0.50 0.04 5.7 4.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	M	
2 6 6 8 8 4 62.8 57.1 67.8 59.6 35.7 18.7 35.7 62.8 57.1 67.8 59.6 35.7 18.7 35.7 62.8 57.1 67.8 59.6 35.7 18.7 35.7 62.8 57.1 67.8 59.6 35.7 18.7 35.7 6.5 0.48 0.56 0.30 0.16 0.30 0.16 0.30 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 1.3 2.28 3.4 3.0 4.0 5.7 4.0 3.0 0.02 0.42 0.05 0.04 0.14 0.06 0.15 0.16	Protected Phases	2	2			9		3	∞		7	4	
62.8 57.1 67.8 59.6 35.7 18.7 35.7 62.8 57.1 67.8 59.6 35.7 18.7 35.7 62.8 53 40 5.3 40 5.7 4.0 4.0 5.3 40 5.3 40 5.7 4.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 1.0 5.3 3.0 3.0 3.0 3.0 3.0 3.0 1.0 2.2 3.0 3.0 3.0 3.0 3.0 3.0 3.0 0.02 0.4 2.38 3.2 4.0 6.7 6.0	Permitted Phases	2			9			∞			4		
S 628 571 678 596 357 187 357 187 678	Actuated Green, G (s)	62.8	57.1		8.79	9.69		35.7	18.7		35.7	18.7	
0.52 0.48 0.56 0.50 0.30 0.16 0.30 4	Effective Green, g (s)	62.8	57.1		8.79	9.69		35.7	18.7		35.7	18.7	
3	Actuated g/C Ratio	0.52	0.48		0.56	0.50		0.30	0.16		0.30	0.16	
S	Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	2.7		4.0	2.7	
132 2285	Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
0.02 0.42 0.03 0.14 0.06 0.015 0.17 0.34 0.08 0.09 0.00 0.35 0.88 0.68 0.98 0.01 0.016 0.37 1.29 1.02 1.00 1.00 1.00 0.77 1.29 1.02 1.00 1.00 1.00 0.77 1.29 1.02 1.00 1.00 1.00 0.78 1.79 0.75 0.05 0.06 0.05 0.79 0.70 0.71 0.00 0.70 0.71 0.00 0.70 0.72 0.00 0.00 0.70 0.72 0.00 0.70 0.73 0.00 0.70 0.73 0.00 0.70 0.70 0.00 0.00 0.70 0.70 0.00 0.70 0.70	Lane Grp Cap (vph)	132	2285		164	2388		322	475		319	250	
0.17 0.34 0.16 0.16 0.18 0.34 0.16 0.16 0.19 0.35 0.38 0.38 0.38 0.38 0.28 0.28 0.28 0.08 0.04 0.10 0.77 0.77 0.29 0.05 0.05 0.77 0.77 0.29 0.05 0.05 0.78 0.78 0.78 0.05 0.05 0.79 0.79 0.79 0.05 0.79 0.79 0.79 0.05 0.79 0.79 0.79 0.05 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.79	v/s Ratio Prot	0.02	0.42		c0.05	c0.48		0.14	90.0		c0.15	0.12	
0.35 0.88 0.68 0.98 1.00 0.41 1.04 1.30 2.83 2.83 2.95 3.83 45.7 39.5 0.71 0.77 1.29 1.02 1.00 1.00 1.00 0.72 1.0 3.4 8.5 11.6 49.0 0.6 60.5 0.72 0.5 0.5 0.6 60.5 0.73 0.73 0.73 0.74 1.5 87.2 46.2 99.9 0.74 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75	v/s Ratio Perm	0.17			0.34			0.16			c0.16		
239 283 223 295 383 457 395 395 4170 0.77 1.29 1.02 1.00 1.00 1.00 1.00 1.00 1.00 1.00	v/c Ratio	0.35	0.88		0.68	0.98		1.00	0.41		1.04	0.75	
170 077 129 102 100 100 100 170 077 129 102 100 100 100 170 034 815 11.6 49.0 0.6 60.5 170 05	Uniform Delay, d1	23.9	28.3		22.3	29.5		38.3	45.7		39.5	48.4	
d2 1.0 3.4 8.5 11.6 49.0 0.6 60.5 5 60.5 5 7.1 87.2 46.2 99.9 5 60.5 5 7.1 87.2 46.2 99.9 5 60.5 5 7.1 87.2 46.2 99.9 5 60.5 5 7.1 87.2 46.2 99.9 5 60.5 5 7.1 87.2 46.2 99.9 5 60.5 5 7.1 87.2 46.2 99.9 5 60.5 5 7.1 87.2	Progression Factor	1.70	0.77		1.29	1.02		1.00	1.00		1.00	1.00	
41.7 25.1 37.2 41.5 87.2 46.2 99.9	Incremental Delay, d2	1.0	3.4		8.5	11.6		49.0	9.0		9.09	2.8	
25.5	Delay (s)	41.7	25.1		37.2	41.5		87.2	46.2		6.66	54.1	
25.5 41.3 67.2 C D Delay 42.8 HCM.2000 Level of Service D D Occapacity ratio 1.00 Sum of lost time (s) 19.0 9th (s) 15.0 Sum of lost time (s) 19.0 15.0 Sum of lost time (s) 19.0 15.0 Sum of lost time (s) 19.0 15.0 Sum of lost time (s) 19.0 15.0 Sum of lost time (s) 19.0 15.0 Sum of lost time (s) 19.0 S	Level of Service		O					ш			ш	٥	
Any Capacity ratio 1.00 Sum of lost time (s)	Approach Delay (s)		25.5			41.3			67.2			74.7	
42.8 HCM 2000 Level of Service 1.00 Sum of lost time (s) 92.1% ICU Level of Service 1.5 IS	Approach LOS		O			O			ш			ш	
42.8 HCM 2000 Level of Service 1.00 Sum of lost time (s) 92.1% ICU Level of Service 15	Intersection Summary												
atio 1.00 Sum of lost time (s) 120.0 Sum of lost time (s) 92.1% ICU Level of Service 15	HCM 2000 Control Delay			42.8	Ĭ	CM 2000	Level of S	Service		٥			
120.0 Sum of lost time (s) 92.1% ICU Level of Service 15	HCM 2000 Volume to Capa	city ratio		1.00									
92.1%	Actuated Cycle Length (s)	,		120.0	S	um of lost	time (s)			19.0			
Analysis Period (min) 15	Intersection Capacity Utiliza:	tion		92.1%	೨	U Level o	of Service			ш			
	Analysis Period (min)			15									

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

The Group Face of the Fig. 1			WBL 104	WBT	NBL ME	NBT ♣	SBL	SBT	
		₹ 3	104	↑↑↑	r	\	K-	₩	
43 1792 104 2075 302 74 311 46 2008 111 2334 302 374 311 46 2008 111 2334 302 374 311 5 2 1 6 8 3 8 7 7 0 20.0 7.0 20.0 7.0 10.0 7.0 11.0 34.3 11.0 34.3 11.0 34.3 11.0 34.7 11.0 11.0 60.0 11.0 60.0 21.0 28.0 21.0 9.2% 50.0% 9.2% 50.0% 17.5% 23.3% 17.5% 1.0 1.0 1.4 1.0 1.6 1.0 2.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0 1.4 1.0 1.6 1.0 2.0 1.0 1.0 1.4 2.3 4 2.5 40 5.3 40 5.7 40 1.0 1.5 1.0 1.0 2.0 1.0 23.4 25.9 42.7 40.0 77.7 28.3 87.4 23.4 25.9 42.7 40.0 77.7 28.3 87.4 23.4 25.9 42.7 40.0 77.7 28.3 87.4 23.4 25.9 42.7 40.0 77.7 28.3 87.4 23.4 25.9 42.7 40.0 77.7 28.3 87.4 23.4 25.9 42.7 40.0 77.7 28.3 87.4 24.0 0 0 0 0 0 0 0 0 0 0 23.4 25.9 42.7 40.0 77.7 28.3 87.4 170.5 108.3 m#40.9 #288.5 #106.6 34.1 #103.4 170.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		2 2	104	2075				-	
1792 104 2075 302 74 311		7 7		0	302	74	311	304	
Pumpt		7	104	2075	302	74	311	304	
Pm+pt NA pm+pt NA pm+pt NA pm+pt NA pm+pt S 2 1 6 3 8 7 2 6 6 3 8 8 7 7 6 6 3 8 8 7 7 6 6 9 1 6 9 3 8 7 7 6 6 9 9 9 7 9 9 9 9 9 9 9 9 9 9 9 9			111	2334	321	308	331	408	
5		2 2 2	pm+pt	NA	pm+pt	M	pm+pt	MA	
2 6 6 8 8 4 4 7.0 20.0 7.0 20.0 7.0 100 7.0 11.0 34.3 11.0 34.3 11.0 34.3 11.0 9.2% 50.0% 9.2% 50.0% 17.5% 23.3% 17.5% 3.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 4.0 5.3 4.0 5.3 4.0 5.7 4.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 23.4 25.9 42.7 40.0 77.7 28.3 87.4 28.4 28.4 28.4 12.0 23.4 25.9 42.7 40.0 77.7 28.3 87.4 10.0 1.0 23.4 25.9 42.7 40.0 77.7 28.3 87.4 10.0 0.0 0.0 23.4 25.9 42.7 40.0 77.7 28.3 87.4 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.		2	-	9	c	∞	7	4	
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11.0 34.3 11.0 34.3 11.0 34.7 11.0 11.0 60.0 11.0 60.0 21.0 12.0 60.0 21.0 22.8 21.0 12.0 60.0 21.0 21.0 12.0 12.0 11.0 60.0 21.0 10 16 10 1.6 1.0 2.0 10 16 10 1.6 1.0 2.0 4.0 5.3 4.0 5.3 4.0 5.7 4.0 5.3 4.0 5.3 4.0 5.3 4.0 5.3 4.0 5.7 7 8 7 8 7 8 8 7 8 7 8 8 7 8 7 8 8 8 7 8 8 9 8 8 8 8 8 10 10 10 10 10 10 10		50.0	7.0	20.0	7.0	10.0	7.0	10.0	
11.0 60.0 11.0 60.0 21.0 280 21.0 92.% 50.0% 92.% 50.0% 17.5% 23.3% 17.5% 23.3% 17.5% 23.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0			11.0	34.3	11.0	34.7	11.0	34.7	
9.2% 50.0% 9.2% 50.0% 17.5% 23.3% 17.5% 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0			11.0	0.09	21.0	28.0	21.0	28.0	
3.0 3.7 3.0 3.7 3.0 3.7 3.0 1.0 1.6 1.0 1.6 1.0 2.0 1.0 1.0 1.6 1.0 1.6 1.0 2.0 1.0 4.0 5.3 4.0 5.3 4.0 5.7 4.0 Lead			9.5%	20.0%	17.5%	23.3%	17.5%	23.3%	
1.0 1.6 1.0 1.6 1.0 20 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.			3.0	3.7	3.0	3.7	3.0	3.7	
100 0.57 4.0 0.57 4.0 0.57 4.0 0.57 4.0 0.57 4.0 0.57 0.55 0.			1.0	1.6	1.0	2.0	1.0	2.0	
100 100			0.0	0.0	0.0	0.0	0.0	0.0	
Lead Lag Lead Lag Lead Lag Lead A Ves Yes Yes Yes Yes Yes Yes Yes Yes Yes Y			4.0	5.3	4.0	5.7	4.0	5.7	
Ves Ves Ves Ves Ves Ves Ves Ves None None Onload Oncore	2		Lead	Lag	Lead	Lag	Lead	Lag	
None C-Min None C-Min None None None 0.33 0.88 0.67 0.96 0.98 0.98 0.52 10.1 23.3 4 25.9 42.7 40.0 77.7 28.3 87.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0			Yes	Yes	Yes	Yes	Yes	Yes	
0.30 0.88 0.67 0.96 0.98 0.52 1.01 2.34 2.59 42.7 40.0 77.7 28.3 87.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0			None	C-Min	None	None	None	None	
23.4 25.9 42.7 40.0 77.7 28.3 87.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0			0.67	96.0	0.98	0.52	1.01	97.0	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			42.7	40.0	17.77	28.3	87.4	54.7	
23.4 25.9 42.7 40.0 77.7 28.3 87.4 (2.5 2.2) 2.1 2.5 (2.8 4.1 6.2 -2.12.1 6.3.5 20.2 6.8.2 (2.8 2.12.1 6.3.5 6.8 4.1 6.2 -2.12.1 6.3.5 (2.0 2.0 2.0 6.8 2.1 6.2 2.2 4.2 4.2 4.2 4.2 4.2 4.2 4.2 4.2 4			0.0	0.0	0.0	0.0	0.0	0.0	
35 88.4 16.2 -212.1 63.5 20.2 68.2 m.75 108.3 m#40.9 #288.5 #106.6 34.1 #103.4 170.0 170.0 90.0 124.7 70.0 50.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			42.7	40.0	17.7	28.3	87.4	54.7	
34.1 #103.4 340.6 677 329 0 0 0 0 0 0 0 0 0 3 0.45 1.01		88.4		~212.1	63.5	20.2	68.2	48.4	
340.6 0 0 0 0 0 0 0		108.3		#258.5	#106.6	34.1	#103.4	64.4	
500 500 500 500 500 500 500 500 500 500				124.7		340.6		275.9	
677 329 0 0 0 0 0 0 3 0.45 1.01 (0.06		70.0		20.0		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			165	2424	329	677	329	640	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0	0	0	0	0	0	0	
3 0.45 1.01		0	0	0	0	0	0	0	
3 0.45 1.01			0	0	0	0	0	0	
Intersection Summary ycycle Length: 120 Actuated Cycle Length: 120 Misser. 0 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 135 Control Type: Actuated-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Oucue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Oucue shown is maximum after two cycles.			0.67	96.0	0.98	0.45	1.01	0.64	
Oycle Length: 120 Mistaled Oycle length: 120 Mistaled Oycle length: 120 Mistal Oycle: 135 Control Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Oucue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. # 95th percentile volume exceeds capacity, queue may be longer. # 10 clue shown is maximum after two cycles. # 10 clue shown is maximum after two cycles. # 10 clue shown is maximum after two cycles.	Intersection Summary								
Actuated Cycle Length: 120 Actuated Cycle Length: 120 Grifse: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 135 Control Type: Actuated-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Oucue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Oucue shown is maximum after two cycles.	Cycle Length: 120								
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Matural Cycle; 1835 Control Type: Actuated-Coordinated Control Type: Actuated-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Oucue shown is maximum after two cycles. # 45th percentile volume exceeds capacity, queue may be longer.	Actuated Cycle Length: 120								
Natural Cycle: 1355 Control Type: Actuated-Coordinated - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Oucue shown is maximum after two cycles.	Offset: 0 (0%), Referenced to phase 2	EBTL and	16:WBTL	, Start of	Green				
Control Type: Actualed-Coordinated Volume exceeds capacity, queue is theoretically infinite. Volume shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Oucue shown is maximum after two cycles. Waturne, for the convenition and the percentile where the	Natural Cycle: 135								
Volume exceeds capacity queue is incordicially finitile. Leue a shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Oue be shown is maximum after two cycles. What is maximum after two cycles are received to the control of the	Control Type: Actuated-Coordinated								
Uceue shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycled are two cycles. **Natures for other percentile varieties in motional per metroan cinnal	 Volume exceeds capacity, queue 	is theoretic	ally infini	a;					
# Solin Beformle Volume exceeds capacity, queue may be longer. # Deformle Volume and after who cycle are made and a manager and a ma	Queue shown is maximum after tw	o cycles.		_					
Underes Shown in Indiality and all all the Workshop of the Management of the Managem	# 95in percentile volume exceeds c	apaciry, qu	ene may	pe longer					
	Queue silowii is iliaxiiilui ii altei tw	o cycles.	The same of	-	-				

Splits and Phases: 2: Fifth Line & Derry Road

402 (R)

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Background (PM) 2032 Scenario 7 (Sensilivity)

Queues 4: Clar

Future Background (PM) 2032 Scenario 7 (Sensitivity)

	~		6	6	0								2	4	0	C.I																										
*	SBR		169	169	1900								0.92	184	Ŭ																											
→	SBT	æ	7	7	1900	5.7	1.00	0.86	1.00	1595	1.00	1595	0.92	∞	7	185	NA	4		19.2	19.2	0.16	2.7	3.0	255	c0.12		0.73	47.9	1.00	6.6	57.8	ш	54.3	D							
۶	SBL	F	80	80	1900	5.7	1.00	1.00	0.95	1770	0.71	1317	0.92	87	0	87	Perm		4	19.2	19.2	0.16	2.7	3.0	210		0.07	0.41	45.3	1.00	1.3	46.7										
•	NBR		61	61	1900								0.92	99	0	0																					В		15.0	۵		
←	NBT	æ	10	9	1900	2.7	1.00	0.87	1.00	1623	1.00	1623	0.92	11	22	22	NA	80		19.2	19.2	0.16	2.7	3.0	259	0.01		0.08	42.9	1.00	0.1	43.0		52.5	O							
•	NBL	F	79	79	1900	2.7	1.00	1.00	0.95	1770	0.43	795	0.92	98	0	98	Perm		∞	19.2	19.2	0.16	2.7	3.0	127		0.11	0.68	47.5	1.00	13.4	6.09	ш				Service					
4	WBR		24	24	1900								0.92	56	0	0																					HCM 2000 Level of Service		time (s)	ICU Level of Service		
↓	WBT	444	2167	2167	1900	5.3	0.91	1.00	1.00	2077	1.00	5077	0.92	2355	-	2380	NA	9		868	868.8	0.75	5.3	3.0	3799	c0.47		0.63	7.2	1:00	0.8	7.9	A	8.0	V		CM 2000		Sum of lost time (s)	U Level o		
-	WBL	F	15	15	1900	4.0	1.00	1.00	0.95	1770	0.02	82	0.92	16	0	16	pm+pt		9	86.8	86.8	0.75	4.0	3.0	86	0.00	0.12	0.16	9.8	1:00	8:0	9.3	A				Ī		S	2		
/	EBR		6	6	1900								0.92	10	0	0																					15.9	99:0	120.0	75.5%	15	
†	EBT	444	2127	2127	1900	2.3	0.91	1.00	1.00	5082	1.00	5082	0.92	2312	0	2322	NA	2		83.3	83.3	69:0	5.3	3.0	3527	c0.46		99:0	10.3	1.56	0.5	16.6	2	16.9	В							
1	EBL	<u>, -</u>	36	39	1900	2.3	1.00	1.00	0.95	1770	0.02	93	0.92	39	0	39	Perm		2	83.3	83.3	69:0	5.3	3.0	64		0.42	0.61	6.7	1.60	19.3	34.8	ပ					ty ratio	,	uc		
	Movement	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Ideal Flow (vphpl)	Total Lost time (s)	Lane Util. Factor	Frt	Fit Protected	Satd. Flow (prot)	Flt Permitted	Satd. Flow (perm)	Peak-hour factor, PHF	Adj. Flow (vph)	RTOR Reduction (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Actuated Green, G (s)	Effective Green, g (s)	Actuated g/C Ratio	Clearance Time (s)	Vehicle Extension (s)	Lane Grp Cap (vph)	v/s Ratio Prot	v/s Ratio Perm	v/c Ratio	Uniform Delay, d1	Progression Factor	Incremental Delay, d2	Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Intersection Summary	HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	Intersection Capacity Utilization	Analysis Period (min)	c Critical Lane Group

12-14-2023 BA Group

Synchro 11 Report

C		t	>	FORM	- 9	-		→	
ane Group	EBL	EBI	WBL	WBI	NBL	NBI	SBL	SBI	
Lane Configurations	<i>y-</i>	₩\$	F	₩	F	æ	F	¢	
raffic Volume (vph)	36	2127	15	2167	79	10	80	7	
-uture Volume (vph)	36	2127	15	2167	79	10	80	7	
ane Group Flow (vph)	36	2322	16	2381	98	77	87	192	
urn Type	Perm	NA	td+md	NA	Perm	M	Perm	NA	
Protected Phases		2	-	9		∞		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	-	9	∞	∞	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	0.9	10.0	10.0	10.0	10.0	10.0	
Vinimum Split (s)	34.3	34.3	10.0	34.3	34.7	34.7	34.7	34.7	
otal Split (s)	75.0	75.0	10.0	82.0	32.0	35.0	35.0	35.0	
otal Split (%)	62.5%	62.5%	8.3%	70.8%	29.2%	29.2%	29.2%	29.2%	
rellow Time (s)	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.6	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
ost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
otal Lost Time (s)	5.3	5.3	4.0	5.3	5.7	5.7	5.7	5.7	
-ead/Lag	Lag	Lag	Lead						
.ead-Lag Optimize?	Yes	Yes	Yes						
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None	
//c Ratio	0.59	0.64	0.11	0.63	0.68	0.25	0.41	0.74	
Control Delay	48.1	17.2	6.1	8.7	72.2	14.2	49.9	61.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fotal Delay	48.1	17.2	6.1	8.7	72.2	14.2	49.9	61.9	
Queue Length 50th (m)	8.3	180.8	0.8	88.4	20.3	2.3	19.6	44.0	
Queue Length 95th (m)	1 6.9m	m188.7	3.2	129.3	36.9	15.1	34.0	9:29	
nternal Link Dist (m)		336.0		475.1		56.4		313.3	
Furn Bay Length (m)	70.0		70.0				40.0		
Sase Capacity (vph)	99	3630	150	3800	194	445	321	395	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.59	0.64	0.11	0.63	0.44	0.17	0.27	0.49	
ntersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 120									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	to phase 2:1	EBTL and	16:WBTL	, Start of	Green				
Natural Cycle: 90	-								
Control Type: Actuated-Coordinated	ordinated								
 Volume for 95th percentile queue is metered by upstream signal 	itile queue i:	s metered	d by upstr	eam sign	al.				
Splits and Phases: 4: Clar	4: Clark Boulevard & Derry Road	d & Dern	/ Road						
*								Ĵ	
✓ Ø1 ✓ Ø2 (R)								₽ Ø4	
)s 75s								35 s	
₩ 06 (B)								- SE	
								35.0	

12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Total (AM) 2032 Scenario 7 (Sensitivity)

139 139 1900 6.3 0.95 0.93 1.00 3302 1.00 3302 0.94 0.16 6.3 3.0 0.33 526 0.05 0.4 41.8 42.0 D 0.06 0.38 41.7 1.00 1.9 43.6 6.3 1.00 1.00 0.95 1258 0.61 813 129 0.94 0 49 40% 17.7 17.7 0.16 6.3 3.0 32 32 900 16.5 E 34 0.36 41.6 1.00 0.4 42.0 D 173 173 173 1900 6.3 6.9 6.9 8498 8498 1.00 6.94 1.00 6.94 1.00 6.94 1.00 6.94 1.00 6.94 6.004 6.004 6 17.7 17.7 0.16 6.3 3.0 55.7 0.06 105 105 6.3 6.3 1.00 1.00 0.95 1805 0.94 920 0.94 17.7 17.7 0.16 6.3 3.0 0.77 44.7 1.00 21.1 65.8 112 HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service 33% 1022 8% 54 NA 923 923 923 1900 6.2 6.2 0.99 11.00 11.00 4385 982 68.6 68.6 0.62 6.2 3.0 27.10 0.38 10.6 1.00 0.4 11.0 B B 4.0 1.00 0.95 0.95 0.06 1111 72.8 72.8 0.66 4.0 3.0 1.36 0.01 0.12 0.20 0.20 0.20 0.7 27 0% 0 19.7 0.80 111.0 88.4% 169 0 % 0.94 2546 2% 49 NA 72.6 72.6 0.65 6.2 3.0 3077 c0.54 6.2 0.91 0.99 1.00 4706 4706 0.94 2372 0.83 14.5 1.00 2.7 17.2 B B 16.5 1 HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cyde Length (s)
Intersection Capacity Utilization
Analysis Period (min) 165 165 1900 4.0 1.00 1.00 0.95 1763 0.23 434 0.94 176 80.8 80.8 80.8 0.73 4.0 3.0 3.0 0.28 0.28 0.43 5.1 1.00 0.7 Fit Protected
Satd. Flow (prot)
Fit Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph) Actuated Green, G (s) Effective Green, g (s) Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor Lane Group Flow (vph) Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS Bus Blockages (#/hr) Turn Type Protected Phases Heavy Vehicles (%) Lane Grp Cap (vph) Uniform Delay, d1 Progression Factor Permitted Phases v/s Ratio Perm v/s Ratio Prot v/c Ratio

12-14-2023 BA Group

Critical Lane Group

Queues 1: Sixth Line & Derry Road

Future Total (AM) 2032 Scenario 7 (Sensitivity)

→	SBT	₩.	142	142	299	¥	4		4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.46	22.1	0.0	22.1	16.1	27.1	201.7		906	0	0	0	0.33						
۶	SBL	r	46	46	46	Perm		4	4		10.0	32.3	33.0	29.7%	4.0	2.3	0.0	6.3			None	0.38	48.0	0.0	48.0	10.1	21.0		30.0	195	0	0	0	0.25						
←	NBT	₩.	173	173	218	¥	∞		∞		10.0	32.3		29.7%	4.0	2.3	0.0	6.3			None	0.38	38.8	0.0	38.8	21.6	30.7	211.8		855	0	0	0	0.25						
•	NBL	F	105	105	112	Perm		∞	∞		10.0	32.3		29.7%	4.0	2.3	0.0	6.3			None	0.77	74.9	0:0	74.9	24.8	42.3		45.0	221	0	0	0	0.51				reen		
ļ	WBT	4413	923	923	1026	NA	9		9		25.0	31.2	0.79	60.4%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.38	11.7	0.0	11.7	39.4	58.3	256.2		2717	0	0	0	0.38				Start of G		
\	WBL	r	25	25	27	pm+pt	-	9	_		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.15	8.9	0.0	8.9	1.3	4.7		100.0	184	0	0	0	0.15				6:WBTL,		
†	EBT	4413	2230	2230	2552	NA	2		2		25.0	31.2	0.79	60.4%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.81	18.4	0.0	18.4	158.2	#245.3	475.1		3150	0	0	0	0.81				BTL and		
4	EBL	*	165	165	176	pm+pt	2	2	2		7.0	11.0	11.0		3.0	1.0	0.0	4.0	Lead	Yes	None	0.42	7.9	0.0	7.9		21.3 #		120.0	417	0	0	0	0.42				o phase 2:E		rdinated
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Oueue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Lenath: 111	Actuated Cycle Length: 111	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 100	Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

12-14-2023 BA Group

Synchro 11 Report

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Future Total (AM) 2032 Scenario 7 (Sensitivity)

	1	†	1	-	ţ	4	•	←	•	۶	→	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	<i>-</i>	444		r	444		F	₩		۳	₩	
Traffic Volume (vph)	92	2448	163	193	815	262	100	289	113	112	71	32
Future Volume (vph)	92	2448	163	193	815	262	100	289	113	112	11	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Fit	1.00	0.99		1.00	96.0		1.00	96.0		1.00	0.95	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1600	4796		1587	4548		1698	3203		1501	3250	
Flt Permitted	0.22	1.00		90:0	1.00		0.68	1.00		0.35	1.00	
Satd. Flow (perm)	368	4796		93	4548		1220	3203		549	3250	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	86	2604	173	202	298	279	106	307	120	119	9/	34
RTOR Reduction (vph)	0	9	0	0	48	0	0	34	0	0	27	0
Lane Group Flow (vph)	86	2771	0	202	1098	0	106	393	0	119	83	0
Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
Bus Blockages (#/hr)	4	36	2	9	22	77	33	33	2	13	-	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	N	
Protected Phases	2	2		-	9			∞			4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	75.3	67.7		83.7	72.1		25.3	25.3		25.3	25.3	
Effective Green, g (s)	75.3	1.79		83.7	72.1		25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.63	0.56		0.70	09.0		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	5.3		4.0	5.3		2.7	5.7		2.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	308	2705		214	2732		257	675		115	989	
v/s Ratio Prot	0.02	c0.58		c0.10	0.24			0.12			0.03	
v/s Ratio Perm	0.18			0.57			0.09			c0.22		
v/c Ratio	0.32	1.02		96.0	0.40		0.41	0.58		1.03	0.12	
Uniform Delay, d1	0.6	26.1		41.6	12.6		40.9	42.6		47.4	38.3	
Progression Factor	0.57	0.52		1.02	0.92		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	19.5		48.7	0.4		1.1	1.3		93.6	0.1	
Delay (s)	5.5	33.0		6.06	12.0		42.0	43.9		140.9	38.4	
Level of Service	A	S		ш	В		٥	D		ш	D	
Approach Delay (s)		32.0			23.9			43.5			91.7	
Approach LOS		ပ			ပ			D			ш	
Intersection Summary												
HCM 2000 Control Delay			33.8	X	CM 2000	HCM 2000 Level of Service	service		ပ			
HCM 2000 Volume to Capacity ratio	acity ratio		1.02									
Actuated Cycle Length (s)			120.0	S	um of lost	time (s)			15.0			
Intersection Capacity Utilization	ation		%8.8%	೨	U Level o	ICU Level of Service			ш			
Analysis Period (min)			15									

c Critical Lane Group

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (AM) 2032 Scenario 7 (Sensitivity)

Lane Configurations		\	Ť	•			_	•	+	
112 112 113 114 115	Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
289 112 289 112 289 112 110 100 100	Lane Configurations	*	4413	*	4413	*	₩	r	₩	
289 112 427 119 NA Perm 8 4 8 4 100 100 100 100 347 347 347 347 347 347 347 347 347 347 347 347 37 37 37 20 20 0 0 0 0 0 0 0 0 57 57 57 57 57 57 60 103 424 1408 424 1408 424 1408 424 1408 424 1408 424 1408 424 1408 424 1408 424 1708 426 -31.5 60 0 0 0 0 0 0	Traffic Volume (vph)	92	2448	193	815	100	289	112	71	
NA Perm 8 4 4 4 8 8 4 4 8 8 4 4 8 8 4 4 8 8 4 9 8 9 9 9 9	Future Volume (vph)	92	2448	193	815	100	289	112	71	
NA Perm 8 4 8 4 8 4 8 4 100 100 100 100 100 100 100 100 100	Lane Group Flow (vph)	86	2777	202	1146	106	427	119	110	
8 8 4 4 8 8 4 4 100 100 100 100 34.7 34.7 34.7 37 37 37 25.8% 25.8% 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Turn Type	bm+pt	NA	pm+pt	NA	Perm	M	Perm	¥	
8 8 4 10 100 100 100 100 100 100 100 100 100	Protected Phases	2	2	-	9		∞		4	
100 100 347 347 310 310 310 310 258% 258% 2 37 37 37 57 57 57 57 57 60 00 6424 1408 06 424 1408 06 424 1408 06 103 06 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Permitted Phases	2		9		00		4		
100 100 100 310 310 310 310 310 310 310	Detector Phase	2	2	-	9	∞	∞	4	4	
100 100 100 1310 3147 347 347 347 347 37 37 37 37 37 37 37 37 37 37 37 37 37	Switch Phase									
347 347 347 310 310 310 310 310 310 310 310 310 310	Minimum Initial (s)	7.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	
310 310 310 310 310 310 310 310	Minimum Split (s)	11.0	34.3	11.0	34.3	34.7	34.7	34.7	34.7	
None None No 100 00 00 00 00 00 00 00 00 00 00 00 00	Total Split (s)	12.0	73.0	16.0	77.0	31.0	31.0	31.0	31.0	
3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7	Total Split (%)	10.0%	%8.09	13.3%	64.2%	25.8%	25.8%	25.8%	25.8%	
2.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	All-Red Time (s)	1.0	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
None None None None None None None None	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
None None None None None None None None	Total Lost Time (s)	4.0	5.3	4.0	5.3	5.7	2.7	2.7	2.7	
None None None No No No No No No No No No No No No No	Lead/Lag	Lead	Lag	Lead	Lag					
Mone None None None None None None None N	Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
0.60 103 C 42.4 140.8 2 0.0 0.0 42.4 140.8 2 42.4 140.8 2 42.4 140.8 2 340.6 50.0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Recall Mode	None	C-Min	None	C-Min	None	None	None	None	
42.4 140.8 2 0 0 0 0 42.4 140.8 2 45.6 -31.5 1 63.4 #70.7 2 340.6 50.0 0	v/c Ratio	0.31	1.02	0.95	0.41	0.41	0.60	1.03	0.15	
2 42.4 10.8 2 42.4 10.8 2 42.4 10.8 2 42.4 10.8 2 42.4 10.8 2 1.5	Control Delay	4.8	34.4	83.0	10.8	46.6	42.4	140.8	27.2	
42,4 140.8 2 45,4 4.70.7 1 463,4 #70.7 1 340,6 50.0 0	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9, 45.6 -31.5 1, 45.4 #70.7 1 3,40.6 50.0 7, 70.9 115 0 0 0 0 0 0 0	Total Delay		34.4	83.0	10.8	46.6	42.4	140.8	27.2	
1 634 #70.7 340.6 50.0 709 115 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 50th (m)	4.2	-273.2	36.2	42.8	22.9	45.6	~31.5	8:0	
340.6 709 115 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 95th (m)	m4.6 m	#293.4	#84.8	50.9	41.4	63.4	#70.7	16.3	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Internal Link DISt (m)	0.001	0.071	0	1.4.7	0.07	340.0	0	6.677	
000000000000000000000000000000000000000	Paso Canacity (Jub)	210	2712	215	0700	25.7	2007	115	717	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Can Reductin	010	71/7	0	00/7	0	0		717	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Spillback Cap Reductn	0	0	0	0	0	0	0	0	
0.60 1.03	Storage Cap Reductn	0	0	0	0	0	0	0	0	
Intersection Summary Cycle Length: 120 Cycle Length: 120 Cycle Length: 120 Cycle Length: 120 Cycle Length: 120 Cycle Length: 120 Cycle Length: 120 Cycle Lycle Type: Actualed-Coordinated Control Type: Actualed-Coordinated Coule shown is maximum after two cycles. # 95th percentile volume exceeds capacity, queue in the program of the cycles. Queue shown is maximum after two cycles. Queue shown is maximum after two cycles.	Reduced v/c Ratio	0.31	1.02	0.95	0.41	0.41	09:0	1.03	0.15	
Cycle Length: 120 Actuated Cycle Length: 120 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green Natural Cycle: 140 Control Type: Actuated-Coordinated Volume exceeds capacity, queue is theoretically infinite. Oucue shown is maximum after two cycles. # 98th percentile volume exceeds capacity, queue may be longer. Oucue shown is maximum after two cycles.	Intersection Summary									
Actualed Cycle Length. 120 Actualed Cycle Length. 120 Natural Cycle: 140 Control Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. - Volume exceeds capacity, queue is theoretically infinite. # Skih percentile volume exceeds capacity, queue may be longer. # Oblime exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles.	Cycle Length: 120									
Offset 0 (0%). Referenced to phase 2:EB1L and 6/WB1L, Start of Green Natural Cycle: 140 Control Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. - Outure a shown is maximum after two cycles. # 96th percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles.	Actuated Cycle Length: 120									
Control Type: Actualed-Coordinated - Volume exceeds capacity, queue is theoretically infinite. - Volume exceeds capacity, queue is theoretically infinite. # 96th percentile volume exceeds capacity, queue may be longer. Oueue shown is maximum after two cycles.	Offset: 0 (0%), Referenced	to phase 2:	BTL and	16:WBTL	, Start of	Green				
Volume of year conditions and the profit of the profit of the percentile volume exceeds capacity, queue may be longer. # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	Control Type: Actuated-Con	prdinated								
	 Volume exceeds capaci 	ity, queue is	theoretic	ally infini	<u>a</u>					
	Oueue shown is maximu	um after two	cycles.							
	# 95th percentile volume	exceeds cal	pacity, qu	eue may	be longer	, .				
	Queue shown is maximu	um after two	cycles.							

Splits and Phases: 2: Fifth Line & Derry Road



HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Total (AM) 2032 Scenario 7 (Sensitivity)

Advanment EBL ane Configurations 1 1 1 1 1 1 1 1 1	FBT +	EBR	WBI	WRT	W/PD			CON	ē	TOO	ככי
	1				VIDIV	NBL	NBT	NBK	SBL	SBI	SBR
			r	4413		F	2		r	£	
(ho		163	189	196	16	28	7	29	26	10	43
			189	196	91	28	7	29	26	10	43
e (s)	<u></u>	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
tor			4.0	5.3		5.7	2.7		5.7	5.7	
	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
			1.00	0.99		1.00	0.88		1.00	0.88	
			0.95	1.00		0.95	1.00		0.95	1.00	
rot)			1770	2070		1770	1639		1770	1636	
_			0.02	1.00		0.72	1.00		0.73	1.00	
Satd. Flow (perm) 437	, 5037		4	5020		1340	1639		1362	1636	
Peak-hour factor, PHF 0.92	2 0.92	Ŭ	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)		177	205	1051	66	63	∞	32	28	=	47
RTOR Reduction (vph) 0	9 (0	0	വ	0	0	29	0	0	43	0
ane Group Flow (vph) 99	2811	0	202	1145	0	63	1	0	28	12	0
urn Type Perm			pm+pt	NA		Perm	NA		Perm	N	
Protected Phases	2		-	9			∞			4	
Permitted Phases	01		9			∞			4		
Actuated Green, G (s) 73.0			0.66	0.66		10.0	10.0		10.0	10.0	
ffective Green, g (s) 73.0			0.66	0.66		10.0	10.0		10.0	10.0	
Actuated g/C Ratio 0.67			0.82	0.82		0.08	0.08		0.08	0.08	
Clearance Time (s) 5.3	3 5.3		4.0	5.3		2.7	2.7		2.7	2.7	
(ehicle Extension (s) 3.0			3.0	3.0		3.0	3.0		3.0	3.0	
ane Grp Cap (vph) 265			386	4141		111	136		113	136	
	Ĭ		c0.10	0.23			0.01			0.01	
's Ratio Perm 0.23			0.34			c0.05			0.02		
//c Ratio 0.3	7 0.92		0.53	0.28		0.57	0.08		0.25	0.11	
niform Delay, d1 11.9	9 20.8		33.4	2.4		52.9	20.7		51.5	6.09	
Progression Factor 1.81			1.00	1.00		1.00	1.00		1.00	1.00	
1.1 aremental Delay, d2			1.4	0.2		6.5	0.2		1.2	0.4	
Delay (s) 22.7			34.8	2.5		59.4	51.0		52.6	51.2	
evel of Service (O	V		ш	۵		۵	۵	
Approach Delay (s)	36.5			7.4			56.2			51.7	
pproach LOS				A			ш			٥	
ntersection Summary											
CM 2000 Control Delay		28.4	ゴ	HCM 2000 Level of Service	Level of S	service		ပ			
HCM 2000 Volume to Capacity ratio		0.80									
Actuated Cycle Length (s)		120.0	S	Sum of lost time (s)	time (s)			15.0			
ntersection Capacity Utilization		83.4%	೨	ICU Level of Service	f Service			ш			
Analysis Period (min)		15									

12-14-2023 Synchro 11 Report BA Group

Queues 4: Clark Boulevard & Derry Road

Future Total (AM) 2032 Scenario 7 (Sensitivity)

-ane Configurations	בפר	EBI	WBL	WBI	NBL	NBT	SBL	SBT	
(day)	*	4	_	4₩	-	÷	-	€\$	
Harric volutrie (vpri)	16	2429	189	296	28	7	26	10	
-uture Volume (vph)	91	2429	189	196	28	7	26	10	
ane Group Flow (vph)	66	2817	202	1150	63	40	28	58	
Furn Type	Perm	AA	pm+pt	Ν	Perm	¥	Perm	NA	
Protected Phases		2	-	9		∞		4	
Permitted Phases	2		9		∞		4		
Detector Phase	2	2	-	9	∞	∞	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	0.9	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	34.3	34.3	10.0	34.3	34.7	34.7	34.7	34.7	
Fotal Split (s)	75.0	75.0	10.0	85.0	35.0	35.0	35.0	35.0	
Fotal Split (%)	62.5%	62.5%	8.3%	70.8%	29.2%	29.2%	29.2%	29.2%	
rellow Time (s)	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.6	1.6	1.0	1.6	2.0	2.0	2.0	2.0	
ost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
otal Lost Time (s)	5.3	5.3	4.0	5.3	5.7	5.7	5.7	5.7	
-ead/Lag	Lag	Lag	Lead						
_ead-Lag Optimize?	Yes	Yes	Yes						
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None	
//c Ratio	0.37	06:0	0.53	0.27	0.47	0.21	0.21	0.28	
Control Delay	25.5	35.8	30.7	2.7	62.2	22.4	52.2	21.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fotal Delay	25.5	35.8	30.7	2.7	62.2	22.4	52.2	21.2	
Queue Length 50th (m)	18.9	222.6	29.1	18.8	15.1	1.8	9.9	2.6	
Queue Length 95th (m)	m20.1	m218.7	26.8	29.5	29.3	12.4	15.6	15.2	
nternal Link Dist (m)		336.0		475.1		56.4		313.3	
Turn Bay Length (m)	70.0		70.0				40.0		
Base Capacity (vph)	270	3118	388	4236	326	424	332	434	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.37	0.00	0.53	0.27	0.19	0.09	0.08	0.13	
ntersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 120									
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	o phase 2:	EBTL an	16:WBTL	, Start of	Green				
Natural Cycle: 120									
Control Type: Actuated-Coordinated	rdinated								
 Volume for 95th percentile queue is metered by upstream signal 	ile queue i	s metere	d by upstr	eam sign	al.				
Splits and Phases: 4. Clar	4. Clark Roulevard & Derry Road	n 8. Dern	, Road						
	N DOMEN	a D	INOGO					-	
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Ø6 (R								- 08	

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HCM Signalized Intersection Capacity Analysis 1: Sixth Line & Derry Road

Future Total (PM) 2032 Scenario 7 (Sensitivity)

Applications EBI EBI EBI WBI WBI MBI NBI NBI NBI NBI NBI APP				٠								-	
176 176	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ph 176 2017 109 34 1899 25 218 166 41 137 226 an) 176 2017 109 34 1899 25 218 166 41 137 226 an) 170 190 1900	Lane Configurations	*	4413		*	4413		F	₩		×	₩	
ph 176 2017 109 34 1899 25 218 146 41 137 226 1 400 6 5 4 40 1900 <t< td=""><td>Traffic Volume (vph)</td><td>176</td><td>2017</td><td>109</td><td>34</td><td>1899</td><td>25</td><td>218</td><td>166</td><td>41</td><td>137</td><td>226</td><td>149</td></t<>	Traffic Volume (vph)	176	2017	109	34	1899	25	218	166	41	137	226	149
1900 1900	Future Volume (vph)	176	2017	109	34	1899	22	218	166	41	137	226	149
1	Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,00 0,91 1,00 0,91 1,00 0,95 1,00	Total Lost time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
1,00 0,99 1,00 1,00 1,00 0,94 1,00 0,95 1,00 1,00 1,00 0,95 1,00 0,95 1,00 1,00 1,00 0,95 1,00 0,95 1,00 0,95 1,00 1,00 1,00 0,94 0	Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
176 176	Ft	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.94	
1763 4719 1805 4435 1805 3466 1258 3354 120	Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
National Color 1,00	Satd. Flow (prot)	1763	4719		1805	4435		1805	3468		1258	3354	
PHF 126 4719 139 4435 852 3468 813 3354 187 2146 116 36 2020 27 223 177 44 146 240 187 2257 0 36 2046 0 0 3 202 202 0 146 310 187 2257 0 36 2046 0 0 232 202 0 146 310 187 2257 0 36 2046 0 0 232 202 0 146 310 187 2257 0 36 2046 0 0 232 202 0 146 310 187 2267 0 36 2046 0 0 232 202 0 146 310 187 2257 0 36 2046 0 0 232 202 0 146 310 187 2257 0 36 2046 0 232 202 0 146 310 187 2257 0 36 248 338 0 0 0 0 0 187 249 136 248 316 316 316 316 189 303 30 30 30 30 30 180 249 249 242 987 231 954 190 249 136 2189 242 987 231 954 191 195 2495 136 2189 242 987 231 954 191 192 2495 136 2189 242 987 231 954 191 192 2495 136 2189 242 987 231 954 191 192 2495 136 2189 242 987 231 954 191 192 2495 136 2189 242 987 231 954 191 192 2495 136 2189 242 987 231 954 191 192 2495 136 2189 242 987 231 954 191 192 2495 136 2189 242 987 231 954 191 192 2495 136 2189 242 987 231 954 191 192 2495 136 2495 242 987 231 954 191 192 2495 136 2495 249 34.6 31.3 191 192 2495 136 2495 249 34.6 31.3 191 192 2495 136 2495 249 34.6 31.3 191 192 2495 136 2495 249 249 249 249 191 192 2495 1494 33.4 34.9 30.3 191 192 2495 144 264 249 249 249 249 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191	Fit Permitted	0.07	1.00		0.07	1.00		0.45	1.00		0.61	1.00	
0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94	Satd. Flow (perm)	126	4719		139	4435		852	3468		813	3354	
187 2146 116 36 2020 27 232 177 44 146 240 240 225	Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
1	Adj. Flow (vph)	187	2146	116	36	2020	27	232	177	44	146	240	159
187 2557 0 36 2046 0 232 202 0 146 310 288 289 38% 0% 0% 5% 640% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1%	RTOR Reduction (vph)	0	2	0	0	-	0	0	19	0	0	86	0
2% 2% 1% 0% 8% 33% 0% 0% 5% 40% 1	Lane Group Flow (vph)	187	2257	0	36	2046	0	232	202	0	146	310	0
pm+pt NA pm+pt NA perm A Perm NA Perm A	Heavy Vehicles (%)	7%	7%	1%	%0	%8	33%	%0	%0	2%	40%	%	1%
pm+pt NA pm+pt NA Perm NA Perm 5 2 1 6 8 4 66.8 58.7 59.0 54.8 31.6 31.6 31.6 66.8 58.7 59.0 54.8 31.6 31.6 31.6 66.8 58.7 59.0 54.8 31.6 31.6 31.6 66.8 58.7 59.0 54.8 31.6 31.6 31.6 66.8 58.7 59.0 54.8 31.6 31.6 31.6 40.6 0.53 0.49 0.28 0.28 0.28 0.28 0.28 50.7 0.4 1.36 2189 24.2 98.7 23.1 50.6 0.9 0.7 0.48 0.0 0.06 0.03 0.06 0.0 0.03 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Bus Blockages (#/hr)	-	46	2	0	24	2	0	0	-	9	-	2
5 2 1 6 8 4 66.8 58.7 59.0 54.8 316 316 316 66.8 58.7 59.0 54.8 316 31.6 31.6 31.6 40 6.2 6.2 3.0 3.0 3.0 3.1 31.6	Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	N	
6 8 8 3 4 66.8 58.7 59.0 54.8 31.6 31.6 31.6 66.8 58.7 59.0 54.8 31.6 32.8 0.28 0.06 0.18 0.06 0.18 0.06 0.18 0.06 0.18 0.06 0.08 0.08 0.06 0.08 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 <t< td=""><td>Protected Phases</td><td>2</td><td>2</td><td></td><td>-</td><td>9</td><td></td><td></td><td>∞</td><td></td><td></td><td>4</td><td></td></t<>	Protected Phases	2	2		-	9			∞			4	
66.8 58.7 59.0 54.8 31.6 31.6 31.6 66.8 58.7 59.0 54.8 31.6 31.6 31.6 0.60 0.63 0.53 0.49 54.8 31.6 31.6 31.6 4.0 6.2 0.53 0.49 0.28 0.28 0.28 3.0 3.0 3.0 3.0 3.0 3.0 3.0 6.0 1.3 1.36 1.36 1.36 3.0 3.0 6.0 0.48 0.01 0.46 0.05 0.05 0.06 3.0 6.0 0.48 0.01 0.46 0.05 0.06 0.06 3.0 6.0 0.48 0.01 0.46 0.05 0.06 0.06 0.06 6.0 0.48 0.01 0.46 0.09 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0	Permitted Phases	2			9			∞			4		
668 587 590 548 316 318 328 6.28 0.28 0.28 0.28 0.28 0.28 0.28 0.28 0.28 0.33 3.0 <	Actuated Green, G (s)	8.99	58.7		29.0	54.8		31.6	31.6		31.6	31.6	
0.60 0.53 0.53 0.49 0.28 0.28 0.28 4.0 6.3 4.0 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3 6.3	Effective Green, g (s)	8.99	58.7		29.0	54.8		31.6	31.6		31.6	31.6	
10 62 40 62 63 63 63 63 63 63 63 63 63 63 63 63 63	Actuated g/C Ratio	09:0	0.53		0.53	0.49		0.28	0.28		0.28	0.28	
30 30 30 30 30 30 30 30	Clearance Time (s)	4.0	6.2		4.0	6.2		6.3	6.3		6.3	6.3	
195 2495 136 2189 242 987 231 COOT CLAB COOT CLAB COOT COOT CLAB COOT CLAB COOT COOT CLAB COOT CLAB COOT CLAB COOT CLAB COOT CLAB COOT CLAB COOT CLAB CLAB CLAB CLAB CLAB CLAB CLAB CLAB CLAB CLAB CLAB CLAB CLAB CLAB CLAB CL	Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
COOP 0.48	Lane Grp Cap (vph)	195	2495		136	2189		242	786		231	954	
0.560 0.13 0.13 0.027 0.08 0.08 0.09 0.06 0.00 0.04 0.00 0.04 0.00 0.04 0.00 0.04 0.00 0.04 0.00 0.04 0.00 0.04 0.00 0.04 0.00 0.04 0.00 0.04 0.00 0.04	v/s Ratio Prot	c0.07	0.48		0.01	0.46			90:0			0.09	
0.96 0.90 0.26 0.93 0.96 0.20 0.63 30	v/s Ratio Perm	00.50			0.13			c0.27			0.18		
30.3 23.6 18.4 26.4 39.1 30.2 34.6 1.0 1.00 1.00 1.00 1.00 1.00 1.00 1.0	v/c Ratio	0.96	0.90		0.26	0.93		96:0	0.20		0.63	0.32	
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Uniform Delay, d1	30.3	23.6		18.4	26.4		39.1	30.2		34.6	31.3	
2 52.0 6.0 1.0 9.0 45.8 0.1 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5	Progression Factor	1.00	1:00		1.00	1.00		1.00	1.00		1.00	1.00	
S2.3	Incremental Delay, d2	52.0	0.9		1.0	0.6		45.8	0.1		5.5	0.2	
F C B D F C D 33.6	Delay (s)	82.3	29.6		19.4	35.4		84.9	30.3		40.2	31.5	
33.6 35.1 58.2 C D E E K K K K K K K K K K K K K	Level of Service	ш.	ပ		В	۵		ш	ပ		٥	ပ	
C D D E // A 36.2 HCM 2000 Level of Service Capacity ratio 0.98 In (s) 111.0 Sum of lost time (s) Ultization 89.3% ICU Level of Service 15	Approach Delay (s)		33.6			35.1			58.2			33.8	
189 36.2 HCM 2000 Level of Service Capacity ratio 0.98 111.0 Sum of lost time (s) 111.0 Sum of lost time (s) 111.0	Approach LOS		S			O			ш			ပ	
slay 36.2 HCM 2000 Level of Service Capacity ratio 0.98 0.98 h (s) 111.0 Sum of lost time (s) Utilization 89.3% ICU Level of Service 15 15	Intersection Summary												
Capacity ratio 0.98 Sum of lost time (s) 111.0 Sum of lost time (s) 10 Litization 89.3% ICU Level of Service 15	HCM 2000 Control Delay			36.2	エ	CM 2000	Level of S	service		O			
h (s) 111.0 Sum of lost time (s) Utilization 89.3% ICU Level of Service 15	HCM 2000 Volume to Capa	icity ratio		0.98									
Utilization 89.3% ICU Level of Service 15	Actuated Cycle Length (s)			111.0	Š	um of lost	time (s)			16.5			
	Intersection Capacity Utiliza	ation		86.3%	೨	U Level o	f Service			ш			
	Analysis Period (min)			15									

Synchro 11 Report 12-14-2023 BA Group

Queues 1: Sixth Line & Derry Road

Future Total (PM) 2032 Scenario 7 (Sensitivity)

+	SBT	₩	226	226	366	¥	4		4		10.0	32.3	37.0	33.3%	4.0	2.3	0:0	6.3			None	0.38	22.9	0:0	22.9	26.0	201.7	7.102	1044	0	0	0	0.38							
٠	SBL	<u>.</u> -	137	137	146	Perm		4	4		10.0	32.3	37.0	33.3%	4.0	2.3	0.0	6.3			None	0.63	49.3	0.0	49.3	29.4	#27.4	30.0	231	0	0	0	0.63							
-	NBT	₽	166	166	221	¥	∞		∞		10.0	32.3	37.0	33.3%	4.0	2.3	0:0	6.3			None	0.22	27.5	0.0	27.5	17.8	28.2	0.11.0	1006	0	0	0	0.22							
	NBL	*	218	218	232	Perm		00	∞		10.0	32.3	37.0	33.3%	4.0	2.3	0.0	6.3			None	96.0	89.2	0.0	89.2	52.7	#104.8	45.0	242	0	0	0	96:0				Green			
	WBT	₩₽	1899	1899	2047	NA	9		9		25.0	31.2	62.0	25.9%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.93	35.6	0.0	35.6	152.1	756.2	7.00.7	2230	0	0	0	0.92				, Start of (ne longer	De lorider
•	WBL	<u>-</u>	34	34	36	pm+pt	_	9	_		7.0	11.0	11.0	%6.6	3.0	1.0	0.0	4.0	Lead	Yes	None	0.19	10.4	0.0	10.4	2.9	φ.	100.0	185	0	0	0	0.19				6:WBTL		vem on a	eue may
t	EBT	₩₽	2017	2017	2262	A	2		2		25.0	31.2	63.0	26.8%	4.0	2.2	0.0	6.2	Lag	Yes	C-Min	0.88	28.0	0.0	28.0	169.5	#200.4 A75.1	- 10/4	2566	0	0	0	0.88				EBTL and		acity ou	Jacilly, yu
١.	EBL	je-	176	176	187	bm+pt	2	2	വ		7.0	11.0	12.0	10.8%	3.0	1.0	0.0	4.0	Lead	Yes	None	96.0	81.4	0.0	81.4	26.6	#13.2	120.0	195	0	0	0	96:0				o phase 2:1		rainatea vreeds car	XCEEUS Cal
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Oueue Delay	Total Delay	Oueue Length 50th (m)	Queue Lengin 95in (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 111	Actuated Cycle Length: 111	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 90	Control Type: Actuated-Coordinated # 95th neceptile volume exceeds canacity attents may be longer	# Apili belicellile volulle #

1: Sixth Line & Derry Road Splits and Phases:



12-14-2023 BA Group

HCM Signalized Intersection Capacity Analysis 2: Fifth Line & Derry Road

Future Total (PM) 2032 Scenario 7 (Sensitivity)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations	*	4413		*	4413		*	₩		r	₽ ₽	
raffic Volume (vph)	43	1845	%	104	2220	122	302	75	215	312	304	80
uture Volume (vph)	43	1845	%	104	2220	122	302	75	215	312	304	80
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Fotal Lost time (s)	4.0	5.3		4.0	5.3		4.0	2.7		4.0	5.7	
ane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
F	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.97	
It Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
satd. Flow (prot)	1600	4805		1587	4813		1698	3051		1501	3340	
It Permitted	0.07	1.00		0.07	1.00		0.29	1.00		0.43	1.00	
satd. Flow (perm)	118	4805		112	4813		523	3051		683	3340	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	46	1963	102	11	2362	130	321	8	229	332	323	82
ROR Reduction (vph)	0	2	0	0	2	0	0	114	0	0	20	0
ane Group Flow (vph)	46	2060	0	111	2487	0	321	195	0	332	388	0
Heavy Vehicles (%)	11%	7%	7%	11%	3%	18%	2%	%6	3%	14%	7%	14%
3us Blockages (#/hr)	4	36	2	9	22	22	co	m	2	13	-	2
urn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	¥	
Protected Phases	2	2		-	9		3	∞		7	4	
Permitted Phases	2			9			∞			4		
Actuated Green, G (s)	62.8	57.1		8.79	9.69		35.7	18.7		35.7	18.7	
Effective Green, g (s)	62.8	57.1		8'. 19	9.69		35.7	18.7		35.7	18.7	
Actuated g/C Ratio	0.52	0.48		0.56	0.50		0.30	0.16		0.30	0.16	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	2.7		4.0	2.7	
ehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
ane Grp Cap (vph)	132	2286		164	2390		322	475		319	520	
/s Ratio Prot	0.02	0.43		c0.05	c0.52		0.14	90:0		c0.15	0.12	
/s Ratio Perm	0.17			0.34			0.16			c0.16		
/c Ratio	0.35	0.90		89.0	1.04		1.00	0.41		1.04	0.75	
Iniform Delay, d1	26.1	28.9		22.8	30.2		38.3	45.7		39.5	48.4	
Progression Factor	1.67	0.78		1.24	1.30		1.00	1.00		1.00	1.00	
ncremental Delay, d2	1.0	4.1		7.4	27.2		49.0	9.0		61.4	5.8	
Delay (s)	44.7	26.7		35.5	999		87.2	46.3		100.9	54.1	
evel of Service	۵	O		۵	ш		ш	۵		ш	۵	
Approach Delay (s)		27.1			65.2			67.1			75.1	
Approach LOS		O			ш			ш			ш	
ntersection Summary												
HCM 2000 Control Delay			53.4	Ĭ	HCM 2000 Level of Service	Level of S	Service		٥			
HCM 2000 Volume to Capacity ratio	city ratio		1.04									
Actuated Cycle Length (s)	,		120.0	Š	um of lost	time (s)			19.0			
ntersection Capacity Utilization	ation		95.0%	2	ICU Level of Service	f Service			ш			

Synchro 11 Report 12-14-2023 BA Group

Queues 2: Fifth Line & Derry Road

Future Total (PM) 2032 Scenario 7 (Sensitivity)

→	SBT	₩	304	304	408	Ę ×	+	4		10.0	34.7	28.0	23.3%	3.7	2.0	0:0	2.7	Lag	Yes	None	97.0	54.7	0.0	54.7	48.4	64.4	275.9		640	0	0	0	0.64											
۶	SBL	*	312	312	332	hiit T	- 4			7.0	11.0	21.0	17.5%	3.0	1.0	0.0	4.0	Lead	Yes	None	1.01	88.1	0.0	88.1	~68.8	#103.7		20.0	329	0	0	0	1.01											
←	NBT	4₽	75	75	309	50	5	8	•	10.0	34.7	28.0	23.3%	3.7	2.0	0.0	5.7	Lag	Yes	None	0.52	28.6	0.0	28.6	20.4	34.3	340.6		9/9	0	0	0	0.46											
€	NBL	*	302	302	321	hiii+pi	200	· m	•	7.0	11.0	21.0	17.5%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.98	17.7	0.0	17.7	63.5	#106.6		70.0	329	0	0	0	0.98				Green						-	<u>d</u> .
ļ.	WBT	444	2220	2220	2492	Y.	0	9		20.0	34.3	0.09	20.0%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	1.03	8.09	0.0	8.09	~244.9	#289.0	124.7		2425	0	0	0	1.03				, Start of			je.		be longer	abjo moo	udic ilibə
\	WBL	*	104	104		hiii+	- 4	· -		7.0	11.0	11.0	9.5%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.67	39.8	0.0	39.8	18.4	m#28.7		0.06	165	0	0	0	0.67				6:WBTL			ally infini		ene may	hymotr	nedn for
t	EBT	444	1845	1845	2065	Z C	7	2		20.0	34.3	0.09	20.0%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	06.0	27.5	0.0	27.5			170.5		2290	0	0	0	0.00				EBTL and			theoretic	cycles.	oacity, qu	cycles.) literated ex
1	EBL	F	43	43	46	h + H	S C	2 12	•	7.0	11.0	11.0	9.5%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.30	23.0	0.0	23.0	3.6	m6.9 m		100.0	152	0	0	0	0.30				phase 2:F		linated	, queue is	after two	ceeds car	arter two	e dnene is
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Tull Type	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	√c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m)	Base Capacity (vph)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary	Cycle Length: 120	Actuated Cycle Length: 120	Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	Natural Cycle: 145	Control Type: Actuated-Coordinated	 Volume exceeds capacity, queue is theoretically infinite. 	Queue shown is maximum after two cycles.	# 95th percentile volume exceeds capacity, queue may be longer	Cueue snown is maximum after two cycles.	III VOIUITIE IOI 70111 PEICEITIIIE QUEUE IS ITTEIELEU DY UPSITEATTI SIGNA

Splits and Phases: 2: Fifth Line & Derry Road

- W2 (R)

HCM Signalized Intersection Capacity Analysis 4: Clark Boulevard & Derry Road

Future Total (PM) 2032 Scenario 7 (Sensitivity)

Movement EB EFF EBF WEI WEI WEI WEI NEI NBT NBF NBI NBT NBF SBI SBI SBI SBI SBI SBI SBI SBI SBI SBI			Ť	~	•		/		-	L	ğ.	+	*
3 4+4+ 5 4+4+ 5 4+4+ 5 4+4+ 5 4 2188 24 211 10 134 80 7 3 2132 58 43 2188 24 211 10 134 80 7 1900 <th>vement</th> <th>EBL</th> <th>EBT</th> <th>EBR</th> <th>WBL</th> <th>WBT</th> <th>WBR</th> <th>NBL</th> <th>NBT</th> <th>NBR</th> <th>SBL</th> <th>SBT</th> <th>SBR</th>	vement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
36 2)132 SS 43 2)183 24 211 10 134 80 7 36 2)132 SS 43 2)183 24 211 10 134 80 7 37 36 2)132 SS 43 2)183 24 211 10 134 80 7 38 2)13 SS 53 40 1900 1900 1900 1900 1900 1900 1900 1	ne Configurations	<i>y</i> -	4413		je-	4413		je.	÷		r	¢	
36 2132 58 43 2183 24 211 10 134 80 7 1900 <	ffic Volume (vph)	36	2132	28	43	2183	24	211	9	134	80	7	169
1900 1900	ure Volume (vph)	39	2132	28	43	2183	24	211	10	134	80	7	169
5.3 5.3 4.0 5.3 5.7 <td>al Flow (vphpl)</td> <td>1900</td>	al Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1,00 0,91 1,00 0,91 1,00	al Lost time (s)	5.3	5.3		4.0	5.3		2.7	5.7		2.7	5.7	
1.00 1.00 1.00 1.00 1.00 0.86 1.00 0.86 1.00 0.86 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	e Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
0.95 100 0.95 100 0.95 100 170 5065 1770 5077 1770 1770 1770 1790 </td <td></td> <td>1.00</td> <td>1.00</td> <td></td> <td>1.00</td> <td>1.00</td> <td></td> <td>1.00</td> <td>98.0</td> <td></td> <td>1.00</td> <td>98.0</td> <td></td>		1.00	1.00		1.00	1.00		1.00	98.0		1.00	98.0	
1170 5065 1170 5077 1170 1603 1170 1595 1006 5065 100 0.058 1.00 0.058 1.00 0.058 1.00 0.058 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.059 1.00 0.05 1.00 0.059 1.00 0.	Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
0.06 1.00 0.05 1.00 0.65 1.00 0.65 1.00 0.65 1.00 0.65 1.00 0.65 1.00 0.65 1.00 0.65 1.00 0.65 1.00 0.65 1.00 0.65 0.92 <th< td=""><td>d. Flow (prot)</td><td>1770</td><td>2065</td><td></td><td>1770</td><td>2077</td><td></td><td>1770</td><td>1603</td><td></td><td>1770</td><td>1595</td><td></td></th<>	d. Flow (prot)	1770	2065		1770	2077		1770	1603		1770	1595	
106 5065 1100 5077 987 1603 1106 1595 1092 092 092 092 092 092 092 092 092 092	Permitted	90:0	1.00		0.02	1.00		0.53	1.00		0.59	1.00	
092 093 093 <td>d. Flow (perm)</td> <td>106</td> <td>2065</td> <td></td> <td>100</td> <td>2077</td> <td></td> <td>786</td> <td>1603</td> <td></td> <td>1106</td> <td>1595</td> <td></td>	d. Flow (perm)	106	2065		100	2077		786	1603		1106	1595	
39 2317 63 47 2373 26 229 11 146 87 8 9 2 0 0 1 0 229 90 0 6 6 0 6 6 6 6 6 0 6	ik-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
9 237 8 0 0 1 0 68 0 0 87 Perm NA pm+pt NA Perm NA Pe	. Flow (vph)	36	2317	63	47	2373	79	229	Ξ	146	87	∞	184
39 2378 0 47 2398 0 229 90 0 87 Perim NA pm+pt NA Perim NA Perim 2 6 8 8 4 702 702 790 790 300 300 300 702 702 790 790 300 300 300 300 5.7 70.2 790 790 790 300 300 300 300 0.59 70.2 790 790 300	OR Reduction (vph)	0	2	0	0	-	0	0	89	0	0	9	0
Perm NA pm+pt NA Perm NA Perm 2 1 6 8 4 2 6 8 4 4 70.2 70.2 79.0 79.0 30.0 30.0 30.0 70.2 70.2 79.0 79.0 30.0 30.0 30.0 30.0 6.5 6.5 7.4 79.0 79.0 30.0 <td>e Group Flow (vph)</td> <td>39</td> <td>23.78</td> <td>0</td> <td>47</td> <td>2398</td> <td>0</td> <td>229</td> <td>06</td> <td>0</td> <td>87</td> <td>186</td> <td>0</td>	e Group Flow (vph)	39	23.78	0	47	2398	0	229	06	0	87	186	0
2 1 6 8 8 4 4 2 70.2 70.2 70.2 70.2 70.2 70.2 70.2 70.	n Type	Perm	NA		pm+pt	ΑN		Perm	Ν		Perm	¥	
2 6 8 8 4 70.2 70.2 79.0 30.0 30.0 30.0 70.2 70.2 79.0 79.0 30.0 30.0 30.0 0.59 0.59 0.66 0.66 0.65 0.25 0.25 0.25 5.3 5.3 3.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 20.0 20.2 0.25 0.27 0.06 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.02 0.02 0.02 0.02 0.09 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 <td>tected Phases</td> <td></td> <td>2</td> <td></td> <td>-</td> <td>9</td> <td></td> <td></td> <td>∞</td> <td></td> <td></td> <td>4</td> <td></td>	tected Phases		2		-	9			∞			4	
702 702 702 790 790 300 300 300 0 0 0 0 0 0 0 0 0 0 0 0 0	mitted Phases	2			9			∞			4		
702 702 702 790 790 300 300 300 000 000 000 000 000 000 0	uated Green, G (s)	70.2	70.2		79.0	79.0		30.0	30.0		30.0	30.0	
0.59 0.59 0.66 0.66 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25	ective Green, g (s)	70.2	70.2		79.0	79.0		30.0	30.0		30.0	30.0	
5.3 5.3 6.4 0 5.3 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.2 5.3 5.3 5.3 5.3 5.4 5.2 5.2 5.3 5.3 5.2 5.2 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.3	uated g/C Ratio	0.59	0.59		99.0	99.0		0.25	0.25		0.25	0.25	
30 30 30 30 30 30 30 30 30 30 30 30 30 3	arance Time (s)	5.3	5.3		4.0	5.3		2.7	2.7		2.7	2.7	
62 2963 132 3342 246 400 276 0.047 0.011 0.047 0.05 0.03 0.80 0.22 0.032 0.63 0.80 0.36 0.72 0.93 0.22 0.32 1.64 19.5 17.7 13.3 440 35.7 36.6 1.52 1.53 1.00 1.00 1.00 1.00 1.00 2.01 1.1 1.6 1.4 38.9 0.3 0.7 2.01 1.4 14.6 82.9 36.0 37.3 D C B B B F D D C B B B C C 1.00 0.34 1.1 14.7 13.3 13.3 0.7 2.65 HCM 2000 Level of Service C 1.20 Sum of lost time (s) 15.0 1.20 Sum of lost time (s) 15.0	icle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
C047 0.01 C0.47 0.06 0.08 0.63 0.80 0.22 0.02 0.64 0.80 0.36 0.72 0.93 0.22 0.32 16.4 19.5 17.7 13.3 44.0 35.7 36.6 11.5 1.53 1.00 1.00 1.00 1.00 1.00 20.1 1.6 1.4 38.9 0.2 0.07 20.1 1.6 1.4 88.9 36.0 37.3 D C B B B F D D C B R B C C C B C C C C C C C C Talio 0.84 1.00 0.00 0.00 1.20.0 Sum of lost time (\$\$) 15.0 1.20.0 Sum of lost time (\$\$) 15.0	e Grp Cap (vph)	62	2963		132	3342		246	400		276	398	
0.37 0.22 0.023 0.08 0.645 0.08 0.36 0.72 0.093 0.22 0.32 16.4 19.5 17.7 13.3 44.0 38.7 36.6 1.15 11.3 16 14 38.9 0.3 0.07 20.1 1.1 16 14 38.9 0.3 0.0 D C 82.9 36.0 37.3 D C 84	Ratio Prot		c0.47		0.01	c0.47			90:0			0.12	
0.63 0.80 0.36 0.72 0.93 0.22 0.32 0.164 195 17.7 13.3 44.0 35.7 3.6.6 0.72 0.32 0.32 0.15.2 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.20.1 1.1 1.6 1.4 38.9 0.3 0.3 0.7 44.9 30.9 19.4 14.6 82.9 36.0 37.3 0.7 0.7 8 B F G B F G B B F G G G G G G G G G G G	Ratio Perm	0.37			0.22			c0.23			0.08		
1.64 195 177 133 440 35.7 36.6 1.62 1.63 1.00 1.00 1.00 1.00 20.1 1.1 16 1.4 389 0.3 0.7 44.9 30.9 19.4 14.6 82.9 36.0 37.3 D C B B F D D C B B F D D C B C B C C S B E E C D C C C C C C C C C C C C C C C C C C	Ratio	0.63	0.80		0.36	0.72		0.93	0.22		0.32	0.47	
201 1.15 1.00 1.00 1.00 1.00 1.00 2.01 1.00 2.01 1.00 1.00	form Delay, d1	16.4	19.5		17.7	13.3		44.0	35.7		36.6	38.2	
20.1 1.1 1.6 1.4 389 0.3 0.7 1.4 1.4 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	gression Factor	1.52	1.53		1:00	1.00		1:00	1.00		1.00	1.00	
449 309 194 146 829 36.0 37.3 D C B B F F D D C B C C C C C C C C C C C C C C C C C	emental Delay, d2	20.1	1.		1.6	1.4		38.9	0.3		0.7	6.0	
26.5 HCM 2000 Level of Service C 26.5 HCM 2000 Level of Service C 79,1% (CU Level of Service D 75,1% (CU Level of Service D	ay (s)	44.9	30.9		19.4	14.6		82.9	36.0		37.3	39.1	
31.1 14.7 63.8 C B E E 26.5 HCM 2000 Level of Service C 79.1% ICU Level of Service D 79.1% ICU Level of Service D 75.1% ICU Level of Service D	el of Service	٥	O		Ф	В		ш.	۵		۵	۵	
C B E E 26.5 HCM 2000 Level of Service ratio 0.84 Sum of lost time (s) 79.1% ICU Level of Service 15	roach Delay (s)		31.1			14.7			63.8			38.5	
26.5 HCM 2000 Level of Service 0.84 20m of lost time (s) 79.1% ICU Level of Service 15	proach LOS		S			В			ш			Ω	
26.5 HCM 2000 Level of Service 0.84 12.00 Sum of lost time (s) 79.1% ICU Level of Service 15	rsection Summary												
ratio 0.84 Sum of lost time (s) 70.1% ICU Level of Service 15	M 2000 Control Delay			26.5	X	2M 2000	Level of 3	Service		၁			
120.0 Sum of lost time (s) 79,1% ICU Level of Service 15	M 2000 Volume to Capac	ity ratio		0.84									
79.1% ICU Level of Service	uated Cycle Length (s)			120.0	S	nm of lost	time (s)			15.0			
llysis Period (min) 15	rsection Capacity Utilizat	on		79.1%	2	U Level o	of Service			۵			
	llysis Period (min)			15									

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Queues 4: Clark Boulevard & Derry Road

Future Total (PM) 2032 Scenario 7 (Sensitivity)

→ 丿 ←	BT SBL SBT	***	7 80 7		57 87 192	NA Perm NA	8 4	4	8 4 4		10.0 10.0 10.0	34.7		29.2% 29.		2.0	0.0	5.7 5.7 5.7			None	0.32	40.6	0.0	40.6	17.7	33.7	56.4 313.3	40.0 469 277 406	0	0	0 0 0	0.33 0.31 0.47	
•	NBL NB	<u></u>	211		229 1	Perm N		∞	∞		10.0 10			29.				5.7 5									#107.6 32	26	747 44		0	0	0.93 0.3	
ļ	WBT	4413	2183	2183	2399	NA	9		9		10.0	34.3			3.7	1.6	0.0	5.3				0.72	14.8	0.0	14.8			475.1	3375	0	0	0	0.71	
-	WBL	r	43	43	47	pm+pt	_	9	-		0.9	10.0	10.0	8.3%	3.0	1.0	0.0	4.0	Lead	Yes	None	0.31	12.1	0.0	12.1	3.6	9.7		70.0	0	0	0	0.31	
†	EBT	443	2132	2132	2380	ΝA	2		2		10.0	34.3	75.0	62.5%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.79	31.0	0.0	31.0	181.4	m195.3	336.0	3033	0	0	0	0.78	
4	EBL	*	36	36	36	Perm		2	2		10.0	34.3	75.0	62.5%	3.7	1.6	0.0	5.3	Lag	Yes	C-Min	0.63	55.2	0.0	55.2		m9.7		70.0	0	0	0	0.62	
	Lane Group	Lane Configurations	Traffic Volume (vph)	Future Volume (vph)	Lane Group Flow (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Total Split (%)	Yellow Time (s)	All-Red Time (s)	Lost Time Adjust (s)	Total Lost Time (s)	Lead/Lag	Lead-Lag Optimize?	Recall Mode	v/c Ratio	Control Delay	Queue Delay	Total Delay	Queue Length 50th (m)	Queue Length 95th (m)	Internal Link Dist (m)	Turn Bay Length (m) Rase Canacity (wh)	Starvation Cap Reductn	Spillback Cap Reductn	Storage Cap Reductn	Reduced v/c Ratio	Intersection Summary

Splits and Phases: 4: Clark Boulevard & Derry Road

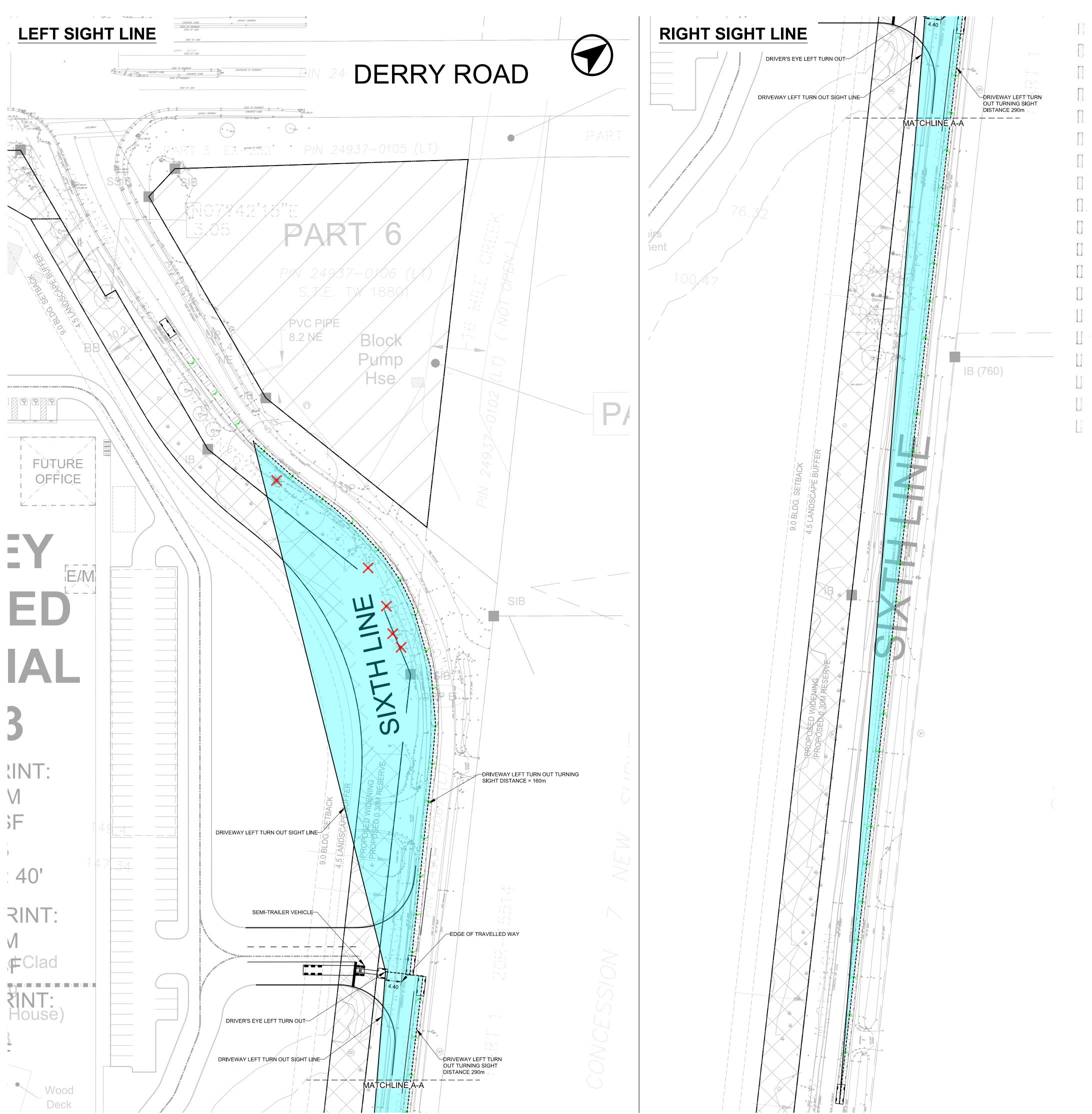


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Synchro 11 Report

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Appendix K: Sight Distance Figures



Geometric Design Guide for Canadian Roads Chapter 9 – Intersections

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Passenger car
Single-unit truck
Combination truck (WB 19 and WB 20)

Longer truck

Time Gap (tg)(s) at
Design Speed of Major Road
7.5

9.5

11.5

To be established by road authority

Notes: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.2 s for each percent grade for left turns.
- Some road authorities use higher values for certain specialized vehicles (e.g., Alberta uses 22 s for very long log trucks).

The intersection sight distance along the major road (distance b in Figure 9.9.2) is determined by:

ISD = $0.278 V_{\text{major}} t_{\text{g}}$ (9.9.1)

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)

V_{major} = design speed of the major road (km/h)

t_g = time gap for minor road vehicle to enter the

For example, a passenger car turning left onto a two-lane major road should be provided sight distance equivalent to a time gap of 7.5 s in major-road traffic. If the design speed of the major road is 100 km/h, this corresponds to a sight distance of 0.278(100)(7.5) = 208.5 or 210 m, rounded for design.

A passenger car turning left onto a four-lane undivided roadway will need to cross two near lanes, rather than one. This increases the recommended gap in major-road traffic from 7.5 to 8.0 s. The corresponding value of sight distance for this example would be 223 m. If the minor-road approach to such an intersection is located on a 4% upgrade, then the time gap selected for intersection sight distance design for left turns should be increased from 8.0 to 8.8 s, equivalent to an increase of 0.2 s for each percent grade.

The design values for intersection sight distance for passenger cars are shown in **Table 9.9.4**. **Figure 9.9.4** includes design values, based on the time gaps for the design vehicles included in **Table 9.9.3**.

No adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicle will be on the same grade when departing from the intersection. However, if the minor-road design vehicle is a heavy truck and the intersection is located near a sag vertical curve with grades over 3%, then an adjustment to extend the recommended sight distance based on the major-road grade should be considered.

June 2017

LEFT SIGHT LINE:

POSTED SPEED = 40 km/h (ADVISORY)
DESIGN SPEED = 50 km/h

 $t_{q} = 11.5$

ISD = $0.278 \times (V_{major}) \times t_g$ ISD = $0.278 \times (50 \text{km/h}) \times (11.5 \text{s})$

ISD = 160m

RIGHT SIGHT LINE:

POSTED SPEED = 70 km/h
DESIGN SPEED = 90 km/h

 $t_{g} = 11.5$

ISD = $0.278 \times (V_{major}) \times t_g$ ISD = $0.278 \times (90 \text{km/h}) \times (11.5 \text{s})$

ISD = 290m

GENERAL NOTES

- 1. TOPOGRAPHIC SURVEY BY STANTEC DATED DECEMBER 2023
- 2. SITE PLAN BY WARE MALCOMB DATED
 - DECEMBER 2023
- THIS DRAWING DOES NOT CONSTITUTE A
 REMOVALS PLAN, NOR HAS IT CONSIDERED THE
 OPINIONS OF A REGISTERED ARBORIST. IT ALSO
 MAKES NO CLAIMS REGARDING THE ACCURACY
 OF THE REFERENCED TOPOGRAPHIC SKETCH.
 ADDITIONAL TREES AND BUSHES MAY EXIST
 WITHIN THE REQUIRED SIGHT AREA WHICH ARE
 NOT INDICATED ON THIS PLAN

REMOVALS LEGEND



POSSIBLE TREE TO BE REMOVED OR TRIMMED



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6728 SIXTH LINE / DERRY ROAD ANATOLIA DEVELOPMENT

SIXTH LINE ACCESS SIGHT DISTANCE REVIEW LEFT TURN EXIT

Date: March 16, 2023

Project No.: 8184-01

0 5 10

Scale: 1:500

SD-01

Appendix L: Pavement Marking and Signage Plan

