DERRY ROAD & 5TH LINE, DERRY GREEN PROPOSED INDUSTRIAL DEVELOPMENT

UPDATED Traffic Impact Study and Parking Justification

Milton, Ontario

Prepared For: The Remington Group Incorporated

May 2025

May 9, 2025

Justyn Giannou, Assistant Project Manager, Land Division
The Remington Group Inc.
7501 Keele Street, Suite 100 | Vaughan, Ontario | L4K 1Y2
e-mail: jgiannou@remingtongroupinc.com

RE: Updated Transportation Considerations Report – Derry Road at Fifth Line Development

Dear Justyn:

Attached please find BA Group's Updated Transportation Considerations Report (Traffic Impact Study) for the proposed industrial development located at Derry Road and Fifth Line.

This Transportation Considerations Report (Traffic Impact Study) has been updated and prepared as part of the **Official Plan Amendment (OPA), Draft Plan of Subdivision (DPOS)** and **Zoning By-law Amendment (ZBA)** being submitted to the Town of Milton.

I can confirm that the enclosed report has been prepared under my supervision and to the best of my knowledge is accurate and true.

I trust that the foregoing is satisfactory.

Sincerely,
BA Consulting Group Ltd.

Deanna Green, MSc. P.Eng.
Senior Associate

© BA Consulting Group Ltd.
95 St. Clair Avenue West, Suite 1000
Toronto, ON M4V 1N6
www.bagroup.com

Responses to Town of Milton and Halton Region Comments

Regarding BA Group July 23, 2023 Traffic Impact Study

Derry Road & Fifth Line, Town of Milton

Draft Plan of Subdivision / Zoning By-law Amendment

Prepared for: The Remington Group Incorporated

Responses to Town of Milton Comments (September 22, 2023)

Comment 1: The Owner is to dedicate lands sufficient to provide a 37.5m right-of-way of Fifth Line to the Satisfaction of the Town of Milton, in accordance with the EA study completed by MMM Group – October 2016. These lands shall be dedicated to the Town of Milton for the purpose of road right-of-way widening and future road improvements.

Response: Noted.

Comment 2: Please correct and append the correct TOR at the end of the report. The current TOR is for the Anatolia development. Additional comments may be provided as per the approved TOR.

Response: The initial transportation consultant on the file (CGH Consulting) began work on both the Anatolia and Remington sites in tandem. When BA Group was retained to continue with the transportation work for both of the sites, only the Terms of Reference for the Anatolia site were made available. As the sites are adjacent, it was assumed that the Terms of Reference and methodology for the Anatolia site TIS could be adopted for the Remington site TIS. For this reason, the Terms of Reference for the Anatolia site have been provided in Appendix B of the May 2025 BA Group Report.

Comment 3: Figures 6, 7 and Traffic Modeling – Fifth Line is projected to be reconstructed and will ultimately be designed as a four-lane cross-section between Derry Road and Britannia Road. Fifth Line is currently shown/modeled as a two-lane cross-section north of the community park entrance to south of Clark Boulevard. As of now, construction is anticipated to start in 2024-2025.

Response: Noted. All future scenarios in the updated traffic analysis include Fifth Line with a 4-lane cross-section.

Comment 4: Section 3.2 (Proposed Parking Supply) - The traffic consultant must contact the Town to confirm the scope of work prior to submission of a parking study.

Response: Following discussions with the Town of Milton, the following rates and methodology are being proposed for the site's parking supply:

Proposed Large Buildings:

For large buildings (Building 1 on the north portion of site and Buildings 2 & 8 on the south portion of the site), a 10% reduction in GFA has NOT been applied. It is proposed that the parking supply for the large buildings align with the Town's ***suggested*** minimum parking rates below. Parking is calculated for each individual building, including accessory office space, as follows:

- *For the first 5,000 m^2 of gross floor area, 1 parking space per **100 m^2** of gross floor area shall be provided; and*
- *Gross floor area greater than 5,000 m^2, 1 parking space per **200 m^2** of gross floor area.*

***Proposed Small Buildings*:**

A 10% reduction in GFA for the remaining buildings with a relatively small GFA, has been applied as part of the parking calculations. This includes Building 1 on the **south** portion of the site, along with Buildings 2, 3, 4, 5, 7 and 9. It is proposed that the parking supply for the small buildings align with the Town's current minimum parking rates outlined in Town of Milton Comprehensive Zoning By-law 016-2014 (HUSP Urban Area – March 2023) for parking considerations.

Comment 5: Section 5.1 (Truck Circulation) – Please note that a detailed pavement marking and signage plan will be required as part of the Site Plan application.

Response: A detailed pavement marking and signage plan will be provided as part of the Site Plan application.

Comment 6: Traffic volumes – Please provide the exact number of calculated site trips, future background and total traffic volumes. It is the Town's preference to use the exact volumes for analysis as opposed to rounding to the nearest five.

Response: The traffic analysis has been updated such that the traffic volumes have not been rounded to the nearest 5 vehicles in the updated analysis.

Comment 7: Trip Generation – Please ensure that reasonable assumptions are made, and clearly documented within the report when calculating the expected trip generation for the site. If the uses are not known, it is preferred that a conservative approach be evaluated as to account for the "worst-case" scenario. Additionally, please append all relative trip generation data/sheets to the TIS.

Response: Under the Official Plan, the Derry Green Corporate Business Park Secondary Plan (DGCBP) provides the flexibility to accommodate a broad range of potential uses that include prestige offices, street related employment uses, R&D and light industrial development. The total number of weekday peak hour trips associated with each of the 10 proposed buildings have been forecasted based on ITE 11th Edition trip generation rates for LUC 150 – Warehousing and LUC 110 – General Light Industrial uses. The chosen rates are summarized in **Table 11** of the May 2025 BA Group Report. The average of the two rates was used in

Comment 8: Please identify the trip assumptions for the community park and where the values were derived from as this was not documented within the TIS.

Response: The community park has not been included within the current proposal hence no trips have been included for this use in the updated analysis.

Comment 9: Section 7.3.3 – Provide additional justification as to why the proxy-site data was used to calculate the heavy-vehicle percentages and how the proxy site is comparable to the current development. Alternatively, heavy-vehicle percentages from the ITE Trip Generation Manual can be used for a similar land-use.

Response: The trip generation has been revised in the updated traffic analysis and is now based only on the prevailing ITE 11th Edition trip rates and heavy vehicle percentages.

Comment 10: Section 9.2 – Fifth Line/Clark Boulevard. Please identify the need to assess left-turn lanes. The ultimate design is already projected to include a signalized intersection with left-turn lanes on all approaches. Additionally, this scenario (stop control) as indicated within this section was never analyzed within the TIS. Please clarify this section.

Response: Although the ultimate design of the intersection of Fifth Line at Clark Boulevard includes a signalized intersection with left-turn lanes on all approaches, a left-turn justification warrant was included within the May 2025 BA Group Report as supplementary information only. It is acknowledged that there are no plans to operate this intersection without left-turn lanes nor without a traffic signal.

Comment 11: Section 9.2 & Table 30 – Please clarify the need to provide traffic signal warrants for the Fifth Line at Clark boulevard intersection. As mentioned previously, the ultimate design will include traffic signals at the intersection.

Response: Although the ultimate design of the intersection of Fifth Line at Clark Boulevard includes a signalized intersection with left-turn lanes on all approaches, a traffic signal warrant assessment was included within the May 2025 BA Group Report as supplementary information only. It is acknowledged that there are no plans to operate this intersection with two-way stop control.

Responses to September 13, 2023 Region of Halton Comments

Comment: Transportation Impact Study (TIS): Staff have reviewed the submitted "Derry Road & 5th Line, Derry Green Proposed Industrial Development, Traffic Impact Study and Parking Justification, Milton, Ontario" prepared by BA Group (dated July 2023). The Transportation Impact Study (TIS) and development concept must be updated to address the following critical items, per the technical comments provided in Appendix 'A' to this letter. The revised concept will require co-ordination with Regional Transportation Planning staff prior to the formal subdivision and by-law amendment submissions.

Response: Noted.

Comment: Future 5 ½ Line Corridor - 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 six-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. The exact location and configuration will be confirmed through a future Municipal Class Environmental Assessment (MCEA) Study which has not yet been initiated. However, 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 the requirements laid out in the study, as provided in Appendix 'A'.

Response: Noted.

Comment: Proposed Access to Derry Road - The development proposes a full-moves signalized access to Derry Road for Building 1, located approximately 300 metres east of Fifth Line measured from inner stop bar to inner stop bar. The TIS notes that traffic signal control is not warranted at this access per the Ontario Traffic Manual (OTM) Book 12 traffic signal warrant, but the TIS recommends traffic signal control at the access to mitigate northbound left-turn delays for outbound site traffic. This site access will require co-ordination with Transportation Planning per the requirements set out in Appendix 'A'.

Response: The updated site plan no longer includes a full movements signalized intersection along Derry Road for Building 1. Access to Building 1 on the north portion of the site is proposed via a new right-in/ right-out only intersection on Derry Road (approximately 330 metres east of Fifth Line). Building 1 on the Remington lands will also be provided access via a driveway easement to Clark Boulevard. This driveway easement will provide Building 1 traffic with access to the proposed new signalized intersection of Clark Boulevard at Derry Road. Access for Buildings 1 to 6 on the south portion of the site is proposed to be provided along Clark Boulevard to/from Fifth Line. As part of Phase 2, Clark Boulevard will be extended to provide a connection between Fifth Line and Derry Road so that all buildings on the south portion of the site will have the option to travel along Clark Boulevard, either to Fifth Line or Derry Road.

Comment: Right-of-way Requirement – Fifth Line: As noted above, 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 the 47-metre right-of-way from Fifth Line being protected for by the Town for the future potential 5 ½ Line alignment. Additional comments related to setbacks, noise feasibility studies and stormwater management have been provide in Appendix 'A'.

Response: Noted. To accommodate the potential future 5 ½ Line alignment, the current Site Plan reflects the future 47 metre right-of-way requirement along Clark Boulevard.

Responses to September 13, 2023 Region of Halton Comments (Appendix A - Technical Transportation Planning Comments)

Comment: Future 5 ½ Line Corridor - 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 six-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. The exact location and configuration will be confirmed through a future Municipal Class Environmental Assessment (MCEA) Study which has not yet been initiated. However, 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 the following potential alignments for the future 5 ½ Line corridor with a 47-metre right-of-way:

- Existing Fifth Line alignment. Land protection along Fifth Line has been co-ordinated with the Town and it is understood that the Town will be protecting for a 47- metre right-of-way dedication.
- Future north-south roadway (currently designated as Clark Boulevard) between Fifth Line and Sixth Line. The development proposal must consider that the future north-south roadway through the subject property (currently designated as Clark Boulevard) may ultimately be identified as a six-lane Regional Road, requiring a 47 metre right-of-way, continuing southerly beyond the subject property towards Britannia Road.

The modelling and analysis in the TIS does not need to consider either of these roadways as a six-lane roadway in the future. However, the development proposal must consider and the TIS must acknowledge 5 ½ Line as described above.

Response: As noted in the Town's September 2023 comments, "*the owner is to dedicate lands sufficient to provide a **37.5m right-of-way of Fifth Line** to the Satisfaction of the Town of Milton, in accordance with the EA study completed by MMM Group – October 2016. These lands shall be dedicated to the Town of Milton for the purpose of road right-of-way widening and future road improvements.*"

It is acknowledged that a future 47 metre right-of-way along the current Clark Bouelvard (potential future 5 ½ Line) has been considered.

Comment: Proposed Access to Derry Road - The development proposes a full-moves signalized access to Derry Road for Building 1, located approximately 300 metres east of Fifth Line measured from inner stop bar to inner stop bar. The TIS notes that traffic signal control is not warranted at this access per the Ontario Traffic Manual (OTM) Book 12 traffic signal warrant, but the TIS recommends traffic signal control at the access to mitigate northbound left-turn delays for outbound site traffic. This site access will require co-ordination with Transportation Planning as the following items will need to be considered:

- Access requirements for adjacent properties on Derry Road in the area; particularly the approved access for the Broccolini property on the north side of Derry Road to be located at the westerly limit of the Derry Road site frontage (located within 100 metres of the proposed Remington site access, which would result in an access spacing deficiency per Halton Region's Access Management Guideline).

- Potential for an internal connection to the adjacent Anatolia property for which access to Derry Road is proposed via the future signalized north-south roadway connection (currently designated as Clark Boulevard) to Derry Road.
- The forecasted total site traffic volumes at the proposed Remington site access (which may be updated in the TIS by addressing the additional comments provided below).
- The forecasted traffic operations at the site access under a full-moves side-street stop-controlled configuration (these forecasted operations must be provided to Transportation Planning).

The operation and geometrics of the proposed Remington site access would be confirmed through co-ordination with Transportation Planning prior to the formal submission and through Transportation Planning's review of a TIS Update at the formal submission stage. The detailed access geometrics would be later finalized through Engineering Drawings to be provided at the Engineering Submission stage of the development application process.

Response: The updated site plan no longer includes a full movements signalized intersection along Derry Road for Building 1. Access to Building 1 on the north portion of the site is proposed via a new right-in/ right-out only intersection on Derry Road (approximately 330 metres east of Fifth Line). Building 1 on the Remington lands will also be provided access via a driveway easement to Clark Boulevard. This driveway easement will provide Building 1 traffic with access to the proposed new signalized intersection of Clark Boulevard at Derry Road. Access for Buildings 1 to 6 on the south portion of the site is proposed to be provided along Clark Boulevard to/from Fifth Line. As part of Phase 2, Clark Boulevard will be extended to provide a connection between Fifth Line and Derry Road so that all buildings on the south portion of the site will have the option to travel along Clark Boulevard, either to Fifth Line or Derry Road.

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

1. A review of auxiliary eastbound right-turn lane or taper requirements on Derry Road at the proposed access.
2. A comparison between minimum sightline requirements per the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR) and provided sightline availability at the proposed access to Derry Road. done
3. A comparison between minimum clear throat length requirements and provided clear throat length availability at the proposed access to Derry Road.
4. A comparison between minimum access spacing requirements along Derry Road per Halton Region's Access Management Guideline, and the provided access spacing on Derry Road from Fifth Line to the future north-south roadway intersection.
5. A comparison of the trip generation forecasts between the proposed development and the subject property from the Derry Green Secondary Plan Transportation Study.

Response:

1. The functional plan includes an eastbound right-turn taper on Derry Road at the proposed right-in/ right-out site access for Building 1.

2. A sightline assessment and comparison between minimum sightline requirements as per the TAC standards, has been undertaken at the proposed right-in/ right-out access on Derry Road and is provided in **Appendix I** of the May 2025 BA Group Report.

3. Throat Length:
   - It is important to note that the Derry Road access is now a right-in/ right-out only with a right-turn taper being provided along Derry Road. It is also important to note that the maximum vehicle queue leaving the site is expected to be less than 5 metres, during peak periods of the day.

   - **Building 1 has around 20 metres of clear throat length,** measured between the stop bar and the internal intersection. Although TAC measures this distance from the edge of the curb return, it is our opinion that given the large radii being proposed, and that the stop bar is located halfway along the radius of the curb, that measuring from the stop bar is appropriate for determining the provided clear throat length as a representation of the internal queueing space available**.** (Ref: TAC Chapter 8 – Access).

   - Per TAC, a light industrial building with a GFA of under 10,000 m^2 would require a minimum clear throat length of 15 metres when off an arterial road. For a building with a GFA between 10,000 and 45,000 m^2, the minimum clear throat length requirement off an arterial road increases to 30 metres. (TAC Table 8.9.3)

   - The northern Building 1 has a proposed 12,400 m^2 of light industrial GFA, which just barely pushes it into the 30-metre clear throat length requirement category. Given the scale of the building being much closer in size to a 10,000 m^2 site than a 45,000 m^2 industrial site, it is our opinion that an appropriate minimum throat length if applying the TAC guidelines would be between 15 and 30 metres.

   - Furthermore, the RI/RO access for Building 1 is not the only method of access to this portion of the site. Supplementary access is also provided through the adjacent Anatolia lands, intended for vehicles arriving from the east and leaving towards the west, which can perform left-turning movements at the Clark Boulevard and Derry Road intersection. Therefore, the anticipated volume of light and heavy vehicles that enter and exit the northern Building 1 is split between the right/in right/out access and the Clark Boulevard intersection. The allocation of these traffic volumes is expected to be approximately 50/50 throughout the day, with more inbound AM trips weighted to the right-in right-out and more outbound PM trips weighted to the Clark left turn. Therefore, the traffic generating potential of the 12,400 m^2 building can be considered to be approximately half at the right-in right-out access alone, which if applied a 6,200 m^2 (half of the proposed GFA) building, would as per TAC guidelines only require a minimum clear throat length of 15 metres, which the provided 20 metre clear throat length would meet.

4. As the proposed new right-in/ right-out access along Derry Road is approximately 330 metres away from Fifth Line, the requirements of Halton Region's Access Management Guideline are met as the minimum distance required is 115 metres.
5. A comparison of the trip generation forecasts between the proposed development and the site from the Derry Green Secondary Plan Transportation Study has been included in the May 2025 BA Group Report in **Table 25**.

Comment: Use the exact traffic volumes from the existing traffic counts for the baseline analysis volumes as opposed to rounding the volumes to the nearest five.

Response: The traffic analysis has been updated such that the traffic volumes have not been rounded to the nearest 5 vehicles.

Comment: Update the descriptions of Clark Boulevard and the future 5 ½ Line corridor, as well as Figure 5 (Future Area Road Improvements) to reflect the description and status noted in the comments above under "Future 5 ½ Line Corridor".

Response: Noted and updated in the May 2025 BA Group Report.

Comment: Note in the TIS report that the location of the future north-south roadway connection to Derry Road will be confirmed through the Anatolia property development review process.

Response: Noted.

Comment: Update Figure 8 to illustrate the existing active transportation infrastructure on Derry Road west of James Snow Parkway.

Response: Figure 8 has been updated in the May 2025 BA Group Report to illustrate the existing active transportation infrastructure (multi-use pathway) on Derry Road, west of James Snow Parkway.

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

Response: The latest available documentation for all background developments has been reviewed and incorporated into the updated traffic forecast.

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: As in the previous traffic analysis, the assumptions outlined above have been adopted in the updated traffic forecast for the May 2025 BA Group Report.

Comment: Use the exact forecasted future background and total traffic volumes in the analysis as opposed to rounding the volume forecasts to the nearest five.

Response: The traffic analysis has been updated such that the traffic volumes have not been rounded to the nearest 5 vehicles.

Comment: If the specific uses of the proposed buildings are better known when updating the TIS for the formal DPS and ZBA submission, then apply the most appropriate Land Use Category (LUC) from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th edition for each building. Alternatively, consideration could be given to applying an alternate LUC that reflects a variety of industrial uses within an industrial area. The future traffic analyses in support of the future Site Plan Applications for each building can confirm the exact use and apply the most appropriate LUC if the exact use for each building is not known when updating the TIS for the formal DPS and ZBA submission.

Response: Noted. ITE 11th Edition rates for a combination of warehousing and manufacturing uses were adopted to reflect a conservative estimate of site traffic. Site traffic estimates may be adjusted as appropriate in future submissions.

Comment: Correct the text in Table 10 to reference the 11th edition of the ITE Trip Generation Manual as opposed to the 10th edition.

Response: This table has been corrected in the May 2025 BA Group Report and ITE 11th Edition rates have been used in the traffic analysis.

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: Proxy data is not used in the updated analysis. The updated trip generation estimates were based on prevailing ITE 11th Edition trip rates and heavy vehicle percentages.

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: The updated trip generation estimates have been based on prevailing ITE 11th Edition trip rates and heavy vehicle percentages.

Comment: Use the exact inbound and outbound trip generation forecasts from the ITE Trip Generation Manual as opposed to rounding the volume forecasts to the nearest five.

Response: The traffic analysis has been updated such that the traffic volumes have not been rounded to the nearest 5 vehicles in the updated analysis.

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

Response: As ITE rates were used in the updated traffic analysis as opposed to proxy trip rates, additional information to support trip generation has not been provided.

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. In addition, please document these critical thresholds as defined in Halton Region's TIS Guidelines.

Response: The updated traffic operations summaries include highlights on all critical movements, based upon the above criteria.

Comment: Under the sensitivity analysis section where the acceleration of the future Derry Road widening is analyzed, 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 (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: The May 2025 BA Group Report has been updated in Section 2.1.2. to include updated information regarding the benefits of the 5 ½ Line corridor.

Comment: Append all auxiliary left-turn lane warrant analysis worksheets to the TIS report.

Response: As supplementary information, a left-turn lane warrant analysis for the intersection of Fifth Line and Clark Boulevard is provided in **Appendix K** of the May 2025 BA Group Report.

Comment: Append Halton Region's Terms of Reference comments pertaining to the Remington development to the TIS (the currently appended comments pertain to the adjacent Anatolia development).

Response: The initial transportation consultant on the file (CGH Consulting) began work on both the Anatolia and Remington sites in tandem. When BA Group was retained to continue with the transportation work for both of the sites, only the Terms of Reference for the Anatolia site were made available. As the sites are adjacent, it was assumed that the Terms of Reference and methodology for the Anatolia site TIS could be adopted for the Remington site TIS. For this reason, the Terms of Reference for the Anatolia site have been provided in Appendix B.

Comment: Correct the appended Synchro reports to reflect the agreed-upon 2027 and 2032 horizon years as opposed to the 2028 and 2033 horizon years.

Response: It is estimated that the Phase 1 buildings will be completed and fully leased by the end of 2030 while the Phase 2 buildings will be completed by 2035. For this reason, travel demand forecasts were established for Phase 1 (2030) and Phase 2 (2035) horizons. The detailed traffic analysis for both the 2030 and 2035 horizons include scenarios that consider the status of the Clark Boulevard Extension, as well as the

potential development on the adjacent Anatolia 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. 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 the two horizons (2030 and 2035). The chosen horizons are more conservative than the initial 2027 and 2032 horizons and are more reflective of the development plans for both Remington and Anatolia.

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

Response: A daylight triangle of 15m X 15m has been illustrated on the southeast corner at Derry Road and Fifth Line in the functional plans provided in Appendix C of the May 2025 BA Group Report.

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. A daylight triangle of 15m X 15m was was provided at Derry Road and the future Clark Boulevard as part of the approval of the adjacent Anatolia site.

TABLE OF CONTENTS

Executive Summary 1

1.0 INTRODUCTION 5

1.1 Development Concept 5

1.1.1 Summary of Site Statistics 5

1.1.2 Site Access and Circulation 6

1.2 Study Scope 10

2.0 TRANSPORTATION CONTEXT 12

2.1 Area Road Network 12

2.1.1 Existing Area Road Network 12

2.1.2 Future Area Road Network 12

2.2 Area Transit Network 20

2.2.1 Existing Transit Service 20

2.2.2 Future Transit Service 20

2.3 Area Cycling and Pedestrian Network 20

3.0 VEHICLE PARKING CONSIDERATIONS 22

3.1 Comprehensive Zoning By-Law 016-2014 22

3.2 Proposed Parking Rates 23

3.2.1 Accessible Parking 25

4.0 BICYCLE PARKING CONSIDERATIONS 27

5.0 LOADING CONSIDERATIONS 28

5.1 Truck Circulation 29

6.0 TRANSPORTATION DEMAND MANAGEMENT PLAN 30

6.1 Overview 30

6.1.1 Vehicle Parking 30

6.1.2 Bicycle Parking Spaces 30

6.1.3 Carpool Program & Parking Spaces 30

6.1.4 Employee Information & Education 30

6.1.5 Monitoring 30

6.2 TDM Plan Implementation 31

7.0 TRAFFIC VOLUME FORECASTING 32

7.1 Existing Traffic Conditions 32

7.2 Future Background Traffic Conditions 34

7.2.1 Background Growth Scenarios 34
7.2.2 General Corridor Growth 34
7.2.3 Background Developments 35
7.2.4 Total Background Growth Traffic Volumes 36
7.2.5 Future Total Background Traffic Volumes 36
7.3 Site Traffic 41
7.3.1 Existing Site Traffic 41
7.3.2 Development Phases 41
7.3.3 Total Site Trip Generation 41
7.3.4 Heavy Vehicle Percentages 42
7.3.5 Site Traffic Distribution 43
7.3.6 Site Traffic Volumes 43
7.4 Future Total Traffic Volumes 45

8.0 TRAFFIC OPERATIONS ANALYSIS 54
8.1 Analysis Methodology 54
8.2 Analysis Assumption and Parameters 54
8.3 Traffic Analysis Summary 55
8.3.1 Signalized Intersections 55
8.3.2 Unsignalized Intersections 60
8.3.3 Sensitivity Analysis – Derry Road Expansion 62
8.3.4 Traffic Analysis Summary 64
8.3.5 Derry Green Secondary Plan Traffic Volume Comparison 65

9.0 SAFETY ANALYSIS 66
9.1 Sight Distance Assessment 66
9.1.1 Building 7 Driveway 66
9.1.2 Building 8 South Driveway 68
9.1.3 Building 8 North Driveway 68
9.1.4 Building 1 (North Property) Driveway 69
9.1.5 Sight Distance Summary 70
9.2 Assessment for Left-Turning Lanes 71
9.3 Queuing Assessment 72
9.4 Traffic Signal Warrant Analysis 73

10.0 CONCLUSIONS AND RECOMMENDATIONS 74

LIST OF TABLES

Table 1	Summary of Proposed Development	6
Table 2	Zoning By-Law 06-2014: Minimum Parking Requirements	22
Table 3	Proposed Minimum Parking Rates and Supply	24
Table 4	Zoning By-Law 016-2014: Accessible Parking Requirements	25
Table 5	Summary of Bicycle Parking	27
Table 6	Summary of Loading Supply	28
Table 7	Recommended TDM Strategies	31
Table 8	Turning Movement Count Summary	32
Table 9	Future Background Growth Scenarios	34
Table 10	Area Background Developments	35
Table 11:	Vehicle Trip Generation Rate Data	41
Table 12	Total Site Vehicle Trip Generation	42
Table 13	Site Heavy Vehicle Percentage	42
Table 14	Site Traffic Distribution	43
Table 15	Site Vehicle Trip Summary	44
Table 16	Sixth Line / Derry Road Capacity Analysis Summary	56
Table 17	Fifth Line / Derry Road Capacity Analysis Summary	57
Table 18	James Snow Parkway / Derry Road Capacity Analysis Summary	58
Table 19	Clark Boulevard / Derry Road Capacity Analysis Summary	59
Table 20	Fifth Line / Clark Boulevard Capacity Analysis Summary	60
Table 21	2027 Unsignalized Intersection Capacity Analysis Summary	61
Table 22	Sixth Line / Derry Road Capacity Analysis Summary – Derry Road Expansion Sensitivity	62
Table 23	2032 Fifth Line / Derry Road Capacity Analysis Summary – Derry Road Expansion Sensitivity	63
Table 24	2032 Clark Boulevard / Derry Road Capacity Analysis Summary – Derry Road Expansion Sensitivity	64
Table 25	Secondary Plan Comparison – Clark Boulevard / Derry Road	65
Table 26	Sight Distance (Building 7 Driveway)	67
Table 27	Sight Distance (Building 8 South Driveway)	68
Table 28	Sight Distance (Building 8 North Driveway)	69
Table 29	Sight Distance (Building 1 Driveway)	69
Table 30	Queueing Summary – Key Intersection Movements	72
Table 31	Traffic Signal Warrants (2035) – Fifth Line / Clark Boulevard	73

LIST OF FIGURES

Figure 1: Site Location 8
Figure 2: Development Proposal 9
Figure 3: Existing Area Road Network 15
Figure 4: Existing Lane Configuration & Traffic Control 16
Figure 5: Future Area Road Improvements 17
Figure 6: Future Lane Configuration & Traffic Control - 2030 Horizon 18
Figure 7: Future Lane Configuration & Traffic Control - 2032 Horizon 19
Figure 8: Area Cycling Network 21
Figure 9: Existing Traffic Volumes 33
Figure 10: Background Growth Traffic Allowances – 2030 Horizon 37
Figure 11: Background Growth Traffic Allowances - 2035 Horizon 38
Figure 12: Future Total Background Traffic – 2030 Horizon 39
Figure 13: Future Total Background Traffic – 2035 Horizon 40
Figure 14: Light Vehicle Site Traffic Volumes – 2030 Horizon 46
Figure 15: Heavy Vehicle Site Traffic Volumes – 2030 Horizon 47
Figure 16: Total Site Traffic Volumes – 2030 Horizon 48
Figure 17: Light Vehicle Site Traffic Volumes – 2035 Horizon 49
Figure 18: Heavy Vehicle Site Traffic Volumes – 2035 Horizon 50
Figure 19: Total Site Traffic Volumes – 2035 Horizon 51
Figure 20: Future Total Traffic Volumes – 2030 Horizon 52
Figure 21: Future Total Traffic Volumes – 2035 Horizon 53

TABLE OF APPENDICES

Appendix A: Development Concept Plan

Appendix B: Town & Region Comments for Terms of Reference

Appendix C: Functional Road Plans

Appendix D: Vehicle Maneuvering Diagrams

Appendix E: Traffic Volumes

Appendix F: TTS Data

Appendix G: Traffic Signal Timings

Appendix H: Synchro Worksheets

Appendix I: Sight Distance Assessment

Appendix J: Traffic Signal Warrant Analysis

Appendix K: Left-Turn Lane Assessment

EXECUTIVE SUMMARY

BA Group was retained by The Remington Group Incorporated to provide transportation consulting services related to a proposed industrial development located on Fifth Line at Derry Road, in the Town of Milton, in the Region of Halton. The site is bounded by Derry Road to the north, future industrial lands to the east and north (Anatolia Lands) and Fifth Line to the west and is north of the future Milton Phase 4 Britannia residential Secondary Plan Area. The site is within the Town's Derry Green Corporate Business Park Secondary Plan Area. The site includes two parcels of land, inclusive of north and south draft plans, that are divided by the existing Union Gas corridor. The south lands are at 6605 Fifth Line while the north lands do not have a municipal address.

Development Concept

The proposed development of the site includes the construction of 10 buildings, with a total gross floor area (GFA) of approximately 65,140 m^2. Under the Official Plan, the in-effect Derry Green Corporate Business Park Secondary Plan (DGCBP) provides the flexibility to accommodate a broad range of potential uses that will include prestige offices, street-related employment uses, R&D and light industrial development. It is estimated that the Phase 1 buildings will be completed and fully leased by the end of 2030 while the Phase 2 buildings will be completed by 2035.

The east-west portion only of the new public road (Clark Boulevard) that connects between Fifth Line and the Anatolia property, is proposed to be constructed with a 26.0 metre right-of-way as part of the development proposal for Phase 1, with the assumption that Anatolia will construct the remaining north-south segment of Clark Boulevard that connects between Derry Road and the Remington property, such that the full connection of Clark Boulevard would be in place for Phase 2 of this proposal.

The updated site plan no longer includes a full movements signalized intersection along Derry Road for Building 1. Access to Building 1 on the north portion of the site is proposed via a new unsignalized right-in/ right-out only intersection on Derry Road (approximately 330 metres east of Fifth Line). Building 1 on the Remington lands will also be provided access via a driveway easement across the Anatolia lands to Clark Boulevard. This driveway easement will provide Building 1 traffic with access to the proposed new signalized intersection of Clark Boulevard at Derry Road. Access for Buildings 1 to 6 on the south portion of the site is proposed to be provided along Clark Boulevard to/from Fifth Line. As part of Phase 2, Clark Boulevard will be extended to provide a connection between Fifth Line and Derry Road so that all buildings on the south portion of the site will have the option to travel along Clark Boulevard, either to Fifth Line or Derry Road.

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 Sixth Line to the east of the site and Fifth Line, directly adjacent to the western border of the site. There are future plans to widen both Fifth Line and Sixth Line.

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 shared roadway cycle route is located along Sixth Line, providing access to the Great Lakes Waterfront Trail and Greenbelt Route and a multi-use pathway exists along the west side of James Snow Parkway. Off-street multiuse trails are provided along Derry Road between Ontario Street South and Trudeau Drive, and painted bike lanes are provided Trudeau Drive less than 2.0 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 bicycle parking supply that currently 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.

Vehicle Parking Considerations

The site is subject to the Town of Milton Comprehensive Zoning By-law 016-2014 (HUSP Urban Area – June 2019) for parking considerations. Application of this By-law to the site results in a total minimum parking requirement of 713 spaces (equivalent rate of 1.13 spaces/100 m^2). For the large buildings (Building 1 on the north portion of site and Buildings 6 & 8 on the south portion of the site), a 10% reduction in GFA was NOT applied. A 10% reduction in GFA for the remaining buildings with a relatively small GFA, was applied as part of the parking calculations.

For the large buildings, it is proposed that the parking supply align with the Town's suggested minimum parking rates below.

1. *For the first 5,000 m^2 of gross floor area, 1 parking space per **100 m^2** of gross floor area shall be provided; and*
2. *Gross floor area greater than 5,000 m^2, 1 parking space per **200 m^2** of gross floor area.*

For the small buildings it is proposed that the parking supply aligns with the Town's current minimum parking rates outlined in Town of Milton Comprehensive Zoning By-law 016-2014 (HUSP Urban Area – March 2023) for parking considerations.

The proposed parking supply slightly exceeds the minimum requirement of the proposed approach and includes 667 parking spaces, which equates to an average of 1.06 spaces per 100 m^2 GFA (1 space / 94 m^2) for the entire site

Bicycle Parking Considerations

Application of Zoning By-law 016-2014 to the site requires a total minimum of 17 bicycle parking spaces. The current architectural drawings provide a total of 32 parking spaces for bicycles. The proposed bicycle parking supply currently exceeds 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 for loading considerations, results in the minimum requirement of 22 loading spaces. As the development proposal includes a total of 58 loading spaces, the requirements of the Zoning By-law are exceeded. The loading supply include 12 metre x 3.5 metre spaces for tractor trailers and 6 metre x 3.5 metre spaces for cube vans.

Travel Demand

Travel demand forecasts were established for Phase 1 (2030) and Phase 2 (2035) horizons. The detailed traffic analysis for both the 2030 and 2035 horizons include scenarios that consider the status of the Clark Boulevard Extension, as well as the potential development on the adjacent Anatolia 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. 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 the two horizons (2030 and 2035).

When Phase 1 is complete in 2030, the site is expected to generate a total of 200 and 183 two-way trips, during the morning and afternoon peak hours, respectively. Following the full build-out of both phases in 2035, the site is expected to generate a total of 319 and 291 two-way trips during the morning and afternoon peak hours, respectively.

Traffic Analysis

While the area road network operates acceptably under existing conditions, capacity constraints arise in both the 2030 and 2035 future horizons. Specific vehicle movements at intersections along Derry Road are capacity constrained in 2030 and these operational issues are increased due to additional growth in 2035. 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 2035 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 undertaken

demonstrates 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

Sufficient turning sight distance is available for traffic right from the Building 1 driveway onto Derry Road (considering traffic approaching from the left) to comply with the TAC Geometric Design Guide for Canadian Roads. Based upon the site driveway sight distance review for the buildings on the south portion of the site, the proposed points of access along Clark Boulevard are expected to be adequate at the proposed driveway access points. With a recommended posted speed limit of 40 km/h and a design speed of 50 km/h speed around the curve, all relevant sightlines are acceptable. In addition, the proposed Building 1 (north property) site driveway along Derry Road, with a posted speed limit of 80 km/h and a design speed of 100 km/h accommodates sufficient sightlines. Therefore, the sightlines are expected to be 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; 50^{th} and 95^{th} percentile queues were reported for signalized intersection movements. The queueing assessment for key movements under existing conditions, 2030 future conditions and 2035 future conditions, indicates that queues can be accommodated within the available storage capacity in all scenarios. Storage capacities for key movements used by site traffic were based upon available plans for proposed intersections; 50^{th} percentile and 95^{th} 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.

- It is recommended that future traffic operations at the intersection 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 be installed, in order to address minor sight distance concerns along the Clark Boulevard curve.
- It is recommended that traffic signals be installed at Fifth Line & Clark Boulevard (planned as part of future intersection upgrades).

1.0 INTRODUCTION

BA Group was retained by The Remington Group Incorporated to provide transportation consulting services related to a proposed industrial development located on Fifth Line at Derry Road, in the Town of Milton, in the Region of Halton. The site is bounded by Derry Road to the north, future industrial lands to the east and north (Anatolia Lands) and Fifth Line to the west and is north of the future Milton Phase 4 Britannia residential Secondary Plan Area. The site is within the Town's Derry Green Corporate Business Park Secondary Plan Area.

The site includes two parcels of land, inclusive of north and south draft plans, that are divided by the existing Union Gas corridor. The south lands are at 6605 Fifth Line while the north lands do not have a municipal address. The site location is illustrated in **Figure 1**.

This Updated Traffic Impact Study and Parking Justification have been prepared as part of the **Official Plan Amendment (OPA), Draft Plan of Subdivision (DPOS)** and **Zoning By-law Amendment (ZBA)** applications being submitted to the Town of Milton.

1.1 DEVELOPMENT CONCEPT

1.1.1 Summary of Site Statistics

The proposed development of the site includes the construction of 10 buildings, with a total gross floor area (GFA) of approximately 65,140 m^2. Under the Official Plan, the in-effect Derry Green Corporate Business Park Secondary Plan (DGCBP) provides the flexibility to accommodate a broad range of potential uses that will include prestige offices, street related employment uses, R&D and light industrial development.

It is estimated that the Phase 1 buildings will be completed and fully leased by the end of 2030 while the Phase 2 buildings will be completed by 2035. The proposed development is summarized in **Table 1** and illustrated in **Figure 2**. A reduced scale drawing of the development concept plan is provided in **Appendix A.**

TABLE 1 SUMMARY OF PROPOSED DEVELOPMENT

Industrial Land Use	Proposed Building GFA	Proposed Number of Vehicle Parking Spaces	Proposed Number of Bicycle Parking Spaces	Proposed Number of Loading Spaces
Phase 1: North Parcel				
Building 1	12,400 m^2	90	3	10
Phase 1: South Parcel				
Building 1	2,850 m^2	49	2	1
Building 2	2,830 m^2	57	2	2
Building 3	3,300 m^2	61	2	2
Building 4	4,500 m^2	66	2	2
Building 5	1,700 m^2	39	2	0
Building 6	13,300 m^2	93	3	15
Phase 1 Sub-total	**40,880 m^2**	**455**	**16**	**32**
Phase 2: South Parcel				
Building 7	7,300 m^2	83	3	3
Building 8	16,300 m^2	109	4	22
Building 9	660 m^2	20	1	1
Phase 2 Sub-total	**24,260 m^2**	212	8	**26**
SITE TOTAL	**65,140 m^2**	**667**	**24**	**58**

Notes:
1. Site statistics based on site plans provided by Korsiak Urban Planning dated March 7, 2025.

1.1.2 Site Access and Circulation

1.1.2.1 New Public Road - Clark Boulevard

The east-west portion only of the new public road (Clark Boulevard) that connects between Fifth Line and the Anatolia property, is proposed to be constructed with a 26.0 metre right-of-way as part of the development proposal for Phase 1, with the assumption that Anatolia will construct the remaining north-south segment of Clark Boulevard that connects between Derry Road and the Remington property, such that the full connection of Clark Boulevard would be in place for Phase 2 of this proposal.

The updated site plan no longer includes a full movements signalized intersection along Derry Road for Building 1. Access to Building 1 on the north portion of the site is proposed via a new unsignalized right-in/ right-out only intersection on Derry Road (approximately 330 metres east of Fifth Line). Building 1 on the Remington lands will also be provided access via a driveway easement across the Anatolia lands to Clark Boulevard. This driveway easement will provide Building 1 traffic with access to the proposed new signalized intersection of Clark Boulevard at Derry Road. The location of the future north-south roadway connection to Derry Road has been confirmed through the Anatolia property development approval process.

Access for Buildings 1 to 6 on the south portion of the site is proposed to be provided along Clark Boulevard to/from Fifth Line. As part of Phase 2, Clark Boulevard will be extended to provide a connection between Fifth Line and Derry Road so that all buildings on the south portion of the site will have the option to travel along Clark Boulevard, either to Fifth Line or Derry Road.

It is understood that the Region of Halton, through their Transportation Master Plan (TMP), has identified the potential need for a north-south roadway corridor (5 ½ Line), between Fifth Line and Sixth Line, in order to accommodate future growth. The Environmental Assessment (EA) for the 5 ½ Line project has just begun in order to confirm the need for this potential road project and evaluate alternative options to accommodate growth. In the meantime, the site plan continues to respect the potential 47 metre right-of-way for 5 ½ Line.

1.1.2.2 Vehicle Access to Buildings

Phases 1 & 2: Building 1 (north portion of site)

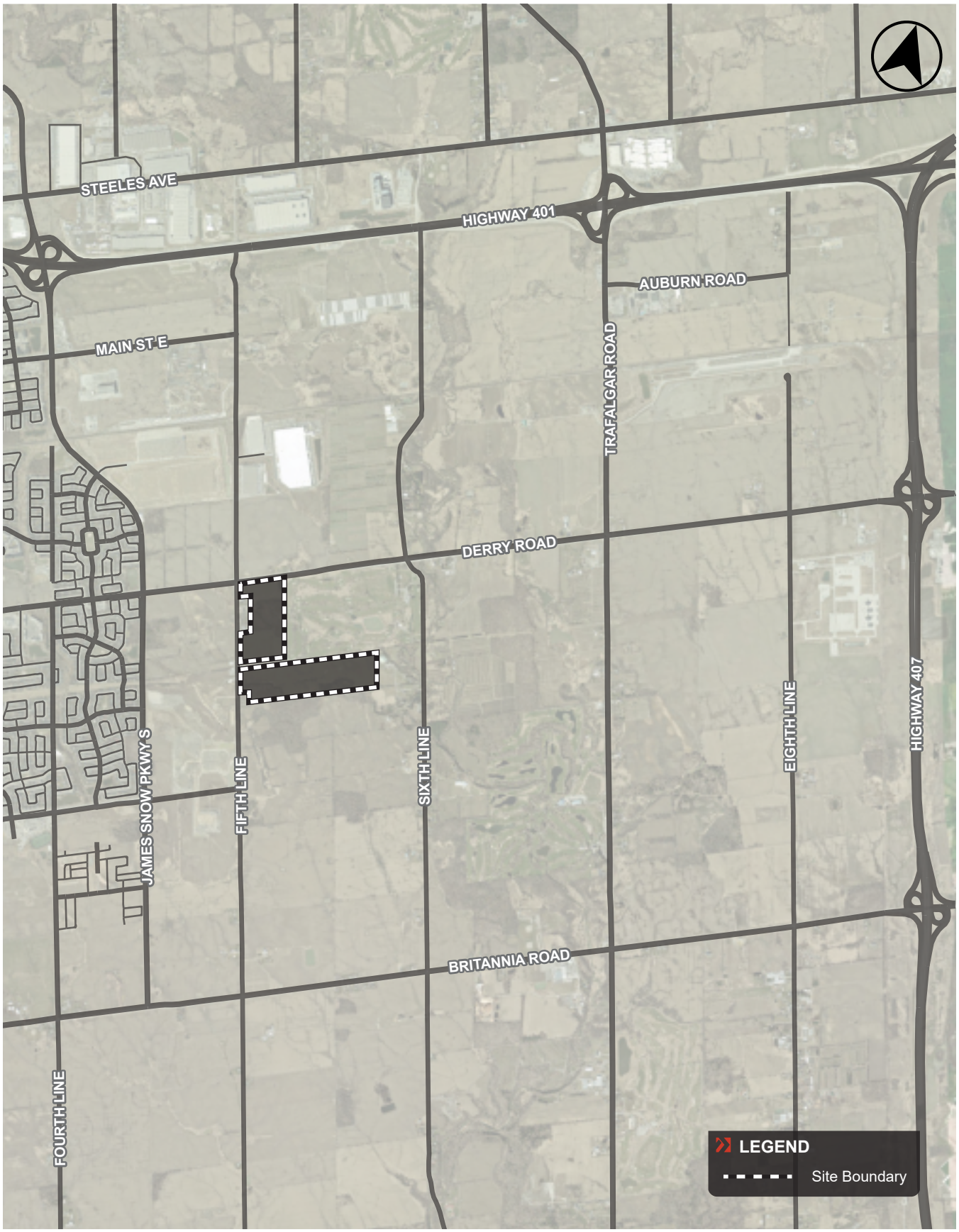
- 1 right-in right-out access (t-intersection) along Derry Road, approximately 330 metres east of Fifth Line, and approximately 430 metres to Clark Boulevard as per the location proposed by the Anatolia property. Additional access to and from this building is provided via an easement through the Anatolia lands, within their drive aisles, which connects to Clark Boulevard.

Phase 1: Buildings 1 to 6 (south portion of site)

- Access to be provided via private driveways along Clark Boulevard, with connectivity to Fifth Line.

Phase 2: Buildings 1 to 9 (south portion of site)

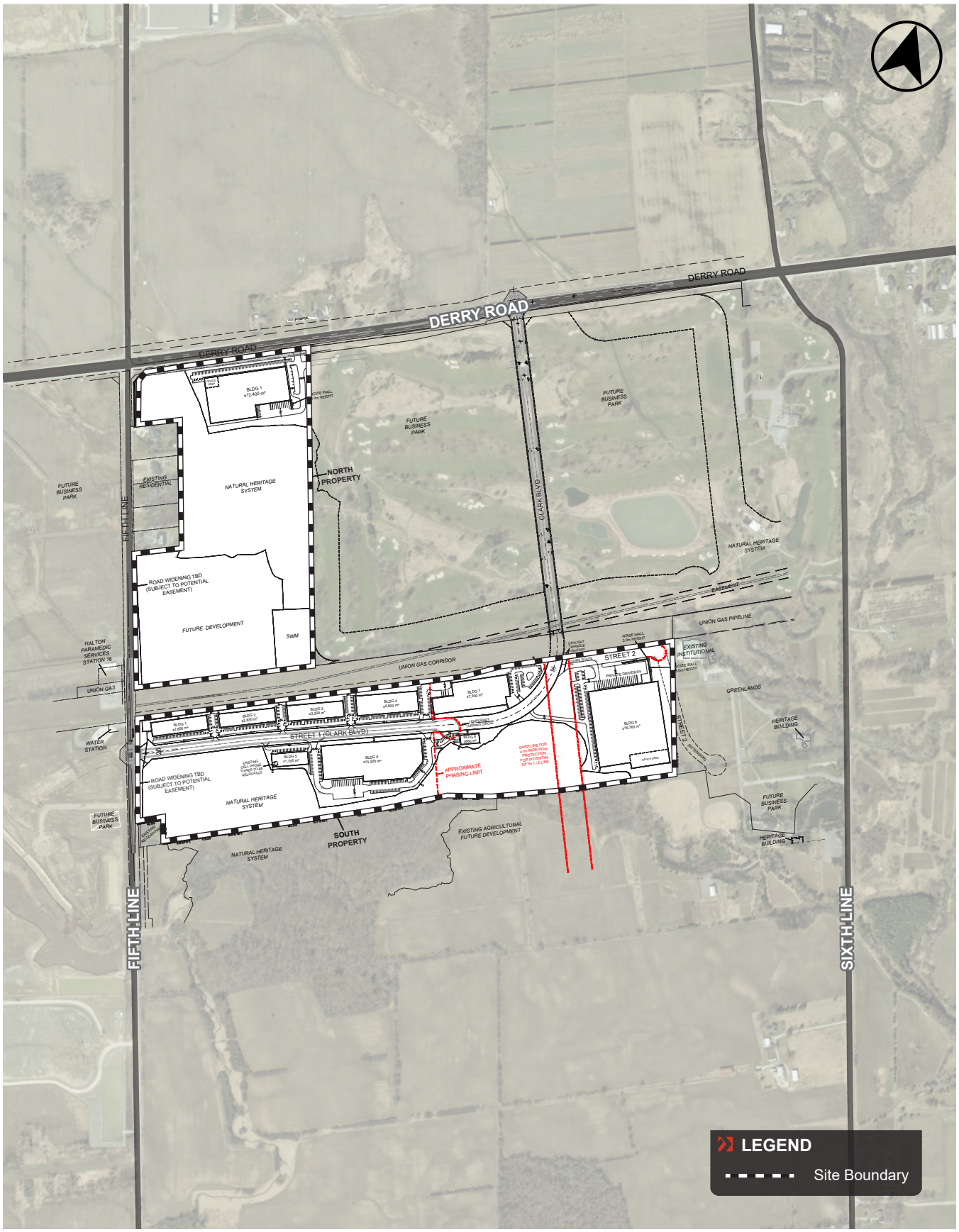
- Access to be provided via private driveways along Clark Boulevard with connectivity to both Fifth Line and Derry Road.



\\bamediaaccount.file.core.windows.net\fp02ata\WP\7040\06\Graphics\Adobe\IDs\7040-06_2025.indd

Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 1 SITE LOCATION



\\bamediaaccount.file.core.windows.net\fp02data\WP\7040\06\Graphics\Adobe\IDs\7040-06_2025.indd

Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 2 DEVELOPMENT PROPOSAL

1.2 STUDY SCOPE

The study scope is summarized below. The comprehensive comments received from the Halton Region and the Town of Milton regarding the terms of reference for the Traffic Impact Study, are provided 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, Fifth Line and Clark Boulevard.
- 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 as required.
- 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 **Figure 4.**

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 travelling 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 travelling 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 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 travelling 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 in the vicinity 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 travelling 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 the *Halton Region Transportation Master Plan (2031) – The Road to Change* and *Halton Region's Transportation Development and Non-Development Capital Implementation Plan (2023 - 2031) and* within *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 & the 2024 Transportation Master Plan*

Update has identified other improvements in the study area. The planned road improvements are described below.

Region of Halton Road Projects

5 ½ Line (New North Halton Corridor)

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 six-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. The exact location and configuration will be confirmed through a future Municipal Class Environmental Assessment (MCEA) Study which has not yet been initiated. However, in consideration of the Council approved policy framework noted above, and in an effort to ensure the proposed development remains viable, the development proposal has considered the following potential alignments for the future 5 ½ Line corridor with a 47-metre right-of-way:

- Existing Fifth Line alignment. Land protection along Fifth Line is being co-ordinated with the Town.
- Future north-south roadway (currently designated as Clark Boulevard) between Fifth Line and Sixth Line. The development proposal has considered that the future north-south roadway through the site (currently Clark Boulevard) may ultimately be identified as a six-lane Regional Road, requiring a 47 metre right-of-way, continuing southerly beyond the subject property towards Britannia Road.

Trafalgar Road
Planned widening from 4 to 6 lanes between Steeles Avenue and Britannia Road with construction to begin in 2030.

James Snow Parkway
Planned widening from 4 to 6 lanes between Steeles Avenue and Britannia Road with construction to tentatively begin in 2026. The EA is underway and the consultant is HDR.

Derry Road
Planned widening from 4 to 6 lanes between Highway 407 and Tremaine Road with construction planned by 2031.

Britannia Road
Road widening from 2 to 6 lanes between Tremaine Road and Highway 407. Project was 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 now largely completed.

Town of Milton Road Projects

Fifth Line
The Fifth Line widening from 2 to 4 lanes as a minor arterial (Highway 401 to Britannia Road) was included in Milton's TMP as "Other ongoing and future planning projects" and the project is already well underway.

Sixth Line
The Environmental Assessment (EA) process for the widening of Sixth Line from 2 to 4 lanes as an arterial road, from Britannia Road to Highway 401, has begun.

Main Street
The Environmental Assessment (EA) process for extension of Main Street (0 to 4 lanes) Fifth Line to Trafalgar Road, is currently underway.

Louis St.Laurent Avenue
The extension of Louis St. Laurent Avenue from Fifth Line to Trafalgar Road will be subject to an EA to confirm the alignment as there are environmental considerations to be made. The Town currently has tentative plans to start the EA for the portion between Fifth Line and Sixth Line in 2026, but this may be subject to change.

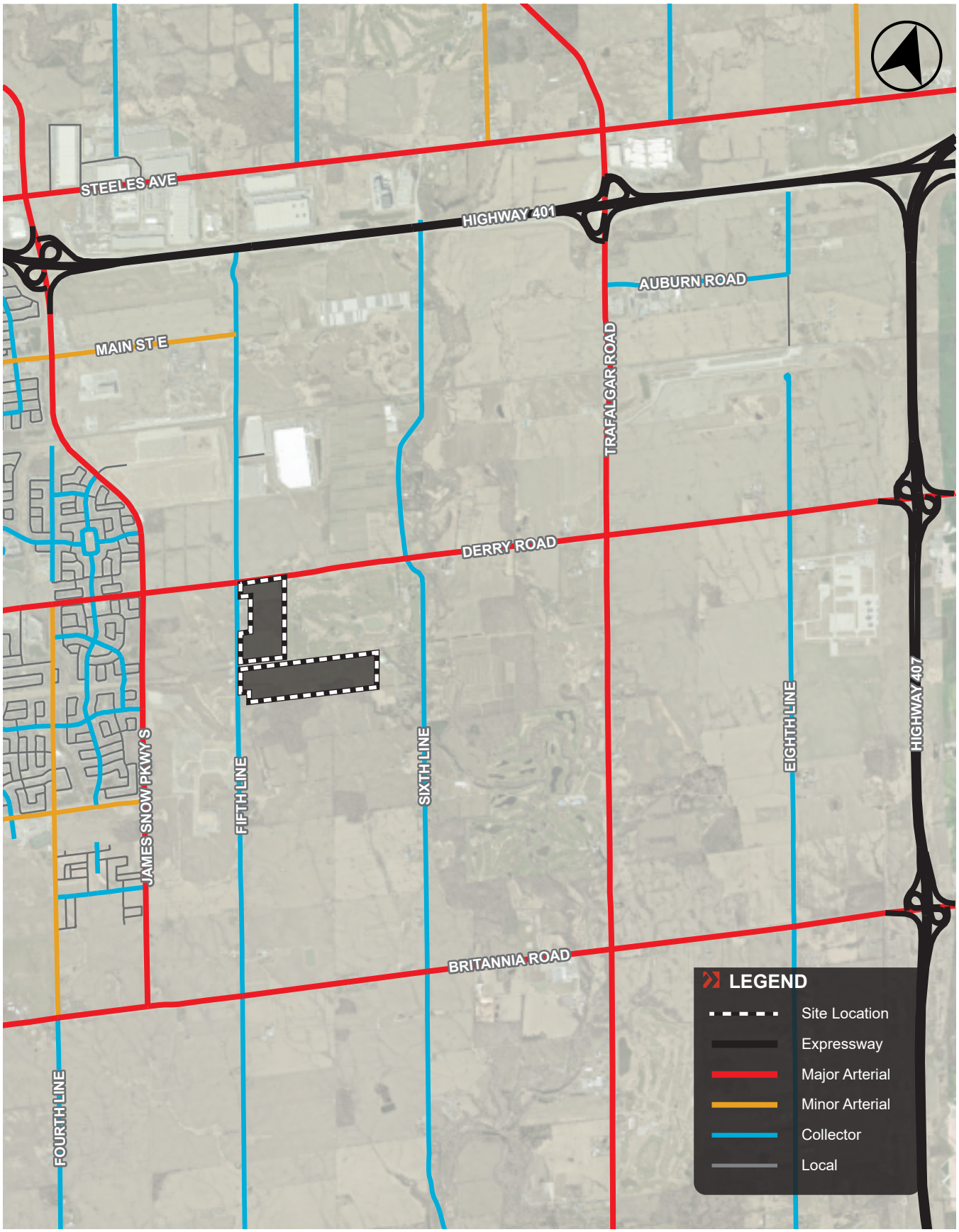
It is noted that the Louis St. Laurent / James Snow Parkway intersection was already operating as a 4-legged intersection at the time that the traffic counts utilized in this Study were undertaken.

2.1.2.2 Development Proposal Road Network

The proposed alignment and functional plans for Phase 1 and Phase 2 of the development proposal and the status of Clark Boulevard, along with the functional plan for the proposed new right-in/ right-out intersection along Derry Road, are shown in **Appendix C.**

Clark Boulevard
The east-west portion only of the new public road (Clark Boulevard) that connects between Fifth Line and the Anatolia property, is proposed to be constructed with a 26.0 metre right-of-way as part of the development proposal for Phase 1, with the assumption that Anatolia will construct the remaining north-south segment of Clark Boulevard that connects between Derry Road and the Remington property, such that the full connection of Clark Boulevard would be in place for Phase 2 of this proposal. In the future conditions, the remaining north-south segment of Clark Boulevard, across the Anatolia property, is proposed to be constructed with a 26.0 metre right-of-way and will connect from the Remington property to a new signalized intersection at Derry Road. As part of Phase 2, Clark Boulevard will be extended to provide a connection between Fifth Line and Derry Road so that all buildings on the south portion of the site will have the option to travel along Clark Boulevard, either to Fifth Line or Derry Road.

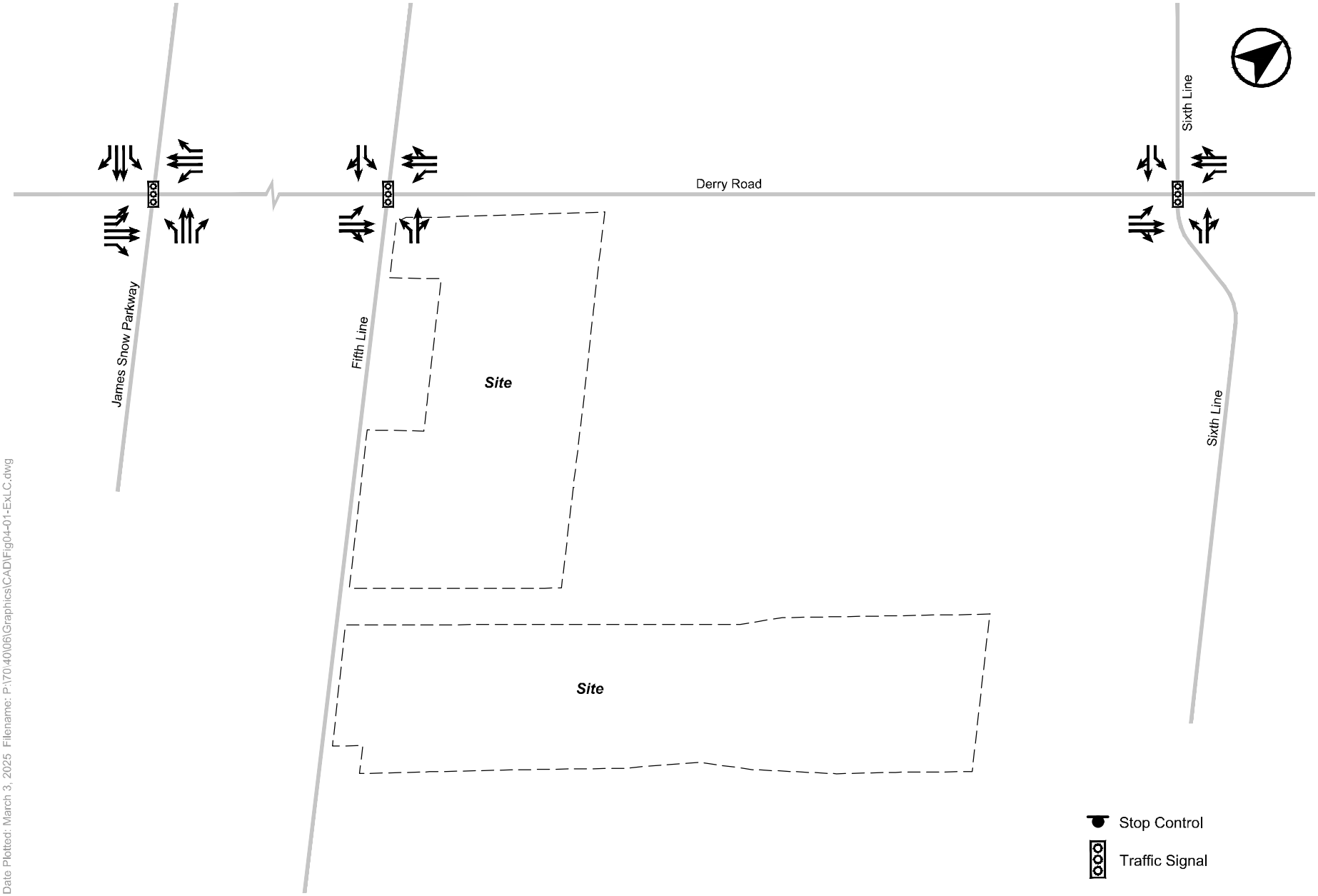
The future lane configuration and traffic control for the 2030 horizon is provided in **Figure 6**. The future lane configuration and traffic control for the 2035 horizon is provided in **Figure 7.**



\\bamediaaccount.file.core.windows.net\fp02ata\WP\70\40\06\Graphics\Adobe\IDs\7040-06_2025.indd

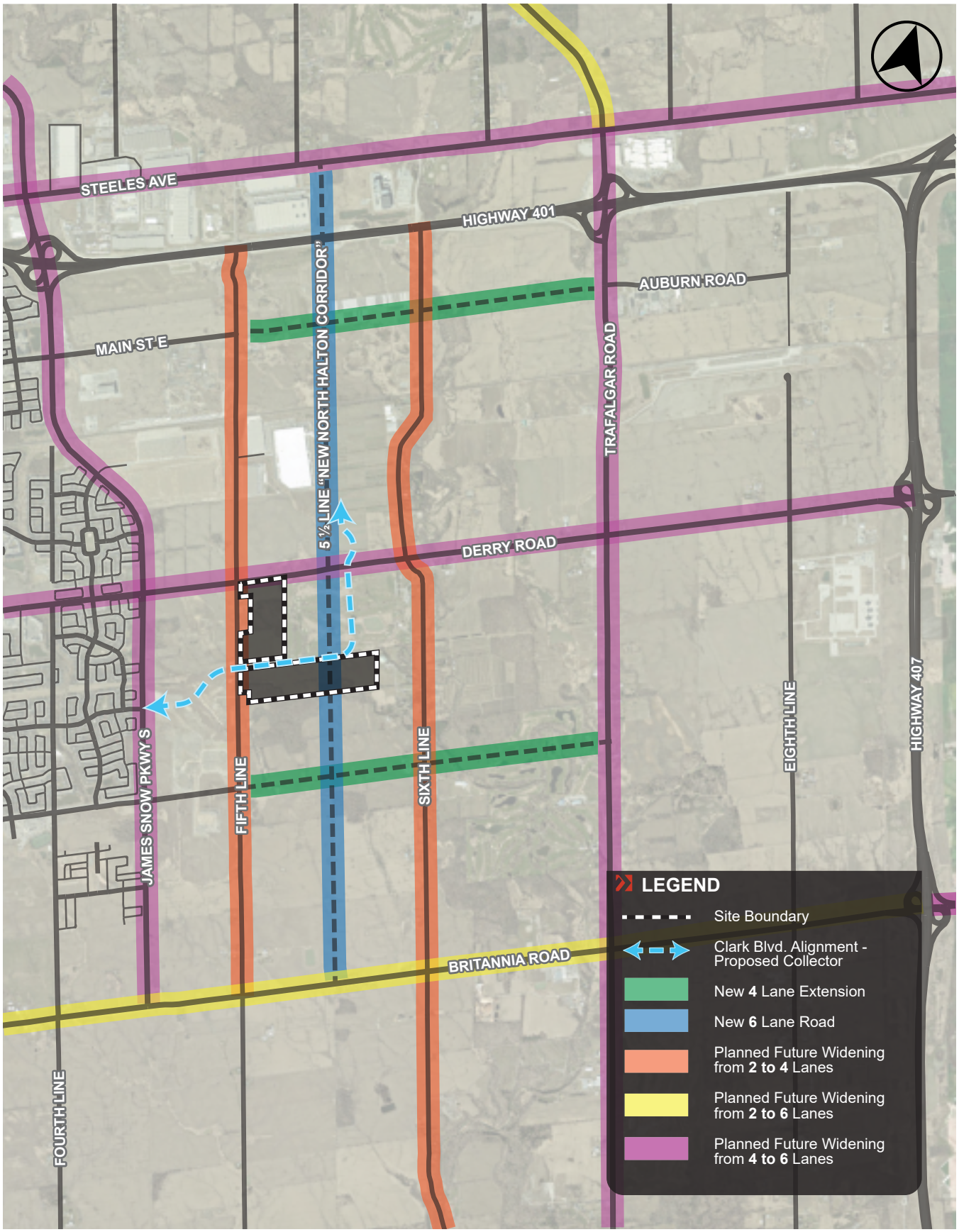
Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 3 EXISTING AREA ROAD NETWORK



Date Plotted: March 3, 2025 Filename: P:\70\40\06\Graphics\CAD\Fig04-01-ExLC.dwg

FIGURE 4 EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL



\\bamediaaccount.file.core.windows.net\fp02data\WP\7040\06\Graphics\Adobe\IDs\7040-06_2025.indd

Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 5 FUTURE AREA ROAD IMPROVEMENTS

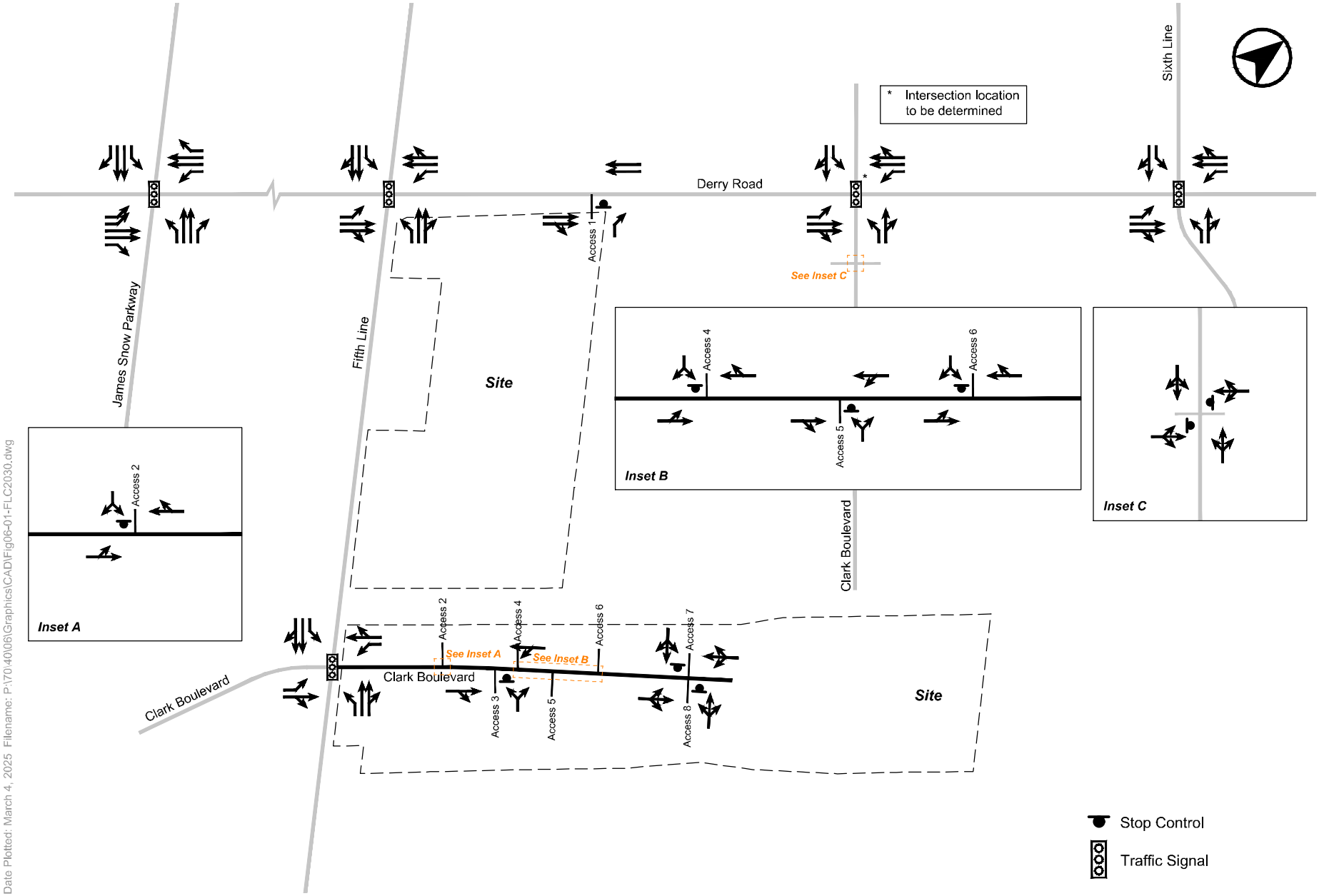


FIGURE 6 FUTURE LANE CONFIGURATION AND TRAFFIC CONTROL - 2030 HORIZON

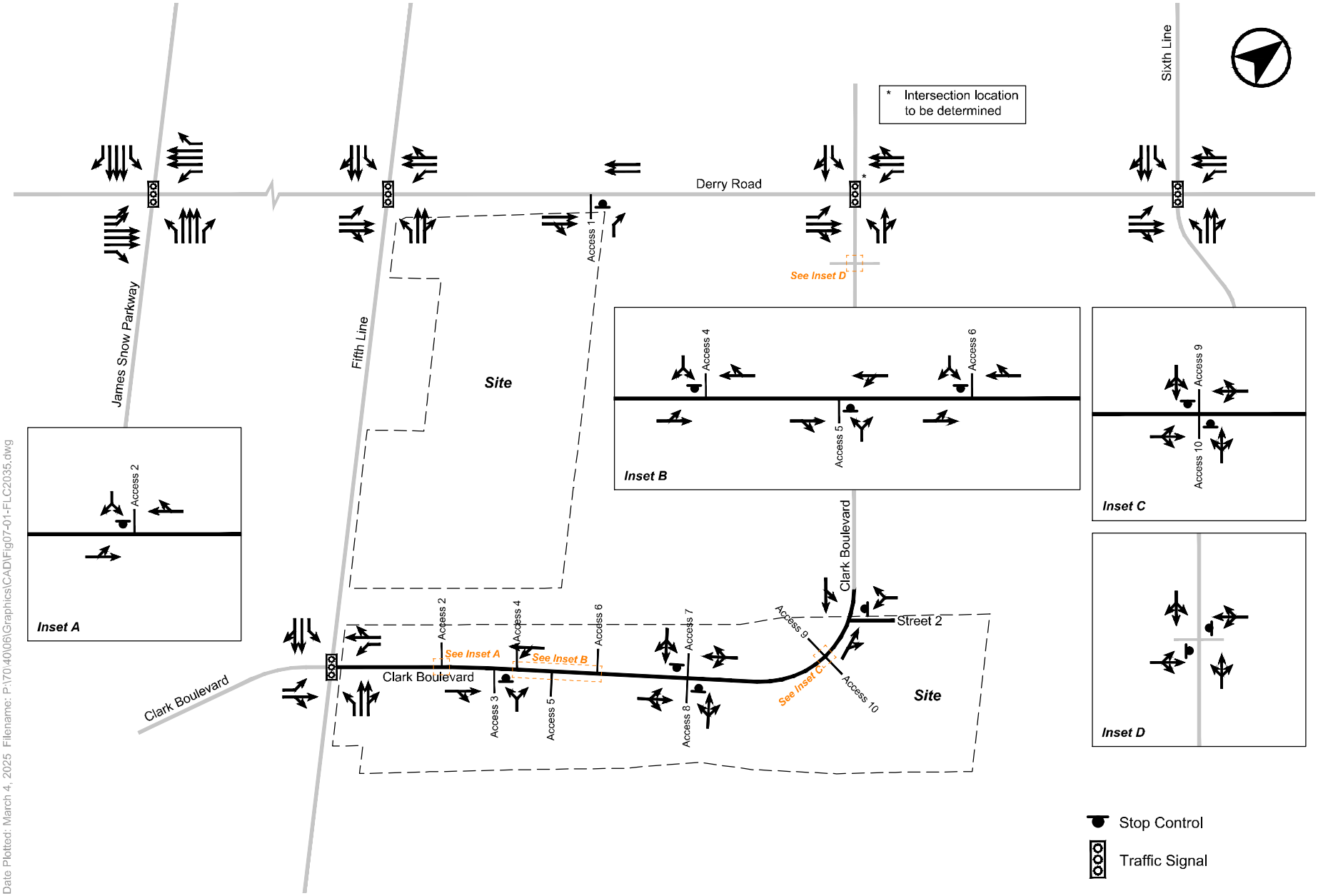


FIGURE 7 FUTURE LANE CONFIGURATION AND TRAFFIC CONTROL - 2035 HORIZON

2.2 AREA TRANSIT NETWORK

2.2.1 Existing Transit Service

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. Currently there is no local transit to the site but the Milton Transportation Master Plan is under review, which will include service to the Derry Green Corporate Business Park (DGCBP) Area.

2.2.2 Future Transit Service

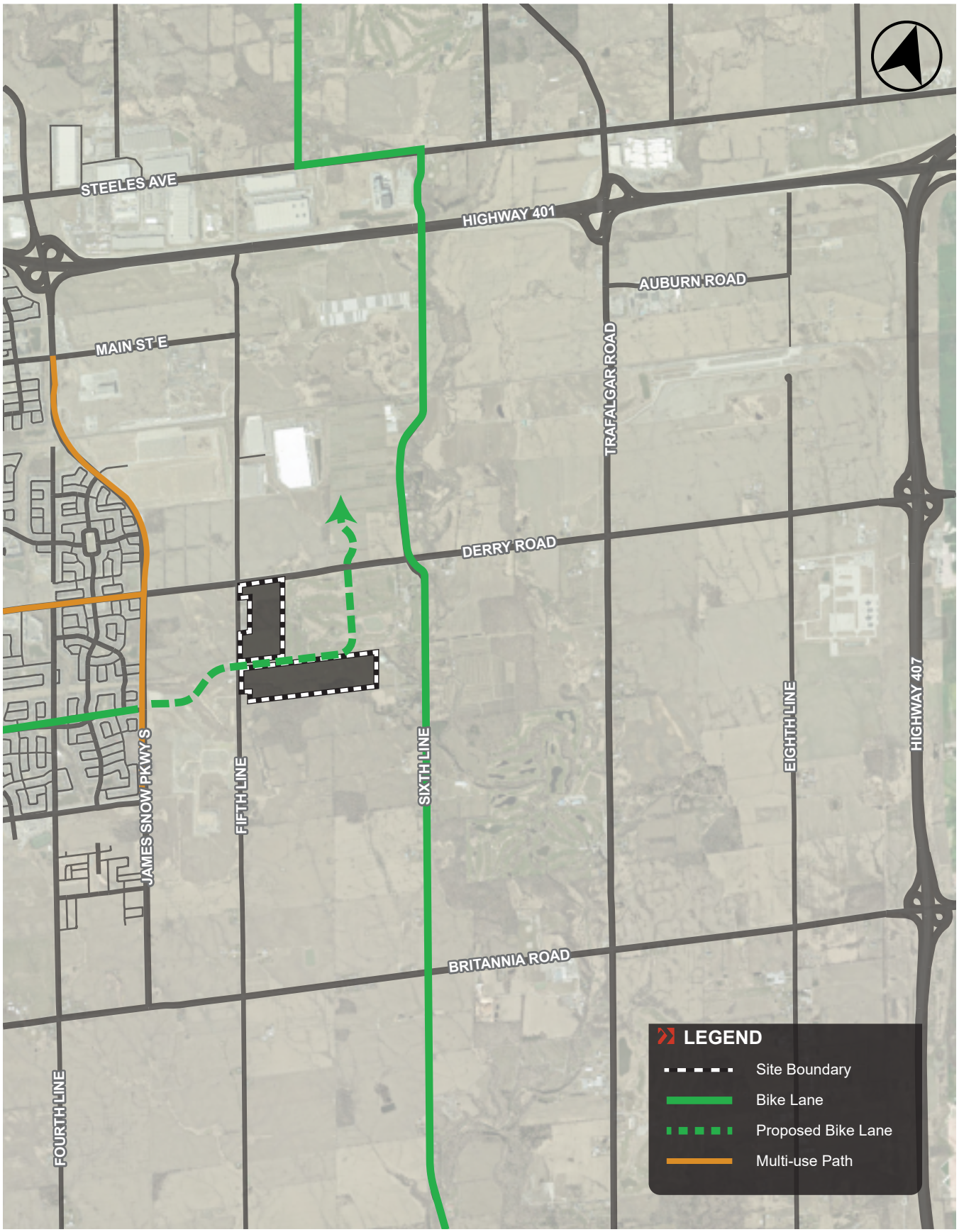
There is a future Milton-Trafalgar GO Station planned at Trafalgar Road before Highway 401, north of Derry Road. It is likely that transportation networks, including local and/or Regional Transit and active transportation networks, will be provided to/from this location.

2.3 AREA CYCLING AND PEDESTRIAN NETWORK

In the vicinity of the site, a shared roadway cycle route is located along Sixth Line that provides access to the Great Lakes Waterfront Trail and Greenbelt Route and a multi-use pathway exists on the west side of James Snow Parkway. 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.

The area cycling network is illustrated in **Figure 8**.

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.



\\bamediaaccount.file.core.windows.net\fp02data\WP\7040\06\Graphics\Adobe\IDs\7040-06_2025.indd

Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 8 AREA CYCLING NETWORK

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 713 spaces. The average required parking rate for the site is 1.13 spaces per 100 m^2 GFA (1 space/88 m^2).

For the large buildings (Building 1 on the north portion of site and Buildings 6 & 8 on the south portion of the site), a 10% reduction in GFA has NOT been applied. A 10% reduction in GFA for the remaining buildings with a relatively small GFA, **has been applied** as part of the parking calculations.

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

Industrial Land Use	Proposed Building GFA	Minimum Zoning By-law Requirement	Minimum Number of Required Parking Spaces
Phase 1: North Parcel			
Building 1	12,400 m^2	0 to 1,000 m^2 = 1 space/30 m^2 1,001 m^2 to 5,000 m^2 = 1 space/100 m^2 >5,000 m^2 = 1 space/200 m^2	111
Phase 1: South Parcel			
Building 1	2,565 m^2	0 to 1,000 m^2 = 1 space/30 m^2 1,001 m^2 to 5,000 m^2 = 1 space/100 m^2 >5,000 m^2 = 1 space/200 m^2	49
Building 2	2,547 m^2		49
Building 3	2,970 m^2		54
Building 4	4,050 m^2		64
Building 5	1,530 m^2		39
Building 6	13,300 m^2		115
Phase 1 Sub-total	**39,362 m^2**	**--**	**481**
Phase 2: South Parcel			
Building 7	6,570 m^2	0 to 1,000 m^2 = 1 space/30 m^2 1,001 m^2 to 5,000 m^2 = 1 space/100 m^2 >5,000 m^2 = 1 space/200 m^2	82
Building 8	16,300 m^2		130
Building 9	594 m^2		20
Phase 2 Sub-total	**23,464 m^2**	**--**	**232**
SITE TOTAL	**62,826 m^2**	**--**	**713**

Notes:
1. Site statistics based on site plans provided by Korsiak Urban Planning dated March 7, 2025.
2. As per Section 5.13 in the Zoning By-law, partial parking spaces must be rounded up to the nearest whole number.
3. Yellow shaded cells are large buildings (Buildings 1, 6 & 8) where the total GFA has NOT been reduced by 10%. The GFA has been reduced by 10% for all remaining buildings.

3.2 PROPOSED PARKING RATES

Application of the parking approach to the site, as outlined below, is summarized in **Table 3** and results in a total minimum parking requirement of 642 spaces. The average minimum required parking rate for the site, based on the proposed parking approach, is 1.02 spaces per 100 m^2 GFA (1 space / 98 m^2).

The proposed parking supply slightly exceeds the minimum requirement of the proposed approach and includes 667 parking spaces, which equates to an average of 1.06 spaces per 100 m^2 GFA (1 space / 94 m^2) for the entire site.

As these calculations consider the removal of 10% for the smaller buildings only, the total GFA for the parking calculations was considered to be 62,826 m^2.

Following discussions with the Town of Milton, the following rates and methodology are being proposed for the site's parking supply:

Proposed Large Buildings:

For large buildings (Building 1 on the north portion of site and Buildings 2 & 8 on the south portion of the site), a 10% reduction in GFA has NOT been applied.

It is proposed that the parking supply for the large buildings align with the Town's suggested minimum parking rates below.

> *Parking is calculated for each individual building, including accessory office space, as follows:*
>
> 3. *For the first 5,000 m^2 of gross floor area, 1 parking space per **100 m^2** of gross floor area shall be provided; and*
> 4. *Gross floor area greater than 5,000 m^2, 1 parking space per **200 m^2** of gross floor area.*

Proposed Small Buildings:

A 10% reduction in GFA for the remaining buildings with a relatively small GFA, has been applied as part of the parking calculations. This includes Building 1 on the **south** portion of the site, along with Buildings 2, 3, 4, 5, 7 and 9.

It is proposed that the parking supply for the small buildings align with the Town's current minimum parking rates outlined in Town of Milton Comprehensive Zoning By-law 016-2014 (HUSP Urban Area – March 2023) for parking considerations.

TABLE 3 PROPOSED MINIMUM PARKING RATES AND SUPPLY

Industrial Land Use	Proposed Building GFA	Proposed Minimum Parking Rates	Minimum Number of Required Parking Spaces	Proposed Number of Parking Spaces	Proposed Parking (Equivalent Rates)
Phase 1: North Parcel					
Building 1	12,400 m^2	0 to 5,000 m^2 = 1 space/100 m^2 >5,000 m^2 = 1 space/200 m^2	87	90	1 space/138 m^2 (0.72 spaces/100 m^2)
Phase 1: South Parcel					
Building 1	2,565 m^2	0 to 1,000 m^2 = 1 space/30 m^2 1,001 m^2 to 5,000 m^2 = 1 space/100 m^2 >5,000 m^2 = 1 space/200 m^2	49	49	1 space/52 m^2 (1.91 spaces/100 m^2)
Building 2	2,547 m^2		49	57	1 space/45 m^2 (2.23 spaces/100 m^2)
Building 3	2,970 m^2		53	61	1 space/49 m^2 (2.05 spaces/100 m^2)
Building 4	4,050 m^2		64	66	1 space/61 m^2 (1.62 spaces/100 m^2)
Building 5	1,530 m^2		39	39	1 space/39 m^2 (2.5 spaces/100 m^2)
Building 6	13,300 m^2	0 to 5,000 m^2 = 1 space/100 m^2 >5,000 m^2 = 1 space/200 m^2	92	93	1 space/143 m^2 (0.70 spaces/100 m^2)
Phase 1 Sub-total	**39,362 m^2**	**--**	**433**	**455**	**--**
Phase 2: South Parcel					
Building 7	6,570 m^2	0 to 1,000 m^2 = 1 space/30 m^2 1,001 m^2 to 5,000 m^2 = 1 space/100 m^2 >5,000 m^2 = 1 space/200 m^2	82	83	1 space/79 m^2 (1.26 spaces/100 m^2)
Building 8	16,300 m^2	0 to 5,000 m^2 = 1 space/100 m^2 >5,000 m^2 = 1 space/200 m^2	107	109	1 space/150 m^2 (0.67 spaces/100 m^2)
Building 9	594 m^2	0 to 1,000 m^2 = 1 space/30 m^2 1,001 m^2 to 5,000 m^2 = 1 space/100 m^2 >5,000 m^2 = 1 space/200 m^2	20	20	1 space/30 m^2 (3.36 spaces/100 m^2)
Phase 2 Sub-total	**23,464 m^2**	**--**	**209**	**212**	**--**

Industrial Land Use	Proposed Building GFA	Proposed Minimum Parking Rates	Minimum Number of Required Parking Spaces	Proposed Number of Parking Spaces	Proposed Parking (Equivalent Rates)
SITE TOTAL	**62,826 m²**	**--**	**642**	**667**	**--**

Notes:
1. Site statistics based on site plans provided by Korsiak Urban Planning March 7, 2025
2. As per Section 5.13 in the Zoning By-law, partial parking spaces must be rounded up to the nearest whole number.
3. Yellow shaded cells are large buildings (Buildings 1, 6 & 8) where the total GFA has NOT been reduced by 10%.

3.2.1 Accessible Parking

As per the minimum accessible parking requirements of Zoning By-law 016-2014 summarized in **Table 4**, the site requires a minimum of 30 accessible parking spaces, based on the minimum vehicle parking supply required by the proposed parking rates for the site. The proposed supply of 49 accessible parking spaces exceeds the requirements of the Zoning By-law and will meet the needs of the site.

TABLE 4 ZONING BY-LAW 016-2014: ACCESSIBLE PARKING REQUIREMENTS

Building	Minimum Required Number of Parking Spaces	Zoning By-law Requirement Accessible Parking Spaces	Minimum Number of Accessible Parking Spaces Required	Proposed Accessible Parking Spaces
Phase 1 : North Parcel				
Building 1 (north block)	87	4%	4	4
Phase 1: South Parcel				
Building 1 (south block)	49	4%	2	4
Building 2	49	4%	2	6
Building 3	53	4%	3	8
Building 4	64	4%	3	6
Building 5	39	4%	2	5
Building 6	92	4%	4	5
Phase 1 Sub-Total	**433**		**20**	**38**
Phase 2: South Parcel				
Building 7	82	4%	4	5
Building 8	107	1 + 3%	5	5
Building 9	20	4%	1	1
Phase 1 Sub-Total	**209**	**--**	**10**	**11**
SITE TOTAL	**642**		**30**	**49**

Notes:
1. Site statistics based on site plans provided by Korsiak Urban Planning dated March 7, 2025
2. As per Section 5.13 in the Zoning By-law, partial parking spaces must be rounded up to the nearest whole number.

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 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.

4.0 BICYCLE PARKING CONSIDERATIONS

As summarized in **Table 5,** Zoning By-law 016-2014 requires a total minimum of 24 bicycle parking spaces. The architectural drawings will provide a minimum of 24 parking spaces for bicycles. The proposed bicycle parking supply exceeds the requirements of the Zoning By-law at this time and will meet the needs of the site.

TABLE 5 SUMMARY OF BICYCLE PARKING

Industrial Land Use	Minimum Number of Required Parking Spaces	Minimum Zoning By-law Requirement	Minimum Number of Required Bicycle Parking Spaces	Proposed Number of Bicycle Parking Spaces
Phase 1: North Parcel				
Building 1	87	3% of minimum required vehicle parking	3	3
Phase 1: South Parcel				
Building 1	49	3% of minimum required vehicle parking	2	2
Building 2	49		2	2
Building 3	53		2	2
Building 4	64		2	2
Building 5	39		2	2
Building 6	92		3	3
Phase 1 Sub-total	**433**	**--**	**16**	**16**
Phase 2: South Parcel				
Building 7	82	3% of minimum required vehicle parking	3	3
Building 8	107		4	4
Building 9	20		1	1
Phase 2 Sub-total	**209**	**--**	**8**	**8**
SITE TOTAL	**642**	**--**	**24**	**24**

Notes:
1. Site statistics based on site plans provided by Korsiak Urban Planning dated March 7, 2025.
2. 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 6**, application of Zoning By-law 016-2014 to the site for loading considerations, results in the minimum requirement of 22 loading spaces. As the development proposal includes a total of 58 loading spaces, the requirements of the Zoning By-law are exceeded and the loading supply will meet the practical needs of the site.

The loading spaces displayed in red are 12 metres x 3.5 metres and are large enough to accommodate tractor trailers. The remainder of loading spaces 6 metres x 3.5 are and are expected to be used by cube vans.

TABLE 6 SUMMARY OF LOADING SUPPLY

Industrial Land Use	GFA	Minimum Zoning By-law Requirement	Minimum Number of Required Loading Spaces	Proposed Number of Loading Spaces
Phase 1: North Parcel				
Building 1	12,400 m^2	3 loading spaces + 1 additional loading space for each additional 9,300m^2 or fraction thereof in excess of 7,441m^2.	4	**10**
Phase 1: South Parcel				
Building 1	2,850 m^2	2	2	**1**
Building 2	2,830 m^2	2	2	**2**
Building 3	3,300 m^2	2	2	**2**
Building 4	4,500 m^2	2	2	**2**
Building 5	1,700 m^2	0	0	**0**
Building 6	13,300 m^2	3 loading spaces + 1 additional loading space for each additional 9,300m^2 or fraction thereof in excess of 7,441m^2.	4	**15**
Phase 1 Sub-total	**40,880 m^2**	**--**	**16**	**32**
Phase 2: South Parcel				
Building 7	7,300 m^2	2	2	**3**
Building 8	16,300 m^2	3 loading spaces + 1 additional loading space for each additional 9,300m^2 or fraction thereof in excess of 7,441m^2.	4	**22**

Industrial Land Use	GFA	Minimum Zoning By-law Requirement	Minimum Number of Required Loading Spaces	Proposed Number of Loading Spaces
Building 9	660 m^2	0	0	**1**
Phase 2 Sub-total	**24,260 m^2**	**--**	**6**	**26**
SITE TOTAL	**65,140 m^2**	**--**	**22**	**58**

Notes:
1. Site statistics based on site plans provided by Korsiak Urban Planning dated March 7, 2025.
2. Partial loading spaces must be rounded up to the nearest whole number.

5.1 TRUCK CIRCULATION

Large truck loading/unloading activity is expected to occur at Buildings 1 (on the North portion of the site) and on 6, 7, and 8 on the south portion of the site. These buildings all have large docks intended for tractor trailers. The swept path requirements for these tractor trailers have been tested at the driveway accesses to Derry Road and Clark boulevard for these buildings using a Ministry of Transportation Ontario (MTO) WB20.5 design vehicle.

The remaining buildings are anticipated to receive small deliveries occasionally. The swept path requirements for the driveways to these buildings have instead been tested using a Transportation Association of Canada (TAC) Heavy Single Unit (HSU) truck. An HSU-sized truck represents the largest conceivable vehicle these buildings might need to receive but is not expected to be reflective of typical demands (i.e. cube vans).

Vehicle manoeuvring drawings for the site are provided in **Appendix D.** A detailed pavement marking and signage plan for the site will be provided in a subsequent submission.

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 7.**

6.1.1 Vehicle Parking

Provide an appropriate parking supply for the site that is slightly less than the site equivalent minimum Zoning By-law requirement.

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 24 spaces. The architectural drawings for the site will illustrate a minimum of 24 parking and will meet the minimum parking requirements of the Zoning By-law.

6.1.3 Carpool Program & Parking Spaces

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 & Education

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

6.1.5 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 what might be expected for some of the building uses, some employees may 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 7 RECOMMENDED TDM STRATEGIES

Measure	Description	Cost Estimate	Implementation Strategy
Vehicle Parking Supply	A parking supply that is less than the minimum Zoning By-law requirement is to be considered as part of a future ZBA application.	Integrated into overall development cost.	Construct as part of development.
Bicycle Parking	Provide a supply of bicycle parking spaces that is greater than the minimum Zoning By-law requirement.	Integrated into overall development cost.	Construct as part of development. A total of 32 bicycle parking spaces are proposed on the site.
Carpool Program	Encourage employees to carpool. 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.
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 8**.

TABLE 8 TURNING MOVEMENT COUNT SUMMARY

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

Based on background growth assumptions outlined in detail in **Section 7.2.2**, a compounding growth rate of 2% was applied for three years to establish 2025 traffic volumes. These volumes were adopted to represent existing traffic conditions.

Existing traffic volumes are illustrated in **Figure 9**. Detailed turning movement counts are provided in **Appendix E**.

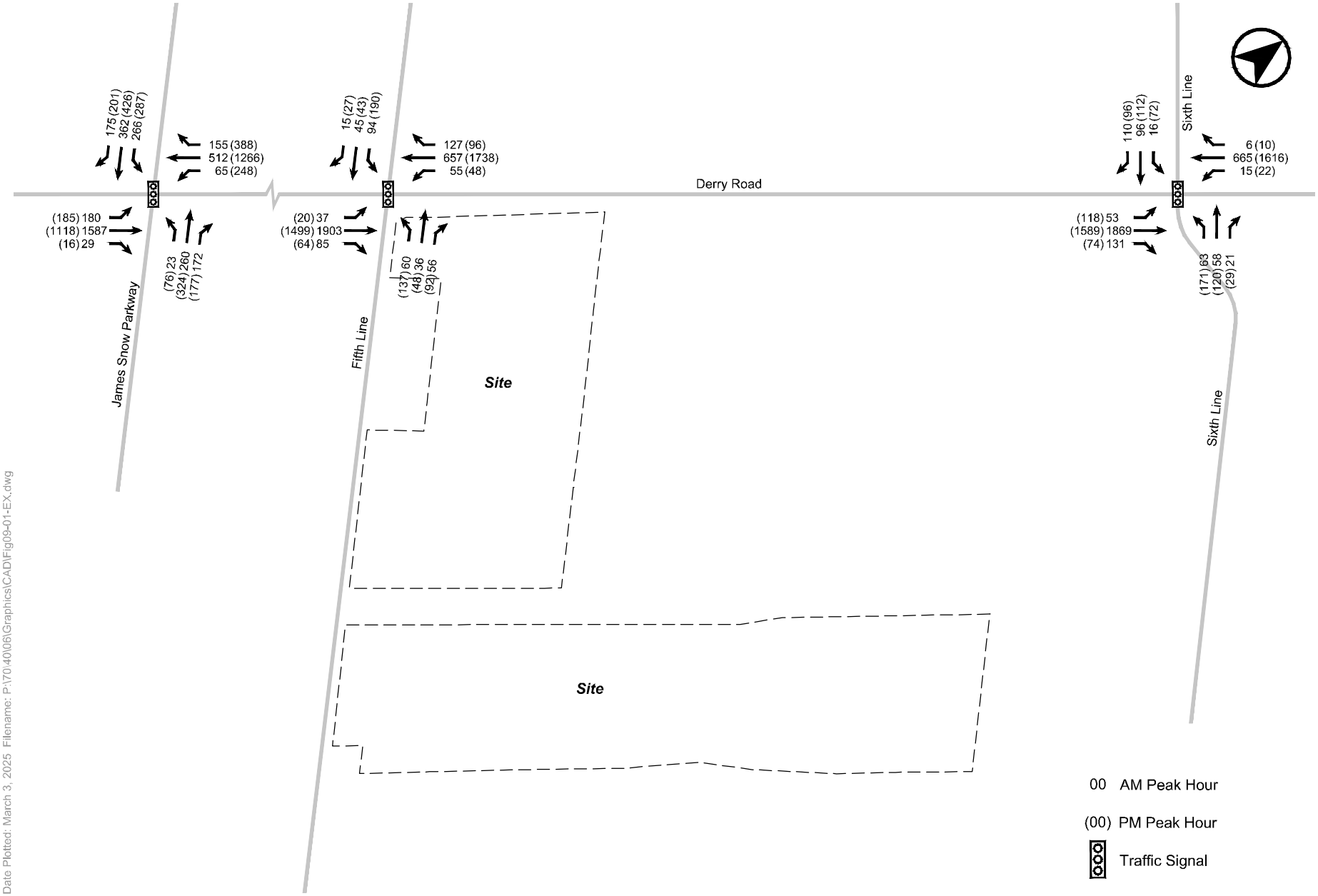


FIGURE 9 EXISTING TRAFFIC VOLUMES

BA GROUP 7040-06

DERRY ROAD & 5TH LINE (REMINGTON LANDS)

7.2 FUTURE BACKGROUND TRAFFIC CONDITIONS

7.2.1 Background Growth Scenarios

Background growth was considered for the near-term analysis horizon (2030) and the long-term horizon (2035). It is assumed that in the near-term horizon, Clark Boulevard is not fully connected between Derry Road and Fifth Line, though a portion of the road will be built as part of the Anatolia site on the south side of Derry Road. Under long-term future conditions, it is assumed that Clark Boulevard is fully built and connected between Derry Road and Fifth Line. The relevant network and development assumptions for these scenarios are summarized in **Table 9**.

TABLE 9 FUTURE BACKGROUND GROWTH SCENARIOS

Scenario	Horizon Year	Status of Anatolia Site	Background Traffic[3]	Road Network Improvements
Near-term	2030	Full build-out of Anatolia site	Background traffic as per Derry Green Secondary Plan	Clark Boulevard partially built within Anatolia site south of Derry Road
Long-term	2035	5 years post build-out of Anatolia site		Clark Boulevard extended between Fifth Line and Derry Road
Sensitivity Analysis				
Long-term Sensitivity	2035	5 years post build-out of Anatolia site	Background traffic as per Derry Green Secondary Plan	Clark Boulevard extended between Fifth Line and Derry Road + Derry Road widened to 6 lanes

Notes:
1. The portions of Clark Boulevard west of Fifth Line and north of Derry Road are assumed to be complete in all scenarios consistent with the Derry Green Secondary Plan and with studies available for developments proposed on those lands.
2. The portion of Clark Boulevard directly south of Derry Road is to be constructed as part of the development of the Anatolia site. It is assumed to be present under future background and future total conditions in all scenarios, regardless of the status of the Clark Boulevard extension.
3. Background traffic volumes are only routed along the Clark Boulevard extension east of Fifth Line under future total conditions in each scenario, because this portion is constructed as part of the proposed development.

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 2030 horizon. A 2% growth rate was maintained up to the 2035 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 2030 and 2035. 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 707,000 m^2 of industrial GFA, 5,000 m^2 of commercial GFA, and 16,500 m^2 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 10 summarizes the characteristics of background developments included in the study.

TABLE 10 AREA BACKGROUND DEVELOPMENTS

Development	Location	Development Statistics	Source	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	89,000 m^2 industrial GFA	LEA, March 2022	--
11319 Derry Road	North of Derry Road, between Fifth Line and future Clark Boulevard extension	14,198 m^2 industrial GFA	LEA, June 2023	--
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
Anatolia Property	Bounded by Derry Road, Sixth Line, and the Remington site; includes lands abutting the Clark Boulevard extension	183,945 m^2 industrial GFA	BA Group	Includes portion of Clark Boulevard extension south of Derry Road[2]
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]

Notes:
1. Minor adjustments were made to traffic volumes associated with the Anatolia Lands and other Secondary Plan Lands under near-term (2030) future background conditions, in order to account for the lack of a connection via the Clark Boulevard extension through the Remington site.

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 (2030 or 2035) and traffic volumes for the specific background developments included in the scenario. Background growth traffic volumes as applied under future background conditions are illustrated in **Figure 10** and **Figure 11** for the 2030 horizon and 2035 horizon, respectively.

7.2.5 Future Total 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 2030 and 2035 horizons are illustrated in **Figure 12** and **Figure 13** respectively.

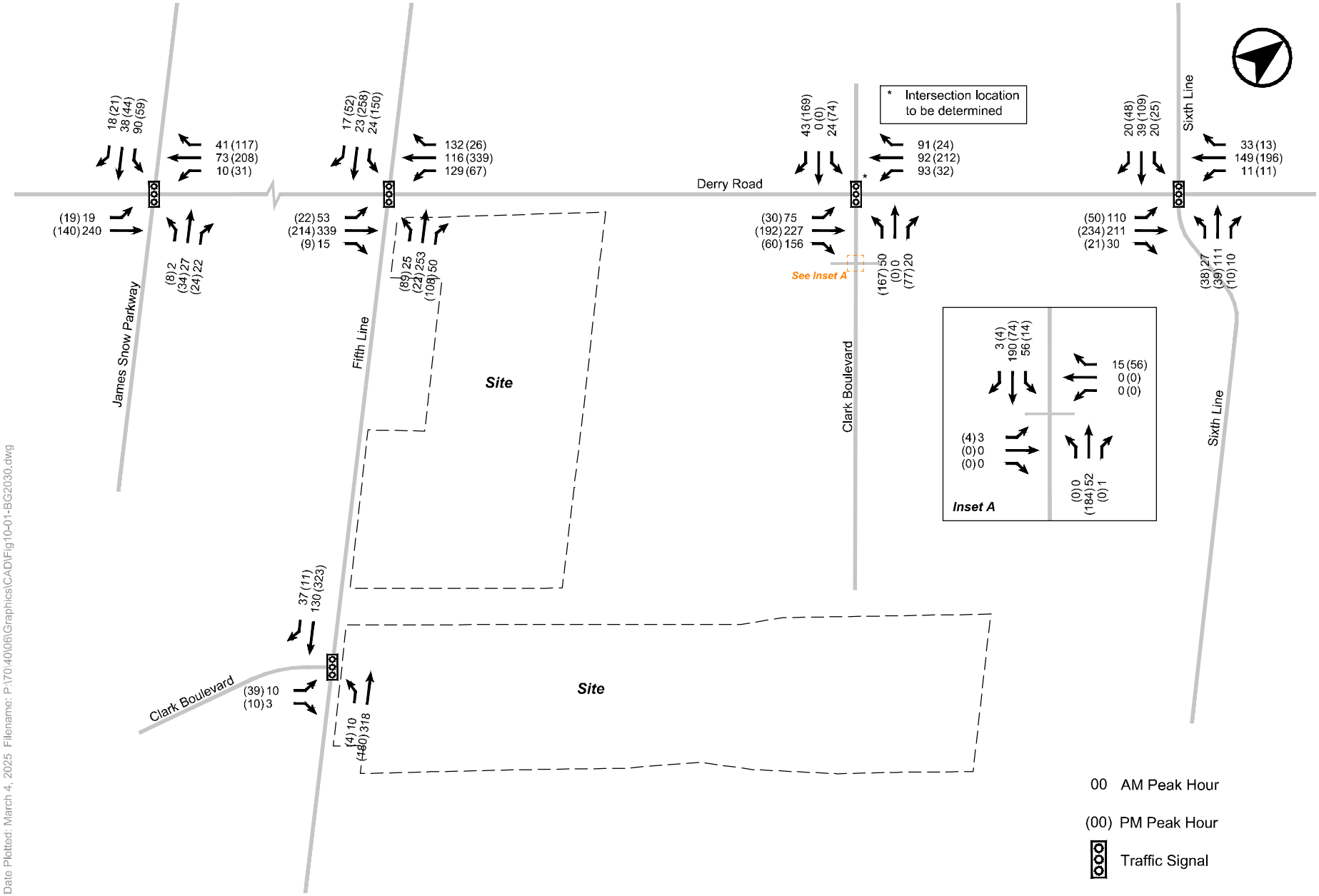
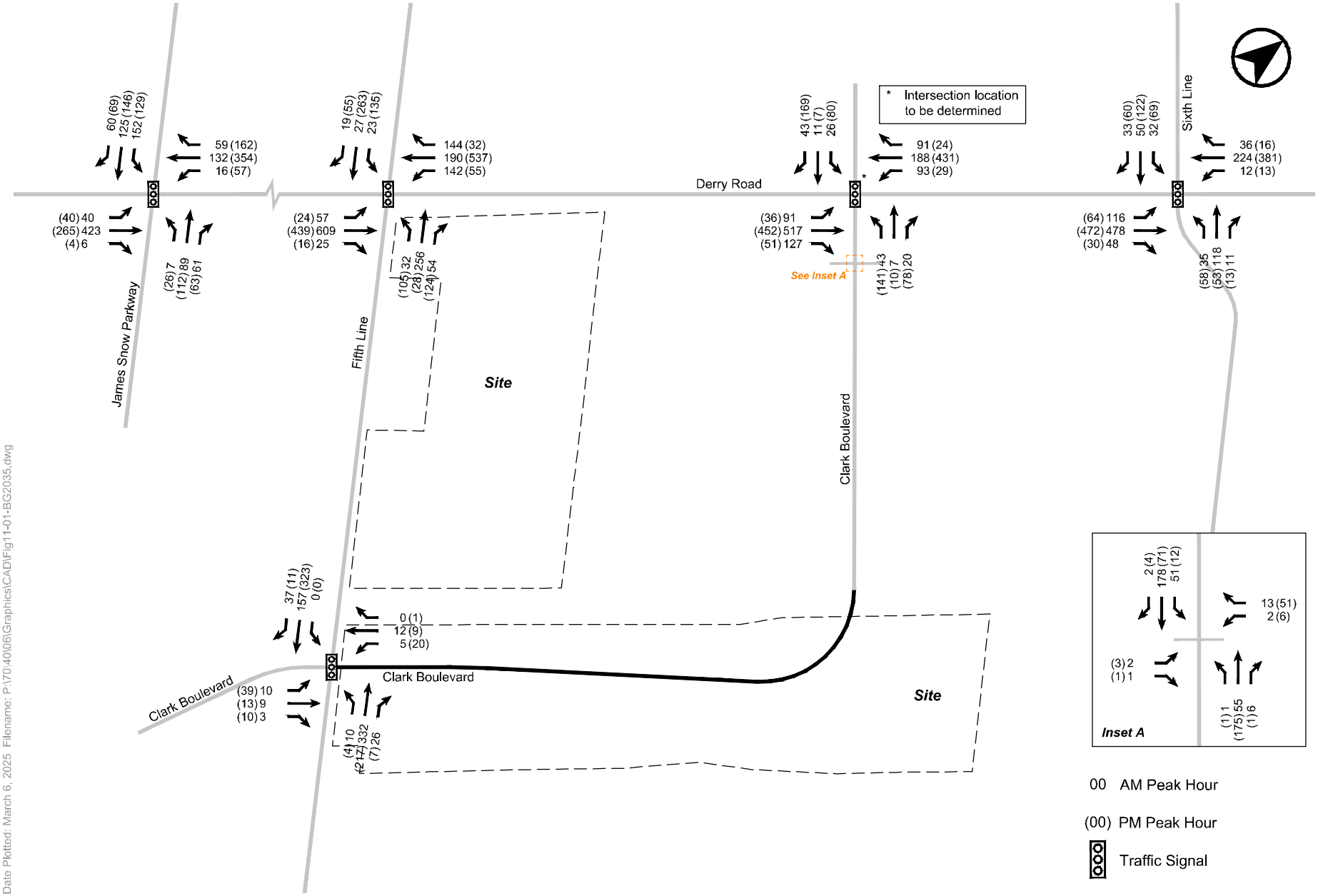
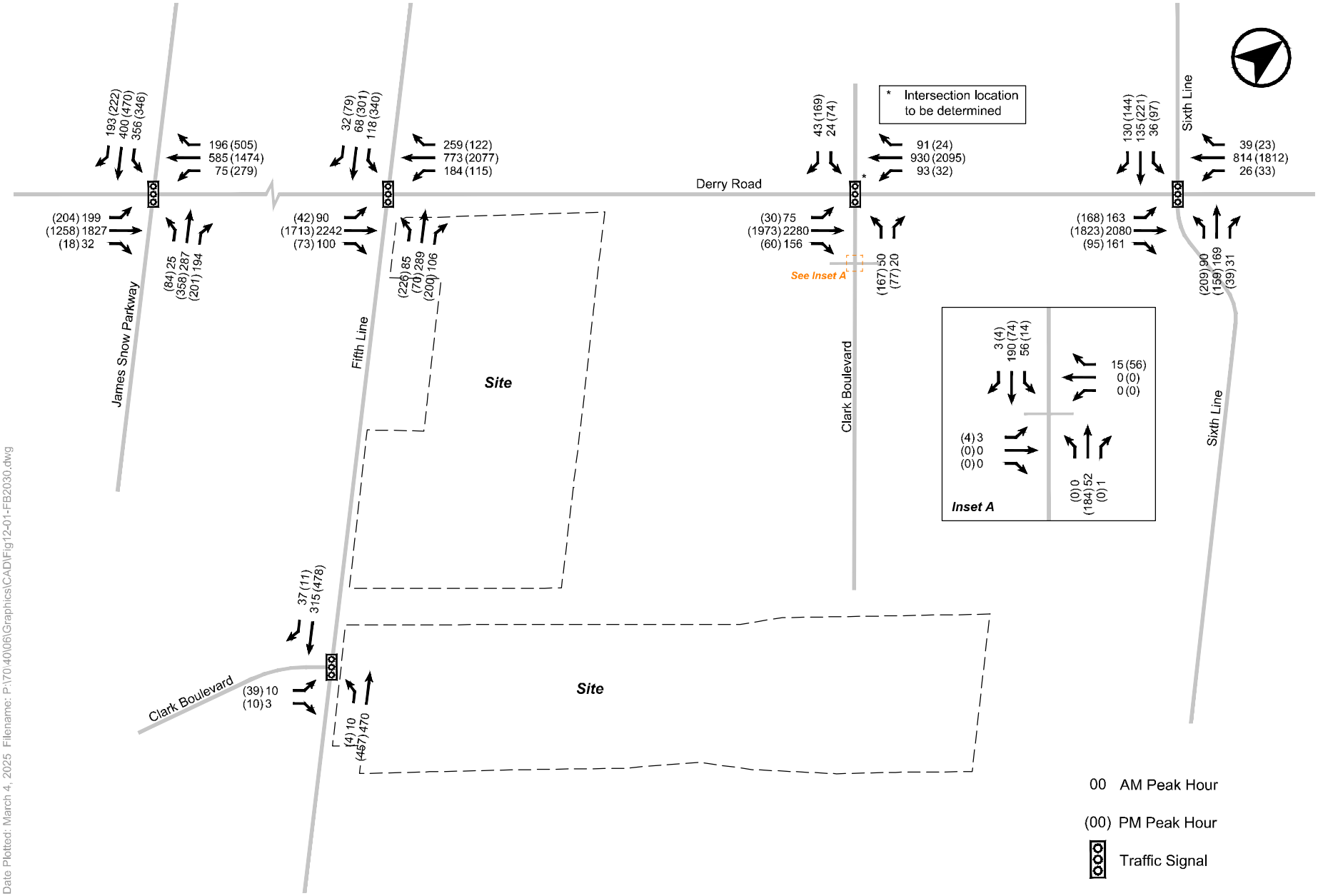


FIGURE 10 BACKGROUND GROWTH TRAFFIC ALLOWANCE - 2030 HORIZON



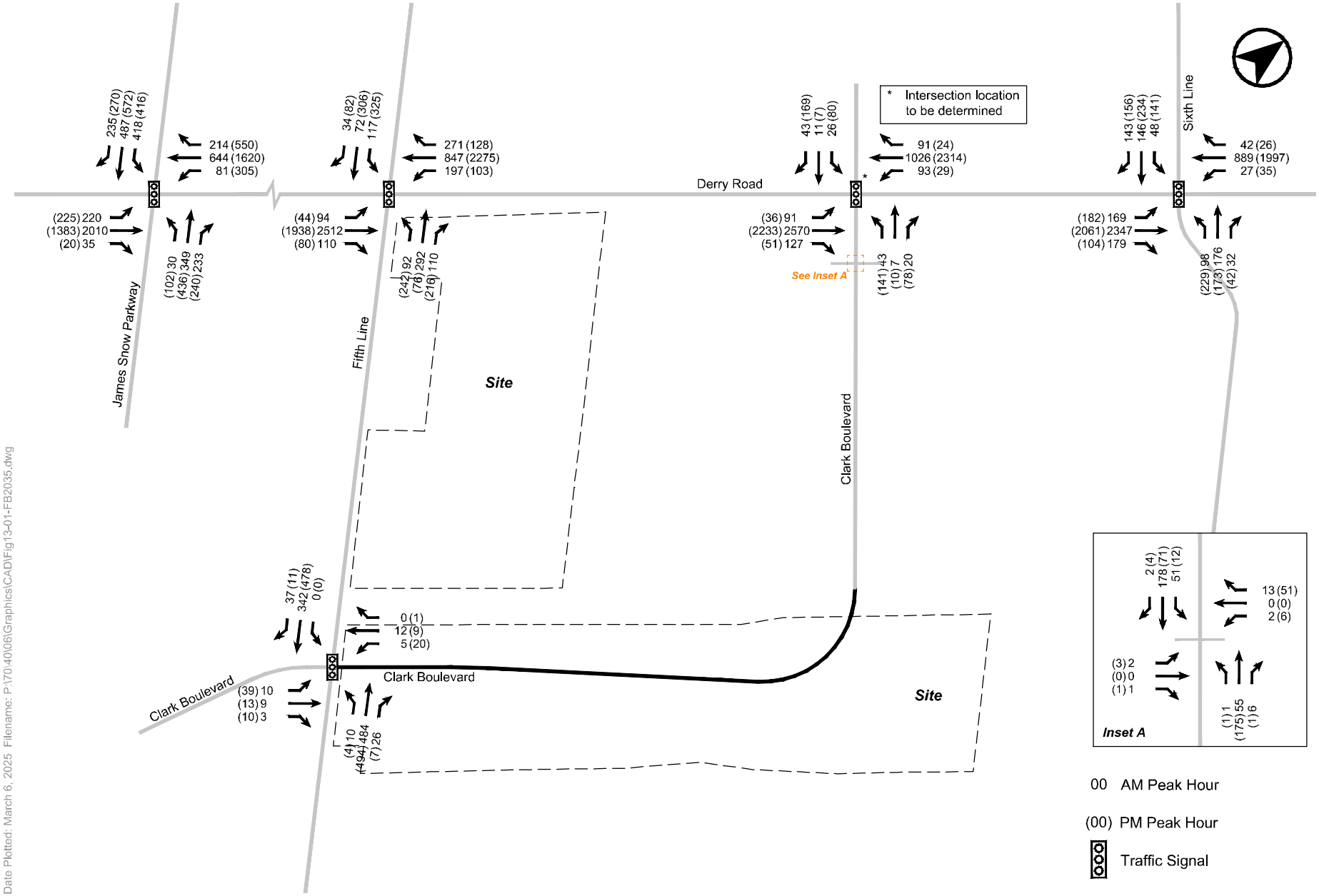
Date Plotted: March 6, 2025 Filename: P:\70\40\06\Graphics\CAD\Fig11-01-BG2035.dwg

FIGURE 11 BACKGROUND GROWTH TRAFFIC ALLOWANCE - 2035 HORIZON



Date Plotted: March 4, 2025 Filename: P:\70\40\06\Graphics\CAD\Fig12-01-FB2030.dwg

FIGURE 12 FUTURE BACKGROUND TRAFFIC VOLUMES - 2030 HORIZON



Date Plotted: March 6, 2025 Filename: P:\70\40\06\Graphics\CAD\Fig13-01-FB2035.dwg

FIGURE 13 FUTURE BACKGROUND TRAFFIC VOLUMES - 2035 HORIZON

7.3 SITE TRAFFIC

7.3.1 Existing Site Traffic

The site is currently unoccupied. For the traffic analysis, no existing traffic was removed from the network with the redevelopment of the site.

7.3.2 Development Phases

The development is proposed to be built in two phases. Phase 1 includes the north building (Building 1) adjacent to Derry Road, as well as Buildings 1 through 6 along Clark Boulevard, on the south portion of the site. Phase 2 includes the remaining buildings along Clark Boulevard (Buildings 7 through 9), as well as the complete extension of Clark Boulevard that provides connectivity between Fifth Line and Derry Road. The extension of Clark Boulevard results in a change in travel patterns within the study area for some of the traffic associated with the Phase 1 buildings.

Phase 1 is assumed to be completed by 2030, while Phase 2 is assumed to be complete in 2035.

7.3.3 Total Site Trip Generation

Under the Official Plan, the in-effect Derry Green Corporate Business Park Secondary Plan (DGCBP) provides the flexibility to accommodate a broad range of potential uses that will include prestige offices, street related employment uses, R&D and light industrial development. The total number of weekday peak hour trips associated with each of the 10 proposed buildings have been forecasted based on ITE 11th Edition trip generation rates for LUC 150 – Warehousing and LUC 110 – General Light Industrial uses. The chosen rates are summarized in **Table 11**. The average of the two rates was used in order to account for some uncertainty in proposed land uses on the site, recognizing that while some of the space may be used for warehousing, other possible uses may generate higher levels of site activity.

TABLE 11: VEHICLE TRIP GENERATION RATE DATA

Source	Vehicle Trip Rate (vehicle trips per 1,000 ft²)					
	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
ITE 10th Edition + Supplement LUC 150 Warehousing General Urban/Suburban	0.13	0.04	0.17	0.05	0.13	0.18
ITE 10th Edition + Supplement LUC 110 General Light Industrial General Urban/Suburban	0.65	0.09	0.74	0.09	0.56	0.65
Average	**0.39**	**0.06**	**0.45**	**0.07**	**0.34**	**0.41**
Adopted	**0.39**	**0.06**	**0.45**	**0.07**	**0.34**	**0.41**

Forecasted site trips for each of the three proposed buildings are summarized in **Table 12**.

TABLE 12 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 ft^2)		*0.13*	*0.04*	*0.17*	*0.05*	*0.13*	*0.18*
North Building 1	133,472 ft^2	52	9	61	9	46	55
Building 1	30,677 ft^2	12	2	14	2	11	13
Building 2	30,462 ft^2	12	2	14	2	11	13
Building 3	35,521 ft^2	14	2	16	3	12	15
Building 4	48,438 ft^2	19	3	22	3	17	20
Building 5	18,299 ft^2	7	1	8	1	7	8
Building 6	143,160 ft^2	56	9	65	10	49	59
Building 7	78,576 ft^2	31	5	36	6	27	33
Building 8	175,452 ft^2	69	11	80	12	60	72
Building 9	7,104 ft^2	3	0	3	1	2	3
Total Vehicle Trips		**275**	**44**	**319**	**49**	**242**	**291**

7.3.4 Heavy Vehicle Percentages

The ITE rates summarized in **Table 11** account for both heavy and light vehicles. Heavy vehicle percentages for warehouse traffic were determined based on ITE documentation and warehouse proxy data collected by BA Group, as summarized in **Table 13**.

TABLE 13 SITE HEAVY VEHICLE PERCENTAGE

Study	Date	AM Peak Hour			PM Peak Hour		
		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 2nd, 2016	10%	71%	17%	60%	10%	16%
	Thursday, August 16th, 2018	9%	35%	13%	31%	5%	10%
Average Heavy Vehicle %		9%	43%	14%	41%	8%	14%
Adopted Heavy Vehicle %		**9%**	**43%**	**14%**	**41%**	**8%**	**14%**

Notes:

1. 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.

7.3.5 Site Traffic Distribution

Site traffic was assigned onto 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 14**.

TABLE 14 SITE TRAFFIC DISTRIBUTION

Direction	Route	Light Vehicles[1]		Heavy Vehicles[2]	
		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%**

Notes:
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 F**.
2. Heavy vehicle distribution is based on area travel patterns for heavy vehicles.

7.3.6 Site Traffic Volumes

As summarized above, vehicle trips associated with the proposed development are forecasted based on ITE 11th Edition trip generation rates and separated into heavy and light vehicle trips based on a combination of ITE data and proxy data collected by BA Group.

Vehicle trips, disaggregated by vehicle type and by building within the proposed development, are summarized in **Table 15**.

TABLE 15 SITE VEHICLE TRIP SUMMARY

Vehicle Type	AM Peak Hour			PM Peak Hour		
	In	Out	2-way	In	Out	2-way
Phase 1 (2030 Horizon)						
North Building 1						
Light Vehicles	47	5	52	5	42	47
Heavy Vehicles	5	4	9	4	4	8
Total	**52**	**9**	**61**	**9**	**46**	**55**
Building 1						
Light Vehicles	11	1	12	1	10	11
Heavy Vehicles	1	1	2	1	1	2
Total	**12**	**2**	**14**	**2**	**11**	**13**
Building 2						
Light Vehicles	11	1	12	1	10	11
Heavy Vehicles	1	1	2	1	1	2
Total	**12**	**2**	**14**	**2**	**11**	**13**
Building 3						
Light Vehicles	13	1	14	2	11	13
Heavy Vehicles	1	1	2	1	1	2
Total	**14**	**2**	**16**	**3**	**12**	**15**
Building 4						
Light Vehicles	17	2	19	2	15	17
Heavy Vehicles	2	1	3	1	2	3
Total	**19**	**3**	**22**	**3**	**17**	**20**
Building 5						
Light Vehicles	6	1	7	0	6	6
Heavy Vehicles	1	0	1	1	1	2
Total	**7**	**1**	**8**	**1**	**7**	**8**
Building 6						
Light Vehicles	51	5	56	6	45	51
Heavy Vehicles	5	4	9	4	4	8
Total	**56**	**9**	**65**	**10**	**49**	**59**
Total Vehicle Traffic (2030)	**172**	**28**	**200**	**30**	**153**	**183**

Table continues on next page…

Vehicle Type	AM Peak Hour			PM Peak Hour		
	In	Out	2-way	In	Out	2-way
Phase 2 (2035 Horizon)						
Building 7						
Light Vehicles	28	3	31	4	25	29
Heavy Vehicles	3	2	5	2	2	4
Total	**31**	**5**	**36**	**6**	**27**	**33**
Building 8						
Light Vehicles	63	6	69	7	55	62
Heavy Vehicles	6	5	11	5	5	10
Total	**69**	**11**	**80**	**12**	**60**	**72**
Building 9						
Light Vehicles	3	0	3	1	2	3
Heavy Vehicles	0	0	0	0	0	0
Total	**3**	**0**	**3**	**1**	**2**	**3**
Total Vehicle Trips (2035)	**275**	**44**	**319**	**49**	**242**	**291**

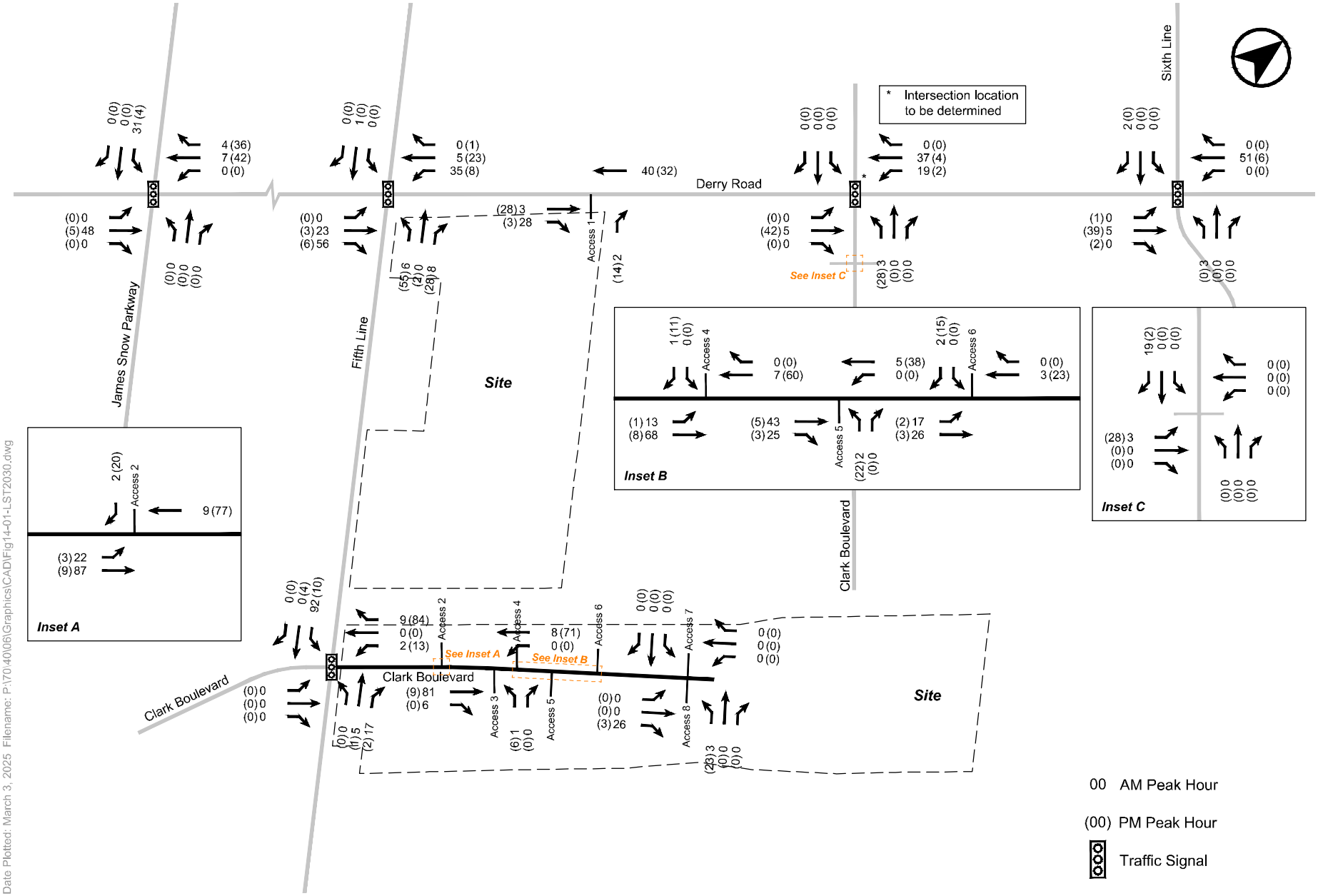
Site traffic route choices vary depending on the construction of the Clark Boulevard extension between Fifth Line and the site, necessitating a separate assignment for the two horizons (2030 and 2035).

When Phase 1 is complete in 2030, the site is expected to generate a total of 200 and 183 two-way trips, during the morning and afternoon peak hours, respectively. Light vehicle site traffic volumes for the 2030 horizon are illustrated in **Figure 14** while heavy vehicle site volumes are illustrated in **Figure 15**. Total vehicle site traffic volumes for 2030 are illustrated in **Figure 16**.

Following the full buildout of both phases in 2035, the site is expected to generate a total of 319 and 291 two-way trips during the morning and afternoon peak hours, respectively. Light vehicle site traffic volumes for the 2035 horizon are illustrated in **Figure 17** while heavy vehicle site traffic volumes are provided in **Figure 18.** Total vehicle site traffic volumes for 2035 are illustrated in **Figure 19**.

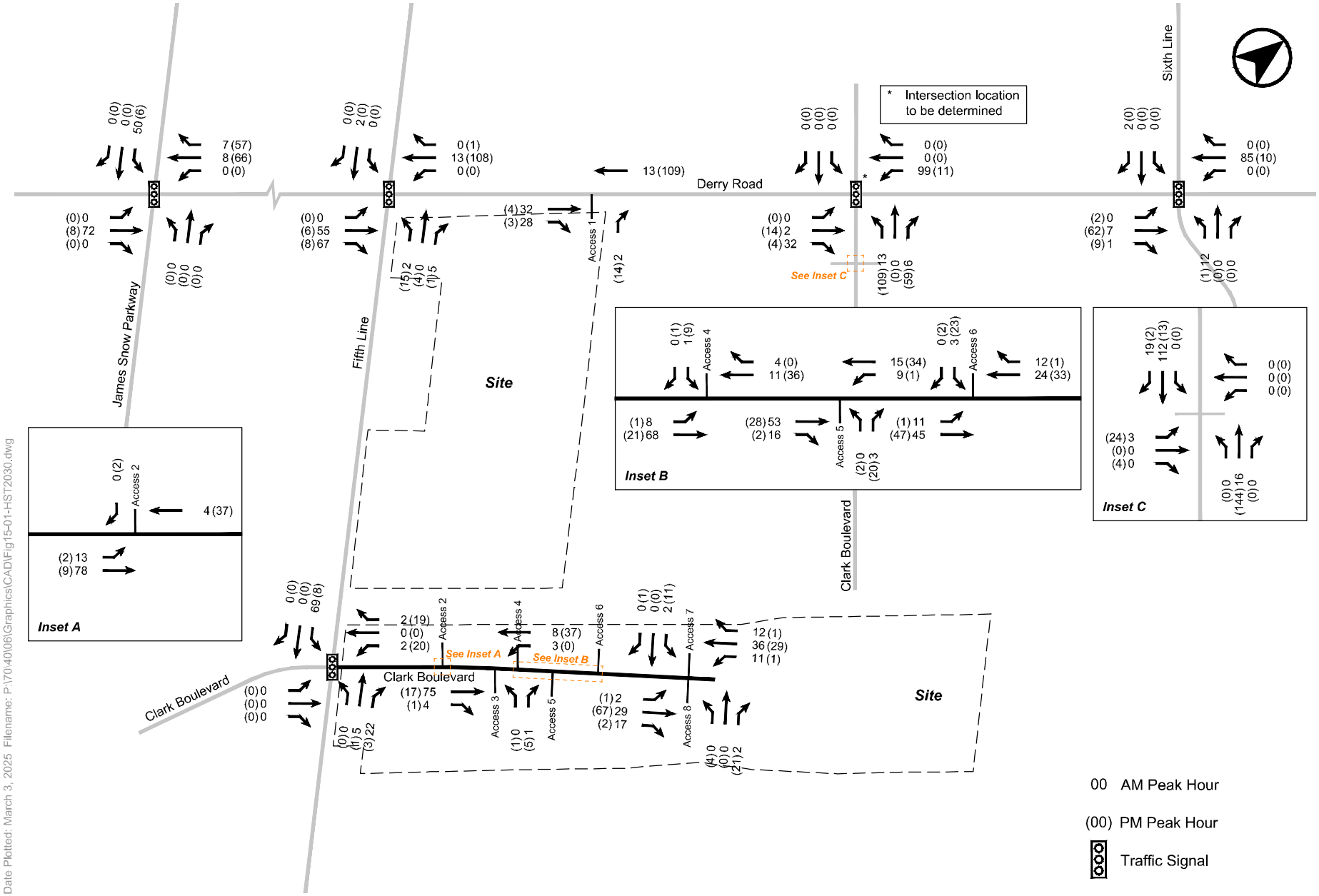
7.4 FUTURE TOTAL TRAFFIC VOLUMES

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 2030 and 2035 analysis horizons are illustrated in **Figure 20** and **Figure 21**, respectively.



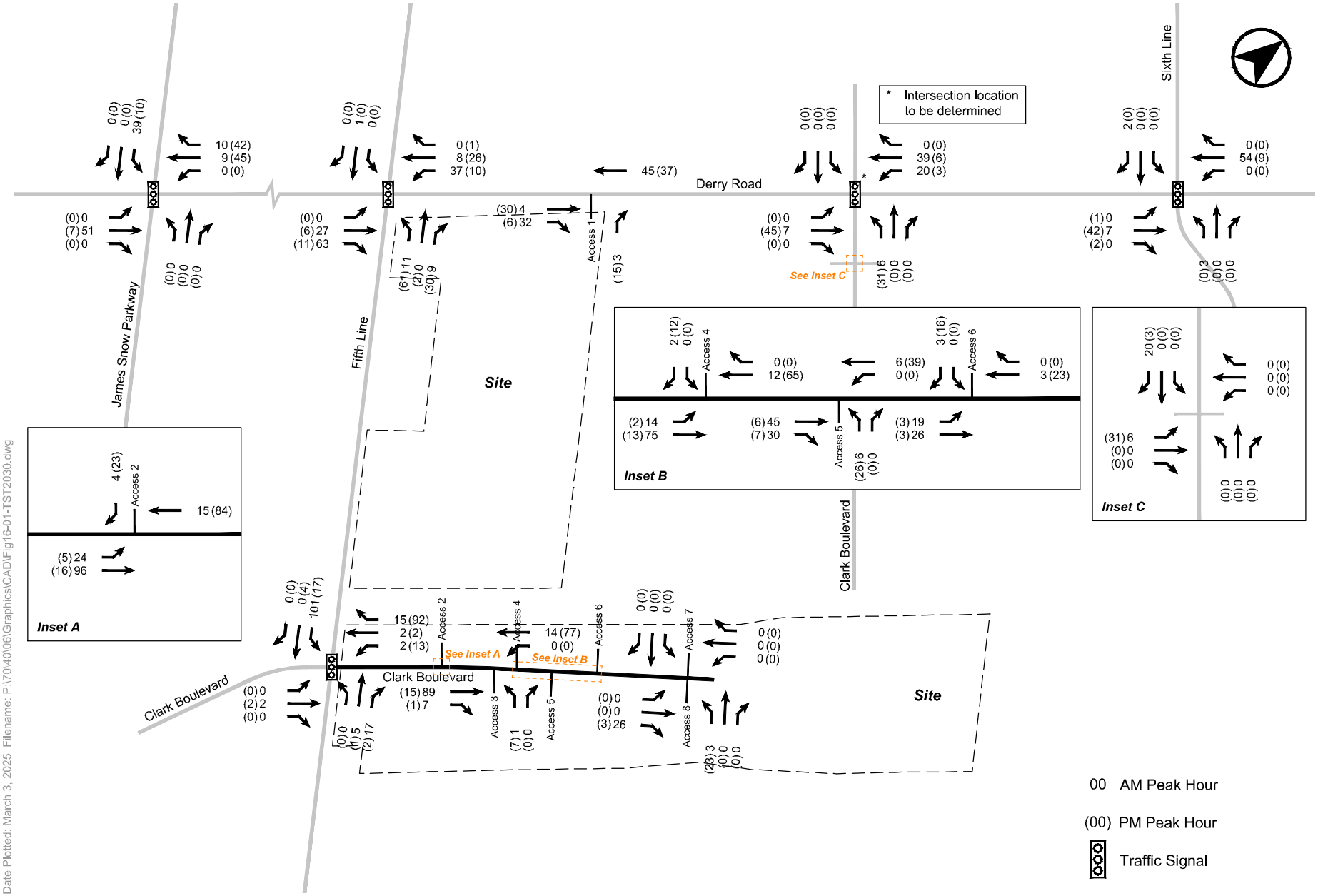
Date Plotted: March 3, 2025 Filename: P:\70\40\06\Graphics\CAD\Fig14-01-LST2030.dwg

FIGURE 14 LIGHT VEHICLE SITE TRAFFIC VOLUMES - 2030 HORIZON



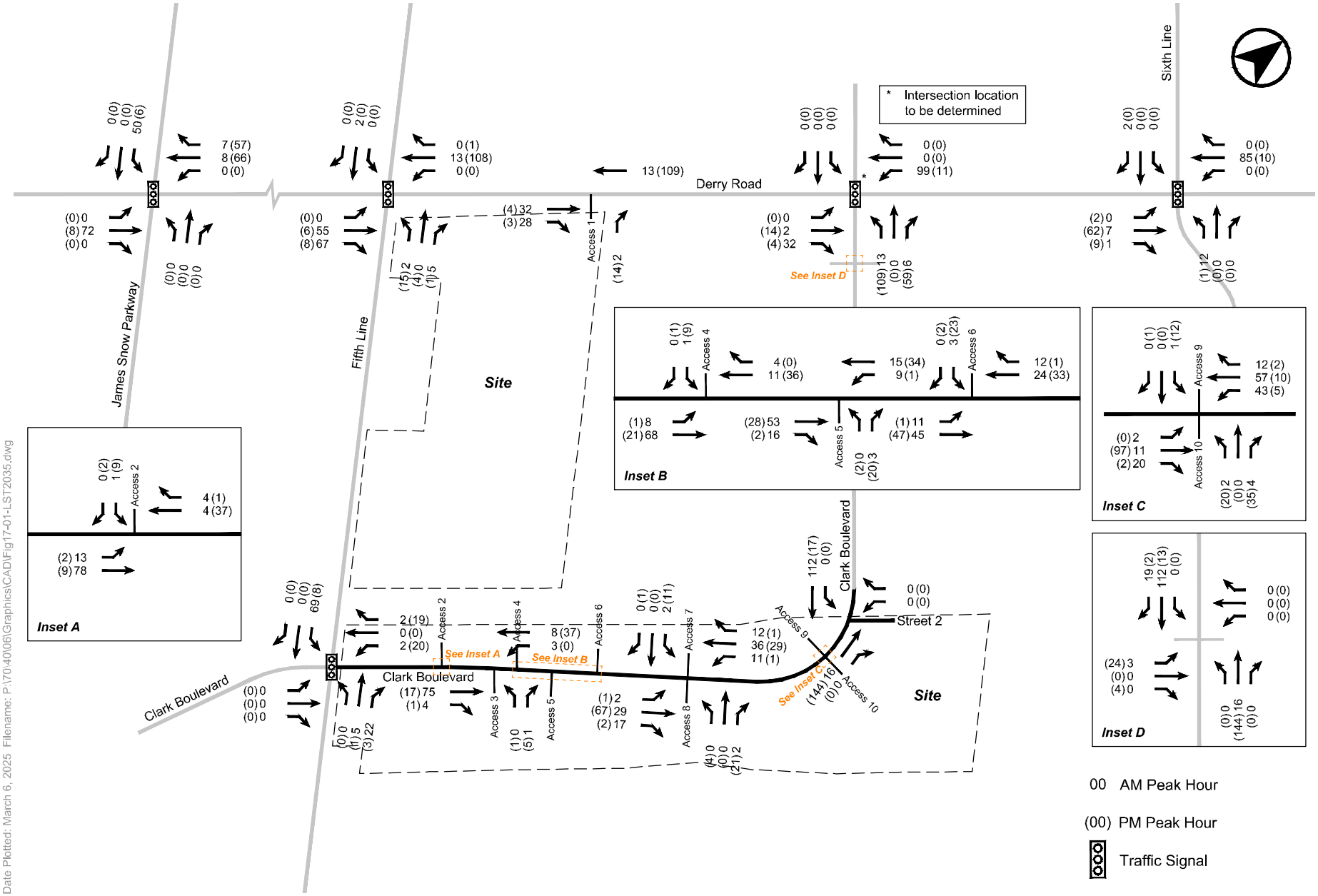
Date Plotted: March 3, 2025 Filename: P:\70\40\06\Graphics\CAD\Fig15-01-HST2030.dwg

FIGURE 15 HEAVY VEHICLE SITE TRAFFIC VOLUMES - 2030 HORIZON



Date Plotted: March 3, 2025 Filename: P:\70\40\06\Graphics\CAD\Fig16-01-TST2030.dwg

FIGURE 16 TOTAL SITE TRAFFIC VOLUMES - 2030 HORIZON



Date Plotted: March 6, 2025 Filename: P:\70\40\06\Graphics\CAD\Fig17-01-LST2035.dwg

FIGURE 17 LIGHT VEHICLE SITE TRAFFIC VOLUMES - 2035 HORIZON

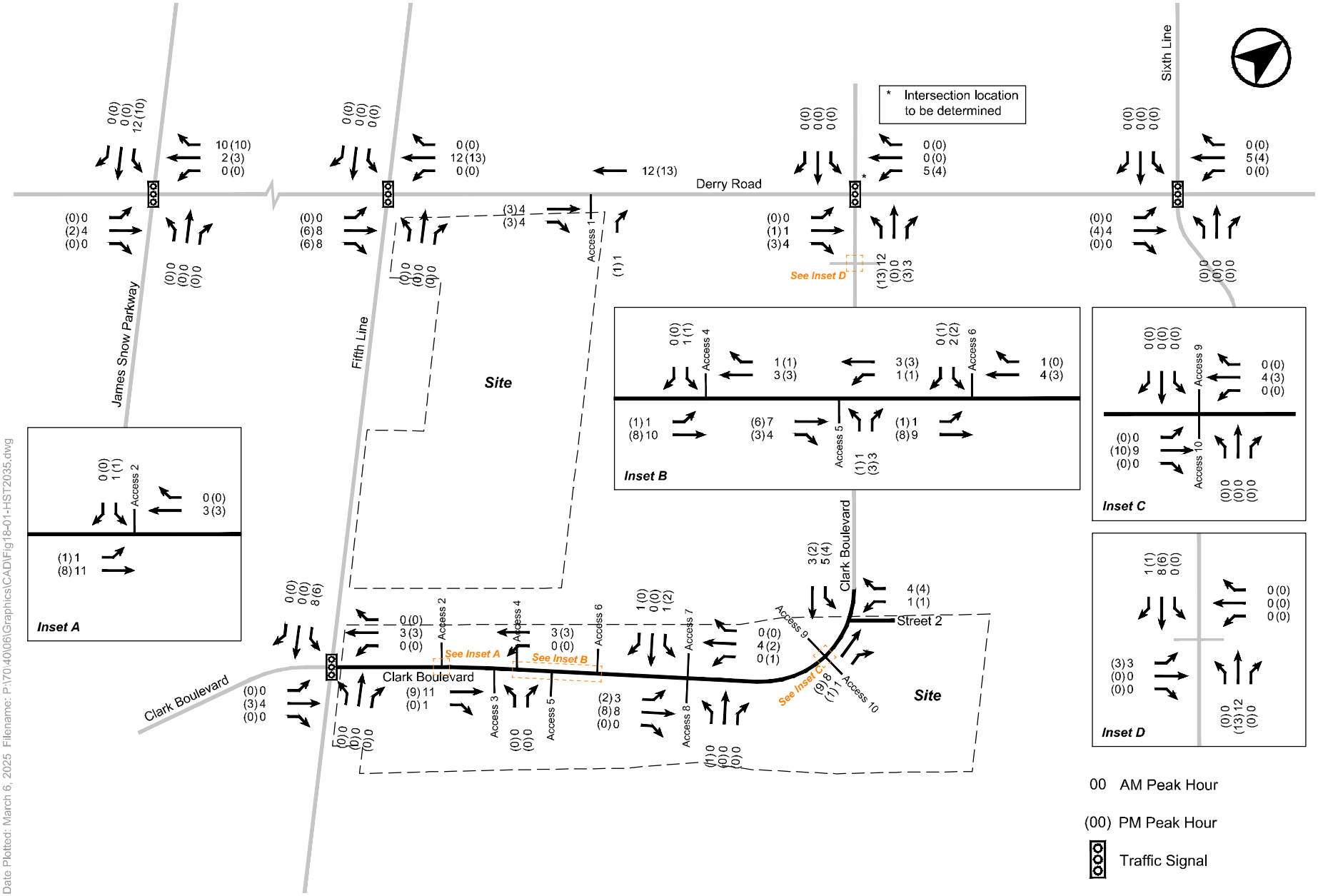


FIGURE 18 HEAVY VEHICLE SITE TRAFFIC VOLUMES - 2035 HORIZON

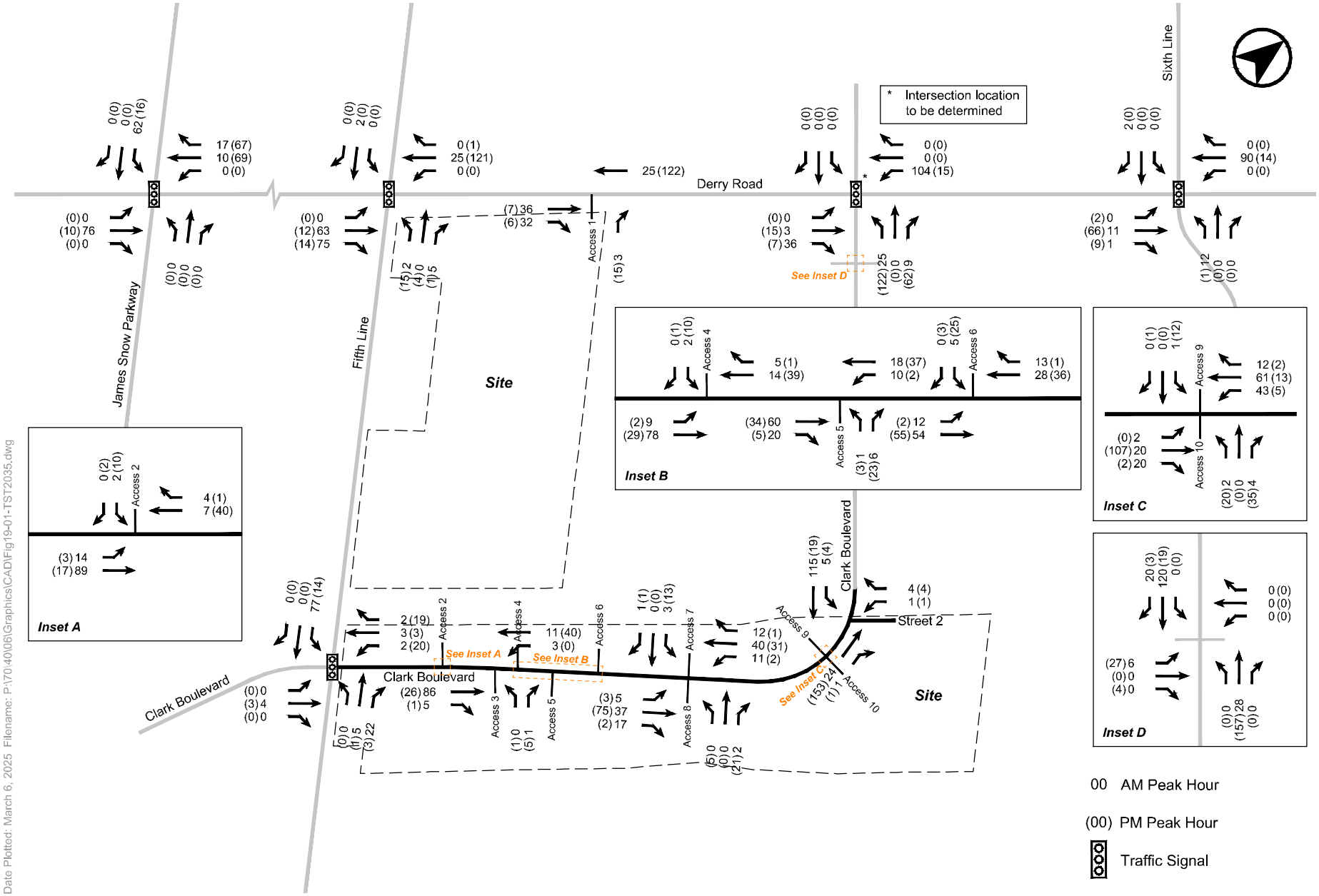


FIGURE 19 TOTAL SITE TRAFFIC VOLUMES - 2035 HORIZON

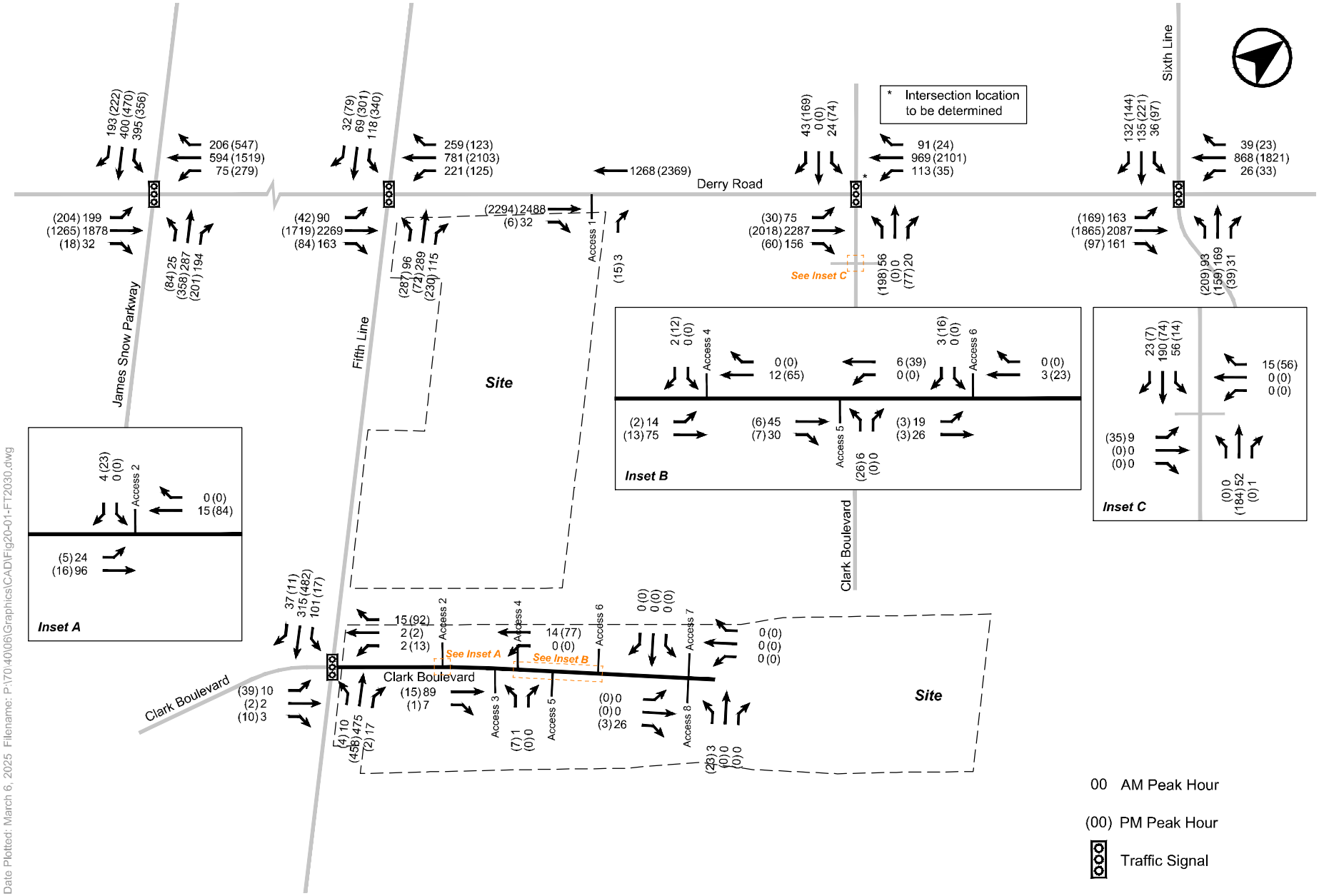
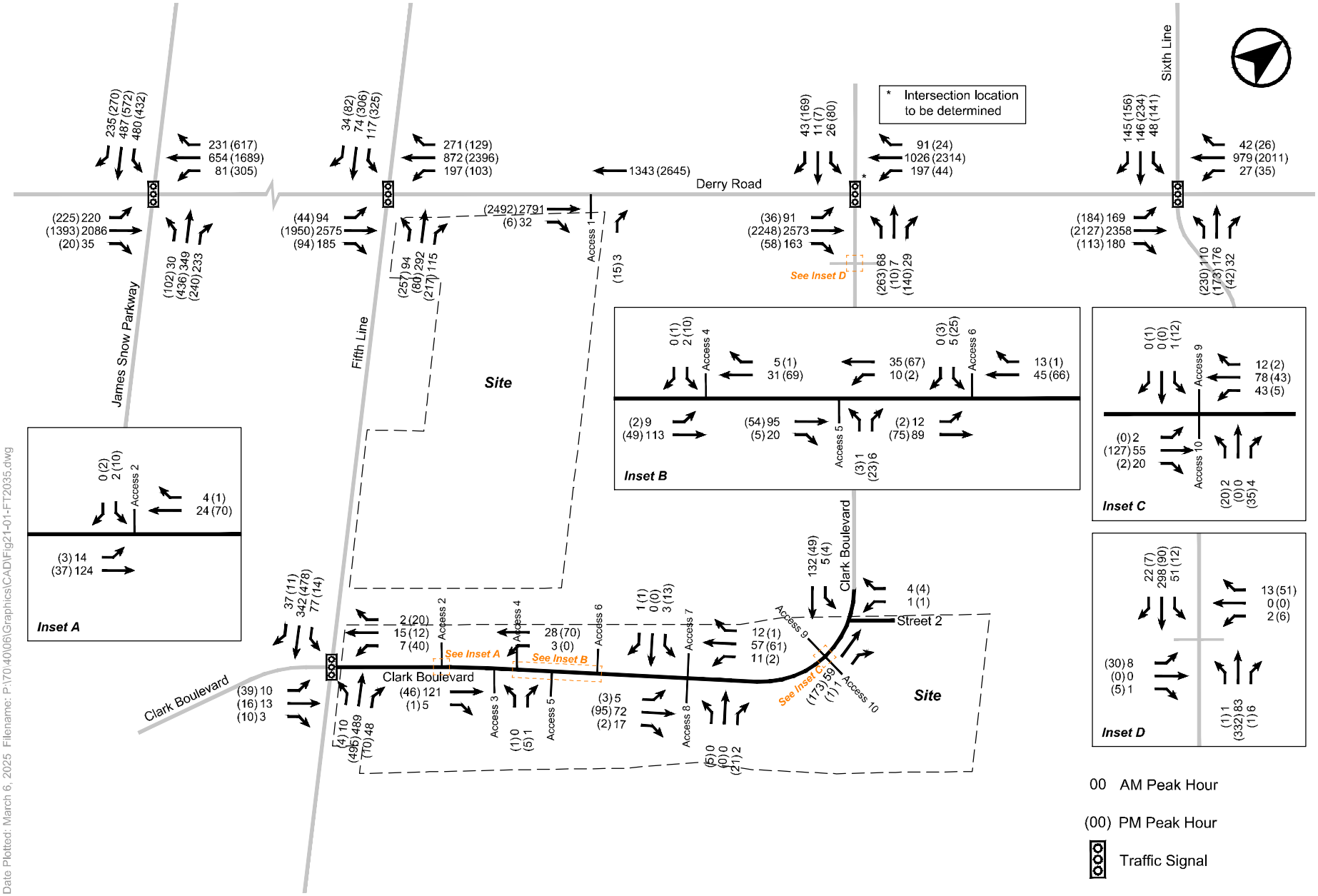


FIGURE 20 FUTURE TOTAL TRAFFIC VOLUMES - 2030 HORIZON



Date Plotted: March 6, 2025 Filename: P:\70\40\06\Graphics\CAD\Fig21-01-FT2035.dwg

FIGURE 21 FUTURE TOTAL TRAFFIC VOLUMES - 2035 HORIZON

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

Existing traffic signal timing plans for study area intersections have been obtained from the Region of Halton and are attached in **Appendix G**. 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

The intersection capacity analysis results include the following scenarios:

- 2025 Existing Conditions

- 2030 Future Horizon
    - Future Background Conditions (Clark Boulevard across Anatolia property)
    - Future Total Conditions (Clark Boulevard connected at Fifth Line and Derry Road but no connectivity between Fifth Line and Derry Road)

- 2035 Future Horizon
    - Future Background Conditions (Clark Boulevard across Anatolia property)
    - Future Total Conditions (Clark Boulevard connected between Fifth Line and Derry Road)

- 2035 Future Horizon Sensitivity – Derry Road Expansion
    - Future Background Conditions (Clark Boulevard across Anatolia property)
    - Future Total Conditions(Clark Boulevard connected between Fifth Line and Derry Road)

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

8.3.1 Signalized Intersections

Under existing conditions, the study area includes three signalized intersections. Under future conditions in 2030 and in 2035, the study area includes five signalized intersections and four unsignalized intersections to be considered with the development of the site. 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 and future conditions. Analysis results for this intersection are summarized in **Table 16**.

TABLE 16 SIXTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Key Movements	Existing		2030 Horizon Year				2035 Horizon Year			
			Future Background		Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.11 (0.59)	A (C)	0.41 (0.87)	A (E)	0.45 (0.87)	A (E)	0.44 (0.71)	A (D)	0.49 (0.71)	A (D)
EBTR	**0.90** (0.80)	C (B)	**1.08 (1.18)**	E (F)	**1.10 (1.21)**	E (F)	**1.16 (1.20)**	F (F)	**1.19 (1.24)**	F (F)
WBL	0.15 (0.21)	B (B)	0.21 (0.26)	C (C)	0.21 (0.26)	C (C)	0.21 (0.27)	C (C)	0.21 (0.27)	C (C)
WBTR	0.33 (0.86)	A (C)	0.46 **(1.21)**	B (F)	0.50 **(1.22)**	B (F)	0.48 **(1.29)**	B (F)	0.54 **(1.30)**	B (F)
NBL	0.67 (0.93)	E (F)	**0.96 (1.03)**	F (F)	0.89 **(1.03)**	F (F)	0.76 **(0.96)**	E (F)	0.79 **(0.97)**	E (F)
NBTR	0.26 (0.37)	D (D)	0.61 (0.32)	D (C)	0.58 (0.32)	D (C)	0.38 (0.21)	D (C)	0.36 (0.21)	D (C)
SBL	0.12 (0.31)	D (D)	0.34 (0.38)	D (D)	0.31 (0.38)	D (D)	0.40 (0.74)	D (E)	0.37 (0.74)	D (E)
SBTR	0.69 (0.49)	D (D)	0.77 **(0.89)**	D (E)	0.74 **(0.89)**	D (E)	0.35 (0.50)	D (D)	0.33 (0.50)	D (D)
Overall	**0.84 (0.85)**	**C (C)**	**1.03 (1.16)**	**D (F)**	**1.03 (1.18)**	**D (F)**	**1.06 (1.17)**	**E (F)**	**1.09 (1.18)**	**E (F)**

Notes:
1. 00 (00) – AM (PM)
2. Capacity analysis for future scenarios is carried out using a signal timing plan adjustments to account for future travel patterns, while maintaining the existing cycle length.

This intersection operates acceptably under existing conditions, but it is forecasted to be pushed over capacity under 2030 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.

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 17**.

TABLE 17 FIFTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Key Movements	Existing		2030 Horizon Year				2035 Horizon Year			
			Future Background		Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.09 (0.21)	A (C)	0.31 (0.32)	A (C)	0.32 (0.32)	A (C)	0.36 (0.33)	A (C)	0.37 (0.33)	A (C)
EBTR	**0.86** (0.80)	A (C)	**1.24 (1.09)**	F (F)	**1.29 (1.13)**	F (F)	**1.38 (1.23)**	F (F)	**1.46 (1.25)**	F (F)
WBL	0.46 (0.35)	C (B)	**0.95** (0.65)	F (D)	**1.14** (0.67)	F (D)	**1.02** (0.61)	F (C)	**1.02** (0.61)	F (C)
WBTR	0.35 **(0.90)**	A (C)	0.55 **(1.27)**	B (F)	0.55 **(1.31)**	B (F)	0.59 **(1.40)**	B (F)	0.61 **(1.48)**	B (F)
NBL	0.39 (0.47)	D (D)	0.34 (0.75)	D (D)	0.39 (0.91)	D (E)	0.38 (0.79)	D (D)	0.39 (0.83)	D (E)
NBTR	0.22 (0.23)	D (D)	0.57 (0.38)	D (D)	0.58 (0.44)	D (D)	0.58 (0.42)	D (D)	0.59 (0.42)	D (D)
SBL	0.68 (0.82)	E (E)	**1.02 (1.04)**	F (F)	**1.04 (1.05)**	F (F)	**1.02 (1.01)**	F (F)	**1.04 (1.00)**	F (F)
SBTR	0.23 (0.14)	D (D)	0.12 (0.75)	D (E)	0.12 (0.75)	D (E)	0.12 (0.75)	D (E)	0.13 (0.75)	D (E)
Overall	**0.81 (0.87)**	**B (C)**	**1.15 (1.18)**	**F (F)**	**1.21 (1.19)**	**F (F)**	**1.26 (1.24)**	**F (F)**	**1.31 (1.28)**	**F (F)**

Notes:
1. 00 (00) – AM (PM)
2. Capacity analysis for future scenarios is carried out using a signal timing plan adjustments to account for future travel patterns, while maintaining the existing cycle length.

This intersection operates acceptably under existing conditions, but it is forecasted to be pushed over capacity under 2030 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.

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 18**.

TABLE 18 JAMES SNOW PARKWAY / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Key Movements	Existing		2030 Horizon Year				2035 Horizon Year			
			Future Background		Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.56 (0.57)	D (D)	0.57 (0.59)	D (D)	0.57 (0.59)	D (D)	0.60 (0.61)	D (D)	0.60 (0.61)	D (D)
EBT	**1.00 (0.99)**	D (E)	**1.24 (1.12)**	F (F)	**1.29 (1.13)**	F (F)	**0.94 (0.86)**	D (D)	**0.99 (0.86)**	D (D)
EBR	0.02 (0.01)	B (C)	0.02 (0.01)	C (C)	0.02 (0.01)	C (C)	0.02 (0.01)	C (C)	0.02 (0.01)	C (C)
WBL	0.43 (0.75)	B (C)	0.47 (0.82)	C (D)	0.47 (0.83)	C (D)	0.50 (0.89)	C (E)	0.50 (0.91)	C (E)
WBT	0.37 **(0.94)**	C (D)	0.46 **(1.11)**	C (F)	0.47 **(1.15)**	C (F)	0.35 **(0.86)**	C (D)	0.36 **(0.90)**	C (D)
WBR	0.10 (0.39)	D (D)	0.13 (0.59)	E (C)	0.14 (0.65)	E (D)	0.14 (0.55)	E (C)	0.15 (0.64)	E (D)
NBL	0.12 (0.34)	D (D)	0.12 (0.33)	D (D)	0.12 (0.33)	D (D)	0.17 (0.41)	D (D)	0.17 (0.41)	D (D)
NBT	0.58 (0.66)	D (D)	0.60 (0.69)	D (D)	0.60 (0.69)	D (D)	0.55 (0.63)	D (D)	0.54 (0.63)	D (D)
NBR	0.11 (0.12)	D (D)	0.12 (0.20)	D (D)	0.12 (0.22)	D (D)	0.34 (0.49)	D (D)	0.41 (0.50)	D (D)
SBL	0.62 (0.68)	C (C)	0.74 (0.81)	C (D)	0.81 (0.83)	D (D)	0.86 **(0.95)**	D (E)	**0.98 (0.98)**	E (E)
SBT	0.38 (0.45)	C (D)	0.38 (0.52)	C (D)	0.38 (0.52)	C (D)	0.33 (0.46)	C (D)	0.33 (0.45)	C (D)
SBR	0.12 (0.13)	C (C)	0.13 (0.14)	C (C)	0.13 (0.14)	C (C)	0.16 (0.18)	C (C)	0.16 (0.18)	C (C)
Overall	**0.85 (0.84)**	**D (D)**	**1.01 (0.99)**	**F (E)**	**1.06 (1.01)**	**F (E)**	**0.92 (0.97)**	**D (D)**	**1.00 (0.99)**	**D (D)**

Notes:
1. 00 (00) – AM (PM)
2. Capacity analysis for future scenarios is carried out using a signal timing plan adjustments to account for future travel patterns, while maintaining the existing cycle length.

This intersection is forecasted to operate essentially at capacity under 2030 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.

This intersection operates acceptably under 2035 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.

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 19**.

TABLE 19 CLARK BOULEVARD / DERRY ROAD CAPACITY ANALYSIS SUMMARY

Key Movements	Existing		2030 Horizon Year				2035 Horizon Year			
			Future Background		Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	Intersection does not exist.		0.24 (0.54)	B (D)	0.25 (0.53)	B (D)	0.32 (0.63)	B (D)	0.39 (0.63)	C (E)
EBTR			**1.04 (0.99)**	D (D)	**1.07 (1.06)**	E (E)	**1.14 (1.08)**	F (E)	**1.43 (1.29)**	F (F)
WBL			0.54 (0.30)	D (C)	0.58 (0.33)	D (C)	0.54 (0.26)	D (C)	0.53 (0.36)	D (C)
WBTR			0.38 **(0.94)**	A (C)	0.40 **(0.98)**	A (C)	0.42 **(1.00)**	A (D)	0.42 **(1.16)**	A (F)
NBL			0.51 (0.90)	E (F)	0.55 (0.89)	E (E)	0.47 (0.90)	E (F)	0.62 **(0.97)**	E (F)
NBTR			0.01 (0.05)	D (D)	0.01 (0.05)	D (D)	0.08 (0.09)	D (D)	0.07 (0.21)	D (C)
SBL			0.24 (0.29)	D (D)	0.23 (0.25)	D (D)	0.27 (0.35)	D (D)	0.23 (0.27)	D (C)
SBTR			0.03 (0.41)	D (D)	0.03 (0.37)	D (D)	0.13 (0.61)	D (D)	0.11 (0.42)	D (D)
Overall			**0.95 (0.98)**	**D (C)**	**0.97 (1.03)**	**D (D)**	**1.04 (1.05)**	**E (D)**	**1.15 (1.20)**	**F (F)**

Notes:
1. 00 (00) – AM (PM)

This intersection generally operates near or essentially at capacity under 2030 future conditions, and is pushed above it's theoretical capacity under 2035 conditions. It is noted that due to the additional background traffic volumes added relative to existing conditions, the capacity of the eastbound through movement is constrained during the weekday morning and afternoon peak hours in 2030 and 2035, and the westbound through movement is constrained during the weekday afternoon peak hour in 2035. 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 20**.

TABLE 20 FIFTH LINE / CLARK BOULEVARD CAPACITY ANALYSIS SUMMARY

Key Movements	Existing		2030 Horizon Year				2035 Horizon Year			
			Future Background		Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	Intersection does not exist.		0.17 (0.27)	B (B)	0.14 (0.19)	B (B)	0.13 (0.21)	B (B)	0.11 (0.20)	B (B)
EBTR			0.00 (0.01)	B (B)	0.03 (0.01)	B (B)	0.12 (0.08)	B (B)	0.15 (0.09)	B (B)
WBL			-- (--)	-- (--)	0.03 (0.06)	B (B)	0.06 (0.11)	B (B)	0.08 (0.21)	B (B)
WBTR			-- (--)	-- (--)	0.04 (0.07)	B (B)	0.15 (0.05)	B (B)	0.17 (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			0.21 (0.22)	A (A)	0.23 (0.29)	A (A)	0.24 (0.27)	A (A)	0.26 (0.28)	A (A)
SBL			-- (--)	-- (--)	0.20 (0.04)	A (A)	0.00 (0.00)	A (A)	0.16 (0.03)	A (A)
SBTR			0.16 (0.24)	A (A)	0.16 (0.31)	A (A)	0.18 (0.26)	A (A)	0.18 (0.27)	A (A)
Overall			**0.21 (0.24)**	**A (A)**	**0.22 (0.27)**	**A (A)**	**0.24 (0.26)**	**A (A)**	**0.25 (0.27)**	**A (A)**

Notes:
1. 00 (00) – AM (PM)

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

8.3.2 Unsignalized Intersections

Analysis results for unsignalized intersections within the study area are summarized in **Table 21**.

These intersections operate acceptably under 2030 and 2035 future conditions.

TABLE 21 2027 UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Movements	Existing		2030 Horizon Year				2035 Horizon Year			
			Future Background		Future Total		Future Background		Future Total	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
Clark Boulevard / Anatolia Access2 (north driveway)										
EBLTR	Intersection does not exist.		B (B)	11.8 (11.8)	B (B)	12.0 (12.2)	B (B)	10.8 (10.8)	B (B)	13.3 (13.9)
WBLTR			A (A)	8.6 (9.6)	A (A)	8.6 (9.6)	A (A)	9.0 (9.7)	A (B)	9.4 (11.1)
NBLTR			A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.1 (0.0)	A (A)	0.1 (0.0)
SBLTR			A (A)	1.9 (1.2)	A (A)	1.8 (1.2)	A (A)	1.9 (1.1)	A (A)	1.3 (1.0)
North Building 1 Access / Derry Road										
SBTL	Intersection does not exist.				D (D)	32.0 (29.3)	Intersection does not exist.		E (D)	40.2 (34.3)
Building 1 & 2 Access / Clark Boulevard										
EBLT	Intersection does not exist.				A (A)	1.6 (1.7)	Intersection does not exist.		A (A)	0.8 (0.5)
SBLR					A (A)	8.4 (8.8)			A (A)	9.6 (9.1)
Building 5 Access / Clark Boulevard										
WBLT	Intersection does not exist.				A (A)	0.0 (0.0)	Intersection does not exist.		A (A)	0.7 (0.0)
NBLR					A (A)	9.1 (9.0)			A (A)	8.9 (8.7)
Building 2 & 3 Access / Clark Boulevard										
EBLT	Intersection does not exist.				A (A)	1.2 (0.9)	Intersection does not exist.		A (A)	0.6 (0.3)
SBLR					A (A)	8.4 (8.7)			A (A)	9.5 (9.2)
Building 5 & 6 Access / Clark Boulevard										
WBLT	Intersection does not exist.				A (A)	0.0 (0.0)	Intersection does not exist.		A (A)	1.7 (0.2)
NBLR					A (A)	8.9 (8.9)			A (A)	8.9 (8.8)
Building 3 & 4 Access / Clark Boulevard										
EBLT	Intersection does not exist.				A (A)	3.2 (3.6)	Intersection does not exist.		A (A)	0.9 (0.2)
					A (A)	0.0 (0.0)			A (A)	0.0 (0.0)
SBLR					A (A)	8.3 (8.5)			A (A)	9.5 (9.4)
Building 4 & 7 Access – Building 6 & 9 Access / Clark Boulevard										
EBLTR	Intersection does not exist.				A (A)	0.0 (0.0)	Intersection does not exist.		A (A)	0.4 (0.2)
WBLTR					A (A)	0.0 (0.0)			A (A)	1.1 (0.2)
NBLTR					A (A)	8.6 (8.6)			A (A)	8.7 (9.1)
SBLTR					A (A)	0.0 (0.0)			A (A)	9.5 (9.9)
Building 7 Access – Building 8 Access / Clark Boulevard										
EBLTR	Intersection does not exist.								A (A)	0.2 (0.0)
WBLTR									A (A)	2.6 (0.7)
NBLTR									A (A)	9.2 (9.6)
SBLTR									B (B)	10.4 (10.2)
Clark Boulevard / Street 2										
WBLR	Intersection does not exist.								A (A)	8.8 (9.4)
SBLT									A (A)	0.3 (0.6)

Notes:
1. 00 (00) – AM (PM)
2. This intersection, build as part of the Anatolia development, is included because traffic for Remington North Building 1 passes through it via an easement between the two properties.

8.3.3 Sensitivity Analysis – Derry Road Expansion

Under future conditions, particularly for the 2035 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 2035 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 2035.

Capacity analysis results for affected signalized intersections are provided 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 22**.

TABLE 22 SIXTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY – DERRY ROAD EXPANSION SENSITIVITY

Movement	2035 Horizon			
	Future Background		Future Total	
	V/C	LOS	V/C	LOS
EBL	0.42 (0.71)	A (D)	0.46 (0.71)	A (D)
EBTR	0.81 (0.83)	B (C)	0.83 **(0.86)**	B (C)
WBL	0.21 (0.27)	B (B)	0.21 (0.27)	B (C)
WBTR	0.34 **(0.90)**	B (C)	0.37 **(0.91)**	B (C)
NBL	0.76 **(0.96)**	E (F)	0.79 **(0.97)**	E (F)
NBTR	0.38 (0.21)	D (C)	0.36 (0.21)	D (C)
SBL	0.40 (0.74)	D (E)	0.37 (0.74)	D (E)
SBTR	0.35 (0.50)	D (D)	0.33 (0.50)	D (D)
Overall	**0.79 (0.92)**	**B (C)**	**0.81 (0.93)**	**B (C)**

Notes:
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.

This intersection operates acceptably under 2035 future conditions if Derry Road is widened to six lanes.

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 23**.

TABLE 23 2032 FIFTH LINE / DERRY ROAD CAPACITY ANALYSIS SUMMARY – DERRY ROAD EXPANSION SENSITIVITY

Movement	2035 Horizon			
	Future Background		Future Total	
	V/C	LOS	V/C	LOS
EBL	0.33 (0.33)	A (C)	0.34 (0.33)	A (C)
EBTR	**0.96 (0.85)**	B (C)	**1.02 (0.87)**	C (C)
WBL	**1.02** (0.61)	F (C)	**1.02** (0.61)	F (C)
WBTR	0.40 **(0.97)**	B (D)	0.41 **(1.03)**	B (E)
NBL	0.38 (0.79)	D (D)	0.39 (0.83)	D (E)
NBTR	0.58 (0.42)	D (D)	0.59 (0.42)	D (D)
SBL	**1.02 (1.01)**	F (F)	**1.04 (1.00)**	F (F)
SBTR	0.12 (0.75)	D (E)	0.13 (0.75)	D (E)
Overall	**1.04 (0.99)**	**C (D)**	**1.05 (1.02)**	**C (D)**

Notes:
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.

While some movements are capacity constrained due to particularly heavy volumes, this intersection essentially operates at capacity under 2035 future conditions, if Derry Road is widened to six lanes.

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

Movement	2035 Horizon			
	Future Background		Future Total	
	V/C	LOS	V/C	LOS
EBL	0.33 (0.63)	B (D)	0.41 (0.64)	C (E)
EBTR	0.80 (0.75)	C (B)	**0.99 (0.90)**	D (C)
WBL	0.54 (0.26)	C (B)	0.53 (0.36)	D (C)
WBTR	0.29 (0.70)	A (B)	0.29 (0.80)	A (B)
NBL	0.47 (0.90)	E (F)	0.62 **(0.97)**	E (F)
NBTR	0.08 (0.09)	D (D)	0.07 (0.21)	D (C)
SBL	0.27 (0.35)	D (D)	0.23 (0.27)	D (C)
SBTR	0.13 (0.61)	D (D)	0.11 (0.41)	D (D)
Overall	**0.75 (0.79)**	**B (B)**	**0.85 (0.93)**	**C (C)**

Notes:
1. 00 (00) – AM (PM)

This intersection operates acceptably under 2035 future conditions if Derry Road is widened to six lanes.

8.3.4 Traffic Analysis Summary

While the area road network operates acceptably under existing conditions, capacity constraints arise in both the 2030 and 2035 future horizons. Specific vehicle movements at intersections along Derry Road are capacity constrained in 2030, and these operational issues are increased due to additional growth in 2035. 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. 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.

8.3.5 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 Remington Lands. The long-term 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 25**. The site trips considered for this report for the Remington Lands (2035 horizon) are slightly higher than what was estimated within the Derry Green Secondary Plan, though this comparison does not account for the development of the Anatolia Lands, which are also accessed from Clark Boulevard.

TABLE 25 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 Peak traffic volumes provided			47	150	197
Proposed Remington Development	140	34	174	22	184	206
Difference				**-25**	**+34**	**+9**

Notes:
1. Represents the sum of eastbound right-turn and westbound left-turn movements at the intersection of Clark Boulevard / Derry Road.
2. 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 three site driveways along the curved portion of Clark Boulevard and the proposed right-in right-out access at Derry Road for Building 1.

The driveway to Building 7 on the inside of the Clark Boulevard curve provides access to a parking lot and was tested with a passenger car as the design vehicle. The southern driveway to Building 8 on the outside of the curve was also tested with a passenger car, while the north driveway was tested with articulated trucks, as was the right-in right-out driveway from Building 1 (north property) at Derry Road. In the vicinity of the Clark Boulevard curve, the sight distance assessment assumed the recommended installation of curve advisory speed limit signs of 40 km/h for both the northbound and southbound directions of travel on Clark Boulevard.

The sight distances were evaluated in accordance with the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads. Key parameters included:

- Assumed driver 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 eye to edge of major-road travel way;
- Proposed posted 40 km/h curve advisory speed limit (50 km/h design speed) on Clark Boulevard along the length of the curve;
- Left-turning design vehicle “Passenger Car” for Building 7 and 8 parking access driveways;
- Left-turning design vehicle “Combination Truck – WB 19 and WB 20” for Building 8’s heavy truck driveway; and
- Right-turning design vehicle “Combination Truck – WB 19 and WB 20” for Building 1 (north property)’s right-in right-out driveway.

Based upon the site driveway sight distance review, the visibility at the proposed driveway access points is expected to be adequate.

Along the curve on Clark boulevard, with the recommended posted advisory speed limit of 40 km/h and a design speed of 50 km/h speed around the curve, all relevant sightlines are acceptable. In addition, the right-turning exit visibility for the Derry Road driveway is acceptable. The details of the sightline assessment are provided in the following sections.

The relevant graphics and representations of required sight distances are provided in sight distance plans in **Appendix J.**

9.1.1 Building 7 Driveway

A sight distance review was undertaken for the Building 7 driveway on the inner curve of Clark Boulevard, 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 and south of the site access. It is

recommended to post speed limit curve advisory warning signage at 40 km/h at both ends of the curve along Clark Boulevard, to address visibility and sight distance concerns along the curve.

The minimum required sight distances along Clark Boulevard at the proposed site access are shown in **Table 25** and in plan SD-01 in **Appendix J**. Only the critical left-turn maneuvers were tested as any right-turn maneuvers require less sight distance. As neither tractor-trailer type vehicles nor single-unit trucks are expected to use this driveway, the chosen design vehicle was a passenger car, which has a shorter time-gap compared to both tractor-trailer type vehicles and single-unit trucks.

TABLE 26 SIGHT DISTANCE (BUILDING 7 DRIVEWAY)

Movement	TAC Minimum Requirement (metres)	Available Sight Distance (metres)
Turning Sight Distance from Left – Southbound (Design Speed of 50 km/h)		
Site Access at Clark Boulevard		
Left-turn from Site Access to Clark Boulevard[1]	105	>105
Turning Sight Distance from Right – Northbound (Design Speed of 50 km/h)		
Site Access at Clark Boulevard		
Left-turn from Site Access to Clark Boulevard[1]	125	>125

Notes:

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

The available sight distance for the left-turn from the Building 7 driveway to Clark Boulevard is sufficiently greater than the required 105 metre minimum and is easily achieved. The sightlines are therefore sufficient to accommodate the proposed driveway.

9.1.2 Building 8 South Driveway

A sight distance review was undertaken for the south driveway of Building 8 on the curve of Clark Boulevard, 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 and south of the site access.

The minimum required sight distances along Clark Boulevard at the proposed site access are shown in Table 27 and in plan SD-02 in **Appendix J**. Only the critical left-turn maneuvers were tested as the right-turn maneuvers require less sight distance. As neither tractor-trailer type vehicles nor single-unit trucks are expected to use this driveway, the chosen design vehicle was a passenger car, which has a shorter time-gap compared to both tractor-trailer type vehicles and single-unit trucks.

TABLE 27 SIGHT DISTANCE (BUILDING 8 SOUTH DRIVEWAY)

Movement	TAC Minimum Requirement (metres)	Available Sight Distance (metres)
Turning Sight Distance from Left or Right – Southbound or Northbound (Design Speed of 50 km/h)		
Site Access at Clark Boulevard		
Left-turn from Site Access to Clark Boulevard[1]	105	>105

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

The available sight distance for the left-turn from the Building 8 south driveway to Clark Boulevard is sufficiently greater than the required 105 metre minimum and is easily achieved. The sightlines are therefore sufficient to accommodate the proposed driveway.

9.1.3 Building 8 North Driveway

A sight distance review was undertaken for the north driveway of Building 8 on the curve of Clark Boulevard, 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) south of the site access and assuming the proposed design speed of 60 km/h (10km/h over the existing posted speed limit of 50 km/h), north of the site access.

The minimum required sight distances along Clark Boulevard at the proposed site access are shown in Table 28 and in plan SD-03 in **Appendix J**. Only the critical left-turn maneuvers were tested as the right-turn maneuvers require less sight distance. For the Building 8 north driveway, a tractor trailer was chosen as the design vehicle, with an approximately larger time-gap than a single-unit truck or passenger car.

TABLE 28 SIGHT DISTANCE (BUILDING 8 NORTH DRIVEWAY)

Movement	TAC Minimum Requirement (metres)	Available Sight Distance (metres)
Turning Sight Distance from Left or Right – Southbound or Northbound (Design Speed of 50 km/h)		
Site Access at Clark Boulevard		
Left-turn from Site Access to Clark Boulevard[1]	160	>160

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

The available sight distance for the left-turn from the Building 8 north driveway to Clark Boulevard is sufficiently greater than the required 160 metre minimum and is easily achieved. The sightlines are therefore sufficient to accommodate the proposed driveway.

9.1.4 Building 1 (North Property) Driveway

A sight distance review was undertaken for the Building 1 (north property) driveway on Derry Road, for the right-turning sight distance using a proposed reduced design speed of 100 km/h (20 km/h over the proposed posted curve advisory speed limit of 80 km/h), west of the site access.

The minimum required sight distance along Derry Road at the proposed site access are shown in Table 29 and in plan SD-04 in **Appendix J**. As this site access is restricted to right-in and right-out manoeuvres, only the right-turn maneuver was tested. For the Building 1 (north property) site driveway, a tractor trailer was chosen as the design vehicle, with an approximately larger time-gap than a single-unit truck or passenger car.

TABLE 29 SIGHT DISTANCE (BUILDING 1 DRIVEWAY)

Movement	TAC Minimum Requirement (metres)	Available Sight Distance (metres)
Turning Sight Distance from Left (Design Speed of 100 km/h)		
Site Access at Derry Road		
Right-turn from Site Access to Derry Road[1]	295	>295

Notes
1. Transportation Association of Canada (TAC) Manual, Case B2, Table 9.9.5.

The available sight distance for the right-turn from the Building 1 (north property) driveway to Derry Road is sufficiently greater than the required 295 metre minimum and is easily achieved. The sightlines are therefore sufficient to accommodate the proposed driveway.

9.1.5 Sight Distance Summary

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 site driveway sight distance review, the proposed points of access along Clark Boulevard are expected to be adequate at the proposed driveway access points. With a recommended posted speed limit of 40 km/h and a design speed of 50 km/h speed around the curve, all relevant sightlines are acceptable.

In addition, the proposed building 1 (north property) site driveway along Derry Road, with a posted speed limit of 80 km/h and a design speed of 100 km/h accommodates sufficient sightlines. Therefore, the sightlines are expected to be sufficient to functionally accommodate the proposed driveways.

9.2 ASSESSMENT FOR LEFT-TURNING LANES

Although it is acknowledged that the Town's plans for the construction of Fifth Line at Clark Boulevard already include left-turning lanes on all approaches, as supplementary information, a left-turn lane assessment was undertaken at this intersection. As part of this report, a detailed evaluation for a left-turn lane on Fifth Line/ Clark Boulevard was completed using the Ministry of Transportation Ontario (MTO) Geometric Design Standards for Ontario Highways. The evaluation was based on a design speed of 90 km/h at the intersection of Fifth Line / Clark Boulevard. Traffic volumes were taken from the 2035 future conditions scenario.

At the Fifth Line / Clark Boulevard access, the necessity of NBLT, SBLT, WBLT and EBLT lanes for all approaches was assessed. Traffic volumes along Clark Boulevard are sufficiently low that left-turn lanes are not warranted. For the SBLT lane, the opposing traffic volume during the AM peak period is 489 vph, the advancing volume is 419 vph, and the left-turn volume is 77 vph. This results in a left-turn volume percentage of approximately 20%. Figure EA-19 "Left Turn Storage Lanes, Two Lane Highways, Unsignalized" from the MTO's Geometric Standards for Ontario Highways was used, where it was determined that a SBLT lane with a storage length of 15 metres **is** warranted at the intersection.

The same exercise was repeated for the NBLT lane, using an opposing volume of 489 vph, an advancing volume of 499 vph, and a left turn volume of 10 vph. Rounding up to the nearest 5%, the approximate percentage of left turning vehicles was 5%. Using Figure EA-18, it was determined that the warrant **is** met for a NBLT lane with a storage length of 15 metres.

Based on BA Group's comprehensive traffic analysis undertaken for this report, a traffic signal is being recommended at the intersection of Fifth Line and Clark Boulevard (as per outlined **Section 9.4).** It is noted that although left-turn lanes are not warranted on the WB and EB approaches of Clark Boulevard, there is sufficient space within the existing curb to curb width to provide these dedicated lanes, hence they are being recommended in order to improve traffic operations at the intersection.

As shown in the detailed evaluation in **Appendix K**, northbound and southbound left-turn lanes are warranted at the intersection of Fifth Line and Clark Boulevard.

9.3 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 and future conditions are summarized in **Table 30**.

TABLE 30 QUEUEING SUMMARY – KEY INTERSECTION MOVEMENTS

Key Movements	Existing Storage Capacity (m)	2030 Horizon Year				2035 Horizon Year			
		Future Background		Future Total		Future Background		Future Total	
		50th %ile Queue	95th %ile Queue	50th %ile Queue	95th %ile Queue	50th %ile Queue	95th %ile Queue	50th %ile Queue	95th %ile Queue
Sixth Line / Derry Road									
EBL	150	10.7 (24.2)	21.6 (69.6)	11.8 (24.5)	21.6 (70.6)	9.5 (23.7)	21.2 (79.3)	10.1 (24.2)	22.5 (80.7)
EBTR	670	334.0 (304.4)	401.7 (349.7)	345.5 (316.1)	403.5 (361.2)	395.3 (339.0)	471.0 (414.3)	404.4 (358.7)	481.0 (433.6)
Fifth Line / Derry Road									
WBL	115	33.8 (15.2)	83.0 (48.1)	53.1 (17.8)	106.0 (55.6)	40.6 (12.2)	91.1 (40.0)	39.8 (12.2)	91.2 (40.0)
WBTR	540	66.8 (428.7)	78.8 (498.6)	67.3 (437.4)	79.2 (507.1)	73.2 (495.0)	88.7 **(562.5)**	74.1 (533.7)	90.3 **(600.3)**
Clark Boulevard / Derry Road									
WBL	135	7.4 (2.4)	26.6 (7.0)	12.6 (3.0)	33.4 (7.5)	7.4 (2.0)	26.4 (6.4)	31.0 (4.2)	60.5 (8.9)
NBL	85[2]	13.0 (44.0)	25.9 (68.2)	14.6 (50.6)	28.2 **(87.1)**	11.3 (37.4)	23.5 (58.7)	17.8 (70.2)	32.8 **(127.3)**
Fifth Line / Clark Boulevard									
WBL	115	-- (--)	-- (--)	0.1 (0.5)	1.2 (2.7)	0.2 (0.7)	1.7 (3.6)	0.4 (0.6)	1.9 (5.6)
WBTR	>115	-- (--)	-- (--)	0.1 (0.1)	3.3 (5.8)	0.4 (0.3)	2.9 (2.3)	0.5 (0.3)	3.1 (3.9)

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 Anatolia site driveways, and an additional 15m south of the driveways.

The queuing assessment indicates that queues can be accommodated by the available storage capacity in all scenarios, with the exception of two movements. Westbound through movement queues at the intersection of **Fifth Line / Derry Road** may at times be metered by the upstream intersection of **Clark Boulevard / Derry Road** during the weekday afternoon peak hour. Northbound left-turning queues at the intersection of **Clark Boulevard / Derry Road** may occasionally extend beyond the available storage during the weekday afternoon peak hour.

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.

9.4 TRAFFIC SIGNAL WARRANT ANALYSIS

Although it is acknowledged that the Town's plans for the construction of Fifth Line at Clark Boulevard already include a traffic signal, as supplementary information, the need for traffic signals was evaluated at the intersection of **Fifth Line / Clark Boulevard** under 2035 future conditions. The traffic signal warrant analysis was based on the Ontario Traffic Manual (OTM) Book 12 methodology (Justification 1,2 and 3).

The results of the traffic signal warrant analysis are summarized in **Table 31**, with the relevant excerpts and detailed analysis provided in **Appendix J**.

TABLE 31 TRAFFIC SIGNAL WARRANTS (2035) – FIFTH LINE / CLARK BOULEVARD

Justification	Description	Required	Hour Ending								Percentage Compliance	
		2 Lanes or more [Free Flow][2]	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00	Average	Sectional
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches	720	1053	858	647	1210	1043	1177	1149	1283		
		100%	100%	100%	80%	100%	100%	100%	100%	100%	98%	**70%**
	B. Vehicle volume, minor streets	144	50	38	28	181	144	159	137	164		
		100%	35%	26%	20%	100%	100%	100%	80%	100%	70%	
2. Delay to Cross Traffic	A. Vehicle volume, major street	720	1003	820	619	1030	899	1018	1012	1118		
		100%	100%	100%	80%	100%	100%	100%	100%	100%	98%	
	B. Combined vehicle/pedestrian volume crossing artery from minor street	60	37	29	23	130	105	115	100	119		**81%**
		100%	62%	49%	39%	100%	100%	100%	100%	100%	81%	
Overall Compliance is 81%[3]												

Notes:
1. Relevant OTM excerpts are provided in **Appendix J**.
2. Thresholds are increased by 20% for future intersections.
3. Justification 3 cannot be applied here since neither of the other justifications reaches 80% compliance.

The proposed traffic signal is not quite warranted based upon OTM Book 12 but is recommended, as with a compliance level of 81%, the intersection will likely require traffic signals in the future. A traffic signal will also provide a protected crossing for pedestrians and cyclists across Fifth Line and will improve the overall level of safety at the intersection.

10.0 CONCLUSIONS AND RECOMMENDATIONS

Traffic Analysis Summary

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 2030 and 2035 future horizons. Specific vehicle movements at intersections along Derry Road are capacity constrained in 2030, and these operational issues are increased due to additional growth in 2035. 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 undertaken demonstrates 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.

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. 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.

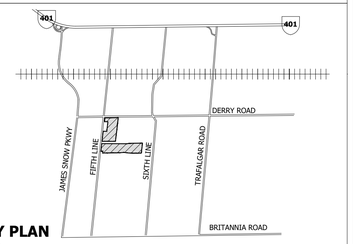
Recommendations

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.

- It is recommended that future traffic operations at the intersection 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 be installed in order to address minor sight distance concerns along the Clark Boulevard curve.
- It is recommended that traffic signals be installed at Fifth Line & Clark Boulevard (planned as part of future intersection upgrades).

Appendix A:
Development Concept Plan

CONCEPT 1
BASE PLAN
1 STOREY BUILDINGS
REMINGTON - DERRY GREEN



KEY PLAN

SUBJECT LANDS **N.T.S.**

Parking Requirements (M1 Zone)			
Building (BLDG)	Required Parking	Provided Parking	Provided Accessible Parking
NORTH 1	87[2]	90	4
SOUTH 1	49[1]	49	4
2	49[1]	57	6
3	53[1]	61	8
4	64[1]	66	6
5	39[1]	39	5
6	92[2]	93	5
7	82[1]	83	5
8	107[2]	109	5
9	20[1]	20	1

1.*For all permitted uses in M1 zone, 1 space per 30 m² for first 1,000 m² GFA, and 1 space per 100 m² for GFA between 1,001 m² and 5,000 m², and 1 space per 200 m² for GFA greater than 5,000 m². Non Residential parking based on GFA less than 10%.*

2.*For industrial and warehouse/distribution uses including accessory office space, 1 space per 100 m² for first 5,000 m² GFA and 1 space per 200 m² for GFA greater than 5,000 m².*

Loading Requirements (M1 Zone)		
Building (BLDG)	Required	Provided
NORTH 1	4*	10*
SOUTH 1	2*	1**
2	2*	2**
3	2*	2**
4	2*	2**
5	1**	1**
6	4*	15**
7	3*	3**
8	4*	22*
9	1**	1**

**Loading Space (12m x 3.5m)*

***Loading Area (6m x 3.5m)*

THE REMINGTON GROUP

SCALE 1:2000

March 7, 2025

KORSIAK Urban Planning
206-277 Lakeshore Road East
Oakville, Ontario L6J 1H9
T: 905-257-0227
info@korsiak.com

S:\Korsiak & Company\REMINGTON\Derry Green\Concept\2025-03\Remington Derry Green - base plan for coordination - Mar-07-25 - w.s.dwg

Appendix B:
Town & Region Comments for Terms of Reference

From: Kavleen.Sachdeva@milton.ca
To: Robin Marinac
Cc: Mark Crockford
Subject: RE: Anatolia Milton Industrial TIS TOR
Date: April 28, 2022 1:46:08 PM
Attachments: image001.png
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

Confidentiality notice: This message and any attachments are intended only for the recipient named above. This message may contain confidential or personal information that may be subject to the Municipal Freedom of Information Act and must not be distributed or disclosed to unauthorized persons. If you received this message in error, please notify the sender immediately. Thank you for your assistance.

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:
    - Fifth Line
    - Sixth Line
    - Clark Boulevard
    - Derry Road
    - James Snow Parkway

- The following intersections will be included in the Transportation Impact Assessment:
    - Fifth Line at Derry Road
    - Sixth Line at Derry Road
    - Clark Boulevard at Derry Road (future) - assume four-legged intersection for 2027 beyond
    - Clark Boulevard at Fifth Line (future)
    - All proposed future Site Accesses (two accesses on Derry Road, one access on Sixth Line, and proposed accesses on Clark Boulevard)
    - 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.
    - 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.
    - 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.
    - 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:

- 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.
- 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 includes background site traffic generated by background developments.
- 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 includes background site traffic generated by background developments.
- 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.
- 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.
- 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.

  - *Boyne Secondary Plan Survey Area – Road Network Assessment* prepared by GHD
  - *Derry Green Secondary Plan Survey Area – Transportation Strategy Report (2010)* prepared

by Entra Consultants *(Data request)* See above.
    - *Derry Green Corporate Business Park Secondary Plan Modification (2016)* prepared by Read, Voorhees & Associates *(Data request)* See above.
    - *Derry Green Corporate Business Park Transportation Impact Study (2021)* prepared by Crozier Consulting Engineers
    - Transportation Impact Study for the Sun Life Broccolini lands (south of Derry Road) within the Derry Green Business Park *(Data request)* See above.
    - Transportation Impact Study for the Orlando Corporation lands within the Derry Green Business Park *(Data request)* See above.
    - Menkes Milton Industrial Inc. Phase 1 lands within the Derry Green Business Park *(Data request)* See above.
    - 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 plus 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.
    - 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.
    - 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.
    - 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.
    - It is assumed that the changes to Derry Road will be present in the 2032 future analysis

horizons.

- 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.
  - 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.
  - Please indicate the intent of the additional lanes (general use lane, HOV lane etc.) *(Data request)*
  - 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 semi-trailer 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.
  - 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.

- 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.
- 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.
- 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.
  - 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.
  - 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.
    - 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.
    - Other Synchro inputs will be based on site observations, Halton Region's Transportation Impact Study Guidelines, as well as Synchro default parameters.
    - 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.
    - Any proposed unsignalized accesses directly to Derry Road must be restricted to a right-in/right-out (RI/RO) operation.
    - 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 co-ordination 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):
    - Sightlines along Derry Road;
    - the proposed clear throat length at the accesses; and
    - 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

This message, including any attachments, is intended only for the person(s) named above and may contain confidential and/or privileged information. Any use, distribution, copying or disclosure by anyone other than the intended recipient is strictly prohibited. If you are not the intended recipient, please notify us immediately by telephone or e-mail and permanently delete the original transmission from us, including any attachments, without making a copy.

From: Robin Marinac <robin.marinac@cghtransportation.com>
Sent: Tuesday, April 19, 2022 3:02 PM
To: Loro, Darren <Darren.Loro@halton.ca>; Kavleen.Sachdeva@milton.ca
Cc: Mark Crockford <mark.crockford@cghtransportation.com>
Subject: Anatolia Milton Industrial TIS TOR

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. If you are unsure or need assistance please contact the IT Service Desk.

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

Appendix C:
Functional Road Plans

GENERAL NOTES

1. TOPOGRAPHIC SKETCH BY STANTEC DATED JANUARY 09 2023
2. TOPOGRAHIC SURVEY(S) BY SCHAEFFERS DATED APRIL 15 2019
3. FIFTH LINE RECONSTRUCTION PLAN BY WSP DATED OCTOBER 26 225
4. CONCEPTUAL PLAN BY KORSIAK DATED MARCH

LEGEND

PROPERTY LINE

PROPOSED RIGHT-OF-WAY

FUTURE BUSINESS PARK

EXISTING RESIDENTIAL

DERRY ROAD

RIGHT-IN RIGHT-OUT ACCESS

MEDIAN ISLAND TO EXTEND 40m PAST CURB RETURN OF DRIVEWAY PER HALTON REGION GUIDELINES

DESIGN OF CLARK BOULEVARD / DERRY ROAD INTERSECTION IS PART OF THIS SUBMISSION

MATCH TO EXISTING

NEW PROPERTY LINE PER REGION OF HALTON COMMENTS REGARDING WIDENING OF DERRY ROAD TO 47m R.O.W.

CONNECTION TO ANATOLIA LANDS

ACCESS TO PARKING AREA

SEPARATION BETWEEN DRIVEWAY AND PROPERTY LINE TO BE DICTATED BY GRADING/SLOPE REQUIREMENTS

OFFICE AREA

BLDG 1

ACCESS TO LOADING DOORS - DETAILED DESIGN TO BE TESTED WHEN CONFIRMED

NOISE WALL 6.0m HEIGHT

NORTH PROPERTY

(SUBJECT TO POTENTIAL EASEMENT)

SOUTH PROPERTY

HALTON PARAMEDIC SERVICES STATION 16

FUTURE DEVELOPMENT

SWM

UNION GAS

UNION GAS CORRIDOR

3.0 m MILTON PIPELINE TRAIL

FIFTH LINE

DAYLIGHT TRIANGLE 15mX15m

FIRE ROUTE

BLDG 1 ±2,850 m²

BLDG 2 ±2,830 m²

BLDG 3 ±3,300 m²

BLDG 4 ±4,500 m²

BLDG 5 ±1,700 m²

BLDG 6 ±13,300 m²

BLDG 7 ±7,300 m²

BLDG 9 ±660 m²

STREET 1 (CLARK BLVD)

26.0m PROPOSED ROW

CLARK BOULEVARD

TEMPORARY TURNING CIRCLE

ROAD WIDENING TBD (SUBJECT TO POTENTIAL EASEMENT)

EXISTING CELL PHONE TOWER TO BE RELOCATED

NATURAL HERITAGE SYSTEM

APPROXIMATE PHASING LIMIT

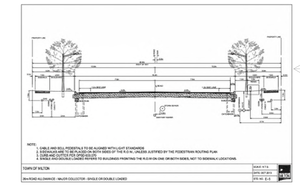
DASH LINE FOR 47m WIDE ROW PROTECTION FOR POTENTIAL FIFTH 1 / 2 LINE

EXISTING RESIDENTIAL

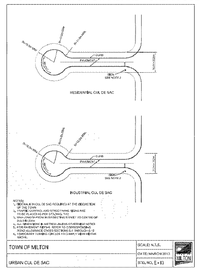
SOUTH

SECTION A - A

TOWN OF MILTON STANDARD - 26m ROAD ALLOWANCE - MAJOR COLLECTOR



TOWN OF MILTON STANDARD - URBAN CUL-DE-SAC



02	05-09-25	MTR	ISSUED FOR SUBMISSION
01	07-04-23	WGC	ISSUED FOR CLIENT REVIEW
00	MM-DD-YR	INT	REVISION NOTE

BA Group

BA Consulting Group Ltd.
300 – 45 St. Clair Ave. W.
Toronto ON M4V 1K9
ph. 416 961 7110
mail. bagroup@bagroup.com

MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

REMINGTON DERRY GREEN INDUSTRIAL DEVELOPMENT

INTERIM FUNCTIONAL ROAD PLAN

Date: June 28, 2023

Project No.: 7040-06

Scale: 1:1,000 (0 10 20 30 40 50m)

FD-01

Date Plotted: May 9, 2025 Filename: //7040-06/BA/Functional Road Plan/2025/2. 2025-05-06/ba-fd-Remington-R04-2025-05-06.dwg

GENERAL NOTES

1. TOPOGRAPHIC SKETCH BY STANTEC DATED JANUARY 09 2023
2. TOPOGRAHIC SURVEY(S) BY SCHAEFFERS DATED APRIL 15 2019
3. FIFTH LINE RECONSTRUCTION PLAN BY WSP DATED OCTOBER 26 225
4. CONCEPTUAL PLAN BY KORSIAK DATED MARCH

LEGEND

PROPERTY LINE

PROPOSED RIGHT-OF-WAY

FUTURE BUSINESS PARK

EXISTING RESIDENTIAL

DERRY ROAD

RIGHT-IN RIGHT-OUT ACCESS

MEDIAN ISLAND TO EXTEND 40m PAST CURB RETURN OF DRIVEWAY PER HALTON REGION GUIDELINES

MATCH TO EXISTING

NEW PROPERTY LINE PER REGION OF HALTON COMMENTS REGARDING WIDENING OF DERRY ROAD TO 47m R.O.W.

CONNECTION TO ANATOLIA LANDS

ACCESS TO PARKING AREA

SEPARATION BETWEEN DRIVEWAY AND PROPERTY LINE TO BE DICTATED BY GRADING/SLOPE REQUIREMENTS

OFFICE AREA

BLDG 1

ACCESS TO LOADING DOOR - DETAILED DESIGN TO BE TESTED WHEN CONFIRMED

NOISE WALL 6.0m HEIGHT

NORTH PROPERTY

(SUBJECT TO POTENTIAL EASEMENT)

SOUTH PROPERTY

FUTURE DEVELOPMENT

SWM

HALTON PARAMEDIC SERVICES STATION 16

UNION GAS

UNION GAS CORRIDOR

3.0 m MILTON PIPELINE TRAIL

FIFTH LINE

BLDG 1 ±2,850 m²

BLDG 2 ±2,830 m²

BLDG 3 ±3,300 m²

BLDG 4 ±4,500 m²

BLDG 5 ±1,700 m²

BLDG 6 ±13,300 m²

BLDG 7 ±7,300 m²

BLDG 9 ±660 m²

STREET 1 (CLARK BLVD)

26.00m PROPOSED ROW

CLARK BOULEVARD

TURNING CIRCLE

DAYLIGHT TRIANGLE 15mX15m

FIRE ROUTE

ROAD WIDENING TBD (SUBJECT TO POTENTIAL EASEMENT)

EXISTING CELL PHONE TOWER TO BE RELOCATED

NATURAL HERITAGE SYSTEM

APPROXIMATE PHASING LIMIT

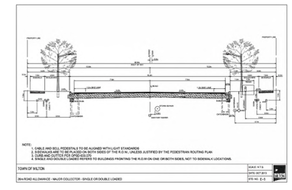
DASH LINE FOR 47m WIDE ROW PROTECTION FOR POTENTIAL FIFTH 1 / 2 LINE

EXISTING RESIDENTIAL

SOUTH

SECTION A - A

TOWN OF MILTON STANDARD - 26m ROAD ALLOWANCE - MAJOR COLLECTOR



02	05-09-25	MTR	ISSUED FOR SUBMISSION
01	07-04-23	WGC	ISSUED FOR CLIENT REVIEW
00	MM-DD-YR	INT	REVISION NOTE

BA Group

BA Consulting Group Ltd.
300 - 45 St. Clair Ave. W.
Toronto ON M4V 1K9
ph. 416 961 7110
mail. toronto@bagroup.com

MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

REMINGTON DERRY GREEN INDUSTRIAL DEVELOPMENT

ULTIMATE FUNCTIONAL ROAD PLAN

Date: June 28, 2023

Project No.: 7040-06

Scale: 1:1,000 (0 10 20 30 40 50m)

FD-01

Date Plotted: May 9, 2025 Filename: J:\7040-06\BA\Functional Road Plan\2025\2. 2025-05-06\ba-fd-Remington-R04-2025-05-06.dwg

Appendix D:
Vehicle Maneuvering Diagrams

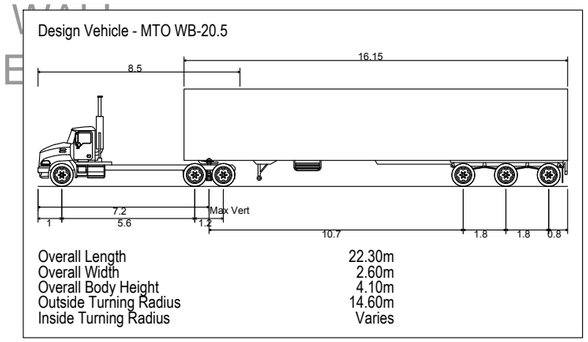
BUSINESS PARK

DERRY ROAD

OFFICE AREA

BLDG 1
±12,400 m²

NOISE WALL
6.0m HE



Overall Length	22.30m
Overall Width	2.60m
Overall Body Height	4.10m
Outside Turning Radius	14.60m
Inside Turning Radius	Varies

BA Group

REMINGTON DERRY GREEN INDUSTRIAL DEVELOPMENT

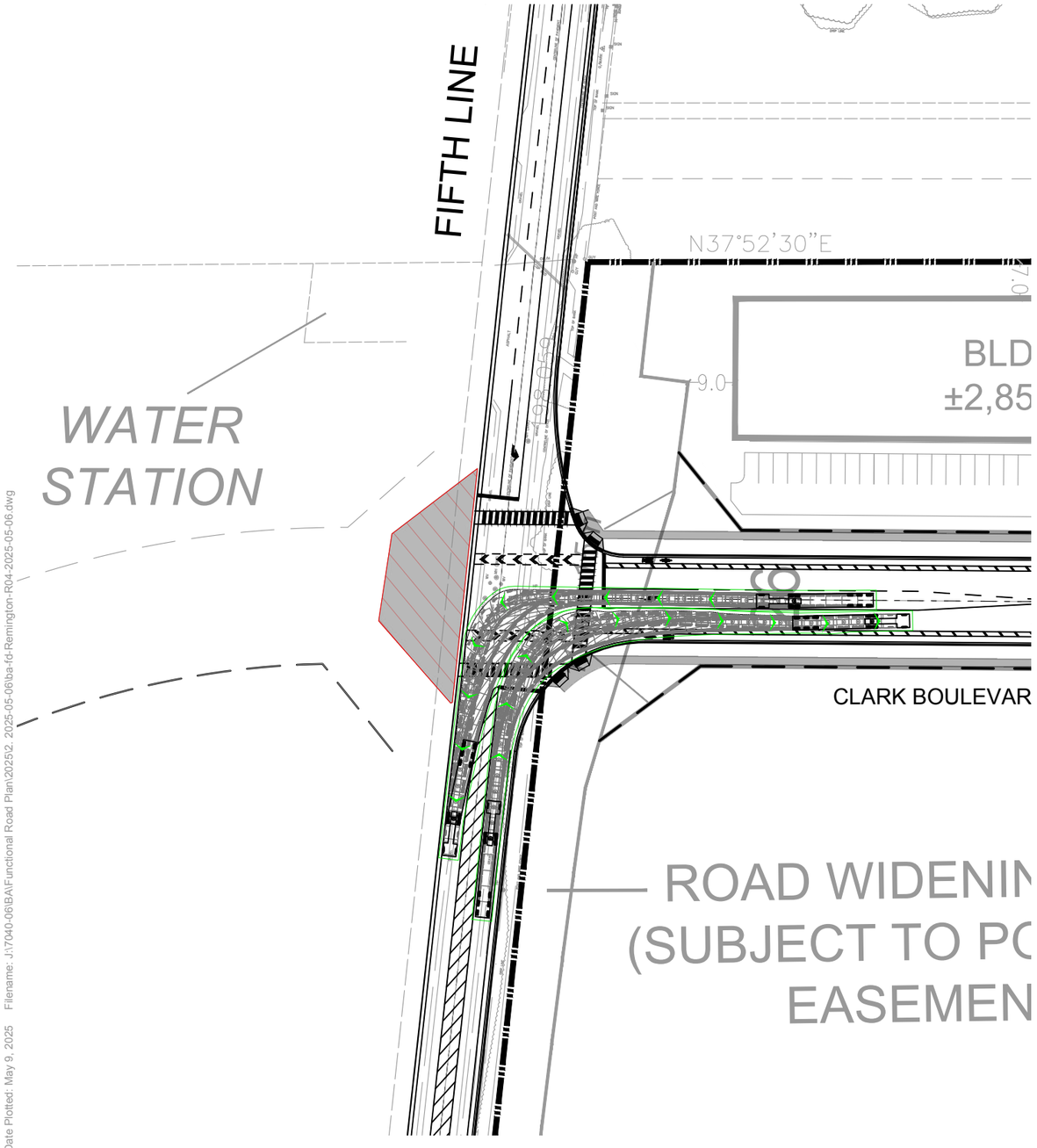
VEHICLE MANOEUVRING DIAGRAM
BUILDING 1 ACCESS / DERRY ROAD
MTO WB-20.5 TRACTOR TRAILER VEHICLE

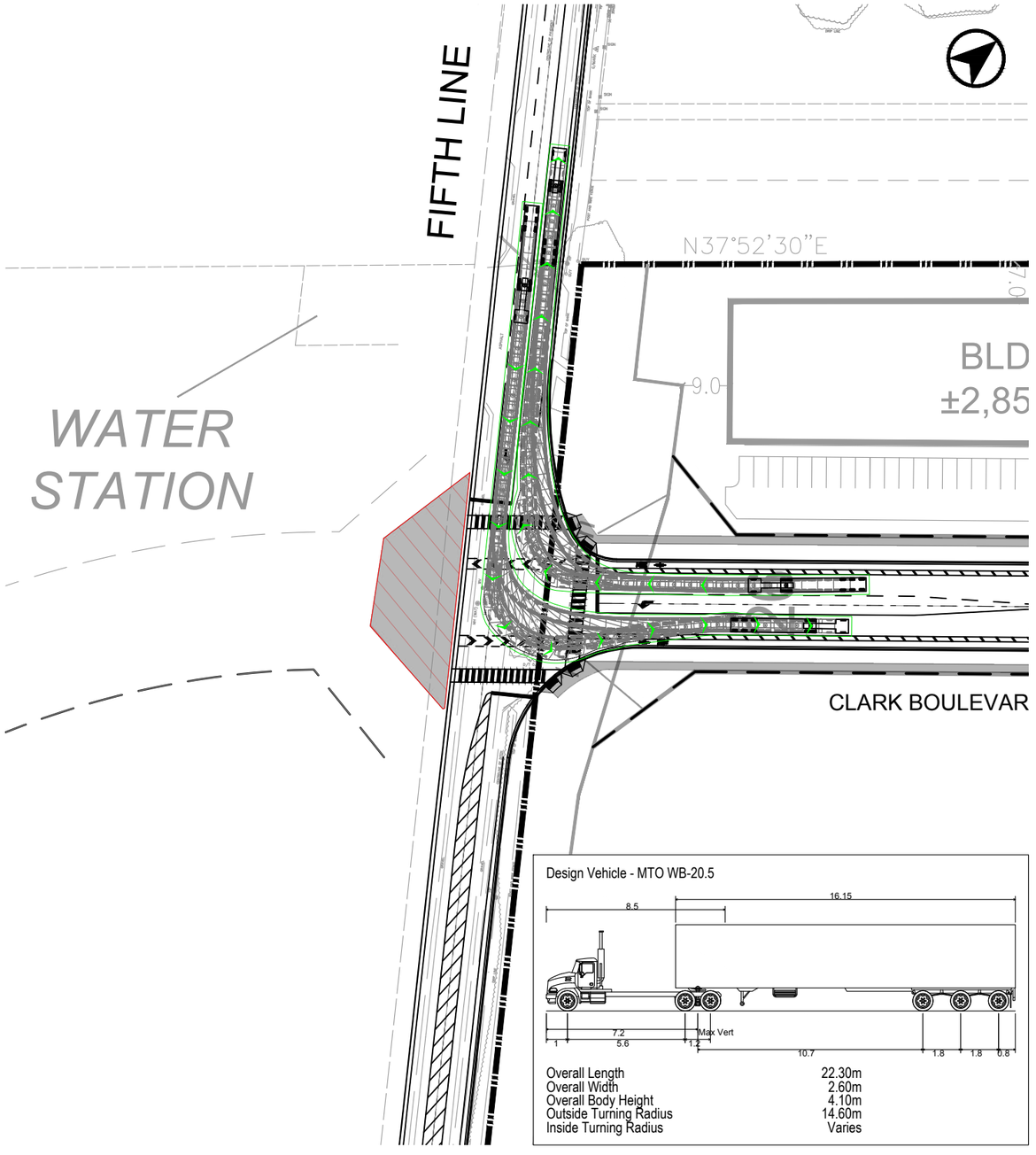
Project:	REMINGTON DERRY
Project No.	7040-06
Date:	December 12, 2023
Revised:	MAY 09, 2025

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. VMD-01

Date Plotted: May 9, 2025 Filename: J:\7040-06\BA\Functional Road Plan\2025\2. 2025-05-06\ba-fd-Remington-R04-2025-05-06.dwg





Date Plotted: May 9, 2025 Filename: J:\7040-06\BA\Functional Road Plan\20252_ 2025-05-06\ba-fd-Remington-R04-2025-05-06.dwg

BA Group

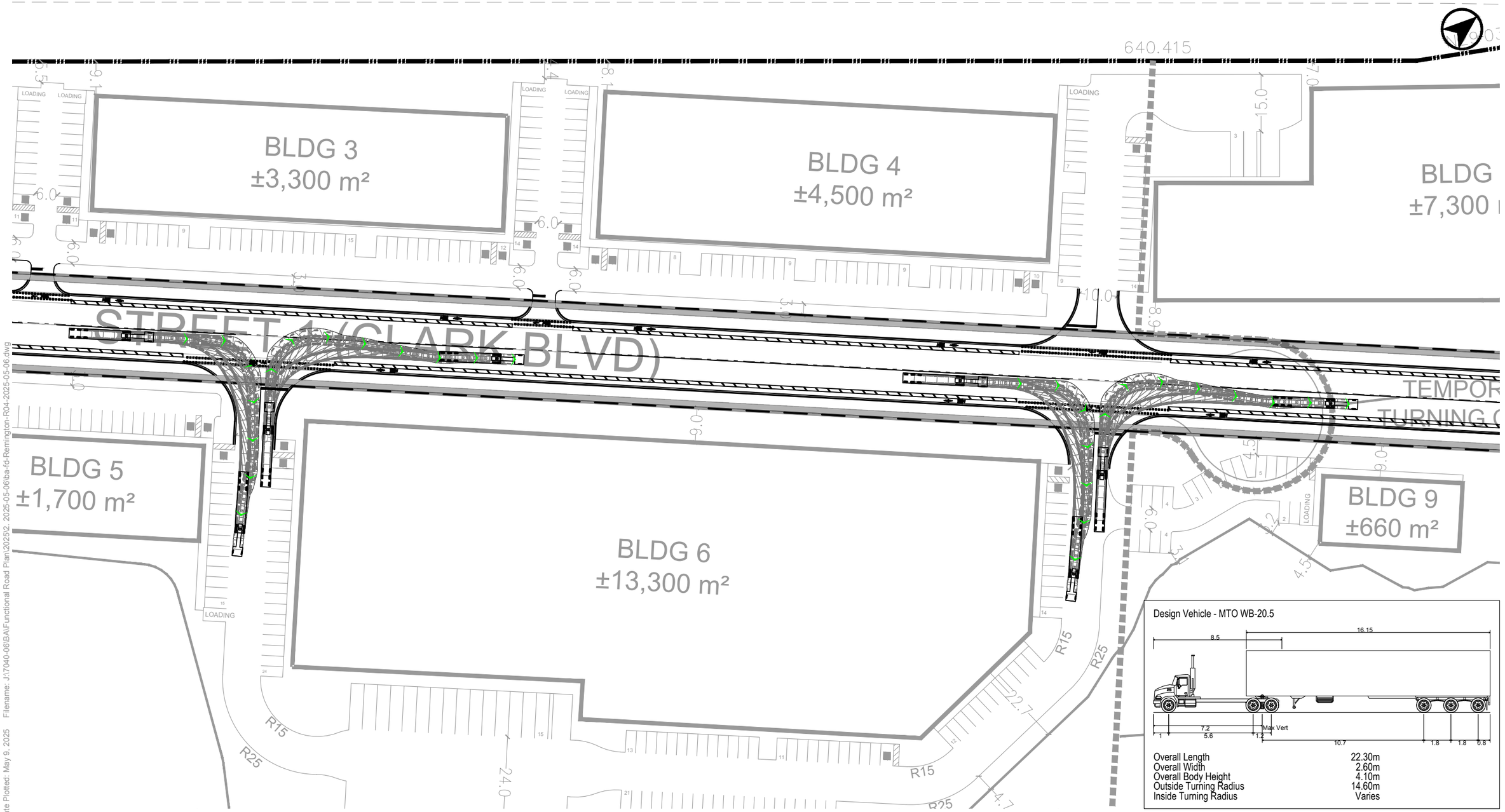
REMINGTON DERRY GREEN INDUSTRIAL DEVELOPMENT

VEHICLE MANOEUVRING DIAGRAM
FIFTH LINE AND CLARK BOULEVARD
MTO WB-20.5 TRACTOR TRAILER VEHICLE

Project:	REMINGTON DERRY
Project No.	7040-06
Date:	December 12, 2023
Revised:	MAY 09, 2025

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. VMD-02



Date Plotted: May 9, 2025 Filename: J:\7040-06\BA\Functional Road Plan\2025\2_2025-05-06\ba-fd-Remington-R04-2025-05-06.dwg

BA Group

REMINGTON DERRY GREEN INDUSTRIAL DEVELOPMENT

VEHICLE MANOEUVRING DIAGRAM

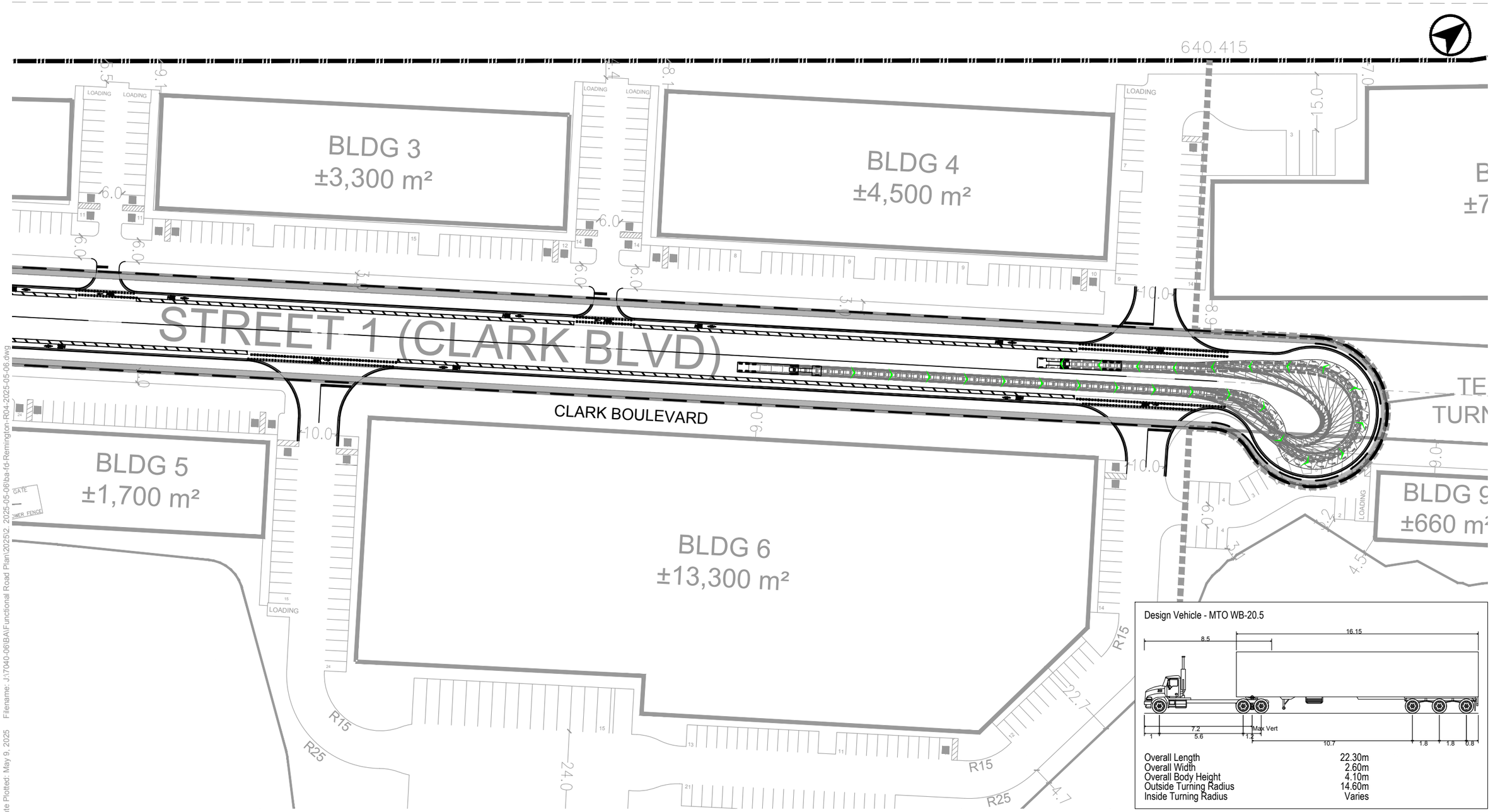
BUILDING 9 - RIGHT-TURN ENTRY AND RIGHT-TURN EXIT

MTO WB-20.5 TRACTOR TRAILER VEHICLE

Project:	REMINGTON DERRY
Project No.	7040-06
Date:	December 12, 2023
Revised:	MAY 09, 2025

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. VMD-03



Design Vehicle - MTO WB-20.5

Overall Length	22.30m
Overall Width	2.60m
Overall Body Height	4.10m
Outside Turning Radius	14.60m
Inside Turning Radius	Varies

Date Plotted: May 9, 2025 Filename: J:\7040-06\BA\Functional Road Plan\20252\2025-05-06\ba-fd-Remington-R04-2025-05-06.dwg

BA Group

REMINGTON DERRY GREEN INDUSTRIAL DEVELOPMENT

VEHICLE MANOEUVRING DIAGRAM
CLARK BOULEVARD INTERIM CUL-DE-SAC
MTO WB-20.5 TRACTOR TRAILER VEHICLE

Project:	REMINGTON DERRY
Project No.	7040-06
Date:	December 12, 2023
Revised:	MAY 09, 2025

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. VMD-04

DAYLIGHT TRIANGLE 15mX15m

NOISE WALL 3.0m HEIGHT

STREET 2

PRIVATE DRIVEWAY

BLDG 7
±7,300 m²

BLDG 9
±660 m²

TEMPORARY TURNING CIRCLE

CLARK BOULEVARD

N36°58'05"E

N29°03'55"E 70.490

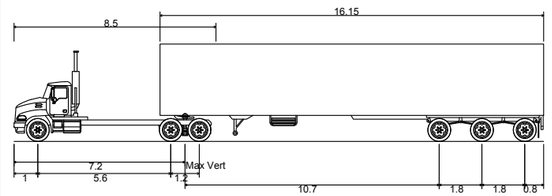
336.059

R15

R=150 m

LOADING

Design Vehicle - MTO WB-20.5



Overall Length	22.30m
Overall Width	2.60m
Overall Body Height	4.10m
Outside Turning Radius	14.60m
Inside Turning Radius	Varies

Filename: J:\7040-06\BA\Functional Road Plan\2025\2. 2025-05-06\ba-fd-Remington-R04-2025-05-06.dwg

Date Plotted: May 9, 2025

BA Group

REMINGTON DERRY GREEN INDUSTRIAL DEVELOPMENT

VEHICLE MANOEUVRING DIAGRAM

BUILDING 8 -RIGHT-TURN ENTRY AND RIGHT-TURN EXIT

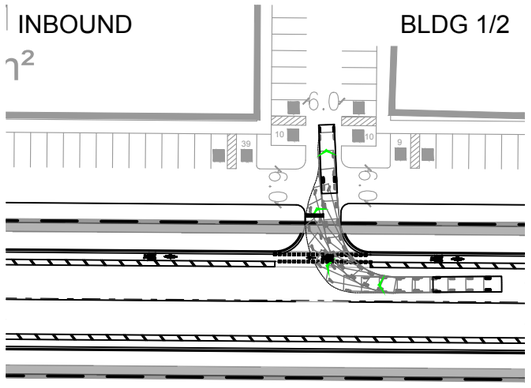
MTO WB-20.5 TRACTOR TRAILER VEHICLE

Project:	REMINGTON DERRY
Project No.	7040-06
Date:	December 12, 2023
Revised:	MAY 09, 2025

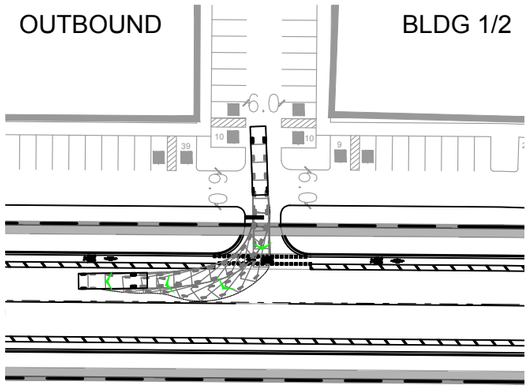
Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. VMD-05

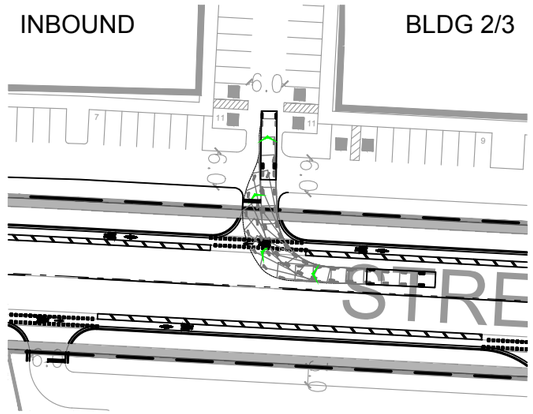
INBOUND BLDG 1/2



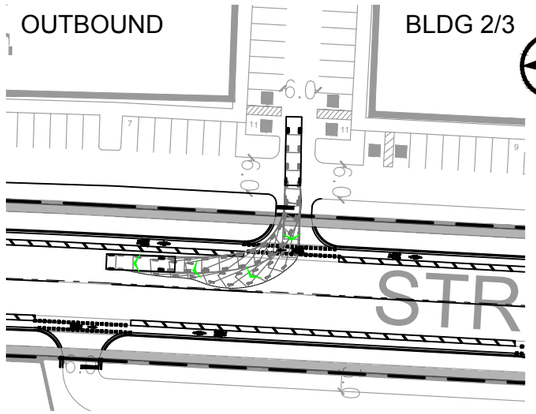
OUTBOUND BLDG 1/2



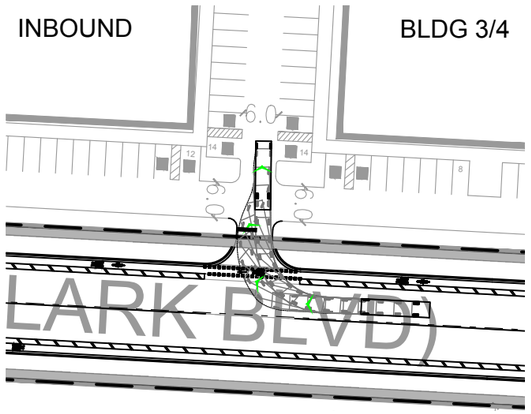
INBOUND BLDG 2/3



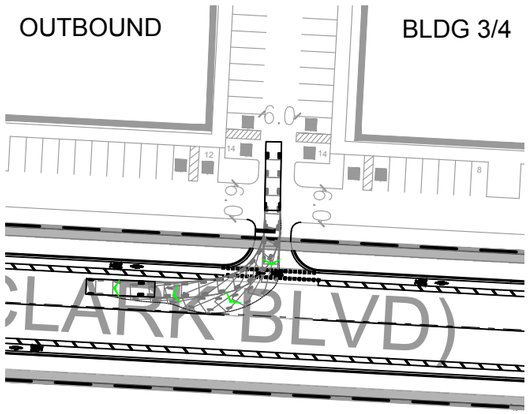
OUTBOUND BLDG 2/3



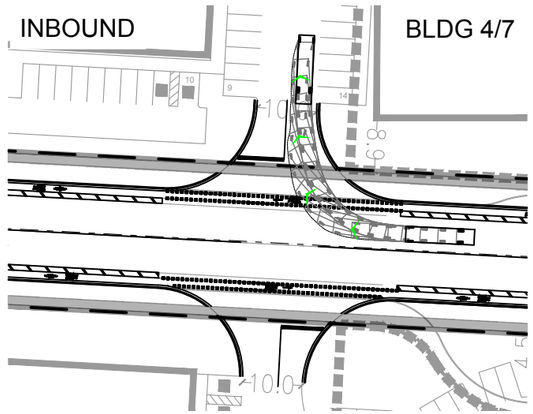
INBOUND BLDG 3/4



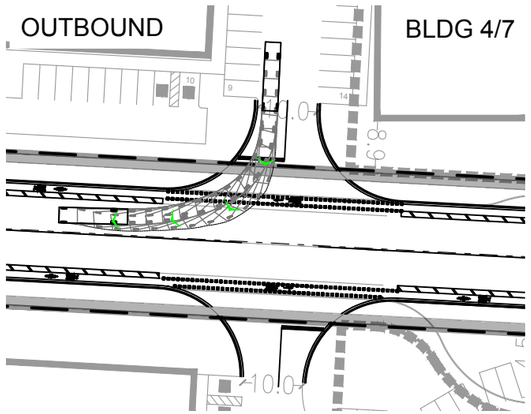
OUTBOUND BLDG 3/4



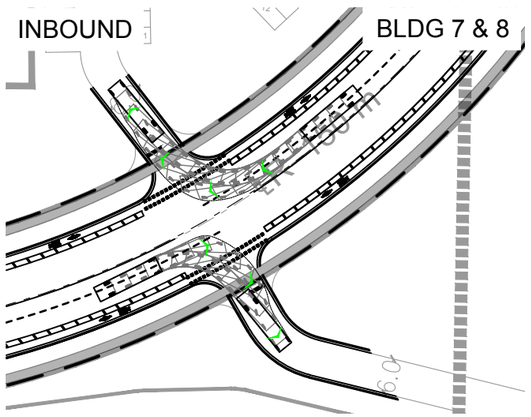
INBOUND BLDG 4/7



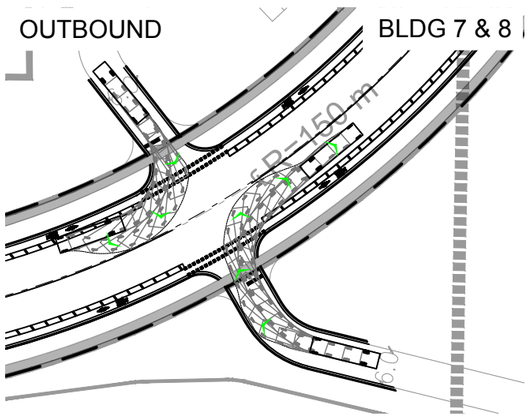
OUTBOUND BLDG 4/7



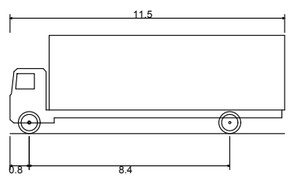
INBOUND BLDG 7 & 8



OUTBOUND BLDG 7 & 8



Design Vehicle - TAC HSU (Heavy Single Unit)



Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
Inside Turning Radius	8.69m

Date Plotted: May 9, 2025 Filename: J:\7040-06\BA\Functional Road Plan\20252_ 2025-05-06\ba-fd-Remington-R04-2025-05-06.dwg

BA Group

REMINGTON DERRY GREEN INDUSTRIAL DEVELOPMENT

VEHICLE MANOEUVRING DIAGRAM

VARIOUS BUILDINGS - RIGHT TURN ENTRY AND EXIT

TAC HEAVY SINGLE UNIT TRUCK

Project:	REMINGTON DERRY
Project No.	7040-06
Date:	December 12, 2023
Revised:	MAY 09, 2025

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. VMD-06

Appendix E:
Traffic Volumes

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #22-199 - CGH Transportation

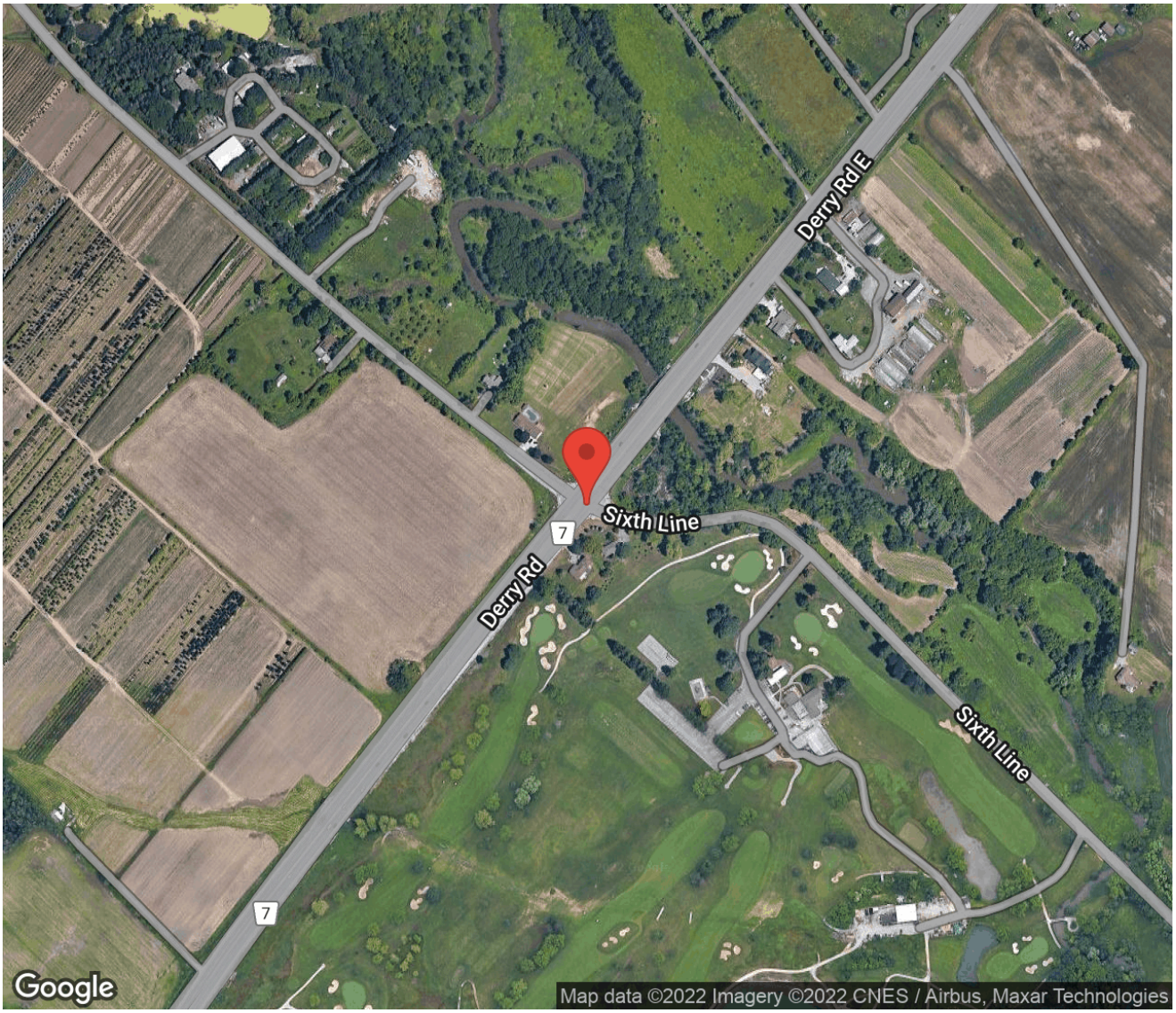
Intersection Count Report

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:	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	Sixth Line & Derry Rd
Site Code:	2219900003
Municipality:	Milton
Count Date:	Jun 16, 2022



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Sixth Line & Derry Rd
Site Code:	2219900003
Municipality:	Milton
Count Date:	Jun 16, 2022

Sixth Line - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Buses, Bicycles						Includes Cars, Trucks, Buses, Bicycles						
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
BREAK													
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Sixth Line & Derry Rd
Site Code:	2219900003
Municipality:	Milton
Count Date:	Jun 16, 2022

Derry Rd - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Buses, Bicycles						Includes Cars, Trucks, Buses, Bicycles						
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
BREAK													
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Sixth Line & Derry Rd
Site Code: 2219900003
Municipality: Milton
Count Date: Jun 16, 2022

North Approach - Sixth Line

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Sixth Line & Derry Rd
Site Code: 2219900003
Municipality: Milton
Count Date: Jun 16, 2022

North Approach - Sixth Line

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Sixth Line & Derry Rd
Site Code: 2219900003
Municipality: Milton
Count Date: Jun 16, 2022

South Approach - Sixth Line

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Sixth Line & Derry Rd
Site Code: 2219900003
Municipality: Milton
Count Date: Jun 16, 2022

South Approach - Sixth Line

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Sixth Line & Derry Rd
Site Code: 2219900003
Municipality: Milton
Count Date: Jun 16, 2022

East Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
					Total					Total					Total					Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Sixth Line & Derry Rd
Site Code: 2219900003
Municipality: Milton
Count Date: Jun 16, 2022

East Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Sixth Line & Derry Rd
Site Code: 2219900003
Municipality: Milton
Count Date: Jun 16, 2022

West Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
					Total					Total					Total					Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Sixth Line & Derry Rd
Site Code: 2219900003
Municipality: Milton
Count Date: Jun 16, 2022

West Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	07:30:00
To:	09:00:00	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
Cars	201	108	309
Trucks	7	2	9
Buses	2	1	3
Bicycles	0	0	0
	210	**111**	**321**

Sixth Line

Bicycles	0	0	0	0
Buses	1	1	0	0
Trucks	1	0	6	0
Cars	102	90	9	0
Totals	**104**	**91**	**15**	**0**

East Approach

	Out	In	Total
Cars	607	1747	2354
Trucks	49	50	99
Buses	7	6	13
Bicycles	0	0	0
	663	**1803**	**2466**

Peds: 0

Derry Rd

Bicycles	Buses	Trucks	Cars	Totals
0	0	0	0	**0**
0	1	0	49	**50**
0	5	44	1719	**1768**
0	0	2	121	**123**

Peds: 0

Peds: 0

Derry Rd

	Totals	Cars	Trucks	Buses	Bicycles
	0	0	0	0	0
	6	4	2	0	0
	643	589	47	7	0
	14	14	0	0	0

Peds: 0

West Approach

	Out	In	Total
Cars	1889	750	2639
Trucks	46	48	94
Buses	6	8	14
Bicycles	0	0	0
	1941	**806**	**2747**

Totals	**59**	**55**	**20**	**0**
Cars	59	55	19	0
Trucks	0	0	0	0
Buses	0	0	1	0
Bicycles	0	0	0	0

Sixth Line

South Approach

	Out	In	Total
Cars	133	225	358
Trucks	0	2	2
Buses	1	1	2
Bicycles	0	0	0
	134	**228**	**362**

Cars - Trucks - Buses - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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)

Start Time	North Approach Sixth Line						South Approach Sixth Line						East Approach Derry Rd						West Approach Derry Rd						Total Vehicles
	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
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	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	15:00:00	From:	16:30:00
To:	18:00:00	To:	17:30:00

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
Cars	259	227	486
Trucks	3	7	10
Buses	1	0	1
Bicycles	0	0	0
	263	**234**	**497**

Sixth Line

Bicycles	0	0	0	0
Buses	1	0	0	0
Trucks	0	2	1	0
Cars	89	103	67	0
Totals	**90**	**105**	**68**	**0**

East Approach

	Out	In	Total
Cars	1508	1524	3032
Trucks	39	56	95
Buses	1	3	4
Bicycles	0	0	0
	1548	**1583**	**3131**

Derry Rd

Bicycles	Buses	Trucks	Cars	Totals
0	0	0	0	**0**
0	0	3	108	**111**
0	3	55	1430	**1488**
0	0	0	70	**70**

Peds: 0

Peds: 0

Peds: 0

Derry Rd

	Totals	Cars	Trucks	Buses	Bicycles
	0	0	0	0	0
	9	7	2	0	0
	1518	1481	36	1	0
	21	20	1	0	0

West Approach

	Out	In	Total
Cars	1608	1731	3339
Trucks	58	36	94
Buses	3	2	5
Bicycles	0	0	0
	1669	**1769**	**3438**

Sixth Line

Totals	**161**	**114**	**27**	**0**
Cars	161	112	27	0
Trucks	0	2	0	0
Buses	0	0	0	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	300	193	493
Trucks	2	3	5
Buses	0	0	0
Bicycles	0	0	0
	302	**196**	**498**

Cars - Trucks - Buses - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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)

Start Time	North Approach Sixth Line						South Approach Sixth Line						East Approach Derry Rd						West Approach Derry Rd						Total Vehicles
	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
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	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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:	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	Fifth Line & Derry Rd
Site Code:	2219900002
Municipality:	Milton
Count Date:	Jun 16, 2022

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection: Fifth Line & Derry Rd
Site Code: 2219900002
Municipality: Milton
Count Date: Jun 16, 2022

Fifth Line - Traffic Summary

Hour	North Approach Totals (Includes Cars, Trucks, Buses, Bicycles)						South Approach Totals (Includes Cars, Trucks, Buses, Bicycles)						Total
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
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
BREAK													
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Fifth Line & Derry Rd
Site Code:	2219900002
Municipality:	Milton
Count Date:	Jun 16, 2022

Derry Rd - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Buses, Bicycles						Includes Cars, Trucks, Buses, Bicycles						
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
BREAK													
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Fifth Line & Derry Rd
Site Code: 2219900002
Municipality: Milton
Count Date: Jun 16, 2022

North Approach - Fifth Line

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Fifth Line & Derry Rd
Site Code: 2219900002
Municipality: Milton
Count Date: Jun 16, 2022

North Approach - Fifth Line

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Fifth Line & Derry Rd
Site Code: 2219900002
Municipality: Milton
Count Date: Jun 16, 2022

South Approach - Fifth Line

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
					Total					Total					Total					Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Fifth Line & Derry Rd
Site Code: 2219900002
Municipality: Milton
Count Date: Jun 16, 2022

South Approach - Fifth Line

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Fifth Line & Derry Rd
Site Code: 2219900002
Municipality: Milton
Count Date: Jun 16, 2022

East Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
					Total					Total					Total					Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Fifth Line & Derry Rd
Site Code: 2219900002
Municipality: Milton
Count Date: Jun 16, 2022

East Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
					Total					Total					Total					Total	
15:00	12	346	10	0	368	2	11	9	0	22	0	2	1	0	3	0	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	0
15:30	11	349	12	0	372	0	11	2	0	13	0	1	0	0	1	0	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	0
16:00	13	385	16	0	414	1	5	3	0	9	0	1	0	0	1	0	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	0
16:30	22	378	25	0	425	0	9	10	0	19	0	3	0	0	3	0	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	0
17:00	4	420	11	0	435	0	5	0	0	5	0	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	0
17:30	19	351	10	0	380	1	4	1	0	6	0	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	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	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Fifth Line & Derry Rd
Site Code: 2219900002
Municipality: Milton
Count Date: Jun 16, 2022

West Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Fifth Line & Derry Rd
Site Code: 2219900002
Municipality: Milton
Count Date: Jun 16, 2022

West Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	07:30:00
To:	09:00:00	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
Cars	129	159	288
Trucks	16	28	44
Buses	0	1	1
Bicycles	0	0	0
	145	**188**	**333**

Fifth Line

Bicycles	0	0	0	0
Buses	0	0	0	0
Trucks	2	1	13	0
Cars	12	41	76	0
Totals	**14**	**42**	**89**	**0**

East Approach

	Out	In	Total
Cars	740	1884	2624
Trucks	44	44	88
Buses	6	7	13
Bicycles	0	0	0
	790	**1935**	**2725**

Derry Rd

Bicycles	Buses	Trucks	Cars	Totals
0	0	0	0	**0**
0	0	4	31	**35**
0	7	29	1757	**1793**
0	0	2	78	**80**

Peds: 0

Peds: 0

Peds: 0

Derry Rd

	Totals	Cars	Trucks	Buses	Bicycles
	0	0	0	0	0
	120	98	21	1	0
	618	596	17	5	0
	52	46	6	0	0

West Approach

	Out	In	Total
Cars	1866	662	2528
Trucks	35	22	57
Buses	7	5	12
Bicycles	0	0	0
	1908	**689**	**2597**

Fifth Line

Totals	**57**	**33**	**53**	**0**
Cars	54	30	51	0
Trucks	3	3	2	0
Buses	0	0	0	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	135	165	300
Trucks	8	9	17
Buses	0	0	0
Bicycles	0	0	0
	143	**174**	**317**

- Cars - Trucks - Buses - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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)

Start Time	North Approach Fifth Line						South Approach Fifth Line						East Approach Derry Rd						West Approach Derry Rd						Total Vehicles
	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
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
From: 15:00:00
To: 18:00:00

One Hour Peak
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
Cars	216	140	356
Trucks	29	14	43
Buses	0	0	0
Bicycles	0	0	0
	245	**154**	**399**

Fifth Line

Bicycles	0	0	0	0
Buses	0	0	0	0
Trucks	2	4	23	0
Cars	23	37	156	0
Totals	**25**	**41**	**179**	**0**

East Approach

	Out	In	Total
Cars	1734	1612	3346
Trucks	36	61	97
Buses	4	5	9
Bicycles	0	0	0
	1774	**1678**	**3452**

Derry Rd

Bicycles	Buses	Trucks	Cars	Totals	
0	0	0	0	**0**	↶
0	0	0	19	**19**	↑
0	5	34	1373	**1412**	→
0	0	0	60	**60**	↓

Peds: 0

Peds: 0

Derry Rd

	Totals	Cars	Trucks	Buses	Bicycles
↶	**0**	0	0	0	0
↑	**90**	76	14	0	0
←	**1639**	1613	22	4	0
↓	**45**	45	0	0	0

Peds: 0

West Approach

	Out	In	Total
Cars	1452	1759	3211
Trucks	34	30	64
Buses	5	4	9
Bicycles	0	0	0
	1491	**1793**	**3284**

Totals	**129**	**45**	**87**	**0**
Cars	123	45	83	0
Trucks	6	0	4	0
Buses	0	0	0	0
Bicycles	0	0	0	0

Fifth Line

South Approach

	Out	In	Total
Cars	251	142	393
Trucks	10	4	14
Buses	0	0	0
Bicycles	0	0	0
	261	**146**	**407**

Cars - Trucks - Buses - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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)

Start Time	North Approach Fifth Line						South Approach Fifth Line						East Approach Derry Rd						West Approach Derry Rd						Total Vehicles
	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
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					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #22-199 - CGH Transportation

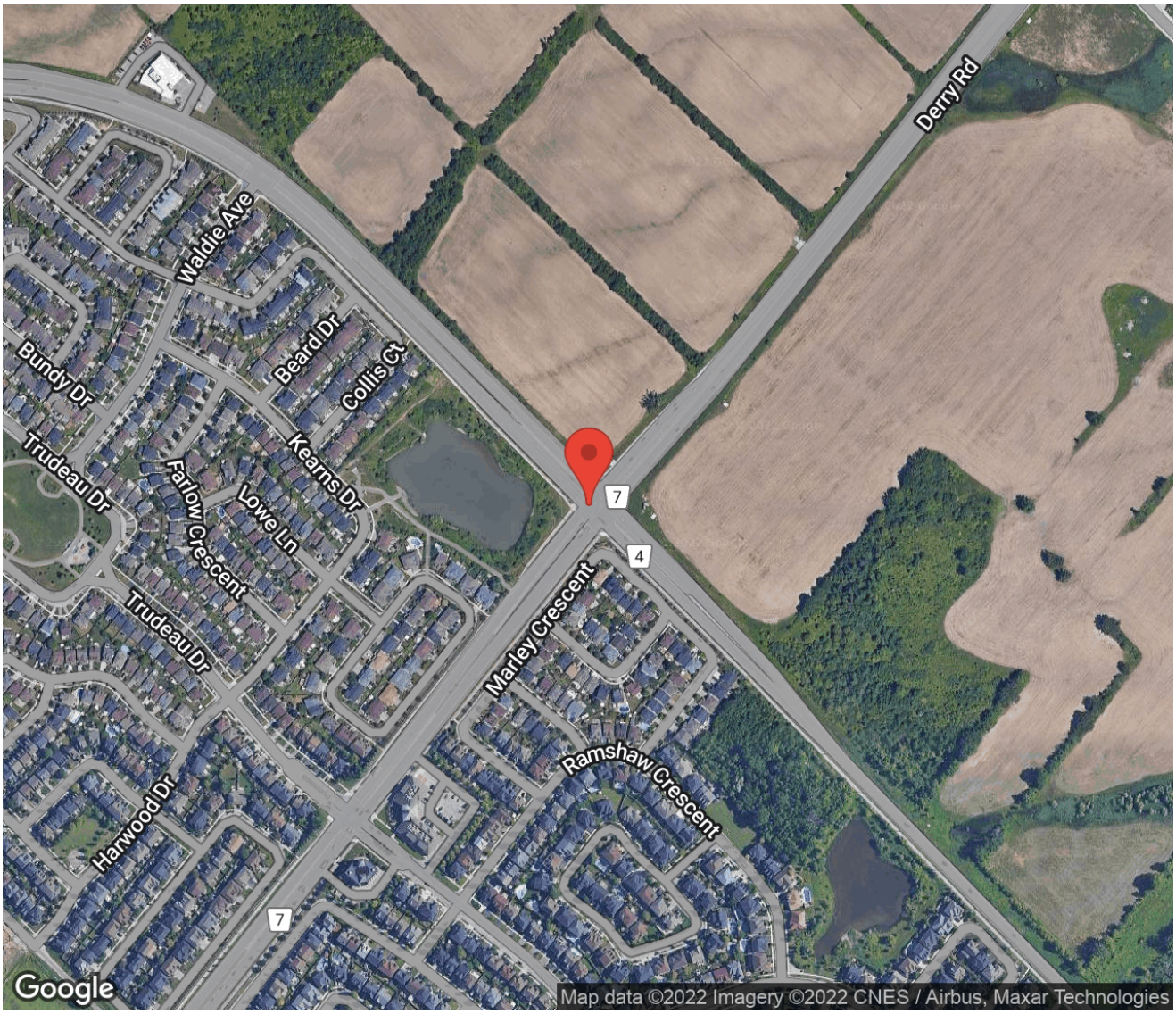
Intersection Count Report

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:	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	James Snow Pkwy S & Derry Rd
Site Code:	2219900001
Municipality:	Milton
Count Date:	Jun 16, 2022



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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 Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Buses, Bicycles						Includes Cars, Trucks, Buses, Bicycles						
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
BREAK													
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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 Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Buses, Bicycles						Includes Cars, Trucks, Buses, Bicycles						
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
BREAK													
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: James Snow Pkwy S & Derry Rd
Site Code: 2219900001
Municipality: Milton
Count Date: Jun 16, 2022

North Approach - James Snow Pkwy S

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: James Snow Pkwy S & Derry Rd
Site Code: 2219900001
Municipality: Milton
Count Date: Jun 16, 2022

North Approach - James Snow Pkwy S

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: James Snow Pkwy S & Derry Rd
Site Code: 2219900001
Municipality: Milton
Count Date: Jun 16, 2022

South Approach - James Snow Pkwy S

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: James Snow Pkwy S & Derry Rd
Site Code: 2219900001
Municipality: Milton
Count Date: Jun 16, 2022

South Approach - James Snow Pkwy S

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↩	Total	↰	↑	↱	↩	Total	↰	↑	↱	↩	Total	↰	↑	↱	↩	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: James Snow Pkwy S & Derry Rd
Site Code: 2219900001
Municipality: Milton
Count Date: Jun 16, 2022

East Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: James Snow Pkwy S & Derry Rd
Site Code: 2219900001
Municipality: Milton
Count Date: Jun 16, 2022

East Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: James Snow Pkwy S & Derry Rd
Site Code: 2219900001
Municipality: Milton
Count Date: Jun 16, 2022

West Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: James Snow Pkwy S & Derry Rd
Site Code: 2219900001
Municipality: Milton
Count Date: Jun 16, 2022

West Approach - Derry Rd

Start Time	Cars					Trucks					Buses					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period
From: 07:00:00
To: 09:00:00

One Hour Peak
From: 07:30:00
To: 08:30:00

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
Cars	693	530	1223
Trucks	60	22	82
Buses	4	9	13
Bicycles	0	0	0
	757	**561**	**1318**

James Snow Pkwy S

Bicycles	0	0	0	0
Buses	1	2	1	0
Trucks	12	34	14	0
Cars	152	305	236	0
Totals	**165**	**341**	**251**	**0**

East Approach

	Out	In	Total
Cars	658	1872	2530
Trucks	25	32	57
Buses	6	4	10
Bicycles	0	0	0
	689	**1908**	**2597**

Derry Rd

Bicycles	Buses	Trucks	Cars	Totals
0	0	0	0	**0**
0	1	4	165	**170**
0	2	17	1476	**1495**
0	0	1	26	**27**

Peds: 1
Peds: 6
Peds: 0
Peds: 0

Derry Rd

	Totals	Cars	Trucks	Buses	Bicycles
	0	0	0	0	0
	146	141	4	1	0
	482	458	19	5	0
	61	59	2	0	0

West Approach

	Out	In	Total
Cars	1667	632	2299
Trucks	22	31	53
Buses	3	6	9
Bicycles	0	0	0
	1692	**669**	**2361**

James Snow Pkwy S

Totals	**22**	**245**	**162**	**0**
Cars	22	224	160	0
Trucks	0	14	1	0
Buses	0	7	1	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	406	390	796
Trucks	15	37	52
Buses	8	2	10
Bicycles	0	0	0
	429	**429**	**858**

Cars - Trucks - Buses - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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)

Start Time	North Approach James Snow Pkwy S						South Approach James Snow Pkwy S						East Approach Derry Rd						West Approach Derry Rd						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
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**	**0.8**	**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	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	15:00:00	From:	16:30:00
To:	18:00:00	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
Cars	833	816	1649
Trucks	27	27	54
Buses	0	2	2
Bicycles	0	0	0
	860	**845**	**1705**

James Snow Pkwy S

Bicycles	0	0	0	0
Buses	0	0	0	0
Trucks	3	18	6	0
Cars	186	383	264	0
Totals	**189**	**401**	**270**	**0**

East Approach

	Out	In	Total
Cars	1759	1456	3215
Trucks	32	31	63
Buses	2	5	7
Bicycles	0	0	0
	1793	**1492**	**3285**

Derry Rd

Bicycles	Buses	Trucks	Cars	Totals
0	0	0	0	**0**
0	0	3	171	**174**
0	5	18	1032	**1055**
0	0	1	14	**15**

Peds: 0

Peds: 0

N
W
E
S

Peds: 1

Peds: 1

Derry Rd

Totals	Cars	Trucks	Buses	Bicycles
0	0	0	0	0
366	351	15	0	0
1193	1176	15	2	0
234	232	2	0	0

West Approach

	Out	In	Total
Cars	1217	1431	2648
Trucks	22	20	42
Buses	5	3	8
Bicycles	0	0	0
	1244	**1454**	**2698**

Totals	**72**	**305**	**167**	**0**
Cars	69	294	160	0
Trucks	2	9	7	0
Buses	1	2	0	0
Bicycles	0	0	0	0

James Snow Pkwy S

South Approach

	Out	In	Total
Cars	523	629	1152
Trucks	18	21	39
Buses	3	0	3
Bicycles	0	0	0
	544	**650**	**1194**

- Cars - Trucks - Buses - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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)

Start Time	North Approach James Snow Pkwy S						South Approach James Snow Pkwy S						East Approach Derry Rd						West Approach Derry Rd						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
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 F:
TTS Data

	SUMMARY		ROUNDED	
	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%

INBOUND

Thu Nov 10 2022 10:19:14 GMT-0500 (Eastern Standard Time) - Run Time: 2857ms

Cross Tabulation Query Form - Trip - 2016 v1.1

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:

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

Trip 2016
Table:

,1				North JSP	North 5th Line	North 6th Line	South JSP	South 5th Line	South 6th Line	East Derry	West Derry	Total	North JSP	North 5th Line	North 6th Line	South JSP	South 5th Line	South 6th Line	East Derry	West Derry	
PD 3 of Toronto,24	PD 3 of Toronto	24	1%							100%		100%	0%	0%	0%	0%	0%	0%	1%	0%	
PD 8 of Toronto,22	PD 8 of Toronto	22	1%							100%		100%	0%	0%	0%	0%	0%	0%	1%	0%	
PD 9 of Toronto,39	PD 9 of Toronto	39	1%							100%		100%	0%	0%	0%	0%	0%	0%	1%	0%	
PD 10 of Toronto,21	PD 10 of Toronto	21	1%							100%		100%	0%	0%	0%	0%	0%	0%	1%	0%	
PD 12 of Toronto,13	PD 12 of Toronto	13	0%							100%		100%	0%	0%	0%	0%	0%	0%	0%	0%	
Oshawa,30	Oshawa	30	1%							100%		100%	0%	0%	0%	0%	0%	0%	1%	0%	
Vaughan,18	Vaughan	18	1%							100%		100%	0%	0%	0%	0%	0%	0%	1%	0%	
Brampton,351	Brampton	351	12%							100%		100%	0%	0%	0%	0%	0%	0%	12%	0%	
Mississauga,401	Mississauga	401	14%							100%		100%	0%	0%	0%	0%	0%	0%	14%	0%	
Halton Hills,267	Halton Hills	267	9%	70%	10%	10%				10%		100%	6%	1%	1%	0%	0%	0%	1%	0%	
Milton,798	Milton												0%	0%	0%	0%	0%	0%	0%	0%	
4103,62	4103	62	2%								100%	100%	0%	0%	0%	0%	0%	0%	0%	2%	
4105, 106	4105	106	4%								100%	100%	0%	0%	0%	0%	0%	0%	0%	4%	
4108,15	4108	15	1%								100%	100%	0%	0%	0%	0%	0%	0%	0%	1%	
4110,75	4110	75	3%								100%	100%	0%	0%	0%	0%	0%	0%	0%	3%	
4118,17	4118	17	1%	50%	50%							100%	0%	0%	0%	0%	0%	0%	0%	0%	
4119,43	4119	43	1%	100%								100%	1%	0%	0%	0%	0%	0%	0%	0%	
4120,93	4120	93	3%	30%							70%	100%	1%	0%	0%	0%	0%	0%	0%	2%	
4123, 108	4123	108	4%	50%							50%	100%	2%	0%	0%	0%	0%	0%	0%	2%	
4124,97	4124	97	3%	30%							70%	100%	1%	0%	0%	0%	0%	0%	0%	2%	
4125,78	4125	78	3%								100%	100%	0%	0%	0%	0%	0%	0%	0%	3%	
4126,15	4126	15	1%	30%							70%	100%	0%	0%	0%	0%	0%	0%	0%	0%	
4127,41	4127	41	1%	30%							70%	100%	0%	0%	0%	0%	0%	0%	0%	1%	
4130,8	4130	8	0%	70%							30%	100%	0%	0%	0%	0%	0%	0%	0%	0%	
4135,9	4135	9	0%	70%							30%	100%	0%	0%	0%	0%	0%	0%	0%	0%	
4144,32	4144	32	1%	100%								100%	1%	0%	0%	0%	0%	0%	0%	0%	
Oakville,97	Oakville	97	3%					20%	20%	30%	30%	100%	0%	0%	0%	0%	1%	1%	1%	1%	
Burlington,277	Burlington	277	9%					50%	20%		30%	100%	0%	0%	0%	0%	5%	2%	0%	3%	
Flamborough,23	Flamborough	23	1%					40%	20%		40%	100%	0%	0%	0%	0%	0%	0%	0%	0%	
Dundas,31	Dundas	31	1%					50%	20%		30%	100%	0%	0%	0%	0%	1%	0%	0%	0%	
Stoney Creek,35	Stoney Creek	35	1%					50%	20%		30%	100%	0%	0%	0%	0%	1%	0%	0%	0%	
Hamilton,133	Hamilton	133	5%					50%	20%		30%	100%	0%	0%	0%	0%	2%	1%	0%	1%	
Lincoln,18	Lincoln	18	1%					50%	20%		30%	100%	0%	0%	0%	0%	0%	0%	0%	0%	
St. Catharines,35	St. Catharines	35	1%					50%	20%		30%	100%	0%	0%	0%	0%	1%	0%	0%	0%	
Waterloo,23	Waterloo	23	1%	100%								100%	1%	0%	0%	0%	0%	0%	0%	0%	
Cambridge,79	Cambridge	79	3%	100%								100%	3%	0%	0%	0%	0%	0%	0%	0%	
City of Guelph,70	City of Guelph	70	2%	100%								100%	2%	0%	0%	0%	0%	0%	0%	0%	
Guelph/Eramosa,4	Guelph/Eramosa	4	0%	100%								100%	0%	0%	0%	0%	0%	0%	0%	0%	
Centre Wellington,16	Centre Wellington	16	1%	100%								100%	1%	0%	0%	0%	0%	0%	0%	0%	
Shelburne,75	Shelburne	75	3%								100%	100%	0%	0%	0%	0%	0%	0%	0%	3%	
Brantford,6	Brantford	6	0%					50%	20%		30%	100%	0%	0%	0%	0%	0%	0%	0%	0%	
External,27	External	27	1%					50%	20%		30%	100%	0%	0%	0%	0%	0%	0%	0%	0%	
	Total	2934	100%										21%	1%	1%	0%	11%	5%	33%	29%	100%

Thu Nov 10 2022 10:17:34 GMT-0500 (Eastern Standard Time) - Run Time: 2553ms

Cross Tabulation Query Form - Trip - 2016 v1.1

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:

Filters:
Start time of trip - start_time In 600-859
and
Trip purpose of destination - purp_dest In W,
and
Primary travel mode of trip - mode_prime In D,U,M,P,T,S
and
Planning district of origin - pd_orig In 38,

OUTBOUND

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

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd_dest
Column: 2006 GTA zone of origin - gta06_orig

RowG:
ColG:(4112,4116,4117,4118,4121,4145,4147,4148)
TblG:

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

Trip 2016
Table:

,1				North JSP	North 5th Line	North 6th Line	South JSP	South 5th Line	South 6th Line	East Derry	West Derry	Total	North JSP	North 5th Line	North 6th Line	South JSP	South 5th Line	South 6th Line	East Derry	West Derry
PD 3 of Toronto,24	PD 3 of Toronto	24	1%							100%		100%	0%	0%	0%	0%	0%	0%	1%	0%
PD 8 of Toronto,7	PD 8 of Toronto	7	0%							100%		100%	0%	0%	0%	0%	0%	0%	0%	0%
PD 9 of Toronto,39	PD 9 of Toronto	39	1%							100%		100%	0%	0%	0%	0%	0%	0%	1%	0%
PD 12 of Toronto,13	PD 12 of Toronto	13	0%							100%		100%	0%	0%	0%	0%	0%	0%	0%	0%
Caledon,18	Caledon	18	1%							100%		100%	0%	0%	0%	0%	0%	0%	1%	0%
Brampton,293	Brampton	293	10%							100%		100%	0%	0%	0%	0%	0%	0%	10%	0%
Mississauga,310	Mississauga	310	11%							100%		100%	0%	0%	0%	0%	0%	0%	11%	0%
Halton Hills,280	Halton Hills	280	10%	70%	10%	10%				10%		100%	7%	1%	1%	0%	0%	0%	1%	0%
Milton,1000	Milton												0%	0%	0%	0%	0%	0%	0%	0%
4103, 112	4103	112	4%								100%	100%	0%	0%	0%	0%	0%	0%	0%	4%
4105,71	4105	71	2%								100%	100%	0%	0%	0%	0%	0%	0%	0%	2%
4108,15	4108	15	1%								100%	100%	0%	0%	0%	0%	0%	0%	0%	1%
4110, 107	4110	107	4%								100%	100%	0%	0%	0%	0%	0%	0%	0%	4%
4118,17	4118	17	1%	50%	50%							100%	0%	0%	0%	0%	0%	0%	0%	0%
4119, 132	4119	132	5%	100%								100%	5%	0%	0%	0%	0%	0%	0%	0%
4120, 116	4120	116	4%	30%							70%	100%	1%	0%	0%	0%	0%	0%	0%	3%
4123,86	4123	86	3%	50%							50%	100%	2%	0%	0%	0%	0%	0%	0%	2%
4124,96	4124	96	3%	30%							70%	100%	1%	0%	0%	0%	0%	0%	0%	2%
4125,91	4125	91	3%								100%	100%	0%	0%	0%	0%	0%	0%	0%	3%
4126,68	4126	68	2%	30%							70%	100%	1%	0%	0%	0%	0%	0%	0%	2%
4127,63	4127	63	2%	30%							70%	100%	1%	0%	0%	0%	0%	0%	0%	2%
4130,8	4130	8	0%	70%							30%	100%	0%	0%	0%	0%	0%	0%	0%	0%
4135,9	4135	9	0%	70%							30%	100%	0%	0%	0%	0%	0%	0%	0%	0%
4148,9	4148	9	0%	100%								100%	0%	0%	0%	0%	0%	0%	0%	0%
Oakville,152	Oakville	152	5%					20%	20%	30%	30%	100%	0%	0%	0%	0%	1%	1%	2%	2%
Burlington,337	Burlington	337	12%					50%	20%		30%	100%	0%	0%	0%	0%	6%	2%	0%	4%
Flamborough,12	Flamborough	12	0%					40%	20%		40%	100%	0%	0%	0%	0%	0%	0%	0%	0%
Dundas,31	Dundas	31	1%					50%	20%		30%	100%	0%	0%	0%	0%	1%	0%	0%	0%
Hamilton,71	Hamilton	71	2%					50%	20%		30%	100%	0%	0%	0%	0%	1%	0%	0%	1%
Waterloo,23	Waterloo	23	1%	100%								100%	1%	0%	0%	0%	0%	0%	0%	0%
Cambridge,31	Cambridge	31	1%	100%								100%	1%	0%	0%	0%	0%	0%	0%	0%
City of Guelph,92	City of Guelph	92	3%	100%								100%	3%	0%	0%	0%	0%	0%	0%	0%
Guelph/Eramosa,4	Guelph/Eramosa	4	0%	100%								100%	0%	0%	0%	0%	0%	0%	0%	0%
Centre Wellington,58	Centre Wellington	58	2%	100%								100%	2%	0%	0%	0%	0%	0%	0%	0%
Erin,56	Erin	56	2%	70%	10%	10%				10%		100%	1%	0%	0%	0%	0%	0%	0%	0%
Brantford,6	Brantford	6	0%					50%	20%		30%	100%	0%	0%	0%	0%	0%	0%	0%	0%
	Total	###	100%										26%	1%	1%	0%	9%	4%	27%	30%	100%

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

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

RowG:
ColG:(4112,4116,4117,4118,4121,4145,4147,4148)
TblG:

Filters:
Start time of trip - start_time In 1500-1759
and
Trip purpose of origin - purp_orig In W,
and
Primary travel mode of trip - mode_prime In D,U,M,P,T,S
and
Planning district of destination - pd_dest In 38,

Appendix G:
Traffic Signal Timings

Sixth Line & Derry Road

Colorado Springs

ECONOLITE

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 Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B		B		B		B		B							
Sequence 1																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 2																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 3																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 4																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	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	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	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 9																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 10																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 11																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 12																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.

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	X	X		X	X	X		X								
Exclusive Ped																

Phase Compatibility (MM) 1-1-2

Phase	
n/a	Barrier Mode

Phase and Overlap Descriptions

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	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																

Administration (MM) 1-7-1

Enable Controller/Cabinet Interlock CRC	No
CRC (16 bit)	32CB
Enable Automatic Backup to Datakey	No

Backup Prevent (MM) 1-1-3

	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	1		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases	2	X		.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	X		.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	X		.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	X		.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

Simultaneous Gap (MM) 1-1-4

	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	.	.	.	.	.	.	.		.	.	.	.	.	.	.	.
With	9	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.
Phase	10	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
	Disable	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Load Switch Assignments (MM) 1-3

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto	X		X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto	X		X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			

10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

Colorado Springs

ECONOLITE

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	X	X						
Detector Rack	X							

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 Can Serve With Channel	
Channel 1	**Channel 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

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Configuration Communications 1 (SDLC)

Ethernet Port Configuration (MM) 1-5-1

DHCP Enable:	No
Controller IP:	10.70.10.51
Subnet Mask:	255.255.255.0
Default Gateway IP:	10.70.10.1
Server IP:	10.70.10.1

NTCIP (MM) 1-5-5

NTCIP Backup Time (Sec):	0
NTCIP UDP Port:	501
Ethernet Priority:	1
Port 2 Priority (Port C50S for 2070):	4
Port 3A Priority (Port C21S for 2070):	2
Port 3B Priority (Port C22S for 2070):	3

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

System Detector Assignment

System Detector	Local Detector

Wireless Configuration (MM) 1-5-7

Wireless Channel Number: 6
Wireless Access Code: 327723274

Colorado Springs

ECONOLITE

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	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Display Options (MM) 1-7-2

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

Sign On (MM) 8-5

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

Software Modules (MM) 8-7

Application Version: 32.66.10
OS (Boot) Version: 06.07.00

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Logic Processor Page 1

Logic Statement Control (MM) 1-8-1

Logic #	Statement Control

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Logic Processor Page 2

Logic Statements (MM) 1-8-2

Colorado Springs

ECONOLITE

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

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

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

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 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	X	X		X	X	X		X	x	x	x	x
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 timings in controller

Sync Reference to 3:15

Pattern 1
Time: 6:00
Cycle Length: 120
Offset (%): 70%

Direction	WBLT	EB		SB
Phase	*1*	*2*	*3*	*4*
%	9	68	0	23
Direction	**EBLT**	**WB**		**NB**
Phase	***5***	***6***	***7***	***8***
%	9	68	0	23

Pattern 2
Time:
Cycle Length:
Offset (%):

Direction				
Phase	*1*	*2*	*3*	*4*
%				
Direction				
Phase	***5***	***6***	***7***	***8***
%				

Pattern 3
Time: 15:15
Cycle Length: 120
Offset (%): 4%

Direction	WBLT	EB		SB
Phase	*1*	*2*	*3*	*4*
%	9	68	0	23
Direction	**EBLT**	**WB**		**NB**
Phase	***5***	***6***	***7***	***8***
%	9	68	0	23

Pattern 4
Time:
Cycle Length:
Offset (%):

Direction				
Phase	*1*	*2*	*3*	*4*
%				
Direction				
Phase	***5***	***6***	***7***	***8***
%				

Pattern 5
Time: 09:30, 18:30
Cycle Length: Local
Offset (%):

Direction	WBLT	EB		SB
Phase	*1*	*2*	*3*	*4*
%				
Direction	**EBLT**	**WB**		**NB**
Phase	**5**	**6**	**7**	**8**
%				

Pattern 6
Time:
Cycle Length:
Offset (%):

Direction				
Phase	*1*	*2*	*3*	*4*
%		x		x
Direction				
Phase	**5**	**6**	**7**	**8**
%		x		x

Date: 9-Jul-2018
Intersection: Derry Rd & James Snow Pkwy

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	X	X	X	X	X	X	X	X	X	x	x	x
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		x				x						
Ped Recall												

Notes:

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

Pattern 1
Time: 6:00
Cycle Length: 120
Offset (%): 58%

Direction	WBL	EB	NBL	SB
Phase	*1*	*2*	*3*	*4*
%	0	34	9	57
Direction	**EBL**	**WB**	**SBL**	**NB**
Phase	***5***	***6***	***7***	***8***
%	14	20	46	20

Pattern 2
Time: 9:30, 18:30
Cycle Length: 110
Offset (%): 59%

Direction	WBL	EB	NBL	SB
Phase	*1*	*2*	*3*	*4*
%	10	25	10	55
Direction	**EBL**	**WB**	**SBL**	**NB**
Phase	***5***	***6***	***7***	***8***
%	10	25	45	20

Pattern 3
Time: 15:15
Cycle Length: 120
Offset (%): 58%

Direction	WBL	EB	NBL	SB
Phase	*1*	*2*	*3*	*4*
%	10	36	12	42
Direction	**EBL**	**WB**	**SBL**	**NB**
Phase	***5***	***6***	***7***	***8***
%	10	36	36	18

Pattern 4
Time: Weekend, 07:00-19:00
Cycle Length: 110
Offset (%): 59%

Direction	WBL	EB	NBL	SB
Phase	*1*	*2*	*3*	*4*
%	10	25	10	55
Direction	**EBL**	**WB**	**SBL**	**NB**
Phase	***5***	***6***	***7***	***8***
%	10	25	45	20

Pattern 5
Time: 21:00
Cycle Length: Local
Offset (%):

Direction	WBL	EB	NBL	SB
Phase	*1*	*2*	*3*	*4*
%				
Direction	**EBL**	**WB**	**SBL**	**NB**
Phase	**5**	**6**	**7**	**8**
%				

Pattern 6
Time:
Cycle Length:
Offset (%):

Direction				
Phase	*1*	*2*	*3*	*4*
%		x		x
Direction				
Phase	**5**	**6**	**7**	**8**
%		x		x

Appendix H:
Synchro Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	1869	131	15	665	6	63	58	21	16	96	110
Future Volume (vph)	53	1869	131	15	665	6	63	58	21	16	96	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
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	1.00		1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	3507		1745	3332		1745	1802		1246	1730	
Flt Permitted	0.34	1.00		0.06	1.00		0.37	1.00		0.70	1.00	
Satd. Flow (perm)	621	3507		102	3332		675	1802		922	1730	
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)	56	1988	139	16	707	6	67	62	22	17	102	117
RTOR Reduction (vph)	0	3	0	0	0	0	0	13	0	0	42	0
Lane Group Flow (vph)	56	2124	0	16	713	0	67	71	0	17	177	0
Heavy Vehicles (%)	2%	2%	1%	0%	8%	33%	0%	0%	5%	40%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	80.9	75.1		74.9	72.1		16.6	16.6		16.6	16.6	
Effective Green, g (s)	80.9	75.1		74.9	72.1		16.6	16.6		16.6	16.6	
Actuated g/C Ratio	0.73	0.68		0.67	0.65		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)	509	2372		110	2164		100	269		137	258	
v/s Ratio Prot	c0.01	c0.61		0.00	0.21			0.04			c0.10	
v/s Ratio Perm	0.07			0.09			0.10			0.02		
v/c Ratio	0.11	0.90		0.15	0.33		0.67	0.26		0.12	0.69	
Uniform Delay, d1	4.5	14.7		17.7	8.7		44.6	41.8		40.9	44.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	5.8		0.6	0.4		16.2	0.5		0.4	7.4	
Delay (s)	4.6	20.5		18.3	9.1		60.8	42.3		41.3	52.1	
Level of Service	A	C		B	A		E	D		D	D	
Approach Delay (s)		20.1			9.3			50.5			51.4	
Approach LOS		C			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	91.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	53	1869	15	665	63	58	16	96
Future Volume (vph)	53	1869	15	665	63	58	16	96
Lane Group Flow (vph)	56	2127	16	713	67	84	17	219
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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)	20.0	58.0	20.0	58.0	33.0	33.0	33.0	33.0
Total Split (%)	18.0%	52.3%	18.0%	52.3%	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	0.11	0.87	0.09	0.33	0.67	0.30	0.12	0.73
Control Delay	4.8	20.3	5.6	10.0	73.7	35.4	40.2	48.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	20.3	5.6	10.0	73.7	35.4	40.2	48.5
Queue Length 50th (m)	2.7	144.8	0.8	36.0	14.6	14.1	3.4	37.5
Queue Length 95th (m)	7.5	#323.5	3.0	57.1	29.2	27.1	9.6	60.0
Internal Link Dist (m)		55.4		256.2		211.8		201.7
Turn Bay Length (m)	120.0		100.0		45.0		30.0	
Base Capacity (vph)	627	2451	313	2191	162	444	221	453
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	0.09	0.87	0.05	0.33	0.41	0.19	0.08	0.48

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: 120
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Sixth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	1903	85	55	657	127	60	36	56	94	45	15
Future Volume (vph)	37	1903	85	55	657	127	60	36	56	94	45	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.91		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1572	3517		1572	3341		1662	1638		1531	1742	
Flt Permitted	0.32	1.00		0.05	1.00		0.72	1.00		0.68	1.00	
Satd. Flow (perm)	528	3517		78	3341		1251	1638		1097	1742	
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)	39	2024	90	59	699	135	64	38	60	100	48	16
RTOR Reduction (vph)	0	2	0	0	11	0	0	50	0	0	10	0
Lane Group Flow (vph)	39	2112	0	59	823	0	64	48	0	100	54	0
Heavy Vehicles (%)	11%	2%	2%	11%	3%	18%	5%	9%	3%	14%	2%	14%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	87.6	83.4		90.4	84.8		16.0	16.0		16.0	16.0	
Effective Green, g (s)	87.6	83.4		90.4	84.8		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.73	0.70		0.75	0.71		0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	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)	421	2444		128	2360		166	218		146	232	
v/s Ratio Prot	0.00	c0.60		c0.02	0.25			0.03			0.03	
v/s Ratio Perm	0.06			0.32			0.05			c0.09		
v/c Ratio	0.09	0.86		0.46	0.35		0.39	0.22		0.68	0.23	
Uniform Delay, d1	4.6	14.0		21.1	6.9		47.5	46.4		49.6	46.5	
Progression Factor	0.28	0.45		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	2.5		2.6	0.4		1.5	0.5		12.5	0.5	
Delay (s)	1.4	8.8		23.7	7.3		49.0	46.9		62.1	47.0	
Level of Service	A	A		C	A		D	D		E	D	
Approach Delay (s)		8.6			8.3			47.7			56.2	
Approach LOS		A			A			D			E	

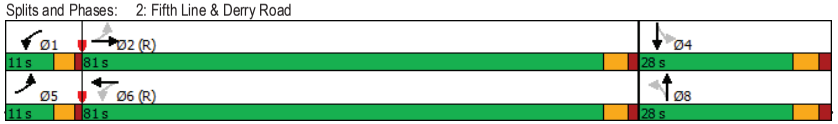
Intersection Summary				
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	76.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	37	1903	55	657	60	36	94	45
Future Volume (vph)	37	1903	55	657	60	36	94	45
Lane Group Flow (vph)	39	2114	59	834	64	98	100	64
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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)	11.0	81.0	11.0	81.0	28.0	28.0	28.0	28.0
Total Split (%)	9.2%	67.5%	9.2%	67.5%	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	0.08	0.86	0.40	0.35	0.38	0.36	0.68	0.26
Control Delay	1.3	10.1	20.2	7.6	52.6	24.5	71.8	39.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.3	10.1	20.2	7.6	52.6	24.5	71.8	39.3
Queue Length 50th (m)	0.4	18.6	2.7	39.4	14.7	8.9	24.0	11.7
Queue Length 95th (m)	m1.1	m#100.8	15.1	59.9	27.6	24.1	41.3	24.0
Internal Link Dist (m)		354.1		336.2		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	461	2468	147	2415	232	351	203	333
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	0.08	0.86	0.40	0.35	0.28	0.28	0.49	0.19

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
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



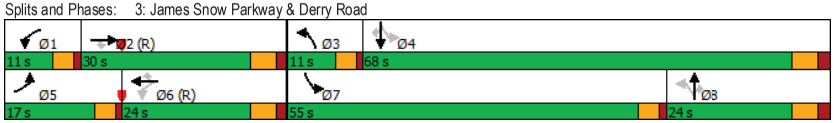
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	1587	29	65	512	155	23	260	172	266	362	175
Future Volume (vph)	180	1587	29	65	512	155	23	260	172	266	362	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
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
Lane 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
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
Flt 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)	3319	3574	1551	1694	3471	1530	1741	3343	1581	1662	3282	1464
Flt Permitted	0.95	1.00	1.00	0.08	1.00	1.00	0.53	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	3319	3574	1551	145	3471	1530	975	3343	1581	676	3282	1464
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)	184	1619	30	66	522	158	23	265	176	271	369	179
RTOR Reduction (vph)	0	0	16	0	0	93	0	0	152	0	0	126
Lane Group Flow (vph)	184	1619	14	66	522	65	23	265	24	271	369	53
Confl. Peds. (#/hr)	1					1	6					6
Heavy Vehicles (%)	2%	1%	3%	3%	4%	3%	0%	8%	1%	5%	10%	7%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	11.9	54.4	54.4	55.9	49.2	49.2	20.6	16.4	16.4	43.9	35.7	35.7
Effective Green, g (s)	11.9	54.4	54.4	55.9	49.2	49.2	20.6	16.4	16.4	43.9	35.7	35.7
Actuated g/C Ratio	0.10	0.45	0.45	0.47	0.41	0.41	0.17	0.14	0.14	0.37	0.30	0.30
Clearance 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
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)	329	1620	703	154	1423	627	194	456	216	440	976	435
v/s Ratio Prot	c0.06	c0.45		0.02	0.15		0.00	0.08		c0.12	0.11	
v/s Ratio Perm			0.01	0.18		0.04	0.02		0.02	c0.10		0.04
v/c Ratio	0.56	1.00	0.02	0.43	0.37	0.10	0.12	0.58	0.11	0.62	0.38	0.12
Uniform Delay, d1	51.5	32.8	18.1	26.7	24.6	21.8	41.7	48.6	45.4	29.1	33.4	30.7
Progression Factor	1.00	1.00	1.00	0.68	0.90	1.85	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	22.2	0.1	1.8	0.7	0.3	0.3	1.9	0.2	2.6	0.2	0.1
Delay (s)	53.6	55.0	18.1	19.9	22.8	40.7	42.0	50.5	45.6	31.7	33.6	30.9
Level of Service	D	D	B	B	C	D	D	D	D	C	C	C
Approach Delay (s)		54.3			26.4			48.2			32.4	
Approach LOS		D			C			D			C	

Intersection Summary				
HCM 2000 Control Delay	43.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	88.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	1587	29	65	512	155	23	260	172	266	362	175
Future Volume (vph)	180	1587	29	65	512	155	23	260	172	266	362	175
Lane Group Flow (vph)	184	1619	30	66	522	158	23	265	176	271	369	179
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	30.0	30.0	11.0	24.0	24.0	11.0	24.0	24.0	55.0	68.0	68.0
Total Split (%)	14.2%	25.0%	25.0%	9.2%	20.0%	20.0%	9.2%	20.0%	20.0%	45.8%	56.7%	56.7%
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	0.96	0.04	0.38	0.36	0.21	0.10	0.65	0.51	0.61	0.38	0.32
Control Delay	57.8	46.2	0.1	16.5	23.9	7.5	24.5	57.3	12.0	33.9	34.2	5.6
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	57.8	46.2	0.1	16.5	23.9	7.5	24.5	57.3	12.0	33.9	34.2	5.6
Queue Length 50th (m)	22.7	201.2	0.0	5.2	48.2	7.3	3.7	33.4	0.0	50.9	40.5	0.0
Queue Length 95th (m)	33.9	#318.9	0.0	15.7	75.8	25.4	8.0	46.5	20.2	63.6	47.8	15.4
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)	373	1691	804	176	1468	745	235	511	391	711	1703	846
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	0.49	0.96	0.04	0.38	0.36	0.21	0.10	0.52	0.45	0.38	0.22	0.21

Intersection Summary
Cycle Length: 120
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.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	1589	74	22	1616	10	171	120	29	72	112	96
Future Volume (vph)	118	1589	74	22	1616	10	171	120	29	72	112	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
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	1.00		1.00	0.97		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)	1711	3486		1678	3532		1745	1830		1728	1751	
Flt Permitted	0.06	1.00		0.07	1.00		0.48	1.00		0.61	1.00	
Satd. Flow (perm)	110	3486		123	3532		885	1830		1106	1751	
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)	122	1638	76	23	1666	10	176	124	30	74	115	99
RTOR Reduction (vph)	0	2	0	0	0	0	0	8	0	0	29	0
Lane Group Flow (vph)	122	1712	0	23	1676	0	176	146	0	74	185	0
Heavy Vehicles (%)	2%	3%	0%	4%	2%	22%	0%	1%	0%	1%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	74.6	67.8		64.2	61.4		23.9	23.9		23.9	23.9	
Effective Green, g (s)	74.6	67.8		64.2	61.4		23.9	23.9		23.9	23.9	
Actuated g/C Ratio	0.67	0.61		0.58	0.55		0.22	0.22		0.22	0.22	
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)	206	2129		110	1953		190	394		238	377	
v/s Ratio Prot	c0.05	c0.49		0.01	c0.47			0.08			0.11	
v/s Ratio Perm	0.35			0.12			c0.20			0.07		
v/c Ratio	0.59	0.80		0.21	0.86		0.93	0.37		0.31	0.49	
Uniform Delay, d1	22.7	16.5		14.7	21.1		42.7	37.1		36.6	38.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.5	3.3		0.9	5.2		44.4	0.6		0.7	1.0	
Delay (s)	27.2	19.9		15.7	26.2		87.1	37.7		37.4	39.2	
Level of Service	C	B		B	C		F	D		D	D	
Approach Delay (s)		20.3			26.1			64.1			38.7	
Approach LOS		C			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	92.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	118	1589	22	1616	171	120	72	112
Future Volume (vph)	118	1589	22	1616	171	120	72	112
Lane Group Flow (vph)	122	1714	23	1676	176	154	74	214
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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)	20.0	58.0	20.0	58.0	33.0	33.0	33.0	33.0
Total Split (%)	18.0%	52.3%	18.0%	52.3%	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	0.59	0.78	0.13	0.86	0.93	0.38	0.31	0.53
Control Delay	28.3	19.9	8.3	28.0	91.4	36.8	39.2	35.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.3	19.9	8.3	28.0	91.4	36.8	39.2	35.9
Queue Length 50th (m)	10.9	130.7	1.6	169.5	38.2	27.2	13.8	34.6
Queue Length 95th (m)	30.2	213.3	4.4	#246.7	#77.8	46.6	27.9	58.6
Internal Link Dist (m)		55.4		256.2		211.8		201.7
Turn Bay Length (m)	120.0		100.0		45.0		30.0	
Base Capacity (vph)	307	2205	308	1954	212	447	266	449
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	0.40	0.78	0.07	0.86	0.83	0.34	0.28	0.48

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 percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Sixth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1499	64	48	1738	96	137	48	92	190	43	27
Future Volume (vph)	20	1499	64	48	1738	96	137	48	92	190	43	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	3520		1745	3521		1678	1669		1558	1649	
Flt Permitted	0.06	1.00		0.06	1.00		0.71	1.00		0.61	1.00	
Satd. Flow (perm)	105	3520		109	3521		1253	1669		998	1649	
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
Adj. Flow (vph)	21	1578	67	51	1829	101	144	51	97	200	45	28
RTOR Reduction (vph)	0	3	0	0	4	0	0	53	0	0	17	0
Lane Group Flow (vph)	21	1642	0	51	1926	0	144	95	0	200	56	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	15%	4%	0%	4%	12%	9%	8%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	72.7	69.9		78.3	72.7		29.5	29.5		29.5	29.5	
Effective Green, g (s)	72.7	69.9		78.3	72.7		29.5	29.5		29.5	29.5	
Actuated g/C Ratio	0.61	0.58		0.65	0.61		0.25	0.25		0.25	0.25	
Clearance Time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	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)	101	2050		147	2133		308	410		245	405	
v/s Ratio Prot	0.00	0.47		c0.02	c0.55			0.06			0.03	
v/s Ratio Perm	0.12			0.21			0.11			c0.20		
v/c Ratio	0.21	0.80		0.35	0.90		0.47	0.23		0.82	0.14	
Uniform Delay, d1	21.8	19.6		17.3	20.6		38.6	36.2		42.7	35.3	
Progression Factor	1.43	1.14		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	1.9		1.4	6.8		1.1	0.3		18.6	0.2	
Delay (s)	31.8	24.3		18.8	27.4		39.7	36.5		61.3	35.5	
Level of Service	C	C		B	C		D	D		E	D	
Approach Delay (s)		24.4			27.2			38.1			54.4	
Approach LOS		C			C			D			D	

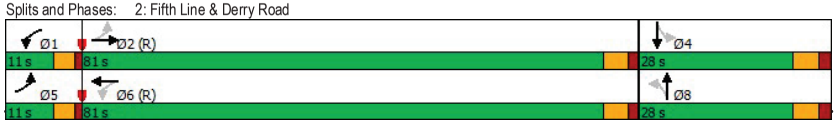
Intersection Summary				
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	83.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	20	1499	48	1738	137	48	190	43
Future Volume (vph)	20	1499	48	1738	137	48	190	43
Lane Group Flow (vph)	21	1645	51	1930	144	148	200	73
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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)	11.0	81.0	11.0	81.0	28.0	28.0	28.0	28.0
Total Split (%)	9.2%	67.5%	9.2%	67.5%	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	0.13	0.79	0.31	0.88	0.47	0.32	0.82	0.17
Control Delay	8.7	23.7	10.9	24.2	46.7	23.3	70.1	28.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	23.7	10.9	24.2	46.7	23.3	70.1	28.8
Queue Length 50th (m)	2.5	134.2	4.5	196.4	28.8	14.5	44.2	9.1
Queue Length 95th (m)	m1.5	m90.8	6.6	230.2	56.5	37.3	#103.8	24.5
Internal Link Dist (m)		354.1		336.2		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	163	2223	166	2224	307	463	245	422
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	0.13	0.74	0.31	0.87	0.47	0.32	0.82	0.17

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: 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.

Splits and Phases: 2: Fifth Line & Derry Road



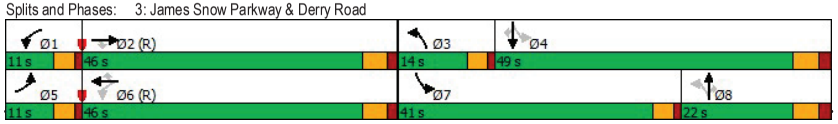
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	1118	16	248	1266	388	76	324	177	287	426	201
Future Volume (vph)	185	1118	16	248	1266	388	76	324	177	287	426	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
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
Lane 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
Frpb, 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
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
Flt 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)	3351	3539	1487	1745	3574	1536	1678	3505	1515	1710	3471	1581
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.49	1.00	1.00	0.31	1.00	1.00
Satd. Flow (perm)	3351	3539	1487	167	3574	1536	874	3505	1515	554	3471	1581
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	193	1165	17	258	1319	404	79	338	184	299	444	209
RTOR Reduction (vph)	0	0	11	0	0	166	0	0	157	0	0	150
Lane Group Flow (vph)	193	1165	6	258	1319	238	79	338	27	299	444	59
Confl. Peds. (#/hr)			1	1					1	1		
Heavy Vehicles (%)	1%	2%	6%	0%	1%	4%	4%	3%	4%	2%	4%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	12.1	39.9	39.9	63.4	47.3	47.3	25.2	17.7	17.7	45.6	34.1	34.1
Effective Green, g (s)	12.1	39.9	39.9	63.4	47.3	47.3	25.2	17.7	17.7	45.6	34.1	34.1
Actuated g/C Ratio	0.10	0.33	0.33	0.53	0.39	0.39	0.21	0.15	0.15	0.38	0.28	0.28
Clearance 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
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)	337	1176	494	344	1408	605	233	516	223	440	986	449
v/s Ratio Prot	0.06	0.33		c0.12	c0.37		0.02	0.10		c0.14	0.13	
v/s Ratio Perm			0.00	0.27		0.15	0.05		0.02	c0.12		0.04
v/c Ratio	0.57	0.99	0.01	0.75	0.94	0.39	0.34	0.66	0.12	0.68	0.45	0.13
Uniform Delay, d1	51.5	39.9	26.8	31.9	34.9	26.1	39.3	48.3	44.4	28.5	35.3	31.9
Progression Factor	1.00	1.00	1.00	0.80	1.23	1.96	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	24.1	0.0	4.9	7.9	1.0	0.9	3.0	0.2	4.1	0.3	0.1
Delay (s)	53.8	64.0	26.9	30.5	50.8	52.2	40.2	51.3	44.6	32.6	35.6	32.1
Level of Service	D	E	C	C	D	D	D	D	D	C	D	C
Approach Delay (s)		62.1			48.4			47.8			33.9	
Approach LOS		E			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	85.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	1118	16	248	1266	388	76	324	177	287	426	201
Future Volume (vph)	185	1118	16	248	1266	388	76	324	177	287	426	201
Lane Group Flow (vph)	193	1165	17	258	1319	404	79	338	184	299	444	209
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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)	11.0	46.0	46.0	11.0	46.0	46.0	14.0	22.0	22.0	41.0	49.0	49.0
Total Split (%)	9.2%	38.3%	38.3%	9.2%	38.3%	38.3%	11.7%	18.3%	18.3%	34.2%	40.8%	40.8%
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	0.97	0.03	0.75	0.92	0.52	0.31	0.69	0.50	0.67	0.45	0.35
Control Delay	59.2	59.3	0.1	34.0	49.0	20.1	26.6	56.2	11.0	34.0	36.4	5.4
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	59.2	59.3	0.1	34.0	49.0	20.1	26.6	56.2	11.0	34.0	36.4	5.4
Queue Length 50th (m)	23.5	149.0	0.0	51.1	184.0	59.8	12.5	42.5	0.0	54.8	49.5	0.0
Queue Length 95th (m)	#50.0	#197.0	0.0	m#99.7	#243.3	m78.6	19.1	56.3	19.9	65.9	56.5	16.1
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)	336	1200	592	346	1434	780	274	522	382	572	1252	704
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	0.57	0.97	0.03	0.75	0.92	0.52	0.29	0.65	0.48	0.52	0.35	0.30

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 110 (92%), Referenced to phase 2:EBT and 6:WBTL, 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.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	2080	161	26	814	39	90	169	31	36	135	130
Future Volume (vph)	163	2080	161	26	814	39	90	169	31	36	135	130
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)	1770	3504		1805	3286		1805	1842		1289	1743	
Flt Permitted	0.25	1.00		0.06	1.00		0.29	1.00		0.45	1.00	
Satd. Flow (perm)	469	3504		115	3286		543	1842		606	1743	
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)	173	2213	171	28	866	41	96	180	33	38	144	138
RTOR Reduction (vph)	0	4	0	0	3	0	0	7	0	0	33	0
Lane Group Flow (vph)	173	2380	0	28	904	0	96	206	0	38	249	0
Heavy Vehicles (%)	2%	2%	1%	0%	8%	33%	0%	0%	5%	40%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	77.8	69.8		70.2	66.0		20.5	20.5		20.5	20.5	
Effective Green, g (s)	77.8	69.8		70.2	66.0		20.5	20.5		20.5	20.5	
Actuated g/C Ratio	0.70	0.63		0.63	0.59		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)	422	2203		136	1953		100	340		111	321	
v/s Ratio Prot	c0.03	c0.68		0.01	0.28			0.11			0.14	
v/s Ratio Perm	0.26			0.12			c0.18			0.06		
v/c Ratio	0.41	1.08		0.21	0.46		0.96	0.61		0.34	0.77	
Uniform Delay, d1	6.7	20.6		25.2	12.6		44.8	41.6		39.4	43.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	45.0		0.8	0.8		76.1	3.1		1.8	11.1	
Delay (s)	7.4	65.6		25.9	13.4		120.9	44.6		41.2	54.1	
Level of Service	A	E		C	B		F	D		D	D	
Approach Delay (s)		61.6			13.8			68.3			52.6	
Approach LOS		E			B			E			D	

Intersection Summary				
HCM 2000 Control Delay	50.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	110.8%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	163	2080	26	814	90	169	36	135
Future Volume (vph)	163	2080	26	814	90	169	36	135
Lane Group Flow (vph)	173	2384	28	907	96	213	38	282
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	67.0	11.0	67.0	33.0	33.0	33.0	33.0
Total Split (%)	9.9%	60.4%	9.9%	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	0.41	1.06	0.15	0.46	0.96	0.62	0.34	0.79
Control Delay	8.5	58.1	7.5	14.2	125.3	47.0	45.9	52.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	58.1	7.5	14.2	125.3	47.0	45.9	52.7
Queue Length 50th (m)	10.7	~334.0	1.6	58.4	21.8	43.2	7.6	53.1
Queue Length 95th (m)	21.6	#401.7	5.0	81.3	#49.4	64.3	17.5	79.0
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)	426	2257	184	1956	130	449	146	450
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	0.41	1.06	0.15	0.46	0.74	0.47	0.26	0.63

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.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Sixth Line & Derry Road

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

Future Background (AM)
2030 Horizon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	2242	100	184	773	259	85	289	106	118	68	32
Future Volume (vph)	90	2242	100	184	773	259	85	289	106	118	68	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	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.96		1.00	0.96		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)	1626	3517		1626	3254		1719	3226		1583	3246	
Flt Permitted	0.21	1.00		0.06	1.00		0.69	1.00		0.36	1.00	
Satd. Flow (perm)	356	3517		95	3254		1240	3226		592	3246	
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)	96	2385	106	196	822	276	90	307	113	126	72	34
RTOR Reduction (vph)	0	3	0	0	27	0	0	32	0	0	27	0
Lane Group Flow (vph)	96	2488	0	196	1071	0	90	388	0	126	79	0
Heavy Vehicles (%)	11%	2%	2%	11%	3%	18%	5%	9%	3%	14%	2%	14%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Effective Green, g (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.64	0.57		0.69	0.60		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	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)	305	2013		206	1957		261	680		124	684	
v/s Ratio Prot	0.02	c0.71		c0.09	0.33			0.12			0.02	
v/s Ratio Perm	0.18			0.57			0.07			c0.21		
v/c Ratio	0.31	1.24		0.95	0.55		0.34	0.57		1.02	0.12	
Uniform Delay, d1	9.5	25.6		41.3	14.2		40.3	42.5		47.4	38.3	
Progression Factor	0.59	0.56		0.99	0.91		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	107.5		47.8	1.1		0.8	1.2		85.2	0.1	
Delay (s)	5.8	122.0		88.8	14.0		41.1	43.6		132.5	38.4	
Level of Service	A	F		F	B		D	D		F	D	
Approach Delay (s)		117.7			25.3			43.2			89.5	
Approach LOS		F			C			D			F	

Intersection Summary				
HCM 2000 Control Delay	82.2	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.15			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	112.3%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Queues
2: Fifth Line & Derry Road

Future Background (AM)
2030 Horizon

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	90	2242	184	773	85	289	118	68
Future Volume (vph)	90	2242	184	773	85	289	118	68
Lane Group Flow (vph)	96	2491	196	1098	90	420	126	106
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	74.0	15.0	77.0	31.0	31.0	31.0	31.0
Total Split (%)	10.0%	61.7%	12.5%	64.2%	25.8%	25.8%	25.8%	25.8%
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	0.31	1.24	0.95	0.55	0.34	0.59	1.02	0.15
Control Delay	4.1	125.9	81.6	13.3	44.7	42.4	133.1	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	125.9	81.6	13.3	44.7	42.4	133.1	26.7
Queue Length 50th (m)	3.9	~410.5	33.8	66.8	19.1	45.0	~32.0	7.6
Queue Length 95th (m)	m3.7	m#344.0	#83.0	78.8	35.7	62.7	#73.0	15.7
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	316	2016	206	1983	261	711	124	711
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	1.24	0.95	0.55	0.34	0.59	1.02	0.15

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.
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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	1827	32	75	585	196	25	287	194	356	400	193
Future Volume (vph)	199	1827	32	75	585	196	25	287	194	356	400	193
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	5.7	5.7	4.0	5.7	5.7
Lane 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
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
Flt 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)	3433	3574	1568	1752	3471	1547	1801	3343	1599	1719	3282	1480
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.51	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	3433	3574	1568	164	3471	1547	972	3343	1599	657	3282	1480
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)	203	1864	33	77	597	200	26	293	198	363	408	197
RTOR Reduction (vph)	0	0	19	0	0	125	0	0	169	0	0	133
Lane Group Flow (vph)	203	1864	14	77	597	75	26	293	29	363	408	64
Confl. Peds. (#/hr)	1					1	6					6
Heavy Vehicles (%)	2%	1%	3%	3%	4%	3%	0%	8%	1%	5%	10%	7%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	12.4	50.5	50.5	52.1	45.1	45.1	22.0	17.6	17.6	47.5	39.1	39.1
Effective Green, g (s)	12.4	50.5	50.5	52.1	45.1	45.1	22.0	17.6	17.6	47.5	39.1	39.1
Actuated g/C Ratio	0.10	0.42	0.42	0.43	0.38	0.38	0.18	0.15	0.15	0.40	0.33	0.33
Clearance 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
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)	354	1504	659	163	1304	581	208	490	234	489	1069	482
v/s Ratio Prot	c0.06	c0.52		0.03	0.17		0.00	0.09		c0.16	0.12	
v/s Ratio Perm			0.01	0.18		0.05	0.02		0.02	c0.13		0.04
v/c Ratio	0.57	1.24	0.02	0.47	0.46	0.13	0.12	0.60	0.12	0.74	0.38	0.13
Uniform Delay, d1	51.3	34.8	20.3	27.4	28.2	24.6	40.6	47.9	44.5	28.2	31.1	28.5
Progression Factor	1.00	1.00	1.00	0.75	0.83	2.37	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	113.6	0.1	1.9	1.0	0.4	0.3	2.0	0.2	6.0	0.2	0.1
Delay (s)	53.5	148.3	20.4	22.6	24.3	58.7	40.9	49.9	44.7	34.2	31.4	28.6
Level of Service	D	F	C	C	C	E	D	D	D	C	C	C
Approach Delay (s)		137.2			32.0			47.4			31.9	
Approach LOS		F			C			D			C	

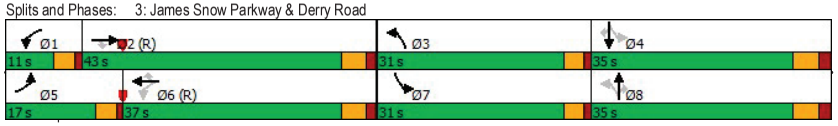
Intersection Summary				
HCM 2000 Control Delay	83.3	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	100.2%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	1827	32	75	585	196	25	287	194	356	400	193
Future Volume (vph)	199	1827	32	75	585	196	25	287	194	356	400	193
Lane Group Flow (vph)	203	1864	33	77	597	200	26	293	198	363	408	197
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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	0.57	1.18	0.04	0.41	0.44	0.28	0.10	0.66	0.51	0.74	0.38	0.32
Control Delay	57.5	121.6	0.1	18.2	24.7	10.6	23.5	56.3	11.1	37.0	32.5	5.5
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	57.5	121.6	0.1	18.2	24.7	10.6	23.5	56.3	11.1	37.0	32.5	5.5
Queue Length 50th (m)	25.1	~303.1	0.0	9.4	61.7	12.2	3.9	36.8	0.0	67.0	42.6	0.0
Queue Length 95th (m)	36.7	#379.9	0.0	m18.9	89.1	35.2	9.1	49.7	20.9	89.8	54.7	16.5
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)	392	1574	745	188	1350	724	546	816	540	499	1069	614
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	0.52	1.18	0.04	0.41	0.44	0.28	0.05	0.36	0.37	0.73	0.38	0.32

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 103 (86%), Referenced to phase 2:EBT 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.
Queue 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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	2280	156	93	930	91	50	0	20	24	0	43
Future Volume (vph)	75	2280	156	93	930	91	50	0	20	24	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
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	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3505		1770	3492		1770	1583		1770	1583	
Flt Permitted	0.26	1.00		0.04	1.00		0.73	1.00		0.74	1.00	
Satd. Flow (perm)	478	3505		82	3492		1353	1583		1384	1583	
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)	82	2478	170	101	1011	99	54	0	22	26	0	47
RTOR Reduction (vph)	0	3	0	0	3	0	0	20	0	0	43	0
Lane Group Flow (vph)	82	2645	0	101	1107	0	54	2	0	26	4	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	87.1	87.1		99.6	99.6		9.4	9.4		9.4	9.4	
Effective Green, g (s)	87.1	87.1		99.6	99.6		9.4	9.4		9.4	9.4	
Actuated g/C Ratio	0.73	0.73		0.83	0.83		0.08	0.08		0.08	0.08	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	346	2544		187	2898		105	124		108	124	
v/s Ratio Prot		c0.75		c0.04	0.32			0.00			0.00	
v/s Ratio Perm	0.17			0.41			c0.04			0.02		
v/c Ratio	0.24	1.04		0.54	0.38		0.51	0.01		0.24	0.03	
Uniform Delay, d1	5.4	16.5		38.4	2.5		53.1	51.0		51.9	51.1	
Progression Factor	1.86	1.92		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	19.4		3.2	0.4		4.2	0.0		1.2	0.1	
Delay (s)	10.3	51.0		41.6	2.9		57.3	51.1		53.1	51.2	
Level of Service	B	D		D	A		E	D		D	D	
Approach Delay (s)		49.8			6.1			55.5			51.9	
Approach LOS		D			A			E			D	

Intersection Summary				
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	95.1%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	75	2280	93	930	50	0	24	0
Future Volume (vph)	75	2280	93	930	50	0	24	0
Lane Group Flow (vph)	82	2648	101	1110	54	22	26	47
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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	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	5.7	5.7	5.7	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	0.23	1.03	0.53	0.37	0.43	0.10	0.20	0.17
Control Delay	13.9	44.2	28.1	3.1	61.1	0.8	53.0	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	44.2	28.1	3.1	61.1	0.8	53.0	1.3
Queue Length 50th (m)	10.5	~367.3	7.4	28.1	13.0	0.0	6.1	0.0
Queue Length 95th (m)	m12.2	m253.8	26.6	45.1	25.9	0.0	15.1	0.0
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)	352	2580	189	2966	330	453	337	497
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	0.23	1.03	0.53	0.37	0.16	0.05	0.08	0.09

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.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Clark Boulevard & Derry Road

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	3	10	470	315	37
Future Volume (vph)	10	3	10	470	315	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	5.7	5.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3484	
Flt Permitted	0.95	1.00	0.53	1.00	1.00	
Satd. Flow (perm)	1770	1583	979	3539	3484	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	3	11	511	342	40
RTOR Reduction (vph)	0	3	0	0	7	0
Lane Group Flow (vph)	11	0	11	511	375	0
Turn Type	Perm	Perm	Perm	NA	NA	
Protected Phases				8	4	
Permitted Phases	2	2	8			
Actuated Green, G (s)	1.4	1.4	26.1	26.1	26.1	
Effective Green, g (s)	1.4	1.4	26.1	26.1	26.1	
Actuated g/C Ratio	0.04	0.04	0.68	0.68	0.68	
Clearance Time (s)	5.3	5.3	5.7	5.7	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	64	57	663	2399	2361	
v/s Ratio Prot				c0.14	0.11	
v/s Ratio Perm	c0.01	0.00	0.01			
v/c Ratio	0.17	0.00	0.02	0.21	0.16	
Uniform Delay, d1	18.0	17.9	2.0	2.3	2.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.0	0.0	0.0	0.0	
Delay (s)	19.3	17.9	2.0	2.4	2.3	
Level of Service	B	B	A	A	A	
Approach Delay (s)	19.0			2.4	2.3	
Approach LOS	B			A	A	

Intersection Summary				
HCM 2000 Control Delay	2.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.21			
Actuated Cycle Length (s)	38.5	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	30.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	10	3	10	470	315
Future Volume (vph)	10	3	10	470	315
Lane Group Flow (vph)	11	3	11	511	382
Turn Type	Perm	Perm	Perm	NA	NA
Protected Phases				8	4
Permitted Phases	2	2	8		
Detector Phase	2	2	8	8	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	34.3	34.3	34.7	34.7	34.7
Total Split (s)	35.0	35.0	85.0	85.0	85.0
Total Split (%)	29.2%	29.2%	70.8%	70.8%	70.8%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	1.6	1.6	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.7	5.7	5.7
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	Min	Min	Min
v/c Ratio	0.02	0.01	0.01	0.16	0.12
Control Delay	11.7	9.7	2.7	1.9	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	9.7	2.7	1.9	1.8
Queue Length 50th (m)	0.4	0.0	0.0	0.0	0.0
Queue Length 95th (m)	3.8	1.6	1.8	16.7	12.0
Internal Link Dist (m)	204.0			156.9	372.1
Turn Bay Length (m)	35.0		35.0		
Base Capacity (vph)	1589	1421	978	3539	3483
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	0.01	0.00	0.01	0.14	0.11

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 34.1
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	169	2347	27	889	98	176	48	146
Future Volume (vph)	169	2347	27	889	98	176	48	146
Lane Group Flow (vph)	180	2687	29	991	104	221	51	307
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	67.0	11.0	67.0	33.0	33.0	33.0	33.0
Total Split (%)	9.9%	60.4%	9.9%	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	0.43	1.14	0.16	0.48	0.76	0.40	0.40	0.48
Control Delay	7.8	88.2	6.8	13.2	76.6	39.6	49.8	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	88.2	6.8	13.2	76.6	39.6	49.8	22.7
Queue Length 50th (m)	9.4	~395.0	1.4	59.1	23.1	22.2	10.7	16.7
Queue Length 95th (m)	21.1	#470.6	4.8	91.8	40.2	31.4	21.7	28.0
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)	418	2363	184	2046	213	855	198	911
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	0.43	1.14	0.16	0.48	0.49	0.26	0.26	0.34

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.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Sixth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	0	0	0	15	0	52	1	56	190	3
Future Volume (Veh/h)	3	0	0	0	0	15	0	52	1	56	190	3
Sign Control		Stop			Stop			Free			Free	
Grade		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)	3	0	0	0	0	16	0	57	1	61	207	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked												
vC, conflicting volume	404	388	208	388	390	58	210			58		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	404	388	208	388	390	58	210			58		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	98	100			96		
cM capacity (veh/h)	532	525	832	554	524	1009	1361			1546		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	3	16	58	271
Volume Left	3	0	0	61
Volume Right	0	16	1	3
cSH	532	1009	1361	1546
Volume to Capacity	0.01	0.02	0.00	0.04
Queue Length 95th (m)	0.1	0.4	0.0	1.0
Control Delay (s)	11.8	8.6	0.0	1.9
Lane LOS	B	A		A
Approach Delay (s)	11.8	8.6	0.0	1.9
Approach LOS	B	A		

Intersection Summary

Average Delay		2.0		
Intersection Capacity Utilization	29.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Queues
2: Fifth Line & Derry Road

Future Background (AM)
2035 Horizon

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	94	2512	197	847	92	292	117	72
Future Volume (vph)	94	2512	197	847	92	292	117	72
Lane Group Flow (vph)	100	2789	210	1189	98	428	124	113
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	74.0	15.0	77.0	31.0	31.0	31.0	31.0
Total Split (%)	10.0%	61.7%	12.5%	64.2%	25.8%	25.8%	25.8%	25.8%
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	0.35	1.38	1.02	0.60	0.38	0.60	1.02	0.16
Control Delay	6.2	193.9	98.7	14.2	45.6	42.6	136.2	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	193.9	98.7	14.2	45.6	42.6	136.2	26.8
Queue Length 50th (m)	4.3	~496.1	~40.6	73.2	21.0	46.0	~31.8	8.2
Queue Length 95th (m)	m4.5	#535.0	#91.1	88.7	38.4	63.7	#72.8	16.5
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	288	2016	206	1988	259	712	121	713
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	0.35	1.38	1.02	0.60	0.38	0.60	1.02	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
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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Fifth Line & Derry Road

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

Future Background (AM)
2035 Horizon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	2347	179	27	889	42	98	176	32	48	146	143
Future Volume (vph)	169	2347	179	27	889	42	98	176	32	48	146	143
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	
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)	1770	3504		1805	3285		1805	3500		1289	3309	
Flt Permitted	0.23	1.00		0.06	1.00		0.47	1.00		0.61	1.00	
Satd. Flow (perm)	429	3504		110	3285		888	3500		824	3309	
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)	180	2497	190	29	946	45	104	187	34	51	155	152
RTOR Reduction (vph)	0	4	0	0	3	0	0	15	0	0	129	0
Lane Group Flow (vph)	180	2683	0	29	988	0	104	206	0	51	178	0
Heavy Vehicles (%)	2%	2%	1%	0%	8%	33%	0%	0%	5%	40%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	81.4	73.2		73.3	69.1		17.1	17.1		17.1	17.1	
Effective Green, g (s)	81.4	73.2		73.3	69.1		17.1	17.1		17.1	17.1	
Actuated g/C Ratio	0.73	0.66		0.66	0.62		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)	414	2310		136	2044		136	539		126	509	
v/s Ratio Prot	c0.03	c0.77		0.01	0.30			0.06			0.05	
v/s Ratio Perm	0.29			0.13			c0.12			0.06		
v/c Ratio	0.43	1.16		0.21	0.48		0.76	0.38		0.40	0.35	
Uniform Delay, d1	5.9	18.9		25.9	11.3		45.0	42.2		42.4	42.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	77.9		0.8	0.8		22.2	0.5		2.1	0.4	
Delay (s)	6.6	96.8		26.7	12.1		67.2	42.7		44.5	42.4	
Level of Service	A	F		C	B		E	D		D	D	
Approach Delay (s)		91.2			12.5			50.5			42.7	
Approach LOS		F			B			D			D	

Intersection Summary

HCM 2000 Control Delay	66.9	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	112.4%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Queues
3: James Snow Parkway & Derry Road

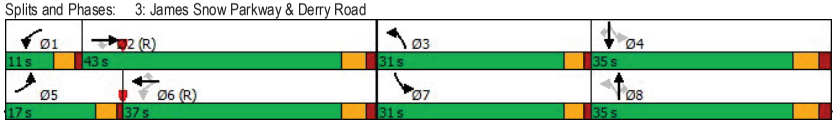
Future Background (AM)
2035 Horizon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	2010	35	81	644	214	30	349	233	418	487	235
Future Volume (vph)	220	2010	35	81	644	214	30	349	233	418	487	235
Lane Group Flow (vph)	224	2051	36	83	657	218	31	356	238	427	497	240
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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	0.60	0.90	0.05	0.44	0.34	0.30	0.14	0.61	0.66	0.86	0.33	0.38
Control Delay	57.6	38.7	0.1	19.0	22.0	10.1	25.1	54.3	21.2	47.8	32.1	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	57.6	38.7	0.1	19.0	22.0	10.1	25.1	54.3	21.2	47.8	32.1	5.7
Queue Length 50th (m)	27.6	173.3	0.0	9.5	45.1	14.1	4.7	31.2	11.0	84.7	36.1	0.0
Queue Length 95th (m)	39.7	#237.3	0.0	m19.3	63.6	38.3	10.7	40.8	37.0	#116.1	45.3	18.7
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)	401	2278	749	189	1933	733	524	1172	534	496	1512	637
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	0.56	0.90	0.05	0.44	0.34	0.30	0.06	0.30	0.45	0.86	0.33	0.38

Intersection Summary

Cycle Length: 120
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.
m Volume for 95th percentile queue is metered by upstream signal.

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



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

Future Background (AM)
2035 Horizon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	2512	110	197	847	271	92	292	110	117	72	34
Future Volume (vph)	94	2512	110	197	847	271	92	292	110	117	72	34
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	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.96		1.00	0.96		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)	1626	3517		1626	3262		1719	3225		1583	3248	
Flt Permitted	0.18	1.00		0.06	1.00		0.68	1.00		0.35	1.00	
Satd. Flow (perm)	308	3517		95	3262		1231	3225		578	3248	
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)	100	2672	117	210	901	288	98	311	117	124	77	36
RTOR Reduction (vph)	0	3	0	0	25	0	0	32	0	0	28	0
Lane Group Flow (vph)	100	2786	0	210	1164	0	98	396	0	124	85	0
Heavy Vehicles (%)	11%	2%	2%	11%	3%	18%	5%	9%	3%	14%	2%	14%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Effective Green, g (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.64	0.57		0.69	0.60		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	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)	277	2013		206	1962		259	679		121	684	
v/s Ratio Prot	0.02	c0.79		c0.09	0.36			0.12			0.03	
v/s Ratio Perm	0.21			0.61			0.08			c0.21		
v/c Ratio	0.36	1.38		1.02	0.59		0.38	0.58		1.02	0.12	
Uniform Delay, d1	10.1	25.6		42.2	14.8		40.6	42.6		47.4	38.4	
Progression Factor	0.72	0.56		0.98	0.91		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	174.7		66.5	1.3		0.9	1.3		88.6	0.1	
Delay (s)	7.7	189.1		107.9	14.7		41.5	43.9		135.9	38.4	
Level of Service	A	F		F	B		D	D		F	D	
Approach Delay (s)		182.8			28.7			43.4			89.5	
Approach LOS		F			C			D			F	

Intersection Summary

HCM 2000 Control Delay	121.2	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.26				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0		
Intersection Capacity Utilization	121.0%	ICU Level of Service	H		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	91	2570	93	1026	43	7	26	11
Future Volume (vph)	91	2570	93	1026	43	7	26	11
Lane Group Flow (vph)	99	2931	101	1214	47	30	28	59
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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	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	5.7	5.7	5.7	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	0.31	1.13	0.53	0.41	0.38	0.17	0.22	0.31
Control Delay	15.7	88.8	28.0	3.2	60.2	26.4	54.3	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	88.8	28.0	3.2	60.2	26.4	54.3	22.9
Queue Length 50th (m)	14.8	~443.3	7.4	32.2	11.3	1.9	6.6	2.8
Queue Length 95th (m)	m13.8	m253.9	26.4	49.1	23.5	11.2	15.9	15.8
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)	317	2596	189	2979	326	421	335	436
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	0.31	1.13	0.53	0.41	0.14	0.07	0.08	0.14

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.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Clark Boulevard & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	2010	35	81	644	214	30	349	233	418	487	235
Future Volume (vph)	220	2010	35	81	644	214	30	349	233	418	487	235
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	5.7	5.7	4.0	5.7	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	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
Flt 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)	3433	5136	1568	1752	4988	1547	1802	4803	1599	1719	4715	1480
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.46	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	3433	5136	1568	164	4988	1547	873	4803	1599	656	4715	1480
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)	224	2051	36	83	657	218	31	356	238	427	497	240
RTOR Reduction (vph)	0	0	21	0	0	136	0	0	164	0	0	163
Lane Group Flow (vph)	224	2051	15	83	657	82	31	356	74	427	497	77
Confl. Peds. (#/hr)	1					1	6					6
Heavy Vehicles (%)	2%	1%	3%	3%	4%	3%	0%	8%	1%	5%	10%	7%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	13.1	50.9	50.9	52.0	44.9	44.9	20.7	16.2	16.2	47.0	38.5	38.5
Effective Green, g (s)	13.1	50.9	50.9	52.0	44.9	44.9	20.7	16.2	16.2	47.0	38.5	38.5
Actuated g/C Ratio	0.11	0.42	0.42	0.43	0.37	0.37	0.17	0.13	0.13	0.39	0.32	0.32
Clearance 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
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)	374	2178	665	165	1866	578	185	648	215	494	1512	474
v/s Ratio Prot	c0.07	c0.40		0.03	0.13		0.01	0.07		c0.19	0.11	
v/s Ratio Perm			0.01	0.19		0.05	0.02		0.05	c0.15		0.05
v/c Ratio	0.60	0.94	0.02	0.50	0.35	0.14	0.17	0.55	0.34	0.86	0.33	0.16
Uniform Delay, d1	50.9	33.1	20.1	26.8	27.1	24.8	41.8	48.5	47.1	29.9	30.9	29.2
Progression Factor	1.00	1.00	1.00	0.77	0.80	2.42	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	9.7	0.1	2.0	0.4	0.4	0.4	1.0	1.0	14.6	0.1	0.2
Delay (s)	53.5	42.9	20.2	22.7	22.1	60.4	42.2	49.4	48.0	44.4	31.1	29.4
Level of Service	D	D	C	C	C	E	D	D	D	D	C	C
Approach Delay (s)		43.5			30.9			48.5			35.6	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	39.9	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.92				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		19.0	
Intersection Capacity Utilization	92.0%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	10	9	5	12	10	484	342
Future Volume (vph)	10	9	5	12	10	484	342
Lane Group Flow (vph)	11	13	5	13	11	554	412
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		2		6		8	4
Permitted Phases	2		6		8		
Detector Phase	2	2	6	6	8	8	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 (%)	29.2%	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	5.7
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	None	Min	Min	Min
v/c Ratio	0.02	0.02	0.01	0.02	0.01	0.18	0.13
Control Delay	8.8	8.1	8.8	8.8	3.6	2.5	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	8.1	8.8	8.8	3.6	2.5	2.4
Queue Length 50th (m)	0.4	0.4	0.2	0.4	0.0	0.0	0.0
Queue Length 95th (m)	2.7	2.8	1.7	2.9	2.0	18.8	13.6
Internal Link Dist (m)		204.0		113.8		156.9	372.1
Turn Bay Length (m)	35.0		35.0		35.0		
Base Capacity (vph)	1739	1679	1739	1739	950	3511	3486
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	0.16	0.12

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 32
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	2570	127	93	1026	91	43	7	20	26	11	43
Future Volume (vph)	91	2570	127	93	1026	91	43	7	20	26	11	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
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	0.89		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3514		1770	3496		1770	1658		1770	1640	
Flt Permitted	0.23	1.00		0.04	1.00		0.72	1.00		0.74	1.00	
Satd. Flow (perm)	431	3514		81	3496		1338	1658		1374	1640	
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)	99	2793	138	101	1115	99	47	8	22	28	12	47
RTOR Reduction (vph)	0	2	0	0	3	0	0	20	0	0	43	0
Lane Group Flow (vph)	99	2929	0	101	1211	0	47	10	0	28	16	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	87.5	87.5		100.0	100.0		9.0	9.0		9.0	9.0	
Effective Green, g (s)	87.5	87.5		100.0	100.0		9.0	9.0		9.0	9.0	
Actuated g/C Ratio	0.73	0.73		0.83	0.83		0.08	0.08		0.08	0.08	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	314	2562		187	2913		100	124		103	123	
v/s Ratio Prot		c0.83		c0.04	0.35			0.01			0.01	
v/s Ratio Perm	0.23			0.41			c0.04			0.02		
v/c Ratio	0.32	1.14		0.54	0.42		0.47	0.08		0.27	0.13	
Uniform Delay, d1	5.7	16.2		38.6	2.6		53.2	51.6		52.4	51.8	
Progression Factor	1.96	2.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	65.0		3.2	0.4		3.5	0.3		1.4	0.5	
Delay (s)	11.5	97.5		41.8	3.0		56.7	51.9		53.8	52.3	
Level of Service	B	F		D	A		E	D		D	D	
Approach Delay (s)		94.7			6.0			54.8			52.8	
Approach LOS		F			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	67.3	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	95.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	1	2	0	13	1	55	6	51	178	2
Future Volume (Veh/h)	2	0	1	2	0	13	1	55	6	51	178	2
Sign Control		Stop			Stop			Free			Free	
Grade		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)	2	0	1	2	0	14	1	60	7	55	193	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked												
vC, conflicting volume	384	373	194	370	370	64	195			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	384	373	194	370	370	64	195			67		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	99	100			96		
cM capacity (veh/h)	551	537	847	569	539	1001	1378			1535		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	3	16	68	250
Volume Left	2	2	1	55
Volume Right	1	14	7	2
cSH	624	914	1378	1535
Volume to Capacity	0.00	0.02	0.00	0.04
Queue Length 95th (m)	0.1	0.4	0.0	0.9
Control Delay (s)	10.8	9.0	0.1	1.9
Lane LOS	B	A	A	A
Approach Delay (s)	10.8	9.0	0.1	1.9
Approach LOS	B	A		

Intersection Summary				
Average Delay			1.9	
Intersection Capacity Utilization			29.0%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	9	3	5	12	0	10	484	26	0	342	37
Future Volume (vph)	10	9	3	5	12	0	10	484	26	0	342	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	5.3		5.7	5.7			5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95			0.95	
Frt	1.00	0.97		1.00	1.00		1.00	0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1798		1770	1863		1770	3512			3488	
Flt Permitted	1.00	1.00		1.00	1.00		0.51	1.00			1.00	
Satd. Flow (perm)	1863	1798		1863	1863		951	3512			3488	
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)	11	10	3	5	13	0	11	526	28	0	372	40
RTOR Reduction (vph)	0	3	0	0	0	0	0	3	0	0	7	0
Lane Group Flow (vph)	11	10	0	5	13	0	11	551	0	0	405	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	1.7	1.7		1.7	1.7		23.6	23.6			23.6	
Effective Green, g (s)	1.7	1.7		1.7	1.7		23.6	23.6			23.6	
Actuated g/C Ratio	0.05	0.05		0.05	0.05		0.65	0.65			0.65	
Clearance Time (s)	5.3	5.3		5.3	5.3		5.7	5.7			5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	87	84		87	87		618	2283			2267	
v/s Ratio Prot		0.01			c0.01			c0.16			0.12	
v/s Ratio Perm	0.01			0.00			0.01					
v/c Ratio	0.13	0.12		0.06	0.15		0.02	0.24			0.18	
Uniform Delay, d1	16.6	16.6		16.5	16.6		2.2	2.6			2.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.7	0.6		0.3	0.8		0.0	0.1			0.0	
Delay (s)	17.2	17.2		16.8	17.4		2.3	2.7			2.6	
Level of Service	B	B		B	B		A	A			A	
Approach Delay (s)		17.2			17.2			2.7			2.6	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay		3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio		0.24		
Actuated Cycle Length (s)		36.3	Sum of lost time (s)	11.0
Intersection Capacity Utilization		31.7%	ICU Level of Service	A
Analysis Period (min)		15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	2347	179	27	889	42	98	176	32	48	146	143
Future Volume (vph)	169	2347	179	27	889	42	98	176	32	48	146	143
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	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)	1770	5035		1805	4720		1805	3500		1289	3309	
Flt Permitted	0.25	1.00		0.06	1.00		0.47	1.00		0.61	1.00	
Satd. Flow (perm)	457	5035		110	4720		888	3500		824	3309	
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)	180	2497	190	29	946	45	104	187	34	51	155	152
RTOR Reduction (vph)	0	6	0	0	4	0	0	15	0	0	129	0
Lane Group Flow (vph)	180	2681	0	29	987	0	104	206	0	51	178	0
Heavy Vehicles (%)	2%	2%	1%	0%	8%	33%	0%	0%	5%	40%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	81.4	73.2		73.3	69.1		17.1	17.1		17.1	17.1	
Effective Green, g (s)	81.4	73.2		73.3	69.1		17.1	17.1		17.1	17.1	
Actuated g/C Ratio	0.73	0.66		0.66	0.62		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)	433	3320		136	2938		136	539		126	509	
v/s Ratio Prot	c0.03	c0.53		0.01	0.21			0.06			0.05	
v/s Ratio Perm	0.27			0.13			c0.12			0.06		
v/c Ratio	0.42	0.81		0.21	0.34		0.76	0.38		0.40	0.35	
Uniform Delay, d1	4.9	13.8		13.0	10.0		45.0	42.2		42.4	42.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	2.2		0.8	0.3		22.2	0.5		2.1	0.4	
Delay (s)	5.5	16.0		13.7	10.3		67.2	42.7		44.5	42.4	
Level of Service	A	B		B	B		E	D		D	D	
Approach Delay (s)		15.3			10.4			50.5			42.7	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	91.1%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	169	2347	27	889	98	176	48	146
Future Volume (vph)	169	2347	27	889	98	176	48	146
Lane Group Flow (vph)	180	2687	29	991	104	221	51	307
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	67.0	11.0	67.0	33.0	33.0	33.0	33.0
Total Split (%)	9.9%	60.4%	9.9%	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	0.41	0.79	0.16	0.34	0.76	0.40	0.40	0.48
Control Delay	7.5	17.2	6.8	11.1	76.6	39.6	49.8	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	17.2	6.8	11.1	76.6	39.6	49.8	22.7
Queue Length 50th (m)	9.4	160.5	1.4	36.2	23.1	22.2	10.7	16.7
Queue Length 95th (m)	21.1	#228.9	4.8	54.6	40.2	31.4	21.7	28.0
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)	436	3396	184	2940	213	855	198	911
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	0.41	0.79	0.16	0.34	0.49	0.26	0.26	0.34

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.

Splits and Phases: 1: Sixth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	2512	110	197	847	271	92	292	110	117	72	34
Future Volume (vph)	94	2512	110	197	847	271	92	292	110	117	72	34
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	0.96		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)	1626	5053		1626	4688		1719	3225		1583	3248	
Flt Permitted	0.20	1.00		0.06	1.00		0.68	1.00		0.35	1.00	
Satd. Flow (perm)	349	5053		95	4688		1231	3225		578	3248	
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)	100	2672	117	210	901	288	98	311	117	124	77	36
RTOR Reduction (vph)	0	4	0	0	47	0	0	32	0	0	28	0
Lane Group Flow (vph)	100	2785	0	210	1142	0	98	396	0	124	85	0
Heavy Vehicles (%)	11%	2%	2%	11%	3%	18%	5%	9%	3%	14%	2%	14%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Effective Green, g (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.64	0.57		0.69	0.60		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	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)	301	2892		206	2820		259	679		121	684	
v/s Ratio Prot	0.02	0.55		c0.09	0.24			0.12			0.03	
v/s Ratio Perm	0.19			c0.61			0.08			c0.21		
v/c Ratio	0.33	0.96		1.02	0.40		0.38	0.58		1.02	0.12	
Uniform Delay, d1	8.8	24.4		41.9	12.6		40.6	42.6		47.4	38.4	
Progression Factor	0.59	0.51		0.99	0.94		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	6.6		67.3	0.4		0.9	1.3		88.6	0.1	
Delay (s)	5.5	19.1		109.0	12.2		41.5	43.9		135.9	38.4	
Level of Service	A	B		F	B		D	D		F	D	
Approach Delay (s)		18.7			26.7			43.4			89.5	
Approach LOS		B			C			D			F	

Intersection Summary				
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	99.1%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	94	2512	197	847	92	292	117	72
Future Volume (vph)	94	2512	197	847	92	292	117	72
Lane Group Flow (vph)	100	2789	210	1189	98	428	124	113
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	74.0	15.0	77.0	31.0	31.0	31.0	31.0
Total Split (%)	10.0%	61.7%	12.5%	64.2%	25.8%	25.8%	25.8%	25.8%
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	0.33	0.96	1.02	0.41	0.38	0.60	1.02	0.16
Control Delay	5.1	19.9	99.8	11.1	45.6	42.6	136.2	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	19.9	99.8	11.1	45.6	42.6	136.2	26.8
Queue Length 50th (m)	4.3	61.6	~40.6	45.4	21.0	46.0	~31.8	8.2
Queue Length 95th (m)	m4.5	#93.1	#91.0	54.2	38.4	63.7	#72.8	16.5
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	311	2897	206	2867	259	712	121	713
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	0.32	0.96	1.02	0.41	0.38	0.60	1.02	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
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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	2010	35	81	644	214	30	349	233	418	487	235
Future Volume (vph)	220	2010	35	81	644	214	30	349	233	418	487	235
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	5.7	5.7	4.0	5.7	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	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
Flt 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)	3433	5136	1568	1752	4988	1547	1802	4803	1599	1719	4715	1480
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.46	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	3433	5136	1568	164	4988	1547	873	4803	1599	656	4715	1480
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)	224	2051	36	83	657	218	31	356	238	427	497	240
RTOR Reduction (vph)	0	0	21	0	0	136	0	0	164	0	0	163
Lane Group Flow (vph)	224	2051	15	83	657	82	31	356	74	427	497	77
Confl. Peds. (#/hr)	1					1	6					6
Heavy Vehicles (%)	2%	1%	3%	3%	4%	3%	0%	8%	1%	5%	10%	7%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	13.1	50.9	50.9	52.0	44.9	44.9	20.7	16.2	16.2	47.0	38.5	38.5
Effective Green, g (s)	13.1	50.9	50.9	52.0	44.9	44.9	20.7	16.2	16.2	47.0	38.5	38.5
Actuated g/C Ratio	0.11	0.42	0.42	0.43	0.37	0.37	0.17	0.13	0.13	0.39	0.32	0.32
Clearance 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
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)	374	2178	665	165	1866	578	185	648	215	494	1512	474
v/s Ratio Prot	c0.07	c0.40		0.03	0.13		0.01	0.07		c0.19	0.11	
v/s Ratio Perm			0.01	0.19		0.05	0.02		0.05	c0.15		0.05
v/c Ratio	0.60	0.94	0.02	0.50	0.35	0.14	0.17	0.55	0.34	0.86	0.33	0.16
Uniform Delay, d1	50.9	33.1	20.1	26.8	27.1	24.8	41.8	48.5	47.1	29.9	30.9	29.2
Progression Factor	1.00	1.00	1.00	0.81	0.87	2.74	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	9.7	0.1	2.2	0.5	0.5	0.4	1.0	1.0	14.6	0.1	0.2
Delay (s)	53.5	42.9	20.2	23.9	24.0	68.4	42.2	49.4	48.0	44.4	31.1	29.4
Level of Service	D	D	C	C	C	E	D	D	D	D	C	C
Approach Delay (s)		43.5			34.1			48.5			35.6	
Approach LOS		D			C			D			D	

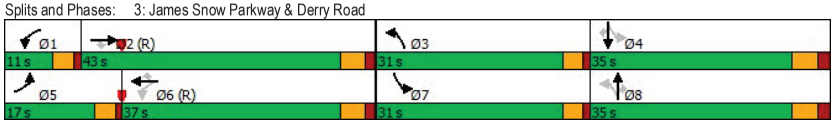
Intersection Summary				
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	92.0%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	2010	35	81	644	214	30	349	233	418	487	235
Future Volume (vph)	220	2010	35	81	644	214	30	349	233	418	487	235
Lane Group Flow (vph)	224	2051	36	83	657	218	31	356	238	427	497	240
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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	0.60	0.90	0.05	0.44	0.34	0.30	0.14	0.61	0.66	0.86	0.33	0.38
Control Delay	57.6	38.7	0.1	20.2	23.9	11.4	25.1	54.3	21.2	47.8	32.1	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	57.6	38.7	0.1	20.2	23.9	11.4	25.1	54.3	21.2	47.8	32.1	5.7
Queue Length 50th (m)	27.6	173.3	0.0	10.0	44.7	12.2	4.7	31.2	11.0	84.7	36.1	0.0
Queue Length 95th (m)	39.7	#237.3	0.0	20.7	63.2	36.9	10.7	40.8	37.0	#116.1	45.3	18.7
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)	401	2278	749	189	1933	733	524	1172	534	496	1512	637
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	0.56	0.90	0.05	0.44	0.34	0.30	0.06	0.30	0.45	0.86	0.33	0.38

Intersection Summary
Cycle Length: 120
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.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	2570	127	93	1026	91	43	7	20	26	11	43
Future Volume (vph)	91	2570	127	93	1026	91	43	7	20	26	11	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	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	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5049		1770	5023		1770	1658		1770	1640	
Flt Permitted	0.22	1.00		0.04	1.00		0.72	1.00		0.74	1.00	
Satd. Flow (perm)	409	5049		81	5023		1338	1658		1374	1640	
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)	99	2793	138	101	1115	99	47	8	22	28	12	47
RTOR Reduction (vph)	0	3	0	0	4	0	0	20	0	0	43	0
Lane Group Flow (vph)	99	2928	0	101	1210	0	47	10	0	28	16	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	87.5	87.5		100.0	100.0		9.0	9.0		9.0	9.0	
Effective Green, g (s)	87.5	87.5		100.0	100.0		9.0	9.0		9.0	9.0	
Actuated g/C Ratio	0.73	0.73		0.83	0.83		0.08	0.08		0.08	0.08	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	298	3681		187	4185		100	124		103	123	
v/s Ratio Prot		c0.58		c0.04	0.24			0.01			0.01	
v/s Ratio Perm	0.24			0.41			c0.04			0.02		
v/c Ratio	0.33	0.80		0.54	0.29		0.47	0.08		0.27	0.13	
Uniform Delay, d1	5.8	10.5		26.1	2.2		53.2	51.6		52.4	51.8	
Progression Factor	2.02	2.08		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.7		3.2	0.2		3.5	0.3		1.4	0.5	
Delay (s)	12.9	22.5		29.3	2.4		56.7	51.9		53.8	52.3	
Level of Service	B	C		C	A		E	D		D	D	
Approach Delay (s)		22.2			4.4			54.8			52.8	
Approach LOS		C			A			D			D	

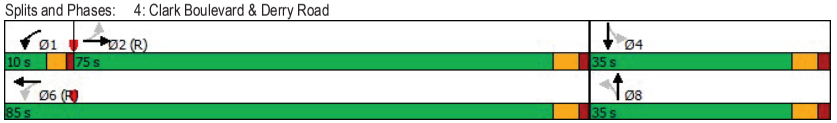
Intersection Summary				
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	79.2%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	91	2570	93	1026	43	7	26	11
Future Volume (vph)	91	2570	93	1026	43	7	26	11
Lane Group Flow (vph)	99	2931	101	1214	47	30	28	59
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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	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	5.7	5.7	5.7	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	0.33	0.79	0.53	0.28	0.38	0.17	0.22	0.31
Control Delay	17.5	25.1	28.0	2.5	60.2	26.4	54.3	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	25.1	28.0	2.5	60.2	26.4	54.3	22.9
Queue Length 50th (m)	16.1	227.3	7.4	19.0	11.3	1.9	6.6	2.8
Queue Length 95th (m)	m20.7	m241.0	26.4	28.3	23.5	11.2	15.9	15.8
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)	301	3731	189	4281	326	421	335	436
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	0.33	0.79	0.53	0.28	0.14	0.07	0.08	0.14

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

Splits and Phases: 4: Clark Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	9	3	5	12	0	10	484	26	0	342	37
Future Volume (vph)	10	9	3	5	12	0	10	484	26	0	342	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	5.3		5.7	5.7			5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95			0.95	
Frt	1.00	0.97		1.00	1.00		1.00	0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1798		1770	1863		1770	3512			3488	
Flt Permitted	1.00	1.00		1.00	1.00		0.51	1.00			1.00	
Satd. Flow (perm)	1863	1798		1863	1863		951	3512			3488	
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)	11	10	3	5	13	0	11	526	28	0	372	40
RTOR Reduction (vph)	0	3	0	0	0	0	0	3	0	0	7	0
Lane Group Flow (vph)	11	10	0	5	13	0	11	551	0	0	405	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	1.7	1.7		1.7	1.7		23.6	23.6			23.6	
Effective Green, g (s)	1.7	1.7		1.7	1.7		23.6	23.6			23.6	
Actuated g/C Ratio	0.05	0.05		0.05	0.05		0.65	0.65			0.65	
Clearance Time (s)	5.3	5.3		5.3	5.3		5.7	5.7			5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	87	84		87	87		618	2283			2267	
v/s Ratio Prot		0.01			c0.01			c0.16			0.12	
v/s Ratio Perm	0.01			0.00			0.01					
v/c Ratio	0.13	0.12		0.06	0.15		0.02	0.24			0.18	
Uniform Delay, d1	16.6	16.6		16.5	16.6		2.2	2.6			2.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.7	0.6		0.3	0.8		0.0	0.1			0.0	
Delay (s)	17.2	17.2		16.8	17.4		2.3	2.7			2.6	
Level of Service	B	B		B	B		A	A			A	
Approach Delay (s)		17.2			17.2			2.7			2.6	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	36.3	Sum of lost time (s)	11.0
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	10	9	5	12	10	484	342
Future Volume (vph)	10	9	5	12	10	484	342
Lane Group Flow (vph)	11	13	5	13	11	554	412
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		2		6		8	4
Permitted Phases	2		6		8		
Detector Phase	2	2	6	6	8	8	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 (%)	29.2%	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	5.7
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	None	Min	Min	Min
v/c Ratio	0.02	0.02	0.01	0.02	0.01	0.18	0.13
Control Delay	8.8	8.1	8.8	8.8	3.6	2.5	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	8.1	8.8	8.8	3.6	2.5	2.4
Queue Length 50th (m)	0.4	0.4	0.2	0.4	0.0	0.0	0.0
Queue Length 95th (m)	2.7	2.8	1.7	2.9	2.0	18.8	13.6
Internal Link Dist (m)		204.0		113.8		156.9	372.1
Turn Bay Length (m)	35.0		35.0		35.0		
Base Capacity (vph)	1739	1679	1739	1739	950	3511	3486
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	0.16	0.12

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 32
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

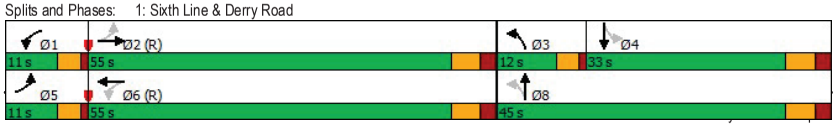
Splits and Phases: 5: Fifth Line & Clark Boulevard

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	168	1823	33	1812	209	159	97	221
Future Volume (vph)	168	1823	33	1812	209	159	97	221
Lane Group Flow (vph)	173	1977	34	1892	215	204	100	376
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	5	2	1	6	3	8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	55.0	11.0	55.0	12.0	45.0	33.0	33.0
Total Split (%)	9.9%	49.5%	9.9%	49.5%	10.8%	40.5%	29.7%	29.7%
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	0.87	1.14	0.19	1.21	1.00	0.33	0.38	0.90
Control Delay	62.6	100.0	13.6	130.0	93.7	27.3	40.4	63.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	100.0	13.6	130.0	93.7	27.3	40.4	63.7
Queue Length 50th (m)	24.2	~304.4	3.3	~281.3	34.7	31.7	19.0	76.4
Queue Length 95th (m)	#69.6	#349.7	8.0	#326.4	#77.5	51.4	35.8	#127.7
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)	199	1730	178	1565	214	645	285	447
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	0.87	1.14	0.19	1.21	1.00	0.32	0.35	0.84

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.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Sixth Line & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	1	2	0	13	1	55	6	51	178	2
Future Volume (Veh/h)	2	0	1	2	0	13	1	55	6	51	178	2
Sign Control		Stop			Stop			Free			Free	
Grade		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)	2	0	1	2	0	14	1	60	7	55	193	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked												
vC, conflicting volume	384	373	194	370	370	64	195			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	384	373	194	370	370	64	195			67		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	99	100			96		
cM capacity (veh/h)	551	537	847	569	539	1001	1378			1535		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	3	16	68	250
Volume Left	2	2	1	55
Volume Right	1	14	7	2
cSH	624	914	1378	1535
Volume to Capacity	0.00	0.02	0.00	0.04
Queue Length 95th (m)	0.1	0.4	0.0	0.9
Control Delay (s)	10.8	9.0	0.1	1.9
Lane LOS	B	A	A	A
Approach Delay (s)	10.8	9.0	0.1	1.9
Approach LOS	B	A		

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	29.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	42	1713	115	2077	226	70	340	301
Future Volume (vph)	42	1713	115	2077	226	70	340	301
Lane Group Flow (vph)	44	1880	121	2314	238	285	358	400
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	64.0	11.0	64.0	23.0	33.0	23.0	33.0
Total Split (%)	8.4%	48.9%	8.4%	48.9%	17.6%	25.2%	17.6%	25.2%
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
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
v/c Ratio	0.28	1.09	0.65	1.25	0.73	0.50	1.02	0.76
Control Delay	16.9	81.6	39.2	148.1	46.6	29.9	91.5	59.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.9	81.6	39.2	148.1	46.6	29.9	91.5	59.0
Queue Length 50th (m)	4.8	~312.6	15.2	~428.7	48.8	20.1	~83.1	52.3
Queue Length 95th (m)	11.3	#369.9	#48.1	#498.6	68.3	33.4	#114.2	67.6
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	160	1732	187	1845	345	750	351	688
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	0.28	1.09	0.65	1.25	0.69	0.38	1.02	0.58

Intersection Summary

Cycle Length: 131
Actuated Cycle Length: 131
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.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Fifth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	1823	95	33	1812	23	209	159	39	97	221	144
Future Volume (vph)	168	1823	95	33	1812	23	209	159	39	97	221	144
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	
Frt	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3484		1736	3524		1805	1829		1787	1770	
Flt Permitted	0.08	1.00		0.08	1.00		0.16	1.00		0.63	1.00	
Satd. Flow (perm)	140	3484		148	3524		300	1829		1185	1770	
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)	173	1879	98	34	1868	24	215	164	40	100	228	148
RTOR Reduction (vph)	0	3	0	0	1	0	0	8	0	0	22	0
Lane Group Flow (vph)	173	1974	0	34	1891	0	215	196	0	100	354	0
Heavy Vehicles (%)	2%	3%	0%	4%	2%	22%	0%	1%	0%	1%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	61.6	53.4		53.5	49.3		36.9	36.9		24.9	24.9	
Effective Green, g (s)	61.6	53.4		53.5	49.3		36.9	36.9		24.9	24.9	
Actuated g/C Ratio	0.55	0.48		0.48	0.44		0.33	0.33		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)	199	1676		131	1565		208	608		265	397	
v/s Ratio Prot	c0.06	c0.57		0.01	0.54		c0.07	0.11			0.20	
v/s Ratio Perm	0.42			0.11			c0.27			0.08		
v/c Ratio	0.87	1.18		0.26	1.21		1.03	0.32		0.38	0.89	
Uniform Delay, d1	29.3	28.8		24.6	30.9		33.3	27.7		36.5	41.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.7	86.6		1.1	100.1		71.5	0.3		0.9	21.5	
Delay (s)	60.0	115.4		25.7	131.0		104.8	28.0		37.4	63.2	
Level of Service	E	F		C	F		F	C		D	E	
Approach Delay (s)		110.9			129.1			67.4			57.8	
Approach LOS		F			F			E			E	

Intersection Summary

HCM 2000 Control Delay	109.2	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.16			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	109.2%	ICU Level of Service	H	
Analysis Period (min)	15			

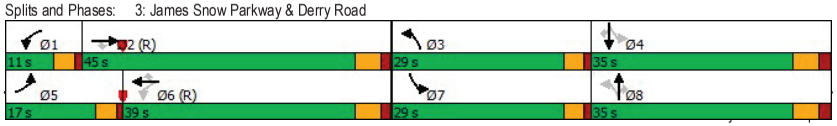
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	1258	18	279	1474	505	84	358	201	346	470	222
Future Volume (vph)	204	1258	18	279	1474	505	84	358	201	346	470	222
Lane Group Flow (vph)	213	1310	19	291	1535	526	88	373	209	360	490	231
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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%	9.2%	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
v/c Ratio	0.58	1.12	0.03	0.82	1.11	0.68	0.31	0.69	0.53	0.80	0.52	0.39
Control Delay	57.5	103.4	0.1	51.1	95.5	20.2	26.0	54.9	13.1	40.8	38.9	6.0
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	57.5	103.4	0.1	51.1	95.5	20.2	26.0	54.9	13.1	40.8	38.9	6.0
Queue Length 50th (m)	26.3	~196.6	0.0	53.0	~233.5	50.6	13.5	46.8	3.9	65.5	53.7	0.0
Queue Length 95th (m)	38.1	#240.6	0.0	#129.7	#314.0	106.8	22.8	60.5	25.4	87.1	68.4	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)	399	1170	562	354	1384	774	503	855	518	465	959	609
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	0.53	1.12	0.03	0.82	1.11	0.68	0.17	0.44	0.40	0.77	0.51	0.38

Intersection Summary

Cycle Length: 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
~ 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: 3: James Snow Parkway & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1713	73	115	2077	122	226	70	200	340	301	79
Future Volume (vph)	42	1713	73	115	2077	122	226	70	200	340	301	79
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	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	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3520		1805	3518		1736	3117		1612	3215	
Flt Permitted	0.06	1.00		0.06	1.00		0.32	1.00		0.41	1.00	
Satd. Flow (perm)	118	3520		112	3518		582	3117		699	3215	
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
Adj. Flow (vph)	44	1803	77	121	2186	128	238	74	211	358	317	83
RTOR Reduction (vph)	0	2	0	0	3	0	0	109	0	0	19	0
Lane Group Flow (vph)	44	1878	0	121	2311	0	238	176	0	358	381	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	15%	4%	0%	4%	12%	9%	8%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	70.2	64.3		77.2	67.8		36.8	19.3		39.8	20.8	
Effective Green, g (s)	70.2	64.3		77.2	67.8		36.8	19.3		39.8	20.8	
Actuated g/C Ratio	0.54	0.49		0.59	0.52		0.28	0.15		0.30	0.16	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.7		4.0	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)	139	1727		187	1820		317	459		344	510	
v/s Ratio Prot	0.01	0.53		c0.05	c0.66		0.10	0.06		c0.15	0.12	
v/s Ratio Perm	0.15			0.33			0.11			c0.16		
v/c Ratio	0.32	1.09		0.65	1.27		0.75	0.38		1.04	0.75	
Uniform Delay, d1	28.7	33.4		30.6	31.6		39.5	50.5		42.5	52.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	49.6		7.5	125.9		9.6	0.5		59.5	5.9	
Delay (s)	30.0	83.0		38.1	157.5		49.1	51.0		102.0	58.5	
Level of Service	C	F		D	F		D	D		F	E	
Approach Delay (s)		81.8			151.6			50.2			79.0	
Approach LOS		F			F			D			E	

Intersection Summary

HCM 2000 Control Delay	108.6	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.18				
Actuated Cycle Length (s)	131.0	Sum of lost time (s)	19.0		
Intersection Capacity Utilization	110.2%	ICU Level of Service	H		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	30	1973	32	2095	167	0	74	0
Future Volume (vph)	30	1973	32	2095	167	0	74	0
Lane Group Flow (vph)	33	2210	35	2303	182	84	80	184
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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)	70.0	70.0	10.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	58.3%	58.3%	8.3%	66.7%	33.3%	33.3%	33.3%	33.3%
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	5.7	5.7	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	0.52	0.97	0.23	0.94	0.90	0.20	0.29	0.48
Control Delay	52.3	36.2	10.5	26.3	85.9	6.0	40.0	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	36.2	10.5	26.3	85.9	6.0	40.0	31.0
Queue Length 50th (m)	4.5	~309.5	2.4	239.7	44.0	0.0	16.7	27.2
Queue Length 95th (m)	#26.0	#387.3	7.0	#370.9	#68.2	9.7	28.9	45.8
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)	64	2272	151	2458	273	521	373	493
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	0.52	0.97	0.23	0.94	0.67	0.16	0.21	0.37

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: 130
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: 4: Clark Boulevard & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	1258	18	279	1474	505	84	358	201	346	470	222
Future Volume (vph)	204	1258	18	279	1474	505	84	358	201	346	470	222
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	5.7	5.7	4.0	5.7	5.7
Lane 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
Frpb, 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
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
Flt 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)	3467	3539	1503	1805	3574	1553	1736	3505	1532	1769	3471	1599
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.47	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	3467	3539	1503	174	3574	1553	865	3505	1532	514	3471	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	212	1310	19	291	1535	526	88	373	209	360	490	231
RTOR Reduction (vph)	0	0	13	0	0	173	0	0	162	0	0	169
Lane Group Flow (vph)	213	1310	6	291	1535	353	88	373	47	360	490	62
Confl. Peds. (#/hr)			1	1					1	1		
Heavy Vehicles (%)	1%	2%	6%	0%	1%	4%	4%	3%	4%	2%	4%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	12.6	39.7	39.7	63.1	46.5	46.5	27.9	18.4	18.4	45.9	32.4	32.4
Effective Green, g (s)	12.6	39.7	39.7	63.1	46.5	46.5	27.9	18.4	18.4	45.9	32.4	32.4
Actuated g/C Ratio	0.10	0.33	0.33	0.53	0.39	0.39	0.23	0.15	0.15	0.38	0.27	0.27
Clearance 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
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)	364	1170	497	355	1384	601	270	537	234	442	937	431
v/s Ratio Prot	0.06	0.37		c0.13	c0.43		0.03	0.11		c0.16	0.14	
v/s Ratio Perm			0.00	0.30		0.23	0.05		0.03	c0.15		0.04
v/c Ratio	0.59	1.12	0.01	0.82	1.11	0.59	0.33	0.69	0.20	0.81	0.52	0.14
Uniform Delay, d1	51.2	40.1	27.0	33.8	36.8	29.1	37.2	48.1	44.4	29.5	37.2	33.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	65.7	0.0	13.7	59.9	4.2	0.7	3.9	0.4	11.0	0.5	0.2
Delay (s)	53.6	105.8	27.0	47.5	96.7	33.3	37.9	52.0	44.8	40.5	37.8	33.4
Level of Service	D	F	C	D	F	C	D	D	D	D	D	C
Approach Delay (s)		97.6			76.4			47.9			37.7	
Approach LOS		F			E			D			D	

Intersection Summary					
HCM 2000 Control Delay	71.4	HCM 2000 Level of Service		E	
HCM 2000 Volume to Capacity ratio	0.99				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		19.0	
Intersection Capacity Utilization	95.6%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	39	10	4	457	478
Future Volume (vph)	39	10	4	457	478
Lane Group Flow (vph)	42	11	4	497	532
Turn Type	Perm	Perm	Perm	NA	NA
Protected Phases				8	4
Permitted Phases	2	2	8		
Detector Phase	2	2	8	8	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	34.3	34.3	34.7	34.7	34.7
Total Split (s)	35.0	35.0	85.0	85.0	85.0
Total Split (%)	29.2%	29.2%	70.8%	70.8%	70.8%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	1.6	1.6	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.7	5.7	5.7
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	Min	Min	Min
v/c Ratio	0.08	0.02	0.01	0.18	0.19
Control Delay	11.6	7.3	5.2	3.8	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	7.3	5.2	3.8	3.8
Queue Length 50th (m)	1.4	0.0	0.0	0.0	0.0
Queue Length 95th (m)	6.8	2.3	1.1	17.0	18.1
Internal Link Dist (m)	204.0			156.9	372.1
Turn Bay Length (m)	35.0		35.0		
Base Capacity (vph)	1531	1371	846	3539	3529
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	0.03	0.01	0.00	0.14	0.15

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 35.2
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1973	60	32	2095	24	167	0	77	74	0	169
Future Volume (vph)	30	1973	60	32	2095	24	167	0	77	74	0	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3524		1770	3533		1770	1583		1770	1583	
Flt Permitted	0.05	1.00		0.05	1.00		0.51	1.00		0.70	1.00	
Satd. Flow (perm)	98	3524		93	3533		958	1583		1308	1583	
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	2145	65	35	2277	26	182	0	84	80	0	184
RTOR Reduction (vph)	0	1	0	0	1	0	0	66	0	0	45	0
Lane Group Flow (vph)	33	2209	0	35	2302	0	182	18	0	80	139	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	75.7	75.7		83.5	83.5		25.5	25.5		25.5	25.5	
Effective Green, g (s)	75.7	75.7		83.5	83.5		25.5	25.5		25.5	25.5	
Actuated g/C Ratio	0.63	0.63		0.70	0.70		0.21	0.21		0.21	0.21	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	61	2223		117	2458		203	336		277	336	
v/s Ratio Prot		c0.63		0.01	c0.65			0.01			0.09	
v/s Ratio Perm	0.34			0.20			c0.19			0.06		
v/c Ratio	0.54	0.99		0.30	0.94		0.90	0.05		0.29	0.41	
Uniform Delay, d1	12.4	21.9		30.0	15.9		46.0	37.6		39.6	40.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.3	17.6		1.4	8.4		35.8	0.1		0.6	0.8	
Delay (s)	42.7	39.5		31.4	24.3		81.8	37.7		40.2	41.6	
Level of Service	D	D		C	C		F	D		D	D	
Approach Delay (s)		39.6			24.4			67.8			41.2	
Approach LOS		D			C			E			D	

Intersection Summary					
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.98				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0		
Intersection Capacity Utilization	92.3%	ICU Level of Service	F		
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	0	0	0	56	0	184	0	14	74	4
Future Volume (Veh/h)	4	0	0	0	0	56	0	184	0	14	74	4
Sign Control		Stop			Stop			Free			Free	
Grade		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)	4	0	0	0	0	61	0	200	0	15	80	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked												
vC, conflicting volume	373	312	82	312	314	200	84			200		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	373	312	82	312	314	200	84			200		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	93	100			99		
cM capacity (veh/h)	537	596	978	635	595	841	1513			1372		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	61	200	99
Volume Left	4	0	0	15
Volume Right	0	61	0	4
cSH	537	841	1513	1372
Volume to Capacity	0.01	0.07	0.00	0.01
Queue Length 95th (m)	0.2	1.9	0.0	0.3
Control Delay (s)	11.8	9.6	0.0	1.2
Lane LOS	B	A		A
Approach Delay (s)	11.8	9.6	0.0	1.2
Approach LOS	B	A		

Intersection Summary				
Average Delay			2.1	
Intersection Capacity Utilization			26.3%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	39	10	4	457	478	11
Future Volume (vph)	39	10	4	457	478	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	5.7	5.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3527	
Flt Permitted	0.95	1.00	0.45	1.00	1.00	
Satd. Flow (perm)	1770	1583	846	3539	3527	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	11	4	497	520	12
RTOR Reduction (vph)	0	10	0	0	1	0
Lane Group Flow (vph)	42	1	4	497	531	0
Turn Type	Perm	Perm	Perm	NA	NA	
Protected Phases				8	4	
Permitted Phases	2	2	8			
Actuated Green, G (s)	3.4	3.4	24.2	24.2	24.2	
Effective Green, g (s)	3.4	3.4	24.2	24.2	24.2	
Actuated g/C Ratio	0.09	0.09	0.63	0.63	0.63	
Clearance Time (s)	5.3	5.3	5.7	5.7	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	155	139	530	2218	2211	
v/s Ratio Prot				0.14	c0.15	
v/s Ratio Perm	c0.02	0.00	0.00			
v/c Ratio	0.27	0.01	0.01	0.22	0.24	
Uniform Delay, d1	16.4	16.1	2.7	3.1	3.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.0	0.0	0.1	0.1	
Delay (s)	17.4	16.1	2.7	3.2	3.2	
Level of Service	B	B	A	A	A	
Approach Delay (s)	17.1			3.2	3.2	
Approach LOS	B			A	A	

Intersection Summary				
HCM 2000 Control Delay		3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio		0.24		
Actuated Cycle Length (s)		38.6	Sum of lost time (s)	11.0
Intersection Capacity Utilization		31.1%	ICU Level of Service	A
Analysis Period (min)		15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	2061	104	35	1997	26	229	173	42	141	234	156
Future Volume (vph)	182	2061	104	35	1997	26	229	173	42	141	234	156
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	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3485		1736	3523		1805	3477		1787	3360	
Flt Permitted	0.07	1.00		0.08	1.00		0.29	1.00		0.61	1.00	
Satd. Flow (perm)	135	3485		143	3523		555	3477		1154	3360	
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)	188	2125	107	36	2059	27	236	178	43	145	241	161
RTOR Reduction (vph)	0	3	0	0	1	0	0	21	0	0	112	0
Lane Group Flow (vph)	188	2229	0	36	2085	0	236	200	0	145	290	0
Heavy Vehicles (%)	2%	3%	0%	4%	2%	22%	0%	1%	0%	1%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	67.5	59.3		55.2	51.0		31.0	31.0		19.0	19.0	
Effective Green, g (s)	67.5	59.3		55.2	51.0		31.0	31.0		19.0	19.0	
Actuated g/C Ratio	0.61	0.53		0.50	0.46		0.28	0.28		0.17	0.17	
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)	266	1861		131	1618		245	971		197	575	
v/s Ratio Prot	c0.08	c0.64		0.01	c0.59		c0.07	0.06			0.09	
v/s Ratio Perm	0.35			0.13			c0.20			0.13		
v/c Ratio	0.71	1.20		0.27	1.29		0.96	0.21		0.74	0.50	
Uniform Delay, d1	29.3	25.9		24.5	30.0		37.5	30.6		43.6	41.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.3	94.5		1.1	134.8		47.0	0.1		13.3	0.7	
Delay (s)	37.6	120.4		25.6	164.8		84.4	30.7		57.0	42.4	
Level of Service	D	F		C	F		F	C		E	D	
Approach Delay (s)		114.0			162.4			58.4			46.3	
Approach LOS		F			F			E			D	

Intersection Summary				
HCM 2000 Control Delay	121.3	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.17			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	107.4%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	182	2061	35	1997	229	173	141	234
Future Volume (vph)	182	2061	35	1997	229	173	141	234
Lane Group Flow (vph)	188	2232	36	2086	236	221	145	402
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	5	2	1	6	3	8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	55.0	11.0	55.0	12.0	45.0	33.0	33.0
Total Split (%)	9.9%	49.5%	9.9%	49.5%	10.8%	40.5%	29.7%	29.7%
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	0.70	1.17	0.20	1.29	0.92	0.22	0.74	0.59
Control Delay	38.2	106.7	12.7	163.5	72.8	25.9	64.0	30.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	106.7	12.7	163.5	72.8	25.9	64.0	30.4
Queue Length 50th (m)	23.7	~339.0	2.9	~330.7	43.1	17.5	31.6	29.3
Queue Length 95th (m)	#79.3	#414.3	8.3	#375.8	#73.1	25.0	50.5	41.9
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)	269	1914	177	1618	256	1231	277	910
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	0.70	1.17	0.20	1.29	0.92	0.18	0.52	0.44

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.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Sixth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1938	80	103	2275	128	242	76	216	325	306	82
Future Volume (vph)	44	1938	80	103	2275	128	242	76	216	325	306	82
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	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	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3521		1805	3520		1736	3117		1612	3213	
Flt Permitted	0.06	1.00		0.06	1.00		0.30	1.00		0.39	1.00	
Satd. Flow (perm)	118	3521		113	3520		555	3117		668	3213	
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
Adj. Flow (vph)	46	2040	84	108	2395	135	255	80	227	342	322	86
RTOR Reduction (vph)	0	2	0	0	3	0	0	109	0	0	19	0
Lane Group Flow (vph)	46	2122	0	108	2527	0	255	198	0	342	389	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	15%	4%	0%	4%	12%	9%	8%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	70.3	64.4		75.9	67.2		37.8	19.9		40.0	21.0	
Effective Green, g (s)	70.3	64.4		75.9	67.2		37.8	19.9		40.0	21.0	
Actuated g/C Ratio	0.54	0.49		0.58	0.51		0.29	0.15		0.31	0.16	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.7		4.0	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)	139	1730		177	1805		321	473		340	515	
v/s Ratio Prot	0.01	0.60		c0.04	c0.72		0.11	0.06		c0.15	0.12	
v/s Ratio Perm	0.16			0.31			0.12			c0.16		
v/c Ratio	0.33	1.23		0.61	1.40		0.79	0.42		1.01	0.75	
Uniform Delay, d1	28.7	33.3		28.5	31.9		39.2	50.3		42.2	52.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	107.3		6.1	183.4		12.7	0.6		50.3	6.2	
Delay (s)	30.1	140.6		34.6	215.3		51.9	50.9		92.5	58.8	
Level of Service	C	F		C	F		D	D		F	E	
Approach Delay (s)		138.3			207.9			51.4			74.1	
Approach LOS		F			F			D			E	

Intersection Summary				
HCM 2000 Control Delay	152.5	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.24			
Actuated Cycle Length (s)	131.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	115.7%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	44	1938	103	2275	242	76	325	306
Future Volume (vph)	44	1938	103	2275	242	76	325	306
Lane Group Flow (vph)	46	2124	108	2530	255	307	342	408
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	64.0	11.0	64.0	23.0	33.0	23.0	33.0
Total Split (%)	8.4%	48.9%	8.4%	48.9%	17.6%	25.2%	17.6%	25.2%
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
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
v/c Ratio	0.29	1.23	0.61	1.38	0.78	0.53	0.98	0.77
Control Delay	17.4	137.7	35.3	203.5	49.7	31.8	82.0	59.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	137.7	35.3	203.5	49.7	31.8	82.0	59.2
Queue Length 50th (m)	5.0	~382.2	12.2	~495.0	52.7	23.2	76.5	53.4
Queue Length 95th (m)	11.7	#442.4	#40.0	#562.5	73.1	36.6	#106.7	68.8
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	159	1733	178	1831	342	750	348	687
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	0.29	1.23	0.61	1.38	0.75	0.41	0.98	0.59

Intersection Summary
Cycle Length: 131
Actuated Cycle Length: 131
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.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Fifth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	1383	20	305	1620	550	102	436	240	416	572	270
Future Volume (vph)	225	1383	20	305	1620	550	102	436	240	416	572	270
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	5.7	5.7	4.0	5.7	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	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
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
Flt 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)	3467	5085	1503	1805	5136	1553	1736	5036	1532	1769	4988	1599
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.42	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	3467	5085	1503	174	5136	1553	760	5036	1532	523	4988	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	1441	21	318	1688	573	106	454	250	433	596	281
RTOR Reduction (vph)	0	0	14	0	0	248	0	0	144	0	0	207
Lane Group Flow (vph)	234	1441	7	318	1688	325	106	454	106	433	596	74
Confl. Peds. (#/hr)			1	1					1	1		
Heavy Vehicles (%)	1%	2%	6%	0%	1%	4%	4%	3%	4%	2%	4%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	13.3	39.7	39.7	63.2	45.9	45.9	27.4	17.1	17.1	45.8	31.5	31.5
Effective Green, g (s)	13.3	39.7	39.7	63.2	45.9	45.9	27.4	17.1	17.1	45.8	31.5	31.5
Actuated g/C Ratio	0.11	0.33	0.33	0.53	0.38	0.38	0.23	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	5.7	5.7	4.0	5.7	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)	384	1682	497	356	1964	594	257	717	218	456	1309	419
v/s Ratio Prot	0.07	0.28		c0.14	0.33		0.04	0.09		c0.20	0.12	
v/s Ratio Perm			0.00	c0.32		0.21	0.06		0.07	c0.17		0.05
v/c Ratio	0.61	0.86	0.01	0.89	0.86	0.55	0.41	0.63	0.49	0.95	0.46	0.18
Uniform Delay, d1	50.9	37.5	27.0	34.8	34.1	28.9	38.1	48.5	47.4	31.0	37.1	34.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	5.9	0.1	23.4	5.2	3.6	1.1	1.8	1.7	29.3	0.3	0.2
Delay (s)	53.6	43.4	27.0	58.3	39.3	32.5	39.1	50.3	49.1	60.3	37.3	34.4
Level of Service	D	D	C	E	D	C	D	D	D	E	D	C
Approach Delay (s)		44.6			40.1			48.5			44.3	
Approach LOS		D			D			D			D	

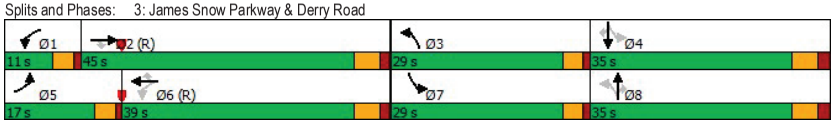
Intersection Summary				
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	91.4%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	1383	20	305	1620	550	102	436	240	416	572	270
Future Volume (vph)	225	1383	20	305	1620	550	102	436	240	416	572	270
Lane Group Flow (vph)	234	1441	21	318	1688	573	106	454	250	433	596	281
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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%	9.2%	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
v/c Ratio	0.61	0.86	0.04	0.89	0.86	0.68	0.40	0.63	0.69	0.94	0.45	0.45
Control Delay	57.5	43.7	0.1	60.4	40.5	14.5	28.5	52.2	26.7	58.3	38.0	6.3
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	57.5	43.7	0.1	60.4	40.5	14.5	28.5	52.2	26.7	58.3	38.0	6.3
Queue Length 50th (m)	28.9	121.5	0.0	60.0	139.8	32.9	16.6	39.4	18.7	84.5	45.2	0.0
Queue Length 95th (m)	41.2	141.8	0.0	#142.2	#202.7	88.4	26.9	48.7	45.9	#128.4	55.7	20.5
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)	410	1682	562	356	1963	841	480	1229	501	466	1314	628
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	0.57	0.86	0.04	0.89	0.86	0.68	0.22	0.37	0.50	0.93	0.45	0.45

Intersection Summary
Cycle 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: Actuated-Coordinated
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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	2233	51	29	2314	24	141	10	78	80	7	169
Future Volume (vph)	36	2233	51	29	2314	24	141	10	78	80	7	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.87		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3527		1770	3534		1770	1615		1770	1595	
Flt Permitted	0.05	1.00		0.05	1.00		0.47	1.00		0.69	1.00	
Satd. Flow (perm)	96	3527		91	3534		885	1615		1294	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)	39	2427	55	32	2515	26	153	11	85	87	8	184
RTOR Reduction (vph)	0	1	0	0	1	0	0	69	0	0	3	0
Lane Group Flow (vph)	39	2481	0	32	2540	0	153	27	0	87	189	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	77.9	77.9		85.9	85.9		23.1	23.1		23.1	23.1	
Effective Green, g (s)	77.9	77.9		85.9	85.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.65	0.65		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	62	2289		121	2529		170	310		249	307	
v/s Ratio Prot		c0.70		0.01	c0.72			0.02			0.12	
v/s Ratio Perm	0.41			0.18			c0.17			0.07		
v/c Ratio	0.63	1.08		0.26	1.00		0.90	0.09		0.35	0.61	
Uniform Delay, d1	12.5	21.0		30.7	17.0		47.3	39.8		41.9	44.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	39.8	46.1		1.2	19.0		41.6	0.1		0.9	3.6	
Delay (s)	52.2	67.1		31.8	36.0		88.9	39.9		42.8	48.0	
Level of Service	D	E		C	D		F	D		D	D	
Approach Delay (s)		66.9			36.0			70.0			46.4	
Approach LOS		E			D			E			D	

Intersection Summary				
HCM 2000 Control Delay	51.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	97.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	36	2233	29	2314	141	10	80	7
Future Volume (vph)	36	2233	29	2314	141	10	80	7
Lane Group Flow (vph)	39	2482	32	2541	153	96	87	192
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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)	70.0	70.0	10.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	58.3%	58.3%	8.3%	66.7%	33.3%	33.3%	33.3%	33.3%
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	5.7	5.7	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	0.62	1.06	0.21	1.00	0.90	0.25	0.35	0.62
Control Delay	65.6	59.6	9.2	37.6	93.2	11.1	43.6	51.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	59.6	9.2	37.6	93.2	11.1	43.6	51.1
Queue Length 50th (m)	5.6	~372.4	2.0	~306.7	37.4	2.2	18.8	43.1
Queue Length 95th (m)	#31.1	#460.4	6.4	#429.7	58.7	15.4	31.5	61.6
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)	63	2340	155	2529	252	522	370	458
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	0.62	1.06	0.21	1.00	0.61	0.18	0.24	0.42

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.
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: 4: Clark Boulevard & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	13	10	20	9	1	4	494	7	0	478	11
Future Volume (vph)	39	13	10	20	9	1	4	494	7	0	478	11
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	5.3		5.7	5.7			5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95			0.95	
Frt	1.00	0.93		1.00	0.99		1.00	1.00			1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1740		1770	1837		1770	3531			3527	
Flt Permitted	1.00	1.00		1.00	1.00		0.45	1.00			1.00	
Satd. Flow (perm)	1863	1740		1863	1837		846	3531			3527	
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)	42	14	11	22	10	1	4	537	8	0	520	12
RTOR Reduction (vph)	0	10	0	0	1	0	0	1	0	0	2	0
Lane Group Flow (vph)	42	15	0	22	10	0	4	544	0	0	530	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	3.8	3.8		3.8	3.8		19.8	19.8			19.8	
Effective Green, g (s)	3.8	3.8		3.8	3.8		19.8	19.8			19.8	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.57	0.57			0.57	
Clearance Time (s)	5.3	5.3		5.3	5.3		5.7	5.7			5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	204	191		204	201		484	2020			2018	
v/s Ratio Prot		0.01			0.01			c0.15			0.15	
v/s Ratio Perm	c0.02			0.01			0.00					
v/c Ratio	0.21	0.08		0.11	0.05		0.01	0.27			0.26	
Uniform Delay, d1	14.0	13.8		13.9	13.8		3.2	3.7			3.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.5	0.2		0.2	0.1		0.0	0.1			0.1	
Delay (s)	14.5	14.0		14.1	13.9		3.2	3.8			3.8	
Level of Service	B	B		B	B		A	A			A	
Approach Delay (s)		14.3			14.0			3.8			3.8	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	34.6	Sum of lost time (s)	11.0
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	39	13	20	9	4	494	478
Future Volume (vph)	39	13	20	9	4	494	478
Lane Group Flow (vph)	42	25	22	11	4	545	532
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		2		6		8	4
Permitted Phases	2		6		8		
Detector Phase	2	2	6	6	8	8	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 (%)	29.2%	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	5.7
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	None	Min	Min	Min
v/c Ratio	0.07	0.04	0.04	0.02	0.01	0.21	0.20
Control Delay	8.4	6.6	8.2	7.8	6.2	4.8	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	6.6	8.2	7.8	6.2	4.8	4.8
Queue Length 50th (m)	1.4	0.5	0.7	0.3	0.0	0.0	0.0
Queue Length 95th (m)	5.5	3.4	3.6	2.3	1.1	18.6	18.1
Internal Link Dist (m)		204.0		113.8		156.9	372.1
Turn Bay Length (m)	35.0		35.0		35.0		
Base Capacity (vph)	1765	1649	1765	1740	846	3532	3529
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	0.02	0.02	0.01	0.01	0.00	0.15	0.15

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 31.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	182	2061	35	1997	229	173	141	234
Future Volume (vph)	182	2061	35	1997	229	173	141	234
Lane Group Flow (vph)	188	2232	36	2086	236	221	145	402
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	5	2	1	6	3	8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	55.0	11.0	55.0	12.0	45.0	33.0	33.0
Total Split (%)	9.9%	49.5%	9.9%	49.5%	10.8%	40.5%	29.7%	29.7%
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	0.70	0.81	0.20	0.90	0.92	0.22	0.74	0.59
Control Delay	38.2	25.6	12.7	34.4	72.8	25.9	64.0	30.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	25.6	12.7	34.4	72.8	25.9	64.0	30.4
Queue Length 50th (m)	23.7	159.0	2.9	162.3	43.1	17.5	31.6	29.3
Queue Length 95th (m)	#79.3	#227.5	8.3	#193.1	#73.1	25.0	50.5	41.9
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)	269	2751	177	2325	256	1231	277	910
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	0.70	0.81	0.20	0.90	0.92	0.18	0.52	0.44

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.

Splits and Phases: 1: Sixth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	1	6	0	51	1	175	1	12	71	4
Future Volume (Veh/h)	3	0	1	6	0	51	1	175	1	12	71	4
Sign Control		Stop			Stop			Free			Free	
Grade		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)	3	0	1	7	0	55	1	190	1	13	77	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked												
vC, conflicting volume	352	298	79	298	300	190	81			191		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	352	298	79	298	300	190	81			191		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	99	100	94	100			99		
cM capacity (veh/h)	559	608	981	648	607	851	1517			1383		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	62	192	94
Volume Left	3	7	1	13
Volume Right	1	55	1	4
cSH	627	822	1517	1383
Volume to Capacity	0.01	0.08	0.00	0.01
Queue Length 95th (m)	0.2	2.0	0.0	0.2
Control Delay (s)	10.8	9.7	0.0	1.1
Lane LOS	B	A	A	A
Approach Delay (s)	10.8	9.7	0.0	1.1
Approach LOS	B	A		

Intersection Summary

Average Delay	2.2			
Intersection Capacity Utilization	22.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Queues
2: Fifth Line & Derry Road

Future Background (PM) - Sensitivity
2035 Horizon

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	44	1938	103	2275	242	76	325	306
Future Volume (vph)	44	1938	103	2275	242	76	325	306
Lane Group Flow (vph)	46	2124	108	2530	255	307	342	408
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	64.0	11.0	64.0	23.0	33.0	23.0	33.0
Total Split (%)	8.4%	48.9%	8.4%	48.9%	17.6%	25.2%	17.6%	25.2%
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
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
v/c Ratio	0.29	0.85	0.61	0.96	0.78	0.53	0.98	0.77
Control Delay	17.4	34.3	35.3	42.1	49.7	31.8	82.0	59.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	34.3	35.3	42.1	49.7	31.8	82.0	59.2
Queue Length 50th (m)	5.0	185.0	12.2	~250.2	52.7	23.2	76.5	53.4
Queue Length 95th (m)	11.7	221.5	#40.0	#317.8	73.1	36.6	#106.7	68.8
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	159	2491	178	2630	342	750	348	687
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	0.29	0.85	0.61	0.96	0.75	0.41	0.98	0.59

Intersection Summary

Cycle Length: 131
Actuated Cycle Length: 131
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.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Fifth Line & Derry Road

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

Future Background (PM) - Sensitivity
2035 Horizon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	2061	104	35	1997	26	229	173	42	141	234	156
Future Volume (vph)	182	2061	104	35	1997	26	229	173	42	141	234	156
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	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5007		1736	5063		1805	3477		1787	3360	
Flt Permitted	0.07	1.00		0.08	1.00		0.29	1.00		0.61	1.00	
Satd. Flow (perm)	135	5007		143	5063		555	3477		1154	3360	
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)	188	2125	107	36	2059	27	236	178	43	145	241	161
RTOR Reduction (vph)	0	4	0	0	1	0	0	21	0	0	112	0
Lane Group Flow (vph)	188	2228	0	36	2085	0	236	200	0	145	290	0
Heavy Vehicles (%)	2%	3%	0%	4%	2%	22%	0%	1%	0%	1%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	67.5	59.3		55.2	51.0		31.0	31.0		19.0	19.0	
Effective Green, g (s)	67.5	59.3		55.2	51.0		31.0	31.0		19.0	19.0	
Actuated g/C Ratio	0.61	0.53		0.50	0.46		0.28	0.28		0.17	0.17	
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)	266	2674		131	2326		245	971		197	575	
v/s Ratio Prot	c0.08	0.44		0.01	c0.41		c0.07	0.06			0.09	
v/s Ratio Perm	0.35			0.13			c0.20			0.13		
v/c Ratio	0.71	0.83		0.27	0.90		0.96	0.21		0.74	0.50	
Uniform Delay, d1	27.7	21.7		18.4	27.6		37.5	30.6		43.6	41.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.3	3.2		1.1	5.9		47.0	0.1		13.3	0.7	
Delay (s)	36.0	24.9		19.6	33.5		84.4	30.7		57.0	42.4	
Level of Service	D	C		B	C		F	C		E	D	
Approach Delay (s)		25.8			33.3			58.4			46.3	
Approach LOS		C			C			E			D	

Intersection Summary

HCM 2000 Control Delay	33.4	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.92				
Actuated Cycle Length (s)	111.0	Sum of lost time (s)		20.5	
Intersection Capacity Utilization	90.5%	ICU Level of Service		E	
Analysis Period (min)	15				

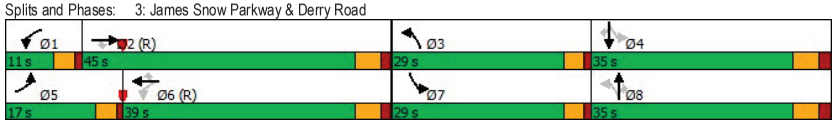
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	1383	20	305	1620	550	102	436	240	416	572	270
Future Volume (vph)	225	1383	20	305	1620	550	102	436	240	416	572	270
Lane Group Flow (vph)	234	1441	21	318	1688	573	106	454	250	433	596	281
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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%	9.2%	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
v/c Ratio	0.61	0.86	0.04	0.89	0.86	0.68	0.40	0.63	0.69	0.94	0.45	0.45
Control Delay	57.5	43.7	0.1	60.4	40.5	14.5	28.5	52.2	26.7	58.3	38.0	6.3
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	57.5	43.7	0.1	60.4	40.5	14.5	28.5	52.2	26.7	58.3	38.0	6.3
Queue Length 50th (m)	28.9	121.5	0.0	60.0	139.8	32.9	16.6	39.4	18.7	84.5	45.2	0.0
Queue Length 95th (m)	41.2	141.8	0.0	#142.2	#202.7	88.4	26.9	48.7	45.9	#128.4	55.7	20.5
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)	410	1682	562	356	1963	841	480	1229	501	466	1314	628
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	0.57	0.86	0.04	0.89	0.86	0.68	0.22	0.37	0.50	0.93	0.45	0.45

Intersection Summary

Cycle 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: Actuated-Coordinated
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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1938	80	103	2275	128	242	76	216	325	306	82
Future Volume (vph)	44	1938	80	103	2275	128	242	76	216	325	306	82
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	5.7		4.0	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	0.99		1.00	0.89		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5059		1805	5057		1736	3117		1612	3213	
Flt Permitted	0.06	1.00		0.06	1.00		0.30	1.00		0.39	1.00	
Satd. Flow (perm)	118	5059		113	5057		555	3117		668	3213	
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
Adj. Flow (vph)	46	2040	84	108	2395	135	255	80	227	342	322	86
RTOR Reduction (vph)	0	3	0	0	4	0	0	109	0	0	19	0
Lane Group Flow (vph)	46	2121	0	108	2526	0	255	198	0	342	389	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	15%	4%	0%	4%	12%	9%	8%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	70.3	64.4		75.9	67.2		37.8	19.9		40.0	21.0	
Effective Green, g (s)	70.3	64.4		75.9	67.2		37.8	19.9		40.0	21.0	
Actuated g/C Ratio	0.54	0.49		0.58	0.51		0.29	0.15		0.31	0.16	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.7		4.0	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)	139	2487		177	2594		321	473		340	515	
v/s Ratio Prot	0.01	0.42		c0.04	c0.50		0.11	0.06		c0.15	0.12	
v/s Ratio Perm	0.16			0.31			0.12			c0.16		
v/c Ratio	0.33	0.85		0.61	0.97		0.79	0.42		1.01	0.75	
Uniform Delay, d1	28.4	29.2		24.5	31.0		39.2	50.3		42.2	52.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	4.0		6.1	12.5		12.7	0.6		50.3	6.2	
Delay (s)	29.8	33.1		30.6	43.6		51.9	50.9		92.5	58.8	
Level of Service	C	C		C	D		D	D		F	E	
Approach Delay (s)		33.0			43.0			51.4			74.1	
Approach LOS		C			D			D			E	

Intersection Summary

HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	131.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	36	2233	29	2314	141	10	80	7
Future Volume (vph)	36	2233	29	2314	141	10	80	7
Lane Group Flow (vph)	39	2482	32	2541	153	96	87	192
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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)	70.0	70.0	10.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	58.3%	58.3%	8.3%	66.7%	33.3%	33.3%	33.3%	33.3%
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	5.7	5.7	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	0.62	0.74	0.21	0.70	0.90	0.25	0.35	0.62
Control Delay	65.6	17.6	9.2	12.1	93.2	11.1	43.6	51.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	17.6	9.2	12.1	93.2	11.1	43.6	51.1
Queue Length 50th (m)	5.6	151.5	2.0	116.9	37.4	2.2	18.8	43.1
Queue Length 95th (m)	#31.1	220.0	6.4	177.5	58.7	15.4	31.5	61.6
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)	63	3361	155	3634	252	522	370	458
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	0.62	0.74	0.21	0.70	0.61	0.18	0.24	0.42

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	1383	20	305	1620	550	102	436	240	416	572	270
Future Volume (vph)	225	1383	20	305	1620	550	102	436	240	416	572	270
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	5.7	5.7	4.0	5.7	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	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
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
Flt 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)	3467	5085	1503	1805	5136	1553	1736	5036	1532	1769	4988	1599
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.42	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	3467	5085	1503	174	5136	1553	760	5036	1532	523	4988	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	1441	21	318	1688	573	106	454	250	433	596	281
RTOR Reduction (vph)	0	0	14	0	0	248	0	0	144	0	0	207
Lane Group Flow (vph)	234	1441	7	318	1688	325	106	454	106	433	596	74
Confl. Peds. (#/hr)			1	1					1	1		
Heavy Vehicles (%)	1%	2%	6%	0%	1%	4%	4%	3%	4%	2%	4%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	13.3	39.7	39.7	63.2	45.9	45.9	27.4	17.1	17.1	45.8	31.5	31.5
Effective Green, g (s)	13.3	39.7	39.7	63.2	45.9	45.9	27.4	17.1	17.1	45.8	31.5	31.5
Actuated g/C Ratio	0.11	0.33	0.33	0.53	0.38	0.38	0.23	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	5.7	5.7	4.0	5.7	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)	384	1682	497	356	1964	594	257	717	218	456	1309	419
v/s Ratio Prot	0.07	0.28		c0.14	0.33		0.04	0.09		c0.20	0.12	
v/s Ratio Perm			0.00	c0.32		0.21	0.06		0.07	c0.17		0.05
v/c Ratio	0.61	0.86	0.01	0.89	0.86	0.55	0.41	0.63	0.49	0.95	0.46	0.18
Uniform Delay, d1	50.9	37.5	27.0	34.8	34.1	28.9	38.1	48.5	47.4	31.0	37.1	34.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	5.9	0.1	23.4	5.2	3.6	1.1	1.8	1.7	29.3	0.3	0.2
Delay (s)	53.6	43.4	27.0	58.3	39.3	32.5	39.1	50.3	49.1	60.3	37.3	34.4
Level of Service	D	D	C	E	D	C	D	D	D	E	D	C
Approach Delay (s)		44.6			40.1			48.5			44.3	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	43.2	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.97				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		19.0	
Intersection Capacity Utilization	91.4%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	39	13	20	9	4	494	478
Future Volume (vph)	39	13	20	9	4	494	478
Lane Group Flow (vph)	42	25	22	11	4	545	532
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		2		6		8	4
Permitted Phases	2		6		8		
Detector Phase	2	2	6	6	8	8	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 (%)	29.2%	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	5.7
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	None	Min	Min	Min
v/c Ratio	0.07	0.04	0.04	0.02	0.01	0.21	0.20
Control Delay	8.4	6.6	8.2	7.8	6.2	4.8	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	6.6	8.2	7.8	6.2	4.8	4.8
Queue Length 50th (m)	1.4	0.5	0.7	0.3	0.0	0.0	0.0
Queue Length 95th (m)	5.5	3.4	3.6	2.3	1.1	18.6	18.1
Internal Link Dist (m)		204.0		113.8		156.9	372.1
Turn Bay Length (m)	35.0		35.0		35.0		
Base Capacity (vph)	1765	1649	1765	1740	846	3532	3529
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	0.02	0.02	0.01	0.01	0.00	0.15	0.15

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 31.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	2233	51	29	2314	24	141	10	78	80	7	169
Future Volume (vph)	36	2233	51	29	2314	24	141	10	78	80	7	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	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	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.87		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5068		1770	5077		1770	1615		1770	1595	
Flt Permitted	0.05	1.00		0.05	1.00		0.47	1.00		0.69	1.00	
Satd. Flow (perm)	96	5068		91	5077		885	1615		1294	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)	39	2427	55	32	2515	26	153	11	85	87	8	184
RTOR Reduction (vph)	0	1	0	0	1	0	0	69	0	0	3	0
Lane Group Flow (vph)	39	2481	0	32	2540	0	153	27	0	87	189	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	77.9	77.9		85.9	85.9		23.1	23.1		23.1	23.1	
Effective Green, g (s)	77.9	77.9		85.9	85.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.65	0.65		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	62	3289		121	3634		170	310		249	307	
v/s Ratio Prot		c0.49		0.01	c0.50			0.02			0.12	
v/s Ratio Perm	0.41			0.18			c0.17			0.07		
v/c Ratio	0.63	0.75		0.26	0.70		0.90	0.09		0.35	0.61	
Uniform Delay, d1	12.5	14.5		13.7	9.7		47.3	39.8		41.9	44.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	39.8	1.7		1.2	1.1		41.6	0.1		0.9	3.6	
Delay (s)	52.2	16.1		14.9	10.8		88.9	39.9		42.8	48.0	
Level of Service	D	B		B	B		F	D		D	D	
Approach Delay (s)		16.7			10.9			70.0			46.4	
Approach LOS		B			B			E			D	

Intersection Summary				
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	78.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	1	6	0	51	1	175	1	12	71	4
Future Volume (Veh/h)	3	0	1	6	0	51	1	175	1	12	71	4
Sign Control		Stop			Stop			Free			Free	
Grade		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)	3	0	1	7	0	55	1	190	1	13	77	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked												
vC, conflicting volume	352	298	79	298	300	190	81			191		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	352	298	79	298	300	190	81			191		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	99	100	94	100			99		
cM capacity (veh/h)	559	608	981	648	607	851	1517			1383		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	62	192	94
Volume Left	3	7	1	13
Volume Right	1	55	1	4
cSH	627	822	1517	1383
Volume to Capacity	0.01	0.08	0.00	0.01
Queue Length 95th (m)	0.2	2.0	0.0	0.2
Control Delay (s)	10.8	9.7	0.0	1.1
Lane LOS	B	A	A	A
Approach Delay (s)	10.8	9.7	0.0	1.1
Approach LOS	B	A		

Intersection Summary				
Average Delay			2.2	
Intersection Capacity Utilization			22.9%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	13	10	20	9	1	4	494	7	0	478	11
Future Volume (vph)	39	13	10	20	9	1	4	494	7	0	478	11
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	5.3		5.7	5.7			5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95			0.95	
Frt	1.00	0.93		1.00	0.99		1.00	1.00			1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1740		1770	1837		1770	3531			3527	
Flt Permitted	1.00	1.00		1.00	1.00		0.45	1.00			1.00	
Satd. Flow (perm)	1863	1740		1863	1837		846	3531			3527	
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)	42	14	11	22	10	1	4	537	8	0	520	12
RTOR Reduction (vph)	0	10	0	0	1	0	0	1	0	0	2	0
Lane Group Flow (vph)	42	15	0	22	10	0	4	544	0	0	530	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	3.8	3.8		3.8	3.8		19.8	19.8			19.8	
Effective Green, g (s)	3.8	3.8		3.8	3.8		19.8	19.8			19.8	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.57	0.57			0.57	
Clearance Time (s)	5.3	5.3		5.3	5.3		5.7	5.7			5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	204	191		204	201		484	2020			2018	
v/s Ratio Prot		0.01			0.01			c0.15			0.15	
v/s Ratio Perm	c0.02			0.01			0.00					
v/c Ratio	0.21	0.08		0.11	0.05		0.01	0.27			0.26	
Uniform Delay, d1	14.0	13.8		13.9	13.8		3.2	3.7			3.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.5	0.2		0.2	0.1		0.0	0.1			0.1	
Delay (s)	14.5	14.0		14.1	13.9		3.2	3.8			3.8	
Level of Service	B	B		B	B		A	A			A	
Approach Delay (s)		14.3			14.0			3.8			3.8	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.26			
Actuated Cycle Length (s)	34.6	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	31.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	2087	161	26	868	39	93	169	31	36	135	132
Future Volume (vph)	163	2087	161	26	868	39	93	169	31	36	135	132
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)	1770	3504		1805	3289		1805	1842		1289	1742	
Flt Permitted	0.23	1.00		0.06	1.00		0.29	1.00		0.45	1.00	
Satd. Flow (perm)	432	3504		115	3289		542	1842		609	1742	
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)	173	2220	171	28	923	41	99	180	33	38	144	140
RTOR Reduction (vph)	0	4	0	0	2	0	0	7	0	0	34	0
Lane Group Flow (vph)	173	2387	0	28	962	0	99	206	0	38	250	0
Heavy Vehicles (%)	2%	2%	1%	0%	8%	33%	0%	0%	5%	40%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	77.5	69.6		70.1	65.9		20.7	20.7		20.7	20.7	
Effective Green, g (s)	77.5	69.6		70.1	65.9		20.7	20.7		20.7	20.7	
Actuated g/C Ratio	0.70	0.63		0.63	0.59		0.19	0.19		0.19	0.19	
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)	396	2197		136	1952		101	343		113	324	
v/s Ratio Prot	c0.03	c0.68		0.01	0.29			0.11			0.14	
v/s Ratio Perm	0.27			0.12			c0.18			0.06		
v/c Ratio	0.44	1.09		0.21	0.49		0.98	0.60		0.34	0.77	
Uniform Delay, d1	7.1	20.7		25.2	12.9		44.9	41.4		39.2	42.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	47.4		0.8	0.9		82.9	3.0		1.8	10.8	
Delay (s)	7.9	68.1		25.9	13.8		127.8	44.3		41.0	53.7	
Level of Service	A	E		C	B		F	D		D	D	
Approach Delay (s)		64.0			14.2			70.8			52.2	
Approach LOS		E			B			E			D	

Intersection Summary				
HCM 2000 Control Delay	51.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	111.2%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	163	2087	26	868	93	169	36	135
Future Volume (vph)	163	2087	26	868	93	169	36	135
Lane Group Flow (vph)	173	2391	28	964	99	213	38	284
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	67.0	11.0	67.0	33.0	33.0	33.0	33.0
Total Split (%)	9.9%	60.4%	9.9%	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	0.43	1.06	0.15	0.49	0.98	0.61	0.34	0.79
Control Delay	9.1	60.5	7.5	14.7	130.6	46.5	45.5	52.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	60.5	7.5	14.7	130.6	46.5	45.5	52.1
Queue Length 50th (m)	10.8	~336.1	1.6	63.8	22.6	43.2	7.6	53.3
Queue Length 95th (m)	21.6	#403.5	5.0	88.5	#51.3	64.3	17.4	79.7
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)	399	2250	184	1956	130	449	146	450
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	0.43	1.06	0.15	0.49	0.76	0.47	0.26	0.63

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
~ 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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	2269	163	221	781	259	96	289	115	118	69	32
Future Volume (vph)	90	2269	163	221	781	259	96	289	115	118	69	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	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.96		1.00	0.96		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)	1626	3504		1626	3256		1719	3221		1583	3249	
Flt Permitted	0.20	1.00		0.06	1.00		0.68	1.00		0.35	1.00	
Satd. Flow (perm)	351	3504		95	3256		1239	3221		576	3249	
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)	96	2414	173	235	831	276	102	307	122	126	73	34
RTOR Reduction (vph)	0	4	0	0	27	0	0	36	0	0	27	0
Lane Group Flow (vph)	96	2583	0	235	1080	0	102	393	0	126	80	0
Heavy Vehicles (%)	11%	2%	2%	11%	3%	18%	5%	9%	3%	14%	2%	14%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Effective Green, g (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.64	0.57		0.69	0.60		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	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)	302	2006		206	1959		261	679		121	684	
v/s Ratio Prot	0.02	c0.74		c0.10	0.33			0.12			0.02	
v/s Ratio Perm	0.18			0.69			0.08			c0.22		
v/c Ratio	0.32	1.29		1.14	0.55		0.39	0.58		1.04	0.12	
Uniform Delay, d1	9.6	25.6		42.2	14.2		40.7	42.6		47.4	38.3	
Progression Factor	0.61	0.55		0.99	0.90		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	129.7		104.7	1.1		1.0	1.2		93.3	0.1	
Delay (s)	5.8	143.8		146.6	14.0		41.7	43.8		140.7	38.4	
Level of Service	A	F		F	B		D	D		F	D	
Approach Delay (s)		138.9			37.2			43.4			93.7	
Approach LOS		F			D			D			F	

Intersection Summary				
HCM 2000 Control Delay	97.6	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.21			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	117.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	90	2269	221	781	96	289	118	69
Future Volume (vph)	90	2269	221	781	96	289	118	69
Lane Group Flow (vph)	96	2587	235	1107	102	429	126	107
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	74.0	15.0	77.0	31.0	31.0	31.0	31.0
Total Split (%)	10.0%	61.7%	12.5%	64.2%	25.8%	25.8%	25.8%	25.8%
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	0.31	1.29	1.14	0.56	0.39	0.60	1.04	0.15
Control Delay	3.8	148.4	135.8	13.4	46.0	42.1	140.3	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	148.4	135.8	13.4	46.0	42.1	140.3	26.8
Queue Length 50th (m)	4.1	~438.1	~53.1	67.3	21.9	45.6	~33.6	7.7
Queue Length 95th (m)	m3.7	m#353.8	#106.1	79.3	39.9	63.4	#73.8	15.8
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	313	2010	206	1985	261	714	121	711
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	0.31	1.29	1.14	0.56	0.39	0.60	1.04	0.15

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
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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	1878	32	75	594	206	25	287	194	395	400	193
Future Volume (vph)	199	1878	32	75	594	206	25	287	194	395	400	193
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	5.7	5.7	4.0	5.7	5.7
Lane 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
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
Flt 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)	3433	3574	1568	1752	3471	1547	1801	3343	1599	1719	3282	1480
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.51	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	3433	3574	1568	166	3471	1547	972	3343	1599	657	3282	1480
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)	203	1916	33	77	606	210	26	293	198	403	408	197
RTOR Reduction (vph)	0	0	19	0	0	132	0	0	169	0	0	132
Lane Group Flow (vph)	203	1916	14	77	606	78	26	293	29	403	408	65
Confl. Peds. (#/hr)	1					1	6					6
Heavy Vehicles (%)	2%	1%	3%	3%	4%	3%	0%	8%	1%	5%	10%	7%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	12.4	49.9	49.9	51.5	44.5	44.5	22.0	17.6	17.6	48.1	39.7	39.7
Effective Green, g (s)	12.4	49.9	49.9	51.5	44.5	44.5	22.0	17.6	17.6	48.1	39.7	39.7
Actuated g/C Ratio	0.10	0.42	0.42	0.43	0.37	0.37	0.18	0.15	0.15	0.40	0.33	0.33
Clearance 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
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)	354	1486	652	163	1287	573	208	490	234	497	1085	489
v/s Ratio Prot	c0.06	c0.54		0.03	0.17		0.00	0.09		c0.18	0.12	
v/s Ratio Perm			0.01	0.17		0.05	0.02		0.02	c0.15		0.04
v/c Ratio	0.57	1.29	0.02	0.47	0.47	0.14	0.12	0.60	0.12	0.81	0.38	0.13
Uniform Delay, d1	51.3	35.0	20.7	27.6	28.8	25.0	40.6	47.9	44.5	28.6	30.7	28.1
Progression Factor	1.00	1.00	1.00	0.79	0.83	2.34	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	135.4	0.1	1.9	1.1	0.4	0.3	2.0	0.2	9.7	0.2	0.1
Delay (s)	53.5	170.5	20.7	23.6	25.0	59.1	40.9	49.9	44.7	38.3	30.9	28.2
Level of Service	D	F	C	C	C	E	D	D	D	D	C	C
Approach Delay (s)		157.1			32.9			47.4			33.3	
Approach LOS		F			C			D			C	

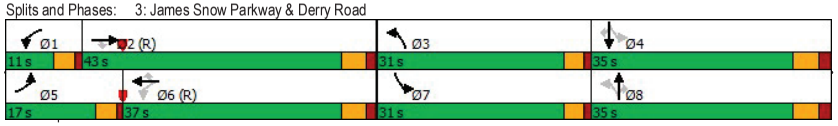
Intersection Summary				
HCM 2000 Control Delay	93.1	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	103.8%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	1878	32	75	594	206	25	287	194	395	400	193
Future Volume (vph)	199	1878	32	75	594	206	25	287	194	395	400	193
Lane Group Flow (vph)	203	1916	33	77	606	210	26	293	198	403	408	197
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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	0.57	1.23	0.04	0.41	0.45	0.29	0.10	0.66	0.51	0.81	0.38	0.32
Control Delay	57.5	140.8	0.1	18.7	25.2	10.3	23.5	56.3	11.1	41.5	32.2	5.4
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	57.5	140.8	0.1	18.7	25.2	10.3	23.5	56.3	11.1	41.5	32.2	5.4
Queue Length 50th (m)	25.1	~317.2	0.0	9.4	62.2	12.7	3.9	36.8	0.0	76.6	42.6	0.0
Queue Length 95th (m)	36.7	#393.7	0.0	m19.4	90.7	36.2	9.1	49.7	20.9	101.6	54.7	16.5
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)	392	1558	738	188	1334	723	549	816	540	502	1085	621
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	0.52	1.23	0.04	0.41	0.45	0.29	0.05	0.36	0.37	0.80	0.38	0.32

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 103 (86%), Referenced to phase 2:EBT 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.
Queue 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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	2287	156	113	969	91	56	0	20	24	0	43
Future Volume (vph)	75	2287	156	113	969	91	56	0	20	24	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
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	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3505		1770	3494		1770	1583		1770	1583	
Flt Permitted	0.25	1.00		0.04	1.00		0.73	1.00		0.74	1.00	
Satd. Flow (perm)	459	3505		84	3494		1353	1583		1384	1583	
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)	82	2486	170	123	1053	99	61	0	22	26	0	47
RTOR Reduction (vph)	0	3	0	0	3	0	0	20	0	0	43	0
Lane Group Flow (vph)	82	2653	0	123	1149	0	61	2	0	26	4	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.0	85.0		99.2	99.2		9.8	9.8		9.8	9.8	
Effective Green, g (s)	85.0	85.0		99.2	99.2		9.8	9.8		9.8	9.8	
Actuated g/C Ratio	0.71	0.71		0.83	0.83		0.08	0.08		0.08	0.08	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	325	2482		212	2888		110	129		113	129	
v/s Ratio Prot		c0.76		c0.05	0.33			0.00			0.00	
v/s Ratio Perm	0.18			0.43			c0.05			0.02		
v/c Ratio	0.25	1.07		0.58	0.40		0.55	0.01		0.23	0.03	
Uniform Delay, d1	6.2	17.5		39.5	2.7		53.0	50.7		51.6	50.7	
Progression Factor	1.84	1.83		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	32.0		4.0	0.4		5.9	0.0		1.0	0.1	
Delay (s)	11.6	63.9		43.5	3.1		58.9	50.7		52.6	50.8	
Level of Service	B	E		D	A		E	D		D	D	
Approach Delay (s)		62.4			7.0			56.8			51.5	
Approach LOS		E			A			E			D	

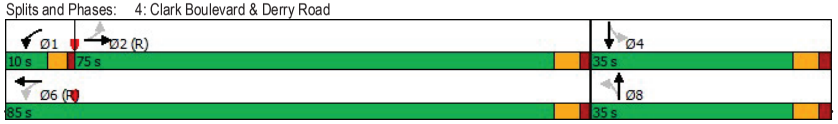
Intersection Summary				
HCM 2000 Control Delay	45.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	96.7%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	75	2287	113	969	56	0	24	0
Future Volume (vph)	75	2287	113	969	56	0	24	0
Lane Group Flow (vph)	82	2656	123	1152	61	22	26	47
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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	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	5.7	5.7	5.7	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	0.25	1.06	0.57	0.39	0.46	0.09	0.19	0.17
Control Delay	16.0	56.6	31.7	3.4	61.9	0.8	52.0	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	56.6	31.7	3.4	61.9	0.8	52.0	1.3
Queue Length 50th (m)	11.7	~381.6	12.6	31.1	14.6	0.0	6.1	0.0
Queue Length 95th (m)	m12.5	m245.7	33.4	49.8	28.3	0.0	14.9	0.0
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)	328	2517	214	2953	330	453	337	488
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	0.25	1.06	0.57	0.39	0.18	0.05	0.08	0.10

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.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Clark Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2	3	2	2	15	10	475	17	101	315	37
Future Volume (vph)	10	2	3	2	2	15	10	475	17	101	315	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	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.87		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1695		1770	1614		1770	3521		1770	3484	
Flt Permitted	1.00	1.00		1.00	1.00		0.53	1.00		0.45	1.00	
Satd. Flow (perm)	1863	1695		1863	1614		979	3521		845	3484	
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)	11	2	3	2	2	16	11	516	18	110	342	40
RTOR Reduction (vph)	0	3	0	0	15	0	0	2	0	0	7	0
Lane Group Flow (vph)	11	2	0	2	3	0	11	532	0	110	375	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	1.6	1.6		1.6	1.6		24.4	24.4		24.4	24.4	
Effective Green, g (s)	1.6	1.6		1.6	1.6		24.4	24.4		24.4	24.4	
Actuated g/C Ratio	0.04	0.04		0.04	0.04		0.66	0.66		0.66	0.66	
Clearance Time (s)	5.3	5.3		5.3	5.3		5.7	5.7		5.7	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)	80	73		80	69		645	2321		557	2297	
v/s Ratio Prot		0.00			0.00			c0.15			0.11	
v/s Ratio Perm	c0.01			0.00			0.01			0.13		
v/c Ratio	0.14	0.03		0.03	0.04		0.02	0.23		0.20	0.16	
Uniform Delay, d1	17.0	17.0		17.0	17.0		2.2	2.5		2.5	2.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.2		0.1	0.2		0.0	0.1		0.2	0.0	
Delay (s)	17.8	17.1		17.1	17.2		2.2	2.6		2.6	2.4	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		17.6			17.2			2.6			2.5	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	3.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.22			
Actuated Cycle Length (s)	37.0	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	44.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	10	2	2	2	10	475	101	315
Future Volume (vph)	10	2	2	2	10	475	101	315
Lane Group Flow (vph)	11	5	2	18	11	534	110	382
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	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)	35.0	35.0	35.0	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	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio	0.02	0.01	0.00	0.04	0.01	0.17	0.15	0.12
Control Delay	9.7	8.4	10.0	6.5	3.3	2.3	3.6	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.7	8.4	10.0	6.5	3.3	2.3	3.6	2.2
Queue Length 50th (m)	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Queue Length 95th (m)	3.1	1.8	1.2	3.3	2.0	18.2	11.7	12.6
Internal Link Dist (m)		204.0		113.8		156.9		372.1
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	1715	1560	1715	1487	978	3522	844	3483
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	0.00	0.00	0.01	0.01	0.15	0.13	0.11

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 32.6
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	0	0	0	15	0	52	1	56	190	23
Future Volume (Veh/h)	9	0	0	0	0	15	0	52	1	56	190	23
Sign Control		Stop			Stop			Free			Free	
Grade		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)	10	0	0	0	0	16	0	57	1	61	207	25
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked												
vC, conflicting volume	415	400	220	399	412	58	232			58		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	415	400	220	399	412	58	232			58		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	98	100			96		
cM capacity (veh/h)	523	517	820	544	509	1009	1336			1546		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	16	58	293
Volume Left	10	0	0	61
Volume Right	0	16	1	25
cSH	523	1009	1336	1546
Volume to Capacity	0.02	0.02	0.00	0.04
Queue Length 95th (m)	0.5	0.4	0.0	1.0
Control Delay (s)	12.0	8.6	0.0	1.8
Lane LOS	B	A		A
Approach Delay (s)	12.0	8.6	0.0	1.8
Approach LOS	B	A		

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	35.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2488	32	0	1268	0	3
Future Volume (Veh/h)	2488	32	0	1268	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2704	35	0	1378	0	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				360		
pX, platoon unblocked					0.95	
vC, conflicting volume			2739		3410	1370
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2739		3431	1370
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			144		5	136

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1803	936	689	689	3
Volume Left	0	0	0	0	0
Volume Right	0	35	0	0	3
cSH	1700	1700	1700	1700	136
Volume to Capacity	1.06	0.55	0.41	0.41	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.5
Control Delay (s)	0.0	0.0	0.0	0.0	32.0
Lane LOS					D
Approach Delay (s)	0.0		0.0		32.0
Approach LOS					D

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	79.8%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	26	3	0	0	3
Future Volume (Veh/h)	19	26	3	0	0	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	28	3	0	0	3
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	3				73	3
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3				73	3
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1619				919	1081

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	49	3	3
Volume Left	21	0	0
Volume Right	0	0	3
cSH	1619	1700	1081
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (m)	0.3	0.0	0.1
Control Delay (s)	3.2	0.0	8.3
Lane LOS	A		A
Approach Delay (s)	3.2	0.0	8.3
Approach LOS			A

Intersection Summary				
Average Delay		3.3		
Intersection Capacity Utilization		19.1%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	26	0	0	0	3	0	0	0	0	0
Future Volume (Veh/h)	0	0	26	0	0	0	3	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		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)	0	0	28	0	0	0	3	0	0	0	0	0
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	0			28			14	14	14	14	28	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			28			14	14	14	14	28	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1585			1002	880	1066	1002	865	1085

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	28	0	3	0
Volume Left	0	0	3	0
Volume Right	28	0	0	0
cSH	1623	1700	1002	1700
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.1	0.0
Control Delay (s)	0.0	0.0	8.6	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	8.6	0.0
Approach LOS			A	A

Intersection Summary				
Average Delay		0.8		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	75	12	0	0	2
Future Volume (Veh/h)	14	75	12	0	0	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	82	13	0	0	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		297				
pX, platoon unblocked						
vC, conflicting volume	13				125	13
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	13				125	13
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1606				862	1067

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	97	13	2
Volume Left	15	0	0
Volume Right	0	0	2
cSH	1606	1700	1067
Volume to Capacity	0.01	0.01	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	1.2	0.0	8.4
Lane LOS	A		A
Approach Delay (s)	1.2	0.0	8.4
Approach LOS			A

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		21.4%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	45	30	0	6	6	0
Future Volume (Veh/h)	45	30	0	6	6	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	33	0	7	7	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	345					
pX, platoon unblocked						
vC, conflicting volume			82		72	66
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			82		72	66
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1515		931	998

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	82	7	7
Volume Left	0	0	7
Volume Right	33	0	0
cSH	1700	1515	931
Volume to Capacity	0.05	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.2
Control Delay (s)	0.0	0.0	8.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		14.2%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	24	96	15	0	0	4
Future Volume (Veh/h)	24	96	15	0	0	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	104	16	0	0	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		138				
pX, platoon unblocked						
vC, conflicting volume	16				172	16
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	16				172	16
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	100
cM capacity (veh/h)	1602				805	1063

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	130	16	4
Volume Left	26	0	0
Volume Right	0	0	4
cSH	1602	1700	1063
Volume to Capacity	0.02	0.01	0.00
Queue Length 95th (m)	0.4	0.0	0.1
Control Delay (s)	1.6	0.0	8.4
Lane LOS	A		A
Approach Delay (s)	1.6	0.0	8.4
Approach LOS			A

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		23.0%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	89	7	0	14	1	0
Future Volume (Veh/h)	89	7	0	14	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	8	0	15	1	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	258					
pX, platoon unblocked						
vC, conflicting volume			105		116	101
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			105		116	101
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1486		880	954

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	105	15	1
Volume Left	0	0	1
Volume Right	8	0	0
cSH	1700	1486	880
Volume to Capacity	0.06	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	9.1
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		15.1%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	2358	180	27	979	42	110	176	32	48	146	145
Future Volume (vph)	169	2358	180	27	979	42	110	176	32	48	146	145
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	
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)	1770	3504		1805	3290		1805	3500		1289	3307	
Flt Permitted	0.20	1.00		0.06	1.00		0.48	1.00		0.61	1.00	
Satd. Flow (perm)	369	3504		112	3290		903	3500		828	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)	180	2509	191	29	1041	45	117	187	34	51	155	154
RTOR Reduction (vph)	0	4	0	0	2	0	0	15	0	0	128	0
Lane Group Flow (vph)	180	2696	0	29	1084	0	117	206	0	51	181	0
Heavy Vehicles (%)	2%	2%	1%	0%	8%	33%	0%	0%	5%	40%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	80.0	71.9		72.2	68.0		18.4	18.4		18.4	18.4	
Effective Green, g (s)	80.0	71.9		72.2	68.0		18.4	18.4		18.4	18.4	
Actuated g/C Ratio	0.72	0.65		0.65	0.61		0.17	0.17		0.17	0.17	
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)	368	2269		136	2015		149	580		137	548	
v/s Ratio Prot	c0.04	c0.77		0.01	0.33			0.06			0.05	
v/s Ratio Perm	0.32			0.13			c0.13			0.06		
v/c Ratio	0.49	1.19		0.21	0.54		0.79	0.36		0.37	0.33	
Uniform Delay, d1	7.1	19.5		25.6	12.4		44.4	41.0		41.2	40.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	89.5		0.8	1.0		23.2	0.4		1.7	0.4	
Delay (s)	8.1	109.0		26.4	13.5		67.6	41.4		42.9	41.2	
Level of Service	A	F		C	B		E	D		D	D	
Approach Delay (s)		102.7			13.8			50.5			41.4	
Approach LOS		F			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	73.1	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.09			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	112.8%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	169	2358	27	979	110	176	48	146
Future Volume (vph)	169	2358	27	979	110	176	48	146
Lane Group Flow (vph)	180	2700	29	1086	117	221	51	309
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	67.0	11.0	67.0	33.0	33.0	33.0	33.0
Total Split (%)	9.9%	60.4%	9.9%	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	0.49	1.16	0.16	0.54	0.79	0.37	0.37	0.46
Control Delay	9.7	99.4	7.2	14.6	76.4	38.1	46.6	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.7	99.4	7.2	14.6	76.4	38.1	46.6	21.5
Queue Length 50th (m)	10.1	~404.4	1.5	70.8	25.9	21.8	10.5	16.4
Queue Length 95th (m)	22.5	#481.0	5.1	104.6	43.6	30.7	21.2	27.4
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)	370	2323	184	2020	216	855	199	912
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	0.49	1.16	0.16	0.54	0.54	0.26	0.26	0.34

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.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Sixth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	2575	185	197	872	271	94	292	115	117	74	34
Future Volume (vph)	94	2575	185	197	872	271	94	292	115	117	74	34
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	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.96		1.00	0.96		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)	1626	3504		1626	3268		1719	3222		1583	3253	
Flt Permitted	0.17	1.00		0.06	1.00		0.68	1.00		0.34	1.00	
Satd. Flow (perm)	294	3504		95	3268		1229	3222		569	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)	100	2739	197	210	928	288	100	311	122	124	79	36
RTOR Reduction (vph)	0	4	0	0	24	0	0	35	0	0	28	0
Lane Group Flow (vph)	100	2932	0	210	1192	0	100	398	0	124	87	0
Heavy Vehicles (%)	11%	2%	2%	11%	3%	18%	5%	9%	3%	14%	2%	14%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Effective Green, g (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.64	0.57		0.69	0.60		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	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)	269	2006		206	1966		259	679		119	685	
v/s Ratio Prot	0.02	c0.84		c0.09	0.36			0.12			0.03	
v/s Ratio Perm	0.21			0.61			0.08			c0.22		
v/c Ratio	0.37	1.46		1.02	0.61		0.39	0.59		1.04	0.13	
Uniform Delay, d1	10.2	25.6		42.2	15.0		40.7	42.6		47.4	38.4	
Progression Factor	0.87	0.57		1.00	0.88		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	209.0		66.5	1.3		1.0	1.3		94.2	0.1	
Delay (s)	9.4	223.5		108.7	14.5		41.6	43.9		141.6	38.5	
Level of Service	A	F		F	B		D	D		F	D	
Approach Delay (s)		216.5			28.4			43.5			92.0	
Approach LOS		F			C			D			F	

Intersection Summary				
HCM 2000 Control Delay	141.9	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.31			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	125.3%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	94	2575	197	872	94	292	117	74
Future Volume (vph)	94	2575	197	872	94	292	117	74
Lane Group Flow (vph)	100	2936	210	1216	100	433	124	115
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	74.0	15.0	77.0	31.0	31.0	31.0	31.0
Total Split (%)	10.0%	61.7%	12.5%	64.2%	25.8%	25.8%	25.8%	25.8%
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	0.37	1.46	1.02	0.61	0.39	0.61	1.04	0.16
Control Delay	7.0	228.4	99.1	14.1	45.9	42.4	141.2	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	228.4	99.1	14.1	45.9	42.4	141.2	27.1
Queue Length 50th (m)	4.3	~538.2	~39.8	74.1	21.5	46.3	~33.1	8.4
Queue Length 95th (m)	m4.5	m#572.3	#91.2	90.3	39.2	64.1	#73.3	16.8
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	279	2010	206	1988	259	714	119	714
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	0.36	1.46	1.02	0.61	0.39	0.61	1.04	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
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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Fifth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	2086	35	81	654	231	30	349	233	480	487	235
Future Volume (vph)	220	2086	35	81	654	231	30	349	233	480	487	235
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	5.7	5.7	4.0	5.7	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	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
Flt 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)	3433	5136	1568	1752	4988	1547	1802	4803	1599	1719	4715	1480
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.46	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	3433	5136	1568	166	4988	1547	873	4803	1599	659	4715	1480
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)	224	2129	36	83	667	236	31	356	238	490	497	240
RTOR Reduction (vph)	0	0	21	0	0	148	0	0	148	0	0	162
Lane Group Flow (vph)	224	2129	15	83	667	88	31	356	90	490	497	78
Confl. Peds. (#/hr)	1					1	6					6
Heavy Vehicles (%)	2%	1%	3%	3%	4%	3%	0%	8%	1%	5%	10%	7%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	13.1	50.5	50.5	51.6	44.5	44.5	20.9	16.4	16.4	47.4	38.9	38.9
Effective Green, g (s)	13.1	50.5	50.5	51.6	44.5	44.5	20.9	16.4	16.4	47.4	38.9	38.9
Actuated g/C Ratio	0.11	0.42	0.42	0.43	0.37	0.37	0.17	0.14	0.14	0.39	0.32	0.32
Clearance 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
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)	374	2161	659	165	1849	573	186	656	218	498	1528	479
v/s Ratio Prot	c0.07	c0.41		0.03	0.13		0.01	0.07		c0.22	0.11	
v/s Ratio Perm			0.01	0.19		0.06	0.02		0.06	c0.17		0.05
v/c Ratio	0.60	0.99	0.02	0.50	0.36	0.15	0.17	0.54	0.41	0.98	0.33	0.16
Uniform Delay, d1	50.9	34.4	20.3	27.6	27.4	25.2	41.6	48.3	47.4	31.7	30.6	28.9
Progression Factor	1.00	1.00	1.00	0.84	0.80	2.43	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	16.2	0.1	2.0	0.5	0.5	0.4	0.9	1.3	35.9	0.1	0.2
Delay (s)	53.5	50.6	20.4	25.2	22.3	61.6	42.1	49.2	48.6	67.6	30.8	29.1
Level of Service	D	D	C	C	C	E	D	D	D	E	C	C
Approach Delay (s)		50.4			31.9			48.6			45.1	
Approach LOS		D			C			D			D	

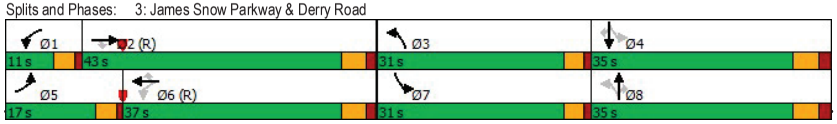
Intersection Summary				
HCM 2000 Control Delay	45.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	96.9%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	2086	35	81	654	231	30	349	233	480	487	235
Future Volume (vph)	220	2086	35	81	654	231	30	349	233	480	487	235
Lane Group Flow (vph)	224	2129	36	83	667	236	31	356	238	490	497	240
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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	0.60	0.94	0.05	0.44	0.35	0.32	0.13	0.60	0.68	0.98	0.33	0.37
Control Delay	57.6	42.9	0.1	20.1	22.2	10.1	24.7	53.7	25.5	68.0	31.7	5.6
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	57.6	42.9	0.1	20.1	22.2	10.1	24.7	53.7	25.5	68.0	31.7	5.6
Queue Length 50th (m)	27.6	184.8	0.0	9.2	46.2	14.8	4.7	31.2	15.3	102.3	36.1	0.0
Queue Length 95th (m)	39.7	#257.7	0.0	m20.2	65.6	39.7	10.4	40.2	41.5	#146.8	44.5	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)	401	2259	744	190	1915	739	526	1172	520	499	1529	642
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	0.56	0.94	0.05	0.44	0.35	0.32	0.06	0.30	0.46	0.98	0.33	0.37

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 125
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.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	2573	163	197	1026	91	68	7	29	26	11	43
Future Volume (vph)	91	2573	163	197	1026	91	68	7	29	26	11	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
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	0.88		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3508		1770	3496		1770	1639		1770	1640	
Flt Permitted	0.23	1.00		0.05	1.00		0.72	1.00		0.73	1.00	
Satd. Flow (perm)	431	3508		99	3496		1338	1639		1362	1640	
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)	99	2797	177	214	1115	99	74	8	32	28	12	47
RTOR Reduction (vph)	0	4	0	0	3	0	0	29	0	0	43	0
Lane Group Flow (vph)	99	2970	0	214	1211	0	74	11	0	28	16	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	71.2	71.2		98.3	98.3		10.7	10.7		10.7	10.7	
Effective Green, g (s)	71.2	71.2		98.3	98.3		10.7	10.7		10.7	10.7	
Actuated g/C Ratio	0.59	0.59		0.82	0.82		0.09	0.09		0.09	0.09	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	255	2081		402	2863		119	146		121	146	
v/s Ratio Prot		c0.85		c0.10	0.35			0.01			0.01	
v/s Ratio Perm	0.23			0.33			c0.06			0.02		
v/c Ratio	0.39	1.43		0.53	0.42		0.62	0.07		0.23	0.11	
Uniform Delay, d1	12.9	24.4		34.5	3.0		52.7	50.1		50.8	50.3	
Progression Factor	1.76	1.54		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	192.6		1.4	0.5		9.7	0.2		1.0	0.3	
Delay (s)	23.1	230.3		35.8	3.5		62.4	50.3		51.8	50.6	
Level of Service	C	F		D	A		E	D		D	D	
Approach Delay (s)		223.6			8.3			58.2			51.0	
Approach LOS		F			A			E			D	

Intersection Summary				
HCM 2000 Control Delay	151.0	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.15			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	110.2%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	91	2573	197	1026	68	7	26	11
Future Volume (vph)	91	2573	197	1026	68	7	26	11
Lane Group Flow (vph)	99	2974	214	1214	74	40	28	59
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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	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	5.7	5.7	5.7	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	0.38	1.40	0.53	0.41	0.52	0.20	0.19	0.27
Control Delay	25.6	212.8	31.2	3.8	63.5	21.7	50.8	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	212.8	31.2	3.8	63.5	21.7	50.8	20.9
Queue Length 50th (m)	19.3	~517.2	31.0	36.4	17.8	1.8	6.5	2.7
Queue Length 95th (m)	m14.8	m#302.4	60.5	58.4	32.8	12.2	15.4	15.2
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)	259	2118	404	2931	326	424	332	436
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	0.38	1.40	0.53	0.41	0.23	0.09	0.08	0.14

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.
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: 4: Clark Boulevard & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	13	3	7	15	2	10	489	48	77	342	37
Future Volume (vph)	10	13	3	7	15	2	10	489	48	77	342	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	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1813		1770	1832		1770	3492		1770	3488	
Flt Permitted	1.00	1.00		1.00	1.00		0.51	1.00		0.43	1.00	
Satd. Flow (perm)	1863	1813		1863	1832		951	3492		804	3488	
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)	11	14	3	8	16	2	11	532	52	84	372	40
RTOR Reduction (vph)	0	3	0	0	2	0	0	6	0	0	7	0
Lane Group Flow (vph)	11	14	0	8	16	0	11	578	0	84	405	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	1.9	1.9		1.9	1.9		23.1	23.1		23.1	23.1	
Effective Green, g (s)	1.9	1.9		1.9	1.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.05	0.05		0.05	0.05		0.64	0.64		0.64	0.64	
Clearance Time (s)	5.3	5.3		5.3	5.3		5.7	5.7		5.7	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)	98	95		98	96		610	2240		515	2238	
v/s Ratio Prot		0.01			c0.01			c0.17			0.12	
v/s Ratio Perm	0.01			0.00			0.01			0.10		
v/c Ratio	0.11	0.15		0.08	0.17		0.02	0.26		0.16	0.18	
Uniform Delay, d1	16.2	16.3		16.2	16.3		2.3	2.8		2.6	2.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.7		0.4	0.8		0.0	0.1		0.1	0.0	
Delay (s)	16.8	17.0		16.6	17.1		2.4	2.8		2.7	2.7	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		16.9			17.0			2.8			2.7	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.25			
Actuated Cycle Length (s)	36.0	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	45.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	10	13	7	15	10	489	77	342
Future Volume (vph)	10	13	7	15	10	489	77	342
Lane Group Flow (vph)	11	17	8	18	11	584	84	412
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	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)	35.0	35.0	35.0	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	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	0.01	0.03	0.01	0.19	0.12	0.13
Control Delay	8.2	7.8	8.3	7.9	3.9	2.7	4.1	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	7.8	8.3	7.9	3.9	2.7	4.1	2.6
Queue Length 50th (m)	0.4	0.5	0.4	0.5	0.0	0.0	0.0	0.0
Queue Length 95th (m)	2.3	2.9	1.9	3.1	2.0	19.6	9.1	13.6
Internal Link Dist (m)		204.0		113.8		156.9		372.1
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	1749	1703	1749	1719	950	3493	805	3486
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	0.01	0.01	0.17	0.10	0.12

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 31.7
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	1	2	0	13	1	83	6	51	298	22
Future Volume (Veh/h)	8	0	1	2	0	13	1	83	6	51	298	22
Sign Control		Stop			Stop			Free			Free	
Grade		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)	9	0	1	2	0	14	1	90	7	55	324	24
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked	0.98	0.98	0.98	0.98	0.98		0.98					
vC, conflicting volume	556	545	336	542	554	94	348			97		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	540	529	316	526	538	94	329			97		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	99	100			96		
cM capacity (veh/h)	426	431	712	441	426	963	1211			1496		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	16	98	403
Volume Left	9	2	1	55
Volume Right	1	14	7	24
cSH	444	839	1211	1496
Volume to Capacity	0.02	0.02	0.00	0.04
Queue Length 95th (m)	0.6	0.5	0.0	0.9
Control Delay (s)	13.3	9.4	0.1	1.3
Lane LOS	B	A	A	A
Approach Delay (s)	13.3	9.4	0.1	1.3
Approach LOS	B	A		

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	36.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2791	32	0	1343	0	3
Future Volume (Veh/h)	2791	32	0	1343	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3034	35	0	1460	0	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				360		
pX, platoon unblocked					0.93	
vC, conflicting volume			3069		3782	1534
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			3069		3838	1534
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	97
cM capacity (veh/h)			106		2	105

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	2023	1046	730	730	3
Volume Left	0	0	0	0	0
Volume Right	0	35	0	0	3
cSH	1700	1700	1700	1700	105
Volume to Capacity	1.19	0.62	0.43	0.43	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.7
Control Delay (s)	0.0	0.0	0.0	0.0	40.2
Lane LOS					E
Approach Delay (s)	0.0		0.0		40.2
Approach LOS					E

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	88.2%	ICU Level of Service	E	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	55	20	43	78	12	2	0	4	1	0	0
Future Volume (Veh/h)	2	55	20	43	78	12	2	0	4	1	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		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)	2	60	22	47	85	13	2	0	4	1	0	0
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	98			82			260	267	71	264	272	92
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	98			82			260	267	71	264	272	92
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	100	100	100	100	100
cM capacity (veh/h)	1495			1515			675	618	991	669	615	966

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	84	145	6	1
Volume Left	2	47	2	1
Volume Right	22	13	4	0
cSH	1495	1515	858	669
Volume to Capacity	0.00	0.03	0.01	0.00
Queue Length 95th (m)	0.0	0.8	0.2	0.0
Control Delay (s)	0.2	2.6	9.2	10.4
Lane LOS	A	A	A	B
Approach Delay (s)	0.2	2.6	9.2	10.4
Approach LOS			A	B

Intersection Summary					
Average Delay	1.9				
Intersection Capacity Utilization	23.9%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	4	59	1	5	132
Future Volume (Veh/h)	1	4	59	1	5	132
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)	1	4	64	1	5	143
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	218	64			65	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	218	64			65	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	768	1000			1537	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	5	65	148
Volume Left	1	0	5
Volume Right	4	1	0
cSH	943	1700	1537
Volume to Capacity	0.01	0.04	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	8.8	0.0	0.3
Lane LOS	A		A
Approach Delay (s)	8.8	0.0	0.3
Approach LOS	A		

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	21.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	89	45	13	5	0
Future Volume (Veh/h)	12	89	45	13	5	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	97	49	14	5	0
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	63				179	56
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	63				179	56
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	100
cM capacity (veh/h)	1540				804	1011

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	110	63	5
Volume Left	13	0	5
Volume Right	0	14	0
cSH	1540	1700	804
Volume to Capacity	0.01	0.04	0.01
Queue Length 95th (m)	0.2	0.0	0.2
Control Delay (s)	0.9	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	0.9	0.0	9.5
Approach LOS			A

Intersection Summary				
Average Delay			0.8	
Intersection Capacity Utilization			22.0%	ICU Level of Service A
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	72	17	11	57	12	0	0	2	3	0	1
Future Volume (Veh/h)	5	72	17	11	57	12	0	0	2	3	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		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)	5	78	18	12	62	13	0	0	2	3	0	1
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	75			96			190	196	87	192	198	68
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	75			96			190	196	87	192	198	68
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	100	100	100
cM capacity (veh/h)	1524			1498			762	692	971	760	689	995

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	101	87	2	4
Volume Left	5	12	0	3
Volume Right	18	13	2	1
cSH	1524	1498	971	808
Volume to Capacity	0.00	0.01	0.00	0.00
Queue Length 95th (m)	0.1	0.2	0.0	0.1
Control Delay (s)	0.4	1.1	8.7	9.5
Lane LOS	A	A	A	A
Approach Delay (s)	0.4	1.1	8.7	9.5
Approach LOS			A	A

Intersection Summary				
Average Delay			1.0	
Intersection Capacity Utilization			17.7%	ICU Level of Service A
Analysis Period (min)			15	

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	113	31	5	2	0
Future Volume (Veh/h)	9	113	31	5	2	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	123	34	5	2	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		297				
pX, platoon unblocked						
vC, conflicting volume	39				180	36
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39				180	36
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1571				805	1036

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	133	39	2
Volume Left	10	0	2
Volume Right	0	5	0
cSH	1571	1700	805
Volume to Capacity	0.01	0.02	0.00
Queue Length 95th (m)	0.2	0.0	0.1
Control Delay (s)	0.6	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	0.6	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		23.1%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	95	20	10	35	1	6
Future Volume (Veh/h)	95	20	10	35	1	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	22	11	38	1	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	345					
pX, platoon unblocked						
vC, conflicting volume			125		174	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			125		174	114
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1462		810	939

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	125	49	8
Volume Left	0	11	1
Volume Right	22	0	7
cSH	1700	1462	920
Volume to Capacity	0.07	0.01	0.01
Queue Length 95th (m)	0.0	0.2	0.2
Control Delay (s)	0.0	1.7	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	1.7	8.9
Approach LOS			A

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		19.1%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	124	24	4	2	0
Future Volume (Veh/h)	14	124	24	4	2	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	135	26	4	2	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		138				
pX, platoon unblocked						
vC, conflicting volume	30				193	28
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30				193	28
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1583				788	1047

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	150	30	2
Volume Left	15	0	2
Volume Right	0	4	0
cSH	1583	1700	788
Volume to Capacity	0.01	0.02	0.00
Queue Length 95th (m)	0.2	0.0	0.1
Control Delay (s)	0.8	0.0	9.6
Lane LOS	A		A
Approach Delay (s)	0.8	0.0	9.6
Approach LOS			A

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		24.0%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	121	5	3	28	0	1
Future Volume (Veh/h)	121	5	3	28	0	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	132	5	3	30	0	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	258					
pX, platoon unblocked						
vC, conflicting volume			137		170	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			137		170	134
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1447		818	914

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	137	33	1
Volume Left	0	3	0
Volume Right	5	0	1
cSH	1700	1447	914
Volume to Capacity	0.08	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.7	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	0.7	8.9
Approach LOS			A

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		16.7%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	2358	180	27	979	42	110	176	32	48	146	145
Future Volume (vph)	169	2358	180	27	979	42	110	176	32	48	146	145
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	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)	1770	5035		1805	4728		1805	3500		1289	3307	
Flt Permitted	0.22	1.00		0.06	1.00		0.48	1.00		0.61	1.00	
Satd. Flow (perm)	403	5035		112	4728		903	3500		828	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)	180	2509	191	29	1041	45	117	187	34	51	155	154
RTOR Reduction (vph)	0	6	0	0	3	0	0	15	0	0	128	0
Lane Group Flow (vph)	180	2694	0	29	1083	0	117	206	0	51	181	0
Heavy Vehicles (%)	2%	2%	1%	0%	8%	33%	0%	0%	5%	40%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	80.0	71.9		72.2	68.0		18.4	18.4		18.4	18.4	
Effective Green, g (s)	80.0	71.9		72.2	68.0		18.4	18.4		18.4	18.4	
Actuated g/C Ratio	0.72	0.65		0.65	0.61		0.17	0.17		0.17	0.17	
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)	390	3261		136	2896		149	580		137	548	
v/s Ratio Prot	c0.03	c0.54		0.01	0.23			0.06			0.05	
v/s Ratio Perm	0.30			0.13			c0.13			0.06		
v/c Ratio	0.46	0.83		0.21	0.37		0.79	0.36		0.37	0.33	
Uniform Delay, d1	5.5	14.8		14.1	10.8		44.4	41.0		41.2	40.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	2.5		0.8	0.4		23.2	0.4		1.7	0.4	
Delay (s)	6.4	17.4		14.9	11.2		67.6	41.4		42.9	41.2	
Level of Service	A	B		B	B		E	D		D	D	
Approach Delay (s)		16.7			11.3			50.5			41.4	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	91.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	169	2358	27	979	110	176	48	146
Future Volume (vph)	169	2358	27	979	110	176	48	146
Lane Group Flow (vph)	180	2700	29	1086	117	221	51	309
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	67.0	11.0	67.0	33.0	33.0	33.0	33.0
Total Split (%)	9.9%	60.4%	9.9%	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	0.46	0.81	0.16	0.37	0.79	0.37	0.37	0.46
Control Delay	9.0	18.6	7.2	11.9	76.4	38.1	46.6	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	18.6	7.2	11.9	76.4	38.1	46.6	21.5
Queue Length 50th (m)	10.1	168.9	1.5	42.6	25.9	21.8	10.5	16.4
Queue Length 95th (m)	22.5	#258.5	5.1	61.0	43.6	30.7	21.2	27.4
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)	392	3339	184	2903	216	855	199	912
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	0.46	0.81	0.16	0.37	0.54	0.26	0.26	0.34

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.

Splits and Phases: 1: Sixth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	2575	185	197	872	271	94	292	115	117	74	34
Future Volume (vph)	94	2575	185	197	872	271	94	292	115	117	74	34
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	0.96		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)	1626	5034		1626	4695		1719	3222		1583	3253	
Flt Permitted	0.20	1.00		0.06	1.00		0.68	1.00		0.34	1.00	
Satd. Flow (perm)	337	5034		95	4695		1229	3222		569	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)	100	2739	197	210	928	288	100	311	122	124	79	36
RTOR Reduction (vph)	0	7	0	0	46	0	0	35	0	0	28	0
Lane Group Flow (vph)	100	2929	0	210	1170	0	100	398	0	124	87	0
Heavy Vehicles (%)	11%	2%	2%	11%	3%	18%	5%	9%	3%	14%	2%	14%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Effective Green, g (s)	76.2	68.7		83.2	72.2		25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.64	0.57		0.69	0.60		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	5.3		4.0	5.3		5.7	5.7		5.7	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)	294	2881		206	2824		259	679		119	685	
v/s Ratio Prot	0.02	0.58		c0.09	0.25			0.12			0.03	
v/s Ratio Perm	0.19			c0.61			0.08			c0.22		
v/c Ratio	0.34	1.02		1.02	0.41		0.39	0.59		1.04	0.13	
Uniform Delay, d1	8.8	25.6		42.2	12.7		40.7	42.6		47.4	38.4	
Progression Factor	0.63	0.54		1.01	0.91		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	16.2		67.3	0.4		1.0	1.3		94.2	0.1	
Delay (s)	5.9	30.0		110.0	12.0		41.6	43.9		141.6	38.5	
Level of Service	A	C		F	B		D	D		F	D	
Approach Delay (s)		29.2			26.4			43.5			92.0	
Approach LOS		C			C			D			F	

Intersection Summary				
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	102.1%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	94	2575	197	872	94	292	117	74
Future Volume (vph)	94	2575	197	872	94	292	117	74
Lane Group Flow (vph)	100	2936	210	1216	100	433	124	115
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	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	74.0	15.0	77.0	31.0	31.0	31.0	31.0
Total Split (%)	10.0%	61.7%	12.5%	64.2%	25.8%	25.8%	25.8%	25.8%
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	0.34	1.02	1.02	0.42	0.39	0.61	1.04	0.16
Control Delay	5.2	31.3	100.2	10.9	45.9	42.4	141.2	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	31.3	100.2	10.9	45.9	42.4	141.2	27.1
Queue Length 50th (m)	4.3	~288.5	~38.7	46.0	21.5	46.3	~33.1	8.4
Queue Length 95th (m)	m4.5	m#312.2	#91.0	54.6	39.2	64.1	#73.3	16.8
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	304	2888	206	2868	259	714	119	714
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	0.33	1.02	1.02	0.42	0.39	0.61	1.04	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
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.
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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	2086	35	81	654	231	30	349	233	480	487	235
Future Volume (vph)	220	2086	35	81	654	231	30	349	233	480	487	235
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	5.7	5.7	4.0	5.7	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	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
Flt 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)	3433	5136	1568	1752	4988	1547	1802	4803	1599	1719	4715	1480
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.46	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	3433	5136	1568	166	4988	1547	873	4803	1599	659	4715	1480
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)	224	2129	36	83	667	236	31	356	238	490	497	240
RTOR Reduction (vph)	0	0	21	0	0	148	0	0	148	0	0	162
Lane Group Flow (vph)	224	2129	15	83	667	88	31	356	90	490	497	78
Confl. Peds. (#/hr)	1					1	6					6
Heavy Vehicles (%)	2%	1%	3%	3%	4%	3%	0%	8%	1%	5%	10%	7%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	13.1	50.5	50.5	51.6	44.5	44.5	20.9	16.4	16.4	47.4	38.9	38.9
Effective Green, g (s)	13.1	50.5	50.5	51.6	44.5	44.5	20.9	16.4	16.4	47.4	38.9	38.9
Actuated g/C Ratio	0.11	0.42	0.42	0.43	0.37	0.37	0.17	0.14	0.14	0.39	0.32	0.32
Clearance 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
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)	374	2161	659	165	1849	573	186	656	218	498	1528	479
v/s Ratio Prot	c0.07	c0.41		0.03	0.13		0.01	0.07		c0.22	0.11	
v/s Ratio Perm			0.01	0.19		0.06	0.02		0.06	c0.17		0.05
v/c Ratio	0.60	0.99	0.02	0.50	0.36	0.15	0.17	0.54	0.41	0.98	0.33	0.16
Uniform Delay, d1	50.9	34.4	20.3	27.6	27.4	25.2	41.6	48.3	47.4	31.7	30.6	28.9
Progression Factor	1.00	1.00	1.00	0.93	0.87	2.77	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	16.2	0.1	2.2	0.5	0.5	0.4	0.9	1.3	35.9	0.1	0.2
Delay (s)	53.5	50.6	20.4	28.0	24.2	70.4	42.1	49.2	48.6	67.6	30.8	29.1
Level of Service	D	D	C	C	C	E	D	D	D	E	C	C
Approach Delay (s)		50.4			35.6			48.6			45.1	
Approach LOS		D			D			D			D	

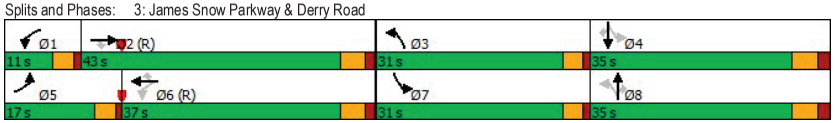
Intersection Summary				
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	96.9%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	2086	35	81	654	231	30	349	233	480	487	235
Future Volume (vph)	220	2086	35	81	654	231	30	349	233	480	487	235
Lane Group Flow (vph)	224	2129	36	83	667	236	31	356	238	490	497	240
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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	0.60	0.94	0.05	0.44	0.35	0.32	0.13	0.60	0.68	0.98	0.33	0.37
Control Delay	57.6	42.9	0.1	22.4	24.2	11.5	24.7	53.7	25.5	68.0	31.7	5.6
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	57.6	42.9	0.1	22.4	24.2	11.5	24.7	53.7	25.5	68.0	31.7	5.6
Queue Length 50th (m)	27.6	184.8	0.0	10.1	45.8	13.5	4.7	31.2	15.3	102.3	36.1	0.0
Queue Length 95th (m)	39.7	#257.7	0.0	22.6	65.2	40.1	10.4	40.2	41.5	#146.8	44.5	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)	401	2259	744	190	1915	739	526	1172	520	499	1529	642
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	0.56	0.94	0.05	0.44	0.35	0.32	0.06	0.30	0.46	0.98	0.33	0.37

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	2573	163	197	1026	91	68	7	29	26	11	43
Future Volume (vph)	91	2573	163	197	1026	91	68	7	29	26	11	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	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	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.88		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5040		1770	5023		1770	1639		1770	1640	
Flt Permitted	0.22	1.00		0.05	1.00		0.72	1.00		0.73	1.00	
Satd. Flow (perm)	409	5040		99	5023		1338	1639		1362	1640	
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)	99	2797	177	214	1115	99	74	8	32	28	12	47
RTOR Reduction (vph)	0	6	0	0	5	0	0	29	0	0	43	0
Lane Group Flow (vph)	99	2968	0	214	1209	0	74	11	0	28	16	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	71.2	71.2		98.3	98.3		10.7	10.7		10.7	10.7	
Effective Green, g (s)	71.2	71.2		98.3	98.3		10.7	10.7		10.7	10.7	
Actuated g/C Ratio	0.59	0.59		0.82	0.82		0.09	0.09		0.09	0.09	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	242	2990		402	4114		119	146		121	146	
v/s Ratio Prot		c0.59		c0.10	0.24			0.01			0.01	
v/s Ratio Perm	0.24			0.33			c0.06			0.02		
v/c Ratio	0.41	0.99		0.53	0.29		0.62	0.07		0.23	0.11	
Uniform Delay, d1	13.1	24.1		34.5	2.6		52.7	50.1		50.8	50.3	
Progression Factor	1.77	1.59		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	7.5		1.4	0.2		9.7	0.2		1.0	0.3	
Delay (s)	24.7	46.0		35.8	2.8		62.4	50.3		51.8	50.6	
Level of Service	C	D		D	A		E	D		D	D	
Approach Delay (s)		45.3			7.7			58.2			51.0	
Approach LOS		D			A			E			D	

Intersection Summary				
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	87.2%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	91	2573	197	1026	68	7	26	11
Future Volume (vph)	91	2573	197	1026	68	7	26	11
Lane Group Flow (vph)	99	2974	214	1214	74	40	28	59
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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	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	5.7	5.7	5.7	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	0.40	0.98	0.53	0.29	0.52	0.20	0.19	0.27
Control Delay	27.5	41.3	31.2	3.0	63.5	21.7	50.8	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	41.3	31.2	3.0	63.5	21.7	50.8	20.9
Queue Length 50th (m)	19.4	236.1	31.0	21.5	17.8	1.8	6.5	2.7
Queue Length 95th (m)	m20.5	m#234.6	60.5	33.5	32.8	12.2	15.4	15.2
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)	245	3045	404	4212	326	424	332	436
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	0.40	0.98	0.53	0.29	0.23	0.09	0.08	0.14

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
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.

Splits and Phases: 4: Clark Boulevard & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	13	3	7	15	2	10	489	48	77	342	37
Future Volume (vph)	10	13	3	7	15	2	10	489	48	77	342	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	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1813		1770	1832		1770	3492		1770	3488	
Flt Permitted	1.00	1.00		1.00	1.00		0.51	1.00		0.43	1.00	
Satd. Flow (perm)	1863	1813		1863	1832		951	3492		804	3488	
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)	11	14	3	8	16	2	11	532	52	84	372	40
RTOR Reduction (vph)	0	3	0	0	2	0	0	6	0	0	7	0
Lane Group Flow (vph)	11	14	0	8	16	0	11	578	0	84	405	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	1.9	1.9		1.9	1.9		23.1	23.1		23.1	23.1	
Effective Green, g (s)	1.9	1.9		1.9	1.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.05	0.05		0.05	0.05		0.64	0.64		0.64	0.64	
Clearance Time (s)	5.3	5.3		5.3	5.3		5.7	5.7		5.7	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)	98	95		98	96		610	2240		515	2238	
v/s Ratio Prot		0.01			c0.01			c0.17			0.12	
v/s Ratio Perm	0.01			0.00			0.01			0.10		
v/c Ratio	0.11	0.15		0.08	0.17		0.02	0.26		0.16	0.18	
Uniform Delay, d1	16.2	16.3		16.2	16.3		2.3	2.8		2.6	2.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.7		0.4	0.8		0.0	0.1		0.1	0.0	
Delay (s)	16.8	17.0		16.6	17.1		2.4	2.8		2.7	2.7	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		16.9			17.0			2.8			2.7	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.25			
Actuated Cycle Length (s)	36.0	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	45.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	10	13	7	15	10	489	77	342
Future Volume (vph)	10	13	7	15	10	489	77	342
Lane Group Flow (vph)	11	17	8	18	11	584	84	412
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	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)	35.0	35.0	35.0	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	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	0.01	0.03	0.01	0.19	0.12	0.13
Control Delay	8.2	7.8	8.3	7.9	3.9	2.7	4.1	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	7.8	8.3	7.9	3.9	2.7	4.1	2.6
Queue Length 50th (m)	0.4	0.5	0.4	0.5	0.0	0.0	0.0	0.0
Queue Length 95th (m)	2.3	2.9	1.9	3.1	2.0	19.6	9.1	13.6
Internal Link Dist (m)		204.0		113.8		156.9		372.1
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	1749	1703	1749	1719	950	3493	805	3486
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	0.01	0.01	0.17	0.10	0.12

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 31.7
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	1	2	0	13	1	83	6	51	298	22
Future Volume (Veh/h)	8	0	1	2	0	13	1	83	6	51	298	22
Sign Control		Stop			Stop			Free			Free	
Grade		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)	9	0	1	2	0	14	1	90	7	55	324	24
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked	0.98	0.98	0.98	0.98	0.98		0.98					
vC, conflicting volume	556	545	336	542	554	94	348			97		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	540	529	316	526	538	94	329			97		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	99	100			96		
cM capacity (veh/h)	426	431	712	441	426	963	1211			1496		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	16	98	403
Volume Left	9	2	1	55
Volume Right	1	14	7	24
cSH	444	839	1211	1496
Volume to Capacity	0.02	0.02	0.00	0.04
Queue Length 95th (m)	0.6	0.5	0.0	0.9
Control Delay (s)	13.3	9.4	0.1	1.3
Lane LOS	B	A	A	A
Approach Delay (s)	13.3	9.4	0.1	1.3
Approach LOS	B	A		

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	36.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2791	32	0	1343	0	3
Future Volume (Veh/h)	2791	32	0	1343	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3034	35	0	1460	0	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				360		
pX, platoon unblocked						
vC, conflicting volume			3069		3538	1029
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			3069		3538	1029
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			106		4	231

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	1214	1214	642	487	487	487	3
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	35	0	0	0	3
cSH	1700	1700	1700	1700	1700	1700	231
Volume to Capacity	0.71	0.71	0.38	0.29	0.29	0.29	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	20.8
Lane LOS							C
Approach Delay (s)	0.0			0.0			20.8
Approach LOS							C

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	64.6%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	55	20	43	78	12	2	0	4	1	0	0
Future Volume (Veh/h)	2	55	20	43	78	12	2	0	4	1	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		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)	2	60	22	47	85	13	2	0	4	1	0	0
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	98			82			260	267	71	264	272	92
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	98			82			260	267	71	264	272	92
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	100	100	100	100	100
cM capacity (veh/h)	1495			1515			675	618	991	669	615	966

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	84	145	6	1
Volume Left	2	47	2	1
Volume Right	22	13	4	0
cSH	1495	1515	858	669
Volume to Capacity	0.00	0.03	0.01	0.00
Queue Length 95th (m)	0.0	0.8	0.2	0.0
Control Delay (s)	0.2	2.6	9.2	10.4
Lane LOS	A	A	A	B
Approach Delay (s)	0.2	2.6	9.2	10.4
Approach LOS			A	B

Intersection Summary					
Average Delay	1.9				
Intersection Capacity Utilization	23.9%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	4	59	1	5	132
Future Volume (Veh/h)	1	4	59	1	5	132
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)	1	4	64	1	5	143
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	218	64			65	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	218	64			65	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	768	1000			1537	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	5	65	148
Volume Left	1	0	5
Volume Right	4	1	0
cSH	943	1700	1537
Volume to Capacity	0.01	0.04	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	8.8	0.0	0.3
Lane LOS	A		A
Approach Delay (s)	8.8	0.0	0.3
Approach LOS	A		

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	21.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	89	45	13	5	0
Future Volume (Veh/h)	12	89	45	13	5	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	97	49	14	5	0
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	63				179	56
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	63				179	56
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	100
cM capacity (veh/h)	1540				804	1011

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	110	63	5
Volume Left	13	0	5
Volume Right	0	14	0
cSH	1540	1700	804
Volume to Capacity	0.01	0.04	0.01
Queue Length 95th (m)	0.2	0.0	0.2
Control Delay (s)	0.9	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	0.9	0.0	9.5
Approach LOS			A

Intersection Summary				
Average Delay			0.8	
Intersection Capacity Utilization			22.0%	ICU Level of Service A
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	72	17	11	57	12	0	0	2	3	0	1
Future Volume (Veh/h)	5	72	17	11	57	12	0	0	2	3	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		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)	5	78	18	12	62	13	0	0	2	3	0	1
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	75			96			190	196	87	192	198	68
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	75			96			190	196	87	192	198	68
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	100	100	100
cM capacity (veh/h)	1524			1498			762	692	971	760	689	995

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	101	87	2	4
Volume Left	5	12	0	3
Volume Right	18	13	2	1
cSH	1524	1498	971	808
Volume to Capacity	0.00	0.01	0.00	0.00
Queue Length 95th (m)	0.1	0.2	0.0	0.1
Control Delay (s)	0.4	1.1	8.7	9.5
Lane LOS	A	A	A	A
Approach Delay (s)	0.4	1.1	8.7	9.5
Approach LOS			A	A

Intersection Summary				
Average Delay			1.0	
Intersection Capacity Utilization			17.7%	ICU Level of Service A
Analysis Period (min)			15	

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	113	31	5	2	0
Future Volume (Veh/h)	9	113	31	5	2	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	123	34	5	2	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		297				
pX, platoon unblocked						
vC, conflicting volume	39				180	36
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39				180	36
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1571				805	1036

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	133	39	2
Volume Left	10	0	2
Volume Right	0	5	0
cSH	1571	1700	805
Volume to Capacity	0.01	0.02	0.00
Queue Length 95th (m)	0.2	0.0	0.1
Control Delay (s)	0.6	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	0.6	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		23.1%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	95	20	10	35	1	6
Future Volume (Veh/h)	95	20	10	35	1	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	22	11	38	1	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	345					
pX, platoon unblocked						
vC, conflicting volume			125		174	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			125		174	114
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1462		810	939

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	125	49	8
Volume Left	0	11	1
Volume Right	22	0	7
cSH	1700	1462	920
Volume to Capacity	0.07	0.01	0.01
Queue Length 95th (m)	0.0	0.2	0.2
Control Delay (s)	0.0	1.7	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	1.7	8.9
Approach LOS			A

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		19.1%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	124	24	4	2	0
Future Volume (Veh/h)	14	124	24	4	2	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	135	26	4	2	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		138				
pX, platoon unblocked						
vC, conflicting volume	30				193	28
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30				193	28
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1583				788	1047

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	150	30	2
Volume Left	15	0	2
Volume Right	0	4	0
cSH	1583	1700	788
Volume to Capacity	0.01	0.02	0.00
Queue Length 95th (m)	0.2	0.0	0.1
Control Delay (s)	0.8	0.0	9.6
Lane LOS	A		A
Approach Delay (s)	0.8	0.0	9.6
Approach LOS			A

Intersection Summary				
Average Delay		0.8		
Intersection Capacity Utilization		24.0%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	121	5	3	28	0	1
Future Volume (Veh/h)	121	5	3	28	0	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	132	5	3	30	0	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	258					
pX, platoon unblocked						
vC, conflicting volume			137		170	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			137		170	134
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1447		818	914

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	137	33	1
Volume Left	0	3	0
Volume Right	5	0	1
cSH	1700	1447	914
Volume to Capacity	0.08	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.7	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	0.7	8.9
Approach LOS			A

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		16.7%	ICU Level of Service	A
Analysis Period (min)		15		

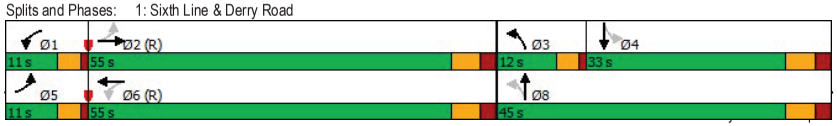
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	1865	97	33	1821	23	209	159	39	97	221	144
Future Volume (vph)	169	1865	97	33	1821	23	209	159	39	97	221	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total 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	
Frt	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3484		1736	3524		1805	1829		1787	1770	
Flt Permitted	0.08	1.00		0.08	1.00		0.16	1.00		0.63	1.00	
Satd. Flow (perm)	140	3484		149	3524		300	1829		1185	1770	
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)	174	1923	100	34	1877	24	215	164	40	100	228	148
RTOR Reduction (vph)	0	3	0	0	1	0	0	8	0	0	22	0
Lane Group Flow (vph)	174	2020	0	34	1900	0	215	196	0	100	354	0
Heavy Vehicles (%)	2%	3%	0%	4%	2%	22%	0%	1%	0%	1%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	61.6	53.4		53.4	49.2		36.9	36.9		24.9	24.9	
Effective Green, g (s)	61.6	53.4		53.4	49.2		36.9	36.9		24.9	24.9	
Actuated g/C Ratio	0.55	0.48		0.48	0.44		0.33	0.33		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)	201	1676		131	1561		208	608		265	397	
v/s Ratio Prot	c0.07	c0.58		0.01	0.54		c0.07	0.11			0.20	
v/s Ratio Perm	0.41			0.11			c0.27			0.08		
v/c Ratio	0.87	1.21		0.26	1.22		1.03	0.32		0.38	0.89	
Uniform Delay, d1	29.3	28.8		24.6	30.9		33.3	27.7		36.5	41.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	29.9	98.3		1.1	103.9		71.5	0.3		0.9	21.5	
Delay (s)	59.3	127.1		25.7	134.8		104.8	28.0		37.4	63.2	
Level of Service	E	F		C	F		F	C		D	E	
Approach Delay (s)		121.7			132.9			67.4			57.8	
Approach LOS		F			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	115.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	109.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	169	1865	33	1821	209	159	97	221
Future Volume (vph)	169	1865	33	1821	209	159	97	221
Lane Group Flow (vph)	174	2023	34	1901	215	204	100	376
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	5	2	1	6	3	8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	55.0	11.0	55.0	12.0	45.0	33.0	33.0
Total Split (%)	9.9%	49.5%	9.9%	49.5%	10.8%	40.5%	29.7%	29.7%
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	0.87	1.17	0.19	1.22	1.00	0.33	0.38	0.90
Control Delay	63.0	110.9	13.6	132.8	93.7	27.3	40.4	63.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	110.9	13.6	132.8	93.7	27.3	40.4	63.7
Queue Length 50th (m)	24.5	~316.1	3.3	~283.5	34.7	31.7	19.0	76.4
Queue Length 95th (m)	#70.6	#361.2	8.0	#328.7	#77.5	51.4	35.8	#127.7
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)	199	1730	178	1564	214	645	285	447
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	0.87	1.17	0.19	1.22	1.00	0.32	0.35	0.84

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.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Sixth Line & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1719	84	125	2103	123	287	72	230	340	301	79
Future Volume (vph)	42	1719	84	125	2103	123	287	72	230	340	301	79
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	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	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3518		1805	3518		1736	3103		1612	3215	
Flt Permitted	0.06	1.00		0.06	1.00		0.30	1.00		0.40	1.00	
Satd. Flow (perm)	122	3518		114	3518		545	3103		676	3215	
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
Adj. Flow (vph)	44	1809	88	132	2214	129	302	76	242	358	317	83
RTOR Reduction (vph)	0	3	0	0	3	0	0	107	0	0	19	0
Lane Group Flow (vph)	44	1894	0	132	2340	0	302	211	0	358	381	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	15%	4%	0%	4%	12%	9%	8%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	68.4	62.5		76.6	66.7		39.1	20.4		39.7	20.7	
Effective Green, g (s)	68.4	62.5		76.6	66.7		39.1	20.4		39.7	20.7	
Actuated g/C Ratio	0.52	0.48		0.58	0.51		0.30	0.16		0.30	0.16	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.7		4.0	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)	139	1678		197	1791		332	483		340	508	
v/s Ratio Prot	0.01	0.54		c0.05	c0.67		0.13	0.07		c0.15	0.12	
v/s Ratio Perm	0.15			0.34			0.14			c0.17		
v/c Ratio	0.32	1.13		0.67	1.31		0.91	0.44		1.05	0.75	
Uniform Delay, d1	28.7	34.2		32.2	32.1		39.8	50.1		42.4	52.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	66.3		8.6	142.1		27.4	0.6		63.4	6.0	
Delay (s)	30.0	100.5		40.8	174.3		67.1	50.7		105.8	58.7	
Level of Service	C	F		D	F		E	D		F	E	
Approach Delay (s)		98.9			167.1			58.7			80.9	
Approach LOS		F			F			E			F	

Intersection Summary				
HCM 2000 Control Delay	121.4	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.19			
Actuated Cycle Length (s)	131.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	112.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	42	1719	125	2103	287	72	340	301
Future Volume (vph)	42	1719	125	2103	287	72	340	301
Lane Group Flow (vph)	44	1897	132	2343	302	318	358	400
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	64.0	11.0	64.0	23.0	33.0	23.0	33.0
Total Split (%)	8.4%	48.9%	8.4%	48.9%	17.6%	25.2%	17.6%	25.2%
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
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
v/c Ratio	0.28	1.13	0.67	1.29	0.89	0.54	1.03	0.76
Control Delay	17.0	98.2	41.5	163.9	63.3	32.9	92.9	59.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	98.2	41.5	163.9	63.3	32.9	92.9	59.2
Queue Length 50th (m)	4.8	~323.5	17.8	~437.4	64.7	24.9	~84.3	52.3
Queue Length 95th (m)	11.3	#375.1	#55.6	#507.1	#92.8	38.9	#116.8	67.6
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	160	1684	196	1816	343	747	349	688
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	0.28	1.13	0.67	1.29	0.88	0.43	1.03	0.58

Intersection Summary
Cycle Length: 131
Actuated Cycle Length: 131
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.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Fifth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	1265	18	279	1519	547	84	358	201	356	470	222
Future Volume (vph)	204	1265	18	279	1519	547	84	358	201	356	470	222
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	5.7	5.7	4.0	5.7	5.7
Lane 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
Frpb, 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
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
Flt 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)	3467	3539	1503	1805	3574	1553	1736	3505	1532	1769	3471	1599
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.47	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	3467	3539	1503	174	3574	1553	865	3505	1532	514	3471	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	212	1318	19	291	1582	570	88	373	209	371	490	231
RTOR Reduction (vph)	0	0	13	0	0	182	0	0	158	0	0	168
Lane Group Flow (vph)	213	1318	6	291	1582	388	88	373	51	371	490	63
Confl. Peds. (#/hr)			1	1					1	1		
Heavy Vehicles (%)	1%	2%	6%	0%	1%	4%	4%	3%	4%	2%	4%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	12.6	39.7	39.7	62.8	46.2	46.2	27.9	18.4	18.4	46.2	32.7	32.7
Effective Green, g (s)	12.6	39.7	39.7	62.8	46.2	46.2	27.9	18.4	18.4	46.2	32.7	32.7
Actuated g/C Ratio	0.10	0.33	0.33	0.52	0.39	0.39	0.23	0.15	0.15	0.39	0.27	0.27
Clearance 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
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)	364	1170	497	350	1375	597	270	537	234	446	945	435
v/s Ratio Prot	0.06	0.37		c0.13	c0.44		0.03	0.11		c0.16	0.14	
v/s Ratio Perm			0.00	0.30		0.25	0.05		0.03	c0.15		0.04
v/c Ratio	0.59	1.13	0.01	0.83	1.15	0.65	0.33	0.69	0.22	0.83	0.52	0.14
Uniform Delay, d1	51.2	40.1	27.0	34.0	36.9	30.3	37.2	48.1	44.5	29.5	37.0	33.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	68.3	0.0	15.4	76.6	5.4	0.7	3.9	0.5	12.5	0.5	0.2
Delay (s)	53.6	108.5	27.0	49.4	113.5	35.7	37.9	52.0	45.0	42.0	37.5	33.2
Level of Service	D	F	C	D	F	D	D	D	D	D	D	C
Approach Delay (s)		99.9			87.7			48.0			38.1	
Approach LOS		F			F			D			D	

Intersection Summary				
HCM 2000 Control Delay	77.0	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	96.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	1265	18	279	1519	547	84	358	201	356	470	222
Future Volume (vph)	204	1265	18	279	1519	547	84	358	201	356	470	222
Lane Group Flow (vph)	213	1318	19	291	1582	570	88	373	209	371	490	231
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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%	9.2%	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
v/c Ratio	0.58	1.13	0.03	0.83	1.15	0.73	0.31	0.69	0.53	0.82	0.52	0.38
Control Delay	57.5	106.0	0.1	52.3	111.3	22.4	26.0	54.9	13.7	42.2	38.6	5.9
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	57.5	106.0	0.1	52.3	111.3	22.4	26.0	54.9	13.7	42.2	38.6	5.9
Queue Length 50th (m)	26.3	~198.8	0.0	53.0	~246.3	60.0	13.5	46.8	4.8	68.0	53.6	0.0
Queue Length 95th (m)	38.1	#243.1	0.0	#129.7	#326.8	#135.3	22.8	60.5	26.5	90.4	68.4	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)	399	1170	562	350	1375	779	504	855	515	466	965	611
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	0.53	1.13	0.03	0.83	1.15	0.73	0.17	0.44	0.41	0.80	0.51	0.38

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 103 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 125
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: 3: James Snow Parkway & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	2018	60	35	2101	24	198	0	77	74	0	169
Future Volume (vph)	30	2018	60	35	2101	24	198	0	77	74	0	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3524		1770	3533		1770	1583		1770	1583	
Flt Permitted	0.06	1.00		0.05	1.00		0.54	1.00		0.70	1.00	
Satd. Flow (perm)	102	3524		97	3533		998	1583		1308	1583	
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	2193	65	38	2284	26	215	0	84	80	0	184
RTOR Reduction (vph)	0	2	0	0	1	0	0	64	0	0	43	0
Lane Group Flow (vph)	33	2256	0	38	2309	0	215	20	0	80	141	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	72.7	72.7		80.4	80.4		28.6	28.6		28.6	28.6	
Effective Green, g (s)	72.7	72.7		80.4	80.4		28.6	28.6		28.6	28.6	
Actuated g/C Ratio	0.61	0.61		0.67	0.67		0.24	0.24		0.24	0.24	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	61	2134		116	2367		237	377		311	377	
v/s Ratio Prot		c0.64		0.01	c0.65			0.01			0.09	
v/s Ratio Perm	0.32			0.21			c0.22			0.06		
v/c Ratio	0.54	1.06		0.33	0.98		0.91	0.05		0.26	0.37	
Uniform Delay, d1	13.9	23.6		29.2	18.9		44.4	35.3		37.1	38.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.3	36.7		1.7	13.6		34.3	0.1		0.4	0.6	
Delay (s)	44.2	60.4		30.8	32.5		78.7	35.3		37.5	38.8	
Level of Service	D	E		C	C		E	D		D	D	
Approach Delay (s)		60.2			32.4			66.5			38.4	
Approach LOS		E			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	46.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	94.2%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	30	2018	35	2101	198	0	74	0
Future Volume (vph)	30	2018	35	2101	198	0	74	0
Lane Group Flow (vph)	33	2258	38	2310	215	84	80	184
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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)	70.0	70.0	10.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	58.3%	58.3%	8.3%	66.7%	33.3%	33.3%	33.3%	33.3%
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	5.7	5.7	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	0.53	1.03	0.25	0.98	0.91	0.19	0.26	0.44
Control Delay	54.7	52.9	11.8	34.0	82.3	5.9	37.4	28.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	52.9	11.8	34.0	82.3	5.9	37.4	28.5
Queue Length 50th (m)	4.9	~340.1	2.9	274.0	51.1	0.0	15.9	25.9
Queue Length 95th (m)	#25.5	#400.0	7.5	#372.8	#87.4	9.9	28.9	45.8
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	2186	150	2368	285	521	373	493
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	0.53	1.03	0.25	0.98	0.75	0.16	0.21	0.37

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.
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: 4: Clark Boulevard & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	2	10	13	2	92	4	458	2	17	482	11
Future Volume (vph)	39	2	10	13	2	92	4	458	2	17	482	11
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	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.87		1.00	0.85		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1626		1770	1589		1770	3537		1770	3527	
Flt Permitted	0.69	1.00		0.75	1.00		0.45	1.00		0.47	1.00	
Satd. Flow (perm)	1287	1626		1395	1589		843	3537		873	3527	
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)	42	2	11	14	2	100	4	498	2	18	524	12
RTOR Reduction (vph)	0	9	0	0	82	0	0	1	0	0	2	0
Lane Group Flow (vph)	42	4	0	14	20	0	4	499	0	18	534	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	5.9	5.9		5.9	5.9		16.6	16.6		16.6	16.6	
Effective Green, g (s)	5.9	5.9		5.9	5.9		16.6	16.6		16.6	16.6	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.50	0.50		0.50	0.50	
Clearance Time (s)	5.3	5.3		5.3	5.3		5.7	5.7		5.7	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)	226	286		245	279		417	1752		432	1747	
v/s Ratio Prot		0.00			0.01			0.14			c0.15	
v/s Ratio Perm	c0.03			0.01			0.00			0.02		
v/c Ratio	0.19	0.01		0.06	0.07		0.01	0.29		0.04	0.31	
Uniform Delay, d1	11.8	11.4		11.5	11.5		4.3	5.0		4.4	5.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.0		0.1	0.1		0.0	0.1		0.0	0.1	
Delay (s)	12.2	11.4		11.6	11.6		4.3	5.1		4.4	5.1	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		12.0			11.6			5.0			5.1	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	33.5	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	32.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	39	2	13	2	4	458	17	482
Future Volume (vph)	39	2	13	2	4	458	17	482
Lane Group Flow (vph)	42	13	14	102	4	500	18	536
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	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)	35.0	35.0	35.0	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	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio	0.10	0.02	0.03	0.18	0.01	0.23	0.03	0.25
Control Delay	8.8	5.6	8.2	3.6	7.0	6.5	7.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	5.6	8.2	3.6	7.0	6.5	7.3	6.6
Queue Length 50th (m)	1.5	0.1	0.5	0.1	0.1	10.2	0.6	11.0
Queue Length 95th (m)	5.7	2.1	2.7	5.8	1.1	17.1	2.8	18.2
Internal Link Dist (m)		204.0		113.8		156.9		372.1
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	1223	1546	1326	1515	844	3536	874	3529
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	0.03	0.01	0.01	0.07	0.00	0.14	0.02	0.15

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 31.3
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	0	0	0	56	0	184	0	14	74	7
Future Volume (Veh/h)	35	0	0	0	0	56	0	184	0	14	74	7
Sign Control		Stop			Stop			Free			Free	
Grade		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)	38	0	0	0	0	61	0	200	0	15	80	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked												
vC, conflicting volume	375	314	84	314	318	200	88			200		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	375	314	84	314	318	200	88			200		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	100	100	100	93	100			99		
cM capacity (veh/h)	535	595	975	633	592	841	1508			1372		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	38	61	200	103
Volume Left	38	0	0	15
Volume Right	0	61	0	8
cSH	535	841	1508	1372
Volume to Capacity	0.07	0.07	0.00	0.01
Queue Length 95th (m)	1.8	1.9	0.0	0.3
Control Delay (s)	12.2	9.6	0.0	1.2
Lane LOS	B	A		A
Approach Delay (s)	12.2	9.6	0.0	1.2
Approach LOS	B	A		

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	31.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2294	6	0	2369	0	15
Future Volume (Veh/h)	2294	6	0	2369	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2493	7	0	2575	0	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				360		
pX, platoon unblocked					0.37	
vC, conflicting volume			2500		3784	1250
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2500		5143	1250
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	90
cM capacity (veh/h)			179		0	164

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1662	838	1288	1288	16
Volume Left	0	0	0	0	0
Volume Right	0	7	0	0	16
cSH	1700	1700	1700	1700	164
Volume to Capacity	0.98	0.49	0.76	0.76	0.10
Queue Length 95th (m)	0.0	0.0	0.0	0.0	2.5
Control Delay (s)	0.0	0.0	0.0	0.0	29.3
Lane LOS					D
Approach Delay (s)	0.0		0.0		29.3
Approach LOS					D

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	73.6%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	3	23	0	0	16
Future Volume (Veh/h)	3	3	23	0	0	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	3	25	0	0	17
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	25				34	25
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	25				34	25
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	1589				977	1051

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	6	25	17
Volume Left	3	0	0
Volume Right	0	0	17
cSH	1589	1700	1051
Volume to Capacity	0.00	0.01	0.02
Queue Length 95th (m)	0.0	0.0	0.4
Control Delay (s)	3.6	0.0	8.5
Lane LOS	A		A
Approach Delay (s)	3.6	0.0	8.5
Approach LOS			A

Intersection Summary				
Average Delay		3.5		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	3	0	0	0	23	0	0	0	0	0
Future Volume (Veh/h)	0	0	3	0	0	0	23	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		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)	0	0	3	0	0	0	25	0	0	0	0	0
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	0			3			2	2	2	2	3	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			3			2	2	2	2	3	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1623			1619			1021	894	1083	1021	893	1085

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	3	0	25	0
Volume Left	0	0	25	0
Volume Right	3	0	0	0
cSH	1623	1700	1021	1700
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (m)	0.0	0.0	0.6	0.0
Control Delay (s)	0.0	0.0	8.6	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	8.6	0.0
Approach LOS			A	A

Intersection Summary				
Average Delay		7.7		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	13	65	0	0	12
Future Volume (Veh/h)	2	13	65	0	0	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	14	71	0	0	13
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		297				
pX, platoon unblocked						
vC, conflicting volume	71				89	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	71				89	71
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1529				910	991

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	16	71	13
Volume Left	2	0	0
Volume Right	0	0	13
cSH	1529	1700	991
Volume to Capacity	0.00	0.04	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.9	0.0	8.7
Lane LOS	A		A
Approach Delay (s)	0.9	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	13.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	6	7	0	39	26	0
Future Volume (Veh/h)	6	7	0	39	26	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	8	0	42	28	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	345					
pX, platoon unblocked						
vC, conflicting volume			15		53	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			15		53	11
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	100
cM capacity (veh/h)			1603		955	1070

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	15	42	28
Volume Left	0	0	28
Volume Right	8	0	0
cSH	1700	1603	955
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (m)	0.0	0.0	0.7
Control Delay (s)	0.0	0.0	8.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	16	84	0	0	23
Future Volume (Veh/h)	5	16	84	0	0	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	17	91	0	0	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		138				
pX, platoon unblocked						
vC, conflicting volume	91				118	91
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	91				118	91
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	97
cM capacity (veh/h)	1504				875	967

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	22	91	25
Volume Left	5	0	0
Volume Right	0	0	25
cSH	1504	1700	967
Volume to Capacity	0.00	0.05	0.03
Queue Length 95th (m)	0.1	0.0	0.6
Control Delay (s)	1.7	0.0	8.8
Lane LOS	A		A
Approach Delay (s)	1.7	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	15.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	15	1	0	77	7	0
Future Volume (Veh/h)	15	1	0	77	7	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	1	0	84	8	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	258					
pX, platoon unblocked						
vC, conflicting volume			17		100	16
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			17		100	16
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1600		898	1063

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	17	84	8
Volume Left	0	0	8
Volume Right	1	0	0
cSH	1700	1600	898
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.2
Control Delay (s)	0.0	0.0	9.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	14.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	2127	113	35	2011	26	230	173	42	141	234	156
Future Volume (vph)	184	2127	113	35	2011	26	230	173	42	141	234	156
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	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3484		1736	3524		1805	3477		1787	3360	
Flt Permitted	0.07	1.00		0.08	1.00		0.29	1.00		0.61	1.00	
Satd. Flow (perm)	136	3484		144	3524		555	3477		1154	3360	
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)	190	2193	116	36	2073	27	237	178	43	145	241	161
RTOR Reduction (vph)	0	3	0	0	1	0	0	21	0	0	112	0
Lane Group Flow (vph)	190	2306	0	36	2099	0	237	200	0	145	290	0
Heavy Vehicles (%)	2%	3%	0%	4%	2%	22%	0%	1%	0%	1%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	67.5	59.3		55.0	50.8		31.0	31.0		19.0	19.0	
Effective Green, g (s)	67.5	59.3		55.0	50.8		31.0	31.0		19.0	19.0	
Actuated g/C Ratio	0.61	0.53		0.50	0.46		0.28	0.28		0.17	0.17	
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)	269	1861		131	1612		245	971		197	575	
v/s Ratio Prot	c0.08	c0.66		0.01	c0.60		c0.07	0.06			0.09	
v/s Ratio Perm	0.35			0.13			c0.20			0.13		
v/c Ratio	0.71	1.24		0.27	1.30		0.97	0.21		0.74	0.50	
Uniform Delay, d1	29.3	25.9		24.5	30.1		37.5	30.6		43.6	41.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.2	112.4		1.1	140.7		47.9	0.1		13.3	0.7	
Delay (s)	37.5	138.3		25.6	170.8		85.4	30.7		57.0	42.4	
Level of Service	D	F		C	F		F	C		E	D	
Approach Delay (s)		130.6			168.4			59.0			46.3	
Approach LOS		F			F			E			D	

Intersection Summary				
HCM 2000 Control Delay	130.9	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.18			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	109.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	184	2127	35	2011	230	173	141	234
Future Volume (vph)	184	2127	35	2011	230	173	141	234
Lane Group Flow (vph)	190	2309	36	2100	237	221	145	402
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	5	2	1	6	3	8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	55.0	11.0	55.0	12.0	45.0	33.0	33.0
Total Split (%)	9.9%	49.5%	9.9%	49.5%	10.8%	40.5%	29.7%	29.7%
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	0.70	1.21	0.20	1.30	0.93	0.22	0.74	0.59
Control Delay	38.4	124.1	12.6	169.3	73.6	25.9	64.0	30.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	124.1	12.6	169.3	73.6	25.9	64.0	30.4
Queue Length 50th (m)	24.2	~358.7	2.9	~334.3	43.4	17.5	31.6	29.3
Queue Length 95th (m)	#80.7	#433.6	8.3	#379.2	#73.6	25.0	50.5	41.9
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)	271	1913	178	1612	256	1231	277	910
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	0.70	1.21	0.20	1.30	0.93	0.18	0.52	0.44

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.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Sixth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1950	94	103	2396	129	257	80	217	325	306	82
Future Volume (vph)	44	1950	94	103	2396	129	257	80	217	325	306	82
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	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	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3518		1805	3522		1736	3123		1612	3213	
Flt Permitted	0.06	1.00		0.06	1.00		0.30	1.00		0.40	1.00	
Satd. Flow (perm)	119	3518		114	3522		547	3123		671	3213	
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
Adj. Flow (vph)	46	2053	99	108	2522	136	271	84	228	342	322	86
RTOR Reduction (vph)	0	3	0	0	2	0	0	108	0	0	19	0
Lane Group Flow (vph)	46	2149	0	108	2656	0	271	204	0	342	389	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	15%	4%	0%	4%	12%	9%	8%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	70.0	64.1		75.6	66.9		38.4	20.2		40.0	21.0	
Effective Green, g (s)	70.0	64.1		75.6	66.9		38.4	20.2		40.0	21.0	
Actuated g/C Ratio	0.53	0.49		0.58	0.51		0.29	0.15		0.31	0.16	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.7		4.0	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)	139	1721		178	1798		325	481		341	515	
v/s Ratio Prot	0.01	0.61		c0.04	c0.75		0.12	0.07		c0.15	0.12	
v/s Ratio Perm	0.16			0.31			0.13			c0.16		
v/c Ratio	0.33	1.25		0.61	1.48		0.83	0.42		1.00	0.75	
Uniform Delay, d1	28.7	33.5		28.5	32.0		39.2	50.1		42.3	52.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	117.1		5.7	217.7		16.6	0.6		49.5	6.2	
Delay (s)	30.1	150.5		34.2	249.7		55.7	50.7		91.7	58.8	
Level of Service	C	F		C	F		E	D		F	E	
Approach Delay (s)		148.0			241.3			53.1			73.8	
Approach LOS		F			F			D			E	

Intersection Summary				
HCM 2000 Control Delay	171.4	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.28			
Actuated Cycle Length (s)	131.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	119.2%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	44	1950	103	2396	257	80	325	306
Future Volume (vph)	44	1950	103	2396	257	80	325	306
Lane Group Flow (vph)	46	2152	108	2658	271	312	342	408
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	64.0	11.0	64.0	23.0	33.0	23.0	33.0
Total Split (%)	8.4%	48.9%	8.4%	48.9%	17.6%	25.2%	17.6%	25.2%
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
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
v/c Ratio	0.29	1.25	0.61	1.46	0.82	0.53	0.98	0.77
Control Delay	17.5	147.7	35.5	237.2	53.1	32.0	80.9	59.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	147.7	35.5	237.2	53.1	32.0	80.9	59.2
Queue Length 50th (m)	5.0	~390.7	12.2	~533.7	56.6	23.8	76.5	53.4
Queue Length 95th (m)	11.7	#450.8	#40.0	#600.3	#78.8	37.6	#106.2	68.8
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	159	1724	178	1822	343	751	350	687
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	0.29	1.25	0.61	1.46	0.79	0.42	0.98	0.59

Intersection Summary
Cycle Length: 131
Actuated Cycle Length: 131
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.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Fifth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	1393	20	305	1689	617	102	436	240	432	572	270
Future Volume (vph)	225	1393	20	305	1689	617	102	436	240	432	572	270
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	5.7	5.7	4.0	5.7	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	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
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
Flt 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)	3467	5085	1503	1805	5136	1553	1736	5036	1532	1769	4988	1599
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.42	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	3467	5085	1503	174	5136	1553	760	5036	1532	525	4988	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	1451	21	318	1759	643	106	454	250	450	596	281
RTOR Reduction (vph)	0	0	14	0	0	268	0	0	140	0	0	206
Lane Group Flow (vph)	234	1451	7	318	1759	375	106	454	110	450	596	75
Confl. Peds. (#/hr)			1	1					1	1		
Heavy Vehicles (%)	1%	2%	6%	0%	1%	4%	4%	3%	4%	2%	4%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	13.3	39.7	39.7	62.8	45.5	45.5	27.4	17.2	17.2	46.2	32.0	32.0
Effective Green, g (s)	13.3	39.7	39.7	62.8	45.5	45.5	27.4	17.2	17.2	46.2	32.0	32.0
Actuated g/C Ratio	0.11	0.33	0.33	0.52	0.38	0.38	0.23	0.14	0.14	0.39	0.27	0.27
Clearance 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
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)	384	1682	497	350	1947	588	256	721	219	461	1330	426
v/s Ratio Prot	0.07	0.29		c0.14	0.34		0.04	0.09		c0.20	0.12	
v/s Ratio Perm			0.00	c0.33		0.24	0.06		0.07	c0.17		0.05
v/c Ratio	0.61	0.86	0.01	0.91	0.90	0.64	0.41	0.63	0.50	0.98	0.45	0.18
Uniform Delay, d1	50.9	37.6	27.0	35.2	35.2	30.5	38.1	48.4	47.4	31.2	36.6	33.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	6.1	0.1	26.2	7.4	5.2	1.1	1.7	1.8	35.4	0.2	0.2
Delay (s)	53.6	43.7	27.0	61.4	42.6	35.7	39.1	50.1	49.2	66.5	36.9	34.1
Level of Service	D	D	C	E	D	D	D	D	D	E	D	C
Approach Delay (s)		44.9			43.1			48.4			46.3	
Approach LOS		D			D			D			D	

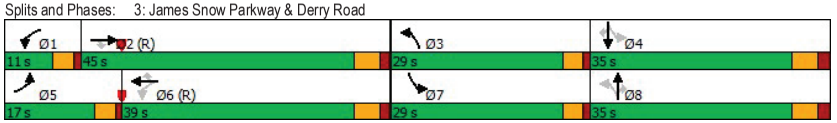
Intersection Summary				
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	92.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	1393	20	305	1689	617	102	436	240	432	572	270
Future Volume (vph)	225	1393	20	305	1689	617	102	436	240	432	572	270
Lane Group Flow (vph)	234	1451	21	318	1759	643	106	454	250	450	596	281
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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%	9.2%	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
v/c Ratio	0.61	0.86	0.04	0.91	0.90	0.75	0.40	0.63	0.70	0.96	0.45	0.44
Control Delay	57.5	44.0	0.1	63.2	43.6	17.4	28.3	52.1	27.6	63.2	37.7	6.2
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	57.5	44.0	0.1	63.2	43.6	17.4	28.3	52.1	27.6	63.2	37.7	6.2
Queue Length 50th (m)	28.9	122.7	0.0	60.0	148.8	44.9	16.6	39.4	19.7	89.0	45.2	0.0
Queue Length 95th (m)	41.2	143.2	0.0	#144.1	#217.7	#125.7	26.7	48.6	46.8	#137.2	55.4	20.4
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)	410	1682	562	350	1947	856	481	1229	498	468	1328	632
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	0.57	0.86	0.04	0.91	0.90	0.75	0.22	0.37	0.50	0.96	0.45	0.44

Intersection Summary
Cycle 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: Actuated-Coordinated
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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	2248	58	44	2314	24	263	10	140	80	7	169
Future Volume (vph)	36	2248	58	44	2314	24	263	10	140	80	7	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3526		1770	3534		1770	1602		1770	1595	
Flt Permitted	0.06	1.00		0.06	1.00		0.55	1.00		0.60	1.00	
Satd. Flow (perm)	113	3526		107	3534		1029	1602		1117	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)	39	2443	63	48	2515	26	286	11	152	87	8	184
RTOR Reduction (vph)	0	1	0	0	1	0	0	67	0	0	3	0
Lane Group Flow (vph)	39	2505	0	48	2540	0	286	96	0	87	189	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	65.9	65.9		74.7	74.7		34.3	34.3		34.3	34.3	
Effective Green, g (s)	65.9	65.9		74.7	74.7		34.3	34.3		34.3	34.3	
Actuated g/C Ratio	0.55	0.55		0.62	0.62		0.29	0.29		0.29	0.29	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	62	1936		133	2199		294	457		319	455	
v/s Ratio Prot		c0.71		0.01	c0.72			0.06			0.12	
v/s Ratio Perm	0.34			0.21			c0.28			0.08		
v/c Ratio	0.63	1.29		0.36	1.16		0.97	0.21		0.27	0.42	
Uniform Delay, d1	18.6	27.0		27.4	22.6		42.4	32.6		33.2	34.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	39.8	136.2		1.7	75.5		44.8	0.2		0.5	0.6	
Delay (s)	58.4	163.2		29.0	98.1		87.1	32.8		33.7	35.3	
Level of Service	E	F		C	F		F	C		C	D	
Approach Delay (s)		161.6			96.8			67.4			34.8	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM 2000 Control Delay	119.7	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.20			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	104.0%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	36	2248	44	2314	263	10	80	7
Future Volume (vph)	36	2248	44	2314	263	10	80	7
Lane Group Flow (vph)	39	2506	48	2541	286	163	87	192
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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)	70.0	70.0	10.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	58.3%	58.3%	8.3%	66.7%	33.3%	33.3%	33.3%	33.3%
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	5.7	5.7	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	0.62	1.28	0.32	1.16	0.97	0.31	0.27	0.42
Control Delay	66.0	155.9	14.0	99.5	89.3	16.4	36.1	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.0	155.9	14.0	99.5	89.3	16.4	36.1	37.4
Queue Length 50th (m)	6.5	~424.7	4.2	~392.7	70.2	12.8	16.7	37.8
Queue Length 95th (m)	#28.5	#467.5	8.9	#435.5	#127.3	31.2	31.6	60.5
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)	63	1960	150	2199	294	525	319	458
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	0.62	1.28	0.32	1.16	0.97	0.31	0.27	0.42

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.
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: 4: Clark Boulevard & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	16	10	40	12	20	4	495	10	14	478	11
Future Volume (vph)	39	16	10	40	12	20	4	495	10	14	478	11
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	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.91		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1753		1770	1687		1770	3529		1770	3527	
Flt Permitted	1.00	1.00		1.00	1.00		0.45	1.00		0.45	1.00	
Satd. Flow (perm)	1863	1753		1863	1687		846	3529		832	3527	
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)	42	17	11	43	13	22	4	538	11	15	520	12
RTOR Reduction (vph)	0	10	0	0	20	0	0	1	0	0	2	0
Lane Group Flow (vph)	42	18	0	43	15	0	4	548	0	15	530	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	3.7	3.7		3.7	3.7		18.3	18.3		18.3	18.3	
Effective Green, g (s)	3.7	3.7		3.7	3.7		18.3	18.3		18.3	18.3	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.55	0.55		0.55	0.55	
Clearance Time (s)	5.3	5.3		5.3	5.3		5.7	5.7		5.7	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)	208	196		208	189		469	1956		461	1955	
v/s Ratio Prot		0.01			0.01			c0.16			0.15	
v/s Ratio Perm	0.02			c0.02			0.00			0.02		
v/c Ratio	0.20	0.09		0.21	0.08		0.01	0.28		0.03	0.27	
Uniform Delay, d1	13.3	13.1		13.3	13.1		3.3	3.9		3.3	3.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.2		0.5	0.2		0.0	0.1		0.0	0.1	
Delay (s)	13.8	13.4		13.8	13.3		3.3	4.0		3.4	3.9	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		13.6			13.6			3.9			3.9	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	33.0	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	32.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	39	16	40	12	4	495	14	478
Future Volume (vph)	39	16	40	12	4	495	14	478
Lane Group Flow (vph)	42	28	43	35	4	549	15	532
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	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)	35.0	35.0	35.0	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	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio	0.07	0.05	0.07	0.06	0.01	0.21	0.02	0.20
Control Delay	7.7	6.3	7.8	5.4	6.2	4.8	6.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	6.3	7.8	5.4	6.2	4.8	6.2	4.8
Queue Length 50th (m)	0.6	0.2	0.6	0.3	0.0	0.0	0.0	0.0
Queue Length 95th (m)	5.5	3.7	5.6	3.9	1.1	18.7	2.5	18.1
Internal Link Dist (m)		204.0		113.8		156.9		372.1
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	1772	1668	1772	1606	846	3529	833	3529
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	0.02	0.02	0.02	0.02	0.00	0.16	0.02	0.15

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 29.8
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	0	5	6	0	51	1	332	1	12	90	7
Future Volume (Veh/h)	30	0	5	6	0	51	1	332	1	12	90	7
Sign Control		Stop			Stop			Free			Free	
Grade		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)	33	0	5	7	0	55	1	361	1	13	98	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked												
vC, conflicting volume	546	492	102	496	496	362	106			362		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	546	492	102	496	496	362	106			362		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	99	99	100	92	100			99		
cM capacity (veh/h)	408	472	953	477	470	683	1485			1197		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	38	62	363	119
Volume Left	33	7	1	13
Volume Right	5	55	1	8
cSH	442	651	1485	1197
Volume to Capacity	0.09	0.10	0.00	0.01
Queue Length 95th (m)	2.2	2.5	0.0	0.3
Control Delay (s)	13.9	11.1	0.0	1.0
Lane LOS	B	B	A	A
Approach Delay (s)	13.9	11.1	0.0	1.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	33.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2492	6	0	2645	0	15
Future Volume (Veh/h)	2492	6	0	2645	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2709	7	0	2875	0	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				360		
pX, platoon unblocked					0.39	
vC, conflicting volume			2716		4150	1358
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2716		5922	1358
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	88
cM capacity (veh/h)			147		0	139

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1806	910	1438	1438	16
Volume Left	0	0	0	0	0
Volume Right	0	7	0	0	16
cSH	1700	1700	1700	1700	139
Volume to Capacity	1.06	0.54	0.85	0.85	0.12
Queue Length 95th (m)	0.0	0.0	0.0	0.0	3.1
Control Delay (s)	0.0	0.0	0.0	0.0	34.3
Lane LOS					D
Approach Delay (s)	0.0		0.0		34.3
Approach LOS					D

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	79.1%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	127	2	5	43	2	20	0	35	12	0	1
Future Volume (Veh/h)	0	127	2	5	43	2	20	0	35	12	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		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)	0	138	2	5	47	2	22	0	38	13	0	1
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	49			140			198	198	139	235	198	48
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	49			140			198	198	139	235	198	48
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	96	98	100	100
cM capacity (veh/h)	1558			1443			758	695	909	688	695	1021

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	140	54	60	14
Volume Left	0	5	22	13
Volume Right	2	2	38	1
cSH	1558	1443	847	704
Volume to Capacity	0.00	0.00	0.07	0.02
Queue Length 95th (m)	0.0	0.1	1.8	0.5
Control Delay (s)	0.0	0.7	9.6	10.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	0.7	9.6	10.2
Approach LOS			A	B

Intersection Summary					
Average Delay	2.8				
Intersection Capacity Utilization	16.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	4	173	1	4	49
Future Volume (Veh/h)	1	4	173	1	4	49
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)	1	4	188	1	4	53
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	250	188			189	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	250	188			189	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	737	853			1385	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	5	189	57
Volume Left	1	0	4
Volume Right	4	1	0
cSH	827	1700	1385
Volume to Capacity	0.01	0.11	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	9.4	0.0	0.6
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	0.6
Approach LOS	A		

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	19.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	75	66	1	25	3
Future Volume (Veh/h)	2	75	66	1	25	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	82	72	1	27	3
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	73				158	72
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	73				158	72
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	100
cM capacity (veh/h)	1527				832	990

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	84	73	30
Volume Left	2	0	27
Volume Right	0	1	3
cSH	1527	1700	845
Volume to Capacity	0.00	0.04	0.04
Queue Length 95th (m)	0.0	0.0	0.9
Control Delay (s)	0.2	0.0	9.4
Lane LOS	A		A
Approach Delay (s)	0.2	0.0	9.4
Approach LOS			A

Intersection Summary				
Average Delay		1.6		
Intersection Capacity Utilization	15.6%	ICU Level of Service		A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	95	2	2	61	1	5	0	21	13	0	1
Future Volume (Veh/h)	3	95	2	2	61	1	5	0	21	13	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		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)	3	103	2	2	66	1	5	0	23	14	0	1
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	67			105			182	181	104	204	182	66
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			105			182	181	104	204	182	66
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	98	98	100	100
cM capacity (veh/h)	1535			1486			777	711	951	734	710	997

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	108	69	28	15
Volume Left	3	2	5	14
Volume Right	2	1	23	1
cSH	1535	1486	914	748
Volume to Capacity	0.00	0.00	0.03	0.02
Queue Length 95th (m)	0.0	0.0	0.8	0.5
Control Delay (s)	0.2	0.2	9.1	9.9
Lane LOS	A	A	A	A
Approach Delay (s)	0.2	0.2	9.1	9.9
Approach LOS			A	A

Intersection Summary				
Average Delay		2.0		
Intersection Capacity Utilization	16.4%	ICU Level of Service		A
Analysis Period (min)		15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	49	69	1	10	1
Future Volume (Veh/h)	2	49	69	1	10	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	53	75	1	11	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		297				
pX, platoon unblocked						
vC, conflicting volume	76				132	76
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	76				132	76
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1523				860	986

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	55	76	12
Volume Left	2	0	11
Volume Right	0	1	1
cSH	1523	1700	869
Volume to Capacity	0.00	0.04	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.3	0.0	9.2
Lane LOS	A		A
Approach Delay (s)	0.3	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		14.2%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	54	5	2	67	3	23
Future Volume (Veh/h)	54	5	2	67	3	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	5	2	73	3	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	345					
pX, platoon unblocked						
vC, conflicting volume			64		138	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			64		138	62
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			1538		854	1004

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	64	75	28
Volume Left	0	2	3
Volume Right	5	0	25
cSH	1700	1538	985
Volume to Capacity	0.04	0.00	0.03
Queue Length 95th (m)	0.0	0.0	0.7
Control Delay (s)	0.0	0.2	8.8
Lane LOS		A	A
Approach Delay (s)	0.0	0.2	8.8
Approach LOS			A

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		15.1%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	37	70	1	10	2
Future Volume (Veh/h)	3	37	70	1	10	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	40	76	1	11	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		138				
pX, platoon unblocked						
vC, conflicting volume	77				122	76
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	77				122	76
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1522				871	985

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	43	77	13
Volume Left	3	0	11
Volume Right	0	1	2
cSH	1522	1700	887
Volume to Capacity	0.00	0.05	0.01
Queue Length 95th (m)	0.0	0.0	0.4
Control Delay (s)	0.5	0.0	9.1
Lane LOS	A		A
Approach Delay (s)	0.5	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		14.4%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	46	1	0	70	1	5
Future Volume (Veh/h)	46	1	0	70	1	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	1	0	76	1	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	258					
pX, platoon unblocked						
vC, conflicting volume			51		126	50
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			51		126	50
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1555		868	1018

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	51	76	6
Volume Left	0	0	1
Volume Right	1	0	5
cSH	1700	1555	989
Volume to Capacity	0.03	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		13.7%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	2127	113	35	2011	26	230	173	42	141	234	156
Future Volume (vph)	184	2127	113	35	2011	26	230	173	42	141	234	156
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	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5005		1736	5063		1805	3477		1787	3360	
Flt Permitted	0.07	1.00		0.08	1.00		0.29	1.00		0.61	1.00	
Satd. Flow (perm)	136	5005		144	5063		555	3477		1154	3360	
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)	190	2193	116	36	2073	27	237	178	43	145	241	161
RTOR Reduction (vph)	0	4	0	0	1	0	0	21	0	0	112	0
Lane Group Flow (vph)	190	2305	0	36	2099	0	237	200	0	145	290	0
Heavy Vehicles (%)	2%	3%	0%	4%	2%	22%	0%	1%	0%	1%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	67.5	59.3		55.0	50.8		31.0	31.0		19.0	19.0	
Effective Green, g (s)	67.5	59.3		55.0	50.8		31.0	31.0		19.0	19.0	
Actuated g/C Ratio	0.61	0.53		0.50	0.46		0.28	0.28		0.17	0.17	
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)	269	2673		131	2317		245	971		197	575	
v/s Ratio Prot	c0.08	c0.46		0.01	c0.41		c0.07	0.06			0.09	
v/s Ratio Perm	0.35			0.13			c0.20			0.13		
v/c Ratio	0.71	0.86		0.27	0.91		0.97	0.21		0.74	0.50	
Uniform Delay, d1	27.9	22.3		19.3	27.9		37.5	30.6		43.6	41.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.2	4.0		1.1	6.5		47.9	0.1		13.3	0.7	
Delay (s)	36.1	26.3		20.4	34.4		85.4	30.7		57.0	42.4	
Level of Service	D	C		C	C		F	C		E	D	
Approach Delay (s)		27.0			34.1			59.0			46.3	
Approach LOS		C			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	90.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	184	2127	35	2011	230	173	141	234
Future Volume (vph)	184	2127	35	2011	230	173	141	234
Lane Group Flow (vph)	190	2309	36	2100	237	221	145	402
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	5	2	1	6	3	8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	55.0	11.0	55.0	12.0	45.0	33.0	33.0
Total Split (%)	9.9%	49.5%	9.9%	49.5%	10.8%	40.5%	29.7%	29.7%
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	0.70	0.84	0.20	0.91	0.93	0.22	0.74	0.59
Control Delay	38.4	26.8	12.6	35.2	73.6	25.9	64.0	30.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	26.8	12.6	35.2	73.6	25.9	64.0	30.4
Queue Length 50th (m)	24.2	169.4	2.9	164.1	43.4	17.5	31.6	29.3
Queue Length 95th (m)	#80.7	#241.0	8.3	#202.6	#73.6	25.0	50.5	41.9
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)	271	2748	178	2316	256	1231	277	910
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	0.70	0.84	0.20	0.91	0.93	0.18	0.52	0.44

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: 110
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Sixth Line & Derry Road

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

Future Total (PM) - Sensitivity
2035 Horizon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1950	94	103	2396	129	257	80	217	325	306	82
Future Volume (vph)	44	1950	94	103	2396	129	257	80	217	325	306	82
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	5.7		4.0	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	0.99		1.00	0.89		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5055		1805	5060		1736	3123		1612	3213	
Flt Permitted	0.06	1.00		0.06	1.00		0.30	1.00		0.40	1.00	
Satd. Flow (perm)	119	5055		114	5060		547	3123		671	3213	
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
Adj. Flow (vph)	46	2053	99	108	2522	136	271	84	228	342	322	86
RTOR Reduction (vph)	0	4	0	0	4	0	0	108	0	0	19	0
Lane Group Flow (vph)	46	2148	0	108	2654	0	271	204	0	342	389	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	15%	4%	0%	4%	12%	9%	8%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	70.0	64.1		75.6	66.9		38.4	20.2		40.0	21.0	
Effective Green, g (s)	70.0	64.1		75.6	66.9		38.4	20.2		40.0	21.0	
Actuated g/C Ratio	0.53	0.49		0.58	0.51		0.29	0.15		0.31	0.16	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.7		4.0	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)	139	2473		178	2584		325	481		341	515	
v/s Ratio Prot	0.01	0.43		c0.04	c0.52		0.12	0.07		c0.15	0.12	
v/s Ratio Perm	0.16			0.31			0.13			c0.16		
v/c Ratio	0.33	0.87		0.61	1.03		0.83	0.42		1.00	0.75	
Uniform Delay, d1	28.7	29.7		24.9	32.0		39.2	50.1		42.3	52.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	4.5		5.7	25.1		16.6	0.6		49.5	6.2	
Delay (s)	30.1	34.2		30.7	57.1		55.7	50.7		91.7	58.8	
Level of Service	C	C		C	E		E	D		F	E	
Approach Delay (s)		34.1			56.1			53.1			73.8	
Approach LOS		C			E			D			E	

Intersection Summary				
HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	131.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	98.1%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Queues
2: Fifth Line & Derry Road

Future Total (PM) - Sensitivity
2035 Horizon

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	44	1950	103	2396	257	80	325	306
Future Volume (vph)	44	1950	103	2396	257	80	325	306
Lane Group Flow (vph)	46	2152	108	2658	271	312	342	408
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	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	64.0	11.0	64.0	23.0	33.0	23.0	33.0
Total Split (%)	8.4%	48.9%	8.4%	48.9%	17.6%	25.2%	17.6%	25.2%
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
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
v/c Ratio	0.29	0.87	0.61	1.02	0.82	0.53	0.98	0.77
Control Delay	17.5	35.3	35.5	53.7	53.1	32.0	80.9	59.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	35.3	35.5	53.7	53.1	32.0	80.9	59.2
Queue Length 50th (m)	5.0	189.4	12.2	~289.7	56.6	23.8	76.5	53.4
Queue Length 95th (m)	11.7	#232.3	#40.0	#343.9	#78.8	37.6	#106.2	68.8
Internal Link Dist (m)		170.5		124.7		340.6		275.9
Turn Bay Length (m)	100.0		90.0		70.0		50.0	
Base Capacity (vph)	159	2476	178	2618	343	751	350	687
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	0.29	0.87	0.61	1.02	0.79	0.42	0.98	0.59

Intersection Summary
Cycle Length: 131
Actuated Cycle Length: 131
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.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Fifth Line & Derry Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	1393	20	305	1689	617	102	436	240	432	572	270
Future Volume (vph)	225	1393	20	305	1689	617	102	436	240	432	572	270
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	5.7	5.7	4.0	5.7	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	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
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
Flt 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)	3467	5085	1503	1805	5136	1553	1736	5036	1532	1769	4988	1599
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.42	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	3467	5085	1503	174	5136	1553	760	5036	1532	525	4988	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	1451	21	318	1759	643	106	454	250	450	596	281
RTOR Reduction (vph)	0	0	14	0	0	268	0	0	140	0	0	206
Lane Group Flow (vph)	234	1451	7	318	1759	375	106	454	110	450	596	75
Confl. Peds. (#/hr)			1	1					1	1		
Heavy Vehicles (%)	1%	2%	6%	0%	1%	4%	4%	3%	4%	2%	4%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Actuated Green, G (s)	13.3	39.7	39.7	62.8	45.5	45.5	27.4	17.2	17.2	46.2	32.0	32.0
Effective Green, g (s)	13.3	39.7	39.7	62.8	45.5	45.5	27.4	17.2	17.2	46.2	32.0	32.0
Actuated g/C Ratio	0.11	0.33	0.33	0.52	0.38	0.38	0.23	0.14	0.14	0.39	0.27	0.27
Clearance 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
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)	384	1682	497	350	1947	588	256	721	219	461	1330	426
v/s Ratio Prot	0.07	0.29		c0.14	0.34		0.04	0.09		c0.20	0.12	
v/s Ratio Perm			0.00	c0.33		0.24	0.06		0.07	c0.17		0.05
v/c Ratio	0.61	0.86	0.01	0.91	0.90	0.64	0.41	0.63	0.50	0.98	0.45	0.18
Uniform Delay, d1	50.9	37.6	27.0	35.2	35.2	30.5	38.1	48.4	47.4	31.2	36.6	33.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	6.1	0.1	26.2	7.4	5.2	1.1	1.7	1.8	35.4	0.2	0.2
Delay (s)	53.6	43.7	27.0	61.4	42.6	35.7	39.1	50.1	49.2	66.5	36.9	34.1
Level of Service	D	D	C	E	D	D	D	D	D	E	D	C
Approach Delay (s)		44.9			43.1			48.4			46.3	
Approach LOS		D			D			D			D	

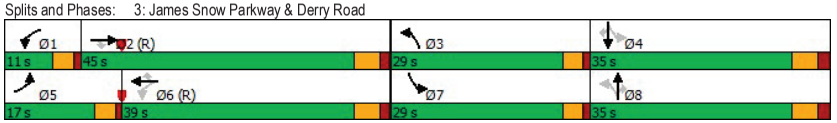
Intersection Summary				
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	92.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	1393	20	305	1689	617	102	436	240	432	572	270
Future Volume (vph)	225	1393	20	305	1689	617	102	436	240	432	572	270
Lane Group Flow (vph)	234	1451	21	318	1759	643	106	454	250	450	596	281
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	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	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%	9.2%	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
v/c Ratio	0.61	0.86	0.04	0.91	0.90	0.75	0.40	0.63	0.70	0.96	0.45	0.44
Control Delay	57.5	44.0	0.1	63.2	43.6	17.4	28.3	52.1	27.6	63.2	37.7	6.2
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	57.5	44.0	0.1	63.2	43.6	17.4	28.3	52.1	27.6	63.2	37.7	6.2
Queue Length 50th (m)	28.9	122.7	0.0	60.0	148.8	44.9	16.6	39.4	19.7	89.0	45.2	0.0
Queue Length 95th (m)	41.2	143.2	0.0	#144.1	#217.7	#125.7	26.7	48.6	46.8	#137.2	55.4	20.4
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)	410	1682	562	350	1947	856	481	1229	498	468	1328	632
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	0.57	0.86	0.04	0.91	0.90	0.75	0.22	0.37	0.50	0.96	0.45	0.44

Intersection Summary
Cycle 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: Actuated-Coordinated
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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	2248	58	44	2314	24	263	10	140	80	7	169
Future Volume (vph)	36	2248	58	44	2314	24	263	10	140	80	7	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	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	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5066		1770	5077		1770	1602		1770	1595	
Flt Permitted	0.06	1.00		0.06	1.00		0.55	1.00		0.60	1.00	
Satd. Flow (perm)	113	5066		107	5077		1030	1602		1118	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)	39	2443	63	48	2515	26	286	11	152	87	8	184
RTOR Reduction (vph)	0	2	0	0	1	0	0	67	0	0	3	0
Lane Group Flow (vph)	39	2504	0	48	2540	0	286	96	0	87	189	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	65.8	65.8		74.6	74.6		34.4	34.4		34.4	34.4	
Effective Green, g (s)	65.8	65.8		74.6	74.6		34.4	34.4		34.4	34.4	
Actuated g/C Ratio	0.55	0.55		0.62	0.62		0.29	0.29		0.29	0.29	
Clearance Time (s)	5.3	5.3		4.0	5.3		5.7	5.7		5.7	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)	61	2777		133	3156		295	459		320	457	
v/s Ratio Prot		c0.49		0.01	c0.50			0.06			0.12	
v/s Ratio Perm	0.34			0.21			c0.28			0.08		
v/c Ratio	0.64	0.90		0.36	0.80		0.97	0.21		0.27	0.41	
Uniform Delay, d1	18.8	24.2		22.8	17.2		42.3	32.5		33.1	34.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	41.6	5.3		1.7	2.3		43.5	0.2		0.5	0.6	
Delay (s)	60.5	29.5		24.5	19.5		85.8	32.7		33.6	35.3	
Level of Service	E	C		C	B		F	C		C	D	
Approach Delay (s)		30.0			19.6			66.5			34.7	
Approach LOS		C			B			E			C	

Intersection Summary				
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	84.6%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	36	2248	44	2314	263	10	80	7
Future Volume (vph)	36	2248	44	2314	263	10	80	7
Lane Group Flow (vph)	39	2506	48	2541	286	163	87	192
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	6.0	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)	70.0	70.0	10.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	58.3%	58.3%	8.3%	66.7%	33.3%	33.3%	33.3%	33.3%
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	5.7	5.7	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	0.62	0.89	0.32	0.80	0.97	0.31	0.27	0.42
Control Delay	66.0	29.1	14.0	19.7	89.0	16.4	36.0	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.0	29.1	14.0	19.7	89.0	16.4	36.0	37.4
Queue Length 50th (m)	6.5	198.7	4.2	162.8	70.2	12.8	16.7	37.8
Queue Length 95th (m)	#28.5	224.7	8.9	183.9	#127.3	31.2	31.6	60.5
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)	63	2815	150	3159	294	526	320	459
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	0.62	0.89	0.32	0.80	0.97	0.31	0.27	0.42

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: 100
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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	16	10	40	12	20	4	495	10	14	478	11
Future Volume (vph)	39	16	10	40	12	20	4	495	10	14	478	11
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	5.3		5.7	5.7		5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.91		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1753		1770	1687		1770	3529		1770	3527	
Flt Permitted	1.00	1.00		1.00	1.00		0.45	1.00		0.45	1.00	
Satd. Flow (perm)	1863	1753		1863	1687		846	3529		832	3527	
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)	42	17	11	43	13	22	4	538	11	15	520	12
RTOR Reduction (vph)	0	10	0	0	20	0	0	1	0	0	2	0
Lane Group Flow (vph)	42	18	0	43	15	0	4	548	0	15	530	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	3.7	3.7		3.7	3.7		18.3	18.3		18.3	18.3	
Effective Green, g (s)	3.7	3.7		3.7	3.7		18.3	18.3		18.3	18.3	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.55	0.55		0.55	0.55	
Clearance Time (s)	5.3	5.3		5.3	5.3		5.7	5.7		5.7	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)	208	196		208	189		469	1956		461	1955	
v/s Ratio Prot		0.01			0.01			c0.16			0.15	
v/s Ratio Perm	0.02			c0.02			0.00			0.02		
v/c Ratio	0.20	0.09		0.21	0.08		0.01	0.28		0.03	0.27	
Uniform Delay, d1	13.3	13.1		13.3	13.1		3.3	3.9		3.3	3.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.2		0.5	0.2		0.0	0.1		0.0	0.1	
Delay (s)	13.8	13.4		13.8	13.3		3.3	4.0		3.4	3.9	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		13.6			13.6			3.9			3.9	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	33.0	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	32.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	39	16	40	12	4	495	14	478
Future Volume (vph)	39	16	40	12	4	495	14	478
Lane Group Flow (vph)	42	28	43	35	4	549	15	532
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	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)	35.0	35.0	35.0	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	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio	0.07	0.05	0.07	0.06	0.01	0.21	0.02	0.20
Control Delay	7.7	6.3	7.8	5.4	6.2	4.8	6.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	6.3	7.8	5.4	6.2	4.8	6.2	4.8
Queue Length 50th (m)	0.6	0.2	0.6	0.3	0.0	0.0	0.0	0.0
Queue Length 95th (m)	5.5	3.7	5.6	3.9	1.1	18.7	2.5	18.1
Internal Link Dist (m)		204.0		113.8		156.9		372.1
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	1772	1668	1772	1606	846	3529	833	3529
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	0.02	0.02	0.02	0.02	0.00	0.16	0.02	0.15

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 29.8
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Fifth Line & Clark Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	0	5	6	0	51	1	332	1	12	90	7
Future Volume (Veh/h)	30	0	5	6	0	51	1	332	1	12	90	7
Sign Control		Stop			Stop			Free			Free	
Grade		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)	33	0	5	7	0	55	1	361	1	13	98	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											80	
pX, platoon unblocked												
vC, conflicting volume	546	492	102	496	496	362	106			362		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	546	492	102	496	496	362	106			362		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	99	99	100	92	100			99		
cM capacity (veh/h)	408	472	953	477	470	683	1485			1197		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	38	62	363	119
Volume Left	33	7	1	13
Volume Right	5	55	1	8
cSH	442	651	1485	1197
Volume to Capacity	0.09	0.10	0.00	0.01
Queue Length 95th (m)	2.2	2.5	0.0	0.3
Control Delay (s)	13.9	11.1	0.0	1.0
Lane LOS	B	B	A	A
Approach Delay (s)	13.9	11.1	0.0	1.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	33.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2492	6	0	2645	0	15
Future Volume (Veh/h)	2492	6	0	2645	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2709	7	0	2875	0	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				360		
pX, platoon unblocked					0.59	
vC, conflicting volume			2716		3671	906
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2716		3102	906
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	94
cM capacity (veh/h)			147		5	279

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	1084	1084	549	958	958	958	16
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	7	0	0	0	16
cSH	1700	1700	1700	1700	1700	1700	279
Volume to Capacity	0.64	0.64	0.32	0.56	0.56	0.56	0.06
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	18.7
Lane LOS							C
Approach Delay (s)	0.0			0.0			18.7
Approach LOS							C

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	127	2	5	43	2	20	0	35	12	0	1
Future Volume (Veh/h)	0	127	2	5	43	2	20	0	35	12	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		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)	0	138	2	5	47	2	22	0	38	13	0	1
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	49			140			198	198	139	235	198	48
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	49			140			198	198	139	235	198	48
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	96	98	100	100
cM capacity (veh/h)	1558			1443			758	695	909	688	695	1021

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	140	54	60	14
Volume Left	0	5	22	13
Volume Right	2	2	38	1
cSH	1558	1443	847	704
Volume to Capacity	0.00	0.00	0.07	0.02
Queue Length 95th (m)	0.0	0.1	1.8	0.5
Control Delay (s)	0.0	0.7	9.6	10.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	0.7	9.6	10.2
Approach LOS			A	B

Intersection Summary					
Average Delay	2.8				
Intersection Capacity Utilization	16.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	4	173	1	4	49
Future Volume (Veh/h)	1	4	173	1	4	49
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)	1	4	188	1	4	53
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	250	188			189	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	250	188			189	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	737	853			1385	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	5	189	57
Volume Left	1	0	4
Volume Right	4	1	0
cSH	827	1700	1385
Volume to Capacity	0.01	0.11	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	9.4	0.0	0.6
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	0.6
Approach LOS	A		

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	19.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	75	66	1	25	3
Future Volume (Veh/h)	2	75	66	1	25	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	82	72	1	27	3
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	73				158	72
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	73				158	72
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	100
cM capacity (veh/h)	1527				832	990

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	84	73	30
Volume Left	2	0	27
Volume Right	0	1	3
cSH	1527	1700	845
Volume to Capacity	0.00	0.04	0.04
Queue Length 95th (m)	0.0	0.0	0.9
Control Delay (s)	0.2	0.0	9.4
Lane LOS	A		A
Approach Delay (s)	0.2	0.0	9.4
Approach LOS			A

Intersection Summary				
Average Delay		1.6		
Intersection Capacity Utilization	15.6%	ICU Level of Service		A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	95	2	2	61	1	5	0	21	13	0	1
Future Volume (Veh/h)	3	95	2	2	61	1	5	0	21	13	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		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)	3	103	2	2	66	1	5	0	23	14	0	1
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	67			105			182	181	104	204	182	66
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			105			182	181	104	204	182	66
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	98	98	100	100
cM capacity (veh/h)	1535			1486			777	711	951	734	710	997

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	108	69	28	15
Volume Left	3	2	5	14
Volume Right	2	1	23	1
cSH	1535	1486	914	748
Volume to Capacity	0.00	0.00	0.03	0.02
Queue Length 95th (m)	0.0	0.0	0.8	0.5
Control Delay (s)	0.2	0.2	9.1	9.9
Lane LOS	A	A	A	A
Approach Delay (s)	0.2	0.2	9.1	9.9
Approach LOS			A	A

Intersection Summary				
Average Delay		2.0		
Intersection Capacity Utilization	16.4%	ICU Level of Service		A
Analysis Period (min)		15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	49	69	1	10	1
Future Volume (Veh/h)	2	49	69	1	10	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	53	75	1	11	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		297				
pX, platoon unblocked						
vC, conflicting volume	76				132	76
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	76				132	76
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1523				860	986

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	55	76	12
Volume Left	2	0	11
Volume Right	0	1	1
cSH	1523	1700	869
Volume to Capacity	0.00	0.04	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.3	0.0	9.2
Lane LOS	A		A
Approach Delay (s)	0.3	0.0	9.2
Approach LOS			A

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		14.2%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	54	5	2	67	3	23
Future Volume (Veh/h)	54	5	2	67	3	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	5	2	73	3	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	345					
pX, platoon unblocked						
vC, conflicting volume			64		138	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			64		138	62
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			1538		854	1004

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	64	75	28
Volume Left	0	2	3
Volume Right	5	0	25
cSH	1700	1538	985
Volume to Capacity	0.04	0.00	0.03
Queue Length 95th (m)	0.0	0.0	0.7
Control Delay (s)	0.0	0.2	8.8
Lane LOS		A	A
Approach Delay (s)	0.0	0.2	8.8
Approach LOS			A

Intersection Summary				
Average Delay		1.6		
Intersection Capacity Utilization		15.1%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	37	70	1	10	2
Future Volume (Veh/h)	3	37	70	1	10	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	40	76	1	11	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		138				
pX, platoon unblocked						
vC, conflicting volume	77				122	76
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	77				122	76
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1522				871	985

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	43	77	13
Volume Left	3	0	11
Volume Right	0	1	2
cSH	1522	1700	887
Volume to Capacity	0.00	0.05	0.01
Queue Length 95th (m)	0.0	0.0	0.4
Control Delay (s)	0.5	0.0	9.1
Lane LOS	A		A
Approach Delay (s)	0.5	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		14.4%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	46	1	0	70	1	5
Future Volume (Veh/h)	46	1	0	70	1	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	1	0	76	1	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	258					
pX, platoon unblocked						
vC, conflicting volume			51		126	50
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			51		126	50
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1555		868	1018

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	51	76	6
Volume Left	0	0	1
Volume Right	1	0	5
cSH	1700	1555	989
Volume to Capacity	0.03	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		13.7%	ICU Level of Service A
Analysis Period (min)		15	

Appendix I:
Sight Distance Assessment

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	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 vehicle.
- 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:

$$ISD = 0.278\ V_{major}\ t_g \qquad (9.9.1)$$

Where:
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 major road (s)

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.

LEFT SIGHT LINE:
POSTED SPEED = 40 km/h (ADVISORY)
DESIGN SPEED = 50 km/h

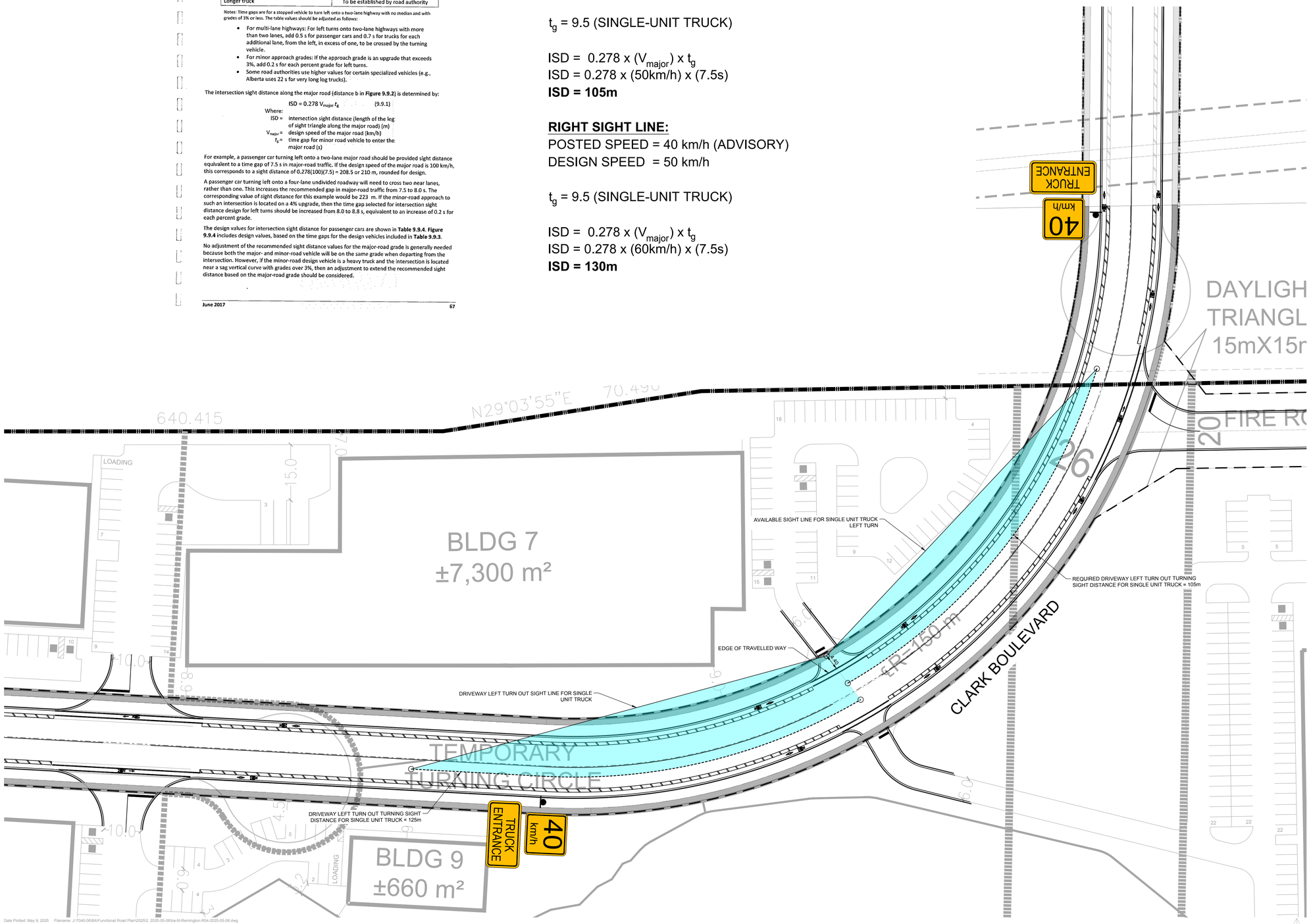
t_g = 9.5 (SINGLE-UNIT TRUCK)

ISD = 0.278 x (V_{major}) x t_g
ISD = 0.278 x (50km/h) x (7.5s)
ISD = 105m

RIGHT SIGHT LINE:
POSTED SPEED = 40 km/h (ADVISORY)
DESIGN SPEED = 50 km/h

t_g = 9.5 (SINGLE-UNIT TRUCK)

ISD = 0.278 x (V_{major}) x t_g
ISD = 0.278 x (60km/h) x (7.5s)
ISD = 130m



Date Plotted: May 9, 2025 Filename: J:\7040-06\BA\Functional Road Plan\2025\2. 2025-05-06\ba-fd-Remington-R04-2025-05-06.dwg

GENERAL NOTES

1. SITE PLAN BY KORSIAK DATED JANUARY, 2025
2. THIS DRAWING DOES NOT CONSTITUTE A SIGNAGE PLAN AND MAKES NO CLAIMS ABOUT THE CONSTRUCTABILITY OF PROPOSED SIGNAGE LOCATIONS

PROPOSED WARNING SIGNAGE

TRUCK ENTRANCE
Wc-8t
(300 x 600)mm

40 km/h
Wa-7t
(450 x 450)mm

02	05-09-25	MTR	ISSUED FOR SUBMISSION
01	07-04-23	WGC	ISSUED FOR SUBMISSION

BA Group
BA Consulting Group Ltd.
300 - 45 St. Clair Ave. W.
Toronto ON M4V 1K9
TEL 416 961 7110
EMAIL bagroup@bagroup.com
MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

REMINGTON DERRY GREEN

CLARK BOULEVARD
SIGHT DISTANCE REVIEW
BUILDING 7 ACCESS
LEFT TURN EXIT

Date: June 13, 2023
Project No.: 7040-06
Scale: 1:500 (0 5 10 15 20m)

SD-01

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	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 vehicle.
- 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:

$$ISD = 0.278\, V_{major}\, t_g \qquad (9.9.1)$$

Where:
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 major road (s)

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.

LEFT SIGHT LINE:

POSTED SPEED = 40 km/h (ADVISORY)
DESIGN SPEED = 50 km/h

t_g = 9.5 (SINGLE-UNIT TRUCK)

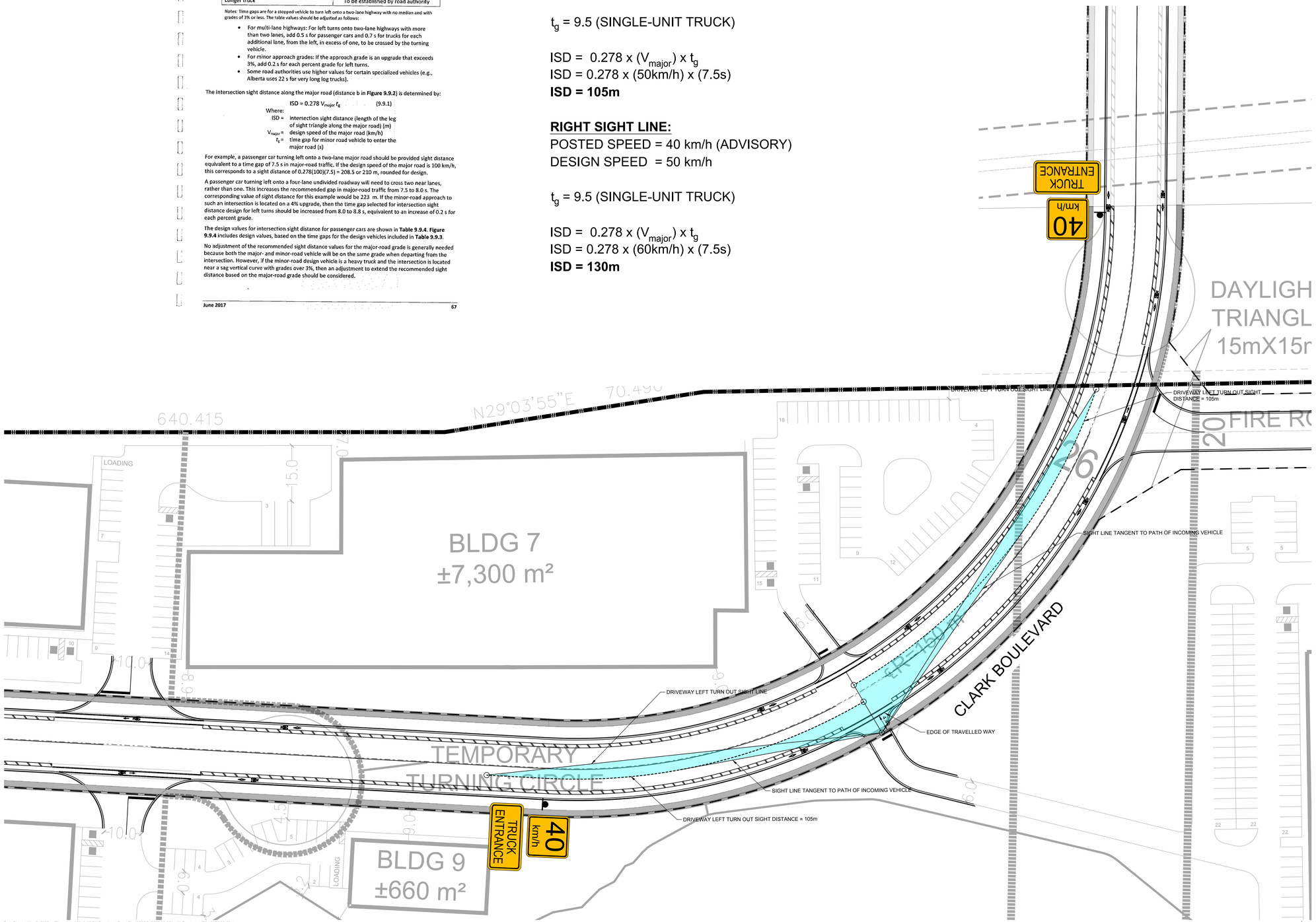
ISD = 0.278 x (V_{major}) x t_g
ISD = 0.278 x (50km/h) x (7.5s)
ISD = 105m

RIGHT SIGHT LINE:

POSTED SPEED = 40 km/h (ADVISORY)
DESIGN SPEED = 50 km/h

t_g = 9.5 (SINGLE-UNIT TRUCK)

ISD = 0.278 x (V_{major}) x t_g
ISD = 0.278 x (60km/h) x (7.5s)
ISD = 130m



Date Plotted: May 9, 2025 Filename: J:\7040-06\BA\Functional Road Plan\2025\2. 2025-05-06\ba-fd-Remington-R04-2025-05-06.dwg

GENERAL NOTES

1. SITE PLAN BY KORSIAK DATED MARCH
2. THIS DRAWING DOES NOT CONSTITUTE A SIGNAGE PLAN AND MAKES NO CLAIMS ABOUT THE CONSTRUCTABILITY OF PROPOSED SIGNAGE LOCATIONS

PROPOSED WARNING SIGNAGE

Wc-8t
(300 x 600)mm

Wa-7t
(450 x 450)mm

02	05-09-25	MTR	ISSUED FOR SUBMISSION
01	07-04-23	WGC	ISSUED FOR SUBMISSION

BA Group
BA Consulting Group Ltd.
300 - 45 St. Clair Ave. W.
Toronto ON M4V 1K9
TEL 416 961 7110
EMAIL bagroup@bagroup.com
MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

REMINGTON DERRY GREEN

CLARK BOULEVARD
SIGHT DISTANCE REVIEW
BUILDING 8 SOUTH ACCESS
LEFT TURN EXIT

Date: June 13, 2023
Project No.: 7040-06
Scale: 1:500 0 5 10 15 20m

SD-02

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	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 vehicle.
- 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:

$$ISD = 0.278\, V_{major}\, t_g \qquad (9.9.1)$$

Where:
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 major road (s)

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.

LEFT SIGHT LINE:
POSTED SPEED = 40 km/h (ADVISORY)
DESIGN SPEED = 50 km/h

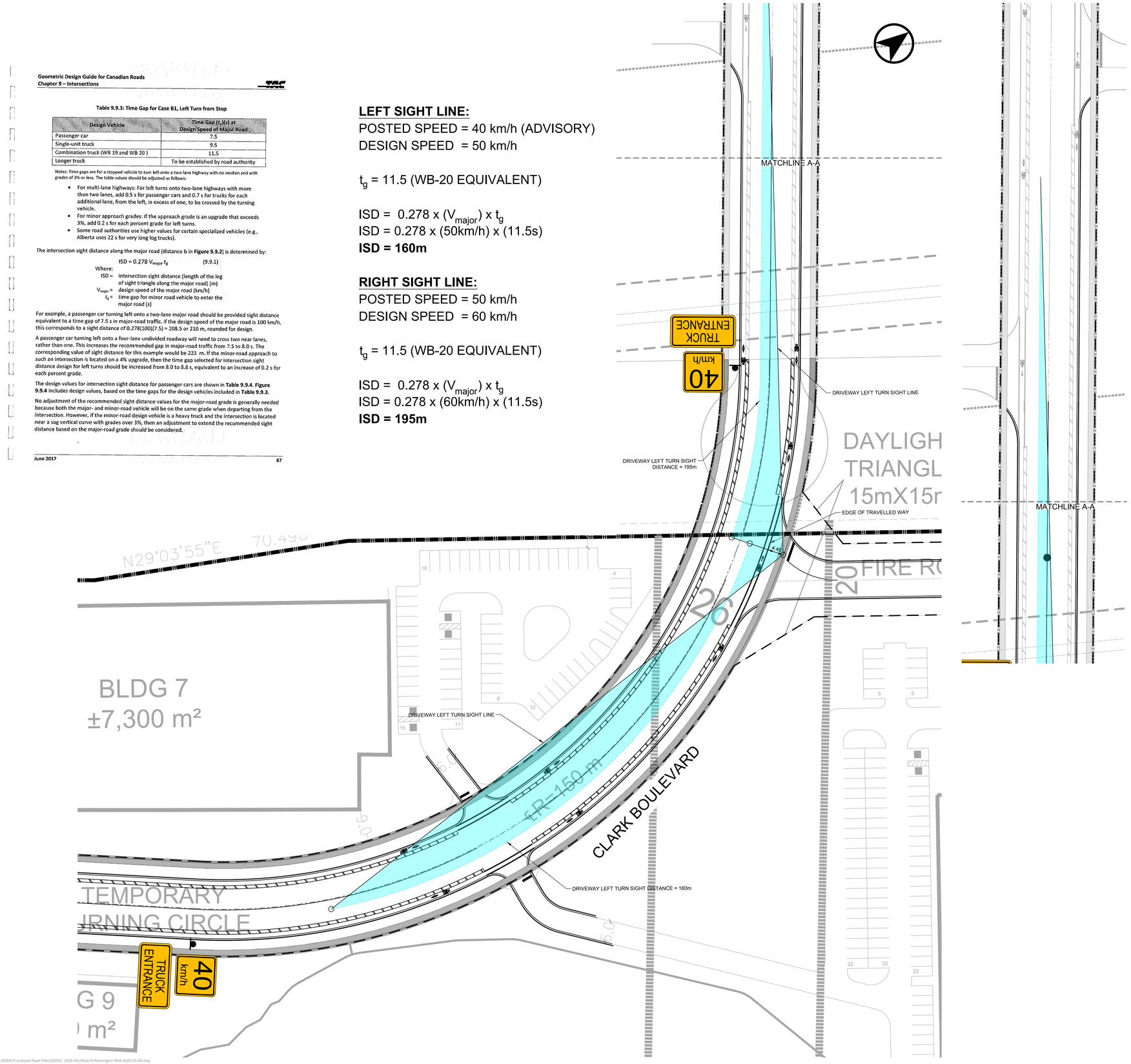
t_g = 11.5 (WB-20 EQUIVALENT)

ISD = 0.278 x (V_{major}) x t_g
ISD = 0.278 x (50km/h) x (11.5s)
ISD = 160m

RIGHT SIGHT LINE:
POSTED SPEED = 50 km/h
DESIGN SPEED = 60 km/h

t_g = 11.5 (WB-20 EQUIVALENT)

ISD = 0.278 x (V_{major}) x t_g
ISD = 0.278 x (60km/h) x (11.5s)
ISD = 195m



GENERAL NOTES

1. SITE PLAN BY KORSIAK DATED MARCH
2. THIS DRAWING DOES NOT CONSTITUTE A SIGNAGE PLAN AND MAKES NO CLAIMS ABOUT THE CONSTRUCTABILITY OF PROPOSED SIGNAGE LOCATIONS

PROPOSED WARNING SIGNAGE

Wc-8t
(300 x 600)mm

Wa-7t
(450 x 450)mm

02	05-09-25	MTR	ISSUED FOR SUBMISSION
01	07-04-23	WGC	ISSUED FOR SUBMISSION

BA Group
BA Consulting Group Ltd.
300 - 45 St. Clair Ave. W.
Toronto ON M4V 1K9
TEL 416 961 7110
EMAIL bagroup@bagroup.com
MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

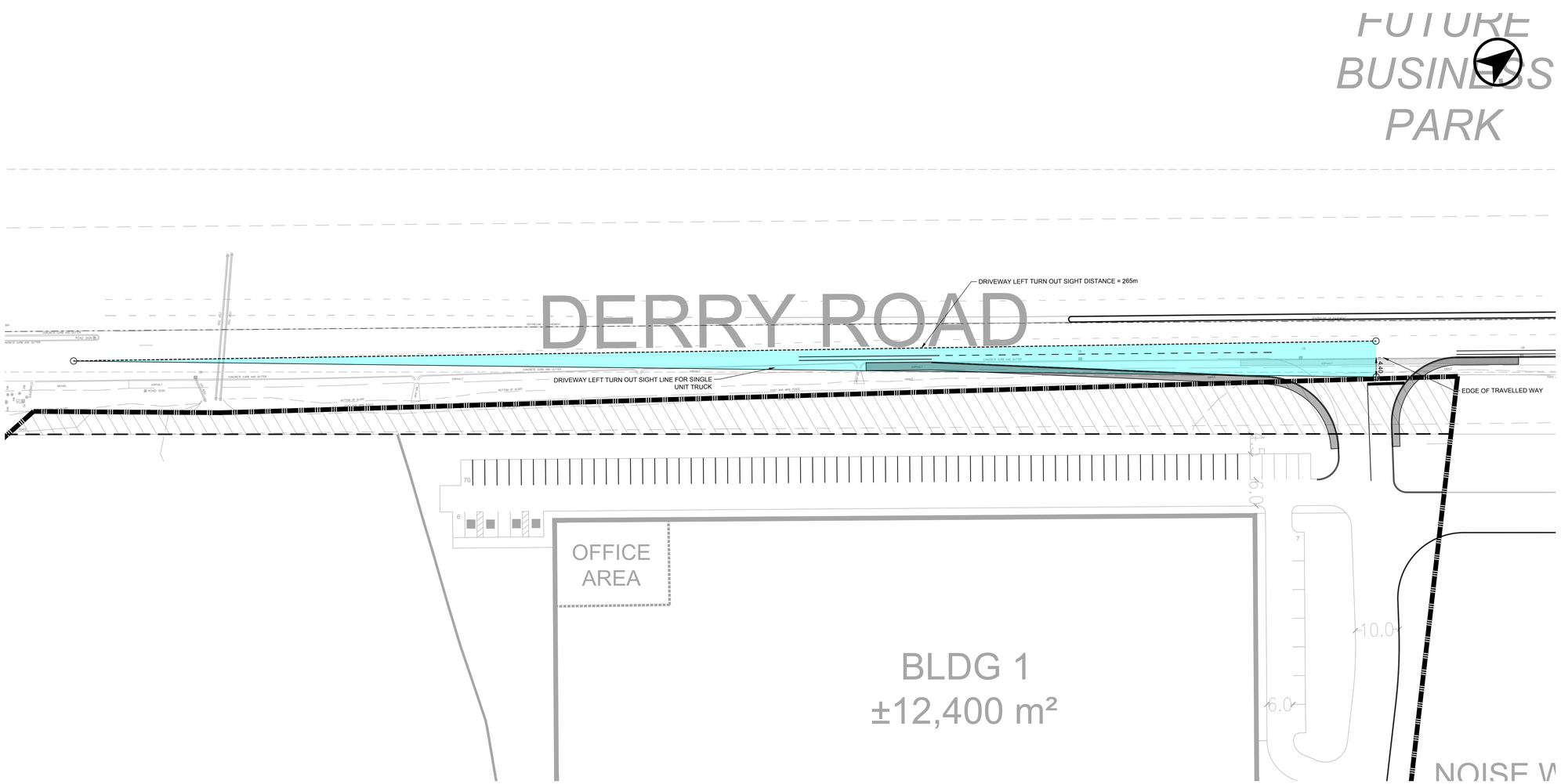
REMINGTON DERRY GREEN

CLARK BOULEVARD
SIGHT DISTANCE REVIEW
BUILDING 8 NORTH ACCESS
LEFT TURN EXIT

Date: June 13, 2023
Project No.: 7040-06
Scale: 1:500 (0 5 10 15 20m)

SD-03

Date Plotted: May 9, 2025 Filename: J:\7040-06\BA\Functional Road Plan\2025\2_2025-05-06\ba-fd-Remington-R04-2025-05-06.dwg



RIGHT SIGHT LINE:

POSTED SPEED = 80 km/h (ADVISORY)
DESIGN SPEED = 100 km/h

t_g = 10.5 (WB-20 EQUIVALENT)

ISD = 0.278 x (V_{major}) x t_g
ISD = 0.278 x (100km/h) x (10.5s)
ISD = 295m

GENERAL NOTES

1. SITE PLAN BY KORSIAK DATED JANUARY, 2025
2. THIS DRAWING DOES NOT CONSTITUTE A SIGNAGE PLAN AND MAKES NO CLAIMS ABOUT THE CONSTRUCTABILITY OF PROPOSED SIGNAGE LOCATIONS

02	05-09-25	MTR	ISSUED FOR SUBMISSION
01	07-04-23	WGC	ISSUED FOR SUBMISSION

BA Group
BA Consulting Group Ltd.
300 - 45 St. Clair Ave. W.
Toronto ON M4V 1K9
TEL 416.961.7110
EMAIL bagroup@bagroup.com
MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

REMINGTON DERRY GREEN

CLARK BOULEVARD
SIGHT DISTANCE REVIEW
BUILDING 1 ACCESS
RIGHT TURN EXIT

Date: June 13, 2023
Project No.: 7040-06
Scale: 1:500 (0 5 10 15 20m)

SD-04

Date Plotted: May 9, 2025 Filename: J:\7040-06\BA\Functional Road Plan\2025\2. 2025-05-06\ba-fd-Remington-R04-2025-05-06.dwg

Appendix J:
Traffic Signal Warrant Analysis

4.4 Justification 1 – Minimum Vehicle Volume

Purpose

The Minimum Vehicle Volume Justification is intended for applications where the principal reason for installing a traffic signal is the cumulative delay produced by a large volume of intersecting traffic at an unsignalized intersection.

Justification 1A reflects the lowest total traffic on all approaches, and Justification 1B reflects the lowest volume on the minor road for which the average delay is similar for both signalized and unsignalized conditions. Therefore, this justification is intended to address the minimum volume conditions for which signalization can be used to minimize total average vehicle delay at the intersection.

As volumes increase beyond threshold criteria, delay to traffic on the minor road will increase, and the overall delay for the intersection will be greater than would be the case if minor delays were distributed between both main and minor roadways.

Standard

The need for a traffic signal must be considered if both Justification 1A and Justification 1B are 100% fulfilled.

If Justifications 1A and 1B do not reach or exceed 100%, but are at least 80% fulfilled, the lesser fulfilled of the Justifications 1A or 1B can be used in the assessment of Justification 3, the Combination Justification.

In applying Justification 1 (Minimum Vehicle Volume) for "T" intersections, the justification values for the minor street are increased by 50%. This approach reflects the reduction in traffic volumes due to the lack of one of the approaches.

Table 12 may be used for Justification 1: Minimum Vehicle Volume. Restricted Flow is applicable to Urban Conditions, while Free Flow is applicable to Rural conditions (see Section 4.2 for definitions).

Guidelines

Justification 1 evaluates total intersection volume and total minor road volume. The hours selected should represent the eight highest hours of the 24-hour traffic volume, and they do not have to be consecutive hours. Each one of the highest eight hours of the entering volumes is compared to the justification value. The justification should be met for each of the eight hours. "Sectional Percent" is calculated in Table 12 for reference purposes, and may indicate how close an intersection is to achieving full justification. "Total Across" is calculated by adding all 8-hour compliance percentages. The Compliance % figures used in Table 12 must not exceed 100%.

Table 12 – Justification 1 – Minimum Vehicle Volume

100% SATISFIED – YES ☐ NO ☐
80% SATISFIED – YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE WARRANT								
APPROACH LANES	1		2 or MORE		HOUR ENDING								TOTAL ACROSS
FLOW CONDITION	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☐									
A. ALL APPROACH LANES	480 (385)	720 (575)	600 (480)	900 (720)									
100% FULFILLED													SECTIONAL PERCENT
80% FULFILLED													
ACTUAL % IF BELOW 80% VALUE													
												TOTAL DOWN / 8 =	
B. MINOR STREET BOTH APPROACHES	120* (95)*	170* (135)*	120* (95)*	170* (135)*									TOTAL ACROSS
100% FULFILLED													SECTIONAL PERCENT
80% FULFILLED													
ACTUAL % IF BELOW 80% VALUE													
												TOTAL DOWN / 8 =	

* For "T" intersections, these values should be increased by 50%.

4.5 Justification 2 – Delay to Cross Traffic

Purpose

The Delay to Cross Traffic Justification is intended for applications where the traffic volume on the main road is so heavy that traffic on the minor road suffers excessive delay or hazard in entering or crossing the main road.

Standard

The need for a traffic signal must be considered if both Justification 2A and Justification 2B are 100% fulfilled. If Justifications 2A or 2B do not meet or exceed 100%, but both are at least 80% fulfilled, the lesser fulfilled of the justifications 2A or 2B can be used in the assessment of Justification 3, the Combination Justification.

Table 13 may be used for Justification 2: Delay to Cross Traffic. Restricted Flow is applicable to Urban Conditions, while Free Flow is applicable to Rural Conditions (see Section 4.2 for definitions).

Table 13 – Justification 2 – Delay to Cross Traffic

100% SATISFIED – YES ☐ NO ☐
80% SATISFIED – YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE WARRANT								
APPROACH LANES	1		2 or MORE		HOUR ENDING								
FLOW CONDITION	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☐								TOTAL ACROSS	
A. MAJOR STREET BOTH APPROACHES	480 (385)	720 (575)	600 (480)	900 (720)									
100% FULFILLED													SECTIONAL PERCENT
80% FULFILLED													
ACTUAL % IF BELOW 80% VALUE													
												TOTAL DOWN / 8 =	
B. TRAFFIC CROSSING MAJOR STREET	50 (40)	75 (60)	50 (40)	75 (60)								TOTAL ACROSS	
100% FULFILLED													SECTIONAL PERCENT
80% FULFILLED													
ACTUAL % IF BELOW 80% VALUE													
												TOTAL DOWN / 8 =	

Guidelines

Justification 2 evaluates major road volume and minor road movements that cross the intersection. The hours selected should represent the eight highest hours of the 24-hour traffic volume, and they do not have to be consecutive hours. The entering volumes of each of the highest eight hours are compared to the justification value. The justification is met if the justification value is 100% and fulfilled by each of the eight hours.

"Sectional Percent" is calculated in Table 13 for reference purposes, and may indicate how close an intersection is to achieving full justification. "Total Across" is calculated by adding all 8-hour compliance percentages. The Compliance % figures used in Table 13 must not exceed 100%.

As right turns are not considered as traffic crossing a road, they should be deleted from the combined pedestrian and vehicle volume in the Delay to Cross Traffic Justification. In one-way street systems, left turns from a one-way street into another one-way street should be treated in a similar manner to right turns, and be deleted from the justification.

When applying Justification 2B, the crossing volume consists of the sum of:

1. The number of pedestrians crossing the main road
2. Total left turns from both the side road approaches
3. The highest through volume from one of the side road approaches
4. Fifty percent of the heavier left-turn traffic movement from the main road when both of the following criteria are met:

   a) The left-turn volume is greater than 120 vehicles per hour

   b) The total of the heavier left-turn volume plus its opposing volume is greater than 720 vehicles per hour

4.10 Justification 7 – Projected Volumes

In some cases, it is desired to determine the future need for traffic signals at an existing or planned intersection. There are two basic scenarios. The first is that the intersection may exist and all that is changing is the addition of one or more developments which will add traffic to the intersection. The second is a development which will require, or be associated with, the construction of one or more new legs at an existing intersection or a completely new intersection or roadway.

The prediction of future traffic demands is based on knowledge of growth in roadway usage, growth of local traffic generators and predicted traffic volumes, obtained from a traffic impact study, transportation planning study, environmental assessment or other similar evaluation. The preferred approach is that eight-hour volume projections are estimated as part of the engineering study and evaluated against Justifications 1, 2 or 3. It is incumbent upon the road authority to ensure that the calculation methodology is sound and is based on good data, so that there is a high level of confidence in the predicted traffic volumes.

For future development, especially where the intersection or road may not exist, eight-hour volumes may be difficult to obtain or predict with the necessary accuracy. If eight-hour volumes are unavailable or not considered to be of sufficient accuracy, Peak Hour Volumes (PHV) may be estimated as part of the transportation studies and reduced to Average Hourly Volumes (AHV) for comparison with traffic signal justifications for projected volumes.

Table 21 – Justification 7 – Projected Volumes

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance		
						Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900			
	*B. Vehicle volume, along minor streets (average hour)	120	170	120	170			
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	480	720	600	900			
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75			

*Note: For "T" intersections, these values should be increased by 50% for 1B only.

The Average Hourly Volume for a typical day can be estimated from the Peak Hour Volumes using the following relationships:

$$AHV = \frac{PHV}{2} \quad \textbf{or} \quad AHV = \frac{amPHV + pmPHV}{4}$$

Alternately, the Average Hourly Volume for the eight highest hours of an average day can be estimated from Annual Average Daily Traffic (AADT) volume using the following relationship:

$$AHV = \frac{AADT}{16}$$

Where:

AHV = Average hourly volume

AADT = Annual average daily traffic

Analysis Using Eight-hour Volumes

If eight-hour projections are available, Justifications 1, 2 or 3 should be used. For the situation of an existing intersection with new development, Justifications 1 or 2 need to be met to 100%, or Justification 3 needs to be met to 80%.

For developments where new intersections or roadways are to be built, there is more uncertainty in the volume projections as the estimate requires projections of background traffic as well as development traffic. For this reason, where new intersection or roadway construction is required, Justifications 1 or 2 must be met to 120%.

Analysis Using Average Hour Volume

In the case that the volume estimates are based on the expansion of peak hour volumes or average daily traffic, the effect on Justifications 1 or 2 of the requirement to meet the warrant for each of eight hours would be lessened by averaging. As well, increased uncertainty is introduced by estimating from as little as one hour of traffic volume. For this reason, the thresholds are raised and, for traffic signals to be considered, Justification 7 as per Table 21 is used but with a 20% increase over the required volumes for an existing intersection and a 50% increase for a future intersection or roadway. For example, under restricted flow and two lanes, the AHV for Part 1A of Justification 7 must be met to 900 x 1.20 = 1080 vph.

Note that future volumes may include side street traffic attracted to the new traffic signal since the signal may provide a significant reduction in delay.

Table 22 – Future Development: Volume Expansion Required to Meet Justifications

Roadway Condition	Full Eight-hour Count Estimate Available		AHV Only Available
	Justification 1 or 2	Justification 3	Justification 7
Both Intersecting Roads Exist; Development is Future	100%	80%	120%
One Road, Both Roads and/or Intersection are Future; Development is Future	120%	N/A	150%

Project No. 7040-06
Intersection Fifth Line / Clark Boulevard **Base Scenario**

ITE 210 - Single-Family Detached Housing Temporal Variation

Time Ending	% of daily total	% of daily peak hour
8:00	6.7	100%
9:00	6.2	93%
12:00	5.2	78%
13:00	5.5	61%
14:00	6	67%
16:00	7.2	80%
17:00	9	100%
18:00	8.8	98%

ITE 110 - General Light Industrial Temporal Variation

Time Ending	% of daily total	% of daily peak hour
8:00	10.1	100%
9:00	7.7	76%
12:00	7.5	74%
13:00	9.9	100%
14:00	7.9	80%
16:00	8.7	88%
17:00	7.5	76%
18:00	9	91%

Temporal Variation - Base

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	AM Peak
9:00	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	
12:00	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	
13:00	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	
14:00	67%	67%	67%	67%	67%	67%	67%	67%	67%	67%	67%	67%	
16:00	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	PM Peak
18:00	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	

Temporal Variation - Growth

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	AM Peak
9:00	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%	
12:00	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
14:00	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	
16:00	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	
17:00	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%	PM Peak
18:00	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	

Existing Volumes

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	0	152	0	0	185	0	0	0	0	0	0	0	AM Peak
9:00	0	141	0	0	171	0	0	0	0	0	0	0	
12:00	0	109	0	0	133	0	0	0	0	0	0	0	
13:00	0	169	0	0	95	0	0	0	0	0	0	0	
14:00	0	185	0	0	103	0	0	0	0	0	0	0	
16:00	0	222	0	0	124	0	0	0	0	0	0	0	
17:00	0	277	0	0	155	0	0	0	0	0	0	0	PM Peak
18:00	0	271	0	0	152	0	0	0	0	0	0	0	

2035 Background Growth Volumes

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	10	332	26	0	157	37	10	9	3	5	12	0	AM Peak
9:00	8	253	20	0	120	28	8	7	2	4	9	0	
12:00	6	188	15	0	89	21	6	5	2	3	7	0	
13:00	5	286	9	0	426	15	51	17	13	26	12	1	
14:00	4	229	7	0	340	12	41	14	11	21	9	1	
16:00	5	252	8	0	375	13	45	15	12	23	10	1	
17:00	4	217	7	0	323	11	39	13	10	20	9	1	PM Peak
18:00	5	260	8	0	388	13	47	16	12	24	11	1	

Site Traffic

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	0	5	22	77	0	0	0	4	0	2	3	2	AM Peak
9:00	0	4	17	59	0	0	0	3	0	2	2	2	
12:00	0	3	12	44	0	0	0	2	0	1	2	1	
13:00	0	1	4	18	0	0	0	4	0	26	4	25	
14:00	0	1	3	15	0	0	0	3	0	21	3	20	
16:00	0	1	3	16	0	0	0	3	0	23	3	22	
17:00	0	1	3	14	0	0	0	3	0	20	3	19	PM Peak
18:00	0	1	4	17	0	0	0	4	0	24	4	23	

2035 Future Total

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	All	Minor	Major	Minor Veh+ped
8:00	10	489	48	77	342	37	10	13	3	7	15	2	1053	50	1003	37
9:00	8	398	37	59	291	28	8	10	2	5	11	2	858	38	820	29
12:00	6	300	27	44	222	21	6	7	2	4	8	1	647	28	619	23
13:00	5	457	13	18	521	15	51	21	13	53	16	26	1210	181	1030	130
14:00	4	414	11	15	444	12	41	17	11	42	13	21	1043	144	899	105
16:00	5	474	12	16	499	13	45	19	12	46	14	23	1177	159	1018	115
17:00	4	495	10	14	478	11	39	16	10	40	12	20	1149	137	1012	100
18:00	5	532	12	17	539	13	47	19	12	48	14	24	1283	164	1118	119

8-Hour Volume

Future Total (2033)			
Time Ending		Major	Minor
8:00		1003	50
9:00		820	38
12:00		619	28
13:00		1030	181
14:00		899	144
16:00		1018	159
17:00		1012	137
18:00		1118	164
Total		**7519**	**902**

TRAFFIC SIGNAL WARRANTS - OTM Book 12, Justifications 1 & 2

Justification	Requirement 2 lanes Free Flow*	FUTURE Hour Ending 8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00	Avg	Sectional Percent
1. Min Vehicle Volumes											
A. Vehicle volumes all approaches	**720**	1053	858	647	1210	1043	1177	1149	1283		
	Score	*146%*	*119%*	*90%*	*168%*	*145%*	*164%*	*160%*	*178%*		
		100%	100%	80%	100%	100%	100%	100%	100%	98%	
B. Vehicle volumes, minor streets	**144**	50	38	28	181	144	159	137	164		70%
	Score	*35%*	*26%*	*20%*	*126%*	*100%*	*110%*	*95%*	*114%*		
		35%	26%	20%	100%	100%	100%	80%	100%	70%	
2. Delay to Cross Traffic											
A. Vehicle volumes, major street	**720**	1003	820	619	1030	899	1018	1012	1118		
	Score	*139%*	*114%*	*86%*	*143%*	*125%*	*141%*	*141%*	*155%*		
		100%	100%	80%	100%	100%	100%	100%	100%	98%	
B. Combined vehicle+ped minor street	**60**	37	29	23	130	105	115	100	119		81%
	score	*62%*	*49%*	*39%*	*217%*	*175%*	*192%*	*167%*	*198%*		
		62%	49%	39%	100%	100%	100%	100%	100%	81%	

OVERALL WARRANT FOR TRAFFIC SIGNAL IS 81%

*Thresholds are increase by 20% because one or more of the roads does not currently exist.

Appendix K:
Left-Turn Lane Assessment

Left-Turn Lane Warrant Analysis (Fifth Line at Clark Boulevard)

AM Peak Period (Southbound on Fifth Line)

Posted Speed = 70 km/h

Design Speed = 90 km/h

Existing Thru Traffic Volume: $V_T = 419$

Opposing Traffic Volume: $V_O = 489$

Employee Access at Healey Road (south access):

Left Turn Traffic Volume: $V_L = 77$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

$$Advancing\ Traffic\ Volume\ V_A = 419 + 77$$

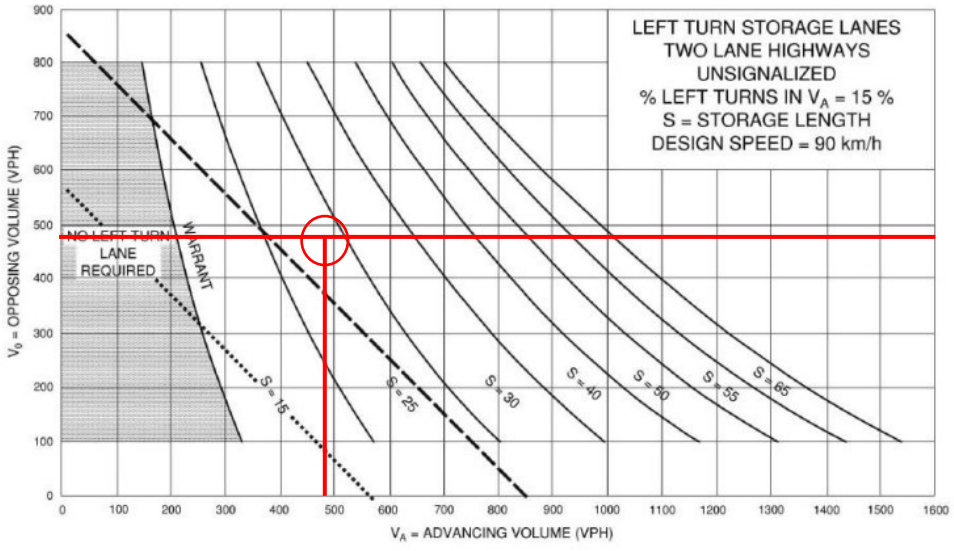
$$Advancing\ Traffic\ Volume\ V_A = 496$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{77}{496} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 15.5\%$$

Exhibit-9A-20



AM Peak Period (Northbound on Fifth Line)

Posted Speed = 70 km/h

Design Speed = 90 km/h

Existing Thru Traffic Volume: $V_T = 499$

Opposing Traffic Volume: $V_O = 489$

Left Turn Traffic Volume: $V_L = 10$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

$$Advancing\ Traffic\ Volume\ V_A = 499 + 10$$

$$Advancing\ Traffic\ Volume\ V_A = 509$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{10}{509} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 2.0\%$$