QUADREAL PROPERTY GROUP

LAZY PAT FARMS PROPERTY (3269 DUNDAS STREET WEST)

TRANSPORTATION STUDY UPDATE

APRIL 24, 2019

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TRANSPORTATION STUDY UPDATE

QUADREAL PROPERTY GROUP

TRANSPORTATION STUDY

PROJECT NO.: 09M-00013-01

DATE: APRIL 24, 2019

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April 24, 2019

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Attention: Michael Reel, Vice President, Investment Management

Subject: Transportation Impact Study Update - Lazy Pat Farms Property (3269 Dundas Street West)

Dear Mr. Reel,

WSP is pleased to present the findings of our Transportation Impact Study for the proposed 407 West Employment Area (also knows as Lazy Pat Farms Property), in the Town of Oakville. This study was completed as an update to the previously completed studies for the proposed development.

The analysis completed as part of this study includes a review of traffic operations for the study area intersections under existing conditions, as well as future background and future total operations under the 2021 and 2031 horizon years. As part of the 2031 future total conditions, WSP completed a sensitivity analysis to assess the impacts of removing the Avenue One creek crossings on study area traffic operations.

In addition to the study intersection operations, WSP completed a review of the existing and future transit and active transportation facilities for the study area based on the North Oakville Secondary Plan, Transit Plan and the Oakville Active Transportation Master Plan

The detailed study analyses, findings and recommendations have been documented within this report. Should you have any questions about the content of this study, please do not hesitate to contact us.

Kind regards,

Craig Kelly, P.Eng., PTOE,
Senior Project Manager, Transportation Planning

NK/ck
WSP ref.: 09M-00013-01

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F COST-ESTIMATE BREAKDOWN

1 INTRODUCTION

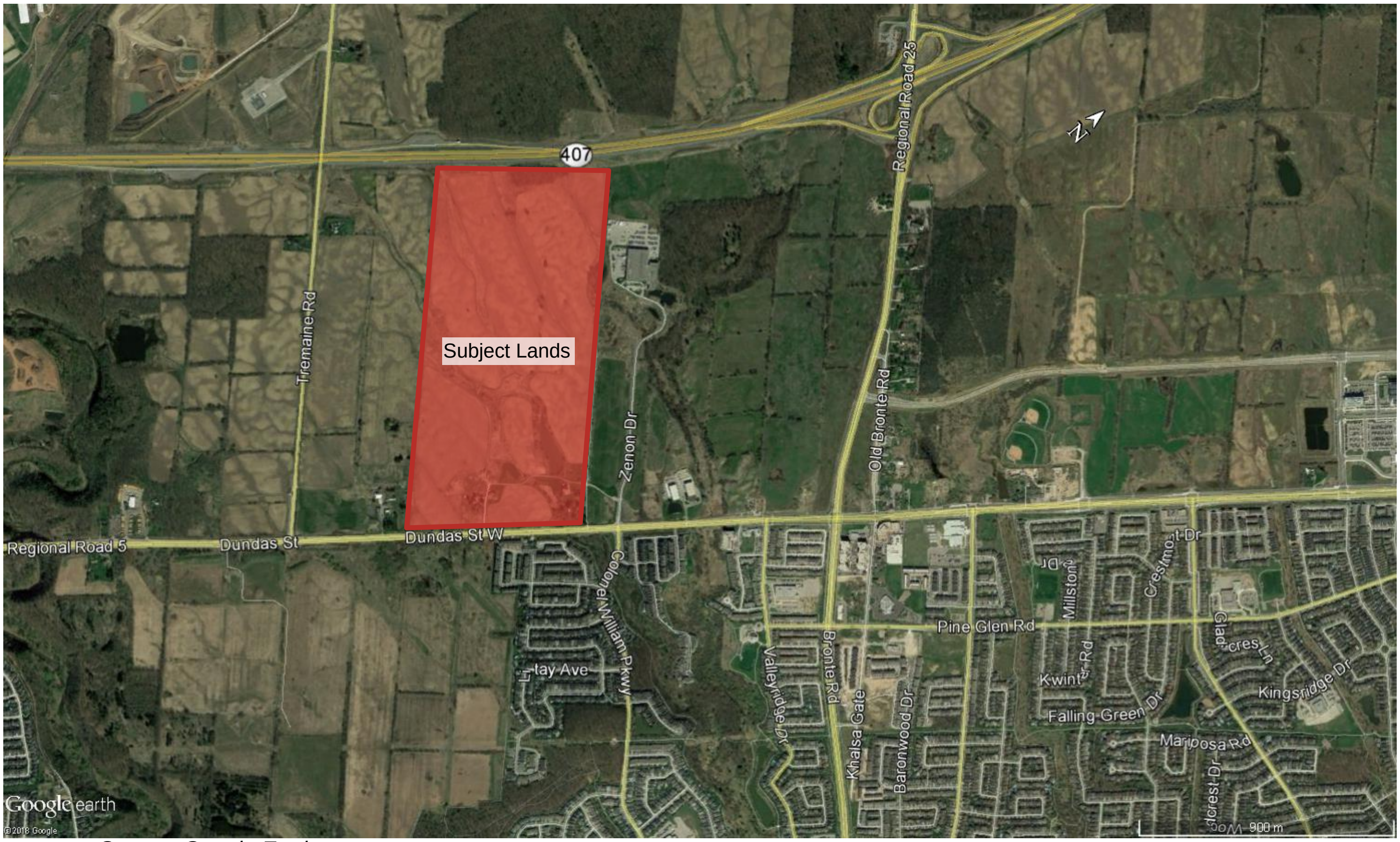
QuadReal Property Group is proposing to develop the Lazy Pat Farms Property, located north of Dundas Street West and mid-block between Bronte Road and Tremaine Road at 3269 Dundas Street West, in the Town of Oakville. As per the North Oakville West Secondary Plan (NOWSP), the subject property is designated as an Employment District. A mix of uses, including General Employment, Light Employment and Employment Related Service-Commercial uses are proposed within the Lazy Pat Farms Property. Please refer to **Figure 1-1** for the site location.

In May 2011, WSP (formerly MMM Group) prepared and submitted a Transportation Impact Study related to the subject property. Following the submission, the Town of Oakville and Halton Region provided comments on the study, which lead to the submission of a second Transportation Impact Study in August 2013. Following the second TIS submission, the Town of Oakville retained CIMA to undertake a peer review of the study, which lead to the submission of a Response to Comments Letter in August 2014.

Halton Region in June of 2018 has provided written comments to the Town of Oakville. In these comments, they indicate they are generally satisfied with the August 2014 response report based on a second peer review in September 2015 by CIMA conducted on behalf of both the Town and Region. However, they have stated: "a revised TIS, using 2017 as the base year (due to the lapse in time), is required by the applicant that incorporates all of the revisions outlined in the response report".

Since the last submission, updates were made to the development proposal. As such, this Transportation Impact Study has been prepared to provide an updated assessment reflecting the changes in the development proposal. The assumptions made as part of this study were established via correspondence of the Terms of Reference with Halton Region and Town of Oakville Staff. This study addresses the impacts of the proposed development on the boundary roadway intersections in the vicinity of the property, and includes a Transit Facilities Plan and Active Transportation Plan. The associated analyses and findings are outlined herein.

Figure 1-1 **Site Location**



Source: Google Earth

2 407 WEST EMPLOYMENT AREA CONCEPT PLAN

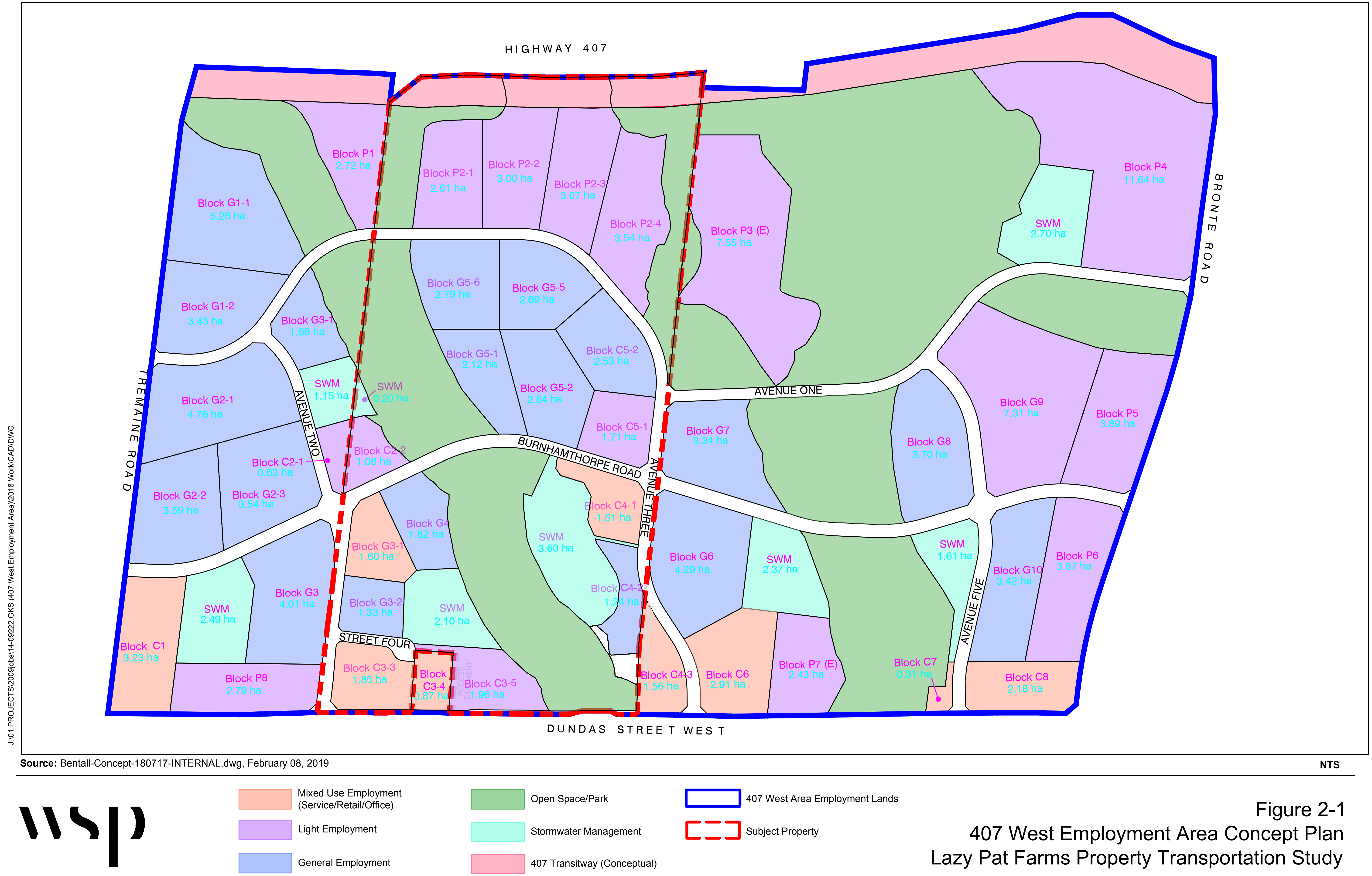
The development is proposed to accommodate an employment area on the subject property. The development is intended to include light and general employment uses and limited retail and service commercial uses, which serve the employment area in accordance with the Town's land use and planning directions for the 407 West Employment Area. The vision for the subject property is to develop an environmentally and economically sustainable employment district that will contribute to the dynamic character of the Town of Oakville. The 407 West Employment Area concept plan is shown in **Figure 2-1**.

The range of employment land uses for the subject property have been further characterized as light employment (prestige office uses), general employment, and service area (service/retail/office) uses, in accordance with the NOWSP and implementing Comprehensive Zoning By-law for North Oakville. The development concept envisions more prestige office uses adjacent to Highway 407 and Bronte Road, due to increased visibility along these major roads. Limited commercial (service/retail/office) uses are envisioned to be clustered at the intersections with Arterial Roads and Avenues along the Dundas Street corridor to serve the employment area. It is recognized that more general industrial uses, such as mixed warehousing and office uses may be accommodated internal to the employment area, and appropriately buffered from surrounding land uses.

The concept plan is consistent with the Town's NOWSP and incorporates an appropriate implementation of the proposed road network based on more detailed study. The road pattern follows a modified grid pattern which responds to the existing environmental and site conditions, while encouraging accessibility and a viable transit network throughout the 407 West Employment Area.

The concept plan accommodates three intersection locations with Dundas Street West, including the existing intersections with Valleyridge Drive and Zenon Drive/Colonel Williams Parkway. A new intersection at Dundas Street is proposed at approximately 750 metres from the Colonel Williams Parkway intersection. Two major east/west road corridors are proposed as identified in the NOWSP to provide access from Tremaine Road to Bronte Road, across the employment area. The southern east/west road aligns with the William Halton Parkway as part of the proposed New North Oakville Transportation Corridor (i.e., Burnhamthorpe Road extension) on the east side of Bronte Road. Additionally, an east-west local road is proposed between the Burnhamthorpe Road extension and Dundas Street West via the proposed north-south roadway west of Colonel William Parkway, providing access to the proposed development blocks and ending in a cul-de-sac.

The development proposal identifies the natural heritage and open space system and stormwater management facilities based on the Town's NOWSP, which has been further refined for the subject property based upon the Environmental Implementation Report and Functional Servicing Study (EIR/FSS) previously prepared in support of these applications.



Source: Bentall-Concept-180717-INTERNAL.dwg, February 08, 2019

NTS

Figure 2-1
407 West Employment Area Concept Plan
Lazy Pat Farms Property Transportation Study

09M-00013-01_Bentall-Concept_20190307_recover_recover.dwg_Employment

Modified: 3/7/2019 2:51 PM By: nawfal.kammah Plot Date: 2019/03/07

3 PROPOSED LAND USES AND SITE ACCESS

3.1 PROPOSED LAND USES

The subject property is situated mid-block between Bronte Road and Tremaine Road, and bounded by Dundas Street West to the south and Highway 407 to the north. The development proposal consists of a mix of General Employment lands, Light Employment lands, and Service Area Employment lands, with the remaining area used as open space and for stormwater management purposes. The subject property is within the North Oakville West Secondary Plan area, where the general development objective for employment uses is a minimum of 0.35 FSI.

The proposed development and the supporting internal road network will be developed in two phases. **Figure 3-1** illustrates the proposed block plan related to the property by phase. **Table 3-1** summarizes the proposed subject property uses and gross floor area by phase.

Table 3-1 – Summary of Proposed Uses by Phase

PHASE	SERVICE AREA EMPLOYMENT (SERVICE/RETAIL/OFFICE)	GENERAL EMPLOYMENT	LIGHT EMPLOYMENT	TOTAL BY PHASE
Phase 1	202,879 ft^2	279,344 ft^2	254,566 ft^2	736,789 ft^2
Phase 2	-	318,612 ft^2	657,675 ft^2	976,287 ft^2
TOTAL	**202,879 ft^2**	**597,956 ft^2**	**912,241 ft^2**	**1,713,076 ft^2**

3.2 PROPOSED SITE ACCESS

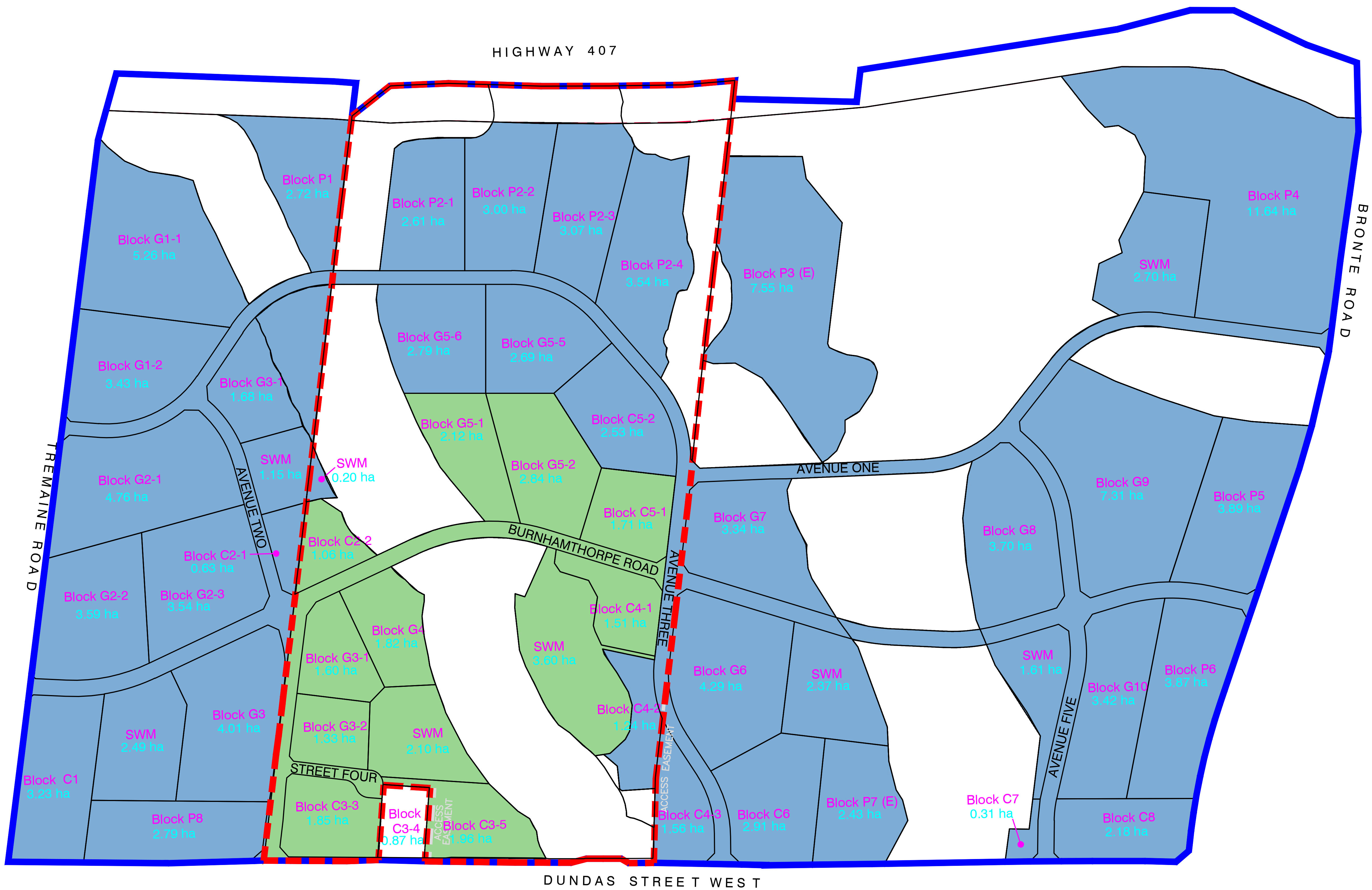
The proposed development is part of the 407 West Employment Area (also referred to as the 407 Employment Lands within this report) bounded by Bronte Road, Tremaine Road, Dundas Street West, and Highway 407. On the basis of the Transportation Plan for the North Oakville West Secondary Plan (NOWSP), the 407 West Employment Area will be served by a grid network of roadways, as shown in **Figure 2-1**, including:

- Two (2) major east-west roadways, namely Avenue One and the New North Oakville Transportation Corridor (NNOTC), shown as Burnhamthorpe Road;
- Three (3) major north-south roadways, namely Avenue Two, Avenue Three, and Avenue Five; and
- One (1) minor roadway, namely Street Four, connected to Avenue Two.

As shown in **Figure 2-1**, both major east-west roadways are parallel with Dundas Street West, connecting Tremaine Road and Bronte Road, between Highway 407 and Dundas Street West. Both roadways are expected to be aligned with the two future east-west roadways in the Tremaine and Dundas Secondary Plan Area, extending to the west of Tremaine Road. Avenue One will terminate eastward at its intersection with Bronte Road. The proposed NNOTC extension (Burnhamthorpe Road) will extend eastward via the existing William Halton Parkway roadway.

Avenue Two will run in the north-south direction between Dundas Street West and Avenue One located approximately 450 metres to the east of Tremaine Road. Avenue Three will run in the north-south direction, aligned with Colonel William Parkway at its intersection with Dundas Street West, terminating at its intersection with Avenue One. Similarly, Avenue Five will run in the north-south direction, aligned with Valleyridge Drive at its intersection with Dundas Street, terminating at its intersection with Avenue One. Please refer to **Figure 3-1** for the assumed phasing of the future road network in the 407 West Employment Area.

J:\01 PROJECTS\2009jobs\14-09222.GKS (407 West Employment Area)\2018 Work\CAD\DWG



Source: Bentall-Concept-180717-INTERNAL.dwg, February 08, 2019

Phase 1 Blocks As Per Traffic Analysis

Phase 2 Blocks As Per Traffic Analysis

407 West Area Employment Lands

Subject Property

Figure 3-1
Proposed Block Plan Phasing Per Traffic Analysis
Lazy Pat Farms Property Transportation Study

09M-00013-01_Bentall-Concept_20190307_recover_recover.dwg_Phasing Plan

Modified: 3/7/2019 2:51 PM By: nawfal.kammah Plot Date: 2019/03/07

4 EXISTING TRAFFIC CONDITIONS

4.1 BOUNDARY ROADWAYS

The key boundary roadways in the vicinity of the property are Dundas Street West, Bronte Road, Tremaine Road, Colonel William Parkway, and Valleyridge Drive.

Dundas Street West bounds the property to the south, and is a major east-west arterial road under the jurisdiction of the Region of Halton. It has a posted speed limit of 60 km/h between Bronte Road and west of Colonel William Parkway. The speed limit increases to 80 km/h beyond west of Colonel William Parkway. It currently consists of a six-lane cross-section roadway with three lanes in each direction between east of Bronte Road and west of Valleyridge Drive, and reduces to a four-lane cross-section roadway to the west of Valleyridge Drive.

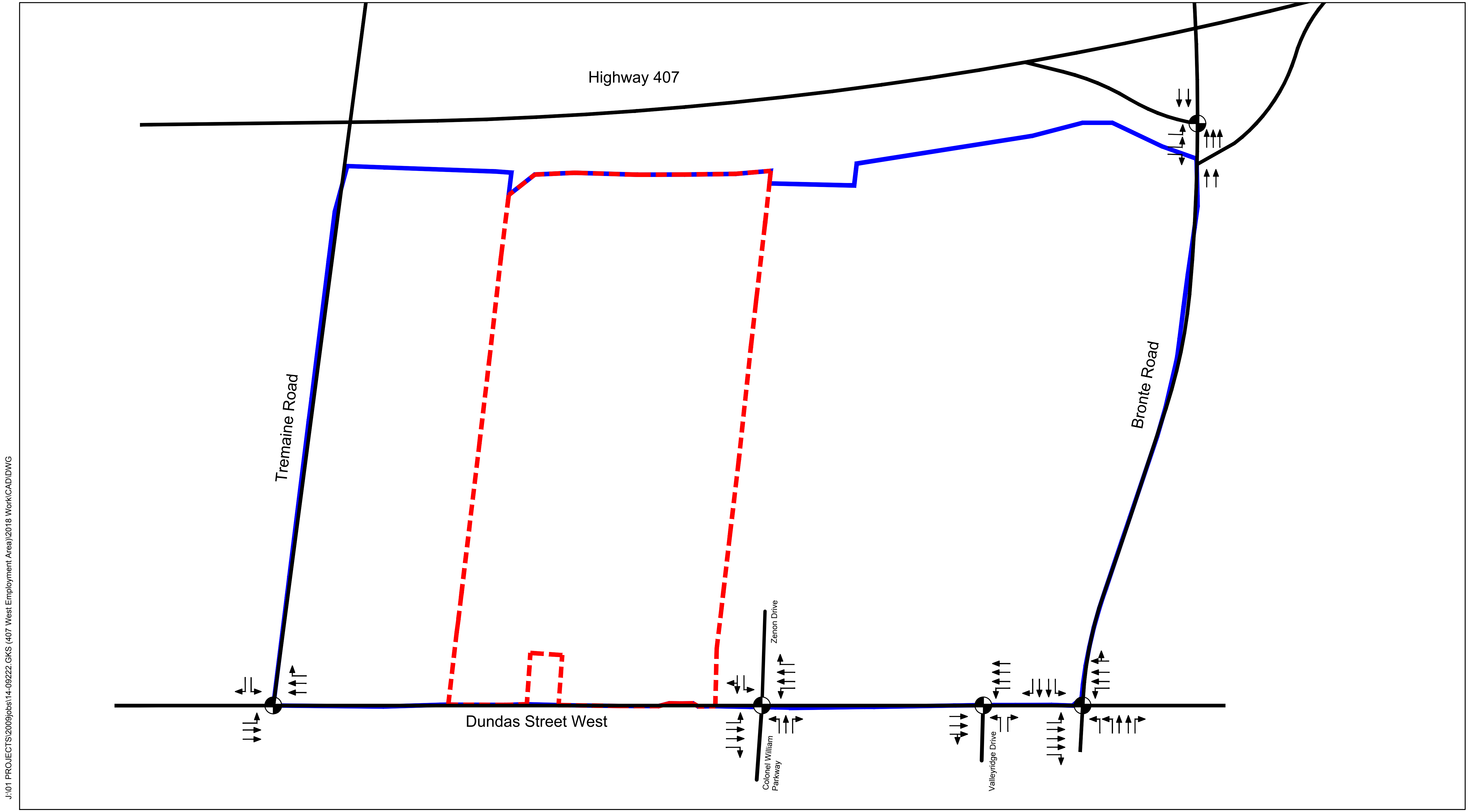
Bronte Road is located to the east of the property, and is a north-south arterial road under the jurisdiction of the Region of Halton and has a posted speed limit of 70 km/h and 60 km/h to the north and south of Dundas Street West, respectively. It currently consists of a four-lane cross-section roadway, with two lanes in each direction.

Tremaine Road is located to the west of the property, and is a north-south arterial road under the jurisdiction of the Region of Halton, with a posted speed limit of 80 km/h. It consists of a two-lane cross-section roadway, with one lane in each direction.

Colonel William Parkway is located to the south-east of the property, and is a north-south local road with a posted speed limit of 50 km/h, under the jurisdiction of the Town of Oakville. Currently, the road terminates at its intersection Dundas Street West, with another roadway named Zenon Drive as the north approach. Colonel William Parkway consists of a two-lane cross-section roadway, with one lane in each direction.

Valleyridge Drive is located to the south-east of the property, and is a north-south local road with a posted speed limit of 40 km/h, under the jurisdiction of the Town of Oakville. It consists of a two-lane cross-section roadway, with one lane in each direction.

Please refer to **Figure 4-1** for the existing lane configurations related to the boundary road intersections.



Source: Bentall-Concept-180717-INTERNAL.dwg, February 08, 2019

NTS

Signalized Intersection

407 West Area Employment Lands

Subject Property

Figure 4-1
Existing Lane Configuration
Lazy Pat Farms Property Transportation Study

09M-00013-01_Bentall-Concept_20190307_recover_recover.dwg_Existing Lane Config.

Modified: 3/7/2019 2:51 PM By: nawfal.kammah Plot Date: 2019/03/07

4.2 TRANSIT SERVICES

The subject property is serviced by Oakville Transit Routes 5 (Dundas) and 33 (Palermo):

- Transit Route 5 runs between the Oakville GO Station to the west of the intersection Dundas Street West at Walkers Line, travelling primarily along Trafalgar Road and Dundas Street West (currently detouring along Sixteen Mile Drive Boulevard due to construction along Dundas Street West). It provides access to the Uptown Core, Sheridan College and Oakville Trafalgar memorial Hospital. Route 5 has headways of 30 minutes during the AM and PM peak hours.
- Transit Route 33 runs between the Bronte GO Station and the intersection of Dundas Street West at Colonel William Parkway, travelling primarily along Bronte Road and Colonel William Parkway. It operates solely during weekday peak hours, with headways of 30 minutes.

4.3 TRAFFIC DATA

Turning movement counts were undertaken by Accu-Traffic under WSP's direction on Tuesday, December 11, 2018 from 7:00 AM to 9:00 AM, and from 4:00 PM to 6:00 PM at the following intersections:

- Dundas Street West and Bronte Road
- Dundas Street West and Tremaine Road
- Dundas Street West and Colonel William Parkway/Private Driveway
- Dundas Street West and Valleyridge Drive
- Bronte Road and Highway 407 Eastbound Off-Ramp

The 2018 surveyed turning movement counts were then compared with turning movement count volumes provided by Halton Region staff for the study intersections (collected in 2017). Using the 2017 counts, and additional surveyed volumes used in Transportation Studies submitted for surrounding developments in the study area, Region staff provided changes to select turning movements at the study intersections. Please refer to **Appendix A** for the 2018 surveyed TMC volumes, 2017 Region volumes, and the traffic volumes confirmed by Region staff to be used within the study for the signalized intersections.

The turning movement volumes used for existing conditions have been illustrated in **Figure 4-2** and **Figure 4-3** for the AM and PM peak hours, respectively (Zenon Drive was labelled as a Private Driveway within the Figure, as it yields access to the Suez Water Technologies and Solution station).

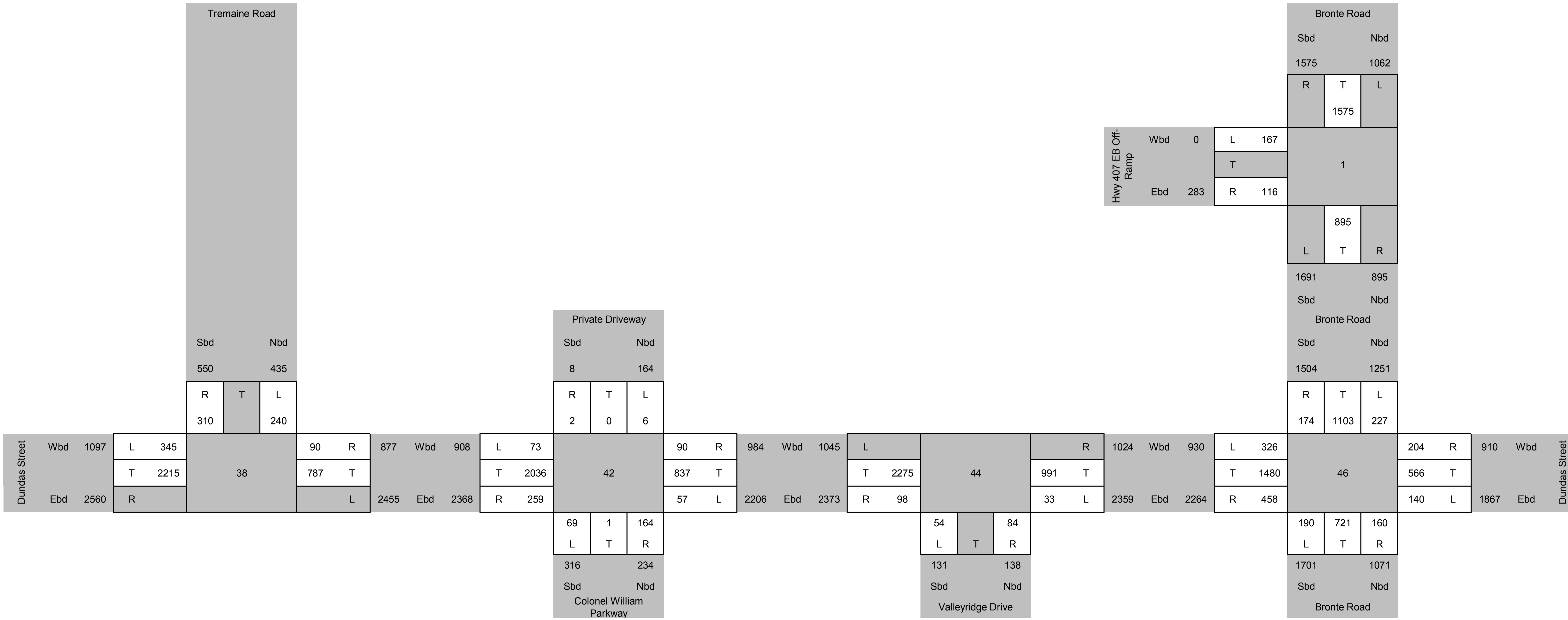
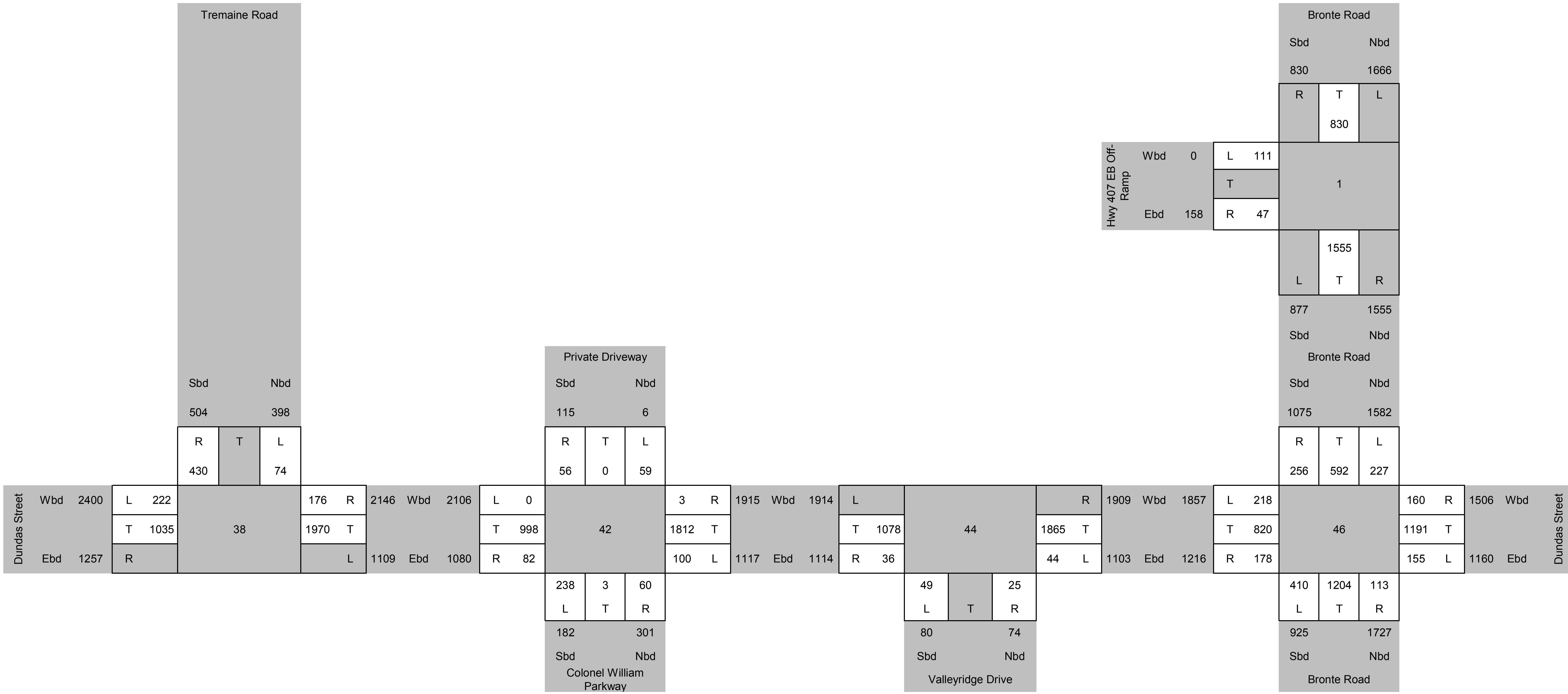


Figure 4-2
2018 Existing Traffic Volumes - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study



Scale: NTS

Figure 4-3
2018 Existing Traffic Volumes - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207.xlsx

4.4 EXISTING INTERSECTION OPERATIONS

The operations of the study intersections have been analyzed on the basis of the existing AM and PM peak hour volumes confirmed by Region staff and existing signal timing plans. It should be noted that the volumes at each intersection reflect the individual peak hours of each intersection, for the purpose of conservative analysis (as such traffic volumes may not be balanced between all intersections).

The signalized intersections were analyzed on the basis of the approach outlined in the Highway Capacity Manual, 2000 Edition, using Synchro v10.0. Please refer to **Appendix B** for the level of service definitions, and **Appendix C** for the Synchro traffic operations assessment results. **Table 4-1** provides a summary of the traffic operations under existing conditions.

Table 4-1 – Intersection Levels of Service Under Existing Conditions

Intersection Name / Movement	Intersection Type	AM Peak Hour			PM Peak Hour		
		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Bronte Road at Hwy 407 EB Off-Ramp	**Signalized**	**0.72**	**11**	**B**	**0.41**	**6**	**A**
Eastbound Left		0.40	33	C	0.37	37	D
Eastbound Right		0.52	36	D	0.03	35	D
Northbound Through		0.30	5	A	0.41	4	A
Southbound Through		0.76	10	B	0.32	3	A
Dundas Street West at Tremaine Road	**Signalized**	**0.99**	**31**	**C**	**1.04**	**55**	**E**
Eastbound Left		0.72	16	B	0.96	86	F
Eastbound Through		0.99	35	D	0.46	10	B
Westbound Through		0.57	16	B	1.09	74	E
Westbound Right		0.08	12	B	0.16	10	B
Southbound Left		0.79	58	E	0.20	39	D
Southbound Right		0.22	41	D	0.94	79	E
Dundas Street West at Colonel William Parkway	**Signalized**	**0.79**	**11**	**B**	**0.85**	**15**	**B**
Eastbound Left		0.16	2	A	0.00	0	A
Eastbound Through		0.86	8	A	0.53	13	B
Eastbound Right		0.19	0	A	0.06	6	A
Westbound Left		0.44	37	D	0.31	5	A
Westbound Through		0.38	8	A	0.82	9	A
Westbound Right		0.06	9	A	0.00	7	A
Northbound Left		0.48	53	D	0.82	60	E
Northbound Through		0.00	48	D	0.01	36	D
Northbound Right		0.43	52	D	0.04	36	D
Southbound Left		0.04	48	D	0.19	37	D
Southbound Through/Right		0.00	48	D	0.04	36	D
Dundas Street West at Valleyridge Drive	**Signalized**	**0.64**	**4.0**	**A**	**0.50**	**9**	**A**
Eastbound Through/Right		0.69	2	A	0.32	16	B
Westbound Left		0.30	39	D	0.13	2	A
Westbound Through		0.28	1	A	0.49	3	A
Northbound Left		0.34	53	D	0.37	56	E
Northbound Right		0.06	49	D	0.02	51	D
Dundas Street West at Bronte Road	**Signalized**	**1.12**	**67**	**E**	**1.13**	**55**	**D**
Eastbound Left		1.18	152	F	1.24	216	F
Eastbound Through		0.91	60	E	0.54	13	B
Eastbound Right		0.66	64	E	0.12	4	A
Westbound Left		0.99	98	F	0.64	31	C
Westbound Through/Right		0.52	34	C	0.89	47	D
Northbound Left		0.71	60	E	0.92	74	E
Northbound Through		0.68	36	D	1.05	81	F
Northbound Right		0.17	29	C	0.09	28	C
Southbound Left		0.93	69	E	0.91	66	E
Southbound Through		1.10	102	F	0.56	36	D
Southbound Right		0.23	31	C	0.32	32	C

Note: V/C ratios noted in red indicates that the movement is considered "critical" per the Halton Region Transportation Impact Study Guidelines (January 2015) – V/C of 0.85 or over for through movements and 0.95 or over for exclusive turning movements.

As indicated in **Table 4-1**, all study intersections operate with below overall capacity during the AM and PM peak hours, with the exception of the intersection of Dundas Street West at Bronte Road during the study periods and Dundas Street West at Tremaine Road during the PM peak hour. At the study intersections (with the exception of Dundas Street West at Bronte Road and Tremaine Road), only the eastbound through movement at the intersection of Dundas Street West at Colonel William Parkway during the AM peak hour is classified as critical per regional guidelines as it operates with a v/c of 0.86. This is deemed acceptable as it exceeds the threshold by only 0.01.

The intersection of Dundas Street West at Tremaine Road is projected to operate under capacity during the AM peak hour, with all turning movements operating under capacity. Only the eastbound through movement is classified as critical per regional guidelines as it operates with a v/c of 0.99. Recommendations to improve operations at the turning movement will be made as part of the future background conditions.

Finally, the intersection of Dundas Street West at Tremaine Road during the PM peak hour and the intersection of Dundas Street West at Bronte Road during the study periods operate over capacity based on the Synchro analysis results. The volume-to-capacity ratios reported by Synchro 10.0 indicate that volumes exceed the theoretical capacity value for several movements under existing conditions, which implies that more traffic is attempting to travel through the intersection than considered physically feasible when using Synchro default parameters. Once traffic volumes reach the theoretical capacity of a lane, drivers tend to change their driving behaviour and become more aggressive, which may result in increased saturation flow rates at intersections. Under these conditions, it is customary for the intersection parameters to be calibrated within the Synchro model to reflect actual roadway conditions and travel patterns.

Additional custom left-turn surveys were conducted by Accu-Traffic to derive the number of vehicles completing the turn during the protected phase and during the permitted phase. The surveys were conducted on Thursday January 31, 2019, under WSP's direction, for the eastbound left-turn movement at the intersection of Dundas Street West at Bronte Road during the AM peak hour (7:30-8:30 AM) and PM peak hour (4:30-5:30 PM). Using the surveyed data, the percentage of vehicles completing the turn during the permissive and protected phases, respectively, was derived and applied to the TMC eastbound left-turn volume to derive an estimate of the surveyed capacity for each phase. The Synchro model volume-to-capacity ratio was then used to derive capacities for the protected and permissive phases, respectively. Finally, the permissive and protected capacities derived from the Synchro model were compared to the capacities derived using the field survey distribution to derive a growth factor, which was applied to the permissive and protected saturation flow rates for the left-turn movement within the Synchro model. This calibration was completed to achieve a volume-to-capacity ratio of 1.0 for the left-turn movements during the AM and PM peak hours. The detailed left-turn saturation flow calibration has been included in **Appendix A** for the applicable movements. The left-turn saturation flow rate calibration, along with the additional calibration adjustments, have been detailed below:

- For the intersection of Dundas Street West at Bronte Road
  - AM Peak Hour:
    - The saturation flow rate of the eastbound left-turn movement protected phase was decreased from 1772 to 1630 based on the special survey results, and increased from 377 to 486 for the permissive phase.
    - The lost time adjustment was coded as "-1" seconds for all exclusive left-turn movements and "-3" seconds for through and right-turn movements. All lost time adjustments were applied following the following equations:

      Y(amber) + AR(all-red) – Tl (lost time) >=3 seconds
  - PM Peak Hour:
    - The saturation flow rate of the eastbound left-turn movement protected phase was increased from 1789 to 1807 based on the special survey results, and from 198 to 238 for the permissive phase.

- The lost time adjustment was coded as “-1” seconds for all exclusive left-turn movements and “-2” seconds for through and right-turn movements.

- For the intersection of Dundas Street West at Tremaine Road
  - During the PM peak Hour:
    - The lost time adjustment was coded as “-1” seconds for all exclusive left-turn movements and “-4” seconds for through and right-turn movements

Following the calibration detailed above, the existing traffic operations for the two study intersections have been detailed in **Table 4-2**.

Table 4-2 – Intersection Levels of Service Under Existing Conditions

Intersection Name / Movement	Intersection Type	AM Peak Hour			PM Peak Hour		
		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Dundas Street West at Tremaine Road	**Signalized**				**0.96**	**36**	**D**
Eastbound Left					0.97	92	F
Eastbound Through					0.44	8	A
Westbound Through					0.99	41	D
Westbound Right					0.15	11	B
Southbound Left					0.17	36	D
Southbound Right					0.88	64	E
Dundas Street West at Bronte Road	**Signalized**	**0.98**	**51**	**D**	**0.99**	**44**	**D**
Eastbound Left		1.00	90	F	1.00	128	F
Eastbound Through		0.85	54	D	0.51	12	B
Eastbound Right		0.65	60	E	0.12	4	A
Westbound Left		0.91	73	E	0.61	29	C
Westbound Through/Right		0.52	34	C	0.86	45	D
Northbound Left		0.89	86	F	0.87	66	E
Northbound Through		0.63	33	C	0.96	53	D
Northbound Right		0.15	26	C	0.09	25	C
Southbound Left		0.91	58	E	0.97	82	F
Southbound Through/Right		0.95	52	D	0.53	34	C
Southbound Right		0.17	26	C	0.30	31	C

Note: V/C ratios and LOS noted in red indicates that the movement is considered “critical” per the Halton Region Transportation Impact Study Guidelines (January 2015) – V/C of 0.85 or over for through movements and 0.95 or over for exclusive turning movements.

As per the above table, the calibrated Synchro model shows that the study intersections operate with overall LOS D, with all turning movements under capacity, with the exception of the eastbound left-turn movement at the intersection of Dundas Street West at Bronte Road per the calibration applied. Various turning movements remain classified as critical per regional guidelines. Recommendations to improve operations at the turning movements will be made as part of the future background conditions.

5 SITE TRIP GENERATION AND PLANNED ROADWAY IMPROVEMENTS

This section of the report provides details with regards to the land use assumptions for the 407 Employment Lands, the planned internal roadway network per phase, and the trip generation and trip distribution used to assign the 407 Employment Lands site generated trips.

5.1 LAND USE ASSUMPTIONS

Two horizon years have been assessed in this study:

- A horizon year to 2021, which accounts for a partial build-out of the subject lands.
- A horizon year to 2031, which accounts for the full build-out of the subject lands as well as the surrounding 407 Employment Lands.

The land use assumptions for the subject property by phase are summarized in **Table 5-1**.

Table 5-1 – Development Proposal Land Uses by Phase

PHASE	SERVICE AREA EMPLOYMENT			GENERAL EMPLOYMENT	LIGHT EMPLOYMENT	TOTAL BY PHASE
	Service Uses	Retail Uses	Office Uses			
Phase 1	81,151 ft²	50,720 ft²	71,008 ft²	279,344 ft²	254,566 ft²	736,789 ft²
Phase 2	-		-	318,612 ft²	657,675 ft²	976,287 ft²
TOTAL	**81,151 ft²**	**50,720 ft²**	**71,008 ft²**	**597,956 ft²**	**912,241 ft²**	**1,713,076 ft²**

5.2 PROPOSED ROAD NETWORK AND PLANNED IMPROVEMENTS

The following roadway improvements have been assumed per correspondence with the Region and City staff and the Halton Region Transportation Development and Non-Development Capital Implementation Plan (2018-2031).

To support Phase 1 development on the subject property, the following road infrastructure has been assumed for the 2021 horizon:

- The segment of Avenue Two between Dundas Street West and Burnhamthorpe Road extension would be built. Avenue Two would connect to a section of Burnhamthorpe that would be built, which would then end in a cul-de-sac.
- Street Four Connecting Avenue Two to the proposed development would be built.

To support Phase 2 development on the subject property, the following road infrastructure has been assumed for the 2031 horizon:

- Widening of Dundas Street West between Tremaine Road and Bronte Road from 4 to 6 lanes. The two additional lanes are assumed to be high-occupancy vehicle (HOV) lanes for the 2031 horizon.

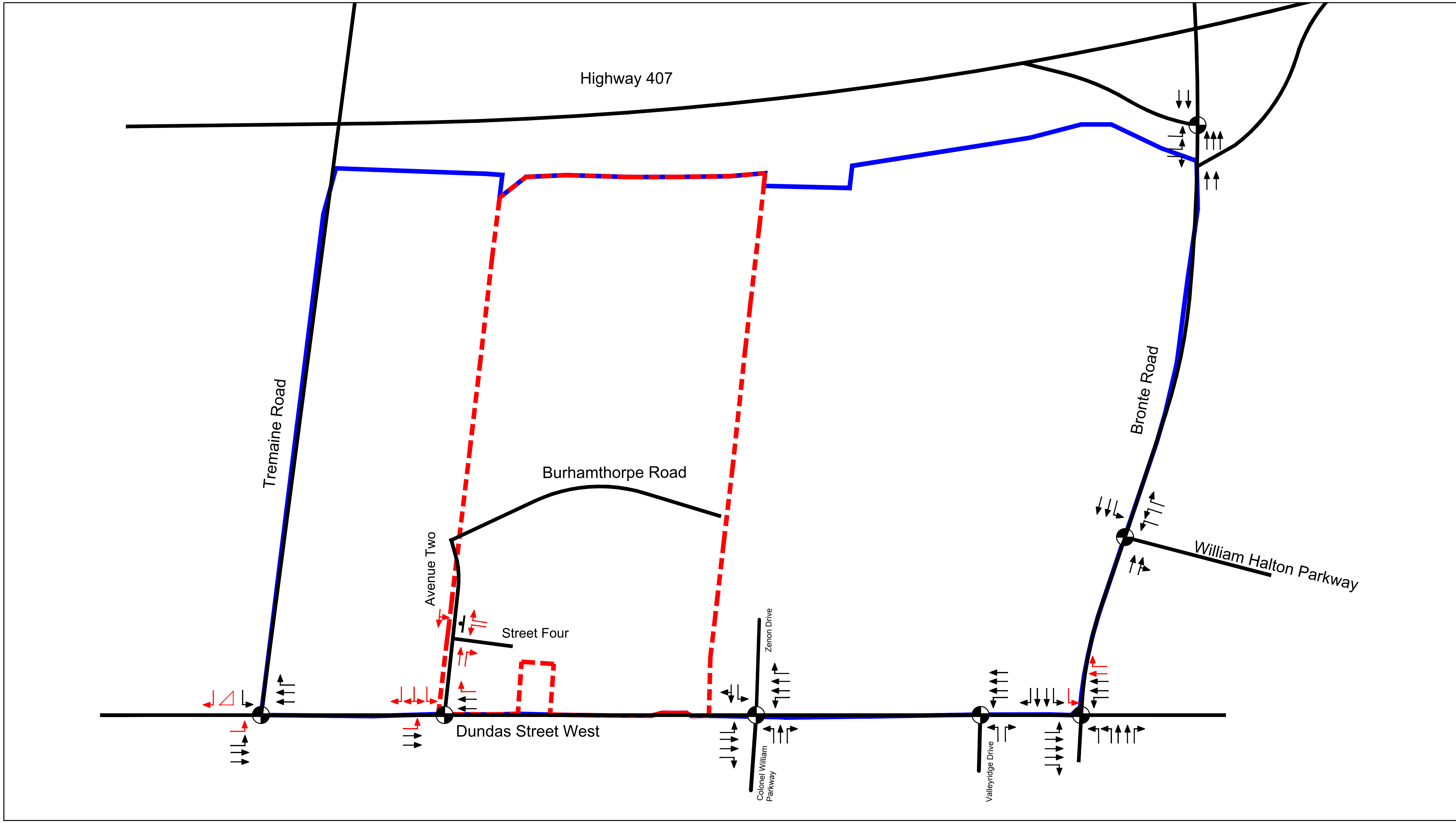
- The Tremaine Road widening between Dundas Street West and Lower Base Line from 2 to 4 lanes.
- The Bronte Road widening between Speers Road and Highway 407 from 4 to 6 lanes.
- The William Halton Parkway Widening between Old Bronte Road and Hospital Gate from 2 to 4 lanes.
- Burnhamthorpe Road extension would be constructed between Tremaine Road and Bronte Road, connecting to the NNOTC to the east of Bronte Road.
- Avenue Three and Avenue Five would be built.
- Avenue One would be built, projected to intersect with Tremaine Road and Bronte Road.

In addition to the proposed Phase 2 scenario, a sensitivity analysis was completed to determine traffic operations assuming the removal of creek crossings at Avenue One (as detailed in the bullet below). This scenario was named Phase 2A within this study, and consist of the following changes compared to the Phase 2 road network:

- The removal of creek crossings would create a segmentation of Avenue One east of Avenue Two and west of Avenue Five, rendering Avenue One non-continuous within the subject lands between Tremaine Road and Bronte Road.

Please refer to **Figure 5-1**, **Figure 5-2** and **Figure 5-3** for the assumed boundary road network for Phase 1 (2021), Phase 2 (2031) and Phase 2A (2031). The lane configuration at the study intersections along Dundas Street West are based on the Environmental Assessment completed in June 2015 by WSP (formerly MMM) as well as recommendations based on the traffic operations analysis completed within this study (detailed in later sections). The proposed signal control for some of the internal intersections are based on signal warrants as detailed in Section 7.2.1. The warrants have been completed using the Phase 2 (2031) traffic volumes for the proposed development. Similarly, exclusive turning lane warrants completed for the internal intersections were based on the Phase 2 (2031) traffic volumes as detailed in Section 7.2.2, as well as projected traffic operations. The results of both warrant types were used to derive the projected internal roadway network used under future background and future total conditions.

J:\01 PROJECTS\2009jobs\14-09222.GKS (407 West Employment Area)\2018 Work\CAD\DWG



Source: Bentall-Concept-180717-INTERNAL.dwg, February 08, 2019

NTS

Signalized Intersection

Stop-Controlled Intersection

Recommended Lane Configuration

407 West Area Employment Lands

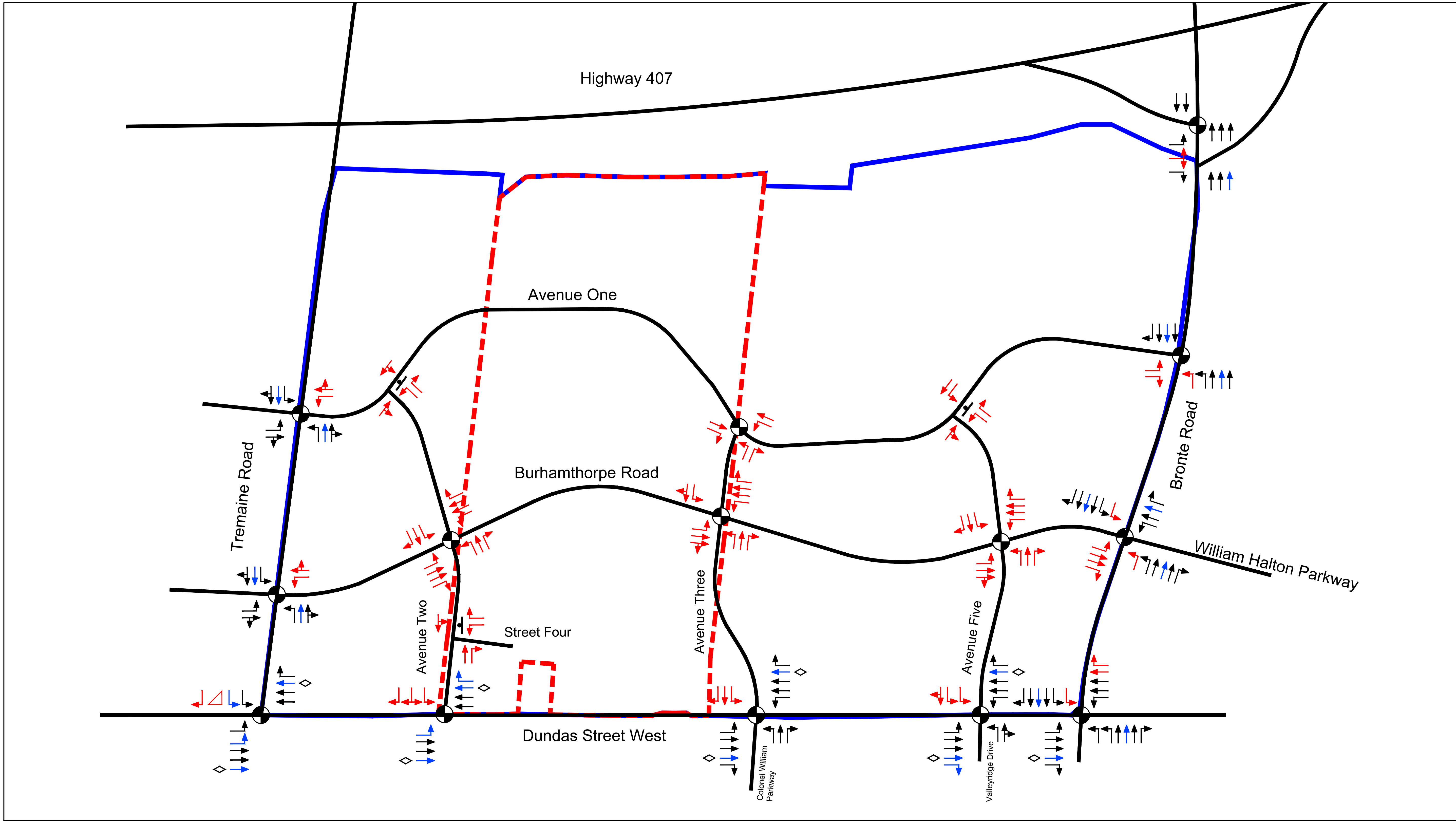
Subject Property

Note: All Channelized right-tun lanes are recommended to be implemented along with an additional receiving lane that would taper out.

Figure 5-1
Phase 1 (2021) Lane Configuration
Lazy Pat Farms Property Transportation Study

09M-00013-01_Bentall-Concept_20190307_recover_recover.dwg_2021 Ph1 Lane Config.

Modified: 3/7/2019 2:51 PM By: nawfal.kammah Plot Date: 2019/03/07



J:\01 PROJECTS\2009\jobs\14-09222.GKS (407 West Employment Area)\2018 Work\CAD\DWG

Source: Bentall-Concept-180717-INTERNAL.dwg, February 08, 2019

NTS

Signalized Intersection
Stop-Controlled Intersection
Recommended Lane Configuration
Planned Lane Configuration per Dundas Street West EA and Planned Widenings
HOV Lane

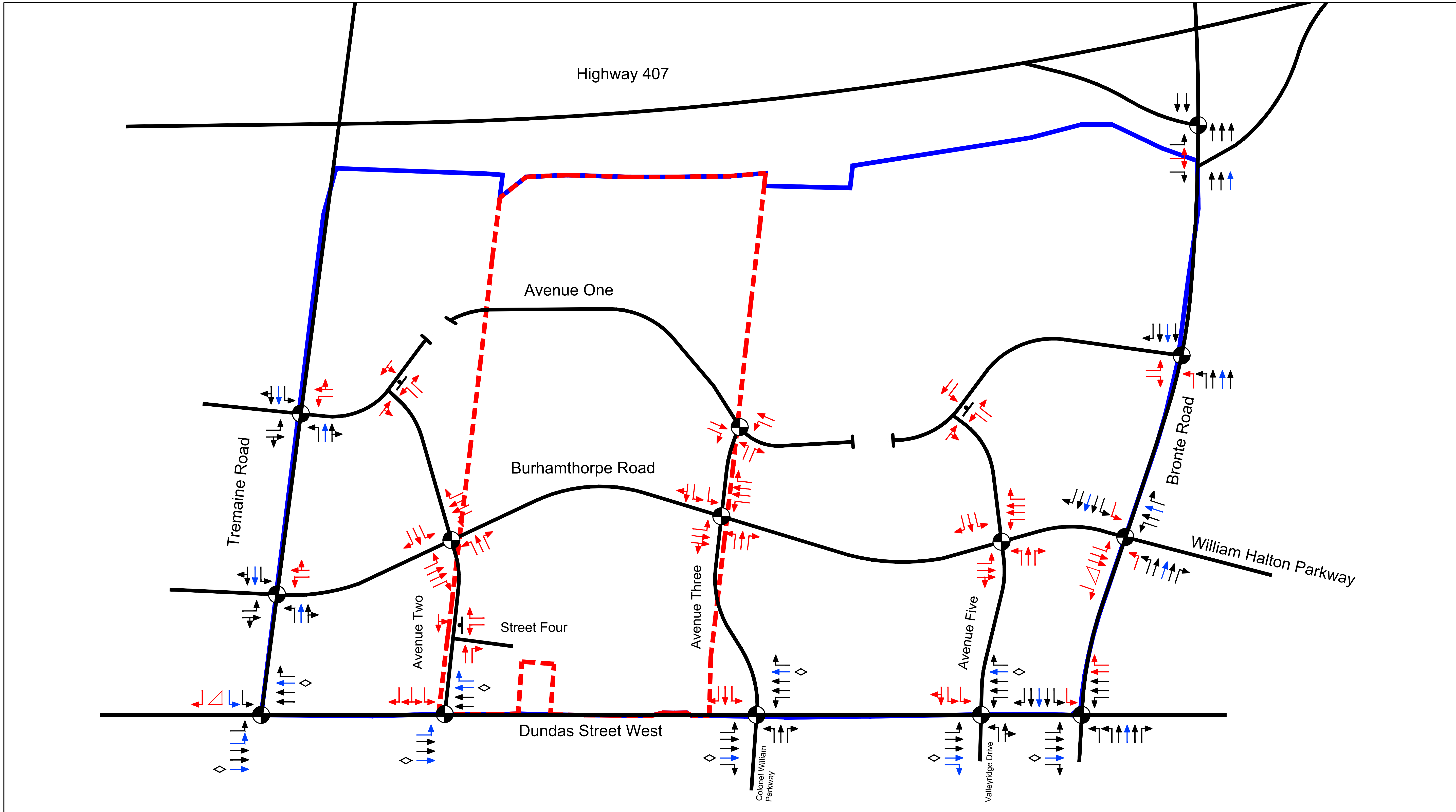
407 West Area Employment Lands
Subject Property

Note: All Channelized right-tun lanes are recommended to be implemented along with an additional receiving lane that would taper out.

Figure 5-2
Phase 2 (2031) Lane Configuration
Lazy Pat Farms Property Transportation Study

09M-00013-01_Bentall-Concept_20190307.dwg_2031 Ph2 Lane Config.

Modified: 3/12/2019 4:08 PM By: nawfal.kammah Plot Date: 2019/03/12



J:\01 PROJECTS\2009jobs\14-09222.GKS (407 West Employment Area)\2018 Work\CAD\DWG

Source: Bentall-Concept-180717-INTERNAL.dwg, February 08, 2019

NTS

Signalized Intersection
Stop-Controlled Intersection
Recommended Lane Configuration
Planned Lane Configuration per Dundas Street West EA and Planned Widenings
HOV Lane

407 West Area Employment Lands
Subject Property

Note: All Channelized right-tun lanes are recommended to be implemented along with an additional receiving lane that would taper out.

Figure 5-3
Phase 2A (2031) Lane Configuration
Lazy Pat Farms Property Transportation Study

09M-00013-01_Bentall-Concept_20190307.dwg_2031 Ph2A Lane Config.

Modified: 3/12/2019 4:08 PM By: nawfal.kammah Plot Date: 2019/03/12

5.3 TRIP GENERATION

This section details the methodology used when completing the trip generation for the subject lands and surrounding 407 Employment Lands.

5.3.1 TRIP GENERATION – GENERAL EMPLOYMENT

According to the comprehensive Zoning By-law for North Oakville (2009-189), permitted uses for the General Employment zone generally includes light employment uses (except hotel and service establishments), general industrial, outside storage and processing, among others.

The trip generation related to the proposed General Employment lands was determined using the Business Park (Land Use 770) code published in the **ITE TRIP GENERATION MANUAL, 10TH EDITION**.

The following equation and directional distributions from the ITE publications were used in the analysis:

Weekday AM Peak Hour: Ln (T) = 0.97 Ln (X) + 0.49
Where X = 1,000 ft^2 GFA
T = Total Vehicle Trips
Distribution = 85% entering and 15% exiting

Weekday PM Peak Hour: Ln (T) = 0.90 Ln (X) + 0.85
Where X = 1,000 ft^2 GFA
T = Total Vehicle Trips
Distribution = 26% entering and 74% exiting

5.3.2 TRIP GENERATION – LIGHT EMPLOYMENT

The proposed Light Employment lands mainly consist of office development, including general office, medical office, research and development, and information processing centres. The trip generation related to the proposed Light Employment lands was determined using the General Office (Land Use 710) code published in the **ITE TRIP GENERATION MANUAL, 10TH EDITION**.

The following equation and directional distributions from the ITE publications were used in the analysis:

Weekday AM Peak Hour: Ln (T) = 0.88 Ln (X) + 1.06
Where X = 1,000 ft^2 GFA
T = Total Vehicle Trips
Distribution = 88% entering and 12% exiting

Weekday PM Peak Hour: T = 1.10 (X) + 65.39
Where X = 1,000 ft^2 GFA
T = Total Vehicle Trips
Distribution = 18% entering and 82% exiting

5.3.3 TRIP GENERATION – SERVICE AREA EMPLOYMENT USES

The proposed Service Area Employment lands mainly consist of a combination of service, retail and office uses, serving the employment uses.

The trip generation related to the office component of the Service Area Employment lands was determined using the General Office (Land Use 710) code published in the **ITE TRIP GENERATION MANUAL, 10TH EDITION**, as detailed in Section 5.3.2.

The trip generation related to the service and retail components of the Service Area Employment lands were determined using the Shopping Centre (Land Use 820) code published in the **ITE TRIP GENERATION MANUAL, 10TH EDITION**. The Shopping Centre Land Use was used as it provides the most appropriate trip rates and associated trip generation related to the service and retail components of the Service Area Employment lands.

The following equation and directional distributions from the ITE publications were used in the analysis related to the service and retail uses:

Weekday AM Peak Hour: $T = 0.50\ (X) + 151.78$
Where $X = 1{,}000\ ft^2$ GFA
T = Total Vehicle Trips
Distribution = 62% entering and 38% exiting

Weekday PM Peak Hour: $Ln\ (T) = 0.74\ Ln\ (X) + 2.89$
Where $X = 1{,}000\ ft^2$ GFA
T = Total Vehicle Trips
Distribution = 48% entering and 52% exiting

Internal Trips

As noted, the proposed Service Area Employment lands (blocks) consist of service, retail, and office uses. The service and retail components of the development are intended to serve the people who work in the proximity. Thus, it is expected that some of the vehicle trips will be joint trips (internal) between the different uses within the subject property, rather than new trips that are coming from the external roadway network. These trips can be made either by walking or by driving using internal roadways within the individual blocks.

The internal trip estimation within the Service Area Employment blocks is based on the procedure outlined in the **ITE Trip Generation Handbook, 3RD EDITION**. It should be noted that no joint trips were assumed for the AM peak hour.

Table 5-2 summarizes the typical internal capture rates for trip origins and trip destinations within a multi-use development as outlined in the ITE Trip Generation Handbook.

Table 5-2 – Typical Internal Capture Rates for Trip Origins and Trip Destinations for the Weekday P.M. Peak Hour

TRIP ORIGIN TO TRIP DESTINATION	CAPTURE RATE FOR TRIP ORIGIN	TRIP DESTINATION FROM TRIP ORIGIN	CAPTURE RATE FOR TRIP DESTINATION
From Office to Retail	20%	To Retail from Office	8%
From Retail to Office	2%	To Office from Retail	31%

The internal capture percentages were applied to the appropriate directional trip generation value. For instance:

A. Internal trips from office to retail = 20 percent x P.M. outbound trips related to the office use
B. Internal trips to retail from office = 8 percent x P.M. inbound trips related to the retail uses

The two internal trip values are compared and the lower value is selected. For instance, if internal trips from office to retail (A) consist of 22 trips, while the internal trips to retail from office (B) consist of 26 trips, the controlling value is 22 internal trips.

These internal trips are assumed to be made by walking or driving within the Service Area Employment block without accessing the public road network. Thus, these internal trips are subtracted from the overall trip generation related to the Service Area Employment blocks. The internal trips were derived using volumes for which the mode split adjustment was also factored (as detailed in Section 5.3.4) in order to base the internal trip reduction solely on vehicle trips.

Pass-by Trips

The Service Area Employment blocks are anticipated to attract some trips from drivers who are already travelling along a roadway adjacent to a Service Area Employment block, and choose to make an intermediate stop while on their way to their primary destination. These are referred to as pass-by-trips. The pass-by trip percentage is the proportion of vehicles entering the development that would have already been travelling by the property while heading to other destinations, but made this intermediate stop along the way. Therefore, the site generated trips added to the boundary road network by the proposed development is typically reduced to account for a certain percentage of site trips which would be on the road network for other purposes, even if the subject development was not there.

This is expected to be the case for the Service Area Employment Blocks which are proposed to be located at the major intersections along Dundas Street West. No pass-by trips were assumed for the AM peak hour, as it is expected that the number of pass-by trips during this time are few and insignificant.

The following equation from the **ITE TRIP GENERATION HANDBOOK, 3RD EDITION,** was used to develop the pass-by trip percentage for the weekday PM. peak period for shopping centre uses:

$T = 0.34\ (X)$
Where $X = 1{,}000\ ft^2$ GFA
T = Average Pass-by Trip Percentage

5.3.4 MODEL SPLIT ADJUSTMENT

The subject property will be well served by various travel modes (e.g. bike path, transit, etc.). Since only nominal non-auto usage has been built into the ITE trip generation rates, further reduction was applied to reflect the growing transit services available in the NOWSP area and TDM initiatives implemented for the subject property, as well as the neighbouring lands.

Based on the 2016 Transportation Tomorrow Survey (TTS) Data, a non-auto mode split of 12% has been surveyed in the Town of Oakville. Assuming a non-auto mode split reduction of 5% included within the ITE trip generation rate, WSP assumed a non-auto mode split reduction of 7% to be applied for the short-term horizon year. Following the approach previously approved by the Region and Town, the non-auto mode split for 2031 is assumed to double to a reduction rate of 14%. Accordingly, the following mode split reductions were applied to the trip generation for the proposed 407 Employment Lands to account for non-auto modes of travel:

- Phase 1 (2021) – 7% reduction
- Phase 2 (2031) – 14% reduction
- Phase 2A (2031) – 14% reduction

The non-auto split adjustment was applied to the General Employment and Light Employment lands.

5.3.5 TRIP GENERATION VOLUMES

Table 5-3 to **Table 5-4** summarize the resulting trip generation related to the subject property, incorporating the non-auto split adjustment to the General Employment and Light Employment lands, and internal trip and pass-by trip reduction to the Service Area Employment lands by Phase.

Table 5-3 – Proposed Development Trip Generation – Phase 1 (2021 Horizon)

LAND USE	TRIP GENERATION	GFA (SQ.FT)	VEHICLE TRIPS					
			Weekday AM Peak Hour			Weekday PM Peak Hour		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Service Area Employment	General office (ITE 10th Edition Manual)	71,008	108	15	123	26	118	144
	Mode Split Adjustment (7%)		8	1	9	2	8	10
	Internal Trip Reduction		0	0	0	7	22	29
	Sub-Total		**100**	**14**	**114**	**17**	**88**	**105**
	Shopping Centre (ITE 10th Edition Manual)	131,871	135	83	218	320	347	667
	Internal Trip Reduction		0	0	0	22	7	29
	Pass-By Trip Reduction (ITE 3rd Edition Handbook)		0	0	0	22	22	44
	Sub-Total		**135**	**83**	**218**	**276**	**318**	**594**
Light Employment	General office (ITE 10th Edition Manual)	254,566	333	45	378	62	284	346
	Mode Split Adjustment (7%)		23	3	26	4	20	24
	Sub-Total		**310**	**42**	**352**	**58**	**264**	**322**
General Employment	Business Park (ITE 10th Edition Manual)	279,344	328	58	386	97	276	373
	Mode Split Adjustment (7%)		23	4	27	7	19	26
	Sub-Total		**305**	**54**	**359**	**90**	**257**	**347**
Total Phase 1 Development			**850**	**193**	**1043**	**441**	**927**	**1368**

Table 5-4 – Proposed Development Trip Generation – Phase 1+2/2A (2031 Horizon)

LAND USE	TRIP GENERATION	GFA (SQ.FT)	VEHICLE TRIPS					
			Weekday AM Peak Hour			Weekday PM Peak Hour		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Service Area Employment	General office (ITE 10th Edition Manual)	71,008	108	15	123	26	118	144
	Mode Split Adjustment (14%)		15	2	17	4	16	20
	Internal Trip Reduction		0	0	0	7	20	27
	Sub-Total		**93**	**13**	**106**	**15**	**82**	**97**
	Shopping Centre (ITE 10th Edition Manual)	131,871	135	83	218	320	347	667
	Internal Trip Reduction		0	0	0	20	7	27
	Pass-By Trip Reduction (ITE 3rd Edition Handbook)		0	0	0	22	22	44
	Sub-Total		**135**	**83**	**218**	**278**	**318**	**596**
Light Employment	General office (ITE 10th Edition Manual)	912,241	1023	140	1163	192	877	1069
	Mode Split Adjustment (14%)		143	20	163	27	123	150
	Sub-Total		**880**	**120**	**1000**	**165**	**754**	**919**
General Employment	Business Park (ITE 10th Edition Manual)	597,956	685	121	806	192	547	739
	Mode Split Adjustment (14%)		96	17	113	27	76	103
	Sub-Total		**589**	**104**	**693**	**165**	**471**	**636**
Total Phase 1 and 2 Development			**1697**	**320**	**2017**	**623**	**1625**	**2248**

5.4 TRIP DISTRIBUTION AND ASSIGNMENT

The 2016 Transportation Tomorrow Survey (TTS) findings were reviewed to determine the site traffic distribution to the boundary roadways. The “auto-driver” data was used to determine the distribution related to the subject property, located in the Oakville Planning District (PD 39). **Table 5-5** summarizes the distributions to/from PD 39, indicating the employment based distribution.

Table 5-5 – Employment Based General Trip Distribution

DIRECTION	PERCENTAGE
Within Oakville	27%
Toronto	11%
York Region	3%
Peel Region	27%
Burlington	13%
Milton	4%
Halton Hills	1%
Hamilton-Niagara Region	12%
Waterloo Region	1%
Guelph	1%
Total	**100%**

The traffic was assigned to the boundary road network accordingly based on the available road links anticipated to be in place during each phase. **Table 5-6** summarizes the trip assignments to the boundary road network by Phase, reflecting the respective assumed road network.

Table 5-6 – Trip Assignment by Phase

TO/FROM	TRIP ASSIGNMENT PERCENTAGES	
	2021 (Phase 1)	2031 (Phase 2/2A)
Tremaine Road North	2%	2%
Bronte Road North	3%	3%
Bronte Road South	35%	32%
Dundas Street East	28%	21%
Dundas Street West	18%	18%
Highway 407 East	8%	6%
Highway 407 West	4%	4%
Colonel William Parkway	1%	1%
Valleyridge Drive	1%	1%
Burnhamthorpe Road East	-	12%
Total	100%	100%

Please refer to **Figure 5-4** to **Figure 5-9** for the proposed development site traffic assignment under Phase 1 (2021) and Phase 2 (2031) during the AM and PM peak hours.

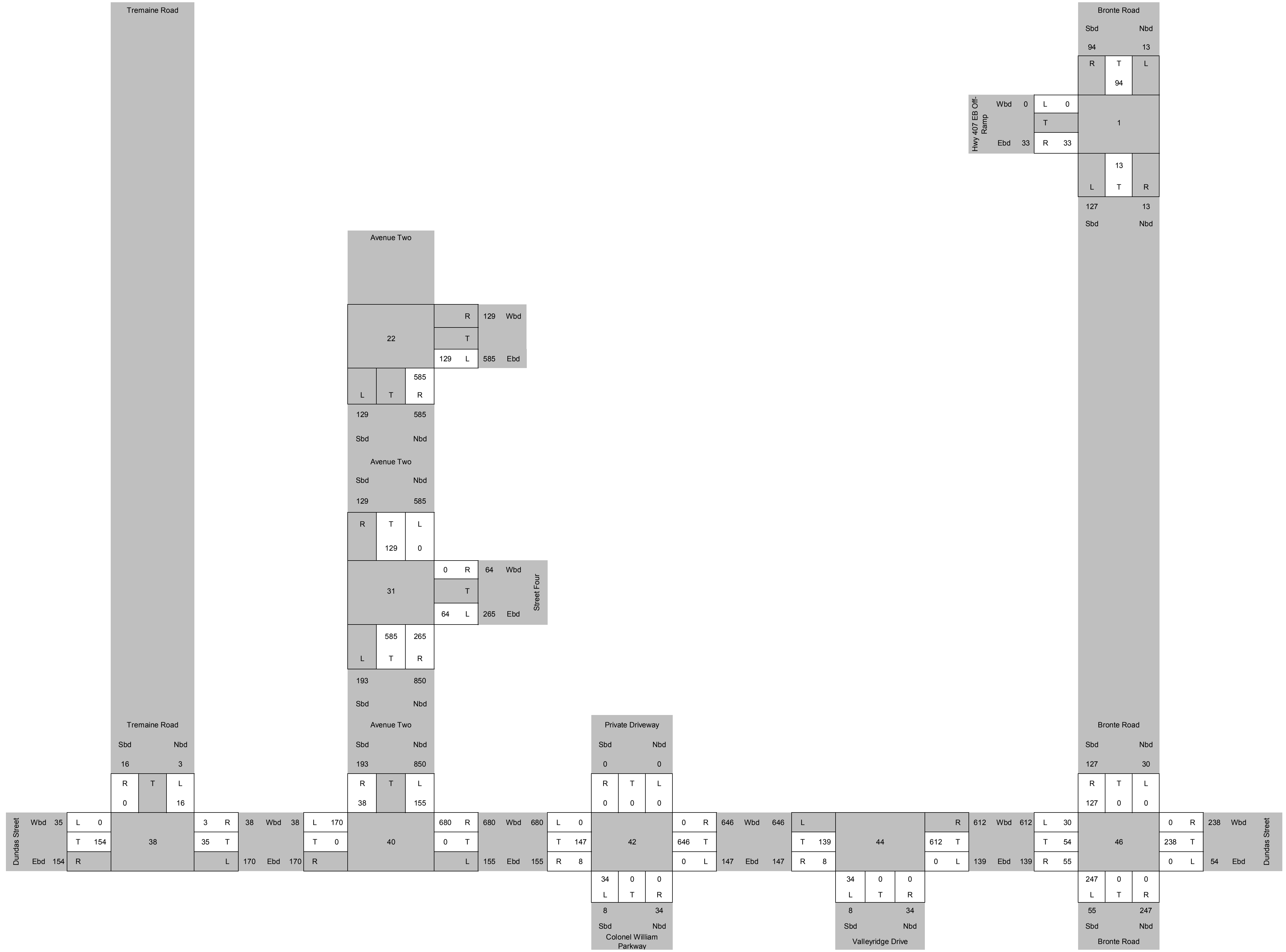


Figure 5-4
Primary Site Generated Trip Assignment - Phase 1 (2021) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

3269 Dundas Street West - Budget Tracking.xlsx

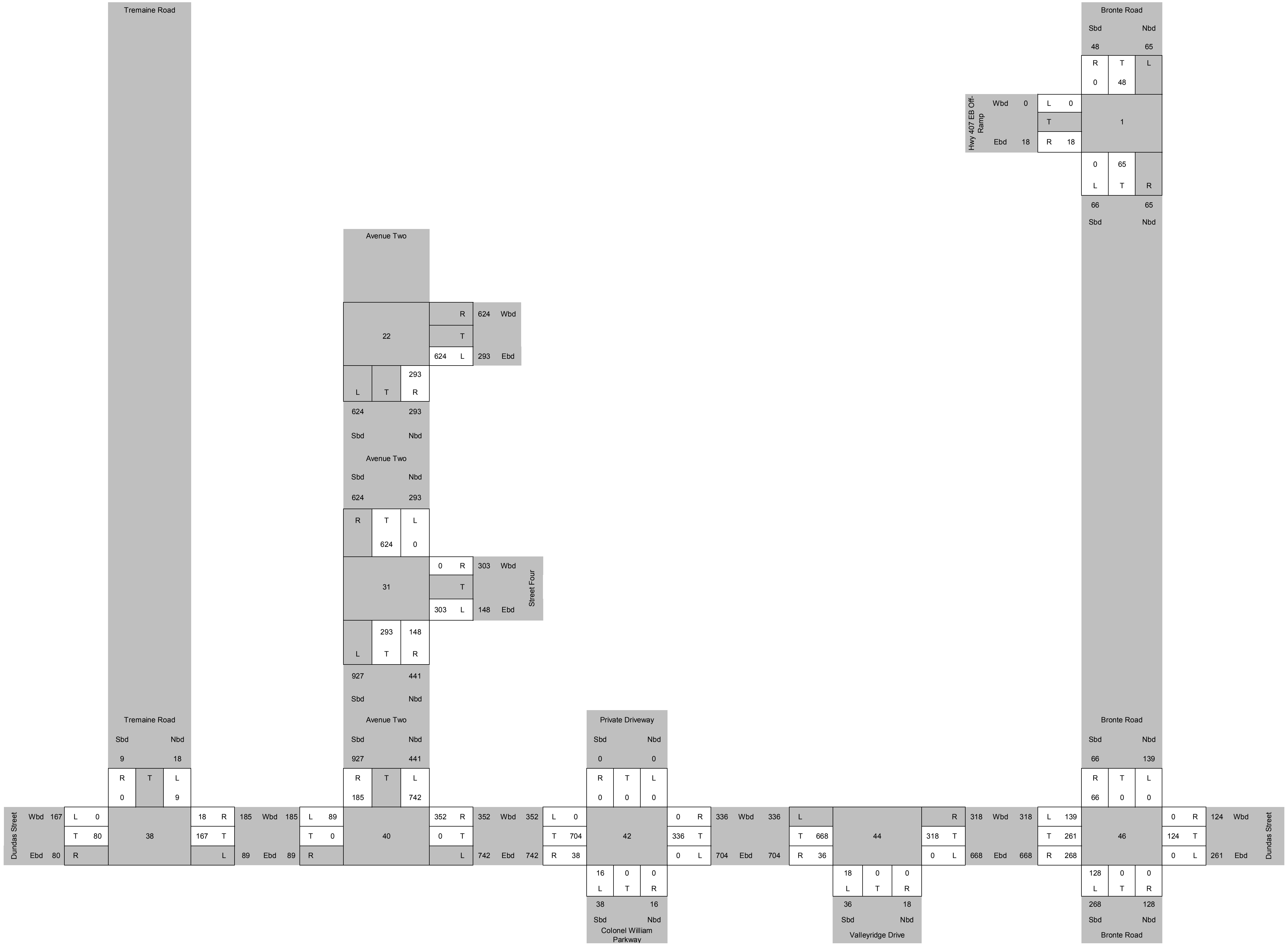
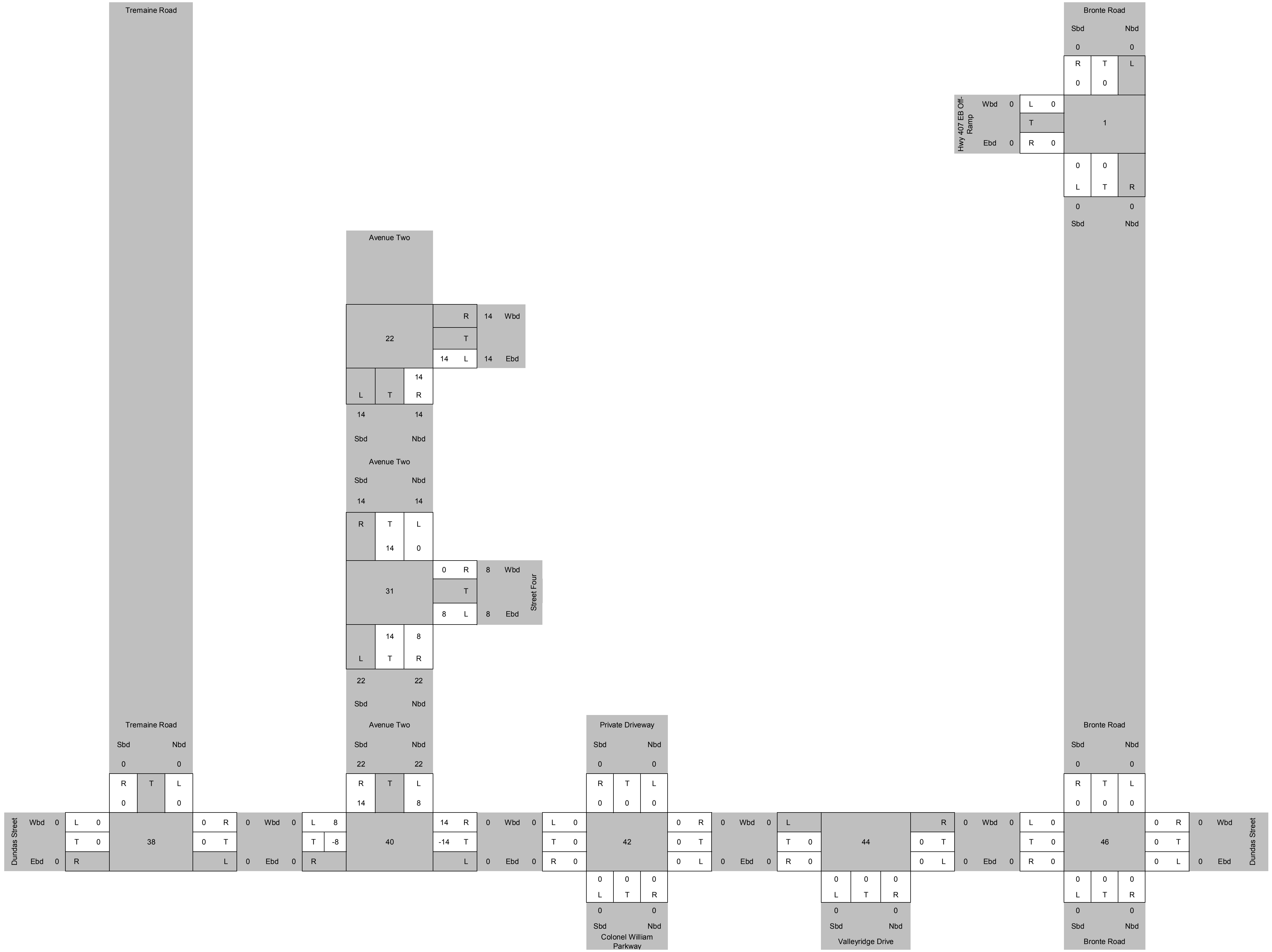


Figure 5-5
Primary Site Generated Trip Assignment - Phase 1 (2021) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

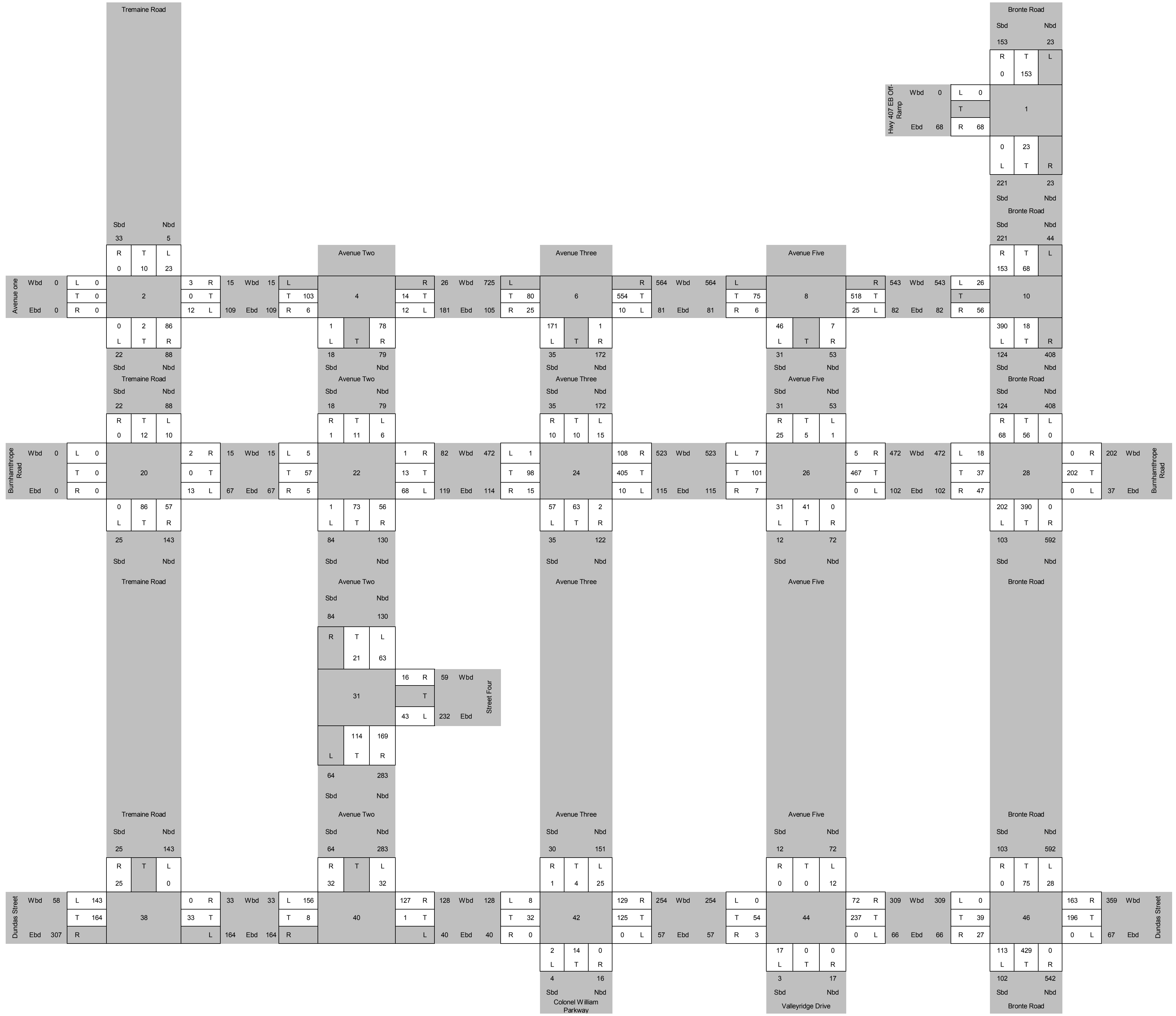
14-09222_Traffic Model PM_20181207.xlsx



Scale: NTS

Figure 5-6
Pass-By Site Generated Trip Assignment - Phase 1 (2021) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207.xlsx



Scale: NTS

Figure 5-7
Primary Site Generated Trip Assignment - Phase 2 (2031) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Note: Volume may not be balanced between study intersections as per the proposed development block driveways within the subject lands.

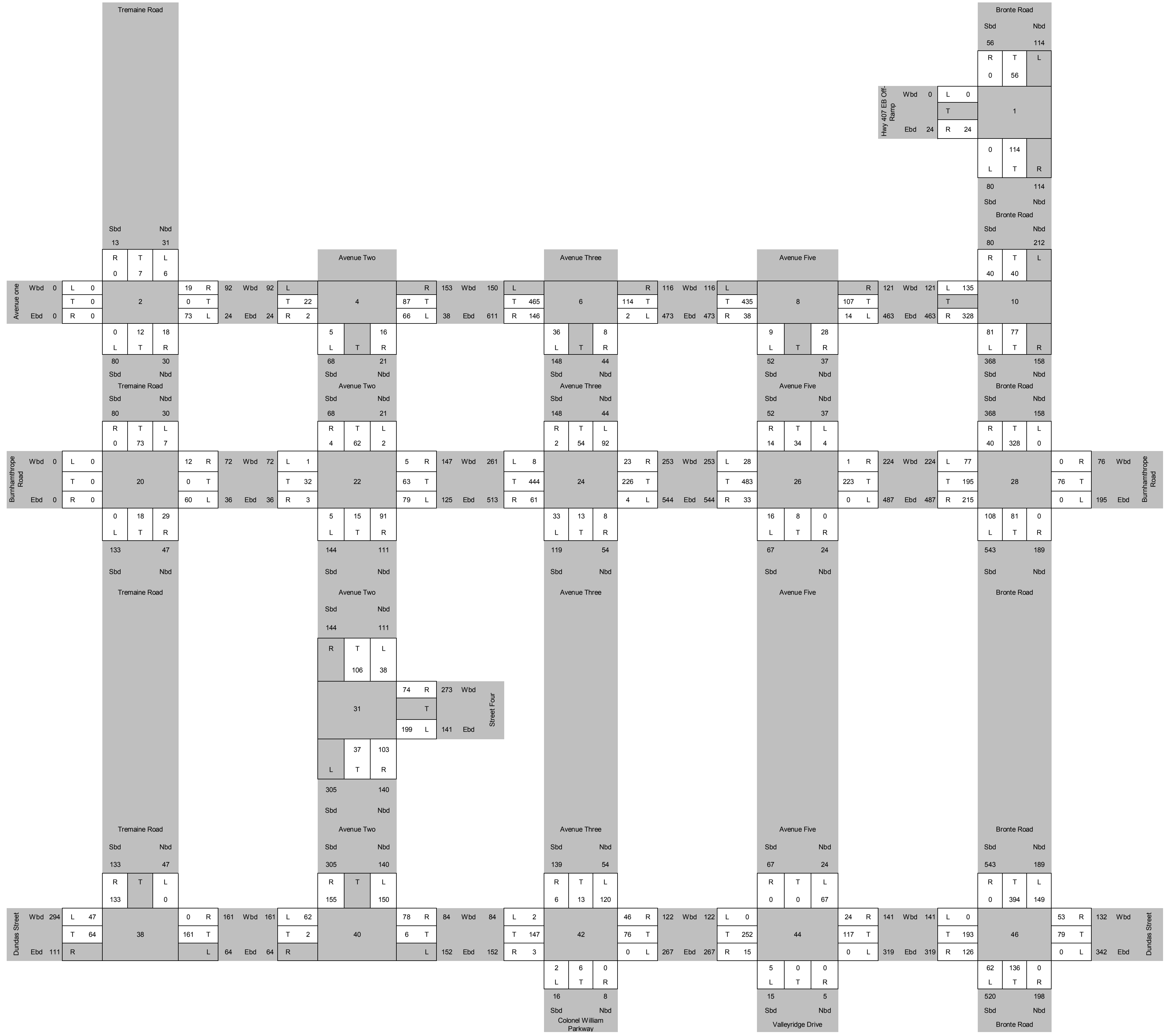


Figure 5-8
Primary Site Generated Trip Assignment - Phase 2 (2031) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Note: Volume may not be balanced between study intersections as per the proposed development block driveways within the subject lands.

14-09222_Traffic Model PM_20181207.xlsx

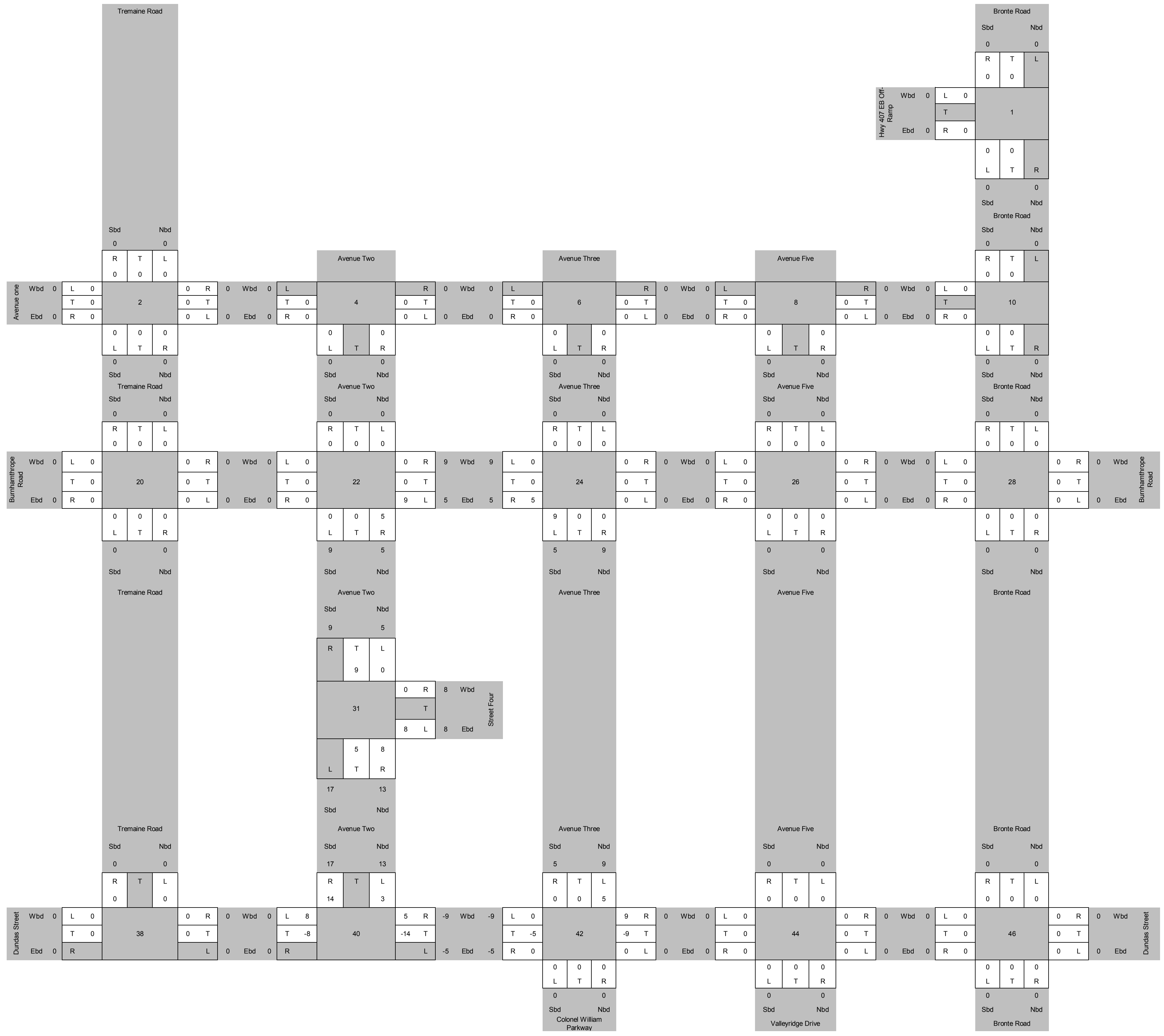


Figure 5-9
Pass-By Site Generated Trip Assignment - Phase 2 (2031) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Note: Volume may not be balanced between study intersections as per the proposed development block driveways within the subject lands.

14-09222_Traffic Model PM_20181207.xlsx

6 FUTURE BACKGROUND CONDITIONS

6.1 ADJACENT BACKGROUND DEVELOPMENTS

Developments located in the vicinity of the property have been included in the background traffic forecasts as detailed below. All developments were discussed with, and approved by, Town and Region staff. Figures illustrating the assignment of trips generated from all adjacent developments, along the boundary road network, have been included in **Appendix D**, for each study horizon year. A summary of the developments used for the study horizon years has been tabulated in **Table 6-4**.

Mixed-Use Development at 2390 Khalsa Gate (Ballantry Homes)

This development proposal consists of 152 townhouse units, 3,000 square feet of commercial space and 12 gas fuelling stations. The trip generation, distribution and traffic assignment are taken directly from the Traffic Impact Study entitled “Khalsa Gate Mixed Use Development” prepared by Cole Engineering Group Limited in February 2010. A full-moves access at the Bronte Road/Khalsa Gate intersection was assumed.

Residential Development at 2385 & 2389 Khalsa Gate (Peppergate Developments)

This development proposal consists of 147 townhouse units. The trip generation, distribution and traffic assignment are taken directly from the Traffic Impact Study entitled “Khalsa Gate Residential Development” prepared by GENIVAR Inc. (now WSP) in November 2010.

ORC Lands

The ORC Lands surrounding the new Oakville Trafalgar Memorial Hospital have yet to be developed. The lands are divided into 12 parcels, two of which (Parcel 1 and Parcel 3) have development plans. Parcels 1 and 3 were included a part of the adjacent background developments as detailed in the following adjacent development descriptions.

Site traffic generated by ORC Lands was based on a blend of trip generation rates from various ITE employment land uses as detailed within the “Halton Healthcare Services, New Oakville Hospital Transportation Impact Study” Exhibit 5-8 prepared by IBI Group in June 2010. After removing the trip generation from parcels 1 and 3, the trip generation for the remaining 10 ORC Lands parcels has been tabulated in **Table 6-1**.

Table 6-1 ORC Lands Trip Generation

HORIZON YEAR	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Phase 1 (2021) Parcels 2, 6-10	685	140	825	182	608	790
Phase 2 (2031) Parcels 2, 4-12	986	201	1187	263	875	1138

The trip distribution for the ORC Lands site generated trips was based on the IBI report for both the 2021 and 2031 horizon years of our study.

Oakville Green Life Science District (ORC Lands Parcel 1)

The proposed Oakville Green Life Sciences and Technology District is a mixed-use development located adjacent to the new Oakville Hospital within Parcel 1 of the ORC Lands. The subject lands consist of 4.7 million square feet to be developed in three phases starting in 2021 with the ultimate phase projected to 2031.The proposed development consists of 1,680 residential units, 400 hotel suites, 157,001 square metres of office use, 65,030 square metres of research and institutional use and 24,527 square metres of retail use. The trip generation, distribution and traffic assignment are taken directly from the "Transportation Impact Study Oakville Green Life Sciences and Technology District" prepared by WSP (formerly MMM Group) in October 2016, for the 2021 and 2031 horizon years of this study.

Erinoak Kids Centre for Treatment and Development (ORC Lands Parcel 3)

The Erinoak Kids Centre for Treatment and Development is to be located adjacent to the new Oakville Hospital within Parcel 3 of the ORC Lands. The development is proposed to consist of 6,780 square metres of clinical use supporting 210 staff. The trip generation, distribution and traffic assignment are taken directly from the "EOK Traffic Impact Study" prepared by Paradigm Transportation Solutions Limited (Paradigm) in November 2012, for which the volumes were included within the "Halton Region Courthouse Transportation Impact Study" completed by Paradigm in April 2018.

Halton Region Courthouse

The Halton Region Courthouse is proposed to be located adjacent (to the west) of the Erinoak Kids Centre and is proposed to include a total of 33 courthouses at full build out, as well as 27,000 square metres of office use. The trip generation, distribution and traffic assignment are taken directly from the "Halton Region Courthouse Transportation Impact Study" completed by Paradigm in April 2018, for the 2021 and 2031 horizon years of this study.

Evergreen Community

The Evergreen Community is part of the Tremaine Dundas Secondary Plan, which is located in the northeast section of the City of Burlington and the northwest quadrant of the Dundas Street West at Tremaine Road intersection, consisting of approximately 150 hectares of which approximately 67 form the Evergreen Community. The Evergreen Community and two additional land parcels, forming the Secondary Plan Area, were considered as background development for our study. The proposed developments consist of 750 residential dwelling units, 1,500 square metres of retail use and 47,104 square metres of industrial/commercial/office space. The trip generation, distribution and traffic assignment are taken directly from the "Tremaine Dundas Secondary Plan Transportation Impact Study" completed by BA Group in June 2018, for the 2021 and 2031 horizon years of this study.

Existing Suez (previously GE) Lands Traffic Reassignment

The existing traffic volumes generated by the Suez Lands was redistributed along the proposed internal roadways using the distribution derived from TTS data (detailed in Section 5.4 of this report) and surveyed volume at the access (Zenon Drive). The traffic reassignment was completed for the 2031 horizon year, for both the Phase 2 and Phase 2A planned road networks.

Surrounding 407 Employment Lands

For the purpose of the traffic operations assessment completed within this Transportation Study, WSP assumed that all of the 407 Employment Lands surrounding the proposed development would be developed by the 2031 horizon year. The land use assumptions for the remaining 407 Employment Lands are summarized in **Table 6-2**.

Table 6-2 – Remaining 407 Employment Lands Land Uses by Phase

PHASE	SERVICE AREA EMPLOYMENT			GENERAL EMPLOYMENT	LIGHT EMPLOYMENT	TOTAL BY PHASE
	Service Uses	Retail Uses	Office Uses			
Phase 2	180,953 ft^2	113,096 ft^2	158,156 ft^2	1,412,915 ft^2	1,767,973 ft^2	3,633,093 ft^2
TOTAL	**180,953 ft^2**	**113,096 ft^2**	**158,156 ft^2**	**1,412,915 ft^2**	**1,767,973 ft^2**	**3,633,093 ft^2**

The surrounding 407 Employment Lands site generated trips were derived using the same methodology as the site generated trips for the 2031 horizon year, with the projected trips detailed in **Table 6-3**.

Table 6-3 – Surrounding 407 Employment Lands Trip Generation – Phase 2/2A (2031 Horizon)

LAND USE	TRIP GENERATION	GFA (SQ.FT)	VEHICLE TRIPS					
			Weekday AM Peak Hour			Weekday PM Peak Hour		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Service Area Employment	General office (ITE 10th Edition Manual)	158,156	219	30	249	43	197	240
	Mode Split Adjustment (14%)		31	4	35	6	28	34
	Internal Trip Reduction		0	0	0	11	34	45
	Sub-Total		**188**	**26**	**214**	**26**	**135**	**161**
	Shopping Centre (ITE 10th Edition Manual)	294,049	185	114	299	580	628	1208
	Internal Trip Reduction		0	0	0	34	11	45
	Pass-By Trip Reduction (ITE 3rd Edition Handbook)		0	0	0	50	50	100
	Sub-Total		**185**	**114**	**299**	**496**	**567**	**1063**
Light Employment	General office (ITE 10th Edition Manual)	1,767,973	1831	250	2081	362	1649	2011
	Mode Split Adjustment (14%)		256	35	291	51	231	282
	Sub-Total		**1575**	**215**	**1790**	**311**	**1418**	**1729**
General Employment	Business Park (ITE 10th Edition Manual)	1,412,915	1578	278	1856	416	1185	1601
	Mode Split Adjustment (14%)		221	39	260	58	166	224
	Sub-Total		**1357**	**239**	**1596**	**358**	**1019**	**1377**
Surrounding 407 Employment Lands			**3305**	**594**	**3899**	**1191**	**3139**	**4330**

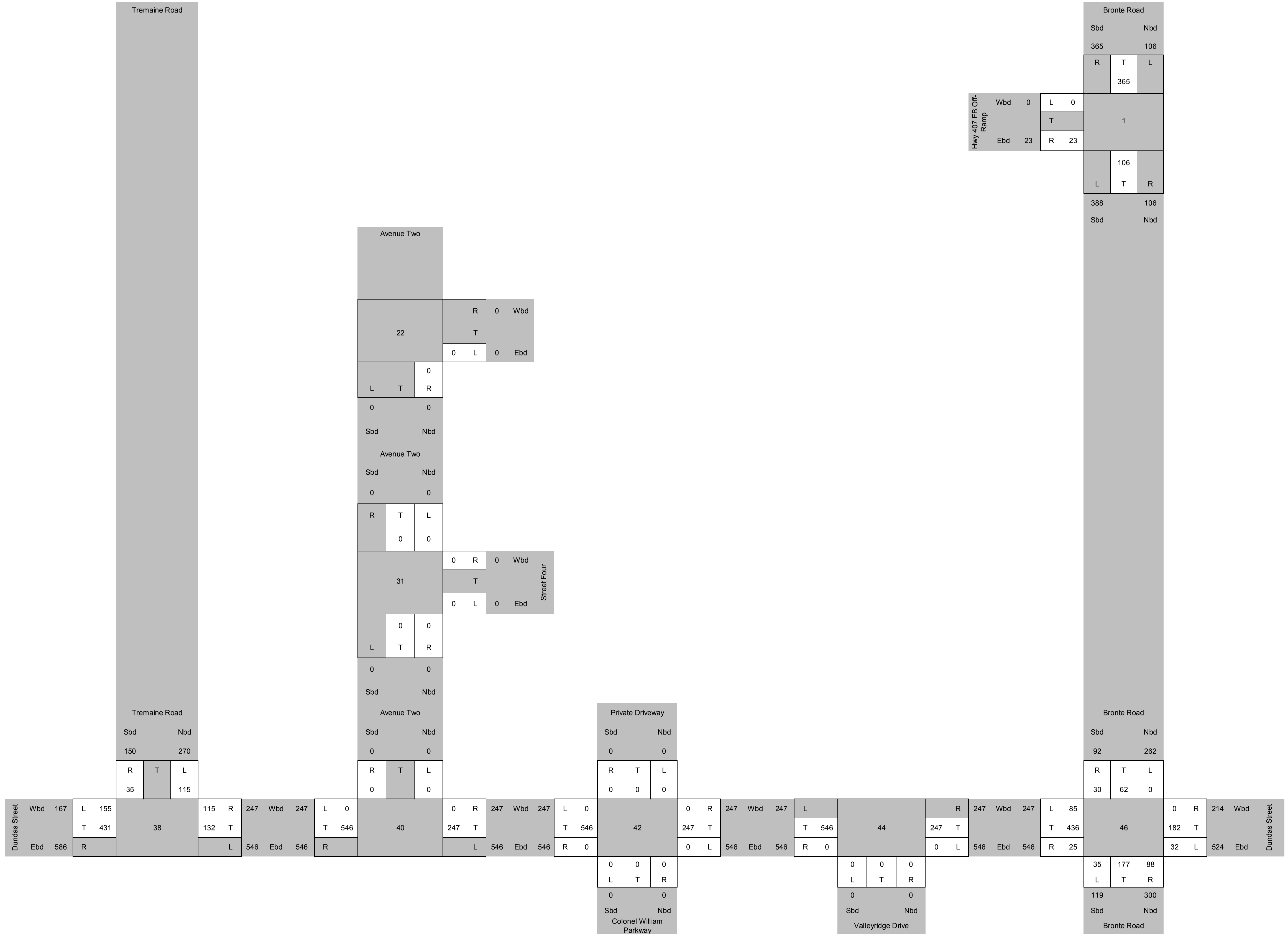
The trip distribution used for the surrounding 407 Employment Lands is similar to that used for the proposed development. Traffic was distributed along the boundary road network based on the proposed employment block, with various trip assignments used for Phase 2 and Phase 2A according to the planned roadway network.

A summary of the background developments applied to each study horizon year has been included in **Table 6-4.**

Table 6-4 – Background Developments per Horizon Year

BACKGROUND DEVELOPMENTS	HORIZON YEAR		NOTES
	2021	2031	
2390 Khalsa Gate	YES	YES	Same traffic volumes applied for both the 2021 and 2031 horizon years.
2385 & 2389 Khalsa Gate	YES	YES	Same traffic volumes applied for both the 2021 and 2031 horizon years.
ORC Lands	YES	YES	Different traffic volumes applied for the 2021 and 2031 horizon years based on the development phasing plan in the Transportation Study.
Oakville Green Life Science District	YES	YES	Different traffic volumes applied for the 2021 and 2031 horizon years based on the development phasing plan in the Transportation Study.
Erinoak Kids Centre for Treatment and Development	YES	YES	Same traffic volumes applied for both the 2021 and 2031 horizon years.
Halton Region Courthouse	YES	YES	Different traffic volumes applied for the 2021 and 2031 horizon years based on the development phasing plan in the Transportation Study.
Evergreen Community	YES	YES	Different traffic volumes applied for the 2021 and 2031 horizon years based on the development phasing plan in the Transportation Study.
Existing GE Lands Traffic Reassignment	NO	YES	Traffic reassignment under the 2031 horizon year along the proposed boundary road network. A different reassignment was completed for Phase 2 and Phase 2A based on the proposed roadway network.
Surrounding 407 Employment Lands	NO	YES	Traffic assignment under the 2031 horizon year along the proposed boundary road network. A different assignment was completed for Phase 2 and Phase 2A for some blocks based on the proposed roadway network.

Please refer to **Figure 6-1** to **Figure 6-4** for the total adjacent development background traffic volumes along the boundary road network for the Phase 1 (2021), Phase 2 (2031)and Phase 2A (2031) during the AM and PM Peak Hours, respectively.



Scale: NTS

Figure 6-1
2021 Background Development Traffic Volumes - Phase 1 (2021) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

3269 Dundas Street West - Budget Tracking.xlsx

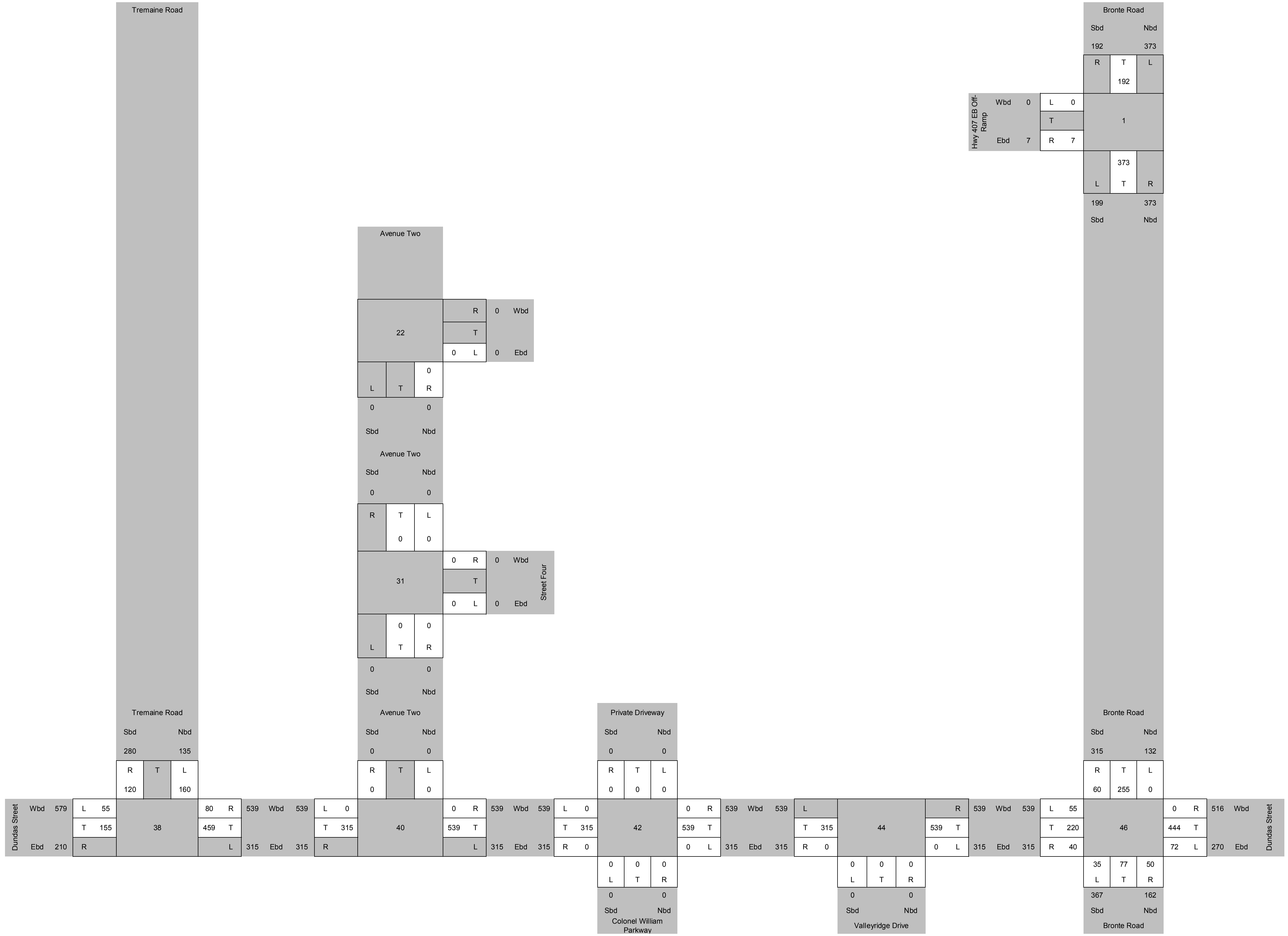


Figure 6-2
2021 Background Development Traffic Volumes - Phase 1 (2021) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207.xlsx

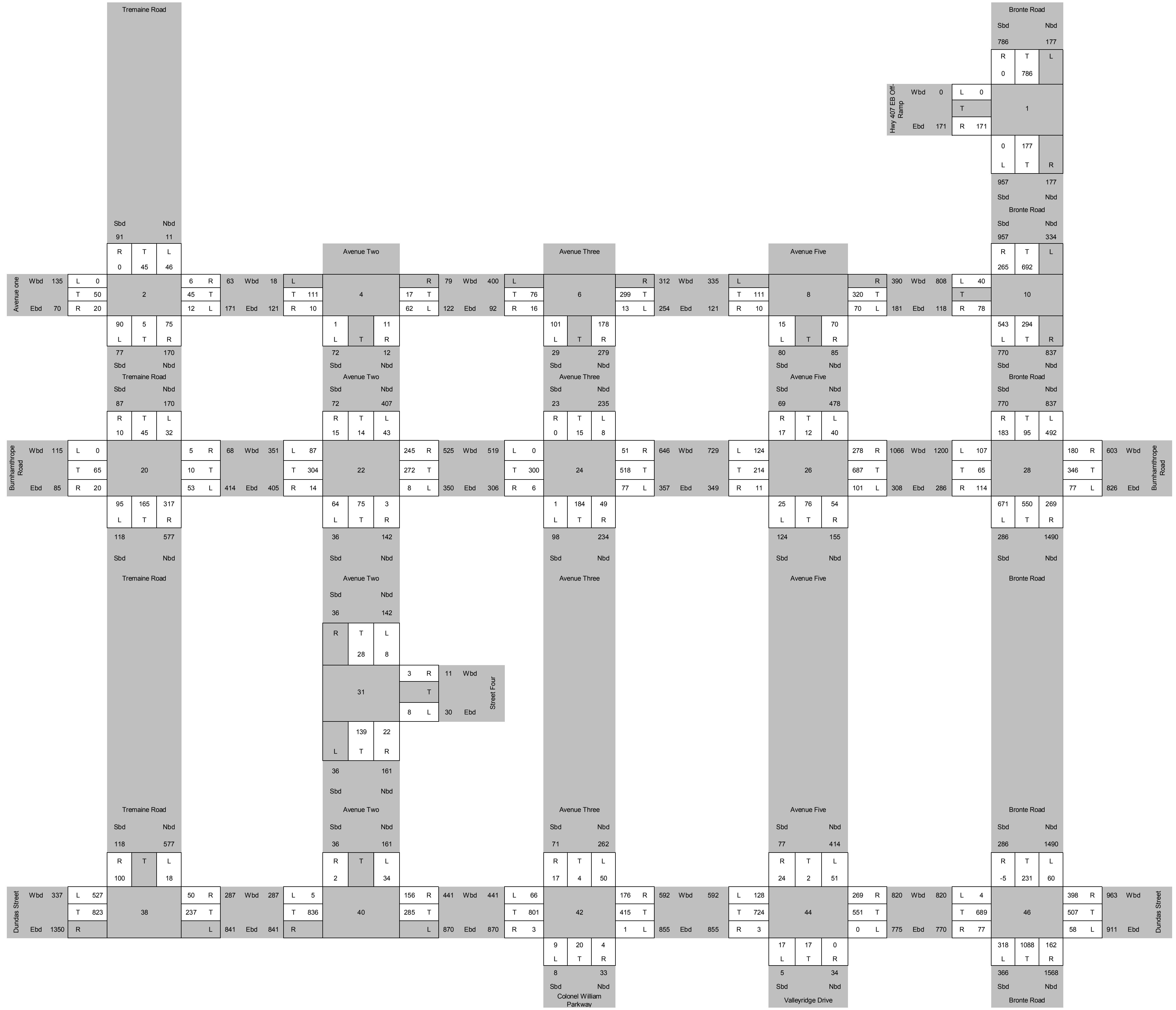


Figure 6-3
2031 Background Development Traffic Volumes - Phase 2 (2031) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Note: Volume may not be balanced between study intersections as per the proposed development block driveways within the subject lands.

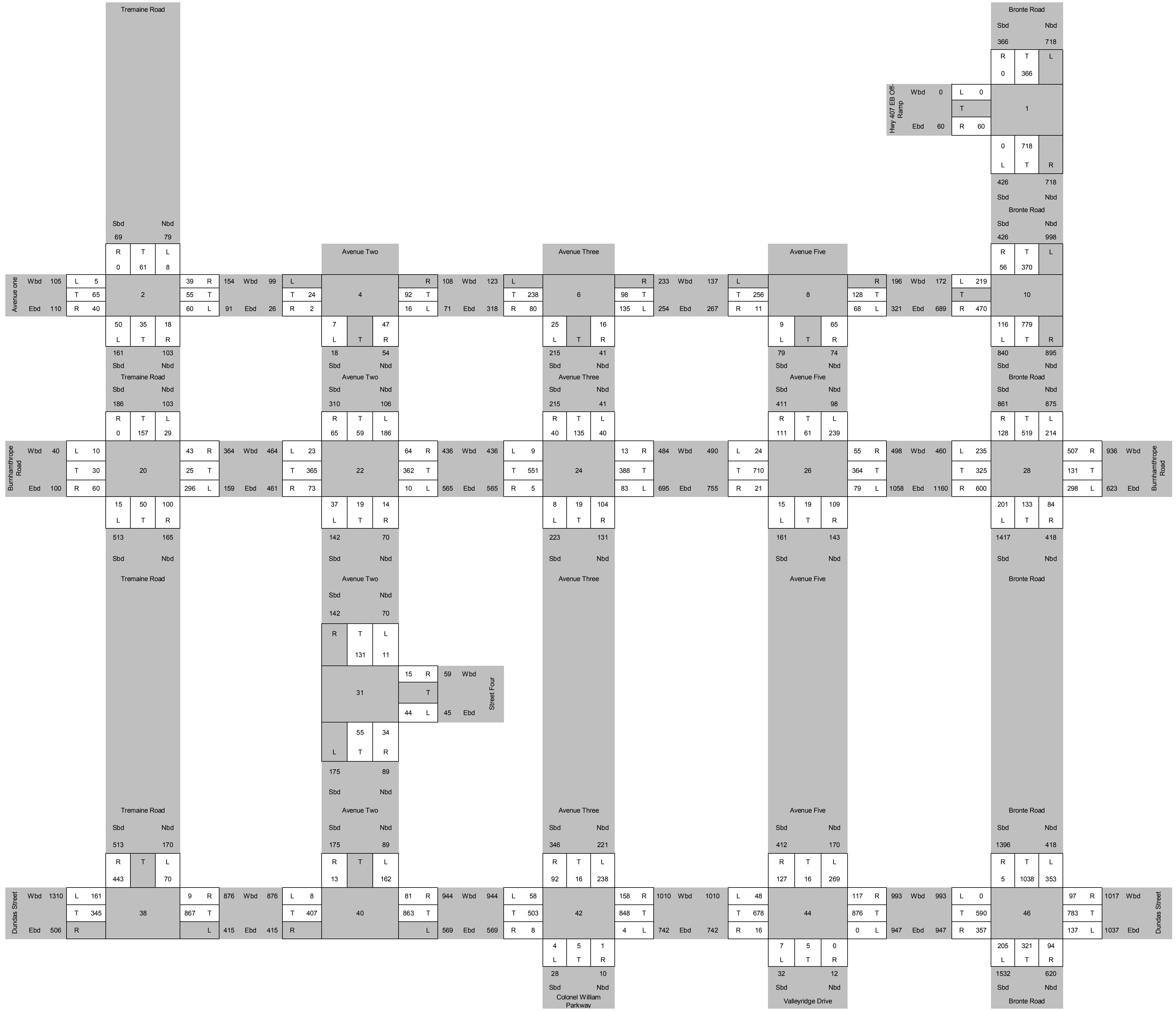


Figure 6-4
2031 Background Development Traffic Volumes - Phase 2 (2031) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Note: Volume may not be balanced between study intersections as per the proposed development block driveways within the subject lands.

14-09222_Traffic Model PM_20181207.xlsx

6.2 CORRIDOR TRAFFIC GROWTH

6.2.1 FUTURE THROUGH TRAFFIC GROWTH (2021)

A through traffic growth rate of 3.0 percent per annum (linear) was applied to Tremaine Road as directed by Region staff. The traffic growth along Tremaine Road was distributed along Dundas Street West based on the existing trip distribution at the study intersection. **Figure 6-5** and **Figure 6-6** illustrate the traffic growth along the boundary road network from 2018 to 2021 for the weekday AM and PM peak hours, respectively.

6.2.2 FUTURE THROUGH TRAFFIC GROWTH (2031)

A through traffic growth rate of 4.0 percent per annum (linear) was applied to the 2021 base traffic volume along Tremaine Road (i.e. 2018 existing traffic volumes plus growth from 2018 to 2021), as directed by Region staff. The traffic growth along Tremaine Road was distributed along Dundas Street West based on the existing trip distribution at the study intersection. **Figure 6-7** and **Figure 6-8** illustrate the traffic growth along the boundary road network from 2021 to 2031 for the weekday AM and PM peak hours, respectively.

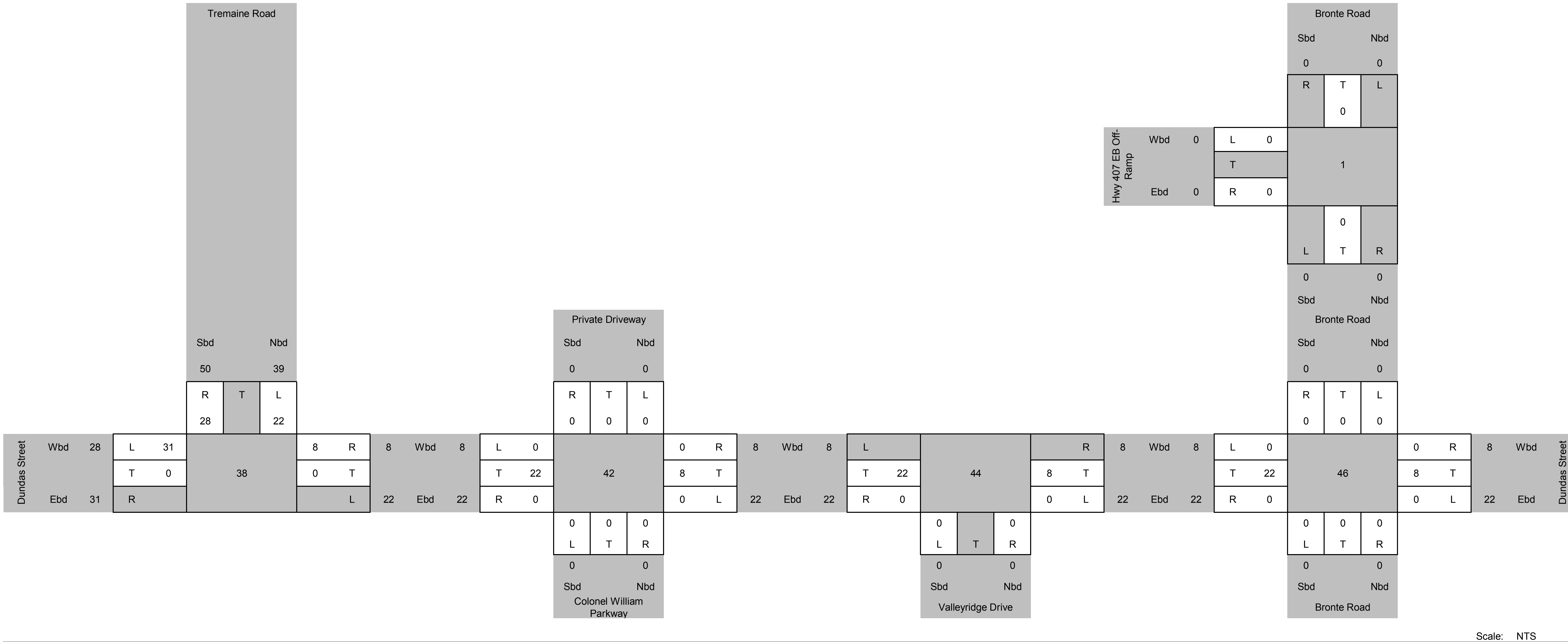
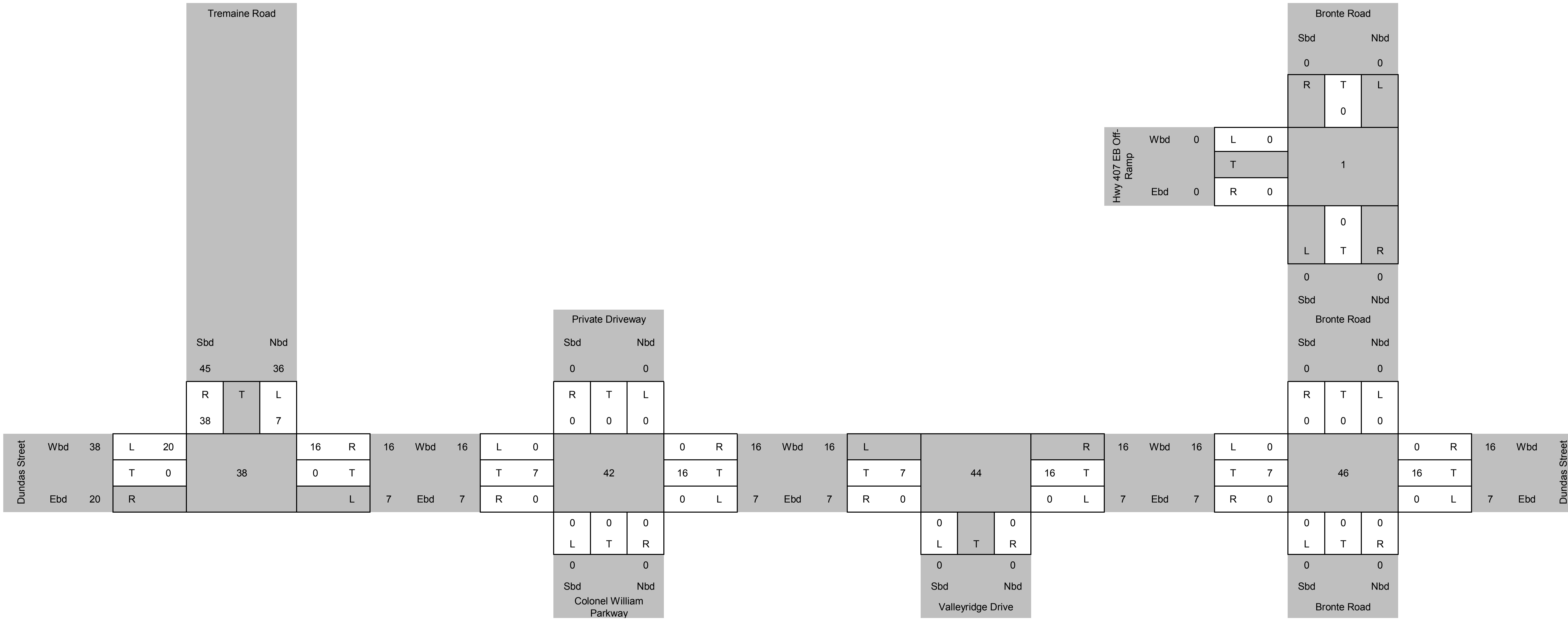


Figure 6-5
Through Traffic Growth Between 2018 and 2021 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

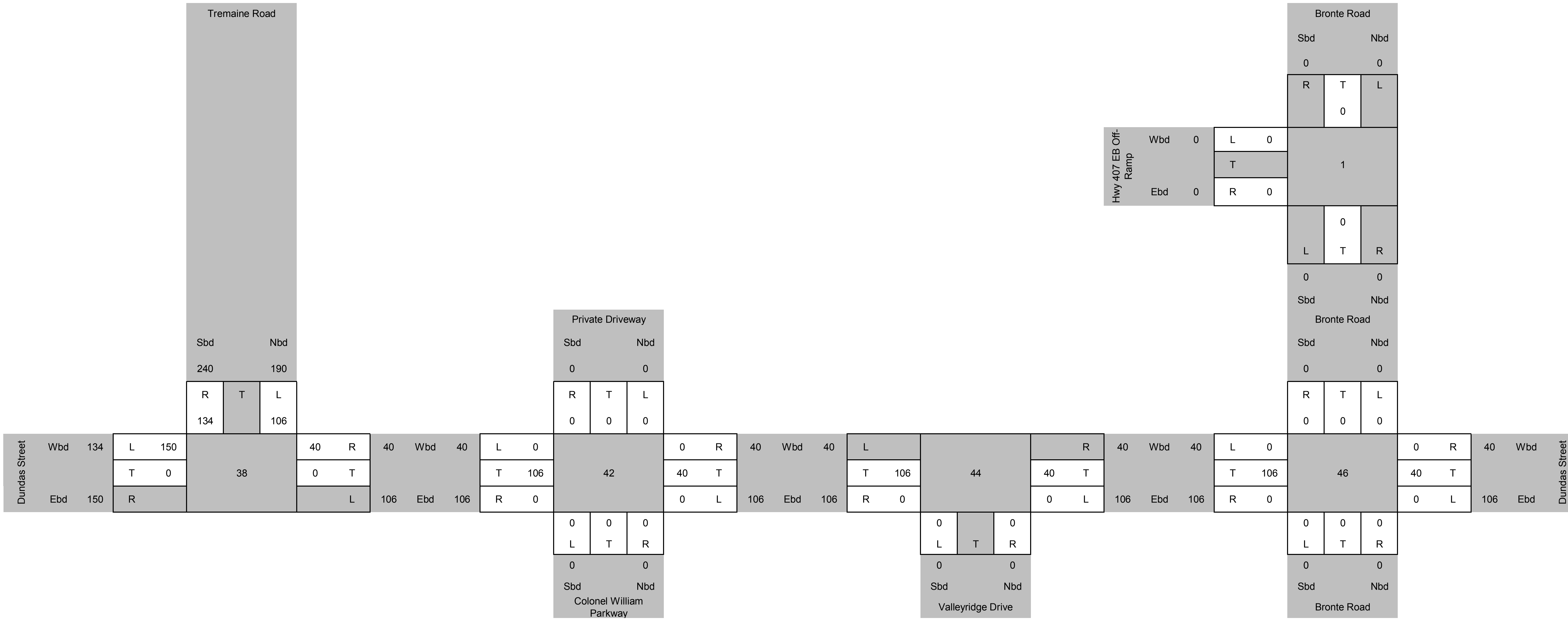
3269 Dundas Street West - Budget Tracking.xlsx



Scale: NTS

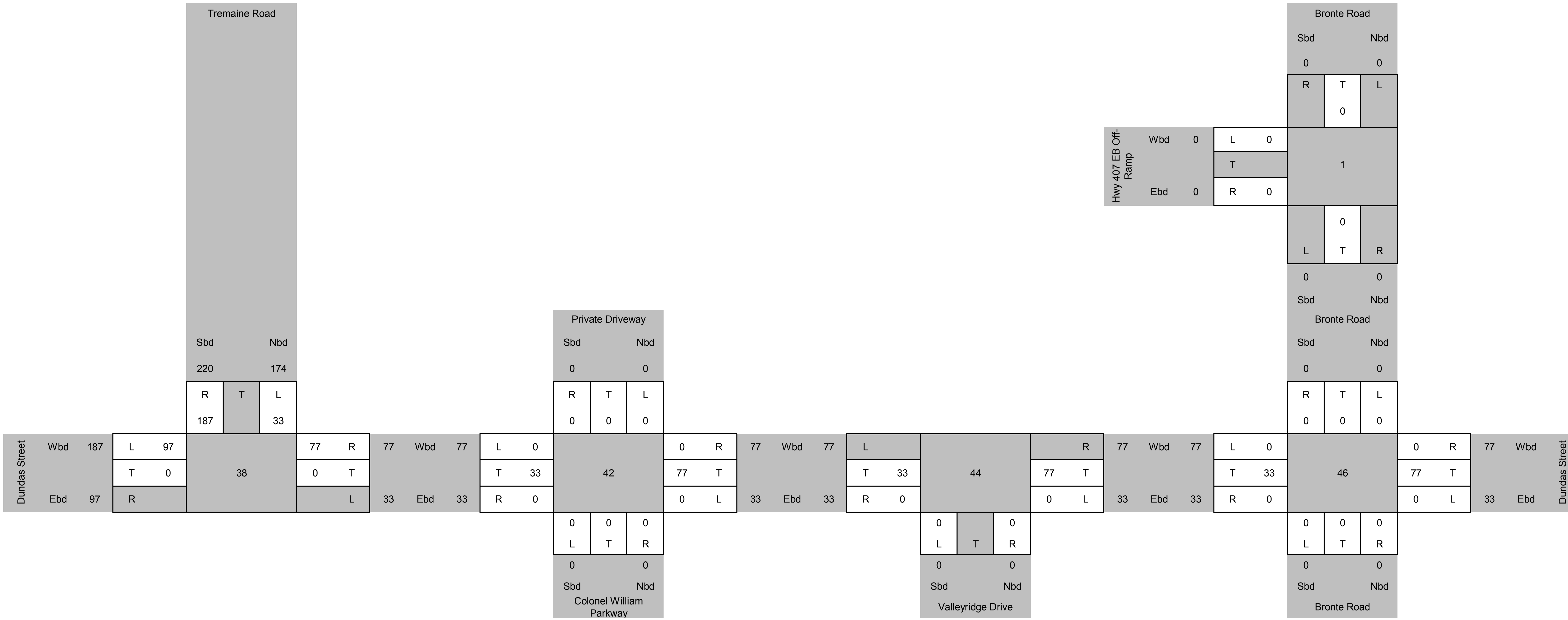
Figure 6-6
Through Traffic Growth Between 2018 and 2021 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207.xlsx



Scale: NTS

Figure 6-7
Through Traffic Growth Between 2021 and 2031 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study



Scale: NTS

Figure 6-8
Through Traffic Growth Between 2021 and 2031 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207.xlsx

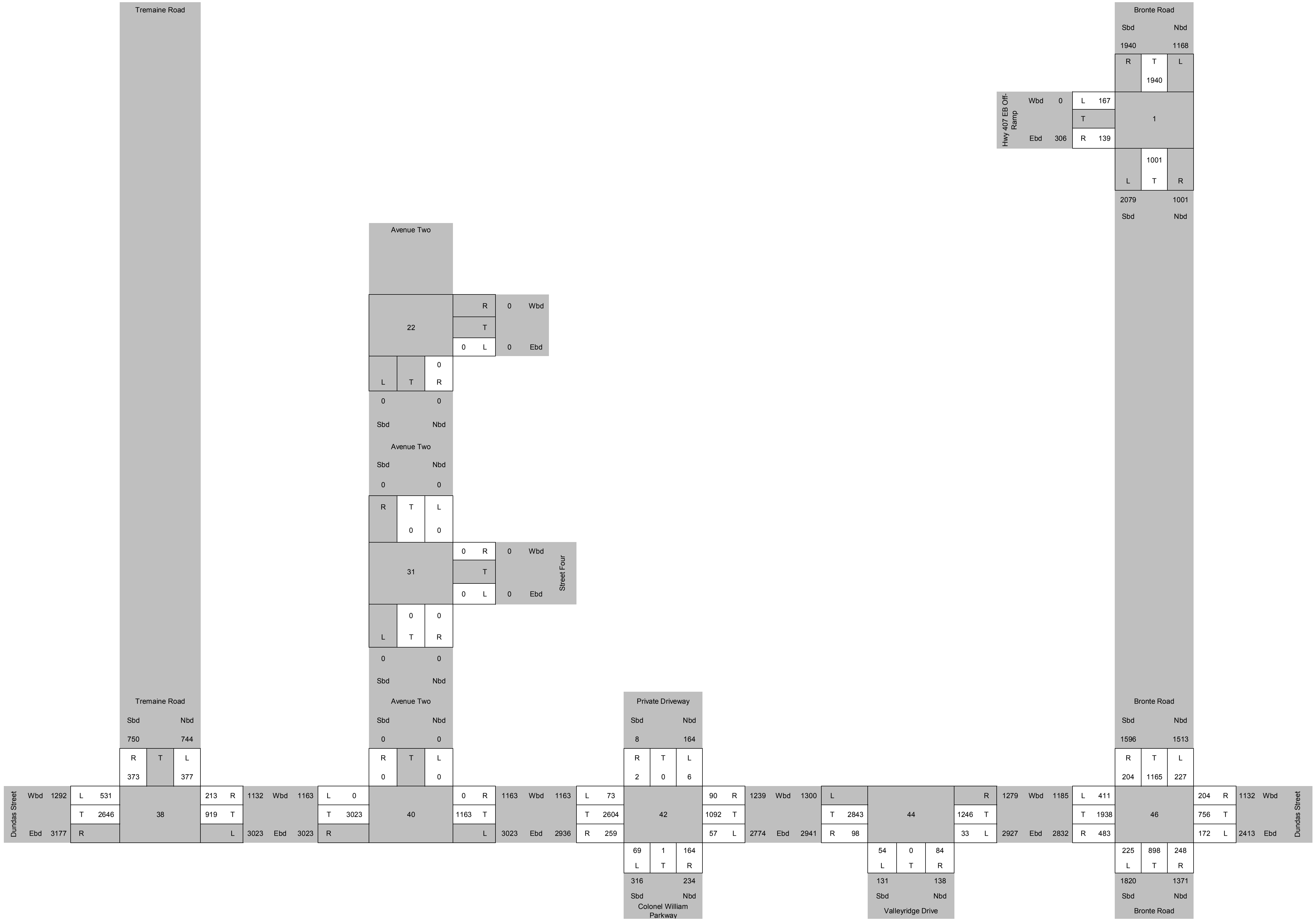
6.3 FUTURE BACKGROUND TRAFFIC VOLUMES

6.3.1 2021 FUTURE BACKGROUND TRAFFIC VOLUMES

The 2021 future background traffic volumes were developed by superimposing the general through traffic growth derived between 2018 and 2021, as well as the background traffic volumes projected for the Phase 1 (2021) horizon year, to the 2018 existing traffic volumes. Please refer to **Figure 6-9** and **Figure 6-10** for the projected Phase 1 (2021) Future Background Traffic Volumes during the AM and PM peak hours, respectively.

6.3.2 2031 FUTURE BACKGROUND TRAFFIC VOLUMES

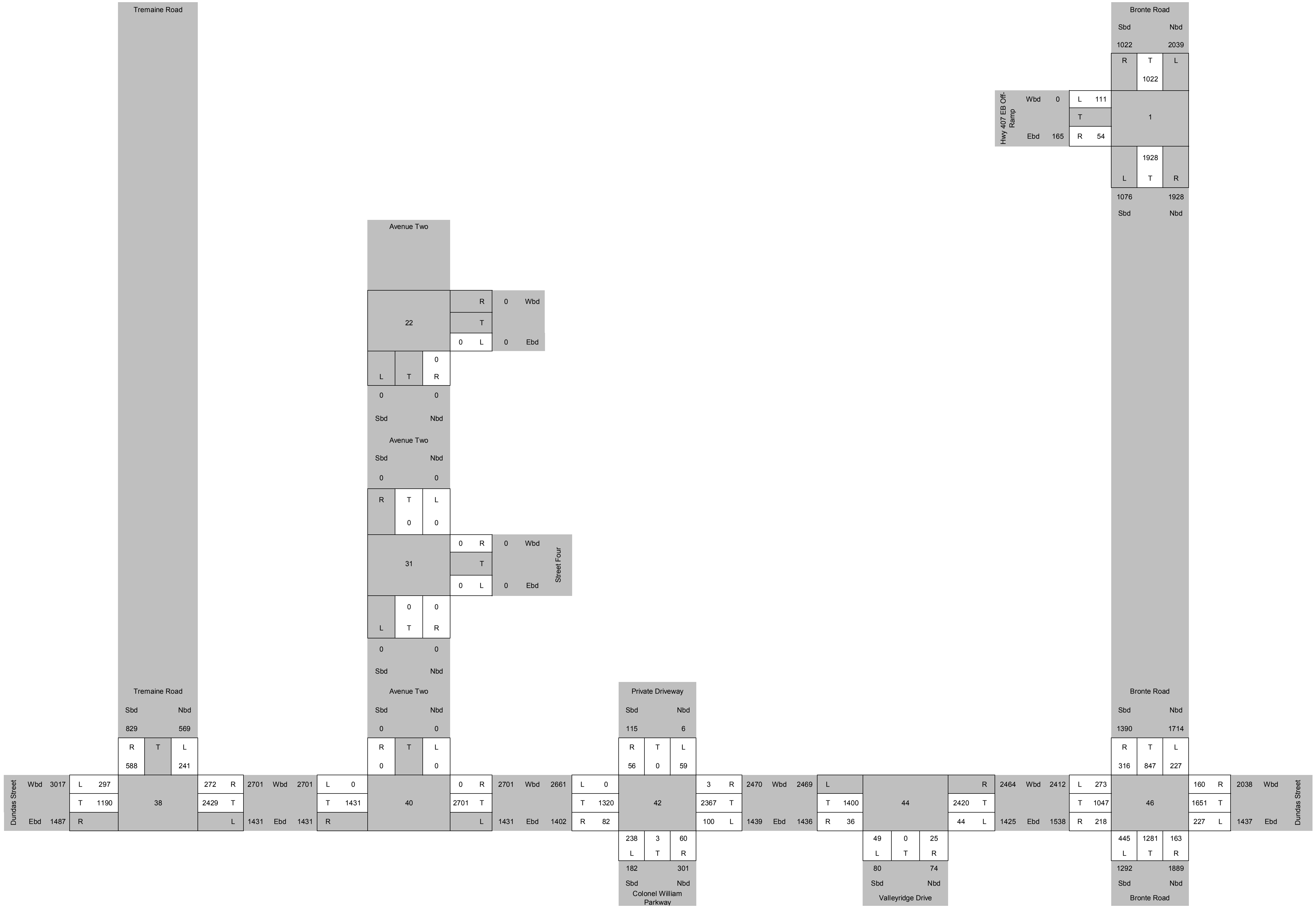
The Phase 2 (2031) future background traffic volumes were developed by superimposing the general through traffic growth derived between 2018 and 2021 and derived between 2021 and 2031, as well as the background traffic volumes projected for the Phase 2 (2031) horizon year, to the 2018 existing traffic volumes. Please refer to **Figure 6-11** and **Figure 6-12** for the projected Phase 2 (2031) Future Background Traffic Volumes during the AM and PM peak hours, respectively.



Scale: NTS

Figure 6-9
Future Background Traffic Volumes - Phase 1 (2021) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

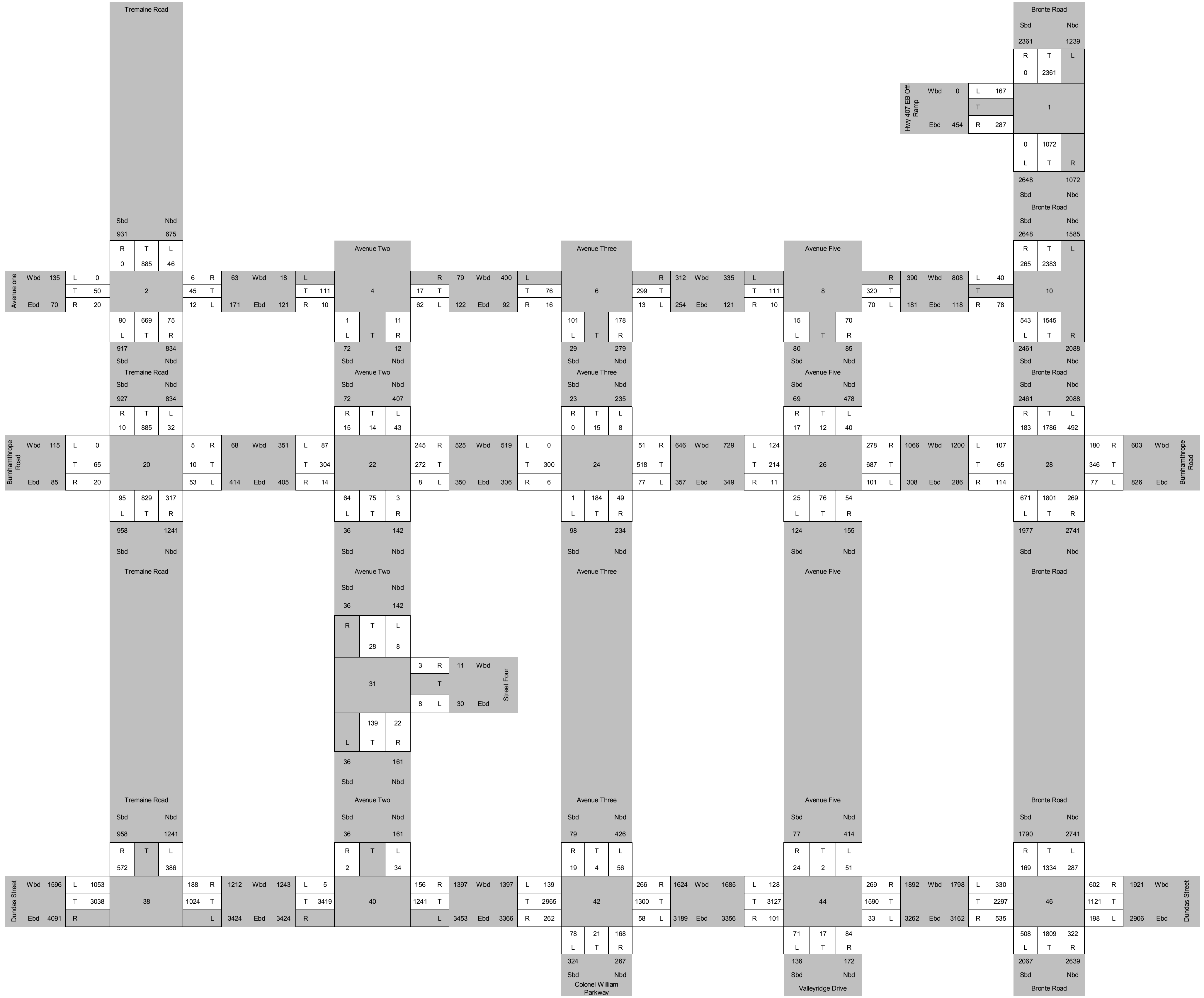
3269 Dundas Street West - Budget Tracking.xlsx



Scale: NTS

Figure 6-10
Future Background Traffic Volumes - Phase 1 (2021) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207.xlsx



Scale: NTS

Figure 6-11
Future Background Traffic Volumes - Phase 2 (2031) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Note: Volume may not be balanced between study intersections as per the proposed development block driveways within the subject lands.

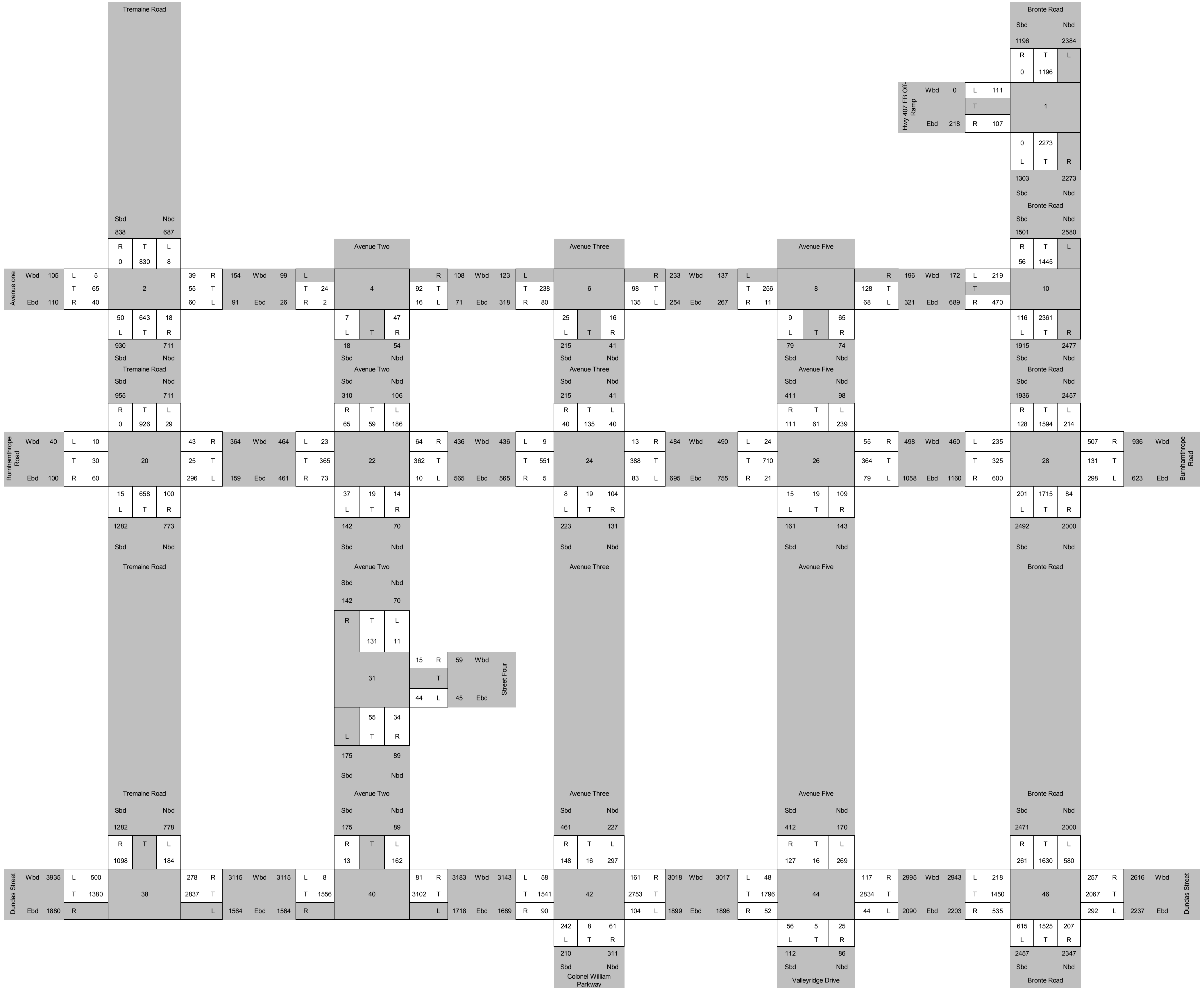


Figure 6-12
Future Background Traffic Volumes - Phase 2 (2031) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Note: Volume may not be balanced between study intersections as per the proposed development block driveways within the subject lands.

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14-09222_Traffic Model PM_20181207.xlsx

7 FUTURE TOTAL TRAFFIC CONDITIONS

7.1 FUTURE TOTAL TRAFFIC VOLUMES

7.1.1 2021 FUTURE TOTAL TRAFFIC VOLUMES

The future total traffic conditions for the Phase1 (2021) horizon year was estimated by superimposing the site generated traffic volumes onto the future background traffic volumes. The resulting future total traffic volumes have been illustrated in **Figure 7-1** and **Figure 7-2** for the AM and PM peak hours, respectively.

7.1.2 2031 FUTURE TOTAL TRAFFIC VOLUMES

The future total traffic conditions for the Phase 2 (2031) horizon year was estimated by superimposing the site generated traffic volumes onto the future background traffic volumes. The resulting future total traffic volumes have been illustrated in **Figure 7-3** and **Figure 7-4** for the AM and PM peak hours, respectively.

Additionally, as stated previously WSP completed a sensitivity analysis under the 2031 horizon year to determine the impact of removing the Avenue One creek crossings on traffic operations (detailed in Section 9.3). The removal of the creek crossings renders the study roadway non-continuous throughout the study area. The Phase 2A (2031) future total traffic volumes have been derived and illustrated in **Figure 7-5** and **Figure 7-6** for the AM and PM peak hours, respectively. All information with regards to the site generated trip assignment and background volumes specific to the Phase 2A scenario, used to derive future total volumes, have been provided in **Appendix D** for reference.

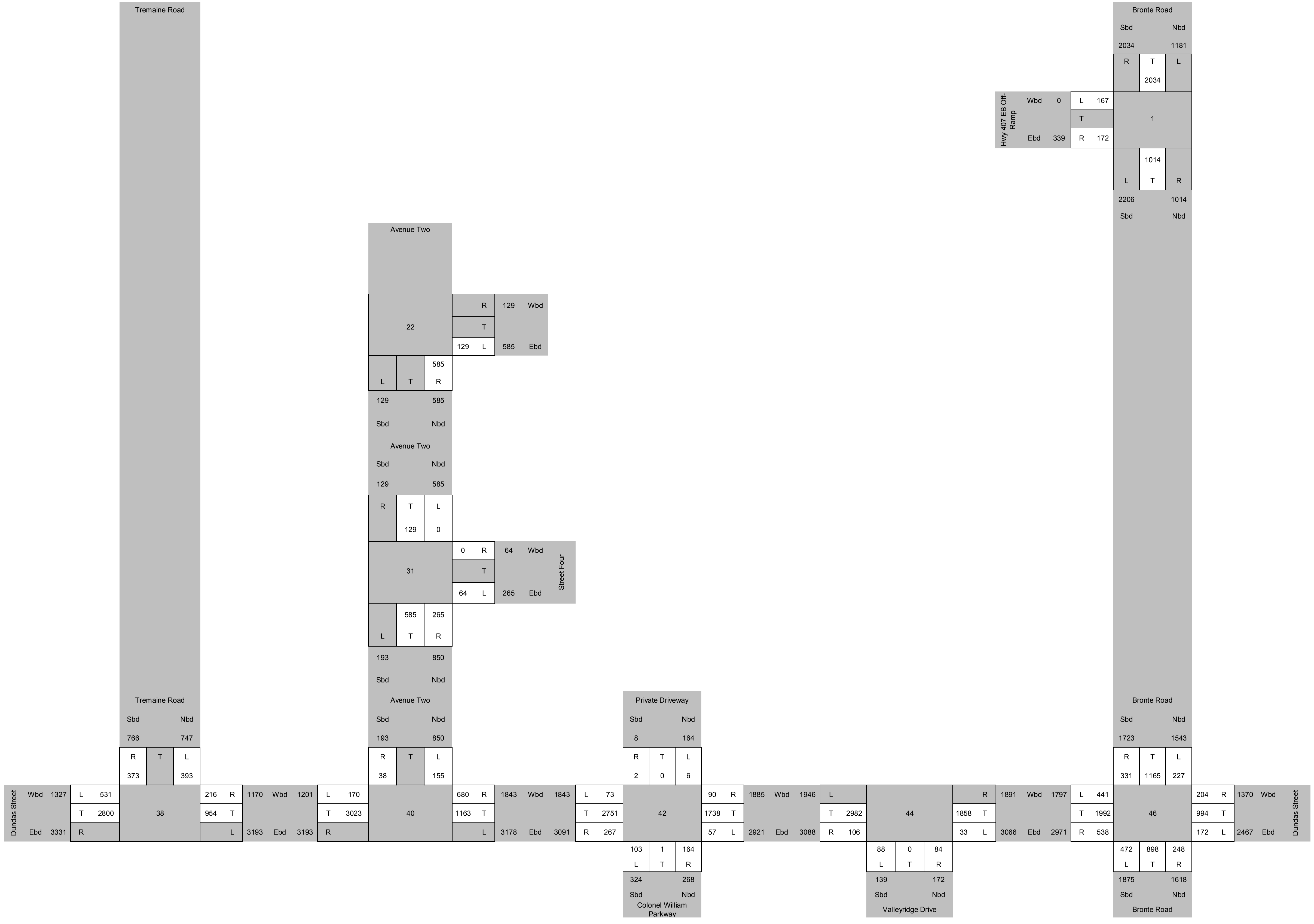
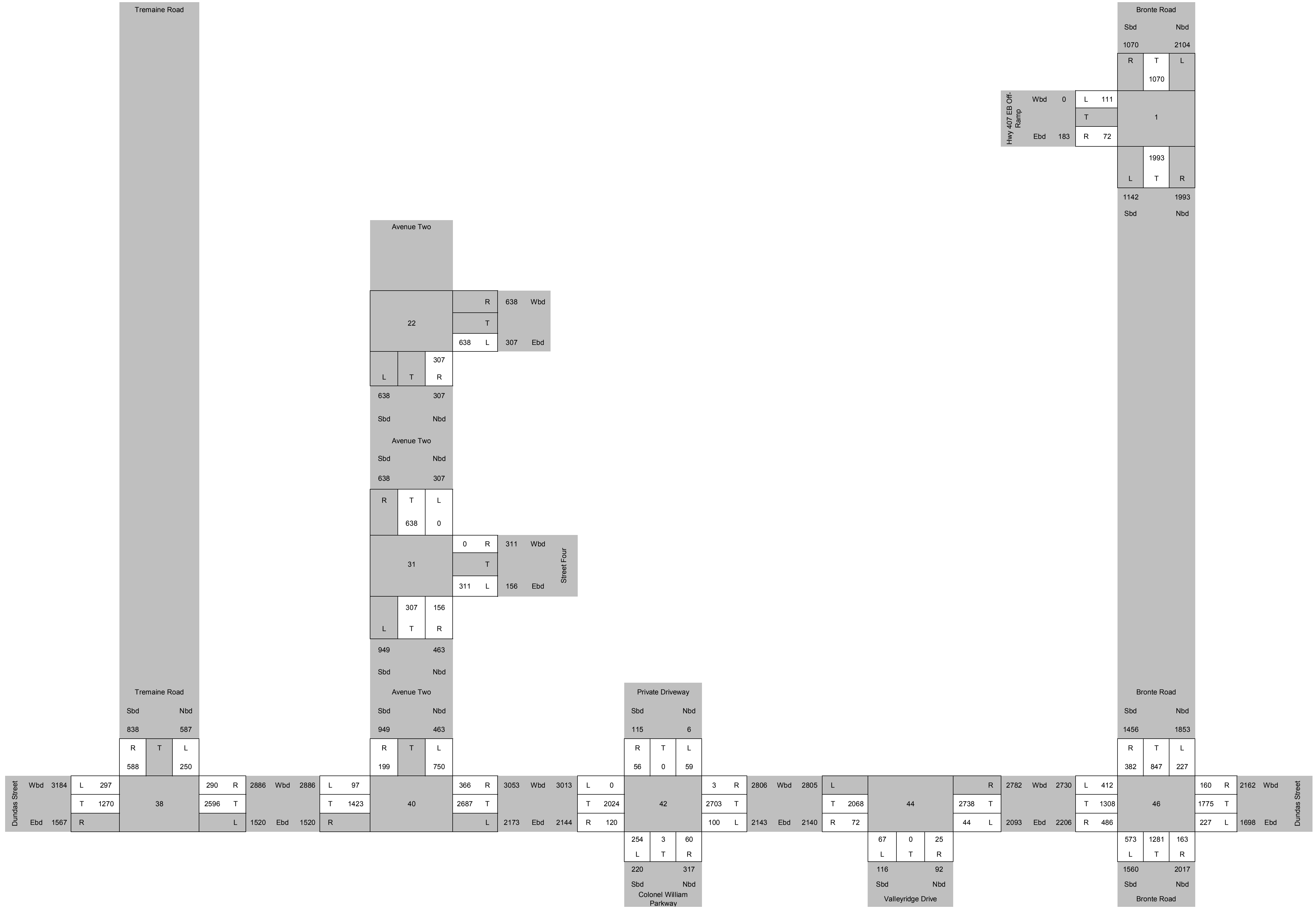


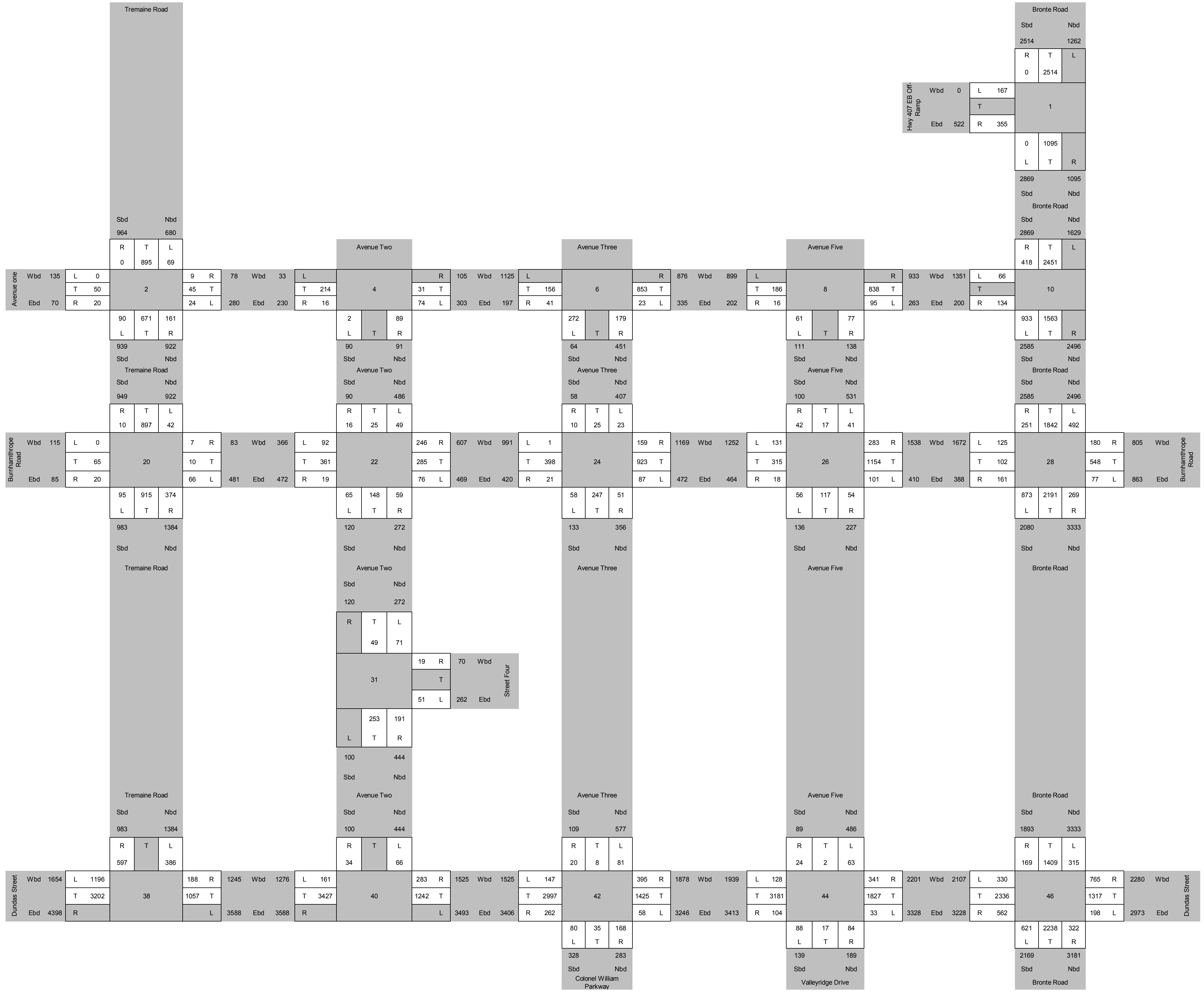
Figure 7-1
Future Total Traffic Volumes - Phase 1 (2021) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study



Scale: NTS

Figure 7-2
Future Total Traffic Volumes - Phase 1 (2021) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207.xlsx



Scale: NTS

Figure 7-3
Future Total Traffic Volumes - Phase 2 (2031) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Note: Volume may not be balanced between study intersections as per the proposed development block driveways within the subject lands.

3269 Dundas Street West - Budget Tracking.xlsx

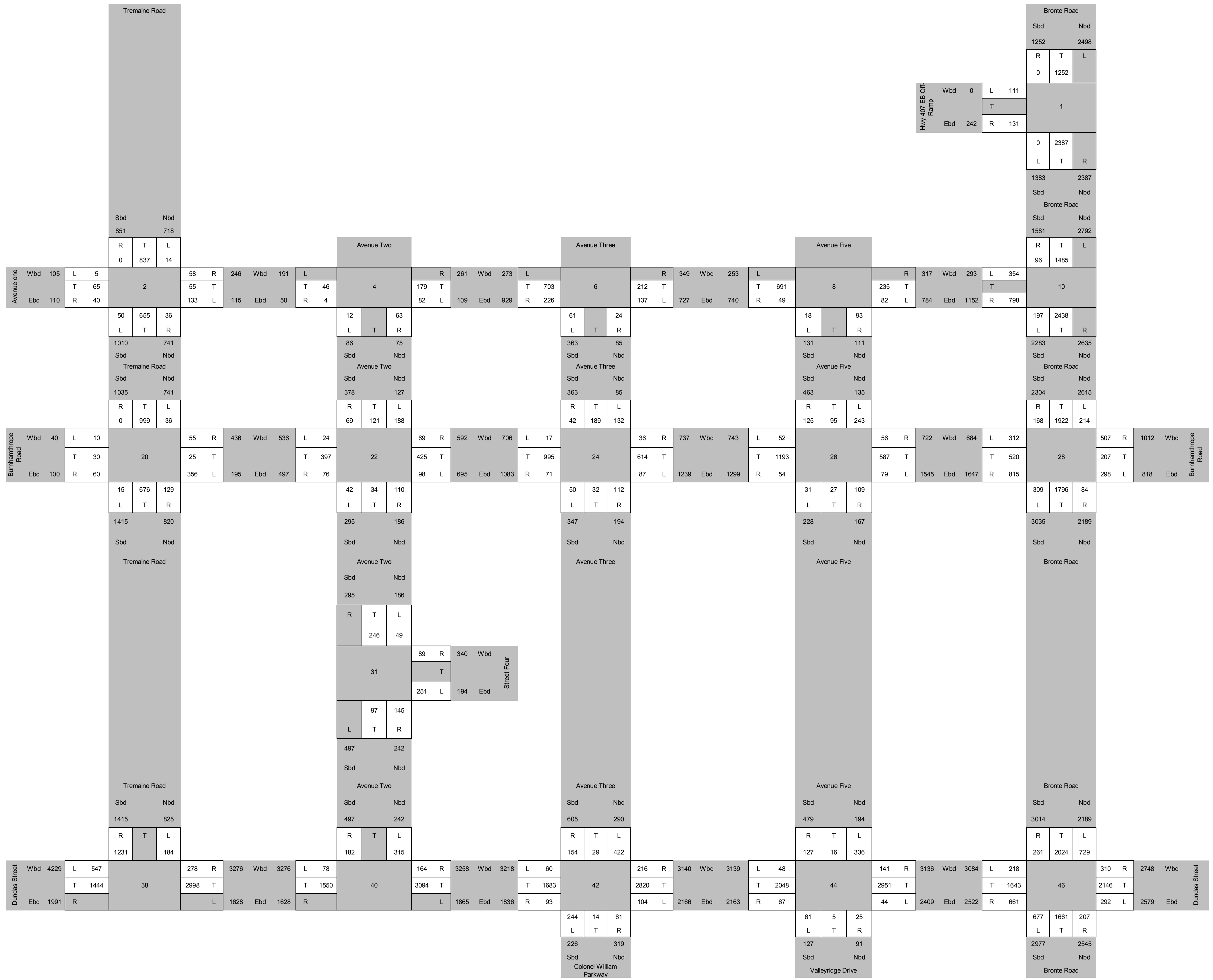


Figure 7-4
Future Total Traffic Volumes - Phase 2 (2031) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Note: Volume may not be balanced between study intersections as per the proposed development block driveways within the subject lands.

14-09222_Traffic Model PM_20181207.xlsx

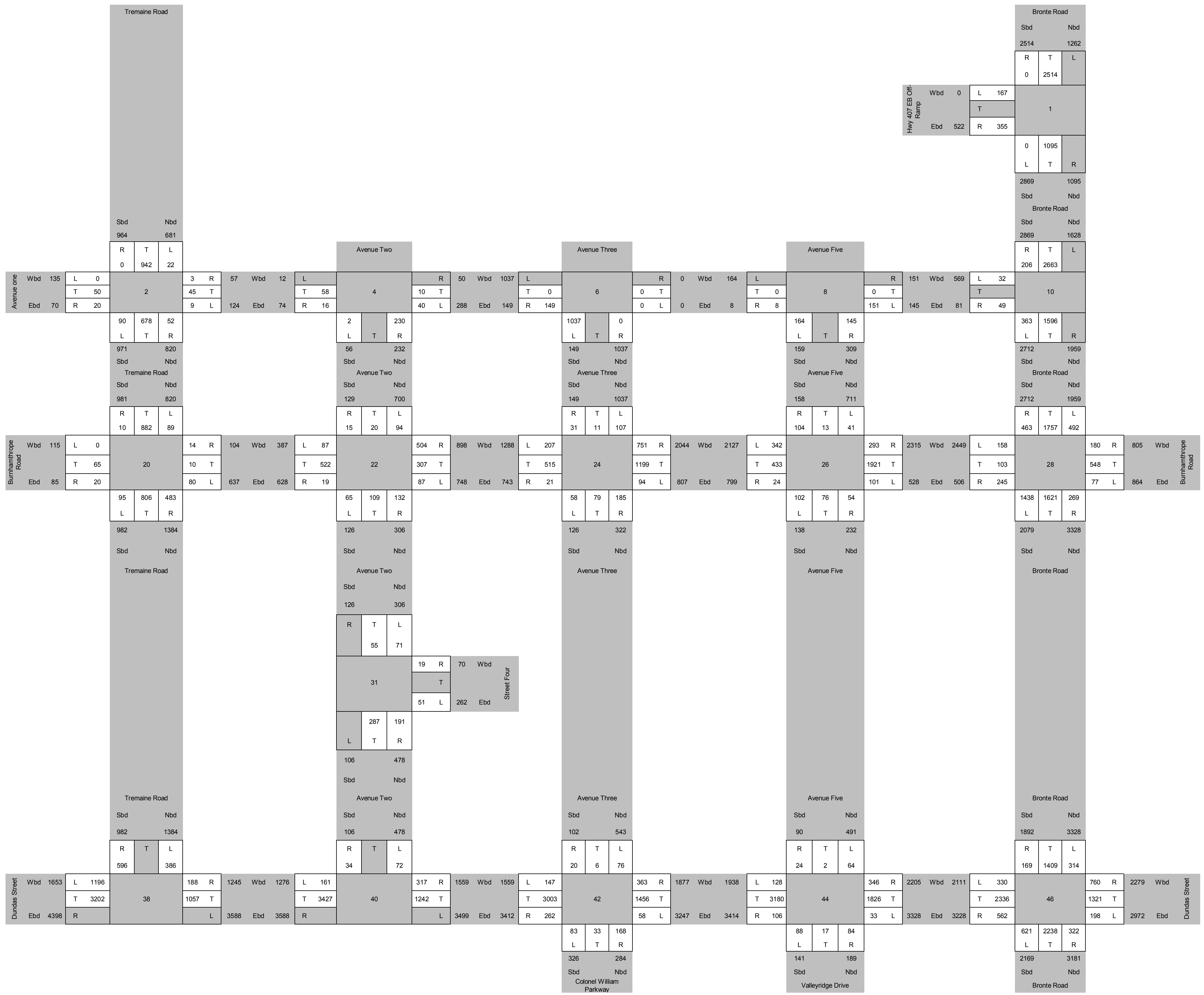


Figure 7-5
Future Total Traffic Volumes - Phase 2A (2031) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Note: Volume may not be balanced between study intersections as per the proposed development block driveways within the subject lands.

3269 Dundas Street West - Budget Tracking.xlsx

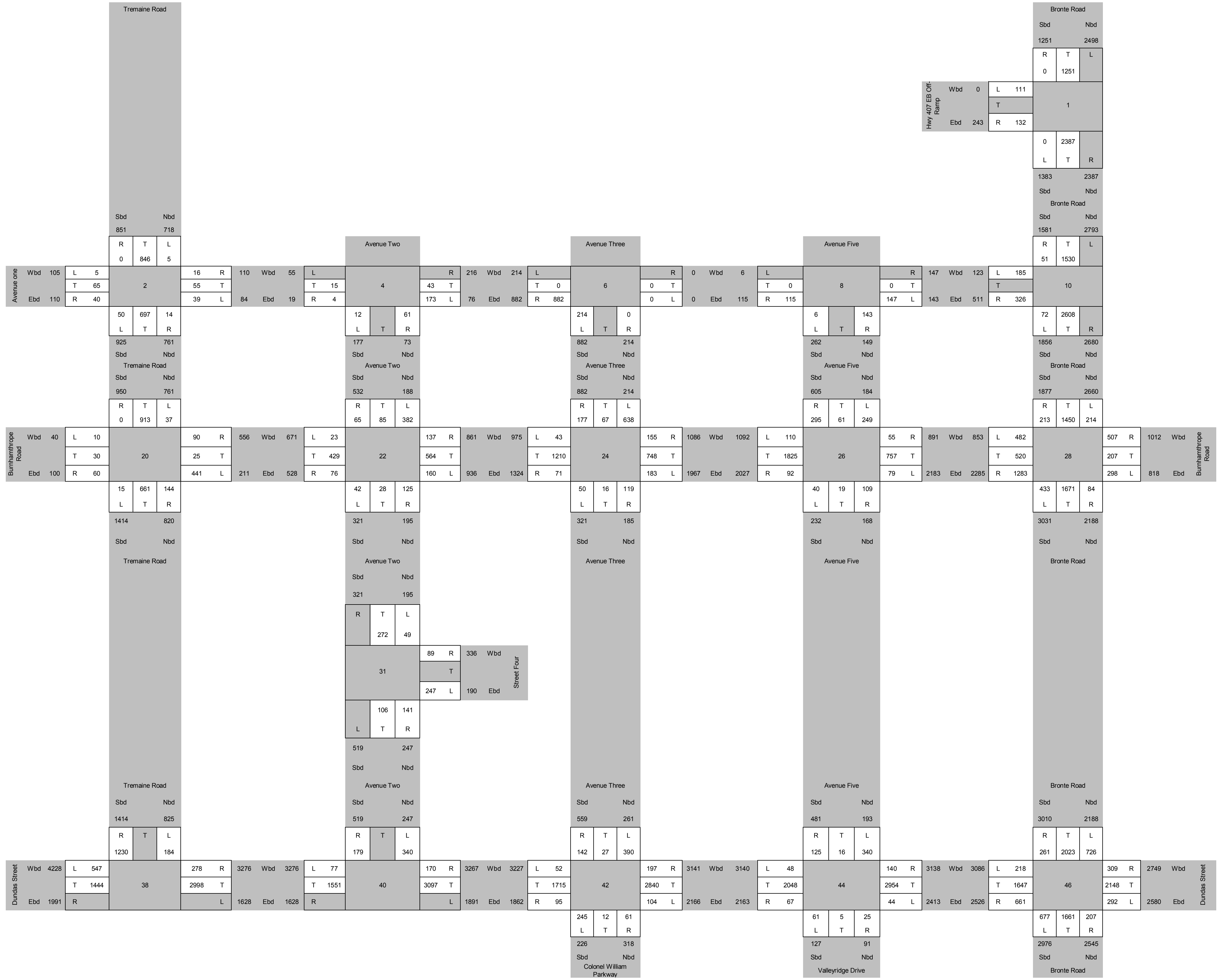


Figure 7-6
Future Total Traffic Volumes - Phase 2A (2031) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Note: Volume may not be balanced between study intersections as per the proposed development block driveways within the subject lands.

14-09222_Traffic Model PM_20181207.xlsx

7.2 INTERNAL INTERSECTIONS CONTROL AND CONFIGURATION

7.2.1 TRAFFIC SIGNAL WARRANTS

Based on the recommended lane configuration for the internal intersections under Phase 2 (see **Figure 5-2**), signal controls were recommended for the intersections of Burnhamthorpe Road at Avenue Two, Avenue Three and Avenue Five. For the remaining internal study intersections, WSP completed signal timing warrants using the Ontario Traffic Manual Book 12 methodology (Justification 7 – Projected Volumes). The proposed Phase 2 lane configuration was used as it considers full connectivity through the network, with Avenue One continuous between Tremaine Road and Bronte Road. Details of the signal warrants are provided in **Appendix E**. The signal warrant results are summarized in **Table 7-1**

Table 7-1 – Signal Warrant Summary

INTERSECTION	JUSTIFICATION 1 (MINIMUM VEHICULAR VOLUME) [150% SATISFACTION]		JUSTIFICATION 2 (DELAY TO CROSS TRAFFIC) [150% SATISFACTION]		SIGNAL WARRANTED
	JUSTIFICATION 1A	JUSTIFICATION 1B	JUSTIFICATION 2A	JUSTIFICATION 2B	
Avenue One at Avenue Two	19%	16%	15%	3%	Not Warranted
Avenue One at Avenue Three	67%	53%	54%	89%	Not Warranted
Avenue One at Avenue Five	57%	24%	51%	18%	Not Warranted
Avenue Two at Street Four	35%	40%	25%	67%	Not Warranted

As indicated in the table above, signals are not warranted for the remaining internal intersections assessed. Therefore, WSP completed the traffic operations analysis for the above listed intersections assuming stop-control, with the exception of Avenue One at Avenue Three.

Under stop-control for the Phase 2 (2031) Future Total conditions (with Avenue One under free-flow conditions), the intersection of Avenue One at Avenue Three is projected to operate as detailed in **Table 7-2** below. The Synchro analysis summary has been included in **Appendix E** along with the traffic signal warrants.

Table 7-2 – Avenue One at Avenue Three – Phase 2 Future Total Operations under Stop-Control

Intersection Name / Movement	Intersection Type	AM Peak Hour			PM Peak Hour		
		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Avenue Three at Avenue One	**Stop-Controlled**	-	-	-	-	-	-
Eastbound Through		0.09	0	A	0.41	0	A
Eastbound Right		0.02	0	A	0.13	0	A
Westbound Left		0.02	8	A	0.19	11	B
Westbound Through		0.50	0	A	0.12	0	A
Northbound Left		1.11	133	F	0.36	38	E
Northbound Right		0.20	10	B	0.05	14	B

As per the above table, the study intersection is projected to operate with the northbound left-turn movement over capacity during the AM peak hour. Therefore, the study intersection was assessed as signalized and coded as such within the Synchro model in order for all turning movements to operate below capacity. The intersection operations under signal control have been detailed in Section 9.0 of this report, along with the remaining study intersections under the 2031 horizon year.

The remainder of the study intersections (to Dundas Street West, Tremaine Road and Bronte Road) were assessed as signalized due to the high volume of through traffic along the regional roads.

7.2.2 EXCLUSIVE TURNING LANE WARRANTS

The lane configurations for the seven (7) internal intersections were developed based on left-turn warrant and right-turn warrant criteria in the Geometric Design Standards for Ontario Highways, as well as the North Oakville Terms of Reference for Transportation Functional Design Studies.

Left-Turn Lane Warrants

According to the Section E.9 of the Geometric Design Standards for Ontario Highways, the left-turn lane requirements are determined based on 1) Volume warrants; and 2) Accident warrants. For future roadway intersections, only the volume warrants are used. For a roadway with a two-lane crossing section, such as the Avenues and Streets, volume warrant for a left-turn lane is determined on the basis of the design speed, and turning, advancing, and opposing design hour volumes at the subject intersection. For a roadway with a four-lane cross-section, such as Burnhamthorpe Road, volume warrant for a left-turn lane is determined based on turning, and opposing design hour volumes. The details of the left-turn lane warrants for the internal intersections were provided in **Appendix E**.

Right-Turn Lane Warrants

According to the Section E.7.2 of the Geometric Design Standards for Ontario Highways, the right-turn lane may be considered when right turning traffic volumes for the design hour is 60 vehicles per hour or more. The North Oakville Terms of Reference for Transportation Functional Design Studies also states that right-turn lanes at signalized intersections where the traffic volume of right-turning traffic will exceed ten percent of the approaching volume. Thus, right-turn lane is considered warranted for the internal intersections when both criteria are met. The details of the right-turn lane warrants for the internal intersections were provided in **Appendix E**.

8 PHASE 1 (2021) FUTURE TRAFFIC OPERATIONS

8.1 2021 FUTURE BACKGROUND TRAFFIC CONDITONS

The traffic operations analysis for the study intersections under the 2021 future background traffic conditions is summarized in **Table 8-1**. Please refer back to **Figure 6-9** and **Figure 6-10** for the projected Phase 1 (2021) Future Background Traffic Volumes during the AM and PM peak hours, respectively. Please refer to **Appendix C** for the traffic operations assessment results. The traffic signal timings for the study intersections during the AM and PM peak hours have been adjusted to optimize the intersection operations, while the cycle lengths remain the same.

As shown in **Table 8-1**, all study intersections are projected to operate below overall capacity during the AM and PM peak hours, with the exception of the intersections of Dundas Street West at Tremaine Road and Bronte Road. Critical turning movements are projected at the intersection of Dundas Street West at Colonel William Parkway for the eastbound through movement during the AM peal hour (v/c of 1.05) and westbound through movement during the PM peak hour (v/c of 1.00), as well as select turning movements at the intersections of Dundas Street West at Tremaine Road and Bronte Road.

In order to improve the 2021 future background traffic operations, WSP recommends the followings changes to the boundary road network and high-level changes to the signal timing plans for both the AM and PM peak hours:

- Increase cycle lengths of all study intersections to 140 seconds to maintain a similar cycle length throughout the network, with the exception of the Bronte Road at Highway 407 Eastbound Off-Ramp intersection (as it is projected to operate at an acceptable level of service and does not share a similar cycle length under existing conditions).
- At the intersection of Dundas Street West at Tremaine Road
    - Introduce a dual eastbound left-turn movement – this improvement is planned to be implemented in conjunction with the Dundas Street West widening per the environmental assessment completed for the corridor, however WSP recommends that the dual left-turn lanes be implemented for the assessed 2021 horizon year, along with an additional receiving lane on Tremaine Road that would taper off.
    - Modify the existing permissive southbound right-turn movement to provide a free channelized right-turn lane along with an additional receiving lane on Dundas Street West that would taper off.
- At the intersection of Dundas Street West at Bronte Road
    - Introduce a dual southbound left-turn movement
    - Introduce an exclusive westbound right-turn lane

With the above listed recommendations applied to the boundary road network, the traffic operations are projected to improve as detailed in **Table 8-1**. During the AM peak hour, the intersections of Dundas Street West at Tremaine Road and Bronte Road are projected to remain over overall capacity, but the intersection delays are projected to reduce. Select turning movements are projected to remain over capacity at the intersections of Dundas Street West at Colonel William Parkway, Tremaine Road and Bronte Road but operations are projected to be improved with the applied recommendations. During the PM peak hour, all study intersections are projected to operate below overall capacity, with all turning movements operating below capacity with the exception of the westbound through movement at the intersection of Dundas Street West at Tremaine Road.

The majority of the turning movement projected to remain over capacity under the 2021 future background traffic conditions (with applied recommendations) are along Dundas Street West. The critical movements at the intersections along Dundas Street West are associated with the peak direction traffic along Dundas Street West, i.e., the eastbound direction during the AM peak hour, and the westbound direction during the PM peak hour. The results indicate that there is insufficient capacity along Dundas Street West to accommodate the forecast corridor traffic growth. As there are no additional reasonable recommendations to be made to the study intersections, WSP assessed traffic operations under the Phase 1 (2021) future total conditions to determine the impact of site generated traffic on the study intersection operations.

8.2 PHASE 1 (2021) FUTURE TOTAL TRAFFIC CONDITIONS

The traffic operations analysis for the study intersections under the 2021 future total traffic volumes is summarized in **Table 8-1**. Please refer back to **Figure 7-1** and **Figure 7-2** for the projected Phase 1 (2021) Future Total Traffic Volumes during the AM and PM peak hours, respectively. Please refer to **Appendix C** for the traffic operations assessment results. The traffic signal timings for the study intersections during the AM and PM peak hours have been optimized per the addition of site generated traffic.

As shown in **Table 8-1**, all study intersections are projected to operate below overall capacity during the AM and PM peak hours, with the exception of the intersections of Dundas Street West at Tremaine Road and Bronte Road during the study periods, and Dundas Street West at Colonel William Parkway and Avenue Two and Avenue Two at Street Four during the PM peak hour, for which critical turning movements are projected. The remaining study intersections are projected to operate with similar LOS as under future background conditions.

As under future background conditions, the majority of turning movements projected to operate over capacity are located along Dundas Street West and are associated with the peak direction traffic along Dundas Street West, i.e., the eastbound direction during the AM peak hour, and the westbound direction during the PM peak hour. Therefore, WSP completed an additional analysis to assess traffic operations at the study intersections assuming three through lanes for each direction along Dundas Street West. This widening was coded to include a High-Occupancy-Vehicle (HOV) lane as per the Dundas Street West widening Environmental Assessment Report, with a lane utilization factor of 0.80 per the Halton Region guidelines along Dundas Street West to the west of Bronte Road. The remaining intersection changes planned in conjunction with the Dundas Street West widening (such as the addition of a dual southbound left-turn lane at Tremaine Road) were not included within this sensitivity analysis.

As per **Table 8-1**, traffic operations are projected to improve with a widening of Dundas Street West in place. All study intersections are projected to operate under overall capacity during the AM and PM peak hours, with the exception of Dundas Street West at Bronte Road as the widening does not impact the aforementioned intersection. Turning movements at the remaining intersections are projected to operate below capacity, with the exception of the westbound through movement at Dundas Street West and Avenue Two projected at a v/c of 1.02 during the PM peak hour. Turning movements at the Avenue Two intersection with Dundas Street West are projected to operate below capacity under 2031 future total conditions, once the remaining accesses to the subject lands are implemented. Therefore, the operations projected without the additional through lanes on Dundas Street West are solely temporary as the Dundas Street West widening is planned for 2022. Additionally, the planned widening consists of additional improvements at the study intersections (such as additional turning lanes), not considered in this additional analysis for the purpose of conservative assessment, projected to further improve operations.

With regards to Street Four, the westbound left-turn movement at the intersection of Street Four at Avenue Two is projected to operate over capacity during the PM peak hour. Street Four was assessed assuming it would yield the only access to the surrounding development blocks (Blocks G3-2, C3-3 and C3-5). Further along the development application process additional accesses may be implemented for these blocks, which would alleviate traffic along Street Four and improve intersection operations. Therefore, the projected operations for the intersection of Street Four at Avenue Two detailed in **Table 8-1** represent the most conservative scenario. Furthermore, the study intersection is projected to operate below capacity under the 2031 horizon year once the remaining accesses to the study area are implemented.

Finally, it is WSP's opinion that the traffic operations at the intersection of Dundas Street West at Bronte Road would improve within the coming years based on anticipated changes in travel patterns. As the study intersection is projected to operate over capacity, drivers are anticipated to change their travel patterns and utilize surrounding intersections that are less congested, balancing traffic amongst intersections and ultimately improving traffic operations at the study intersection of Dundas Street West at Bronte Road. Further analyses, including a sensitivity analysis that considers reduced traffic volumes within the study area, have been completed for the 2031 horizon year as detailed in the following sections.

Therefore, the majority of the study intersections are projected to operate below overall capacity once the Dundas Street West widening takes place, projected for the 2022 horizon year. As such poor level of service operations projected prior to the widening are only temporary and are projected to improve as detailed above.

Table 8-1 – Intersection Levels of Service Under Phase 1 (2021) Future Background and Total Traffic Conditions

Intersection Name	Intersection Type	Phase 1 (2021) Future Background						Phase 1 (2021) Future Background with Recommendations						Phase 1 (2021) Future Total						Phase 1 (2021) Future Total with Dundas Street West Widening					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
Movement		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Bronte Road at Hwy 407 EB Off-Ramp	**Signalized**	**0.74**	**11**	**B**	**0.47**	**6**	**A**	**0.75**	**11**	**B**	**0.47**	**6**	**A**	**0.80**	**13**	**B**	**0.49**	**6**	**A**						
Eastbound Left		0.39	35	C	0.36	37	D	0.36	33	C	0.36	37	D	0.33	32	C	0.37	38	D						
Eastbound Right		0.56	38	D	0.03	36	D	0.53	37	D	0.03	36	D	0.63	39	D	0.05	36	D						
Northbound Through		0.28	4	A	0.49	4	A	0.29	5	A	0.49	4	A	0.30	5	A	0.50	4	A						
Southbound Through		0.78	10	A	0.37	4	A	0.79	11	B	0.37	4	A	0.84	13	B	0.39	4	A						
Dundas Street West at Tremaine Road	**Signalized**	**1.12**	**68**	**E**	**1.31**	**93**	**F**	**1.09**	**52**	**D**	**0.96**	**39**	**D**	**1.15**	**66**	**E**	**1.02**	**46**	**D**	**0.96**	**27**	**C**	**0.86**	**18**	**B**
Eastbound Left		0.94	52	D	1.39	241	F	0.63	12	B	0.84	78	E	0.66	14	B	0.87	84	F	0.70	14	B	0.63	60	E
Eastbound Through		1.14	88	F	0.50	10	B	1.09	69	E	0.44	6	A	1.16	102	F	0.47	7	A	0.94	29	C	0.38	6	A
Westbound Through		0.75	36	D	1.21	121	F	0.50	23	C	1.07	60	E	0.52	16	B	1.14	75	E	0.43	18	B	0.97	21	C
Westbound Right		0.17	54	D	0.24	21	C	0.14	71	E	0.22	17	B	0.14	27	C	0.23	6	A	0.14	40	D	0.24	13	B
Southbound Left		0.91	69	E	0.48	37	D	0.97	92	F	0.69	58	E	0.97	92	F	0.70	58	E	0.91	75	E	0.68	57	E
Southbound Right		0.23	38	D	1.13	129	F	0.23	0	A	0.37	1	A	0.23	0	A	0.37	1	A	0.23	0	A	0.37	1	A
Dundas Street West at Colonel William Parkway	**Signalized**	**0.94**	**34**	**C**	**0.99**	**46**	**D**	**0.93**	**27**	**C**	**0.97**	**34**	**C**	**0.99**	**41**	**D**	**1.09**	**59**	**E**	**0.81**	**22**	**C**	**0.91**	**23**	**C**
Eastbound Left		0.19	6	A	0.00	0	A	0.19	6	A	0.00	0	A	0.37	13	B	0.00	0	A	0.41	10	B	0.00	0	A
Eastbound Through		1.05	46	D	0.66	32	C	1.01	34	C	0.61	15	B	1.08	60	E	0.94	22	C	0.86	19	B	0.76	12	B
Eastbound Right		0.19	12	B	0.05	40	D	0.18	11	B	0.05	10	A	0.19	10	A	0.09	2	A	0.18	13	B	0.08	1	A
Westbound Left		0.42	53	D	0.39	25	C	0.47	60	E	0.38	19	B	0.47	52	D	0.69	62	E	0.47	27	C	0.63	41	D
Westbound Through		0.48	11	B	1.00	55	D	0.46	8	A	0.96	41	D	0.74	15	B	1.11	88	F	0.59	20	C	0.88	24	C
Westbound Right		0.06	14	B	0.00	7	A	0.06	9	A	0.00	7	A	0.06	3	A	0.00	7	A	0.06	15	B	0.00	7	A
Northbound Left		0.45	53	D	0.80	59	E	0.46	61	E	0.85	74	E	0.64	57	E	0.87	76	E	0.64	67	E	0.86	75	E
Northbound Through		0.00	48	D	0.01	36	D	0.00	56	E	0.01	44	D	0.00	54	D	0.01	43	D	0.00	55	D	0.01	43	D
Northbound Right		0.47	53	D	0.04	37	D	0.59	65	E	0.04	44	D	0.55	63	E	0.04	43	D	0.54	62	E	0.04	43	D
Southbound Left		0.04	48	D	0.19	38	D	0.05	56	E	0.20	46	D	0.04	55	E	0.19	45	D	0.04	55	E	0.19	44	D
Southbound Through/Right		0.00	48	D	0.03	37	D	0.00	56	E	0.03	44	D	0.00	55	D	0.03	43	D	0.00	55	D	0.03	43	D
Dundas Street West at Valleyridge Drive	**Signalized**	**0.74**	**9**	**A**	**0.59**	**5**	**A**	**0.72**	**14**	**B**	**0.58**	**6**	**A**	**0.79**	**16**	**B**	**0.66**	**7**	**A**	**0.89**	**29**	**C**	**0.74**	**9**	**A**
Eastbound Through/Right		0.79	10	A	0.39	5	A	0.77	16	B	0.37	8	A	0.83	19	B	0.56	9	A	0.95	33	C	0.63	7	A
Westbound Left		0.28	70	E	0.15	3	A	0.33	65	E	0.15	1	A	0.33	75	E	0.27	13	B	0.33	105	F	0.34	32	C
Westbound Through		0.33	3	A	0.59	4	A	0.33	4	A	0.57	2	A	0.50	7	A	0.65	4	A	0.57	18	B	0.74	8	A
Northbound Left		0.39	56	E	0.35	56	E	0.36	64	E	0.39	67	E	0.50	64	E	0.48	67	E	0.50	64	E	0.48	67	E
Northbound Right		0.06	51	D	0.02	51	D	0.06	59	E	0.02	61	E	0.06	57	E	0.02	60	E	0.06	57	E	0.02	60	E
Dundas Street West at Bronte Road	**Signalized**	**1.22**	**62**	**E**	**1.11**	**71**	**E**	**1.12**	**61**	**E**	**0.98**	**63**	**E**	**1.19**	**81**	**F**	**1.25**	**82**	**F**	**1.21**	**95**	**F**	**1.25**	**83**	**F**
Eastbound Left		0.98	66	E	1.14	154	F	0.90	38	D	0.97	103	F	0.99	61	E	1.44	268	F	0.99	57	E	1.44	266	F
Eastbound Through		0.99	52	D	0.65	53	D	0.99	50	D	0.63	54	D	1.10	88	F	0.74	56	E	1.25	151	F	0.84	62	E
Eastbound Right		0.59	33	C	0.14	125	F	0.57	27	C	0.14	111	F	0.66	29	C	0.53	71	E	0.66	27	C	0.53	80	F
Westbound Left		1.40	254	F	0.85	47	D	1.25	201	F	0.75	37	D	1.31	227	F	0.89	69	E	1.31	227	F	0.89	70	E
Westbound Through / Through/Right		0.62	36	D	1.07	82	F	0.49	39	D	0.96	59	E	0.74	49	D	0.99	64	E	0.74	49	D	0.99	64	E
Westbound Right								0.18	37	D	0.15	33	C	0.22	41	D	0.14	32	C	0.22	41	D	0.14	32	C
Northbound Left		0.98	108	F	1.03	103	F	0.98	117	F	0.87	74	E	1.19	171	F	1.10	130	F	1.19	171	F	1.10	130	F
Northbound Through		0.81	42	D	0.99	59	E	0.86	53	D	0.99	67	E	0.77	44	D	0.99	67	E	0.77	44	D	0.99	67	E
Northbound Right		0.28	31	C	0.18	26	C	0.33	38	D	0.16	30	C	0.30	34	C	0.20	31	C	0.30	34	C	0.20	31	C
Southbound Left		1.18	147	F	1.15	134	F	0.79	70	E	0.92	94	F	0.79	69	E	1.15	168	F	0.79	69	E	1.15	168	F
Southbound Through		1.05	83	F	0.76	42	D	1.07	100	F	0.84	57	E	1.14	126	F	0.89	67	E	1.14	126	F	0.89	67	E
Southbound Right		0.21	51	D	0.36	40	D	0.24	56	E	0.39	65	E	0.48	56	E	0.52	72	E	0.48	56	E	0.52	72	E
Bronte Road at William Halton Parkway	**Signalized**	**0.72**	**15**	**B**	**0.80**	**26**	**C**	**0.72**	**19**	**B**	**0.77**	**26**	**C**	**0.73**	**20**	**B**	**0.82**	**24**	**C**						
Westbound Left		0.22	54	D	0.32	42	D	0.20	62	E	0.33	49	D	0.20	62	E	0.33	49	D						
Westbound Right		0.05	53	D	0.84	64	E	0.05	61	E	0.79	67	E	0.05	61	E	0.79	67	E						
Northbound Through		0.75	19	B	0.81	28	C	0.71	27	C	0.78	26	C	0.72	28	C	0.85	22	C						
Southbound Left		0.74	37	D	0.58	25	C	0.75	41	D	0.53	25	C	0.76	43	D	0.59	38	D						
Southbound Through		0.59	5	A	0.49	9	A	0.58	5	A	0.48	10	A	0.63	5	A	0.50	10	A						

Intersection Name / Movement	Intersection Type	Phase 1 (2021) Future Background						Phase 1 (2021) Future Background with Recommendations						Phase 1 (2021) Future Total						Phase 1 (2021) Future Total with Dundas Street West Widening					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Dundas Street West at Avenue Two	**Signalized**													**0.99**	**19**	**B**	**1.16**	**88**	**F**	**0.79**	**5**	**A**	**0.98**	**39**	**D**
Eastbound Left														0.48	2	A	0.68	64	E	0.58	4	A	0.68	71	E
Eastbound Through														1.04	23	C	0.59	10	B	0.82	3	A	0.48	10	A
Westbound Through														0.40	5	A	1.27	145	F	0.32	1	A	1.02	46	D
Westbound Right														0.42	19	B	0.30	17	B	0.42	3	A	0.28	20	B
Southbound Left/Left-Right														0.53	63	E	0.97	78	E	0.53	63	E	0.93	69	E
Southbound Right														0.02	59	E	0.34	46	D	0.02	59	E	0.32	45	D
Avenue Two at Street Four	Stop-Controlled													-	-	-	-	-	-						
Westbound Left														0.16	16	C	1.07	112	F						
Westbound Right														0.00	0	A	0.00	0	A						
Northbound Through														0.34	0	A	0.18	0	A						
Northbound Right														0.16	0	A	0.09	0	A						
Southbound Through/Left														0.00	0	A	0.00	0	A						

Note: V/C ratios noted in red indicates that the movement is considered "critical" per the Halton Region Transportation Impact Study Guidelines (January 2015) – V/C of 0.85 or over for through movements and 0.95 or over for exclusive turning movements.

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9 PHASE 2 (2031) FUTURE TRAFFIC OPERATIONS

9.1 PHASE 2 (2031) FUTURE BACKGROUND TRAFFIC CONDITIONS

The traffic operations analysis for the study intersections under the Phase 2 (2031) future background traffic volumes is summarized in **Table 9-2.** Please refer back to **Figure 6-11** and **Figure 6-12** for the projected Phase 2 (2031) Future Background Traffic Volumes during the AM and PM peak hours, respectively. The Phase 2 (2031) future background traffic volumes do not include any site generated trips (i.e. it does not include trips generated by the Phase 1 development). Please refer to **Appendix C** for the traffic operations assessment results. The traffic signal timings for the study intersections during the AM and PM peak hours have been adjusted to optimize the intersection operations.

The boundary road network under the 2031 horizon year includes the implementation of the Dundas Street West widening, the Bronte Road widening, the Tremaine Road widening, as well as the William Halton Parkway widening as detailed in Section 5.2. All recommendations made as part of the 2021 future background traffic operations have been maintained, with the following additions:

- Bronte Road at Highway 407 EB Off-Ramp
  - The cycle length at the study intersection was increased to 140 seconds, the same cycle length are the remainders of the intersections.
  - The existing dual eastbound left-turn lane configuration is recommended to be modified to an eastbound left-turn lane and a shared eastbound left/right-turn lane to accommodate future background traffic growth under the 2031 horizon year
- The lane configurations and control type for the internal study intersections (within the 407 Employment Lands) were coded as described in Section 7.2.

Please refer back to **Figure 5-2** for the lane configuration at the study intersections.

As shown in **Table 9-2**, all study intersections are projected to operate below overall capacity during the AM and PM peak hours, with the exception of the intersections of Dundas Street West at Colonel William Parkway during the PM peak hour and Dundas Street West at Bronte Road during the study periods. Critical turning movements are projected at select study intersections. The majority of the critical turning movements are associated with the peak direction traffic along Dundas Street West (i.e. the eastbound direction during the AM peak hour, and the westbound direction during the PM peak hour).

WSP is of the opinion that the projected traffic operations under the 2031 future background conditions would operate with lower delay and better LOS than indicated in Table 9-2 as commuters travelling through the study area would change their travel patterns over time to avoid areas of heavy congestion. The study methodology requested by the reviewing agencies for this transportation study is typical for smaller horizon years and when there are no significant changes in the transportation system; however, the 2031 horizon year is 13 years into the future compared to 2018 existing conditions. Therefore, changes in travel patterns accounting for the planned roadway network developed as part of the North Oakville Secondary Plan, as well as any decrease in traffic volumes due to the planned increase in transit facilities along Dundas Street West and Highway 407, are not captured by the study methodology.

As there are no additional recommendations to be made to the study intersections, WSP assessed traffic operations under the Phase 2 (2031) future total conditions to determine the impact of site generated traffic on the study intersection operations. As part of the 2031 future total conditions, WSP completed a sensitivity analysis to determine the required traffic volume reassignment that would allow the study area intersections to operate below capacity.

9.2 PHASE 2 (2031) FUTURE TOTAL TRAFFIC CONDITIONS

The traffic operations analysis for the study intersections under the Phase 2 (2031) future total traffic volumes is summarized in **Table 9-2.** Please refer back to **Figure 7-3** and **Figure 7-4** for the projected Phase 2 (2031) Future Total Traffic Volumes during the AM and PM peak hours, respectively. Please refer to **Appendix C** for the traffic operations assessment results. The traffic signal timings for the study intersections during the AM and PM peak hours have been adjusted to optimize the intersection operations.

As shown in **Table 9-2**, all study intersections are projected to operate below overall capacity during the AM and PM peak hours, with the exception of the intersections of Dundas Street West at Tremaine Road and Colonel William Parkway and Bronte Road at Avenue One and William Halton Parkway during the PM peak hour, and the intersection of Dundas Street West at Bronte Road during the study periods. The study intersections are projected to operate with similar LOS as under 2031 future background conditions. The majority of the critical turning movements are associated with the peak direction traffic along Dundas Street West (i.e. the eastbound direction during the AM peak hour, and the westbound direction during the PM peak hour). As stated previously, WSP is of the opinion that within the next 13 years to 2031, the commuters travel patterns and overall traffic volumes along the study roadways will change based on the congestion of the study area intersections, the planned road network to be developed as part of the North Oakville Secondary Plan, as well as transit improvements to the Dundas Street West and Highway 407 corridor.

Therefore, WSP completed a sensitivity analysis to determine the reduction in traffic volume required to achieve traffic operations below capacity under 2031 future total conditions. The traffic reduction was derived using the Dundas Street West at Bronte Road intersection volumes as a base. The traffic reduction along Bronte Road was distributed along William Halton Parkway and the Highway 407 ramps included within the study area, based on the Phase 2 (2031) future total conditions turning movement at the two study intersections. The traffic reduction along Dundas Street West was maintained along the corridor. The 13-year linear traffic growth between the 2018 existing conditions and the Phase 2 (2031) future total traffic volumes, as well as between existing conditions and the Phase 2 (2031) future total traffic volumes under this sensitivity analysis, have been detailed in **Table 9-1**.

Table 9-1 – Phase 2 (2031) Future Total Traffic Conditions – Traffic Reduction under Sensitivity Analysis

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		Forecasted 2031 FT Volume (Associated Growth*)	Derived 2031 FT Volume under sensitivity analysis (Associated Growth*)	Forecasted 2031 FT Volume (Associated Growth*)	Derived 2031 FT Volume under sensitivity analysis (Associated Growth*)
Dundas Street West at Bronte Road	SBT (Bronte Rd)	1409 (28%)	1300 (18%)	2024 (242%)	1300 (120%)
	NBT (Bronte Rd)	2238 (210%)	1450 (101%)	1661 (38%)	1300 (8%)
	EBT (Dundas St W)	2336 (58%)	1300 (-12%)	1643 (100%)	1150 (40%)
	WBT (Dundas St W)	1317 (133%)	1317 (133%)	2146 (80%)	1600 (34%)

*Note: *The associated growth represents the 13-year linear growth between 2018 existing conditions traffic volumes at the noted 2031 FT traffic volume in question.*

As shown in **Table 9-2**, under the sensitivity analysis scenario, all study intersections are projected to operate below overall capacity with the exception of the Dundas Street West at Bronte Road intersection during the AM and PM peak hour projected to operate at a v/c of 1.00. All turning movements are projected to operate below capacity, with the exception of the southbound left-turn movement at the aforementioned intersection during the PM peak hour, projected to operate at a v/c of 1.05. This turning movement is projected to remain over capacity due to the large volume of vehicles completing the turn during the PM peak hour.

Therefore, once the North Oakville roadway network is implemented, along with increased transit along the Dundas Street West and Highway 407 corridors, traffic volumes are anticipated to be redistributed between the various roadway and travel modes. Traffic volumes within the study areas are anticipated to reduce, and the study intersection operations are projected to be improved (as per the sensitivity analysis).

Table 9-2 – Intersection Levels of Service Under Phase 2 (2031) Future Background and Total Traffic Volumes

Intersection Name	Intersection Type	Phase 2 (2031) Future Background						Phase 2 (2031) Future Total						Phase 2 (2031) Future Total with Sensitivity Adjustment					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
Movement		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Bronte Road at Hwy 407 EB Off-Ramp	**Signalized**	**0.85**	**17**	**B**	**0.52**	**7**	**A**	**0.92**	**22**	**C**	**0.55**	**6**	**A**	**0.89**	**21**	**C**	**0.53**	**5**	**A**
Eastbound Left-Left/Right		0.73	66	E	0.45	63	E	0.80	70	E	0.44	63	E	0.78	69	E	0.44	63	E
Eastbound Right		0.72	72	E	0.05	60	E	0.87	92	F	0.05	60	E	0.83	85	F	0.04	60	E
Northbound Through		0.28	2	A	0.53	4	A	0.29	2	A	0.56	2	A	0.22	2	A	0.54	1	A
Southbound Through		0.87	14	B	0.40	3	A	0.93	20	B	0.42	3	A	0.90	16	B	0.23	3	A
Dundas Street West at Tremaine Road	**Signalized**	**0.90**	**27**	**C**	**0.97**	**31**	**C**	**0.95**	**30**	**C**	**1.04**	**41**	**D**	**0.81**	**27**	**C**	**0.92**	**20**	**B**
Eastbound Left		0.88	51	D	0.63	51	D	0.87	45	D	0.69	52	D	0.87	45	D	0.67	51	D
Eastbound Through		0.90	17	B	0.37	3	A	0.95	22	C	0.38	3	A	0.64	9	A	0.25	2	A
Westbound Through		0.65	30	C	1.07	52	D	0.77	39	D	1.13	75	E	0.77	38	D	0.94	25	C
Westbound Right		0.17	29	C	0.24	7	A	0.19	40	D	0.24	8	A	0.19	39	D	0.24	16	B
Southbound Left		0.76	71	E	0.44	50	D	0.76	72	E	0.44	49	D	0.76	72	E	0.44	58	E
Southbound Right		0.35	1	A	0.70	2	A	0.37	1	A	0.78	3	A	0.37	1	A	0.78	3	A
Dundas Street West at Colonel William Parkway/Avenue Three	**Signalized**	**0.85**	**16**	**B**	**1.02**	**59**	**E**	**0.88**	**19**	**B**	**1.15**	**71**	**E**	**0.61**	**16**	**B**	**0.98**	**44**	**D**
Eastbound Left		0.47	6	A	0.48	43	D	0.54	11	B	0.49	45	D	0.53	21	C	0.49	48	D
Eastbound Through		0.91	15	B	0.65	18	B	0.92	16	B	0.71	18	B	0.60	6	A	0.53	16	B
Eastbound Right		0.18	9	A	0.06	1	A	0.18	9	A	0.06	1	A	0.16	1	A	0.06	2	A
Westbound Left		0.48	41	D	0.54	31	C	0.48	37	D	0.61	35	D	0.41	16	B	0.43	25	C
Westbound Through		0.44	9	A	1.10	88	F	0.49	12	B	1.14	102	F	0.49	12	B	0.97	51	D
Westbound Right		0.17	18	B	0.13	26	C	0.25	31	C	0.19	26	C	0.25	29	C	0.19	35	C
Northbound Left		0.53	63	E	0.84	73	E	0.54	63	E	0.85	73	E	0.54	63	E	0.85	73	E
Northbound Through		0.10	57	E	0.02	44	D	0.17	57	E	0.03	44	D	0.17	57	E	0.03	44	D
Northbound Right		0.54	64	E	0.04	44	D	0.54	63	E	0.04	44	D	0.54	63	E	0.04	44	D
Southbound Left		0.44	34	C	0.80	61	E	0.64	98	F	1.13	137	F	0.64	100	F	0.98	88	F
Southbound Through		0.02	35	D	0.03	38	D	0.04	91	F	0.05	38	D	0.04	93	F	0.05	35	C
Southbound Right		0.01	56	E	0.18	41	D	0.01	56	E	0.19	42	D	0.01	56	E	0.17	39	D
Dundas Street West at Valleyridge Drive/Avenue Five	**Signalized**	**0.94**	**32**	**C**	**0.86**	**22**	**C**	**0.97**	**36**	**D**	**0.91**	**28**	**C**	**0.69**	**22**	**C**	**0.77**	**21**	**C**
Eastbound Left		0.55	21	C	0.40	74	E	0.62	36	D	0.39	64	E	0.67	37	D	0.39	48	D
Eastbound Through		1.03	41	D	0.61	14	B	1.06	48	D	0.71	17	B	0.74	21	C	0.56	12	B
Eastbound Right		0.06	15	B	0.03	70	E	0.07	13	B	0.04	9	A	0.07	21	C	0.04	10	B
Westbound Left		0.32	87	F	0.30	21	C	0.32	78	E	0.36	34	C	0.32	34	C	0.25	12	B
Westbound Through		0.60	15	B	0.94	19	B	0.70	15	B	0.99	28	C	0.72	20	B	0.83	17	B
Westbound Right		0.22	15	B	0.08	7	A	0.30	14	B	0.09	12	B	0.31	16	B	0.09	12	B
Northbound Left		0.38	54	D	0.36	60	E	0.44	54	D	0.40	61	E	0.35	50	D	0.38	60	E
Northbound Through/Right		0.17	60	E	0.08	65	E	0.17	59	E	0.08	65	E	0.15	58	E	0.08	65	E
Southbound Left		0.43	66	E	0.75	69	E	0.53	68	E	0.84	73	E	0.38	52	D	0.73	64	E
Southbound Through/Right		0.03	96	F	0.18	60	E	0.04	99	F	0.17	63	E	0.04	82	F	0.16	60	E

Intersection Name / Movement	Intersection Type	Phase 2 (2031) Future Background						Phase 2 (2031) Future Total						Phase 2 (2031) Future Total with Sensitivity Adjustment					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
Movement		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Dundas Street West at Bronte Road	**Signalized**	**1.20**	**95**	**F**	**1.23**	**90**	**F**	**1.36**	**27**	**F**	**1.36**	**127**	**F**	**1.00**	**59**	**E**	**1.00**	**63**	**E**
Eastbound Left		0.83	40	D	1.22	199	F	0.86	42	D	1.22	188	F	0.94	70	E	0.95	87	F
Eastbound Through		1.28	172	F	0.99	76	E	1.26	159	F	1.12	115	F	0.95	59	E	0.94	72	E
Eastbound Right		0.57	13	B	0.60	23	C	0.61	14	B	0.84	35	D	0.64	17	B	0.81	27	C
Westbound Left		1.30	213	F	1.36	230	F	1.39	251	F	1.44	264	F	0.96	92	F	0.97	85	F
Westbound Through		0.73	45	D	1.10	100	F	0.80	45	D	1.17	127	F	0.98	71	E	0.97	63	E
Westbound Right		0.85	49	D	0.35	34	C	1.02	80	F	0.44	37	D	0.98	63	E	0.45	41	D
Northbound Left		1.10	132	F	0.99	92	F	1.57	330	F	1.44	269	F	0.97	84	F	0.98	84	F
Northbound Through		0.99	63	E	0.98	65	E	1.30	187	F	1.02	74	E	0.97	66	E	0.94	63	E
Northbound Right		0.39	25	C	0.27	37	D	0.41	28	C	0.31	36	D	0.44	29	C	0.30	41	D
Southbound Left		1.48	281	F	1.06	93	F	1.30	187	F	1.40	225	F	0.51	20	B	1.05	82	F
Southbound Through		0.98	63	E	1.13	116	F	0.98	57	E	1.20	136	F	0.95	56	E	0.95	57	E
Southbound Right		0.17	62	E	0.38	44	D	0.17	57	E	0.36	35	D	0.21	50	D	0.35	44	D
Bronte Road at William Halton Parkway/Burnhamthorpe Road	**Signalized**	**0.79**	**39**	**D**	**0.93**	**45**	**D**	**0.96**	**48**	**D**	**1.15**	**64**	**E**	**0.93**	**47**	**D**	**0.97**	**49**	**D**
Eastbound Left		0.59	59	E	0.69	47	D	0.82	E	78	0.85	53	D	0.82	77	E	0.83	62	E
Eastbound Through		0.08	50	D	0.71	56	E	0.11	D	41	0.83	56	E	0.11	40	D	0.78	67	E
Eastbound Right		0.14	16	B	0.99	78	E	0.18	B	13	1.31	195	F	0.18	12	B	0.99	63	E
Westbound Left		0.42	57	E	0.99	98	F	0.32	D	51	1.25	190	F	0.31	50	D	0.92	88	F
Westbound Through		0.71	63	E	0.26	54	D	0.84	E	65	0.33	51	D	0.84	65	E	0.39	54	D
Westbound Right		0.23	36	D	0.96	81	F	0.22	C	34	0.96	80	E	0.21	32	C	0.93	76	E
Northbound Left		0.85	36	D	0.26	27	C	0.99	D	38	0.46	31	C	0.96	44	D	0.29	19	B
Northbound Through		0.71	34	C	0.71	26	C	0.90	D	38	0.73	27	C	0.65	32	C	0.61	17	B
Northbound Right		0.16	70	E	0.05	34	C	0.16	E	56	0.05	34	C	0.11	38	D	0.04	39	D
Southbound Left		0.80	70	E	0.44	63	E	0.93	E	69	0.57	63	E	0.81	61	E	0.49	56	E
Southbound Through		0.79	29	C	0.81	31	C	0.98	E	56	0.97	36	D	0.95	54	D	0.91	61	E
Southbound Right		0.16	23	C	0.10	3	A	0.30	D	48	0.16	8	A	0.30	50	D	0.18	14	B
Dundas Street West at Avenue Two	**Signalized**	**0.88**	**8**	**A**	**0.86**	**14**	**B**	**0.89**	**10**	**A**	**0.93**	**24**	**C**	**0.63**	**9**	**A**	**0.79**	**18**	**B**
Eastbound Left		0.02	1	A	0.07	27	C	0.48	2	A	0.50	59	E	0.48	5	A	0.50	29	C
Eastbound Through		0.88	7	A	0.42	4	A	0.90	8	A	0.45	5	A	0.63	5	A	0.31	6	A
Westbound Through		0.34	8	A	0.91	17	B	0.36	9	A	1.01	27	C	0.36	9	A	0.83	14	B
Westbound Right		0.10	14	B	0.06	7	A	0.18	28	C	0.12	10	A	0.18	28	C	0.12	8	A
Southbound Left/Left-Right		0.23	65	E	0.54	60	E	0.34	66	E	0.72	62	E	0.34	66	E	0.72	62	E
Southbound Right		0.00	71	E	0.07	58	E	0.02	73	E	0.55	57	E	0.02	72	E	0.55	57	E
Tremaine Road at Avenue One	**Signalized**	**0.34**	**7**	**A**	**0.35**	**10**	**A**	**0.35**	**7**	**A**	**0.42**	**13**	**B**						
Eastbound Left		0.00	0	A	0.03	27	C	0.00	0	A	0.02	23	C						
Eastbound Through/Right		0.34	31	C	0.32	29	C	0.34	31	C	0.22	24	C						
Westbound Left		0.11	30	C	0.38	34	C	0.21	31	C	0.55	33	C						
Westbound Through/Right		0.29	30	C	0.28	36	D	0.29	31	C	0.20	35	D						
Northbound Left		0.21	6	A	0.12	7	A	0.21	6	A	0.13	10	A						
Northbound Through/Right		0.29	5	A	0.27	6	A	0.33	6	A	0.32	9	A						
Southbound Left		0.09	3	A	0.02	4	A	0.15	4	A	0.03	6	A						
Southbound Through/Right		0.35	4	A	0.34	5	A	0.35	4	A	0.38	7	A						

Intersection Name / Movement	Intersection Type	Phase 2 (2031) Future Background						Phase 2 (2031) Future Total						Phase 2 (2031) Future Total with Sensitivity Adjustment					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Tremaine Road at Burnhamthorpe Road	**Signalized**	**0.46**	**11**	**B**	**0.60**	**15**	**B**	**0.52**	**12**	**B**	**0.69**	**17**	**B**						
Eastbound Left		0.00	0	A	0.02	17	B	0.00	0	A	0.02	16	B						
Eastbound Through/Right		0.31	29	C	0.12	18	B	0.30	29	C	0.12	16	B						
Westbound Left		0.34	22	C	0.75	37	D	0.41	21	C	0.81	38	D						
Westbound Through/Right		0.05	20	B	0.07	26	C	0.05	16	B	0.08	15	B						
Northbound Left		0.24	10	A	0.06	7	A	0.24	9	A	0.08	9	A						
Northbound Through/Right		0.48	15	B	0.42	13	B	0.54	16	B	0.48	16	B						
Southbound Left		0.11	4	A	0.09	8	A	0.18	5	A	0.14	9	A						
Southbound Through/Right		0.37	4	A	0.52	10	A	0.37	4	A	0.60	11	B						
Bronte Road at Avenue One	**Signalized**	**0.74**	**22**	**C**	**0.73**	**19**	**B**	**0.90**	**36**	**D**	**1.02**	**45**	**D**	**0.87**	**40**	**D**	**0.96**	**42**	**D**
Eastbound Left		0.31	67	E	0.77	67	E	0.45	61	E	0.47	33	C	0.45	61	E	0.44	31	C
Eastbound Right		0.05	80	E	0.88	60	E	0.08	61	E	0.98	76	E	0.08	61	E	0.96	69	E
Northbound Left		0.80	75	E	0.20	58	E	0.93	85	F	0.66	73	E	0.93	90	F	0.79	90	F
Northbound Through		0.36	1	A	0.62	4	A	0.37	1	A	0.99	39	D	0.20	2	A	0.90	28	C
Southbound Through		0.77	21	C	0.52	20	B	0.95	37	D	0.80	41	D	0.91	34	C	0.83	45	D
Southbound Right		0.17	24	C	0.04	14	B	0.26	38	D	0.06	25	C	0.26	37	D	0.06	28	C
Avenue Three at Avenue One	**Signalized**	**0.27**	**49**	**D**	**0.18**	**5**	**A**	**0.76**	**30**	**C**	**0.51**	**8**	**A**						
Eastbound Through		0.06	5	A	0.17	3	A	0.14	7	A	0.52	6	A						
Eastbound Right		0.01	5	A	0.05	3	A	0.03	5	A	0.17	4	A						
Westbound Left		0.02	5	A	0.16	3	A	0.03	8	A	0.29	6	A						
Westbound Through		0.25	5	A	0.07	2	A	0.79	24	C	0.16	3	A						
Northbound Left		0.37	45	D	0.25	33	C	0.67	37	D	0.39	42	D						
Northbound Right		0.11	153	F	0.01	39	D	0.11	76	E	0.02	62	E						
Avenue Two at Burnhamthorpe Road	**Signalized**	**0.19**	**21**	**C**	**0.29**	**17**	**B**	**0.23**	**18**	**B**	**0.32**	**20**	**B**						
Eastbound Left		0.12	5	A	0.04	9	A	0.13	6	A	0.04	9	A						
Eastbound Through		0.12	5	A	0.17	9	A	0.15	6	A	0.19	10	B						
Eastbound Right		0.01	4	A	0.05	14	B	0.01	4	A	0.05	16	B						
Westbound Left		0.01	7	A	0.02	15	B	0.11	6	A	0.17	17	B						
Westbound Through		0.11	9	A	0.17	13	B	0.12	6	A	0.21	16	B						
Westbound Right		0.15	53	D	0.04	35	C	0.15	31	C	0.04	39	D						
Northbound Left		0.38	37	D	0.13	26	C	0.33	33	C	0.15	24	C						
Northbound Through		0.33	36	D	0.05	25	C	0.56	35	D	0.08	24	C						
Northbound Right		0.00	27	C	0.01	22	C	0.04	53	D	0.07	36	D						
Southbound Left		0.27	29	C	0.62	29	C	0.28	25	C	0.61	30	C						
Southbound Through		0.06	29	C	0.15	23	C	0.10	24	C	0.29	25	C						
Southbound Right		0.01	27	C	0.04	24	C	0.01	26	C	0.04	29	C						

Intersection Name	Intersection Type	Phase 2 (2031) Future Background						Phase 2 (2031) Future Total						Phase 2 (2031) Future Total with Sensitivity Adjustment					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
Movement		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Avenue Three at Burnhamthorpe Road	**Signalized**	**0.30**	**14**	**B**	**0.30**	**12**	**B**	**0.49**	**17**	**B**	**0.52**	**14**	**B**						
Eastbound Left		0.00	0	A	0.01	6	A	0.00	12	B	0.04	6	A						
Eastbound Through/Right		0.14	13	B	0.25	7	A	0.20	13	B	0.50	9	A						
Westbound Left		0.12	7	A	0.16	10	B	0.15	11	B	0.33	15	B						
Westbound Through		0.23	9	A	0.17	10	A	0.44	16	B	0.29	11	B						
Westbound Right		0.03	16	B	0.01	5	A	0.12	18	B	0.02	34	C						
Northbound Left		0.00	27	C	0.04	18	B	0.20	24	C	0.24	19	B						
Northbound Through		0.54	27	C	0.06	19	B	0.62	28	C	0.09	18	B						
Northbound Right		0.03	40	D	0.07	23	C	0.03	37	D	0.20	17	B						
Southbound Left		0.04	22	C	0.17	24	C	0.11	20	B	0.48	24	C						
Southbound Through/Right		0.04	21	C	0.49	27	C	0.07	19	B	0.59	26	C						
Avenue Five at Burnhamthorpe Road	**Signalized**	**0.28**	**8**	**A**	**0.47**	**16**	**B**	**0.46**	**13**	**B**	**0.66**	**17**	**C**						
Eastbound Left		0.20	2	A	0.04	13	B	0.34	7	A	0.12	13	B						
Eastbound Through/Right		0.08	1	A	0.37	14	B	0.12	1	A	0.64	19	B						
Westbound Left		0.12	1	A	0.21	8	A	0.14	5	A	0.49	22	C						
Westbound Through		0.26	1	A	0.19	6	A	0.45	9	A	0.30	6	A						
Westbound Right		0.18	0	A	0.03	12	B	0.21	9	A	0.03	8	A						
Northbound Left		0.21	55	E	0.04	20	B	0.39	56	E	0.09	21	C						
Northbound Through		0.48	58	E	0.04	19	B	0.61	61	E	0.06	20	C						
Northbound Right		0.03	54	D	0.07	47	D	0.03	49	D	0.15	29	C						
Southbound Left		0.36	43	D	0.68	26	C	0.36	37	D	0.68	26	C						
Southbound Through		0.08	43	D	0.13	18	B	0.09	34	C	0.20	19	B						
Southbound Right		0.01	59	E	0.07	14	B	0.03	14	B	0.08	14	B						
Avenue Two at Avenue One	**Stop-Controlled**	-	-	-	-	-	-	-	-	-	-	-	-						
Eastbound Through/Right		0.07	0	A	0.02	0	A	0.14	0	A	0.03	0	A						
Westbound Through/Left		0.04	6	A	0.01	1	A	0.06	6	A	0.05	3	A						
Northbound Left		0.00	10	B	0.01	9	A	0.00	11	B	0.02	11	B						
Northbound Right		0.01	9	A	0.04	9	A	0.11	10	A	0.06	9	A						
Avenue Five at Avenue One	**Stop-Controlled**	-	-	-	-	-	-	-	-	-	-	-	-						
Eastbound Through/Right		0.07	0	A	0.16	0	A	0.12	0	A	0.44	0	A						
Westbound Left		0.05	8	A	0.05	8	A	0.07	8	A	0.09	10	A						
Westbound Through		0.19	0	A	0.08	0	A	0.49	0	A	0.4	0	A						
Northbound Left		0.03	13	B	0.02	13	B	0.33	34	D	0.09	24	C						
Northbound Right		0.07	9	A	0.08	10	B	0.09	10	A	0.22	16	C						
Avenue Two at Street Four	**Stop-Controlled**	-	-	-	-	-	-	-	-	-	-	-	-						
Westbound Left		0.01	10	A	0.06	10	A	0.10	12	B	0.45	17	C						
Westbound Right		0.00	9	A	0.01	9	A	0.02	10	A	0.09	9	A						
Northbound Through		0.08	0	A	0.03	0	A	0.15	0	A	0.06	0	A						
Northbound Right		0.01	0	A	0.02	0	A	0.11	0	A	0.09	0	A						
Southbound Through/Left		0.01	2	A	0.01	1	A	0.06	5	A	0.04	2	A						

Note: V/C ratios noted in red indicates that the movement is considered "critical" per the Halton Region Transportation Impact Study Guidelines (January 2015) – V/C of 0.85 or over for through movements and 0.95 or over for exclusive turning movements.

9.2.1 STORAGE LENGTH REQUIREMENTS

Based on the sensitivity analysis completed as part of the Phase 2 (2031) future total conditions, WSP completed a queueing analysis to derive storage length requirements for the internal roadway intersections, as well as the boundary road intersections projected to be modified by the proposed site accesses. Storage lengths have been estimated on the bases of the 95th percentile Synchro analysis, detailed in **Table 9-3** below.

Table 9-3 – Queuing Assessment and Proposed Turn Lane Storage Length Required

Intersection Name / Movement	Intersection Type	95th Percentile Queue Lengths (m)		Minimum Storage Length *(Rounded to the nearest 5m)*
		AM Peak Hour	PM Peak Hour	
Dundas Street West at Colonel William Parkway/Avenue Three	**Signalized**			
Eastbound Left		27	18	30
Eastbound Right		2	1	5
Westbound Left		14	25	25
Westbound Right		28	39	40
Northbound Left		37	93	95
Northbound Right		43	0	45
Southbound Left		41	141	145
Southbound Right		4	28	30
Dundas Street West at Valleyridge Drive/Avenue Five	**Signalized**			
Eastbound Left		43	13	45
Eastbound Right		14	2	15
Westbound Left		4	4	5
Westbound Right		33	4	35
Northbound Left		35	25	35
Southbound Left		17	63	65
Bronte Road at William Halton Parkway/Burnhamthorpe Road	**Signalized**			
Eastbound Left		44	106	110
Eastbound Right		16	256	260
Westbound Left		33	60	60
Westbound Right		30	126	130
Northbound Left		143	14	145
Northbound Right		16	7	20
Southbound Left		83	34	85
Southbound Right		36	9	40
Dundas Street West at Avenue Two	**Signalized**			
Eastbound Left		7	19	20
Westbound Right		22	4	25
Southbound Left		17	58	60
Southbound Right		12	64	65
Tremaine Road at Avenue One	**Signalized**			
Eastbound Left		0	3	5
Westbound Left		6	32	35
Northbound Left		14	12	15
Southbound Left		8	3	10
Tremaine Road at Burnhamthorpe Road	**Signalized**			
Eastbound Left		0	3	5
Northbound Left		20	6	20
Southbound Left		3	5	5

Intersection Name Movement	Intersection Type	95th Percentile Queue Lengths (m)		Minimum Storage Length *(Rounded to the nearest 5m)*
		AM Peak Hour	PM Peak Hour	
Bronte Road at Avenue One	**Signalized**			
Eastbound Left		33	105	105
Northbound Left		184	46	185
Southbound Right		15	11	15
Avenue Three at Avenue One	**Signalized**			
Eastbound Right		2	9	10
Westbound Left		3	26	30
Northbound Left		47	20	50
Avenue Two at Burnhamthorpe Road	**Signalized**			
Eastbound Left		19	6	20
Eastbound Right		1	8	10
Westbound Left		15	32	35
Westbound Right		35	19	35
Northbound Left		17	10	20
Northbound Right		8	10	10
Southbound Left		9	34	35
Southbound Right		0	7	10
Avenue Three at Burnhamthorpe Road	**Signalized**			
Eastbound Left		0	4	5
Westbound Left		33	28	35
Westbound Right		42	8	45
Northbound Left		15	10	15
Northbound Right		6	12	15
Southbound Left		7	31	35
Avenue Five at Burnhamthorpe Road	**Signalized**			
Eastbound Left		12	12	15
Westbound Left		12	35	35
Westbound Right		24	3	25
Northbound Left		28	9	30
Northbound Right		12	18	20
Southbound Left		10	31	35
Southbound Right		2	5	5
Avenue Two at Avenue One	**Stop-Controlled**			
Northbound Left		0	1	5
Avenue Five at Avenue One	**Stop-Controlled**			
Northbound Left		10	2	10
Avenue Two at Street Four	**Stop-Controlled**			
Westbound Left		2	18	20
Northbound Right		0	0	0

9.3 PHASE 2A (2031) FUTURE TOTAL TRAFFIC OPERATIONS

WSP completed a traffic operations analysis of the study area intersections assuming that creek crossings would not be in place along Avenue One. Within this scenario Avenue One is segmented between Avenue Five and Avenue Three, as well as between Avenue two and Avenue Three. Please refer to **Figure 5-3** for the assumed boundary road network for Phase 2A (2031). Please refer back to **Figure 7-5 and Figure 7-6** for the projected Phase 2A (2031) Future Total Traffic Volumes during the AM and PM peak hours, respectively.

The Phase 2A (2031) future total traffic assessment assumes the same signal timing and boundary road recommendations as under the Phase 2 (2031) future total scenario, as detailed in Section 9.2 plus the following additional recommendations under Phase 2A:

- Burnhamthorpe Road at Bronte Road
  - Introduce a channelized right-turn lane onto Bronte Road, along with an additional receiving lane which would taper off.
- Avenue Three at Avenue One
  - Increase the cycle length from 70 seconds to 140 seconds during the AM peak hour.
- Avenue Five at Burnhamthorpe Road
  - Increase the cycle length from 70 seconds to 140 seconds during the PM peak hour.
- Avenue Three at Burnhamthorpe Road
  - Increase the cycle length from 70 seconds to 140 seconds during the PM peak hour.
  - The implementation of a dual southbound left-turn lane at the study intersection.
  - Introduce protected-permissive eastbound left-turn phase during the AM peak hour.
  - Introduce protected-permissive westbound left-turn phase during the PM peak hour.

The traffic operations analysis for the study intersections under the Phase 2A (2031) future total traffic conditions is summarized in **Table 9-5.** Please refer to **Appendix D** for the traffic operations assessment results. The traffic signal timings for the study intersections during the AM and PM peak hours have been adjusted to optimize the intersection operations.

As shown in **Table 9-5**, all study intersections are projected to operate below overall capacity during the AM and PM peak hours, with the exception of the intersections of Dundas Street West at Tremaine Road and Colonel William Parkway during the PM peak hour, Bronte Road at William Halton Parkway during the AM peak hour, and the intersection of Dundas Street West at Bronte Road during the study periods. Additionally, turning movements operating over capacity are projected at the intersection of Dundas Street West at Valleyridge Drive during the AM peak hour and Dundas Street West at Avenue Two during the PM peak hour. As stated in the previous scenario analysis, the majority of the critical turning movements are associated with the peak direction traffic along Dundas Street West (i.e. the eastbound direction during the AM peak hour, and the westbound direction during the PM peak hour).

As stated previously, WSP is of the opinion that within the next 13 years to 2031, the commuters travel patterns and overall traffic volumes along the study roadways will change based on the congestion of the study area intersections, the planned road network to be developed as part of the North Oakville Secondary Plan, as well as transit improvements to the Dundas Street West and Highway 407 corridors. Therefore, WSP completed a sensitivity analysis to determine the reduction in traffic volume required to achieve traffic operations below capacity under the Phase 2A (2031) future total conditions as detailed in **Table 9-4**.

Table 9-4 – Phase 2A (2031) Future Total Traffic Conditions – Traffic Reduction under Sensitivity Analysis

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		Forecasted 2031 FT Volume (Associated Growth*)	Derived 2031 FT Volume under sensitivity analysis (Associated Growth*)	Forecasted 2031 FT Volume (Associated Growth*)	Derived 2031 FT Volume under sensitivity analysis (Associated Growth*)
Dundas Street West at Bronte Road	SBT (Bronte Rd)	1409 (28%)	1150 (4%)	2023 (242%)	1300 (120%)
	NBT (Bronte Rd)	2238 (210%)	1600 (122%)	1661 (38%)	1350 (12%)
	EBT (Bronte Rd)	2336 (58%)	1350 (-9%)	1647 (101%)	1100 (34%)
	WBT (Dundas St W	1321 (133%)	1321 (133%)	2148 (80%)	1500 (26%)

*Note: *The associated growth represents the 13-year linear growth between 2018 existing conditions traffic volumes at the noted 2031 FT traffic volume in question.*

As shown in **Table 9-5**, under the sensitivity analysis scenario, all turning movements are projected to operate below overall capacity, with the exception of the eastbound and northbound left-turn movements at the intersection of Bronte Road at Burnhamthorpe Road/William Halton Parkway during the AM peak hour and the southbound left-turn movement at the intersection of Dundas Street West at Bronte Road during the PM peak hour. All remaining study intersections are projected to operate below capacity during the study periods (the intersection of Dundas Street West at Bronte Road is projected to operate over capacity during the AM peak hour, however all intersection turning movements are projected to operate below capacity). The northbound left-turn movement at the intersection of Bronte Road at Burnhamthorpe Road is projected to operate above capacity during the AM peak hour due to the large volume of left-turning vehicles. This volume is significantly increased compared to the Phase 2 scenario since a portion of the proposed development and surrounding 407 Employment Lands blocks are now only accessible via Burnhamthorpe Road and Avenue Three due to the creek crossings removal. Long delays for this movements are one of the expected consequences of Avenue One not being a continuous roadway between Tremaine Road and Bronte Road (i.e. the delay would increase from 44 seconds to 168 seconds).

Based on the projected traffic operations at the study intersections under Phase 2A (2031) future total traffic conditions, the discontinuity of Avenue One within the study area warrants additional turning lane improvements at the intersections of Burnhamthorpe Road at Avenue Three and Bronte Road (as detailed at the start of Section 9.3) and the changes in traffic pattern are projected to cause the intersection of Bronte Road at Burnhamthorpe Road to operate over capacity during the AM peak hour.

Table 9-5 – Intersection Levels of Service Under Phase 2A (2031) Future Background and Total Traffic Volumes

Intersection Name	Intersection Type	Phase 2A (2031) Future Total						Phase 2A (2031) Future Total with Sensitivity Adjustment					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
Movement		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Bronte Road at Hwy 407 EB Off-Ramp	**Signalized**	**0.92**	**22**	**C**	**0.55**	**6**	**A**	**0.84**	**18**	**B**	**0.54**	**7**	**A**
Eastbound Left-Left/Right		0.80	70	E	0.44	63	E	0.77	68	E	0.44	63	E
Eastbound Right		0.87	92	F	0.05	60	E	0.78	78	E	0.04	60	E
Northbound Through		0.29	2	A	0.56	1	A	0.24	2	A	0.55	4	A
Southbound Through		0.93	20	B	0.42	3	A	0.85	13	A	0.24	3	A
Dundas Street West at Tremaine Road	**Signalized**	**0.95**	**31**	**C**	**1.04**	**41**	**D**	**0.81**	**27**	**C**	**0.88**	**18**	**B**
Eastbound Left		0.87	45	D	0.69	52	D	0.87	45	D	0.69	53	D
Eastbound Through		0.95	22	C	0.38	3	A	0.66	9	A	0.24	2	A
Westbound Through		0.77	40	D	1.13	74	E	0.77	39	D	0.88	21	C
Westbound Right		0.19	41	D	0.24	8	A	0.19	39	D	0.24	16	B
Southbound Left		0.76	73	E	0.44	51	D	0.76	74	E	0.44	58	E
Southbound Right		0.37	1	A	0.78	3	A	0.37	1	A	0.78	3	A
Dundas Street West at Colonel William Parkway/Avenue Three	**Signalized**	**0.87**	**19**	**B**	**1.13**	**70**	**E**	**0.62**	**15**	**B**	**0.94**	**37**	**D**
Eastbound Left		0.54	11	B	0.43	43	D	0.55	21	C	0.43	41	D
Eastbound Through		0.92	16	B	0.73	19	B	0.62	6	A	0.51	14	B
Eastbound Right		0.18	9	A	0.06	1	A	0.16	1	A	0.06	2	A
Westbound Left		0.48	36	D	0.61	35	D	0.43	16	B	0.41	22	C
Westbound Through		0.50	13	B	1.14	104	F	0.50	13	B	0.91	38	D
Westbound Right		0.23	27	C	0.17	25	C	0.23	27	C	0.16	30	C
Northbound Left		0.55	64	E	0.85	73	E	0.55	64	E	0.85	73	E
Northbound Through		0.16	57	E	0.03	44	D	0.16	57	E	0.03	44	D
Northbound Right		0.54	63	E	0.04	44	D	0.54	63	E	0.04	44	D
Southbound Left		0.59	69	E	1.04	110	F	0.59	59	E	0.96	89	F
Southbound Through		0.03	64	E	0.05	38	D	0.03	51	D	0.05	38	D
Southbound Right		0.01	56	E	0.17	45	D	0.01	56	E	0.16	50	D
Dundas Street West at Valleyridge Drive/Avenue Five	**Signalized**	**0.97**	**35**	**C**	**0.92**	**27**	**C**	**0.70**	**18**	**B**	**0.75**	**21**	**C**
Eastbound Left		0.62	36	D	0.40	67	E	0.63	42	D	0.39	44	D
Eastbound Through		1.06	47	D	0.70	16	B	0.75	15	B	0.54	12	B
Eastbound Right		0.07	13	B	0.04	9	A	0.07	13	B	0.04	10	B
Westbound Left		0.32	79	E	0.36	37	D	0.32	32	C	0.24	13	B
Westbound Through		0.70	13	B	0.99	26	C	0.72	14	B	0.80	18	B
Westbound Right		0.30	11	B	0.09	12	B	0.31	12	B	0.09	15	B
Northbound Left		0.44	54	D	0.42	61	E	0.37	51	D	0.39	60	E
Northbound Through/Right		0.17	59	E	0.08	65	E	0.16	59	E	0.08	65	E
Southbound Left		0.54	57	E	0.89	83	F	0.38	49	D	0.71	62	E
Southbound Through/Right		0.04	81	F	0.17	62	E	0.04	81	F	0.16	59	E

Intersection Name / Movement	Intersection Type	Phase 2A (2031) Future Total						Phase 2A (2031) Future Total with Sensitivity Adjustment					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
Movement		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Dundas Street West at Bronte Road	**Signalized**	**1.41**	**141**	**F**	**1.37**	**129**	**F**	**1.02**	**60**	**E**	**1.00**	**64**	**E**
Eastbound Left		1.00	69	E	1.22	189	F	0.97	78	E	0.95	87	F
Eastbound Through		1.41	228	F	1.12	116	F	0.98	65	E	0.90	67	E
Eastbound Right		0.69	21	C	0.84	36	D	0.64	16	B	0.81	28	C
Westbound Left		1.39	251	F	1.44	264	F	0.96	92	F	0.97	85	F
Westbound Through		0.84	49	D	1.17	128	F	0.96	66	E	0.91	54	D
Westbound Right		1.01	76	E	0.44	37	D	0.99	67	E	0.43	40	D
Northbound Left		1.89	473	F	1.44	269	F	0.97	84	F	0.98	84	F
Northbound Through		1.25	164	F	0.99	67	E	0.99	66	E	0.98	69	E
Northbound Right		0.40	27	C	0.30	36	D	0.42	26	C	0.30	41	D
Southbound Left		0.92	50	D	1.47	266	F	0.59	20	B	1.05	94	F
Southbound Through		0.81	44	D	1.19	135	F	0.84	53	D	0.95	64	E
Southbound Right		0.19	42	D	0.36	32	C	0.18	71	E	0.35	50	D
Bronte Road at William Halton Parkway/Burnhamthorpe Road	**Signalized**	**1.18**	**100**	**F**	**0.97**	**38**	**D**	**1.14**	**78**	**E**	**0.99**	**37**	**D**
Eastbound Left		0.96	108	F	0.99	66	E	1.04	131	F	0.99	65	E
Eastbound Through		0.11	40	D	0.82	52	D	0.11	36	D	0.68	45	D
Eastbound Right		0.15	0	A	0.80	3	A	0.15	0	A	0.80	3	A
Westbound Left		0.32	51	D	0.84	56	E	0.28	50	D	0.66	56	E
Westbound Through		0.84	65	E	0.34	52	D	0.84	65	E	0.59	63	E
Westbound Right		0.22	34	C	0.98	86	F	0.22	34	C	0.96	82	F
Northbound Left		1.63	317	F	0.85	42	D	1.30	168	F	0.77	46	D
Northbound Through		0.68	31	C	0.82	36	D	0.44	24	C	0.75	31	C
Northbound Right		0.16	54	D	0.06	42	D	0.11	20	C	0.04	112	F
Southbound Left		0.93	81	F	0.50	67	E	0.93	75	E	0.33	61	E
Southbound Through		0.96	51	D	0.76	34	C	0.98	65	E	0.44	33	C
Southbound Right		0.68	40	D	0.21	9	A	0.80	55	E	0.18	8	A
Dundas Street West at Avenue Two	**Signalized**	**0.89**	**10**	**B**	**0.94**	**25**	**C**	**0.67**	**10**	**A**	**0.78**	**18**	**B**
Eastbound Left		0.48	2	A	0.49	60	E	0.48	5	A	0.49	21	C
Eastbound Through		0.90	8	A	0.45	6	A	0.64	5	A	0.29	6	A
Westbound Through		0.36	9	A	1.02	30	C	0.36	9	A	0.80	15	B
Westbound Right		0.20	29	C	0.13	10	A	0.20	31	C	0.12	12	B
Southbound Left/Left-Right		0.36	62	E	0.73	63	E	0.36	63	E	0.73	62	E
Southbound Right		0.02	70	E	0.56	49	D	0.02	74	E	0.55	51	D
Tremaine Road at Avenue One	**Signalized**	**0.36**	**7**	**A**	**0.34**	**9**	**A**						
Eastbound Left		0.00	0	A	0.03	27	C						
Eastbound Through/Right		0.34	31	C	0.33	29	C						
Westbound Left		0.08	31	C	0.25	30	C						
Westbound Through/Right		0.28	32	C	0.26	30	C						
Northbound Left		0.22	6	A	0.12	8	A						
Northbound Through/Right		0.29	6	A	0.29	8	A						
Southbound Left		0.04	3	A	0.01	4	A						
Southbound Through/Right		0.37	4	A	0.35	5	A						

Intersection Name / Movement	Intersection Type	Phase 2A (2031) Future Total						Phase 2A (2031) Future Total with Sensitivity Adjustment					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
Movement		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Tremaine Road at Burnhamthorpe Road	**Signalized**	**0.53**	**13**	**B**	**0.74**	**19**	**B**						
Eastbound Left		0.00	0	A	0.02	14	B						
Eastbound Through/Right		0.29	28	C	0.10	14	B						
Westbound Left		0.47	23	C	0.89	35	D						
Westbound Through/Right		0.05	20	B	0.09	3	A						
Northbound Left		0.24	9	A	0.08	11	B						
Northbound Through/Right		0.54	17	B	0.53	19	B						
Southbound Left		0.39	9	A	0.17	11	B						
Southbound Through/Right		0.37	5	A	0.61	14	B						
Bronte Road at Avenue One	**Signalized**	**0.73**	**17**	**B**	**0.74**	**16**	**B**	**0.68**	**19**	**B**	**0.65**	**16**	**B**
Eastbound Left		0.31	65	E	0.74	68	E	0.31	65	E	0.73	68	E
Eastbound Right		0.03	62	E	0.92	83	F	0.03	62	E	0.81	67	E
Northbound Left		0.72	77	E	0.32	71	E	0.72	86	F	0.34	66	E
Northbound Through		0.37	2	A	0.67	5	A	0.24	2	A	0.59	6	A
Southbound Through		0.78	16	B	0.45	11	B	0.70	15	B	0.27	9	A
Southbound Right		0.13	15	B	0.03	7	A	0.13	15	B	0.03	7	A
Avenue Three at Avenue One	**Signalized**	**0.66**	**18**	**B**	**0.56**	**17**	**B**						
Eastbound Through													
Eastbound Right		0.09	48	D	0.55	13	B						
Westbound Left													
Westbound Through													
Northbound Left		0.81	14	B	0.60	35	C						
Northbound Right													
Avenue Two at Burnhamthorpe Road	**Signalized**	**0.35**	**31**	**C**	**0.55**	**19**	**B**						
Eastbound Left		0.12	6	A	0.06	15	B						
Eastbound Through		0.22	7	A	0.26	16	B						
Eastbound Right		0.01	4	A	0.05	28	C						
Westbound Left		0.15	9	A	0.36	15	B						
Westbound Through		0.13	8	A	0.34	12	B						
Westbound Right		0.31	69	E	0.09	28	C						
Northbound Left		0.34	33	C	0.10	19	B						
Northbound Through		0.42	33	C	0.04	18	B						
Northbound Right		0.08	61	E	0.08	31	C						
Southbound Left		0.53	33	C	0.83	27	C						
Southbound Through		0.08	29	C	0.14	12	B						
Southbound Right		0.01	26	C	0.04	7	A						

Intersection Name Movement	Intersection Type	Phase 2A (2031) Future Total						Phase 2A (2031) Future Total with Sensitivity Adjustment					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Avenue Three at Burnhamthorpe Road	**Signalized**	**0.64**	**30**	**C**	**0.79**	**43**	**D**						
Eastbound Left		0.59	17	B	0.14	23	C						
Eastbound Through/Right		0.20	7	A	0.83	37	D						
Westbound Left		0.18	19	B	0.68	55	D						
Westbound Through		0.54	26	C	0.36	27	C						
Westbound Right		0.67	33	C	0.14	31	C						
Northbound Left		0.48	65	E	0.49	58	E						
Northbound Through		0.48	64	E	0.10	51	D						
Northbound Right		0.12	71	E	0.07	90	F						
Southbound Left		0.62	72	E	0.91	68	E						
Southbound Through/Right		0.06	50	D	0.30	36	D						
Avenue Five at Burnhamthorpe Road	**Signalized**	**0.89**	**37**	**D**	**0.95**	**27**	**C**						
Eastbound Left		0.78	57	E	0.24	10	B						
Eastbound Through/Right		0.16	4	A	0.76	14	B						
Westbound Left		0.20	14	B	0.96	114	F						
Westbound Through		0.99	43	D	0.30	11	B						
Westbound Right		0.28	18	B	0.04	10	A						
Northbound Left		0.65	60	E	0.15	38	D						
Northbound Through		0.36	51	D	0.05	36	D						
Northbound Right		0.03	45	D	0.27	38	D						
Southbound Left		0.28	30	C	0.93	94	F						
Southbound Through		0.06	27	C	0.17	51	D						
Southbound Right		0.07	46	D	0.26	68	E						
Avenue Two at Avenue One	**Stop-Controlled**	-	-	-	-	-	-						
Eastbound Through/Right		0.04	0	A	0.01	0	A						
Westbound Through/Left		0.03	6	A	0.11	6	A						
Northbound Left		0.00	9	A	0.02	12	B						
Northbound Right		0.23	10	A	0.06	9	A						
Avenue Five at Avenue One	**Stop-Controlled**	-	-	-	-	-	-						
Eastbound Through/Right		0.00	0	A	0.07	0	A						
Westbound Left		0.09	8	A	0.10	8	A						
Westbound Through													
Northbound Left		0.26	13	B	0.01	11	B						
Northbound Right		0.13	9	A	0.14	9	A						
Avenue Two at Street Four	**Stop-Controlled**	-	-	-	-	-	-						
Westbound Left		0.10	13	B	0.47	18	C						
Westbound Right		0.03	10	A	0.09	9	A						
Northbound Through		0.17	0	A	0.06	0	A						
Northbound Right		0.11	0	A	0.08	0	A						
Southbound Through/Left		0.07	5	A	0.04	2	A						

Note: V/C ratios noted in red indicates that the movement is considered "critical" per the Halton Region Transportation Impact Study Guidelines (January 2015) – V/C of 0.85 or over for through movements and 0.95 or over for exclusive turning movements.

9.4 TENDERING COSTS

Based on the recommendation to provide a continuous connector link through the 407 Employment Lands in Avenue One from a traffic perspective, WSP completed a high-level cost estimate of all roadway improvements associated with the Phase 2 (2031) future total conditions (detailed in Section 9.2 of this report).

WSP will provide a preliminary cost estimate for recommended roadway/intersection improvements, beyond those identified by the Region, at such time there is agreement on the proposed improvements. High-level cost estimates for the recommended improvements are provided below (with a +/- 25% range):

1. Addition of an exclusive westbound right-turn lane at the intersection of Dundas Street West and Bronte Road - $270,400
2. Conversion of the existing single southbound left-turn lane to double left-turn lanes at the intersection of Dundas Street West and Bronte Road - $45,500
3. Channelized southbound right-turn lane at the intersection of Dundas Street West and Tremaine Road with additional receiving lane at the west leg of the intersection - $279,500
4. Conversion of existing two eastbound left-turn lanes to a left turn eastbound lane and shared left/right eastbound lane at the intersection of Bronte Road at the Hwy 407 Eastbound Off-Ramp - $19,500 (assuming no road works)

The above cost estimates do not include property, utility relocation, engineering or traffic signal modifications at the site. Please refer to **Appendix F** for a breakdown for the above listed high-level cost estimates.

10 PROPOSED INTERNAL ROADWAY CROSS SECTIONS

As per the North Oakville Urban Design and Open Space Guidelines (2009), roadway cross sections are based on the intended land use for the study area. The aforementioned guidelines were used to determine Right-of-Way cross-sections for the proposed roadway network within the 407 Employment Lands, as detailed in **Table 10-1** below.

Table 10-1 Proposed Internal Roadway ROW

STREET NAME	RIGHT-OF-WAY WIDTH	CROSS SECTION
Burnhamthorpe Road	26.0 m	Minor Arterial/Transit Corridor
Avenue One (Between Tremaine Road and Avenue Five)	22.0 m	Avenue/Transit Corridor
Avenue One * (Between Avenue Five and Bronte Road)	26.0 m	Minor Arterial/Transit Corridor
Avenue Two	22.0 m	Avenue/Transit Corridor
Avenue Three	22.0 m	Avenue/Transit Corridor
Avenue Five	22.0 m	Avenue/Transit Corridor
Street Four	20.0 m	Local Road

Based on North Oakville Urban Design and Open Space Guidelines, November 23, 2009, Section 8- Employment.

*Avenue One requires a 26.0m ROW between Avenue Five and Bronte Road as the roadway is recommended to have two lanes in the westbound direction (one terminating as an exclusive westbound left-turn lane at its intersection with Avenue Five), in order to accommodate the dual northbound left-turn lane from Bronte Road onto Avenue One.

11 TRANSIT NETWORK

11.1 TOWN’S TRANSIT-FIRST PLANNING APPROACH

Transit is being promoted as an integral part of the transportation and land use plans for the North Oakville Secondary Plan areas. As part of the North Oakville West Secondary Plan (NOWSP) area, the proposed development is subject to the Town’s Transit-First planning approach being promoted for North Oakville.

As a basic premise of the Transit-First planning approach, the transportation network and corridor designs reflect a desire for an increased reliance and priority on transit in the future. The early introduction of transit services and the need for transit to provide a viable travel alternative at all stages of development is a fundamental element of the transportation policies and network in North Oakville.

Transit-First’s emphasis is aimed at capturing transit ridership prior to people in new development areas establishing travel habits that rely solely on the automobile.

Transit-First has the benefit of being environmentally friendly and supporting land use intensification and reduced roadway rights-of-way from the very onset of development, which promotes the fundamental objective of environmental sustainability.

11.2 TRANSIT SERVICE CONCEPT

11.2.1 INTER-REGIONAL TRANSIT CORRIDORS

The transit network and hierarchy of services in the Town’s NOWSP reflect the anticipated intensity and mix of uses in corridors and utilize the continuous and connected grid network of planned roads. At the top of this hierarchy is the GO Rail service, meeting the needs of the inter-regional traveler. Currently focused primarily on the commuter trip to Toronto, increasing levels of service, including reverse flow trips, will make GO Rail an effective choice for a wider range of inter-regional travel, including midday trips, trips to the eastern GTA, as well as Burlington and Hamilton.

GO Transit is continually expanding its inter-regional bus network to serve demands, and expanded services in the Highway 407 and Highway 403 corridors will eventually lead to the development of bus rapid transit (BRT) services with high-frequency connections to the rest of the GTA.

In addition, there is a 407 GO bus service that currently serves a park and ride stop at the Highway 407 interchange with Bronte Road. In the future, the planned Highway 407 Transitway along the south side of the existing Highway 407 will provide high-frequency BRT adjacent to the property. As part of the development of the Highway 407 Transitway, a planned Transitway station is to be located in the southeast quadrant of Highway 407 and Bronte Road, in close proximity of the property. It is anticipated that GO Transit and Oakville Transit routes will serve this terminal.

11.2.2 TOWN SERVICES

Within Oakville, future transit services are designed to be implemented in two layers: corridor services, comprising Primary and Secondary Corridors, and Community Services. These transit services are intended to provide connections to terminals, major destinations, and neighbourhoods. This is intended to make travel by transit convenient and attractive and thus maximize the ability of residents and employees to use transit. Corridor services provide the basic grid of the service, including inter-municipal connections and connections to the inter-regional network of transit services. Primary and secondary corridors are distinguished by the level of service they offer.

Primary Transit Corridors

Primary Transit Corridor services provide high-frequency service connections within Oakville, as well as inter-municipal connections and connections to the inter-regional network of services. Transit service in the Primary Transit Corridors is ultimately expected to operate in the range of 2 to 5 minutes, with initial service frequencies of 3 to 10 minutes. To ensure that services in these Primary Corridors operate with minimum delay, additional infrastructure will be used to provide transit priority. This will include Reserved Bus Lanes (RBL) and High Occupancy Vehicle (HOV) lanes and transit priority measures at intersections, including possible signal priority measures and queue-jump lanes.

Dundas Street within the Town is identified as a Primary Transit Corridor and is identified in the Metrolinx 15-year plan as a potential rapid transit corridor. Dundas Street is envisioned to transform over time from the introduction of HOV lanes to RBLs, ultimately. In accordance with the Oakville Transit's current Service Design Standards, minimum peak service frequency is anticipated to be in the range of 10 to 20 minutes.

Secondary Transit Corridors

Secondary Transit Corridors are similar to the Primary Transit Corridors in that they provide a high level of service, operate on the grid network of streets and provide cross-boundary connections. Ultimately, Secondary Corridors are expected to have service levels in the 10 to 15-minute range.

In the vicinity of the proposed development, Bronte Road and Burnhamthorpe Road, east of Bronte Road, are identified as Secondary Transit Corridors. In accordance with the Oakville Transit's current Service Design Standards, minimum peak service frequency is anticipated to be in the range of 20 to 40 minutes.

In addition to planned service levels, the Town's standard designs for transit streets - Arterials, Avenues and Connectors - have been developed specifically to accommodate the function and frequency of the transit service that is planned. Therefore, planned roadway facilities in these corridors appropriately reflect the anticipated transit types and service levels in the corridors.

Community Services

Community, or local, services are planned to operate on the interconnected and continuous grid network of planned roads. Local services provide the highest degree of local access. Routes are expected to operate at levels of service between 15 and 30 minutes. These routes are intended to provide direct access to lower demand areas, and are expected to operate on the network of arterial, avenue and connector roads. Riders will use these routes to access local destinations and as connections to the corridor routes for longer distance trips.

Within the subject property, Burnhamthorpe Road and Avenue One, between Bronte Road and Tremaine Road, and Avenue Two, Avenue Three and Avenue Five, between Dundas Street and Avenue One, are intended to accommodate Community Services in accordance with the NOWSP. In accordance with the Oakville Transit's current Service Design Standards, minimum peak service frequency is anticipated to be in the range of 20 to 60 minutes. The proposed transit services serving the subject property are shown in **Figure 11-1**.

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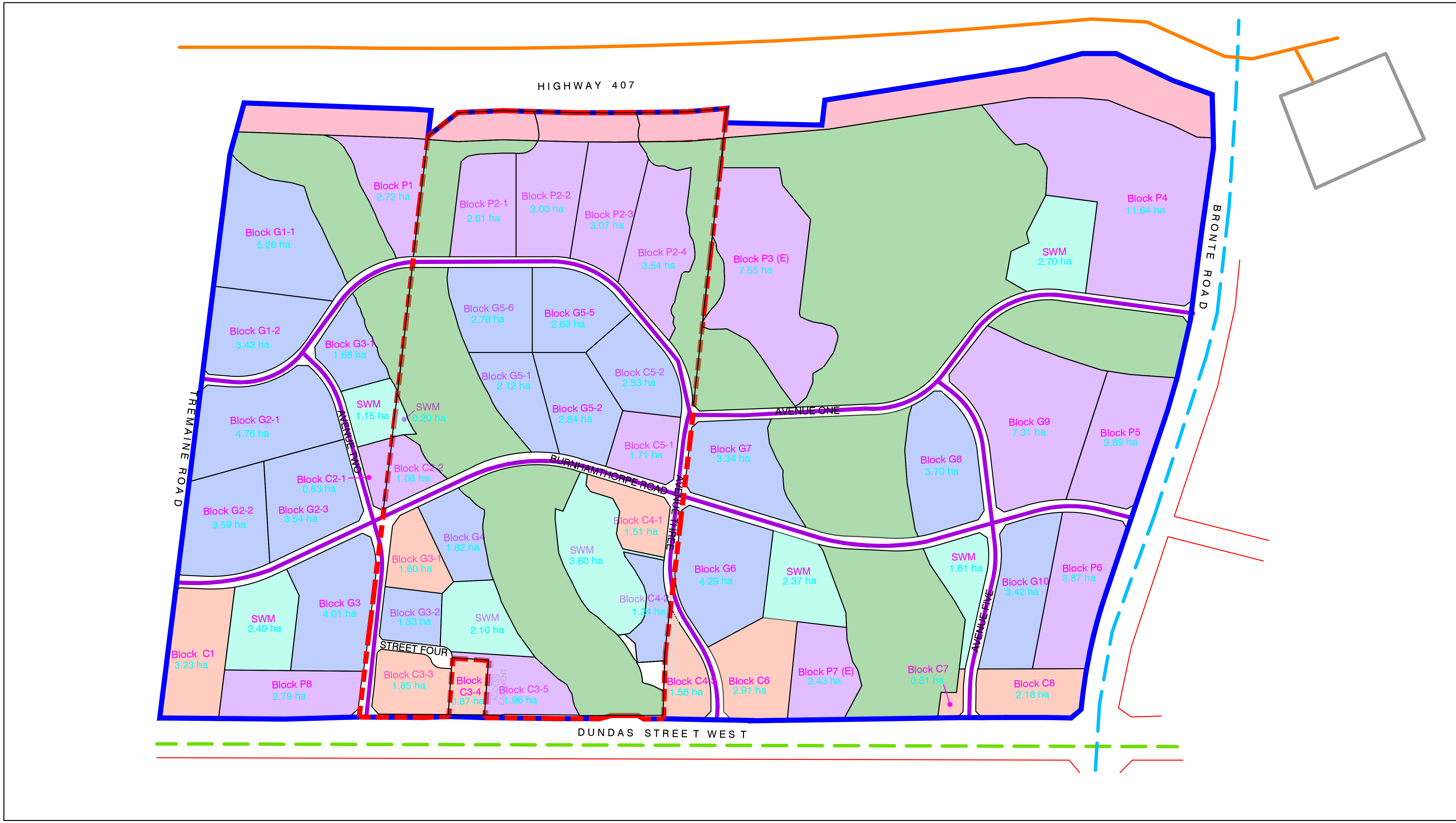

Source: Bentall-Concept-180717-INTERNAL.dwg, February 08, 2019

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- Community Service
- Primary Transit Service Corridor
- Secondary Transit Service Corridor
- Inter-Regional Transit Service Corridor
- Potential Highway 407 Transit Terminal
- 407 West Area Employment Lands
- Subject Property

Figure 11-1
Transit Corridors
Lazy Pat Farms Property Transportation Study

11.3 TRANSIT INFRASTRUCTURE REQUIREMENTS

The proposed avenue roadways within the subject property are to be designed in accordance with the Town's Standard right-of-way for an Avenue/Transit Corridor (22.0 m ROW) - Employment Area, as detailed in Section 10.0. The Town standard is designed to accommodate transit service, and comprises a 3.75m travel lane and a 2.5m curb-side parking lane in each direction, for a total pavement width of 12.5m.

It is anticipated that on-street parking will be prohibited in proximity of intersections to accommodate transit stops.

Intersection curb radii are to be designed to accommodate transit vehicles, as well as heavy trucks, while recognizing objectives related to increased walking and cycling and safety. Consistent with the Oakville Transit Service Guidelines, no additional transit infrastructure improvements or enhancements (beyond the planned Dundas Street HOV/BRT) are deemed to be necessary in the Study Area.

The road network in the 407 West Employment Lands area is consistent with the road network planned for the NOWSP area, and reflects the principles of continuity and connectivity of roads, which is a key element in implementing efficient and effective transit services in the NOWSP area.

As a general guideline, roadway infrastructure requirements for the hierarchy of transit services in and adjacent to the subject property are considered for implementation, as outlined in **Table 11-1**.

Table 11-1 – Typical Service and Technology Levels

TRANSIT SERVICE TYPE	COMBINED HEADWAY*	ROAD INFRASTRUCTURE REQUIREMENT
Community Service	15 to 30 minutes	Not typically
Secondary Transit Corridor	10 to 15 minutes	Transit priorities at congested areas
Primary Transit Corridor	3 to 10 minutes 2 to 5 minutes	HOV lanes Reserved Bus Lanes
Inter-regional Transit Corridor	less than 3 minutes	Separate ROW

** Combined headway is defined as the average time between all scheduled bus services in the corridor.*

At service levels consistent with the current Oakville Transit Service Design Standards, transit infrastructure improvements or enhancements are not warranted for the roadways in or adjacent to the subject property. As previously identified, Dundas Street is envisioned to transform over time from the introduction of HOV lanes to Reserved Bus Lanes in its ultimate configuration.

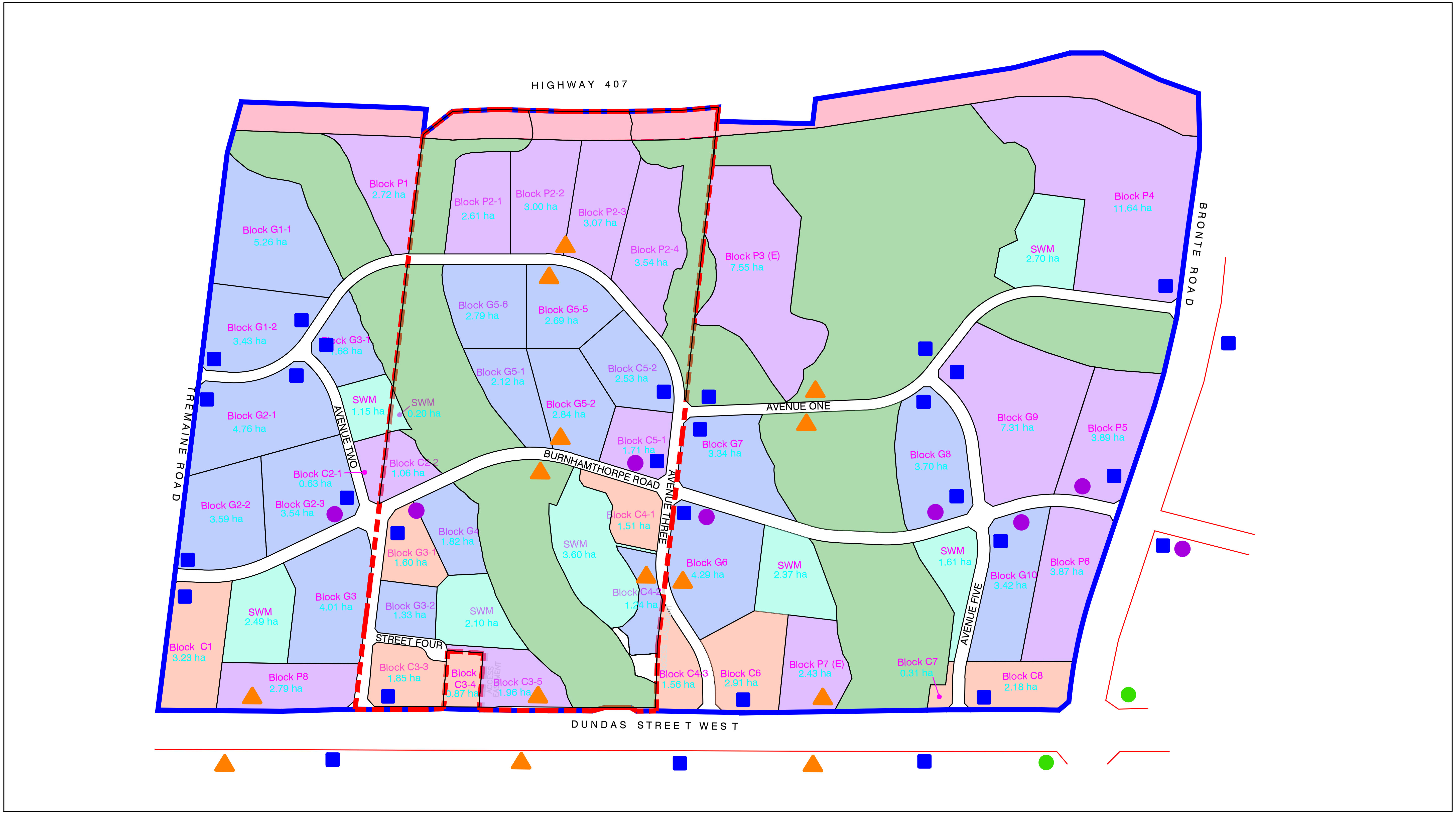
11.4 BUS STOPS AND PASSENGER AMENITIES

Passenger amenities are to be based upon the needs and volumes of passengers at each stop type and location in accordance with the approved Oakville Transit Service Design Standards and direction provided by the Town's North Oakville Secondary Plan, Transit Plan, August 2009.

Passenger amenities are to be placed with consideration to the pedestrian circulation and an unobstructed landing pad to ensure that ramps can be deployed for accessibility at stops.

In accordance with the North Oakville Secondary Plan Transit Plan guidelines, bus stops are to be located so that all employees are generally within 400 metres walking distance of a bus stop. To achieve this goal, bus stops are to have a maximum spacing of approximately 250 metres along a transit route.

Figure 11-2 shows the proposed location of bus stops, by type within the subject property and adjacent lands in the NOWSP area. The location of bus stops is generally consistent with the objective of achieving a maximum spacing of 250m along transit routes. The bus stop types shown in have been established based on the Town's bus stop types and warrants for bus stop amenities, as presented in the North Oakville Secondary Plan Transit Plan.



Source: Bentall-Concept-180717-INTERNAL.dwg, February 08, 2019

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Stop A Far-Side
Stop A Near-Side
Stop D Mid-Block
Transit Node

407 West Area Employment Lands
Subject Property

Figure 11-2
Transit Stop Locations
Lazy Pat Farms Property Transportation Study

Table 11-2 presents the warrants for the proposed bus stop locations within the subject property and adjacent lands in the NOWSP area.

Where appropriate, consideration has been given to locating bus stops on the near side of intersections to minimize interference to roadway operations when traffic is heavy on the far side of the intersection. With near-side bus stop locations, buses can service passengers while stopped at a red light and drivers will have an opportunity to look for on-coming traffic, including other buses that may have passengers loading and unloading. Relative to near-side stop locations, far-side stop locations may increase the potential for rear-end accidents, since drivers often do not anticipate buses stopping after having just proceeded through the intersection. Where there is potential for high volumes of right-turn traffic at an intersection and/or for multi-lane roads where there is sufficient opportunity for vehicles to pass a stopped bus without substantial impedance, a far-side stop location may be preferred due to the improved driver sightlines that this typically creates.

The Street Four roadway is not proposed to have transit facilities implemented along the route. Additionally, no transit stops are planned at the intersection of Street Four at Avenue Two as the intersection is located between transit stops to the north and south along Avenue Two, meeting the 400m spacing requirement between the proposed employment lands and transit facilities, previously mentioned.

Table 11-2 - Warrants for Bus Stop Locations and Passenger Amenities

	Boarding/Transfer	Mobility Needs	Activity	Exposure	Wait Time	Request	Total	Stop Type	Intersection Location
Dundas Street									
intersection with Bronte Rd	10	0	0	3	0	0	13	**Transit Node**	Near-side
intersection with Avenue	10	0	0	3	0	0	13	**Stop A**	Near-side
mid-block	0	0	0	3	0	0	3	**Stop D**	Mid-block
Bronte Road									
intersection with Dundas St	10	0	0	3	2	0	15	**Transit Node**	Far-side
intersection with Burnhamthorpe Rd	10	0	0	3	2	0	15	**Stop A**	Near-side
intersection with Avenue	10	0	0	3	2	0	15	**Stop A**	Near-side
mid-block	0	0	0	3	2	0	5	**Stop D**	Mid-block
Burnhamthorpe Road									
intersection with Bronte Rd	10	0	0	3	2	0	15	**Stop A**	Far-side
intersection with Tremaine Rd	10	0	0	3	2	0	15	**Stop A**	Near-side
intersection with Avenue	10	0	0	3	2	0	15	**Stop A**	Far-side
mid-block	0	0	0	3	2	0	5	**Stop D**	Mid-block
Tremaine Road									
intersection with Dundas St	10	0	0	3	2	0	15	**Stop A**	Far-side
intersection with Burnhamthorpe Rd	10	0	0	3	2	0	15	**Stop A**	Near-side
intersection with Avenue	10	0	0	3	2	0	15	**Stop A**	Near-side
mid-block	0	0	0	3	2	0	5	**Stop D**	Mid-block
Avenues									
intersection with Dundas St	10	0	0	0	2	0	12	**Stop A**	Far-side
intersection with Bronte Rd	10	0	0	0	2	0	12	**Stop A**	Far-side
intersection with Tremaine Rd	10	0	0	0	2	0	12	**Stop A**	Near-side
intersection with Burnhamthorpe Rd	10	0	0	0	2	0	12	**Stop A**	Near-side
intersection with Avenue	10	0	0	0	2	0	12	**Stop A**	Near-side
mid-block	0	0	0	0	2	0	2	**Stop D**	Mid-block

In addition to these important considerations, the proposed locations also take into account the anticipated primary flow of passenger transfers at the proposed locations and the desire to locate stops in the same quadrant of the intersection to reduce walking distances for passengers that are transferring between routes.

It is noted that the different treatment between Burnhamthorpe Road and Avenue One is based on different expectations with respect to potential function and character of the roads, traffic volumes, and turning movements. As a continuous roadway connection across North Oakville, Burnhamthorpe Road is expected to serve a regional function, in addition to supporting area development. This, in part, is expected to result in higher traffic volumes and intersection turning movements along Burnhamthorpe Road relative to Avenue One. Based on this expectation, it is considered desirable to plan for far-side bus stop locations, so potential high volumes of right-turn movements will not be obstructed by stopped transit vehicles.

Sufficient right-of-way is to be provided at all stop locations to accommodate the required bus stop amenities.

11.5 TRANSIT MARKET POTENTIAL

Figure 11-2 above illustrates the transit service coverage within the subject property and adjacent lands in the NOWSP area, based on the anticipated transit corridors and proposed bus stop locations. It is evident from the figure that the vast majority of future employees within the subject property and adjacent lands in the NOWSP area will be within a convenient and comfortable walk of transit service.

Based on trip generation completed for the subject lands and surrounding remainder of the 407 Employment Lands, WSP derived projected transit trips for the study area. The transit trips were derived using the projected mode split for the 2031 horizon year as per the Town of Oakville Switching Gears Transportation Master Plan (February 2013), projecting a transit mode split of 20%, and using the existing auto-driver mode split of 64% per the 2016 TTS Data.

Using the above noted methodology, approximately 2,000 transit trips are projected to be generated during both the AM and PM peak hours from the 407 Employment Lands and subject property. Therefore, implementation of transit within the NOWSP at the level illustrated in **Figure 11-2** is projected to be beneficial in accommodating transit trips and encourage commuters that would otherwise be expected to use private automobiles for travel.

11.6 IMPLEMENTATION

It is anticipated that local transit service can be provided to the subject property either as extensions of existing routes or through the creation of new routes, in accordance with existing Oakville Transit Service Design Standards. The determination of future transit routing and service levels would be at the discretion of Oakville Transit.

It is anticipated that services will be phased in over time, so that initial services are convenient and timely, but cost-effective to deliver. As previously noted, the subject property is served by Oakville Transit Route 33. This route currently loops around Colonel William Parkway and Bronte Road at the west tip of the route. It is possible that this existing transit route could be modified and extended to the subject property (at least initially) as a way to introduce service at levels similar to the existing Route 33 service frequencies. These initial transit services could then be intensified as demand grows to establish regularly scheduled local routes consistent with the NOWSP policies and Oakville Transit Service Design Standards.

Actual service levels and the number of buses required will be dependent on available resources, service standards and policies at the time of implementation, and matching service levels with demand. Any details with respect to availability of transit capacity, passenger counts, delays on transit operations, the need for relocation of existing facilities, and so forth, would be established later in the planning process. It is anticipated that transit implementation will be reviewed in more detail and the appropriate services will be implemented by Oakville Transit, based on the Oakville Transit Service Design Guidelines, when appropriate.

12 ACTIVE TRANSPORTATION NETWORK

The Town of Oakville Active Transportation Master Plan (ATMP), November 2017, recommends a convenient and continuous pedestrian and cycling network that minimizes risk to users and is integrated with other facilities (Regional, bordering municipalities, transit, end of trip, etc.). The ATMP is in line with the North Oakville Trails Plan, May 2013, with a cycling/trail system designed specifically for the communities north of Dundas Street, including the NOWSP area.

The North Oakville Trails Plan has five objectives:

Provide Connections between Neighbourhoods and Different Land Uses, and Provide Links to Schools and Parks: The Plan will assist in making connections between land uses, such as residential and employment areas. The network should include limited connections through the Natural Heritage System. It should also create connections to the developed lands south of Dundas Street.

Support Connections to Major Transit Stations and Transportation Hubs: The Plan should support north Oakville's transit-first approach. It will assist in promoting connections to transit stations and transportation hubs, and reduce the demand for parking requirements. These areas will provide adequate provision of bicycle storage facilities to encourage the use of the trails plan network.

Suitable for a Variety of Users: The Plan will provide a level of comfort, safety, and interest to encourage walking and cycling from a variety of users.

Encourage Alternative Modes of Transportation: The Plan will decrease the dependence on the private automobile and encourage cycling and walking as a mode of utilitarian transportation. The Plan will provide additional opportunities to active transportation users to travel throughout north Oakville.

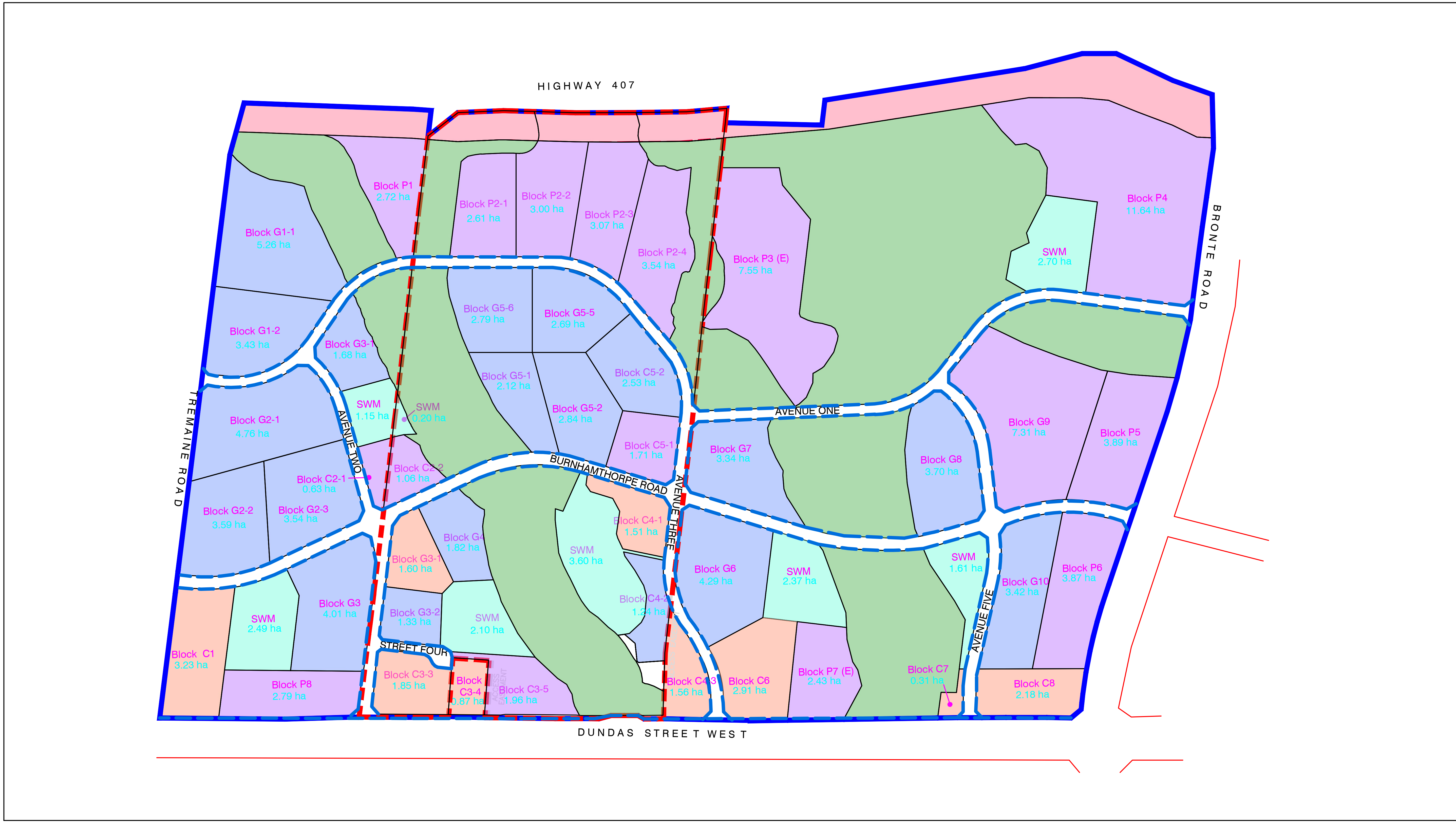
Limit the Impacts to the Natural Heritage System: The Plan will provide a cohesive system of links and connections that will discourage the creation of unauthorized trails within the Natural Heritage System.

With these objectives in mind and based on the proposed network of pedestrian and cycling facilities in the ATMP and North Oakville Trails Plan, a Pedestrian Circulation Plan and Cycling and Trails Network is proposed for the subject property and adjacent lands in the NOWSP area.

12.1 PEDESTRIAN CIRCULATION PLAN

The Pedestrian Circulation Plan is shown in **Figure 12-1**. The proposed plan provides an extensive, fully connected network of sidewalks throughout the planned employment area, comprising 1.5m-wide sidewalks on both sides of all Avenues within the subject property and adjacent lands in the NOWSP area. The sidewalks are proposed to be provided and located in accordance with the Town's typical cross-section for each roadway, as detailed in Section 10.0.

It is anticipated that marked pedestrian crossings will be provided at signalized intersections within the subject property and adjacent lands in the NOWSP area. Where applicable, pedestrian crossings are to be designed and implemented in accordance with Town or Region engineering design practices.



Source: Bentall-Concept-180717-INTERNAL.dwg, February 08, 2019

NTS

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Pedestrian Circulation Path

407 West Area Employment Lands

Subject Property

Figure 12-1
Pedestrian Circulation Plan
Lazy Pat Farms Property Transportation Study

12.2 CYCLING FACILITIES

The Cycling and Trails Network is shown in **Figure 12-2**. Bicycles are designated as a vehicle under the Highway Traffic Act (HTA) and as such are required to obey all of the same rules and regulations as automobiles when being operated on a public roadway. The cycling routes proposed as part of the Town's North Oakville Trail Plans network comprise several facility types, each with its own set of minimum design parameters. These are generally consistent with the Ministry of Transportation (MTO) and the Transportation Association of Canada (TAC) guidelines for the design of on-road facilities and standards for signing the on-road cycling system.

The cycling component of the Town's North Oakville Trails Plan network for the 407 West Employment Lands consists of multi-use trails and signed bike routes. For roadways labelled as Regional Bicycle Facility in the North Oakville Trails Plan, the type of bicycle facility was determined per the Halton Region Active Transportation Master Plan as follows:

- Bike lanes on Bronte Road, along with multi-use trail located within the boulevard;
- Bike lanes on Dundas Street, along with multi-use trail located within the boulevard; and
- Bike lanes on Tremaine Road, along with multi-use trail located within the boulevard.

Within the subject property and adjacent lands within the NOWSP area, all bicycle facilities are proposed to be on-road signed bicycle routes.

The purpose of designating a signed only bicycle route is to promote a road for cycling because it is deemed to be well suited for cycling; it may provide an important connection between destinations, or it is a preferred route identified by cyclists. In the case of signed on-road bicycle routes, the travel lane is shared by motorists and cyclists. These are roads where traffic volumes and vehicle speeds are relatively low. Under these conditions, cyclists can share the road with motor vehicles and there is no need to create a designated space for cyclists. Bicycle route marker signs located at intersections and at regular intervals aid users with wayfinding.

The right-of-way planned for the proposed Burnhamthorpe Road extension between Bronte Road and Tremaine Road (as detailed in Section 10.0) is based on the North Oakville Urban Design and Open Space Guidelines (2009) and accommodates bike lanes. However, the ATMP (2017) proposes on-road signed bicycle routes along the aforementioned section of Burnhamthorpe Road. As such, WSP assumed that on-road signed bicycle routes are proposed along all internal study roadways within the 407 Employment Lands. The proposed bicycle facilities provide connections to the existing and planned bicycle facilities located along the boundary road network.

It is anticipated that bicycle facilities crossing the Regional boundary roads will be provided at signalized intersections, and where applicable, these crossings are to be designed and implemented in accordance with recommendations of the Town's Active Transportation Master Plan, 2017, and North Oakville Trails Plan, 2013. The type of on-road bicycle facility proposed within the study area in the North Oakville Trails Plan, May 2013 is described as Signed Bicycle Routes.

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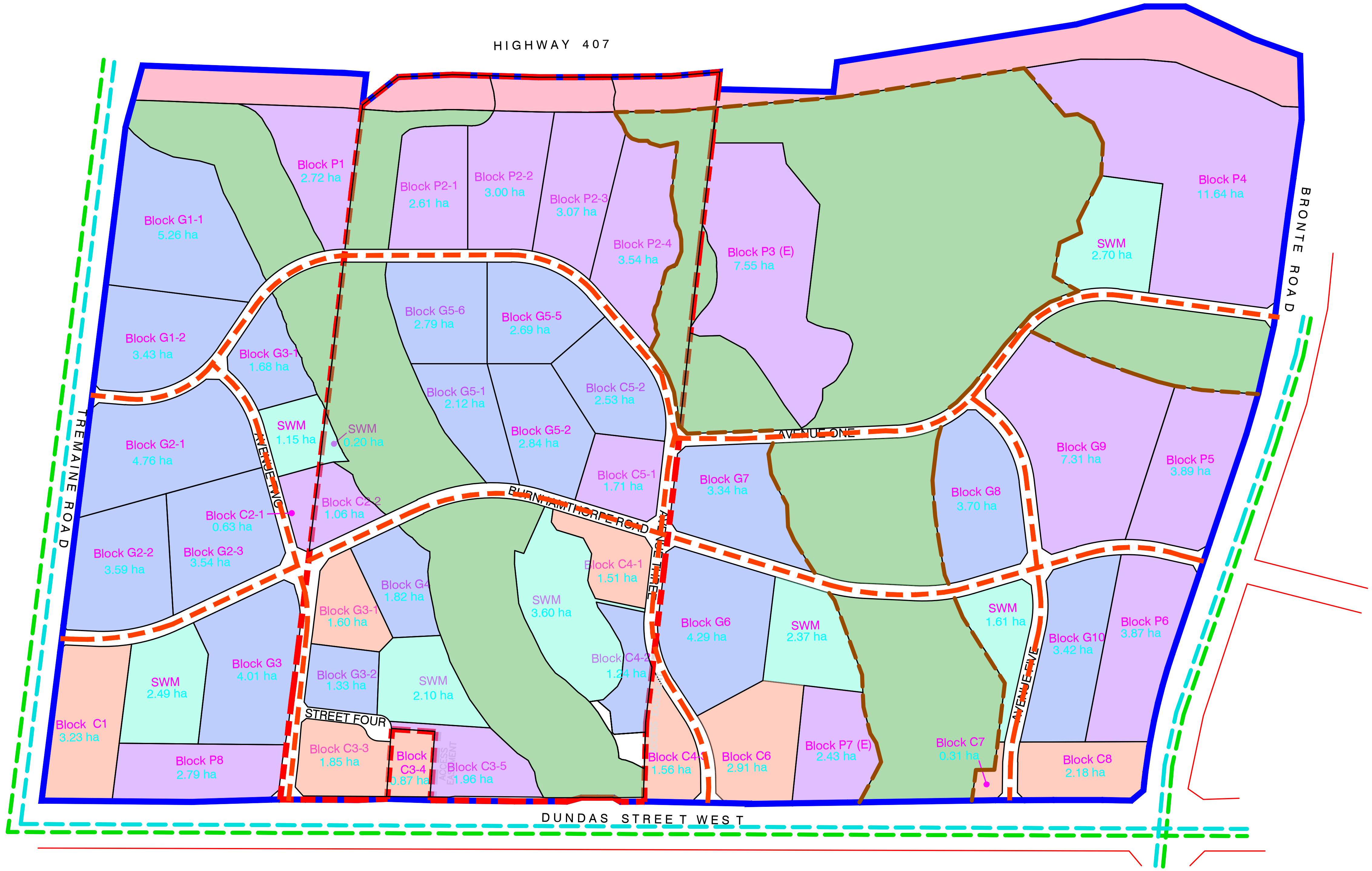

Source: Bentall-Concept-180717-INTERNAL.dwg, February 08, 2019

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Bike Lane

Multi-Use-Path (In Boulevard)

Signed Bike Route (On-Road)

Off-Road Trail

407 West Area Employment Lands

Subject Property

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Figure 12-2
Active Transportation Master Plan Cycling and Trail Network
Lazy Pat Farms Property Transportation Study

09M-00013-01_Bentall-Concept_20190307_recover_recover.dwg_AT Master PLan

Modified: 3/7/2019 4:39 PM By: nawfal.kammah Plot Date: 2019/03/07

12.3 OFF-ROAD TRAILS

The development proposal outlines the proposed natural heritage and open space system based on the Town's North Oakville Trails Plan and NOWSP Transportation Plan. The central open space system and adjacent stormwater management will accommodate pedestrian trails and passive recreational uses, integrated with the adjacent employment development. As shown in **Figure 12-2**, off-road trails are proposed around the Zenon Woodlot/Core area, located east to the subject property, as detailed in the ATMP.

Off-Road Trails are soft surface pathways used primarily by pedestrians, although cycling is not restricted. Off-Road trails will be typically 2.1 – 2.4 metres wide, with a compacted limestone screenings surface, and asphalt paving on slopes greater than 5 percent. Signage should be provided for recreational cyclists and pedestrians. Major trails within the NHS will not receive regular winter maintenance.

13 SUMMARY AND CONCLUSIONS

This Transportation Impact Study addresses the impacts of the proposed phased development (located in the 407 West Employment Area) on the boundary roadway intersections in the vicinity of the property. The subject property is located mid-block between Bronte Road and Tremaine Road, and bounded by Dundas Street West to the south.

The proposed development is expected to generate the following number of vehicle trips under the 2021 and 2031 horizon years:

- 2021 Horizon Year
  - AM Peak Hour – 850 inbound trips and 193 outbound trips
  - PM Peak Hour – 441 inbound trips and 927 outbound trips

- 2031 Horizon Year
  - AM Peak Hour – 1697 inbound trips and 320 outbound trips
  - PM Peak Hour – 623 inbound trips and 1625 outbound trips

Under the 2021 horizon year, the majority of the study intersections are projected to operate below capacity while some are projected to operate above capacity. However, these operations are temporary as the Dundas Street West widening (planned to be implemented in 2022) is projected improve traffic operations, as detailed in Section 8.0 of this study.

Under the 2031 horizon year, with the implementation of the Tremaine Road, Dundas Street West, Bronte Road and William Halton Parkway widenings, the majority of the study intersections are projected to operate below capacity. Select intersections and turning movements are projected to operate above capacity. However, WSP is of the opinion that the projected traffic operations under the 2031 horizon years would operate with lower delay and better LOS as commuters travelling through the study area would change their travel patterns over time to avoid areas of heavy congestion. The study methodology requested by the reviewing agencies is typical for shorter horizon years and when there are no significant changes in the transportation system; however, the 2031 horizon year is 13 years into the future compared to 2018 existing conditions. Therefore, changes in travel patterns accounting for the planned roadway network connections developed as part of the North Oakville Secondary Plan, as well as any decrease in traffic volumes caused to the planned increase in transit facilities along Dundas Street West and Highway 407, are not captured by the study methodology. As such, WSP completed a sensitivity analysis to determine the traffic volume reduction within the study area that would achieve optimized traffic operations for the study intersections, as detailed within Section 9.0 of this report. Results show that, per the sensitivity analysis, study intersections are projected to operate at acceptable levels of service under the Phase 2 (2031) future total conditions. For the scenario where Avenue One would not have creek crossings (Phase 2A), the study intersection of Bronte Road at William Halton Parkway/Burnhamthorpe Road is projected to operate over capacity due to the changes in traffic patterns created by removing the crossings.

As part of the traffic operations assessment, road improvements have been identified as being needed to accommodate the forecasted growth in background traffic unrelated to the property. These include:

- Addition of a westbound exclusive right-turn lane and conversion of the existing single southbound left-turn lane to double left-turn lanes at the Dundas Street West and Bronte Road intersection for the 2021 horizon year.
- Channelization of the southbound right-turn lane configuration, with the southbound right-turn traffic operating under free flow operations at the Dundas Street West and Tremaine Road intersection for the 2021 horizon year.
- Conversion of the existing single eastbound left-turn lane to double left-turn lanes at the Dundas Street West and Tremaine Road intersection for the 2021 horizon year.

- Conversion of the existing two eastbound left-turn lanes to a left-turn eastbound lane and a shared left/right-turn eastbound lane at the Bronte Road and Highway 407 Eastbound Off-Ramp intersection for the 2031 horizon.

In addition to the above-listed recommendations, additional roadway improvements have been recommended for the scenario where Avenue One not be continuous (Phase 2A):

- Conversion of the single southbound left-turn lane to dual left-turn lanes at the intersection of Avenue Three at Burnhamthorpe Road.
- Conversion of the exclusive eastbound right-turn lane to a channelized turning lane operating under free flow conditions at the intersection of Bronte Road at Burnhamthorpe Road.

A network of transit, cycling and pedestrian facilities is planned for the subject property, with connections to future planned facilities within the rest of the NOWSP area and the Town. Facilities are intended to be located and designed in accordance with Town guidelines and standards.

Based on the study findings, it is concluded that the boundary road network could accommodate the additional traffic generated by the proposed development in the 2031 horizon year should changes in traffic patterns associated with the implementation of the North Oakville roadway network, and the reduction in traffic volumes associated with increased transit facilities along the Dundas Street West, Highway 407 and the 407 Employment Lands, yield a reduction in traffic volumes equivalent to the sensitivity analysis completed within this study for the study area intersections.

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APPENDIX

A

TMC AND SURVEYS

APPENDIX

Intersection: Dundas Street at Tremaine Road

Surveyed Counts - 20181211

	AM				Tremaine Road						
					Sbd		Nbd				
					760		512				
					R	T	L				
					456		304				
Dundas Street	Wbd	1243	L	422		38		90	R	877	Wbd
			T	2153				787	T		
	Ebd	2575	R						L	2457	Ebd

Total Volume: 4212

Surveyed Counts - 20181211

	PM				Tremaine Road						
					Sbd		Nbd				
					504		398				
					R	T	L				
					430		74				
Dundas Street	Wbd	2400	L	222		38		176	R	2146	Wbd
			T	1035				1970	T		
	Ebd	1257	R						L	1109	Ebd

Total Volume: 3907

Intersection: Dundas Street at Colonel William Parkway

Surveyed Counts - 20181211

	AM				Zenon Drive						
					Sbd		Nbd				
					8		164				
					R	T	L				
					2	0	6				
Dundas Street	Wbd	908	L	73		42		90	R	984	Wbd
			T	2036				837	T		
	Ebd	2368	R	259				57	L	2206	Ebd
					69	1	164				
					L	T	R				
					316		234				
					Sbd		Nbd				
					Colonel William Parkway						

Total Volume: 3594

Surveyed Counts - 20181211

	PM				Zenon Drive						
					Sbd		Nbd				
					115		6				
					R	T	L				
					56	0	59				
Dundas Street	Wbd	2106	L	0		42		3	R	1915	Wbd
			T	998				1812	T		
	Ebd	1080	R	82				100	L	1117	Ebd
					238	3	60				
					L	T	R				
					182		301				
					Sbd		Nbd				
					Colonel William Parkway						

Total Volume: 3411

Region Counts - 20170527

	AM				Tremaine Road						
					Sbd		Nbd				
					513		343				
					R	T	L				
					305		208				
Dundas Street	Wbd	1122	L	250		38		93	R	910	Wbd
			T	2584				817	T		
	Ebd	2834	R						L	2792	Ebd

Total Volume: 4257

Region Counts - 20170527

	PM				Tremaine Road						
					Sbd		Nbd				
					462		420				
					R	T	L				
					383		79				
Dundas Street	Wbd	2360	L	256		38		164	R	2141	Wbd
			T	1188				1977	T		
	Ebd	1444	R						L	1267	Ebd

Total Volume: 4047

Region Counts - 20170601

	AM				Zenon Drive						
					Sbd		Nbd				
					9		135				
					R	T	L				
					2	1	6				
Dundas Street	Wbd	787	L	66		42		67	R	850	Wbd
			T	1985				715	T		
	Ebd	2235	R	184				68	L	2173	Ebd
					70	2	182				
					L	T	R				
					253		254				
					Sbd		Nbd				
					Colonel William Parkway						

Total Volume: 3348

Region Counts - 20170601

	PM				Zenon Drive						
					Sbd		Nbd				
					165		10				
					R	T	L				
					97	4	64				
Dundas Street	Wbd	2203	L	0		42		8	R	1983	Wbd
			T	959				1833	T		
	Ebd	1041	R	82				142	L	1092	Ebd
					273	2	69				
					L	T	R				
					228		344				
					Sbd		Nbd				
					Colonel William Parkway						

Total Volume: 3533

Intersection: Dundas Street at Tremaine Road

Adjusted WSP counts based on Region's comments

	AM				Tremaine Road						
					Sbd		Nbd				
					550		435				
					R	T	L				
					310		240				
Dundas Street	Wbd	1097	L	345		38		90	R	877	Wbd
			T	2215				787	T		
	Ebd	2560	R						L	2455	Ebd

Total Volume: 3987

Adjusted WSP counts based on Region's comments

	PM				Tremaine Road						
					Sbd		Nbd				
					504		398				
					R	T	L				
					430		74				
Dundas Street	Wbd	2400	L	222		38		176	R	2146	Wbd
			T	1035				1970	T		
	Ebd	1257	R						L	1109	Ebd

Total Volume: 3907

Intersection: Dundas Street at Colonel William Parkway

Adjusted WSP counts based on Region's comments

	AM				Zenon Drive						
					Sbd		Nbd				
					8		164				
					R	T	L				
					2	0	6				
Dundas Street	Wbd	908	L	73		42		90	R	984	Wbd
			T	2036				837	T		
	Ebd	2368	R	259				57	L	2206	Ebd
					69	1	164				
					L	T	R				
					316		234				
					Sbd		Nbd				
					Colonel William Parkway						

Total Volume: 3594

Adjusted WSP counts based on Region's comments

	PM				Zenon Drive						
					Sbd		Nbd				
					115		6				
					R	T	L				
					56	0	59				
Dundas Street	Wbd	2106	L	0		42		3	R	1915	Wbd
			T	998				1812	T		
	Ebd	1080	R	82				100	L	1117	Ebd
					238	3	60				
					L	T	R				
					182		301				
					Sbd		Nbd				
					Colonel William Parkway						

Total Volume: 3411

Intersection: Dundas Street at Valleyridge Drive

Surveyed Counts - 20181211

AM

					Sbd		Nbd				
					0		0				
Dundas Street	Wbd	1045								1024	Wbd
			T	1995		44		991	T		
	Ebd	2093	R	98				33	L	2079	Ebd
					54		84				
					L		R				
					131		138				
					Sbd		Nbd				
					Valleyridge Drive						

Total Volume: 3255

Region Counts - 20170602

AM

					Sbd		Nbd				
					0		0				
Dundas Street	Wbd	785								778	Wbd
			T	2505		44		757	T		
	Ebd	2529	R	24				21	L	2570	Ebd
					28		65				
					L		R				
					45		93				
					Sbd		Nbd				
					Valleyridge Drive						

Total Volume: 3400

Intersection: Dundas Street at Valleyridge Drive

Adjusted WSP counts based on Region's comments

AM

					Sbd		Nbd				
					0		0				
Dundas Street	Wbd	1045								1024	Wbd
			T	2275		44		991	T		
	Ebd	2373	R	98				33	L	2359	Ebd
					54		84				
					L		R				
					131		138				
					Sbd		Nbd				
					Valleyridge Drive						

Total Volume: 3535

Surveyed Counts - 20181211

PM

					Sbd		Nbd				
					0		0				
Dundas Street	Wbd	1914								1909	Wbd
			T	1078		44		1865	T		
	Ebd	1114	R	36				44	L	1103	Ebd
					49		25				
					L		R				
					80		74				
					Sbd		Nbd				
					Valleyridge Drive						

Total Volume: 3097

Region Counts - 20170602

PM

					Sbd		Nbd				
					0		0				
Dundas Street	Wbd	1908								1944	Wbd
			T	1152		44		1865	T		
	Ebd	1187	R	35				79	L	1207	Ebd
					43		55				
					L		R				
					114		98				
					Sbd		Nbd				
					Valleyridge Drive						

Total Volume: 3229

Adjusted WSP counts based on Region's comments

PM

					Sbd		Nbd				
					0		0				
Dundas Street	Wbd	1914								1909	Wbd
			T	1078		44		1865	T		
	Ebd	1114	R	36				44	L	1103	Ebd
					49		25				
					L		R				
					80		74				
					Sbd		Nbd				
					Valleyridge Drive						

Total Volume: 3097

Intersection: Dundas Street at Bronte Road

Surveyed Counts - 20181211

AM

					Bronte Road						
					Sbd		Nbd				
					1504		1251				
					R	T	L				
					174	1103	227				
Dundas Street	Wbd	924	L	326				204	R	910	Wbd
			T	1480		46		566	T		
	Ebd	2264	R	458				140	L	1867	Ebd
					184	721	160				
					L	T	R				
					1701		1065				
					Sbd		Nbd				

Total Volume: 5743

Region Counts - 20170623

AM

					Bronte Road						
					Sbd		Nbd				
					1373		1308				
					R	T	L				
					135	1005	233				
Dundas Street	Wbd	1096	L	261				206	R	969	Wbd
			T	1217		46		605	T		
	Ebd	1907	R	429				158	L	1573	Ebd
					356	841	123				
					L	T	R				
					1592		1320				
					Sbd		Nbd				

Total Volume: 5569

Intersection: Dundas Street at Bronte Road

Adjusted WSP counts based on Region's comments

AM

					Bronte Road						
					Sbd		Nbd				
					1504		1251				
					R	T	L				
					174	1103	227				
Dundas Street	Wbd	930	L	326				204	R	910	Wbd
			T	1480		46		566	T		
	Ebd	2264	R	458				140	L	1867	Ebd
					190	721	160				
					L	T	R				
					1701		1071				
					Sbd		Nbd				

Total Volume: 5749

Surveyed Counts - 20181211

PM

					Bronte Road						
					Sbd		Nbd				
					1075		1582				
					R	T	L				
					256	592	227				
Dundas Street	Wbd	1807	L	218				160	R	1506	Wbd
			T	771		46		1191	T		
	Ebd	1167	R	178				155	L	1111	Ebd
					360	1204	113				
					L	T	R				
					925		1677				
					Sbd		Nbd				

Total Volume: 5425

Region Counts - 20170623

PM

					Bronte Road						
					Sbd		Nbd				
					1097		1934				
					R	T	L				
					209	663	225				
Dundas Street	Wbd	1966	L	232				215	R	1496	Wbd
			T	1135		46		1143	T		
	Ebd	1553	R	186				138	L	1505	Ebd
					614	1487	145				
					L	T	R				
					987		2246				
					Sbd		Nbd				

Total Volume: 6392

Adjusted WSP counts based on Region's comments

PM

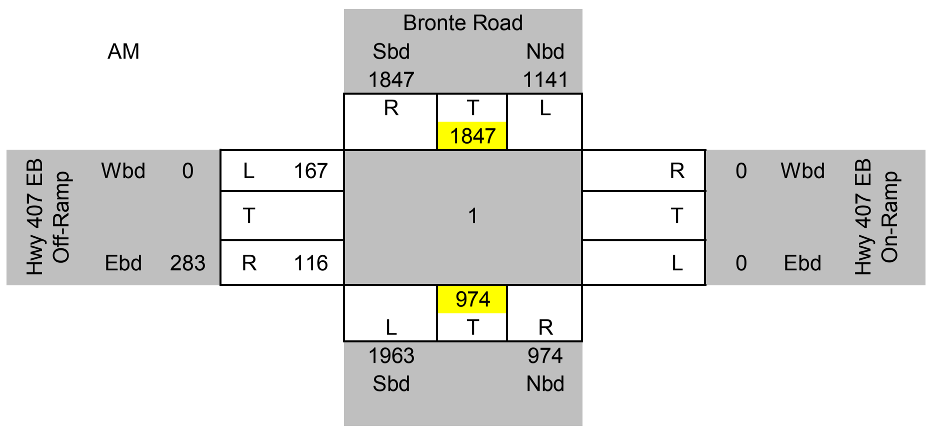
					Bronte Road						
					Sbd		Nbd				
					1075		1582				
					R	T	L				
					256	592	227				
Dundas Street	Wbd	1857	L	218				160	R	1506	Wbd
			T	820		46		1191	T		
	Ebd	1216	R	178				155	L	1160	Ebd
					410	1204	113				
					L	T	R				
					925		1727				
					Sbd		Nbd				

Total Volume: 5524

Intersection: Bronte Road at Highway 407 EB Off-Ramp

Surveyed Counts - 20181211

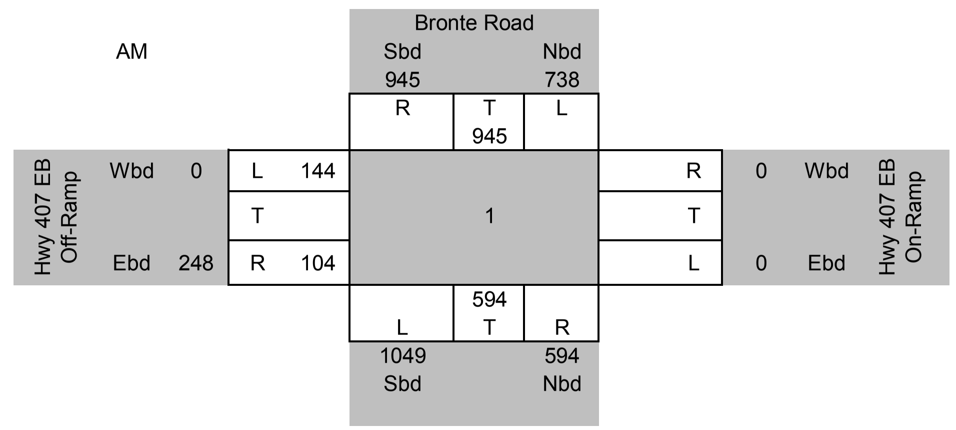
AM



Total Volume: 3104

Region Counts - 20171113

AM

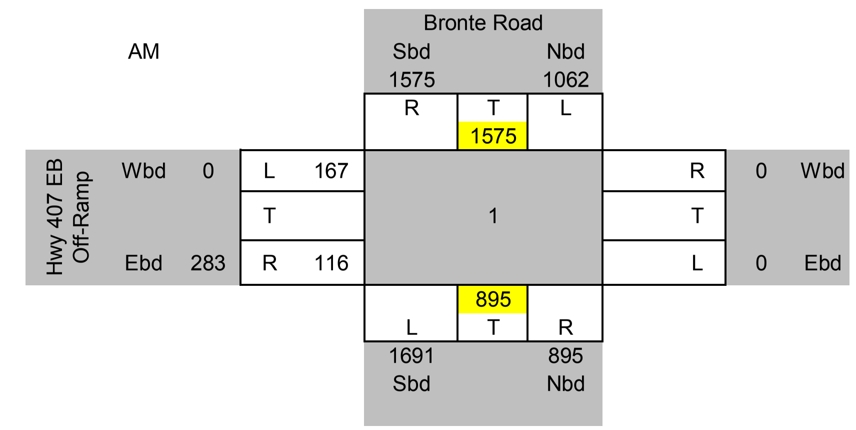


Total Volume: 1787

Intersection: Bronte Road at Highway 407 EB Off-Ramp

Adjusted WSP counts based on Region's comments

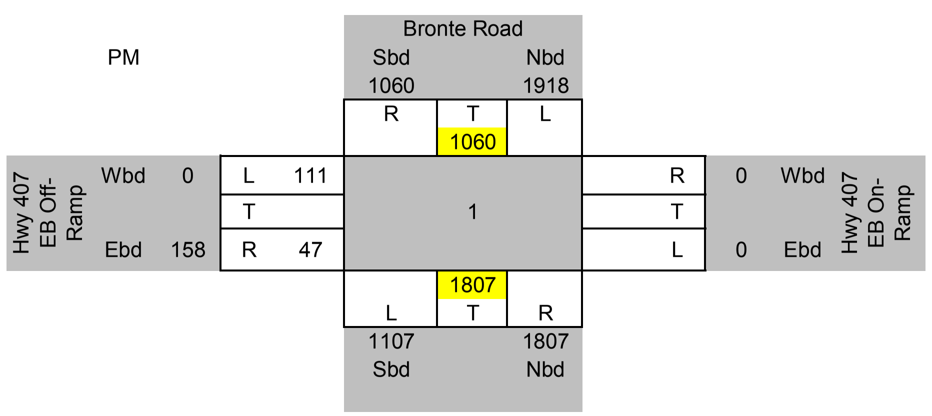
AM



Total Volume: 2753

Surveyed Counts - 20181211

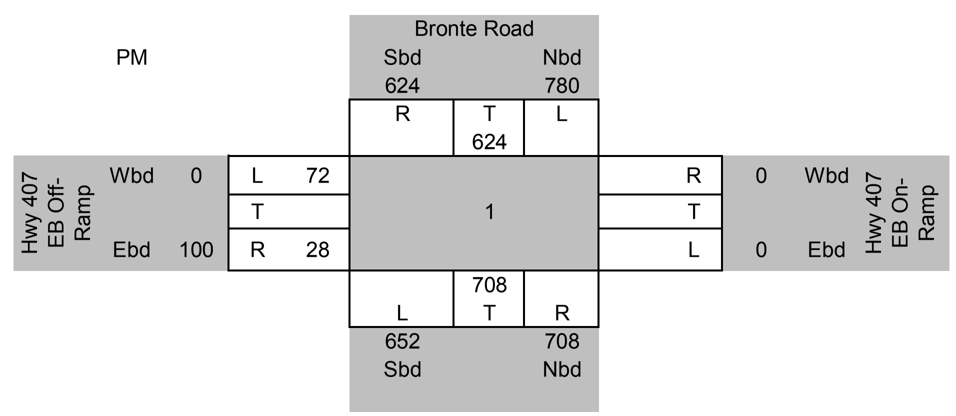
PM



Total Volume: 3025

Region Counts - 20171113

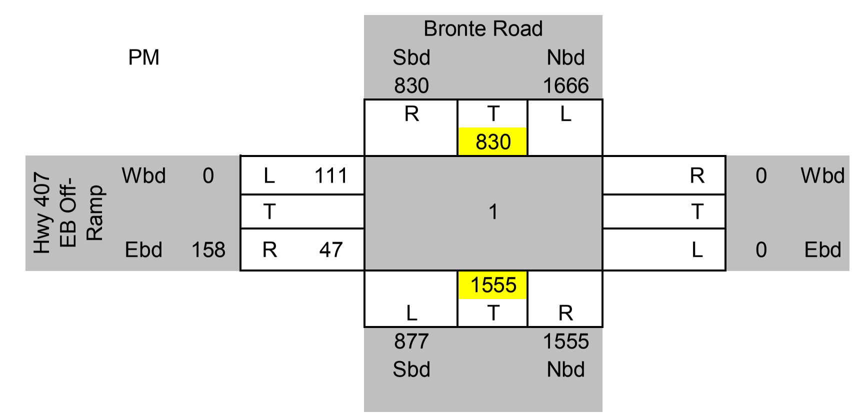
PM



Total Volume: 1432

Adjusted WSP counts based on Region's comments

PM



Total Volume: 2543

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

Municipality: Oakville
Site #: 1816200001
Intersection: Dundas St W & Tremaine Rd
TFR File #: 1
Count date: 11-Dec-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

North Leg Total: 1272
North Entering: 760
North Peds: 0
Peds Cross: ⋈

Heavys	2	1	3
Trucks	0	0	0
Cars	454	303	757
Totals	456	304	

Heavys	8
Trucks	2
Cars	502
Totals	512

East Leg Total: 3334
East Entering: 877
East Peds: 0
Peds Cross: ⧗

Tremaine Rd

Heavys	Trucks	Cars	Totals
88	12	1143	1243

Dundas St W

Cars	Trucks	Heavys	Totals
86	0	4	90
689	12	86	787
775	12	90	

N
W E
S

Heavys	Trucks	Cars	Totals
4	2	416	422
44	16	2093	2153
48	18	2509	

Dundas St W

Cars	Trucks	Heavys	Totals
2396	16	45	2457

Peds Cross: ⧗
West Peds: 1
West Entering: 2575
West Leg Total: 3818

Comments

Accu-Traffic Inc

Afternoon Peak Diagram

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

Municipality: Oakville
Site #: 1816200001
Intersection: Dundas St W & Tremaine Rd
TFR File #: 1
Count date: 11-Dec-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

North Leg Total: 902
North Entering: 504
North Peds: 0
Peds Cross: ⋈

Heavys	12	0	12
Trucks	4	0	4
Cars	414	74	488
Totals	430	74	

Heavys	6
Trucks	0
Cars	392
Totals	398

East Leg Total: 3255
East Entering: 2146
East Peds: 0
Peds Cross: ⧗

Tremaine Rd

Heavys	Trucks	Cars	Totals
59	16	2325	2400

Cars	Trucks	Heavys	Totals
173	0	3	176
1911	12	47	1970
2084	12	50	

Dundas St W

N
W E
S

Heavys	Trucks	Cars	Totals
3	0	219	222
20	9	1006	1035
23	9	1225	

Dundas St W

Cars	Trucks	Heavys	Totals
1080	9	20	1109

Peds Cross: ⧗
West Peds: 0
West Entering: 1257
West Leg Total: 3657

Comments

Accu-Traffic Inc

Morning Peak Diagram

Specified Period		One Hour Peak	
From:	7:00:00	**From:**	7:45:00
To:	9:00:00	**To:**	8:45:00

Municipality: Oakville
Site #: 1816200002
Intersection: Dundas St W & Colonel William Pk
TFR File #: 1
Count date: 11-Dec-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

North Leg Total: 172
North Entering: 8
North Peds: 3
Peds Cross: ⋈

Heavys	0	0	1	1
Trucks	0	0	0	0
Cars	2	0	5	7
Totals	2	0	6	

Heavys	1
Trucks	0
Cars	163
Totals	164

East Leg Total: 3190
East Entering: 984
East Peds: 3
Peds Cross: ⧗

Zenon Dr

Heavys	Trucks	Cars	Totals
83	18	807	908

Dundas St W

Cars	Trucks	Heavys	Totals
90	0	0	90
738	18	81	837
52	0	5	57
880	18	86	

N
W E
S

Heavys	Trucks	Cars	Totals
1	0	72	73
47	20	1969	2036
3	1	255	259
51	21	2296	

Dundas St W

Cars	Trucks	Heavys	Totals
2128	20	58	2206

Colonel William Pkwy

Peds Cross: ⧗
West Peds: 2
West Entering: 2368
West Leg Total: 3276

Cars	307
Trucks	1
Heavys	8
Totals	316

Cars	67	1	154	222
Trucks	0	0	0	0
Heavys	2	0	10	12
Totals	69	1	164	

Peds Cross: ⋈
South Peds: 0
South Entering: 234
South Leg Total: 550

Comments

Accu-Traffic Inc

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Oakville
Site #: 1816200002
Intersection: Dundas St W & Colonel William Pk
TFR File #: 1
Count date: 11-Dec-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

North Leg Total: 121
North Entering: 115
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	1	1
Trucks	0	0	0	0
Cars	56	0	58	114
Totals	56	0	59	

Heavys	0
Trucks	0
Cars	6
Totals	6

East Leg Total: 3032
East Entering: 1915
East Peds: 2
Peds Cross: ⧗

Zenon Dr

Heavys	Trucks	Cars	Totals
48	13	2045	2106

Dundas St W

Cars	Trucks	Heavys	Totals
3	0	0	3
1760	13	39	1812
100	0	0	100
1863	13	39	

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
19	8	971	998
2	1	79	82
21	9	1050	

Dundas St W

Cars	Trucks	Heavys	Totals
1085	8	24	1117

Colonel William Pkwy

Peds Cross: ⧗
West Peds: 1
West Entering: 1080
West Leg Total: 3186

Cars	179
Trucks	1
Heavys	2
Totals	182

Cars	229	3	56	288
Trucks	0	0	0	0
Heavys	9	0	4	13
Totals	238	3	60	

Peds Cross: ⋈
South Peds: 0
South Entering: 301
South Leg Total: 483

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc

Morning Peak Diagram

Specified Period		**One Hour Peak**	
From:	7:00:00	**From:**	8:00:00
To:	9:00:00	**To:**	9:00:00

Municipality: Oakville
Site #: 1816200003
Intersection: Dundas St W & Valleyridge Dr
TFR File #: 1
Count date: 11-Dec-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

East Leg Total: 3103
East Entering: 1024
East Peds: 1
Peds Cross: ⌛

Dundas St W (westbound exiting, west side)

Heavys	Trucks	Cars	Totals
101	19	925	1045

Dundas St W (eastbound approach, west side)

Heavys	Trucks	Cars	Totals
55	21	1919	1995
5	0	93	98
60	21	2012	

East side approach

Cars	Trucks	Heavys	Totals
874	19	98	991
32	0	1	33
906	19	99	

Dundas St W (eastbound exiting, east side)

Cars	Trucks	Heavys	Totals
1999	21	59	2079

N
W E
S

Peds Cross: ⌛
West Peds: 2
West Entering: 2093
West Leg Total: 3138

Valleyridge Dr

Cars	125
Trucks	0
Heavys	6
Totals	131

Cars	51	80	131
Trucks	0	0	0
Heavys	3	4	7
Totals	54	84	

Peds Cross: ⋈
South Peds: 0
South Entering: 138
South Leg Total: 269

Comments

Accu-Traffic Inc

Afternoon Peak Diagram

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

Municipality: Oakville
Site #: 1816200003
Intersection: Dundas St W & Valleyridge Dr
TFR File #: 1
Count date: 11-Dec-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

East Leg Total: 3012
East Entering: 1909
East Peds: 0
Peds Cross: ⌛

Dundas St W (westbound leaving, west leg)

Heavys	Trucks	Cars	Totals
40	13	1861	1914

Dundas St W (eastbound approach)

Heavys	Trucks	Cars	Totals
24	8	1046	1078
1	0	35	36
25	8	1081	

Dundas St W (westbound approach)

Cars	Trucks	Heavys	Totals
1812	13	40	1865
43	0	1	44
1855	13	41	

Dundas St W (eastbound leaving, east leg)

Cars	Trucks	Heavys	Totals
1071	8	24	1103

N
W E
S

Valleyridge Dr

Peds Cross: ⌛
West Peds: 0
West Entering: 1114
West Leg Total: 3028

Cars	78
Trucks	0
Heavys	2
Totals	80

Cars	49	25	74
Trucks	0	0	0
Heavys	0	0	0
Totals	49	25	

Peds Cross: ⋈
South Peds: 0
South Entering: 74
South Leg Total: 154

Comments

Accu-Traffic Inc

Morning Peak Diagram

Specified Period		One Hour Peak	
From:	7:00:00	From:	7:30:00
To:	9:00:00	To:	8:30:00

Municipality: Oakville
Site #: 1816200004
Intersection: Dundas St W & Bronte Rd
TFR File #: 1
Count date: 11-Dec-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

North Leg (Bronte Rd)

North Leg Total: 2755
North Entering: 1504
North Peds: 0
Peds Cross: ⋈

Heavys	8	53	8	69
Trucks	3	21	2	26
Cars	163	1029	217	1409
Totals	174	1103	227	

Heavys	53
Trucks	13
Cars	1185
Totals	1251

East Leg (Dundas St W)

East Leg Total: 2777
East Entering: 910
East Peds: 0
Peds Cross: ⧗

Cars	Trucks	Heavys	Totals
194	1	9	204
498	9	59	566
111	5	24	140
803	15	92	

Cars	Trucks	Heavys	Totals
1803	18	46	1867

West Leg (Dundas St W)

Heavys	Trucks	Cars	Totals
93	14	817	924

Heavys	Trucks	Cars	Totals
5	4	317	326
30	12	1438	1480
12	3	443	458
47	19	2198	

Peds Cross: ⧗
West Peds: 0
West Entering: 2264
West Leg Total: 3188

N
W E
S

South Leg (Bronte Rd)

Cars	1583
Trucks	29
Heavys	89
Totals	1701

Cars	156	674	148	978
Trucks	2	8	4	14
Heavys	26	39	8	73
Totals	184	721	160	

Peds Cross: ⋈
South Peds: 2
South Entering: 1065
South Leg Total: 2766

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Oakville
Site #: 1816200004
Intersection: Dundas St W & Bronte Rd
TFR File #: 1
Count date: 11-Dec-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

North Leg (Bronte Rd)

North Leg Total:	2657
North Entering:	1075
North Peds:	0
Peds Cross:	⋈

Heavys	4	19	3	26
Trucks	1	2	1	4
Cars	251	571	223	1045
Totals	256	592	227	

Heavys	29
Trucks	13
Cars	1540
Totals	1582

East Leg

East Leg Total:	2617
East Entering:	1506
East Peds:	0
Peds Cross:	⧖

Cars	Trucks	Heavys	Totals
154	3	3	160
1163	6	22	1191
149	1	5	155
1466	10	30	

Dundas St W

Cars	Trucks	Heavys	Totals
1072	9	30	1111

West Leg (Dundas St W)

Heavys	Trucks	Cars	Totals
33	8	1766	1807

Heavys	Trucks	Cars	Totals
2	3	213	218
15	5	751	771
3	0	175	178
20	8	1139	

Peds Cross:	⧖
West Peds:	0
West Entering:	1167
West Leg Total:	2974

N
W E
S

South Leg (Bronte Rd)

Cars	895
Trucks	3
Heavys	27
Totals	925

Cars	352	1173	98	1623
Trucks	1	7	3	11
Heavys	7	24	12	43
Totals	360	1204	113	

Peds Cross:	⋈
South Peds:	4
South Entering:	1677
South Leg Total:	2602

Comments

Accu-Traffic Inc

Morning Peak Diagram

Specified Period		One Hour Peak	
From:	7:00:00	From:	7:30:00
To:	9:00:00	To:	8:30:00

Municipality: Oakville
Site #: 1816200005
Intersection: Bronte Rd & HWY 407 EB off Ram
TFR File #: 1
Count date: 11-Dec-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Bronte Rd runs N/S

North Leg Total: 2988
North Entering: 1847
North Peds: 0
Peds Cross: ⋈

Heavys	0	79	0	79
Trucks	0	24	0	24
Cars	0	1744	0	1744
Totals	0	1847	0	

Heavys	68
Trucks	13
Cars	1060
Totals	1141

East Leg Total: 390
East Entering: 0
East Peds: 0
Peds Cross: ⧗

Bronte Rd

Heavys	Trucks	Cars	Totals
0	0	0	0

HWY 407 EB off Ramp

Cars	Trucks	Heavys	Totals
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	

N
W E
S

Heavys	Trucks	Cars	Totals
14	2	151	167
0	0	0	0
1	1	114	116
15	3	265	

HWY 407 EB on Ramp

Cars	Trucks	Heavys	Totals
382	0	8	390

Bronte Rd

Peds Cross: ⧗
West Peds: 0
West Entering: 283
West Leg Total: 283

Cars	1858
Trucks	25
Heavys	80
Totals	1963

Cars	0	909	382	1291
Trucks	0	11	0	11
Heavys	0	54	8	62
Totals	0	974	390	

Peds Cross: ⋈
South Peds: 0
South Entering: 1364
South Leg Total: 3327

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Oakville
Site #: 1816200005
Intersection: Bronte Rd & HWY 407 EB off Ram
TFR File #: 1
Count date: 11-Dec-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Bronte Rd runs N/S

North Leg Total: 2978
North Entering: 1060
North Peds: 0
Peds Cross: ⋈

Heavys	0	20	0	20
Trucks	0	2	0	2
Cars	0	1038	0	1038
Totals	0	1060	0	

Heavys	29
Trucks	13
Cars	1876
Totals	1918

East Leg Total: 140
East Entering: 0
East Peds: 0
Peds Cross: ⧖

Bronte Rd

Heavys	Trucks	Cars	Totals
0	0	0	0

HWY 407 EB off Ramp

Cars	Trucks	Heavys	Totals
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	

N
W
E
S

Heavys	Trucks	Cars	Totals
3	0	108	111
0	0	0	0
1	0	46	47
4	0	154	

HWY 407 EB on Ramp

Cars	Trucks	Heavys	Totals
136	2	2	140

Bronte Rd

Peds Cross: ⧖
West Peds: 0
West Entering: 158
West Leg Total: 158

Cars	1084
Trucks	2
Heavys	21
Totals	1107

Cars	0	1768	136	1904
Trucks	0	13	2	15
Heavys	0	26	2	28
Totals	0	1807	140	

Peds Cross: ⋈
South Peds: 0
South Entering: 1947
South Leg Total: 3054

Comments

Eastbound Left Turn Survey 0:05

Intersection: Dundas Street at Bronte Road - AM Peak
Movement: Eastbound Left
Date: Jan 31, 2019

TIME			Departures				
			Protected Phase		Permissive Phase		
From	To	Cycle	During Green	Sneakers (during amber and all-red)	During Green	Sneakers (during amber and all-red)	comment
7:30	7:35	1	0	0	3	1	No advance green arrow
		2	2	0	8	1	
		3	3	3	4	1	
7:35	7:40	1	3	3	4	3	
		2	4	2	8	2	
7:40	7:45	1	3	3	0	2	
		2	4	2	4	1	
7:45	7:50	1	4	1	2	2	
		2	4	2	1	2	
7:50	7:55	1	2	3	0	2	
		2	4	2	9	2	
7:55	8:00	1	4	3	0	1	
		2	4	2	2	2	
8:00	8:05	1	4	2	13	1	
		2	3	4	1	2	
8:05	8:10	1	3	2	0	2	
		2	3	3	3	2	
8:10	8:15	1	3	3	5	1	
		2	3	2	1	0	
		3	0	1	0	2	
8:15	8:20	1	3	1	2	0	
		2	3	3	1	2	
8:20	8:25	1	4	1	1	0	
		2	3	1	2	1	
8:25	8:30	1	2	1	0	1	
		2	3	0	0	1	
Total							

Eastbound Left Turn Survey 0:05

Intersection: Dundas Street at Bronte Road - PM Peak
Movement: Eastbound Left
Date: Jan 31, 2019

TIME			Departures				
			Protected Phase		Permissive Phase		
From	To	Cycle	During Green	Sneakers (during amber and all-red)	During Green	Sneakers (during amber and all-red)	comment
16:30	16:35	1	0	0	0	1	No advance green arrow
		2	3	0	0	0	
		3	3	1	0	1	
16:35	16:40	1	3	0	0	0	
		2	2	1	1	2	
16:40	16:45	1	1	1	0	2	
		2	3	2	0	2	
16:45	16:50	1	3	2	0	2	
		2	3	3	2	3	
16:50	16:55	1	2	1	1	3	
		2	3	3	3	3	
16:55	17:00	1	4	3	1	3	
		2	4	3	0	1	
17:00	17:05	1	4	2	2	2	
		2	3	2	1	1	
17:05	17:10	1	4	2	1	1	
		2	4	3	1	0	
		3	4	1	1	1	
17:10	17:15	1	3	2	0	0	
		2	2	0	0	2	
17:15	17:20	1	3	3	1	1	
		2	4	0	0	2	
17:20	17:25	1	4	2	2	2	
		2	4	4	1	3	
17:25	17:30	1	3	3	0	2	
		2	3	2	2	1	
Total							

Calibration

AM Peak Hour:

Eastbound Left-Turn at Intersection of Dundas Street West at Bronte Road

From Special Surveys completed after the TMCs, specifically for Calibration:

Vehicles proceeding during protected phase	128	54%
Vehicles proceeding during permissive phas	111	46%

From TMC:

Total Vehicles turning Left: 326

Assuming that the distribution of protected and permissive vehicles is similar,we can apply the distribution derived from the special surveys to the TMC and derive the following

Protected: 176

Permissive 150

From Synchro Prior to Calibration for the subject movement:

Prot-Perm V/C: 1.06

Prot V/C (assuming no turns allowed during Permissive Phase): 1.7 (derived by changing the type of left-turn from perm+protected to only protected)

Derived Capacities from Synchro Model Prior to Calibration:

Overall Capacity:	308
Protect Turn Capacity	192
Permissive Turn Capa	116

Calculation of Calibration Factors:

In order to calibrate the model we determine the relation between the capacity derived by Synchro and the capacity that we know exists, and apply it to the saturation Flow:

Capacity that we know at least exists:		Capacity Derived By Synchro:		Calibration Factors:	
For Protec	176	For Protected:	192	For Protected:	0.92
For Permis	150	For Permissive:	116	For Permissive:	1.29

These factors will be applied to the saturation flows (both permissive and protected) that are in the synchro file:

Sat Flow (protected):	1772	Calibrated Sat Flow (protected):	1630
Sat Flow (permissive)	377	Calibrated Sat Flow (permissive)	486

PM Peak Hour:

Eastbound Left-Turn at Intersection of Dundas Street West at Bronte Road

From Special Surveys completed after the TMCs, specifically for Calibration:

Vehicles proceeding during protected phase	125	67%
Vehicles proceeding during permissive phas	61	33%

From TMC:

Total Vehicles turning Left: 218

Assuming that the distribution of protected and permissive vehicles is similar,we can apply the distribution derived from the special surveys to the TMC and derive the following

Protected: 146

Permissive 72

From Synchro Prior to Calibration for the subject movement:

Prot-Perm V/C: 1.07

Prot V/C (assuming no turns allowed during Permissive Phase): 1.51 (derived by changing the type of left-turn from perm+protected to only protected)

Derived Capacities from Synchro Model Prior to Calibration:

Overall Capacity:	204
Protect Turn Capacity	144
Permissive Turn Capa	60

Calculation of Calibration Factors:

In order to calibrate the model we determine the relation between the capacity derived by Synchro and the capacity that we know exists, and apply it to the saturation Flow:

Capacity that we know at least exists:		Capacity Derived By Synchro:		Calibration Factors:	
For Protec	146	For Protected:	144	For Protected:	1.01
For Permis	72	For Permissive:	60	For Permissive:	1.2

These factors will be applied to the saturation flows (both permissive and protected) that are in the synchro file:

Sat Flow (protected):	1789	Calibrated Sat Flow (protected):	1807
Sat Flow (permissive)	198	Calibrated Sat Flow (permissive)	238

APPENDIX

B LOS DEFINITIONS

APPENDIX

Levels of Service – Highway Capacity Manual

Signalized Intersections

Level of Service	Stopped Delay per Vehicle (sec)	Expected delay to Minor Street traffic from the Major Street
A	< 10	Most vehicles arrive during the green phase and do not stop; traffic progression is extremely favourable.
B	10.1 - 20.0	More vehicles stop than for LOS A; traffic progression is good.
C	20.1 - 35.0	Individual cycle failures may appear and the number of vehicles stopping is significant; traffic progression is fair.
D	35.1 - 55.0	Individual cycle failures are noticeable and many vehicles stop; traffic progression is unfavourable.
E	55.1 - 80.0	Individual cycle failures are frequent; traffic progression is poor; acceptable delay is at its limit.
F	> 80	Many individual cycle failures; arrival flow rate exceeds capacity; delay is unacceptable to most drivers.

Source: Highway Capacity Manual, HCM2000

HIGHWAY LOS Signalized 12-09-18

Levels of Service – Highway Capacity Manual

Unsignalized Intersection

Level of Service	Average Control Delays (s/veh)	Expected delay to Minor Street traffic from the Major Street
A	0 - 10	Little or no delay.
B	> 10 – 15	Short traffic delay.
C	> 15 – 25	Average traffic delay.
D	> 25 – 35	Long traffic delay.
E	> 35 – 50	Very long traffic delay.
F	> 50	Extreme delay encountered with queuing, which may cause severe congestion affecting other traffic movements in the intersection.

Source: Highway Capacity Manual, HCM 2000

UNSIGNALIZED LOS 12-09-18

APPENDIX

C SYNCHRO RESULTS

APPENDIX

APPENDIX

C-1 EXISTING CONDITIONS

APPENDIX

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	167	116	0	895	1575	0
Future Volume (vph)	167	116	0	895	1575	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.95	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3219	1601		4902	3444	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3219	1601		4902	3444	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	196	136	0	1053	1853	0
RTOR Reduction (vph)	0	11	0	0	0	0
Lane Group Flow (vph)	196	125	0	1053	1853	0
Heavy Vehicles (%)	10%	2%	0%	7%	6%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	12.9	12.9		60.1	60.1	
Effective Green, g (s)	12.9	12.9		60.1	60.1	
Actuated g/C Ratio	0.15	0.15		0.71	0.71	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	488	242		3466	2435	
v/s Ratio Prot	0.06			0.21	c0.54	
v/s Ratio Perm		c0.08				
v/c Ratio	0.40	0.52		0.30	0.76	
Uniform Delay, d1	32.6	33.2		4.6	7.9	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	2.5		0.2	2.3	
Delay (s)	33.3	35.6		4.9	10.2	
Level of Service	C	D		A	B	
Approach Delay (s)	34.3			4.9	10.2	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	345	2153	787	90	240	310
Future Volume (vph)	345	2153	787	90	240	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1807	3544	3259	1570	1825	1611
Flt Permitted	0.22	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	417	3544	3259	1570	1825	1611
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	392	2447	894	102	273	352
RTOR Reduction (vph)	0	0	0	45	0	285
Lane Group Flow (vph)	392	2447	894	57	273	67
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	1%	3%	12%	4%	0%	0%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2			6		8
Actuated Green, G (s)	83.3	83.3	57.5	57.5	22.7	22.7
Effective Green, g (s)	83.3	83.3	57.5	57.5	22.7	22.7
Actuated g/C Ratio	0.69	0.69	0.48	0.48	0.19	0.19
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	2.5
Lane Grp Cap (vph)	541	2460	1561	752	345	304
v/s Ratio Prot	0.13	c0.69	0.27		c0.15	
v/s Ratio Perm	0.37			0.04		0.04
v/c Ratio	0.72	0.99	0.57	0.08	0.79	0.22
Uniform Delay, d1	11.5	18.1	22.4	16.9	46.4	41.2
Progression Factor	1.00	1.00	0.67	0.71	1.00	1.00
Incremental Delay, d2	4.8	16.9	1.5	0.2	11.4	0.3
Delay (s)	16.3	35.1	16.5	12.3	57.8	41.4
Level of Service	B	D	B	B	E	D
Approach Delay (s)		32.5	16.1		48.6	
Approach LOS		C	B		D	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
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)	73	2036	259	57	837	90	69	1	164	6	0	2
Future Volume (vph)	73	2036	259	57	837	90	69	1	164	6	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	0.99	
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	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	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	
Satd. Flow (prot)	1805	3544	1588	1674	3259	1562	1768	1921	1493	1555	1610	
Flt Permitted	0.30	1.00	1.00	0.05	1.00	1.00	0.76	1.00	1.00	0.76	1.00	
Satd. Flow (perm)	574	3544	1588	84	3259	1562	1408	1921	1493	1239	1610	
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)	77	2143	273	60	881	95	73	1	173	6	0	2
RTOR Reduction (vph)	0	0	62	0	0	28	0	0	103	0	2	0
Lane Group Flow (vph)	77	2143	211	60	881	67	73	1	70	6	0	0
Confl. Peds. (#/hr)	8					8	2		3	3		2
Heavy Vehicles (%)	1%	3%	2%	9%	12%	0%	3%	0%	6%	17%	0%	0%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	4	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	89.2	84.0	84.0	90.0	84.4	84.4	13.0	13.0	13.0	13.0	13.0	
Effective Green, g (s)	89.2	84.0	84.0	90.0	84.4	84.4	13.0	13.0	13.0	13.0	13.0	
Actuated g/C Ratio	0.74	0.70	0.70	0.75	0.70	0.70	0.11	0.11	0.11	0.11	0.11	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)	480	2480	1111	137	2292	1098	152	208	161	134	174	
v/s Ratio Prot	0.01	c0.60		c0.02	0.27			0.00			0.00	
v/s Ratio Perm	0.11		0.13	0.31		0.04	c0.05		0.05	0.00		
v/c Ratio	0.16	0.86	0.19	0.44	0.38	0.06	0.48	0.00	0.43	0.04	0.00	
Uniform Delay, d1	4.3	13.7	6.2	20.3	7.2	5.5	50.3	47.7	50.0	47.9	47.7	
Progression Factor	0.56	0.51	0.03	1.60	0.89	1.13	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	1.4	0.1	2.2	0.5	0.1	2.8	0.0	2.2	0.1	0.0	
Delay (s)	2.4	8.4	0.3	34.8	6.9	6.4	53.1	47.7	52.2	48.0	47.7	
Level of Service	A	A	A	C	A	A	D	D	D	D	D	
Approach Delay (s)		7.3			8.5			52.5			47.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.7	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)	17.4
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2275	98	33	991	54	84
Future Volume (vph)	2275	98	33	991	54	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5010		1772	4670	1718	1535
Flt Permitted	1.00		0.04	1.00	0.95	1.00
Satd. Flow (perm)	5010		83	4670	1718	1535
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2395	103	35	1043	57	88
RTOR Reduction (vph)	2	0	0	0	0	79
Lane Group Flow (vph)	2496	0	35	1043	57	9
Confl. Peds. (#/hr)					2	1
Heavy Vehicles (%)	4%	5%	3%	12%	6%	5%
Bus Blockages (#/hr)	0	6	0	2	0	0
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	86.4		94.2	94.2	11.8	11.8
Effective Green, g (s)	86.4		94.2	94.2	11.8	11.8
Actuated g/C Ratio	0.72		0.79	0.79	0.10	0.10
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3607		118	3665	168	150
v/s Ratio Prot	c0.50		0.01	c0.22		
v/s Ratio Perm			0.22		c0.03	0.01
v/c Ratio	0.69		0.30	0.28	0.34	0.06
Uniform Delay, d1	9.4		8.6	3.6	50.5	49.1
Progression Factor	0.14		3.90	0.22	1.00	1.00
Incremental Delay, d2	0.7		1.3	0.2	2.5	0.3
Delay (s)	2.0		34.9	1.0	53.0	49.4
Level of Service	A		C	A	D	D
Approach Delay (s)	2.0			2.1	50.8	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
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)	326	1480	458	140	566	204	190	721	160	227	1103	174
Future Volume (vph)	326	1480	458	140	566	204	190	721	160	227	1103	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	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	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
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1772	5092	1563	1508	4573		3079	3411	1512	1755	3411	1541
Flt Permitted	0.24	1.00	1.00	0.10	1.00		0.95	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	441	5092	1563	163	4573		3079	3411	1512	412	3411	1541
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	351	1591	492	151	609	219	204	775	172	244	1186	187
RTOR Reduction (vph)	0	0	138	0	54	0	0	0	87	0	0	75
Lane Group Flow (vph)	351	1591	354	151	774	0	204	775	85	244	1186	112
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	3%	3%	3%	21%	12%	5%	15%	7%	8%	4%	7%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6					8	4		4
Actuated Green, G (s)	51.0	41.0	41.0	47.0	39.0		11.2	40.0	40.0	46.8	37.8	37.8
Effective Green, g (s)	51.0	41.0	41.0	47.0	39.0		11.2	40.0	40.0	46.8	37.8	37.8
Actuated g/C Ratio	0.42	0.34	0.34	0.39	0.32		0.09	0.33	0.33	0.39	0.31	0.31
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0		2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	298	1739	534	153	1486		287	1137	504	261	1074	485
v/s Ratio Prot	c0.10	0.31		0.07	0.17		0.07	0.23		c0.07	c0.35	
v/s Ratio Perm	c0.40		0.23	0.32					0.06	0.29		0.07
v/c Ratio	1.18	0.91	0.66	0.99	0.52		0.71	0.68	0.17	0.93	1.10	0.23
Uniform Delay, d1	29.7	37.8	33.6	29.6	32.9		52.8	34.5	28.2	31.1	41.1	30.4
Progression Factor	1.65	1.39	1.77	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	103.1	7.0	4.8	68.2	1.3		7.5	1.8	0.2	38.2	60.7	0.3
Delay (s)	152.3	59.5	64.3	97.8	34.2		60.3	36.4	28.5	69.3	101.8	30.7
Level of Service	F	E	E	F	C		E	D	C	E	F	C
Approach Delay (s)		73.9			44.0			39.4			88.6	
Approach LOS		E			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	66.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰↰	↱		↑↑↑	↑↑	
Traffic Volume (vph)	111	47	0	1555	830	0
Future Volume (vph)	111	47	0	1555	830	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.95	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3437	1601		5142	3579	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3437	1601		5142	3579	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	116	49	0	1620	865	0
RTOR Reduction (vph)	0	45	0	0	0	0
Lane Group Flow (vph)	116	4	0	1620	865	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	7.8	7.8		65.2	65.2	
Effective Green, g (s)	7.8	7.8		65.2	65.2	
Actuated g/C Ratio	0.09	0.09		0.77	0.77	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	315	146		3944	2745	
v/s Ratio Prot	c0.03			c0.32	0.24	
v/s Ratio Perm		0.00				
v/c Ratio	0.37	0.03		0.41	0.32	
Uniform Delay, d1	36.3	35.2		3.4	3.0	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.1		0.3	0.3	
Delay (s)	37.3	35.3		3.7	3.3	
Level of Service	D	D		A	A	
Approach Delay (s)	36.7			3.7	3.3	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	222	1035	1970	176	74	430
Future Volume (vph)	222	1035	1970	176	74	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1807	3544	3544	1601	1825	1570
Flt Permitted	0.06	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	111	3544	3544	1601	1825	1570
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	234	1089	2074	185	78	453
RTOR Reduction (vph)	0	0	0	44	0	140
Lane Group Flow (vph)	234	1089	2074	141	78	313
Heavy Vehicles (%)	1%	3%	3%	2%	0%	4%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2			6		8
Actuated Green, G (s)	80.4	80.4	64.3	64.3	25.6	25.6
Effective Green, g (s)	80.4	80.4	64.3	64.3	25.6	25.6
Actuated g/C Ratio	0.67	0.67	0.54	0.54	0.21	0.21
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	2.5
Lane Grp Cap (vph)	245	2374	1898	857	389	334
v/s Ratio Prot	c0.10	0.31	c0.59		0.04	
v/s Ratio Perm	0.54			0.09		c0.20
v/c Ratio	0.96	0.46	1.09	0.16	0.20	0.94
Uniform Delay, d1	40.8	9.4	27.9	14.2	38.8	46.4
Progression Factor	1.00	1.00	0.96	0.71	1.00	1.00
Incremental Delay, d2	44.7	0.6	47.8	0.3	0.2	32.9
Delay (s)	85.5	10.1	74.4	10.3	39.0	79.3
Level of Service	F	B	E	B	D	E
Approach Delay (s)		23.4	69.2		73.4	
Approach LOS		C	E		E	

Intersection Summary			
HCM 2000 Control Delay	55.0	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)	18.0
Intersection Capacity Utilization	92.7%	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 (vph)	0	998	82	100	1812	3	238	3	60	59	0	56
Future Volume (vph)	0	998	82	100	1812	3	238	3	60	59	0	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3544	1558	1825	3544	1620	1753	1921	1505	1786	1612	
Flt Permitted		1.00	1.00	0.19	1.00	1.00	0.72	1.00	1.00	0.76	1.00	
Satd. Flow (perm)		3544	1558	369	3544	1620	1326	1921	1505	1421	1612	
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)	0	1051	86	105	1907	3	251	3	63	62	0	59
RTOR Reduction (vph)	0	0	38	0	0	1	0	0	48	0	45	0
Lane Group Flow (vph)	0	1051	48	105	1907	2	251	3	15	62	14	0
Confl. Peds. (#/hr)							1		2	2		1
Heavy Vehicles (%)	0%	3%	4%	0%	3%	0%	4%	0%	7%	2%	0%	0%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)		66.8	66.8	78.8	78.8	78.8	27.8	27.8	27.8	27.8	27.8	
Effective Green, g (s)		66.8	66.8	78.8	78.8	78.8	27.8	27.8	27.8	27.8	27.8	
Actuated g/C Ratio		0.56	0.56	0.66	0.66	0.66	0.23	0.23	0.23	0.23	0.23	
Clearance Time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)		1972	867	339	2327	1063	307	445	348	329	373	
v/s Ratio Prot		0.30		0.02	c0.54			0.00			0.01	
v/s Ratio Perm			0.03	0.18		0.00	c0.19		0.01	0.04		
v/c Ratio		0.53	0.06	0.31	0.82	0.00	0.82	0.01	0.04	0.19	0.04	
Uniform Delay, d1		16.8	12.2	9.8	15.3	7.1	43.7	35.5	35.8	37.0	35.7	
Progression Factor		0.64	0.30	0.49	0.44	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.9	0.1	0.5	3.0	0.0	15.8	0.0	0.1	0.1	0.0	
Delay (s)		11.8	3.8	5.3	9.8	7.1	59.5	35.5	35.8	37.1	35.7	
Level of Service		B	A	A	A	A	E	D	D	D	D	
Approach Delay (s)		11.1			9.5			54.6			36.5	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1078	36	44	1865	49	25
Future Volume (vph)	1078	36	44	1865	49	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5067		1789	5078	1825	1633
Flt Permitted	1.00		0.20	1.00	0.95	1.00
Satd. Flow (perm)	5067		386	5078	1825	1633
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1159	39	47	2005	53	27
RTOR Reduction (vph)	2	0	0	0	0	25
Lane Group Flow (vph)	1196	0	47	2005	53	2
Heavy Vehicles (%)	3%	3%	2%	3%	0%	0%
Bus Blockages (#/hr)	0	4	0	2	0	0
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	87.5		96.6	96.6	9.4	9.4
Effective Green, g (s)	87.5		96.6	96.6	9.4	9.4
Actuated g/C Ratio	0.73		0.80	0.80	0.08	0.08
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3694		370	4087	142	127
v/s Ratio Prot	0.24		0.01	c0.39		
v/s Ratio Perm			0.10		c0.03	0.00
v/c Ratio	0.32		0.13	0.49	0.37	0.02
Uniform Delay, d1	5.8		2.6	3.8	52.5	51.0
Progression Factor	2.64		0.83	0.76	1.00	1.00
Incremental Delay, d2	0.2		0.1	0.3	3.4	0.1
Delay (s)	15.4		2.3	3.1	55.9	51.1
Level of Service	B		A	A	E	D
Approach Delay (s)	15.4			3.1	54.3	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
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)	218	820	178	155	1191	160	410	1204	113	227	592	256
Future Volume (vph)	218	820	178	155	1191	160	410	1204	113	227	592	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00	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
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	5092	1563	1755	5039		3471	3544	1445	1789	3510	1601
Flt Permitted	0.11	1.00	1.00	0.23	1.00		0.95	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	204	5092	1563	430	5039		3471	3544	1445	204	3510	1601
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)	225	845	184	160	1228	165	423	1241	116	234	610	264
RTOR Reduction (vph)	0	0	127	0	15	0	0	0	73	0	0	108
Lane Group Flow (vph)	225	845	57	160	1378	0	423	1241	43	234	610	156
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	3%	2%	4%	2%	4%	2%	3%	13%	2%	4%	2%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6					8	4		4
Actuated Green, G (s)	45.0	37.0	37.0	45.0	37.0		16.0	40.0	40.0	50.0	37.0	37.0
Effective Green, g (s)	45.0	37.0	37.0	45.0	37.0		16.0	40.0	40.0	50.0	37.0	37.0
Actuated g/C Ratio	0.38	0.31	0.31	0.38	0.31		0.13	0.33	0.33	0.42	0.31	0.31
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0		2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	182	1570	481	249	1553		462	1181	481	256	1082	493
v/s Ratio Prot	c0.08	0.17		0.04	0.27		c0.12	c0.35		0.10	0.17	
v/s Ratio Perm	c0.38		0.04	0.20					0.03	0.28		0.10
v/c Ratio	1.24	0.54	0.12	0.64	0.89		0.92	1.05	0.09	0.91	0.56	0.32
Uniform Delay, d1	31.2	34.4	29.8	26.4	39.5		51.3	40.0	27.5	31.9	34.7	31.8
Progression Factor	2.32	0.34	0.11	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	143.6	1.3	0.5	4.9	7.9		22.7	40.6	0.1	34.0	0.8	0.5
Delay (s)	215.9	13.1	3.9	31.3	47.4		74.0	80.6	27.6	65.9	35.6	32.3
Level of Service	F	B	A	C	D		E	F	C	E	D	C
Approach Delay (s)		48.2			45.8			75.6			41.2	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	54.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	167	116	0	895	1575	0
Future Volume (vph)	167	116	0	895	1575	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.95	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3219	1601		4902	3444	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3219	1601		4902	3444	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	196	136	0	1053	1853	0
RTOR Reduction (vph)	0	11	0	0	0	0
Lane Group Flow (vph)	196	125	0	1053	1853	0
Heavy Vehicles (%)	10%	2%	0%	7%	6%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	12.9	12.9		60.1	60.1	
Effective Green, g (s)	12.9	12.9		60.1	60.1	
Actuated g/C Ratio	0.15	0.15		0.71	0.71	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	488	242		3466	2435	
v/s Ratio Prot	0.06			0.21	c0.54	
v/s Ratio Perm		c0.08				
v/c Ratio	0.40	0.52		0.30	0.76	
Uniform Delay, d1	32.6	33.2		4.6	7.9	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	2.5		0.2	2.3	
Delay (s)	33.3	35.6		4.9	10.2	
Level of Service	C	D		A	B	
Approach Delay (s)	34.3			4.9	10.2	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	345	2153	787	90	240	310
Future Volume (vph)	345	2153	787	90	240	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1807	3544	3259	1570	1825	1611
Flt Permitted	0.22	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	417	3544	3259	1570	1825	1611
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	392	2447	894	102	273	352
RTOR Reduction (vph)	0	0	0	45	0	285
Lane Group Flow (vph)	392	2447	894	57	273	67
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	1%	3%	12%	4%	0%	0%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2			6		8
Actuated Green, G (s)	83.3	83.3	57.5	57.5	22.7	22.7
Effective Green, g (s)	83.3	83.3	57.5	57.5	22.7	22.7
Actuated g/C Ratio	0.69	0.69	0.48	0.48	0.19	0.19
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	2.5
Lane Grp Cap (vph)	541	2460	1561	752	345	304
v/s Ratio Prot	0.13	c0.69	0.27		c0.15	
v/s Ratio Perm	0.37			0.04		0.04
v/c Ratio	0.72	0.99	0.57	0.08	0.79	0.22
Uniform Delay, d1	11.5	18.1	22.4	16.9	46.4	41.2
Progression Factor	1.00	1.00	0.67	0.70	1.00	1.00
Incremental Delay, d2	4.8	16.9	1.5	0.2	11.4	0.3
Delay (s)	16.3	35.1	16.4	12.1	57.8	41.4
Level of Service	B	D	B	B	E	D
Approach Delay (s)		32.5	16.0		48.6	
Approach LOS		C	B		D	

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
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)	73	2036	259	57	837	90	69	1	164	6	0	2
Future Volume (vph)	73	2036	259	57	837	90	69	1	164	6	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	0.99	
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	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	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	
Satd. Flow (prot)	1805	3544	1588	1674	3259	1562	1768	1921	1493	1555	1610	
Flt Permitted	0.30	1.00	1.00	0.05	1.00	1.00	0.76	1.00	1.00	0.76	1.00	
Satd. Flow (perm)	574	3544	1588	84	3259	1562	1408	1921	1493	1239	1610	
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)	77	2143	273	60	881	95	73	1	173	6	0	2
RTOR Reduction (vph)	0	0	62	0	0	28	0	0	103	0	2	0
Lane Group Flow (vph)	77	2143	211	60	881	67	73	1	70	6	0	0
Confl. Peds. (#/hr)	8					8	2		3	3		2
Heavy Vehicles (%)	1%	3%	2%	9%	12%	0%	3%	0%	6%	17%	0%	0%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	4	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	89.2	84.0	84.0	90.0	84.4	84.4	13.0	13.0	13.0	13.0	13.0	
Effective Green, g (s)	89.2	84.0	84.0	90.0	84.4	84.4	13.0	13.0	13.0	13.0	13.0	
Actuated g/C Ratio	0.74	0.70	0.70	0.75	0.70	0.70	0.11	0.11	0.11	0.11	0.11	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)	480	2480	1111	137	2292	1098	152	208	161	134	174	
v/s Ratio Prot	0.01	c0.60		c0.02	0.27			0.00			0.00	
v/s Ratio Perm	0.11		0.13	0.31		0.04	c0.05		0.05	0.00		
v/c Ratio	0.16	0.86	0.19	0.44	0.38	0.06	0.48	0.00	0.43	0.04	0.00	
Uniform Delay, d1	4.3	13.7	6.2	20.3	7.2	5.5	50.3	47.7	50.0	47.9	47.7	
Progression Factor	0.56	0.51	0.03	1.72	1.01	1.54	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	1.4	0.1	2.2	0.5	0.1	2.8	0.0	2.2	0.1	0.0	
Delay (s)	2.4	8.4	0.3	37.2	7.8	8.6	53.1	47.7	52.2	48.0	47.7	
Level of Service	A	A	A	D	A	A	D	D	D	D	D	
Approach Delay (s)		7.3			9.6			52.5			47.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.9	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)	17.4
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↱		↰	↑↑↑	↰	↱
Traffic Volume (vph)	2275	98	33	991	54	84
Future Volume (vph)	2275	98	33	991	54	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5010		1772	4670	1718	1535
Flt Permitted	1.00		0.04	1.00	0.95	1.00
Satd. Flow (perm)	5010		83	4670	1718	1535
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2395	103	35	1043	57	88
RTOR Reduction (vph)	2	0	0	0	0	79
Lane Group Flow (vph)	2496	0	35	1043	57	9
Confl. Peds. (#/hr)					2	1
Heavy Vehicles (%)	4%	5%	3%	12%	6%	5%
Bus Blockages (#/hr)	0	6	0	2	0	0
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	86.4		94.2	94.2	11.8	11.8
Effective Green, g (s)	86.4		94.2	94.2	11.8	11.8
Actuated g/C Ratio	0.72		0.79	0.79	0.10	0.10
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3607		118	3665	168	150
v/s Ratio Prot	c0.50		0.01	c0.22		
v/s Ratio Perm			0.22		c0.03	0.01
v/c Ratio	0.69		0.30	0.28	0.34	0.06
Uniform Delay, d1	9.4		8.6	3.6	50.5	49.1
Progression Factor	0.14		4.32	0.23	1.00	1.00
Incremental Delay, d2	0.7		1.2	0.2	2.5	0.3
Delay (s)	2.0		38.5	1.0	53.0	49.4
Level of Service	A		D	A	D	D
Approach Delay (s)	2.0			2.2	50.8	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
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)	326	1480	458	140	566	204	190	721	160	227	1103	174
Future Volume (vph)	326	1480	458	140	566	204	190	721	160	227	1103	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	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	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
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1630	5092	1563	1508	4573		3079	3411	1512	1755	3411	1541
Flt Permitted	0.20	1.00	1.00	0.11	1.00		0.95	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)	486	5092	1563	172	4573		3079	3411	1512	353	3411	1541
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	351	1591	492	151	609	219	204	775	172	244	1186	187
RTOR Reduction (vph)	0	0	122	0	54	0	0	0	93	0	0	92
Lane Group Flow (vph)	351	1591	370	151	774	0	204	775	79	244	1186	95
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	3%	3%	3%	21%	12%	5%	15%	7%	8%	4%	7%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6					8	4		4
Actuated Green, G (s)	53.0	41.0	41.0	44.0	36.0		8.0	40.0	40.0	50.0	41.0	41.0
Effective Green, g (s)	54.0	44.0	44.0	46.0	39.0		9.0	43.0	43.0	52.0	44.0	44.0
Actuated g/C Ratio	0.45	0.37	0.37	0.38	0.32		0.08	0.36	0.36	0.43	0.37	0.37
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0		2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	352	1867	573	166	1486		230	1222	541	269	1250	565
v/s Ratio Prot	c0.12	0.31		0.07	0.17		0.07	0.23		c0.08	c0.35	
v/s Ratio Perm	c0.33		0.24	0.28					0.05	0.32		0.06
v/c Ratio	1.00	0.85	0.65	0.91	0.52		0.89	0.63	0.15	0.91	0.95	0.17
Uniform Delay, d1	28.9	35.0	31.5	29.4	32.9		55.0	32.0	26.1	26.5	36.9	25.7
Progression Factor	1.73	1.42	1.77	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	40.3	3.9	4.2	44.0	1.3		30.8	1.2	0.2	31.4	14.9	0.2
Delay (s)	90.2	53.6	60.0	73.4	34.2		85.8	33.2	26.2	57.9	51.8	25.8
Level of Service	F	D	E	E	C		F	C	C	E	D	C
Approach Delay (s)		60.2			40.3			41.5			49.7	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	50.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	111	47	0	1555	830	0
Future Volume (vph)	111	47	0	1555	830	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.95	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3437	1601		5142	3579	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3437	1601		5142	3579	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	116	49	0	1620	865	0
RTOR Reduction (vph)	0	45	0	0	0	0
Lane Group Flow (vph)	116	4	0	1620	865	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	7.8	7.8		65.2	65.2	
Effective Green, g (s)	7.8	7.8		65.2	65.2	
Actuated g/C Ratio	0.09	0.09		0.77	0.77	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	315	146		3944	2745	
v/s Ratio Prot	c0.03			c0.32	0.24	
v/s Ratio Perm		0.00				
v/c Ratio	0.37	0.03		0.41	0.32	
Uniform Delay, d1	36.3	35.2		3.4	3.0	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.1		0.3	0.3	
Delay (s)	37.3	35.3		3.7	3.3	
Level of Service	D	D		A	A	
Approach Delay (s)	36.7			3.7	3.3	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	222	1035	1970	176	74	430
Future Volume (vph)	222	1035	1970	176	74	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1807	3544	3544	1601	1825	1570
Flt Permitted	0.06	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	109	3544	3544	1601	1825	1570
Peak-hour factor, PHF	0.95	0.95	0.97	0.97	0.95	0.95
Adj. Flow (vph)	234	1089	2031	181	78	453
RTOR Reduction (vph)	0	0	0	45	0	110
Lane Group Flow (vph)	234	1089	2031	136	78	343
Heavy Vehicles (%)	1%	3%	3%	2%	0%	4%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2			6		8
Actuated Green, G (s)	80.3	80.3	65.5	65.5	25.7	25.7
Effective Green, g (s)	81.3	84.3	69.5	69.5	29.7	29.7
Actuated g/C Ratio	0.68	0.70	0.58	0.58	0.25	0.25
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	2.5
Lane Grp Cap (vph)	240	2489	2052	927	451	388
v/s Ratio Prot	c0.10	0.31	c0.57		0.04	
v/s Ratio Perm	0.56			0.08		c0.22
v/c Ratio	0.97	0.44	0.99	0.15	0.17	0.88
Uniform Delay, d1	41.3	7.7	24.9	11.6	35.5	43.5
Progression Factor	1.00	1.00	1.11	0.90	1.00	1.00
Incremental Delay, d2	50.6	0.6	13.2	0.2	0.1	20.5
Delay (s)	91.9	8.2	40.8	10.7	35.6	64.0
Level of Service	F	A	D	B	D	E
Approach Delay (s)		23.0	38.3		59.8	
Approach LOS		C	D		E	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
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)	0	998	82	100	1812	3	238	3	60	59	0	56
Future Volume (vph)	0	998	82	100	1812	3	238	3	60	59	0	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3544	1558	1825	3544	1620	1753	1921	1505	1786	1612	
Flt Permitted		1.00	1.00	0.19	1.00	1.00	0.72	1.00	1.00	0.76	1.00	
Satd. Flow (perm)		3544	1558	369	3544	1620	1326	1921	1505	1421	1612	
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)	0	1051	86	105	1907	3	251	3	63	62	0	59
RTOR Reduction (vph)	0	0	38	0	0	1	0	0	48	0	45	0
Lane Group Flow (vph)	0	1051	48	105	1907	2	251	3	15	62	14	0
Confl. Peds. (#/hr)							1		2	2		1
Heavy Vehicles (%)	0%	3%	4%	0%	3%	0%	4%	0%	7%	2%	0%	0%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)		66.8	66.8	78.8	78.8	78.8	27.8	27.8	27.8	27.8	27.8	
Effective Green, g (s)		66.8	66.8	78.8	78.8	78.8	27.8	27.8	27.8	27.8	27.8	
Actuated g/C Ratio		0.56	0.56	0.66	0.66	0.66	0.23	0.23	0.23	0.23	0.23	
Clearance Time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)		1972	867	339	2327	1063	307	445	348	329	373	
v/s Ratio Prot		0.30		0.02	c0.54			0.00			0.01	
v/s Ratio Perm			0.03	0.18		0.00	c0.19		0.01	0.04		
v/c Ratio		0.53	0.06	0.31	0.82	0.00	0.82	0.01	0.04	0.19	0.04	
Uniform Delay, d1		16.8	12.2	9.8	15.3	7.1	43.7	35.5	35.8	37.0	35.7	
Progression Factor		0.72	0.48	0.47	0.41	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.0	0.1	0.5	3.0	0.0	15.8	0.0	0.1	0.1	0.0	
Delay (s)		13.1	6.0	5.1	9.3	7.1	59.5	35.5	35.8	37.1	35.7	
Level of Service		B	A	A	A	A	E	D	D	D	D	
Approach Delay (s)		12.5			9.1			54.6			36.5	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑→		↰	↑↑↑	↰	↱
Traffic Volume (vph)	1078	36	44	1865	49	25
Future Volume (vph)	1078	36	44	1865	49	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5067		1789	5078	1825	1633
Flt Permitted	1.00		0.20	1.00	0.95	1.00
Satd. Flow (perm)	5067		386	5078	1825	1633
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1159	39	47	2005	53	27
RTOR Reduction (vph)	2	0	0	0	0	25
Lane Group Flow (vph)	1196	0	47	2005	53	2
Heavy Vehicles (%)	3%	3%	2%	3%	0%	0%
Bus Blockages (#/hr)	0	4	0	2	0	0
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	87.5		96.6	96.6	9.4	9.4
Effective Green, g (s)	87.5		96.6	96.6	9.4	9.4
Actuated g/C Ratio	0.73		0.80	0.80	0.08	0.08
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3694		370	4087	142	127
v/s Ratio Prot	0.24		0.01	c0.39		
v/s Ratio Perm			0.10		c0.03	0.00
v/c Ratio	0.32		0.13	0.49	0.37	0.02
Uniform Delay, d1	5.8		2.6	3.8	52.5	51.0
Progression Factor	2.64		0.78	0.69	1.00	1.00
Incremental Delay, d2	0.2		0.1	0.3	3.4	0.1
Delay (s)	15.4		2.1	2.9	55.9	51.1
Level of Service	B		A	A	E	D
Approach Delay (s)	15.4			2.9	54.3	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
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)	218	820	178	155	1191	160	410	1204	113	227	592	256
Future Volume (vph)	218	820	178	155	1191	160	410	1204	113	227	592	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00	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
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1807	5092	1563	1755	5039		3471	3544	1445	1789	3510	1601
Flt Permitted	0.11	1.00	1.00	0.23	1.00		0.95	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	238	5092	1563	421	5039		3471	3544	1445	197	3510	1601
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)	225	845	184	160	1228	165	423	1241	116	234	610	264
RTOR Reduction (vph)	0	0	124	0	14	0	0	0	69	0	0	110
Lane Group Flow (vph)	225	845	60	160	1379	0	423	1241	47	234	610	154
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	3%	2%	4%	2%	4%	2%	3%	13%	2%	4%	2%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6					8	4		4
Actuated Green, G (s)	46.0	37.0	37.0	44.0	36.0		15.8	42.0	42.0	48.2	37.2	37.2
Effective Green, g (s)	48.0	39.0	39.0	46.0	38.0		16.8	44.0	44.0	50.2	39.2	39.2
Actuated g/C Ratio	0.40	0.32	0.32	0.38	0.32		0.14	0.37	0.37	0.42	0.33	0.33
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0		2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	225	1654	507	261	1595		485	1299	529	241	1146	522
v/s Ratio Prot	c0.08	0.17		0.05	0.27		c0.12	c0.35		c0.10	0.17	
v/s Ratio Perm	c0.32		0.04	0.19					0.03	0.31		0.10
v/c Ratio	1.00	0.51	0.12	0.61	0.86		0.87	0.96	0.09	0.97	0.53	0.30
Uniform Delay, d1	29.6	32.8	28.4	25.8	38.6		50.5	37.0	24.9	32.8	32.9	30.1
Progression Factor	2.31	0.33	0.11	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	59.2	1.1	0.5	3.6	6.5		15.6	15.5	0.1	49.6	0.6	0.4
Delay (s)	127.6	12.0	3.5	29.4	45.1		66.2	52.6	25.0	82.4	33.5	30.5
Level of Service	F	B	A	C	D		E	D	C	F	C	C
Approach Delay (s)		31.5			43.5			54.0			43.1	
Approach LOS		C			D			D			D	

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)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX

C-2 2021 HORIZON YEAR

APPENDIX

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	167	139	0	1001	1940	0
Future Volume (vph)	167	139	0	1001	1940	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3219	1575		4902	3444	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3219	1575		4902	3444	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	139	0	1001	1940	0
RTOR Reduction (vph)	0	23	0	0	0	0
Lane Group Flow (vph)	167	116	0	1001	1940	0
Confl. Peds. (#/hr)		2	1			1
Heavy Vehicles (%)	10%	2%	0%	7%	6%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	11.3	11.3		61.7	61.7	
Effective Green, g (s)	11.3	11.3		61.7	61.7	
Actuated g/C Ratio	0.13	0.13		0.73	0.73	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	427	209		3558	2499	
v/s Ratio Prot	0.05			0.20	c0.56	
v/s Ratio Perm		c0.07				
v/c Ratio	0.39	0.56		0.28	0.78	
Uniform Delay, d1	33.7	34.5		4.0	7.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	3.9		0.2	2.4	
Delay (s)	34.5	38.4		4.2	9.8	
Level of Service	C	D		A	A	
Approach Delay (s)	36.3			4.2	9.8	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↰	↱	↑↑		↰	↑↑
Traffic Volume (vph)	51	76	1376	137	347	1732
Future Volume (vph)	51	76	1376	137	347	1732
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		4.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3471	1601	3530		1789	3579
Flt Permitted	0.95	1.00	1.00		0.08	1.00
Satd. Flow (perm)	3471	1601	3530		156	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	51	76	1376	137	347	1732
RTOR Reduction (vph)	0	71	5	0	0	0
Lane Group Flow (vph)	51	5	1508	0	347	1732
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	8.0	8.0	68.8		98.0	98.0
Effective Green, g (s)	8.0	8.0	68.8		98.0	98.0
Actuated g/C Ratio	0.07	0.07	0.57		0.82	0.82
Clearance Time (s)	7.0	7.0	7.0		4.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	231	106	2023		470	2922
v/s Ratio Prot	c0.01		0.43		c0.15	0.48
v/s Ratio Perm		0.00			c0.45	
v/c Ratio	0.22	0.05	0.75		0.74	0.59
Uniform Delay, d1	53.0	52.4	19.1		30.5	3.9
Progression Factor	1.00	1.00	0.94		1.00	1.00
Incremental Delay, d2	0.5	0.2	1.4		6.0	0.9
Delay (s)	53.5	52.6	19.2		36.5	4.8
Level of Service	D	D	B		D	A
Approach Delay (s)	53.0		19.2			10.1
Approach LOS	D		B			B

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	531	2646	919	213	377	373
Future Volume (vph)	531	2646	919	213	377	373
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1807	3544	3259	1570	1825	1611
Flt Permitted	0.16	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	298	3544	3259	1570	1825	1611
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	531	2646	919	213	377	373
RTOR Reduction (vph)	0	0	0	113	0	288
Lane Group Flow (vph)	531	2646	919	100	377	85
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	1%	3%	12%	4%	0%	0%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2			6		8
Actuated Green, G (s)	78.8	78.8	45.3	45.3	27.2	27.2
Effective Green, g (s)	78.8	78.8	45.3	45.3	27.2	27.2
Actuated g/C Ratio	0.66	0.66	0.38	0.38	0.23	0.23
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	2.5
Lane Grp Cap (vph)	566	2327	1230	592	413	365
v/s Ratio Prot	0.23	c0.75	0.28		c0.21	
v/s Ratio Perm	0.39			0.06		0.05
v/c Ratio	0.94	1.14	0.75	0.17	0.91	0.23
Uniform Delay, d1	28.6	20.6	32.4	24.8	45.2	37.9
Progression Factor	1.00	1.00	1.01	2.15	1.00	1.00
Incremental Delay, d2	23.3	67.5	3.8	0.6	24.2	0.2
Delay (s)	51.9	88.1	36.4	54.1	69.4	38.1
Level of Service	D	F	D	D	E	D
Approach Delay (s)		82.1	39.7		53.8	
Approach LOS		F	D		D	

Intersection Summary			
HCM 2000 Control Delay	68.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
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)	73	2604	259	57	1092	90	69	1	164	6	0	2
Future Volume (vph)	73	2604	259	57	1092	90	69	1	164	6	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	0.99	
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	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	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	
Satd. Flow (prot)	1806	3544	1601	1674	3259	1575	1768	1921	1517	1555	1610	
Flt Permitted	0.23	1.00	1.00	0.05	1.00	1.00	0.76	1.00	1.00	0.76	1.00	
Satd. Flow (perm)	441	3544	1601	83	3259	1575	1408	1921	1517	1239	1610	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	2604	259	57	1092	90	69	1	164	6	0	2
RTOR Reduction (vph)	0	0	49	0	0	27	0	0	87	0	2	0
Lane Group Flow (vph)	73	2604	210	57	1092	63	69	1	77	6	0	0
Confl. Peds. (#/hr)	8					8	2		3	3		2
Heavy Vehicles (%)	1%	3%	2%	9%	12%	0%	3%	0%	6%	17%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	89.2	84.1	84.1	90.0	84.5	84.5	13.0	13.0	13.0	13.0	13.0	
Effective Green, g (s)	89.2	84.1	84.1	90.0	84.5	84.5	13.0	13.0	13.0	13.0	13.0	
Actuated g/C Ratio	0.74	0.70	0.70	0.75	0.70	0.70	0.11	0.11	0.11	0.11	0.11	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)	385	2483	1122	135	2294	1109	152	208	164	134	174	
v/s Ratio Prot	0.01	c0.73		c0.02	0.34			0.00			0.00	
v/s Ratio Perm	0.13		0.13	0.30		0.04	0.05		c0.05	0.00		
v/c Ratio	0.19	1.05	0.19	0.42	0.48	0.06	0.45	0.00	0.47	0.04	0.00	
Uniform Delay, d1	4.6	18.0	6.2	31.8	7.9	5.5	50.2	47.7	50.2	47.9	47.7	
Progression Factor	1.41	1.25	1.97	1.59	1.29	2.62	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	23.3	0.0	2.1	0.7	0.1	2.5	0.0	2.5	0.1	0.0	
Delay (s)	6.4	45.8	12.2	52.7	10.8	14.4	52.7	47.7	52.7	48.0	47.7	
Level of Service	A	D	B	D	B	B	D	D	D	D	D	
Approach Delay (s)		41.8			13.0			52.7			47.9	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	109.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2843	98	33	1246	54	84
Future Volume (vph)	2843	98	33	1246	54	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5016		1772	4683	1718	1535
Flt Permitted	1.00		0.04	1.00	0.95	1.00
Satd. Flow (perm)	5016		80	4683	1718	1535
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2843	98	33	1246	54	84
RTOR Reduction (vph)	2	0	0	0	0	77
Lane Group Flow (vph)	2939	0	33	1246	54	7
Confl. Peds. (#/hr)					2	1
Heavy Vehicles (%)	4%	5%	3%	12%	6%	5%
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	88.7		96.4	96.4	9.6	9.6
Effective Green, g (s)	88.7		96.4	96.4	9.6	9.6
Actuated g/C Ratio	0.74		0.80	0.80	0.08	0.08
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3707		116	3762	137	122
v/s Ratio Prot	c0.59		0.01	c0.27		
v/s Ratio Perm			0.22		c0.03	0.00
v/c Ratio	0.79		0.28	0.33	0.39	0.06
Uniform Delay, d1	9.9		12.5	3.2	52.4	51.0
Progression Factor	0.90		5.54	0.80	1.00	1.00
Incremental Delay, d2	0.6		1.1	0.2	3.9	0.4
Delay (s)	9.5		70.3	2.7	56.3	51.4
Level of Service	A		E	A	E	D
Approach Delay (s)	9.5			4.5	53.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.7%	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 (vph)	411	1938	483	172	756	204	225	898	248	227	1165	204
Future Volume (vph)	411	1938	483	172	756	204	225	898	248	227	1165	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	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	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
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1630	5092	1563	913	4594		3079	3411	1512	1755	3411	1541
Flt Permitted	0.15	1.00	1.00	0.11	1.00		0.95	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	486	5092	1563	104	4594		3079	3411	1512	200	3411	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	411	1938	483	172	756	204	225	898	248	227	1165	204
RTOR Reduction (vph)	0	0	127	0	41	0	0	0	109	0	0	98
Lane Group Flow (vph)	411	1938	356	172	920	0	225	898	139	227	1165	106
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	3%	3%	3%	100%	12%	5%	15%	7%	8%	4%	7%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6					8	4		4
Actuated Green, G (s)	58.0	43.0	43.0	47.0	36.0		8.0	36.0	36.0	44.0	36.0	36.0
Effective Green, g (s)	59.0	46.0	46.0	49.0	39.0		9.0	39.0	39.0	46.0	39.0	39.0
Actuated g/C Ratio	0.49	0.38	0.38	0.41	0.32		0.08	0.32	0.32	0.38	0.32	0.32
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	3.0	6.0		2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	420	1951	599	123	1493		230	1108	491	193	1108	500
v/s Ratio Prot	c0.15	0.38		c0.14	0.20		0.07	0.26		c0.09	0.34	
v/s Ratio Perm	0.33		0.23	c0.43					0.09	c0.36		0.07
v/c Ratio	0.98	0.99	0.59	1.40	0.62		0.98	0.81	0.28	1.18	1.05	0.21
Uniform Delay, d1	24.7	36.8	29.5	33.4	34.2		55.4	37.1	30.1	29.8	40.5	29.4
Progression Factor	1.46	0.99	1.03	1.00	1.00		1.00	1.00	1.00	1.09	1.08	1.73
Incremental Delay, d2	29.8	15.0	2.8	220.9	1.9		52.6	4.8	0.4	115.1	39.4	0.2
Delay (s)	65.9	51.6	33.3	254.4	36.1		108.0	41.9	30.5	147.4	83.4	51.2
Level of Service	E	D	C	F	D		F	D	C	F	F	D
Approach Delay (s)		50.5			69.3			50.7			88.4	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	62.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	98.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	111	54	0	1928	1022	0
Future Volume (vph)	111	54	0	1928	1022	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.95	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3437	1601		5142	3579	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3437	1601		5142	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	54	0	1928	1022	0
RTOR Reduction (vph)	0	49	0	0	0	0
Lane Group Flow (vph)	111	5	0	1928	1022	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	7.6	7.6		65.4	65.4	
Effective Green, g (s)	7.6	7.6		65.4	65.4	
Actuated g/C Ratio	0.09	0.09		0.77	0.77	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	307	143		3956	2753	
v/s Ratio Prot	c0.03			c0.37	0.29	
v/s Ratio Perm		0.00				
v/c Ratio	0.36	0.03		0.49	0.37	
Uniform Delay, d1	36.4	35.3		3.6	3.2	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.1		0.4	0.4	
Delay (s)	37.4	35.5		4.0	3.5	
Level of Service	D	D		A	A	
Approach Delay (s)	36.8			4.0	3.5	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	217	355	1658	56	101	1209
Future Volume (vph)	217	355	1658	56	101	1209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		4.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3471	1601	3561		1789	3579
Flt Permitted	0.95	1.00	1.00		0.06	1.00
Satd. Flow (perm)	3471	1601	3561		105	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	217	355	1658	56	101	1209
RTOR Reduction (vph)	0	98	2	0	0	0
Lane Group Flow (vph)	217	257	1712	0	101	1209
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	23.1	23.1	71.7		82.9	82.9
Effective Green, g (s)	23.1	23.1	71.7		82.9	82.9
Actuated g/C Ratio	0.19	0.19	0.60		0.69	0.69
Clearance Time (s)	7.0	7.0	7.0		4.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	668	308	2127		173	2472
v/s Ratio Prot	0.06		c0.48		0.03	c0.34
v/s Ratio Perm		c0.16			0.37	
v/c Ratio	0.32	0.84	0.81		0.58	0.49
Uniform Delay, d1	41.7	46.6	18.7		20.1	8.7
Progression Factor	1.00	1.00	1.47		1.00	1.00
Incremental Delay, d2	0.3	17.5	0.3		4.9	0.7
Delay (s)	42.0	64.1	27.8		25.1	9.4
Level of Service	D	E	C		C	A
Approach Delay (s)	55.7		27.8			10.6
Approach LOS	E		C			B

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	297	1190	2429	272	241	588
Future Volume (vph)	297	1190	2429	272	241	588
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1807	3544	3544	1601	1825	1570
Flt Permitted	0.06	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	112	3544	3544	1601	1825	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	297	1190	2429	272	241	588
RTOR Reduction (vph)	0	0	0	57	0	99
Lane Group Flow (vph)	297	1190	2429	215	241	489
Heavy Vehicles (%)	1%	3%	3%	2%	0%	4%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2			6		8
Actuated Green, G (s)	77.0	77.0	64.0	64.0	29.0	29.0
Effective Green, g (s)	78.0	81.0	68.0	68.0	33.0	33.0
Actuated g/C Ratio	0.65	0.68	0.57	0.57	0.28	0.28
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	2.5
Lane Grp Cap (vph)	214	2392	2008	907	501	431
v/s Ratio Prot	c0.12	0.34	0.69		0.13	
v/s Ratio Perm	c0.79			0.13		c0.31
v/c Ratio	1.39	0.50	1.21	0.24	0.48	1.13
Uniform Delay, d1	40.5	9.5	26.0	13.0	36.3	43.5
Progression Factor	1.00	1.00	0.95	1.59	1.00	1.00
Incremental Delay, d2	200.7	0.7	96.1	0.2	0.5	85.2
Delay (s)	241.2	10.3	120.7	20.9	36.9	128.7
Level of Service	F	B	F	C	D	F
Approach Delay (s)		56.4	110.7		102.0	
Approach LOS		E	F		F	

Intersection Summary			
HCM 2000 Control Delay	93.2	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)	9.0
Intersection Capacity Utilization	110.2%	ICU Level of Service	H
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)	0	1320	82	100	2367	3	238	3	60	59	0	56
Future Volume (vph)	0	1320	82	100	2367	3	238	3	60	59	0	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3544	1570	1825	3544	1633	1753	1921	1505	1786	1612	
Flt Permitted		1.00	1.00	0.12	1.00	1.00	0.72	1.00	1.00	0.76	1.00	
Satd. Flow (perm)		3544	1570	234	3544	1633	1330	1921	1505	1421	1612	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1320	82	100	2367	3	238	3	60	59	0	56
RTOR Reduction (vph)	0	0	35	0	0	1	0	0	47	0	43	0
Lane Group Flow (vph)	0	1320	47	100	2367	2	238	3	13	59	13	0
Confl. Peds. (#/hr)							1		2	2		1
Heavy Vehicles (%)	0%	3%	4%	0%	3%	0%	4%	0%	7%	2%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)		68.2	68.2	79.8	79.8	79.8	26.8	26.8	26.8	26.8	26.8	
Effective Green, g (s)		68.2	68.2	79.8	79.8	79.8	26.8	26.8	26.8	26.8	26.8	
Actuated g/C Ratio		0.57	0.57	0.66	0.66	0.66	0.22	0.22	0.22	0.22	0.22	
Clearance Time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)		2014	892	256	2356	1085	297	429	336	317	360	
v/s Ratio Prot		0.37		0.02	c0.67			0.00			0.01	
v/s Ratio Perm			0.03	0.23		0.00	c0.18		0.01	0.04		
v/c Ratio		0.66	0.05	0.39	1.00	0.00	0.80	0.01	0.04	0.19	0.03	
Uniform Delay, d1		17.8	11.5	12.1	20.1	6.7	44.1	36.2	36.5	37.8	36.5	
Progression Factor		1.69	3.43	2.01	1.83	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.5	0.1	0.8	18.0	0.0	14.7	0.0	0.1	0.1	0.0	
Delay (s)		31.5	39.6	25.1	54.9	6.7	58.8	36.3	36.6	37.9	36.5	
Level of Service		C	D	C	D	A	E	D	D	D	D	
Approach Delay (s)		32.0			53.6			54.1			37.2	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.1	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)	17.4
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↱		↰	↑↑↑	↰	↱
Traffic Volume (vph)	1400	36	44	2420	49	25
Future Volume (vph)	1400	36	44	2420	49	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5073		1789	5092	1825	1633
Flt Permitted	1.00		0.15	1.00	0.95	1.00
Satd. Flow (perm)	5073		290	5092	1825	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1400	36	44	2420	49	25
RTOR Reduction (vph)	1	0	0	0	0	23
Lane Group Flow (vph)	1435	0	44	2420	49	2
Heavy Vehicles (%)	3%	3%	2%	3%	0%	0%
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	87.8		96.8	96.8	9.2	9.2
Effective Green, g (s)	87.8		96.8	96.8	9.2	9.2
Actuated g/C Ratio	0.73		0.81	0.81	0.08	0.08
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3711		296	4107	139	125
v/s Ratio Prot	0.28		0.01	c0.48		
v/s Ratio Perm			0.11		c0.03	0.00
v/c Ratio	0.39		0.15	0.59	0.35	0.02
Uniform Delay, d1	6.0		2.8	4.3	52.6	51.2
Progression Factor	0.85		0.87	0.82	1.00	1.00
Incremental Delay, d2	0.2		0.1	0.2	3.2	0.1
Delay (s)	5.3		2.5	3.7	55.8	51.3
Level of Service	A		A	A	E	D
Approach Delay (s)	5.3			3.7	54.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
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)	273	1047	218	227	1651	160	445	1281	163	227	847	316
Future Volume (vph)	273	1047	218	227	1651	160	445	1281	163	227	847	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00	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
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1807	5092	1575	1755	5065		3471	3544	1445	1789	3510	1601
Flt Permitted	0.11	1.00	1.00	0.13	1.00		0.95	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	238	5092	1575	248	5065		3471	3544	1445	204	3510	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	273	1047	218	227	1651	160	445	1281	163	227	847	316
RTOR Reduction (vph)	0	0	149	0	9	0	0	0	69	0	0	135
Lane Group Flow (vph)	273	1047	69	227	1802	0	445	1281	94	227	847	181
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	3%	2%	4%	2%	4%	2%	3%	13%	2%	4%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6					8	4		4
Actuated Green, G (s)	46.2	36.2	36.2	49.8	38.0		14.0	42.0	42.0	44.0	36.0	36.0
Effective Green, g (s)	48.2	38.2	38.2	51.8	40.0		15.0	44.0	44.0	46.0	38.0	38.0
Actuated g/C Ratio	0.40	0.32	0.32	0.43	0.33		0.12	0.37	0.37	0.38	0.32	0.32
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0		2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	239	1620	501	267	1688		433	1299	529	197	1111	506
v/s Ratio Prot	c0.10	0.21		c0.09	c0.36		c0.13	0.36		c0.09	0.24	
v/s Ratio Perm	0.35		0.04	0.28					0.07	c0.36		0.11
v/c Ratio	1.14	0.65	0.14	0.85	1.07		1.03	0.99	0.18	1.15	0.76	0.36
Uniform Delay, d1	30.0	35.1	29.2	25.1	40.0		52.5	37.7	25.7	31.1	36.9	31.6
Progression Factor	1.78	1.45	4.28	1.00	1.00		1.00	1.00	1.00	0.84	1.04	1.24
Incremental Delay, d2	100.8	1.9	0.6	21.7	42.4		50.5	21.5	0.2	108.2	3.0	0.5
Delay (s)	154.3	52.9	125.3	46.8	82.4		103.0	59.2	26.0	134.3	41.5	39.9
Level of Service	F	D	F	D	F		F	E	C	F	D	D
Approach Delay (s)		81.2			78.4			66.7			56.3	
Approach LOS		F			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	71.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	113.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	167	139	0	1001	1940	0
Future Volume (vph)	167	139	0	1001	1940	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3219	1575		4902	3444	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3219	1575		4902	3444	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	139	0	1001	1940	0
RTOR Reduction (vph)	0	18	0	0	0	0
Lane Group Flow (vph)	167	121	0	1001	1940	0
Confl. Peds. (#/hr)		2	1			1
Heavy Vehicles (%)	10%	2%	0%	7%	6%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	12.3	12.3		60.7	60.7	
Effective Green, g (s)	12.3	12.3		60.7	60.7	
Actuated g/C Ratio	0.14	0.14		0.71	0.71	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	465	227		3500	2459	
v/s Ratio Prot	0.05			0.20	c0.56	
v/s Ratio Perm		c0.08				
v/c Ratio	0.36	0.53		0.29	0.79	
Uniform Delay, d1	32.8	33.7		4.4	8.0	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	3.1		0.2	2.7	
Delay (s)	33.4	36.7		4.6	10.6	
Level of Service	C	D		A	B	
Approach Delay (s)	34.9			4.6	10.6	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	51	76	1376	137	347	1732
Future Volume (vph)	51	76	1376	137	347	1732
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		4.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3471	1601	3530		1789	3579
Flt Permitted	0.95	1.00	1.00		0.09	1.00
Satd. Flow (perm)	3471	1601	3530		172	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	51	76	1376	137	347	1732
RTOR Reduction (vph)	0	71	4	0	0	0
Lane Group Flow (vph)	51	5	1509	0	347	1732
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	10.1	10.1	84.3		115.9	115.9
Effective Green, g (s)	10.1	10.1	84.3		115.9	115.9
Actuated g/C Ratio	0.07	0.07	0.60		0.83	0.83
Clearance Time (s)	7.0	7.0	7.0		4.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	250	115	2125		461	2962
v/s Ratio Prot	c0.01		0.43		c0.15	0.48
v/s Ratio Perm		0.00			c0.47	
v/c Ratio	0.20	0.05	0.71		0.75	0.58
Uniform Delay, d1	61.2	60.5	19.4		34.3	4.0
Progression Factor	1.00	1.00	1.33		1.00	1.00
Incremental Delay, d2	0.4	0.2	1.2		6.8	0.9
Delay (s)	61.6	60.6	27.0		41.1	4.9
Level of Service	E	E	C		D	A
Approach Delay (s)	61.0		27.0			10.9
Approach LOS	E		C			B

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	531	2646	919	213	377	373
Future Volume (vph)	531	2646	919	213	377	373
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	3544	3259	1570	1825	1613
Flt Permitted	0.24	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	882	3544	3259	1570	1825	1613
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	531	2646	919	213	377	373
RTOR Reduction (vph)	0	0	0	92	0	0
Lane Group Flow (vph)	531	2646	919	121	377	373
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	1%	3%	12%	4%	0%	0%
Turn Type	pm+pt	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases	2			6		Free
Actuated Green, G (s)	96.1	96.1	79.5	79.5	29.9	140.0
Effective Green, g (s)	96.1	96.1	79.5	79.5	29.9	140.0
Actuated g/C Ratio	0.69	0.69	0.57	0.57	0.21	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	841	2432	1850	891	389	1613
v/s Ratio Prot	0.06	c0.75	0.28		c0.21	
v/s Ratio Perm	0.38			0.08		0.23
v/c Ratio	0.63	1.09	0.50	0.14	0.97	0.23
Uniform Delay, d1	10.6	22.0	18.2	14.2	54.6	0.0
Progression Factor	1.00	1.00	1.21	4.96	1.00	1.00
Incremental Delay, d2	1.6	47.3	0.9	0.3	37.1	0.3
Delay (s)	12.1	69.2	22.9	70.6	91.7	0.3
Level of Service	B	E	C	E	F	A
Approach Delay (s)		59.7	31.9		46.2	
Approach LOS		E	C		D	

Intersection Summary			
HCM 2000 Control Delay	51.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
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)	73	2604	259	57	1092	90	69	1	164	6	0	2
Future Volume (vph)	73	2604	259	57	1092	90	69	1	164	6	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	0.99	
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	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	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	
Satd. Flow (prot)	1806	3544	1601	1674	3259	1570	1768	1921	1517	1554	1610	
Flt Permitted	0.24	1.00	1.00	0.04	1.00	1.00	0.76	1.00	1.00	0.76	1.00	
Satd. Flow (perm)	447	3544	1601	69	3259	1570	1408	1921	1517	1239	1610	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	2604	259	57	1092	90	69	1	164	6	0	2
RTOR Reduction (vph)	0	0	45	0	0	24	0	0	69	0	2	0
Lane Group Flow (vph)	73	2604	214	57	1092	66	69	1	95	6	0	0
Confl. Peds. (#/hr)	8					8	2		3	3		2
Heavy Vehicles (%)	1%	3%	2%	9%	12%	0%	3%	0%	6%	17%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	106.9	101.7	101.7	108.3	102.4	102.4	15.0	15.0	15.0	15.0	15.0	
Effective Green, g (s)	106.9	101.7	101.7	108.3	102.4	102.4	15.0	15.0	15.0	15.0	15.0	
Actuated g/C Ratio	0.76	0.73	0.73	0.77	0.73	0.73	0.11	0.11	0.11	0.11	0.11	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)	391	2574	1163	121	2383	1148	150	205	162	132	172	
v/s Ratio Prot	0.01	c0.73		c0.02	0.34			0.00			0.00	
v/s Ratio Perm	0.14		0.13	0.35		0.04	0.05		c0.06	0.00		
v/c Ratio	0.19	1.01	0.18	0.47	0.46	0.06	0.46	0.00	0.59	0.05	0.00	
Uniform Delay, d1	4.5	19.1	6.0	39.5	7.6	5.3	58.7	55.8	59.6	56.1	55.8	
Progression Factor	1.31	1.31	1.76	1.46	0.98	1.73	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	8.6	0.0	2.8	0.6	0.1	2.6	0.0	5.7	0.1	0.0	
Delay (s)	5.9	33.7	10.6	60.3	8.0	9.2	61.3	55.8	65.3	56.1	55.8	
Level of Service	A	C	B	E	A	A	E	E	E	E	E	
Approach Delay (s)		31.0			10.5			64.1			56.0	
Approach LOS		C			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	109.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2843	98	33	1246	54	84
Future Volume (vph)	2843	98	33	1246	54	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5016		1772	4683	1717	1535
Flt Permitted	1.00		0.04	1.00	0.95	1.00
Satd. Flow (perm)	5016		68	4683	1717	1535
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2843	98	33	1246	54	84
RTOR Reduction (vph)	1	0	0	0	0	77
Lane Group Flow (vph)	2940	0	33	1246	54	7
Confl. Peds. (#/hr)					2	1
Heavy Vehicles (%)	4%	5%	3%	12%	6%	5%
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	106.2		113.9	113.9	12.1	12.1
Effective Green, g (s)	106.2		113.9	113.9	12.1	12.1
Actuated g/C Ratio	0.76		0.81	0.81	0.09	0.09
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3804		100	3809	148	132
v/s Ratio Prot	c0.59		0.01	c0.27		
v/s Ratio Perm			0.26		c0.03	0.00
v/c Ratio	0.77		0.33	0.33	0.36	0.06
Uniform Delay, d1	9.9		13.6	3.3	60.3	58.7
Progression Factor	1.55		4.64	1.23	1.00	1.00
Incremental Delay, d2	0.6		1.7	0.2	3.2	0.4
Delay (s)	16.0		64.7	4.3	63.5	59.1
Level of Service	B		E	A	E	E
Approach Delay (s)	16.0			5.8	60.8	
Approach LOS	B			A	E	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.7%	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 (vph)	411	1938	483	172	756	204	225	898	248	227	1165	204
Future Volume (vph)	411	1938	483	172	756	204	225	898	248	227	1165	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	7.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1630	5092	1563	913	4683	1555	3079	3411	1512	3404	3411	1541
Flt Permitted	0.23	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	486	5092	1563	88	4683	1555	3079	3411	1512	3404	3411	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	411	1938	483	172	756	204	225	898	248	227	1165	204
RTOR Reduction (vph)	0	0	138	0	0	117	0	0	93	0	0	85
Lane Group Flow (vph)	411	1938	345	172	756	87	225	898	155	227	1165	119
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	3%	3%	3%	100%	12%	5%	15%	7%	8%	4%	7%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	71.0	51.0	51.0	58.9	42.9	42.9	9.5	40.1	40.1	10.9	41.5	41.5
Effective Green, g (s)	72.0	54.0	54.0	60.9	45.9	42.9	10.5	43.1	43.1	11.9	44.5	44.5
Actuated g/C Ratio	0.51	0.39	0.39	0.43	0.33	0.31	0.08	0.31	0.31	0.09	0.32	0.32
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	3.0	6.0	6.0	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	455	1964	602	138	1535	476	230	1050	465	289	1084	489
v/s Ratio Prot	c0.16	0.38		c0.15	0.16		c0.07	0.26		0.07	c0.34	
v/s Ratio Perm	0.30		0.22	c0.39		0.06			0.10			0.08
v/c Ratio	0.90	0.99	0.57	1.25	0.49	0.18	0.98	0.86	0.33	0.79	1.07	0.24
Uniform Delay, d1	24.2	42.6	33.9	43.7	37.7	35.7	64.6	45.5	37.4	62.8	47.8	35.3
Progression Factor	0.93	0.86	0.70	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.10	1.57
Incremental Delay, d2	14.9	13.5	2.6	157.4	1.1	0.8	52.6	7.2	0.6	10.7	47.6	0.3
Delay (s)	37.5	50.3	26.5	201.0	38.8	36.5	117.2	52.7	37.9	70.3	100.0	55.5
Level of Service	D	D	C	F	D	D	F	D	D	E	F	E
Approach Delay (s)		44.4			63.1			60.6			90.1	
Approach LOS		D			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	61.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	98.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	111	54	0	1928	1022	0
Future Volume (vph)	111	54	0	1928	1022	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.95	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3437	1601		5142	3579	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3437	1601		5142	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	54	0	1928	1022	0
RTOR Reduction (vph)	0	49	0	0	0	0
Lane Group Flow (vph)	111	5	0	1928	1022	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	7.6	7.6		65.4	65.4	
Effective Green, g (s)	7.6	7.6		65.4	65.4	
Actuated g/C Ratio	0.09	0.09		0.77	0.77	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	307	143		3956	2753	
v/s Ratio Prot	c0.03			c0.37	0.29	
v/s Ratio Perm		0.00				
v/c Ratio	0.36	0.03		0.49	0.37	
Uniform Delay, d1	36.4	35.3		3.6	3.2	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.1		0.4	0.4	
Delay (s)	37.4	35.5		4.0	3.5	
Level of Service	D	D		A	A	
Approach Delay (s)	36.8			4.0	3.5	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	217	355	1658	56	101	1209
Future Volume (vph)	217	355	1658	56	101	1209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		4.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3471	1601	3561		1789	3579
Flt Permitted	0.95	1.00	1.00		0.06	1.00
Satd. Flow (perm)	3471	1601	3561		113	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	217	355	1658	56	101	1209
RTOR Reduction (vph)	0	112	1	0	0	0
Lane Group Flow (vph)	217	243	1713	0	101	1209
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	26.9	26.9	85.9		99.1	99.1
Effective Green, g (s)	26.9	26.9	85.9		99.1	99.1
Actuated g/C Ratio	0.19	0.19	0.61		0.71	0.71
Clearance Time (s)	7.0	7.0	7.0		4.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	666	307	2184		190	2533
v/s Ratio Prot	0.06		c0.48		0.03	c0.34
v/s Ratio Perm		c0.15			0.34	
v/c Ratio	0.33	0.79	0.78		0.53	0.48
Uniform Delay, d1	48.7	53.9	20.1		21.6	9.0
Progression Factor	1.00	1.00	1.23		1.00	1.00
Incremental Delay, d2	0.3	13.0	1.1		2.8	0.6
Delay (s)	49.0	66.8	25.8		24.5	9.7
Level of Service	D	E	C		C	A
Approach Delay (s)	60.1		25.8			10.8
Approach LOS	E		C			B

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	297	1190	2429	272	241	588
Future Volume (vph)	297	1190	2429	272	241	588
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	0.0
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	3544	3544	1601	1825	1570
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	3544	3544	1601	1825	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	297	1190	2429	272	241	588
RTOR Reduction (vph)	0	0	0	49	0	0
Lane Group Flow (vph)	297	1190	2429	223	241	588
Heavy Vehicles (%)	1%	3%	3%	2%	0%	4%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	13.1	103.1	86.0	86.0	22.9	140.0
Effective Green, g (s)	14.1	107.1	90.0	90.0	26.9	140.0
Actuated g/C Ratio	0.10	0.76	0.64	0.64	0.19	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	353	2711	2278	1029	350	1570
v/s Ratio Prot	c0.08	0.34	c0.69		c0.13	
v/s Ratio Perm				0.14		0.37
v/c Ratio	0.84	0.44	1.07	0.22	0.69	0.37
Uniform Delay, d1	61.9	5.8	25.0	10.4	52.7	0.0
Progression Factor	1.00	1.00	1.03	1.60	1.00	1.00
Incremental Delay, d2	16.4	0.5	34.2	0.2	5.1	0.7
Delay (s)	78.2	6.3	59.9	16.8	57.7	0.7
Level of Service	E	A	E	B	E	A
Approach Delay (s)		20.7	55.6		17.3	
Approach LOS		C	E		B	

Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	99.0%	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 (vph)	0	1320	82	100	2367	3	238	3	60	59	0	56
Future Volume (vph)	0	1320	82	100	2367	3	238	3	60	59	0	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3544	1570	1825	3544	1633	1753	1921	1504	1785	1611	
Flt Permitted		1.00	1.00	0.13	1.00	1.00	0.72	1.00	1.00	0.76	1.00	
Satd. Flow (perm)		3544	1570	258	3544	1633	1329	1921	1504	1420	1611	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1320	82	100	2367	3	238	3	60	59	0	56
RTOR Reduction (vph)	0	0	32	0	0	1	0	0	47	0	44	0
Lane Group Flow (vph)	0	1320	50	100	2367	2	238	3	13	59	12	0
Confl. Peds. (#/hr)							1		2	2		1
Heavy Vehicles (%)	0%	3%	4%	0%	3%	0%	4%	0%	7%	2%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)		85.3	85.3	97.1	97.1	97.1	29.5	29.5	29.5	29.5	29.5	
Effective Green, g (s)		85.3	85.3	97.1	97.1	97.1	29.5	29.5	29.5	29.5	29.5	
Actuated g/C Ratio		0.61	0.61	0.69	0.69	0.69	0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)		2159	956	266	2458	1132	280	404	316	299	339	
v/s Ratio Prot		0.37		0.02	c0.67			0.00			0.01	
v/s Ratio Perm			0.03	0.24		0.00	c0.18		0.01	0.04		
v/c Ratio		0.61	0.05	0.38	0.96	0.00	0.85	0.01	0.04	0.20	0.03	
Uniform Delay, d1		17.0	11.0	11.7	19.8	6.6	53.1	43.7	44.0	45.5	43.9	
Progression Factor		0.81	0.87	1.55	1.56	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.2	0.1	0.8	10.0	0.0	21.2	0.0	0.1	0.1	0.0	
Delay (s)		15.0	9.7	18.9	40.8	6.6	74.3	43.7	44.0	45.6	43.9	
Level of Service		B	A	B	D	A	E	D	D	D	D	
Approach Delay (s)		14.7			39.9			68.0			44.8	
Approach LOS		B			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↱		↰	↑↑↑	↰	↱
Traffic Volume (vph)	1400	36	44	2420	49	25
Future Volume (vph)	1400	36	44	2420	49	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5073		1789	5092	1825	1633
Flt Permitted	1.00		0.16	1.00	0.95	1.00
Satd. Flow (perm)	5073		296	5092	1825	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1400	36	44	2420	49	25
RTOR Reduction (vph)	1	0	0	0	0	23
Lane Group Flow (vph)	1435	0	44	2420	49	2
Heavy Vehicles (%)	3%	3%	2%	3%	0%	0%
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	107.4		116.4	116.4	9.6	9.6
Effective Green, g (s)	107.4		116.4	116.4	9.6	9.6
Actuated g/C Ratio	0.77		0.83	0.83	0.07	0.07
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3891		299	4233	125	111
v/s Ratio Prot	0.28		0.01	c0.48		
v/s Ratio Perm			0.12		c0.03	0.00
v/c Ratio	0.37		0.15	0.57	0.39	0.02
Uniform Delay, d1	5.3		2.5	3.8	62.4	60.8
Progression Factor	1.45		0.49	0.55	1.00	1.00
Incremental Delay, d2	0.2		0.1	0.3	4.2	0.1
Delay (s)	7.9		1.3	2.3	66.6	60.9
Level of Service	A		A	A	E	E
Approach Delay (s)	7.9			2.3	64.7	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
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)	273	1047	218	227	1651	160	445	1281	163	227	847	316
Future Volume (vph)	273	1047	218	227	1651	160	445	1281	163	227	847	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	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)	1807	5092	1574	1755	5142	1570	3471	3544	1445	3471	3510	1601
Flt Permitted	0.09	1.00	1.00	0.14	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	238	5092	1574	250	5142	1570	3471	3544	1445	3471	3510	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	273	1047	218	227	1651	160	445	1281	163	227	847	316
RTOR Reduction (vph)	0	0	147	0	0	83	0	0	79	0	0	137
Lane Group Flow (vph)	273	1047	71	227	1651	77	445	1281	84	227	847	179
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	3%	2%	4%	2%	4%	2%	3%	13%	2%	4%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	58.4	43.4	43.4	61.6	45.0	45.0	19.6	49.0	49.0	9.0	38.4	38.4
Effective Green, g (s)	60.4	45.4	45.4	63.6	47.0	47.0	20.6	51.0	51.0	10.0	40.4	40.4
Actuated g/C Ratio	0.43	0.32	0.32	0.45	0.34	0.34	0.15	0.36	0.36	0.07	0.29	0.29
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	281	1651	510	302	1726	527	510	1291	526	247	1012	462
v/s Ratio Prot	c0.11	0.21		c0.09	c0.32		c0.13	c0.36		c0.07	0.24	
v/s Ratio Perm	0.31		0.04	0.25		0.05			0.06			0.11
v/c Ratio	0.97	0.63	0.14	0.75	0.96	0.15	0.87	0.99	0.16	0.92	0.84	0.39
Uniform Delay, d1	37.0	40.2	33.5	27.3	45.5	32.5	58.4	44.3	30.0	64.6	46.7	39.9
Progression Factor	1.59	1.29	3.29	1.00	1.00	1.00	1.00	1.00	1.00	0.93	1.08	1.60
Incremental Delay, d2	44.6	1.8	0.5	9.6	13.6	0.6	15.0	23.1	0.2	33.8	5.9	0.7
Delay (s)	103.4	53.8	110.7	36.9	59.1	33.1	73.5	67.4	30.2	93.6	56.5	64.5
Level of Service	F	D	F	D	E	C	E	E	C	F	E	E
Approach Delay (s)		70.7			54.5			65.6			64.3	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	63.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	103.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	167	172	0	1014	2034	0
Future Volume (vph)	167	172	0	1014	2034	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3219	1576		4902	3444	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3219	1576		4902	3444	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	172	0	1014	2034	0
RTOR Reduction (vph)	0	14	0	0	0	0
Lane Group Flow (vph)	167	158	0	1014	2034	0
Confl. Peds. (#/hr)		2	1			1
Heavy Vehicles (%)	10%	2%	0%	7%	6%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	13.5	13.5		59.5	59.5	
Effective Green, g (s)	13.5	13.5		59.5	59.5	
Actuated g/C Ratio	0.16	0.16		0.70	0.70	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	511	250		3431	2410	
v/s Ratio Prot	0.05			0.21	c0.59	
v/s Ratio Perm		c0.10				
v/c Ratio	0.33	0.63		0.30	0.84	
Uniform Delay, d1	31.7	33.4		4.8	9.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	5.7		0.2	3.8	
Delay (s)	32.2	39.2		5.0	13.2	
Level of Service	C	D		A	B	
Approach Delay (s)	35.7			5.0	13.2	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	51	76	1406	137	347	1859
Future Volume (vph)	51	76	1406	137	347	1859
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		4.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3471	1601	3531		1789	3579
Flt Permitted	0.95	1.00	1.00		0.09	1.00
Satd. Flow (perm)	3471	1601	3531		161	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	51	76	1406	137	347	1859
RTOR Reduction (vph)	0	71	4	0	0	0
Lane Group Flow (vph)	51	5	1539	0	347	1859
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	10.1	10.1	84.3		115.9	115.9
Effective Green, g (s)	10.1	10.1	84.3		115.9	115.9
Actuated g/C Ratio	0.07	0.07	0.60		0.83	0.83
Clearance Time (s)	7.0	7.0	7.0		4.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	250	115	2126		454	2962
v/s Ratio Prot	c0.01		0.44		c0.15	0.52
v/s Ratio Perm		0.00			c0.48	
v/c Ratio	0.20	0.05	0.72		0.76	0.63
Uniform Delay, d1	61.2	60.5	19.6		35.8	4.3
Progression Factor	1.00	1.00	1.36		1.00	1.00
Incremental Delay, d2	0.4	0.2	1.3		7.5	1.0
Delay (s)	61.6	60.6	28.0		43.3	5.3
Level of Service	E	E	C		D	A
Approach Delay (s)	61.0		28.0			11.3
Approach LOS	E		C			B

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	530	2800	954	216	393	373
Future Volume (vph)	530	2800	954	216	393	373
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	3544	3259	1570	1825	1613
Flt Permitted	0.22	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	826	3544	3259	1570	1825	1613
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	530	2800	954	216	393	373
RTOR Reduction (vph)	0	0	0	95	0	0
Lane Group Flow (vph)	530	2800	954	121	393	373
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	1%	3%	12%	4%	0%	0%
Turn Type	pm+pt	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases	2			6		Free
Actuated Green, G (s)	95.0	95.0	78.3	78.3	31.0	140.0
Effective Green, g (s)	95.0	95.0	78.3	78.3	31.0	140.0
Actuated g/C Ratio	0.68	0.68	0.56	0.56	0.22	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	803	2404	1822	878	404	1613
v/s Ratio Prot	0.06	c0.79	0.29		c0.22	
v/s Ratio Perm	0.39			0.08		0.23
v/c Ratio	0.66	1.16	0.52	0.14	0.97	0.23
Uniform Delay, d1	11.5	22.5	19.2	14.7	54.1	0.0
Progression Factor	1.00	1.00	0.79	1.79	1.00	1.00
Incremental Delay, d2	2.0	79.1	1.0	0.3	37.4	0.3
Delay (s)	13.5	101.6	16.2	26.7	91.5	0.3
Level of Service	B	F	B	C	F	A
Approach Delay (s)		87.6	18.2		47.1	
Approach LOS		F	B		D	

Intersection Summary			
HCM 2000 Control Delay	66.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	170	3023	1163	680	155	38
Future Volume (vph)	170	3023	1163	680	155	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	3579	3579	1601	3471	1457
Flt Permitted	0.23	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	433	3579	3579	1601	3471	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	170	3023	1163	680	155	38
RTOR Reduction (vph)	0	0	0	126	2	31
Lane Group Flow (vph)	170	3023	1163	554	157	3
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	114.0	114.0	114.0	114.0	12.0	12.0
Effective Green, g (s)	114.0	114.0	114.0	114.0	12.0	12.0
Actuated g/C Ratio	0.81	0.81	0.81	0.81	0.09	0.09
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	352	2914	2914	1303	297	124
v/s Ratio Prot		c0.84	0.32		c0.05	
v/s Ratio Perm	0.39			0.35		0.00
v/c Ratio	0.48	1.04	0.40	0.42	0.53	0.02
Uniform Delay, d1	4.0	13.0	3.6	3.7	61.3	58.6
Progression Factor	0.37	0.40	1.29	4.89	1.00	1.00
Incremental Delay, d2	0.4	18.3	0.3	0.7	1.7	0.1
Delay (s)	1.9	23.4	4.9	18.7	63.0	58.7
Level of Service	A	C	A	B	E	E
Approach Delay (s)		22.3	10.0		62.2	
Approach LOS		C	B		E	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
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)	73	2751	267	57	1738	90	103	1	164	6	0	2
Future Volume (vph)	73	2751	267	57	1738	90	103	1	164	6	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	0.99	
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	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	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	
Satd. Flow (prot)	1807	3544	1601	1674	3259	1570	1768	1921	1517	1554	1610	
Flt Permitted	0.09	1.00	1.00	0.04	1.00	1.00	0.76	1.00	1.00	0.76	1.00	
Satd. Flow (perm)	171	3544	1601	70	3259	1570	1408	1921	1517	1239	1610	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	2751	267	57	1738	90	103	1	164	6	0	2
RTOR Reduction (vph)	0	0	45	0	0	19	0	0	67	0	2	0
Lane Group Flow (vph)	73	2751	222	57	1738	71	103	1	97	6	0	0
Confl. Peds. (#/hr)	8					8	2		3	3		2
Heavy Vehicles (%)	1%	3%	2%	9%	12%	0%	3%	0%	6%	17%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	106.3	100.5	100.5	106.5	100.6	100.6	16.2	16.2	16.2	16.2	16.2	
Effective Green, g (s)	106.3	100.5	100.5	106.5	100.6	100.6	16.2	16.2	16.2	16.2	16.2	
Actuated g/C Ratio	0.76	0.72	0.72	0.76	0.72	0.72	0.12	0.12	0.12	0.12	0.12	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)	197	2544	1149	120	2341	1128	162	222	175	143	186	
v/s Ratio Prot	0.02	c0.78		c0.02	0.53			0.00			0.00	
v/s Ratio Perm	0.26		0.14	0.34		0.05	c0.07		0.06	0.00		
v/c Ratio	0.37	1.08	0.19	0.47	0.74	0.06	0.64	0.00	0.55	0.04	0.00	
Uniform Delay, d1	9.9	19.8	6.5	38.6	11.9	5.8	59.1	54.8	58.5	55.0	54.7	
Progression Factor	1.23	1.10	1.49	1.27	1.13	0.57	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	38.6	0.1	2.6	1.9	0.1	8.3	0.0	4.1	0.0	0.0	
Delay (s)	12.5	60.4	9.7	51.8	15.3	3.4	67.4	54.8	62.6	55.0	54.7	
Level of Service	B	E	A	D	B	A	E	D	E	E	D	
Approach Delay (s)		54.9			15.9			64.4			55.0	
Approach LOS		D			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↱		↰	↑↑↑	↰	↱
Traffic Volume (vph)	2982	106	33	1858	88	84
Future Volume (vph)	2982	106	33	1858	88	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5015		1772	4683	1717	1535
Flt Permitted	1.00		0.04	1.00	0.95	1.00
Satd. Flow (perm)	5015		69	4683	1717	1535
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2982	106	33	1858	88	84
RTOR Reduction (vph)	1	0	0	0	0	75
Lane Group Flow (vph)	3087	0	33	1858	88	9
Confl. Peds. (#/hr)					2	1
Heavy Vehicles (%)	4%	5%	3%	12%	6%	5%
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	103.7		111.5	111.5	14.5	14.5
Effective Green, g (s)	103.7		111.5	111.5	14.5	14.5
Actuated g/C Ratio	0.74		0.80	0.80	0.10	0.10
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3714		101	3729	177	158
v/s Ratio Prot	c0.62		0.01	c0.40		
v/s Ratio Perm			0.25		c0.05	0.01
v/c Ratio	0.83		0.33	0.50	0.50	0.06
Uniform Delay, d1	12.2		18.5	4.8	59.3	56.6
Progression Factor	1.46		4.00	1.43	1.00	1.00
Incremental Delay, d2	0.6		1.1	0.3	4.5	0.3
Delay (s)	18.6		75.3	7.2	63.8	56.9
Level of Service	B		E	A	E	E
Approach Delay (s)	18.6			8.3	60.4	
Approach LOS	B			A	E	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.6%	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 (vph)	441	1992	538	172	994	204	472	898	248	227	1165	331
Future Volume (vph)	441	1992	538	172	994	204	472	898	248	227	1165	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	7.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1630	5092	1563	913	4683	1555	3079	3411	1512	3404	3411	1541
Flt Permitted	0.11	1.00	1.00	0.11	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	486	5092	1563	101	4683	1555	3079	3411	1512	3404	3411	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	441	1992	538	172	994	204	472	898	248	227	1165	331
RTOR Reduction (vph)	0	0	172	0	0	115	0	0	93	0	0	109
Lane Group Flow (vph)	441	1992	366	172	994	89	472	898	155	227	1165	222
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	3%	3%	3%	100%	12%	5%	15%	7%	8%	4%	7%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	66.0	47.0	47.0	52.0	37.0	37.0	17.0	45.1	45.1	10.9	39.0	39.0
Effective Green, g (s)	67.0	50.0	50.0	54.0	40.0	37.0	18.0	48.1	48.1	11.9	42.0	42.0
Actuated g/C Ratio	0.48	0.36	0.36	0.39	0.29	0.26	0.13	0.34	0.34	0.09	0.30	0.30
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	3.0	6.0	6.0	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	445	1818	558	131	1338	410	395	1171	519	289	1023	462
v/s Ratio Prot	c0.18	0.39		c0.15	0.21		c0.15	0.26		0.07	c0.34	
v/s Ratio Perm	0.29		0.23	c0.35		0.06			0.10			0.14
v/c Ratio	0.99	1.10	0.66	1.31	0.74	0.22	1.19	0.77	0.30	0.79	1.14	0.48
Uniform Delay, d1	30.3	45.0	37.8	41.8	45.3	40.2	61.0	41.0	33.6	62.8	49.0	40.1
Progression Factor	1.01	0.87	0.68	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.09	1.38
Incremental Delay, d2	29.9	48.8	3.4	184.8	3.8	1.2	110.0	3.3	0.4	10.2	72.3	0.9
Delay (s)	60.5	87.9	29.0	226.6	49.1	41.4	171.0	44.2	34.0	69.3	125.8	56.2
Level of Service	E	F	C	F	D	D	F	D	C	E	F	E
Approach Delay (s)		73.1			70.2			79.6			105.0	
Approach LOS		E			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	81.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	107.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	64	0	585	265	0	129
Future Volume (Veh/h)	64	0	585	265	0	129
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	64	0	585	265	0	129
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			180			
pX, platoon unblocked						
vC, conflicting volume	714	585			850	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	714	585			850	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	100			100	
cM capacity (veh/h)	398	511			788	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	64	0	585	265	129
Volume Left	64	0	0	0	0
Volume Right	0	0	0	265	0
cSH	398	1700	1700	1700	788
Volume to Capacity	0.16	0.00	0.34	0.16	0.00
Queue Length 95th (m)	4.3	0.0	0.0	0.0	0.0
Control Delay (s)	15.8	0.0	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	15.8		0.0		0.0
Approach LOS	C				

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	111	72	0	1993	1070	0
Future Volume (vph)	111	72	0	1993	1070	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.95	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3437	1601		5142	3579	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3437	1601		5142	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	72	0	1993	1070	0
RTOR Reduction (vph)	0	66	0	0	0	0
Lane Group Flow (vph)	111	6	0	1993	1070	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	7.4	7.4		65.6	65.6	
Effective Green, g (s)	7.4	7.4		65.6	65.6	
Actuated g/C Ratio	0.09	0.09		0.77	0.77	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	299	139		3968	2762	
v/s Ratio Prot	c0.03			c0.39	0.30	
v/s Ratio Perm		0.00				
v/c Ratio	0.37	0.05		0.50	0.39	
Uniform Delay, d1	36.6	35.6		3.6	3.2	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.2		0.5	0.4	
Delay (s)	37.7	35.7		4.1	3.6	
Level of Service	D	D		A	A	
Approach Delay (s)	36.9			4.1	3.6	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	217	355	1797	56	101	1275
Future Volume (vph)	217	355	1797	56	101	1275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		4.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3471	1601	3562		1789	3579
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	3471	1601	3562		84	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	217	355	1797	56	101	1275
RTOR Reduction (vph)	0	111	1	0	0	0
Lane Group Flow (vph)	217	244	1852	0	101	1275
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	26.9	26.9	85.9		99.1	99.1
Effective Green, g (s)	26.9	26.9	85.9		99.1	99.1
Actuated g/C Ratio	0.19	0.19	0.61		0.71	0.71
Clearance Time (s)	7.0	7.0	7.0		4.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	666	307	2185		171	2533
v/s Ratio Prot	0.06		c0.52		c0.04	0.36
v/s Ratio Perm		c0.15			0.38	
v/c Ratio	0.33	0.79	0.85		0.59	0.50
Uniform Delay, d1	48.7	53.9	21.8		32.3	9.3
Progression Factor	1.00	1.00	0.99		1.00	1.00
Incremental Delay, d2	0.3	13.1	0.4		5.4	0.7
Delay (s)	49.0	67.0	22.0		37.7	10.0
Level of Service	D	E	C		D	A
Approach Delay (s)	60.2		22.0			12.0
Approach LOS	E		C			B

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	297	1270	2596	289	250	588
Future Volume (vph)	297	1270	2596	289	250	588
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	0.0
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	3544	3544	1601	1825	1570
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	3544	3544	1601	1825	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	297	1270	2596	289	250	588
RTOR Reduction (vph)	0	0	0	48	0	0
Lane Group Flow (vph)	297	1270	2596	241	250	588
Heavy Vehicles (%)	1%	3%	3%	2%	0%	4%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	12.6	102.6	86.0	86.0	23.4	140.0
Effective Green, g (s)	13.6	106.6	90.0	90.0	27.4	140.0
Actuated g/C Ratio	0.10	0.76	0.64	0.64	0.20	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	340	2698	2278	1029	357	1570
v/s Ratio Prot	c0.08	0.36	c0.73		c0.14	
v/s Ratio Perm				0.15		0.37
v/c Ratio	0.87	0.47	1.14	0.23	0.70	0.37
Uniform Delay, d1	62.4	6.2	25.0	10.5	52.5	0.0
Progression Factor	1.00	1.00	0.46	0.57	1.00	1.00
Incremental Delay, d2	21.1	0.6	63.4	0.0	5.7	0.7
Delay (s)	83.5	6.8	74.8	6.0	58.1	0.7
Level of Service	F	A	E	A	E	A
Approach Delay (s)		21.3	67.9		17.8	
Approach LOS		C	E		B	

Intersection Summary			
HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	104.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰↰	↱
Traffic Volume (vph)	97	1423	2687	366	750	199
Future Volume (vph)	97	1423	2687	366	750	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	3579	3579	1601	3471	1457
Flt Permitted	0.05	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	87	3579	3579	1601	3471	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	97	1423	2687	366	750	199
RTOR Reduction (vph)	0	0	0	86	2	67
Lane Group Flow (vph)	97	1423	2687	281	768	112
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	94.0	94.0	83.0	83.0	32.0	32.0
Effective Green, g (s)	94.0	94.0	83.0	83.0	32.0	32.0
Actuated g/C Ratio	0.67	0.67	0.59	0.59	0.23	0.23
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	143	2403	2121	949	793	333
v/s Ratio Prot	0.03	c0.40	c0.75		c0.22	
v/s Ratio Perm	0.42			0.18		0.08
v/c Ratio	0.68	0.59	1.27	0.30	0.97	0.34
Uniform Delay, d1	37.2	12.5	28.5	14.1	53.5	45.1
Progression Factor	1.45	0.76	0.86	1.21	1.00	1.00
Incremental Delay, d2	10.8	1.0	120.4	0.1	24.3	0.6
Delay (s)	64.6	10.5	145.0	17.2	77.8	45.7
Level of Service	E	B	F	B	E	D
Approach Delay (s)		13.9	129.7		71.7	
Approach LOS		B	F		E	

Intersection Summary			
HCM 2000 Control Delay	87.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	115.8%	ICU Level of Service	H
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)	0	2024	120	100	2703	3	254	3	60	59	0	56
Future Volume (vph)	0	2024	120	100	2703	3	254	3	60	59	0	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3544	1570	1825	3544	1633	1753	1921	1504	1785	1611	
Flt Permitted		1.00	1.00	0.04	1.00	1.00	0.72	1.00	1.00	0.76	1.00	
Satd. Flow (perm)		3544	1570	86	3544	1633	1329	1921	1504	1420	1611	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2024	120	100	2703	3	254	3	60	59	0	56
RTOR Reduction (vph)	0	0	39	0	0	1	0	0	47	0	44	0
Lane Group Flow (vph)	0	2024	81	100	2703	2	254	3	13	59	12	0
Confl. Peds. (#/hr)							1		2	2		1
Heavy Vehicles (%)	0%	3%	4%	0%	3%	0%	4%	0%	7%	2%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)		84.9	84.9	95.8	95.8	95.8	30.8	30.8	30.8	30.8	30.8	
Effective Green, g (s)		84.9	84.9	95.8	95.8	95.8	30.8	30.8	30.8	30.8	30.8	
Actuated g/C Ratio		0.61	0.61	0.68	0.68	0.68	0.22	0.22	0.22	0.22	0.22	
Clearance Time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)		2149	952	144	2425	1117	292	422	330	312	354	
v/s Ratio Prot		0.57		0.03	c0.76			0.00			0.01	
v/s Ratio Perm			0.05	0.44		0.00	c0.19		0.01	0.04		
v/c Ratio		0.94	0.09	0.69	1.11	0.00	0.87	0.01	0.04	0.19	0.03	
Uniform Delay, d1		25.3	11.4	36.4	22.1	7.0	52.7	42.7	43.0	44.4	42.9	
Progression Factor		0.60	0.19	1.41	1.40	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		7.2	0.1	10.8	56.7	0.0	23.4	0.0	0.1	0.1	0.0	
Delay (s)		22.2	2.3	62.3	87.6	7.0	76.1	42.7	43.0	44.5	42.9	
Level of Service		C	A	E	F	A	E	D	D	D	D	
Approach Delay (s)		21.1			86.6			69.5			43.8	
Approach LOS		C			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	58.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	115.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↱		↰	↑↑↑	↰	↱
Traffic Volume (vph)	2068	72	44	2738	67	25
Future Volume (vph)	2068	72	44	2738	67	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5066		1789	5092	1825	1633
Flt Permitted	1.00		0.06	1.00	0.95	1.00
Satd. Flow (perm)	5066		121	5092	1825	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2068	72	44	2738	67	25
RTOR Reduction (vph)	2	0	0	0	0	23
Lane Group Flow (vph)	2138	0	44	2738	67	2
Heavy Vehicles (%)	3%	3%	2%	3%	0%	0%
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	106.1		115.3	115.3	10.7	10.7
Effective Green, g (s)	106.1		115.3	115.3	10.7	10.7
Actuated g/C Ratio	0.76		0.82	0.82	0.08	0.08
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3839		161	4193	139	124
v/s Ratio Prot	0.42		0.01	c0.54		
v/s Ratio Perm			0.21		c0.04	0.00
v/c Ratio	0.56		0.27	0.65	0.48	0.02
Uniform Delay, d1	7.1		4.9	4.7	62.0	59.8
Progression Factor	1.23		2.56	0.72	1.00	1.00
Incremental Delay, d2	0.2		0.3	0.3	5.4	0.1
Delay (s)	9.0		12.9	3.6	67.4	59.9
Level of Service	A		B	A	E	E
Approach Delay (s)	9.0			3.8	65.4	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
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)	412	1308	486	227	1775	160	573	1281	163	227	847	382
Future Volume (vph)	412	1308	486	227	1775	160	573	1281	163	227	847	382
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	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)	1807	5092	1574	1755	5142	1570	3471	3544	1445	3471	3510	1601
Flt Permitted	0.08	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	238	5092	1574	154	5142	1570	3471	3544	1445	3471	3510	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	412	1308	486	227	1775	160	573	1281	163	227	847	382
RTOR Reduction (vph)	0	0	197	0	0	81	0	0	60	0	0	156
Lane Group Flow (vph)	412	1308	289	227	1775	79	573	1281	103	227	847	226
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	3%	2%	4%	2%	4%	2%	3%	13%	2%	4%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	61.8	46.8	46.8	62.2	47.0	47.0	20.0	49.0	49.0	7.0	36.0	36.0
Effective Green, g (s)	63.8	48.8	48.8	64.2	49.0	49.0	21.0	51.0	51.0	8.0	38.0	38.0
Actuated g/C Ratio	0.46	0.35	0.35	0.46	0.35	0.35	0.15	0.36	0.36	0.06	0.27	0.27
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	287	1774	548	255	1799	549	520	1291	526	198	952	434
v/s Ratio Prot	c0.16	0.26		0.10	0.35		c0.17	c0.36		0.07	0.24	
v/s Ratio Perm	c0.49		0.18	0.30		0.05			0.07			0.14
v/c Ratio	1.44	0.74	0.53	0.89	0.99	0.14	1.10	0.99	0.20	1.15	0.89	0.52
Uniform Delay, d1	37.6	40.0	36.4	39.2	45.2	31.1	59.5	44.3	30.5	66.0	49.0	43.3
Progression Factor	1.48	1.33	1.87	1.00	1.00	1.00	1.00	1.00	1.00	0.93	1.17	1.62
Incremental Delay, d2	212.7	2.4	3.2	29.5	18.3	0.5	70.3	23.1	0.3	106.0	9.6	1.3
Delay (s)	268.3	55.6	71.0	68.7	63.5	31.7	129.8	67.4	30.7	167.7	67.1	71.6
Level of Service	F	E	E	E	E	C	F	E	C	F	E	E
Approach Delay (s)		98.7			61.7			82.2			84.0	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	81.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	114.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	311	0	307	156	0	638
Future Volume (Veh/h)	311	0	307	156	0	638
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	311	0	307	156	0	638
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			168			
pX, platoon unblocked						
vC, conflicting volume	945	307			463	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	945	307			463	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	100			100	
cM capacity (veh/h)	291	733			1098	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	311	0	307	156	638
Volume Left	311	0	0	0	0
Volume Right	0	0	0	156	0
cSH	291	1700	1700	1700	1098
Volume to Capacity	1.07	0.00	0.18	0.09	0.00
Queue Length 95th (m)	92.3	0.0	0.0	0.0	0.0
Control Delay (s)	112.0	0.0	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	112.0		0.0		0.0
Approach LOS	F				

Intersection Summary			
Average Delay	24.7		
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	530	2800	954	216	393	373
Future Volume (vph)	530	2800	954	216	393	373
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4117	1570	1825	1613
Flt Permitted	0.20	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	748	4476	4117	1570	1825	1613
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	530	2800	954	216	393	373
RTOR Reduction (vph)	0	0	0	100	0	0
Lane Group Flow (vph)	530	2800	954	116	393	373
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	1%	3%	12%	4%	0%	0%
Turn Type	pm+pt	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases	2			6		Free
Actuated Green, G (s)	92.9	92.9	75.5	75.5	33.1	140.0
Effective Green, g (s)	92.9	92.9	75.5	75.5	33.1	140.0
Actuated g/C Ratio	0.66	0.66	0.54	0.54	0.24	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	760	2970	2220	846	431	1613
v/s Ratio Prot	0.07	c0.63	0.23		c0.22	
v/s Ratio Perm	0.40			0.07		0.23
v/c Ratio	0.70	0.94	0.43	0.14	0.91	0.23
Uniform Delay, d1	11.3	21.2	19.3	16.0	52.0	0.0
Progression Factor	1.00	1.00	0.87	2.28	1.00	1.00
Incremental Delay, d2	2.8	7.7	0.6	0.3	23.3	0.3
Delay (s)	14.1	28.8	17.4	36.9	75.3	0.3
Level of Service	B	C	B	D	E	A
Approach Delay (s)		26.5	21.0		38.8	
Approach LOS		C	C		D	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	170	3023	1163	680	155	38
Future Volume (vph)	170	3023	1163	680	155	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3471	1457
Flt Permitted	0.19	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	360	4520	4520	1601	3471	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	170	3023	1163	680	155	38
RTOR Reduction (vph)	0	0	0	126	2	31
Lane Group Flow (vph)	170	3023	1163	554	157	3
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	114.0	114.0	114.0	114.0	12.0	12.0
Effective Green, g (s)	114.0	114.0	114.0	114.0	12.0	12.0
Actuated g/C Ratio	0.81	0.81	0.81	0.81	0.09	0.09
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	293	3680	3680	1303	297	124
v/s Ratio Prot		c0.67	0.26		c0.05	
v/s Ratio Perm	0.47			0.35		0.00
v/c Ratio	0.58	0.82	0.32	0.42	0.53	0.02
Uniform Delay, d1	4.6	7.3	3.3	3.7	61.3	58.6
Progression Factor	0.30	0.30	0.25	0.61	1.00	1.00
Incremental Delay, d2	3.0	0.8	0.2	0.8	1.7	0.1
Delay (s)	4.4	3.0	1.0	3.1	63.0	58.7
Level of Service	A	A	A	A	E	E
Approach Delay (s)		3.0	1.8		62.2	
Approach LOS		A	A		E	

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	78.4%	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 (vph)	73	2751	267	57	1738	90	103	1	164	6	0	2
Future Volume (vph)	73	2751	267	57	1738	90	103	1	164	6	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	0.99	
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	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	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	
Satd. Flow (prot)	1807	4476	1601	1674	4117	1570	1768	1921	1517	1554	1610	
Flt Permitted	0.08	1.00	1.00	0.04	1.00	1.00	0.76	1.00	1.00	0.76	1.00	
Satd. Flow (perm)	149	4476	1601	70	4117	1570	1408	1921	1517	1239	1610	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	2751	267	57	1738	90	103	1	164	6	0	2
RTOR Reduction (vph)	0	0	56	0	0	23	0	0	69	0	2	0
Lane Group Flow (vph)	73	2751	211	57	1738	67	103	1	95	6	0	0
Confl. Peds. (#/hr)	8					8	2		3	3		2
Heavy Vehicles (%)	1%	3%	2%	9%	12%	0%	3%	0%	6%	17%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	106.1	100.5	100.5	106.7	100.8	100.8	16.2	16.2	16.2	16.2	16.2	
Effective Green, g (s)	106.1	100.5	100.5	106.7	100.8	100.8	16.2	16.2	16.2	16.2	16.2	
Actuated g/C Ratio	0.76	0.72	0.72	0.76	0.72	0.72	0.12	0.12	0.12	0.12	0.12	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)	179	3213	1149	120	2964	1130	162	222	175	143	186	
v/s Ratio Prot	0.02	c0.61		c0.02	0.42			0.00			0.00	
v/s Ratio Perm	0.29		0.13	0.34		0.04	c0.07		0.06	0.00		
v/c Ratio	0.41	0.86	0.18	0.47	0.59	0.06	0.64	0.00	0.54	0.04	0.00	
Uniform Delay, d1	6.5	14.5	6.4	24.5	9.5	5.7	59.1	54.8	58.4	55.0	54.7	
Progression Factor	1.50	1.20	2.01	1.01	2.07	2.66	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	1.9	0.2	2.5	0.7	0.1	8.3	0.0	3.8	0.0	0.0	
Delay (s)	10.4	19.3	13.1	27.1	20.4	15.4	67.4	54.8	62.2	55.0	54.7	
Level of Service	B	B	B	C	C	B	E	D	E	E	D	
Approach Delay (s)		18.6			20.3			64.2			55.0	
Approach LOS		B			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2982	106	33	1858	88	84
Future Volume (vph)	2982	106	33	1858	88	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	*0.80		1.00	*0.80	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4409		1772	4117	1717	1535
Flt Permitted	1.00		0.04	1.00	0.95	1.00
Satd. Flow (perm)	4409		69	4117	1717	1535
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2982	106	33	1858	88	84
RTOR Reduction (vph)	1	0	0	0	0	75
Lane Group Flow (vph)	3087	0	33	1858	88	9
Confl. Peds. (#/hr)					2	1
Heavy Vehicles (%)	4%	5%	3%	12%	6%	5%
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	103.7		111.5	111.5	14.5	14.5
Effective Green, g (s)	103.7		111.5	111.5	14.5	14.5
Actuated g/C Ratio	0.74		0.80	0.80	0.10	0.10
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3265		101	3278	177	158
v/s Ratio Prot	c0.70		0.01	c0.45		
v/s Ratio Perm			0.25		c0.05	0.01
v/c Ratio	0.95		0.33	0.57	0.50	0.06
Uniform Delay, d1	15.7		33.2	5.3	59.3	56.6
Progression Factor	1.74		3.13	3.35	1.00	1.00
Incremental Delay, d2	4.8		1.1	0.4	4.5	0.3
Delay (s)	32.1		105.1	18.1	63.8	56.9
Level of Service	C		F	B	E	E
Approach Delay (s)	32.1			19.6	60.4	
Approach LOS	C			B	E	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.6%	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 (vph)	441	1992	538	172	994	204	472	898	248	227	1165	331
Future Volume (vph)	441	1992	538	172	994	204	472	898	248	227	1165	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	7.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1630	4476	1563	913	4683	1555	3079	3411	1512	3404	3411	1541
Flt Permitted	0.11	1.00	1.00	0.11	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	486	4476	1563	101	4683	1555	3079	3411	1512	3404	3411	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	441	1992	538	172	994	204	472	898	248	227	1165	331
RTOR Reduction (vph)	0	0	172	0	0	115	0	0	93	0	0	109
Lane Group Flow (vph)	441	1992	366	172	994	89	472	898	155	227	1165	222
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	3%	3%	3%	100%	12%	5%	15%	7%	8%	4%	7%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	66.0	47.0	47.0	52.0	37.0	37.0	17.0	45.1	45.1	10.9	39.0	39.0
Effective Green, g (s)	67.0	50.0	50.0	54.0	40.0	37.0	18.0	48.1	48.1	11.9	42.0	42.0
Actuated g/C Ratio	0.48	0.36	0.36	0.39	0.29	0.26	0.13	0.34	0.34	0.09	0.30	0.30
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	3.0	6.0	6.0	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	445	1598	558	131	1338	410	395	1171	519	289	1023	462
v/s Ratio Prot	c0.18	c0.45		c0.15	0.21		c0.15	0.26		0.07	c0.34	
v/s Ratio Perm	0.29		0.23	0.35		0.06			0.10			0.14
v/c Ratio	0.99	1.25	0.66	1.31	0.74	0.22	1.19	0.77	0.30	0.79	1.14	0.48
Uniform Delay, d1	30.3	45.0	37.8	41.8	45.3	40.2	61.0	41.0	33.6	62.8	49.0	40.1
Progression Factor	0.78	0.68	0.78	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.09	1.38
Incremental Delay, d2	24.6	113.2	2.4	184.8	3.8	1.2	110.0	3.3	0.4	10.2	72.3	0.9
Delay (s)	48.0	143.9	32.0	226.6	49.1	41.4	171.0	44.2	34.0	69.3	125.8	56.2
Level of Service	D	F	C	F	D	D	F	D	C	E	F	E
Approach Delay (s)		109.4			70.2			79.6			105.0	
Approach LOS		F			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	95.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	107.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	297	1270	2596	289	250	588
Future Volume (vph)	297	1270	2596	289	250	588
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	0.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4476	1601	1825	1570
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	4476	4476	1601	1825	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	297	1270	2596	289	250	588
RTOR Reduction (vph)	0	0	0	56	0	0
Lane Group Flow (vph)	297	1270	2596	233	250	588
Heavy Vehicles (%)	1%	3%	3%	2%	0%	4%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	17.8	101.9	80.1	80.1	24.1	140.0
Effective Green, g (s)	18.8	105.9	84.1	84.1	28.1	140.0
Actuated g/C Ratio	0.13	0.76	0.60	0.60	0.20	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	470	3385	2688	961	366	1570
v/s Ratio Prot	c0.08	0.28	c0.58		c0.14	
v/s Ratio Perm				0.15		0.37
v/c Ratio	0.63	0.38	0.97	0.24	0.68	0.37
Uniform Delay, d1	57.3	5.8	26.6	13.1	51.8	0.0
Progression Factor	1.00	1.00	0.58	0.93	1.00	1.00
Incremental Delay, d2	2.8	0.3	4.1	0.2	4.8	0.7
Delay (s)	60.1	6.1	19.5	12.3	56.6	0.7
Level of Service	E	A	B	B	E	A
Approach Delay (s)		16.3	18.8		17.4	
Approach LOS		B	B		B	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	97	1423	2687	366	750	199
Future Volume (vph)	97	1423	2687	366	750	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3471	1457
Flt Permitted	0.05	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	88	4520	4520	1601	3471	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	97	1423	2687	366	750	199
RTOR Reduction (vph)	0	0	0	107	2	67
Lane Group Flow (vph)	97	1423	2687	259	768	112
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	92.7	92.7	81.7	81.7	33.3	33.3
Effective Green, g (s)	92.7	92.7	81.7	81.7	33.3	33.3
Actuated g/C Ratio	0.66	0.66	0.58	0.58	0.24	0.24
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	143	2992	2637	934	825	346
v/s Ratio Prot	c0.03	0.31	c0.59		c0.22	
v/s Ratio Perm	0.41			0.16		0.08
v/c Ratio	0.68	0.48	1.02	0.28	0.93	0.32
Uniform Delay, d1	36.5	11.7	29.1	14.5	52.2	44.0
Progression Factor	1.64	0.81	0.98	1.36	1.00	1.00
Incremental Delay, d2	11.3	0.5	17.5	0.4	17.0	0.5
Delay (s)	71.1	9.9	46.0	20.1	69.2	44.6
Level of Service	E	A	D	C	E	D
Approach Delay (s)		13.8	42.9		64.6	
Approach LOS		B	D		E	

Intersection Summary			
HCM 2000 Control Delay	38.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	96.2%	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 (vph)	0	2024	120	100	2703	3	254	3	60	59	0	56
Future Volume (vph)	0	2024	120	100	2703	3	254	3	60	59	0	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor		*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4476	1570	1825	4476	1633	1753	1921	1504	1785	1611	
Flt Permitted		1.00	1.00	0.05	1.00	1.00	0.72	1.00	1.00	0.76	1.00	
Satd. Flow (perm)		4476	1570	88	4476	1633	1329	1921	1504	1420	1611	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2024	120	100	2703	3	254	3	60	59	0	56
RTOR Reduction (vph)	0	0	47	0	0	1	0	0	47	0	44	0
Lane Group Flow (vph)	0	2024	73	100	2703	2	254	3	13	59	12	0
Confl. Peds. (#/hr)							1		2	2		1
Heavy Vehicles (%)	0%	3%	4%	0%	3%	0%	4%	0%	7%	2%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)		83.6	83.6	95.6	95.6	95.6	31.0	31.0	31.0	31.0	31.0	
Effective Green, g (s)		83.6	83.6	95.6	95.6	95.6	31.0	31.0	31.0	31.0	31.0	
Actuated g/C Ratio		0.60	0.60	0.68	0.68	0.68	0.22	0.22	0.22	0.22	0.22	
Clearance Time (s)		6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	
Lane Grp Cap (vph)		2672	937	159	3056	1115	294	425	333	314	356	
v/s Ratio Prot		0.45		0.04	c0.60			0.00			0.01	
v/s Ratio Perm			0.05	0.39		0.00	c0.19		0.01	0.04		
v/c Ratio		0.76	0.08	0.63	0.88	0.00	0.86	0.01	0.04	0.19	0.03	
Uniform Delay, d1		20.7	11.9	27.4	17.8	7.0	52.5	42.5	42.8	44.3	42.8	
Progression Factor		0.52	0.05	1.30	1.21	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.6	0.1	5.3	2.9	0.0	22.6	0.0	0.1	0.1	0.0	
Delay (s)		12.3	0.7	40.9	24.4	7.1	75.1	42.5	42.9	44.4	42.8	
Level of Service		B	A	D	C	A	E	D	D	D	D	
Approach Delay (s)		11.7			25.0			68.7			43.6	
Approach LOS		B			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2068	72	44	2738	67	25
Future Volume (vph)	2068	72	44	2738	67	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		4.0	7.0	7.0	7.0
Lane Util. Factor	*0.80		1.00	*0.80	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4454		1789	4476	1825	1633
Flt Permitted	1.00		0.04	1.00	0.95	1.00
Satd. Flow (perm)	4454		80	4476	1825	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2068	72	44	2738	67	25
RTOR Reduction (vph)	1	0	0	0	0	23
Lane Group Flow (vph)	2139	0	44	2738	67	2
Heavy Vehicles (%)	3%	3%	2%	3%	0%	0%
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			6		8	8
Actuated Green, G (s)	106.1		115.3	115.3	10.7	10.7
Effective Green, g (s)	106.1		115.3	115.3	10.7	10.7
Actuated g/C Ratio	0.76		0.82	0.82	0.08	0.08
Clearance Time (s)	7.0		4.0	7.0	7.0	7.0
Vehicle Extension (s)	6.0		3.0	6.0	5.0	5.0
Lane Grp Cap (vph)	3375		129	3686	139	124
v/s Ratio Prot	0.48		0.01	c0.61		
v/s Ratio Perm			0.27		c0.04	0.00
v/c Ratio	0.63		0.34	0.74	0.48	0.02
Uniform Delay, d1	7.9		7.7	5.6	62.0	59.8
Progression Factor	0.81		4.15	1.36	1.00	1.00
Incremental Delay, d2	0.6		0.5	0.5	5.4	0.1
Delay (s)	7.0		32.3	8.1	67.4	59.9
Level of Service	A		C	A	E	E
Approach Delay (s)	7.0			8.5	65.4	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
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)	412	1308	486	227	1775	160	573	1281	163	227	847	382
Future Volume (vph)	412	1308	486	227	1775	160	573	1281	163	227	847	382
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	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)	1807	4476	1574	1755	5142	1570	3471	3544	1445	3471	3510	1601
Flt Permitted	0.08	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	238	4476	1574	154	5142	1570	3471	3544	1445	3471	3510	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	412	1308	486	227	1775	160	573	1281	163	227	847	382
RTOR Reduction (vph)	0	0	197	0	0	81	0	0	60	0	0	156
Lane Group Flow (vph)	412	1308	289	227	1775	79	573	1281	103	227	847	226
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	3%	2%	4%	2%	4%	2%	3%	13%	2%	4%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	61.8	46.8	46.8	62.2	47.0	47.0	20.0	49.0	49.0	7.0	36.0	36.0
Effective Green, g (s)	63.8	48.8	48.8	64.2	49.0	49.0	21.0	51.0	51.0	8.0	38.0	38.0
Actuated g/C Ratio	0.46	0.35	0.35	0.46	0.35	0.35	0.15	0.36	0.36	0.06	0.27	0.27
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	287	1560	548	255	1799	549	520	1291	526	198	952	434
v/s Ratio Prot	c0.16	0.29		0.10	0.35		c0.17	c0.36		0.07	0.24	
v/s Ratio Perm	c0.49		0.18	0.30		0.05			0.07			0.14
v/c Ratio	1.44	0.84	0.53	0.89	0.99	0.14	1.10	0.99	0.20	1.15	0.89	0.52
Uniform Delay, d1	37.6	42.0	36.4	40.0	45.2	31.1	59.5	44.3	30.5	66.0	49.0	43.3
Progression Factor	1.46	1.37	2.12	1.00	1.00	1.00	1.00	1.00	1.00	0.93	1.17	1.62
Incremental Delay, d2	211.7	4.6	3.0	29.5	18.3	0.5	70.3	23.1	0.3	106.0	9.6	1.3
Delay (s)	266.6	62.3	80.3	69.5	63.5	31.7	129.8	67.4	30.7	167.7	67.1	71.6
Level of Service	F	E	F	E	E	C	F	E	C	F	E	E
Approach Delay (s)		104.4			61.7			82.2			84.0	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	83.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	114.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX

C-3 2031 HORIZON YEAR

APPENDIX

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	167	287	0	1072	2361	0
Future Volume (vph)	167	287	0	1072	2361	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.91	0.95	
Frt	0.93	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3178	1457		4902	3444	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3178	1457		4902	3444	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	287	0	1072	2361	0
RTOR Reduction (vph)	15	15	0	0	0	0
Lane Group Flow (vph)	293	131	0	1072	2361	0
Heavy Vehicles (%)	10%	2%	0%	7%	6%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	17.6	17.6		110.4	110.4	
Effective Green, g (s)	17.6	17.6		110.4	110.4	
Actuated g/C Ratio	0.13	0.13		0.79	0.79	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	399	183		3865	2715	
v/s Ratio Prot	c0.09			0.22	c0.69	
v/s Ratio Perm		0.09				
v/c Ratio	0.73	0.72		0.28	0.87	
Uniform Delay, d1	59.0	58.8		4.0	10.0	
Progression Factor	1.00	1.00		0.50	1.00	
Incremental Delay, d2	7.3	13.4		0.2	4.1	
Delay (s)	66.3	72.2		2.2	14.1	
Level of Service	E	E		A	B	
Approach Delay (s)	68.2			2.2	14.1	
Approach LOS	E			A	B	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
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)	0	50	20	12	45	6	90	669	75	46	885	0
Future Volume (vph)	0	50	20	12	45	6	90	669	75	46	885	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.96		1.00	0.98		1.00	0.98		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803		1789	1850		1789	3524		1789	3579	
Flt Permitted		1.00		0.71	1.00		0.32	1.00		0.37	1.00	
Satd. Flow (perm)		1803		1340	1850		605	3524		695	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	50	20	12	45	6	90	669	75	46	885	0
RTOR Reduction (vph)	0	18	0	0	5	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	52	0	12	46	0	90	738	0	46	885	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.0		6.0	6.0		50.0	50.0		50.0	50.0	
Effective Green, g (s)		6.0		6.0	6.0		50.0	50.0		50.0	50.0	
Actuated g/C Ratio		0.09		0.09	0.09		0.71	0.71		0.71	0.71	
Clearance Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		154		114	158		432	2517		496	2556	
v/s Ratio Prot		c0.03			0.02			0.21			c0.25	
v/s Ratio Perm				0.01			0.15			0.07		
v/c Ratio		0.34		0.11	0.29		0.21	0.29		0.09	0.35	
Uniform Delay, d1		30.1		29.5	30.0		3.4	3.6		3.1	3.8	
Progression Factor		1.00		0.99	0.95		1.42	1.39		1.00	1.00	
Incremental Delay, d2		1.3		0.4	1.0		1.0	0.3		0.4	0.4	
Delay (s)		31.4		29.5	29.6		5.8	5.3		3.4	4.2	
Level of Service		C		C	C		A	A		A	A	
Approach Delay (s)		31.4			29.6			5.4			4.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	111	10	62	17	1	11
Future Volume (Veh/h)	111	10	62	17	1	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	111	10	62	17	1	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	247					
pX, platoon unblocked						
vC, conflicting volume			121		257	116
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			121		257	116
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	99
cM capacity (veh/h)			1467		701	936

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	121	79	1	11
Volume Left	0	62	1	0
Volume Right	10	0	0	11
cSH	1700	1467	701	936
Volume to Capacity	0.07	0.04	0.00	0.01
Queue Length 95th (m)	0.0	1.0	0.0	0.3
Control Delay (s)	0.0	6.0	10.1	8.9
Lane LOS		A	B	A
Approach Delay (s)	0.0	6.0	9.0	
Approach LOS			A	

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	24.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Volume (vph)	76	16	13	299	101	178
Future Volume (vph)	76	16	13	299	101	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1883	1601	1789	1883	1789	1601
Flt Permitted	1.00	1.00	0.71	1.00	0.95	1.00
Satd. Flow (perm)	1883	1601	1333	1883	1789	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	76	16	13	299	101	178
RTOR Reduction (vph)	0	6	0	0	0	151
Lane Group Flow (vph)	76	10	13	299	101	27
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	45.3	45.3	45.3	45.3	10.7	10.7
Effective Green, g (s)	45.3	45.3	45.3	45.3	10.7	10.7
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.15	0.15
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1218	1036	862	1218	273	244
v/s Ratio Prot	0.04			c0.16	c0.06	
v/s Ratio Perm		0.01	0.01			0.02
v/c Ratio	0.06	0.01	0.02	0.25	0.37	0.11
Uniform Delay, d1	4.5	4.4	4.4	5.2	26.6	25.6
Progression Factor	0.98	1.14	1.06	0.78	1.67	5.98
Incremental Delay, d2	0.1	0.0	0.0	0.4	0.8	0.2
Delay (s)	4.6	5.0	4.7	4.5	45.2	153.1
Level of Service	A	A	A	A	D	F
Approach Delay (s)	4.6			4.5	114.1	
Approach LOS	A			A	F	

Intersection Summary			
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	111	10	70	320	15	70
Future Volume (Veh/h)	111	10	70	320	15	70
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	111	10	70	320	15	70
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			121		576	116
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			121		576	116
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		97	93
cM capacity (veh/h)			1467		456	936

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	121	70	320	15	70
Volume Left	0	70	0	15	0
Volume Right	10	0	0	0	70
cSH	1700	1467	1700	456	936
Volume to Capacity	0.07	0.05	0.19	0.03	0.07
Queue Length 95th (m)	0.0	1.1	0.0	0.8	1.8
Control Delay (s)	0.0	7.6	0.0	13.2	9.2
Lane LOS		A		B	A
Approach Delay (s)	0.0	1.4		9.9	
Approach LOS				A	

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	26.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	40	78	543	1545	2383	265
Future Volume (vph)	40	78	543	1545	2383	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1789	1601	3471	5142	5142	1601
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1789	1601	3471	5142	5142	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	78	543	1545	2383	265
RTOR Reduction (vph)	0	72	0	0	0	105
Lane Group Flow (vph)	40	6	543	1545	2383	160
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	10.3	10.3	27.4	115.7	84.3	84.3
Effective Green, g (s)	10.3	10.3	27.4	115.7	84.3	84.3
Actuated g/C Ratio	0.07	0.07	0.20	0.83	0.60	0.60
Clearance Time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	131	117	679	4249	3096	964
v/s Ratio Prot	c0.02		c0.16	0.30	c0.46	
v/s Ratio Perm		0.00				0.10
v/c Ratio	0.31	0.05	0.80	0.36	0.77	0.17
Uniform Delay, d1	61.5	60.3	53.7	3.0	20.7	12.3
Progression Factor	1.07	1.32	1.30	0.31	0.98	1.96
Incremental Delay, d2	1.3	0.2	5.0	0.2	1.0	0.2
Delay (s)	67.3	79.6	74.5	1.1	21.2	24.2
Level of Service	E	E	E	A	C	C
Approach Delay (s)	75.4			20.2	21.5	
Approach LOS	E			C	C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
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)	0	65	20	53	10	5	95	829	317	32	885	10
Future Volume (vph)	0	65	20	53	10	5	95	829	317	32	885	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.96		1.00	0.95		1.00	0.96		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1817		1789	1789		1789	3430		1789	3573	
Flt Permitted		1.00		0.70	1.00		0.31	1.00		0.23	1.00	
Satd. Flow (perm)		1817		1322	1789		588	3430		425	3573	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	65	20	53	10	5	95	829	317	32	885	10
RTOR Reduction (vph)	0	18	0	0	4	0	0	31	0	0	1	0
Lane Group Flow (vph)	0	67	0	53	11	0	95	1115	0	32	894	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.3		8.3	8.3		47.7	47.7		47.7	47.7	
Effective Green, g (s)		8.3		8.3	8.3		47.7	47.7		47.7	47.7	
Actuated g/C Ratio		0.12		0.12	0.12		0.68	0.68		0.68	0.68	
Clearance Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		215		156	212		400	2337		289	2434	
v/s Ratio Prot		0.04			0.01			c0.33			0.25	
v/s Ratio Perm				c0.04			0.16			0.08		
v/c Ratio		0.31		0.34	0.05		0.24	0.48		0.11	0.37	
Uniform Delay, d1		28.2		28.3	27.4		4.2	5.3		3.8	4.7	
Progression Factor		1.00		0.72	0.72		2.10	2.70		0.89	0.84	
Incremental Delay, d2		0.8		1.3	0.1		0.9	0.4		0.8	0.4	
Delay (s)		29.1		21.8	19.8		9.8	14.7		4.2	4.4	
Level of Service		C		C	B		A	B		A	A	
Approach Delay (s)		29.1			21.4			14.3			4.4	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
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)	87	304	14	8	272	245	64	75	3	43	14	15
Future Volume (vph)	87	304	14	8	272	245	64	75	3	43	14	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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)	1789	3579	1601	1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.58	1.00	1.00	0.57	1.00	1.00	0.75	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	1100	3579	1601	1067	3579	1601	1410	1883	1601	1334	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	87	304	14	8	272	245	64	75	3	43	14	15
RTOR Reduction (vph)	0	0	4	0	0	78	0	0	3	0	0	13
Lane Group Flow (vph)	87	304	10	8	272	167	64	75	0	43	14	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	47.6	47.6	47.6	47.6	47.6	47.6	8.4	8.4	8.4	8.4	8.4	8.4
Effective Green, g (s)	47.6	47.6	47.6	47.6	47.6	47.6	8.4	8.4	8.4	8.4	8.4	8.4
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.68	0.68	0.12	0.12	0.12	0.12	0.12	0.12
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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)	748	2433	1088	725	2433	1088	169	225	192	160	225	192
v/s Ratio Prot		0.08			0.08			0.04			0.01	
v/s Ratio Perm	0.08		0.01	0.01		c0.10	c0.05		0.00	0.03		0.00
v/c Ratio	0.12	0.12	0.01	0.01	0.11	0.15	0.38	0.33	0.00	0.27	0.06	0.01
Uniform Delay, d1	3.9	3.9	3.6	3.6	3.9	4.0	28.4	28.2	27.1	28.0	27.3	27.1
Progression Factor	1.26	1.24	1.00	1.80	2.17	13.06	1.26	1.25	1.00	1.01	1.04	1.00
Incremental Delay, d2	0.3	0.1	0.0	0.0	0.1	0.3	1.4	0.9	0.0	0.9	0.1	0.0
Delay (s)	5.2	4.9	3.6	6.5	8.5	52.6	37.2	36.1	27.1	29.3	28.6	27.2
Level of Service	A	A	A	A	A	D	D	D	C	C	C	C
Approach Delay (s)		5.0			29.0			36.4			28.7	
Approach LOS		A			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	49.3%	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)	0	300	6	77	518	51	1	184	49	8	15	0
Future Volume (vph)	0	300	6	77	518	51	1	184	49	8	15	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Lane Util. Factor		0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3568		1789	3579	1601	1789	1883	1601	1789	1883	
Flt Permitted		1.00		0.57	1.00	1.00	0.75	1.00	1.00	0.64	1.00	
Satd. Flow (perm)		3568		1065	3579	1601	1408	1883	1601	1208	1883	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	300	6	77	518	51	1	184	49	8	15	0
RTOR Reduction (vph)	0	1	0	0	0	19	0	0	40	0	0	0
Lane Group Flow (vph)	0	305	0	77	518	32	1	184	9	8	15	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)		43.3		43.3	43.3	43.3	12.7	12.7	12.7	12.7	12.7	
Effective Green, g (s)		43.3		43.3	43.3	43.3	12.7	12.7	12.7	12.7	12.7	
Actuated g/C Ratio		0.62		0.62	0.62	0.62	0.18	0.18	0.18	0.18	0.18	
Clearance Time (s)		7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		2207		658	2213	990	255	341	290	219	341	
v/s Ratio Prot		0.09			c0.14			c0.10			0.01	
v/s Ratio Perm				0.07		0.02	0.00		0.01	0.01		
v/c Ratio		0.14		0.12	0.23	0.03	0.00	0.54	0.03	0.04	0.04	
Uniform Delay, d1		5.6		5.5	6.0	5.2	23.5	26.0	23.6	23.6	23.6	
Progression Factor		2.24		1.21	1.40	3.11	1.17	0.98	1.70	0.91	0.87	
Incremental Delay, d2		0.1		0.4	0.2	0.1	0.0	1.6	0.0	0.1	0.1	
Delay (s)		12.6		7.0	8.6	16.2	27.4	27.1	40.2	21.6	20.7	
Level of Service		B		A	A	B	C	C	D	C	C	
Approach Delay (s)		12.6			9.0			29.8			21.0	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	49.8%	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)	124	214	11	101	687	278	25	76	54	40	12	17
Future Volume (vph)	124	214	11	101	687	278	25	76	54	40	12	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3552		1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.37	1.00		0.61	1.00	1.00	0.75	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	691	3552		1151	3579	1601	1412	1883	1601	1333	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	124	214	11	101	687	278	25	76	54	40	12	17
RTOR Reduction (vph)	0	1	0	0	0	62	0	0	49	0	0	16
Lane Group Flow (vph)	124	224	0	101	687	216	25	76	5	40	12	1
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	114.2	114.2		102.7	102.7	102.7	11.8	11.8	11.8	11.8	11.8	11.8
Effective Green, g (s)	114.2	114.2		102.7	102.7	102.7	11.8	11.8	11.8	11.8	11.8	11.8
Actuated g/C Ratio	0.82	0.82		0.73	0.73	0.73	0.08	0.08	0.08	0.08	0.08	0.08
Clearance Time (s)	4.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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
Lane Grp Cap (vph)	622	2897		844	2625	1174	119	158	134	112	158	134
v/s Ratio Prot	c0.01	0.06			c0.19			c0.04			0.01	
v/s Ratio Perm	0.15			0.09		0.13	0.02		0.00	0.03		0.00
v/c Ratio	0.20	0.08		0.12	0.26	0.18	0.21	0.48	0.03	0.36	0.08	0.01
Uniform Delay, d1	2.7	2.5		5.4	6.1	5.7	59.8	61.2	58.9	60.5	59.1	58.8
Progression Factor	0.76	0.27		0.22	0.20	0.01	0.91	0.90	0.91	0.68	0.73	1.00
Incremental Delay, d2	0.2	0.1		0.2	0.2	0.2	0.9	2.2	0.1	1.7	0.2	0.0
Delay (s)	2.2	0.7		1.4	1.4	0.3	55.2	57.5	53.5	43.2	43.1	58.8
Level of Service	A	A		A	A	A	E	E	D	D	D	E
Approach Delay (s)		1.3			1.1			55.8			47.0	
Approach LOS		A			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.7%	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)	107	65	114	77	346	180	671	1801	269	492	1786	183
Future Volume (vph)	107	65	114	77	346	180	671	1801	269	492	1786	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	4.0	7.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	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)	1789	3579	1601	1825	3579	1633	3471	5245	1633	3541	5245	1601
Flt Permitted	0.29	1.00	1.00	0.71	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	552	3579	1601	1369	3579	1633	3471	5245	1633	3541	5245	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	107	65	114	77	346	180	671	1801	269	492	1786	183
RTOR Reduction (vph)	0	0	17	0	0	65	0	0	139	0	0	71
Lane Group Flow (vph)	107	65	97	77	346	115	671	1801	130	492	1786	112
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	30.0	30.0	61.8	19.0	19.0	43.2	31.8	67.8	67.8	24.2	60.2	60.2
Effective Green, g (s)	30.0	30.0	61.8	19.0	19.0	43.2	31.8	67.8	67.8	24.2	60.2	60.2
Actuated g/C Ratio	0.21	0.21	0.44	0.14	0.14	0.31	0.23	0.48	0.48	0.17	0.43	0.43
Clearance Time (s)	4.0	7.0	4.0	7.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
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)	180	766	706	185	485	503	788	2540	790	612	2255	688
v/s Ratio Prot	c0.03	0.02	0.03		c0.10	0.04	c0.19	0.34		0.14	c0.34	
v/s Ratio Perm	0.10		0.03	0.06		0.03			0.08			0.07
v/c Ratio	0.59	0.08	0.14	0.42	0.71	0.23	0.85	0.71	0.16	0.80	0.79	0.16
Uniform Delay, d1	46.4	44.0	23.2	55.4	57.9	36.0	51.8	28.4	20.2	55.6	34.5	24.5
Progression Factor	1.15	1.13	0.69	1.00	1.00	1.00	0.63	1.19	3.44	1.17	0.77	0.92
Incremental Delay, d2	5.2	0.0	0.1	1.5	4.9	0.2	3.4	0.6	0.2	5.0	1.9	0.3
Delay (s)	58.5	49.8	16.2	56.9	62.8	36.2	36.2	34.3	69.8	69.8	28.6	22.9
Level of Service	E	D	B	E	E	D	D	C	E	E	C	C
Approach Delay (s)		39.7			54.1			38.3			36.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	3	139	22	8	28
Future Volume (Veh/h)	8	3	139	22	8	28
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	8	3	139	22	8	28
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			155			267
pX, platoon unblocked						
vC, conflicting volume	183	139			161	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	183	139			161	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			99	
cM capacity (veh/h)	802	909			1418	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	8	3	139	22	36
Volume Left	8	0	0	0	8
Volume Right	0	3	0	22	0
cSH	802	909	1700	1700	1418
Volume to Capacity	0.01	0.00	0.08	0.01	0.01
Queue Length 95th (m)	0.2	0.1	0.0	0.0	0.1
Control Delay (s)	9.5	9.0	0.0	0.0	1.7
Lane LOS	A	A			A
Approach Delay (s)	9.4		0.0		1.7
Approach LOS	A				

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	18.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1053	3038	1024	188	386	572
Future Volume (vph)	1053	3038	1024	188	386	572
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4117	1570	3541	1613
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	4476	4117	1570	3541	1613
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1053	3038	1024	188	386	572
RTOR Reduction (vph)	0	0	0	86	0	0
Lane Group Flow (vph)	1053	3038	1024	102	386	572
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	1%	3%	12%	4%	0%	0%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	47.9	105.8	53.9	53.9	20.2	140.0
Effective Green, g (s)	47.9	105.8	53.9	53.9	20.2	140.0
Actuated g/C Ratio	0.34	0.76	0.38	0.38	0.14	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	1199	3382	1585	604	510	1613
v/s Ratio Prot	0.30	c0.68	0.25		c0.11	
v/s Ratio Perm				0.06		0.35
v/c Ratio	0.88	0.90	0.65	0.17	0.76	0.35
Uniform Delay, d1	43.3	13.0	35.2	28.3	57.5	0.0
Progression Factor	1.00	1.00	0.80	0.99	1.13	1.00
Incremental Delay, d2	7.5	4.3	2.0	0.6	5.8	0.6
Delay (s)	50.8	17.3	30.3	28.7	71.0	0.6
Level of Service	D	B	C	C	E	A
Approach Delay (s)		25.9	30.0		28.9	
Approach LOS		C	C		C	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	3419	1241	156	34	2
Future Volume (vph)	5	3419	1241	156	34	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3471	1457
Flt Permitted	0.17	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	315	4520	4520	1601	3471	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	3419	1241	156	34	2
RTOR Reduction (vph)	0	0	0	28	0	2
Lane Group Flow (vph)	5	3419	1241	128	34	0
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	120.0	120.0	114.6	114.6	6.0	6.0
Effective Green, g (s)	120.0	120.0	114.6	114.6	6.0	6.0
Actuated g/C Ratio	0.86	0.86	0.82	0.82	0.04	0.04
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	284	3874	3699	1310	148	62
v/s Ratio Prot	0.00	c0.76	0.27		c0.01	
v/s Ratio Perm	0.01			0.08		0.00
v/c Ratio	0.02	0.88	0.34	0.10	0.23	0.00
Uniform Delay, d1	1.6	5.9	3.2	2.5	64.8	64.1
Progression Factor	0.47	0.90	2.33	5.44	0.99	1.11
Incremental Delay, d2	0.0	1.7	0.2	0.1	0.8	0.0
Delay (s)	0.8	7.0	7.6	13.8	64.9	71.1
Level of Service	A	A	A	B	E	E
Approach Delay (s)		7.0	8.3		65.2	
Approach LOS		A	A		E	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
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)	139	2965	262	58	1300	266	78	21	168	56	4	19
Future Volume (vph)	139	2965	262	58	1300	266	78	21	168	56	4	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.99
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)	1807	4476	1601	1674	4117	1570	1768	1921	1517	1555	1921	1610
Flt Permitted	0.15	1.00	1.00	0.04	1.00	1.00	0.76	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	279	4476	1601	70	4117	1570	1405	1921	1517	1217	1921	1610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	139	2965	262	58	1300	266	78	21	168	56	4	19
RTOR Reduction (vph)	0	0	50	0	0	75	0	0	81	0	0	17
Lane Group Flow (vph)	139	2965	212	58	1300	191	78	21	87	56	4	2
Confl. Peds. (#/hr)	8					8	2		3	3		2
Heavy Vehicles (%)	1%	3%	2%	9%	12%	0%	3%	0%	6%	17%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	109.3	101.9	101.9	106.3	100.4	100.4	14.8	14.8	14.8	14.8	14.8	14.8
Effective Green, g (s)	109.3	101.9	101.9	106.3	100.4	100.4	14.8	14.8	14.8	14.8	14.8	14.8
Actuated g/C Ratio	0.78	0.73	0.73	0.76	0.72	0.72	0.11	0.11	0.11	0.11	0.11	0.11
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	0.2
Lane Grp Cap (vph)	298	3257	1165	120	2952	1125	148	203	160	128	203	170
v/s Ratio Prot	c0.02	c0.66		0.02	0.32			0.01			0.00	
v/s Ratio Perm	0.34		0.13	0.34		0.12	0.06		c0.06	0.05		0.00
v/c Ratio	0.47	0.91	0.18	0.48	0.44	0.17	0.53	0.10	0.54	0.44	0.02	0.01
Uniform Delay, d1	4.5	15.4	6.0	29.7	8.2	6.4	59.3	56.6	59.4	58.7	56.1	56.1
Progression Factor	1.18	0.82	1.48	1.29	1.09	2.74	1.00	1.00	1.00	0.57	0.62	1.00
Incremental Delay, d2	0.4	2.7	0.2	2.6	0.4	0.3	3.8	0.3	4.1	0.9	0.0	0.0
Delay (s)	5.8	15.3	9.0	40.8	9.3	17.8	63.1	56.9	63.5	34.4	35.1	56.1
Level of Service	A	B	A	D	A	B	E	E	E	C	D	E
Approach Delay (s)		14.4			11.8			62.9			39.6	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	94.9%	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 (vph)	128	3127	101	33	1590	269	71	17	84	51	2	24
Future Volume (vph)	128	3127	101	33	1590	269	71	17	84	51	2	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	4391	1633	1772	4117	1601	1722	1609		3471	1623	
Flt Permitted	0.08	1.00	1.00	0.04	1.00	1.00	0.54	1.00		0.95	1.00	
Satd. Flow (perm)	156	4391	1633	82	4117	1601	980	1609		3471	1623	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	128	3127	101	33	1590	269	71	17	84	51	2	24
RTOR Reduction (vph)	0	0	29	0	0	44	0	76	0	0	22	0
Lane Group Flow (vph)	128	3127	72	33	1590	225	71	25	0	51	4	0
Heavy Vehicles (%)	4%	5%	0%	3%	12%	2%	6%	2%	5%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8					
Actuated Green, G (s)	104.6	96.7	96.7	94.4	90.5	90.5	20.8	12.6		4.8	9.2	
Effective Green, g (s)	104.6	96.7	96.7	94.4	90.5	90.5	20.8	12.6		4.8	9.2	
Actuated g/C Ratio	0.75	0.69	0.69	0.67	0.65	0.65	0.15	0.09		0.03	0.07	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	231	3032	1127	102	2661	1034	189	144		119	106	
v/s Ratio Prot	c0.04	c0.71		0.01	0.39		c0.02	0.02		0.01	0.00	
v/s Ratio Perm	0.37		0.04	0.21		0.14	c0.03					
v/c Ratio	0.55	1.03	0.06	0.32	0.60	0.22	0.38	0.17		0.43	0.03	
Uniform Delay, d1	10.7	21.6	7.0	34.8	14.3	10.2	53.0	58.9		66.3	61.2	
Progression Factor	1.78	0.90	2.15	2.47	1.00	1.41	1.00	1.00		0.96	1.57	
Incremental Delay, d2	1.6	21.2	0.1	1.2	0.6	0.3	1.3	1.2		2.5	0.1	
Delay (s)	20.7	40.6	15.1	87.2	14.9	14.7	54.2	60.0		65.8	96.2	
Level of Service	C	D	B	F	B	B	D	E		E	F	
Approach Delay (s)		39.1			16.1			57.6			76.0	
Approach LOS		D			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	91.0%	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 (vph)	330	2297	535	198	1121	602	508	1809	322	287	1334	169
Future Volume (vph)	330	2297	535	198	1121	602	508	1809	322	287	1334	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	1.0	3.0	4.0	1.0	3.0	4.0	1.0	3.0	4.0	1.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1630	4476	1569	1508	4683	1555	3079	4902	1512	3404	4902	1541
Flt Permitted	0.10	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	486	4476	1569	145	4683	1555	3079	4902	1512	3404	4902	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	2297	535	198	1121	602	508	1809	322	287	1334	169
RTOR Reduction (vph)	0	0	27	0	0	75	0	0	51	0	0	53
Lane Group Flow (vph)	330	2297	508	198	1121	527	508	1809	271	287	1334	116
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	3%	3%	3%	21%	12%	5%	15%	7%	8%	4%	7%	6%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	66.0	53.0	73.0	51.7	42.7	49.7	20.0	49.0	58.0	7.0	36.0	55.3
Effective Green, g (s)	67.0	56.0	79.0	53.7	45.7	55.7	21.0	52.0	64.0	8.0	39.0	61.3
Actuated g/C Ratio	0.48	0.40	0.56	0.38	0.33	0.40	0.15	0.37	0.46	0.06	0.28	0.44
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
Vehicle Extension (s)	2.5	6.0	2.5	2.5	6.0	2.5	2.5	4.0	2.5	2.5	4.0	2.5
Lane Grp Cap (vph)	398	1790	885	152	1528	618	461	1820	691	194	1365	674
v/s Ratio Prot	0.12	c0.51	0.09	c0.09	0.24	0.06	c0.16	c0.37	0.03	c0.08	0.27	0.03
v/s Ratio Perm	0.28		0.23	0.40		0.28			0.15			0.05
v/c Ratio	0.83	1.28	0.57	1.30	0.73	0.85	1.10	0.99	0.39	1.48	0.98	0.17
Uniform Delay, d1	27.5	42.0	19.7	37.1	41.8	38.4	59.5	43.8	25.1	66.0	50.1	23.9
Progression Factor	1.25	1.01	0.67	1.00	1.00	1.00	1.00	1.00	1.00	0.72	0.96	2.58
Incremental Delay, d2	5.5	129.2	0.3	175.7	3.2	10.8	72.6	19.6	0.3	233.2	14.7	0.1
Delay (s)	39.9	171.5	13.4	212.8	44.9	49.2	132.1	63.4	25.4	280.8	62.9	61.7
Level of Service	D	F	B	F	D	D	F	E	C	F	E	E
Approach Delay (s)		131.0			63.6			72.0			97.8	
Approach LOS		F			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	94.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	111.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	111	107	0	2273	1196	0
Future Volume (vph)	111	107	0	2273	1196	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.91	0.95	
Frt	0.96	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3362	1457		5142	3579	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3362	1457		5142	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	107	0	2273	1196	0
RTOR Reduction (vph)	28	62	0	0	0	0
Lane Group Flow (vph)	122	6	0	2273	1196	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	11.4	11.4		116.6	116.6	
Effective Green, g (s)	11.4	11.4		116.6	116.6	
Actuated g/C Ratio	0.08	0.08		0.83	0.83	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	273	118		4282	2980	
v/s Ratio Prot	c0.04			c0.44	0.33	
v/s Ratio Perm		0.00				
v/c Ratio	0.45	0.05		0.53	0.40	
Uniform Delay, d1	61.3	59.3		3.5	2.9	
Progression Factor	1.00	1.00		1.07	1.00	
Incremental Delay, d2	1.6	0.2		0.4	0.4	
Delay (s)	62.9	59.5		4.1	3.3	
Level of Service	E	E		A	A	
Approach Delay (s)	61.8			4.1	3.3	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
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)	5	65	40	60	55	39	50	643	18	8	830	0
Future Volume (vph)	5	65	40	60	55	39	50	643	18	8	830	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
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	0.94		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)	1789	1776		1789	1766		1789	3564		1789	3579	
Flt Permitted	0.70	1.00		0.69	1.00		0.34	1.00		0.40	1.00	
Satd. Flow (perm)	1311	1776		1298	1766		636	3564		754	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	65	40	60	55	39	50	643	18	8	830	0
RTOR Reduction (vph)	0	35	0	0	34	0	0	2	0	0	0	0
Lane Group Flow (vph)	5	70	0	60	60	0	50	659	0	8	830	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.5	8.5		8.5	8.5		47.5	47.5		47.5	47.5	
Effective Green, g (s)	8.5	8.5		8.5	8.5		47.5	47.5		47.5	47.5	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.68	0.68		0.68	0.68	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	215		157	214		431	2418		511	2428	
v/s Ratio Prot		0.04			0.03			0.19			c0.23	
v/s Ratio Perm	0.00			c0.05			0.08			0.01		
v/c Ratio	0.03	0.32		0.38	0.28		0.12	0.27		0.02	0.34	
Uniform Delay, d1	27.1	28.1		28.3	28.0		3.9	4.4		3.7	4.7	
Progression Factor	1.00	1.00		1.16	1.26		1.56	1.39		1.00	1.00	
Incremental Delay, d2	0.1	0.9		1.6	0.7		0.5	0.3		0.1	0.4	
Delay (s)	27.2	29.0		34.3	35.8		6.6	6.4		3.7	5.1	
Level of Service	C	C		C	D		A	A		A	A	
Approach Delay (s)		28.9			35.2			6.5			5.1	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	24	2	16	92	7	47
Future Volume (Veh/h)	24	2	16	92	7	47
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	24	2	16	92	7	47
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	247					
pX, platoon unblocked						
vC, conflicting volume			26		149	25
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			26		149	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 %			99		99	96
cM capacity (veh/h)			1588		835	1051

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	26	108	7	47
Volume Left	0	16	7	0
Volume Right	2	0	0	47
cSH	1700	1588	835	1051
Volume to Capacity	0.02	0.01	0.01	0.04
Queue Length 95th (m)	0.0	0.2	0.2	1.1
Control Delay (s)	0.0	1.1	9.4	8.6
Lane LOS		A	A	A
Approach Delay (s)	0.0	1.1	8.7	
Approach LOS			A	

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Volume (vph)	238	80	135	98	25	16
Future Volume (vph)	238	80	135	98	25	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1883	1601	1789	1883	1789	1601
Flt Permitted	1.00	1.00	0.61	1.00	0.95	1.00
Satd. Flow (perm)	1883	1601	1150	1883	1789	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	238	80	135	98	25	16
RTOR Reduction (vph)	0	21	0	0	0	15
Lane Group Flow (vph)	238	59	135	98	25	1
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	52.0	52.0	52.0	52.0	4.0	4.0
Effective Green, g (s)	52.0	52.0	52.0	52.0	4.0	4.0
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.06	0.06
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1398	1189	854	1398	102	91
v/s Ratio Prot	c0.13			0.05	c0.01	
v/s Ratio Perm		0.04	0.12			0.00
v/c Ratio	0.17	0.05	0.16	0.07	0.25	0.01
Uniform Delay, d1	2.6	2.4	2.6	2.4	31.6	31.1
Progression Factor	1.06	1.16	0.80	0.68	1.00	1.27
Incremental Delay, d2	0.3	0.1	0.4	0.1	1.3	0.0
Delay (s)	3.1	2.9	2.5	1.8	32.8	39.4
Level of Service	A	A	A	A	C	D
Approach Delay (s)	3.0			2.2	35.4	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	256	11	68	128	9	65
Future Volume (Veh/h)	256	11	68	128	9	65
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	256	11	68	128	9	65
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			267		526	262
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			267		526	262
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		98	92
cM capacity (veh/h)			1297		486	777

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	267	68	128	9	65
Volume Left	0	68	0	9	0
Volume Right	11	0	0	0	65
cSH	1700	1297	1700	486	777
Volume to Capacity	0.16	0.05	0.08	0.02	0.08
Queue Length 95th (m)	0.0	1.3	0.0	0.4	2.1
Control Delay (s)	0.0	7.9	0.0	12.6	10.1
Lane LOS		A		B	B
Approach Delay (s)	0.0	2.8		10.4	
Approach LOS				B	

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	219	470	116	2361	1445	56
Future Volume (vph)	219	470	116	2361	1445	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	4.0	4.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1789	1601	3471	5142	5142	1601
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1789	1601	3471	5142	5142	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	219	470	116	2361	1445	56
RTOR Reduction (vph)	0	5	0	0	0	26
Lane Group Flow (vph)	219	465	116	2361	1445	30
Turn Type	Prot	pm+ov	Prot	NA	NA	Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	22.4	46.3	23.9	103.6	75.7	75.7
Effective Green, g (s)	22.4	46.3	23.9	103.6	75.7	75.7
Actuated g/C Ratio	0.16	0.33	0.17	0.74	0.54	0.54
Clearance Time (s)	7.0	4.0	4.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	286	529	592	3805	2780	865
v/s Ratio Prot	0.12	c0.15	0.03	c0.46	0.28	
v/s Ratio Perm		0.14				0.02
v/c Ratio	0.77	0.88	0.20	0.62	0.52	0.04
Uniform Delay, d1	56.3	44.2	49.8	8.7	20.5	15.1
Progression Factor	0.99	1.02	1.16	0.34	0.93	0.91
Incremental Delay, d2	11.6	15.3	0.1	0.5	0.7	0.1
Delay (s)	67.2	60.4	58.1	3.5	19.7	13.8
Level of Service	E	E	E	A	B	B
Approach Delay (s)	62.6			6.0	19.5	
Approach LOS	E			A	B	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
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)	10	30	60	296	25	43	15	658	100	29	926	0
Future Volume (vph)	10	30	60	296	25	43	15	658	100	29	926	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.91		1.00	0.98		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)	1789	1695		1789	1705		1789	3508		1789	3579	
Flt Permitted	0.71	1.00		0.70	1.00		0.26	1.00		0.33	1.00	
Satd. Flow (perm)	1342	1695		1316	1705		481	3508		628	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	30	60	296	25	43	15	658	100	29	926	0
RTOR Reduction (vph)	0	30	0	0	30	0	0	14	0	0	0	0
Lane Group Flow (vph)	10	60	0	296	38	0	15	744	0	29	926	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.0	21.0		21.0	21.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	21.0	21.0		21.0	21.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.50	0.50		0.50	0.50	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	402	508		394	511		240	1754		314	1789	
v/s Ratio Prot		0.04			0.02			0.21			c0.26	
v/s Ratio Perm	0.01			c0.22			0.03			0.05		
v/c Ratio	0.02	0.12		0.75	0.07		0.06	0.42		0.09	0.52	
Uniform Delay, d1	17.3	17.8		22.1	17.5		9.0	11.1		9.2	11.8	
Progression Factor	1.00	1.00		1.31	1.45		0.75	1.07		0.77	0.73	
Incremental Delay, d2	0.0	0.1		7.8	0.1		0.4	0.7		0.6	1.0	
Delay (s)	17.3	17.9		36.8	25.5		7.2	12.5		7.7	9.7	
Level of Service	B	B		D	C		A	B		A	A	
Approach Delay (s)		17.8			34.7			12.4			9.6	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
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)	23	365	73	10	362	64	37	19	14	186	59	65
Future Volume (vph)	23	365	73	10	362	64	37	19	14	186	59	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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)	1789	3579	1601	1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.54	1.00	1.00	0.53	1.00	1.00	0.72	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1009	3579	1601	1006	3579	1601	1353	1883	1601	1403	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	23	365	73	10	362	64	37	19	14	186	59	65
RTOR Reduction (vph)	0	0	30	0	0	27	0	0	11	0	0	51
Lane Group Flow (vph)	23	365	43	10	362	37	37	19	3	186	59	14
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	40.9	40.9	40.9	40.9	40.9	40.9	15.1	15.1	15.1	15.1	15.1	15.1
Effective Green, g (s)	40.9	40.9	40.9	40.9	40.9	40.9	15.1	15.1	15.1	15.1	15.1	15.1
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.58	0.58	0.22	0.22	0.22	0.22	0.22	0.22
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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)	589	2091	935	587	2091	935	291	406	345	302	406	345
v/s Ratio Prot		c0.10			0.10			0.01			0.03	
v/s Ratio Perm	0.02		0.03	0.01		0.02	0.03		0.00	c0.13		0.01
v/c Ratio	0.04	0.17	0.05	0.02	0.17	0.04	0.13	0.05	0.01	0.62	0.15	0.04
Uniform Delay, d1	6.2	6.7	6.2	6.1	6.7	6.2	22.1	21.7	21.6	24.8	22.2	21.7
Progression Factor	1.35	1.30	2.21	2.42	1.97	5.58	1.16	1.15	1.00	1.02	1.02	1.09
Incremental Delay, d2	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.0	0.0	3.7	0.2	0.0
Delay (s)	8.5	8.9	13.9	14.9	13.4	34.7	25.8	25.0	21.6	29.0	22.8	23.7
Level of Service	A	A	B	B	B	C	C	C	C	C	C	C
Approach Delay (s)		9.7			16.6			24.7			26.7	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	47.8%	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)	9	551	5	83	388	13	8	19	104	40	135	40
Future Volume (vph)	9	551	5	83	388	13	8	19	104	40	135	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	3574		1789	3579	1601	1789	1883	1601	1789	1819	
Flt Permitted	0.52	1.00		0.44	1.00	1.00	0.65	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	984	3574		836	3579	1601	1218	1883	1601	1403	1819	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	9	551	5	83	388	13	8	19	104	40	135	40
RTOR Reduction (vph)	0	1	0	0	0	5	0	0	86	0	21	0
Lane Group Flow (vph)	9	555	0	83	388	8	8	19	18	40	154	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	43.9	43.9		43.9	43.9	43.9	12.1	12.1	12.1	12.1	12.1	
Effective Green, g (s)	43.9	43.9		43.9	43.9	43.9	12.1	12.1	12.1	12.1	12.1	
Actuated g/C Ratio	0.63	0.63		0.63	0.63	0.63	0.17	0.17	0.17	0.17	0.17	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	617	2241		524	2244	1004	210	325	276	242	314	
v/s Ratio Prot		c0.16			0.11			0.01			c0.08	
v/s Ratio Perm	0.01			0.10		0.01	0.01		0.01	0.03		
v/c Ratio	0.01	0.25		0.16	0.17	0.01	0.04	0.06	0.07	0.17	0.49	
Uniform Delay, d1	4.9	5.8		5.4	5.5	4.9	24.1	24.2	24.2	24.7	26.2	
Progression Factor	1.15	1.16		1.73	1.75	1.00	0.76	0.78	0.96	0.96	1.00	
Incremental Delay, d2	0.0	0.3		0.6	0.2	0.0	0.1	0.1	0.1	0.3	1.2	
Delay (s)	5.7	6.9		10.0	9.7	4.9	18.4	19.0	23.4	24.1	27.3	
Level of Service	A	A		B	A	A	B	B	C	C	C	
Approach Delay (s)		6.9			9.6			22.5			26.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	50.8%	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)	24	710	21	79	364	55	15	19	109	239	61	111
Future Volume (vph)	24	710	21	79	364	55	15	19	109	239	61	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3563		1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.53	1.00		0.36	1.00	1.00	0.72	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1007	3563		675	3579	1601	1351	1883	1601	1403	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	710	21	79	364	55	15	19	109	239	61	111
RTOR Reduction (vph)	0	2	0	0	0	25	0	0	82	0	0	83
Lane Group Flow (vph)	24	729	0	79	364	30	15	19	27	239	61	28
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	38.4	38.4		38.4	38.4	38.4	17.6	17.6	17.6	17.6	17.6	17.6
Effective Green, g (s)	38.4	38.4		38.4	38.4	38.4	17.6	17.6	17.6	17.6	17.6	17.6
Actuated g/C Ratio	0.55	0.55		0.55	0.55	0.55	0.25	0.25	0.25	0.25	0.25	0.25
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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
Lane Grp Cap (vph)	552	1954		370	1963	878	339	473	402	352	473	402
v/s Ratio Prot		c0.20			0.10			0.01			0.03	
v/s Ratio Perm	0.02			0.12		0.02	0.01		0.02	c0.17		0.02
v/c Ratio	0.04	0.37		0.21	0.19	0.03	0.04	0.04	0.07	0.68	0.13	0.07
Uniform Delay, d1	7.3	9.0		8.1	7.9	7.3	19.8	19.8	20.0	23.6	20.3	20.0
Progression Factor	1.75	1.54		0.77	0.79	1.61	0.98	0.96	2.34	0.89	0.90	0.68
Incremental Delay, d2	0.1	0.5		1.3	0.2	0.1	0.1	0.0	0.1	5.1	0.1	0.1
Delay (s)	12.9	14.3		7.5	6.4	11.8	19.6	19.0	46.7	26.2	18.4	13.6
Level of Service	B	B		A	A	B	B	B	D	C	B	B
Approach Delay (s)		14.3			7.2			40.2			21.6	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
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)	235	325	600	298	131	507	201	1715	84	214	1594	128
Future Volume (vph)	235	325	600	298	131	507	201	1715	84	214	1594	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	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)	1789	3579	1601	1825	3579	1633	3471	5245	1633	3541	5245	1601
Flt Permitted	0.67	1.00	1.00	0.34	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1260	3579	1601	650	3579	1633	3471	5245	1633	3541	5245	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	235	325	600	298	131	507	201	1715	84	214	1594	128
RTOR Reduction (vph)	0	0	40	0	0	68	0	0	36	0	0	49
Lane Group Flow (vph)	235	325	560	298	131	439	201	1715	48	214	1594	79
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	32.0	18.0	49.5	36.0	20.0	39.3	31.5	64.7	80.7	19.3	52.5	66.5
Effective Green, g (s)	32.0	18.0	49.5	36.0	20.0	39.3	31.5	64.7	80.7	19.3	52.5	66.5
Actuated g/C Ratio	0.23	0.13	0.35	0.26	0.14	0.28	0.22	0.46	0.58	0.14	0.38	0.48
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
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)	340	460	566	301	511	458	780	2423	941	488	1966	760
v/s Ratio Prot	0.07	0.09	c0.22	c0.11	0.04	0.13	0.06	0.33	0.01	0.06	c0.30	0.01
v/s Ratio Perm	0.09		0.13	c0.14		0.14			0.02			0.04
v/c Ratio	0.69	0.71	0.99	0.99	0.26	0.96	0.26	0.71	0.05	0.44	0.81	0.10
Uniform Delay, d1	48.0	58.5	45.0	48.5	53.4	49.6	44.6	30.1	12.9	55.4	39.3	20.3
Progression Factor	0.85	0.88	0.99	1.00	1.00	1.00	0.60	0.83	2.66	1.13	0.71	0.16
Incremental Delay, d2	5.7	4.7	33.9	49.0	0.3	31.4	0.1	0.7	0.0	0.5	3.2	0.1
Delay (s)	46.5	56.4	78.4	97.5	53.7	81.0	26.7	25.5	34.4	63.3	31.2	3.3
Level of Service	D	E	E	F	D	F	C	C	C	E	C	A
Approach Delay (s)		65.8			82.4			26.0			32.9	
Approach LOS		E			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	44.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	44	15	55	34	11	131
Future Volume (Veh/h)	44	15	55	34	11	131
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	44	15	55	34	11	131
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			155			267
pX, platoon unblocked						
vC, conflicting volume	208	55			89	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	208	55			89	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	99			99	
cM capacity (veh/h)	775	1012			1506	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	44	15	55	34	142
Volume Left	44	0	0	0	11
Volume Right	0	15	0	34	0
cSH	775	1012	1700	1700	1506
Volume to Capacity	0.06	0.01	0.03	0.02	0.01
Queue Length 95th (m)	1.4	0.3	0.0	0.0	0.2
Control Delay (s)	9.9	8.6	0.0	0.0	0.6
Lane LOS	A	A			A
Approach Delay (s)	9.6		0.0		0.6
Approach LOS	A				

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	500	1380	2837	278	184	1098
Future Volume (vph)	500	1380	2837	278	184	1098
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	0.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4476	1601	3541	1570
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	4476	4476	1601	3541	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	500	1380	2837	278	184	1098
RTOR Reduction (vph)	0	0	0	54	0	0
Lane Group Flow (vph)	500	1380	2837	224	184	1098
Heavy Vehicles (%)	1%	3%	3%	2%	0%	4%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	30.6	113.6	79.0	79.0	12.4	140.0
Effective Green, g (s)	31.6	117.6	83.0	83.0	16.4	140.0
Actuated g/C Ratio	0.23	0.84	0.59	0.59	0.12	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	791	3759	2653	949	414	1570
v/s Ratio Prot	0.14	0.31	c0.63		0.05	
v/s Ratio Perm				0.14		c0.70
v/c Ratio	0.63	0.37	1.07	0.24	0.44	0.70
Uniform Delay, d1	49.0	2.6	28.5	13.5	57.6	0.0
Progression Factor	1.00	1.00	0.60	0.46	0.87	1.00
Incremental Delay, d2	1.7	0.3	35.2	0.3	0.5	2.3
Delay (s)	50.6	2.9	52.3	6.5	50.4	2.3
Level of Service	D	A	D	A	D	A
Approach Delay (s)		15.6	48.2		9.2	
Approach LOS		B	D		A	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	1556	3102	81	162	13
Future Volume (vph)	8	1556	3102	81	162	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3478	1457
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	69	4520	4520	1601	3478	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	1556	3102	81	162	13
RTOR Reduction (vph)	0	0	0	12	0	0
Lane Group Flow (vph)	8	1556	3102	69	163	12
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2			6		4
Actuated Green, G (s)	113.8	113.8	105.6	105.6	12.2	16.4
Effective Green, g (s)	113.8	113.8	105.6	105.6	12.2	16.4
Actuated g/C Ratio	0.81	0.81	0.75	0.75	0.09	0.12
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	107	3674	3409	1207	303	170
v/s Ratio Prot	0.00	c0.34	c0.69		c0.05	0.00
v/s Ratio Perm	0.06			0.04		0.01
v/c Ratio	0.07	0.42	0.91	0.06	0.54	0.07
Uniform Delay, d1	28.7	3.7	13.5	4.4	61.2	55.0
Progression Factor	0.91	0.85	1.24	1.53	0.95	1.04
Incremental Delay, d2	0.3	0.3	0.5	0.0	1.8	0.2
Delay (s)	26.5	3.5	17.2	6.8	60.0	57.6
Level of Service	C	A	B	A	E	E
Approach Delay (s)		3.6	16.9		59.8	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.9%	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 (vph)	58	1541	90	104	2753	161	242	8	61	297	16	148
Future Volume (vph)	58	1541	90	104	2753	161	242	8	61	297	16	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	4.0	6.7	6.7
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
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)	1825	4476	1570	1825	4476	1633	1753	1921	1504	1787	1921	1611
Flt Permitted	0.05	1.00	1.00	0.07	1.00	1.00	0.75	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	103	4476	1570	136	4476	1633	1378	1921	1504	1245	1921	1611
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	58	1541	90	104	2753	161	242	8	61	297	16	148
RTOR Reduction (vph)	0	0	42	0	0	40	0	0	48	0	0	65
Lane Group Flow (vph)	58	1541	48	104	2753	121	242	8	13	297	16	83
Confl. Peds. (#/hr)							1		2	2		1
Heavy Vehicles (%)	0%	3%	4%	0%	3%	0%	4%	0%	7%	2%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	79.6	74.4	74.4	87.0	78.1	78.1	29.3	29.3	29.3	39.3	39.3	39.3
Effective Green, g (s)	79.6	74.4	74.4	87.0	78.1	78.1	29.3	29.3	29.3	39.3	39.3	39.3
Actuated g/C Ratio	0.57	0.53	0.53	0.62	0.56	0.56	0.21	0.21	0.21	0.28	0.28	0.28
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	4.0	6.7	6.7
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	3.0	0.2	0.2
Lane Grp Cap (vph)	122	2378	834	191	2496	910	288	402	314	372	539	452
v/s Ratio Prot	0.02	0.34		c0.03	c0.62			0.00		c0.03	0.01	
v/s Ratio Perm	0.25		0.03	0.30		0.07	0.18		0.01	c0.19		0.05
v/c Ratio	0.48	0.65	0.06	0.54	1.10	0.13	0.84	0.02	0.04	0.80	0.03	0.18
Uniform Delay, d1	31.7	23.4	15.9	17.7	31.0	14.8	53.1	43.9	44.1	47.2	36.5	38.2
Progression Factor	1.30	0.72	0.06	1.64	1.20	1.74	1.00	1.00	1.00	1.04	1.04	1.07
Incremental Delay, d2	2.0	1.3	0.1	1.9	50.6	0.2	19.7	0.0	0.1	11.3	0.0	0.1
Delay (s)	43.2	18.2	1.1	30.9	87.6	25.9	72.8	44.0	44.2	60.6	38.1	40.9
Level of Service	D	B	A	C	F	C	E	D	D	E	D	D
Approach Delay (s)		18.1			82.3			66.5			53.5	
Approach LOS		B			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	59.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	96.0%	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 (vph)	48	1796	52	44	2834	117	56	5	25	269	16	127
Future Volume (vph)	48	1796	52	44	2834	117	56	5	25	269	16	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1772	4476	1601	1772	4611	1633	1789	1675		3471	1633	
Flt Permitted	0.04	1.00	1.00	0.06	1.00	1.00	0.67	1.00		0.95	1.00	
Satd. Flow (perm)	81	4476	1601	119	4611	1633	1254	1675		3471	1633	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	1796	52	44	2834	117	56	5	25	269	16	127
RTOR Reduction (vph)	0	0	18	0	0	32	0	24	0	0	115	0
Lane Group Flow (vph)	48	1796	34	44	2834	85	56	6	0	269	28	0
Heavy Vehicles (%)	3%	3%	2%	3%	0%	0%	2%	2%	0%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8					
Actuated Green, G (s)	97.2	91.8	91.8	97.2	91.8	91.8	14.1	6.4		14.4	13.1	
Effective Green, g (s)	97.2	91.8	91.8	97.2	91.8	91.8	14.1	6.4		14.4	13.1	
Actuated g/C Ratio	0.69	0.66	0.66	0.69	0.66	0.66	0.10	0.05		0.10	0.09	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	121	2934	1049	146	3023	1070	155	76		357	152	
v/s Ratio Prot	c0.02	0.40		0.01	c0.61		0.02	0.00		c0.08	0.02	
v/s Ratio Perm	0.26		0.02	0.20		0.05	c0.02					
v/c Ratio	0.40	0.61	0.03	0.30	0.94	0.08	0.36	0.08		0.75	0.18	
Uniform Delay, d1	33.7	13.9	8.5	10.3	21.5	8.8	58.4	64.0		61.1	58.5	
Progression Factor	2.15	0.96	8.20	2.04	0.85	0.83	1.00	1.00		0.98	1.02	
Incremental Delay, d2	1.6	0.7	0.0	0.1	0.8	0.0	1.4	1.0		8.7	0.6	
Delay (s)	74.0	14.0	69.6	21.1	19.1	7.3	59.9	64.9		68.7	60.1	
Level of Service	E	B	E	C	B	A	E	E		E	E	
Approach Delay (s)		17.0			18.7			61.6			65.7	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
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)	218	1450	535	292	2067	257	615	1525	207	580	1630	261
Future Volume (vph)	218	1450	535	292	2067	257	615	1525	207	580	1630	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	2.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1807	4476	1584	1755	5142	1570	3471	5092	1445	3471	5043	1601
Flt Permitted	0.09	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	238	4476	1584	154	5142	1570	3471	5092	1445	3471	5043	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	218	1450	535	292	2067	257	615	1525	207	580	1630	261
RTOR Reduction (vph)	0	0	46	0	0	60	0	0	87	0	0	89
Lane Group Flow (vph)	218	1450	489	292	2067	197	615	1525	120	580	1630	172
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	3%	2%	4%	2%	4%	2%	3%	13%	2%	4%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	51.0	44.0	68.0	60.0	49.0	49.0	24.0	41.0	41.0	21.0	38.0	38.0
Effective Green, g (s)	53.0	46.0	72.0	61.0	51.0	51.0	25.0	43.0	43.0	22.0	40.0	40.0
Actuated g/C Ratio	0.38	0.33	0.51	0.44	0.36	0.36	0.18	0.31	0.31	0.16	0.29	0.29
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	2.5	2.5	6.0	6.0	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	179	1470	814	215	1873	571	619	1563	443	545	1440	457
v/s Ratio Prot	0.07	0.32	c0.11	c0.13	0.40		0.18	0.30		c0.17	c0.32	
v/s Ratio Perm	0.39		0.20	c0.46		0.13			0.08			0.11
v/c Ratio	1.22	0.99	0.60	1.36	1.10	0.35	0.99	0.98	0.27	1.06	1.13	0.38
Uniform Delay, d1	40.9	46.7	23.9	42.0	44.5	32.4	57.4	48.0	36.7	59.0	50.0	40.0
Progression Factor	1.60	1.23	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.79	1.03	1.09
Incremental Delay, d2	133.7	18.8	0.9	188.3	55.2	1.7	34.3	17.2	0.5	46.4	64.4	0.4
Delay (s)	199.2	76.4	22.7	230.3	99.7	34.0	91.8	65.2	37.1	93.0	116.1	44.1
Level of Service	F	E	C	F	F	C	F	E	D	F	F	D
Approach Delay (s)		75.5			107.9			69.7			103.0	
Approach LOS		E			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	89.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	116.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	167	355	0	1095	2514	0
Future Volume (vph)	167	355	0	1095	2514	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.91	0.95	
Frt	0.92	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3171	1457		4902	3444	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3171	1457		4902	3444	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	355	0	1095	2514	0
RTOR Reduction (vph)	11	11	0	0	0	0
Lane Group Flow (vph)	334	166	0	1095	2514	0
Heavy Vehicles (%)	10%	2%	0%	7%	6%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	18.4	18.4		109.6	109.6	
Effective Green, g (s)	18.4	18.4		109.6	109.6	
Actuated g/C Ratio	0.13	0.13		0.78	0.78	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	416	191		3837	2696	
v/s Ratio Prot	0.11			0.22	c0.73	
v/s Ratio Perm		c0.11				
v/c Ratio	0.80	0.87		0.29	0.93	
Uniform Delay, d1	59.0	59.6		4.3	12.2	
Progression Factor	1.00	1.00		0.38	1.00	
Incremental Delay, d2	11.2	32.2		0.2	7.4	
Delay (s)	70.3	91.8		1.8	19.6	
Level of Service	E	F		A	B	
Approach Delay (s)	77.6			1.8	19.6	
Approach LOS	E			A	B	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.1%	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 (vph)	0	50	20	24	45	9	90	671	161	69	895	0
Future Volume (vph)	0	50	20	24	45	9	90	671	161	69	895	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.96		1.00	0.97		1.00	0.97		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803		1789	1836		1789	3475		1789	3579	
Flt Permitted		1.00		0.71	1.00		0.32	1.00		0.34	1.00	
Satd. Flow (perm)		1803		1340	1836		598	3475		638	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	50	20	24	45	9	90	671	161	69	895	0
RTOR Reduction (vph)	0	18	0	0	8	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	52	0	24	46	0	90	817	0	69	895	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.0		6.0	6.0		50.0	50.0		50.0	50.0	
Effective Green, g (s)		6.0		6.0	6.0		50.0	50.0		50.0	50.0	
Actuated g/C Ratio		0.09		0.09	0.09		0.71	0.71		0.71	0.71	
Clearance Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		154		114	157		427	2482		455	2556	
v/s Ratio Prot		c0.03			0.02			0.24			c0.25	
v/s Ratio Perm				0.02			0.15			0.11		
v/c Ratio		0.34		0.21	0.29		0.21	0.33		0.15	0.35	
Uniform Delay, d1		30.1		29.8	30.0		3.4	3.7		3.2	3.8	
Progression Factor		1.00		1.00	0.99		1.50	1.51		1.00	1.00	
Incremental Delay, d2		1.3		0.9	1.0		1.0	0.3		0.7	0.4	
Delay (s)		31.4		30.6	30.8		6.0	6.0		3.9	4.2	
Level of Service		C		C	C		A	A		A	A	
Approach Delay (s)		31.4			30.7			6.0			4.2	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	214	16	74	31	2	89
Future Volume (Veh/h)	214	16	74	31	2	89
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	214	16	74	31	2	89
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	247					
pX, platoon unblocked						
vC, conflicting volume			230		401	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			230		401	222
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		100	89
cM capacity (veh/h)			1338		572	818

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	230	105	2	89
Volume Left	0	74	2	0
Volume Right	16	0	0	89
cSH	1700	1338	572	818
Volume to Capacity	0.14	0.06	0.00	0.11
Queue Length 95th (m)	0.0	1.3	0.1	2.8
Control Delay (s)	0.0	5.7	11.3	9.9
Lane LOS		A	B	A
Approach Delay (s)	0.0	5.7	10.0	
Approach LOS			A	

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	156	41	23	853	272	179
Future Volume (vph)	156	41	23	853	272	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1883	1601	1789	1883	1789	1601
Flt Permitted	1.00	1.00	0.66	1.00	0.95	1.00
Satd. Flow (perm)	1883	1601	1239	1883	1789	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	156	41	23	853	272	179
RTOR Reduction (vph)	0	18	0	0	0	138
Lane Group Flow (vph)	156	23	23	853	272	41
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	40.1	40.1	40.1	40.1	15.9	15.9
Effective Green, g (s)	40.1	40.1	40.1	40.1	15.9	15.9
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.23	0.23
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1078	917	709	1078	406	363
v/s Ratio Prot	0.08			c0.45	c0.15	
v/s Ratio Perm		0.01	0.02			0.03
v/c Ratio	0.14	0.03	0.03	0.79	0.67	0.11
Uniform Delay, d1	7.0	6.5	6.5	11.7	24.7	21.5
Progression Factor	0.90	0.75	1.27	1.68	1.33	3.53
Incremental Delay, d2	0.3	0.1	0.1	3.9	4.0	0.1
Delay (s)	6.6	4.9	8.3	23.5	36.8	75.8
Level of Service	A	A	A	C	D	E
Approach Delay (s)	6.2			23.1	52.3	
Approach LOS	A			C	D	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	186	16	95	838	61	77
Future Volume (Veh/h)	186	16	95	838	61	77
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	186	16	95	838	61	77
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			202		1222	194
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			202		1222	194
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		67	91
cM capacity (veh/h)			1370		185	847

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	202	95	838	61	77
Volume Left	0	95	0	61	0
Volume Right	16	0	0	0	77
cSH	1700	1370	1700	185	847
Volume to Capacity	0.12	0.07	0.49	0.33	0.09
Queue Length 95th (m)	0.0	1.7	0.0	10.3	2.3
Control Delay (s)	0.0	7.8	0.0	33.8	9.7
Lane LOS		A		D	A
Approach Delay (s)	0.0	0.8		20.4	
Approach LOS				C	

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	66	134	933	1563	2451	418
Future Volume (vph)	66	134	933	1563	2451	418
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1789	1601	3471	5142	5142	1601
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1789	1601	3471	5142	5142	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	134	933	1563	2451	418
RTOR Reduction (vph)	0	123	0	0	0	209
Lane Group Flow (vph)	66	11	933	1563	2451	209
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	11.5	11.5	40.5	114.5	70.0	70.0
Effective Green, g (s)	11.5	11.5	40.5	114.5	70.0	70.0
Actuated g/C Ratio	0.08	0.08	0.29	0.82	0.50	0.50
Clearance Time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	146	131	1004	4205	2571	800
v/s Ratio Prot	c0.04		c0.27	0.30	c0.48	
v/s Ratio Perm		0.01				0.13
v/c Ratio	0.45	0.08	0.93	0.37	0.95	0.26
Uniform Delay, d1	61.2	59.4	48.4	3.3	33.4	20.1
Progression Factor	0.96	1.01	1.55	0.28	0.97	1.89
Incremental Delay, d2	2.2	0.3	8.1	0.1	4.5	0.3
Delay (s)	61.0	60.5	83.3	1.0	37.0	38.3
Level of Service	E	E	F	A	D	D
Approach Delay (s)	60.7			31.8	37.2	
Approach LOS	E			C	D	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	97.3%	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 (vph)	0	65	20	66	10	7	95	915	374	42	897	10
Future Volume (vph)	0	65	20	66	10	7	95	915	374	42	897	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.96		1.00	0.94		1.00	0.96		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1817		1789	1767		1789	3423		1789	3573	
Flt Permitted		1.00		0.70	1.00		0.31	1.00		0.18	1.00	
Satd. Flow (perm)		1817		1322	1767		578	3423		347	3573	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	65	20	66	10	7	95	915	374	42	897	10
RTOR Reduction (vph)	0	18	0	0	6	0	0	35	0	0	1	0
Lane Group Flow (vph)	0	67	0	66	11	0	95	1254	0	42	906	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.6		8.6	8.6		47.4	47.4		47.4	47.4	
Effective Green, g (s)		8.6		8.6	8.6		47.4	47.4		47.4	47.4	
Actuated g/C Ratio		0.12		0.12	0.12		0.68	0.68		0.68	0.68	
Clearance Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		223		162	217		391	2317		234	2419	
v/s Ratio Prot		0.04			0.01			c0.37			0.25	
v/s Ratio Perm				c0.05			0.16			0.12		
v/c Ratio		0.30		0.41	0.05		0.24	0.54		0.18	0.37	
Uniform Delay, d1		28.0		28.3	27.1		4.4	5.8		4.2	4.9	
Progression Factor		1.00		0.67	0.59		1.87	2.65		0.84	0.82	
Incremental Delay, d2		0.8		1.7	0.1		0.9	0.5		1.6	0.4	
Delay (s)		28.7		20.7	16.0		9.0	15.8		5.1	4.4	
Level of Service		C		C	B		A	B		A	A	
Approach Delay (s)		28.7			19.8			15.3			4.5	
Approach LOS		C			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	73.4%	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 (vph)	92	361	19	76	285	246	65	148	59	49	25	16
Future Volume (vph)	92	361	19	76	285	246	65	148	59	49	25	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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)	1789	3579	1601	1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.58	1.00	1.00	0.54	1.00	1.00	0.74	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	1087	3579	1601	1010	3579	1601	1396	1883	1601	1248	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	92	361	19	76	285	246	65	148	59	49	25	16
RTOR Reduction (vph)	0	0	6	0	0	84	0	0	51	0	0	14
Lane Group Flow (vph)	92	361	13	76	285	162	65	148	8	49	25	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	46.2	46.2	46.2	46.2	46.2	46.2	9.8	9.8	9.8	9.8	9.8	9.8
Effective Green, g (s)	46.2	46.2	46.2	46.2	46.2	46.2	9.8	9.8	9.8	9.8	9.8	9.8
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66	0.66	0.14	0.14	0.14	0.14	0.14	0.14
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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)	717	2362	1056	666	2362	1056	195	263	224	174	263	224
v/s Ratio Prot		0.10			0.08			c0.08			0.01	
v/s Ratio Perm	0.08		0.01	0.08		c0.10	0.05		0.01	0.04		0.00
v/c Ratio	0.13	0.15	0.01	0.11	0.12	0.15	0.33	0.56	0.04	0.28	0.10	0.01
Uniform Delay, d1	4.4	4.5	4.1	4.4	4.4	4.5	27.2	28.1	26.0	26.9	26.2	25.9
Progression Factor	1.26	1.27	1.00	1.28	1.31	6.90	1.18	1.15	2.02	0.92	0.91	1.00
Incremental Delay, d2	0.3	0.1	0.0	0.3	0.1	0.3	1.0	2.7	0.1	0.7	0.1	0.0
Delay (s)	5.9	5.9	4.1	5.9	5.9	31.3	33.2	35.1	52.7	25.4	23.9	25.9
Level of Service	A	A	A	A	A	C	C	D	D	C	C	C
Approach Delay (s)		5.8			16.2			38.5			25.1	
Approach LOS		A			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
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)	1	398	21	87	923	159	58	247	51	23	25	10
Future Volume (vph)	1	398	21	87	923	159	58	247	51	23	25	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	3552		1789	3579	1601	1789	1883	1601	1789	1803	
Flt Permitted	0.28	1.00		0.51	1.00	1.00	0.73	1.00	1.00	0.53	1.00	
Satd. Flow (perm)	531	3552		955	3579	1601	1383	1883	1601	1004	1803	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	398	21	87	923	159	58	247	51	23	25	10
RTOR Reduction (vph)	0	4	0	0	0	43	0	0	40	0	8	0
Lane Group Flow (vph)	1	415	0	87	923	116	58	247	11	23	27	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	41.2	41.2		41.2	41.2	41.2	14.8	14.8	14.8	14.8	14.8	
Effective Green, g (s)	41.2	41.2		41.2	41.2	41.2	14.8	14.8	14.8	14.8	14.8	
Actuated g/C Ratio	0.59	0.59		0.59	0.59	0.59	0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	312	2090		562	2106	942	292	398	338	212	381	
v/s Ratio Prot		0.12			c0.26			c0.13			0.02	
v/s Ratio Perm	0.00			0.09		0.07	0.04		0.01	0.02		
v/c Ratio	0.00	0.20		0.15	0.44	0.12	0.20	0.62	0.03	0.11	0.07	
Uniform Delay, d1	5.9	6.7		6.5	8.0	6.4	22.7	25.1	21.9	22.3	22.1	
Progression Factor	2.04	1.85		1.67	1.88	2.84	1.02	1.00	1.68	0.88	0.83	
Incremental Delay, d2	0.0	0.2		0.5	0.6	0.2	0.3	2.9	0.0	0.2	0.1	
Delay (s)	12.1	12.6		11.4	15.6	18.4	23.6	28.0	36.9	19.8	18.5	
Level of Service	B	B		B	B	B	C	C	D	B	B	
Approach Delay (s)		12.6			15.7			28.6			19.0	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
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)	131	315	18	101	1154	283	56	117	54	41	17	42
Future Volume (vph)	131	315	18	101	1154	283	56	117	54	41	17	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3550		1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.20	1.00		0.55	1.00	1.00	0.75	1.00	1.00	0.60	1.00	1.00
Satd. Flow (perm)	385	3550		1038	3579	1601	1406	1883	1601	1128	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	131	315	18	101	1154	283	56	117	54	41	17	42
RTOR Reduction (vph)	0	2	0	0	0	46	0	0	48	0	0	38
Lane Group Flow (vph)	131	331	0	101	1154	237	56	117	6	41	17	4
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	111.7	111.7		99.9	99.9	99.9	14.3	14.3	14.3	14.3	14.3	14.3
Effective Green, g (s)	111.7	111.7		99.9	99.9	99.9	14.3	14.3	14.3	14.3	14.3	14.3
Actuated g/C Ratio	0.80	0.80		0.71	0.71	0.71	0.10	0.10	0.10	0.10	0.10	0.10
Clearance Time (s)	4.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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
Lane Grp Cap (vph)	385	2832		740	2553	1142	143	192	163	115	192	163
v/s Ratio Prot	c0.02	0.09			c0.32			c0.06			0.01	
v/s Ratio Perm	0.25			0.10		0.15	0.04		0.00	0.04		0.00
v/c Ratio	0.34	0.12		0.14	0.45	0.21	0.39	0.61	0.03	0.36	0.09	0.03
Uniform Delay, d1	4.6	3.2		6.4	8.5	6.7	58.8	60.2	56.6	58.6	56.9	56.6
Progression Factor	1.41	0.37		0.77	1.02	1.22	0.92	0.92	0.87	0.61	0.60	0.24
Incremental Delay, d2	0.5	0.1		0.2	0.3	0.2	1.7	5.1	0.1	1.3	0.1	0.0
Delay (s)	7.0	1.3		5.1	8.9	8.5	56.0	60.6	49.2	37.1	34.3	13.5
Level of Service	A	A		A	A	A	E	E	D	D	C	B
Approach Delay (s)		2.9			8.6			56.7			26.7	
Approach LOS		A			A			E			C	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
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)	125	102	161	77	548	180	873	2191	269	492	1842	251
Future Volume (vph)	125	102	161	77	548	180	873	2191	269	492	1842	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	4.0	7.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	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)	1789	3579	1601	1825	3579	1633	3471	5245	1633	3541	5245	1601
Flt Permitted	0.16	1.00	1.00	0.69	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	302	3579	1601	1321	3579	1633	3471	5245	1633	3541	5245	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	102	161	77	548	180	873	2191	269	492	1842	251
RTOR Reduction (vph)	0	0	15	0	0	63	0	0	145	0	0	80
Lane Group Flow (vph)	125	102	146	77	548	117	873	2191	124	492	1842	171
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	36.4	36.4	72.0	25.4	25.4	46.3	35.6	64.7	64.7	20.9	50.0	50.0
Effective Green, g (s)	36.4	36.4	72.0	25.4	25.4	46.3	35.6	64.7	64.7	20.9	50.0	50.0
Actuated g/C Ratio	0.26	0.26	0.51	0.18	0.18	0.33	0.25	0.46	0.46	0.15	0.36	0.36
Clearance Time (s)	4.0	7.0	4.0	7.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
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)	152	930	823	239	649	540	882	2423	754	528	1873	571
v/s Ratio Prot	c0.04	0.03	0.05		0.15	0.03	c0.25	0.42		0.14	c0.35	
v/s Ratio Perm	c0.17		0.05	0.06		0.04			0.08			0.11
v/c Ratio	0.82	0.11	0.18	0.32	0.84	0.22	0.99	0.90	0.16	0.93	0.98	0.30
Uniform Delay, d1	44.4	39.5	18.2	49.8	55.4	33.8	52.0	34.8	21.9	58.8	44.6	32.4
Progression Factor	1.12	1.04	0.68	1.00	1.00	1.00	0.57	1.12	2.97	0.98	1.04	1.48
Incremental Delay, d2	28.7	0.1	0.1	0.8	9.8	0.2	6.9	0.6	0.0	11.4	9.5	0.5
Delay (s)	78.3	41.2	12.5	50.6	65.2	34.0	36.5	39.6	65.1	69.2	55.8	48.4
Level of Service	E	D	B	D	E	C	D	D	E	E	E	D
Approach Delay (s)		41.2			56.8			40.8			57.6	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	48.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	51	19	253	191	71	49
Future Volume (Veh/h)	51	19	253	191	71	49
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	51	19	253	191	71	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			155			267
pX, platoon unblocked						
vC, conflicting volume	444	253			444	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	444	253			444	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	98			94	
cM capacity (veh/h)	535	786			1116	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	51	19	253	191	120
Volume Left	51	0	0	0	71
Volume Right	0	19	0	191	0
cSH	535	786	1700	1700	1116
Volume to Capacity	0.10	0.02	0.15	0.11	0.06
Queue Length 95th (m)	2.4	0.6	0.0	0.0	1.5
Control Delay (s)	12.4	9.7	0.0	0.0	5.2
Lane LOS	B	A			A
Approach Delay (s)	11.7		0.0		5.2
Approach LOS	B				

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1196	3202	1057	188	386	597
Future Volume (vph)	1196	3202	1057	188	386	597
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4117	1570	3541	1613
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	4476	4117	1570	3541	1613
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1196	3202	1057	188	386	597
RTOR Reduction (vph)	0	0	0	89	0	0
Lane Group Flow (vph)	1196	3202	1057	99	386	597
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	1%	3%	12%	4%	0%	0%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	55.2	105.8	46.6	46.6	20.2	140.0
Effective Green, g (s)	55.2	105.8	46.6	46.6	20.2	140.0
Actuated g/C Ratio	0.39	0.76	0.33	0.33	0.14	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	1382	3382	1370	522	510	1613
v/s Ratio Prot	0.34	c0.72	0.26		c0.11	
v/s Ratio Perm				0.06		0.37
v/c Ratio	0.87	0.95	0.77	0.19	0.76	0.37
Uniform Delay, d1	39.0	14.7	41.9	33.2	57.5	0.0
Progression Factor	1.00	1.00	0.83	1.18	1.15	1.00
Incremental Delay, d2	5.9	7.3	4.1	0.8	5.8	0.6
Delay (s)	44.9	21.9	38.8	39.9	72.1	0.6
Level of Service	D	C	D	D	E	A
Approach Delay (s)		28.2	38.9		28.7	
Approach LOS		C	D		C	

Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	161	3427	1242	283	66	34
Future Volume (vph)	161	3427	1242	283	66	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	0.99	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3464	1457
Flt Permitted	0.16	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	303	4520	4520	1601	3464	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	161	3427	1242	283	66	34
RTOR Reduction (vph)	0	0	0	68	3	29
Lane Group Flow (vph)	161	3427	1242	215	66	2
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	118.0	118.0	106.2	106.2	8.0	8.0
Effective Green, g (s)	118.0	118.0	106.2	106.2	8.0	8.0
Actuated g/C Ratio	0.84	0.84	0.76	0.76	0.06	0.06
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	338	3809	3428	1214	197	83
v/s Ratio Prot	0.03	c0.76	0.27		c0.02	
v/s Ratio Perm	0.38			0.13		0.00
v/c Ratio	0.48	0.90	0.36	0.18	0.34	0.02
Uniform Delay, d1	2.7	7.2	5.6	4.7	63.4	62.3
Progression Factor	0.56	0.80	1.56	5.86	1.02	1.16
Incremental Delay, d2	0.5	1.8	0.3	0.3	1.0	0.1
Delay (s)	2.0	7.5	9.1	27.9	65.8	72.6
Level of Service	A	A	A	C	E	E
Approach Delay (s)		7.2	12.6		67.9	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
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)	147	2997	262	58	1425	395	80	35	168	81	8	20
Future Volume (vph)	147	2997	262	58	1425	395	80	35	168	81	8	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.99
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)	1807	4476	1601	1674	4117	1570	1768	1921	1517	1555	1921	1610
Flt Permitted	0.12	1.00	1.00	0.04	1.00	1.00	0.75	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	229	4476	1601	71	4117	1570	1400	1921	1517	1202	1921	1610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	147	2997	262	58	1425	395	80	35	168	81	8	20
RTOR Reduction (vph)	0	0	49	0	0	115	0	0	81	0	0	18
Lane Group Flow (vph)	147	2997	213	58	1425	280	80	35	87	81	8	2
Confl. Peds. (#/hr)	8					8	2		3	3		2
Heavy Vehicles (%)	1%	3%	2%	9%	12%	0%	3%	0%	6%	17%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	110.2	101.8	101.8	105.2	99.3	99.3	14.9	14.9	14.9	14.9	14.9	14.9
Effective Green, g (s)	110.2	101.8	101.8	105.2	99.3	99.3	14.9	14.9	14.9	14.9	14.9	14.9
Actuated g/C Ratio	0.79	0.73	0.73	0.75	0.71	0.71	0.11	0.11	0.11	0.11	0.11	0.11
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	0.2
Lane Grp Cap (vph)	274	3254	1164	120	2920	1113	149	204	161	127	204	171
v/s Ratio Prot	c0.03	c0.67		0.02	0.35			0.02			0.00	
v/s Ratio Perm	0.39		0.13	0.34		0.18	0.06		0.06	c0.07		0.00
v/c Ratio	0.54	0.92	0.18	0.48	0.49	0.25	0.54	0.17	0.54	0.64	0.04	0.01
Uniform Delay, d1	5.4	15.8	6.0	30.6	9.0	7.2	59.3	56.9	59.3	60.0	56.1	56.0
Progression Factor	1.91	0.80	1.45	1.14	1.31	4.25	1.00	1.00	1.00	1.50	1.62	1.00
Incremental Delay, d2	0.7	2.8	0.2	2.4	0.5	0.4	4.1	0.5	3.9	7.5	0.0	0.0
Delay (s)	11.1	15.5	8.9	37.3	12.3	31.0	63.4	57.4	63.2	97.5	91.1	56.0
Level of Service	B	B	A	D	B	C	E	E	E	F	F	E
Approach Delay (s)		14.8			17.0			62.5			89.4	
Approach LOS		B			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	95.6%	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 (vph)	128	3181	104	33	1827	341	88	17	84	63	2	24
Future Volume (vph)	128	3181	104	33	1827	341	88	17	84	63	2	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	4391	1633	1772	4117	1601	1722	1609		3471	1623	
Flt Permitted	0.05	1.00	1.00	0.05	1.00	1.00	0.48	1.00		0.95	1.00	
Satd. Flow (perm)	101	4391	1633	84	4117	1601	863	1609		3471	1623	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	128	3181	104	33	1827	341	88	17	84	63	2	24
RTOR Reduction (vph)	0	0	29	0	0	37	0	76	0	0	23	0
Lane Group Flow (vph)	128	3181	75	33	1827	304	88	25	0	63	3	0
Heavy Vehicles (%)	4%	5%	0%	3%	12%	2%	6%	2%	5%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8					
Actuated Green, G (s)	104.0	96.1	96.1	92.7	88.8	88.8	22.0	13.2		4.8	7.2	
Effective Green, g (s)	104.0	96.1	96.1	92.7	88.8	88.8	22.0	13.2		4.8	7.2	
Actuated g/C Ratio	0.74	0.69	0.69	0.66	0.63	0.63	0.16	0.09		0.03	0.05	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	207	3014	1120	102	2611	1015	201	151		119	83	
v/s Ratio Prot	c0.05	c0.72		0.01	0.44		c0.03	0.02		0.02	0.00	
v/s Ratio Perm	0.41		0.05	0.20		0.19	c0.03					
v/c Ratio	0.62	1.06	0.07	0.32	0.70	0.30	0.44	0.17		0.53	0.04	
Uniform Delay, d1	26.1	22.0	7.2	34.3	16.8	11.6	52.5	58.3		66.5	63.1	
Progression Factor	1.26	0.81	1.83	2.27	0.85	1.15	1.00	1.00		0.97	1.57	
Incremental Delay, d2	2.9	30.0	0.1	0.6	0.5	0.3	1.5	1.1		4.2	0.2	
Delay (s)	35.9	47.8	13.3	78.3	14.9	13.5	54.0	59.4		68.4	99.3	
Level of Service	D	D	B	E	B	B	D	E		E	F	
Approach Delay (s)		46.3			15.6			56.9			77.4	
Approach LOS		D			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	93.0%	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 (vph)	330	2336	562	198	1317	765	621	2238	322	315	1409	169
Future Volume (vph)	330	2336	562	198	1317	765	621	2238	322	315	1409	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	1.0	3.0	4.0	1.0	3.0	4.0	1.0	3.0	4.0	1.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1630	4476	1569	1508	4683	1555	3079	4902	1512	3404	4902	1541
Flt Permitted	0.08	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	486	4476	1569	135	4683	1555	3079	4902	1512	3404	4902	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	2336	562	198	1317	765	621	2238	322	315	1409	169
RTOR Reduction (vph)	0	0	27	0	0	70	0	0	54	0	0	53
Lane Group Flow (vph)	330	2336	535	198	1317	695	621	2238	268	315	1409	116
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	3%	3%	3%	21%	12%	5%	15%	7%	8%	4%	7%	6%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	67.0	55.0	72.0	54.1	46.1	55.1	17.0	46.0	54.0	9.0	38.0	54.9
Effective Green, g (s)	68.0	58.0	78.0	56.1	49.1	61.1	18.0	49.0	60.0	10.0	41.0	60.9
Actuated g/C Ratio	0.49	0.41	0.56	0.40	0.35	0.44	0.13	0.35	0.43	0.07	0.29	0.43
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
Vehicle Extension (s)	2.5	6.0	2.5	2.5	6.0	2.5	2.5	4.0	2.5	2.5	4.0	2.5
Lane Grp Cap (vph)	382	1854	874	142	1642	678	395	1715	648	243	1435	670
v/s Ratio Prot	0.11	c0.52	0.09	c0.09	0.28	0.09	c0.20	c0.46	0.03	0.09	0.29	0.02
v/s Ratio Perm	0.31		0.25	c0.47		0.36			0.14			0.05
v/c Ratio	0.86	1.26	0.61	1.39	0.80	1.02	1.57	1.30	0.41	1.30	0.98	0.17
Uniform Delay, d1	28.6	41.0	20.8	36.6	41.1	39.5	61.0	45.5	27.8	65.0	49.1	24.2
Progression Factor	1.21	0.99	0.66	1.00	1.00	1.00	1.00	1.00	1.00	0.63	0.93	2.37
Incremental Delay, d2	6.8	118.5	0.4	214.5	4.2	40.9	269.4	141.6	0.3	145.8	11.5	0.0
Delay (s)	41.5	159.3	14.2	251.1	45.3	80.4	330.4	187.1	28.1	186.8	57.3	57.3
Level of Service	D	F	B	F	D	F	F	F	C	F	E	E
Approach Delay (s)		122.0			74.9			199.0			78.8	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	127.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	121.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	111	131	0	2387	1252	0
Future Volume (vph)	111	131	0	2387	1252	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.91	0.95	
Frt	0.95	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3339	1457		5142	3579	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3339	1457		5142	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	131	0	2387	1252	0
RTOR Reduction (vph)	47	71	0	0	0	0
Lane Group Flow (vph)	118	6	0	2387	1252	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	11.2	11.2		116.8	116.8	
Effective Green, g (s)	11.2	11.2		116.8	116.8	
Actuated g/C Ratio	0.08	0.08		0.83	0.83	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	267	116		4289	2985	
v/s Ratio Prot	c0.04			c0.46	0.35	
v/s Ratio Perm		0.00				
v/c Ratio	0.44	0.05		0.56	0.42	
Uniform Delay, d1	61.4	59.5		3.6	3.0	
Progression Factor	1.00	1.00		0.06	1.00	
Incremental Delay, d2	1.6	0.3		0.2	0.4	
Delay (s)	63.0	59.8		0.4	3.4	
Level of Service	E	E		A	A	
Approach Delay (s)	62.0			0.4	3.4	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
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)	5	65	40	133	55	58	50	655	36	14	837	0
Future Volume (vph)	5	65	40	133	55	58	50	655	36	14	837	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
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	0.92		1.00	0.99		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)	1789	1776		1789	1738		1789	3551		1789	3579	
Flt Permitted	0.68	1.00		0.69	1.00		0.32	1.00		0.39	1.00	
Satd. Flow (perm)	1289	1776		1298	1738		608	3551		732	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	65	40	133	55	58	50	655	36	14	837	0
RTOR Reduction (vph)	0	33	0	0	47	0	0	4	0	0	0	0
Lane Group Flow (vph)	5	72	0	133	66	0	50	687	0	14	837	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.1	13.1		13.1	13.1		42.9	42.9		42.9	42.9	
Effective Green, g (s)	13.1	13.1		13.1	13.1		42.9	42.9		42.9	42.9	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.61	0.61		0.61	0.61	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	241	332		242	325		372	2176		448	2193	
v/s Ratio Prot		0.04			0.04			0.19			c0.23	
v/s Ratio Perm	0.00			c0.10			0.08			0.02		
v/c Ratio	0.02	0.22		0.55	0.20		0.13	0.32		0.03	0.38	
Uniform Delay, d1	23.2	24.1		25.8	24.0		5.7	6.5		5.3	6.8	
Progression Factor	1.00	1.00		1.20	1.46		1.60	1.40		1.00	1.00	
Incremental Delay, d2	0.0	0.3		2.5	0.3		0.7	0.3		0.1	0.5	
Delay (s)	23.3	24.4		33.4	35.4		9.9	9.4		5.5	7.4	
Level of Service	C	C		C	D		A	A		A	A	
Approach Delay (s)		24.4			34.4			9.5			7.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	46	4	82	179	12	63
Future Volume (Veh/h)	46	4	82	179	12	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	46	4	82	179	12	63
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	247					
pX, platoon unblocked						
vC, conflicting volume			50		391	48
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			50		391	48
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		98	94
cM capacity (veh/h)			1557		581	1021

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	50	261	12	63
Volume Left	0	82	12	0
Volume Right	4	0	0	63
cSH	1700	1557	581	1021
Volume to Capacity	0.03	0.05	0.02	0.06
Queue Length 95th (m)	0.0	1.3	0.5	1.5
Control Delay (s)	0.0	2.6	11.3	8.8
Lane LOS		A	B	A
Approach Delay (s)	0.0	2.6	9.2	
Approach LOS			A	

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Volume (vph)	703	226	137	212	61	24
Future Volume (vph)	703	226	137	212	61	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1883	1601	1789	1883	1789	1601
Flt Permitted	1.00	1.00	0.35	1.00	0.95	1.00
Satd. Flow (perm)	1883	1601	661	1883	1789	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	703	226	137	212	61	24
RTOR Reduction (vph)	0	35	0	0	0	22
Lane Group Flow (vph)	703	191	137	212	61	2
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	49.9	49.9	49.9	49.9	6.1	6.1
Effective Green, g (s)	49.9	49.9	49.9	49.9	6.1	6.1
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.09	0.09
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1342	1141	471	1342	155	139
v/s Ratio Prot	c0.37			0.11	c0.03	
v/s Ratio Perm		0.12	0.21			0.00
v/c Ratio	0.52	0.17	0.29	0.16	0.39	0.02
Uniform Delay, d1	4.6	3.3	3.6	3.3	30.2	29.2
Progression Factor	1.03	1.05	1.33	0.85	1.32	2.12
Incremental Delay, d2	1.5	0.3	1.5	0.2	1.6	0.0
Delay (s)	6.2	3.8	6.4	3.0	41.6	62.0
Level of Service	A	A	A	A	D	E
Approach Delay (s)	5.6			4.3	47.4	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	691	49	82	235	18	93
Future Volume (Veh/h)	691	49	82	235	18	93
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	691	49	82	235	18	93
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			740		1114	716
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			740		1114	716
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		91	78
cM capacity (veh/h)			867		208	430

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	740	82	235	18	93
Volume Left	0	82	0	18	0
Volume Right	49	0	0	0	93
cSH	1700	867	1700	208	430
Volume to Capacity	0.44	0.09	0.14	0.09	0.22
Queue Length 95th (m)	0.0	2.4	0.0	2.1	6.2
Control Delay (s)	0.0	9.6	0.0	23.9	15.7
Lane LOS		A		C	C
Approach Delay (s)	0.0	2.5		17.0	
Approach LOS				C	

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	354	798	197	2438	1485	96
Future Volume (vph)	354	798	197	2438	1485	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1789	1601	3471	5142	5142	1601
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1789	1601	3471	5142	5142	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	354	798	197	2438	1485	96
RTOR Reduction (vph)	0	133	0	0	0	61
Lane Group Flow (vph)	354	665	197	2438	1485	35
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	59.2	59.2	12.1	66.8	50.7	50.7
Effective Green, g (s)	59.2	59.2	12.1	66.8	50.7	50.7
Actuated g/C Ratio	0.42	0.42	0.09	0.48	0.36	0.36
Clearance Time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	756	676	299	2453	1862	579
v/s Ratio Prot	0.20		0.06	c0.47	0.29	
v/s Ratio Perm		c0.42				0.02
v/c Ratio	0.47	0.98	0.66	0.99	0.80	0.06
Uniform Delay, d1	29.1	39.9	62.0	36.4	40.0	29.1
Progression Factor	1.10	1.15	1.19	0.56	0.92	0.86
Incremental Delay, d2	0.4	29.8	3.4	13.3	3.5	0.2
Delay (s)	32.6	75.9	77.4	33.5	40.5	25.2
Level of Service	C	E	E	C	D	C
Approach Delay (s)	62.6			36.8	39.5	
Approach LOS	E			D	D	

Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
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)	10	30	60	356	25	55	15	676	129	36	999	0
Future Volume (vph)	10	30	60	356	25	55	15	676	129	36	999	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.90		1.00	0.98		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)	1789	1695		1789	1689		1789	3493		1789	3579	
Flt Permitted	0.70	1.00		0.70	1.00		0.21	1.00		0.30	1.00	
Satd. Flow (perm)	1328	1695		1316	1689		401	3493		564	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	30	60	356	25	55	15	676	129	36	999	0
RTOR Reduction (vph)	0	22	0	0	37	0	0	20	0	0	0	0
Lane Group Flow (vph)	10	68	0	356	43	0	15	785	0	36	999	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.4	23.4		23.4	23.4		32.6	32.6		32.6	32.6	
Effective Green, g (s)	23.4	23.4		23.4	23.4		32.6	32.6		32.6	32.6	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.47	0.47		0.47	0.47	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	443	566		439	564		186	1626		262	1666	
v/s Ratio Prot		0.04			0.03			0.22			c0.28	
v/s Ratio Perm	0.01			c0.27			0.04			0.06		
v/c Ratio	0.02	0.12		0.81	0.08		0.08	0.48		0.14	0.60	
Uniform Delay, d1	15.6	16.2		21.3	15.9		10.4	12.9		10.7	13.9	
Progression Factor	1.00	1.00		1.28	0.94		0.80	1.16		0.73	0.67	
Incremental Delay, d2	0.0	0.1		10.8	0.1		0.7	0.9		1.0	1.5	
Delay (s)	15.6	16.3		37.9	15.0		9.0	15.8		8.9	10.8	
Level of Service	B	B		D	B		A	B		A	B	
Approach Delay (s)		16.2			33.7			15.6			10.7	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
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)	24	397	76	98	425	69	42	34	110	188	121	69
Future Volume (vph)	24	397	76	98	425	69	42	34	110	188	121	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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)	1789	3579	1601	1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.50	1.00	1.00	0.52	1.00	1.00	0.68	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	949	3579	1601	975	3579	1601	1279	1883	1601	1384	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	397	76	98	425	69	42	34	110	188	121	69
RTOR Reduction (vph)	0	0	32	0	0	29	0	0	85	0	0	54
Lane Group Flow (vph)	24	397	44	98	425	40	42	34	25	188	121	15
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	40.4	40.4	40.4	40.4	40.4	40.4	15.6	15.6	15.6	15.6	15.6	15.6
Effective Green, g (s)	40.4	40.4	40.4	40.4	40.4	40.4	15.6	15.6	15.6	15.6	15.6	15.6
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.58	0.58	0.22	0.22	0.22	0.22	0.22	0.22
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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)	547	2065	924	562	2065	924	285	419	356	308	419	356
v/s Ratio Prot		0.11			c0.12			0.02			0.06	
v/s Ratio Perm	0.03		0.03	0.10		0.02	0.03		0.02	c0.14		0.01
v/c Ratio	0.04	0.19	0.05	0.17	0.21	0.04	0.15	0.08	0.07	0.61	0.29	0.04
Uniform Delay, d1	6.4	7.0	6.4	7.0	7.1	6.4	21.9	21.5	21.5	24.5	22.6	21.3
Progression Factor	1.44	1.40	2.53	2.30	2.24	5.99	1.09	1.09	1.68	1.06	1.07	1.37
Incremental Delay, d2	0.2	0.2	0.1	0.7	0.2	0.1	0.2	0.1	0.1	3.6	0.4	0.1
Delay (s)	9.4	10.1	16.4	16.7	16.1	38.5	24.1	23.5	36.1	29.6	24.6	29.4
Level of Service	A	B	B	B	B	D	C	C	D	C	C	C
Approach Delay (s)		11.0			18.8			31.1			28.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
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)	17	995	71	87	614	36	50	32	112	132	189	42
Future Volume (vph)	17	995	71	87	614	36	50	32	112	132	189	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	3543		1789	3579	1601	1789	1883	1601	1789	1832	
Flt Permitted	0.42	1.00		0.23	1.00	1.00	0.56	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	790	3543		437	3579	1601	1055	1883	1601	1387	1832	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	995	71	87	614	36	50	32	112	132	189	42
RTOR Reduction (vph)	0	5	0	0	0	14	0	0	50	0	15	0
Lane Group Flow (vph)	17	1061	0	87	614	22	50	32	62	132	216	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	42.0	42.0		42.0	42.0	42.0	14.0	14.0	14.0	14.0	14.0	
Effective Green, g (s)	42.0	42.0		42.0	42.0	42.0	14.0	14.0	14.0	14.0	14.0	
Actuated g/C Ratio	0.60	0.60		0.60	0.60	0.60	0.20	0.20	0.20	0.20	0.20	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	474	2125		262	2147	960	211	376	320	277	366	
v/s Ratio Prot		c0.30			0.17			0.02			c0.12	
v/s Ratio Perm	0.02			0.20		0.01	0.05		0.04	0.10		
v/c Ratio	0.04	0.50		0.33	0.29	0.02	0.24	0.09	0.20	0.48	0.59	
Uniform Delay, d1	5.7	8.0		7.0	6.8	5.7	23.5	22.8	23.3	24.8	25.4	
Progression Factor	1.05	1.08		1.65	1.57	6.02	0.79	0.78	0.71	0.93	0.94	
Incremental Delay, d2	0.1	0.8		3.3	0.3	0.0	0.6	0.1	0.3	1.3	2.4	
Delay (s)	6.1	9.4		14.9	10.9	34.2	19.2	17.9	16.8	24.4	26.3	
Level of Service	A	A		B	B	C	B	B	B	C	C	
Approach Delay (s)		9.4			12.5			17.6			25.6	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
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)	52	1193	54	79	587	56	31	27	109	243	95	125
Future Volume (vph)	52	1193	54	79	587	56	31	27	109	243	95	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3555		1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.43	1.00		0.16	1.00	1.00	0.70	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	811	3555		296	3579	1601	1310	1883	1601	1393	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	52	1193	54	79	587	56	31	27	109	243	95	125
RTOR Reduction (vph)	0	4	0	0	0	26	0	0	46	0	0	93
Lane Group Flow (vph)	52	1243	0	79	587	30	31	27	63	243	95	32
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	38.0	38.0		38.0	38.0	38.0	18.0	18.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	38.0	38.0		38.0	38.0	38.0	18.0	18.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.54	0.54		0.54	0.54	0.54	0.26	0.26	0.26	0.26	0.26	0.26
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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
Lane Grp Cap (vph)	440	1929		160	1942	869	336	484	411	358	484	411
v/s Ratio Prot		c0.35			0.16			0.01			0.05	
v/s Ratio Perm	0.06			0.27		0.02	0.02		0.04	c0.17		0.02
v/c Ratio	0.12	0.64		0.49	0.30	0.03	0.09	0.06	0.15	0.68	0.20	0.08
Uniform Delay, d1	7.8	11.3		10.0	8.8	7.5	19.8	19.6	20.1	23.4	20.3	19.7
Progression Factor	1.55	1.56		1.29	0.61	1.00	1.03	1.03	1.41	0.91	0.93	0.71
Incremental Delay, d2	0.5	1.5		9.3	0.4	0.1	0.1	0.0	0.2	5.0	0.2	0.1
Delay (s)	12.6	19.1		22.2	5.7	7.5	20.5	20.2	28.5	26.3	19.1	14.1
Level of Service	B	B		C	A	A	C	C	C	C	B	B
Approach Delay (s)		18.9			7.6			25.7			21.5	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	80.7%	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 (vph)	312	520	815	298	207	507	309	1796	84	214	1922	168
Future Volume (vph)	312	520	815	298	207	507	309	1796	84	214	1922	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	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)	1789	3579	1601	1825	3579	1633	3471	5245	1633	3541	5245	1601
Flt Permitted	0.61	1.00	1.00	0.20	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1151	3579	1601	392	3579	1633	3471	5245	1633	3541	5245	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	312	520	815	298	207	507	309	1796	84	214	1922	168
RTOR Reduction (vph)	0	0	39	0	0	67	0	0	36	0	0	50
Lane Group Flow (vph)	312	520	776	298	207	440	309	1796	48	214	1922	118
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	37.6	24.6	52.0	37.6	24.6	39.5	27.4	65.5	78.5	14.9	53.0	66.0
Effective Green, g (s)	37.6	24.6	52.0	37.6	24.6	39.5	27.4	65.5	78.5	14.9	53.0	66.0
Actuated g/C Ratio	0.27	0.18	0.37	0.27	0.18	0.28	0.20	0.47	0.56	0.11	0.38	0.47
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
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)	368	628	594	238	628	460	679	2453	915	376	1985	754
v/s Ratio Prot	0.08	0.15	c0.26	c0.12	0.06	0.10	0.09	0.34	0.00	0.06	c0.37	0.01
v/s Ratio Perm	0.15		0.23	0.22		0.17			0.02			0.06
v/c Ratio	0.85	0.83	1.31	1.25	0.33	0.96	0.46	0.73	0.05	0.57	0.97	0.16
Uniform Delay, d1	46.4	55.7	44.0	46.3	50.5	49.4	49.7	30.2	13.9	59.5	42.7	21.1
Progression Factor	0.83	0.87	1.06	1.00	1.00	1.00	0.55	0.95	2.88	1.04	0.65	0.36
Incremental Delay, d2	14.2	7.6	148.1	143.2	0.3	30.6	0.2	0.6	0.0	1.0	8.6	0.0
Delay (s)	52.6	56.1	194.6	189.5	50.8	80.0	27.6	29.1	40.1	63.0	36.1	7.6
Level of Service	D	E	F	F	D	E	C	C	D	E	D	A
Approach Delay (s)		124.0			106.2			29.3			36.5	
Approach LOS		F			F			C			D	

Intersection Summary			
HCM 2000 Control Delay	64.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	116.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	251	89	97	145	49	246
Future Volume (Veh/h)	251	89	97	145	49	246
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	251	89	97	145	49	246
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			155			267
pX, platoon unblocked						
vC, conflicting volume	441	97			242	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	441	97			242	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	55	91			96	
cM capacity (veh/h)	552	959			1324	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	251	89	97	145	295
Volume Left	251	0	0	0	49
Volume Right	0	89	0	145	0
cSH	552	959	1700	1700	1324
Volume to Capacity	0.45	0.09	0.06	0.09	0.04
Queue Length 95th (m)	17.9	2.3	0.0	0.0	0.9
Control Delay (s)	16.8	9.1	0.0	0.0	1.6
Lane LOS	C	A			A
Approach Delay (s)	14.8		0.0		1.6
Approach LOS	B				

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰↰	↑↑↑	↑↑↑	↱	↰↰	↱
Traffic Volume (vph)	547	1444	2998	278	184	1231
Future Volume (vph)	547	1444	2998	278	184	1231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	0.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4476	1601	3541	1570
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	4476	4476	1601	3541	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	547	1444	2998	278	184	1231
RTOR Reduction (vph)	0	0	0	51	0	0
Lane Group Flow (vph)	547	1444	2998	227	184	1231
Heavy Vehicles (%)	1%	3%	3%	2%	0%	4%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	30.6	113.6	79.0	79.0	12.4	140.0
Effective Green, g (s)	31.6	117.6	83.0	83.0	16.4	140.0
Actuated g/C Ratio	0.23	0.84	0.59	0.59	0.12	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	791	3759	2653	949	414	1570
v/s Ratio Prot	0.16	0.32	c0.67		0.05	
v/s Ratio Perm				0.14		c0.78
v/c Ratio	0.69	0.38	1.13	0.24	0.44	0.78
Uniform Delay, d1	49.7	2.6	28.5	13.5	57.6	0.0
Progression Factor	1.00	1.00	0.51	0.57	0.85	1.00
Incremental Delay, d2	2.6	0.3	60.1	0.2	0.4	3.3
Delay (s)	52.4	2.9	74.6	7.9	49.4	3.3
Level of Service	D	A	E	A	D	A
Approach Delay (s)		16.5	68.9		9.3	
Approach LOS		B	E		A	

Intersection Summary			
HCM 2000 Control Delay	40.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	78	1550	3094	164	315	182
Future Volume (vph)	78	1550	3094	164	315	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	0.99	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.96	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3452	1457
Flt Permitted	0.04	1.00	1.00	1.00	0.96	1.00
Satd. Flow (perm)	76	4520	4520	1601	3452	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	78	1550	3094	164	315	182
RTOR Reduction (vph)	0	0	0	32	5	0
Lane Group Flow (vph)	78	1550	3094	133	337	155
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2			6		4
Actuated Green, G (s)	107.0	107.0	95.0	95.0	19.0	27.0
Effective Green, g (s)	107.0	107.0	95.0	95.0	19.0	27.0
Actuated g/C Ratio	0.76	0.76	0.68	0.68	0.14	0.19
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	155	3454	3067	1086	468	280
v/s Ratio Prot	0.03	0.34	c0.68		c0.10	c0.03
v/s Ratio Perm	0.35			0.08		0.07
v/c Ratio	0.50	0.45	1.01	0.12	0.72	0.55
Uniform Delay, d1	38.3	5.9	22.5	7.9	57.9	51.1
Progression Factor	1.49	0.85	0.86	1.24	0.98	1.07
Incremental Delay, d2	2.4	0.4	7.3	0.0	5.2	2.4
Delay (s)	59.3	5.4	26.7	9.8	62.2	57.0
Level of Service	E	A	C	A	E	E
Approach Delay (s)		8.0	25.8		60.6	
Approach LOS		A	C		E	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
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)	60	1683	93	104	2820	216	244	14	61	422	29	154
Future Volume (vph)	60	1683	93	104	2820	216	244	14	61	422	29	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	4.0	6.7	6.7
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
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)	1825	4476	1570	1825	4476	1633	1753	1921	1504	1787	1921	1611
Flt Permitted	0.05	1.00	1.00	0.05	1.00	1.00	0.74	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	104	4476	1570	99	4476	1633	1362	1921	1504	1240	1921	1611
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	1683	93	104	2820	216	244	14	61	422	29	154
RTOR Reduction (vph)	0	0	44	0	0	46	0	0	48	0	0	65
Lane Group Flow (vph)	60	1683	49	104	2820	170	244	14	13	422	29	89
Confl. Peds. (#/hr)							1		2	2		1
Heavy Vehicles (%)	0%	3%	4%	0%	3%	0%	4%	0%	7%	2%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	79.2	74.0	74.0	86.6	77.7	77.7	29.7	29.7	29.7	39.7	39.7	39.7
Effective Green, g (s)	79.2	74.0	74.0	86.6	77.7	77.7	29.7	29.7	29.7	39.7	39.7	39.7
Actuated g/C Ratio	0.57	0.53	0.53	0.62	0.56	0.56	0.21	0.21	0.21	0.28	0.28	0.28
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	4.0	6.7	6.7
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	3.0	0.2	0.2
Lane Grp Cap (vph)	122	2365	829	170	2484	906	288	407	319	375	544	456
v/s Ratio Prot	0.02	0.38		c0.04	c0.63			0.01		c0.05	0.02	
v/s Ratio Perm	0.26		0.03	0.34		0.10	0.18		0.01	c0.27		0.06
v/c Ratio	0.49	0.71	0.06	0.61	1.14	0.19	0.85	0.03	0.04	1.13	0.05	0.19
Uniform Delay, d1	31.7	24.9	16.1	23.6	31.1	15.5	53.0	43.8	43.8	50.7	36.5	38.0
Progression Factor	1.37	0.67	0.05	1.34	1.21	1.63	1.00	1.00	1.00	1.04	1.05	1.11
Incremental Delay, d2	2.1	1.7	0.1	3.3	63.8	0.2	20.4	0.0	0.1	84.8	0.0	0.1
Delay (s)	45.4	18.4	1.0	35.0	101.6	25.5	73.4	43.8	43.9	137.3	38.3	42.1
Level of Service	D	B	A	D	F	C	E	D	D	F	D	D
Approach Delay (s)		18.4			94.1			66.4			108.3	
Approach LOS		B			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	70.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
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)	48	2048	67	44	2951	141	61	5	25	336	16	127
Future Volume (vph)	48	2048	67	44	2951	141	61	5	25	336	16	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1772	4476	1601	1772	4611	1633	1789	1675		3471	1633	
Flt Permitted	0.04	1.00	1.00	0.04	1.00	1.00	0.67	1.00		0.95	1.00	
Satd. Flow (perm)	83	4476	1601	83	4611	1633	1254	1675		3471	1633	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	2048	67	44	2951	141	61	5	25	336	16	127
RTOR Reduction (vph)	0	0	24	0	0	45	0	24	0	0	114	0
Lane Group Flow (vph)	48	2048	43	44	2951	96	61	6	0	336	29	0
Heavy Vehicles (%)	3%	3%	2%	3%	0%	0%	2%	2%	0%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8					
Actuated Green, G (s)	95.7	90.2	90.2	95.5	90.1	90.1	13.8	6.2		16.2	14.8	
Effective Green, g (s)	95.7	90.2	90.2	95.5	90.1	90.1	13.8	6.2		16.2	14.8	
Actuated g/C Ratio	0.68	0.64	0.64	0.68	0.64	0.64	0.10	0.04		0.12	0.11	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	123	2883	1031	121	2967	1050	152	74		401	172	
v/s Ratio Prot	c0.02	0.46		0.01	c0.64		0.02	0.00		c0.10	0.02	
v/s Ratio Perm	0.25		0.03	0.23		0.06	c0.02					
v/c Ratio	0.39	0.71	0.04	0.36	0.99	0.09	0.40	0.08		0.84	0.17	
Uniform Delay, d1	34.4	16.3	9.1	14.6	24.7	9.5	58.9	64.2		60.6	57.0	
Progression Factor	1.83	0.95	1.00	2.34	0.97	1.28	1.00	1.00		0.97	1.09	
Incremental Delay, d2	1.3	1.0	0.0	0.2	3.9	0.0	1.7	1.0		14.1	0.5	
Delay (s)	64.4	16.5	9.2	34.3	27.8	12.1	60.6	65.2		73.1	62.7	
Level of Service	E	B	A	C	C	B	E	E		E	E	
Approach Delay (s)		17.3			27.2			62.1			70.0	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
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)	218	1643	661	292	2146	310	677	1661	207	729	2024	261
Future Volume (vph)	218	1643	661	292	2146	310	677	1661	207	729	2024	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	2.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1807	4476	1582	1755	5142	1570	3471	5092	1445	3471	5043	1601
Flt Permitted	0.09	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	238	4476	1582	154	5142	1570	3471	5092	1445	3471	5043	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	218	1643	661	292	2146	310	677	1661	207	729	2024	261
RTOR Reduction (vph)	0	0	33	0	0	64	0	0	64	0	0	68
Lane Group Flow (vph)	218	1643	628	292	2146	246	677	1661	143	729	2024	193
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	3%	2%	4%	2%	4%	2%	3%	13%	2%	4%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	51.0	44.0	62.0	59.0	48.0	48.0	18.0	43.0	43.0	20.0	45.0	45.0
Effective Green, g (s)	53.0	46.0	66.0	60.0	50.0	50.0	19.0	45.0	45.0	21.0	47.0	47.0
Actuated g/C Ratio	0.38	0.33	0.47	0.43	0.36	0.36	0.14	0.32	0.32	0.15	0.34	0.34
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	2.5	2.5	6.0	6.0	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	179	1470	745	203	1836	560	471	1636	464	520	1693	537
v/s Ratio Prot	0.07	0.37	0.12	c0.12	0.42		c0.20	0.33		0.21	c0.40	
v/s Ratio Perm	0.39		0.28	c0.49		0.16			0.10			0.12
v/c Ratio	1.22	1.12	0.84	1.44	1.17	0.44	1.44	1.02	0.31	1.40	1.20	0.36
Uniform Delay, d1	40.9	47.0	32.5	41.1	45.0	34.3	60.5	47.5	35.8	59.5	46.5	35.1
Progression Factor	1.40	1.14	0.87	1.00	1.00	1.00	1.00	1.00	1.00	0.72	1.02	1.00
Incremental Delay, d2	130.9	60.8	6.8	223.0	82.2	2.5	208.7	26.1	0.5	181.9	88.6	0.1
Delay (s)	188.1	114.5	35.0	264.1	127.2	36.8	269.2	73.6	36.3	224.6	136.1	35.3
Level of Service	F	F	D	F	F	D	F	E	D	F	F	D
Approach Delay (s)		100.1			131.6			122.6			148.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	126.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	127.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	167	342	0	864	2422	0
Future Volume (vph)	167	342	0	864	2422	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.91	0.95	
Frt	0.92	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3172	1457		4902	3444	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3172	1457		4902	3444	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	342	0	864	2422	0
RTOR Reduction (vph)	14	14	0	0	0	0
Lane Group Flow (vph)	324	157	0	864	2422	0
Heavy Vehicles (%)	10%	2%	0%	7%	6%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	18.3	18.3		109.7	109.7	
Effective Green, g (s)	18.3	18.3		109.7	109.7	
Actuated g/C Ratio	0.13	0.13		0.78	0.78	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	414	190		3841	2698	
v/s Ratio Prot	0.10			0.18	c0.70	
v/s Ratio Perm		c0.11				
v/c Ratio	0.78	0.83		0.22	0.90	
Uniform Delay, d1	58.9	59.3		4.0	11.1	
Progression Factor	1.00	1.00		0.56	1.00	
Incremental Delay, d2	9.9	25.5		0.1	5.3	
Delay (s)	68.8	84.8		2.4	16.3	
Level of Service	E	F		A	B	
Approach Delay (s)	74.2			2.4	16.3	
Approach LOS	E			A	B	

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	66	134	933	862	2346	418
Future Volume (vph)	66	134	933	862	2346	418
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1789	1601	3471	5142	5142	1601
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1789	1601	3471	5142	5142	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	134	933	862	2346	418
RTOR Reduction (vph)	0	123	0	0	0	209
Lane Group Flow (vph)	66	11	933	862	2346	209
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	11.5	11.5	40.5	114.5	70.0	70.0
Effective Green, g (s)	11.5	11.5	40.5	114.5	70.0	70.0
Actuated g/C Ratio	0.08	0.08	0.29	0.82	0.50	0.50
Clearance Time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	146	131	1004	4205	2571	800
v/s Ratio Prot	c0.04		c0.27	0.17	c0.46	
v/s Ratio Perm		0.01				0.13
v/c Ratio	0.45	0.08	0.93	0.20	0.91	0.26
Uniform Delay, d1	61.2	59.4	48.4	2.8	32.2	20.1
Progression Factor	0.96	1.02	1.61	0.51	0.96	1.84
Incremental Delay, d2	2.2	0.3	11.8	0.1	3.0	0.4
Delay (s)	60.9	61.1	89.7	1.5	33.8	37.4
Level of Service	E	E	F	A	C	D
Approach Delay (s)	61.0			47.4	34.3	
Approach LOS	E			D	C	

Intersection Summary			
HCM 2000 Control Delay	40.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.3%	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 (vph)	125	102	161	73	548	180	873	1490	182	492	1737	251
Future Volume (vph)	125	102	161	73	548	180	873	1490	182	492	1737	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	4.0	7.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	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)	1789	3579	1601	1825	3579	1633	3471	5245	1633	3541	5245	1601
Flt Permitted	0.16	1.00	1.00	0.69	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	302	3579	1601	1321	3579	1633	3471	5245	1633	3541	5245	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	102	161	73	548	180	873	1490	182	492	1737	251
RTOR Reduction (vph)	0	0	15	0	0	61	0	0	102	0	0	81
Lane Group Flow (vph)	125	102	146	73	548	119	873	1490	80	492	1737	170
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	36.4	36.4	73.1	25.4	25.4	49.4	36.7	61.6	61.6	24.0	48.9	48.9
Effective Green, g (s)	36.4	36.4	73.1	25.4	25.4	49.4	36.7	61.6	61.6	24.0	48.9	48.9
Actuated g/C Ratio	0.26	0.26	0.52	0.18	0.18	0.35	0.26	0.44	0.44	0.17	0.35	0.35
Clearance Time (s)	4.0	7.0	4.0	7.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
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)	152	930	835	239	649	576	909	2307	718	607	1832	559
v/s Ratio Prot	c0.04	0.03	0.05		0.15	0.04	c0.25	0.28		0.14	c0.33	
v/s Ratio Perm	c0.17		0.05	0.06		0.04			0.05			0.11
v/c Ratio	0.82	0.11	0.18	0.31	0.84	0.21	0.96	0.65	0.11	0.81	0.95	0.30
Uniform Delay, d1	44.4	39.5	17.6	49.7	55.4	31.6	50.9	30.7	23.1	55.8	44.3	33.2
Progression Factor	1.09	1.02	0.68	1.00	1.00	1.00	0.67	1.02	1.62	1.02	1.07	1.50
Incremental Delay, d2	28.7	0.1	0.1	0.7	9.8	0.2	9.9	0.5	0.1	3.8	6.3	0.6
Delay (s)	76.8	40.3	12.1	50.4	65.2	31.8	43.8	31.7	37.5	60.9	53.7	50.4
Level of Service	E	D	B	D	E	C	D	C	D	E	D	D
Approach Delay (s)		40.4			56.4			36.2			54.8	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	98.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1196	2166	1057	188	386	597
Future Volume (vph)	1196	2166	1057	188	386	597
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4117	1570	3541	1613
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	4476	4117	1570	3541	1613
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1196	2166	1057	188	386	597
RTOR Reduction (vph)	0	0	0	89	0	0
Lane Group Flow (vph)	1196	2166	1057	99	386	597
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	1%	3%	12%	4%	0%	0%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	55.2	105.8	46.6	46.6	20.2	140.0
Effective Green, g (s)	55.2	105.8	46.6	46.6	20.2	140.0
Actuated g/C Ratio	0.39	0.76	0.33	0.33	0.14	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	1382	3382	1370	522	510	1613
v/s Ratio Prot	c0.34	0.48	c0.26		c0.11	
v/s Ratio Perm				0.06		0.37
v/c Ratio	0.87	0.64	0.77	0.19	0.76	0.37
Uniform Delay, d1	39.0	8.1	41.9	33.2	57.5	0.0
Progression Factor	1.00	1.00	0.81	1.14	1.15	1.00
Incremental Delay, d2	5.9	0.9	4.1	0.8	5.8	0.6
Delay (s)	44.9	9.0	37.8	38.6	72.1	0.6
Level of Service	D	A	D	D	E	A
Approach Delay (s)		21.8	38.0		28.7	
Approach LOS		C	D		C	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	161	2391	1242	283	66	34
Future Volume (vph)	161	2391	1242	283	66	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	0.99	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3464	1457
Flt Permitted	0.16	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	303	4520	4520	1601	3464	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	161	2391	1242	283	66	34
RTOR Reduction (vph)	0	0	0	68	3	29
Lane Group Flow (vph)	161	2391	1242	215	66	2
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	118.0	118.0	106.2	106.2	8.0	8.0
Effective Green, g (s)	118.0	118.0	106.2	106.2	8.0	8.0
Actuated g/C Ratio	0.84	0.84	0.76	0.76	0.06	0.06
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	338	3809	3428	1214	197	83
v/s Ratio Prot	0.03	c0.53	0.27		c0.02	
v/s Ratio Perm	0.38			0.13		0.00
v/c Ratio	0.48	0.63	0.36	0.18	0.34	0.02
Uniform Delay, d1	2.7	3.7	5.6	4.7	63.4	62.3
Progression Factor	1.48	1.21	1.56	5.96	1.02	1.16
Incremental Delay, d2	0.8	0.6	0.3	0.3	1.0	0.1
Delay (s)	4.8	5.1	9.0	28.4	65.8	72.4
Level of Service	A	A	A	C	E	E
Approach Delay (s)		5.1	12.6		67.8	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
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)	147	1961	262	58	1425	395	80	35	168	81	8	20
Future Volume (vph)	147	1961	262	58	1425	395	80	35	168	81	8	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.99
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)	1807	4476	1601	1674	4117	1570	1768	1921	1517	1555	1921	1610
Flt Permitted	0.12	1.00	1.00	0.06	1.00	1.00	0.75	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	228	4476	1601	100	4117	1570	1400	1921	1517	1202	1921	1610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	147	1961	262	58	1425	395	80	35	168	81	8	20
RTOR Reduction (vph)	0	0	71	0	0	114	0	0	81	0	0	18
Lane Group Flow (vph)	147	1961	191	58	1425	281	80	35	87	81	8	2
Confl. Peds. (#/hr)	8					8	2		3	3		2
Heavy Vehicles (%)	1%	3%	2%	9%	12%	0%	3%	0%	6%	17%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	110.3	101.8	101.8	105.1	99.2	99.2	14.9	14.9	14.9	14.9	14.9	14.9
Effective Green, g (s)	110.3	101.8	101.8	105.1	99.2	99.2	14.9	14.9	14.9	14.9	14.9	14.9
Actuated g/C Ratio	0.79	0.73	0.73	0.75	0.71	0.71	0.11	0.11	0.11	0.11	0.11	0.11
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	0.2
Lane Grp Cap (vph)	275	3254	1164	141	2917	1112	149	204	161	127	204	171
v/s Ratio Prot	c0.03	c0.44		0.02	0.35			0.02			0.00	
v/s Ratio Perm	0.39		0.12	0.29		0.18	0.06		0.06	c0.07		0.00
v/c Ratio	0.53	0.60	0.16	0.41	0.49	0.25	0.54	0.17	0.54	0.64	0.04	0.01
Uniform Delay, d1	5.4	9.3	5.9	7.8	9.1	7.2	59.3	56.9	59.3	60.0	56.1	56.0
Progression Factor	3.70	0.59	0.16	1.89	1.29	3.87	1.00	1.00	1.00	1.54	1.66	1.00
Incremental Delay, d2	1.2	0.7	0.2	1.5	0.5	0.4	4.1	0.5	3.9	7.5	0.0	0.0
Delay (s)	21.3	6.1	1.2	16.2	12.2	28.5	63.4	57.4	63.2	99.5	93.3	56.0
Level of Service	C	A	A	B	B	C	E	E	E	F	F	E
Approach Delay (s)		6.5			15.7			62.5			91.1	
Approach LOS		A			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	75.5%	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 (vph)	128	2145	104	33	1827	341	88	17	84	63	2	24
Future Volume (vph)	128	2145	104	33	1827	341	88	17	84	63	2	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	4391	1633	1772	4117	1601	1722	1609		3471	1623	
Flt Permitted	0.05	1.00	1.00	0.05	1.00	1.00	0.44	1.00		0.95	1.00	
Satd. Flow (perm)	96	4391	1633	87	4117	1601	805	1609		3471	1623	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	128	2145	104	33	1827	341	88	17	84	63	2	24
RTOR Reduction (vph)	0	0	32	0	0	36	0	75	0	0	23	0
Lane Group Flow (vph)	128	2145	72	33	1827	305	88	26	0	63	3	0
Heavy Vehicles (%)	4%	5%	0%	3%	12%	2%	6%	2%	5%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8					
Actuated Green, G (s)	100.4	92.5	92.5	90.0	86.1	86.1	25.6	14.8		6.8	6.0	
Effective Green, g (s)	100.4	92.5	92.5	90.0	86.1	86.1	25.6	14.8		6.8	6.0	
Actuated g/C Ratio	0.72	0.66	0.66	0.64	0.61	0.61	0.18	0.11		0.05	0.04	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	190	2901	1078	102	2531	984	249	170		168	69	
v/s Ratio Prot	c0.05	c0.49		0.01	0.44		c0.04	0.02		0.02	0.00	
v/s Ratio Perm	0.43		0.04	0.20		0.19	c0.03					
v/c Ratio	0.67	0.74	0.07	0.32	0.72	0.31	0.35	0.15		0.38	0.04	
Uniform Delay, d1	29.2	15.8	8.4	14.3	18.7	12.8	49.3	56.9		64.5	64.2	
Progression Factor	1.00	1.21	2.45	2.29	1.01	1.18	1.00	1.00		0.79	1.27	
Incremental Delay, d2	7.9	1.5	0.1	0.8	0.8	0.4	0.9	0.9		1.4	0.3	
Delay (s)	37.1	20.6	20.7	33.6	19.6	15.5	50.2	57.8		52.3	81.7	
Level of Service	D	C	C	C	B	B	D	E		D	F	
Approach Delay (s)		21.5			19.2			54.2			60.9	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
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)	330	1300	562	198	1317	765	621	1450	322	315	1300	169
Future Volume (vph)	330	1300	562	198	1317	765	621	1450	322	315	1300	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	1.0	3.0	4.0	1.0	3.0	4.0	1.0	3.0	4.0	1.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1630	4476	1572	1508	4683	1555	3079	4902	1512	3404	4902	1541
Flt Permitted	0.10	1.00	1.00	0.11	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	486	4476	1572	167	4683	1555	3079	4902	1512	3404	4902	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	1300	562	198	1317	765	621	1450	322	315	1300	169
RTOR Reduction (vph)	0	0	29	0	0	32	0	0	37	0	0	36
Lane Group Flow (vph)	330	1300	533	198	1317	733	621	1450	285	315	1300	133
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	3%	3%	3%	21%	12%	5%	15%	7%	8%	4%	7%	6%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	57.0	40.0	68.0	51.0	37.0	61.5	28.0	39.5	53.5	24.5	36.0	53.0
Effective Green, g (s)	59.0	43.0	74.0	53.0	40.0	67.5	29.0	42.5	59.5	25.5	39.0	59.0
Actuated g/C Ratio	0.42	0.31	0.53	0.38	0.29	0.48	0.21	0.30	0.42	0.18	0.28	0.42
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
Vehicle Extension (s)	2.5	6.0	2.5	2.5	6.0	2.5	2.5	4.0	2.5	2.5	4.0	2.5
Lane Grp Cap (vph)	351	1374	830	206	1338	749	637	1488	642	620	1365	649
v/s Ratio Prot	c0.12	c0.29	0.14	0.10	0.28	c0.19	c0.20	c0.30	0.05	0.09	0.27	0.03
v/s Ratio Perm	0.27		0.20	0.26		0.28			0.13			0.06
v/c Ratio	0.94	0.95	0.64	0.96	0.98	0.98	0.97	0.97	0.44	0.51	0.95	0.21
Uniform Delay, d1	37.1	47.4	23.5	40.1	49.7	35.5	55.1	48.2	28.5	51.6	49.6	25.6
Progression Factor	1.13	0.99	0.65	1.00	1.00	1.00	1.00	1.00	1.00	0.38	0.96	1.94
Incremental Delay, d2	27.8	11.9	1.2	51.4	21.1	27.3	29.2	17.5	0.4	0.2	8.5	0.1
Delay (s)	69.7	58.9	16.5	91.5	70.8	62.8	84.3	65.7	28.9	20.0	56.0	49.8
Level of Service	E	E	B	F	E	E	F	E	C	B	E	D
Approach Delay (s)		49.7			69.9			65.6			49.1	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	59.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	111	74	0	2335	679	0
Future Volume (vph)	111	74	0	2335	679	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.91	0.95	
Frt	0.98	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3406	1457		5142	3579	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3406	1457		5142	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	74	0	2335	679	0
RTOR Reduction (vph)	8	53	0	0	0	0
Lane Group Flow (vph)	119	5	0	2335	679	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	11.2	11.2		116.8	116.8	
Effective Green, g (s)	11.2	11.2		116.8	116.8	
Actuated g/C Ratio	0.08	0.08		0.83	0.83	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	272	116		4289	2985	
v/s Ratio Prot	c0.03			c0.45	0.19	
v/s Ratio Perm		0.00				
v/c Ratio	0.44	0.04		0.54	0.23	
Uniform Delay, d1	61.4	59.4		3.5	2.4	
Progression Factor	1.00	1.00		0.08	1.00	
Incremental Delay, d2	1.5	0.2		0.3	0.2	
Delay (s)	62.9	59.6		0.5	2.6	
Level of Service	E	E		A	A	
Approach Delay (s)	61.9			0.5	2.6	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	4.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	354	798	197	2091	1485	96
Future Volume (vph)	354	798	197	2091	1485	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1789	1601	3471	5142	5142	1601
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1789	1601	3471	5142	5142	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	354	798	197	2091	1485	96
RTOR Reduction (vph)	0	106	0	0	0	62
Lane Group Flow (vph)	354	692	197	2091	1485	34
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	62.9	62.9	10.1	63.1	49.0	49.0
Effective Green, g (s)	62.9	62.9	10.1	63.1	49.0	49.0
Actuated g/C Ratio	0.45	0.45	0.07	0.45	0.35	0.35
Clearance Time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	803	719	250	2317	1799	560
v/s Ratio Prot	0.20		0.06	c0.41	0.29	
v/s Ratio Perm		c0.43				0.02
v/c Ratio	0.44	0.96	0.79	0.90	0.83	0.06
Uniform Delay, d1	26.5	37.4	63.9	35.6	41.6	30.2
Progression Factor	1.14	1.19	1.22	0.65	0.97	0.92
Incremental Delay, d2	0.4	24.1	11.9	4.9	4.5	0.2
Delay (s)	30.6	68.6	89.8	28.1	44.7	27.9
Level of Service	C	E	F	C	D	C
Approach Delay (s)	56.9			33.4	43.7	
Approach LOS	E			C	D	

Intersection Summary			
HCM 2000 Control Delay	42.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
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)	312	520	815	204	207	507	309	1449	70	214	1292	168
Future Volume (vph)	312	520	815	204	207	507	309	1449	70	214	1292	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	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)	1789	3579	1601	1825	3579	1633	3471	5245	1633	3541	5245	1601
Flt Permitted	0.51	1.00	1.00	0.27	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	953	3579	1601	528	3579	1633	3471	5245	1633	3541	5245	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	312	520	815	204	207	507	309	1449	70	214	1292	168
RTOR Reduction (vph)	0	0	31	0	0	91	0	0	33	0	0	58
Lane Group Flow (vph)	312	520	784	204	207	416	309	1449	37	214	1292	110
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	41.0	26.0	69.2	32.0	21.0	38.4	43.2	63.6	74.6	17.4	37.8	53.8
Effective Green, g (s)	41.0	26.0	69.2	32.0	21.0	38.4	43.2	63.6	74.6	17.4	37.8	53.8
Actuated g/C Ratio	0.29	0.19	0.49	0.23	0.15	0.27	0.31	0.45	0.53	0.12	0.27	0.38
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
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	664	791	222	536	447	1071	2382	870	440	1416	615
v/s Ratio Prot	c0.10	0.15	c0.31	0.07	0.06	0.12	0.09	0.28	0.00	0.06	c0.25	0.02
v/s Ratio Perm	0.15		0.18	0.14		0.14			0.02			0.05
v/c Ratio	0.83	0.78	0.99	0.92	0.39	0.93	0.29	0.61	0.04	0.49	0.91	0.18
Uniform Delay, d1	43.9	54.3	35.1	49.1	53.7	49.5	36.7	28.8	15.6	57.1	49.5	28.5
Progression Factor	1.11	1.14	1.03	1.00	1.00	1.00	0.52	0.58	2.50	0.96	1.12	0.48
Incremental Delay, d2	12.8	5.1	27.1	38.4	0.5	26.2	0.1	0.5	0.0	0.4	5.5	0.1
Delay (s)	61.6	66.8	63.1	87.5	54.1	75.7	19.3	17.4	39.1	55.5	60.8	13.7
Level of Service	E	E	E	F	D	E	B	B	D	E	E	B
Approach Delay (s)		64.0			73.5			18.5			55.4	
Approach LOS		E			E			B			E	

Intersection Summary			
HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	547	951	2452	278	184	1231
Future Volume (vph)	547	951	2452	278	184	1231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	0.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4476	1601	3541	1570
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	4476	4476	1601	3541	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	547	951	2452	278	184	1231
RTOR Reduction (vph)	0	0	0	52	0	0
Lane Group Flow (vph)	547	951	2452	226	184	1231
Heavy Vehicles (%)	1%	3%	3%	2%	0%	4%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	31.7	113.6	77.9	77.9	12.4	140.0
Effective Green, g (s)	32.7	117.6	81.9	81.9	16.4	140.0
Actuated g/C Ratio	0.23	0.84	0.59	0.59	0.12	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	818	3759	2618	936	414	1570
v/s Ratio Prot	0.16	0.21	c0.55		0.05	
v/s Ratio Perm				0.14		c0.78
v/c Ratio	0.67	0.25	0.94	0.24	0.44	0.78
Uniform Delay, d1	48.7	2.3	26.7	14.0	57.6	0.0
Progression Factor	1.00	1.00	0.75	1.13	1.01	1.00
Incremental Delay, d2	2.1	0.2	5.0	0.3	0.4	3.3
Delay (s)	50.8	2.4	25.0	16.3	58.3	3.3
Level of Service	D	A	C	B	E	A
Approach Delay (s)		20.1	24.1		10.4	
Approach LOS		C	C		B	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis <2031 Phase 2 FT Sensitivity> PM Peak Hour
40: Dundas St W & Avenue two 02/22/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↑	↱	↰↰	↱
Traffic Volume (vph)	78	1057	2548	164	315	182
Future Volume (vph)	78	1057	2548	164	315	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	0.99	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.96	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3452	1457
Flt Permitted	0.04	1.00	1.00	1.00	0.96	1.00
Satd. Flow (perm)	76	4520	4520	1601	3452	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	78	1057	2548	164	315	182
RTOR Reduction (vph)	0	0	0	38	5	2
Lane Group Flow (vph)	78	1057	2548	126	337	153
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2			6		4
Actuated Green, G (s)	107.0	107.0	95.0	95.0	19.0	27.0
Effective Green, g (s)	107.0	107.0	95.0	95.0	19.0	27.0
Actuated g/C Ratio	0.76	0.76	0.68	0.68	0.14	0.19
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	155	3454	3067	1086	468	280
v/s Ratio Prot	0.03	0.23	c0.56		c0.10	c0.03
v/s Ratio Perm	0.35			0.08		0.07
v/c Ratio	0.50	0.31	0.83	0.12	0.72	0.55
Uniform Delay, d1	26.8	5.1	16.6	7.8	57.9	51.0
Progression Factor	1.00	1.08	0.78	0.99	0.98	1.08
Incremental Delay, d2	2.5	0.2	1.3	0.1	5.2	2.2
Delay (s)	29.2	5.7	14.2	7.9	62.3	57.1
Level of Service	C	A	B	A	E	E
Approach Delay (s)		7.3	13.8		60.7	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.0%	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 (vph)	60	1190	93	104	2274	216	244	14	61	422	29	154
Future Volume (vph)	60	1190	93	104	2274	216	244	14	61	422	29	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	4.0	6.7	6.7
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
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)	1825	4476	1570	1825	4476	1633	1753	1921	1504	1787	1921	1611
Flt Permitted	0.06	1.00	1.00	0.13	1.00	1.00	0.74	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	110	4476	1570	247	4476	1633	1362	1921	1504	1240	1921	1611
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	1190	93	104	2274	216	244	14	61	422	29	154
RTOR Reduction (vph)	0	0	47	0	0	58	0	0	48	0	0	67
Lane Group Flow (vph)	60	1190	46	104	2274	158	244	14	13	422	29	87
Confl. Peds. (#/hr)							1		2	2		1
Heavy Vehicles (%)	0%	3%	4%	0%	3%	0%	4%	0%	7%	2%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	75.0	69.8	69.8	82.2	73.4	73.4	29.7	29.7	29.7	44.0	44.0	44.0
Effective Green, g (s)	75.0	69.8	69.8	82.2	73.4	73.4	29.7	29.7	29.7	44.0	44.0	44.0
Actuated g/C Ratio	0.54	0.50	0.50	0.59	0.52	0.52	0.21	0.21	0.21	0.31	0.31	0.31
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	4.0	6.7	6.7
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	3.0	0.2	0.2
Lane Grp Cap (vph)	122	2231	782	244	2346	856	288	407	319	429	603	506
v/s Ratio Prot	0.02	0.27		c0.03	c0.51			0.01		c0.07	0.02	
v/s Ratio Perm	0.24		0.03	0.22		0.10	0.18		0.01	c0.24		0.05
v/c Ratio	0.49	0.53	0.06	0.43	0.97	0.19	0.85	0.03	0.04	0.98	0.05	0.17
Uniform Delay, d1	30.8	24.0	18.1	15.4	32.2	17.5	53.0	43.8	43.8	47.4	33.4	34.8
Progression Factor	1.49	0.62	0.09	1.58	1.25	1.96	1.00	1.00	1.00	1.04	1.05	1.13
Incremental Delay, d2	2.2	0.9	0.1	0.9	10.1	0.3	20.4	0.0	0.1	38.6	0.0	0.1
Delay (s)	48.1	15.6	1.8	25.3	50.5	34.7	73.4	43.8	43.9	87.8	35.0	39.3
Level of Service	D	B	A	C	D	C	E	D	D	F	C	D
Approach Delay (s)		16.1			48.2			66.4			72.9	
Approach LOS		B			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	43.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	93.5%	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 (vph)	48	1555	67	44	2405	141	61	5	25	336	16	127
Future Volume (vph)	48	1555	67	44	2405	141	61	5	25	336	16	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1772	4476	1601	1772	4611	1633	1789	1675		3471	1633	
Flt Permitted	0.05	1.00	1.00	0.09	1.00	1.00	0.67	1.00		0.95	1.00	
Satd. Flow (perm)	85	4476	1601	169	4611	1633	1254	1675		3471	1633	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	1555	67	44	2405	141	61	5	25	336	16	127
RTOR Reduction (vph)	0	0	25	0	0	47	0	24	0	0	112	0
Lane Group Flow (vph)	48	1555	42	44	2405	94	61	6	0	336	31	0
Heavy Vehicles (%)	3%	3%	2%	3%	0%	0%	2%	2%	0%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8					
Actuated Green, G (s)	93.2	87.6	87.6	93.0	87.5	87.5	14.3	6.2		18.7	16.8	
Effective Green, g (s)	93.2	87.6	87.6	93.0	87.5	87.5	14.3	6.2		18.7	16.8	
Actuated g/C Ratio	0.67	0.63	0.63	0.66	0.62	0.62	0.10	0.04		0.13	0.12	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	124	2800	1001	175	2881	1020	159	74		463	195	
v/s Ratio Prot	c0.02	0.35		0.01	c0.52		0.02	0.00		c0.10	0.02	
v/s Ratio Perm	0.24		0.03	0.16		0.06	c0.02					
v/c Ratio	0.39	0.56	0.04	0.25	0.83	0.09	0.38	0.08		0.73	0.16	
Uniform Delay, d1	23.3	15.0	10.1	10.3	20.6	10.4	58.4	64.2		58.2	55.3	
Progression Factor	2.00	0.73	1.00	1.14	0.75	1.17	1.00	1.00		1.00	1.07	
Incremental Delay, d2	1.6	0.6	0.1	0.3	1.3	0.1	1.5	1.0		5.5	0.4	
Delay (s)	48.2	11.5	10.1	12.1	16.7	12.3	60.0	65.2		63.6	59.5	
Level of Service	D	B	B	B	B	B	E	E		E	E	
Approach Delay (s)		12.5			16.4			61.7			62.4	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	79.4%	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 (vph)	218	1150	661	292	1600	310	677	1300	207	729	1300	261
Future Volume (vph)	218	1150	661	292	1600	310	677	1300	207	729	1300	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	2.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1807	4476	1586	1755	5142	1570	3471	5092	1445	3471	5043	1601
Flt Permitted	0.11	1.00	1.00	0.10	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	238	4476	1586	184	5142	1570	3471	5092	1445	3471	5043	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	218	1150	661	292	1600	310	677	1300	207	729	1300	261
RTOR Reduction (vph)	0	0	49	0	0	86	0	0	91	0	0	107
Lane Group Flow (vph)	218	1150	612	292	1600	225	677	1300	116	729	1300	154
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	3%	2%	4%	2%	4%	2%	3%	13%	2%	4%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	48.1	36.1	63.1	59.0	43.0	43.0	27.0	36.0	36.0	27.0	36.0	36.0
Effective Green, g (s)	50.1	38.1	67.1	60.0	45.0	45.0	28.0	38.0	38.0	28.0	38.0	38.0
Actuated g/C Ratio	0.36	0.27	0.48	0.43	0.32	0.32	0.20	0.27	0.27	0.20	0.27	0.27
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	2.5	2.5	6.0	6.0	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	230	1218	760	302	1652	504	694	1382	392	694	1368	434
v/s Ratio Prot	0.09	0.26	0.17	c0.14	c0.31		0.20	0.26		c0.21	c0.26	
v/s Ratio Perm	0.25		0.22	0.28		0.14			0.08			0.10
v/c Ratio	0.95	0.94	0.81	0.97	0.97	0.45	0.98	0.94	0.30	1.05	0.95	0.35
Uniform Delay, d1	37.2	49.9	30.9	43.0	46.8	37.6	55.7	49.9	40.4	56.0	50.1	41.1
Progression Factor	1.23	1.16	0.70	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.99	1.05
Incremental Delay, d2	41.3	14.2	5.4	42.4	15.8	2.8	27.9	12.8	0.6	36.9	7.5	0.3
Delay (s)	87.1	72.1	27.0	85.4	62.6	40.5	83.5	62.7	41.0	81.6	56.8	43.6
Level of Service	F	E	C	F	E	D	F	E	D	F	E	D
Approach Delay (s)		59.0			62.5			67.1			63.2	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	63.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	306	145	746	2000
v/c Ratio	0.66	0.66	0.20	0.75
Control Delay	60.3	64.4	3.1	11.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	60.3	64.4	3.1	11.8
Queue Length 50th (m)	40.1	38.2	8.3	133.8
Queue Length 95th (m)	52.1	59.8	19.0	208.0
Internal Link Dist (m)	457.6		83.2	486.7
Turn Bay Length (m)		75.0		
Base Capacity (vph)	895	416	3782	2657
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.35	0.20	0.75

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	24	54	90	832	69	895
v/c Ratio	0.25	0.12	0.20	0.19	0.30	0.14	0.32
Control Delay	23.2	27.6	23.9	7.0	5.5	5.1	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	27.6	23.9	7.0	5.5	5.1	4.3
Queue Length 50th (m)	5.9	3.0	5.9	7.2	33.7	3.0	23.9
Queue Length 95th (m)	16.2	m6.2	m10.7	13.5	43.7	7.6	33.1
Internal Link Dist (m)	139.5		222.8		411.3		881.9
Turn Bay Length (m)		100.0		15.0		15.0	
Base Capacity (vph)	707	516	713	474	2769	506	2840
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	0.10	0.05	0.08	0.19	0.30	0.14	0.32

Intersection Summary

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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	156	41	23	853	272	179
v/c Ratio	0.14	0.04	0.03	0.79	0.67	0.36
Control Delay	7.4	2.0	9.7	24.3	40.1	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	2.0	9.7	24.3	40.1	10.7
Queue Length 50th (m)	6.1	0.1	1.9	122.3	34.6	6.4
Queue Length 95th (m)	18.0	1.7	m3.3	m159.9	47.0	14.9
Internal Link Dist (m)	778.4			459.4	191.6	
Turn Bay Length (m)		25.0	30.0		50.0	
Base Capacity (vph)	1079	935	710	1079	613	666
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.04	0.03	0.79	0.44	0.27

Intersection Summary

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

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	66	134	933	862	2346	418
v/c Ratio	0.45	0.53	0.93	0.20	0.91	0.41
Control Delay	68.3	17.3	89.2	1.5	34.1	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	17.3	89.2	1.5	34.1	3.7
Queue Length 50th (m)	18.1	3.0	141.1	9.3	190.0	4.8
Queue Length 95th (m)	32.8	20.7	#184.0	10.7	227.2	m14.9
Internal Link Dist (m)	444.2			110.3	476.7	
Turn Bay Length (m)	230.0		205.0			230.0
Base Capacity (vph)	345	416	1005	4206	2571	1009
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.32	0.93	0.20	0.91	0.41

Intersection Summary

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.

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	85	66	17	95	1289	42	907
v/c Ratio	0.29	0.33	0.06	0.23	0.52	0.17	0.35
Control Delay	23.7	22.1	10.8	10.8	15.1	6.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	22.1	10.8	10.8	15.1	6.1	4.6
Queue Length 50th (m)	7.7	13.3	0.0	16.1	135.5	1.7	19.0
Queue Length 95th (m)	18.3	21.2	4.6	m20.2	182.3	3.4	21.7
Internal Link Dist (m)	176.3		420.0		260.1		411.3
Turn Bay Length (m)				15.0		15.0	
Base Capacity (vph)	713	509	685	414	2482	249	2559
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	0.12	0.13	0.02	0.23	0.52	0.17	0.35

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	92	361	19	76	285	246	65	148	59	49	25	16
v/c Ratio	0.12	0.14	0.02	0.11	0.11	0.21	0.28	0.47	0.18	0.23	0.08	0.05
Control Delay	7.2	6.5	0.8	7.5	6.6	5.5	31.5	34.0	10.9	24.3	21.5	0.4
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	7.2	6.5	0.8	7.5	6.6	5.5	31.5	34.0	10.9	24.3	21.5	0.4
Queue Length 50th (m)	9.2	19.0	0.0	10.3	20.7	31.9	8.6	19.6	2.3	6.6	3.3	0.0
Queue Length 95th (m)	18.8	29.0	m0.5	14.8	20.0	34.9	17.0	32.9	8.3	m8.6	m4.5	m0.0
Internal Link Dist (m)		420.0			634.6			242.9			311.6	
Turn Bay Length (m)	15.0		15.0	80.0		60.0	50.0		25.0	50.0		50.0
Base Capacity (vph)	760	2503	1138	706	2503	1193	538	726	655	481	726	655
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	0.12	0.14	0.02	0.11	0.11	0.21	0.12	0.20	0.09	0.10	0.03	0.02

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1	419	87	923	159	58	247	51	23	35
v/c Ratio	0.00	0.20	0.16	0.44	0.16	0.20	0.62	0.13	0.11	0.09
Control Delay	16.0	13.4	13.6	17.0	8.9	24.0	31.7	6.2	18.8	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	13.4	13.6	17.0	8.9	24.0	31.7	6.2	18.8	13.4
Queue Length 50th (m)	0.1	22.3	13.0	88.4	16.8	7.9	38.9	1.2	2.5	2.8
Queue Length 95th (m)	m0.0	32.2	33.4	129.6	42.2	14.5	50.5	6.0	7.0	8.3
Internal Link Dist (m)		634.6		571.7			458.6			191.6
Turn Bay Length (m)	15.0		75.0		20.0	50.0		20.0	100.0	
Base Capacity (vph)	312	2092	561	2105	984	533	726	655	387	701
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.20	0.16	0.44	0.16	0.11	0.34	0.08	0.06	0.05

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	131	333	101	1154	283	56	117	54	41	17	42
v/c Ratio	0.33	0.12	0.14	0.45	0.24	0.39	0.61	0.25	0.36	0.09	0.19
Control Delay	6.1	1.3	6.0	9.9	4.4	55.4	62.9	12.1	41.3	34.4	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	1.3	6.0	9.9	4.4	55.4	62.9	12.1	41.3	34.4	2.7
Queue Length 50th (m)	1.7	2.1	10.0	63.6	20.1	14.6	31.9	2.3	8.5	3.3	1.1
Queue Length 95th (m)	11.8	3.1	m12.4	m139.3	m24.0	28.0	50.2	11.6	m10.4	m4.3	m1.6
Internal Link Dist (m)		571.7		306.7			401.3			269.3	
Turn Bay Length (m)	25.0		40.0		40.0	30.0		30.0	35.0		15.0
Base Capacity (vph)	466	2835	741	2555	1188	331	443	424	265	443	424
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.12	0.14	0.45	0.24	0.17	0.26	0.13	0.15	0.04	0.10

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	125	102	161	73	548	180	873	1490	182	492	1737	251
v/c Ratio	0.79	0.11	0.17	0.31	0.85	0.25	0.96	0.65	0.22	0.81	0.95	0.39
Control Delay	75.9	40.1	8.1	52.8	68.2	12.9	45.1	32.6	5.9	62.3	53.7	26.4
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	75.9	40.1	8.1	52.8	68.2	12.9	45.1	32.6	5.9	62.3	53.7	26.4
Queue Length 50th (m)	24.9	9.8	6.6	17.5	76.9	14.5	111.8	134.4	12.7	74.7	115.1	28.6
Queue Length 95th (m)	#44.0	16.7	15.6	32.6	97.7	29.7	m#142.6	m147.1	m15.8	m82.5	#200.6	m35.6
Internal Link Dist (m)		306.7			570.2			141.9			259.9	
Turn Bay Length (m)	100.0		140.0	35.0		80.0	100.0		150.0	100.0		15.0
Base Capacity (vph)	159	971	929	254	690	746	910	2309	820	682	1832	640
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	0.79	0.11	0.17	0.29	0.79	0.24	0.96	0.65	0.22	0.72	0.95	0.39

Intersection Summary

\# 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.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1196	2166	1057	188	386	597
v/c Ratio	0.86	0.64	0.77	0.31	0.76	0.37
Control Delay	46.5	9.5	39.1	15.0	75.6	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	9.5	39.1	15.0	75.6	1.3
Queue Length 50th (m)	156.1	104.1	94.0	3.2	58.8	2.8
Queue Length 95th (m)	176.7	138.2	#156.8	51.4	72.8	4.5
Internal Link Dist (m)		269.3	401.7		260.1	
Turn Bay Length (m)	85.0			60.0	70.0	
Base Capacity (vph)	1383	3383	1370	612	910	1613
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.64	0.77	0.31	0.42	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	161	2391	1242	283	69	31
v/c Ratio	0.46	0.61	0.36	0.22	0.27	0.23
Control Delay	5.9	5.2	9.2	3.8	63.1	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	5.2	9.2	3.8	63.1	26.8
Queue Length 50th (m)	3.7	152.5	65.8	14.5	9.2	0.7
Queue Length 95th (m)	6.7	36.5	63.5	21.6	17.4	11.6
Internal Link Dist (m)		401.7	707.1		131.1	
Turn Bay Length (m)	130.0			90.0	185.0	
Base Capacity (vph)	391	3899	3473	1295	867	387
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.61	0.36	0.22	0.08	0.08

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	147	1961	262	58	1425	395	80	35	168	81	8	20
v/c Ratio	0.53	0.60	0.21	0.37	0.49	0.32	0.54	0.17	0.69	0.63	0.04	0.08
Control Delay	17.1	6.7	0.5	18.8	13.4	4.4	71.5	56.5	42.1	112.1	87.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.1	6.7	0.5	18.8	13.4	4.4	71.5	56.5	42.1	112.1	87.8	7.0
Queue Length 50th (m)	5.1	59.2	0.0	4.6	70.2	10.9	21.5	9.1	20.7	23.8	2.2	0.6
Queue Length 95th (m)	26.9	67.2	2.0	m14.1	83.2	28.1	36.6	18.6	42.8	40.6	8.3	4.1
Internal Link Dist (m)		707.1			504.0			309.6			458.6	
Turn Bay Length (m)	60.0		100.0	60.0		75.0	30.0		30.0	20.0		20.0
Base Capacity (vph)	333	3278	1243	157	2917	1226	362	498	460	311	498	484
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	0.44	0.60	0.21	0.37	0.49	0.32	0.22	0.07	0.37	0.26	0.02	0.04

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	2145	104	33	1827	341	88	101	63	26
v/c Ratio	0.66	0.71	0.09	0.24	0.70	0.32	0.35	0.45	0.32	0.19
Control Delay	37.2	19.8	6.3	17.2	19.5	11.7	50.9	22.9	53.9	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	19.8	6.3	17.2	19.5	11.7	50.9	22.9	53.9	33.1
Queue Length 50th (m)	20.6	146.3	3.5	2.8	94.6	31.5	20.7	4.4	9.1	2.8
Queue Length 95th (m)	43.0	167.7	13.9	m3.6	m99.9	m33.4	34.8	21.9	17.1	12.0
Internal Link Dist (m)		504.0			219.0			321.0		401.3
Turn Bay Length (m)	55.0		75.0	25.0		25.0	20.0		90.0	
Base Capacity (vph)	196	3038	1159	136	2614	1050	344	432	669	389
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.71	0.09	0.24	0.70	0.32	0.26	0.23	0.09	0.07

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	330	1300	562	198	1317	765	621	1050	322	315	800	169
v/c Ratio	0.92	0.94	0.63	0.93	0.96	0.94	0.97	0.95	0.43	0.59	0.86	0.23
Control Delay	59.3	57.9	14.4	82.4	65.2	49.9	84.8	63.5	21.6	25.6	51.7	26.6
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	59.3	57.9	14.4	82.4	65.2	49.9	84.8	63.5	21.6	25.6	51.7	26.6
Queue Length 50th (m)	49.7	152.9	68.0	40.5	131.8	173.4	88.9	151.7	47.1	28.9	123.7	34.0
Queue Length 95th (m)	#107.7	#177.8	34.2	#88.7	#162.4	#261.7	#126.4	#197.1	72.5	m31.6	m128.5	m39.0
Internal Link Dist (m)		219.0			753.0			338.5			240.5	
Turn Bay Length (m)	95.0		80.0	115.0		40.0	190.0		45.0	180.0		50.0
Base Capacity (vph)	359	1388	897	213	1371	834	637	1107	752	583	950	734
Starvation Cap Reductn	0	0	6	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	0.92	0.94	0.63	0.93	0.96	0.92	0.97	0.95	0.43	0.54	0.84	0.23

Intersection Summary

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.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	214	16	74	31	2	89
Future Volume (Veh/h)	214	16	74	31	2	89
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	214	16	74	31	2	89
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	247					
pX, platoon unblocked						
vC, conflicting volume			230		401	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			230		401	222
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		100	89
cM capacity (veh/h)			1338		572	818

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	230	105	2	89
Volume Left	0	74	2	0
Volume Right	16	0	0	89
cSH	1700	1338	572	818
Volume to Capacity	0.14	0.06	0.00	0.11
Queue Length 95th (m)	0.0	1.3	0.1	2.8
Control Delay (s)	0.0	5.7	11.3	9.9
Lane LOS		A	B	A
Approach Delay (s)	0.0	5.7	10.0	
Approach LOS			A	

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	186	16	95	838	61	77
Future Volume (Veh/h)	186	16	95	838	61	77
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	186	16	95	838	61	77
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			202		1222	194
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			202		1222	194
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		67	91
cM capacity (veh/h)			1370		185	847

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	202	95	838	61	77
Volume Left	0	95	0	61	0
Volume Right	16	0	0	0	77
cSH	1700	1370	1700	185	847
Volume to Capacity	0.12	0.07	0.49	0.33	0.09
Queue Length 95th (m)	0.0	1.7	0.0	10.3	2.3
Control Delay (s)	0.0	7.8	0.0	33.8	9.7
Lane LOS		A		D	A
Approach Delay (s)	0.0	0.8		20.4	
Approach LOS				C	

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	51	19	253	191	71	49
Future Volume (Veh/h)	51	19	253	191	71	49
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	51	19	253	191	71	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			155			267
pX, platoon unblocked						
vC, conflicting volume	444	253			444	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	444	253			444	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	98			94	
cM capacity (veh/h)	535	786			1116	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	51	19	253	191	120
Volume Left	51	0	0	0	71
Volume Right	0	19	0	191	0
cSH	535	786	1700	1700	1116
Volume to Capacity	0.10	0.02	0.15	0.11	0.06
Queue Length 95th (m)	2.4	0.6	0.0	0.0	1.5
Control Delay (s)	12.4	9.7	0.0	0.0	5.2
Lane LOS	B	A			A
Approach Delay (s)	11.7		0.0		5.2
Approach LOS	B				

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	115	40	2285	382
v/c Ratio	0.43	0.27	0.53	0.13
Control Delay	64.9	21.2	2.7	2.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	64.9	21.2	2.7	2.3
Queue Length 50th (m)	15.6	0.0	37.8	8.0
Queue Length 95th (m)	25.1	12.6	35.3	12.4
Internal Link Dist (m)	457.6		83.2	486.7
Turn Bay Length (m)		75.0		
Base Capacity (vph)	394	201	4299	2992
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.29	0.20	0.53	0.13

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	5	105	133	113	50	691	14	837
v/c Ratio	0.02	0.29	0.55	0.30	0.13	0.32	0.03	0.38
Control Delay	20.8	17.2	37.7	18.4	12.0	10.2	7.1	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	17.2	37.7	18.4	12.0	10.2	7.1	8.0
Queue Length 50th (m)	0.6	7.3	20.8	10.8	5.2	39.8	0.6	24.8
Queue Length 95th (m)	2.8	17.3	31.7	21.5	11.9	52.8	3.1	44.0
Internal Link Dist (m)		139.5		222.8		411.3		881.9
Turn Bay Length (m)	15.0		100.0		15.0		15.0	
Base Capacity (vph)	496	709	500	706	372	2177	448	2191
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	0.15	0.27	0.16	0.13	0.32	0.03	0.38

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	703	226	137	212	61	24
v/c Ratio	0.47	0.17	0.26	0.14	0.24	0.10
Control Delay	6.1	2.3	7.8	4.0	37.7	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	2.3	7.8	4.0	37.7	20.2
Queue Length 50th (m)	44.0	4.7	22.8	32.9	10.1	1.1
Queue Length 95th (m)	60.1	9.3	25.9	7.4	20.0	1.6
Internal Link Dist (m)	778.4			459.4	191.6	
Turn Bay Length (m)		25.0	30.0		50.0	
Base Capacity (vph)	1493	1294	524	1493	690	632
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.17	0.26	0.14	0.09	0.04

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	354	798	197	2091	1485	96
v/c Ratio	0.44	0.97	0.79	0.90	0.83	0.15
Control Delay	31.8	57.2	94.6	28.8	45.4	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	57.2	94.6	28.8	45.4	6.0
Queue Length 50th (m)	75.7	195.4	27.2	215.0	140.8	0.0
Queue Length 95th (m)	105.3	#266.1	m#45.9	93.1	160.6	10.9
Internal Link Dist (m)	444.2			82.5	476.7	
Turn Bay Length (m)	230.0		205.0			230.0
Base Capacity (vph)	830	846	250	2318	1799	622
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.94	0.79	0.90	0.83	0.15

Intersection Summary

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.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	90	356	80	15	805	36	999
v/c Ratio	0.02	0.15	0.81	0.13	0.08	0.49	0.14	0.60
Control Delay	12.9	10.3	42.2	5.2	19.1	25.0	10.8	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	10.3	42.2	5.2	19.1	25.0	10.8	11.5
Queue Length 50th (m)	0.9	5.0	74.6	6.1	3.0	95.9	2.1	35.7
Queue Length 95th (m)	3.2	12.1	92.8	0.6	m5.9	111.4	4.8	41.3
Internal Link Dist (m)		176.3		420.0		260.1		411.3
Turn Bay Length (m)	15.0		100.0		15.0		15.0	
Base Capacity (vph)	550	721	545	731	186	1645	262	1665
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	0.12	0.65	0.11	0.08	0.49	0.14	0.60

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	24	397	76	98	425	69	42	34	110	188	121	69
v/c Ratio	0.04	0.19	0.08	0.17	0.21	0.07	0.15	0.08	0.25	0.61	0.29	0.17
Control Delay	12.0	11.2	5.1	19.9	17.9	12.3	23.0	21.5	6.4	34.1	24.9	6.1
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	12.0	11.2	5.1	19.9	17.9	12.3	23.0	21.5	6.4	34.1	24.9	6.1
Queue Length 50th (m)	2.3	21.5	2.7	16.8	38.5	6.3	5.5	4.4	2.8	25.0	15.0	0.6
Queue Length 95th (m)	m5.9	29.3	8.4	31.5	54.3	18.9	m9.8	m8.4	9.9	33.7	21.4	6.7
Internal Link Dist (m)		420.0			634.6			242.9			311.6	
Turn Bay Length (m)	15.0		15.0	80.0		60.0	50.0		25.0	50.0		50.0
Base Capacity (vph)	547	2065	956	563	2065	953	493	726	685	533	726	659
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	0.04	0.19	0.08	0.17	0.21	0.07	0.09	0.05	0.16	0.35	0.17	0.10

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	17	1066	87	614	36	50	32	112	132	231
v/c Ratio	0.04	0.50	0.33	0.29	0.04	0.24	0.08	0.30	0.47	0.60
Control Delay	7.8	10.0	21.7	16.1	5.8	19.1	15.8	8.1	28.5	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	10.0	21.7	16.1	5.8	19.1	15.8	8.1	28.5	28.7
Queue Length 50th (m)	1.2	47.1	17.8	65.8	2.9	5.5	3.4	5.7	19.4	32.5
Queue Length 95th (m)	3.8	66.9	27.7	77.1	7.6	9.6	6.7	11.8	30.8	47.3
Internal Link Dist (m)		634.6		571.7			458.6			191.6
Turn Bay Length (m)	15.0		75.0		20.0	50.0		20.0	100.0	
Base Capacity (vph)	473	2129	262	2145	984	406	726	655	534	718
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.50	0.33	0.29	0.04	0.12	0.04	0.17	0.25	0.32

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	52	1247	79	587	56	31	27	109	243	95	125
v/c Ratio	0.12	0.64	0.49	0.30	0.06	0.09	0.06	0.24	0.68	0.20	0.25
Control Delay	16.1	21.0	33.8	10.1	4.3	18.0	17.3	12.5	30.3	18.1	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	21.0	33.8	10.1	4.3	18.0	17.3	12.5	30.3	18.1	3.0
Queue Length 50th (m)	5.1	85.9	17.6	30.0	0.7	5.1	4.4	11.9	27.7	8.7	0.1
Queue Length 95th (m)	12.4	109.4	m#35.2	36.2	m3.2	m8.5	m7.6	m18.0	30.6	12.5	4.7
Internal Link Dist (m)		571.7		306.7			401.3			269.3	
Turn Bay Length (m)	25.0		40.0		20.0	30.0		30.0	35.0		15.0
Base Capacity (vph)	440	1934	160	1942	897	504	726	655	537	726	694
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.64	0.49	0.30	0.06	0.06	0.04	0.17	0.45	0.13	0.18

Intersection Summary

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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	312	520	815	204	207	507	309	1449	70	214	1292	168
v/c Ratio	0.79	0.78	0.91	0.87	0.39	0.83	0.29	0.61	0.07	0.49	0.91	0.22
Control Delay	58.0	68.8	39.7	73.3	54.9	43.3	19.6	18.4	4.1	55.8	60.9	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	58.0	68.8	39.7	73.3	54.9	43.3	19.6	18.4	4.1	55.8	60.9	6.0
Queue Length 50th (m)	72.3	73.6	203.2	43.5	27.4	101.6	12.4	125.7	2.6	30.1	~114.7	2.8
Queue Length 95th (m)	106.3	95.3	#256.3	#60.3	38.1	126.3	m14.3	m152.0	m7.2	m33.8	m#159.0	m8.5
Internal Link Dist (m)		306.7			570.2			126.0			287.6	
Turn Bay Length (m)	100.0		140.0	35.0		80.0	100.0		150.0	100.0		15.0
Base Capacity (vph)	395	818	903	234	690	717	1079	2379	990	682	1415	748
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	0.79	0.64	0.90	0.87	0.30	0.71	0.29	0.61	0.07	0.31	0.91	0.22

Intersection Summary

~ 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.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	547	951	2452	278	184	1231
v/c Ratio	0.67	0.25	0.94	0.28	0.44	0.78
Control Delay	53.5	2.6	25.7	9.2	60.3	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	2.6	25.7	9.2	60.3	9.7
Queue Length 50th (m)	72.3	17.2	202.6	18.7	22.3	104.3
Queue Length 95th (m)	90.8	24.9	#313.2	m22.8	34.4	125.4
Internal Link Dist (m)		312.4	401.7		260.1	
Turn Bay Length (m)	85.0			60.0	70.0	
Base Capacity (vph)	818	3758	2617	988	1011	1570
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.25	0.94	0.28	0.18	0.78

Intersection Summary

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.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	78	1057	2548	164	342	155
v/c Ratio	0.50	0.31	0.83	0.15	0.72	0.44
Control Delay	28.1	6.0	15.2	3.1	65.0	50.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	6.0	15.2	3.1	65.0	50.8
Queue Length 50th (m)	5.6	34.0	93.9	3.1	48.4	43.1
Queue Length 95th (m)	19.2	38.5	m119.5	m4.2	58.4	64.3
Internal Link Dist (m)		401.7	707.1		131.1	
Turn Bay Length (m)	130.0			90.0	185.0	
Base Capacity (vph)	156	3455	3067	1125	867	355
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.31	0.83	0.15	0.39	0.44

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	60	1190	93	104	2274	216	244	14	61	422	29	154
v/c Ratio	0.43	0.53	0.11	0.42	0.96	0.23	0.85	0.03	0.15	0.93	0.05	0.27
Control Delay	32.6	16.4	0.4	23.8	48.4	18.0	77.7	40.7	0.8	72.6	32.6	15.7
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	32.6	16.4	0.4	23.8	48.4	18.0	77.7	40.7	0.8	72.6	32.6	15.7
Queue Length 50th (m)	4.2	75.1	0.0	16.3	~202.8	22.2	64.8	3.1	0.0	99.9	4.9	8.4
Queue Length 95th (m)	18.3	84.8	1.1	m24.6	#318.7	m39.3	92.7	8.7	0.0	#141.4	m12.0	28.0
Internal Link Dist (m)		707.1			504.0			309.6			458.6	
Turn Bay Length (m)	60.0		100.0	60.0		75.0	30.0		30.0	20.0		20.0
Base Capacity (vph)	140	2232	844	273	2372	922	350	493	477	453	690	640
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	0.43	0.53	0.11	0.38	0.96	0.23	0.70	0.03	0.13	0.93	0.04	0.24

Intersection Summary

~ 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	48	1555	67	44	2405	141	61	30	336	143
v/c Ratio	0.34	0.53	0.06	0.22	0.80	0.13	0.32	0.21	0.72	0.50
Control Delay	24.9	11.6	0.8	9.2	16.9	3.6	48.7	29.1	67.4	19.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	11.6	0.8	9.2	16.9	3.6	48.7	29.1	67.4	19.1
Queue Length 50th (m)	3.6	66.0	0.2	3.6	96.4	3.1	13.1	1.3	47.9	3.8
Queue Length 95th (m)	m12.6	m98.3	m1.7	m4.1	m102.2	m3.8	24.5	11.5	63.4	25.7
Internal Link Dist (m)		504.0			219.0			321.0		401.3
Turn Bay Length (m)	55.0		75.0	25.0		25.0	20.0		90.0	
Base Capacity (vph)	142	2915	1086	197	3001	1106	237	402	500	546
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.53	0.06	0.22	0.80	0.13	0.26	0.07	0.67	0.26

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	218	1150	661	292	1600	310	677	950	207	729	925	261
v/c Ratio	0.95	0.95	0.78	0.97	0.97	0.53	0.96	0.99	0.43	1.03	0.97	0.49
Control Delay	84.4	72.3	22.7	83.3	62.5	25.9	80.1	76.9	19.6	82.9	73.0	25.7
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	84.4	72.3	22.8	83.3	62.5	25.9	80.1	76.9	19.6	82.9	73.0	25.7
Queue Length 50th (m)	47.0	140.9	52.3	64.6	159.9	41.1	96.6	138.4	17.6	~113.2	135.2	35.4
Queue Length 95th (m)	#92.0	#168.1	107.4	#122.6	#192.4	70.4	#133.7	#182.9	41.0	#150.1	#178.2	65.9
Internal Link Dist (m)		219.0			753.0			338.5			256.3	
Turn Bay Length (m)	95.0		80.0	115.0		40.0	190.0		45.0	180.0		50.0
Base Capacity (vph)	229	1214	844	301	1652	590	706	961	483	706	952	538
Starvation Cap Reductn	0	0	3	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	0.95	0.95	0.79	0.97	0.97	0.53	0.96	0.99	0.43	1.03	0.97	0.49

Intersection Summary

~ 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.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	46	4	82	179	12	63
Future Volume (Veh/h)	46	4	82	179	12	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	46	4	82	179	12	63
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	247					
pX, platoon unblocked						
vC, conflicting volume			50		391	48
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			50		391	48
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		98	94
cM capacity (veh/h)			1557		581	1021

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	50	261	12	63
Volume Left	0	82	12	0
Volume Right	4	0	0	63
cSH	1700	1557	581	1021
Volume to Capacity	0.03	0.05	0.02	0.06
Queue Length 95th (m)	0.0	1.3	0.5	1.5
Control Delay (s)	0.0	2.6	11.3	8.8
Lane LOS		A	B	A
Approach Delay (s)	0.0	2.6	9.2	
Approach LOS			A	

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	691	49	82	235	18	93
Future Volume (Veh/h)	691	49	82	235	18	93
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	691	49	82	235	18	93
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			740		1114	716
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			740		1114	716
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		91	78
cM capacity (veh/h)			867		208	430

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	740	82	235	18	93
Volume Left	0	82	0	18	0
Volume Right	49	0	0	0	93
cSH	1700	867	1700	208	430
Volume to Capacity	0.44	0.09	0.14	0.09	0.22
Queue Length 95th (m)	0.0	2.4	0.0	2.1	6.2
Control Delay (s)	0.0	9.6	0.0	23.9	15.7
Lane LOS		A		C	C
Approach Delay (s)	0.0	2.5		17.0	
Approach LOS				C	

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	251	89	97	145	49	246
Future Volume (Veh/h)	251	89	97	145	49	246
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	251	89	97	145	49	246
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			155			267
pX, platoon unblocked						
vC, conflicting volume	441	97			242	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	441	97			242	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	55	91			96	
cM capacity (veh/h)	552	959			1324	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	251	89	97	145	295
Volume Left	251	0	0	0	49
Volume Right	0	89	0	145	0
cSH	552	959	1700	1700	1324
Volume to Capacity	0.45	0.09	0.06	0.09	0.04
Queue Length 95th (m)	17.9	2.3	0.0	0.0	0.9
Control Delay (s)	16.8	9.1	0.0	0.0	1.6
Lane LOS	C	A			A
Approach Delay (s)	14.8		0.0		1.6
Approach LOS	B				

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	167	355	0	1095	2514	0
Future Volume (vph)	167	355	0	1095	2514	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.91	0.95	
Frt	0.92	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3171	1457		4902	3444	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3171	1457		4902	3444	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	355	0	1095	2514	0
RTOR Reduction (vph)	11	11	0	0	0	0
Lane Group Flow (vph)	334	166	0	1095	2514	0
Heavy Vehicles (%)	10%	2%	0%	7%	6%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	18.4	18.4		109.6	109.6	
Effective Green, g (s)	18.4	18.4		109.6	109.6	
Actuated g/C Ratio	0.13	0.13		0.78	0.78	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	416	191		3837	2696	
v/s Ratio Prot	0.11			0.22	c0.73	
v/s Ratio Perm		c0.11				
v/c Ratio	0.80	0.87		0.29	0.93	
Uniform Delay, d1	59.0	59.6		4.3	12.2	
Progression Factor	1.00	1.00		0.37	1.00	
Incremental Delay, d2	11.2	32.2		0.2	7.4	
Delay (s)	70.3	91.8		1.8	19.6	
Level of Service	E	F		A	B	
Approach Delay (s)	77.6			1.8	19.6	
Approach LOS	E			A	B	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.1%	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 (vph)	0	50	20	9	45	3	90	678	52	22	942	0
Future Volume (vph)	0	50	20	9	45	3	90	678	52	22	942	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.96		1.00	0.99		1.00	0.99		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803		1789	1866		1789	3540		1789	3579	
Flt Permitted		1.00		0.71	1.00		0.30	1.00		0.37	1.00	
Satd. Flow (perm)		1803		1340	1866		565	3540		705	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	50	20	9	45	3	90	678	52	22	942	0
RTOR Reduction (vph)	0	18	0	0	3	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	52	0	9	45	0	90	726	0	22	942	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.0		6.0	6.0		50.0	50.0		50.0	50.0	
Effective Green, g (s)		6.0		6.0	6.0		50.0	50.0		50.0	50.0	
Actuated g/C Ratio		0.09		0.09	0.09		0.71	0.71		0.71	0.71	
Clearance Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		154		114	159		403	2528		503	2556	
v/s Ratio Prot		c0.03			0.02			0.21			c0.26	
v/s Ratio Perm				0.01			0.16			0.03		
v/c Ratio		0.34		0.08	0.28		0.22	0.29		0.04	0.37	
Uniform Delay, d1		30.1		29.5	30.0		3.4	3.6		2.9	3.9	
Progression Factor		1.00		1.05	1.02		1.48	1.49		1.00	1.00	
Incremental Delay, d2		1.3		0.3	1.0		1.1	0.2		0.2	0.4	
Delay (s)		31.4		31.2	31.5		6.1	5.6		3.1	4.3	
Level of Service		C		C	C		A	A		A	A	
Approach Delay (s)		31.4			31.5			5.7			4.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	58	16	40	10	2	230
Future Volume (Veh/h)	58	16	40	10	2	230
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	58	16	40	10	2	230
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	247					
pX, platoon unblocked						
vC, conflicting volume			74		156	66
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			74		156	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 %			97		100	77
cM capacity (veh/h)			1526		813	998

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	74	50	2	230
Volume Left	0	40	2	0
Volume Right	16	0	0	230
cSH	1700	1526	813	998
Volume to Capacity	0.04	0.03	0.00	0.23
Queue Length 95th (m)	0.0	0.6	0.1	6.8
Control Delay (s)	0.0	6.0	9.4	9.7
Lane LOS		A	A	A
Approach Delay (s)	0.0	6.0	9.7	
Approach LOS			A	

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Volume (vph)	0	149	0	0	1037	0
Future Volume (vph)	0	149	0	0	1037	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0	
Lane Util. Factor		1.00			1.00	
Frt		0.85			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		1601			1789	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		1601			1789	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	149	0	0	1037	0
RTOR Reduction (vph)	0	121	0	0	0	0
Lane Group Flow (vph)	0	28	0	0	1037	0
Turn Type		Perm	Perm		Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)		26.0			100.0	
Effective Green, g (s)		26.0			100.0	
Actuated g/C Ratio		0.19			0.71	
Clearance Time (s)		7.0			7.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		297			1277	
v/s Ratio Prot					c0.58	
v/s Ratio Perm		c0.02				
v/c Ratio		0.09			0.81	
Uniform Delay, d1		47.2			13.6	
Progression Factor		1.00			0.80	
Incremental Delay, d2		0.6			3.0	
Delay (s)		47.9			13.9	
Level of Service		D			B	
Approach Delay (s)	47.9			0.0	13.9	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	8	151	0	164	145
Future Volume (Veh/h)	0	8	151	0	164	145
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	8	151	0	164	145
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			8		306	4
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			8		306	4
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		74	87
cM capacity (veh/h)			1612		622	1080

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	8	151	0	164	145
Volume Left	0	151	0	164	0
Volume Right	8	0	0	0	145
cSH	1700	1612	1700	622	1080
Volume to Capacity	0.00	0.09	0.00	0.26	0.13
Queue Length 95th (m)	0.0	2.4	0.0	8.0	3.5
Control Delay (s)	0.0	7.5	0.0	12.9	8.9
Lane LOS		A		B	A
Approach Delay (s)	0.0	7.5		11.0	
Approach LOS				B	

Intersection Summary			
Average Delay	9.7		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	32	49	363	1596	2663	206
Future Volume (vph)	32	49	363	1596	2663	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1789	1601	3471	5142	5142	1601
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1789	1601	3471	5142	5142	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	49	363	1596	2663	206
RTOR Reduction (vph)	0	46	0	0	0	68
Lane Group Flow (vph)	32	3	363	1596	2663	138
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	8.2	8.2	20.3	117.8	93.5	93.5
Effective Green, g (s)	8.2	8.2	20.3	117.8	93.5	93.5
Actuated g/C Ratio	0.06	0.06	0.15	0.84	0.67	0.67
Clearance Time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	104	93	503	4326	3434	1069
v/s Ratio Prot	c0.02		c0.10	0.31	c0.52	
v/s Ratio Perm		0.00				0.09
v/c Ratio	0.31	0.03	0.72	0.37	0.78	0.13
Uniform Delay, d1	63.2	62.2	57.2	2.6	16.0	8.4
Progression Factor	1.00	1.00	1.27	0.50	0.98	1.78
Incremental Delay, d2	1.7	0.1	3.8	0.2	0.7	0.1
Delay (s)	64.9	62.3	76.5	1.5	16.4	15.2
Level of Service	E	E	E	A	B	B
Approach Delay (s)	63.3			15.4	16.3	
Approach LOS	E			B	B	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
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)	0	65	20	80	10	14	95	806	483	89	882	10
Future Volume (vph)	0	65	20	80	10	14	95	806	483	89	882	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.96		1.00	0.91		1.00	0.94		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1817		1789	1719		1789	3377		1789	3573	
Flt Permitted		1.00		0.70	1.00		0.31	1.00		0.18	1.00	
Satd. Flow (perm)		1817		1322	1719		587	3377		345	3573	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	65	20	80	10	14	95	806	483	89	882	10
RTOR Reduction (vph)	0	17	0	0	12	0	0	71	0	0	1	0
Lane Group Flow (vph)	0	68	0	80	12	0	95	1218	0	89	891	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		9.0		9.0	9.0		47.0	47.0		47.0	47.0	
Effective Green, g (s)		9.0		9.0	9.0		47.0	47.0		47.0	47.0	
Actuated g/C Ratio		0.13		0.13	0.13		0.67	0.67		0.67	0.67	
Clearance Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		233		169	221		394	2267		231	2399	
v/s Ratio Prot		0.04			0.01			c0.36			0.25	
v/s Ratio Perm				c0.06			0.16			0.26		
v/c Ratio		0.29		0.47	0.05		0.24	0.54		0.39	0.37	
Uniform Delay, d1		27.6		28.3	26.8		4.5	5.9		5.1	5.0	
Progression Factor		1.00		0.74	0.73		1.84	2.83		0.79	0.81	
Incremental Delay, d2		0.7		2.1	0.1		0.9	0.5		4.6	0.4	
Delay (s)		28.3		23.0	19.7		9.2	17.2		8.7	4.5	
Level of Service		C		C	B		A	B		A	A	
Approach Delay (s)		28.3			22.2			16.7			4.9	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	74.7%	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 (vph)	87	522	19	87	307	504	65	109	132	94	20	15
Future Volume (vph)	87	522	19	87	307	504	65	109	132	94	20	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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)	1789	3579	1601	1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.56	1.00	1.00	0.46	1.00	1.00	0.74	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)	1064	3579	1601	864	3579	1601	1402	1883	1601	1293	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	87	522	19	87	307	504	65	109	132	94	20	15
RTOR Reduction (vph)	0	0	6	0	0	170	0	0	114	0	0	13
Lane Group Flow (vph)	87	522	13	87	307	334	65	109	18	94	20	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	46.4	46.4	46.4	46.4	46.4	46.4	9.6	9.6	9.6	9.6	9.6	9.6
Effective Green, g (s)	46.4	46.4	46.4	46.4	46.4	46.4	9.6	9.6	9.6	9.6	9.6	9.6
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66	0.66	0.14	0.14	0.14	0.14	0.14	0.14
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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)	705	2372	1061	572	2372	1061	192	258	219	177	258	219
v/s Ratio Prot		0.15			0.09			0.06			0.01	
v/s Ratio Perm	0.08		0.01	0.10		c0.21	0.05		0.01	c0.07		0.00
v/c Ratio	0.12	0.22	0.01	0.15	0.13	0.31	0.34	0.42	0.08	0.53	0.08	0.01
Uniform Delay, d1	4.3	4.7	4.0	4.4	4.4	5.0	27.3	27.7	26.4	28.1	26.3	26.1
Progression Factor	1.31	1.35	1.00	1.83	1.84	13.54	1.18	1.16	2.32	1.07	1.08	1.00
Incremental Delay, d2	0.3	0.2	0.0	0.5	0.1	0.7	1.0	1.1	0.2	3.0	0.1	0.0
Delay (s)	6.0	6.5	4.0	8.6	8.1	68.7	33.4	33.2	61.2	32.9	28.5	26.1
Level of Service	A	A	A	A	A	E	C	C	E	C	C	C
Approach Delay (s)		6.3			42.2			45.3			31.5	
Approach LOS		A			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
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)	207	515	21	94	1199	751	58	79	185	107	11	31
Future Volume (vph)	207	515	21	94	1199	751	58	79	185	107	11	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	3558		1789	3579	1601	1789	1883	1601	3471	1675	
Flt Permitted	0.17	1.00		0.45	1.00	1.00	0.73	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	320	3558		852	3579	1601	1374	1883	1601	3471	1675	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	207	515	21	94	1199	751	58	79	185	107	11	31
RTOR Reduction (vph)	0	2	0	0	0	83	0	0	169	0	26	0
Lane Group Flow (vph)	207	534	0	94	1199	668	58	79	16	107	16	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6		6	8		8			
Actuated Green, G (s)	102.6	102.6		87.6	87.6	87.6	12.4	12.4	12.4	7.0	23.4	
Effective Green, g (s)	102.6	102.6		87.6	87.6	87.6	12.4	12.4	12.4	7.0	23.4	
Actuated g/C Ratio	0.73	0.73		0.63	0.63	0.63	0.09	0.09	0.09	0.05	0.17	
Clearance Time (s)	4.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	349	2607		533	2239	1001	121	166	141	173	279	
v/s Ratio Prot	c0.05	0.15			0.34			0.04		c0.03	0.01	
v/s Ratio Perm	0.39			0.11		c0.42	c0.04		0.01			
v/c Ratio	0.59	0.20		0.18	0.54	0.67	0.48	0.48	0.12	0.62	0.06	
Uniform Delay, d1	9.9	5.9		11.0	14.7	16.8	60.7	60.7	58.8	65.2	49.0	
Progression Factor	1.46	1.16		1.73	1.72	1.86	1.02	1.02	1.19	1.00	1.02	
Incremental Delay, d2	2.7	0.2		0.3	0.4	1.4	2.9	2.1	0.4	6.4	0.1	
Delay (s)	17.2	7.0		19.4	25.8	32.7	64.7	64.0	70.5	71.6	50.2	
Level of Service	B	A		B	C	C	E	E	E	E	D	
Approach Delay (s)		9.8			28.0			67.9			65.6	
Approach LOS		A			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.3%	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 (vph)	342	433	24	101	1921	293	102	76	54	41	13	104
Future Volume (vph)	342	433	24	101	1921	293	102	76	54	41	13	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3550		1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.05	1.00		0.49	1.00	1.00	0.75	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	94	3550		920	3579	1601	1411	1883	1601	1333	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	342	433	24	101	1921	293	102	76	54	41	13	104
RTOR Reduction (vph)	0	2	0	0	0	47	0	0	48	0	0	92
Lane Group Flow (vph)	342	455	0	101	1921	246	102	76	6	41	13	12
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	110.3	110.3		76.0	76.0	76.0	15.7	15.7	15.7	15.7	15.7	15.7
Effective Green, g (s)	110.3	110.3		76.0	76.0	76.0	15.7	15.7	15.7	15.7	15.7	15.7
Actuated g/C Ratio	0.79	0.79		0.54	0.54	0.54	0.11	0.11	0.11	0.11	0.11	0.11
Clearance Time (s)	4.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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
Lane Grp Cap (vph)	440	2796		499	1942	869	158	211	179	149	211	179
v/s Ratio Prot	c0.17	0.13			c0.54			0.04			0.01	
v/s Ratio Perm	0.44			0.11		0.15	c0.07		0.00	0.03		0.01
v/c Ratio	0.78	0.16		0.20	0.99	0.28	0.65	0.36	0.03	0.28	0.06	0.07
Uniform Delay, d1	44.5	3.6		16.4	31.6	17.3	59.5	57.5	55.4	56.9	55.6	55.6
Progression Factor	1.10	0.97		0.85	1.23	1.05	0.87	0.87	0.81	0.51	0.48	0.83
Incremental Delay, d2	8.2	0.1		0.1	4.1	0.1	8.3	1.0	0.1	0.9	0.1	0.1
Delay (s)	56.9	3.6		14.1	42.9	18.2	60.3	51.1	44.9	30.1	26.7	46.4
Level of Service	E	A		B	D	B	E	D	D	C	C	D
Approach Delay (s)		26.5			38.5			53.7			40.5	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	99.4%	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 (vph)	158	103	245	77	548	180	1438	1621	269	492	1757	463
Future Volume (vph)	158	103	245	77	548	180	1438	1621	269	492	1757	463
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	4.0	7.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	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)	1789	3579	1601	1825	3579	1633	3471	5245	1633	3541	5245	1601
Flt Permitted	0.16	1.00	1.00	0.69	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	302	3579	1601	1320	3579	1633	3471	5245	1633	3541	5245	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	158	103	245	77	548	180	1438	1621	269	492	1757	463
RTOR Reduction (vph)	0	0	0	0	0	63	0	0	147	0	0	81
Lane Group Flow (vph)	158	103	245	77	548	117	1438	1621	122	492	1757	382
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4			8	1	5	2		1	6	
Permitted Phases	4		Free	8		8			2			6
Actuated Green, G (s)	37.4	37.4	140.0	25.4	25.4	46.3	35.6	63.7	63.7	20.9	49.0	49.0
Effective Green, g (s)	37.4	37.4	140.0	25.4	25.4	46.3	35.6	63.7	63.7	20.9	49.0	49.0
Actuated g/C Ratio	0.27	0.27	1.00	0.18	0.18	0.33	0.25	0.46	0.46	0.15	0.35	0.35
Clearance Time (s)	4.0	7.0		7.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
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
Lane Grp Cap (vph)	165	956	1601	239	649	540	882	2386	743	528	1835	560
v/s Ratio Prot	c0.05	0.03			0.15	0.03	c0.41	0.31		0.14	c0.34	
v/s Ratio Perm	c0.20		0.15	0.06		0.04			0.07			0.24
v/c Ratio	0.96	0.11	0.15	0.32	0.84	0.22	1.63	0.68	0.16	0.93	0.96	0.68
Uniform Delay, d1	46.3	38.7	0.0	49.8	55.4	33.8	52.2	30.1	22.5	58.8	44.5	38.8
Progression Factor	1.10	1.03	1.00	1.00	1.00	1.00	0.62	1.03	2.39	1.09	0.94	0.93
Incremental Delay, d2	56.7	0.0	0.2	0.8	9.8	0.2	284.1	0.1	0.0	17.0	9.4	4.3
Delay (s)	107.8	39.9	0.2	50.6	65.2	34.0	316.5	31.2	53.7	81.3	51.1	40.4
Level of Service	F	D	A	D	E	C	F	C	D	F	D	D
Approach Delay (s)		41.9			56.8			156.3			54.8	
Approach LOS		D			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	100.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	117.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	51	19	287	191	71	55
Future Volume (Veh/h)	51	19	287	191	71	55
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	51	19	287	191	71	55
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			155			267
pX, platoon unblocked						
vC, conflicting volume	484	287			478	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	484	287			478	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	97			93	
cM capacity (veh/h)	506	752			1084	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	51	19	287	191	126
Volume Left	51	0	0	0	71
Volume Right	0	19	0	191	0
cSH	506	752	1700	1700	1084
Volume to Capacity	0.10	0.03	0.17	0.11	0.07
Queue Length 95th (m)	2.5	0.6	0.0	0.0	1.6
Control Delay (s)	12.9	9.9	0.0	0.0	5.1
Lane LOS	B	A			A
Approach Delay (s)	12.1		0.0		5.1
Approach LOS	B				

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1196	3202	1057	188	386	596
Future Volume (vph)	1196	3202	1057	188	386	596
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4117	1570	3541	1613
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	4476	4117	1570	3541	1613
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1196	3202	1057	188	386	596
RTOR Reduction (vph)	0	0	0	89	0	0
Lane Group Flow (vph)	1196	3202	1057	99	386	596
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	1%	3%	12%	4%	0%	0%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	55.2	105.8	46.6	46.6	20.2	140.0
Effective Green, g (s)	55.2	105.8	46.6	46.6	20.2	140.0
Actuated g/C Ratio	0.39	0.76	0.33	0.33	0.14	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	1382	3382	1370	522	510	1613
v/s Ratio Prot	0.34	c0.72	0.26		c0.11	
v/s Ratio Perm				0.06		0.37
v/c Ratio	0.87	0.95	0.77	0.19	0.76	0.37
Uniform Delay, d1	39.0	14.7	41.9	33.2	57.5	0.0
Progression Factor	1.00	1.00	0.85	1.22	1.16	1.00
Incremental Delay, d2	5.9	7.3	4.1	0.8	5.8	0.6
Delay (s)	44.9	21.9	39.6	41.2	72.5	0.6
Level of Service	D	C	D	D	E	A
Approach Delay (s)		28.2	39.8		28.9	
Approach LOS		C	D		C	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	161	3427	1242	317	72	34
Future Volume (vph)	161	3427	1242	317	72	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	0.99	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3466	1457
Flt Permitted	0.16	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	303	4520	4520	1601	3466	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	161	3427	1242	317	72	34
RTOR Reduction (vph)	0	0	0	77	3	29
Lane Group Flow (vph)	161	3427	1242	240	72	2
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	117.9	117.9	106.1	106.1	8.1	8.1
Effective Green, g (s)	117.9	117.9	106.1	106.1	8.1	8.1
Actuated g/C Ratio	0.84	0.84	0.76	0.76	0.06	0.06
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	337	3806	3425	1213	200	84
v/s Ratio Prot	0.03	c0.76	0.27		c0.02	
v/s Ratio Perm	0.38			0.15		0.00
v/c Ratio	0.48	0.90	0.36	0.20	0.36	0.02
Uniform Delay, d1	2.7	7.2	5.7	4.8	63.5	62.2
Progression Factor	0.57	0.80	1.52	5.87	0.97	1.12
Incremental Delay, d2	0.5	1.8	0.3	0.3	1.1	0.1
Delay (s)	2.0	7.5	8.8	28.7	62.4	70.0
Level of Service	A	A	A	C	E	E
Approach Delay (s)		7.3	12.9		64.6	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
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)	147	3003	262	58	1456	363	83	33	168	76	6	20
Future Volume (vph)	147	3003	262	58	1456	363	83	33	168	76	6	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.99
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)	1807	4476	1601	1674	4117	1570	1768	1921	1517	1555	1921	1610
Flt Permitted	0.11	1.00	1.00	0.04	1.00	1.00	0.75	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	217	4476	1601	71	4117	1570	1403	1921	1517	1204	1921	1610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	147	3003	262	58	1456	363	83	33	168	76	6	20
RTOR Reduction (vph)	0	0	49	0	0	104	0	0	81	0	0	18
Lane Group Flow (vph)	147	3003	213	58	1456	259	83	33	87	76	6	2
Confl. Peds. (#/hr)	8					8	2		3	3		2
Heavy Vehicles (%)	1%	3%	2%	9%	12%	0%	3%	0%	6%	17%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	110.5	101.7	101.7	104.7	98.8	98.8	15.0	15.0	15.0	15.0	15.0	15.0
Effective Green, g (s)	110.5	101.7	101.7	104.7	98.8	98.8	15.0	15.0	15.0	15.0	15.0	15.0
Actuated g/C Ratio	0.79	0.73	0.73	0.75	0.71	0.71	0.11	0.11	0.11	0.11	0.11	0.11
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	0.2
Lane Grp Cap (vph)	271	3251	1163	120	2905	1107	150	205	162	129	205	172
v/s Ratio Prot	c0.03	c0.67		0.02	0.35			0.02			0.00	
v/s Ratio Perm	0.39		0.13	0.34		0.17	0.06		0.06	c0.06		0.00
v/c Ratio	0.54	0.92	0.18	0.48	0.50	0.23	0.55	0.16	0.54	0.59	0.03	0.01
Uniform Delay, d1	5.8	15.9	6.0	30.7	9.4	7.3	59.3	56.8	59.2	59.6	56.0	55.9
Progression Factor	1.79	0.81	1.48	1.11	1.29	3.59	1.00	1.00	1.00	1.08	1.14	1.00
Incremental Delay, d2	0.8	2.9	0.2	2.4	0.5	0.4	4.8	0.4	3.8	4.3	0.0	0.0
Delay (s)	11.2	15.9	9.1	36.4	12.6	26.5	64.1	57.2	63.0	68.8	63.8	55.9
Level of Service	B	B	A	D	B	C	E	E	E	E	E	E
Approach Delay (s)		15.2			16.0			62.7			66.0	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	95.7%	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 (vph)	128	3180	106	33	1826	346	88	17	84	64	2	24
Future Volume (vph)	128	3180	106	33	1826	346	88	17	84	64	2	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	4391	1633	1772	4117	1601	1722	1609		3471	1623	
Flt Permitted	0.05	1.00	1.00	0.05	1.00	1.00	0.48	1.00		0.95	1.00	
Satd. Flow (perm)	101	4391	1633	84	4117	1601	863	1609		3471	1623	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	128	3180	106	33	1826	346	88	17	84	64	2	24
RTOR Reduction (vph)	0	0	29	0	0	38	0	76	0	0	23	0
Lane Group Flow (vph)	128	3180	77	33	1826	308	88	25	0	64	3	0
Heavy Vehicles (%)	4%	5%	0%	3%	12%	2%	6%	2%	5%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8					
Actuated Green, G (s)	104.0	96.1	96.1	92.7	88.8	88.8	22.0	13.2		4.8	7.2	
Effective Green, g (s)	104.0	96.1	96.1	92.7	88.8	88.8	22.0	13.2		4.8	7.2	
Actuated g/C Ratio	0.74	0.69	0.69	0.66	0.63	0.63	0.16	0.09		0.03	0.05	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	207	3014	1120	102	2611	1015	201	151		119	83	
v/s Ratio Prot	c0.05	c0.72		0.01	0.44		c0.03	0.02		0.02	0.00	
v/s Ratio Perm	0.41		0.05	0.20		0.19	c0.03					
v/c Ratio	0.62	1.06	0.07	0.32	0.70	0.30	0.44	0.17		0.54	0.04	
Uniform Delay, d1	26.0	22.0	7.2	34.3	16.8	11.6	52.5	58.3		66.5	63.1	
Progression Factor	1.29	0.80	1.77	2.29	0.79	0.93	1.00	1.00		0.78	1.28	
Incremental Delay, d2	2.9	29.8	0.1	0.2	0.1	0.1	1.5	1.1		4.6	0.2	
Delay (s)	36.4	47.3	12.9	78.8	13.4	10.8	54.0	59.4		56.7	80.7	
Level of Service	D	D	B	E	B	B	D	E		E	F	
Approach Delay (s)		45.8			14.0			56.9			63.6	
Approach LOS		D			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	93.0%	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 (vph)	330	2336	562	198	1321	760	621	2238	322	314	1409	169
Future Volume (vph)	330	2336	562	198	1321	760	621	2238	322	314	1409	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	1.0	3.0	4.0	1.0	3.0	4.0	1.0	3.0	4.0	1.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1630	4476	1568	1508	4683	1555	3079	4902	1512	3404	4902	1541
Flt Permitted	0.08	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	486	4476	1568	141	4683	1555	3079	4902	1512	3404	4902	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	2336	562	198	1321	760	621	2238	322	314	1409	169
RTOR Reduction (vph)	0	0	31	0	0	52	0	0	52	0	0	33
Lane Group Flow (vph)	330	2336	531	198	1321	708	621	2238	270	314	1409	136
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	3%	3%	3%	21%	12%	5%	15%	7%	8%	4%	7%	6%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	61.0	49.0	63.0	52.0	44.0	57.0	14.0	48.0	56.0	13.0	47.0	60.0
Effective Green, g (s)	62.0	52.0	69.0	54.0	47.0	63.0	15.0	51.0	62.0	14.0	50.0	66.0
Actuated g/C Ratio	0.44	0.37	0.49	0.39	0.34	0.45	0.11	0.36	0.44	0.10	0.36	0.47
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
Vehicle Extension (s)	2.5	6.0	2.5	2.5	6.0	2.5	2.5	4.0	2.5	2.5	4.0	2.5
Lane Grp Cap (vph)	329	1662	772	142	1572	699	329	1785	669	340	1750	726
v/s Ratio Prot	c0.10	c0.52	0.08	c0.09	0.28	0.12	c0.20	c0.46	0.03	0.09	0.29	0.02
v/s Ratio Perm	0.34		0.25	0.45		0.34			0.15			0.07
v/c Ratio	1.00	1.41	0.69	1.39	0.84	1.01	1.89	1.25	0.40	0.92	0.81	0.19
Uniform Delay, d1	39.0	44.0	27.2	35.9	43.0	38.5	62.5	44.5	26.4	62.5	40.6	21.5
Progression Factor	1.01	1.00	0.75	1.00	1.00	1.00	1.00	1.00	1.00	0.50	1.04	1.95
Incremental Delay, d2	29.3	183.7	0.8	214.5	5.6	37.4	410.7	119.0	0.3	18.7	1.6	0.0
Delay (s)	68.6	227.6	21.1	250.5	48.6	75.9	473.2	163.5	26.7	50.1	43.7	41.8
Level of Service	E	F	C	F	D	E	F	F	C	D	D	D
Approach Delay (s)		175.4			75.3			210.1			44.6	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	140.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	121.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	111	132	0	2387	1251	0
Future Volume (vph)	111	132	0	2387	1251	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.91	0.95	
Frt	0.95	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3338	1457		5142	3579	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3338	1457		5142	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	132	0	2387	1251	0
RTOR Reduction (vph)	48	71	0	0	0	0
Lane Group Flow (vph)	118	6	0	2387	1251	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	11.2	11.2		116.8	116.8	
Effective Green, g (s)	11.2	11.2		116.8	116.8	
Actuated g/C Ratio	0.08	0.08		0.83	0.83	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	267	116		4289	2985	
v/s Ratio Prot	c0.04			c0.46	0.35	
v/s Ratio Perm		0.00				
v/c Ratio	0.44	0.05		0.56	0.42	
Uniform Delay, d1	61.4	59.5		3.6	3.0	
Progression Factor	1.00	1.00		0.36	1.00	
Incremental Delay, d2	1.6	0.3		0.4	0.4	
Delay (s)	63.0	59.8		1.7	3.4	
Level of Service	E	E		A	A	
Approach Delay (s)	62.0			1.7	3.4	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
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)	5	65	40	39	55	16	50	697	14	5	846	0
Future Volume (vph)	5	65	40	39	55	16	50	697	14	5	846	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
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	0.97		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)	1789	1776		1789	1820		1789	3568		1789	3579	
Flt Permitted	0.71	1.00		0.69	1.00		0.33	1.00		0.38	1.00	
Satd. Flow (perm)	1339	1776		1298	1820		624	3568		718	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	65	40	39	55	16	50	697	14	5	846	0
RTOR Reduction (vph)	0	35	0	0	14	0	0	1	0	0	0	0
Lane Group Flow (vph)	5	70	0	39	57	0	50	710	0	5	846	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.4	8.4		8.4	8.4		47.6	47.6		47.6	47.6	
Effective Green, g (s)	8.4	8.4		8.4	8.4		47.6	47.6		47.6	47.6	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.68	0.68		0.68	0.68	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	160	213		155	218		424	2426		488	2433	
v/s Ratio Prot		c0.04			0.03			0.20			c0.24	
v/s Ratio Perm	0.00			0.03			0.08			0.01		
v/c Ratio	0.03	0.33		0.25	0.26		0.12	0.29		0.01	0.35	
Uniform Delay, d1	27.2	28.2		27.9	28.0		3.9	4.5		3.6	4.7	
Progression Factor	1.00	1.00		1.04	1.04		1.84	1.81		1.00	1.00	
Incremental Delay, d2	0.1	0.9		0.9	0.6		0.5	0.3		0.0	0.4	
Delay (s)	27.3	29.1		30.0	29.7		7.7	8.4		3.6	5.1	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		29.0			29.8			8.3			5.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	15	4	173	43	12	61
Future Volume (Veh/h)	15	4	173	43	12	61
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	4	173	43	12	61
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	247					
pX, platoon unblocked						
vC, conflicting volume			19		406	17
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			19		406	17
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			89		98	94
cM capacity (veh/h)			1597		536	1062

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	19	216	12	61
Volume Left	0	173	12	0
Volume Right	4	0	0	61
cSH	1700	1597	536	1062
Volume to Capacity	0.01	0.11	0.02	0.06
Queue Length 95th (m)	0.0	2.8	0.5	1.4
Control Delay (s)	0.0	6.2	11.9	8.6
Lane LOS		A	B	A
Approach Delay (s)	0.0	6.2	9.1	
Approach LOS			A	

Intersection Summary			
Average Delay	6.5		
Intersection Capacity Utilization	28.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Volume (vph)	0	882	0	0	214	0
Future Volume (vph)	0	882	0	0	214	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0	
Lane Util. Factor		1.00			1.00	
Frt		0.85			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		1601			1789	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		1601			1789	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	882	0	0	214	0
RTOR Reduction (vph)	0	353	0	0	0	0
Lane Group Flow (vph)	0	529	0	0	214	0
Turn Type		Perm	Perm		Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)		42.0			14.0	
Effective Green, g (s)		42.0			14.0	
Actuated g/C Ratio		0.60			0.20	
Clearance Time (s)		7.0			7.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		960			357	
v/s Ratio Prot					c0.12	
v/s Ratio Perm		c0.33				
v/c Ratio		0.55			0.60	
Uniform Delay, d1		8.4			25.5	
Progression Factor		1.27			1.25	
Incremental Delay, d2		2.3			2.7	
Delay (s)		12.9			34.6	
Level of Service		B			C	
Approach Delay (s)	12.9			0.0	34.6	
Approach LOS	B			A	C	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	115	147	0	6	143
Future Volume (Veh/h)	0	115	147	0	6	143
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	115	147	0	6	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			115		352	58
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			115		352	58
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		99	86
cM capacity (veh/h)			1474		582	1009

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	115	147	0	6	143
Volume Left	0	147	0	6	0
Volume Right	115	0	0	0	143
cSH	1700	1474	1700	582	1009
Volume to Capacity	0.07	0.10	0.00	0.01	0.14
Queue Length 95th (m)	0.0	2.5	0.0	0.2	3.7
Control Delay (s)	0.0	7.7	0.0	11.3	9.2
Lane LOS		A		B	A
Approach Delay (s)	0.0	7.7		9.2	
Approach LOS				A	

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰↰	↑↑↑	↑↑↑	↱
Traffic Volume (vph)	185	326	72	2608	1530	51
Future Volume (vph)	185	326	72	2608	1530	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	4.0	4.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1789	1601	3471	5142	5142	1601
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1789	1601	3471	5142	5142	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	326	72	2608	1530	51
RTOR Reduction (vph)	0	24	0	0	0	17
Lane Group Flow (vph)	185	302	72	2608	1530	34
Turn Type	Prot	pm+ov	Prot	NA	NA	Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	19.7	28.9	9.2	106.3	93.1	93.1
Effective Green, g (s)	19.7	28.9	9.2	106.3	93.1	93.1
Actuated g/C Ratio	0.14	0.21	0.07	0.76	0.66	0.66
Clearance Time (s)	7.0	4.0	4.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	251	330	228	3904	3419	1064
v/s Ratio Prot	0.10	c0.06	0.02	c0.51	0.30	
v/s Ratio Perm		0.13				0.02
v/c Ratio	0.74	0.92	0.32	0.67	0.45	0.03
Uniform Delay, d1	57.7	54.4	62.4	8.2	11.2	8.0
Progression Factor	1.00	1.00	1.13	0.60	0.91	0.91
Incremental Delay, d2	10.7	28.8	0.5	0.5	0.4	0.1
Delay (s)	68.4	83.2	70.9	5.4	10.6	7.3
Level of Service	E	F	E	A	B	A
Approach Delay (s)	77.8			7.2	10.5	
Approach LOS	E			A	B	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
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)	10	30	60	441	25	90	15	661	144	37	913	0
Future Volume (vph)	10	30	60	441	25	90	15	661	144	37	913	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.88		1.00	0.97		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)	1789	1695		1789	1662		1789	3483		1789	3579	
Flt Permitted	0.68	1.00		0.70	1.00		0.23	1.00		0.28	1.00	
Satd. Flow (perm)	1286	1695		1316	1662		434	3483		533	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	30	60	441	25	90	15	661	144	37	913	0
RTOR Reduction (vph)	0	28	0	0	56	0	0	25	0	0	0	0
Lane Group Flow (vph)	10	62	0	441	59	0	15	780	0	37	913	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.5	26.5		26.5	26.5		29.5	29.5		29.5	29.5	
Effective Green, g (s)	26.5	26.5		26.5	26.5		29.5	29.5		29.5	29.5	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.42	0.42		0.42	0.42	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	486	641		498	629		182	1467		224	1508	
v/s Ratio Prot		0.04			0.04			0.22			c0.26	
v/s Ratio Perm	0.01			c0.34			0.03			0.07		
v/c Ratio	0.02	0.10		0.89	0.09		0.08	0.53		0.17	0.61	
Uniform Delay, d1	13.6	14.0		20.3	14.0		12.1	15.1		12.6	15.7	
Progression Factor	1.00	1.00		0.91	0.17		0.83	1.18		0.73	0.74	
Incremental Delay, d2	0.0	0.1		16.6	0.1		0.7	1.2		1.5	1.8	
Delay (s)	13.6	14.1		35.1	2.5		10.8	18.9		10.8	13.5	
Level of Service	B	B		D	A		B	B		B	B	
Approach Delay (s)		14.1			28.4			18.8			13.4	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	73.5%	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 (vph)	23	429	76	160	564	137	42	28	125	382	85	65
Future Volume (vph)	23	429	76	160	564	137	42	28	125	382	85	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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)	1789	3579	1601	1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.44	1.00	1.00	0.50	1.00	1.00	0.70	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	821	3579	1601	946	3579	1601	1322	1883	1601	1392	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	23	429	76	160	564	137	42	28	125	382	85	65
RTOR Reduction (vph)	0	0	40	0	0	73	0	0	84	0	0	43
Lane Group Flow (vph)	23	429	36	160	564	64	42	28	41	382	85	22
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	32.8	32.8	32.8	32.8	32.8	32.8	23.2	23.2	23.2	23.2	23.2	23.2
Effective Green, g (s)	32.8	32.8	32.8	32.8	32.8	32.8	23.2	23.2	23.2	23.2	23.2	23.2
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47	0.47	0.33	0.33	0.33	0.33	0.33	0.33
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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	1677	750	443	1677	750	438	624	530	461	624	530
v/s Ratio Prot		0.12			0.16			0.01			0.05	
v/s Ratio Perm	0.03		0.02	c0.17		0.04	0.03		0.03	c0.27		0.01
v/c Ratio	0.06	0.26	0.05	0.36	0.34	0.09	0.10	0.04	0.08	0.83	0.14	0.04
Uniform Delay, d1	10.2	11.2	10.1	11.9	11.7	10.3	16.2	15.9	16.1	21.6	16.4	15.9
Progression Factor	1.46	1.42	2.73	1.05	1.00	2.74	1.16	1.16	1.95	0.69	0.73	0.42
Incremental Delay, d2	0.3	0.4	0.1	2.2	0.5	0.2	0.1	0.0	0.1	11.7	0.1	0.0
Delay (s)	15.1	16.3	27.7	14.6	12.3	28.4	18.8	18.4	31.3	26.5	12.0	6.7
Level of Service	B	B	C	B	B	C	B	B	C	C	B	A
Approach Delay (s)		17.9			15.3			26.8			21.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
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)	43	1210	71	183	748	155	50	16	119	638	67	177
Future Volume (vph)	43	1210	71	183	748	155	50	16	119	638	67	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		4.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	3549		1789	3579	1601	1789	1883	1601	3471	1679	
Flt Permitted	0.37	1.00		0.07	1.00	1.00	0.61	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	693	3549		128	3579	1601	1144	1883	1601	3471	1679	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	43	1210	71	183	748	155	50	16	119	638	67	177
RTOR Reduction (vph)	0	3	0	0	0	29	0	0	108	0	81	0
Lane Group Flow (vph)	43	1278	0	183	748	126	50	16	11	638	163	0
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2			6		6	8		8			
Actuated Green, G (s)	60.8	60.8		81.3	81.3	81.3	12.5	12.5	12.5	28.2	44.7	
Effective Green, g (s)	60.8	60.8		81.3	81.3	81.3	12.5	12.5	12.5	28.2	44.7	
Actuated g/C Ratio	0.43	0.43		0.58	0.58	0.58	0.09	0.09	0.09	0.20	0.32	
Clearance Time (s)	7.0	7.0		4.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	300	1541		270	2078	929	102	168	142	699	536	
v/s Ratio Prot		c0.36		c0.08	0.21			0.01		c0.18	0.10	
v/s Ratio Perm	0.06			0.31		0.08	c0.04		0.01			
v/c Ratio	0.14	0.83		0.68	0.36	0.14	0.49	0.10	0.07	0.91	0.30	
Uniform Delay, d1	23.9	35.0		34.6	15.6	13.4	60.7	58.6	58.4	54.7	35.9	
Progression Factor	0.93	0.91		1.40	1.68	2.33	0.89	0.87	1.53	1.00	1.00	
Incremental Delay, d2	1.0	5.2		6.3	0.5	0.3	3.6	0.2	0.2	13.3	0.2	
Delay (s)	23.2	37.1		54.9	26.5	31.4	57.7	51.1	89.6	67.9	36.1	
Level of Service	C	D		D	C	C	E	D	F	E	D	
Approach Delay (s)		36.7			32.0			77.7			59.1	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
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)	110	1825	92	79	757	55	40	19	109	249	61	295
Future Volume (vph)	110	1825	92	79	757	55	40	19	109	249	61	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3553		1789	3579	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.35	1.00		0.06	1.00	1.00	0.72	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	654	3553		116	3579	1601	1351	1883	1601	1403	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	1825	92	79	757	55	40	19	109	249	61	295
RTOR Reduction (vph)	0	3	0	0	0	13	0	0	26	0	0	216
Lane Group Flow (vph)	110	1914	0	79	757	42	40	19	83	249	61	79
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	99.1	99.1		99.1	99.1	99.1	26.9	26.9	26.9	26.9	26.9	26.9
Effective Green, g (s)	99.1	99.1		99.1	99.1	99.1	26.9	26.9	26.9	26.9	26.9	26.9
Actuated g/C Ratio	0.71	0.71		0.71	0.71	0.71	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
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
Lane Grp Cap (vph)	462	2515		82	2533	1133	259	361	307	269	361	307
v/s Ratio Prot		0.54			0.21			0.01			0.03	
v/s Ratio Perm	0.17			c0.68		0.03	0.03		0.05	c0.18		0.05
v/c Ratio	0.24	0.76		0.96	0.30	0.04	0.15	0.05	0.27	0.93	0.17	0.26
Uniform Delay, d1	7.2	13.0		18.8	7.6	6.1	47.1	46.2	48.2	55.6	47.2	48.1
Progression Factor	1.33	1.01		1.82	1.35	1.59	0.79	0.78	0.78	1.06	1.07	1.40
Incremental Delay, d2	0.7	1.3		79.5	0.2	0.0	0.3	0.1	0.5	35.3	0.2	0.4
Delay (s)	10.3	14.4		113.7	10.5	9.8	37.7	36.1	37.8	94.4	50.7	67.6
Level of Service	B	B		F	B	A	D	D	D	F	D	E
Approach Delay (s)		14.2			19.6			37.6			77.0	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	99.7%	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 (vph)	482	520	1283	298	207	507	433	1671	84	214	1450	213
Future Volume (vph)	482	520	1283	298	207	507	433	1671	84	214	1450	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	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)	1789	3579	1601	1825	3579	1633	3471	5245	1633	3541	5245	1601
Flt Permitted	0.58	1.00	1.00	0.22	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1086	3579	1601	419	3579	1633	3471	5245	1633	3541	5245	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	482	520	1283	298	207	507	433	1671	84	214	1450	213
RTOR Reduction (vph)	0	0	0	0	0	44	0	0	28	0	0	34
Lane Group Flow (vph)	482	520	1283	298	207	463	433	1671	56	214	1450	179
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2	3	1	6	7
Permitted Phases	4		Free	8		8			2			6
Actuated Green, G (s)	47.8	24.8	140.0	45.2	23.5	40.4	20.5	54.6	76.3	16.9	51.0	74.0
Effective Green, g (s)	47.8	24.8	140.0	45.2	23.5	40.4	20.5	54.6	76.3	16.9	51.0	74.0
Actuated g/C Ratio	0.34	0.18	1.00	0.32	0.17	0.29	0.15	0.39	0.54	0.12	0.36	0.53
Clearance Time (s)	4.0	7.0		4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
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
Lane Grp Cap (vph)	486	633	1601	353	600	471	508	2045	889	427	1910	846
v/s Ratio Prot	c0.16	0.15		0.13	0.06	0.12	0.12	0.32	0.01	0.06	0.28	0.03
v/s Ratio Perm	c0.18		c0.80	0.14		0.16			0.02			0.08
v/c Ratio	0.99	0.82	0.80	0.84	0.34	0.98	0.85	0.82	0.06	0.50	0.76	0.21
Uniform Delay, d1	43.3	55.5	0.0	39.2	51.5	49.5	58.3	38.2	15.0	57.6	39.1	17.5
Progression Factor	0.79	0.84	1.00	1.00	1.00	1.00	0.64	0.90	2.79	1.15	0.79	0.51
Incremental Delay, d2	31.4	5.9	3.0	16.6	0.3	36.8	4.9	1.3	0.0	0.8	2.6	0.1
Delay (s)	65.5	52.2	3.0	55.8	51.8	86.2	42.2	35.6	41.9	67.0	33.6	9.1
Level of Service	E	D	A	E	D	F	D	D	D	E	C	A
Approach Delay (s)		27.4			70.2			37.2			34.7	
Approach LOS		C			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	102.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	247	89	106	141	49	272
Future Volume (Veh/h)	247	89	106	141	49	272
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	247	89	106	141	49	272
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			155			267
pX, platoon unblocked						
vC, conflicting volume	476	106			247	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	476	106			247	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	53	91			96	
cM capacity (veh/h)	527	948			1319	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	247	89	106	141	321
Volume Left	247	0	0	0	49
Volume Right	0	89	0	141	0
cSH	527	948	1700	1700	1319
Volume to Capacity	0.47	0.09	0.06	0.08	0.04
Queue Length 95th (m)	18.8	2.4	0.0	0.0	0.9
Control Delay (s)	17.7	9.2	0.0	0.0	1.5
Lane LOS	C	A			A
Approach Delay (s)	15.4		0.0		1.5
Approach LOS	C				

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	547	1444	2998	278	184	1230
Future Volume (vph)	547	1444	2998	278	184	1230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	0.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4476	1601	3541	1570
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	4476	4476	1601	3541	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	547	1444	2998	278	184	1230
RTOR Reduction (vph)	0	0	0	51	0	0
Lane Group Flow (vph)	547	1444	2998	227	184	1230
Heavy Vehicles (%)	1%	3%	3%	2%	0%	4%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	30.6	113.6	79.0	79.0	12.4	140.0
Effective Green, g (s)	31.6	117.6	83.0	83.0	16.4	140.0
Actuated g/C Ratio	0.23	0.84	0.59	0.59	0.12	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	791	3759	2653	949	414	1570
v/s Ratio Prot	0.16	0.32	c0.67		0.05	
v/s Ratio Perm				0.14		c0.78
v/c Ratio	0.69	0.38	1.13	0.24	0.44	0.78
Uniform Delay, d1	49.7	2.6	28.5	13.5	57.6	0.0
Progression Factor	1.00	1.00	0.50	0.57	0.87	1.00
Incremental Delay, d2	2.6	0.3	60.0	0.2	0.4	3.0
Delay (s)	52.4	2.9	74.3	7.9	50.8	3.0
Level of Service	D	A	E	A	D	A
Approach Delay (s)		16.5	68.7		9.3	
Approach LOS		B	E		A	

Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	77	1551	3097	170	340	179
Future Volume (vph)	77	1551	3097	170	340	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	0.99	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3462	1457
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	77	4520	4520	1601	3462	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	77	1551	3097	170	340	179
RTOR Reduction (vph)	0	0	0	33	3	0
Lane Group Flow (vph)	77	1551	3097	137	355	161
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2			6		4
Actuated Green, G (s)	106.3	106.3	94.3	94.3	19.7	27.7
Effective Green, g (s)	106.3	106.3	94.3	94.3	19.7	27.7
Actuated g/C Ratio	0.76	0.76	0.67	0.67	0.14	0.20
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	156	3431	3044	1078	487	288
v/s Ratio Prot	0.03	0.34	c0.69		c0.10	c0.03
v/s Ratio Perm	0.35			0.09		0.08
v/c Ratio	0.49	0.45	1.02	0.13	0.73	0.56
Uniform Delay, d1	37.5	6.2	22.9	8.2	57.6	50.6
Progression Factor	1.54	0.85	0.85	1.22	0.99	0.93
Incremental Delay, d2	2.3	0.4	10.2	0.0	5.4	2.3
Delay (s)	60.1	5.7	29.6	10.0	62.6	49.4
Level of Service	E	A	C	A	E	D
Approach Delay (s)		8.2	28.6		58.5	
Approach LOS		A	C		E	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
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)	52	1715	95	104	2840	197	245	12	61	390	27	142
Future Volume (vph)	52	1715	95	104	2840	197	245	12	61	390	27	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	4.0	6.7	6.7
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
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)	1825	4476	1570	1825	4476	1633	1753	1921	1504	1787	1921	1611
Flt Permitted	0.05	1.00	1.00	0.05	1.00	1.00	0.74	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	104	4476	1570	99	4476	1633	1365	1921	1504	1243	1921	1611
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	52	1715	95	104	2840	197	245	12	61	390	27	142
RTOR Reduction (vph)	0	0	45	0	0	42	0	0	48	0	0	65
Lane Group Flow (vph)	52	1715	50	104	2840	155	245	12	13	390	27	77
Confl. Peds. (#/hr)							1		2	2		1
Heavy Vehicles (%)	0%	3%	4%	0%	3%	0%	4%	0%	7%	2%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	79.1	74.0	74.0	86.7	77.8	77.8	29.7	29.7	29.7	39.7	39.7	39.7
Effective Green, g (s)	79.1	74.0	74.0	86.7	77.8	77.8	29.7	29.7	29.7	39.7	39.7	39.7
Actuated g/C Ratio	0.56	0.53	0.53	0.62	0.56	0.56	0.21	0.21	0.21	0.28	0.28	0.28
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	4.0	6.7	6.7
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	3.0	0.2	0.2
Lane Grp Cap (vph)	121	2365	829	171	2487	907	289	407	319	375	544	456
v/s Ratio Prot	0.02	0.38		c0.04	c0.63			0.01		c0.04	0.01	
v/s Ratio Perm	0.23		0.03	0.34		0.10	0.18		0.01	c0.25		0.05
v/c Ratio	0.43	0.73	0.06	0.61	1.14	0.17	0.85	0.03	0.04	1.04	0.05	0.17
Uniform Delay, d1	31.6	25.2	16.1	24.1	31.1	15.3	53.0	43.7	43.8	50.7	36.4	37.7
Progression Factor	1.31	0.66	0.06	1.32	1.21	1.63	1.00	1.00	1.00	1.06	1.03	1.18
Incremental Delay, d2	1.6	1.8	0.1	3.1	66.7	0.2	20.4	0.0	0.1	56.1	0.0	0.1
Delay (s)	43.2	18.6	1.0	35.1	104.4	25.1	73.4	43.8	43.9	109.8	37.6	44.7
Level of Service	D	B	A	D	F	C	E	D	D	F	D	D
Approach Delay (s)		18.4			97.1			66.6			89.8	
Approach LOS		B			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	69.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
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)	48	2048	67	44	2954	140	61	5	25	340	16	125
Future Volume (vph)	48	2048	67	44	2954	140	61	5	25	340	16	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1772	4476	1601	1772	4611	1633	1789	1675		3471	1633	
Flt Permitted	0.04	1.00	1.00	0.04	1.00	1.00	0.67	1.00		0.95	1.00	
Satd. Flow (perm)	82	4476	1601	82	4611	1633	1256	1675		3471	1633	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	2048	67	44	2954	140	61	5	25	340	16	125
RTOR Reduction (vph)	0	0	23	0	0	44	0	24	0	0	112	0
Lane Group Flow (vph)	48	2048	44	44	2954	96	61	6	0	340	29	0
Heavy Vehicles (%)	3%	3%	2%	3%	0%	0%	2%	2%	0%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8					
Actuated Green, G (s)	96.4	91.0	91.0	96.4	91.0	91.0	13.3	6.2		15.4	14.5	
Effective Green, g (s)	96.4	91.0	91.0	96.4	91.0	91.0	13.3	6.2		15.4	14.5	
Actuated g/C Ratio	0.69	0.65	0.65	0.69	0.65	0.65	0.10	0.04		0.11	0.10	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	121	2909	1040	121	2997	1061	146	74		381	169	
v/s Ratio Prot	c0.02	0.46		0.01	c0.64		0.02	0.00		c0.10	0.02	
v/s Ratio Perm	0.26		0.03	0.24		0.06	c0.02					
v/c Ratio	0.40	0.70	0.04	0.36	0.99	0.09	0.42	0.08		0.89	0.17	
Uniform Delay, d1	34.7	15.8	8.8	14.2	23.9	9.1	59.4	64.2		61.5	57.3	
Progression Factor	1.89	0.95	1.00	2.61	0.97	1.29	1.00	1.00		0.99	1.07	
Incremental Delay, d2	1.4	0.9	0.0	0.2	2.6	0.0	1.9	1.0		21.5	0.5	
Delay (s)	66.9	16.0	8.9	37.2	25.7	11.8	61.3	65.2		82.5	62.0	
Level of Service	E	B	A	D	C	B	E	E		F	E	
Approach Delay (s)		16.9			25.2			62.6			76.5	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
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)	218	1647	661	292	2148	309	677	1661	207	726	2023	261
Future Volume (vph)	218	1647	661	292	2148	309	677	1661	207	726	2023	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	2.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1807	4476	1582	1755	5142	1570	3471	5092	1445	3471	5043	1601
Flt Permitted	0.09	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	238	4476	1582	154	5142	1570	3471	5092	1445	3471	5043	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	218	1647	661	292	2148	309	677	1661	207	726	2023	261
RTOR Reduction (vph)	0	0	33	0	0	63	0	0	63	0	0	68
Lane Group Flow (vph)	218	1647	628	292	2148	246	677	1661	144	726	2023	193
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	3%	2%	4%	2%	4%	2%	3%	13%	2%	4%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	51.0	44.0	62.0	59.0	48.0	48.0	18.0	44.0	44.0	19.0	45.0	45.0
Effective Green, g (s)	53.0	46.0	66.0	60.0	50.0	50.0	19.0	46.0	46.0	20.0	47.0	47.0
Actuated g/C Ratio	0.38	0.33	0.47	0.43	0.36	0.36	0.14	0.33	0.33	0.14	0.34	0.34
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	2.5	2.5	6.0	6.0	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	179	1470	745	203	1836	560	471	1673	474	495	1693	537
v/s Ratio Prot	0.07	0.37	0.12	c0.12	0.42		0.20	0.33		c0.21	c0.40	
v/s Ratio Perm	0.39		0.28	c0.49		0.16			0.10			0.12
v/c Ratio	1.22	1.12	0.84	1.44	1.17	0.44	1.44	0.99	0.30	1.47	1.19	0.36
Uniform Delay, d1	40.9	47.0	32.5	41.1	45.0	34.3	60.5	46.8	35.1	60.0	46.5	35.1
Progression Factor	1.43	1.16	0.89	1.00	1.00	1.00	1.00	1.00	1.00	0.82	0.94	0.90
Incremental Delay, d2	130.8	61.9	6.8	223.0	82.7	2.5	208.7	20.2	0.5	217.0	91.7	0.4
Delay (s)	189.1	116.4	35.7	264.1	127.7	36.8	269.2	67.1	35.5	266.3	135.4	31.8
Level of Service	F	F	D	F	F	D	F	E	D	F	F	C
Approach Delay (s)		101.6			132.0			118.3			158.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	128.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	127.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	167	325	0	914	2295	0
Future Volume (vph)	167	325	0	914	2295	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.91	0.95	
Frt	0.93	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3174	1457		4902	3444	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3174	1457		4902	3444	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	325	0	914	2295	0
RTOR Reduction (vph)	17	17	0	0	0	0
Lane Group Flow (vph)	313	145	0	914	2295	0
Heavy Vehicles (%)	10%	2%	0%	7%	6%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	17.9	17.9		110.1	110.1	
Effective Green, g (s)	17.9	17.9		110.1	110.1	
Actuated g/C Ratio	0.13	0.13		0.79	0.79	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	405	186		3855	2708	
v/s Ratio Prot	0.10			0.19	c0.67	
v/s Ratio Perm		c0.10				
v/c Ratio	0.77	0.78		0.24	0.85	
Uniform Delay, d1	59.1	59.1		3.9	9.6	
Progression Factor	1.00	1.00		0.44	1.00	
Incremental Delay, d2	9.3	19.2		0.1	3.5	
Delay (s)	68.4	78.3		1.9	13.1	
Level of Service	E	E		A	B	
Approach Delay (s)	71.7			1.9	13.1	
Approach LOS	E			A	B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	32	49	363	1047	2414	206
Future Volume (vph)	32	49	363	1047	2414	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1789	1601	3471	5142	5142	1601
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1789	1601	3471	5142	5142	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	49	363	1047	2414	206
RTOR Reduction (vph)	0	46	0	0	0	68
Lane Group Flow (vph)	32	3	363	1047	2414	138
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	8.2	8.2	20.3	117.8	93.5	93.5
Effective Green, g (s)	8.2	8.2	20.3	117.8	93.5	93.5
Actuated g/C Ratio	0.06	0.06	0.15	0.84	0.67	0.67
Clearance Time (s)	7.0	7.0	4.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	104	93	503	4326	3434	1069
v/s Ratio Prot	c0.02		c0.10	0.20	c0.47	
v/s Ratio Perm		0.00				0.09
v/c Ratio	0.31	0.03	0.72	0.24	0.70	0.13
Uniform Delay, d1	63.2	62.2	57.2	2.2	14.6	8.4
Progression Factor	1.00	1.00	1.42	0.61	1.01	1.78
Incremental Delay, d2	1.7	0.1	4.5	0.1	0.5	0.1
Delay (s)	64.9	62.3	85.5	1.5	15.1	15.2
Level of Service	E	E	F	A	B	B
Approach Delay (s)	63.3			23.1	15.1	
Approach LOS	E			C	B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.3%	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 (vph)	158	103	245	67	548	180	1438	1072	180	492	1508	463
Future Volume (vph)	158	103	245	67	548	180	1438	1072	180	492	1508	463
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	4.0	7.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	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)	1789	3579	1601	1825	3579	1633	3471	5245	1633	3541	5245	1601
Flt Permitted	0.16	1.00	1.00	0.69	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	302	3579	1601	1320	3579	1633	3471	5245	1633	3541	5245	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	158	103	245	67	548	180	1438	1072	180	492	1508	463
RTOR Reduction (vph)	0	0	0	0	0	63	0	0	97	0	0	88
Lane Group Flow (vph)	158	103	245	67	548	117	1438	1072	83	492	1508	375
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4			8	1	5	2		1	6	
Permitted Phases	4		Free	8		8			2			6
Actuated Green, G (s)	36.4	36.4	140.0	25.4	25.4	46.3	44.6	64.7	64.7	20.9	41.0	41.0
Effective Green, g (s)	36.4	36.4	140.0	25.4	25.4	46.3	44.6	64.7	64.7	20.9	41.0	41.0
Actuated g/C Ratio	0.26	0.26	1.00	0.18	0.18	0.33	0.32	0.46	0.46	0.15	0.29	0.29
Clearance Time (s)	4.0	7.0		7.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
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
Lane Grp Cap (vph)	152	930	1601	239	649	540	1105	2423	754	528	1536	468
v/s Ratio Prot	c0.05	0.03			0.15	0.03	c0.41	0.20		0.14	c0.29	
v/s Ratio Perm	c0.22		0.15	0.05		0.04			0.05			0.23
v/c Ratio	1.04	0.11	0.15	0.28	0.84	0.22	1.30	0.44	0.11	0.93	0.98	0.80
Uniform Delay, d1	48.4	39.5	0.0	49.4	55.4	33.8	47.7	25.5	21.3	58.8	49.1	45.7
Progression Factor	0.97	0.91	1.00	1.00	1.00	1.00	0.64	0.91	0.95	0.96	0.99	0.99
Incremental Delay, d2	83.6	0.1	0.2	0.6	9.8	0.2	137.7	0.2	0.1	18.6	15.7	10.0
Delay (s)	130.5	35.9	0.2	50.1	65.2	34.0	168.3	23.5	20.3	75.2	64.5	55.3
Level of Service	F	D	A	D	E	C	F	C	C	E	E	E
Approach Delay (s)		48.1			56.9			100.6			64.9	
Approach LOS		D			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	77.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	112.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1196	2216	1057	188	386	596
Future Volume (vph)	1196	2216	1057	188	386	596
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4117	1570	3541	1613
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	4476	4117	1570	3541	1613
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1196	2216	1057	188	386	596
RTOR Reduction (vph)	0	0	0	89	0	0
Lane Group Flow (vph)	1196	2216	1057	99	386	596
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	1%	3%	12%	4%	0%	0%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	55.2	105.8	46.6	46.6	20.2	140.0
Effective Green, g (s)	55.2	105.8	46.6	46.6	20.2	140.0
Actuated g/C Ratio	0.39	0.76	0.33	0.33	0.14	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	1382	3382	1370	522	510	1613
v/s Ratio Prot	c0.34	0.50	c0.26		c0.11	
v/s Ratio Perm				0.06		0.37
v/c Ratio	0.87	0.66	0.77	0.19	0.76	0.37
Uniform Delay, d1	39.0	8.3	41.9	33.2	57.5	0.0
Progression Factor	1.00	1.00	0.83	1.15	1.18	1.00
Incremental Delay, d2	5.9	1.0	4.1	0.8	5.8	0.6
Delay (s)	44.9	9.3	38.7	39.1	73.7	0.6
Level of Service	D	A	D	D	E	A
Approach Delay (s)		21.8	38.8		29.4	
Approach LOS		C	D		C	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	161	2441	1242	317	72	34
Future Volume (vph)	161	2441	1242	317	72	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	0.99	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3466	1457
Flt Permitted	0.16	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	303	4520	4520	1601	3466	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	161	2441	1242	317	72	34
RTOR Reduction (vph)	0	0	0	77	3	29
Lane Group Flow (vph)	161	2441	1242	240	72	2
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	117.9	117.9	106.1	106.1	8.1	8.1
Effective Green, g (s)	117.9	117.9	106.1	106.1	8.1	8.1
Actuated g/C Ratio	0.84	0.84	0.76	0.76	0.06	0.06
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	337	3806	3425	1213	200	84
v/s Ratio Prot	0.03	c0.54	0.27		c0.02	
v/s Ratio Perm	0.38			0.15		0.00
v/c Ratio	0.48	0.64	0.36	0.20	0.36	0.02
Uniform Delay, d1	2.7	3.8	5.7	4.8	63.5	62.2
Progression Factor	1.43	1.19	1.56	6.27	0.97	1.19
Incremental Delay, d2	0.8	0.7	0.3	0.3	1.1	0.1
Delay (s)	4.7	5.2	9.1	30.6	62.5	74.2
Level of Service	A	A	A	C	E	E
Approach Delay (s)		5.1	13.5		65.9	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
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)	147	2017	262	58	1456	363	83	33	168	76	6	20
Future Volume (vph)	147	2017	262	58	1456	363	83	33	168	76	6	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.99
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)	1807	4476	1601	1674	4117	1570	1768	1921	1517	1555	1921	1610
Flt Permitted	0.11	1.00	1.00	0.05	1.00	1.00	0.75	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	217	4476	1601	92	4117	1570	1403	1921	1517	1204	1921	1610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	147	2017	262	58	1456	363	83	33	168	76	6	20
RTOR Reduction (vph)	0	0	72	0	0	103	0	0	81	0	0	18
Lane Group Flow (vph)	147	2017	190	58	1456	260	83	33	87	76	6	2
Confl. Peds. (#/hr)	8					8	2		3	3		2
Heavy Vehicles (%)	1%	3%	2%	9%	12%	0%	3%	0%	6%	17%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	110.4	101.7	101.7	104.8	98.9	98.9	15.0	15.0	15.0	15.0	15.0	15.0
Effective Green, g (s)	110.4	101.7	101.7	104.8	98.9	98.9	15.0	15.0	15.0	15.0	15.0	15.0
Actuated g/C Ratio	0.79	0.73	0.73	0.75	0.71	0.71	0.11	0.11	0.11	0.11	0.11	0.11
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	0.2	0.2	0.2
Lane Grp Cap (vph)	269	3251	1163	135	2908	1109	150	205	162	129	205	172
v/s Ratio Prot	c0.03	c0.45		0.02	0.35			0.02			0.00	
v/s Ratio Perm	0.39		0.12	0.30		0.17	0.06		0.06	c0.06		0.00
v/c Ratio	0.55	0.62	0.16	0.43	0.50	0.23	0.55	0.16	0.54	0.59	0.03	0.01
Uniform Delay, d1	5.8	9.5	5.9	8.5	9.3	7.2	59.3	56.8	59.2	59.6	56.0	55.9
Progression Factor	3.33	0.58	0.17	1.65	1.29	3.64	1.00	1.00	1.00	0.91	0.90	1.00
Incremental Delay, d2	1.4	0.7	0.2	1.7	0.5	0.4	4.8	0.4	3.8	4.3	0.0	0.0
Delay (s)	20.6	6.2	1.2	15.8	12.6	26.7	64.1	57.2	63.0	58.7	50.6	55.9
Level of Service	C	A	A	B	B	C	E	E	E	E	D	E
Approach Delay (s)		6.6			15.4			62.7			57.7	
Approach LOS		A			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	76.6%	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 (vph)	128	2194	106	33	1826	346	88	17	84	64	2	24
Future Volume (vph)	128	2194	106	33	1826	346	88	17	84	64	2	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	4391	1633	1772	4117	1601	1722	1609		3471	1623	
Flt Permitted	0.05	1.00	1.00	0.05	1.00	1.00	0.47	1.00		0.95	1.00	
Satd. Flow (perm)	96	4391	1633	87	4117	1601	845	1609		3471	1623	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	128	2194	106	33	1826	346	88	17	84	64	2	24
RTOR Reduction (vph)	0	0	31	0	0	37	0	76	0	0	23	0
Lane Group Flow (vph)	128	2194	75	33	1826	309	88	25	0	64	3	0
Heavy Vehicles (%)	4%	5%	0%	3%	12%	2%	6%	2%	5%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8					
Actuated Green, G (s)	101.2	93.3	93.3	89.9	86.0	86.0	24.8	14.0		6.8	6.8	
Effective Green, g (s)	101.2	93.3	93.3	89.9	86.0	86.0	24.8	14.0		6.8	6.8	
Actuated g/C Ratio	0.72	0.67	0.67	0.64	0.61	0.61	0.18	0.10		0.05	0.05	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	202	2926	1088	102	2529	983	237	160		168	78	
v/s Ratio Prot	c0.05	c0.50		0.01	0.44		c0.04	0.02		0.02	0.00	
v/s Ratio Perm	0.41		0.05	0.20		0.19	c0.03					
v/c Ratio	0.63	0.75	0.07	0.32	0.72	0.31	0.37	0.16		0.38	0.04	
Uniform Delay, d1	28.8	15.6	8.2	14.5	18.7	12.9	50.0	57.6		64.6	63.5	
Progression Factor	1.27	0.86	1.59	2.14	0.72	0.91	1.00	1.00		0.73	1.27	
Incremental Delay, d2	5.4	1.5	0.1	0.9	0.9	0.4	1.0	1.0		1.4	0.2	
Delay (s)	42.0	14.9	13.1	31.8	14.3	12.2	51.0	58.6		48.8	80.6	
Level of Service	D	B	B	C	B	B	D	E		D	F	
Approach Delay (s)		16.2			14.2			55.1			58.0	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	73.9%	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 (vph)	330	1350	562	198	1321	760	621	1600	322	314	1150	169
Future Volume (vph)	330	1350	562	198	1321	760	621	1600	322	314	1150	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	1.0	3.0	4.0	1.0	3.0	4.0	1.0	3.0	4.0	1.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1630	4476	1572	1508	4683	1555	3079	4902	1512	3404	4902	1541
Flt Permitted	0.10	1.00	1.00	0.10	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	486	4476	1572	163	4683	1555	3079	4902	1512	3404	4902	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	1350	562	198	1321	760	621	1600	322	314	1150	169
RTOR Reduction (vph)	0	0	29	0	0	50	0	0	34	0	0	55
Lane Group Flow (vph)	330	1350	533	198	1321	710	621	1600	288	314	1150	114
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	3%	3%	3%	21%	12%	5%	15%	7%	8%	4%	7%	6%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	56.0	40.0	68.0	52.0	38.0	58.8	28.0	43.2	57.2	20.8	36.0	52.0
Effective Green, g (s)	58.0	43.0	74.0	54.0	41.0	64.8	29.0	46.2	63.2	21.8	39.0	58.0
Actuated g/C Ratio	0.41	0.31	0.53	0.39	0.29	0.46	0.21	0.33	0.45	0.16	0.28	0.41
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
Vehicle Extension (s)	2.5	6.0	2.5	2.5	6.0	2.5	2.5	4.0	2.5	2.5	4.0	2.5
Lane Grp Cap (vph)	340	1374	830	206	1371	719	637	1617	682	530	1365	638
v/s Ratio Prot	c0.12	c0.30	0.14	0.10	0.28	c0.17	c0.20	c0.33	0.05	0.09	0.23	0.02
v/s Ratio Perm	0.28		0.20	0.27		0.29			0.14			0.05
v/c Ratio	0.97	0.98	0.64	0.96	0.96	0.99	0.97	0.99	0.42	0.59	0.84	0.18
Uniform Delay, d1	38.9	48.1	23.5	40.3	48.8	37.2	55.1	46.7	26.0	55.0	47.6	25.9
Progression Factor	1.11	0.99	0.63	1.00	1.00	1.00	1.00	1.00	1.00	0.34	1.05	2.75
Incremental Delay, d2	34.8	17.4	1.1	51.4	17.0	30.0	29.2	19.7	0.3	0.8	2.7	0.0
Delay (s)	77.9	65.3	15.9	91.7	65.8	67.1	84.3	66.4	26.3	19.7	52.6	71.3
Level of Service	E	E	B	F	E	E	F	E	C	B	D	E
Approach Delay (s)		54.8			68.5			65.7			48.2	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	60.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	106.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	111	71	0	2343	711	0
Future Volume (vph)	111	71	0	2343	711	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.91	0.95	
Frt	0.98	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3410	1457		5142	3579	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3410	1457		5142	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	71	0	2343	711	0
RTOR Reduction (vph)	7	52	0	0	0	0
Lane Group Flow (vph)	118	5	0	2343	711	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	11.1	11.1		116.9	116.9	
Effective Green, g (s)	11.1	11.1		116.9	116.9	
Actuated g/C Ratio	0.08	0.08		0.84	0.84	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		6.0	6.0	
Lane Grp Cap (vph)	270	115		4293	2988	
v/s Ratio Prot	c0.03			c0.46	0.20	
v/s Ratio Perm		0.00				
v/c Ratio	0.44	0.04		0.55	0.24	
Uniform Delay, d1	61.5	59.5		3.5	2.4	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.2		0.4	0.2	
Delay (s)	63.0	59.7		3.9	2.6	
Level of Service	E	E		A	A	
Approach Delay (s)	62.0			3.9	2.6	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	185	326	72	2313	930	51
Future Volume (vph)	185	326	72	2313	930	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	4.0	4.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1789	1601	3471	5142	5142	1601
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1789	1601	3471	5142	5142	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	326	72	2313	930	51
RTOR Reduction (vph)	0	65	0	0	0	17
Lane Group Flow (vph)	185	261	72	2313	930	34
Turn Type	Prot	pm+ov	Prot	NA	NA	Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	19.8	28.3	8.5	106.2	93.7	93.7
Effective Green, g (s)	19.8	28.3	8.5	106.2	93.7	93.7
Actuated g/C Ratio	0.14	0.20	0.06	0.76	0.67	0.67
Clearance Time (s)	7.0	4.0	4.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	253	323	210	3900	3441	1071
v/s Ratio Prot	0.10	c0.05	0.02	c0.45	0.18	
v/s Ratio Perm		0.11				0.02
v/c Ratio	0.73	0.81	0.34	0.59	0.27	0.03
Uniform Delay, d1	57.6	53.2	63.1	7.4	9.3	7.8
Progression Factor	1.00	1.00	1.04	0.69	0.97	0.93
Incremental Delay, d2	10.4	13.7	0.6	0.4	0.2	0.1
Delay (s)	67.9	66.9	66.1	5.5	9.3	7.3
Level of Service	E	E	E	A	A	A
Approach Delay (s)	67.3			7.3	9.2	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
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)	482	520	1283	175	207	507	433	1376	68	214	850	213
Future Volume (vph)	482	520	1283	175	207	507	433	1376	68	214	850	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	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)	1789	3579	1601	1825	3579	1633	3471	5245	1633	3541	5245	1601
Flt Permitted	0.44	1.00	1.00	0.46	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	831	3579	1601	883	3579	1633	3471	5245	1633	3541	5245	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	482	520	1283	175	207	507	433	1376	68	214	850	213
RTOR Reduction (vph)	0	0	0	0	0	68	0	0	37	0	0	45
Lane Group Flow (vph)	482	520	1283	175	207	439	433	1376	31	214	850	168
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2	3	1	6	7
Permitted Phases	4		Free	8		8			2			6
Actuated Green, G (s)	47.6	29.8	140.0	27.5	13.7	39.1	22.6	49.0	62.8	25.4	51.8	81.7
Effective Green, g (s)	47.6	29.8	140.0	27.5	13.7	39.1	22.6	49.0	62.8	25.4	51.8	81.7
Actuated g/C Ratio	0.34	0.21	1.00	0.20	0.10	0.28	0.16	0.35	0.45	0.18	0.37	0.58
Clearance Time (s)	4.0	7.0		4.0	7.0	4.0	4.0	7.0	4.0	4.0	7.0	4.0
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
Lane Grp Cap (vph)	487	761	1601	266	350	456	560	1835	732	642	1940	934
v/s Ratio Prot	c0.21	0.15		0.06	0.06	c0.17	0.12	0.26	0.00	0.06	0.16	0.04
v/s Ratio Perm	0.13		c0.80	0.06		0.09			0.01			0.07
v/c Ratio	0.99	0.68	0.80	0.66	0.59	0.96	0.77	0.75	0.04	0.33	0.44	0.18
Uniform Delay, d1	42.8	50.8	0.0	50.0	60.5	49.7	56.2	40.1	21.7	49.9	33.2	13.6
Progression Factor	0.80	0.85	1.00	1.00	1.00	1.00	0.77	0.74	5.14	1.22	0.98	0.54
Incremental Delay, d2	30.6	1.7	3.0	5.8	2.7	32.6	2.9	1.2	0.0	0.3	0.7	0.1
Delay (s)	64.6	45.0	3.0	55.8	63.1	82.3	46.3	30.9	111.6	61.2	33.2	7.5
Level of Service	E	D	A	E	E	F	D	C	F	E	C	A
Approach Delay (s)		25.5			72.6			37.4			33.6	
Approach LOS		C			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	547	897	2350	278	184	1230
Future Volume (vph)	547	897	2350	278	184	1230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	0.0
Lane Util. Factor	0.97	*0.80	*0.80	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3506	4476	4476	1601	3541	1570
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3506	4476	4476	1601	3541	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	547	897	2350	278	184	1230
RTOR Reduction (vph)	0	0	0	53	0	0
Lane Group Flow (vph)	547	897	2350	225	184	1230
Heavy Vehicles (%)	1%	3%	3%	2%	0%	4%
Turn Type	Prot	NA	NA	Perm	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases				6		Free
Actuated Green, G (s)	30.5	113.6	79.1	79.1	12.4	140.0
Effective Green, g (s)	31.5	117.6	83.1	83.1	16.4	140.0
Actuated g/C Ratio	0.22	0.84	0.59	0.59	0.12	1.00
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.5	5.5	5.5	2.5	
Lane Grp Cap (vph)	788	3759	2656	950	414	1570
v/s Ratio Prot	0.16	0.20	c0.52		0.05	
v/s Ratio Perm				0.14		c0.78
v/c Ratio	0.69	0.24	0.88	0.24	0.44	0.78
Uniform Delay, d1	49.8	2.2	24.4	13.5	57.6	0.0
Progression Factor	1.00	1.00	0.74	1.12	1.01	1.00
Incremental Delay, d2	2.7	0.2	3.0	0.4	0.4	3.0
Delay (s)	52.5	2.4	21.0	15.5	58.3	3.0
Level of Service	D	A	C	B	E	A
Approach Delay (s)		21.4	20.4		10.2	
Approach LOS		C	C		B	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	77	1004	2449	170	340	179
Future Volume (vph)	77	1004	2449	170	340	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	1.00	*0.80	*0.80	1.00	0.97	0.91
Frt	1.00	1.00	1.00	0.85	0.99	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	4520	4520	1601	3462	1457
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	77	4520	4520	1601	3462	1457
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	77	1004	2449	170	340	179
RTOR Reduction (vph)	0	0	0	42	3	2
Lane Group Flow (vph)	77	1004	2449	128	355	159
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2			6		4
Actuated Green, G (s)	106.3	106.3	94.3	94.3	19.7	27.7
Effective Green, g (s)	106.3	106.3	94.3	94.3	19.7	27.7
Actuated g/C Ratio	0.76	0.76	0.67	0.67	0.14	0.20
Clearance Time (s)	4.0	7.0	7.0	7.0	7.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	156	3431	3044	1078	487	288
v/s Ratio Prot	0.03	0.22	c0.54		c0.10	c0.03
v/s Ratio Perm	0.35			0.08		0.08
v/c Ratio	0.49	0.29	0.80	0.12	0.73	0.55
Uniform Delay, d1	24.4	5.2	16.3	8.1	57.6	50.5
Progression Factor	0.74	1.14	0.85	1.47	0.98	0.96
Incremental Delay, d2	2.4	0.2	1.3	0.1	5.4	2.3
Delay (s)	20.5	6.1	15.1	12.0	61.7	50.9
Level of Service	C	A	B	B	E	D
Approach Delay (s)		7.2	14.9		58.3	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.7%	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 (vph)	52	1168	95	104	2192	197	245	12	61	390	27	142
Future Volume (vph)	52	1168	95	104	2192	197	245	12	61	390	27	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	4.0	6.7	6.7
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
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)	1825	4476	1570	1825	4476	1633	1753	1921	1504	1787	1921	1611
Flt Permitted	0.06	1.00	1.00	0.14	1.00	1.00	0.74	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	106	4476	1570	267	4476	1633	1365	1921	1504	1243	1921	1611
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	52	1168	95	104	2192	197	245	12	61	390	27	142
RTOR Reduction (vph)	0	0	46	0	0	54	0	0	48	0	0	66
Lane Group Flow (vph)	52	1168	49	104	2192	143	245	12	13	390	27	76
Confl. Peds. (#/hr)							1		2	2		1
Heavy Vehicles (%)	0%	3%	4%	0%	3%	0%	4%	0%	7%	2%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	77.4	72.3	72.3	83.8	75.5	75.5	29.7	29.7	29.7	42.0	42.0	42.0
Effective Green, g (s)	77.4	72.3	72.3	83.8	75.5	75.5	29.7	29.7	29.7	42.0	42.0	42.0
Actuated g/C Ratio	0.55	0.52	0.52	0.60	0.54	0.54	0.21	0.21	0.21	0.30	0.30	0.30
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.7	6.7	6.7	4.0	6.7	6.7
Vehicle Extension (s)	2.5	5.0	5.0	3.0	5.0	5.0	3.5	3.5	3.5	3.0	0.2	0.2
Lane Grp Cap (vph)	121	2311	810	252	2413	880	289	407	319	405	576	483
v/s Ratio Prot	0.02	0.26		c0.02	c0.49			0.01		c0.06	0.01	
v/s Ratio Perm	0.22		0.03	0.22		0.09	0.18		0.01	c0.23		0.05
v/c Ratio	0.43	0.51	0.06	0.41	0.91	0.16	0.85	0.03	0.04	0.96	0.05	0.16
Uniform Delay, d1	27.2	22.2	16.9	14.3	29.1	16.3	53.0	43.7	43.8	48.4	34.8	36.0
Progression Factor	1.46	0.61	0.09	1.45	1.14	1.80	1.00	1.00	1.00	1.13	1.10	1.38
Incremental Delay, d2	1.7	0.8	0.1	0.8	4.9	0.3	20.4	0.0	0.1	33.9	0.0	0.1
Delay (s)	41.4	14.2	1.6	21.5	38.1	29.7	73.4	43.8	43.9	88.6	38.4	49.8
Level of Service	D	B	A	C	D	C	E	D	D	F	D	D
Approach Delay (s)		14.3			36.8			66.6			76.3	
Approach LOS		B			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	37.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
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)	48	1501	67	44	2306	140	61	5	25	340	16	125
Future Volume (vph)	48	1501	67	44	2306	140	61	5	25	340	16	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1772	4476	1601	1772	4611	1633	1789	1675		3471	1633	
Flt Permitted	0.05	1.00	1.00	0.10	1.00	1.00	0.67	1.00		0.95	1.00	
Satd. Flow (perm)	86	4476	1601	184	4611	1633	1256	1675		3471	1633	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	1501	67	44	2306	140	61	5	25	340	16	125
RTOR Reduction (vph)	0	0	25	0	0	47	0	24	0	0	109	0
Lane Group Flow (vph)	48	1501	42	44	2306	93	61	6	0	340	32	0
Heavy Vehicles (%)	3%	3%	2%	3%	0%	0%	2%	2%	0%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8					
Actuated Green, G (s)	92.7	87.1	87.1	92.5	87.0	87.0	14.2	6.2		19.2	17.4	
Effective Green, g (s)	92.7	87.1	87.1	92.5	87.0	87.0	14.2	6.2		19.2	17.4	
Actuated g/C Ratio	0.66	0.62	0.62	0.66	0.62	0.62	0.10	0.04		0.14	0.12	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	124	2784	996	183	2865	1014	157	74		476	202	
v/s Ratio Prot	c0.02	0.34		0.01	c0.50		0.02	0.00		c0.10	0.02	
v/s Ratio Perm	0.24		0.03	0.15		0.06	c0.02					
v/c Ratio	0.39	0.54	0.04	0.24	0.80	0.09	0.39	0.08		0.71	0.16	
Uniform Delay, d1	21.4	15.0	10.3	10.2	20.1	10.6	58.5	64.2		57.8	54.7	
Progression Factor	2.00	0.76	1.00	1.19	0.81	1.38	1.00	1.00		0.99	1.08	
Incremental Delay, d2	1.6	0.6	0.1	0.3	1.2	0.1	1.6	1.0		4.9	0.3	
Delay (s)	44.3	12.0	10.3	12.5	17.5	14.7	60.1	65.2		62.2	59.3	
Level of Service	D	B	B	B	B	B	E	E		E	E	
Approach Delay (s)		12.9			17.3			61.8			61.4	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	77.6%	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 (vph)	218	1100	661	292	1500	309	677	1350	207	726	1300	261
Future Volume (vph)	218	1100	661	292	1500	309	677	1350	207	726	1300	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	2.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	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)	1807	4476	1586	1755	5142	1570	3471	5092	1445	3471	5043	1601
Flt Permitted	0.11	1.00	1.00	0.10	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	238	4476	1586	184	5142	1570	3471	5092	1445	3471	5043	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	218	1100	661	292	1500	309	677	1350	207	726	1300	261
RTOR Reduction (vph)	0	0	49	0	0	91	0	0	91	0	0	107
Lane Group Flow (vph)	218	1100	612	292	1500	218	677	1350	116	726	1300	154
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	3%	2%	4%	2%	4%	2%	3%	13%	2%	4%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Actuated Green, G (s)	48.1	36.1	63.1	59.0	43.0	43.0	27.0	36.0	36.0	27.0	36.0	36.0
Effective Green, g (s)	50.1	38.1	67.1	60.0	45.0	45.0	28.0	38.0	38.0	28.0	38.0	38.0
Actuated g/C Ratio	0.36	0.27	0.48	0.43	0.32	0.32	0.20	0.27	0.27	0.20	0.27	0.27
Clearance Time (s)	4.0	7.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	2.5	6.0	2.5	2.5	6.0	6.0	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	230	1218	760	302	1652	504	694	1382	392	694	1368	434
v/s Ratio Prot	0.09	0.25	0.17	c0.14	0.29		0.20	c0.27		c0.21	0.26	
v/s Ratio Perm	0.25		0.22	c0.28		0.14			0.08			0.10
v/c Ratio	0.95	0.90	0.81	0.97	0.91	0.43	0.98	0.98	0.30	1.05	0.95	0.35
Uniform Delay, d1	36.7	49.2	30.9	42.8	45.5	37.4	55.7	50.6	40.4	56.0	50.1	41.1
Progression Factor	1.23	1.16	0.71	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.05	1.21
Incremental Delay, d2	41.5	10.0	5.4	42.4	8.9	2.7	27.9	18.8	0.6	42.5	11.6	0.5
Delay (s)	86.8	67.2	27.5	85.2	54.4	40.1	83.5	69.3	41.0	93.5	64.3	50.2
Level of Service	F	E	C	F	D	D	F	E	D	F	E	D
Approach Delay (s)		56.1			56.6			71.0			71.9	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	64.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	108.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX

D

TRAFFIC MODEL COMPONENTS

APPENDIX

APPENDIX

D-1 AM PEAK HOUR COMPONENTS

APPENDIX

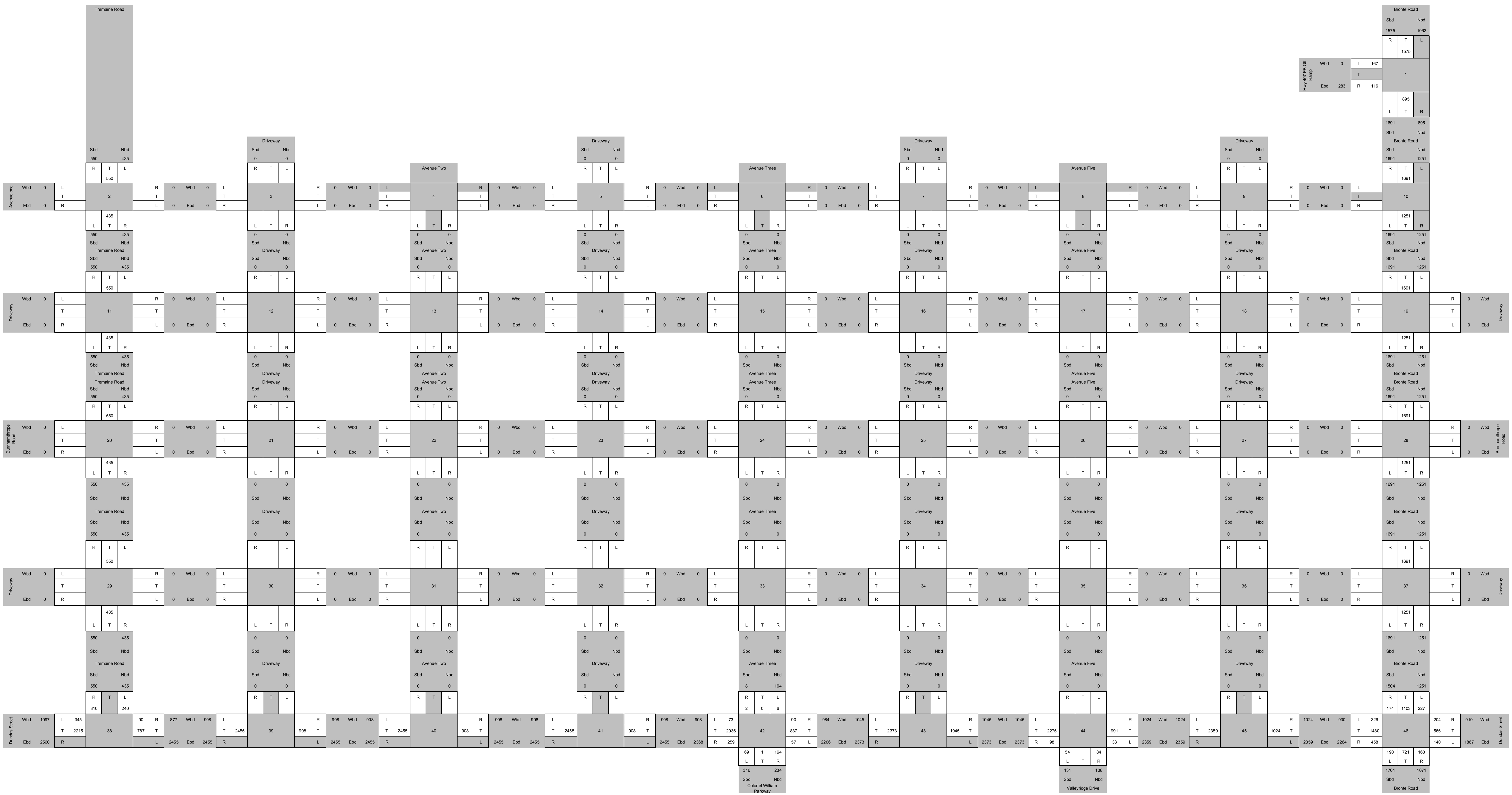


Figure X
2018 Existing Traffic Volumes - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

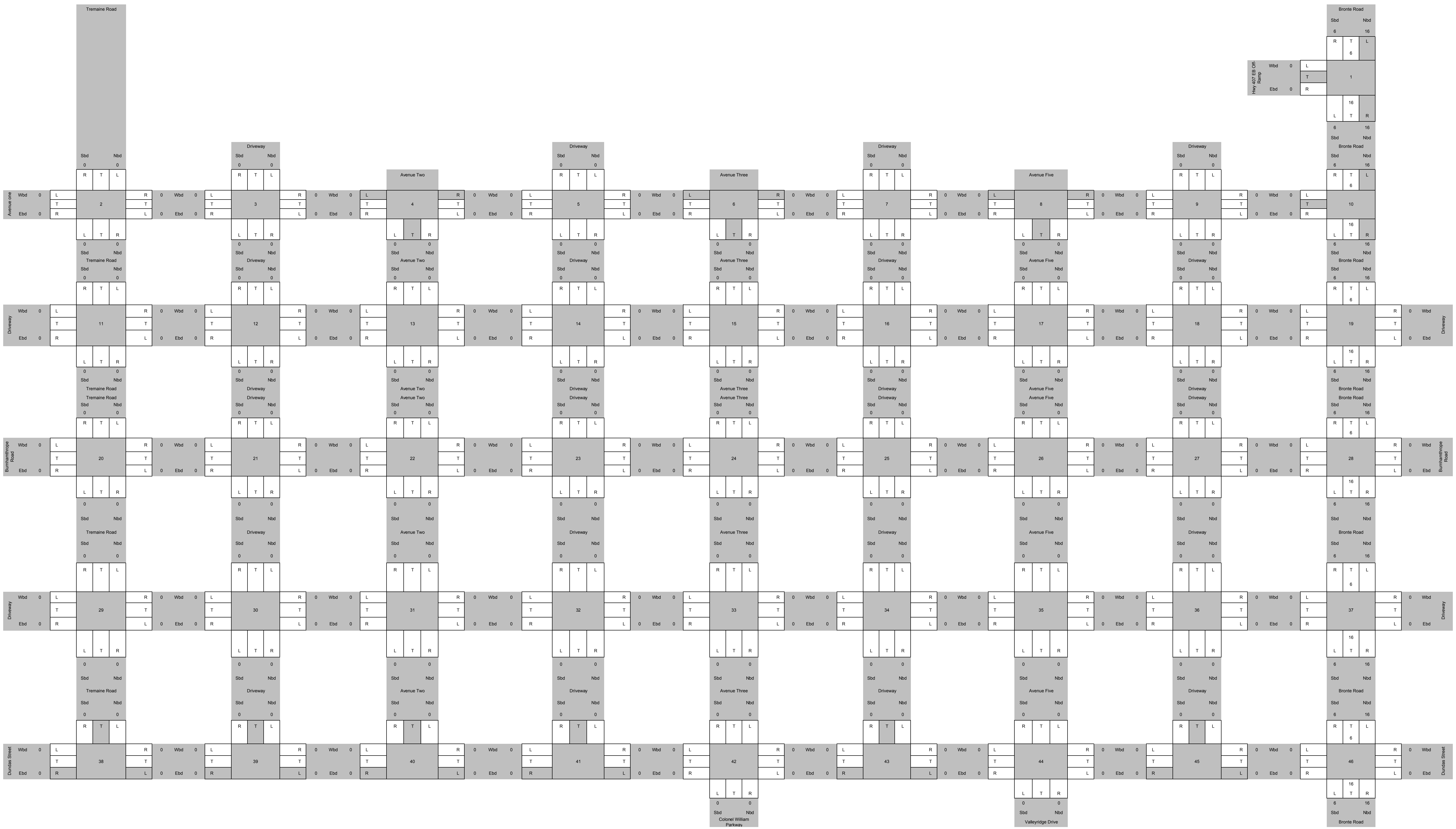


Figure X
2390 Khalsa Gate Background Development - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

16-09222_Traffic Model PM_20181207.xlsx

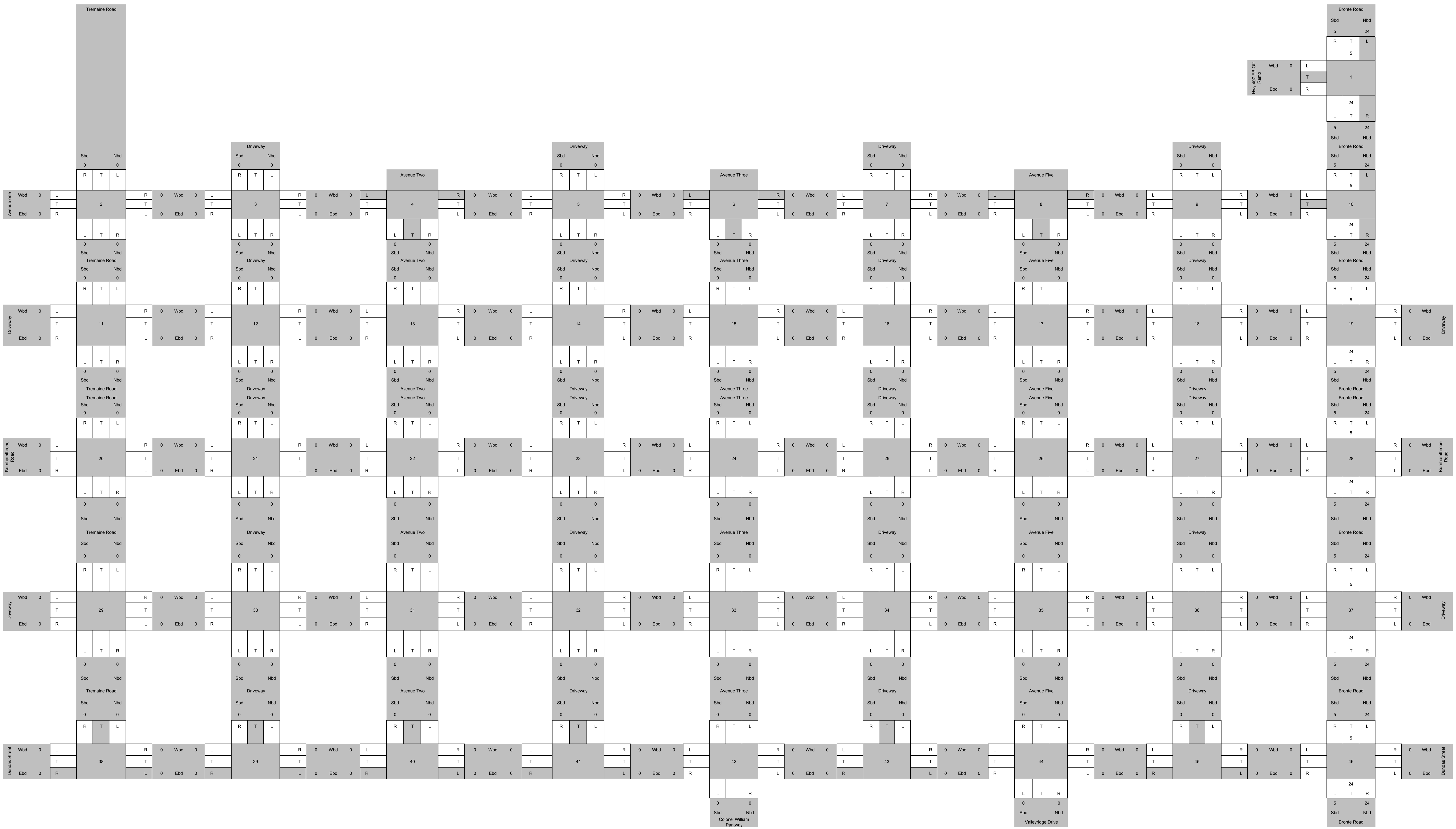


Figure X
2385 & 2389 Khalsa Gate Background Development - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207.xlsx

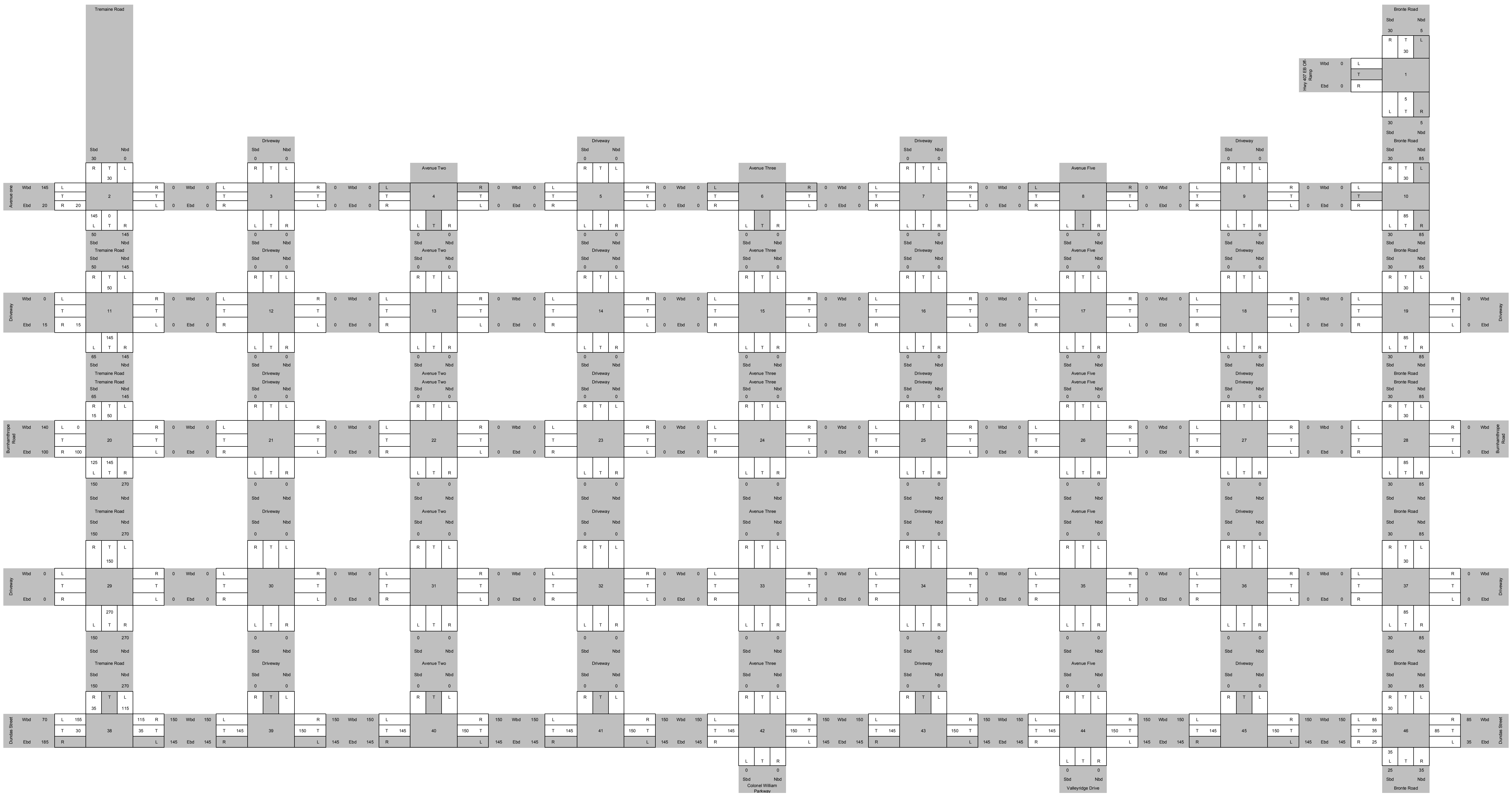


Figure X
Evergreen and Adjacent Lands Background Development - 2021 Horizon Year - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

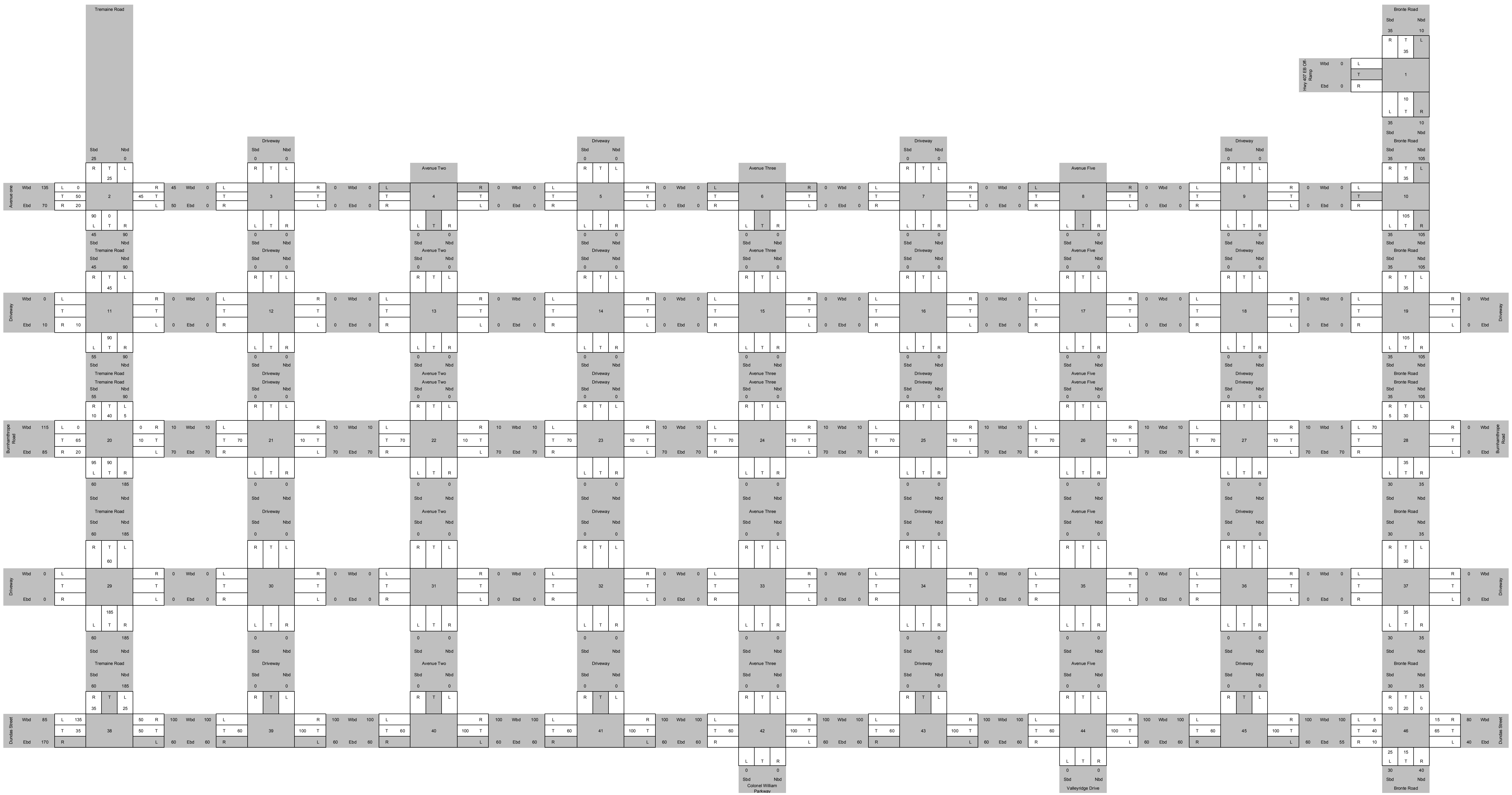


Figure X
Evergreen and Adjacent Lands Background Development - 2031 Horizon Year - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09022_Traffic Model PM_20181207.xlsx

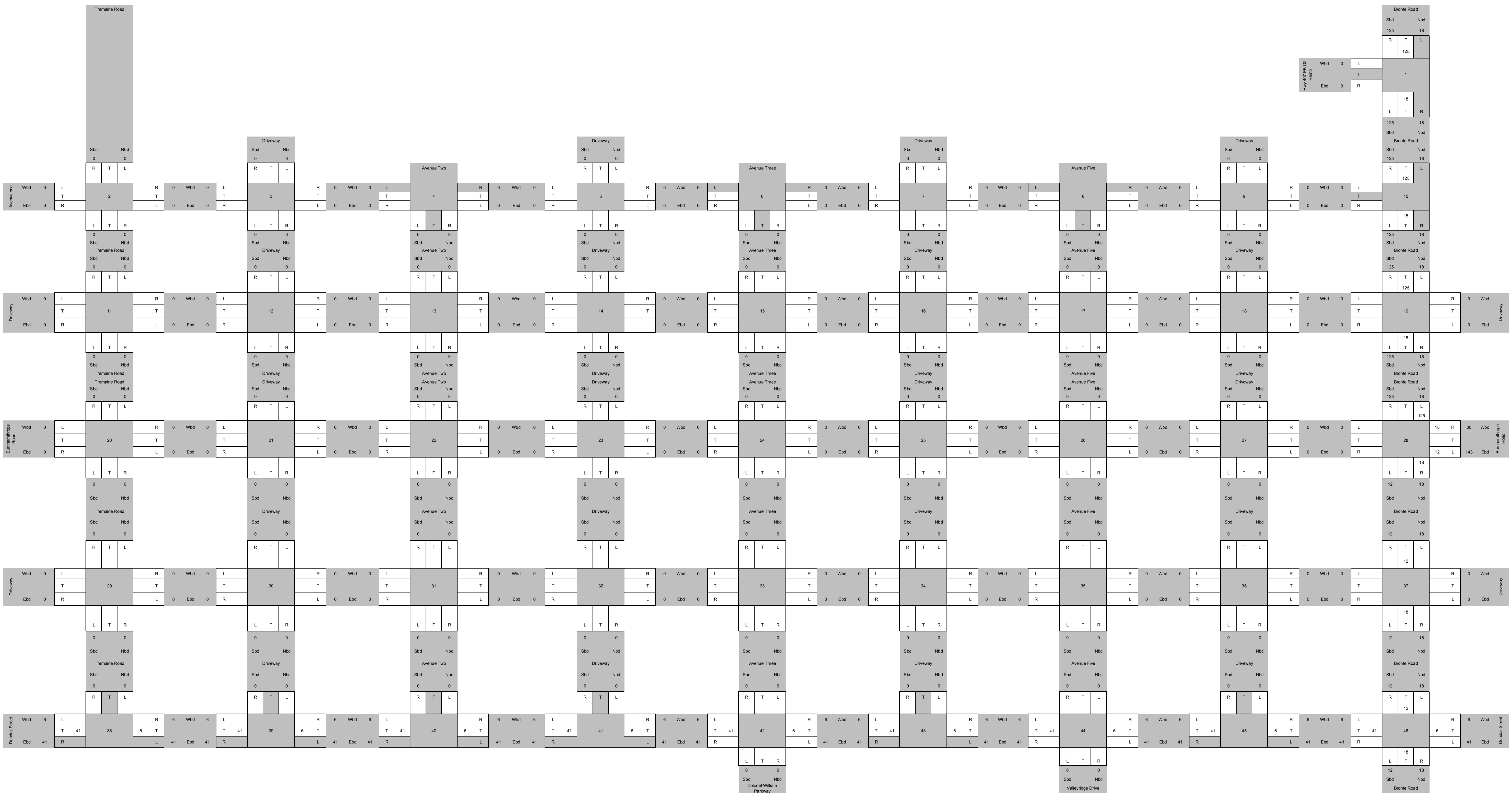
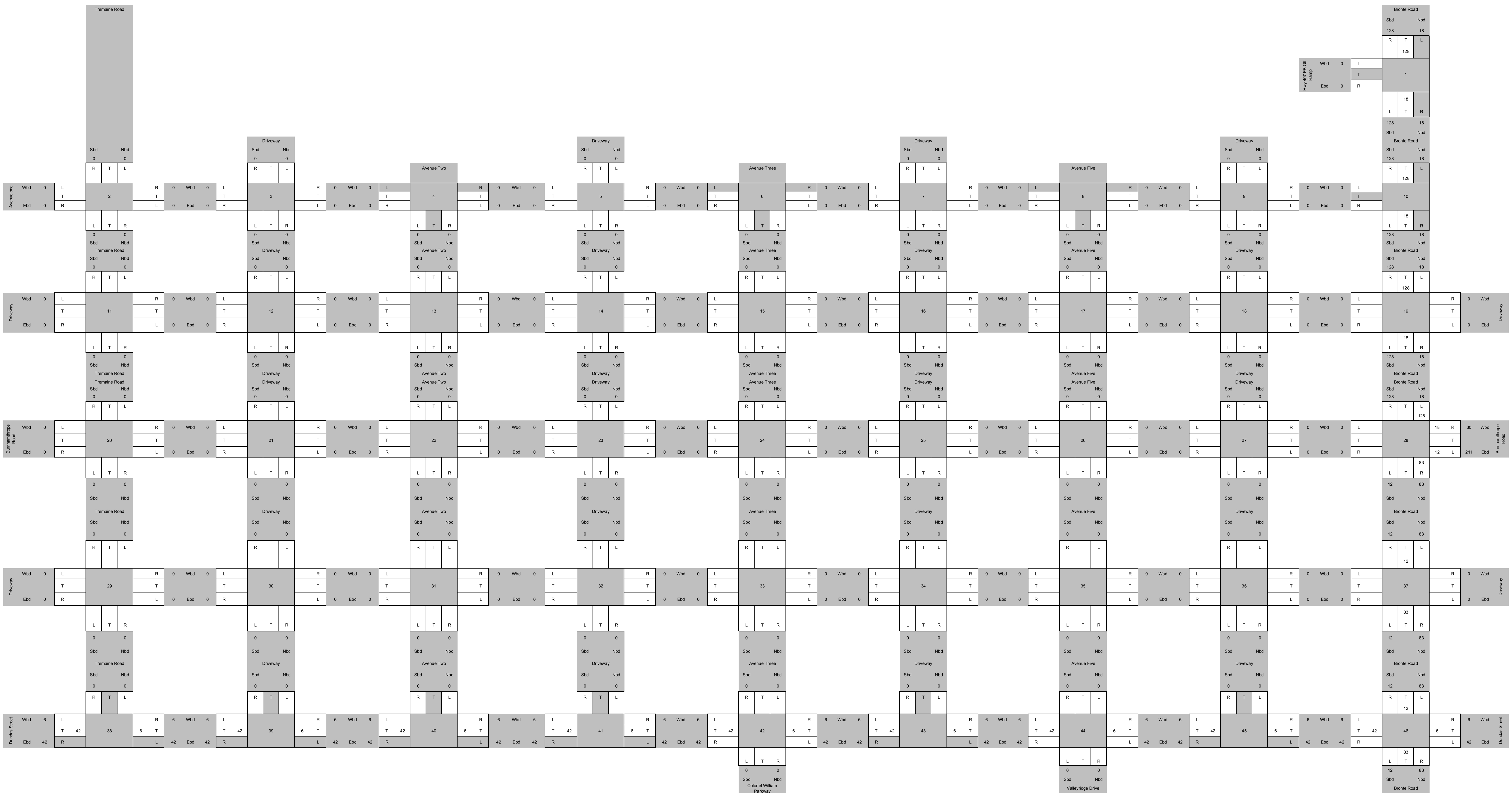


Figure X
Halton Region Courthouse Background Development 2021 Horizon Year - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20161207.xlsx



Scale: NTS

Figure X
Halton Region Courthouse Background Development 2031 Horizon Year - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00222_Traffic Model PM_20181207.xlsx

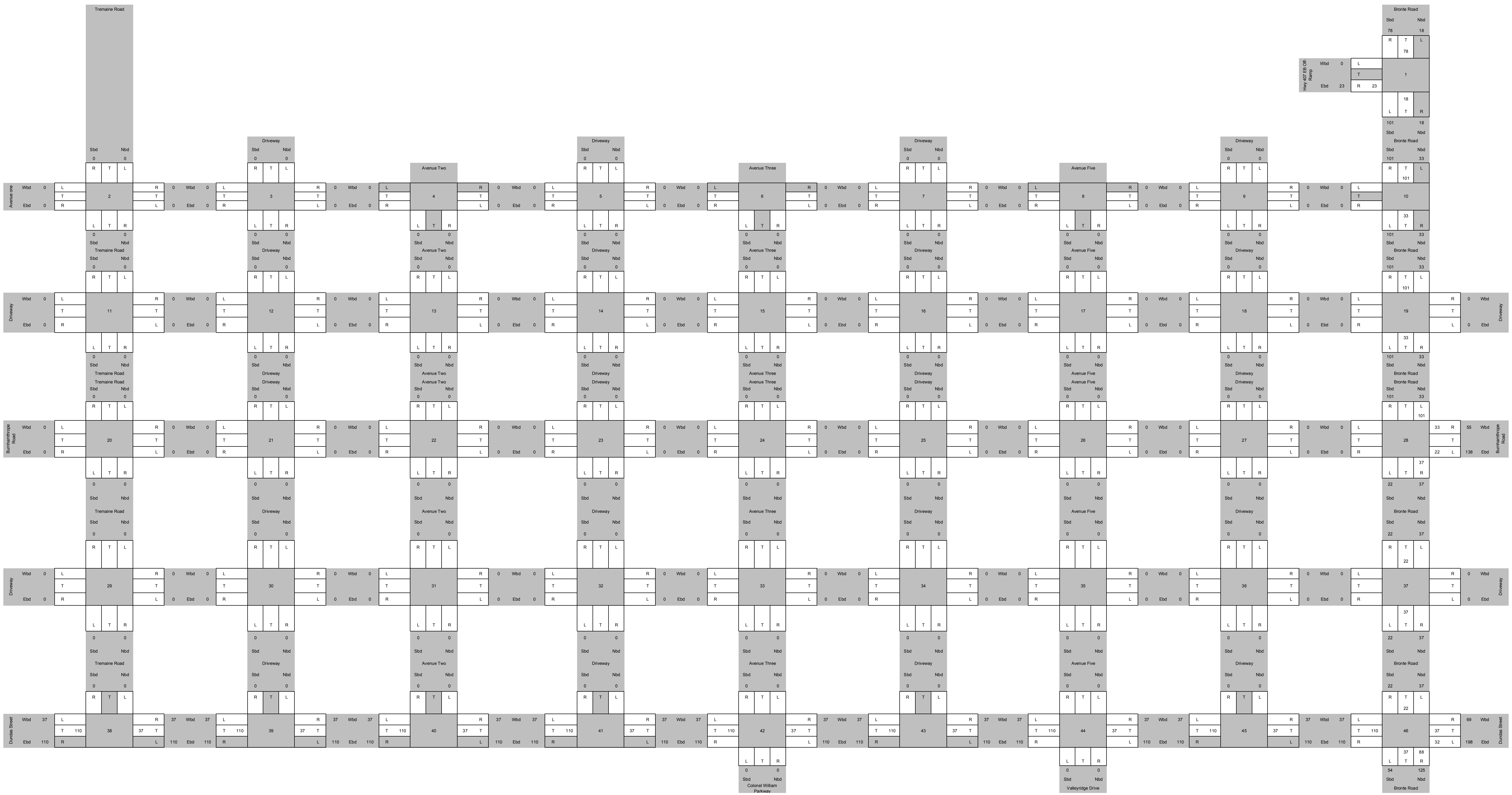
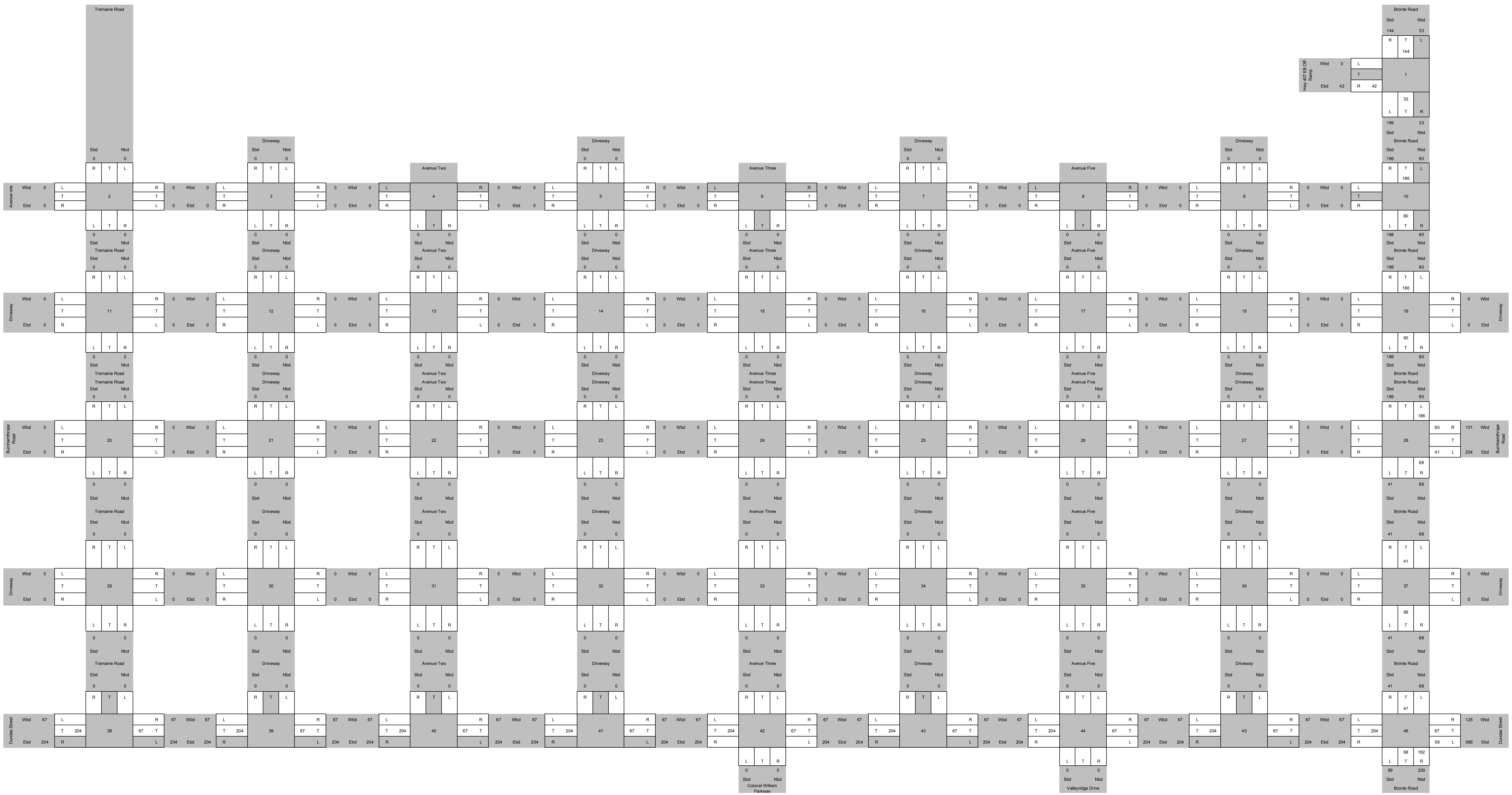


Figure X
Oakville Green Life Sciences and Technology District (ORC Parcel 1) Background Development 2021 Horizon Year - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS



Scale: NTS

Figure X
Oakville Green Life Sciences and Technology District (ORC Parcel 1) Background Development 2031 Horizon Year - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207.xlsx

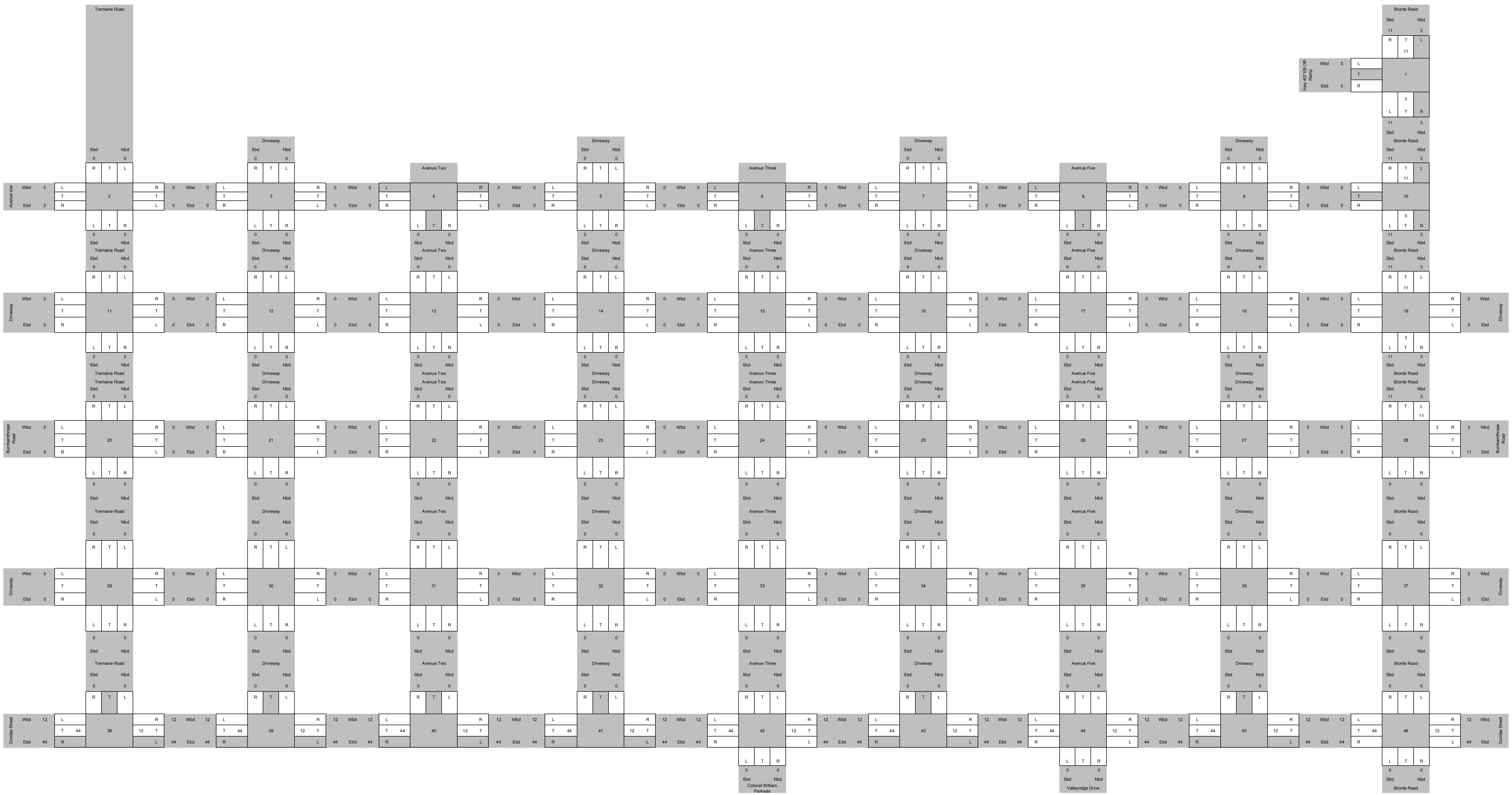


Figure X
ErinOak Kids Centre Background Development - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

14-09222_Traffic Model PM_20181207.xlsx

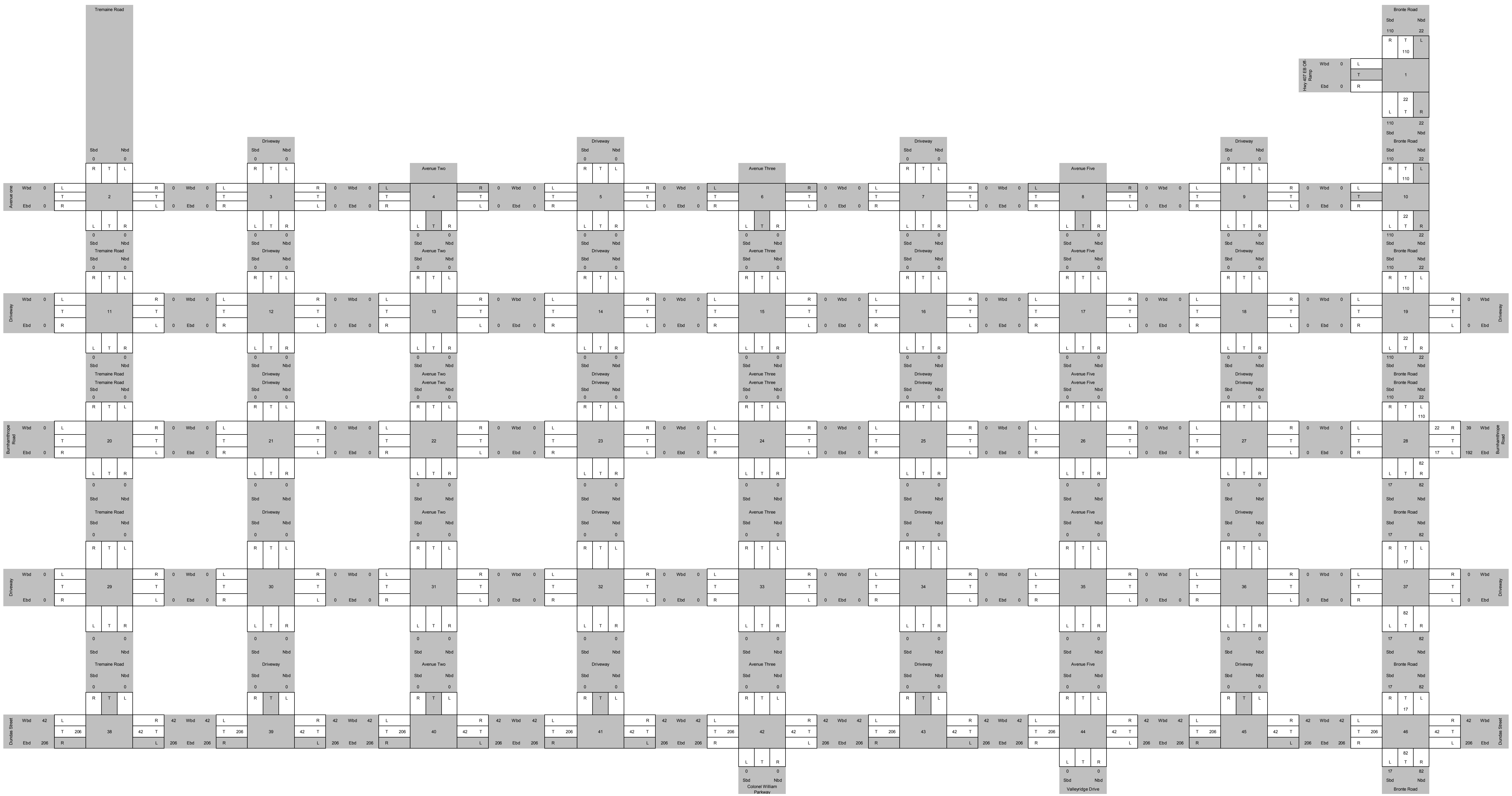


Figure X
ORC Lands Parcels 2 & 6-10 Background Development 2021 Horizon Year - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207.xlsx

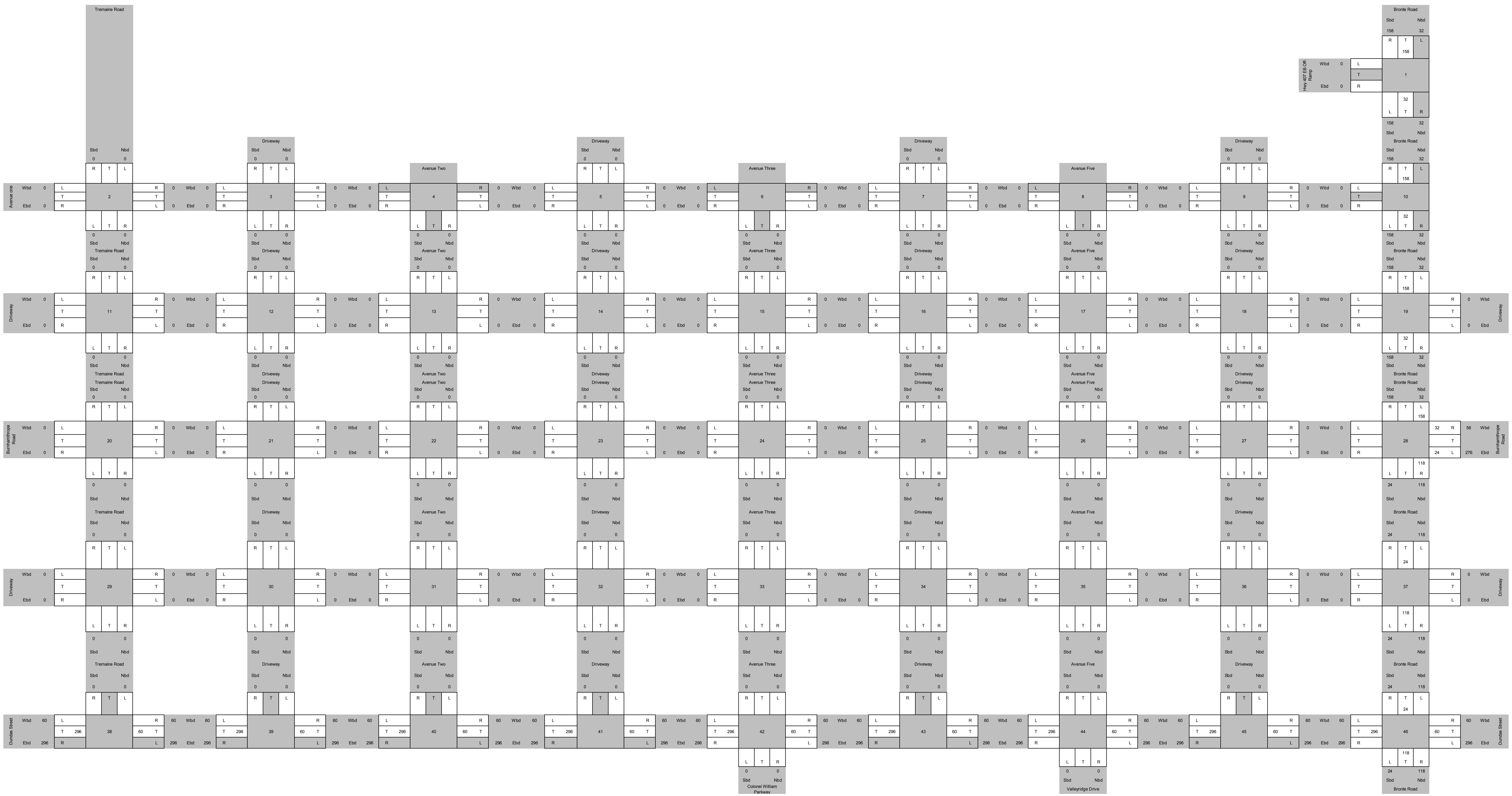


Figure X
ORC Lands Parcels 2 & 4-12 Background Development 2031 Horizon Year - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Surrounding 407 Employment Lands
Trip Gen Breakdown per group

Trip Assignment Notes:

The trip assignment for the 407 employments lands (site and surrounding 407 background developments) have been distributed along the driveways based on the Blocks layout.
The trip generation for each block is based on a percentage of the overall trip generation (per land use) for the site or surrounding background 407 lands, with the percentage of the trip generation derived based on the percentage of the block GFA compared to the overall GFA used for the trip gen.

407 Background Lands Trip Gen per block sharing a driveway (to be applied to 2031 horizon year):

Group 9	Group 10	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20	Group 21	Group 22
C3-4	C1	G2-1	G3-1	G1-1	C4-3	C6	G7	C7	C8	G8	G9	P5	P4
	P8	G2-2	C2-1	G1-2		G6			G10				
	G3	G2-3		P1					P6				

Percentage of Trip Gen for these blocks: Rounded up to match overall trip gen values

Group 9

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C3-4	Service Area Employment	Shopping Centre	23,130	8%	15	9	24	39	45	84
		Shopping Centre Pass-	23,130	8%	0	0	0	4	4	8
		Office	12,455	8%	15	2	17	2	10	12
Total Primary					**30**	**11**	**41**	**41**	**55**	**96**
Total Pass-By					**0**	**0**	**0**	**4**	**4**	**8**

Group 10

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C1	Service Area Employment	Shopping Centre	85,875	29%	54	33	87	145	165	310
		Shopping Centre Pass-	85,875	29%	0	0	0	15	15	30
		General Office	46,241	29%	55	8	63	7	40	47
P8	Light Employment	General Office	150,157	9%	133	19	152	26	120	146
G3	General Employment	Business Park	138,122	10%	133	23	156	35	100	135
Total Primary					**375**	**83**	**458**	**213**	**425**	**638**
Total Pass-By					**0**	**0**	**0**	**15**	**15**	**30**

Group 11

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G2-1	General Employment	Business Park	163,956	12%	157	29	186	41	119	160
G2-2	General Employment	Business Park	123,656	9%	119	22	141	31	90	121
G2-3	General Employment	Business Park	121,934	9%	117	20	137	31	87	118
Total					**393**	**71**	**464**	**103**	**296**	**399**

Group 12

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C2-1	Light Employment	General	33,906	2%	30	4	34	6	27	33
G3-1	General Employment	Business Park	57,867	4%	56	9	65	15	41	56
Total					**86**	**13**	**99**	**21**	**68**	**89**

Group 13 **For Phase 2 - Broken Down Within the Excel Sheets as 13-1 (Block G1-1 & G1-2) and 13-2 (Block P1) as Block P1 would be across the river crossin**

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
P1	Light Employment	General	146,389	8%	131	18	149	26	118	144
G1-1	General Employment	Business Park	181,178	13%	174	30	204	46	130	176
G1-2	General Employment	Business Park	118,145	8%	114	20	134	30	86	116
Total					**419**	**68**	**487**	**102**	**334**	**436**

Group 14

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C4-3	Service Area Employment	Shopping	41,475	14%	26	16	42	70	80	150
		Shopping Centre Pass-	41,475	14%	0	0	0	7	7	14
		General	22,333	14%	27	3	30	4	19	23
Total Primary					**53**	**19**	**72**	**74**	**99**	**173**
Total Pass-By					**0**	**0**	**0**	**7**	**7**	**14**

Group 15

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C6	Service Area Employment	Shopping	77,368	26%	49	30	79	130	150	280
		Shopping Centre Pass	77,368	26%	0	0	0	13	13	26
		General	41,660	26%	49	7	56	7	35	42
G6	General Employment	Business Park	147,767	11%	142	26	168	38	107	145
Total					**240**	**63**	**303**	**175**	**292**	**467**
Total Pass-By					**0**	**0**	**0**	**13**	**13**	**26**

Group 16

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G7	General Employment	Business Park	115,045	8%	110	19	129	29	83	112
Total					**110**	**19**	**129**	**29**	**83**	**112**

Group 17

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C7	Service Area Employment	Shopping	8,242	3%	5	3	8	14	16	30
		Shopping Centre Pass	8,242	3%	0	0	0	1	1	2
		General	4,438	3%	5	1	6	1	4	5
Total					**10**	**4**	**14**	**15**	**20**	**35**
Total Pass-By					**0**	**0**	**0**	**1**	**1**	**2**

Group 18

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C8	Service Area Employment	Shopping	57,959	20%	36	23	59	98	111	209
		Shopping Centre Pass	57,959	20%	0	0	0	10	10	20
		General	31,029	20%	37	5	42	5	27	32
P6	Light Employment	General	208,282	12%	186	25	211	37	167	204
G10	General Employment	Business Park	117,800	8%	113	19	132	30	84	114
Total Primary					**372**	**72**	**444**	**170**	**389**	**559**
Total Pass-By					**0**	**0**	**0**	**10**	**10**	**20**

Group 19

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G8	General Employment	Business Park	127,445	9%	122	22	144	32	92	124
Total					**122**	**22**	**144**	**32**	**92**	**124**

Group 20

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G9	Light Employment	General	393,421	22%	351	48	399	69	317	386
Total					**351**	**48**	**399**	**69**	**317**	**386**

Group 21

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
P5	Light Employment	General	209,358	12%	186	25	211	37	167	204
Total					**186**	**25**	**211**	**37**	**167**	**204**

Group 22

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
P4	Light Employment	General	626,460	35%	558	76	634	110	502	612
Total					**558**	**76**	**634**	**110**	**502**	**612**

Overall Background 407 Lands

	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
	IN	OUT	Total	IN	OUT	Total
Total Primary	**3305**	**594**	**3899**	**1191**	**3139**	**4330**
Total Pass-By	**0**	**0**	**0**	**50**	**50**	**100**

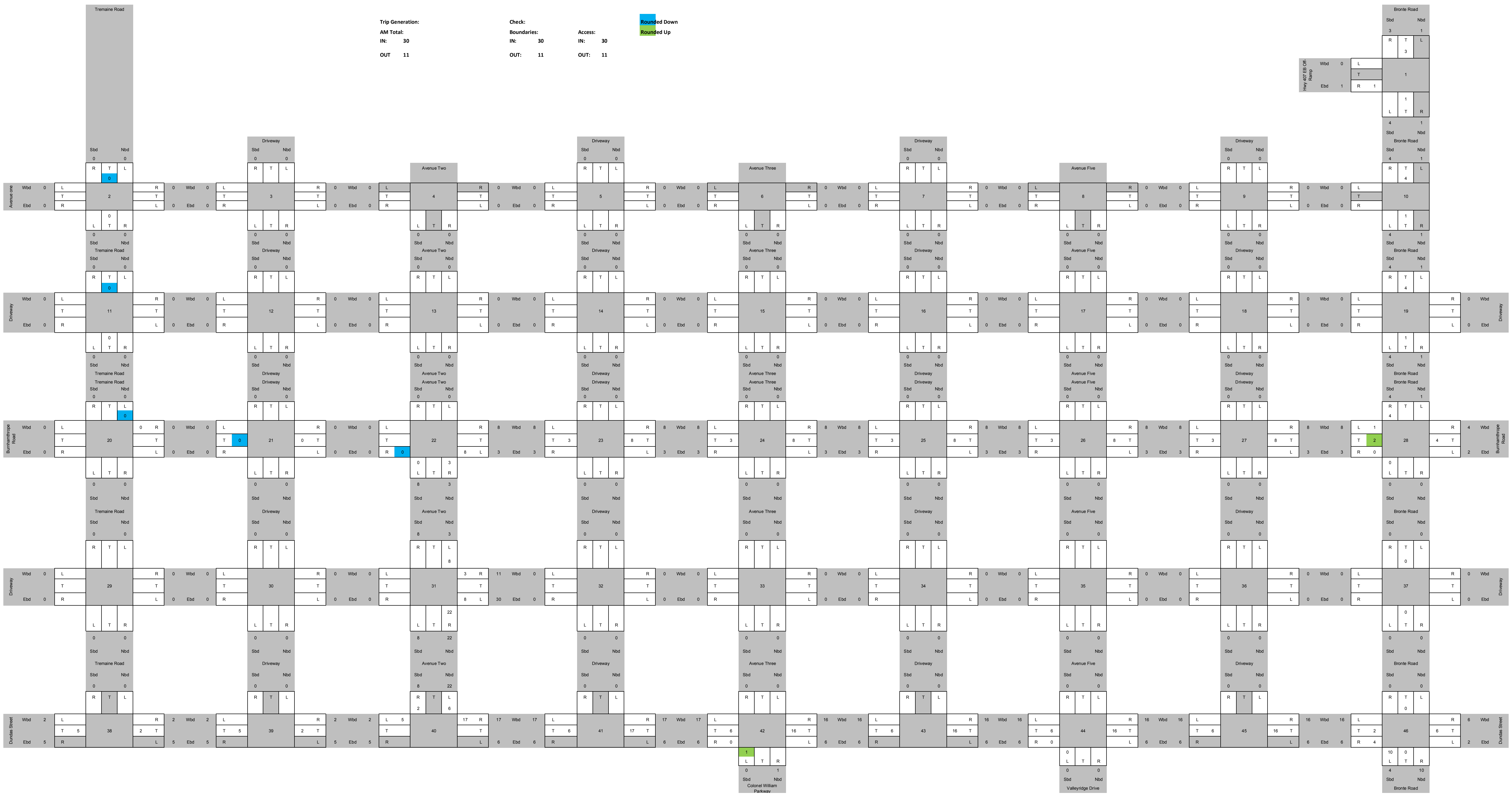


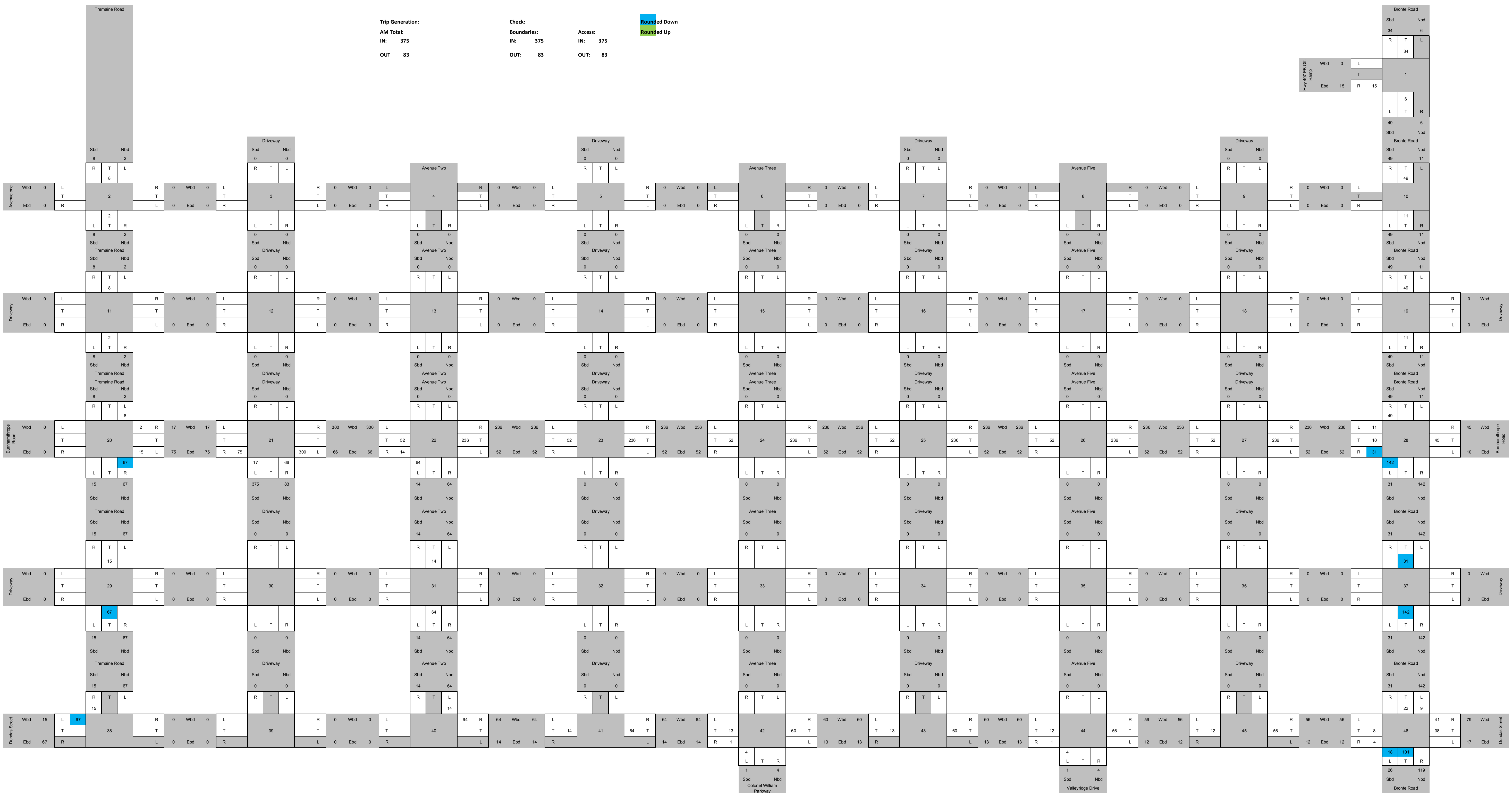
Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 9 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
AM Total:
IN: 375
OUT 83

Check:
Boundaries:
IN: 375
OUT: 83

Access:
IN: 375
OUT: 83

Rounded Down
Rounded Up



Scale: NTS

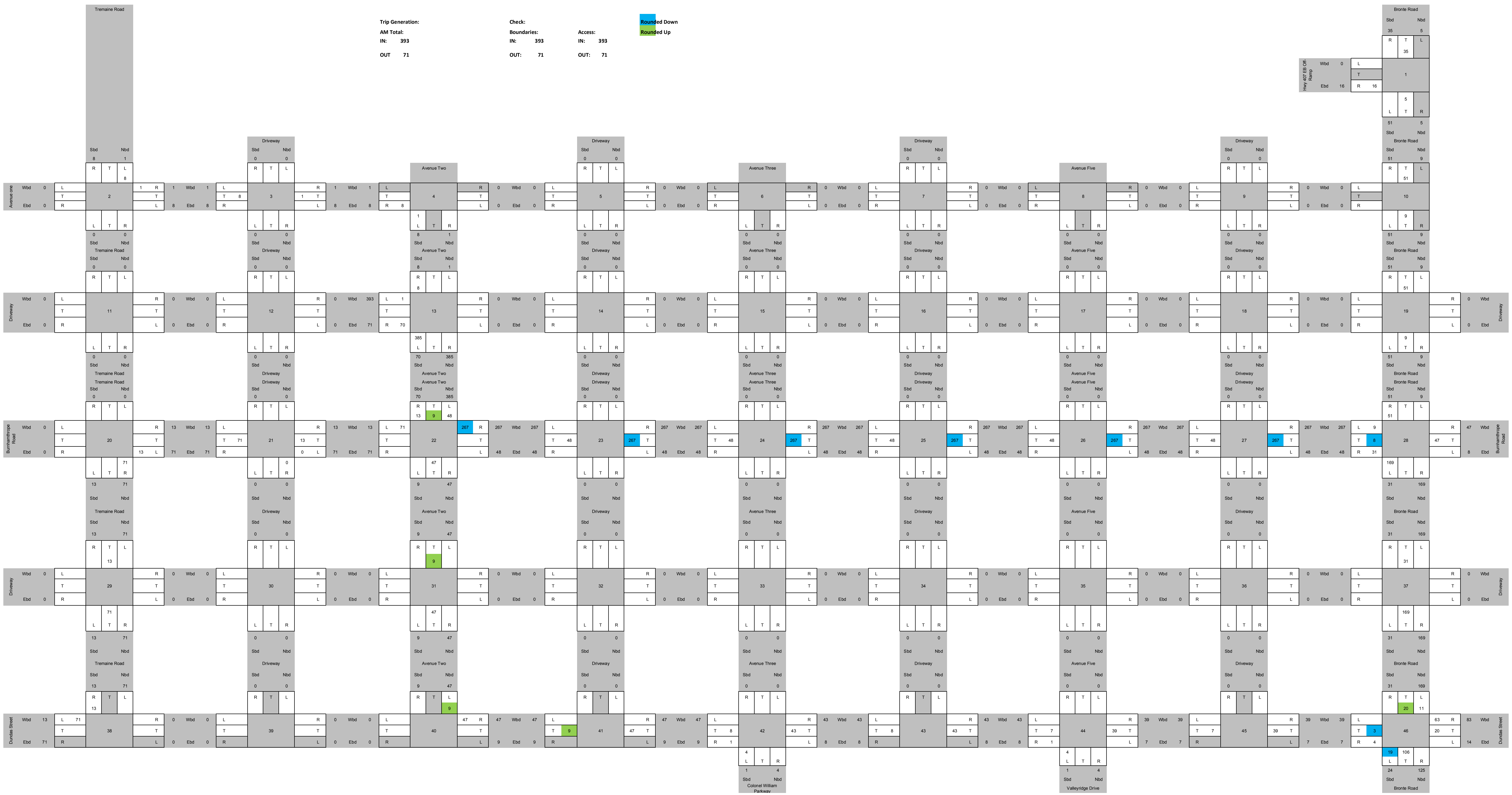
Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 10 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
AM Total:
IN: 393
OUT 71

Check:
Boundaries:
IN: 393
OUT: 71

Access:
IN: 393
OUT: 71

Rounded Down
Rounded Up



Scale: NTS

Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 11 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

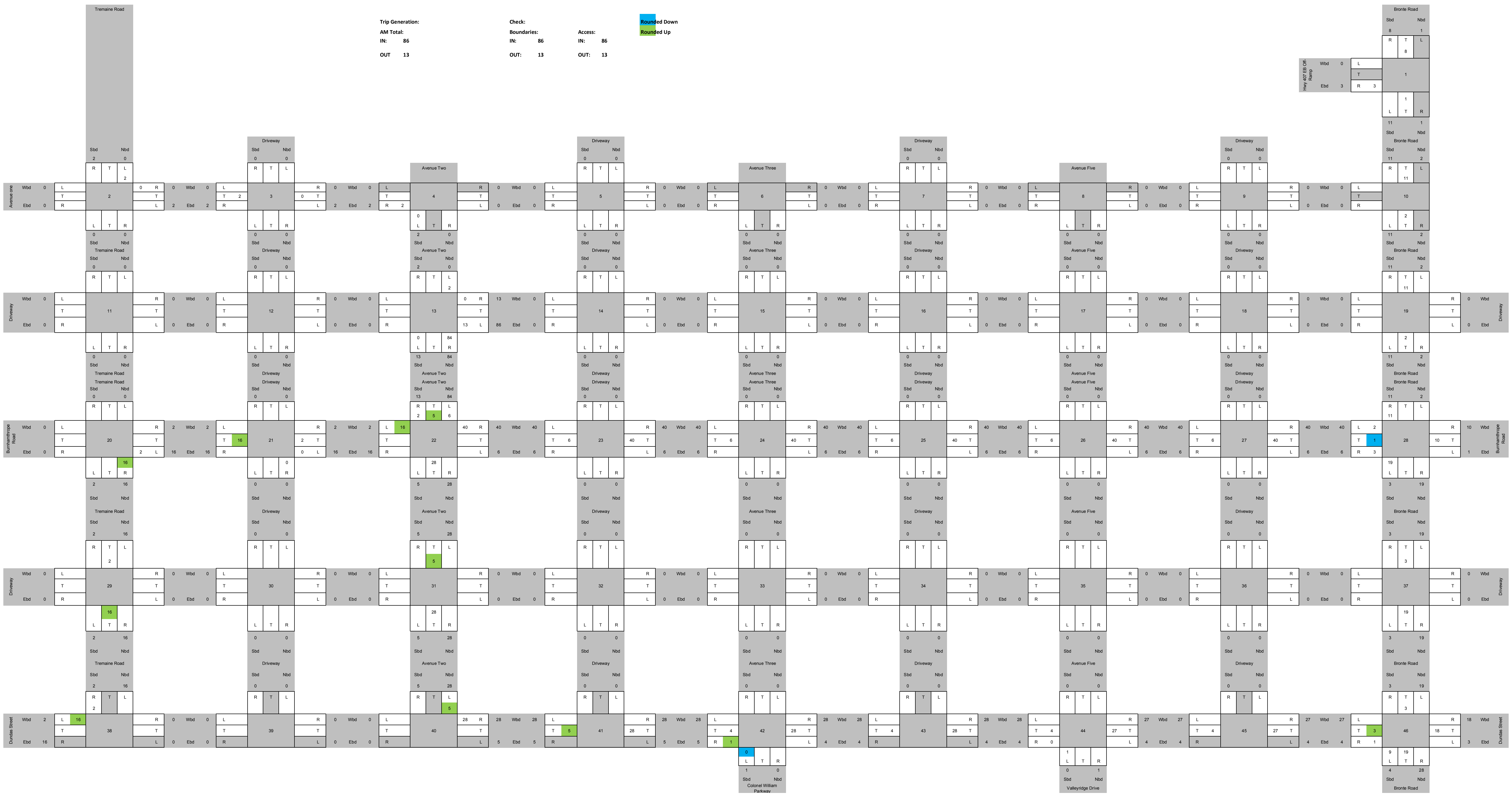
14-00022_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 86
OUT 13

Check:
Boundaries:
IN: 86
OUT: 13

Access:
IN: 86
OUT: 13

Rounded Down
Rounded Up



Scale: NTS

Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 12 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

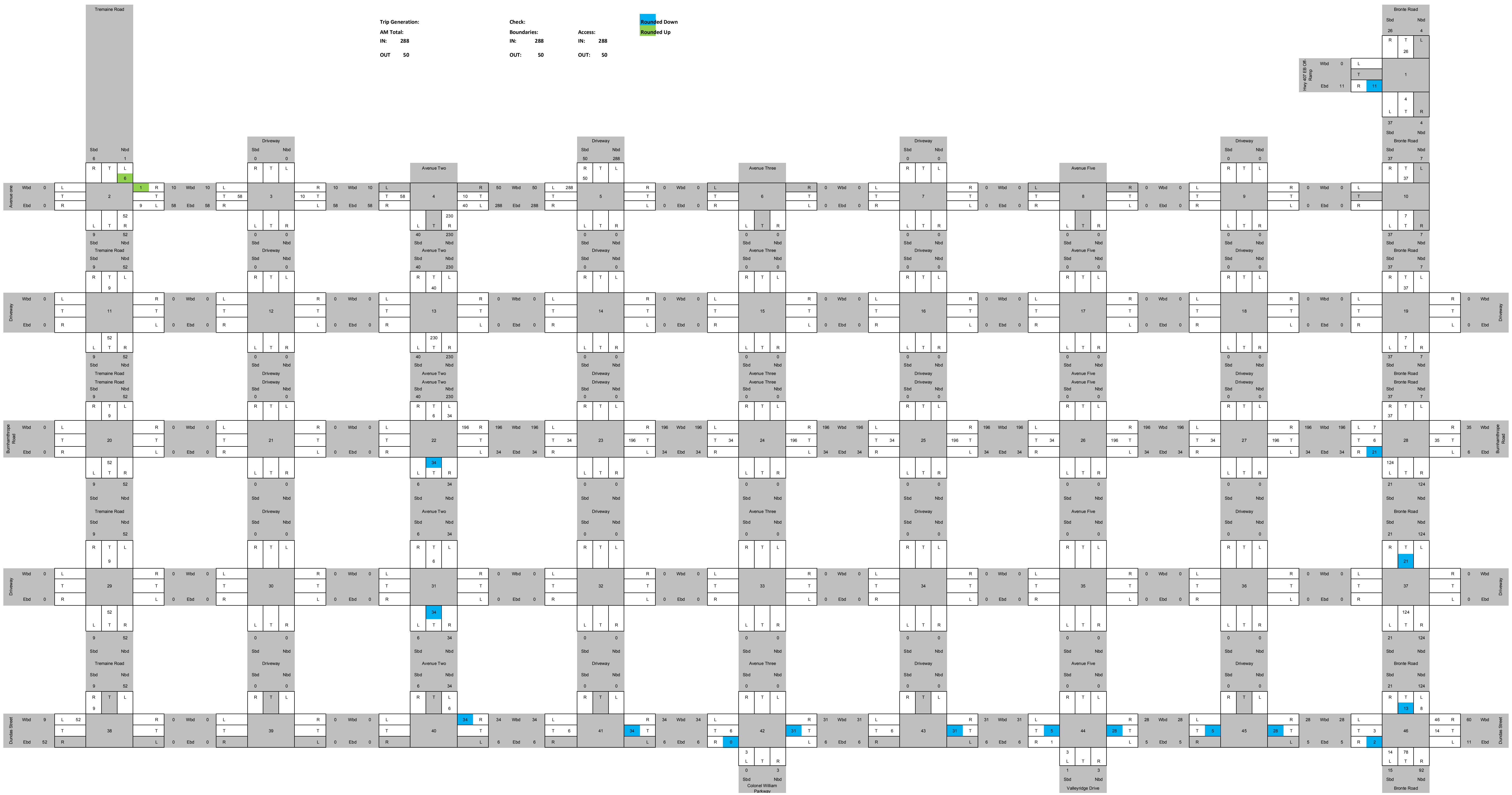
14-09222_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 288
OUT 50

Check:
Boundaries:
IN: 288
OUT: 50

Access:
IN: 288
OUT: 50

Rounded Down
Rounded Up



Scale: NTS

Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 13-1 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00022_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 131
OUT 18

Check:
Boundaries:
IN: 131
OUT: 18

Access:
IN: 131
OUT: 18

Rounded Down
Rounded Up

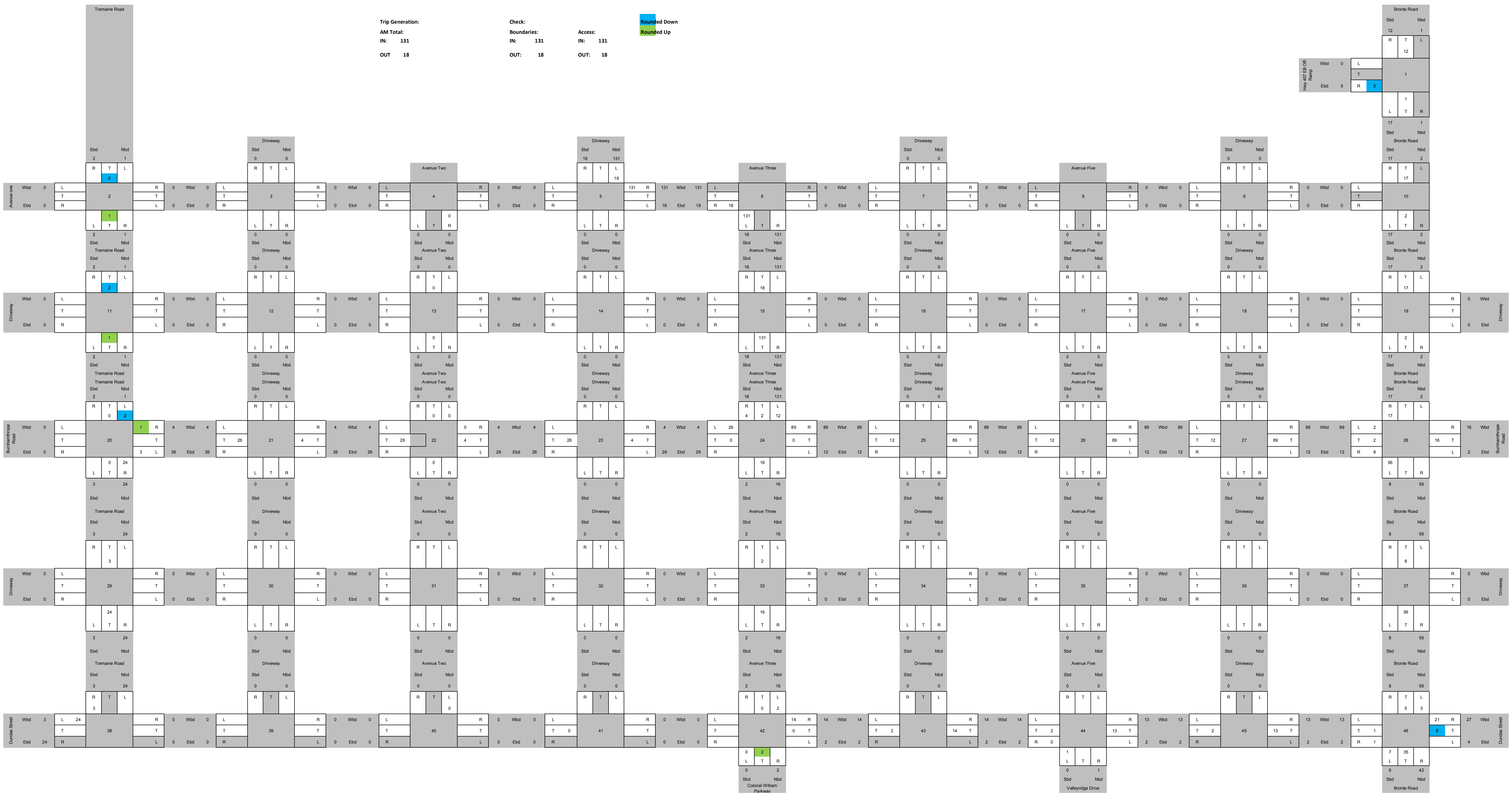


Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 13-2 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00022_Traffic Model AM_20181207.xlsx

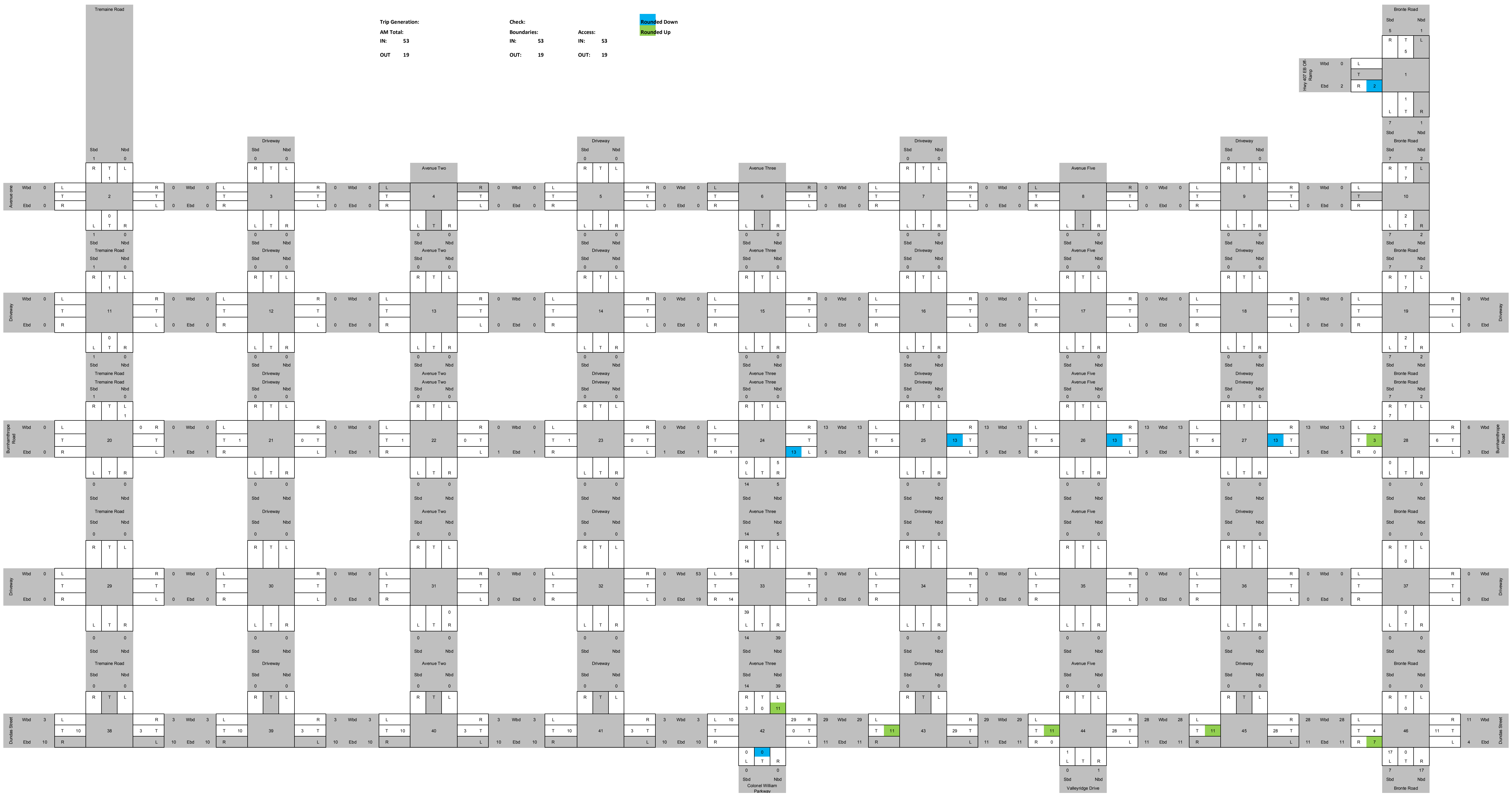


Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 14 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00022_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 240
OUT 63

Check:
Boundaries:
IN: 240
OUT: 63

Access:
IN: 240
OUT: 63

Rounded Down
Rounded Up

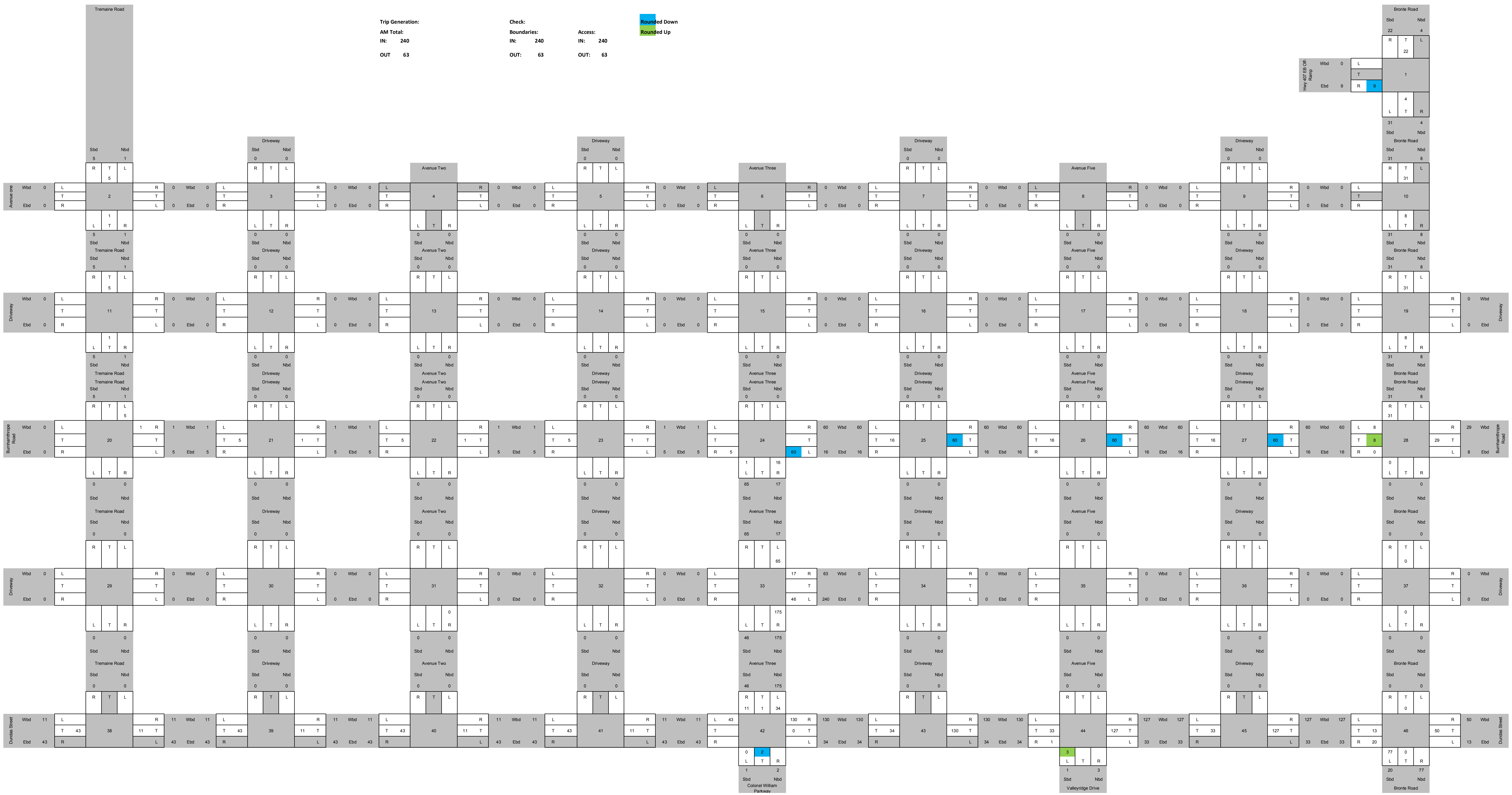


Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 15 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

wsp

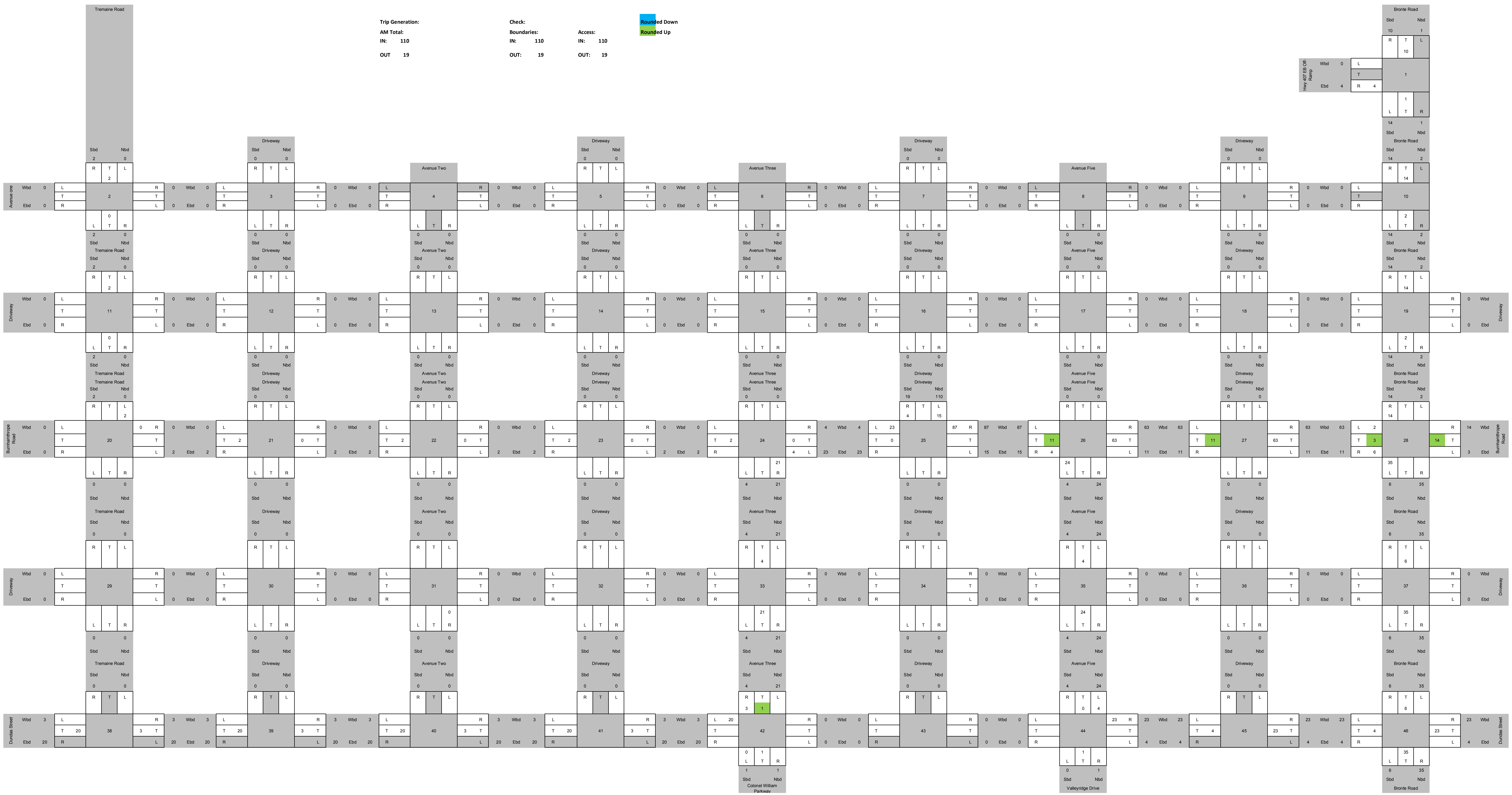


Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 16 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09022_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 10
OUT 4

Check:
Boundaries:
IN: 10
OUT: 4

Access:
IN: 10
OUT: 4

Rounded Down
Rounded Up

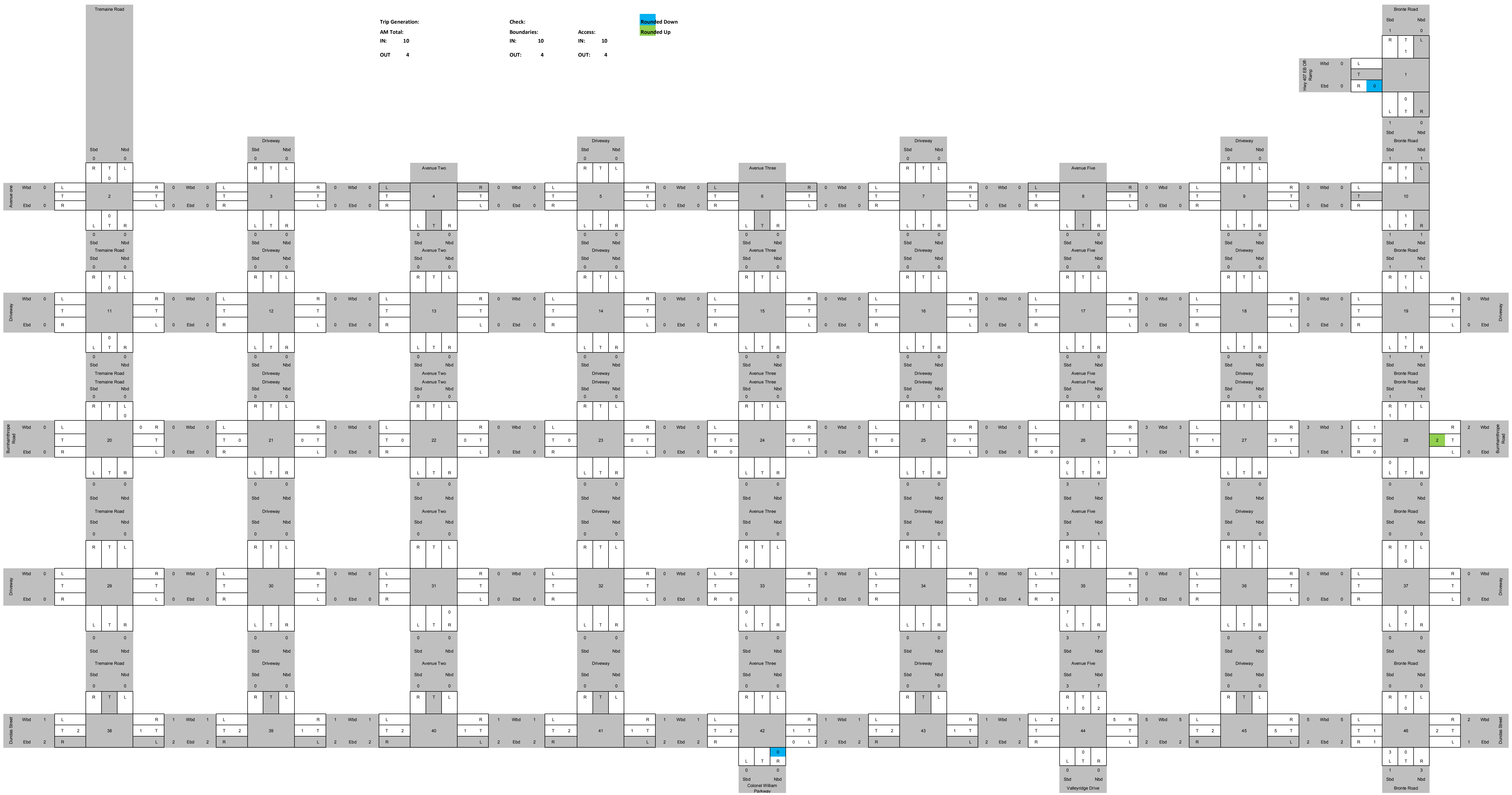


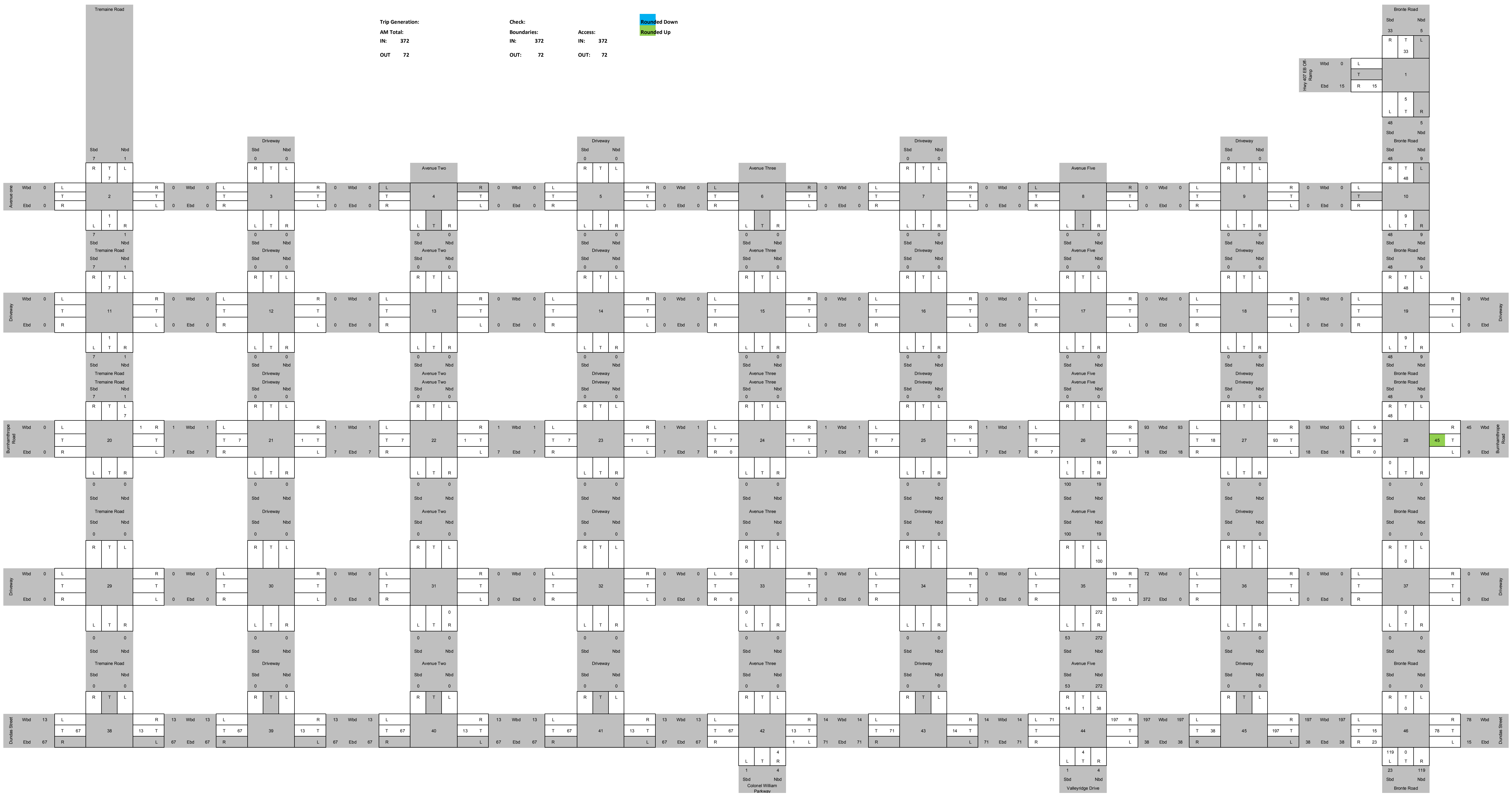
Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 17 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
AM Total:
IN: 372
OUT 72

Check:
Boundaries:
IN: 372
OUT: 72

Access:
IN: 372
OUT: 72

Rounded Down
Rounded Up



Scale: NTS

Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 18 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09022_Traffic Model AM_20181207.xlsx

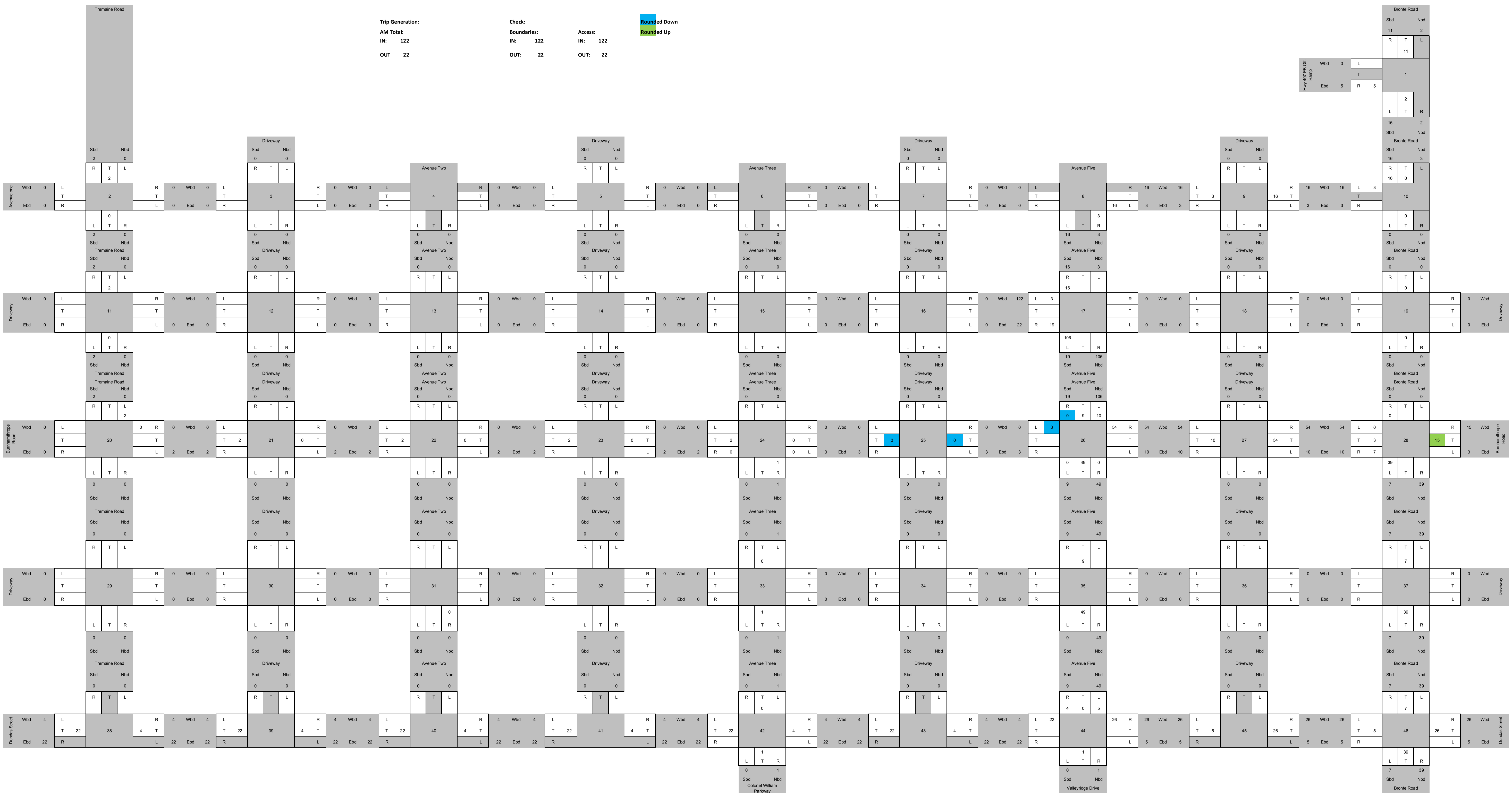


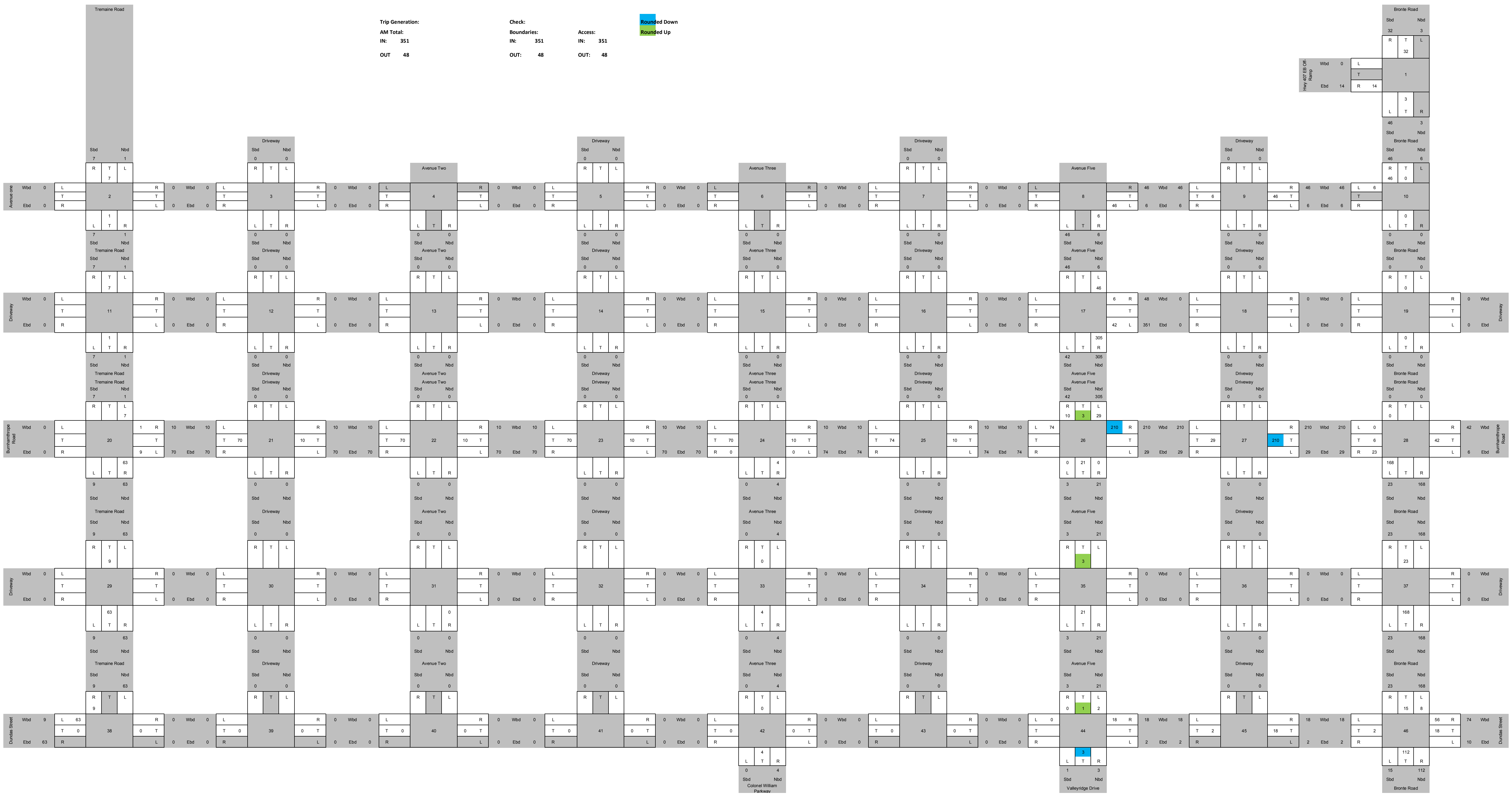
Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 19 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
AM Total:
IN: 351
OUT 48

Check:
Boundaries:
IN: 351
OUT: 48

Access:
IN: 351
OUT: 48

Rounded Down
Rounded Up



Scale: NTS

Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 20 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-06022_Traffic Model AM_20181207.xlsx

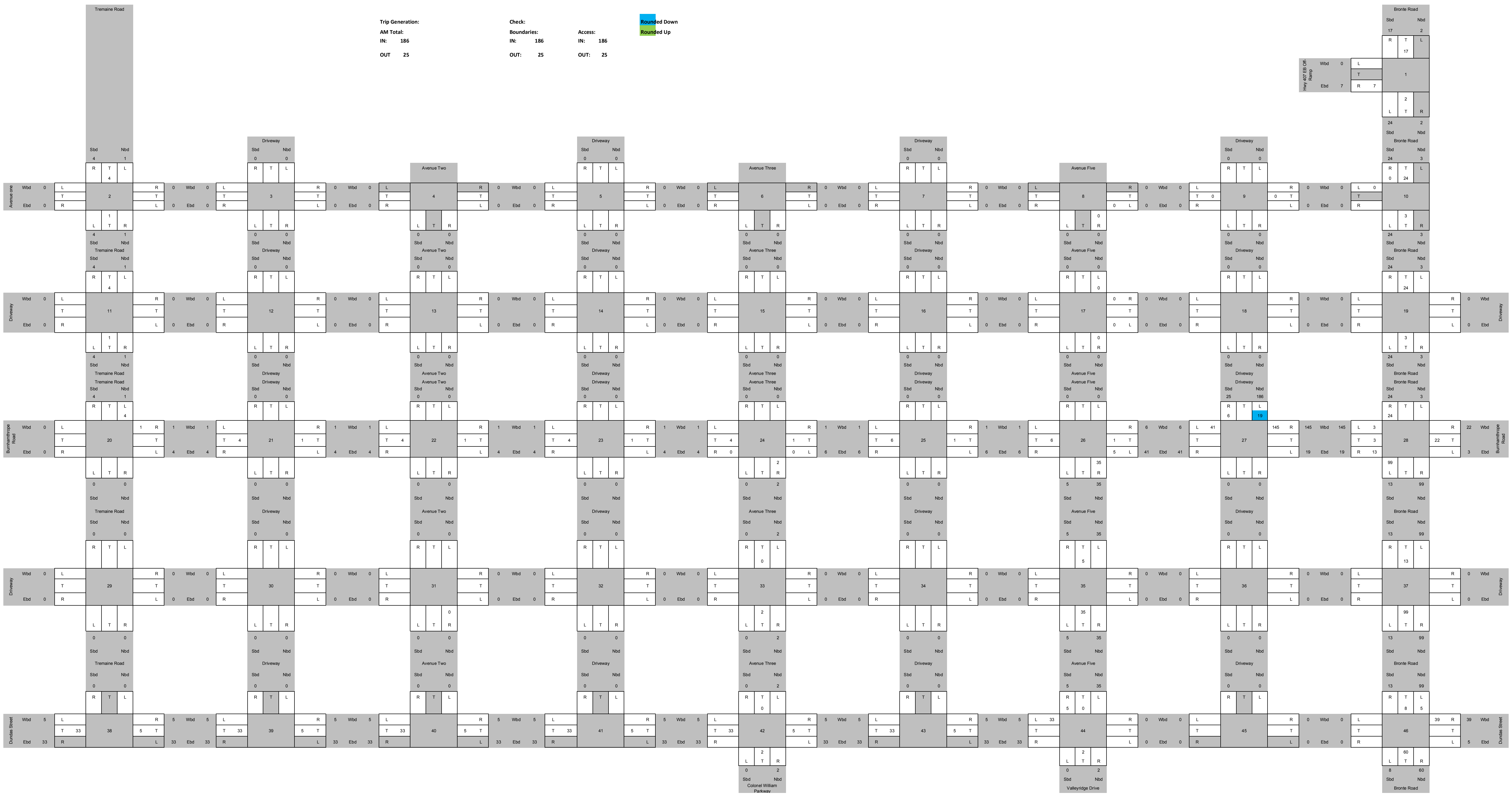


Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 21 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
AM Total:
IN: 558
OUT 76

Check:
Boundaries:
IN: 558
OUT: 75

Access:
IN: 558
OUT: 76

Rounded Down
Rounded Up

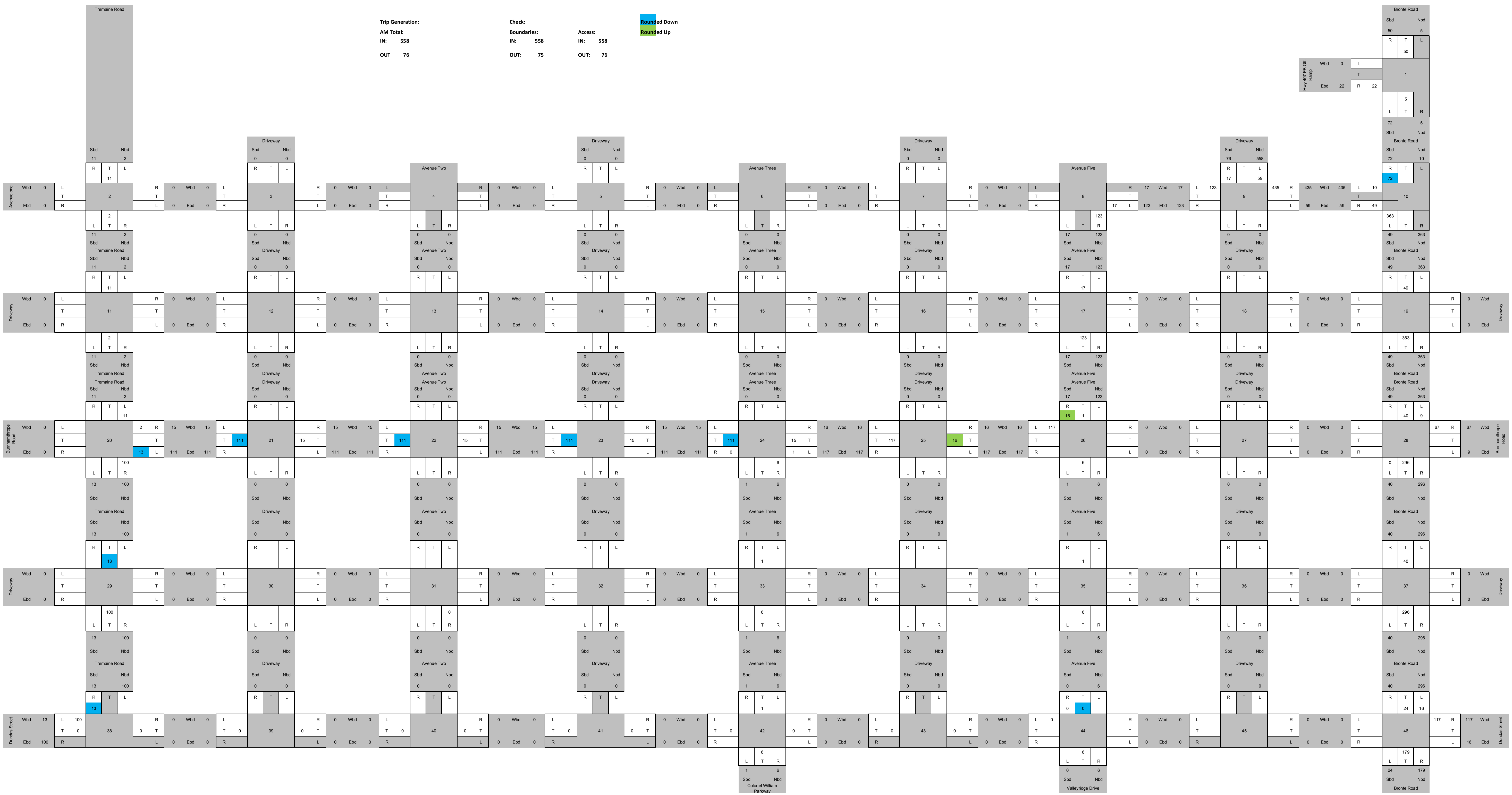


Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 22 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00022_Traffic Model AM_20191207.xlsx

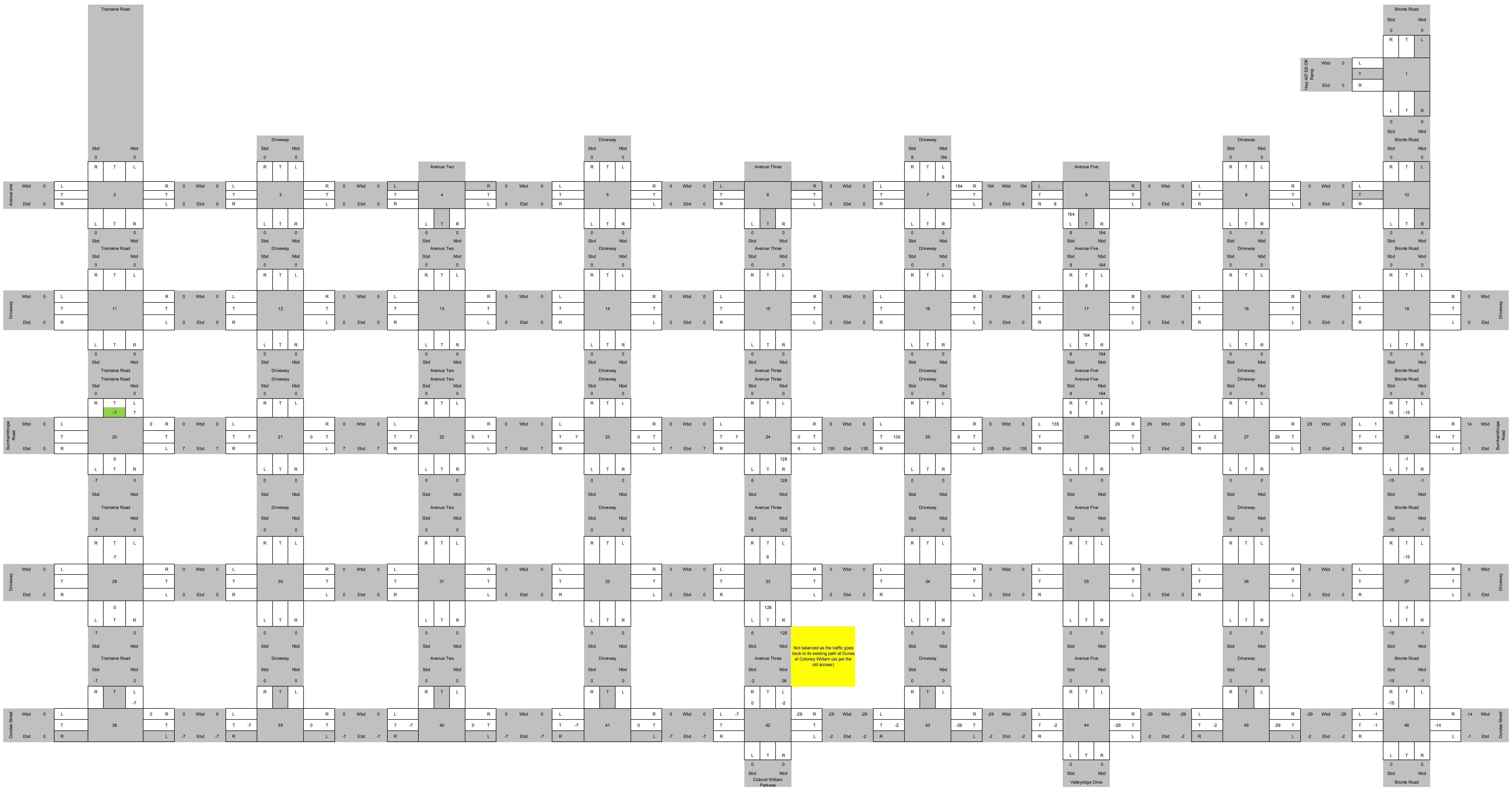


Figure X
GE Lands Background Development Traffic Reassignment Phase 2A - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

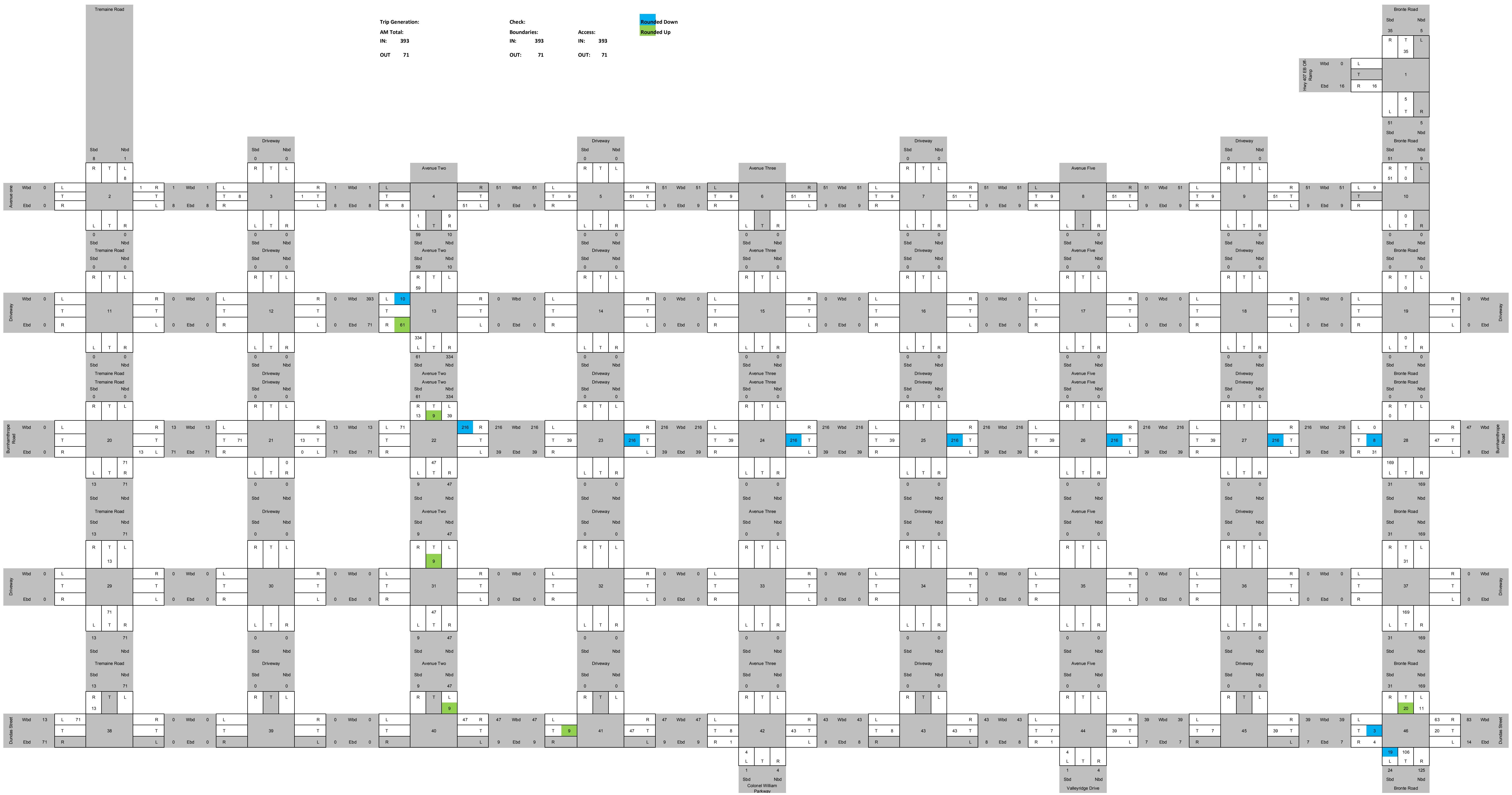


Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 11 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00022_Traffic Model AM_20181207.xlsx

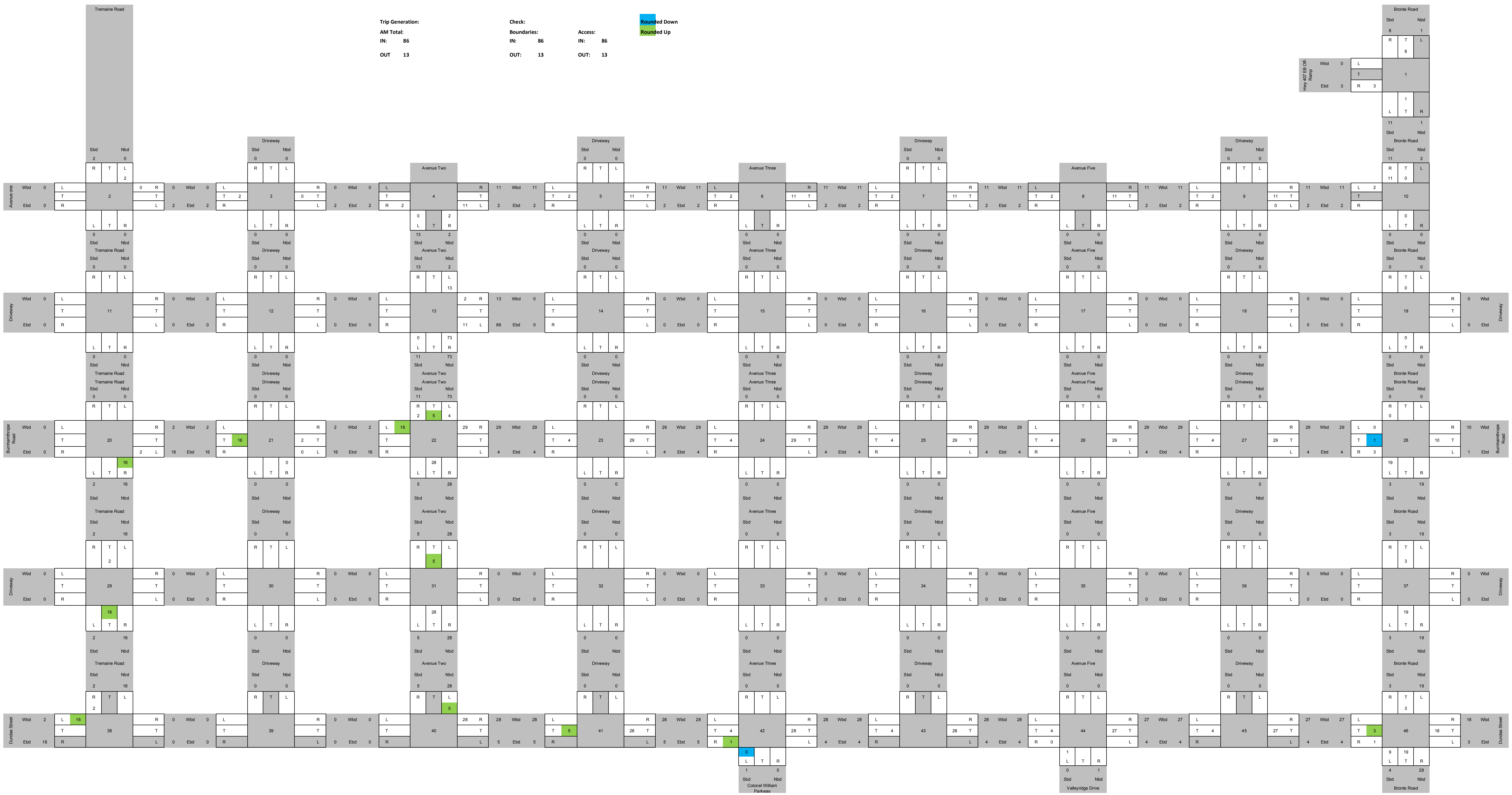


Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 12 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

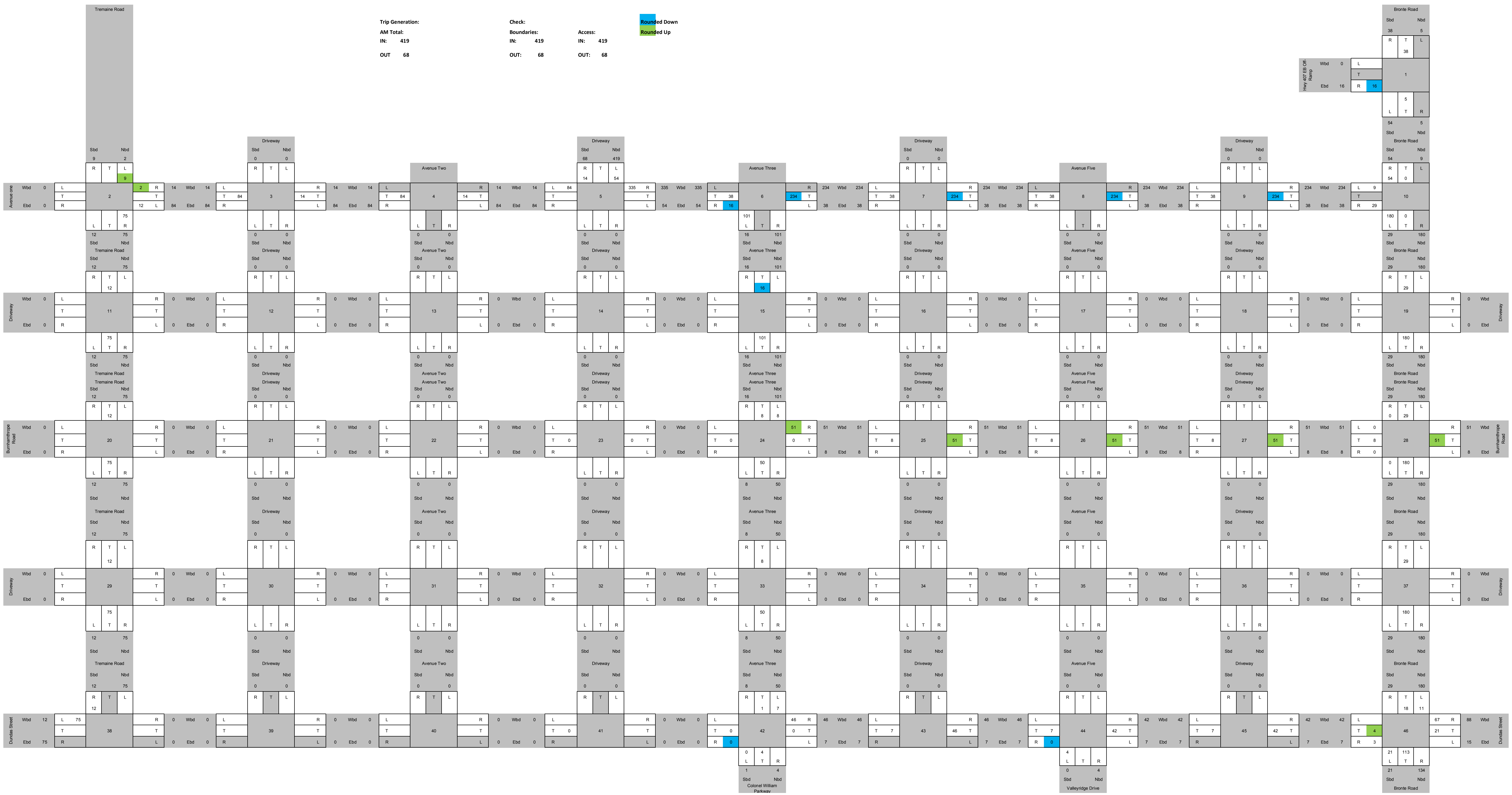
14-00222_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 419
OUT 68

Check:
Boundaries:
IN: 419
OUT: 68

Access:
IN: 419
OUT: 68

Rounded Down
Rounded Up



Scale: NTS

Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 13 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-05022_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 122
OUT 22

Check:
Boundaries:
IN: 122
OUT: 22

Access:
IN: 122
OUT: 22

Rounded Down
Rounded Up

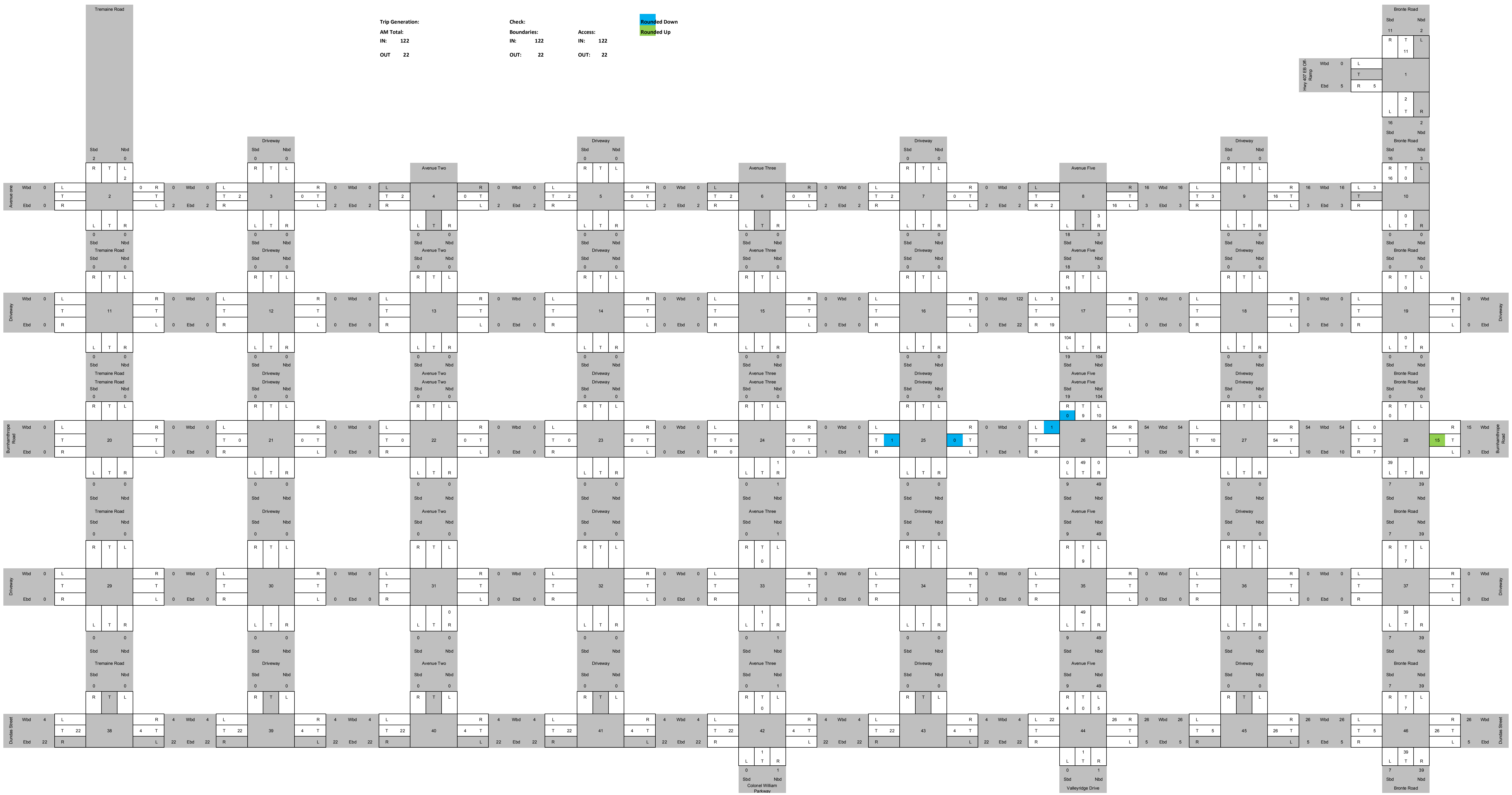


Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 19 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

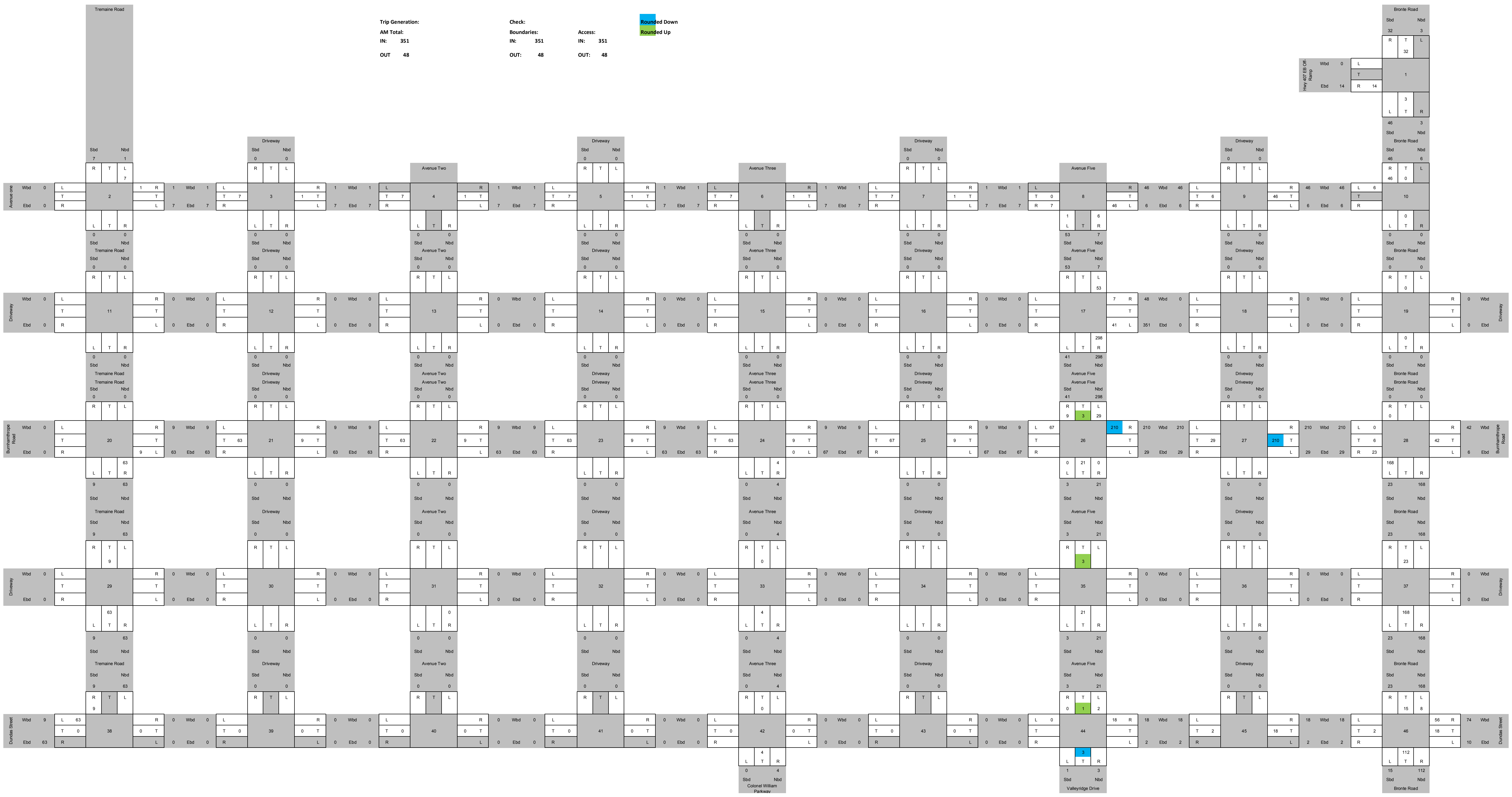


Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 20 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09022_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 558
OUT 76

Check:
Boundaries:
IN: 558
OUT: 76

Access:
IN: 558
OUT: 76

Rounded Down
Rounded Up

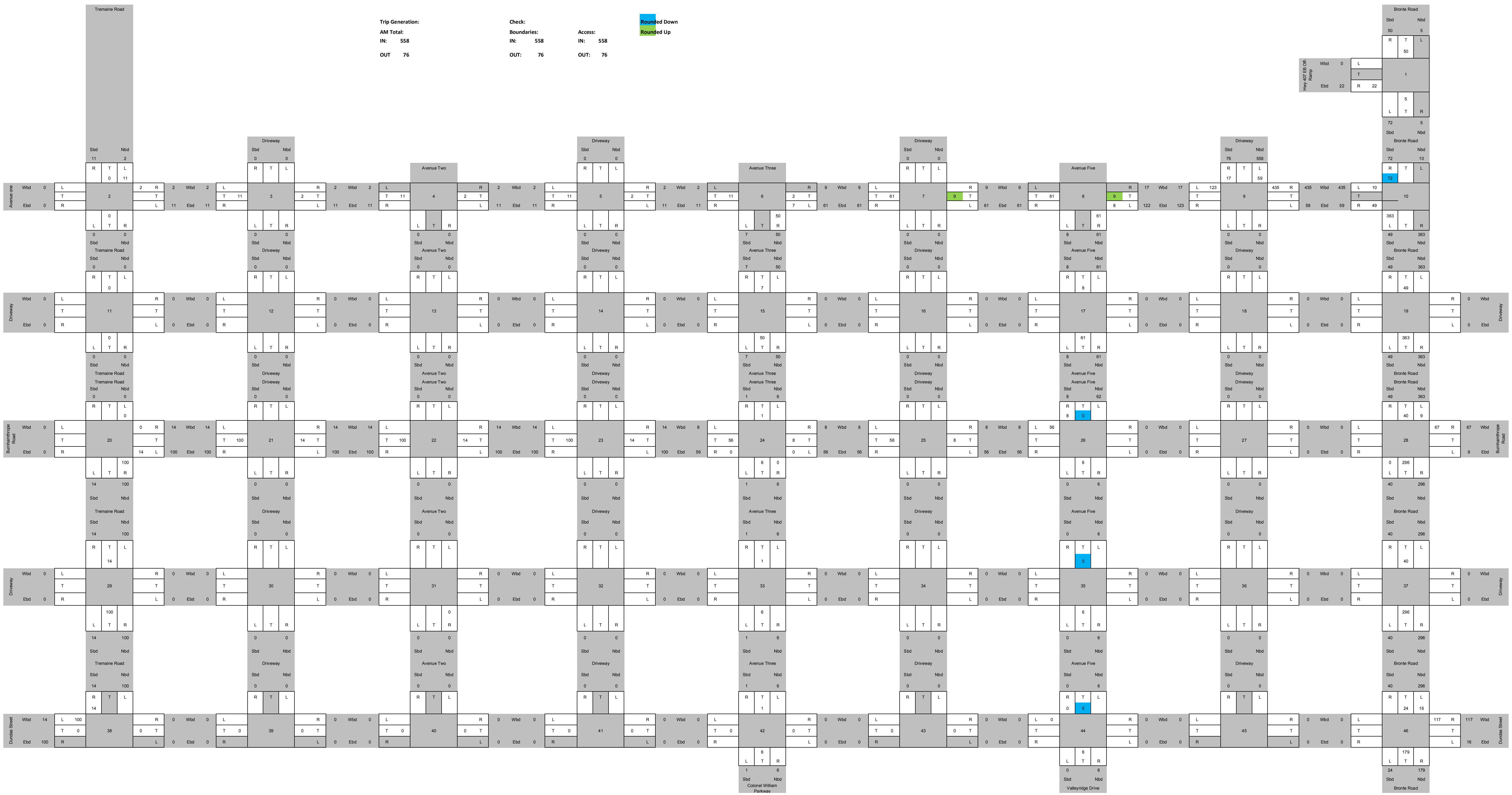
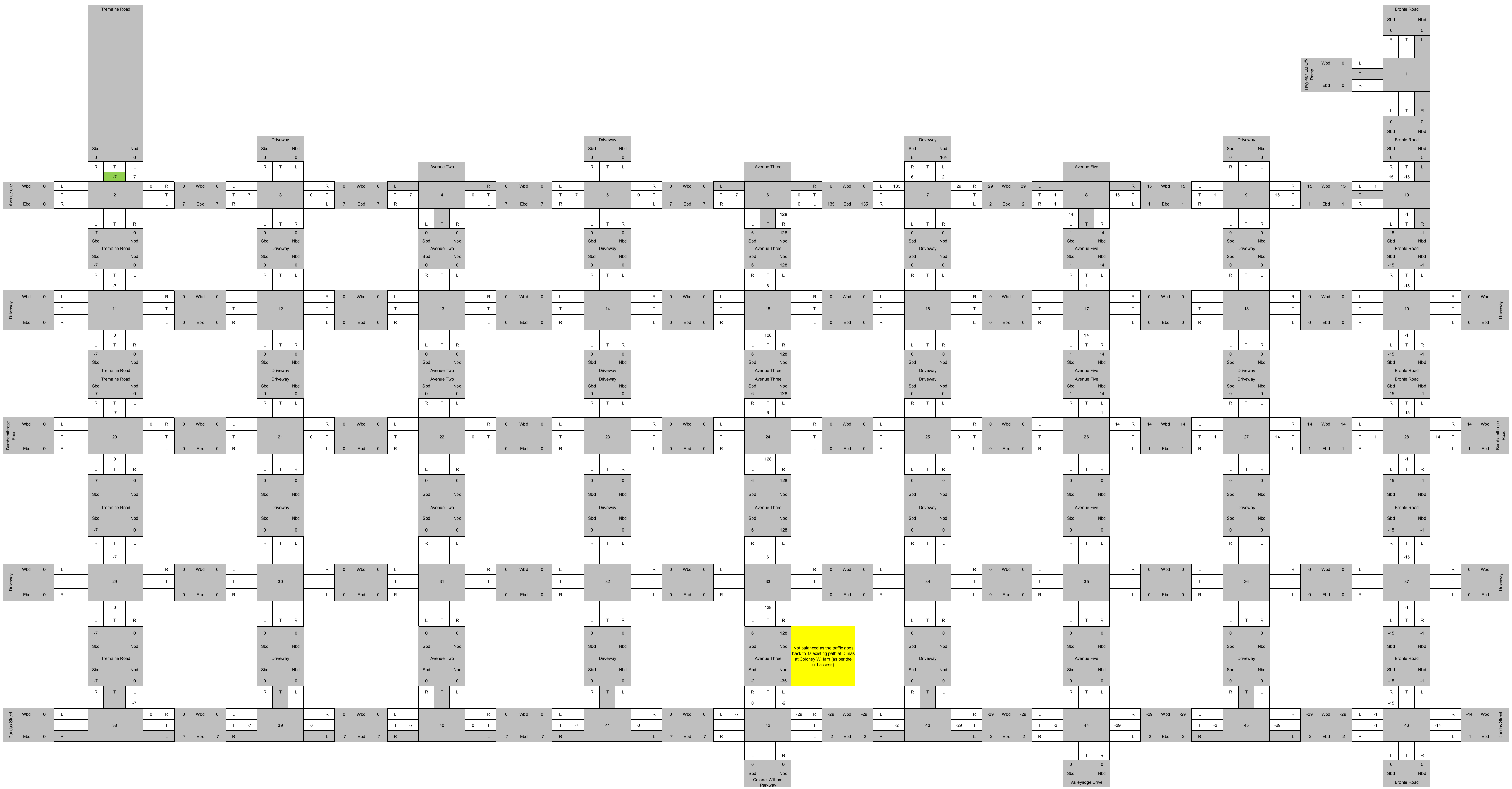


Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 22 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

14-00222_Traffic Model AM_20181207.xlsx



Scale: NTS

Figure X
GE Lands Background Development Traffic Reassignment Phase 2 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09022_Traffic Model AM_20181207.xlsx

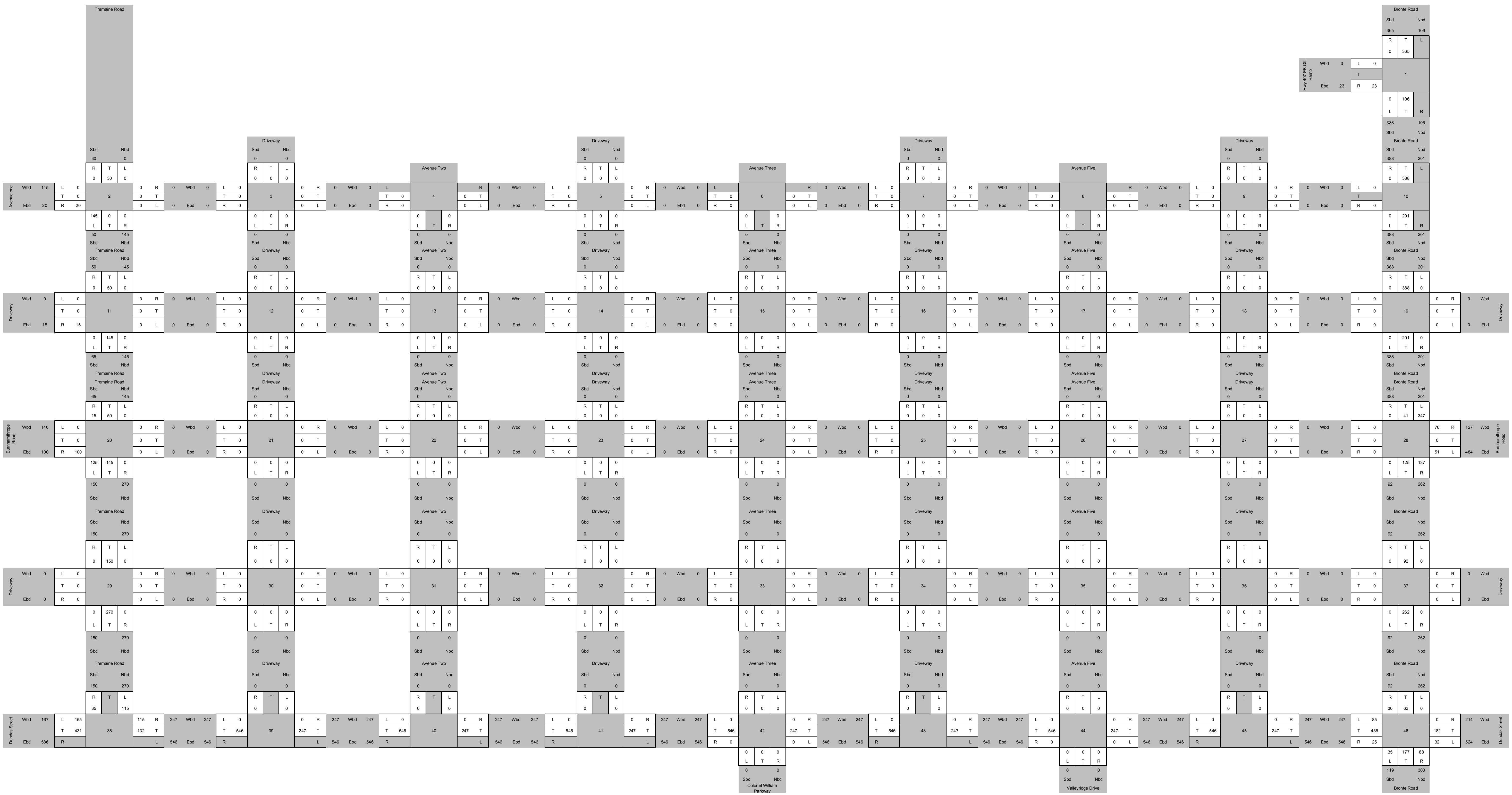
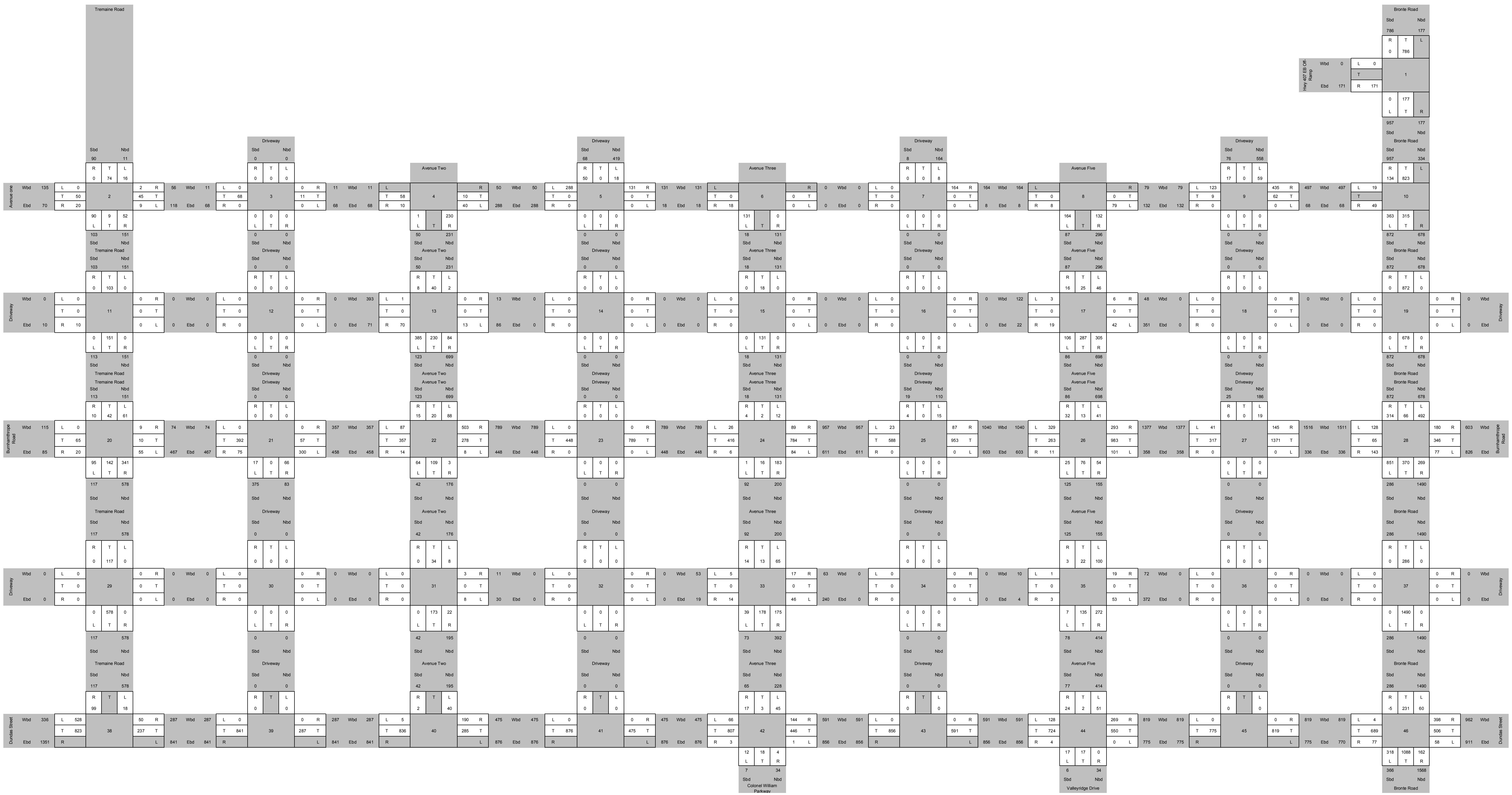


Figure X
Overall Additional Background Development Traffic (not including existing traffic growth) 2021 Phase 1 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study



Scale: NTS

Figure X
Overall Additional Background Development Traffic (not including existing traffic growth) 2031 Phase 2A - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

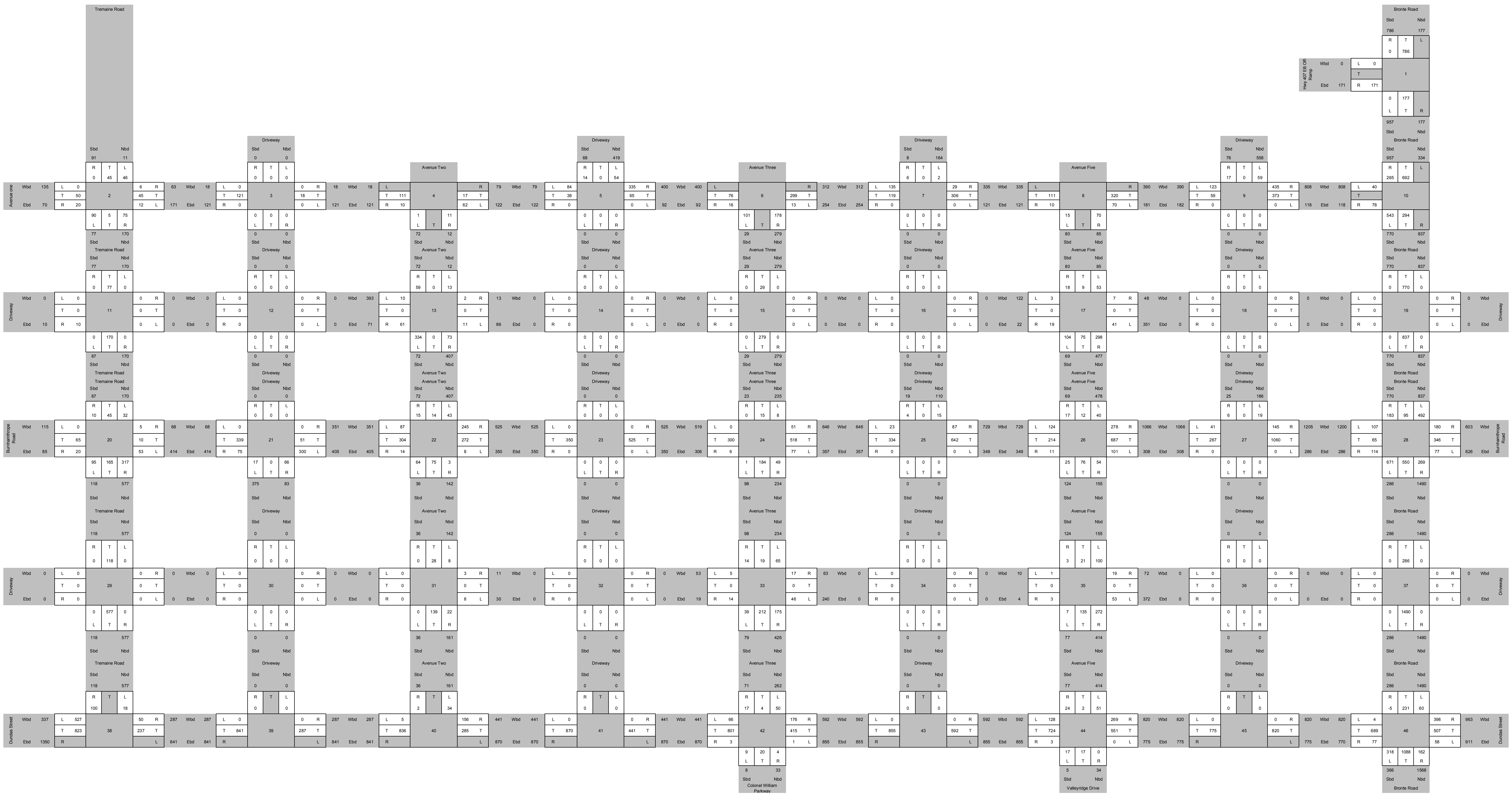


Figure X
Overall Additional Background Development Traffic (not including existing traffic growth) 2031 Phase 2 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model AM_20181207.xlsx

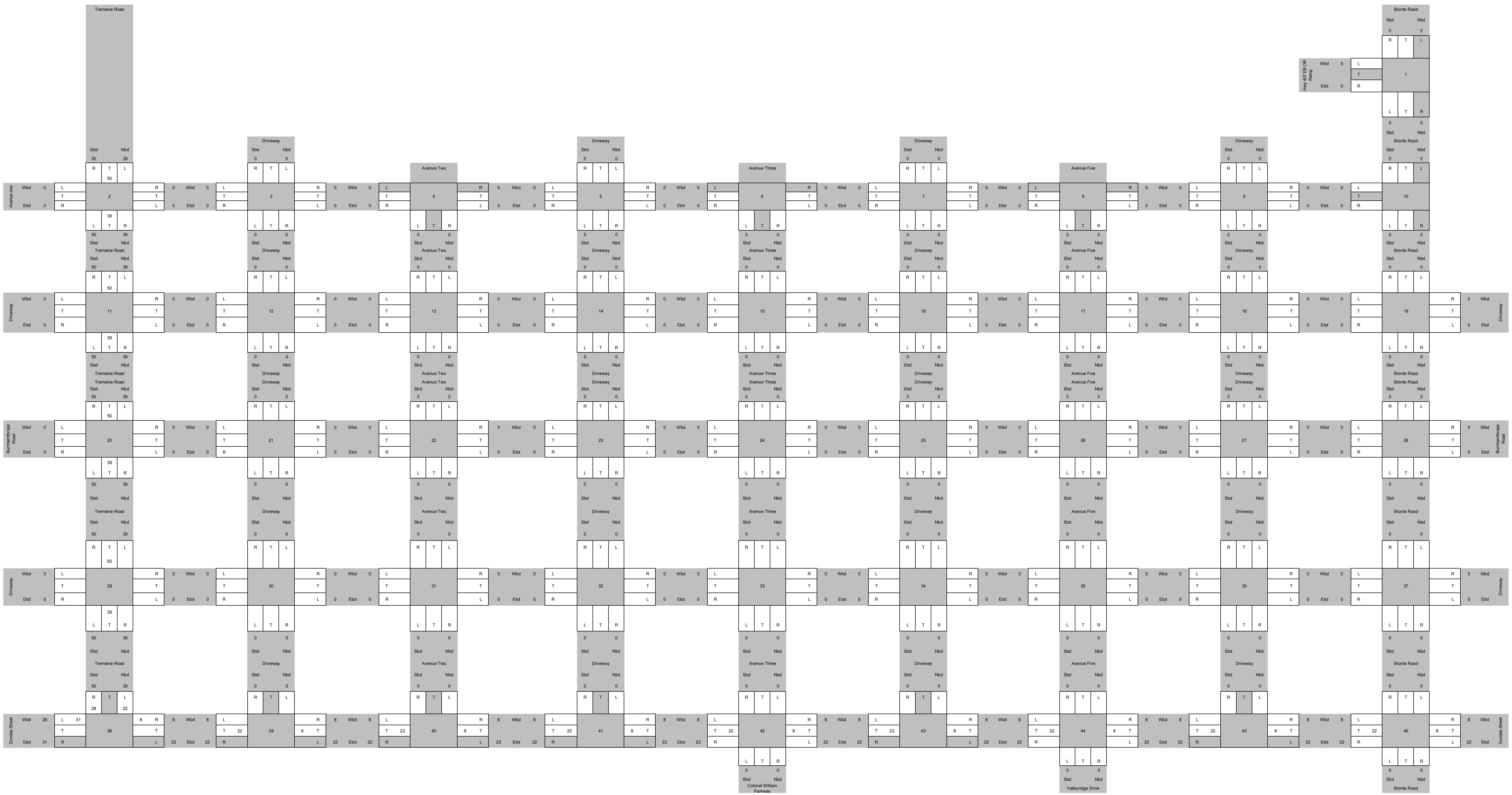


Figure X
Traffic Growth from Existing 2018 Volumes to 2021 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

14-09022_Traffic Model AM_20181207.xlsx

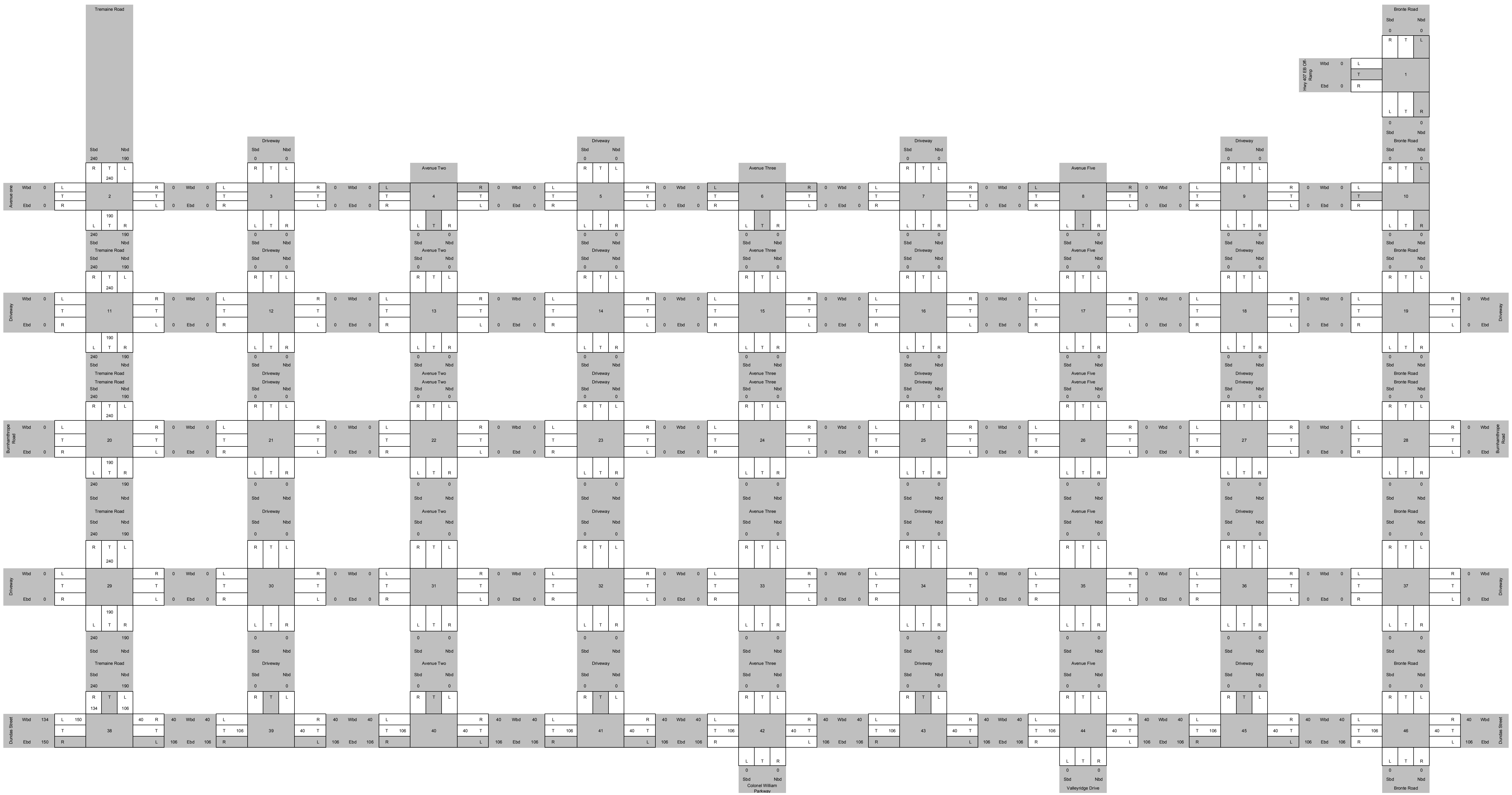
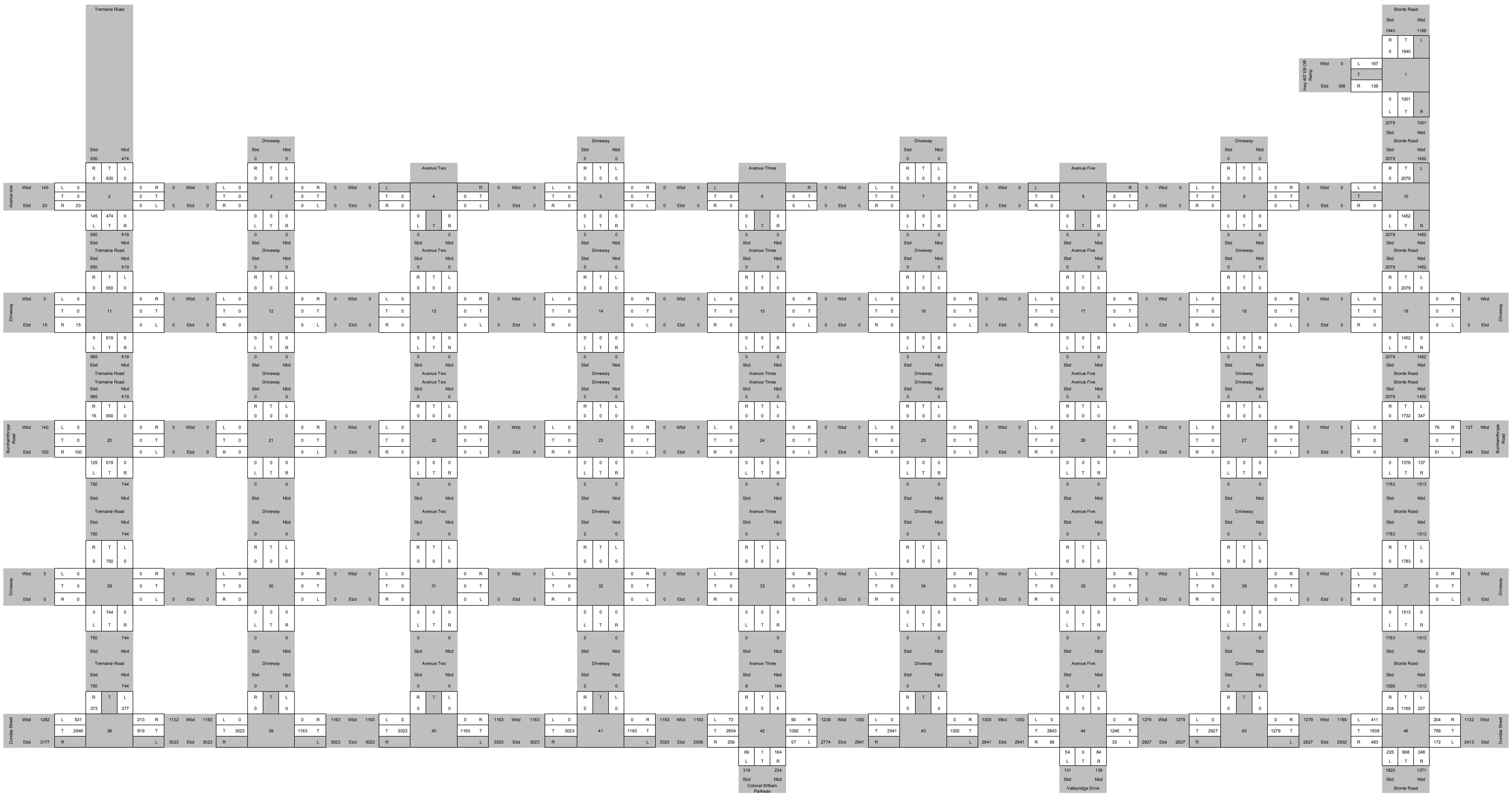


Figure X
Traffic Growth from derived 2021 Volumes (Existing with Applied Growth) to 2031 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study



Scale: NTS

Figure X
Future Background Volumes - Phase 1 (2021) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09022_Traffic Model AM_20161207.xlsx

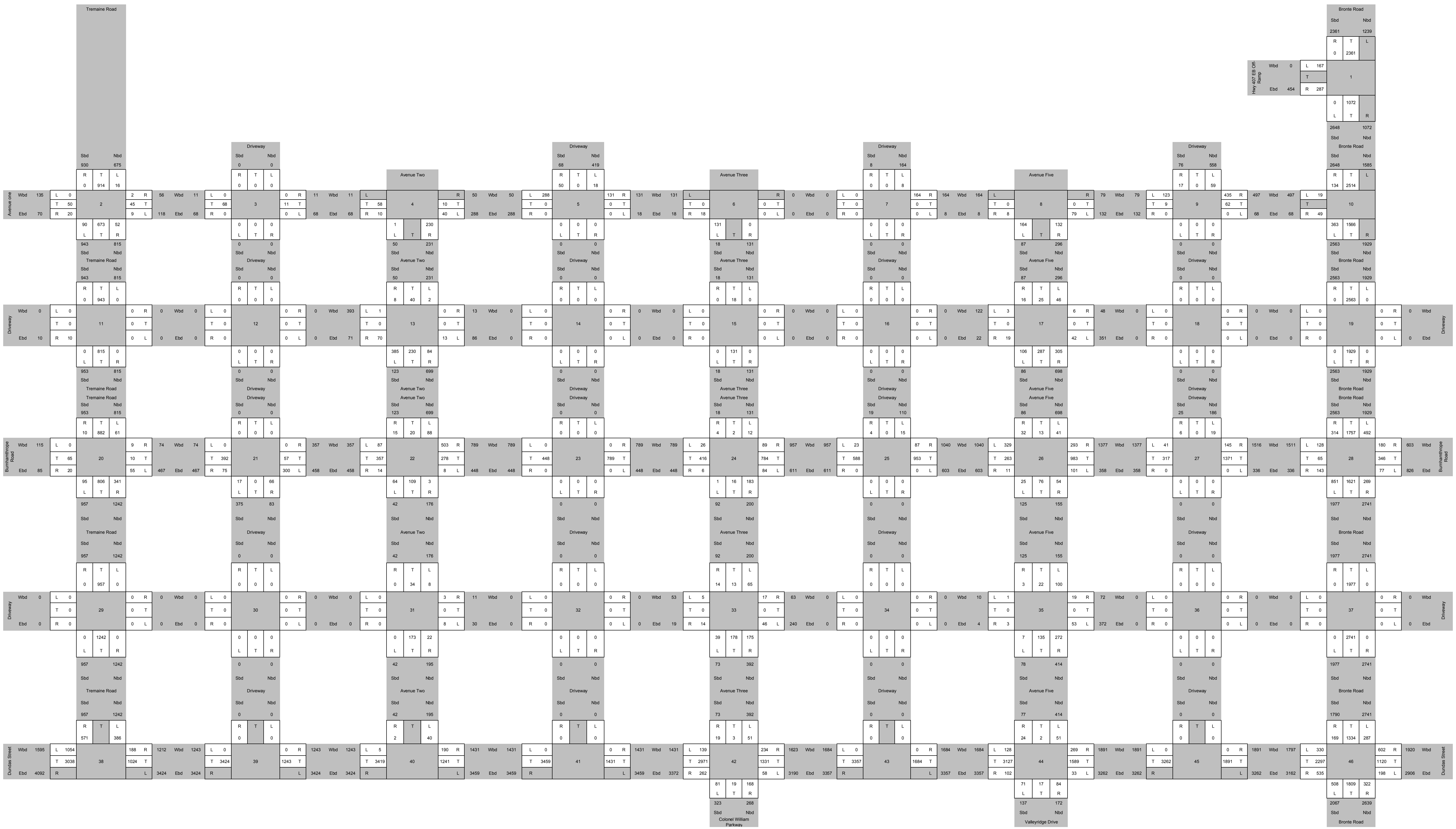
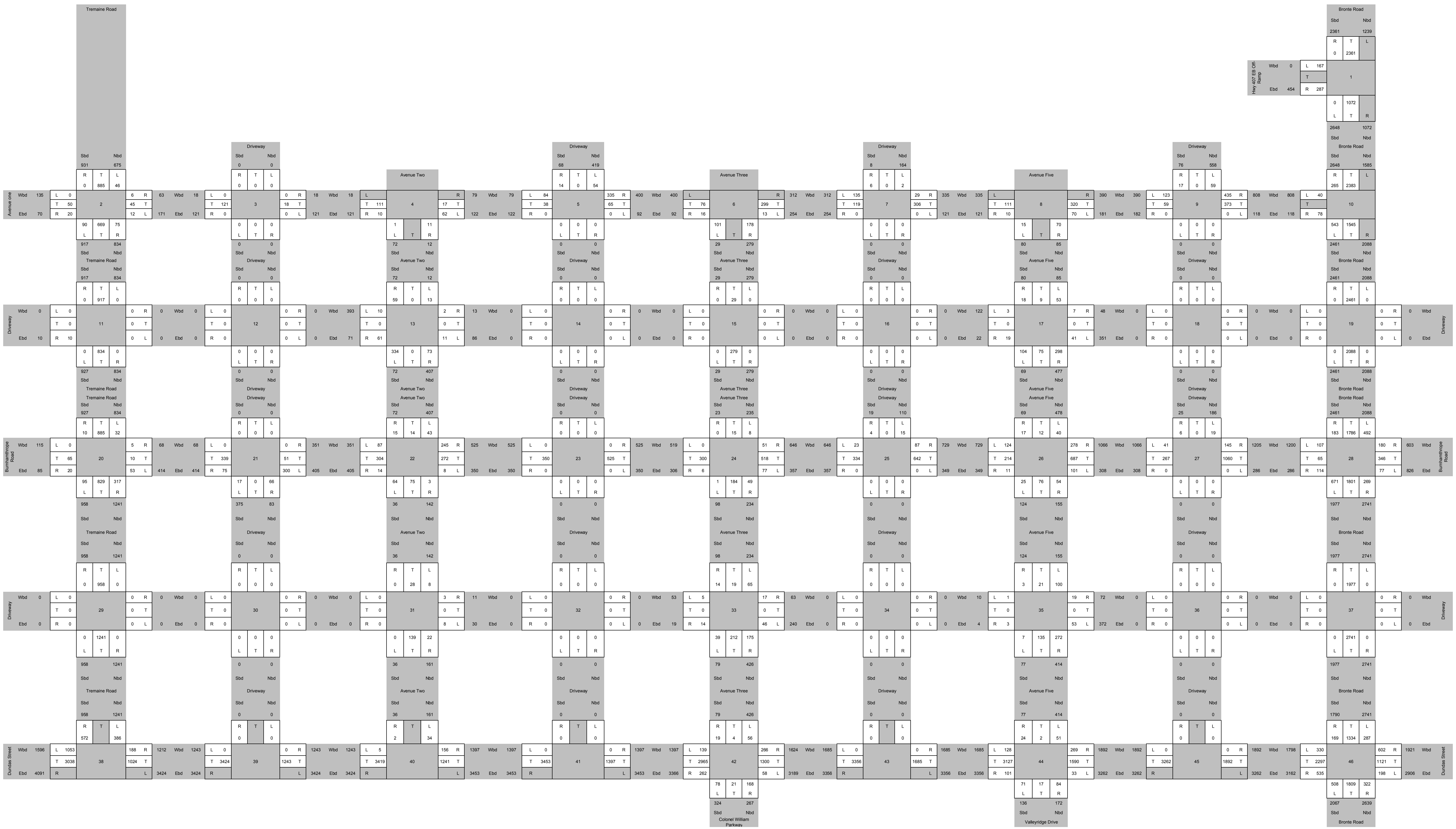


Figure X
Future Background Volumes - Phase 2A (2031) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

16-09222_Traffic Model AM_20181207.xlsx



Scale: NTS

Figure X
Future Background Volumes - Phase 2 (2031) - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model AM_20181207.xlsx

Subject Lands Trip Generation per Group

Trip Assignment Notes:

The trip assignment for the 407 employments lands (site and surrounding 407 background developments) have been distributed along the driveways based on the Blocks layout.
The trip generation for each block is based on a percentage of the overall trip generation (per land use) for the site or surrounding background 407 lands, with the percentage of the trip generation derived based on the percentage of the block GFA compared to the overall GFA used for the trip gen.

Blocks assumed to use the Same Driveways:

For the Phase 1 development (2021 horizon year):

Group 1	Group 2	Group 3	Group 4	Group 5
C3-3	G3-1	C2-2	C4-1	G5-1
C3-5	G4			G5-2
G3-2				C5-1

Percentage of Trip Gen for these blocks: Rounded up to match overall trip gen values
Rounded Down to match overall trip gen values

Group 1

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
		Shopping Centre	49,186	37%	50	31	81	103	119	222
		Shopping Centre Pass	49,186	37%	0	0	0	8	8	16
C3-3	Service Area Employment	Office	26,485	37%	37	6	43	6	33	39
C3-5	Light Employment	General Office	105,486	41%	128	18	146	24	109	133
G3-2	General Employment	Business Park	45,811	16%	50	9	59	15	42	57
Total Primary					**265**	**64**	**329**	**148**	**303**	**451**
Total Pass-By					**0**	**0**	**0**	**8**	**8**	**16**

Group 2

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
		Shopping Centre	42,539	32%	44	27	71	89	103	192
		Centre Pass-By	42,539	32%	0	0	0	7	7	14
G3-1	Service Area Employment	General Office	22,906	32%	32	5	37	6	28	34
G4	General Employment	Business Park	62,689	22%	68	12	80	20	58	78
Total Primary					**144**	**44**	**188**	**115**	**189**	**304**
Total Pass-By					**0**	**0**	**0**	**7**	**7**	**14**

Group 3

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C2-2	Light Employment	General	57,049	22%	70	9	79	13	59	72
Total					**70**	**9**	**79**	**13**	**59**	**72**

Group 4

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
		Shopping Centre	40,146	30%	41	25	66	84	96	180
		Shopping Centre Pass-By	40,146	30%	0	0	0	7	7	14
C4-1	Service Area Employment	General Office	21,617	30%	31	3	34	5	27	32
Total Primary					**72**	**28**	**100**	**89**	**123**	**212**
Total Pass-By					**0**	**0**	**0**	**7**	**7**	**14**

Group 5

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C5-1	Light Employment	General	92,031	36%	112	15	127	21	96	117
G5-1	General Employment	Business Park	73,022	26%	80	14	94	23	68	91
G5-2	General Employment	Business Park	97,822	35%	107	19	126	32	89	121
Total					**299**	**48**	**347**	**76**	**253**	**329**

Overall Phase 1

					Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
Total Primary					**850**	**193**	**1043**	**441**	**927**	**1368**
Total Pass-By					**0**	**0**	**0**	**22**	**22**	**44**

	Shopping Centre			135	83	218	276	318	594
	Shopping Centre Pass-By			0	0	0	22	22	44
Service Area Employment	General Office			100	14	114	17	88	105
Light Employment	General Office			310	42	352	58	264	322
General Employment	Business Park			305	54	359	90	257	347

For the Phase 1 and 2 development (2031 horizon year):

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
C3-3	G3-1	C2-2	C4-1	G5-1	C4-2	G5-6	P2-1
C3-5	G4			G5-2		G5-5	P2-2
G3-2				C5-1		C5-2	P2-3
							P2-4

Percentage of Trip Gen for these blocks: Rounded up to match overall trip gen values
Manually changed to match overall trip gen
Rounded Down to match overall trip gen values

Group 1

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
		Shopping Centre	49,186	37%	50	31	81	103	119	222
		Shopping Centre Pass-By	49,186	37%	0	0	0	8	8	16
C3-3	Service Area Employment	General Office	26,485	37%	35	5	40	5	32	37
C3-5	Light Employment	General Office	105,486	12%	102	14	116	19	87	106
G3-2	General Employment	Business Park	45,811	8%	45	9	54	14	35	49
Total Primary					**232**	**59**	**291**	**141**	**273**	**414**
Total Pass-By					**0**	**0**	**0**	**8**	**8**	**16**

Group 2

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
		Shopping Centre	42,539	32%	44	26	70	90	103	193
		Shopping Centre Pass-By	42,539	32%	0	0	0	7	7	14
G3-1	Service Area Employment	General Office	22,906	32%	30	4	34	5	26	31
G4	General Employment	Business Park	62,689	11%	62	11	73	18	49	67
Total					**136**	**41**	**177**	**113**	**178**	**291**
Total Pass-By					**0**	**0**	**0**	**7**	**7**	**14**

Group 3

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C2-2	Light Employment	General Office	57,049	6%	54	8	62	11	46	57
Total					**54**	**8**	**62**	**11**	**46**	**57**

Group 4

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
		Shopping Centre	40,146	30%	41	26	67	85	96	181
		Shopping Centre Pass-By	40,146	30%	0	0	0	7	7	14
C4-1	Service Area Employment	General Office	21,617	30%	28	4	32	5	24	29
Total					**69**	**30**	**99**	**90**	**120**	**210**
Total Pass-By					**0**	**0**	**0**	**7**	**7**	**14**

Group 5

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C5-1	Light Employment	General Office	92,031	10%	89	12	101	17	76	93
G5-1	General Employment	Business Park	73,022	12%	72	14	86	21	58	79
G5-2	General Employment	Business Park	97,822	16%	97	17	114	29	77	106
Total					**258**	**43**	**301**	**67**	**211**	**278**

Group 6

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C4-2	General Employment	Business Park	42,711	7%	42	8	50	13	33	46
Total					**42**	**8**	**50**	**13**	**33**	**46**

Group 7

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G5-6	General Employment	Business Park	96,100	11%	93	13	106	18	79	97
G5-5	General Employment	Business Park	92,656	16%	92	16	108	27	72	99
C5-2	General Employment	Business Park	87,145	15%	86	16	102	25	68	93
Total					**271**	**45**	**316**	**70**	**219**	**289**

Group 8

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
P2-1	Light Employment	General Office	140,469	15%	136	18	154	25	117	142
P2-2	Light Employment	General Office	161,459	18%	156	21	177	29	134	163
P2-3	Light Employment	General Office	165,226	18%	159	22	181	30	136	166
P2-4	Light Employment	General Office	190,521	21%	184	25	209	34	158	192
Total					**635**	**86**	**721**	**118**	**545**	**663**

Overall Phase 1 & 2

					Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
Total Primary					**1697**	**320**	**2017**	**623**	**1625**	**2248**
Total Pass-By					**0**	**0**	**0**	**22**	**22**	**44**

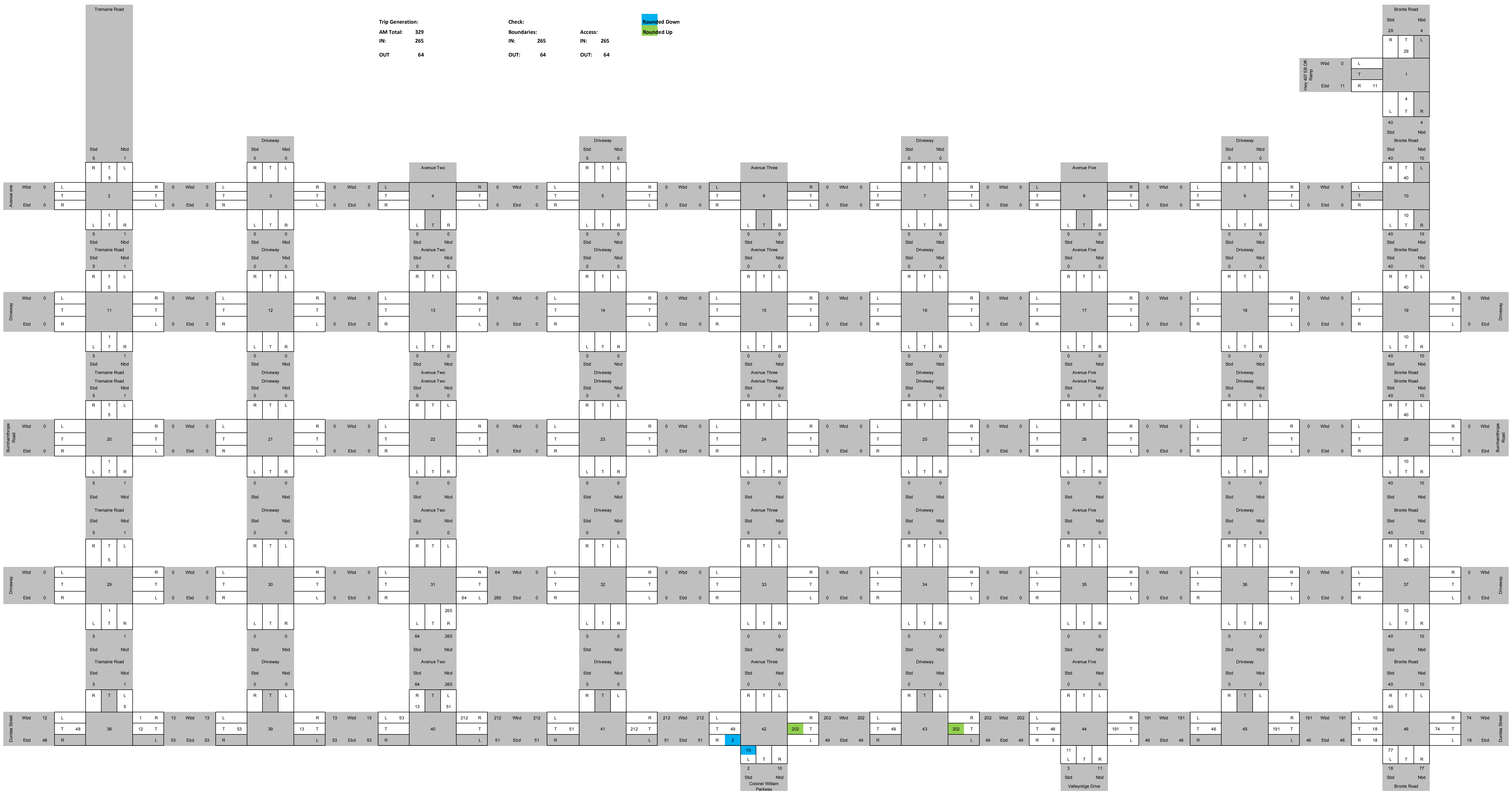
	Shopping Centre			135	83	218	278	318	596
	Shopping Centre Pass-By			0	0	0	22	22	44
Service Area Employment	General Office			93	13	106	15	82	97
Light Employment	General Office			880	120	1000	165	754	919
General Employment	Business Park			589	104	693	165	471	636

Trip Generation:
AM Total: 329
IN: 265
OUT 64

Check:
Boundaries:
IN: 265
OUT: 64

Access:
IN: 265
OUT: 64

Rounded Down
Rounded Up



Scale: NTS

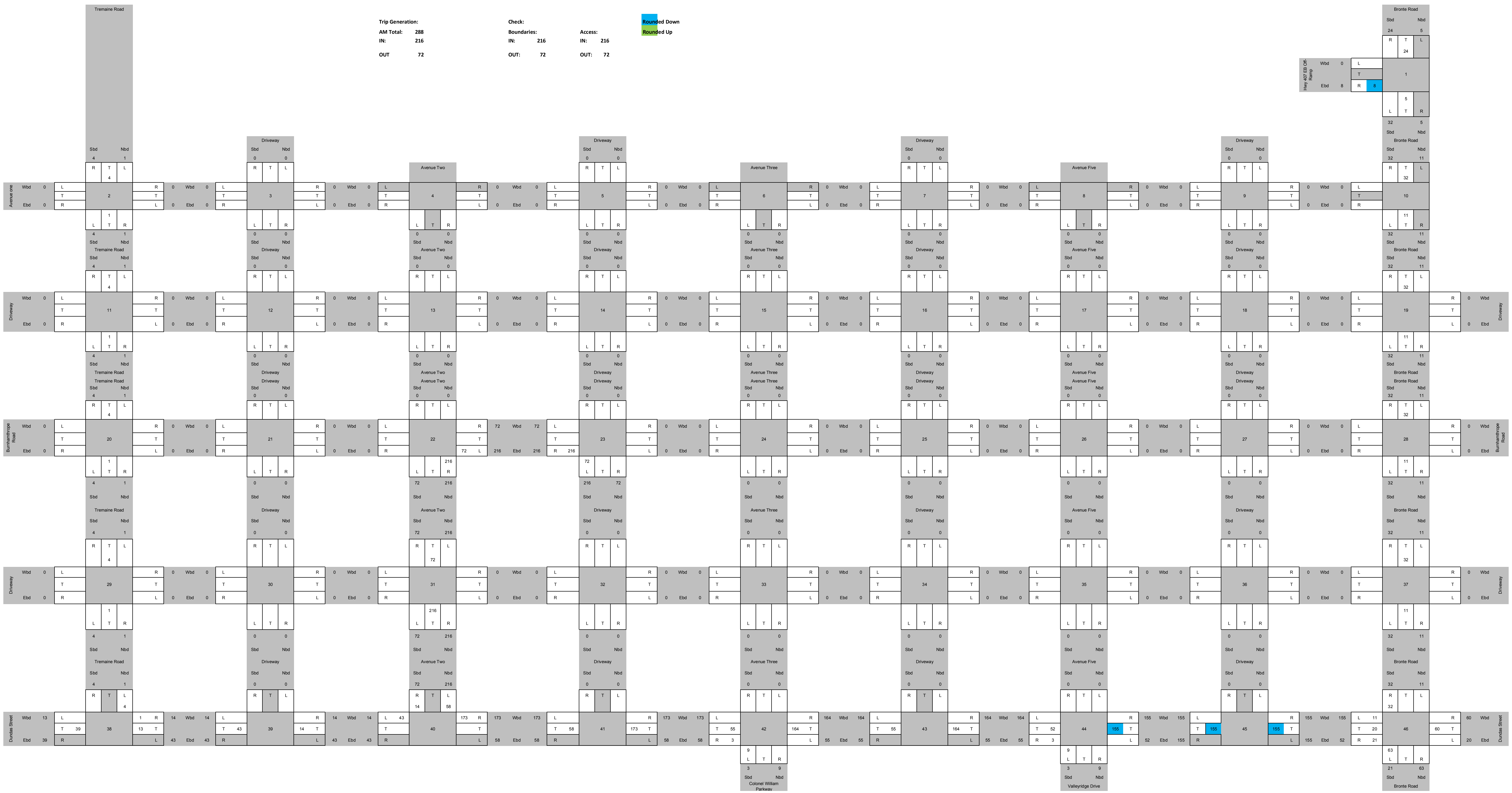
Figure X
Phase 1 Trip Assignment - Block Group 1 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
AM Total: 288
IN: 216
OUT 72

Check:
Boundaries:
IN: 216
OUT: 72

Access:
IN: 216
OUT: 72

Rounded Down
Rounded Up



Scale: NTS

Figure X
Phase 1 Trip Assignment - Block Groups 2&4 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model AM_20181207.xlsx

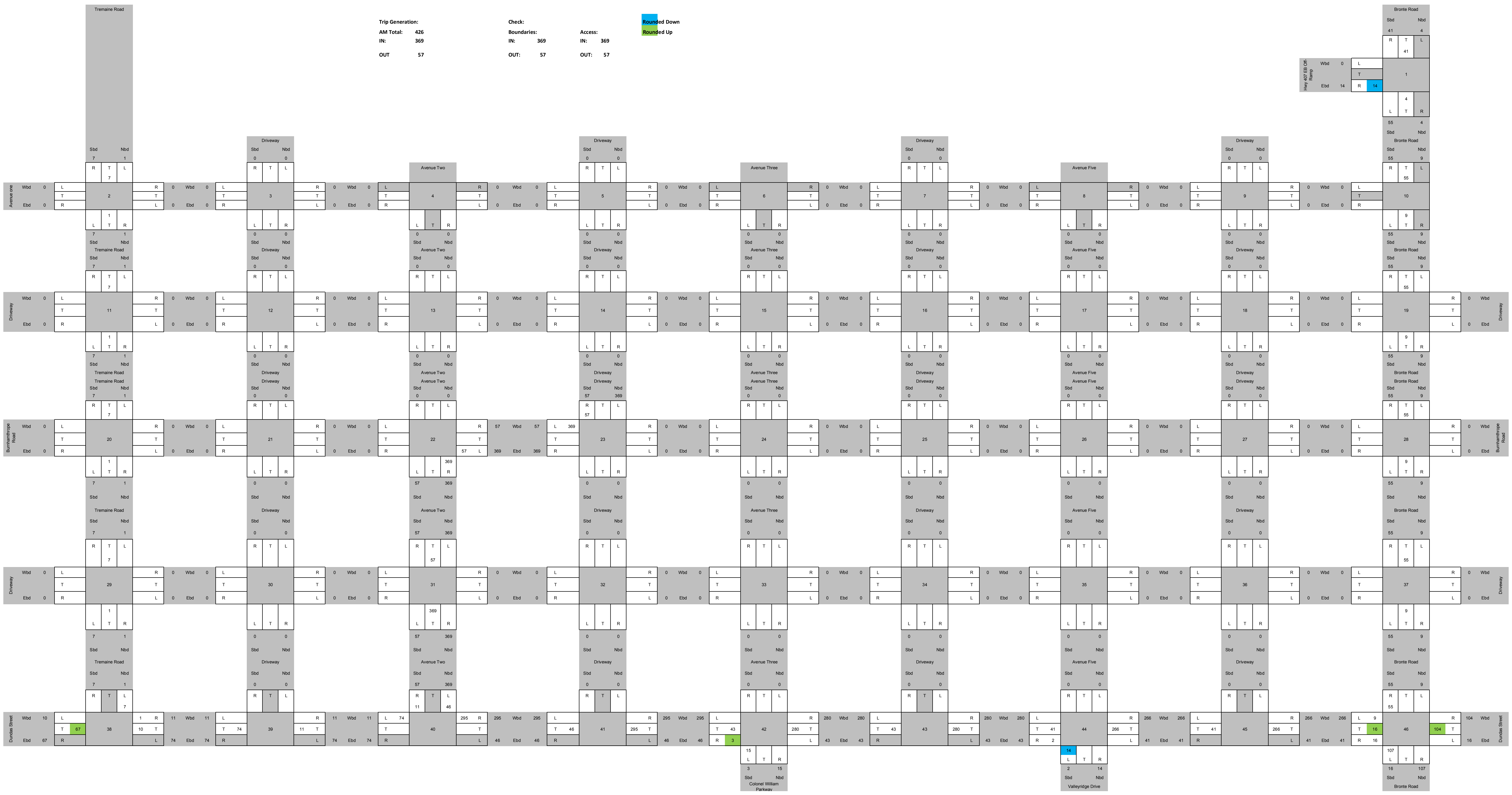


Figure X
Phase 1 Trip Assignment - Block Groups 3&5 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09022_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 850
OUT 193

Check:
Boundaries:
IN: 850
OUT: 193

Access:
IN: 850
OUT: 193

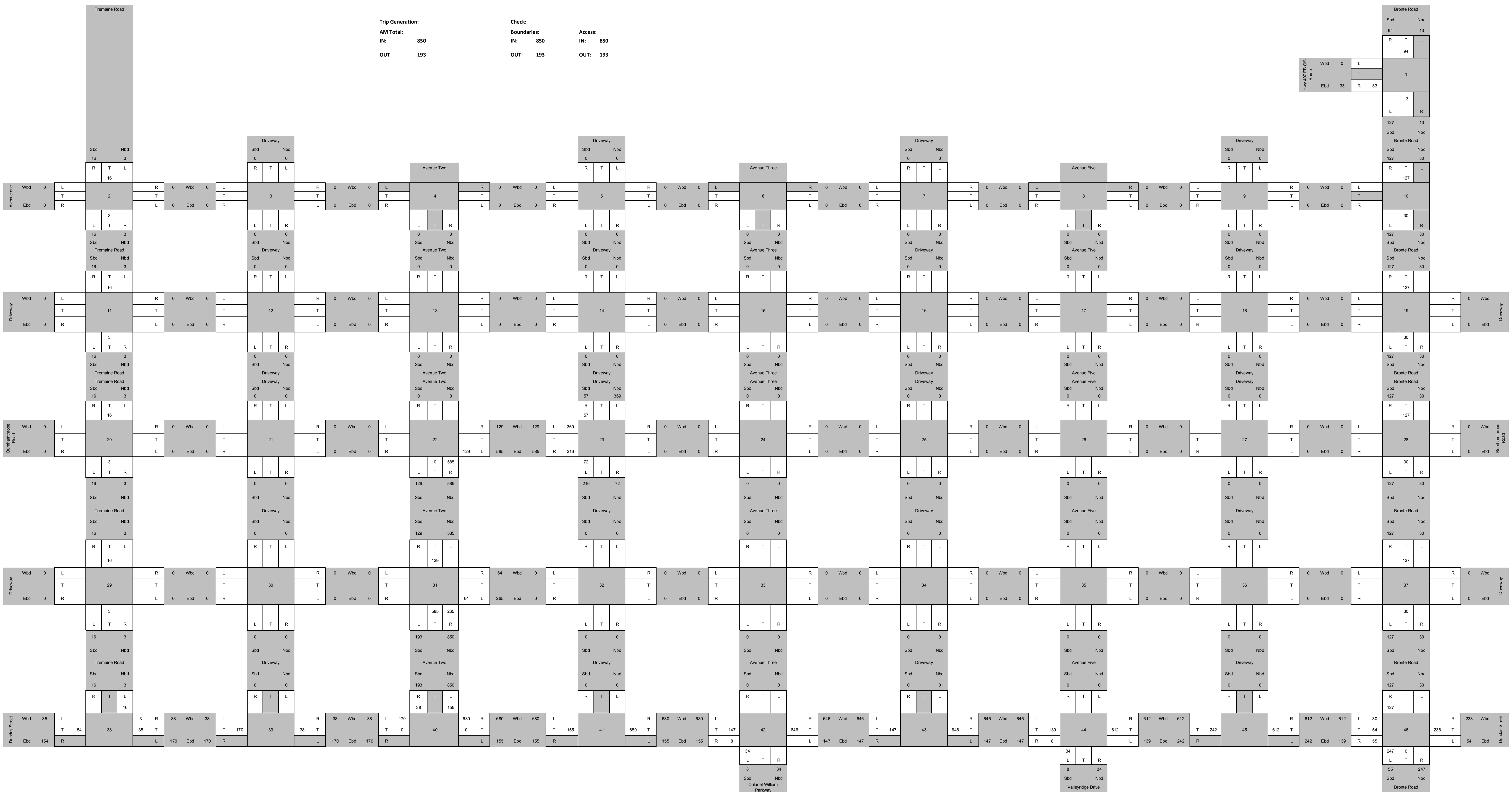
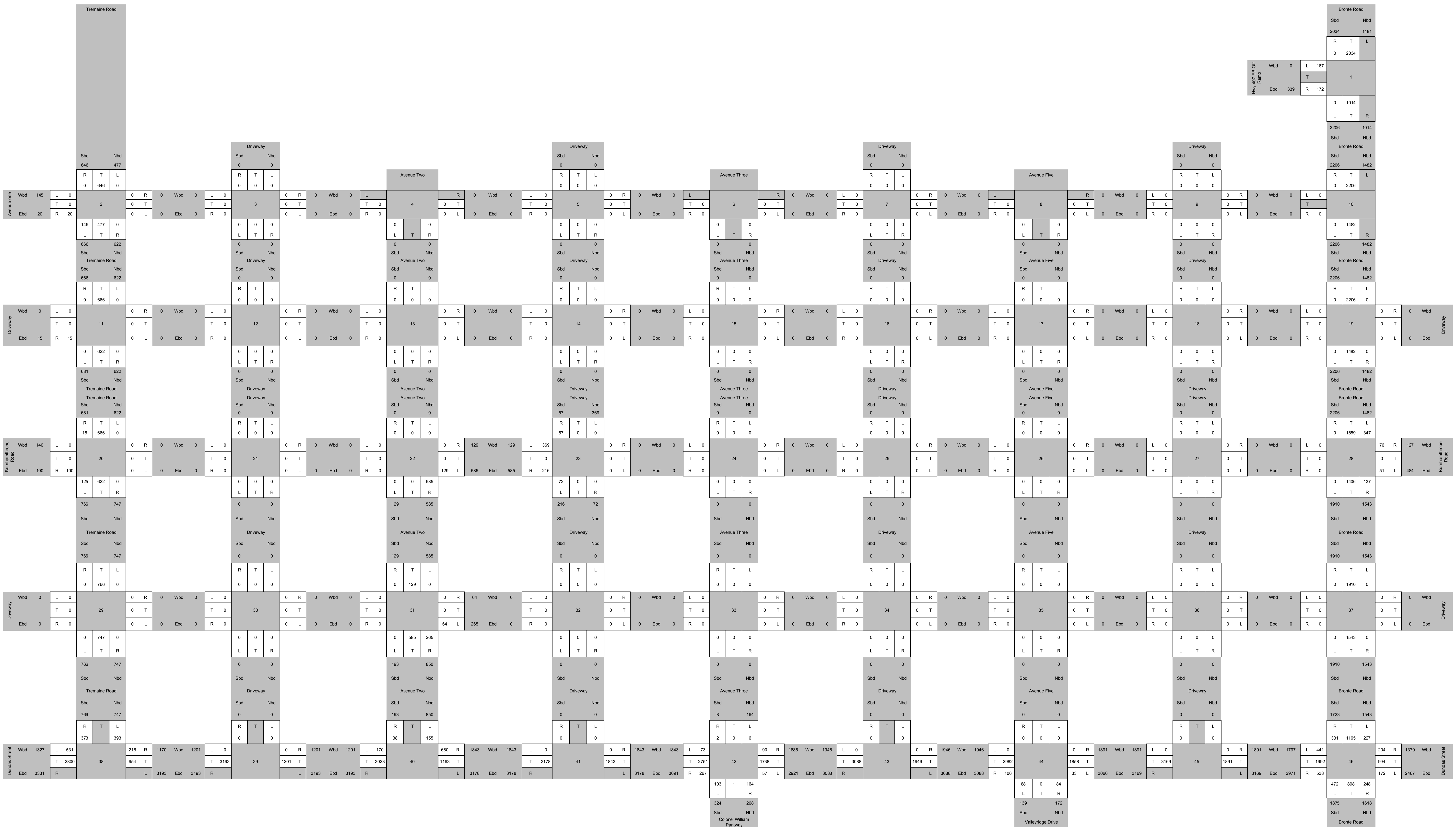


Figure X
Phase 1 Site Generated Traffic - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study



Scale: NTS

Figure X
Phase 1 (2021) Future Total Traffic Volumes - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 232
OUT 59

Check:
Boundaries:
IN: 232
OUT: 59

Access:
IN: 232
OUT: 59

Rounded Down
Rounded Up

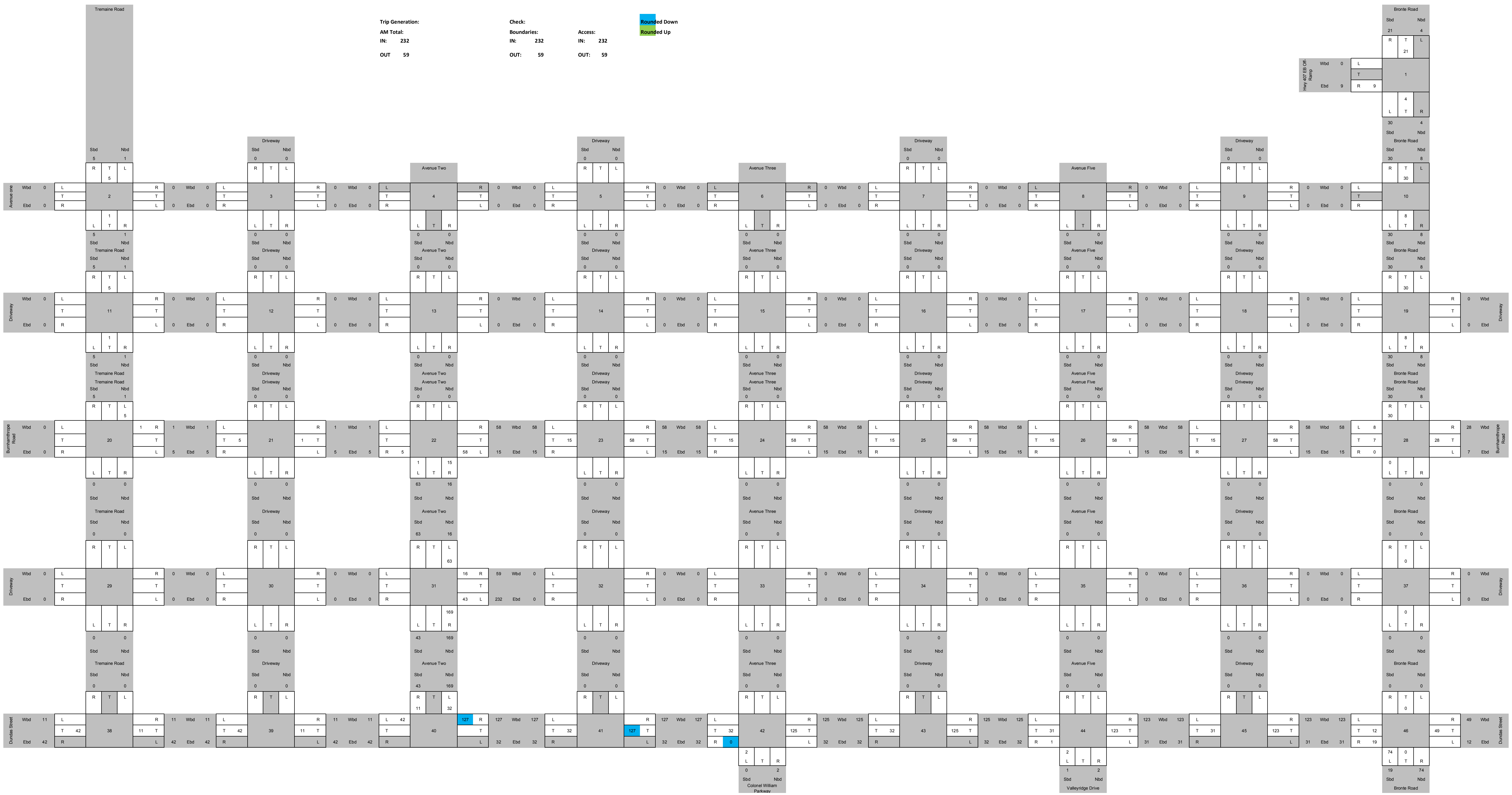


Figure X
Phase 2A and 2 Trip Assignment - Block Group 1 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

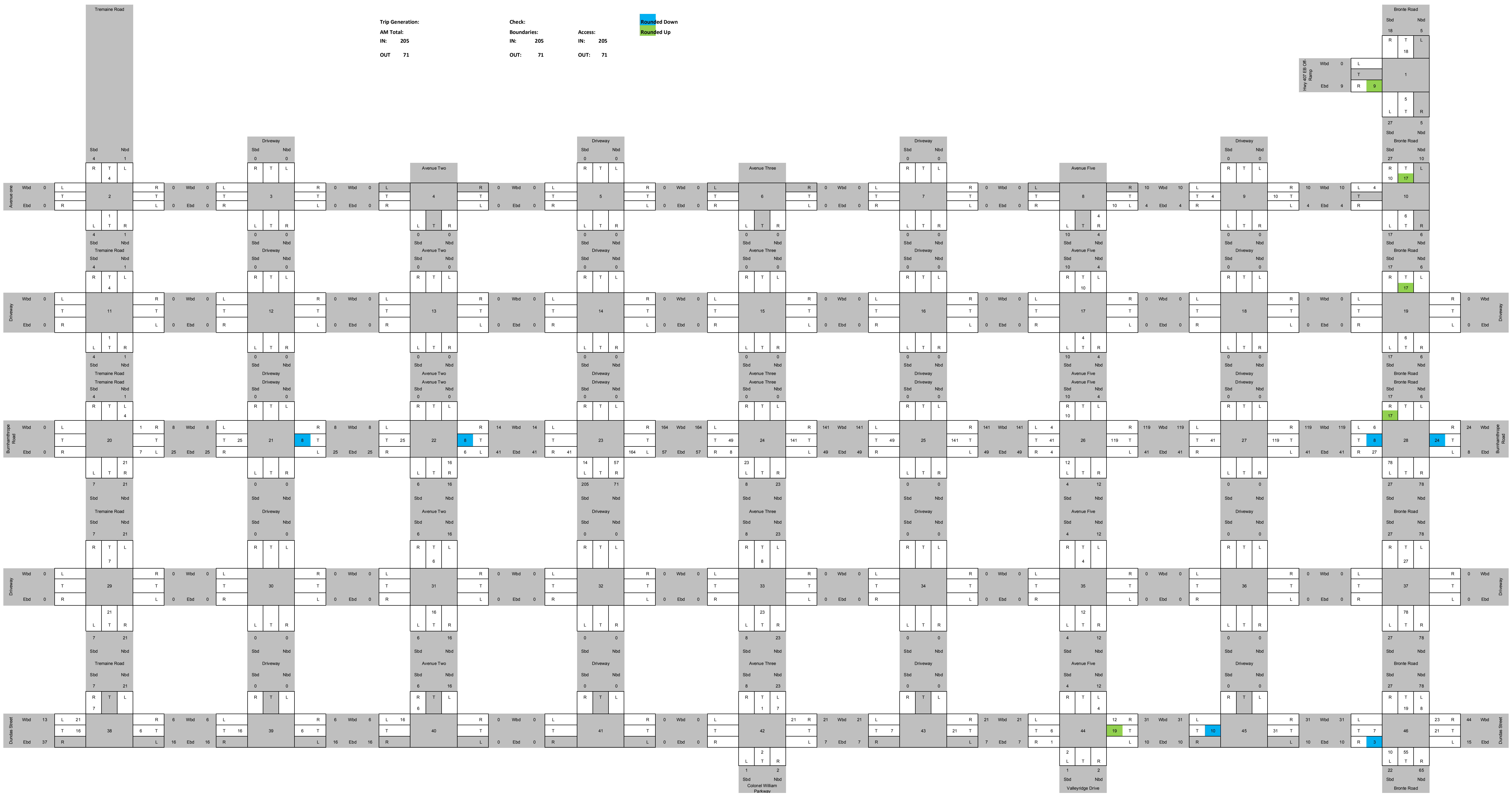


Figure X
Phase 2A and 2 Trip Assignment - Block Group 2&4 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

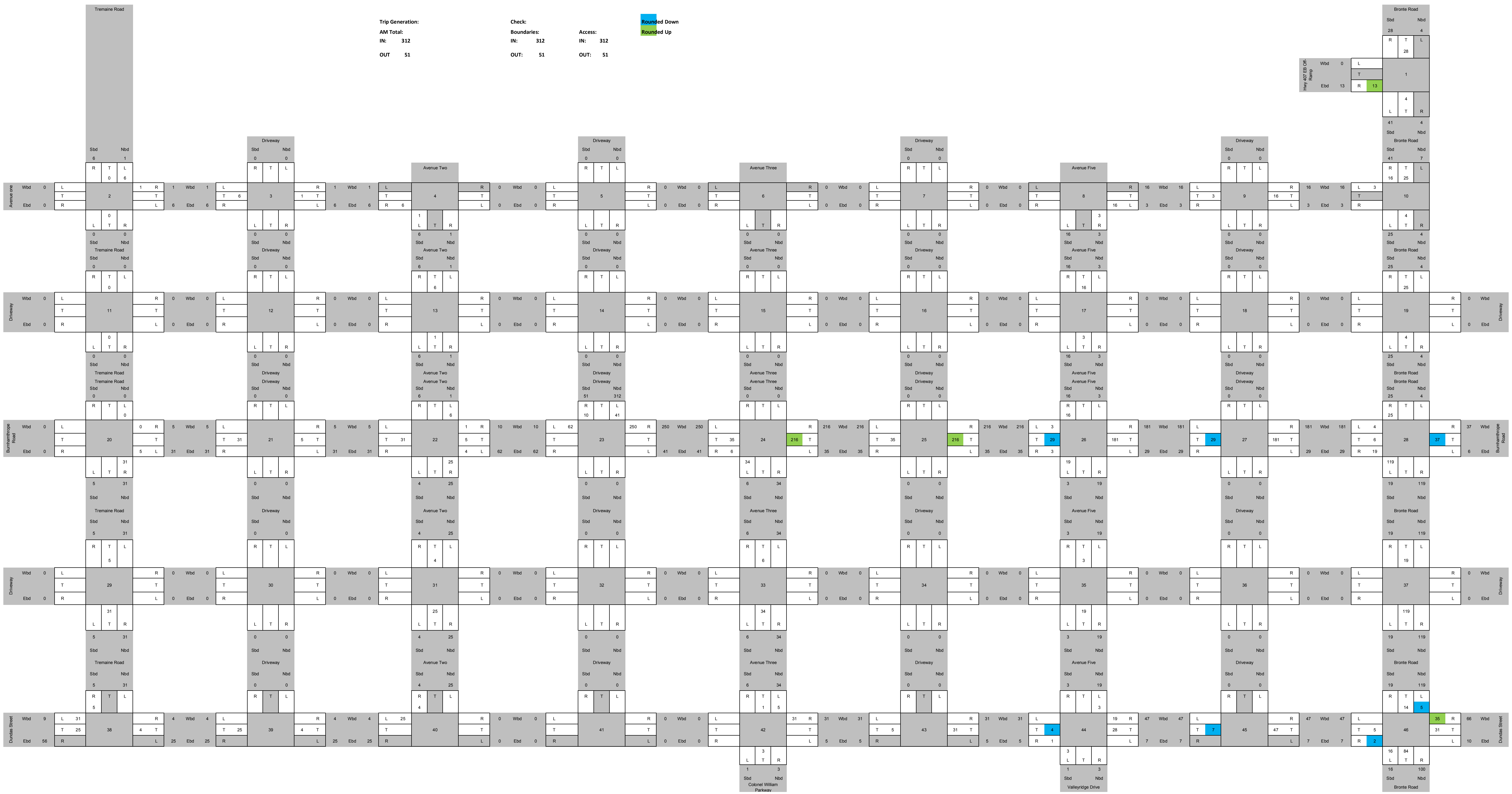
14-00022_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 312
OUT 51

Check:
Boundaries:
IN: 312
OUT: 51

Access:
IN: 312
OUT: 51

Rounded Down
Rounded Up



Scale: NTS

Figure X
Phase 2A Trip Assignment - Block Group 3&5 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
AM Total:
IN: 312
OUT 51

Check:
Boundaries:
IN: 312
OUT: 51

Access:
IN: 312
OUT: 51

Rounded Down
Rounded Up

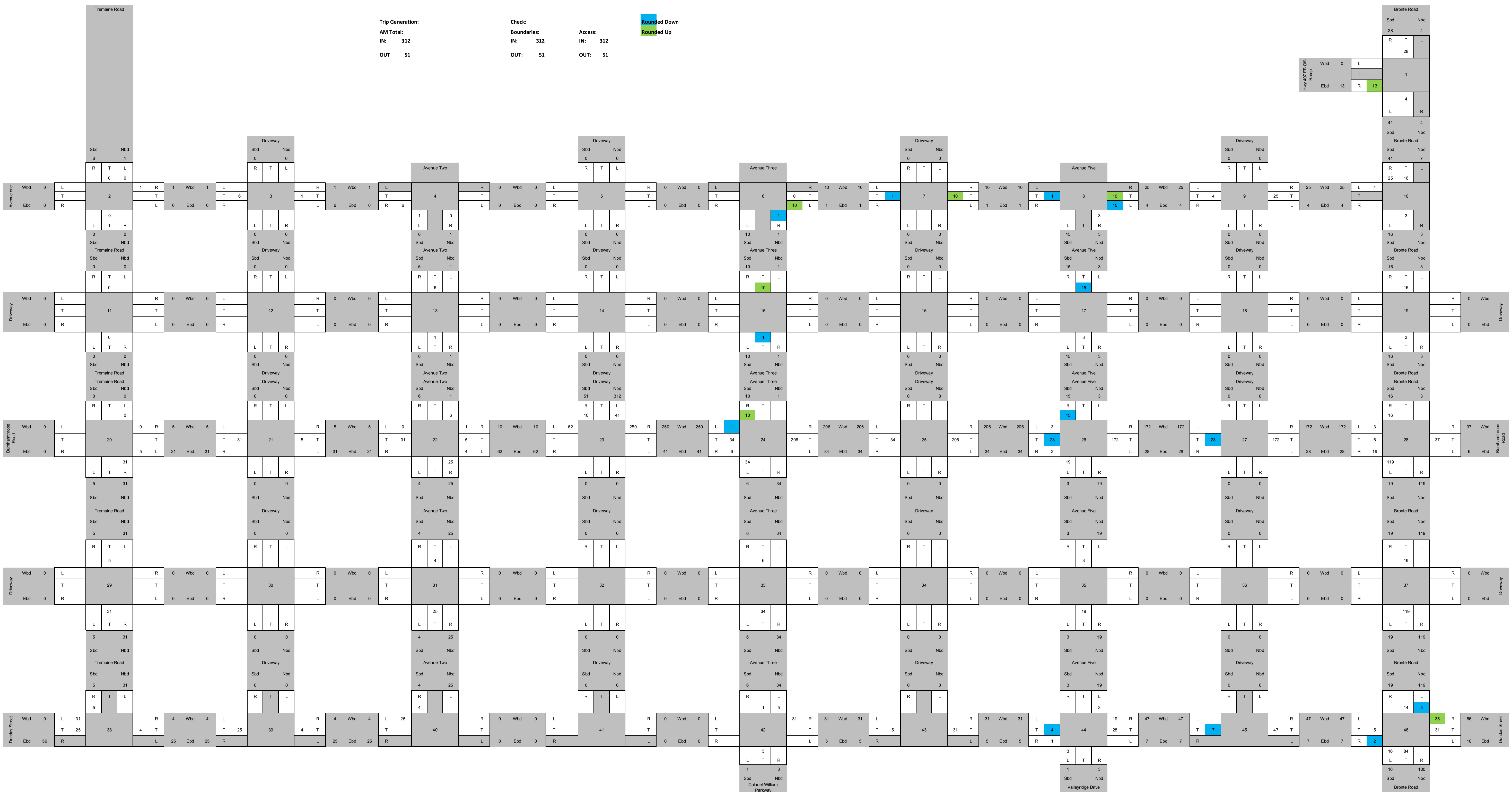


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Figure X
Phase 2 Trip Assignment - Block Group 3&5 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 42
OUT 8

Check:
Boundaries:
IN: 42
OUT: 8

Access:
IN: 42
OUT: 8

Rounded Down
Rounded Up

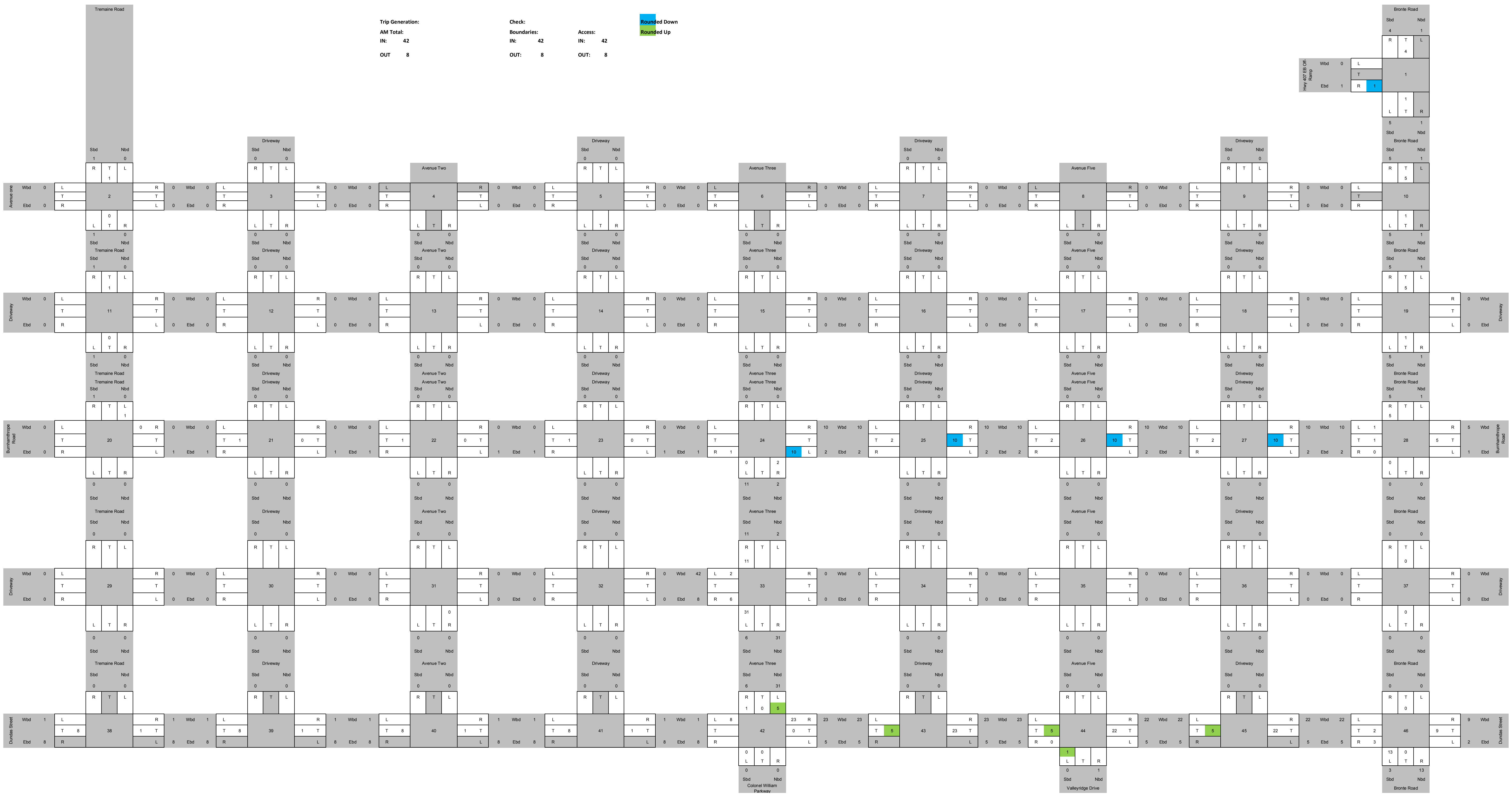


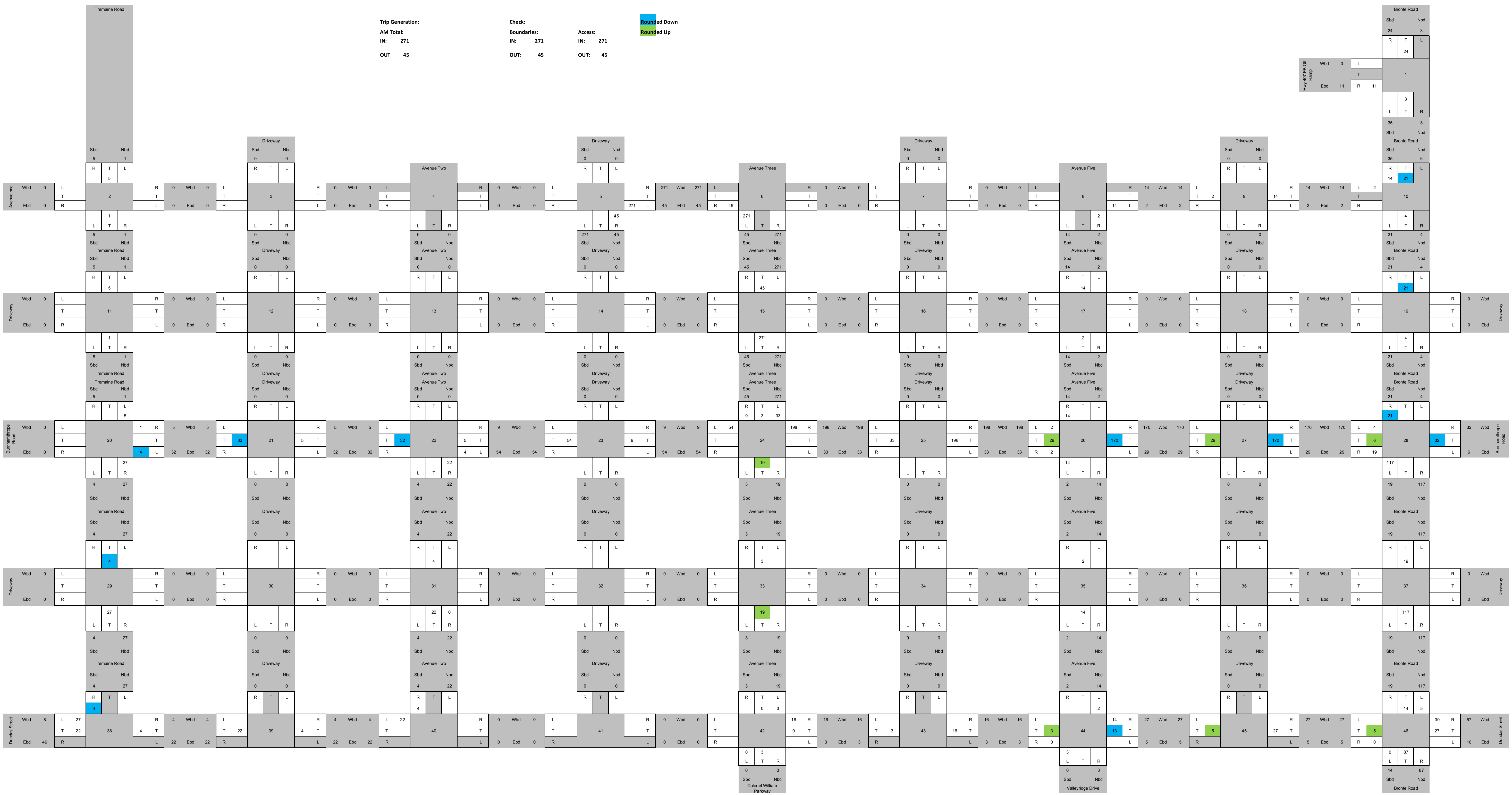
Figure X
Phase 2A and 2 Trip Assignment - Block Group 6 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
AM Total:
IN: 271
OUT 45

Check:
Boundaries:
IN: 271
OUT: 45

Access:
IN: 271
OUT: 45

Rounded Down
Rounded Up



Scale: NTS

Figure X
Phase 2A Trip Assignment - Block Group 7 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-05022_Traffic Model AM_20181207.xlsx

Trip Generation:
AM Total:
IN: 635
OUT 86

Check:
Boundaries:
IN: 635
OUT: 86

Access:
IN: 635
OUT: 86

Rounded Down
Rounded Up

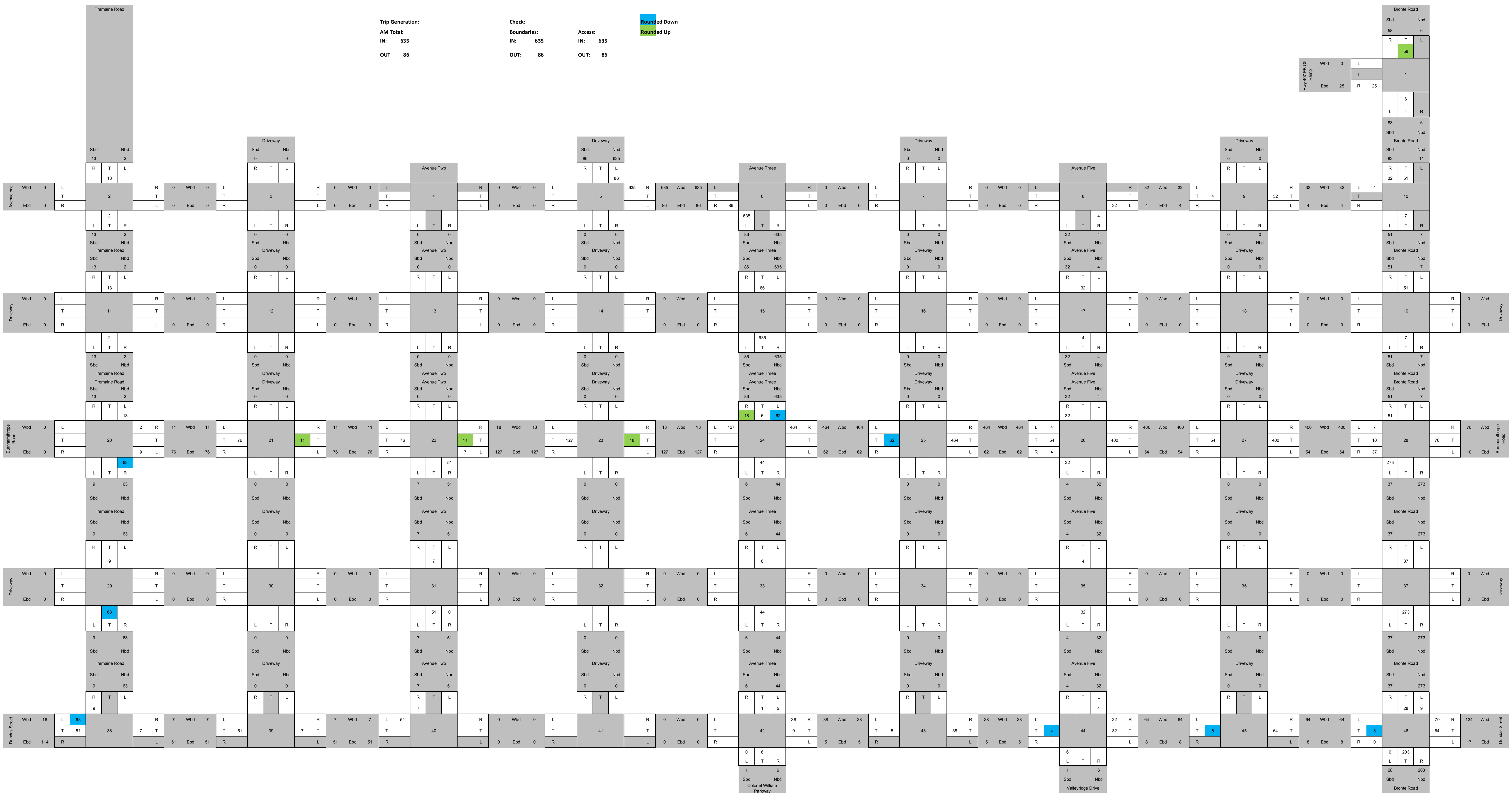


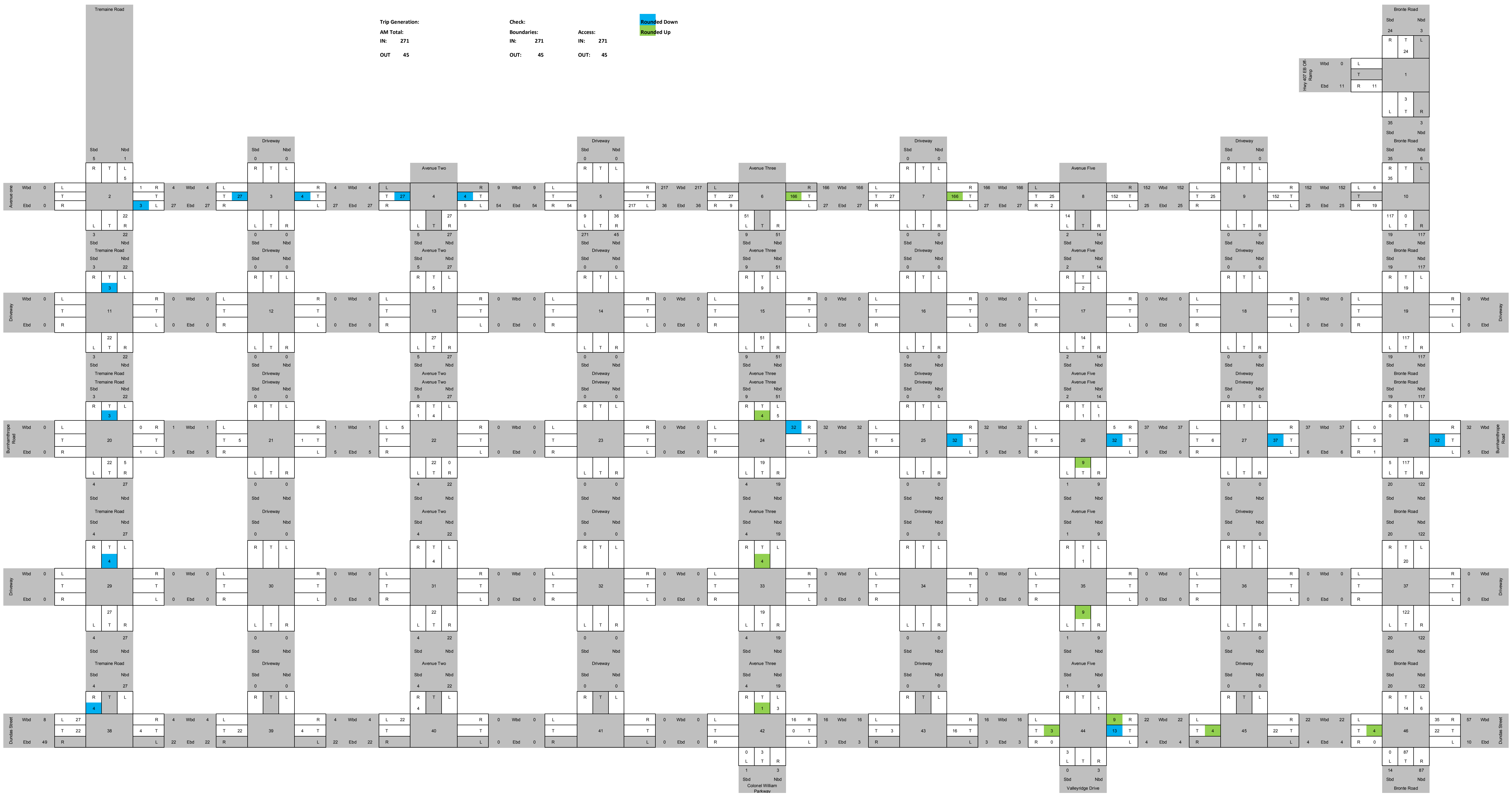
Figure X
Phase 2A Trip Assignment - Block Group 8 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
AM Total:
IN: 271
OUT 45

Check:
Boundaries:
IN: 271
OUT: 45

Access:
IN: 271
OUT: 45

Rounded Down
Rounded Up



Scale: NTS

Figure X
Phase 2 Trip Assignment - Block Group 7 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00022_Traffic Model AM_20161207.xlsx

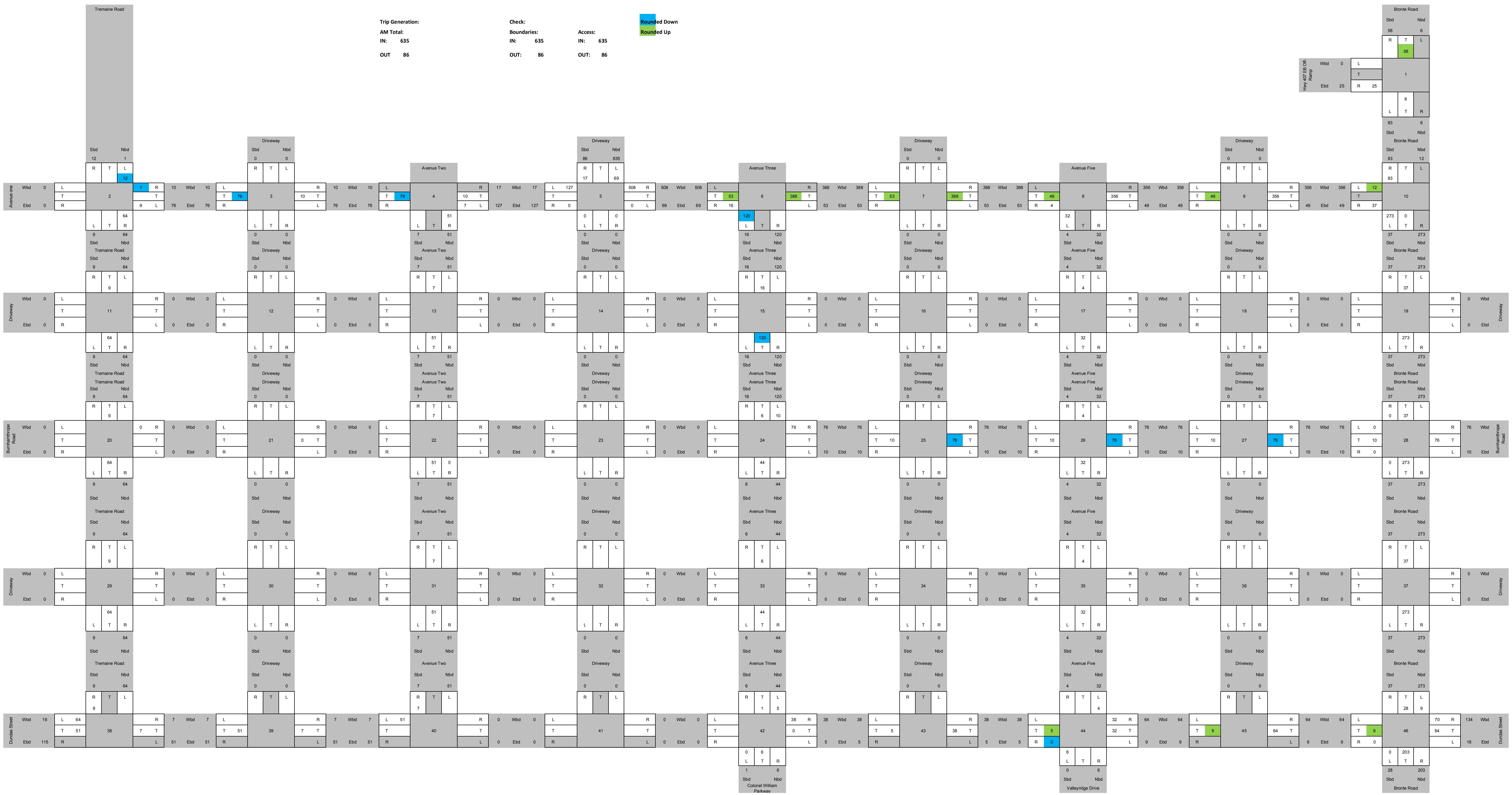


Figure X
Phase 2 Trip Assignment - Block Group 8 - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
AM Total:
IN: 1697
OUT 320

Check:
Boundaries:
IN: 1697
OUT: 320

Access:
IN: 1697
OUT: 320

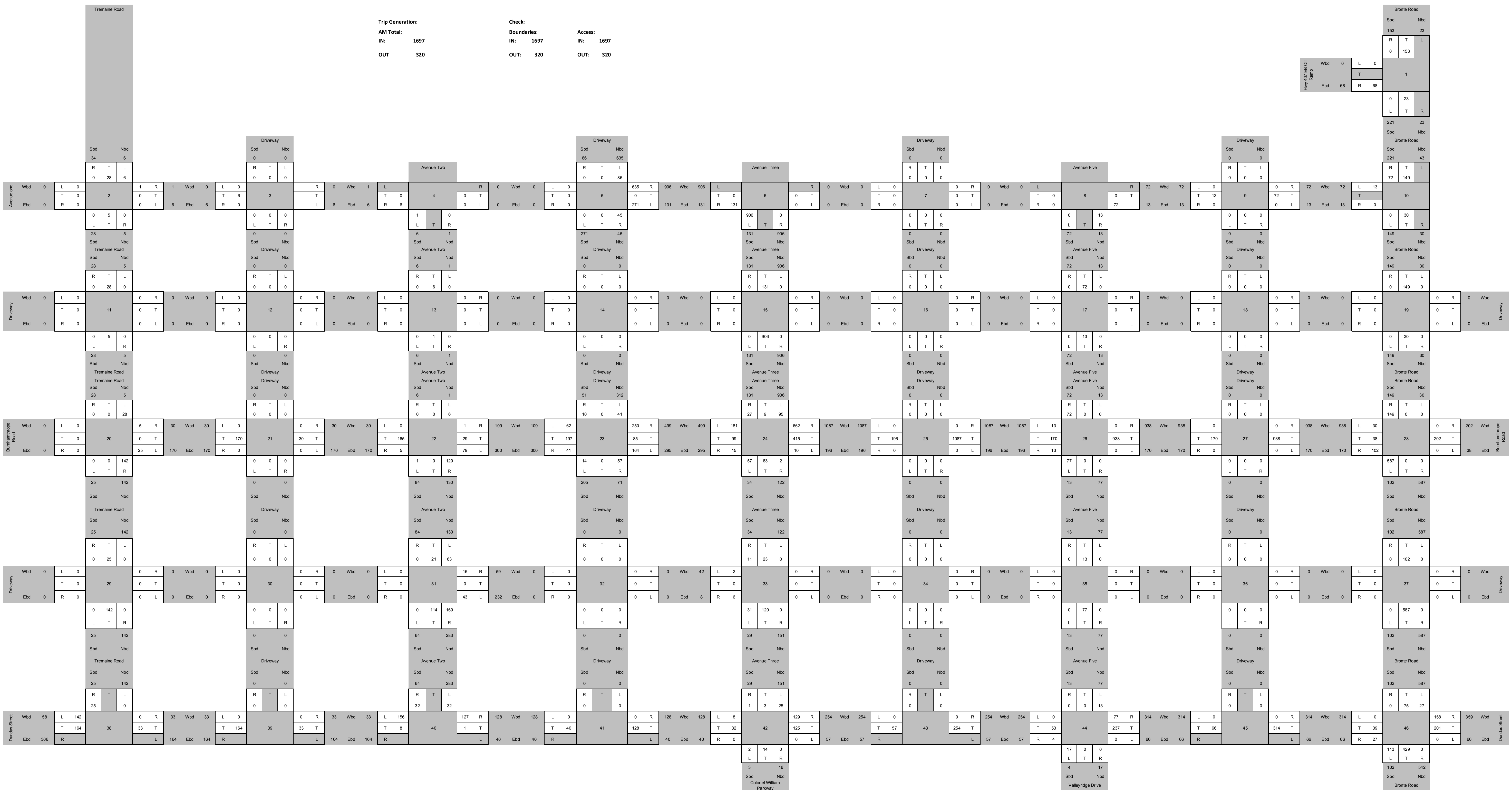


Figure X
Phase 2A Site Traffic - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00022_Traffic Model AM_20181207.xlsx

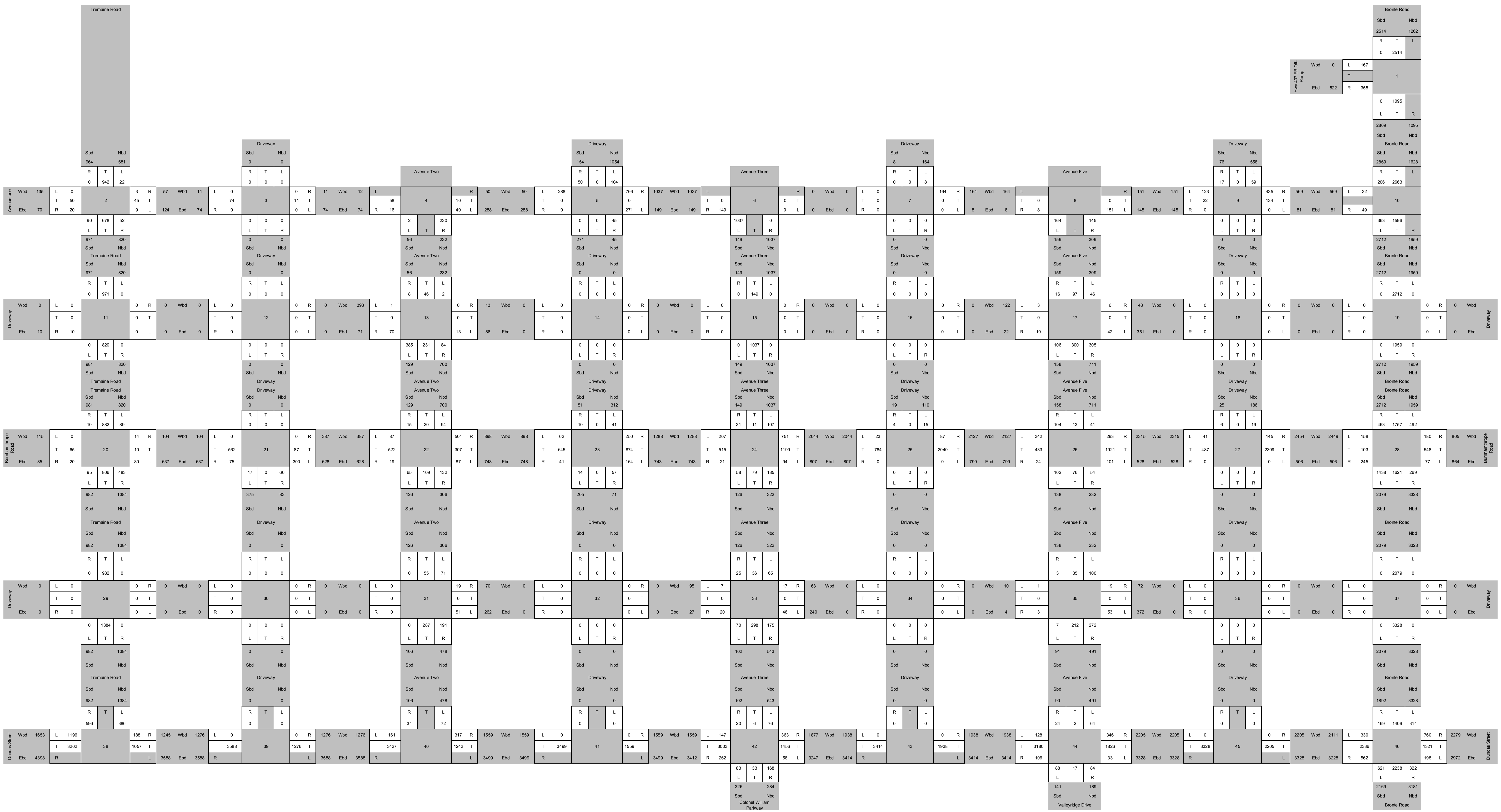


Figure X
Phase 2A (2031) Future Total Traffic Volumes - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

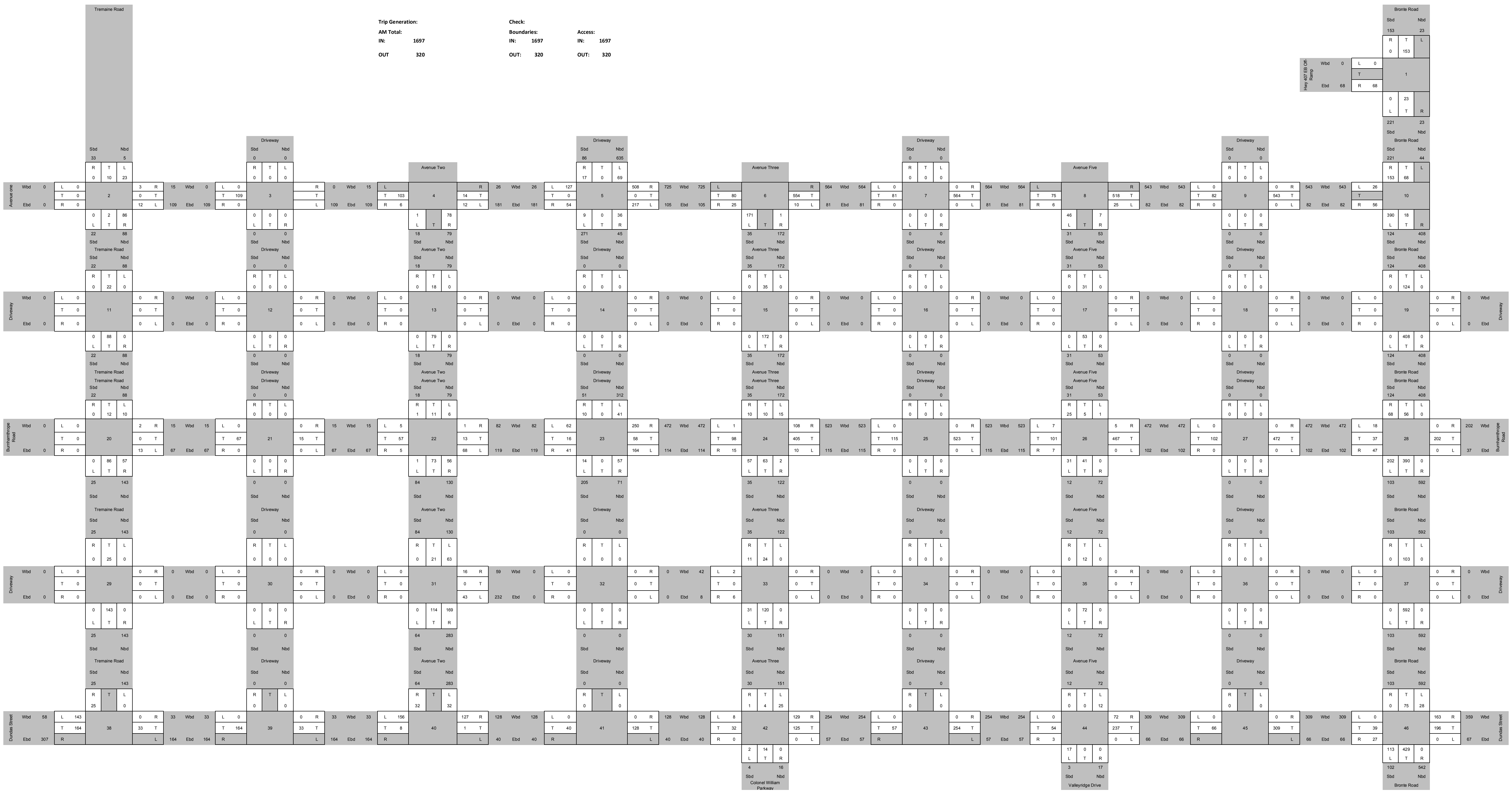


Figure X
Phase 2 Site Traffic - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09022_Traffic Model AM_20161207.xlsx

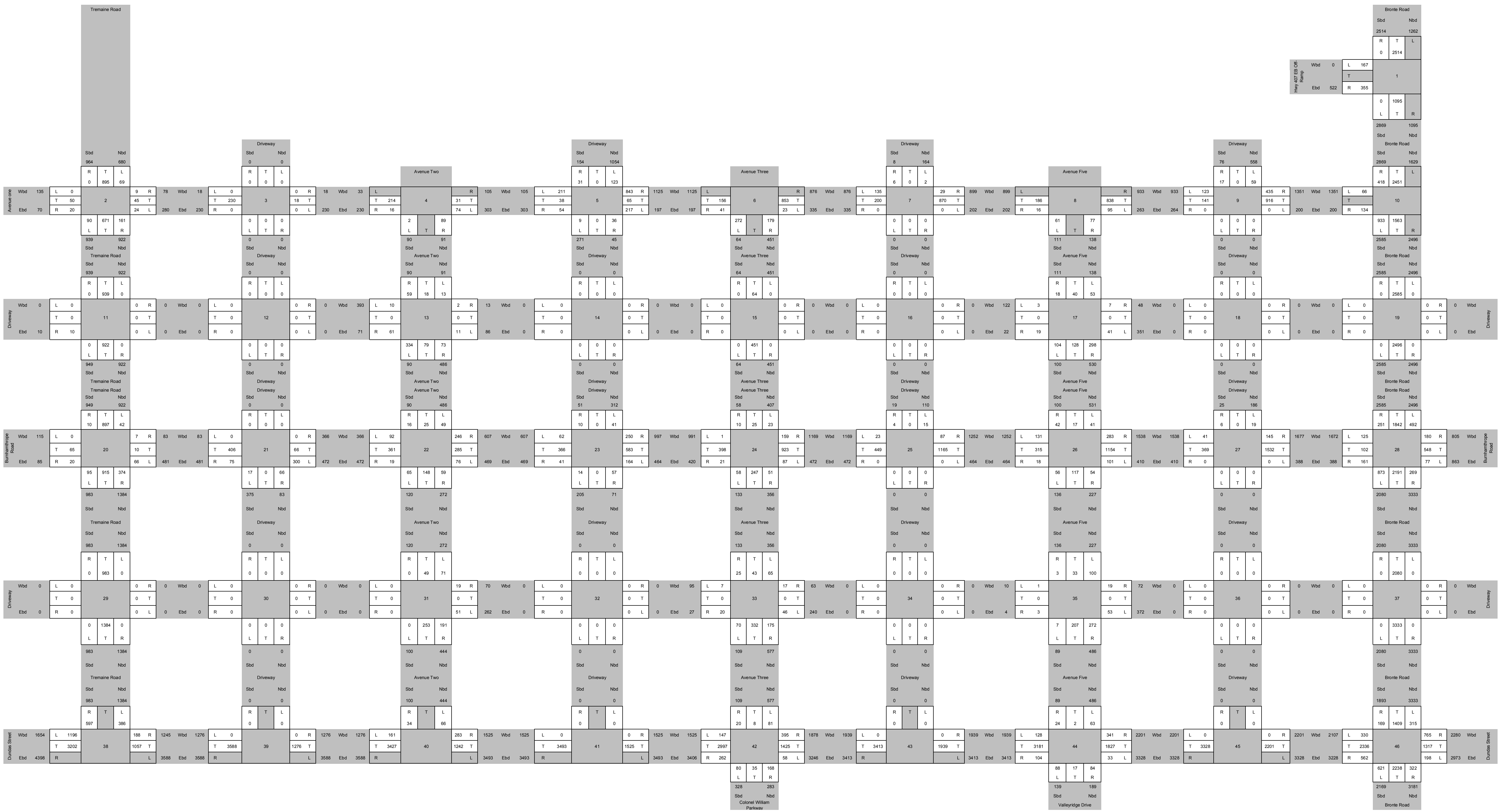


Figure X
Phase 2 (2031) Future Total Traffic Volumes - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

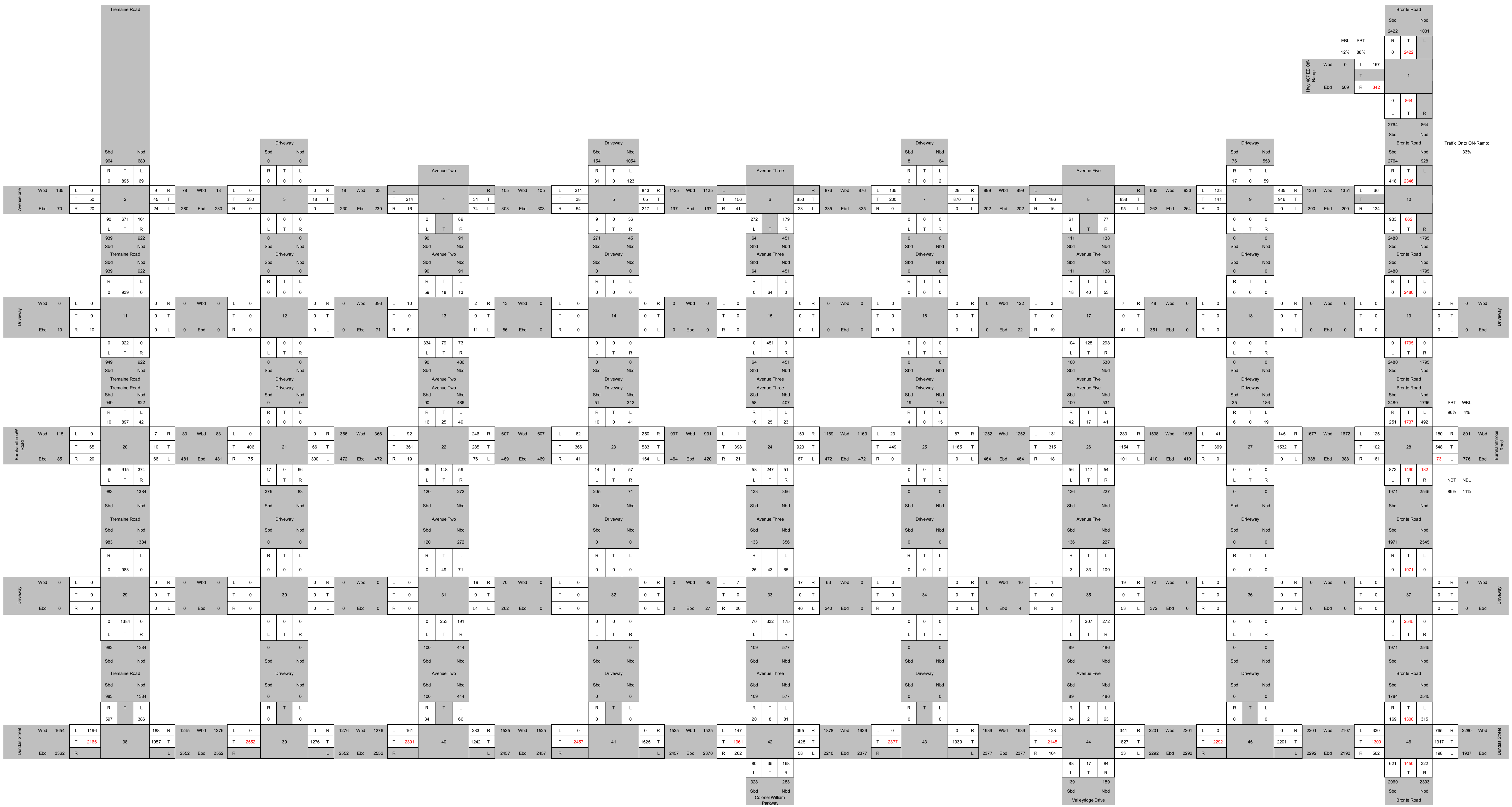


Figure X
Phase 2 (2031) Future Total Traffic Volumes with Sensitivity Adjustment - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Modified Volumes

14-00022_Traffic Model AM_20161207.xlsx

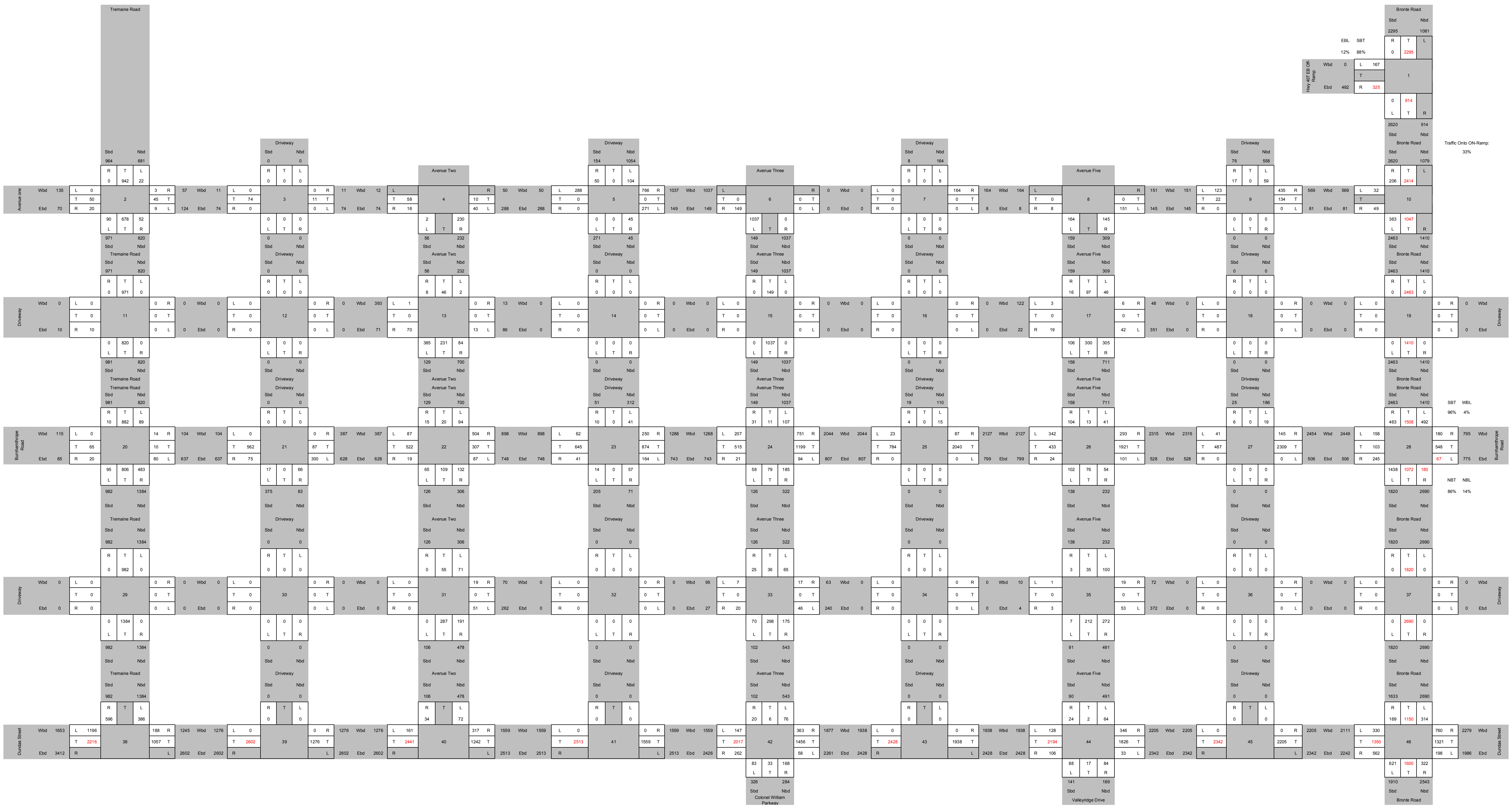


Figure X
Phase 2A (2031) Future Total Traffic Volumes with Sensitivity Adjustment - Weekday AM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Modified Volumes

APPENDIX

D-2 PM PEAK HOUR COMPONENTS

APPENDIX

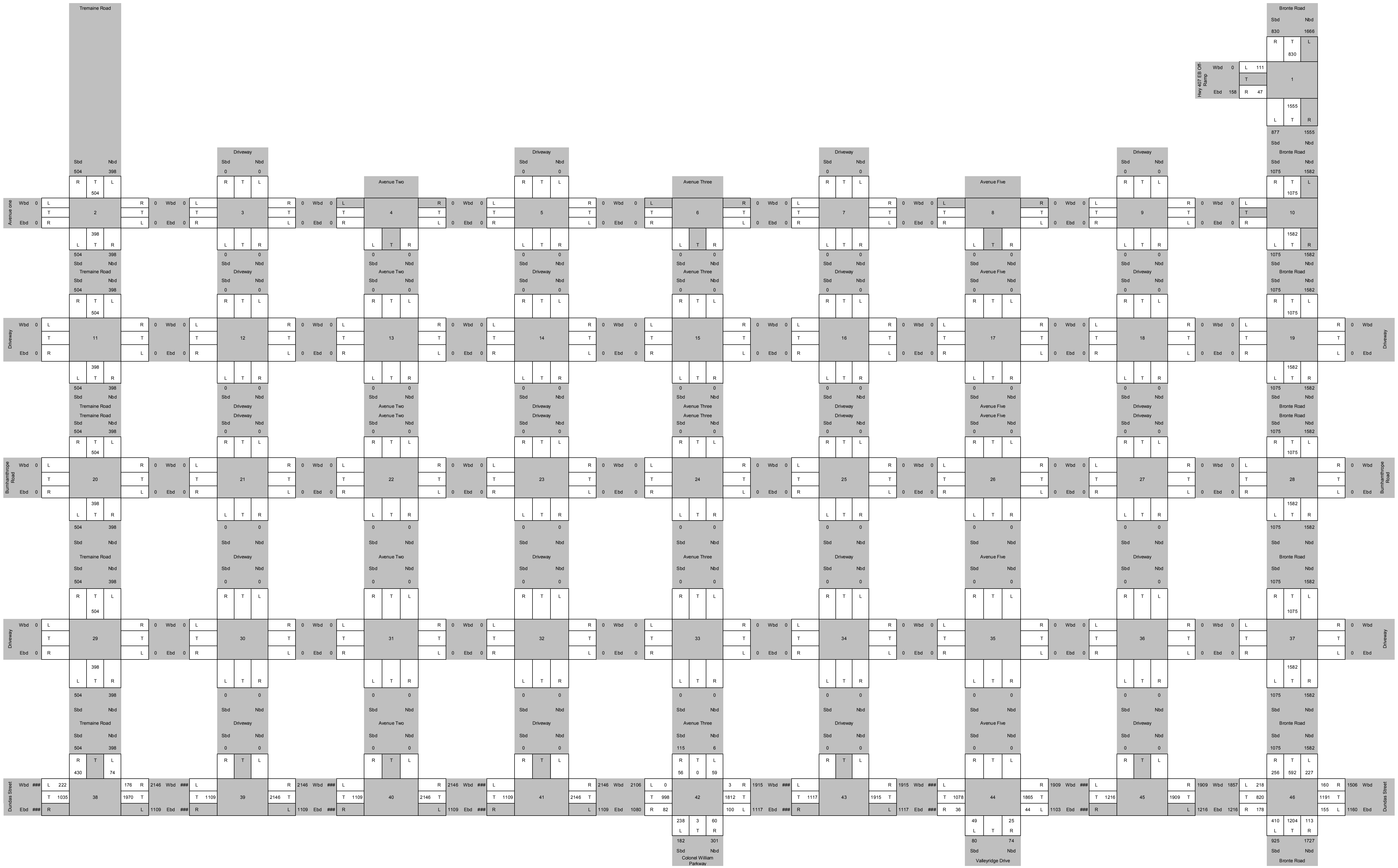


Figure X
2018 Existing Traffic Volumes - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

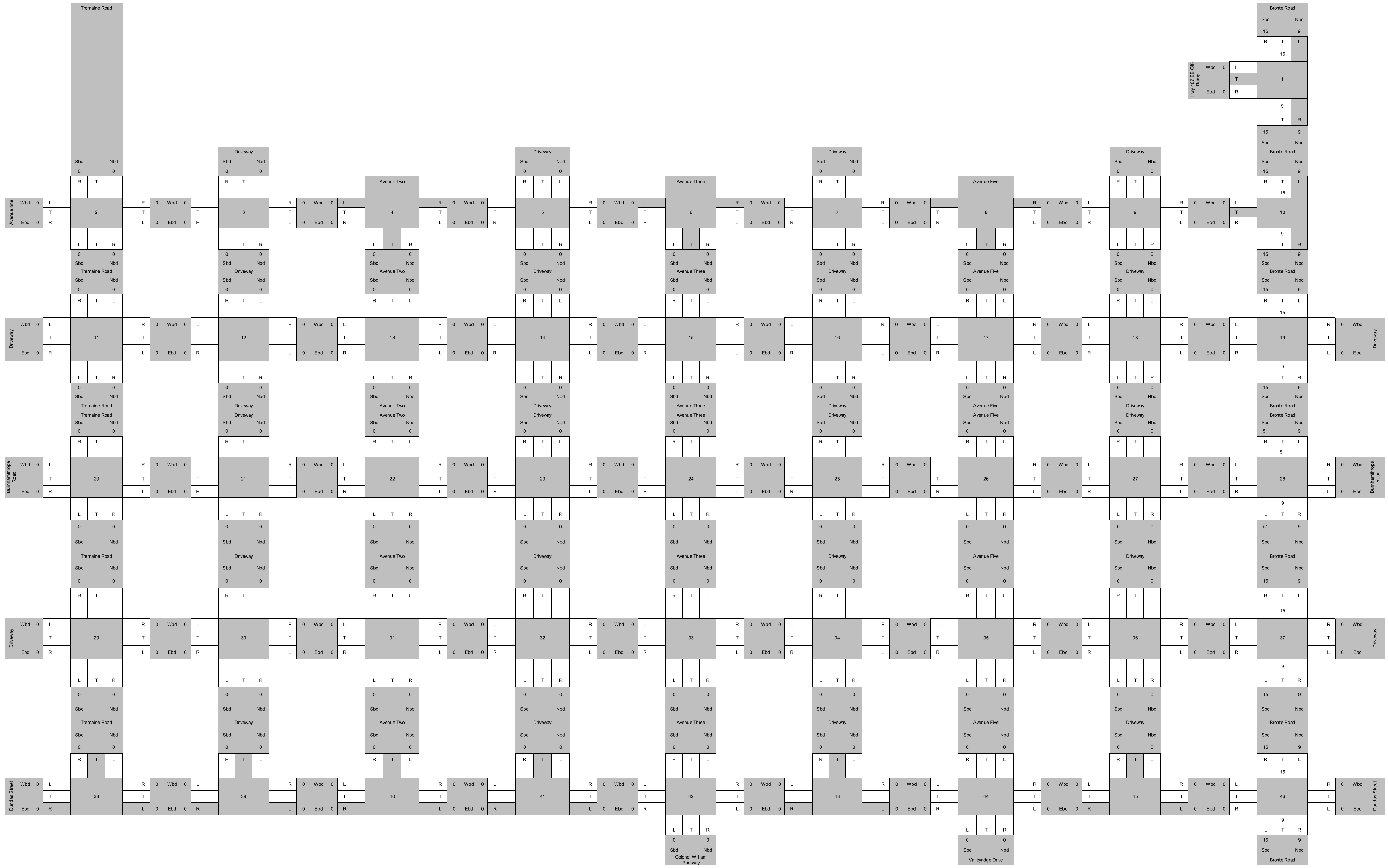


Figure X
2390 Khalsa Gate Background Development - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

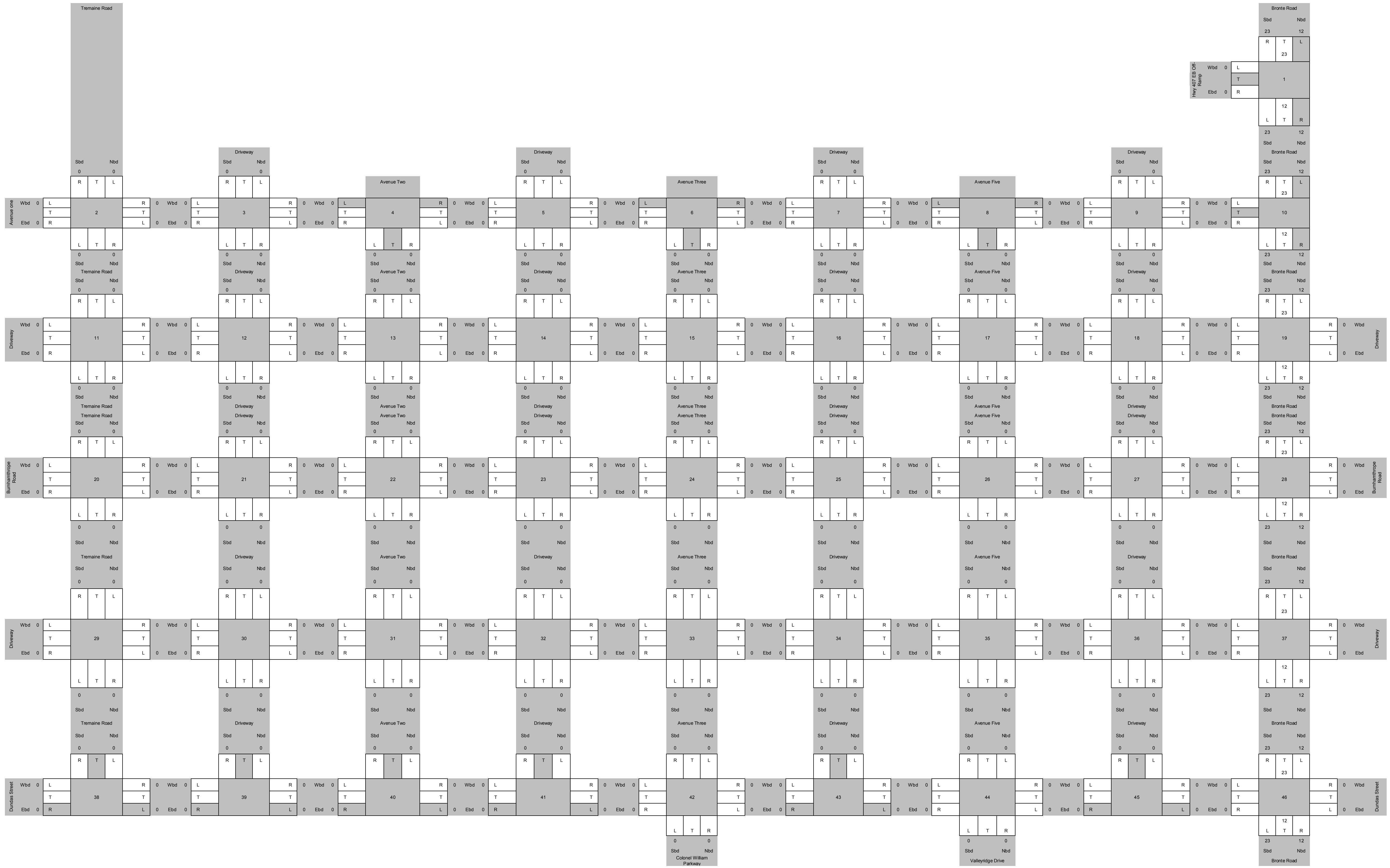


Figure X
2385 & 2389 Khalsa Gate Background Development - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

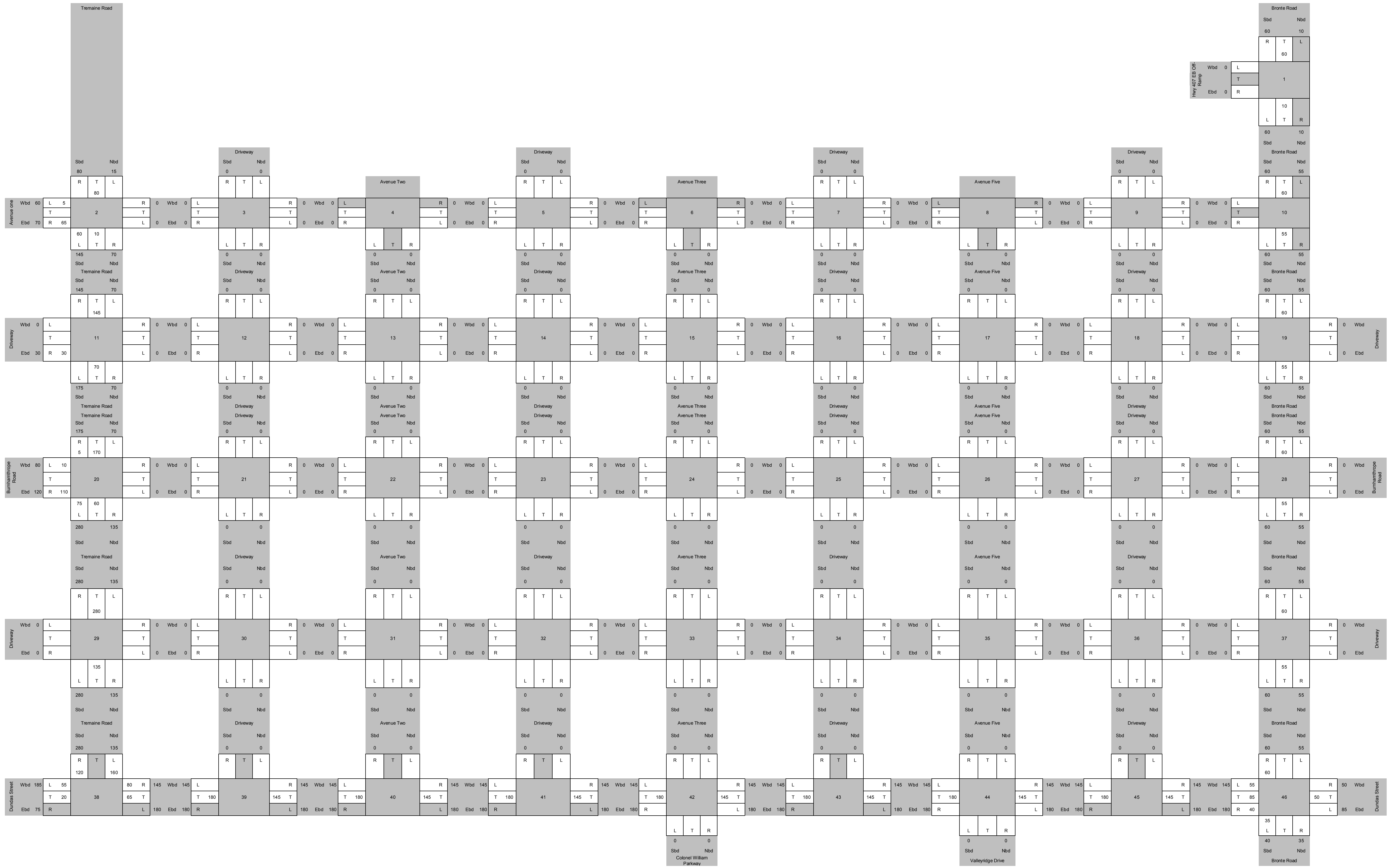
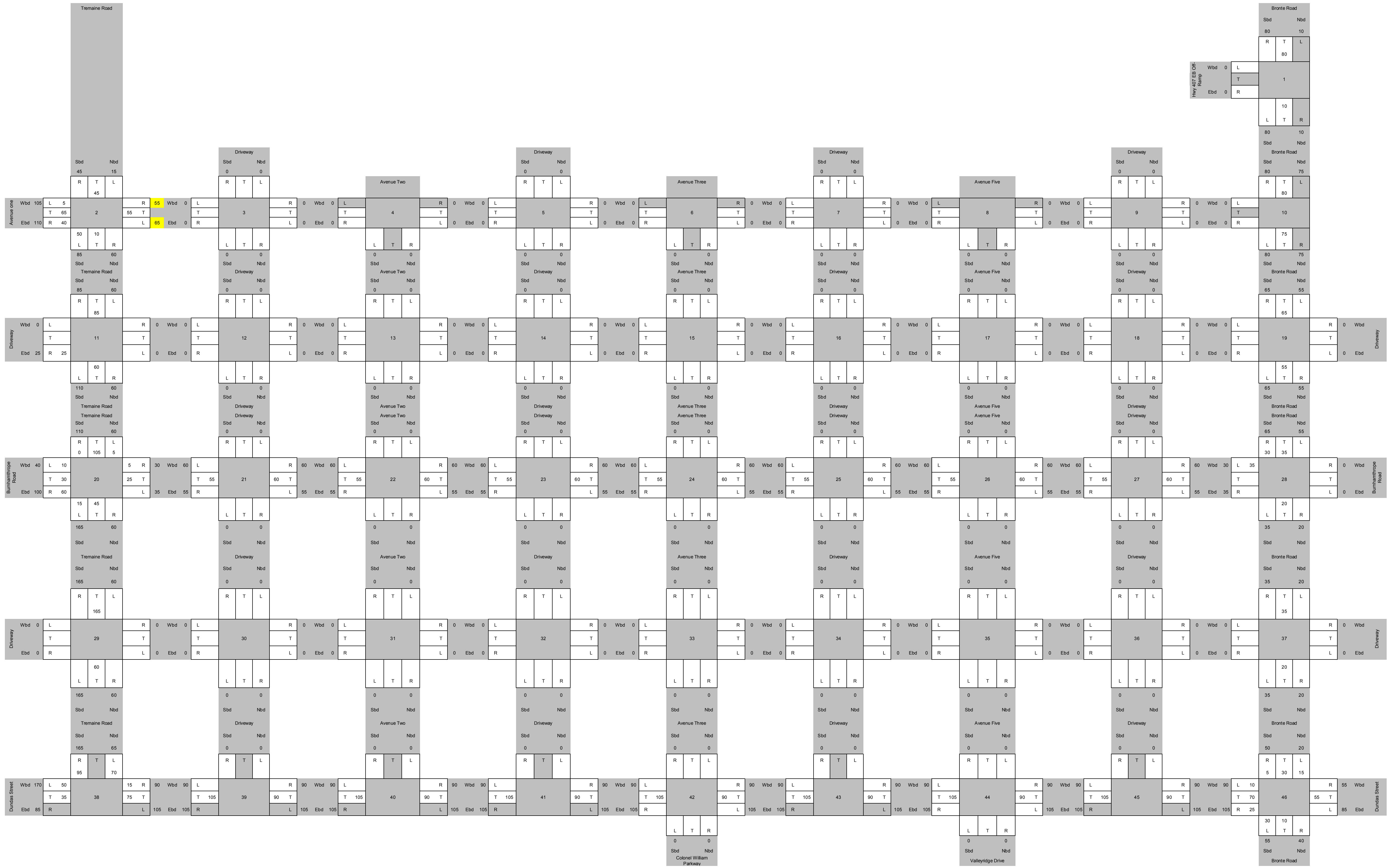


Figure X
Evergreen and Adjacent Lands Background Development - 2021 Horizon Year - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx



Scale: NTS

Figure X
Evergreen and Adjacent Lands Background Development - 2031 Horizon Year - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

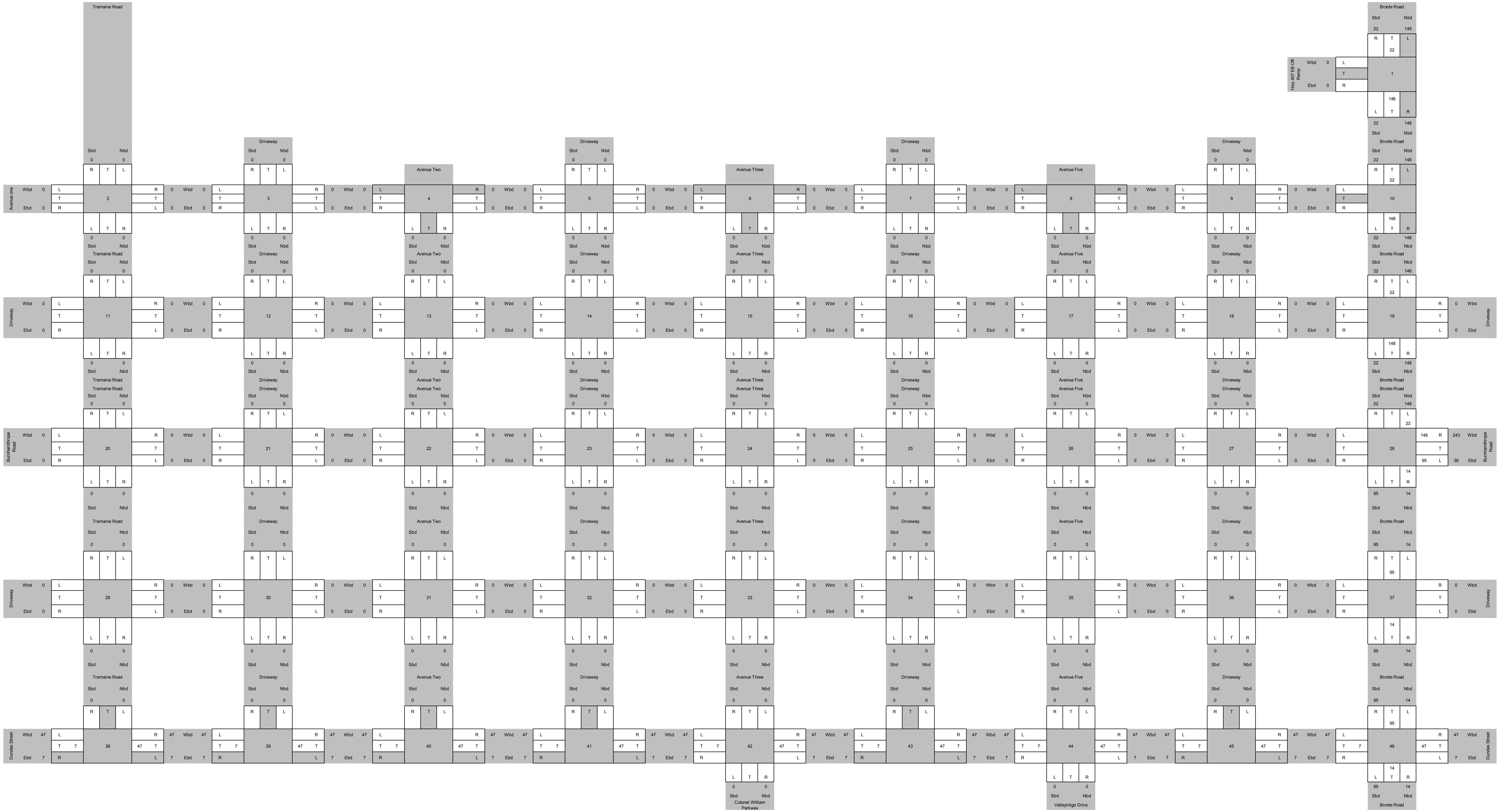


Figure X
Halton Region Courthouse Background Development 2021 Horizon Year - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

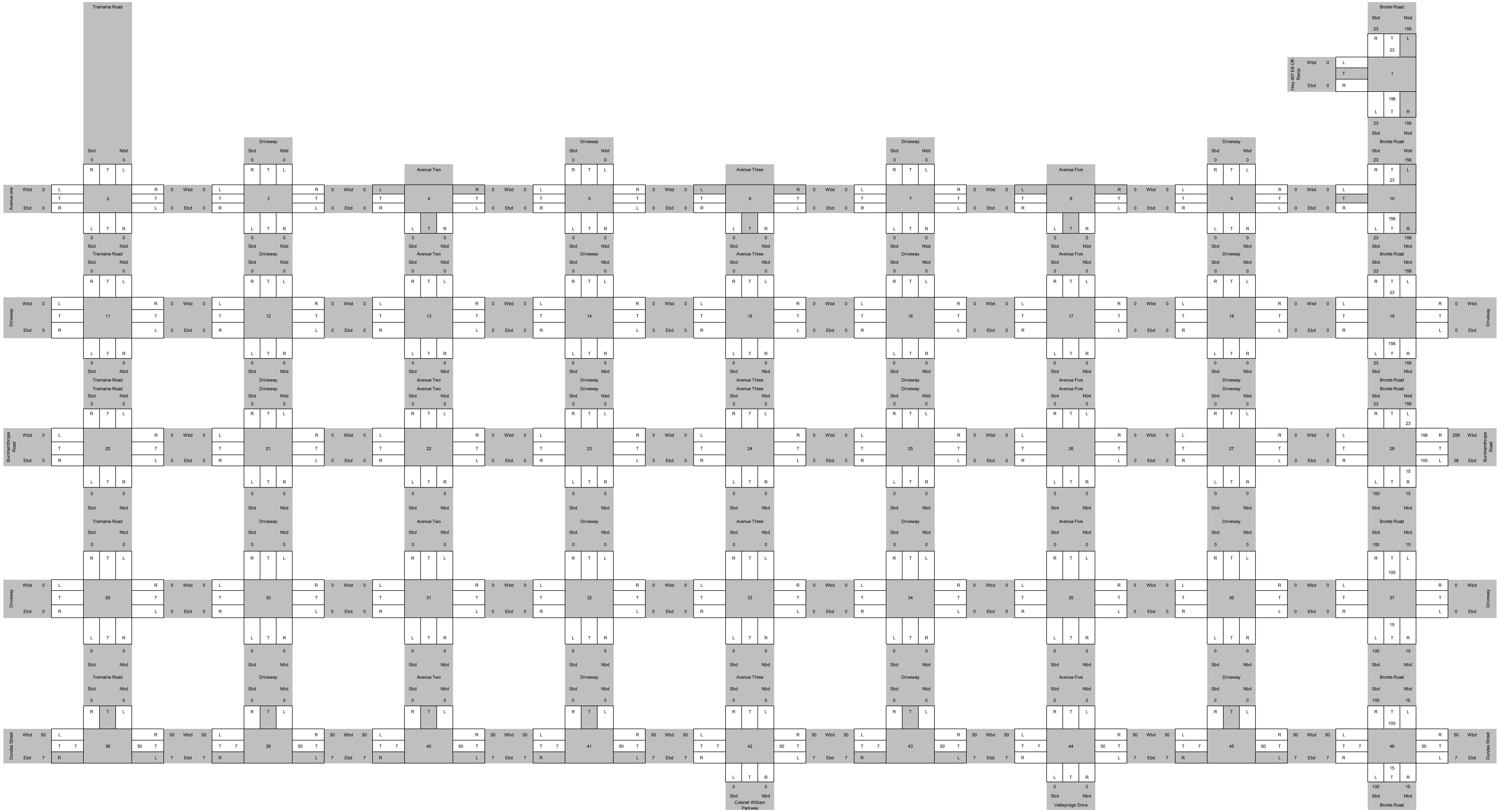


Figure X
Halton Region Courthouse Background Development 2031 Horizon Year - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

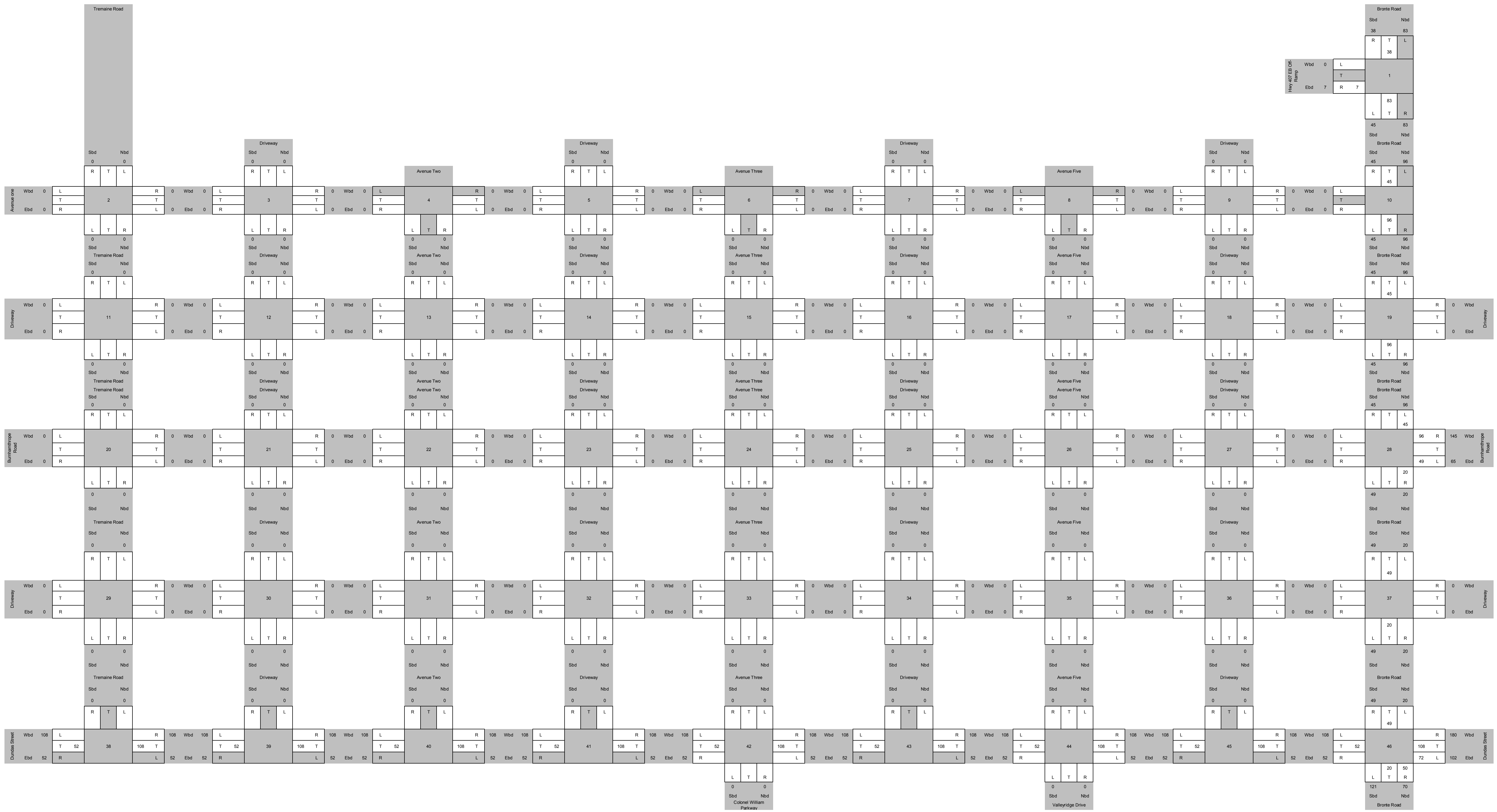


Figure X
Oakville Green Life Sciences and Technology District (ORC Parcel 1) Background Development 2021 Horizon Year - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00022_Traffic Model PM_20161207 (with proper Phase names for Appendix).dsx

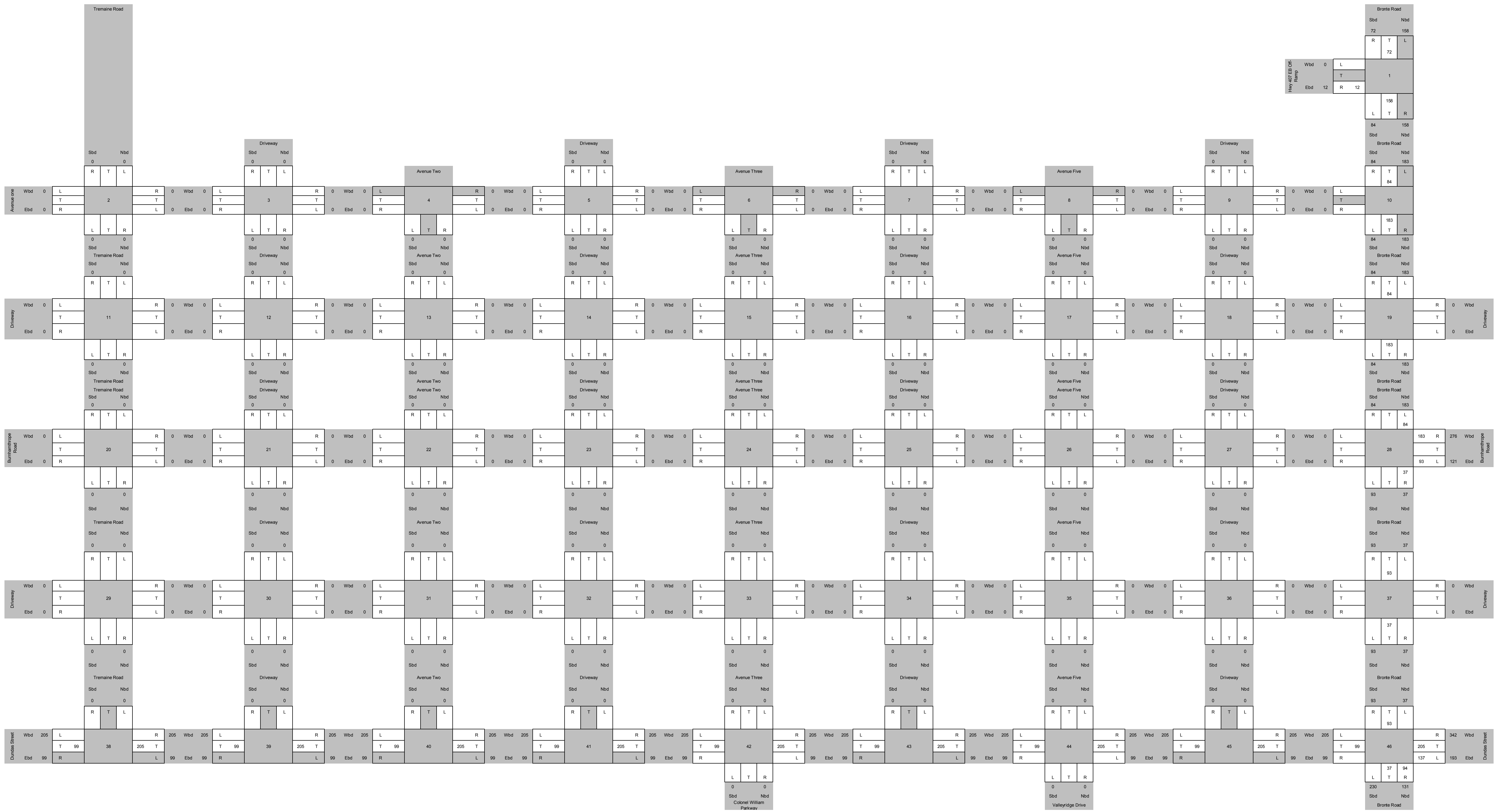


Figure X
Oakville Green Life Sciences and Technology District (ORC Parcel 1) Background Development 2031 Horizon Year - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

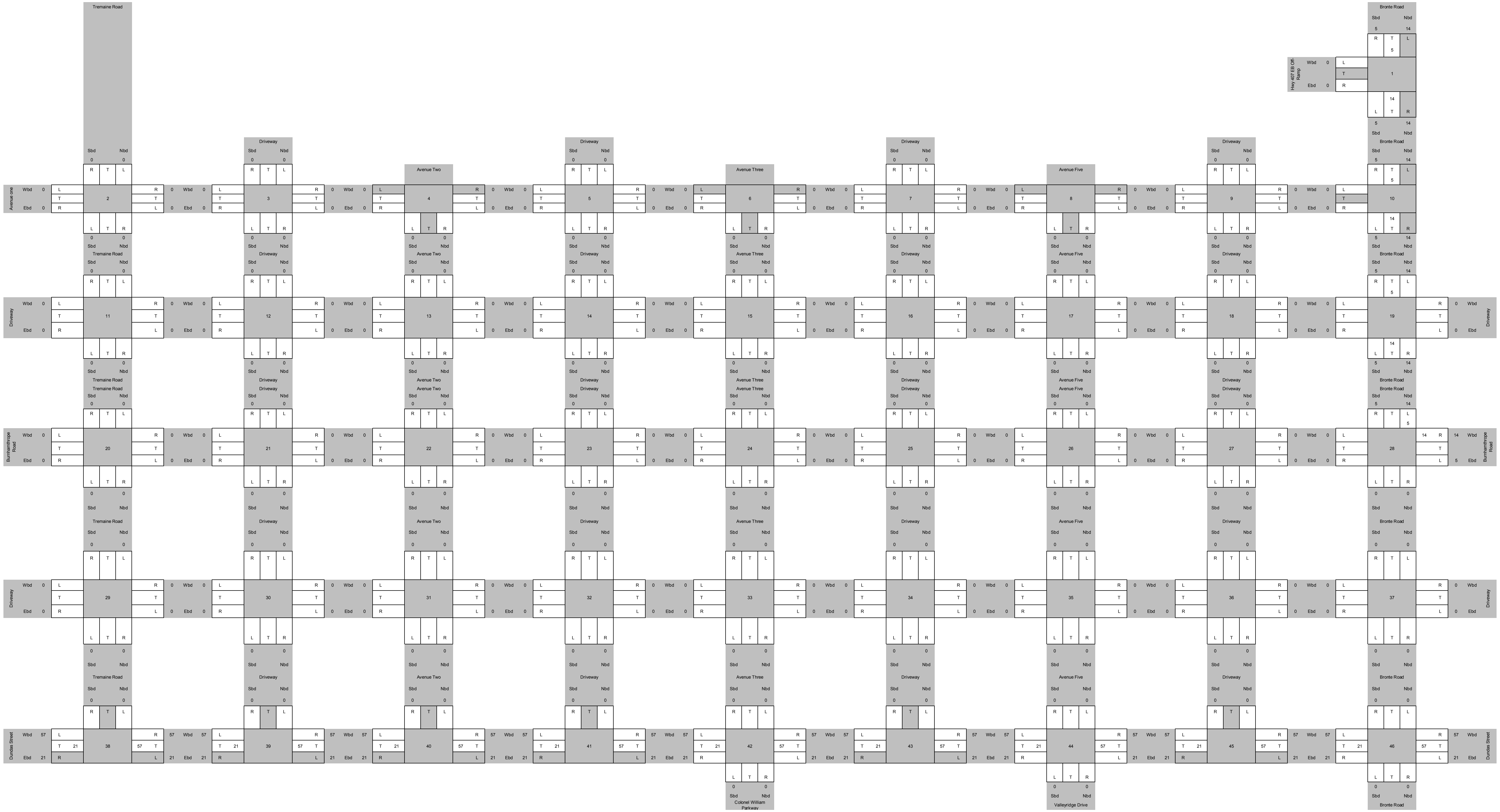


Figure X
ErinOak Kids Centre Background Development - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

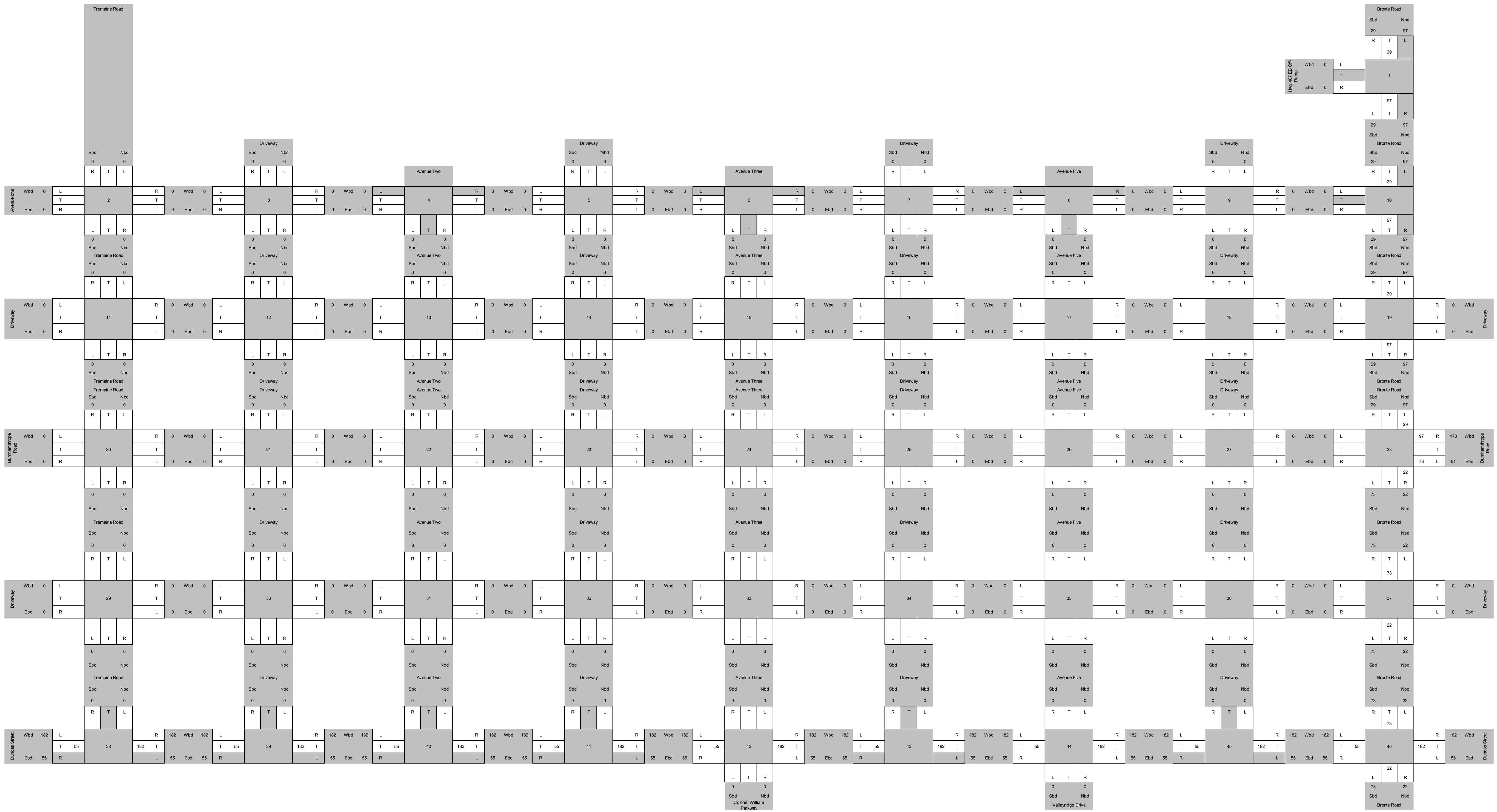


Figure X
ORC Lands Parcels 2 & 6-10 Background Development 2021 Horizon Year - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

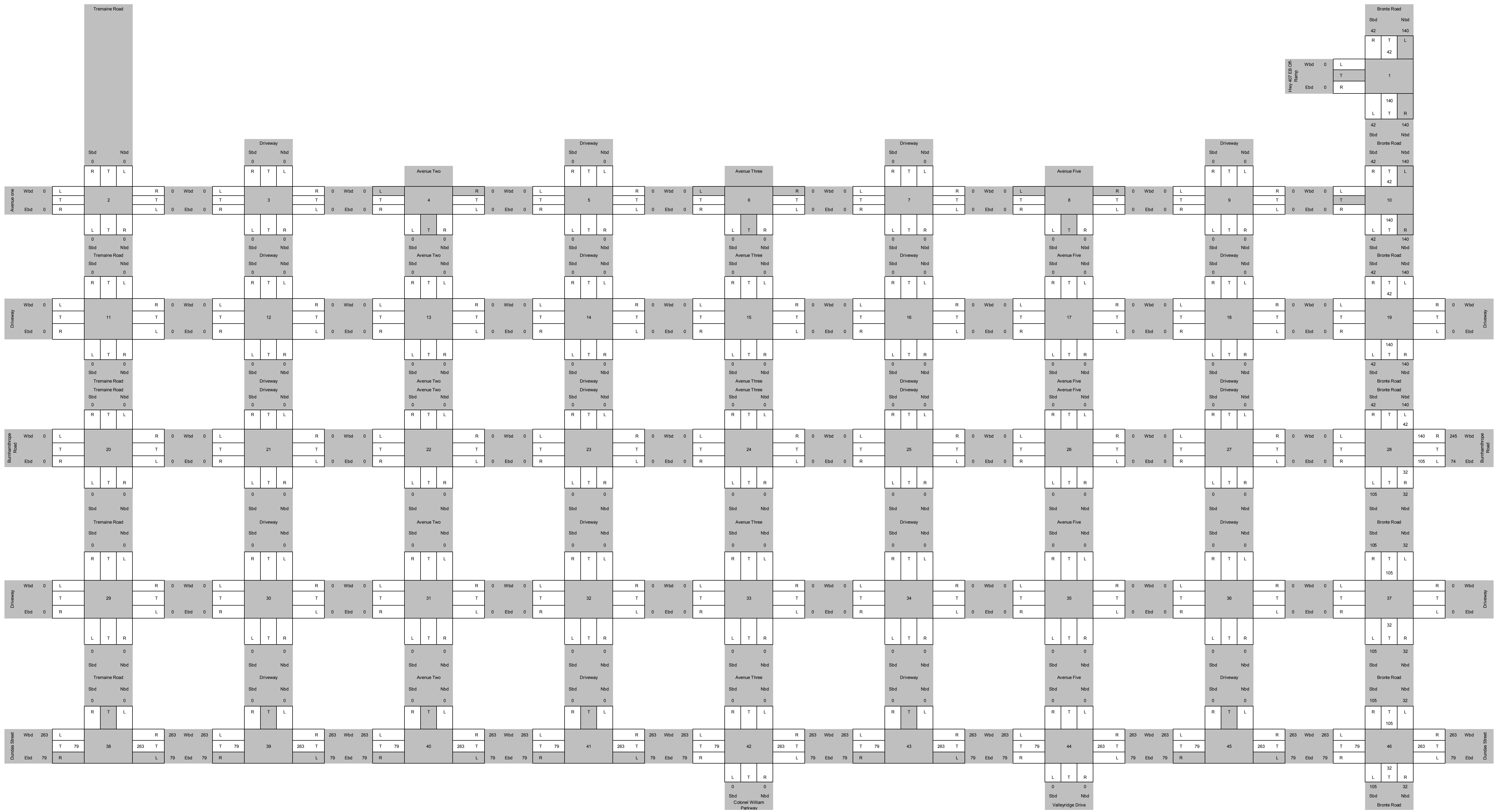


Figure X
ORC Lands Parcels 2 & 4-12 Background Development 2031 Horizon Year - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00022_Traffic Model PM_20161207 (with proper Phase names for Appendix).xlsx

Surrounding 407 Lands Trip Generation per Group

Trip Assignment Notes:

The trip assignment for the 407 employments lands (site and surrounding 407 background developments) have been distributed along the driveways based on the Blocks layout.
The trip generation for each block is based on a percentage of the overall trip generation (per land use) for the site or surrounding background 407 lands, with the percentage of the trip generation derived based on the percentage of the block GFA compared to the overall GFA used for the trip gen.

407 Background Lands Trip Gen per block sharing a driveway (to be applied to 2031 horizon year):

Group 9	Group 10	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20	Group 21	Group 22
C3-4	C1	G2-1	G3-1	G1-1	C4-3	C6	G7	C7	C8	G8	G9	P5	P4
	P8	G2-2	C2-1	G1-2		G6			G10				
	G3	G2-3		P1					P6				

Percentage of Trip Gen for these blocks: Rounded up to match overall trip gen values

Group 9

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C3-4	Service Area Employment	Shopping Centre	23,130	8%	15	9	24	39	45	84
		Shopping Centre Pass-By	23,130	8%	0	0	0	4	4	8
		General Office	12,455	8%	15	2	17	2	10	12
Total Primary					**30**	**11**	**41**	**41**	**55**	**96**
Total Pass-By					**0**	**0**	**0**	**4**	**4**	**8**

Group 10

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C1	Service Area Employment	Shopping Centre	85,875	29%	54	33	87	145	165	310
		Shopping Centre Pass-By	85,875	29%	0	0	0	15	15	30
		General Office	46,241	29%	55	8	63	7	40	47
P8	Light Employment	General Office	150,157	9%	133	19	152	26	120	146
G3	General Employment	Business Park	138,122	10%	133	23	156	35	100	135
Total Primary					**375**	**83**	**458**	**213**	**425**	**638**
Total Pass-By					**0**	**0**	**0**	**15**	**15**	**30**

Group 11

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G2-1	General Employment	Business Park	163,956	12%	157	29	186	41	119	160
G2-2	General Employment	Business Park	123,656	9%	119	22	141	31	90	121
G2-3	General Employment	Business Park	121,934	9%	117	20	137	31	87	118
Total					**393**	**71**	**464**	**103**	**296**	**399**

Group 12

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C2-1	Light Employment	General Office	33,906	2%	30	4	34	6	27	33
G3-1	General Employment	Business Park	57,867	4%	56	9	65	15	41	56
Total					**86**	**13**	**99**	**21**	**68**	**89**

Group 13 **For Phase 2 - Broken Down Within the Excel Sheets as 13-1 (Block G1-1 & G1-2) and 13-2 (Block P1) as Block P1 would be across the river crossin**

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
P1	Light Employment	General Office	146,389	8%	131	18	149	26	118	144
G1-1	General Employment	Business Park	181,178	13%	174	30	204	46	130	176
G1-2	General Employment	Business Park	118,145	8%	114	20	134	30	86	116
Total					**419**	**68**	**487**	**102**	**334**	**436**

Group 14

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen			Block Trip Gen		
					Weekday AM Peak Hour			Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C4-3	Service Area Employment	Shopping Centre	41,475	14%	26	16	42	70	80	150
		Shopping Centre Pass-By	41,475	14%	0	0	0	7	7	14
		General Office	22,333	14%	27	3	30	4	19	23
Total Primary					**53**	**19**	**72**	**74**	**99**	**173**
Total Pass-By					**0**	**0**	**0**	**7**	**7**	**14**

Group 15

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C6	Service Area Employment	Shopping Centre	77,368	26%	49	30	79	130	150	280
		Shopping Centre Pass-By	77,368	26%	0	0	0	13	13	26
		General Office	41,660	26%	49	7	56	7	35	42
G6	General Employment	Business Park	147,767	11%	142	26	168	38	107	145
Total					**240**	**63**	**303**	**175**	**292**	**467**
Total Pass-By					**0**	**0**	**0**	**13**	**13**	**26**

Group 16

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G7	General Employment	Business Park	115,045	8%	110	19	129	29	83	112
Total					**110**	**19**	**129**	**29**	**83**	**112**

Group 17

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C7	Service Area Employment	Shopping Centre	8,242	3%	5	3	8	14	16	30
		Shopping Centre Pass-By	8,242	3%	0	0	0	1	1	2
		General Office	4,438	3%	5	1	6	1	4	5
Total					**10**	**4**	**14**	**15**	**20**	**35**
Total Pass-By					**0**	**0**	**0**	**1**	**1**	**2**

Group 18

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C8	Service Area Employment	Shopping Centre	57,959	20%	36	23	59	98	111	209
		Shopping Centre Pass-By	57,959	20%	0	0	0	10	10	20
		General Office	31,029	20%	37	5	42	5	27	32
P6	Light Employment	General Office	208,282	12%	186	25	211	37	167	204
G10	General Employment	Business Park	117,800	8%	113	19	132	30	84	114
Total Primary					**372**	**72**	**444**	**170**	**389**	**559**
Total Pass-By					**0**	**0**	**0**	**10**	**10**	**20**

Group 19

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G8	General Employment	Business Park	127,445	9%	122	22	144	32	92	124
Total					**122**	**22**	**144**	**32**	**92**	**124**

Group 20

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G9	Light Employment	General Office	393,421	22%	351	48	399	69	317	386
Total					**351**	**48**	**399**	**69**	**317**	**386**

Group 21

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
P5	Light Employment	General Office	209,358	12%	186	25	211	37	167	204
Total					**186**	**25**	**211**	**37**	**167**	**204**

Group 22

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Trip Gen	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
P4	Light Employment	General Office	626,460	35%	558	76	634	110	502	612
Total					**558**	**76**	**634**	**110**	**502**	**612**

Overall Background 407 Lands

					Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
Total Primary					**3305**	**594**	**3899**	**1191**	**3139**	**4330**
Total Pass-By					**0**	**0**	**0**	**50**	**50**	**100**

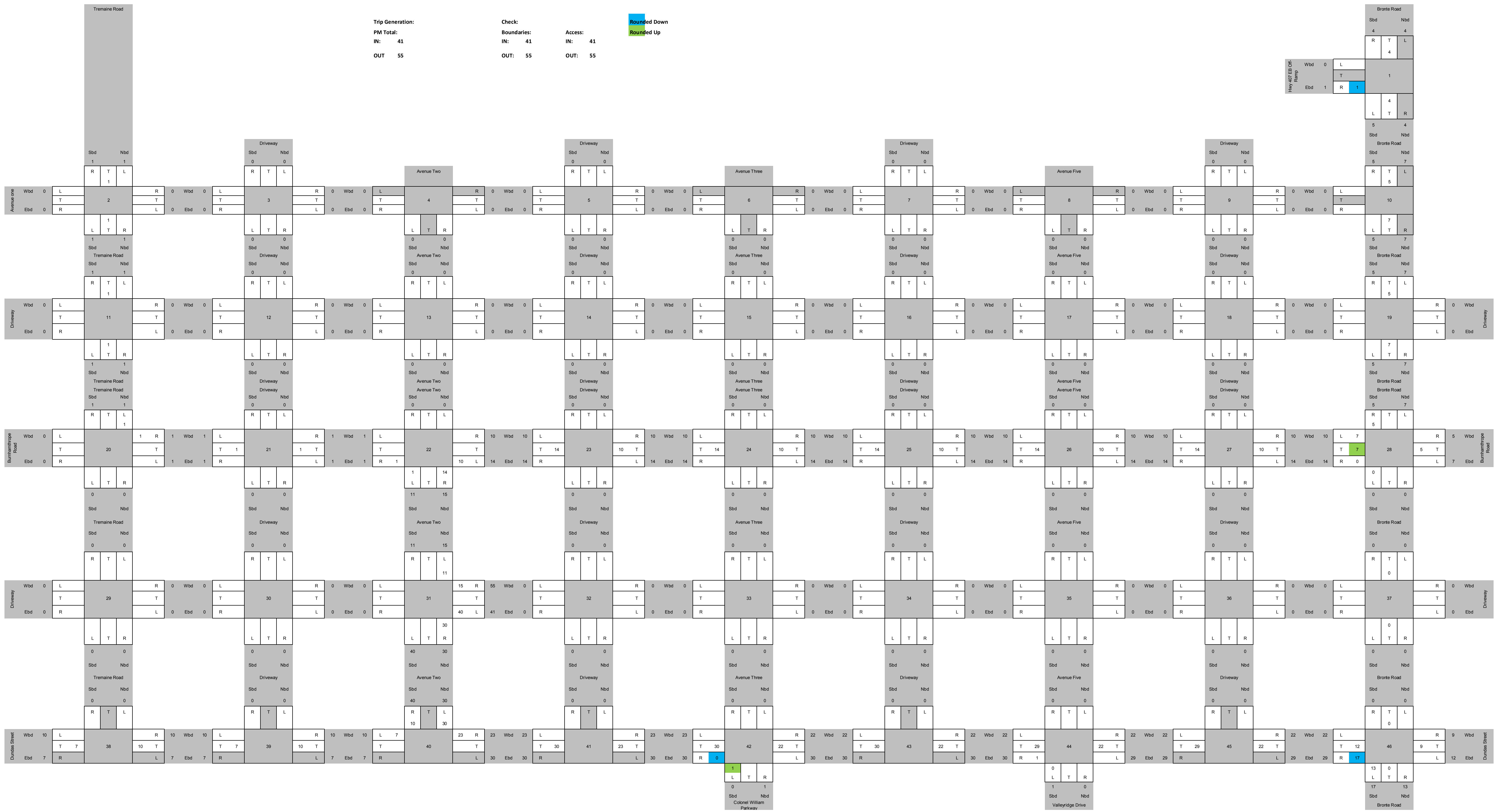


Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 9 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

Trip Generation:
PM Total:
IN: 4
OUT 4

Check:
Boundaries:
IN: 0
OUT: 0

Access:
IN: 4
OUT: 4

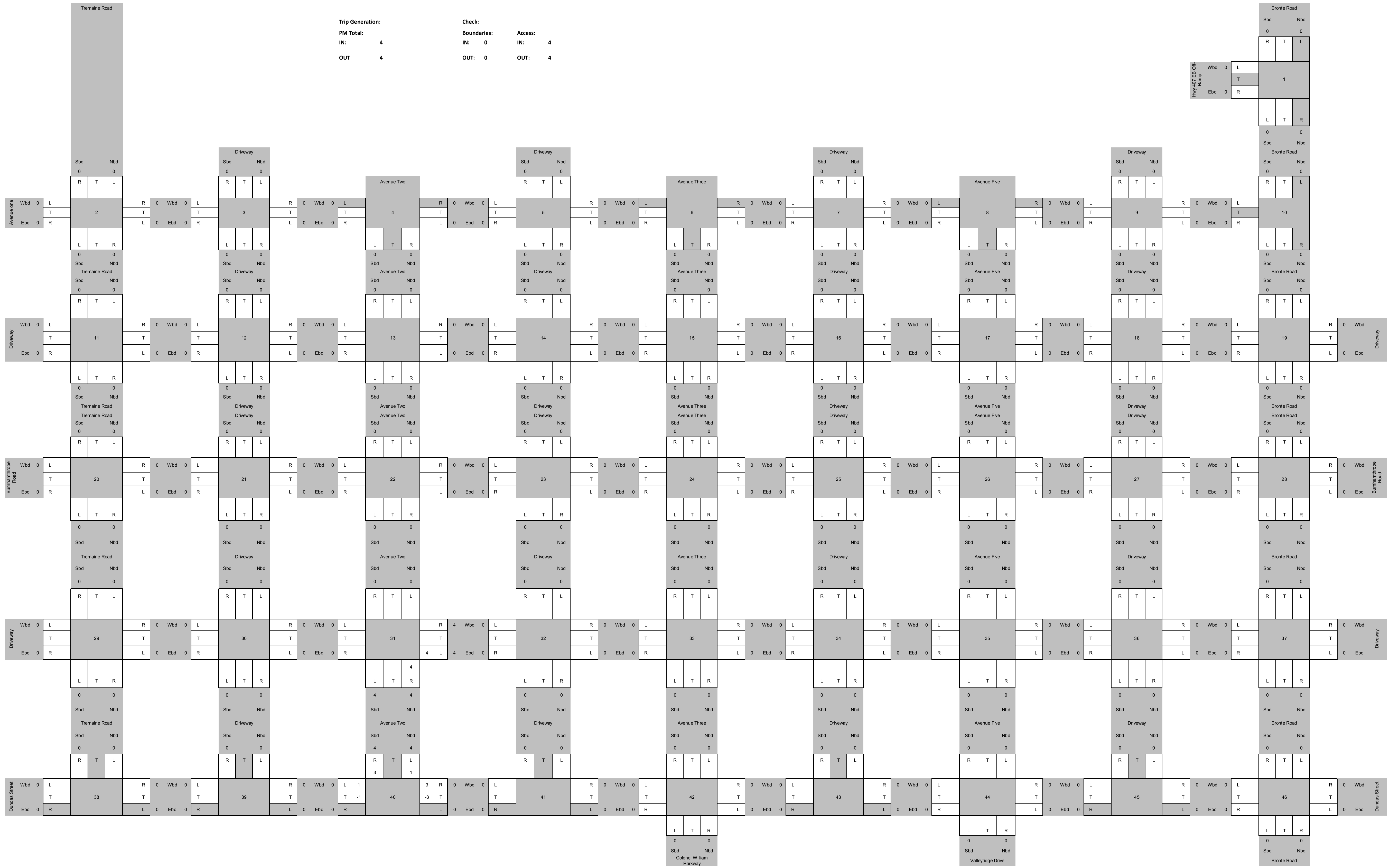
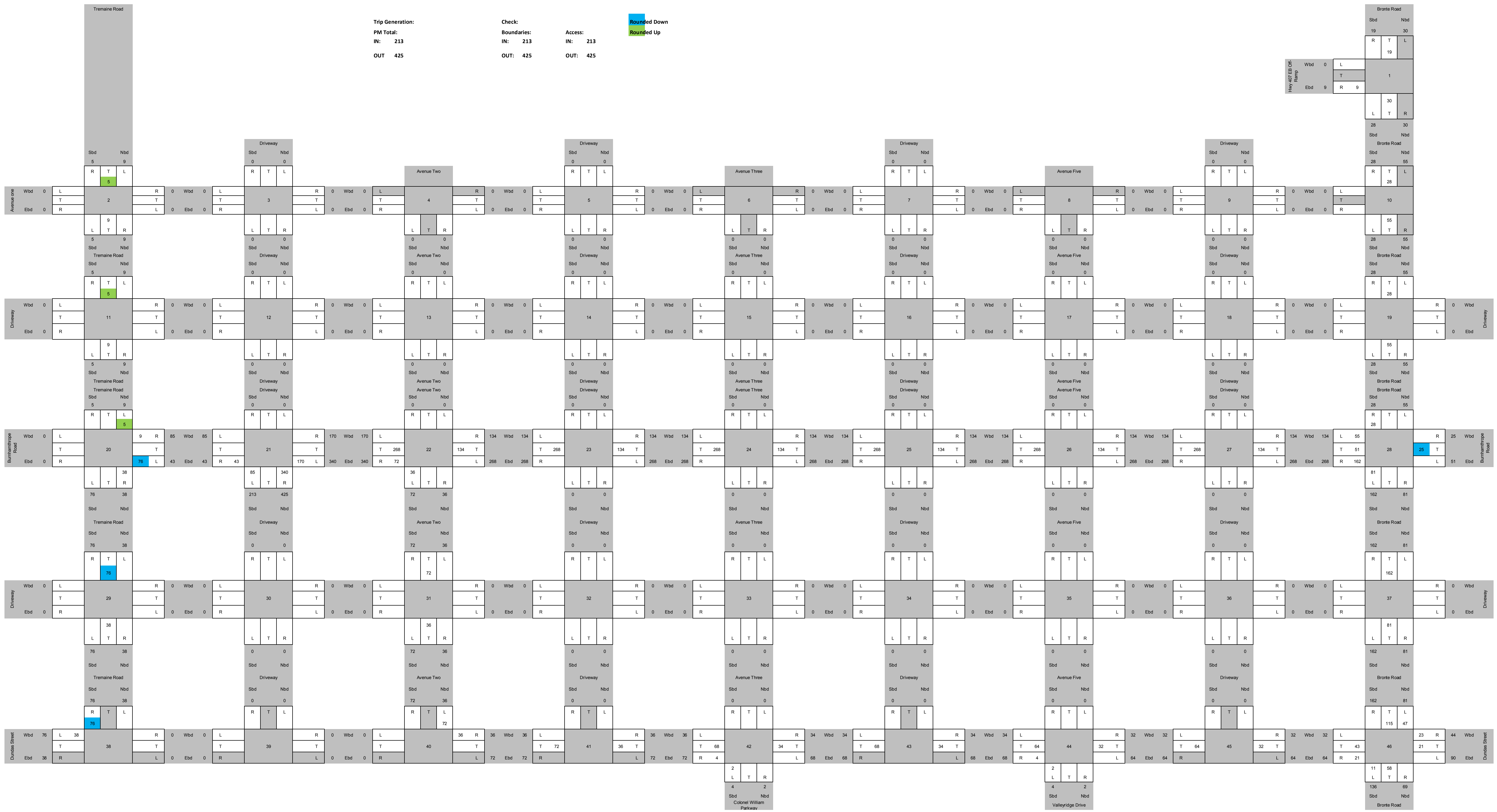


Figure X
407 Lands Background Development Phase 2A&2 Pass-By Trip Assignment Block Group 9 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx



Scale: NTS

Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 10 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 15
OUT 15

Check:
Boundaries:
IN: 0
OUT: 0

Access:
IN: 15
OUT: 15

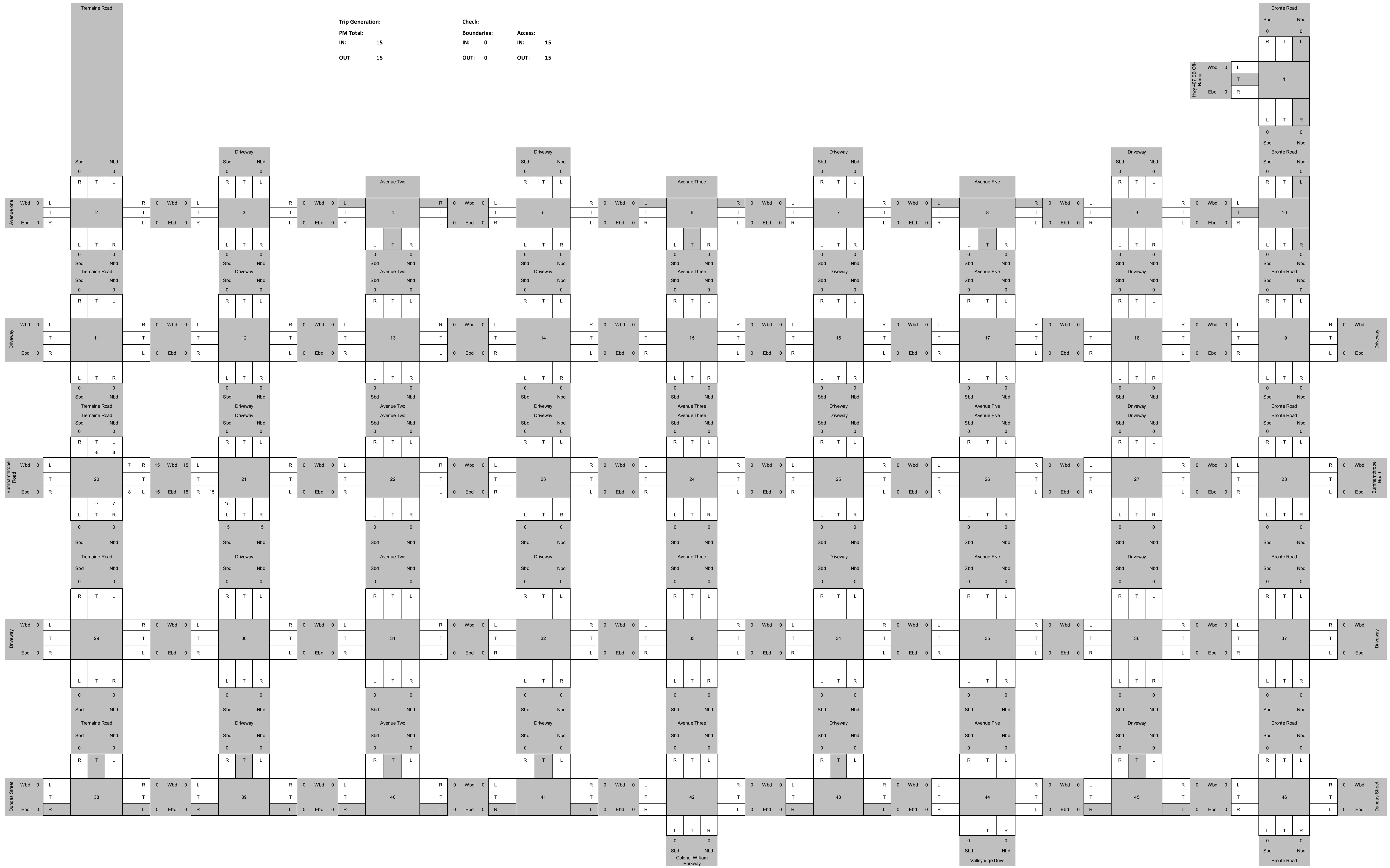


Figure X
407 Lands Background Development Phase 2A&2 Pass-By Trip Assignment Block Group 10 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 103
OUT 296

Check:
Boundaries:
IN: 103
OUT: 296

Access:
IN: 103
OUT: 296

Rounded Down
Rounded Up

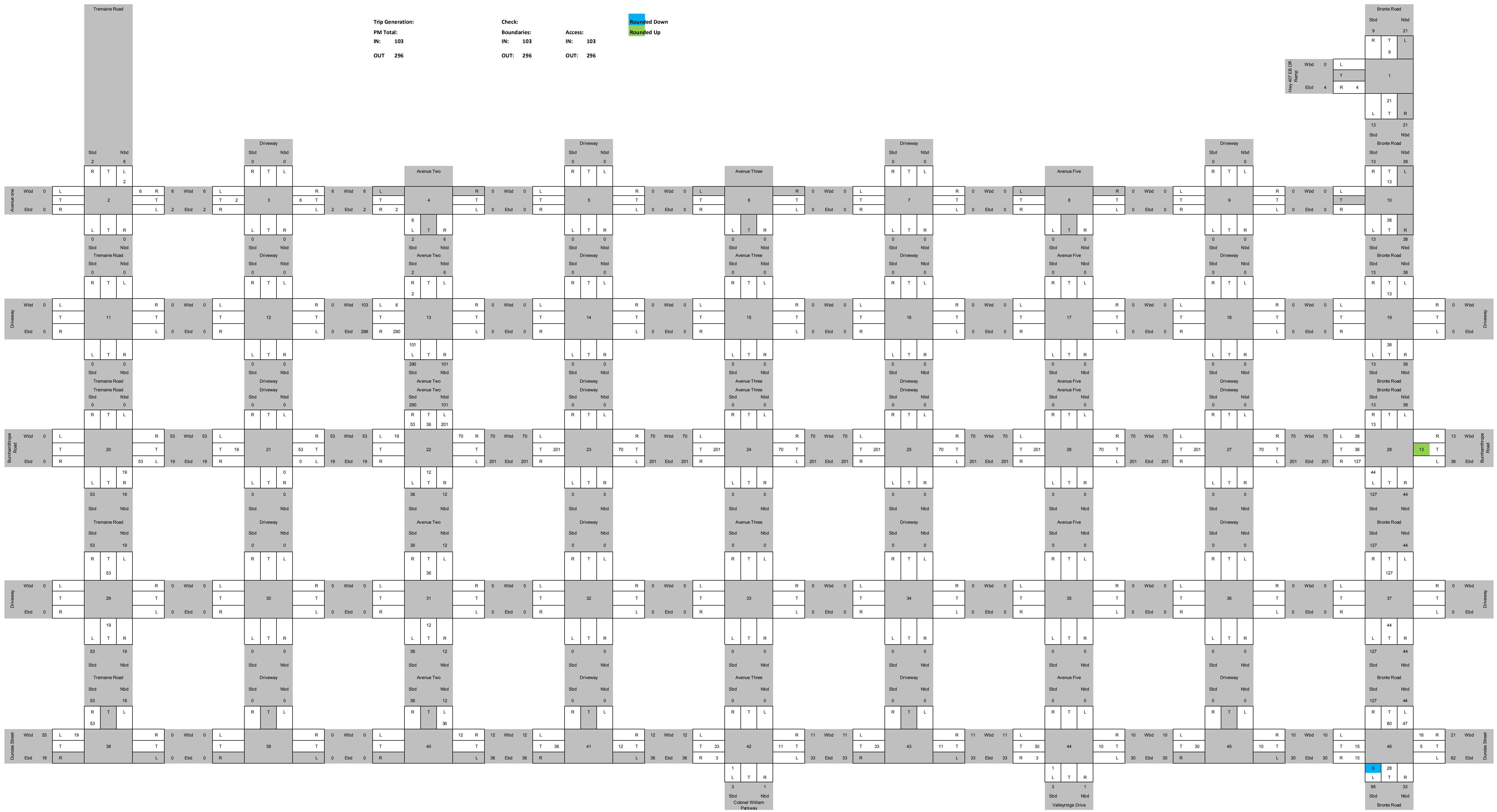


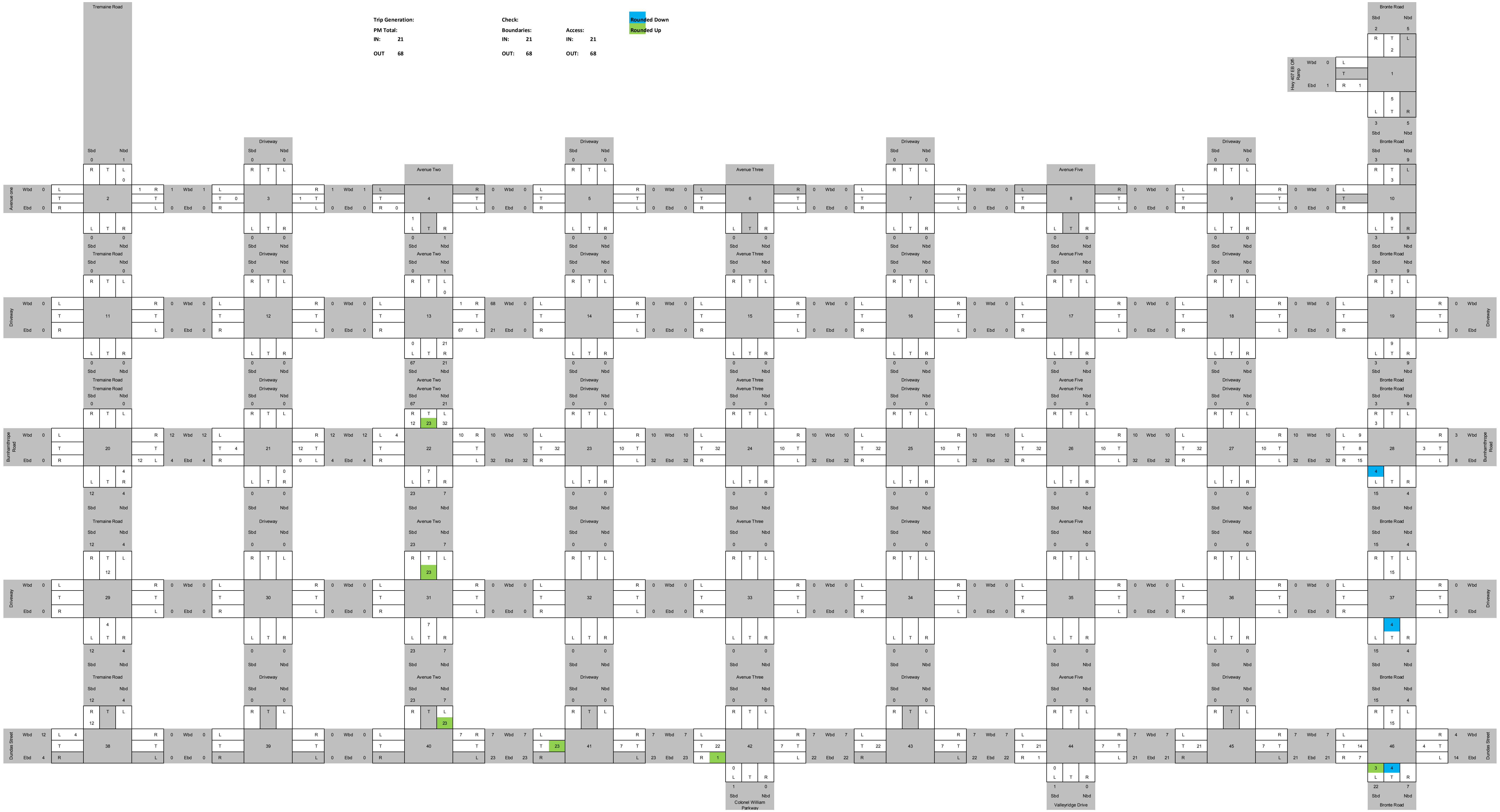
Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 11 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 21
OUT 68

Check:
Boundaries:
IN: 21
OUT: 68

Access:
IN: 21
OUT: 68

Rounded Down
Rounded Up



Scale: NTS

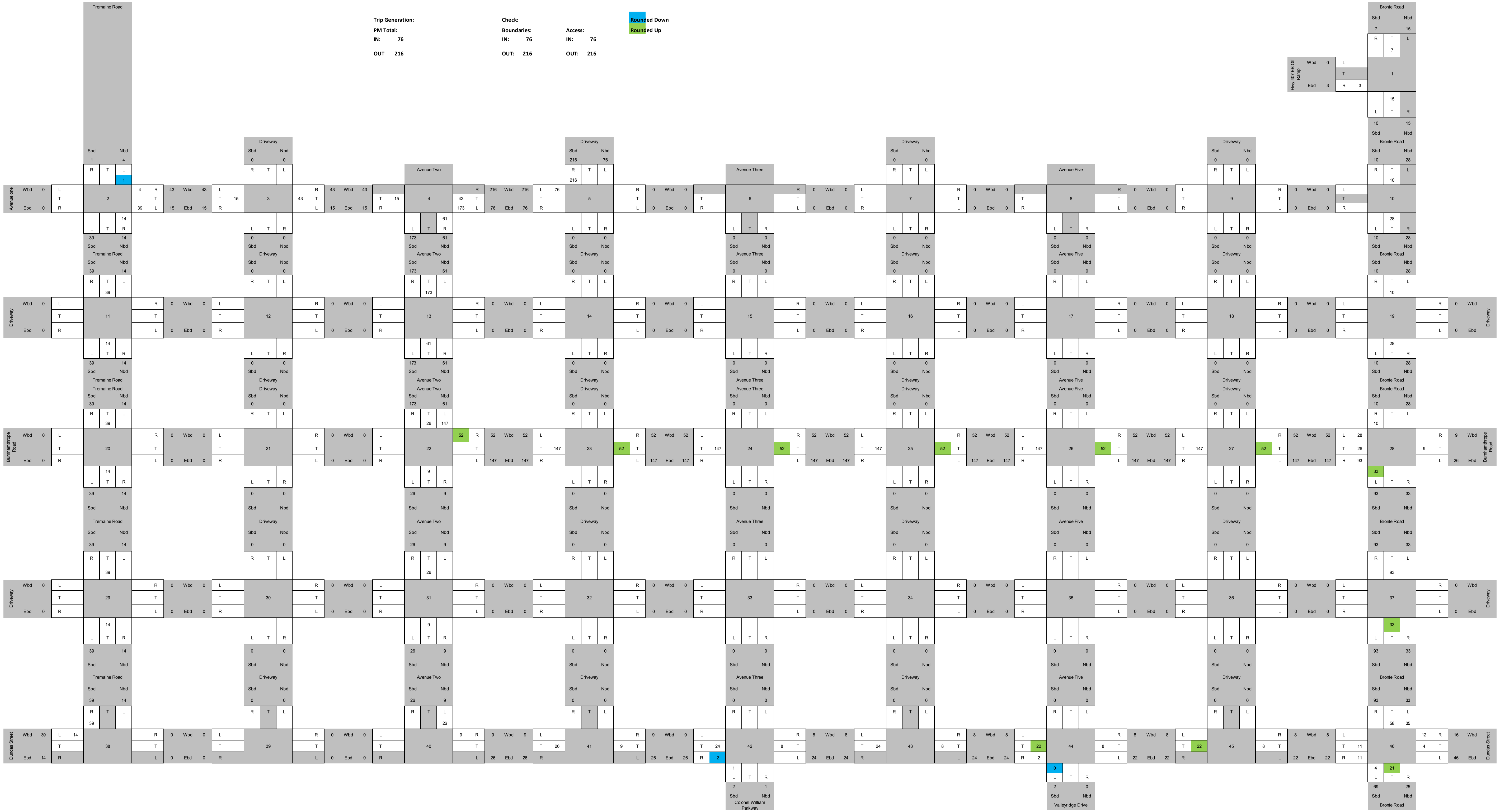
Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 12 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 76
OUT 216

Check:
Boundaries:
IN: 76
OUT: 216

Access:
IN: 76
OUT: 216

Rounded Down
Rounded Up



Scale: NTS

Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 13-1 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

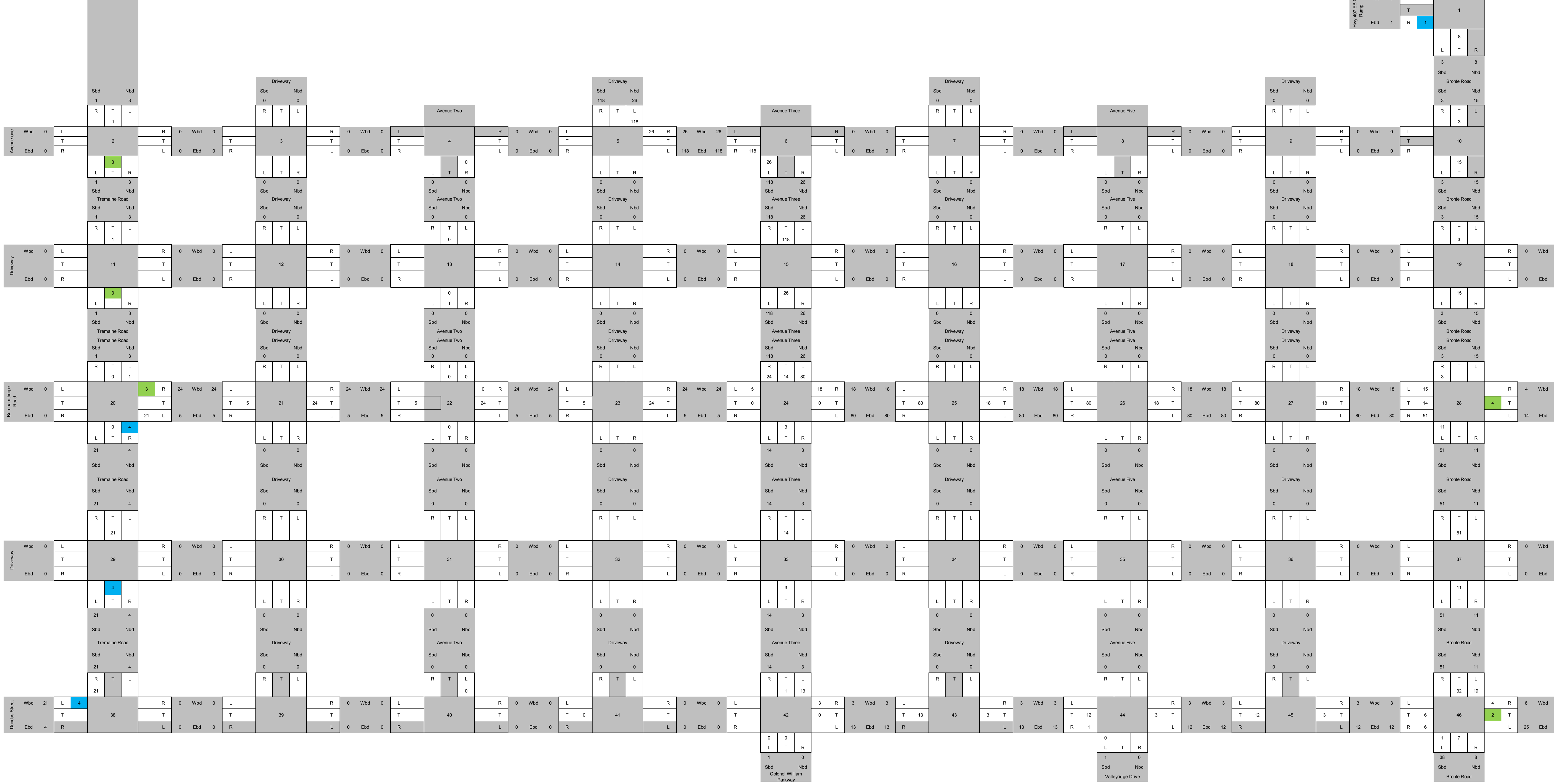
14-00222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
AM Total:
IN: 26
OUT 118

Check:
Boundaries:
IN: 26
OUT: 118

Access:
IN: 26
OUT: 118

Rounded Down
Rounded Up



Scale: NTS

Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 13-2 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 74
OUT 99

Check:
Boundaries:
IN: 74
OUT: 99

Access:
IN: 74
OUT: 99

Rounded Down
Rounded Up

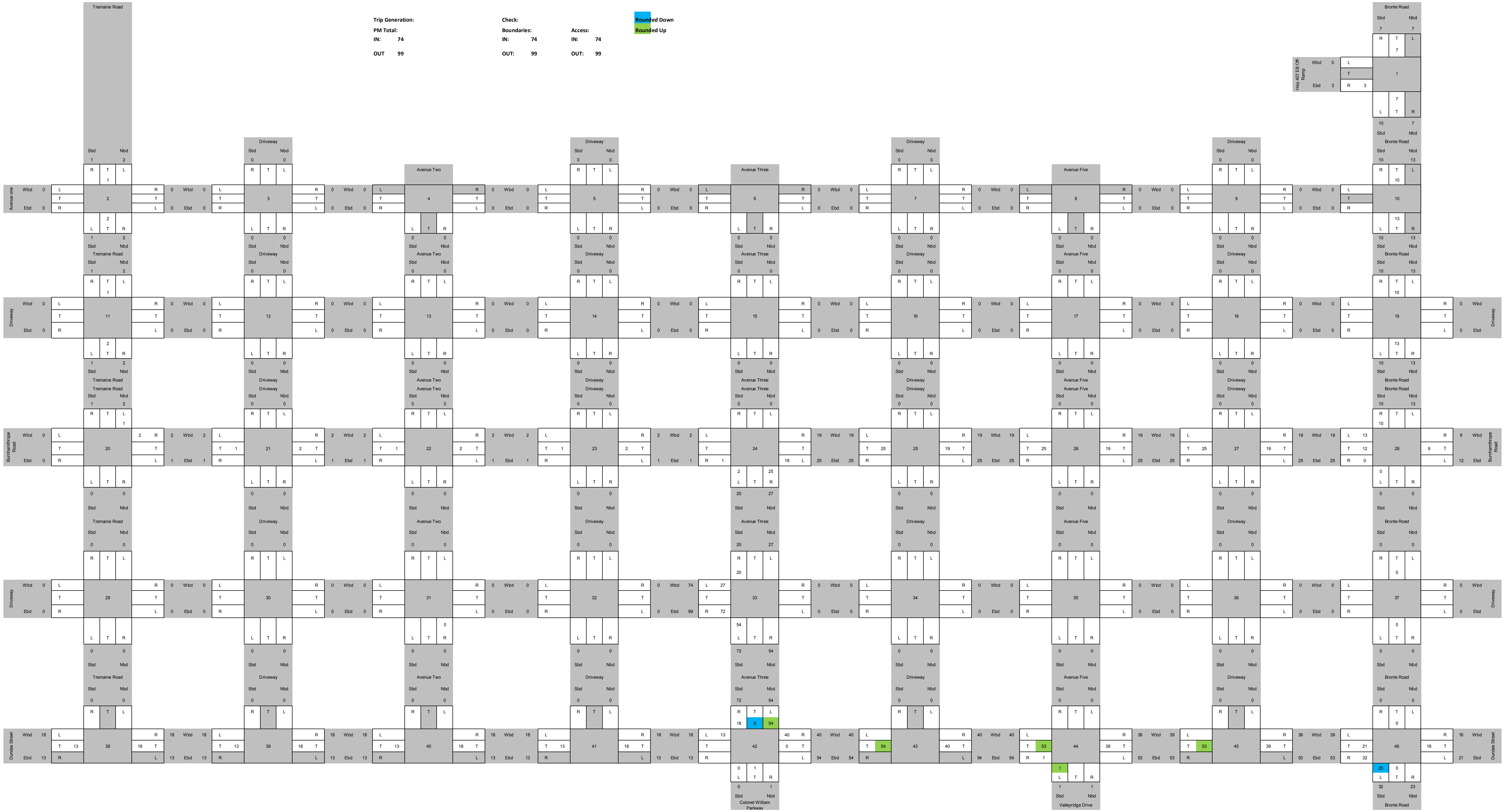


Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 14 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

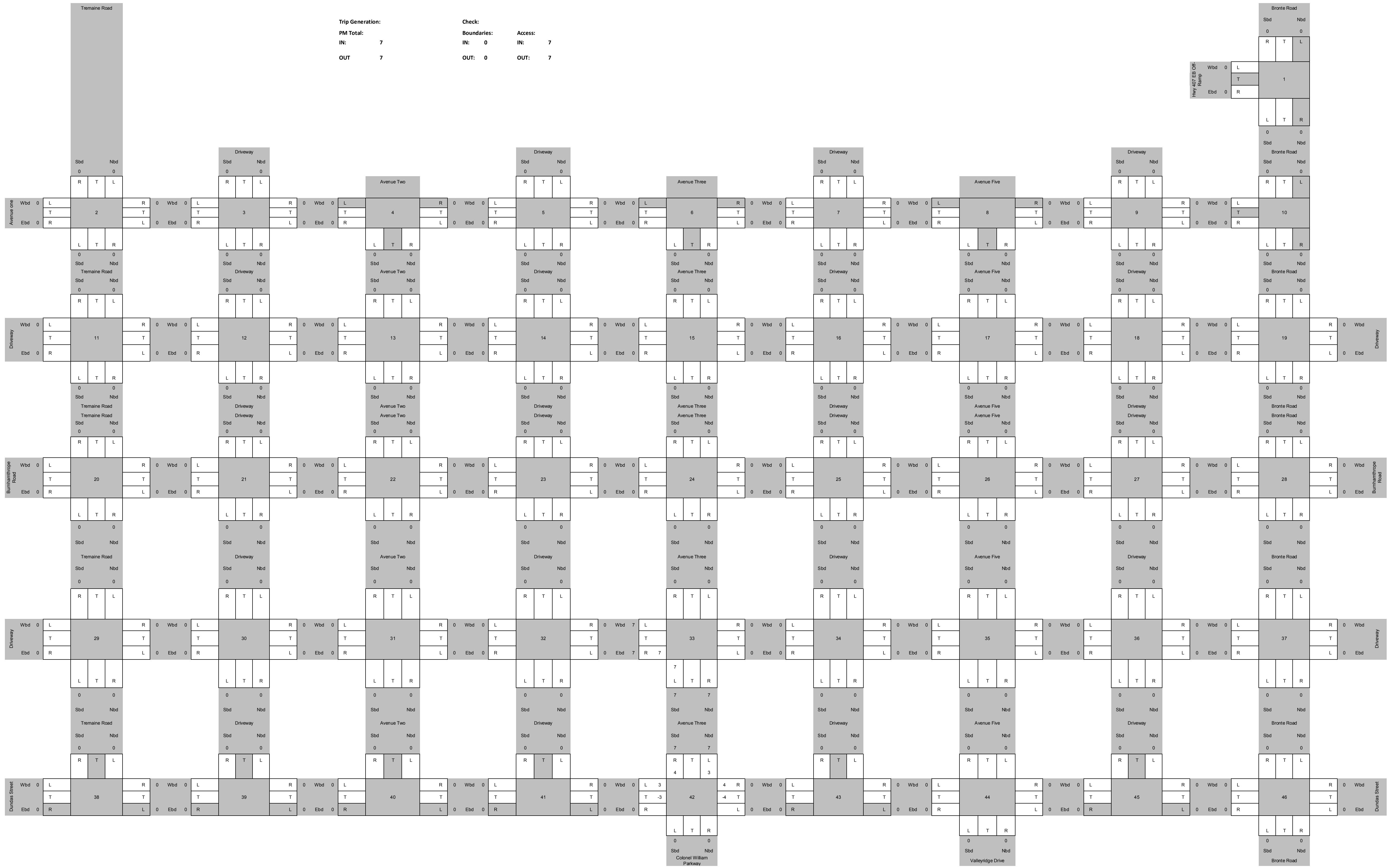
Scale: NTS

14-06022_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 7
OUT 7

Check:
Boundaries:
IN: 0
OUT: 0

Access:
IN: 7
OUT: 7



Scale: NTS

Figure X
407 Lands Background Development Phase 2A&2 Pass-By Trip Assignment Block Group 14 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

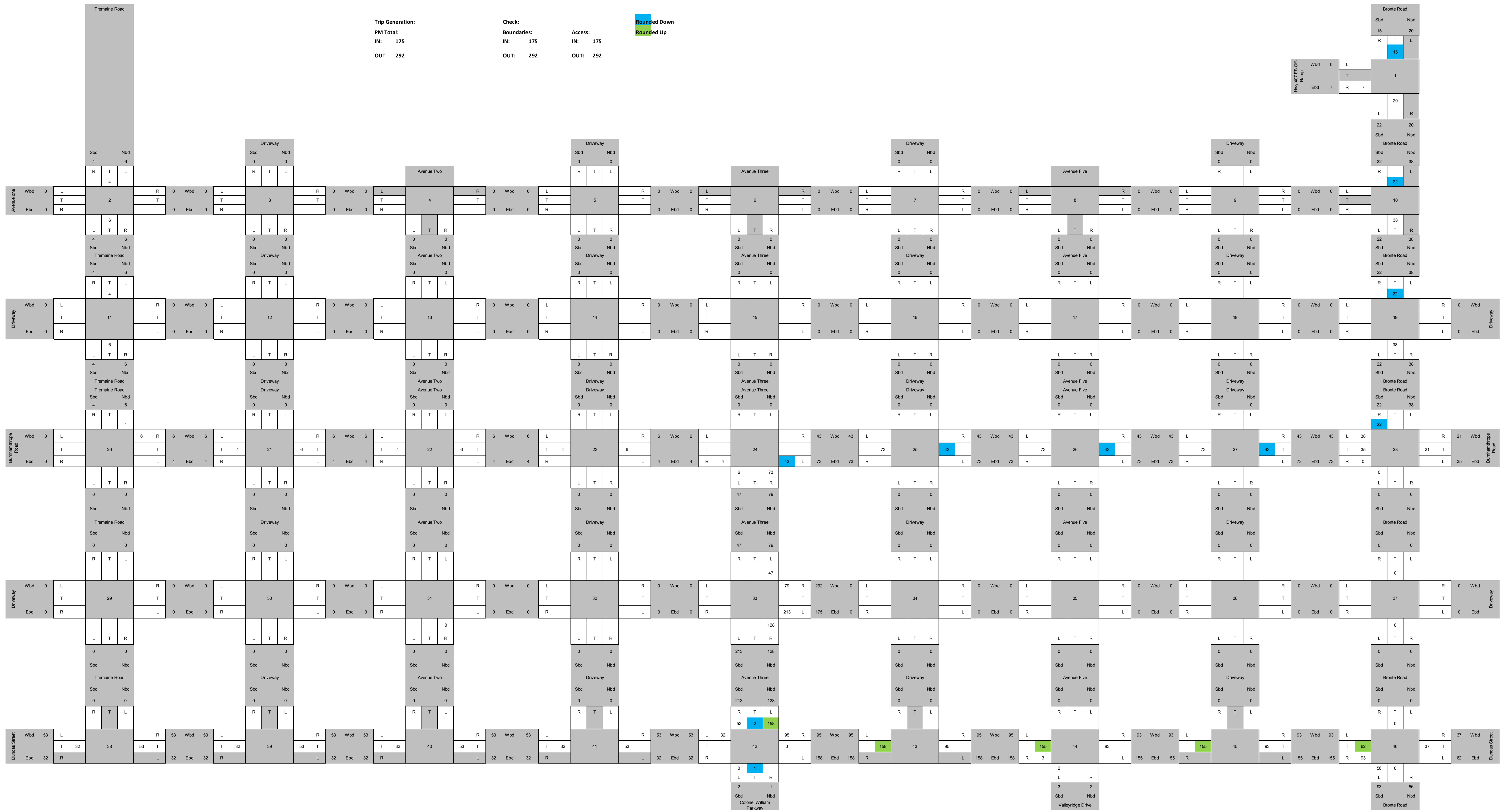
14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 175
OUT 292

Check:
Boundaries:
IN: 175
OUT: 292

Access:
IN: 175
OUT: 292

Rounded Down
Rounded Up



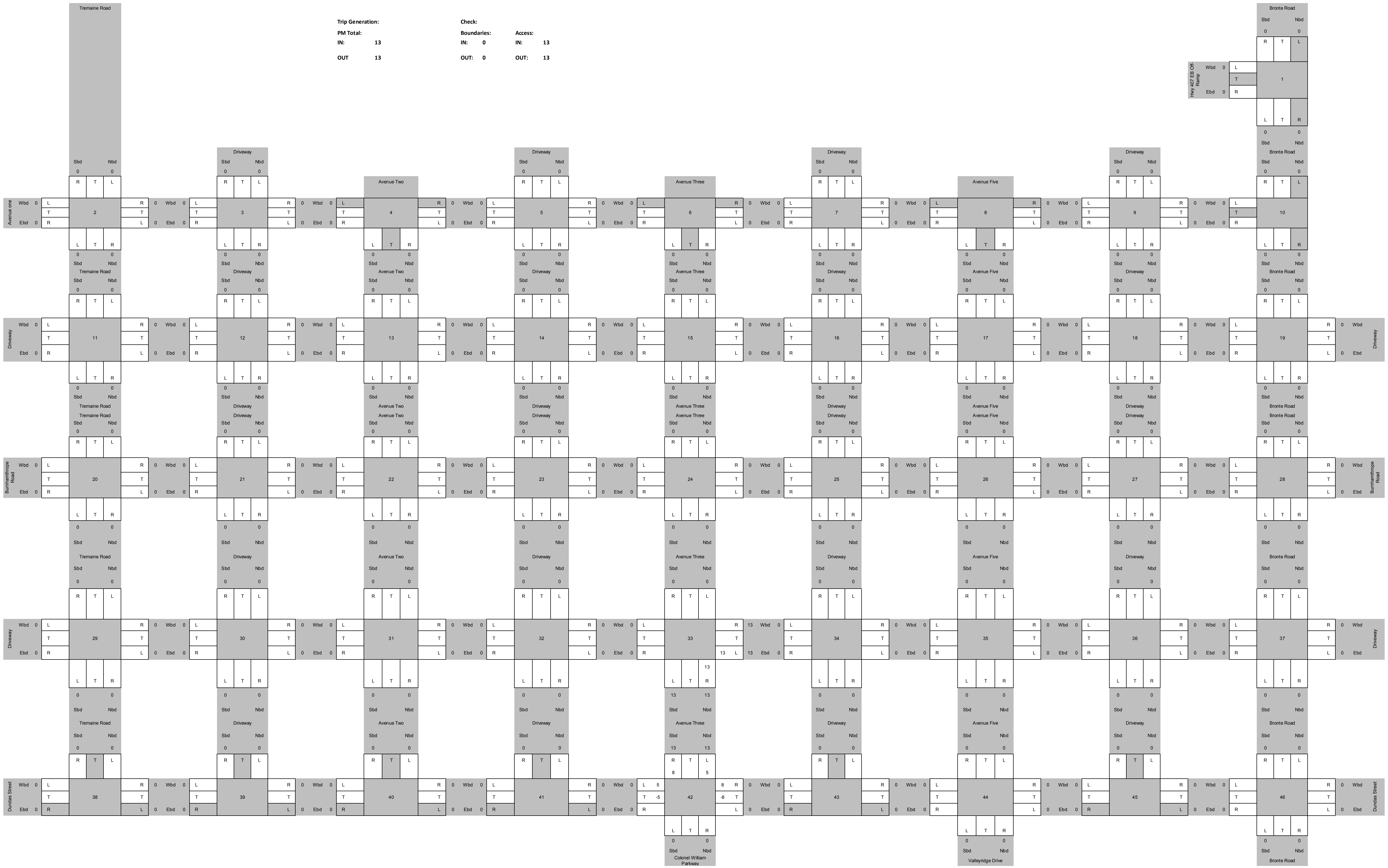
Scale: NTS

Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 15 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 13
OUT 13

Check:
Boundaries:
IN: 0
OUT: 0

Access:
IN: 13
OUT: 13



Scale: NTS

Figure X
407 Lands Background Development Phase 2A&2 Pass-By Trip Assignment Block Group 15 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

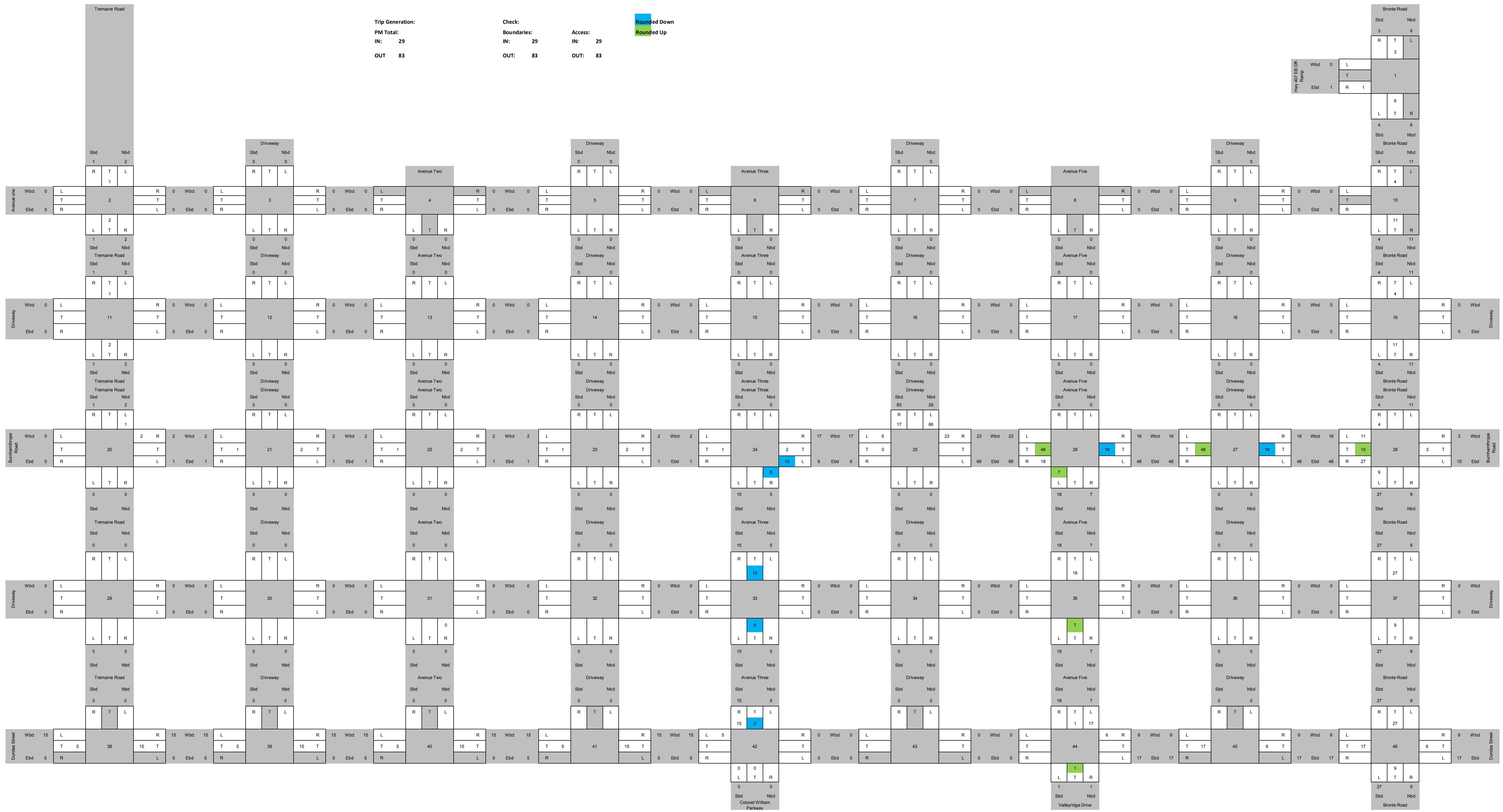


Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 16 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 15
OUT 20

Check:
Boundaries:
IN: 15
OUT: 20

Access:
IN: 15
OUT: 20

Rounded Down
Rounded Up

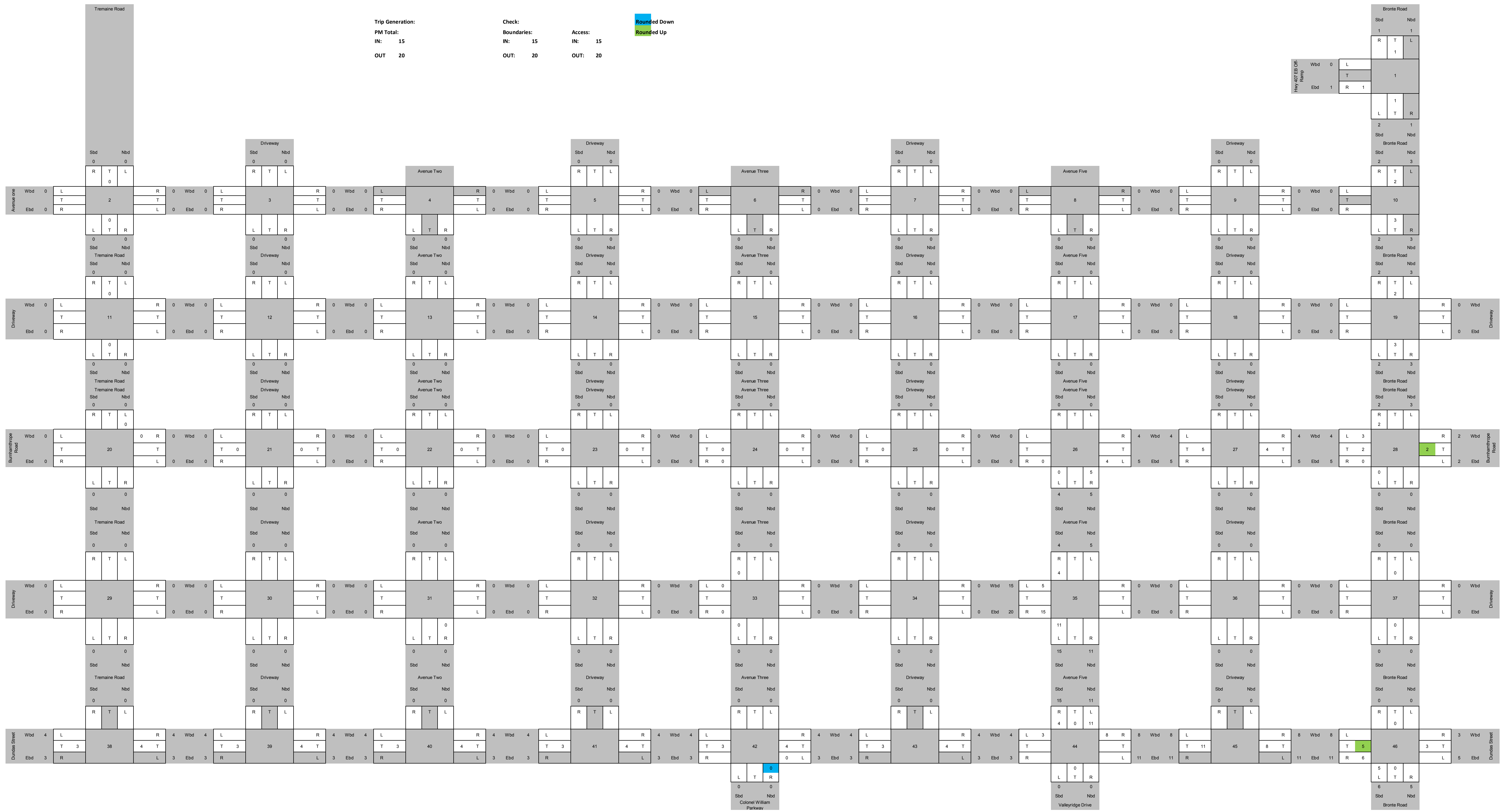
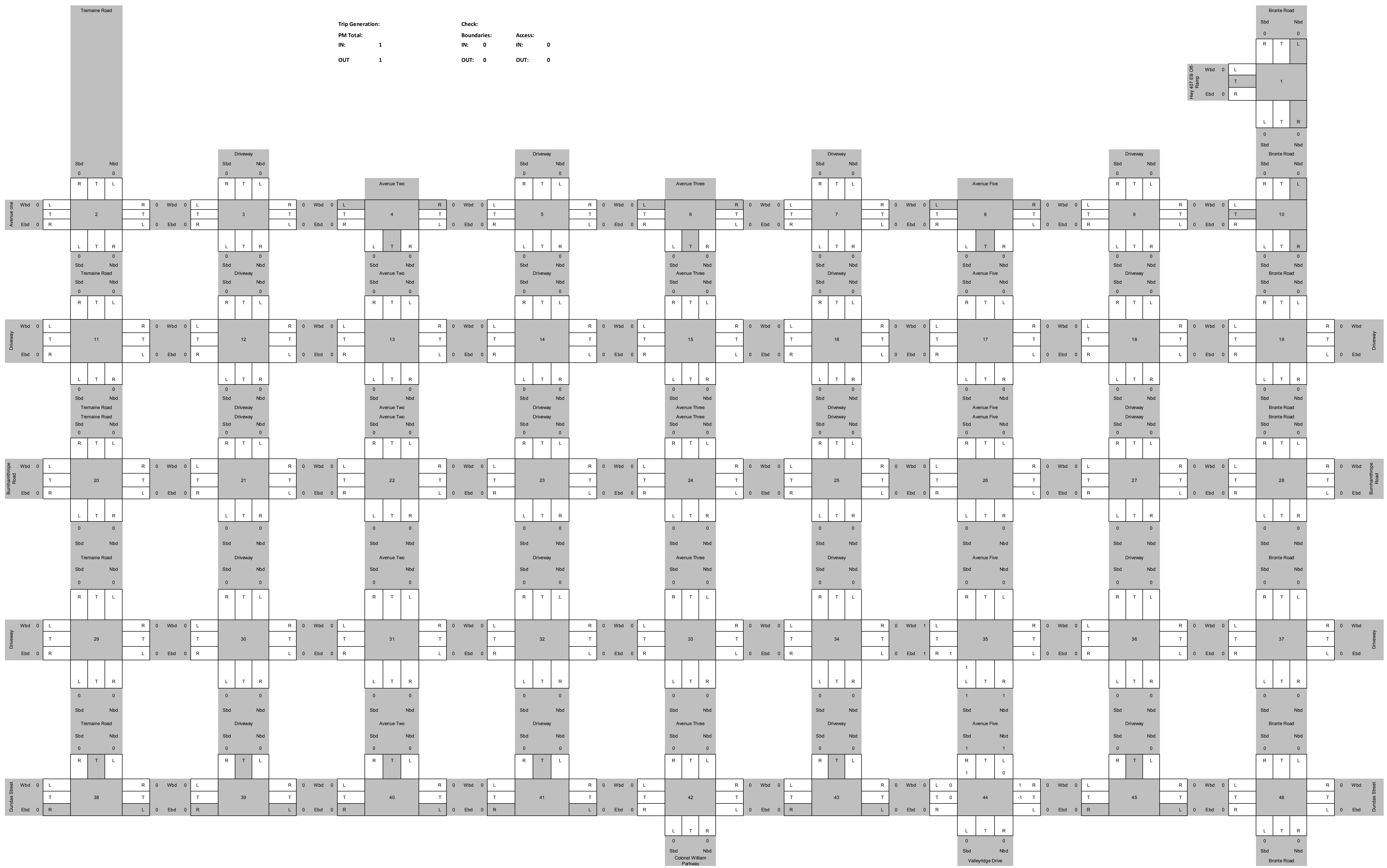


Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 17 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study



Trip Generation:
PM Total:

IN:	1	IN:	0	IN:	0
OUT	1	OUT:	0	OUT:	0

Check: **Boundaries:** **Access:**

Scale: NTS

Figure X
407 Lands Background Development Phase 2A&2 Pass-By Trip Assignment Block Group 17 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

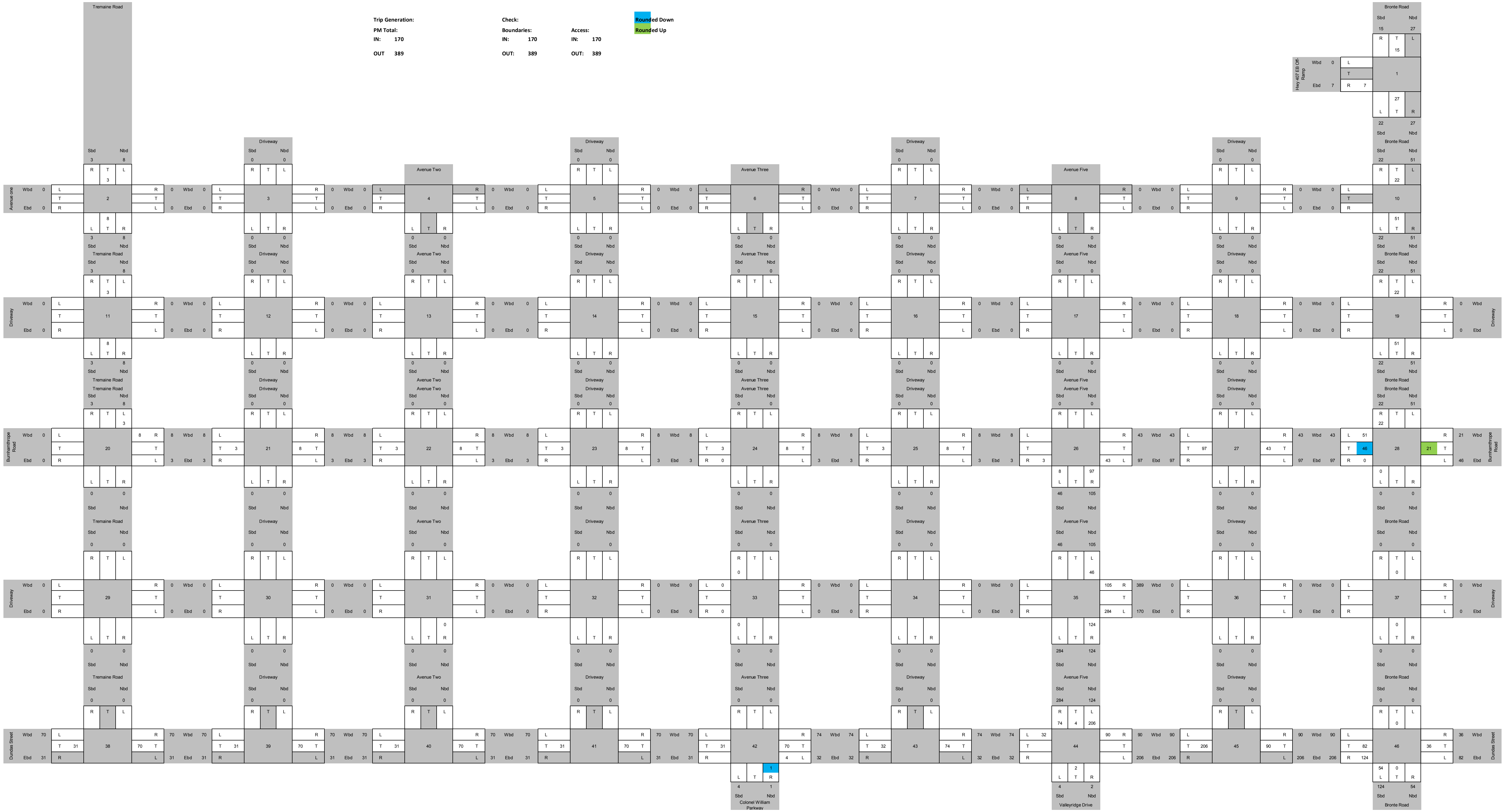
14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 170
OUT 389

Check:
Boundaries:
IN: 170
OUT: 389

Access:
IN: 170
OUT: 389

Rounded Down
Rounded Up



Scale: NTS

Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 18 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 1
OUT 1

Check:
Boundaries:
IN: 0
OUT: 0

Access:
IN: 0
OUT: 0

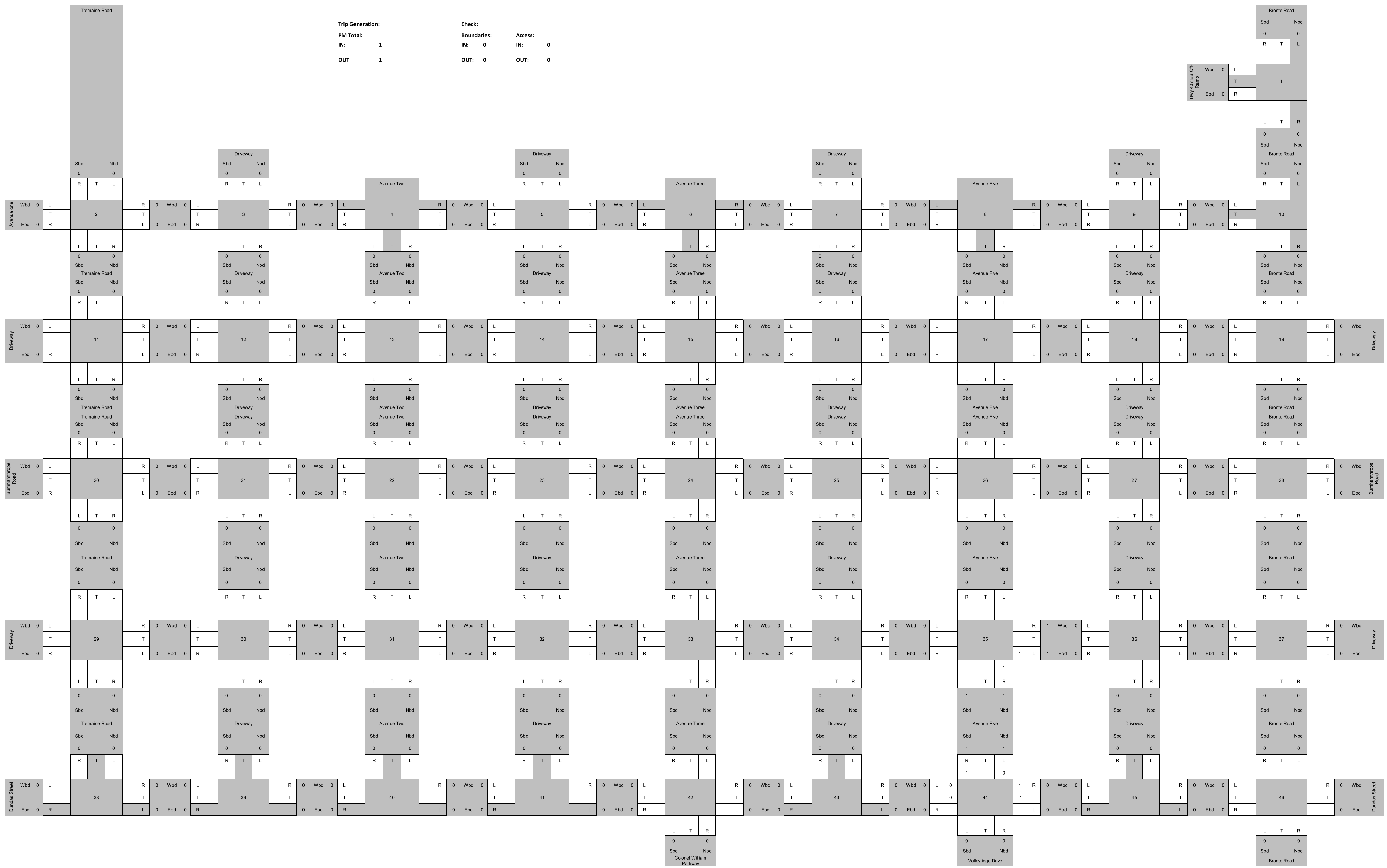


Figure X
407 Lands Background Development Phase 2A&2 Pass-By Trip Assignment Block Group 18 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 32
OUT 92

Check:
Boundaries:
IN: 32
OUT: 92

Access:
IN: 32
OUT: 92

Rounded Down
Rounded Up

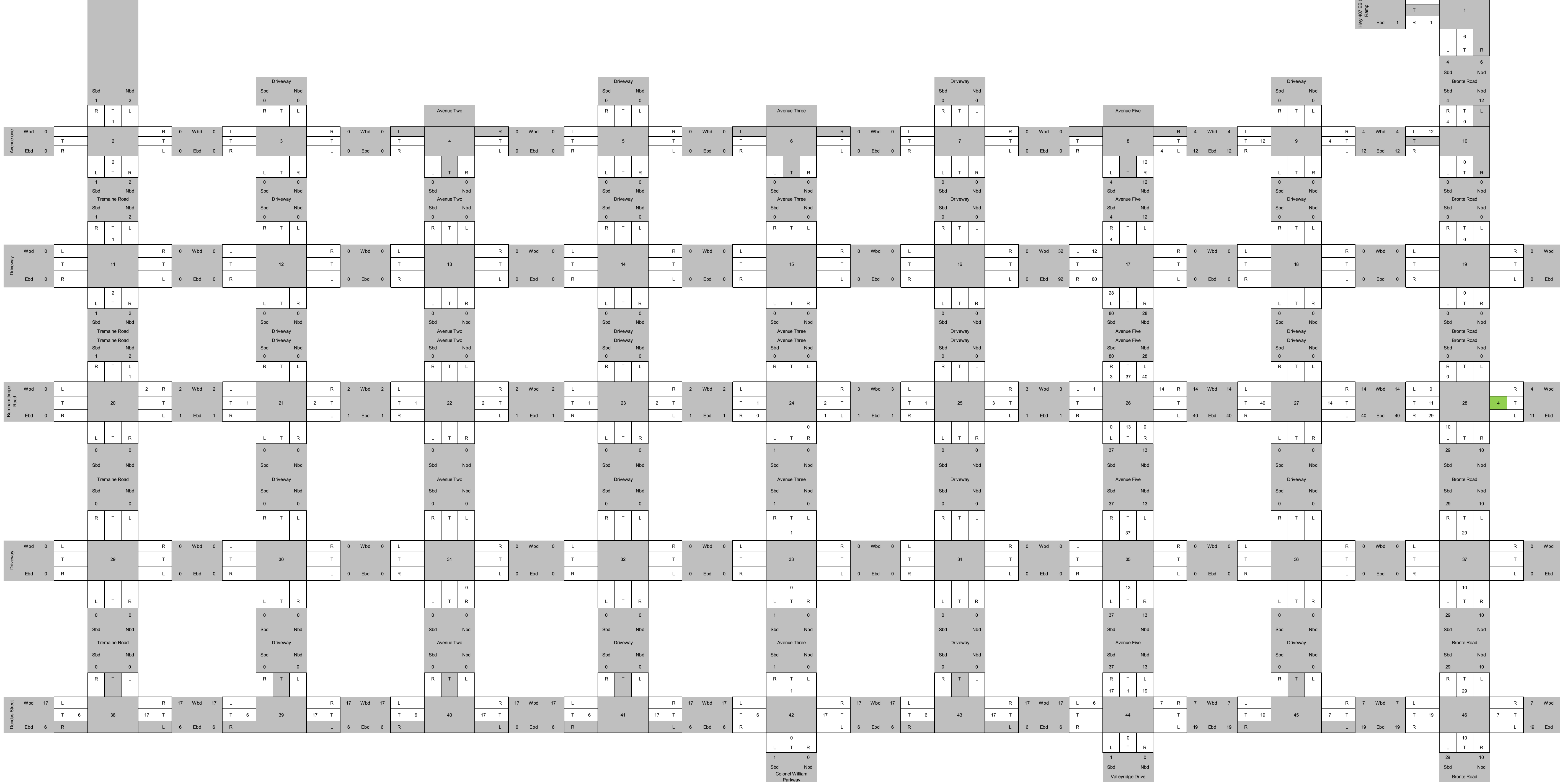


Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 19 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

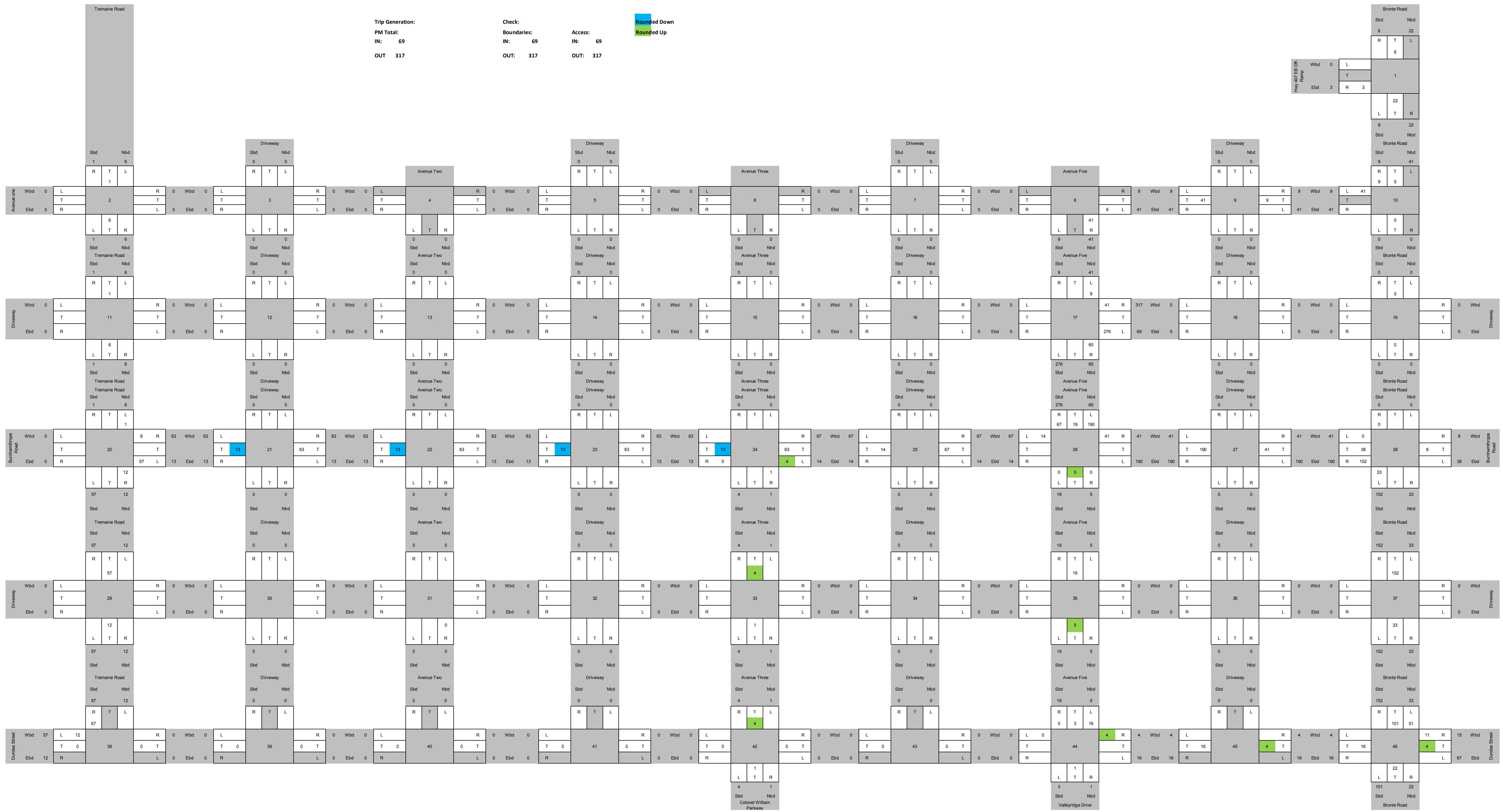


Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 20 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 37
OUT 167

Check:
Boundaries:
IN: 37
OUT: 167

Access:
IN: 37
OUT: 167

Rounded Down
Rounded Up

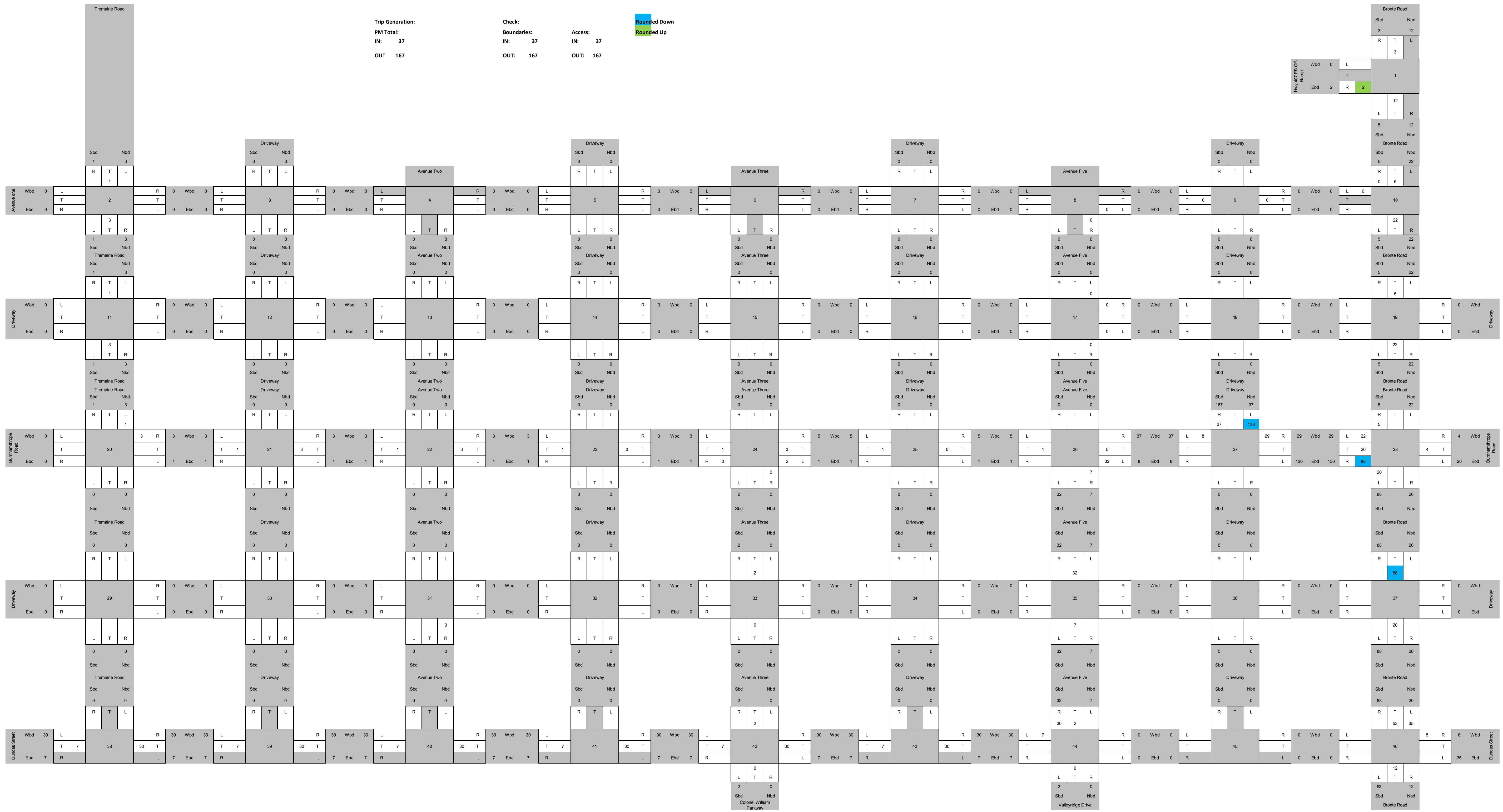


Figure X
407 Lands Background Development Phase 2A&2 Trip Assignment Block Group 21 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

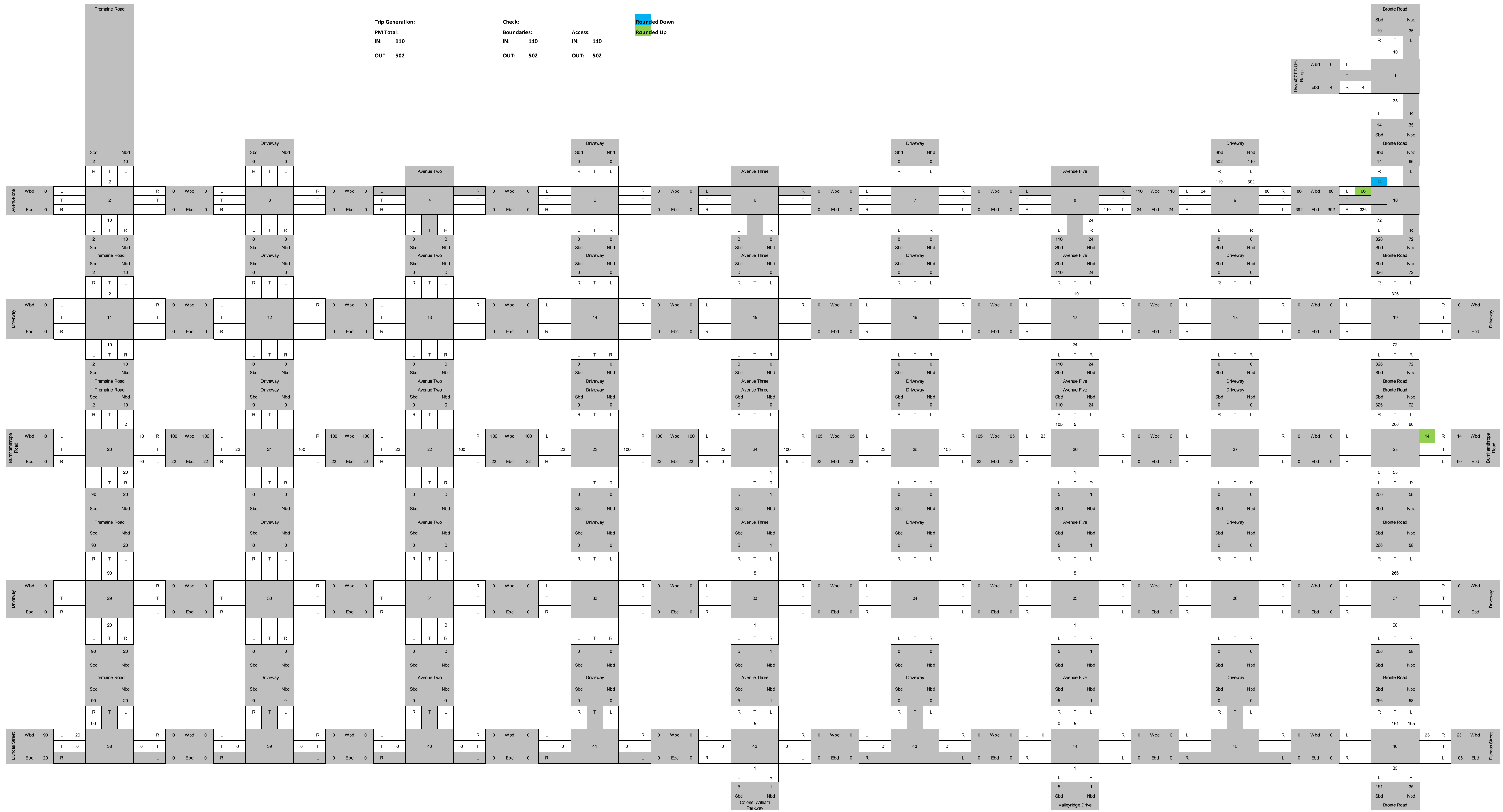
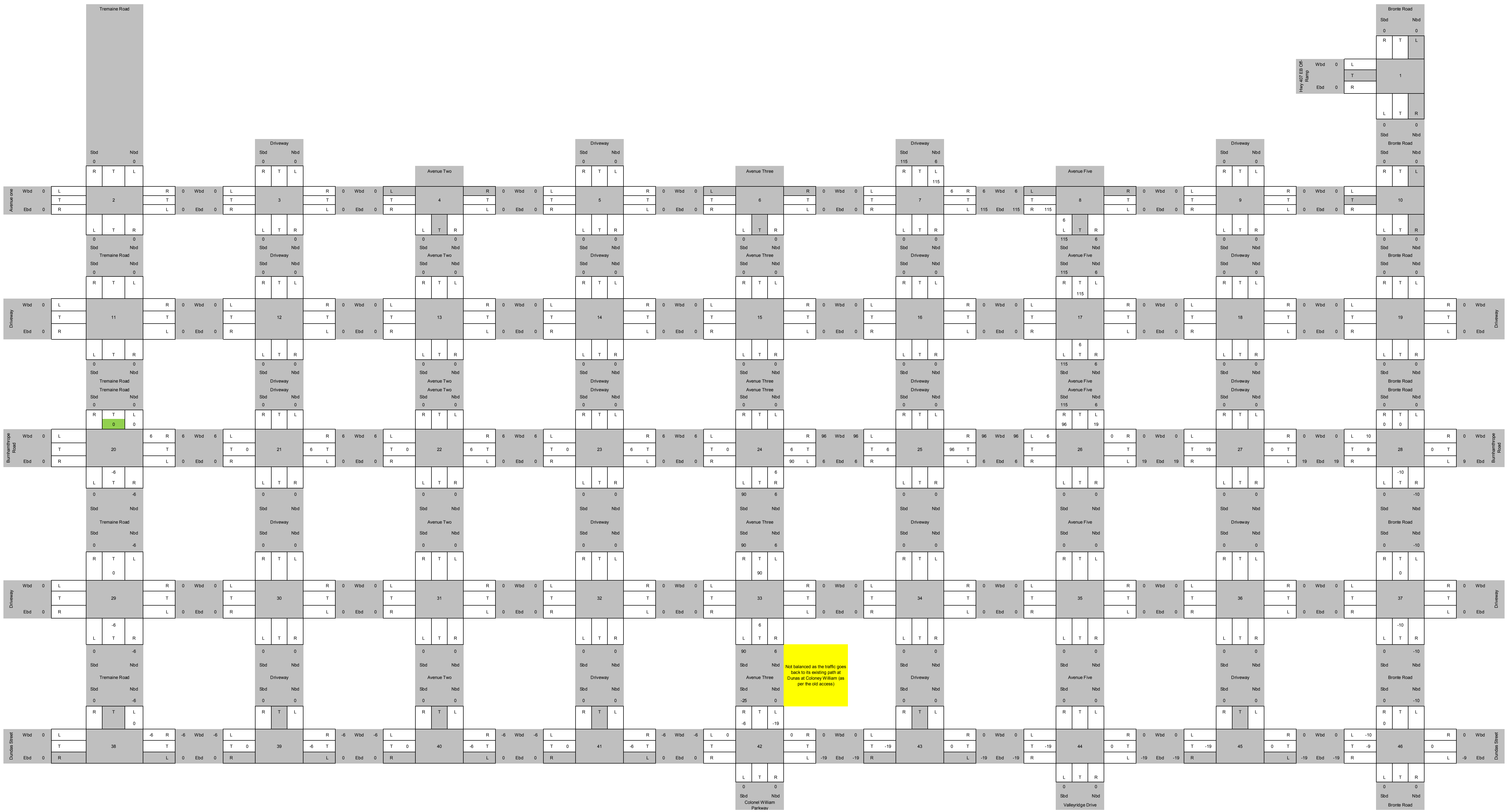


Figure X
407 Lands Background Development Phase 2A Trip Assignment Block Group 22 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09022_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx



Scale: NTS

Figure X
GE Lands Background Development Traffic Reassignment Phase 2A - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

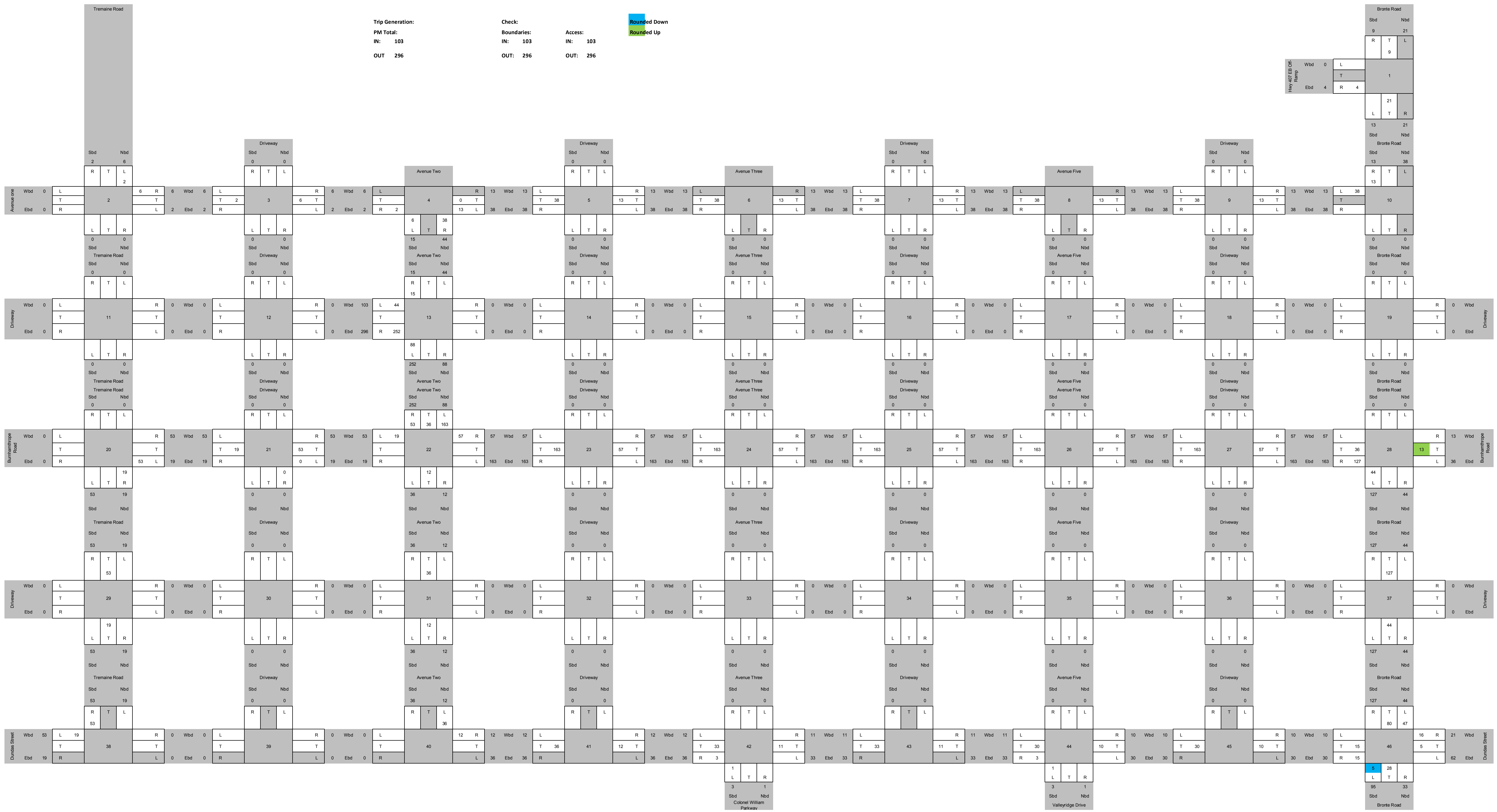


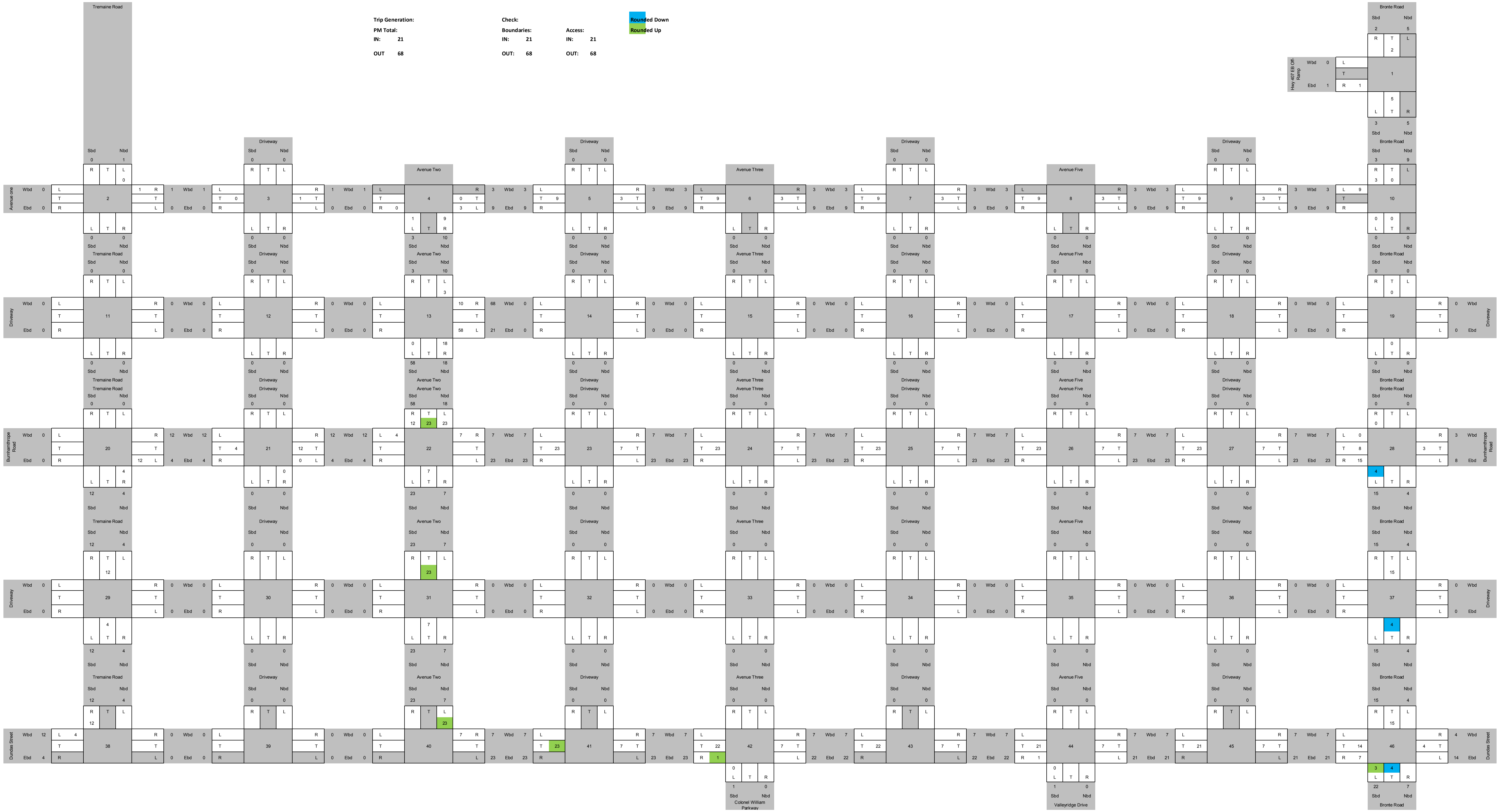
Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 11 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 21
OUT 68

Check:
Boundaries:
IN: 21
OUT: 68

Access:
IN: 21
OUT: 68

Rounded Down
Rounded Up



Scale: NTS

Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 12 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 102
OUT 334

Check:
Boundaries:
IN: 102
OUT: 334

Access:
IN: 102
OUT: 334

Rounded Down
Rounded Up

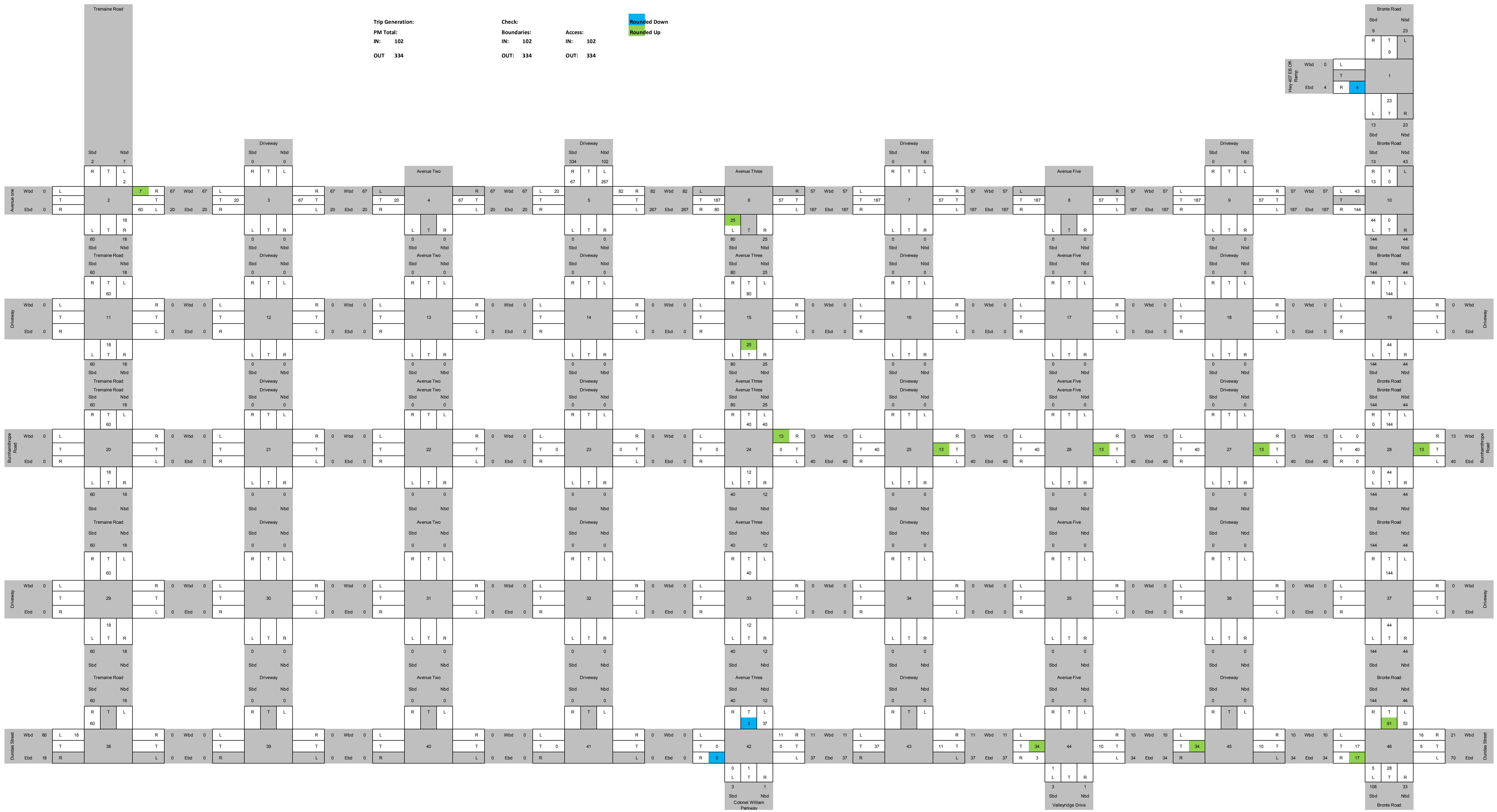


Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 13 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

wsp

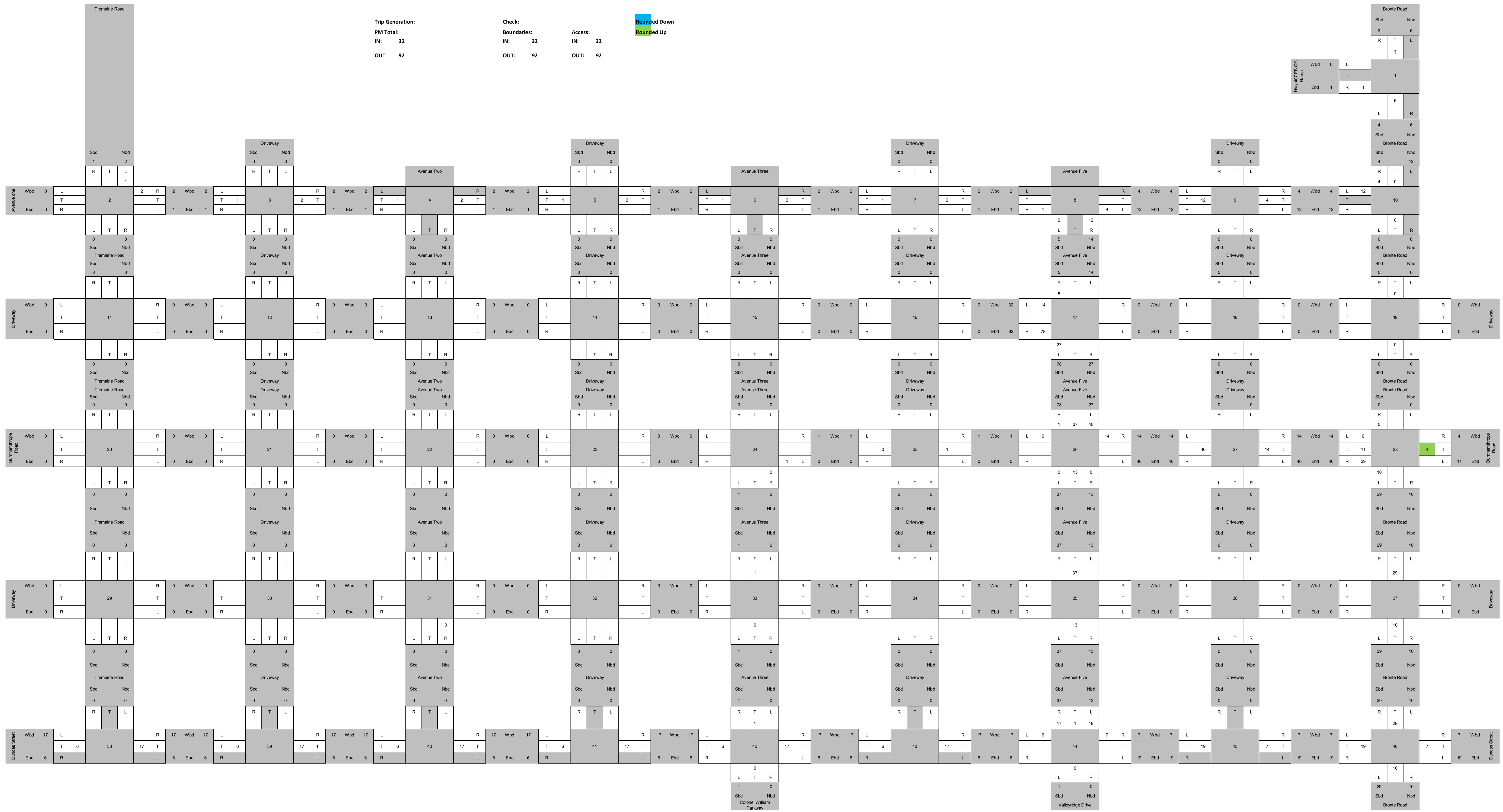


Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 19 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 69
OUT 317

Check:
Boundaries:
IN: 69
OUT: 317

Access:
IN: 69
OUT: 317

Rounded Down
Rounded Up

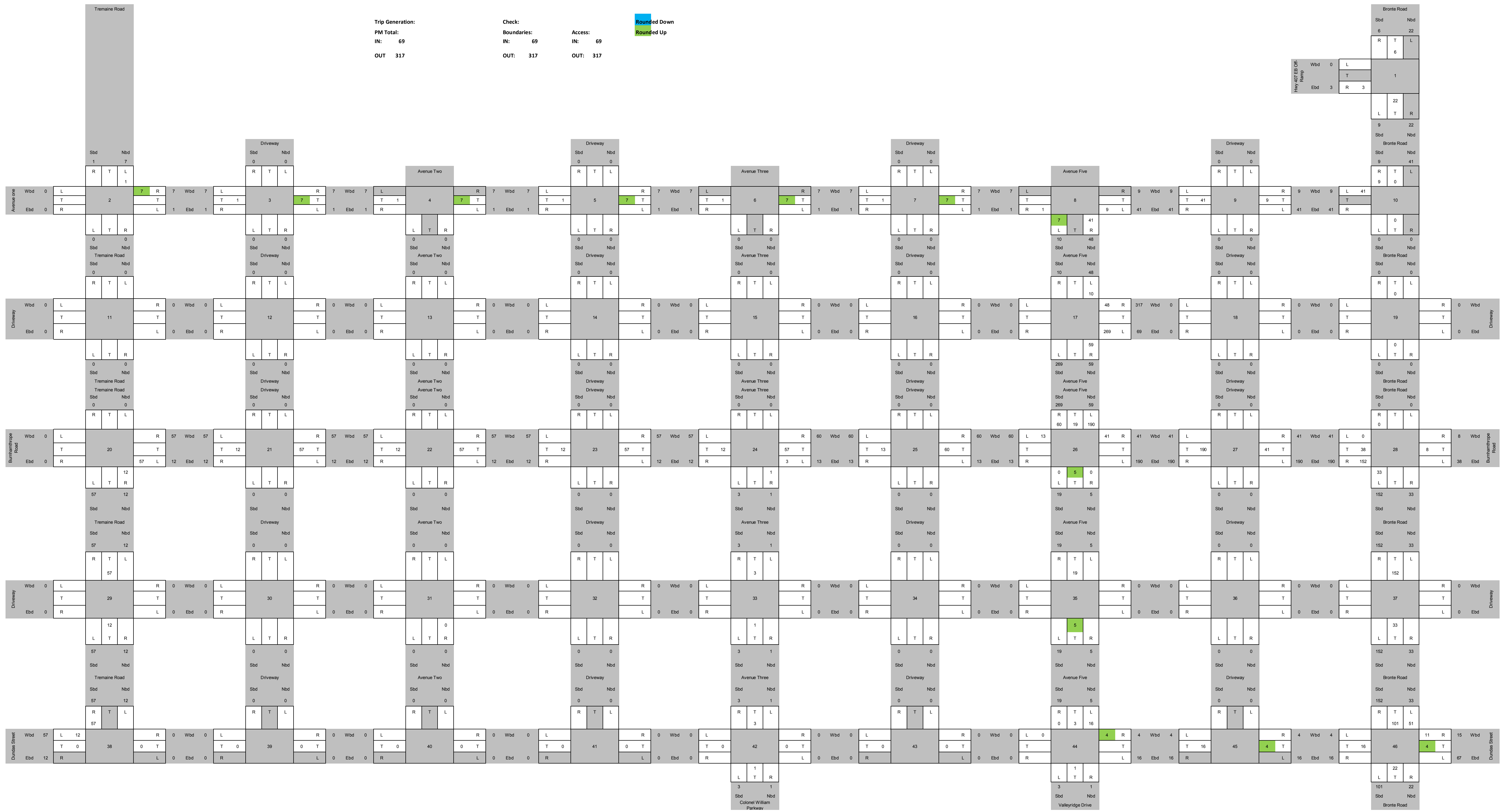


Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 20 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 110
OUT 502

Check:
Boundaries:
IN: 110
OUT: 502

Access:
IN: 110
OUT: 502

Rounded Down
Rounded Up

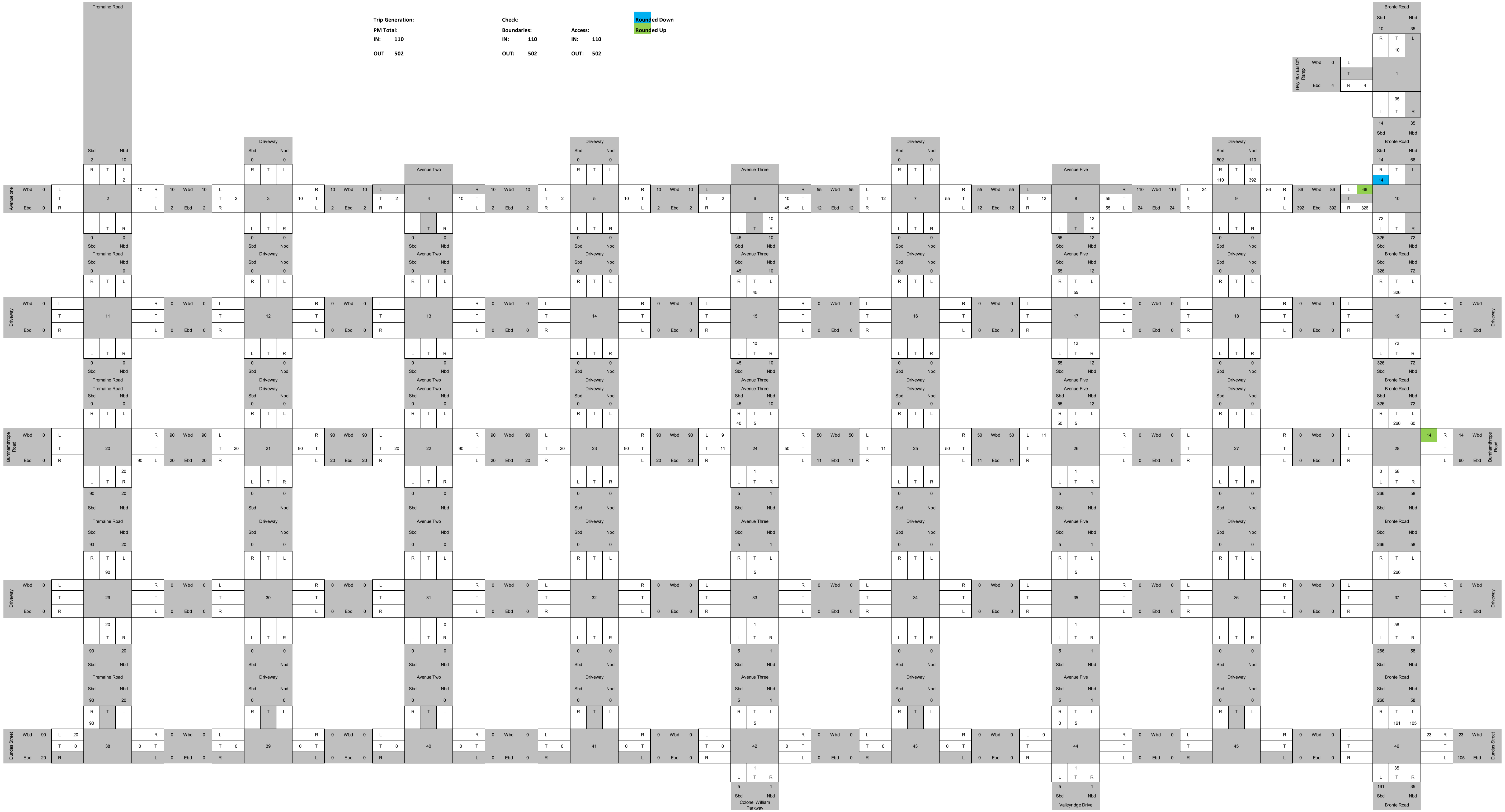
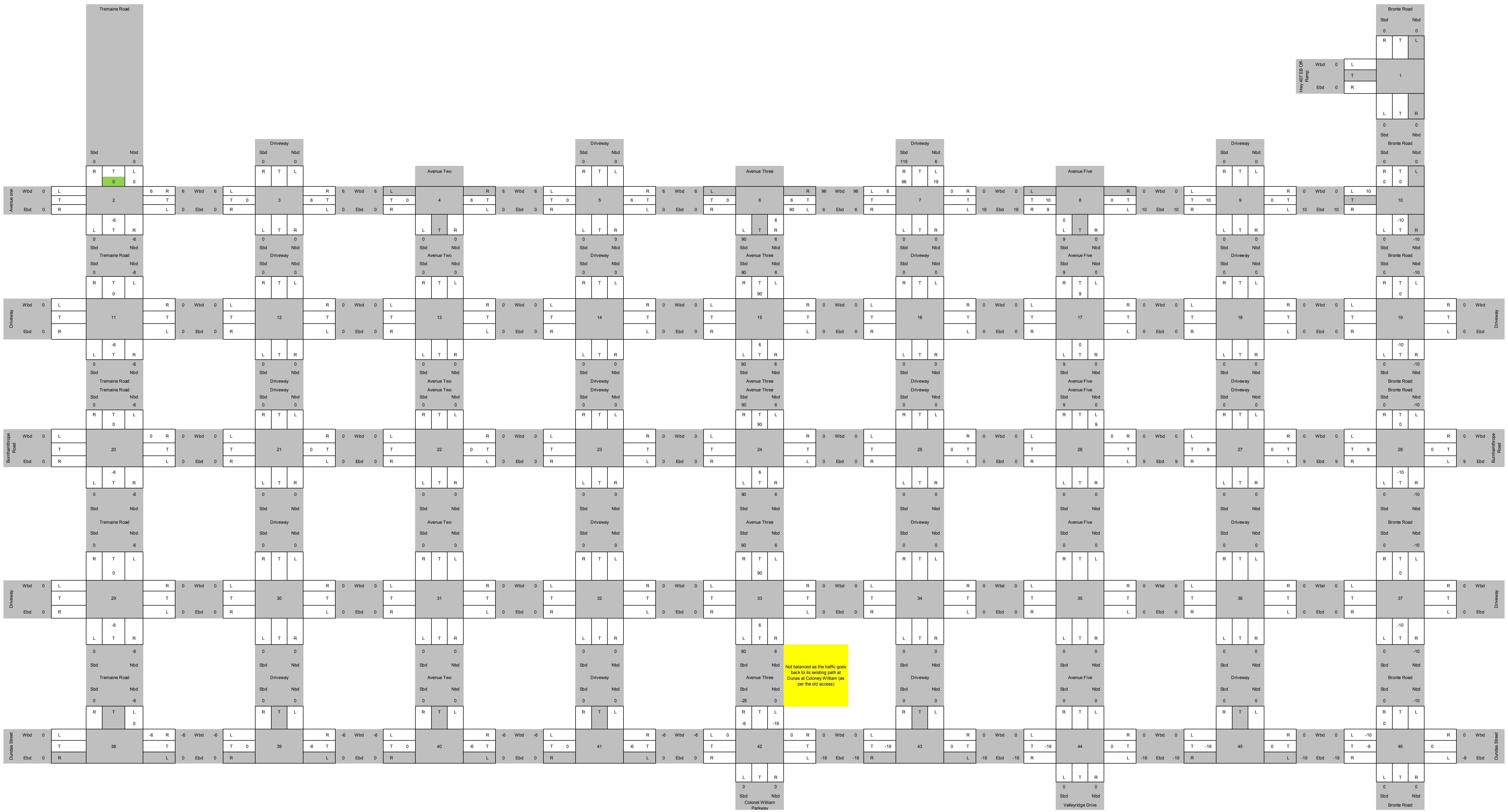


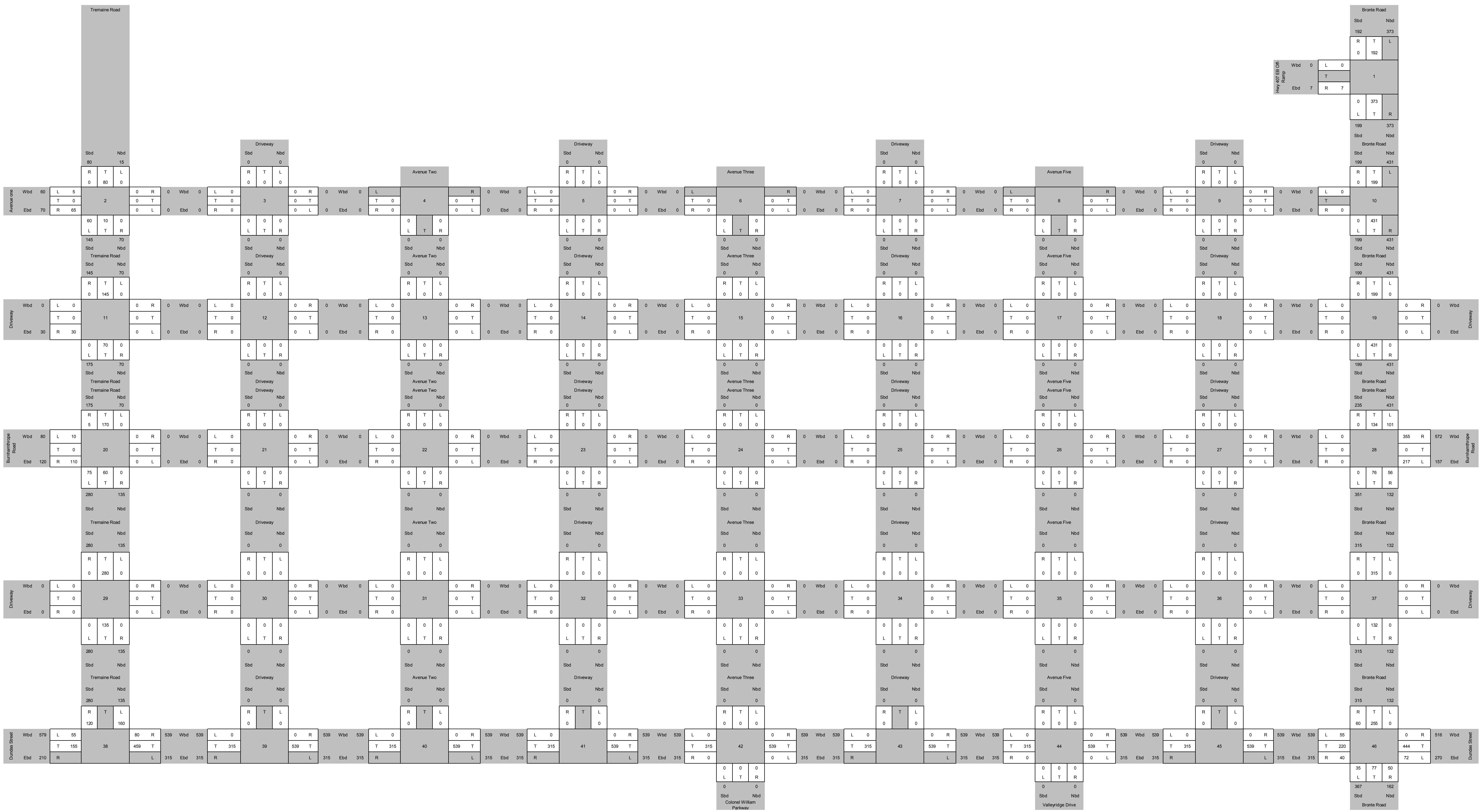
Figure X
407 Lands Background Development Phase 2 Trip Assignment Block Group 22 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study



Scale: NTS

Figure X
GE Lands Background Development Traffic Reassignment Phase 2 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx



Scale: NTS

Figure X
Overall Additional Background Development Traffic (not including existing traffic growth) 2021 Phase 1 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20161207 (with proper Phase names for Appendix).xlsx

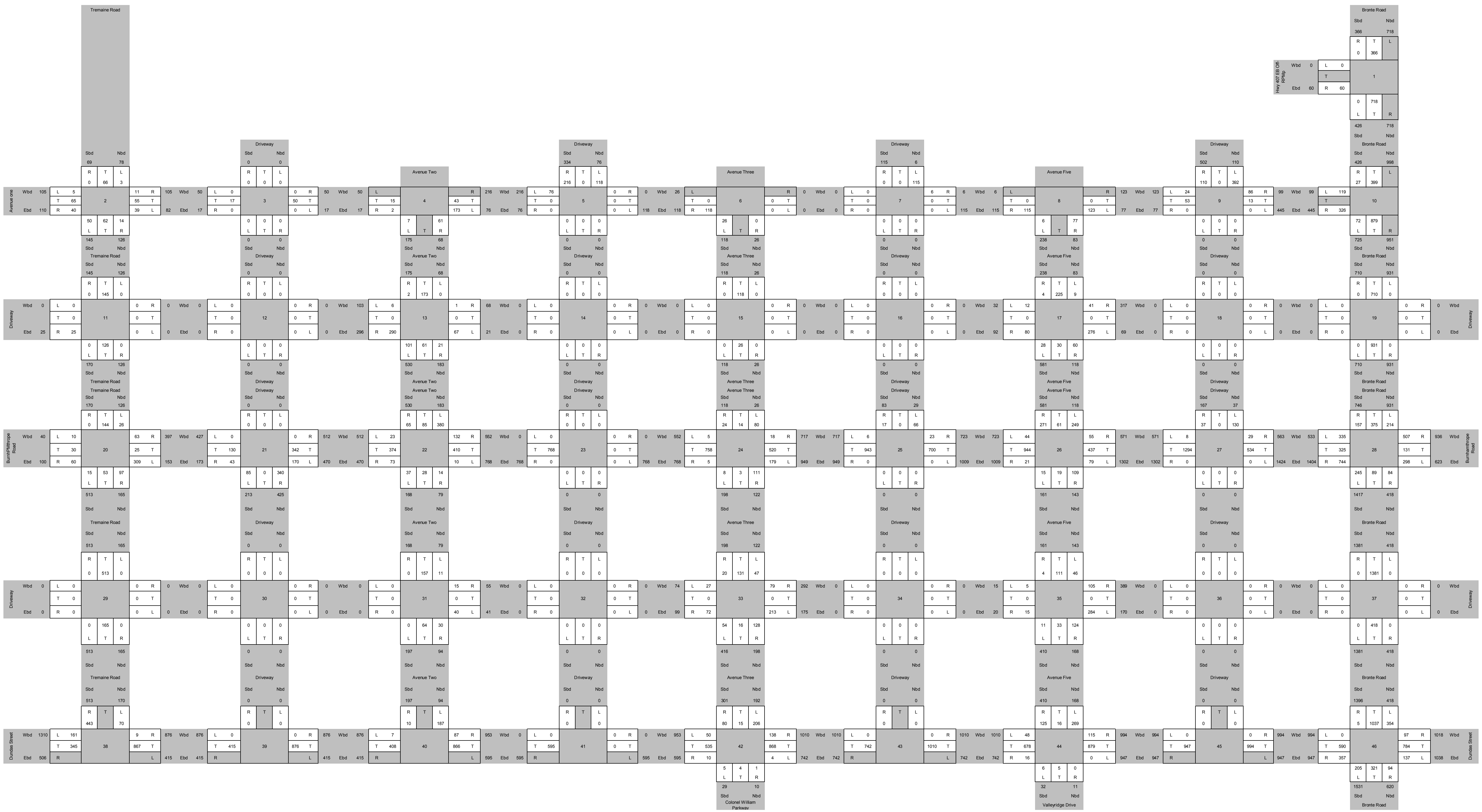


Figure X
Overall Additional Background Development Traffic (not including existing traffic growth) 2031 Phase 2A - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-08822_Traffic Model PM_20161207 (with proper Phase names for Appendix).xlsx

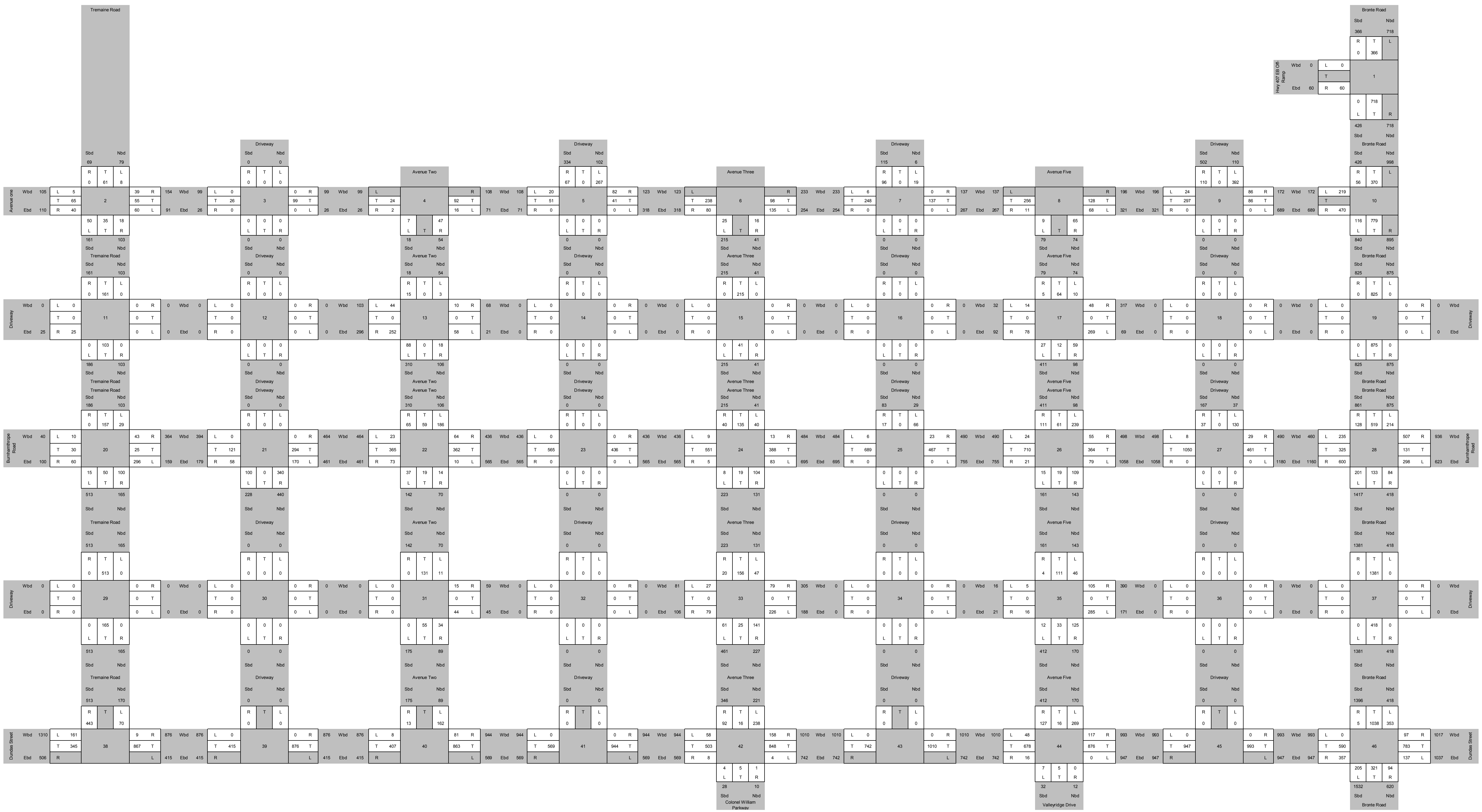


Figure X
Overall Additional Background Development Traffic (not including existing traffic growth) 2031 Phase 2 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Scale: NTS

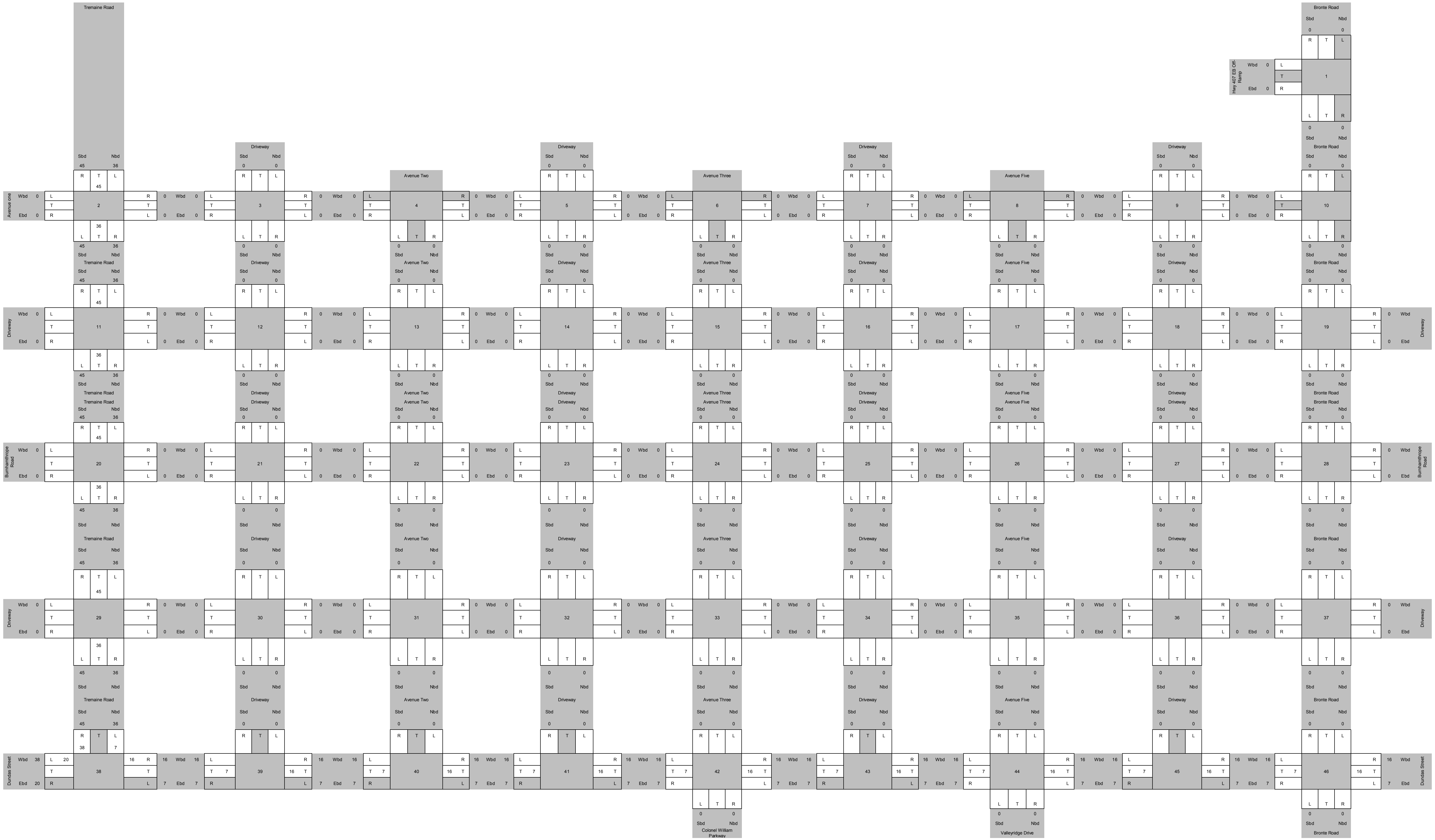


Figure X
Traffic Growth from Existing 2018 Volumes to 2021 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

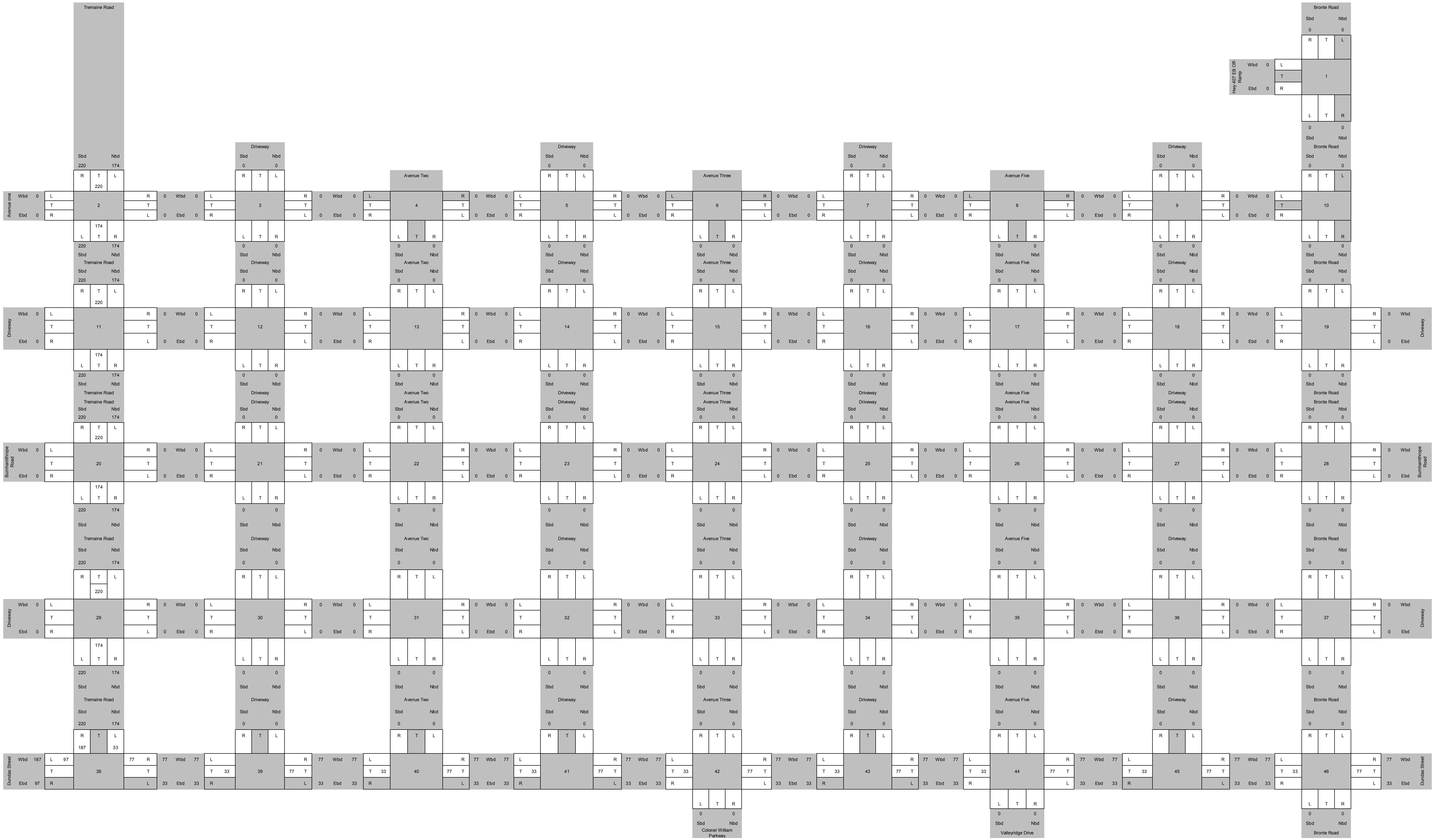


Figure X
Traffic Growth from derived 2021 Volumes (Existing with Applied Growth) to 2031 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

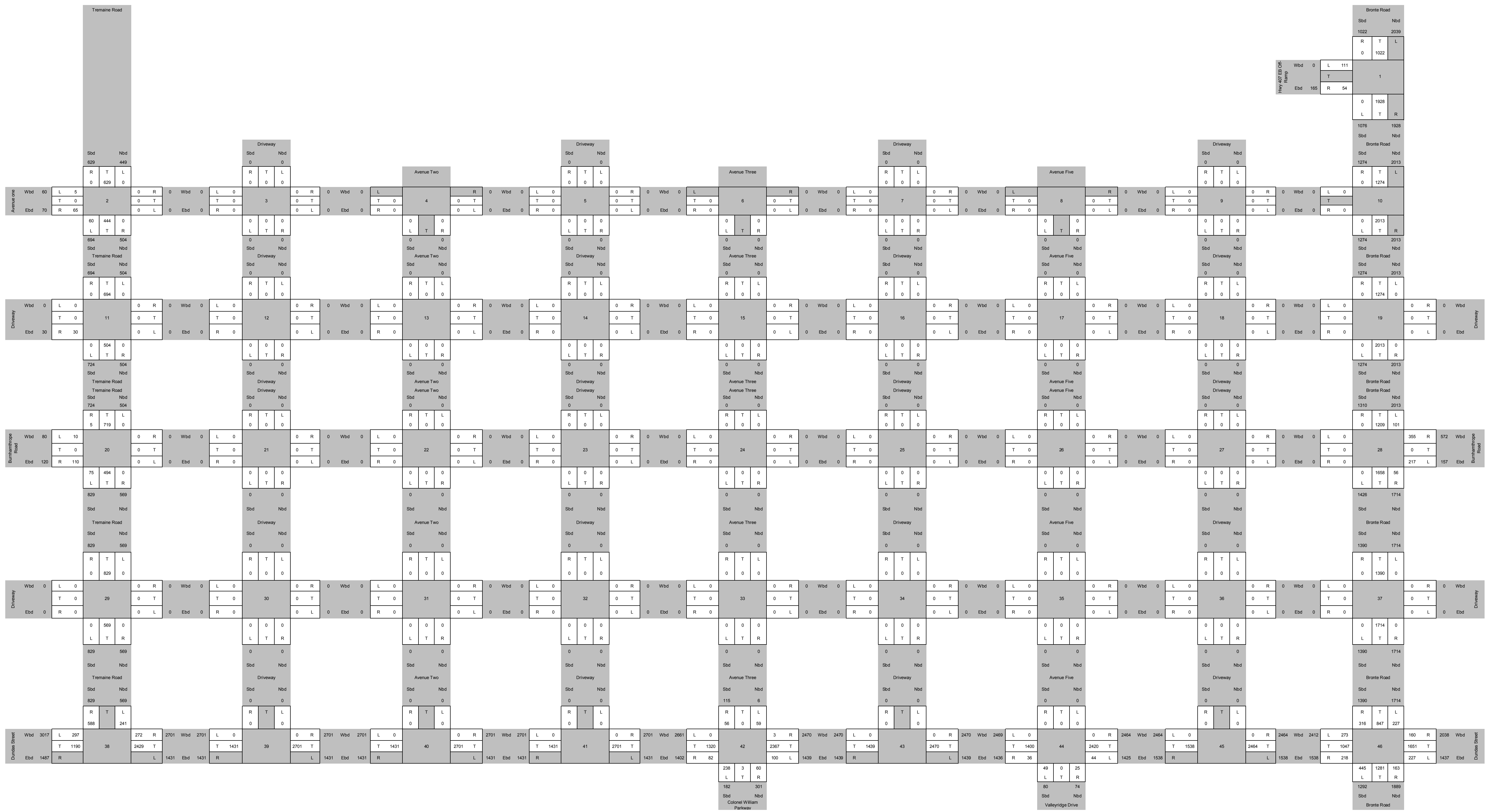
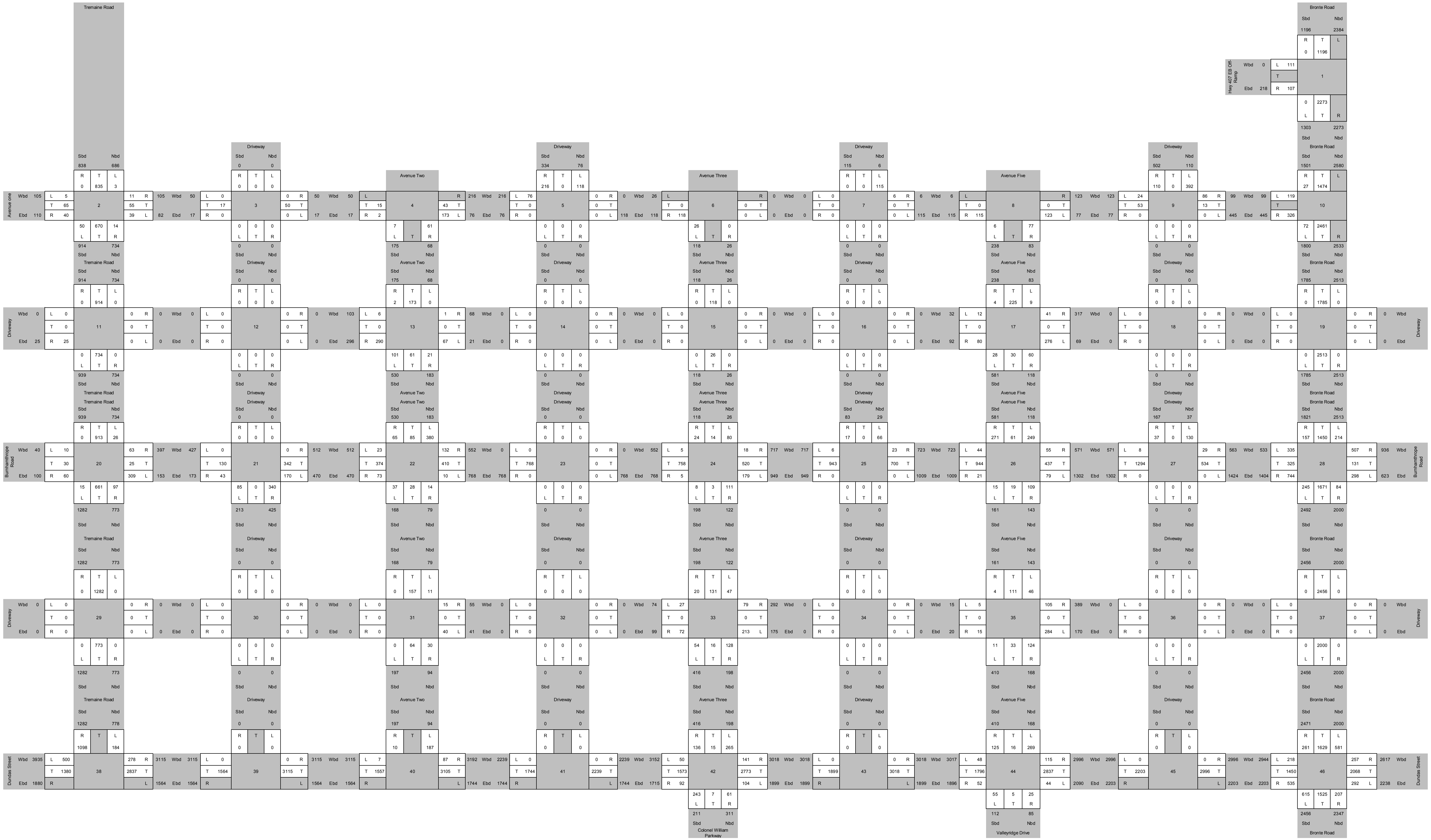


Figure X
Future Background Volumes - Phase 1 (2021) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

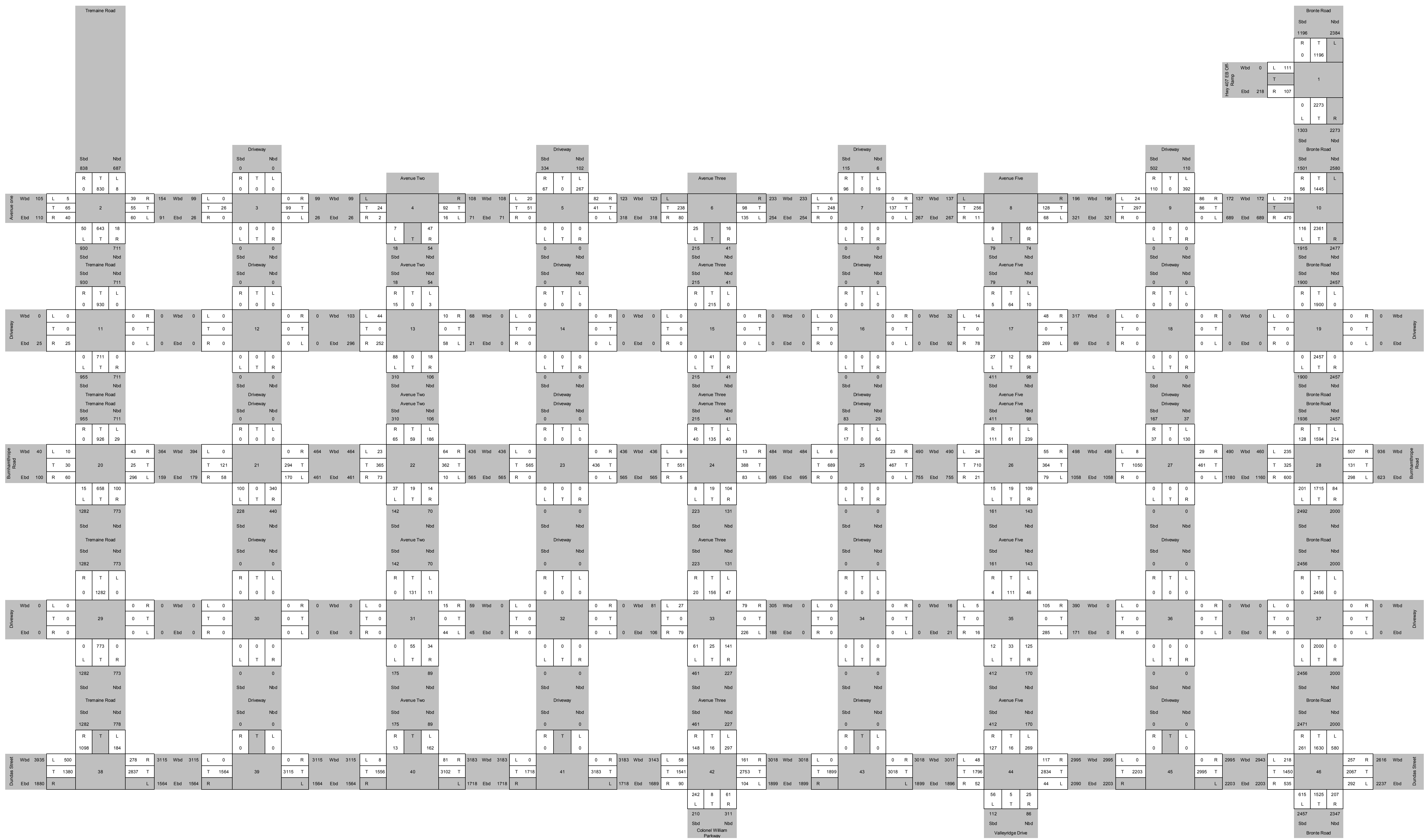
14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx



Scale: NTS

Figure X
Future Background Volumes - Phase 2A (2031) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx



Scale: NTS

Figure X
Future Background Volumes - Phase 2 (2031) - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Subject Lands Trip Gen per Group

Trip Assignment Notes:

The trip assignment for the 407 employments lands (site and surrounding 407 background developments) have been distributed along the driveways based on the Blocks layout.
The trip generation for each block is based on a percentage of the overall trip generation (per land use) for the site or surrounding background 407 lands, with the percentage of the trip generation derived based on the percentage of the block GFA compared to the overall GFA used for the trip gen.

Blocks assumed to use the Same Driveways:

For the Phase 1 development (2021 horizon year):

Group 1	Group 2	Group 3	Group 4	Group 5
C3-3	G3-1	C2-2	C4-1	G5-1
C3-5	G4			G5-2
G3-2				C5-1

Percentage of Trip Gen for these blocks:

Rounded up to match overall trip gen values
Rounded Down tp match overall trip gen values

Group 1

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C3-3	Service Area Employment	Shopping Centre	49,186	37%	50	31	81	103	119	222
		Shopping Centre Pass-By	49,186	37%	0	0	0	8	8	16
		General Office	26,485	37%	37	6	43	6	33	39
C3-5	Light Employment	General Office	105,486	41%	128	18	146	24	109	133
G3-2	General Employment	Business Park	45,811	16%	50	9	59	15	42	57
Total Primary					**265**	**64**	**329**	**148**	**303**	**451**
Total Pass-By					**0**	**0**	**0**	**8**	**8**	**16**

Group 2

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G3-1	Service Area Employment	Shopping Centre	42,539	32%	44	27	71	89	103	192
		Shopping Centre Pass-By	42,539	32%	0	0	0	7	7	14
		General Office	22,906	32%	32	5	37	6	28	34
G4	General Employment	Business Park	62,689	22%	68	12	80	20	58	78
Total Primary					**144**	**44**	**188**	**115**	**189**	**304**
Total Pass-By					**0**	**0**	**0**	**7**	**7**	**14**

Group 3

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C2-2	Light Employment	General Office	57,049	22%	70	9	79	13	59	72
Total					**70**	**9**	**79**	**13**	**59**	**72**

Group 4

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C4-1	Service Area Employment	Shopping Centre	40,146	30%	41	25	66	84	96	180
		Shopping Centre Pass-By	40,146	30%	0	0	0	7	7	14
		General Office	21,617	30%	31	3	34	5	27	32
Total Primary					**72**	**28**	**100**	**89**	**123**	**212**
Total Pass-By					**0**	**0**	**0**	**7**	**7**	**14**

Group 5

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C5-1	Light Employment	General Office	92,031	36%	112	15	127	21	96	117
G5-1	General Employment	Business Park	73,022	26%	80	14	94	23	68	91
G5-2	General Employment	Business Park	97,822	35%	107	19	126	32	89	121
Total					**299**	**48**	**347**	**76**	**253**	**329**

Overall Phase 1

					Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
Total Primary					**850**	**193**	**1043**	**441**	**927**	**1368**
Total Pass-By					**0**	**0**	**0**	**22**	**22**	**44**

				AM IN	AM OUT	AM Total	PM IN	PM OUT	PM Total
Service Area Employment	Shopping Centre			135	83	218	276	318	594
	Shopping Centre Pass-By			0	0	0	22	22	44
	General Office			100	14	114	17	88	105
Light Employment	General Office			310	42	352	58	264	322
General Employment	Business Park			305	54	359	90	257	347

For the Phase 1 and 2 development (2031 horizon year):

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
C3-3	G3-1	C2-2	C4-1	G5-1	C4-2	G5-6	P2-1
C3-5	G4			G5-2		G5-5	P2-2
G3-2				C5-1		C5-2	P2-3
							P2-4

Percentage of Trip Gen for these blocks:

Rounded up to match overall trip gen values
Rounded Down tp match overall trip gen values
Manually Rounded

Group 1

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C3-3	Service Area Employment	Shopping Centre	49,186	37%	50	31	81	103	119	222
		Shopping Centre Pass-By	49,186	37%	0	0	0	8	8	16
		General Office	26,485	37%	35	5	40	5	32	37
C3-5	Light Employment	General Office	105,486	12%	102	14	116	19	87	106
G3-2	General Employment	Business Park	45,811	8%	45	9	54	14	35	49
Total Primary					**232**	**59**	**291**	**141**	**273**	**414**
Total Pass-By					**0**	**0**	**0**	**8**	**8**	**16**

Group 2

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G3-1	Service Area Employment	Shopping Centre	42,539	32%	44	26	70	90	103	193
		Shopping Centre Pass-By	42,539	32%	0	0	0	7	7	14
		General Office	22,906	32%	30	4	34	5	26	31
G4	General Employment	Business Park	62,689	11%	62	11	73	18	49	67
Total Primary					**136**	**41**	**177**	**113**	**178**	**291**
Total Pass-By					**0**	**0**	**0**	**7**	**7**	**14**

Group 3

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C2-2	Light Employment	General Office	57,049	6%	54	8	62	11	46	57
Total					**54**	**8**	**62**	**11**	**46**	**57**

Group 4

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C4-1	Service Area Employment	Shopping Centre	40,146	30%	41	26	67	85	96	181
		Shopping Centre Pass-By	40,146	30%	0	0	0	7	7	14
		General Office	21,617	30%	28	4	32	5	24	29
Total Primary					**69**	**30**	**99**	**90**	**120**	**210**
Total Pass-By					**0**	**0**	**0**	**7**	**7**	**14**

Group 5

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C5-1	Light Employment	General Office	92,031	10%	89	12	101	17	76	93
G5-1	General Employment	Business Park	73,022	12%	72	14	86	21	58	79
G5-2	General Employment	Business Park	97,822	16%	97	17	114	29	77	106
Total					**258**	**43**	**301**	**67**	**211**	**278**

Group 6

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
C4-2	General Employment	Business Park	42,711	7%	42	8	50	13	33	46
Total					**42**	**8**	**50**	**13**	**33**	**46**

Group 7

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
G5-6	Light Employment	Business Park	96,100	11%	93	13	106	18	79	97
G5-5	General Employment	Business Park	92,656	16%	92	16	108	27	72	99
C5-2	General Employment	Business Park	87,145	15%	86	16	102	25	68	93
Total					**271**	**45**	**316**	**70**	**219**	**289**

Group 8

Block name	Block Land Use	Land Use for Trip Gen	GFA (sq.ft)	Percentage of Overall Phase 1	Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
P2-1	Light Employment	General Office	140,469	15%	136	18	154	25	117	142
P2-2	Light Employment	General Office	161,459	18%	156	21	177	29	134	163
P2-3	Light Employment	General Office	165,226	18%	159	22	181	30	136	166
P2-4	Light Employment	General Office	190,521	21%	184	25	209	34	158	192
Total					**635**	**86**	**721**	**118**	**545**	**663**

Overall Phase 1 & 2

					Block Trip Gen Weekday AM Peak Hour			Block Trip Gen Weekday PM Peak Hour		
					IN	OUT	Total	IN	OUT	Total
Total Primary					**1697**	**320**	**2017**	**623**	**1625**	**2248**
Total Pass-By					**0**	**0**	**0**	**22**	**22**	**44**

				AM IN	AM OUT	AM Total	PM IN	PM OUT	PM Total
Service Area Employment	Shopping Centre			135	83	218	278	318	596
	Shopping Centre Pass-By			0	0	0	22	22	44
	General Office			93	13	106	15	82	97
Light Employment	General Office			880	120	1000	165	754	919
General Employment	Business Park			589	104	693	165	471	636

Trip Generation:
PM Total:

IN:	**148**
OUT	**303**

Check:
Boundaries:

IN:	**148**
OUT:	**303**

Access:

IN:	**148**
OUT:	**303**

Rounded Down
Rounded Up

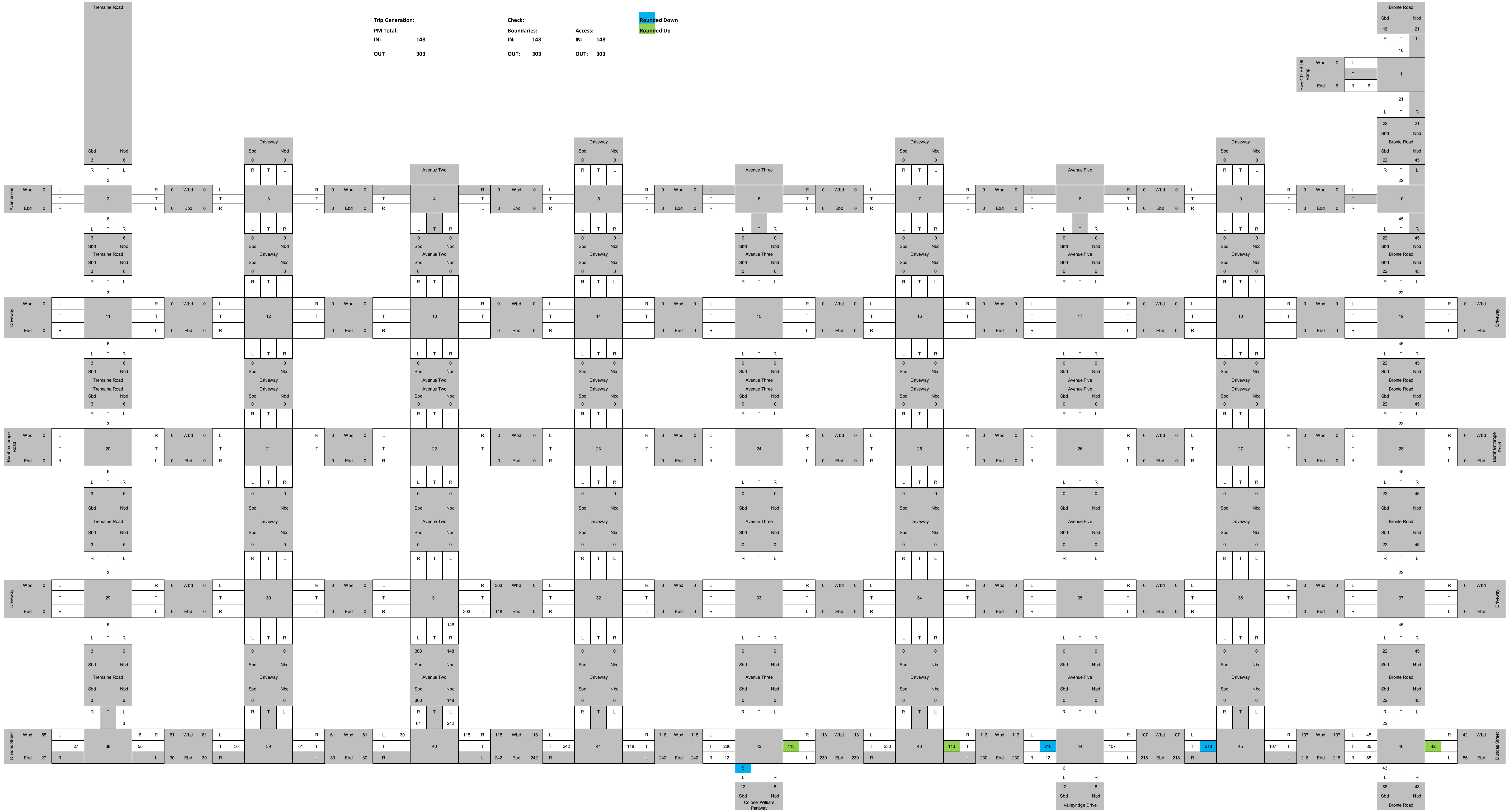


Figure X
Phase 1 Trip Assignment - Block Group 1 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 8
OUT 8

Check:
Boundaries:
IN: 0
OUT: 0

Access:
IN: 8
OUT: 8

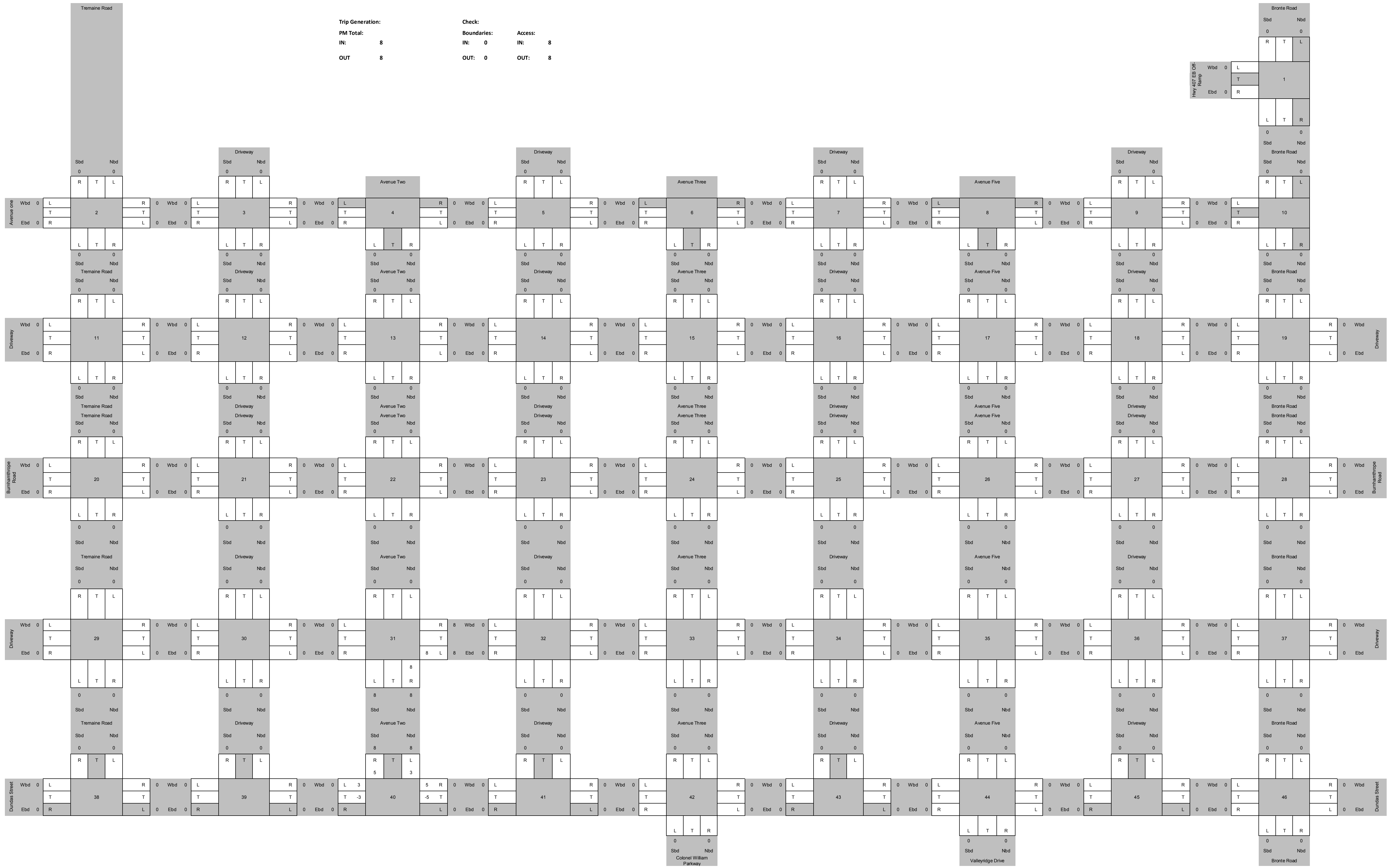


Figure X
Phase 1 Pass-By Trip Assignment - Block Group 1 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:

PM Total:

IN:	**204**
OUT	**312**

Check:

Boundaries:

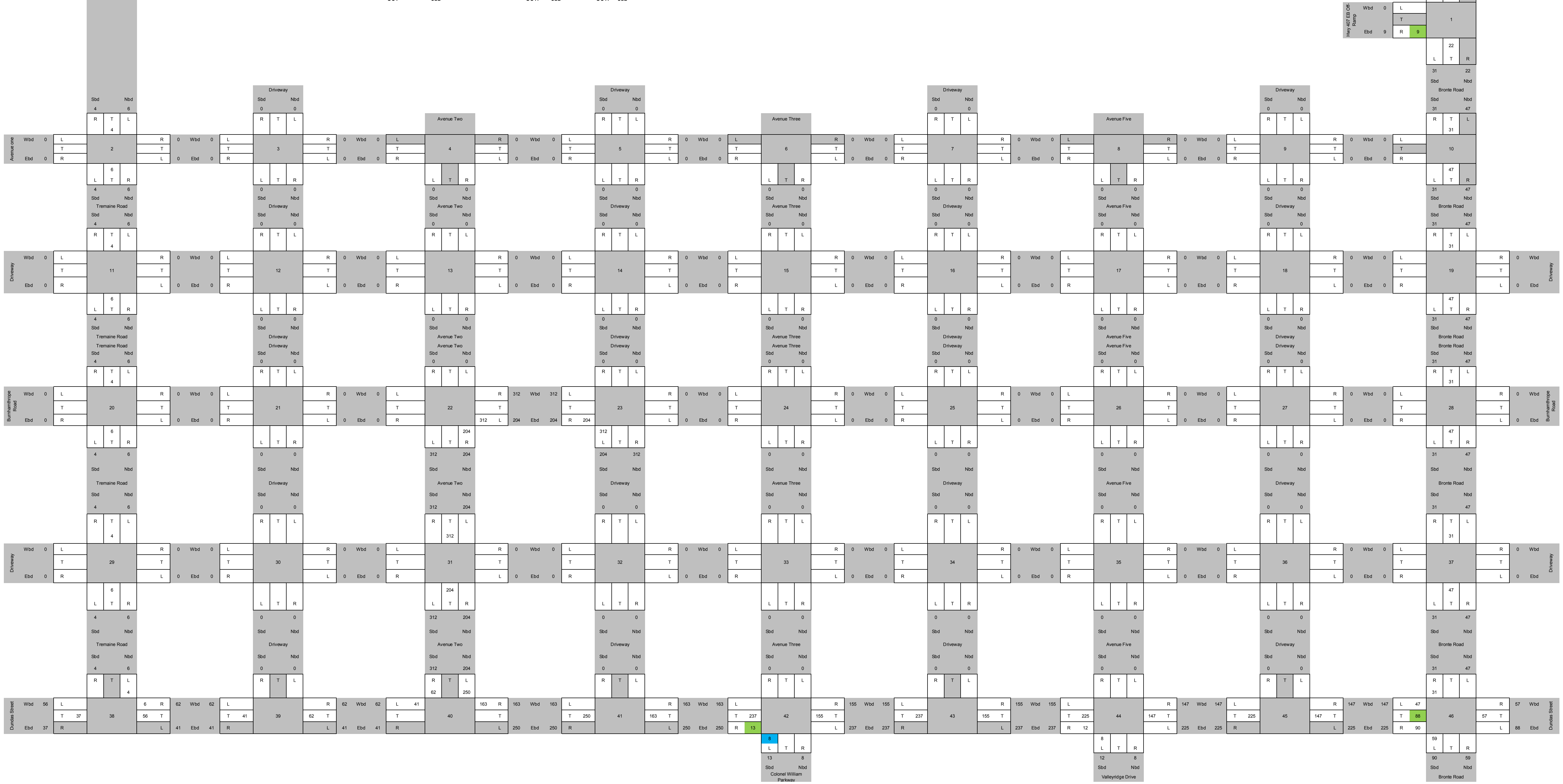
IN:	**204**
OUT:	**312**

Access:

IN:	**204**
OUT:	**312**

Rounded Down

Rounded Up



Scale: NTS

Figure X
Phase 1 Trip Assignment - Block Group 2&4 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00232_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

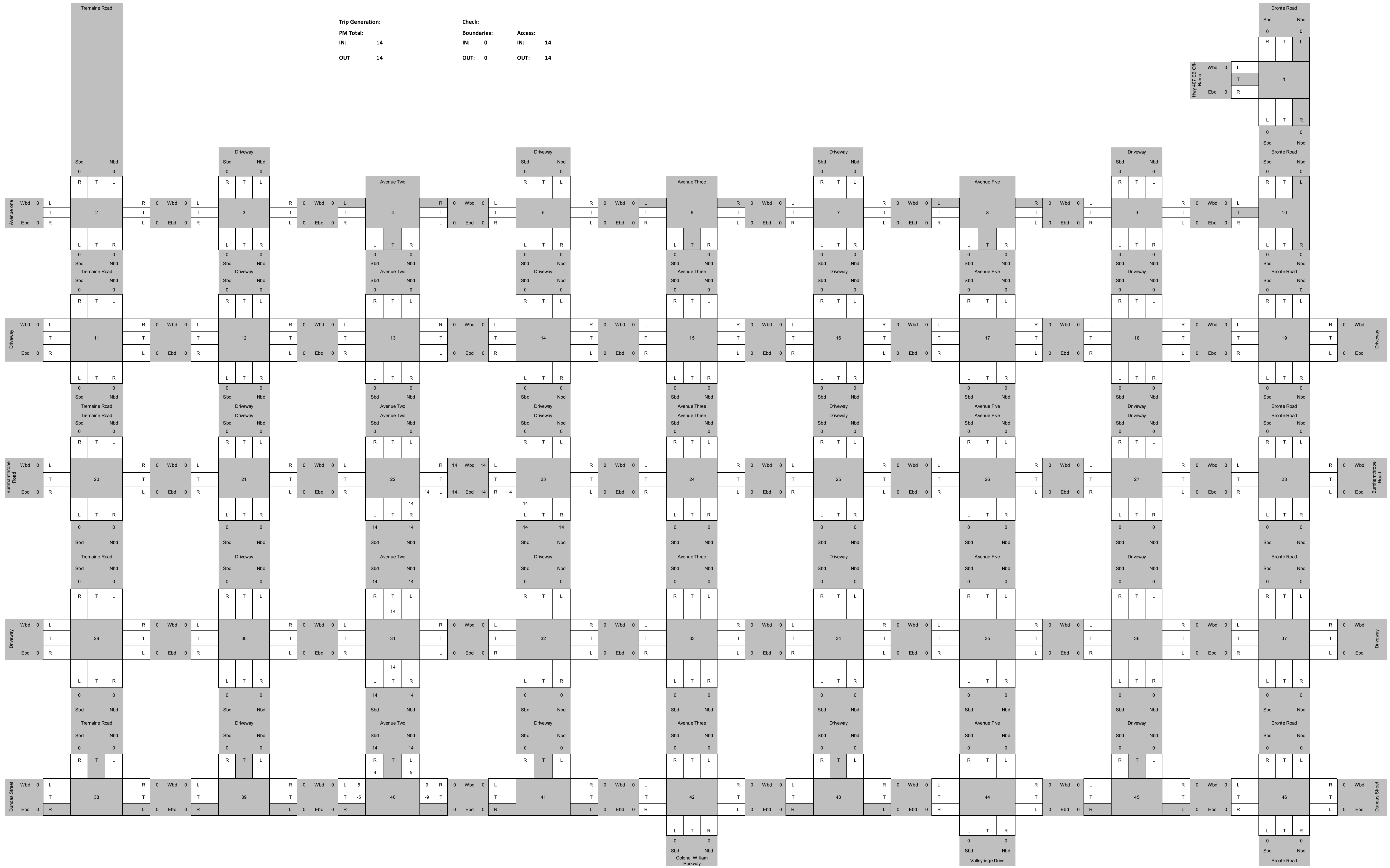


Figure X
Phase 1 Pass-By Trip Assignment - Block Group 2&4 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

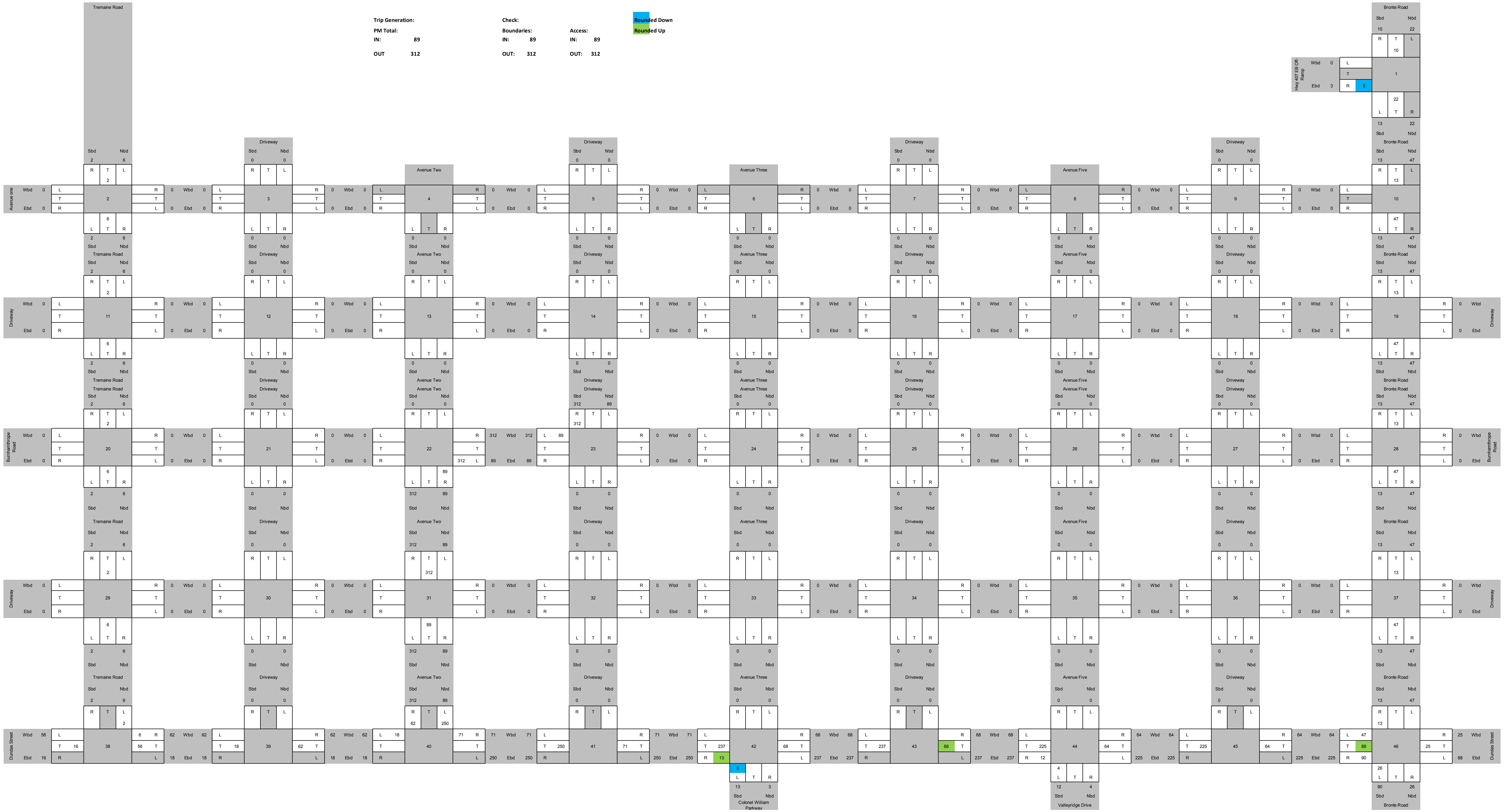
14-05022_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 89
OUT 312

Check:
Boundaries:
IN: 89
OUT: 312

Access:
IN: 89
OUT: 312

Rounded Down
Rounded Up



Scale: NTS

Figure X
Phase 1 Trip Assignment - Block Groups 3&5 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: **441**
OUT **927**

Check:
Boundaries:
IN: **441**
OUT: **927**

Access:
IN: **441**
OUT: **927**

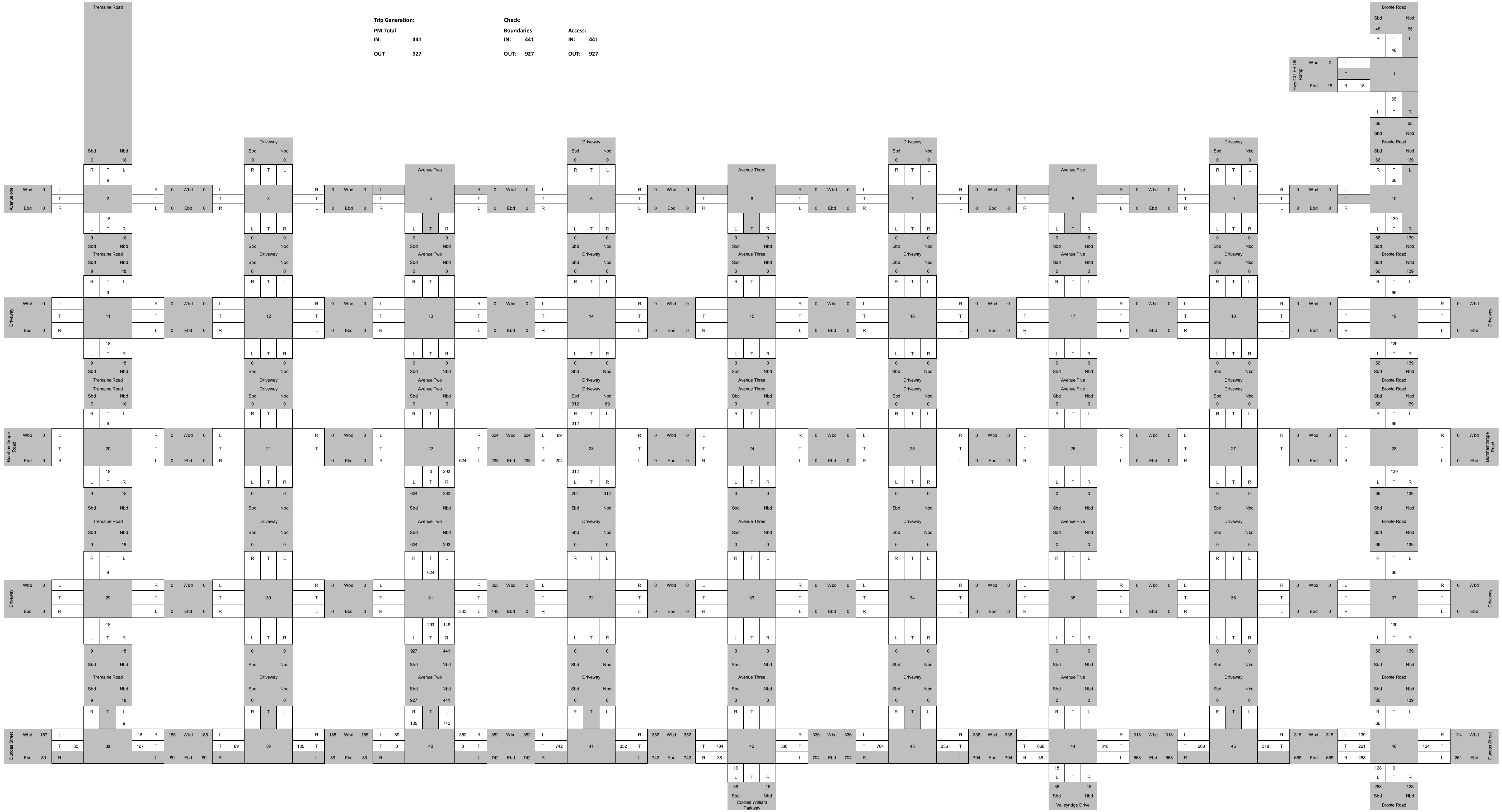


Figure X
Phase 1 Site Generated Traffic - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:

PM Total:

IN: 22

OUT 22

Check:

Boundaries:

IN: 0

OUT: 0

Access:

IN: 22

OUT: 22

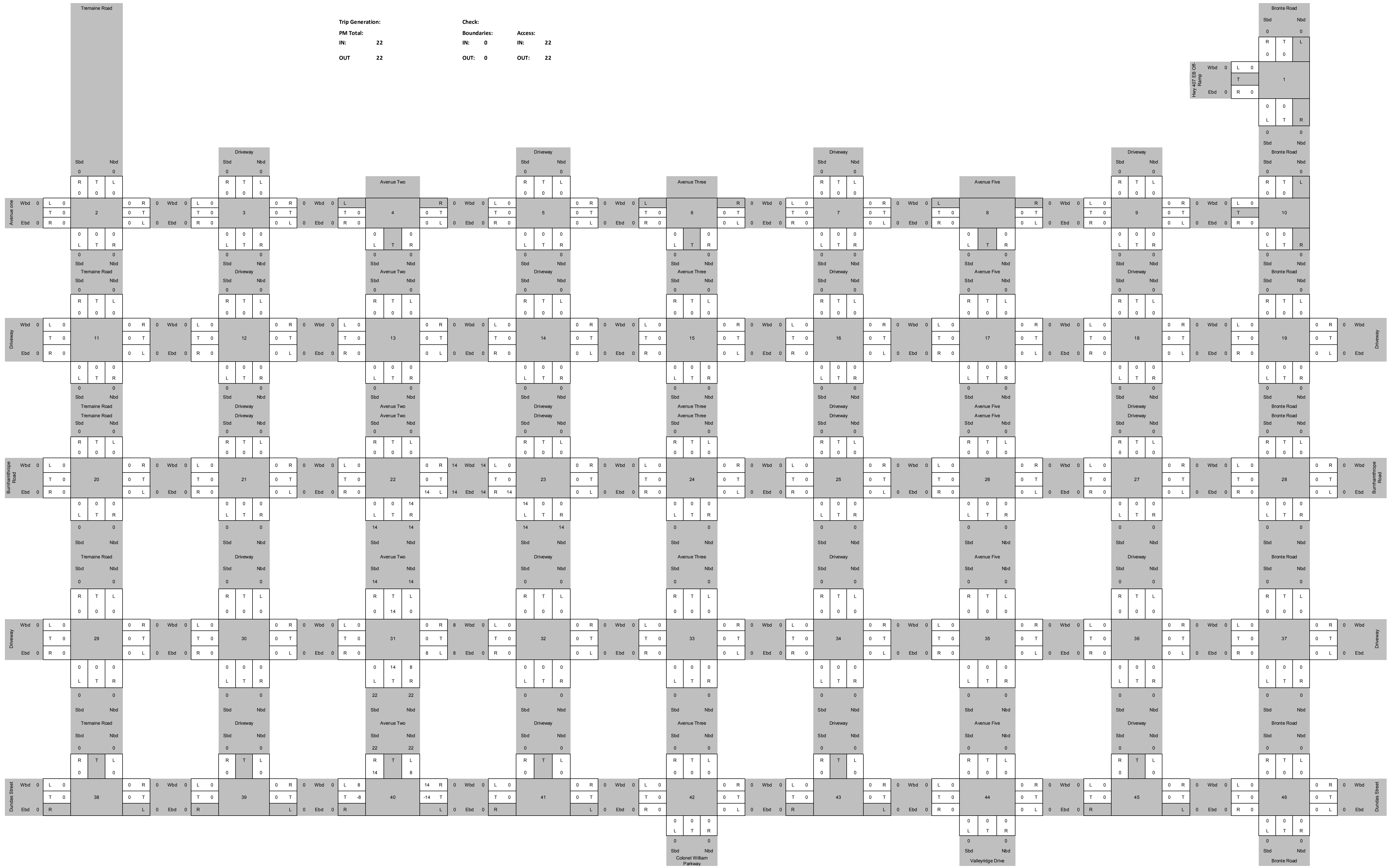
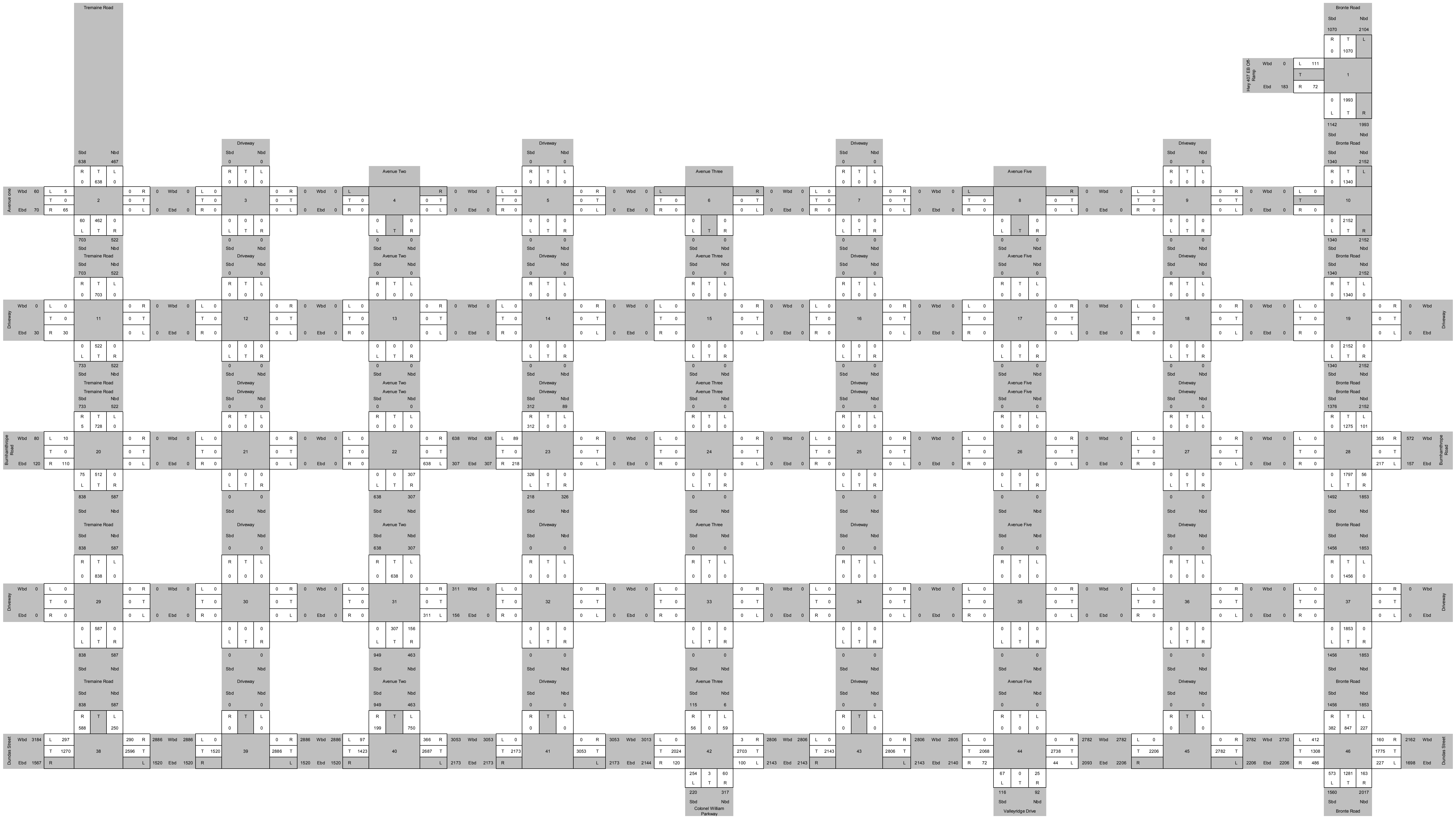


Figure X
Phase 1 Pass-By Site Generated Traffic - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx



Scale: NTS

Figure X
Phase 1 (2021) Future Total Traffic Volumes - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

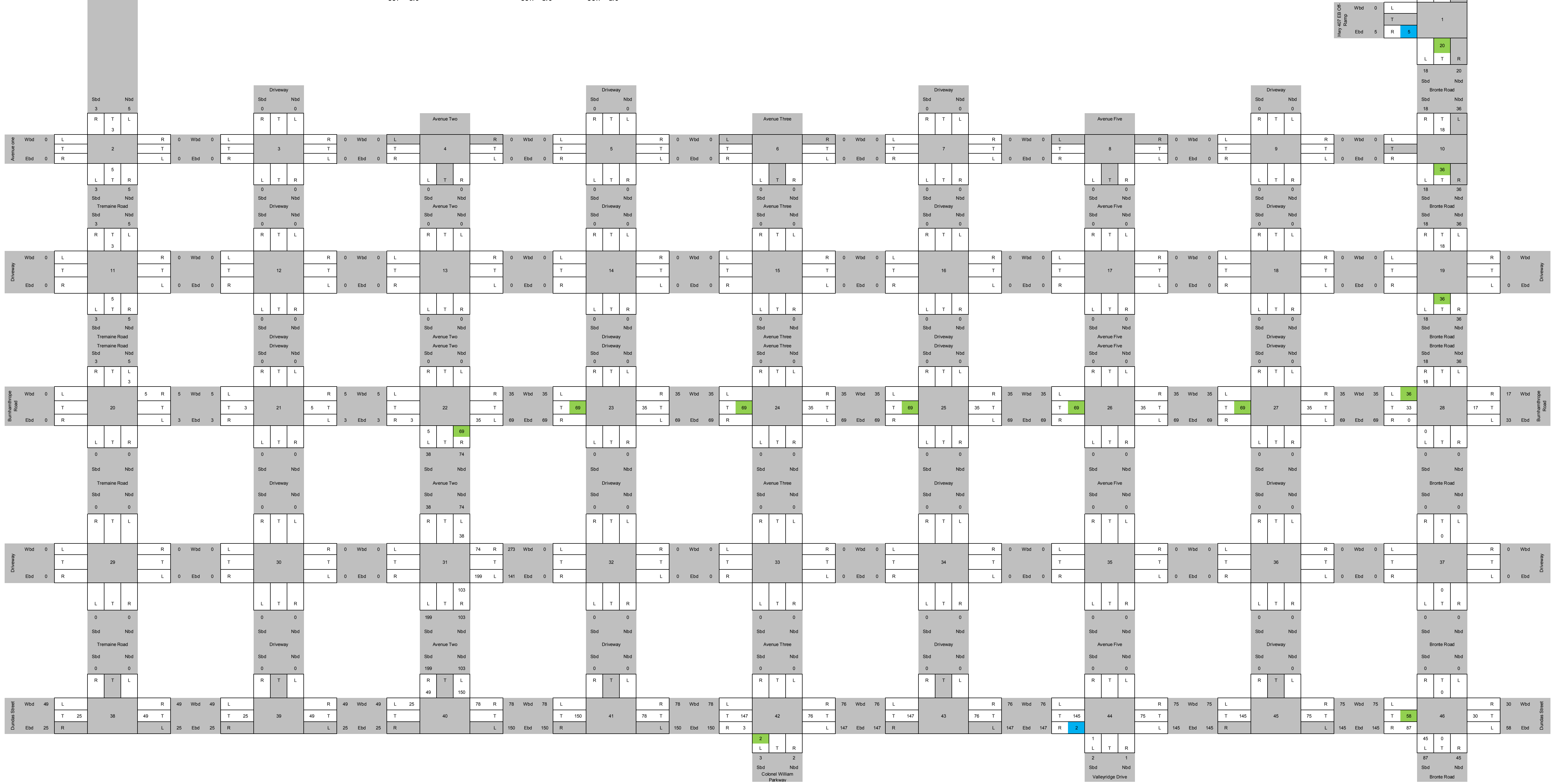
14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 141
OUT: 273

Check:
Boundaries:
IN: 141
OUT: 273

Access:
IN: 141
OUT: 273

Rounded Down
Rounded Up



Scale: NTS

Figure X
Phase 2A&2 Trip Assignment - Block Group 1 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 8
OUT 8

Check:
Boundaries:
IN: 0
OUT: 0

Access:
IN: 8
OUT: 8

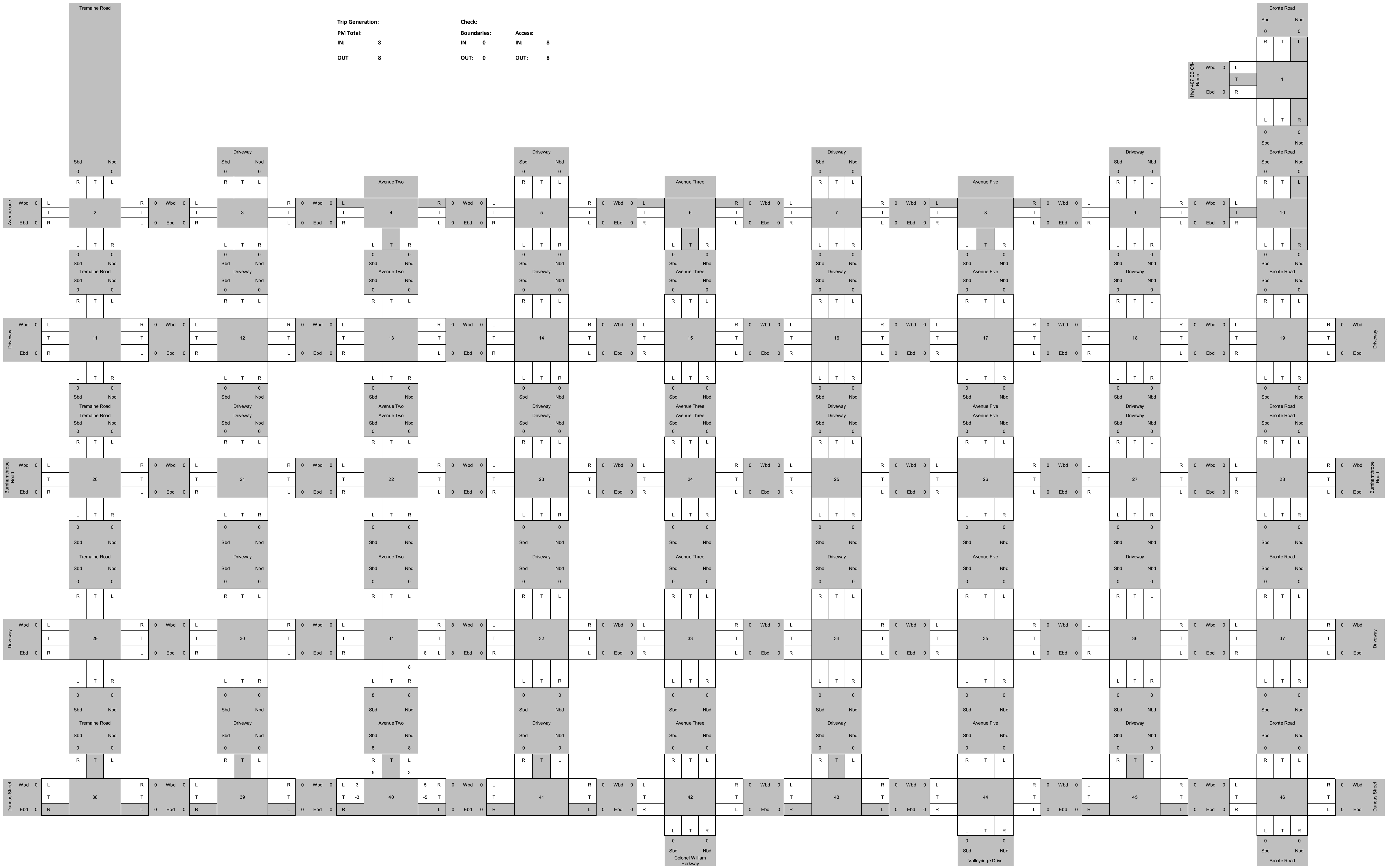


Figure X
Phase 2A&2 Pass-By Trip Assignment - Block Group 1 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

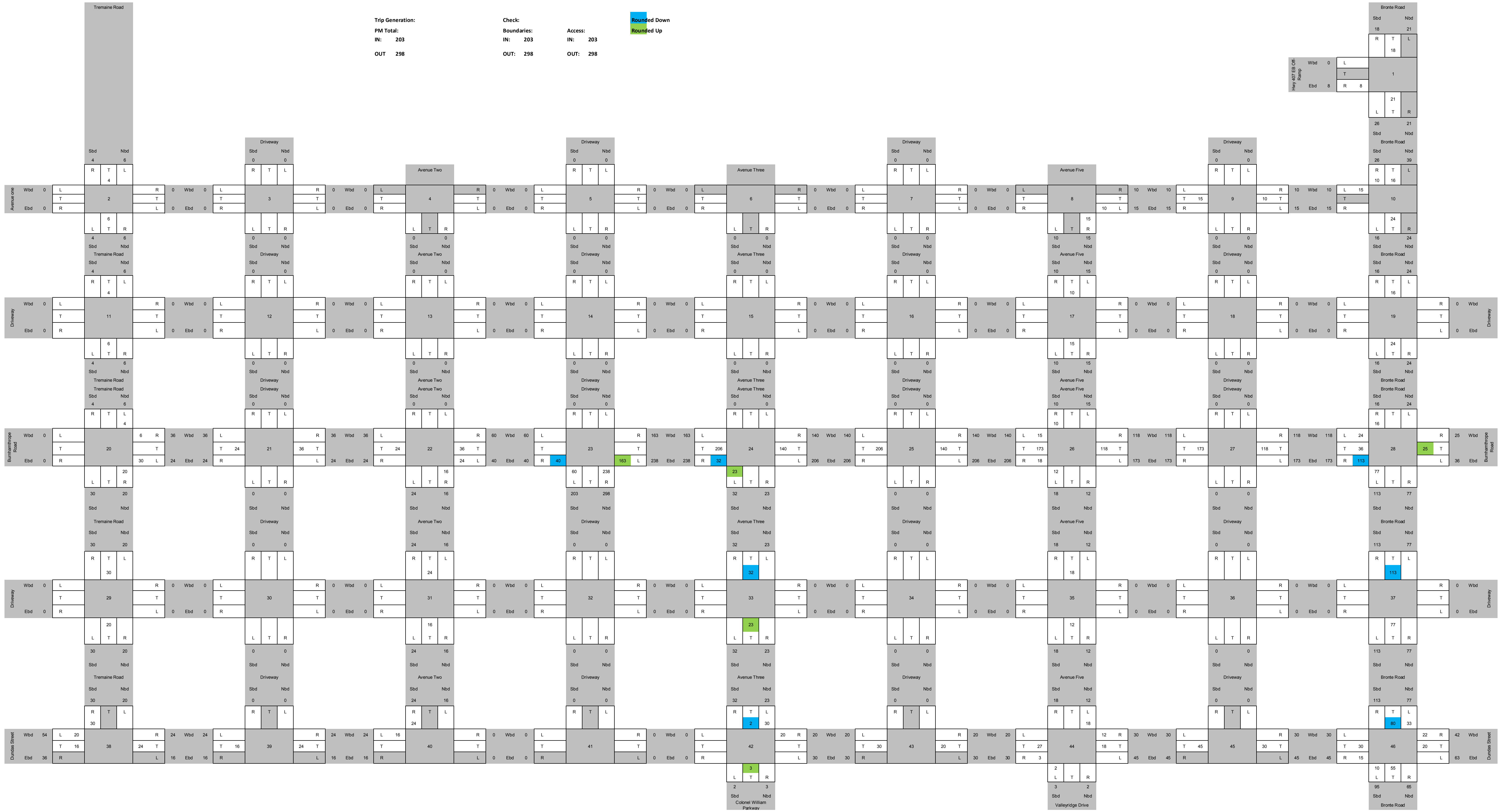


Figure X
Phase 2A&2 Trip Assignment - Block Group 2&4 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-00022_Traffic Model PM_20161207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 14
OUT 14

Check:
Boundaries:
IN: 0
OUT: 0

Access:
IN: 14
OUT: 14

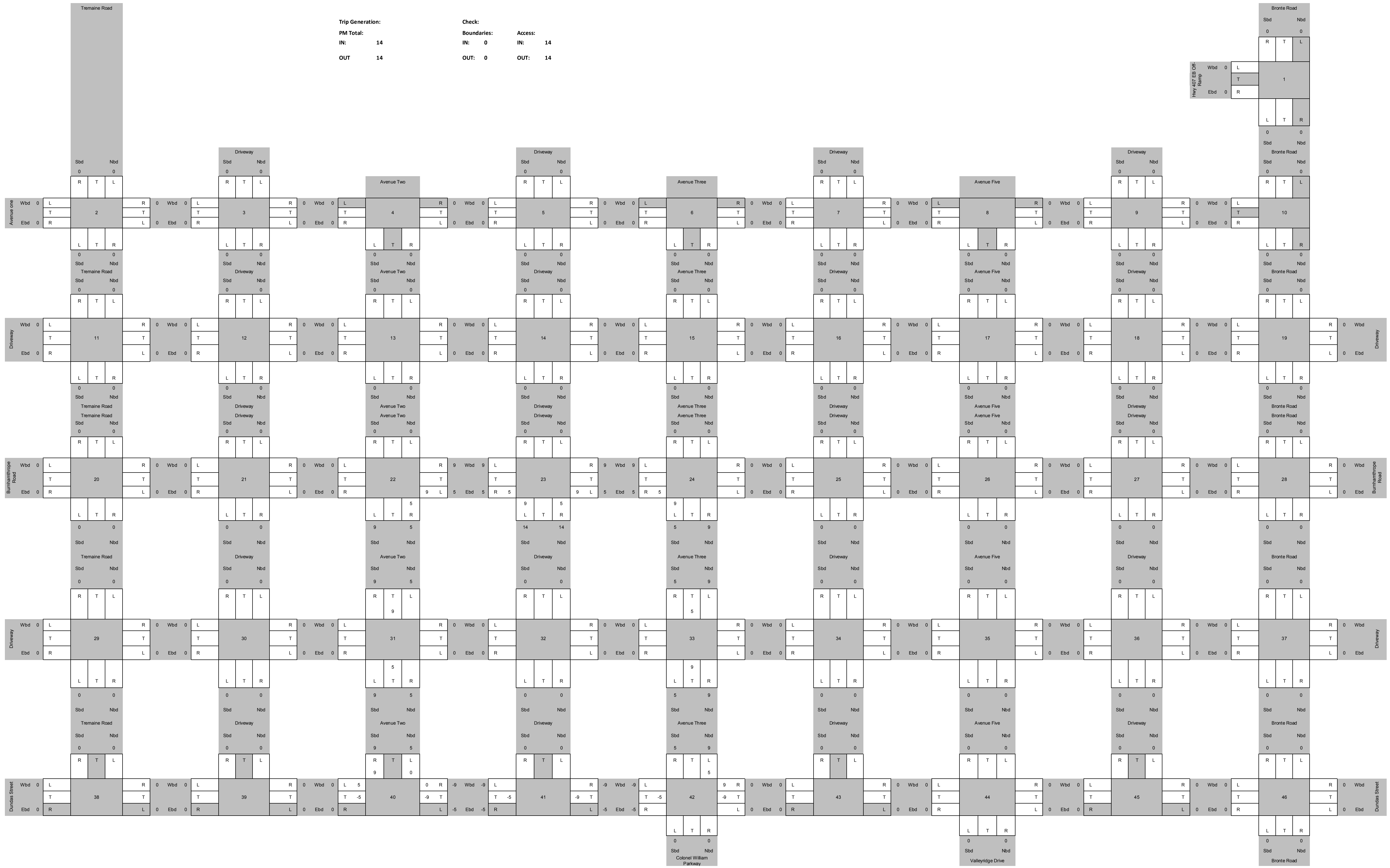


Figure X
Phase 2A&2 Pass-By Trip Assignment - Block Group 2&4 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

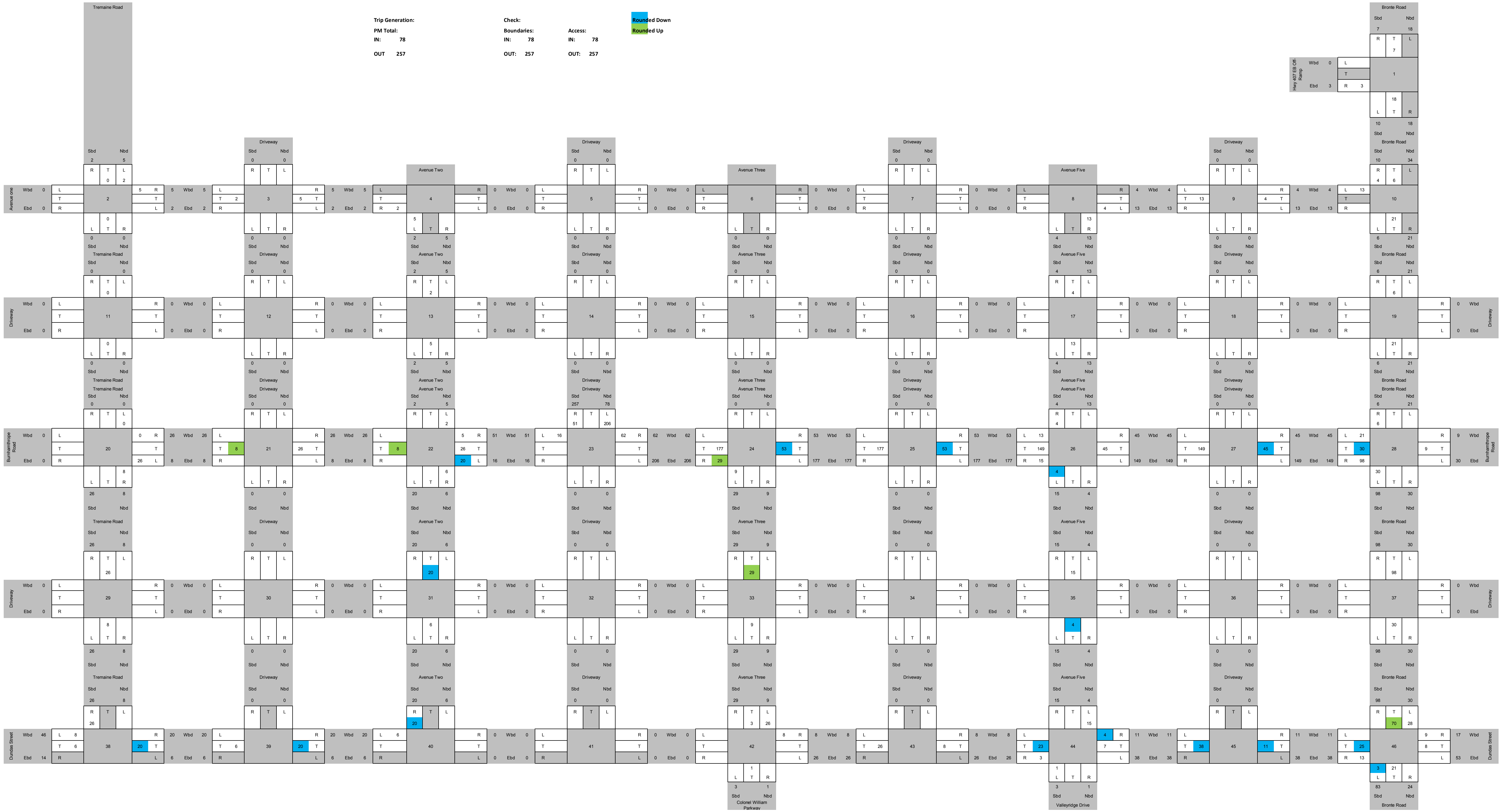
14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 78
OUT 257

Check:
Boundaries:
IN: 78
OUT: 257

Access:
IN: 78
OUT: 257

Rounded Down
Rounded Up



Scale: NTS

Figure X
Phase 2A Trip Assignment - Block Group 3&5 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 78
OUT 257

Check:
Boundaries:
IN: 78
OUT: 257

Access:
IN: 78
OUT: 257

Rounded Down
Rounded Up

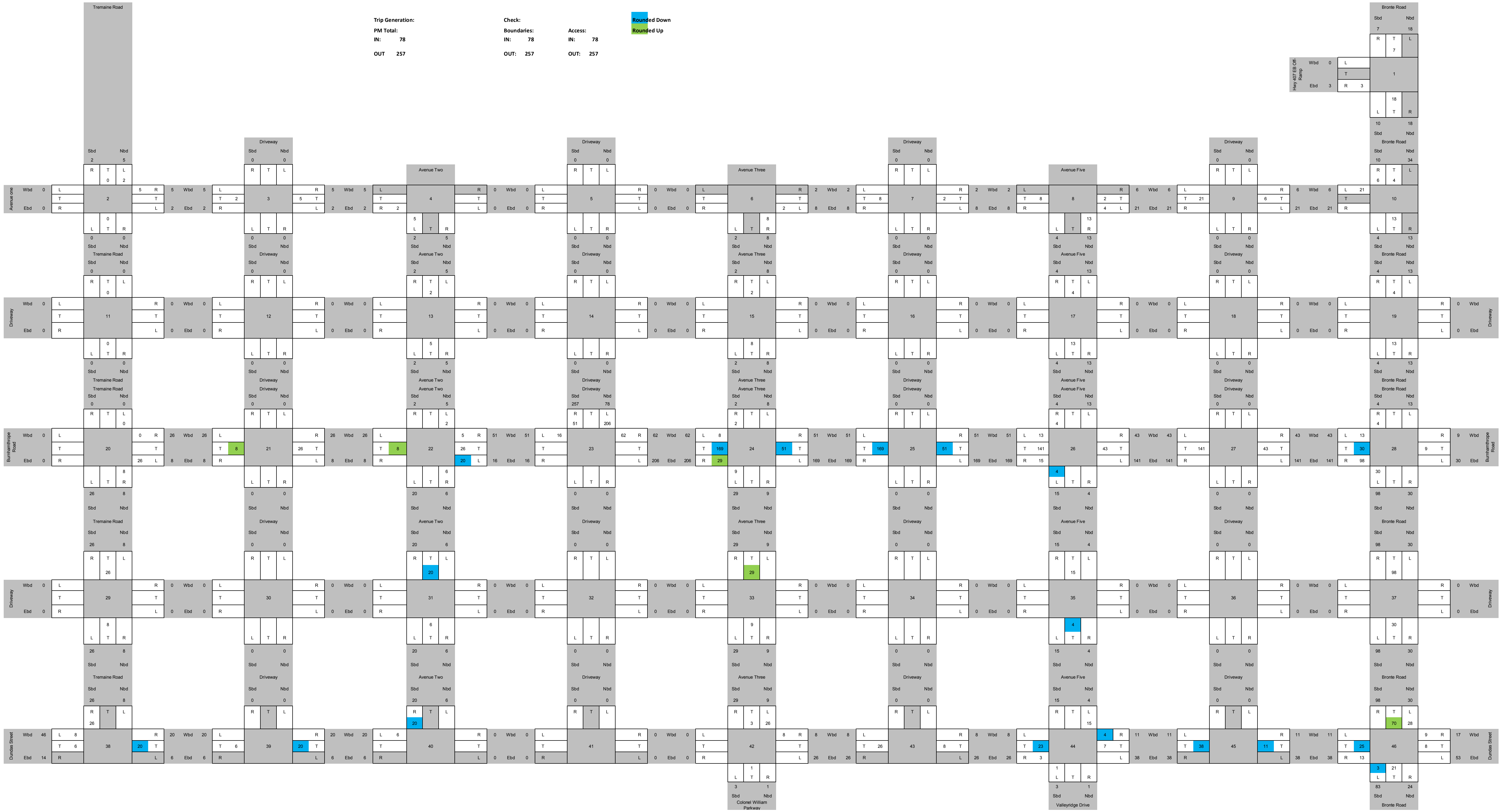


Figure X
Phase 2 Trip Assignment - Block Group 3&5 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

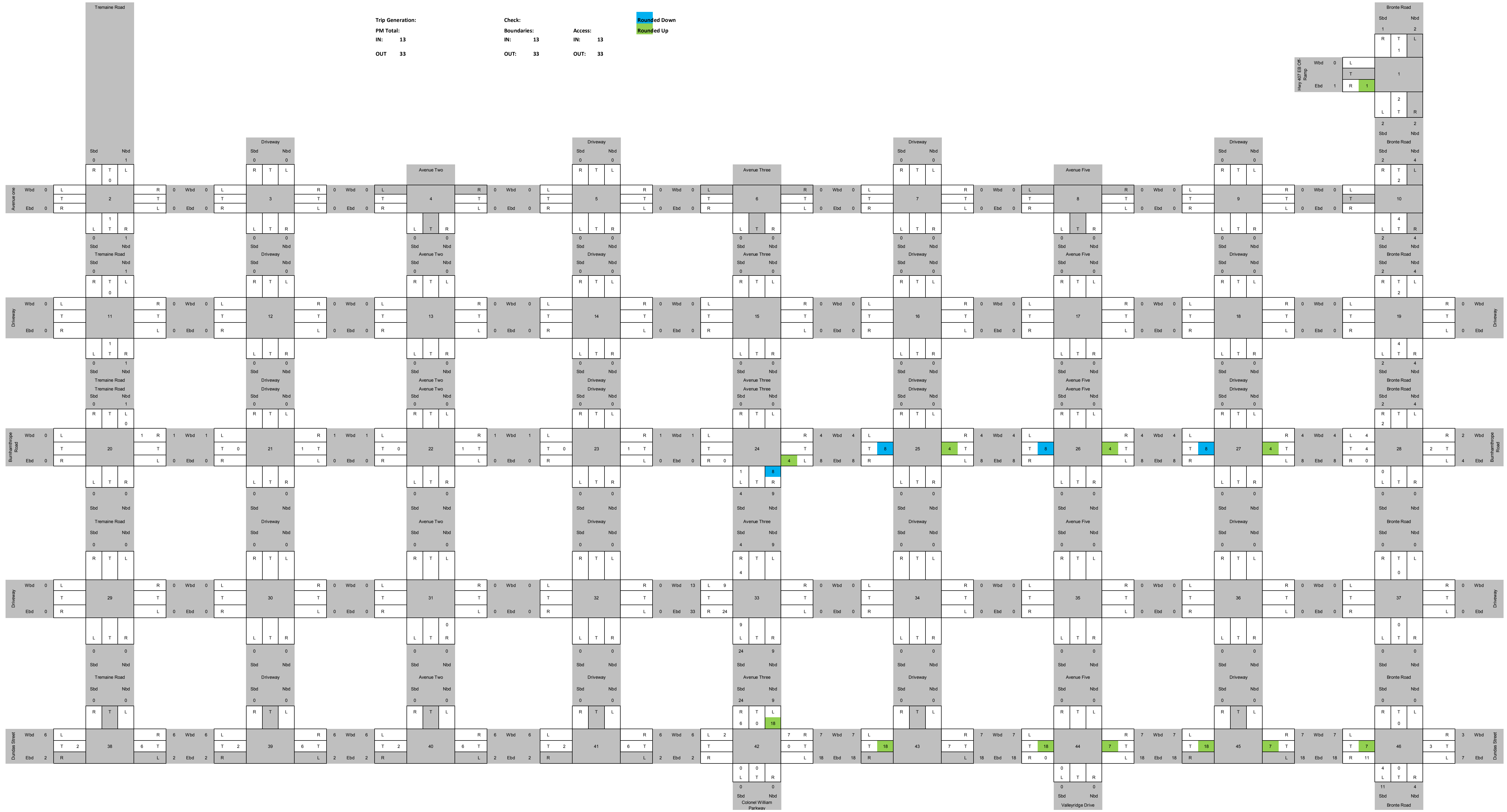
14-09922_Traffic Model PM_20181207 (with proper Phase names for Appendix.xlsx

Trip Generation:
PM Total:
IN: 13
OUT 33

Check:
Boundaries:
IN: 13
OUT: 33

Access:
IN: 13
OUT: 33

Rounded Down
Rounded Up



Scale: NTS

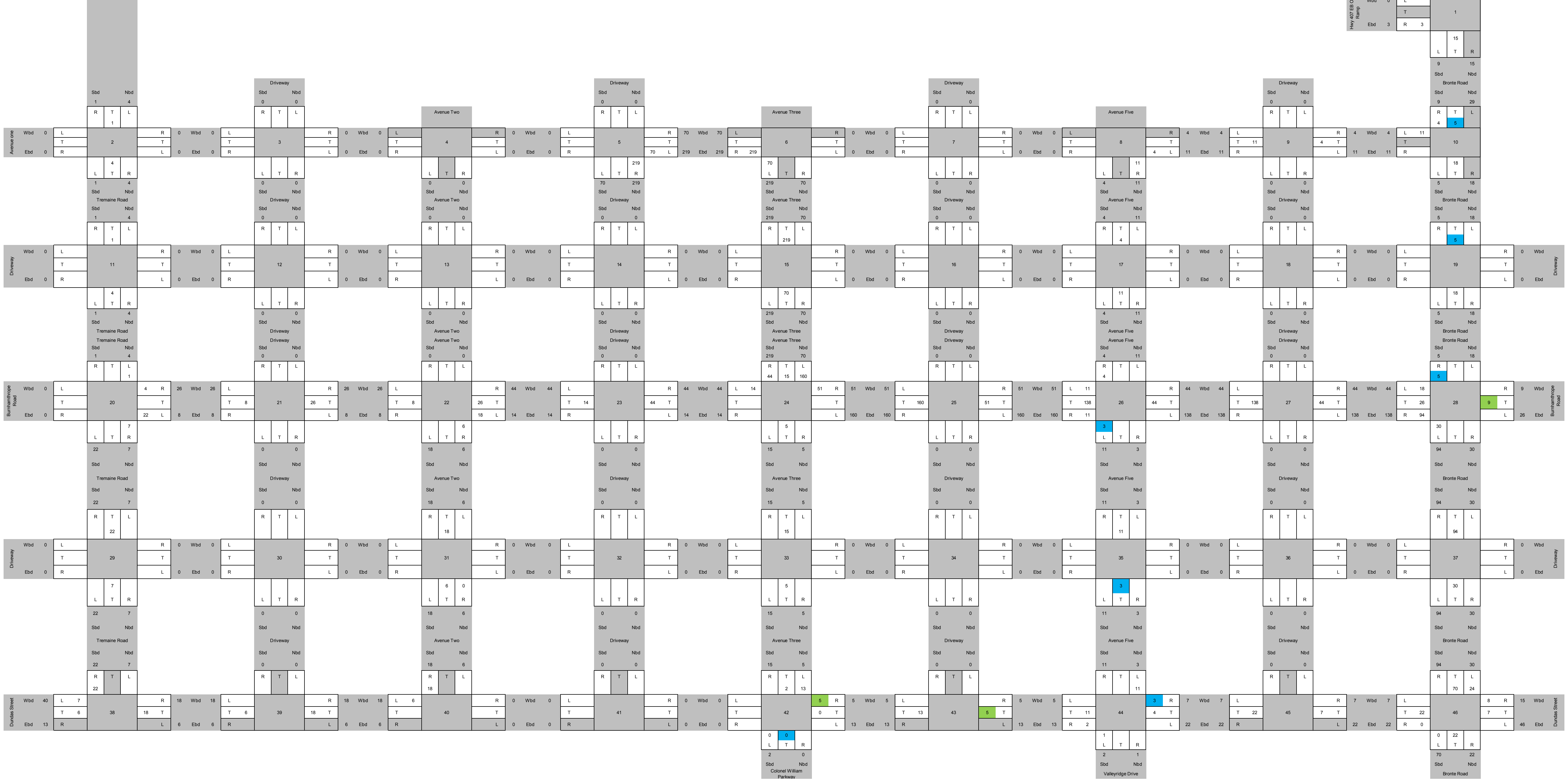
Figure X
Phase 2A&2 Trip Assignment - Block Group 6 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 70
OUT 219

Check:
Boundaries:
IN: 70
OUT: 219

Access:
IN: 70
OUT: 219

Rounded Down
Rounded Up



Scale: NTS

Figure X
Phase 2A Trip Assignment - Block Group 7 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-09022_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

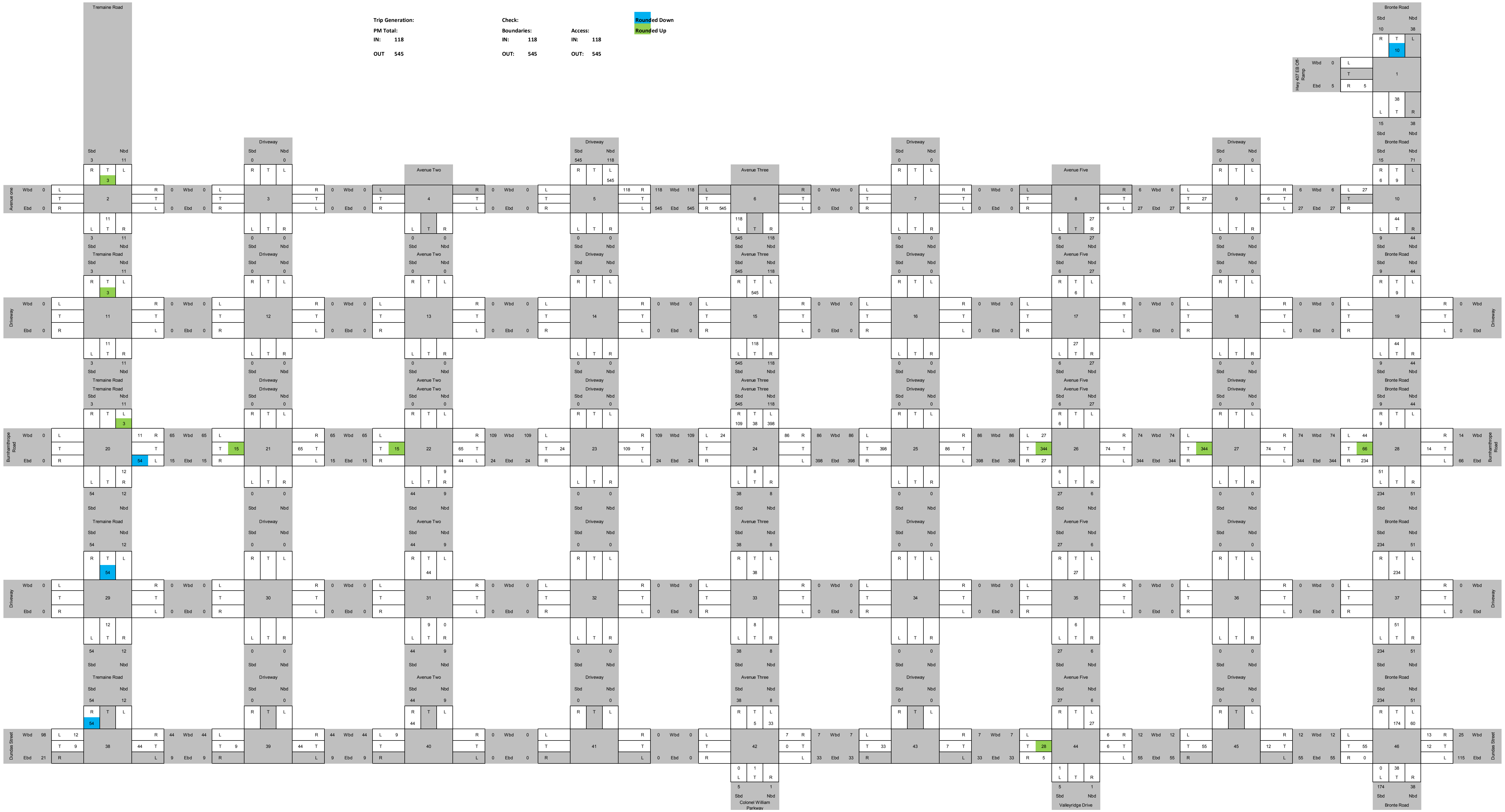


Figure X
Phase 2A Trip Assignment - Block Group 8 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

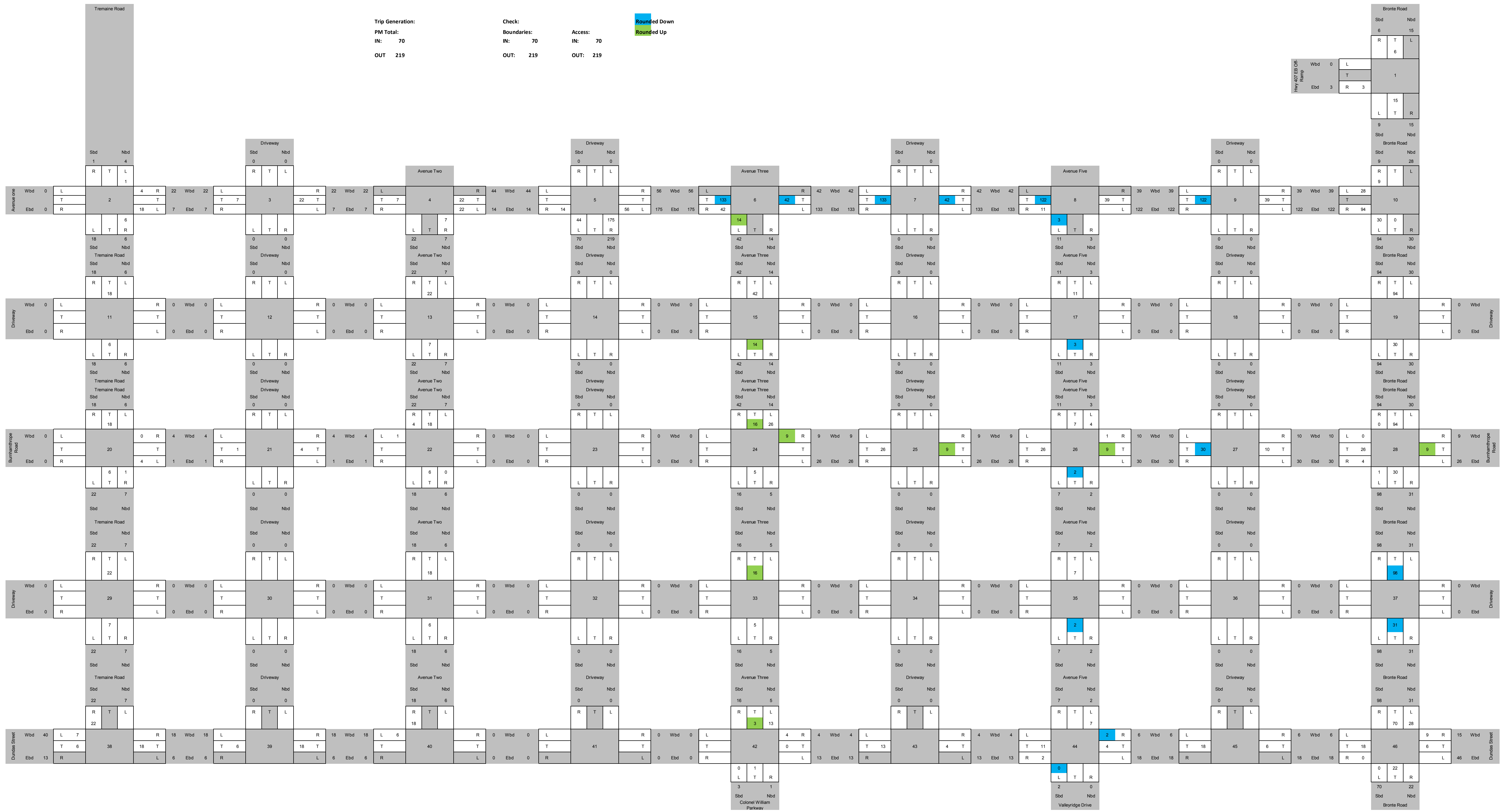
14-09222_Traffic Model PM_20191201 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 70
OUT 219

Check:
Boundaries:
IN: 70
OUT: 219

Access:
IN: 70
OUT: 219

Rounded Down
Rounded Up



Scale: NTS

Figure X
Phase 2 Trip Assignment - Block Group 7 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

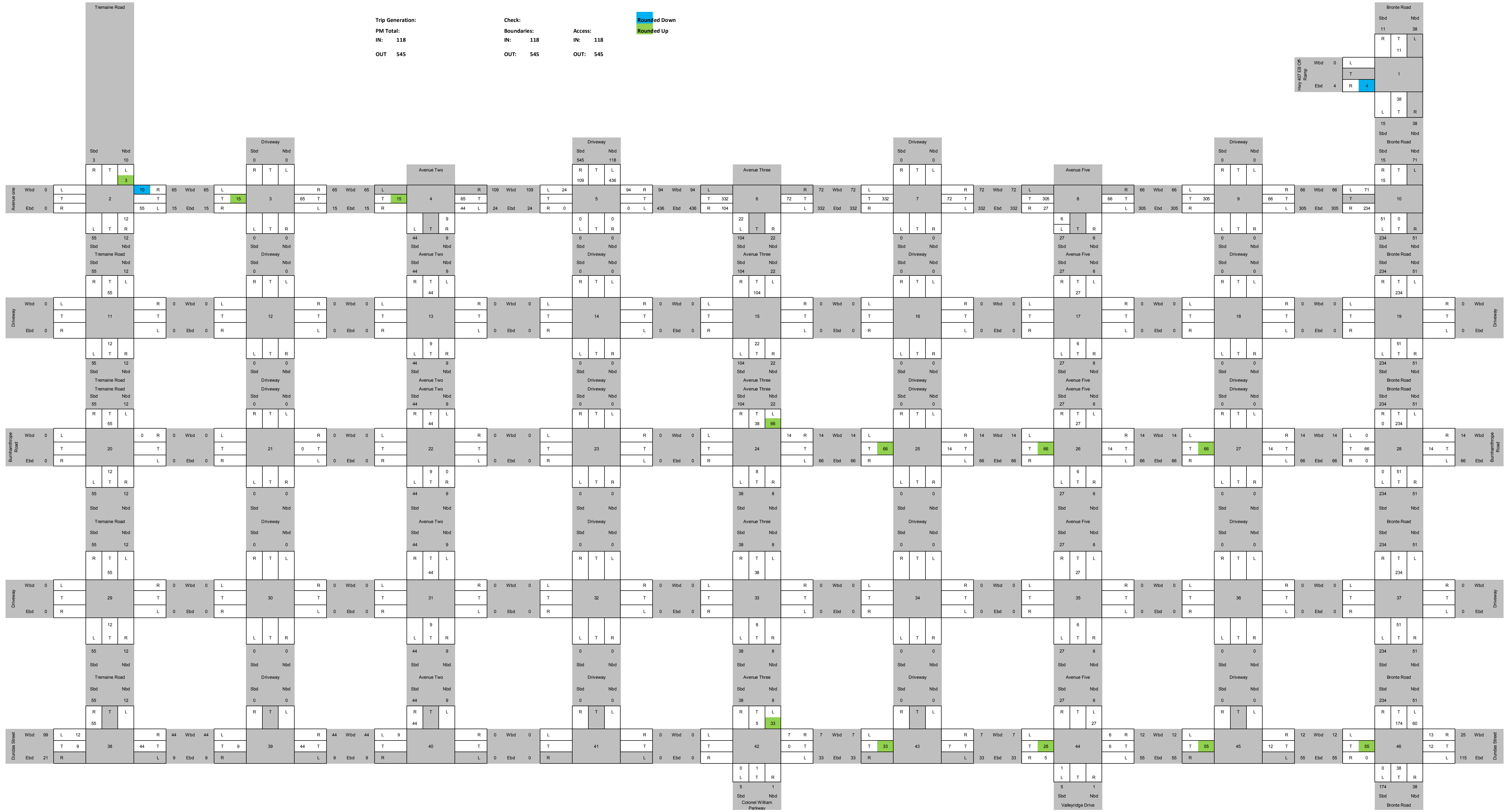


Figure X
Phase 2 Trip Assignment - Block Group 8 - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-06022_Traffic Model PM_20191201 (with proper Phase names for Appendix).xlsx

Trip Generation:
PM Total:
IN: 623
OUT 1625

Check:
Boundaries:
IN: 623
OUT: 1625

Access:
IN: 623
OUT: 1625

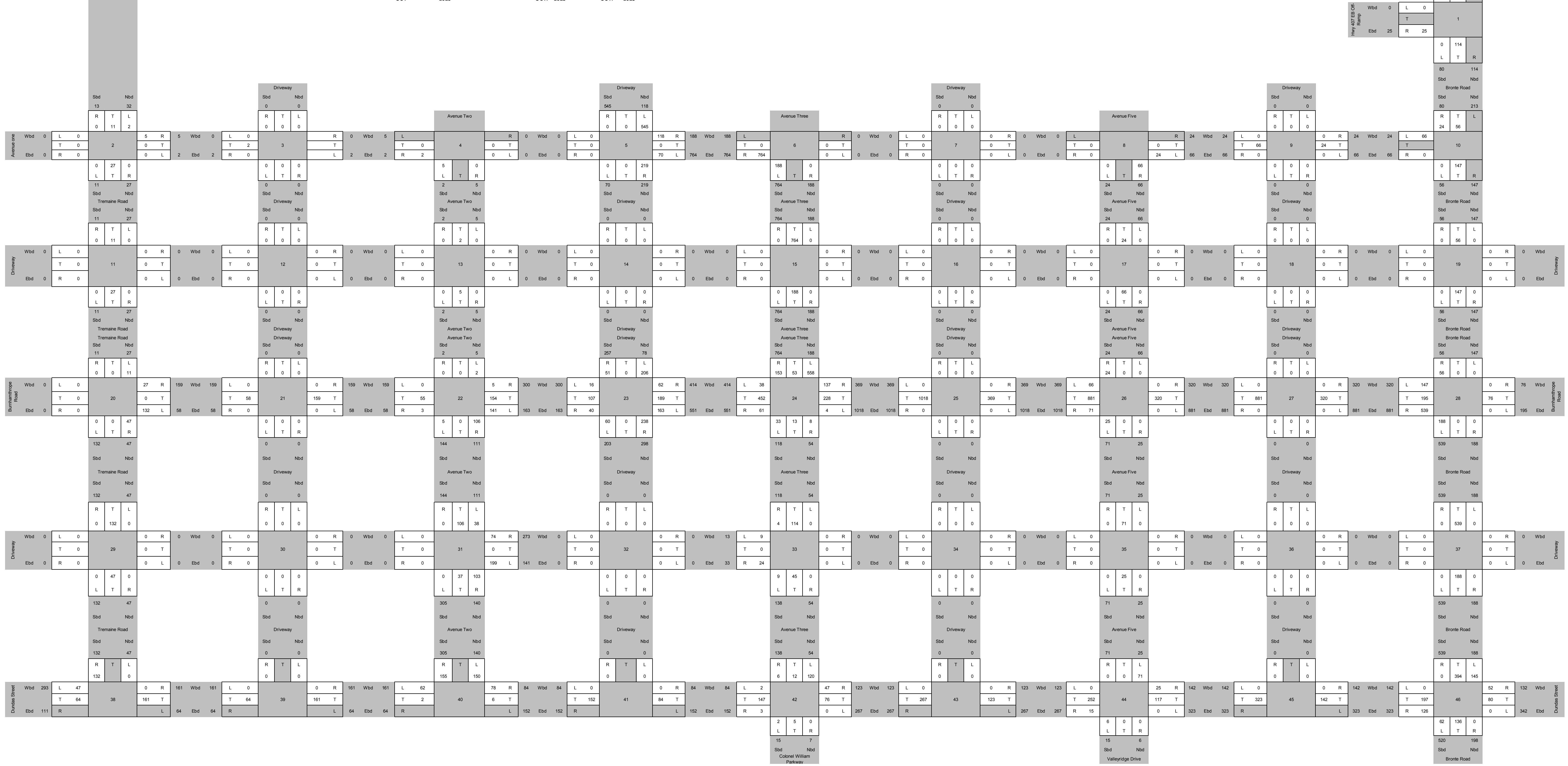
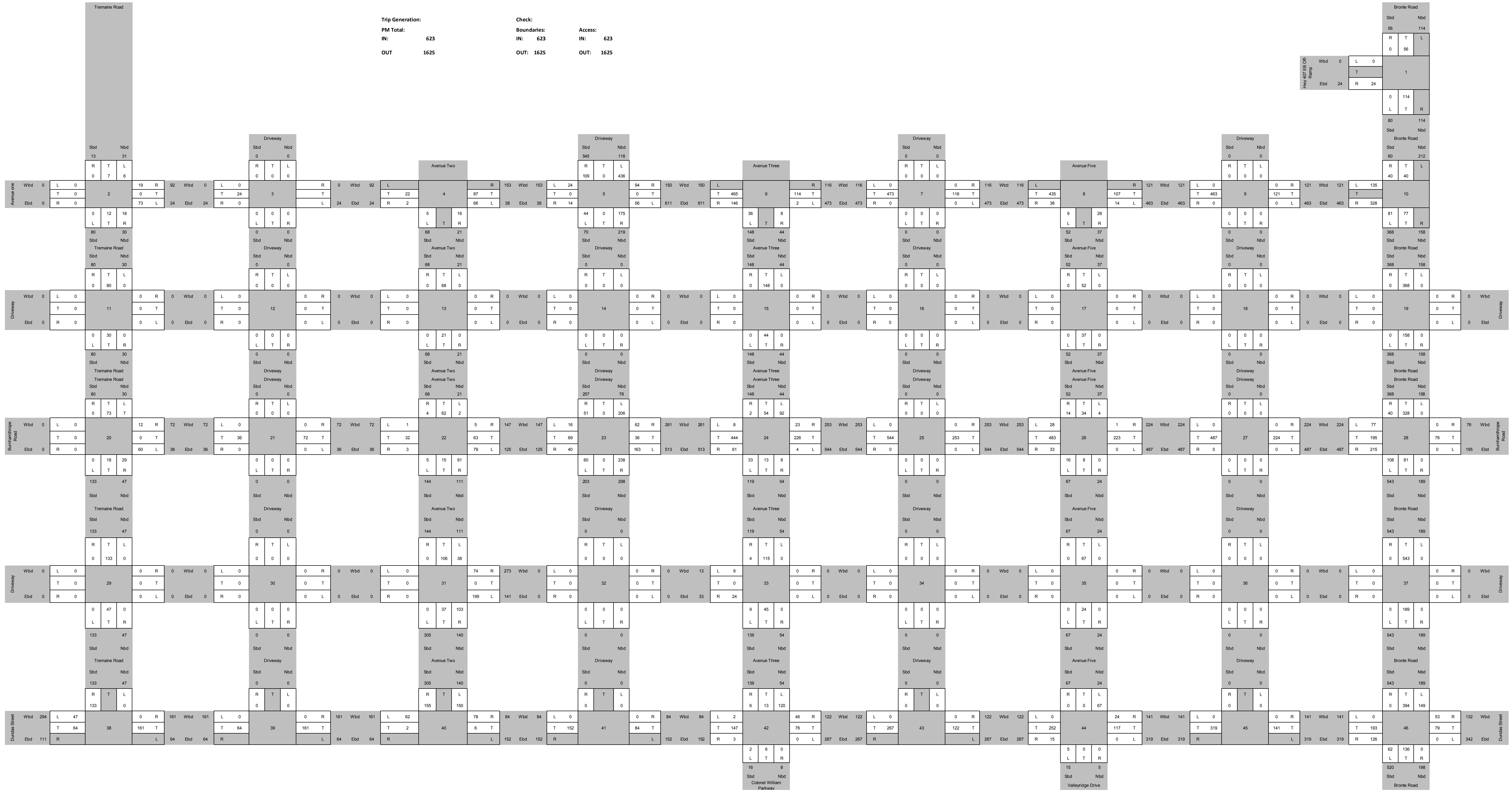


Figure X
Phase 2A Site Traffic - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:

PM Total:		**Check:**		**Access:**
		Boundaries:		
IN: 623		**IN:** 623		**IN:** 623
OUT 1625		**OUT:** 1625		**OUT:** 1625



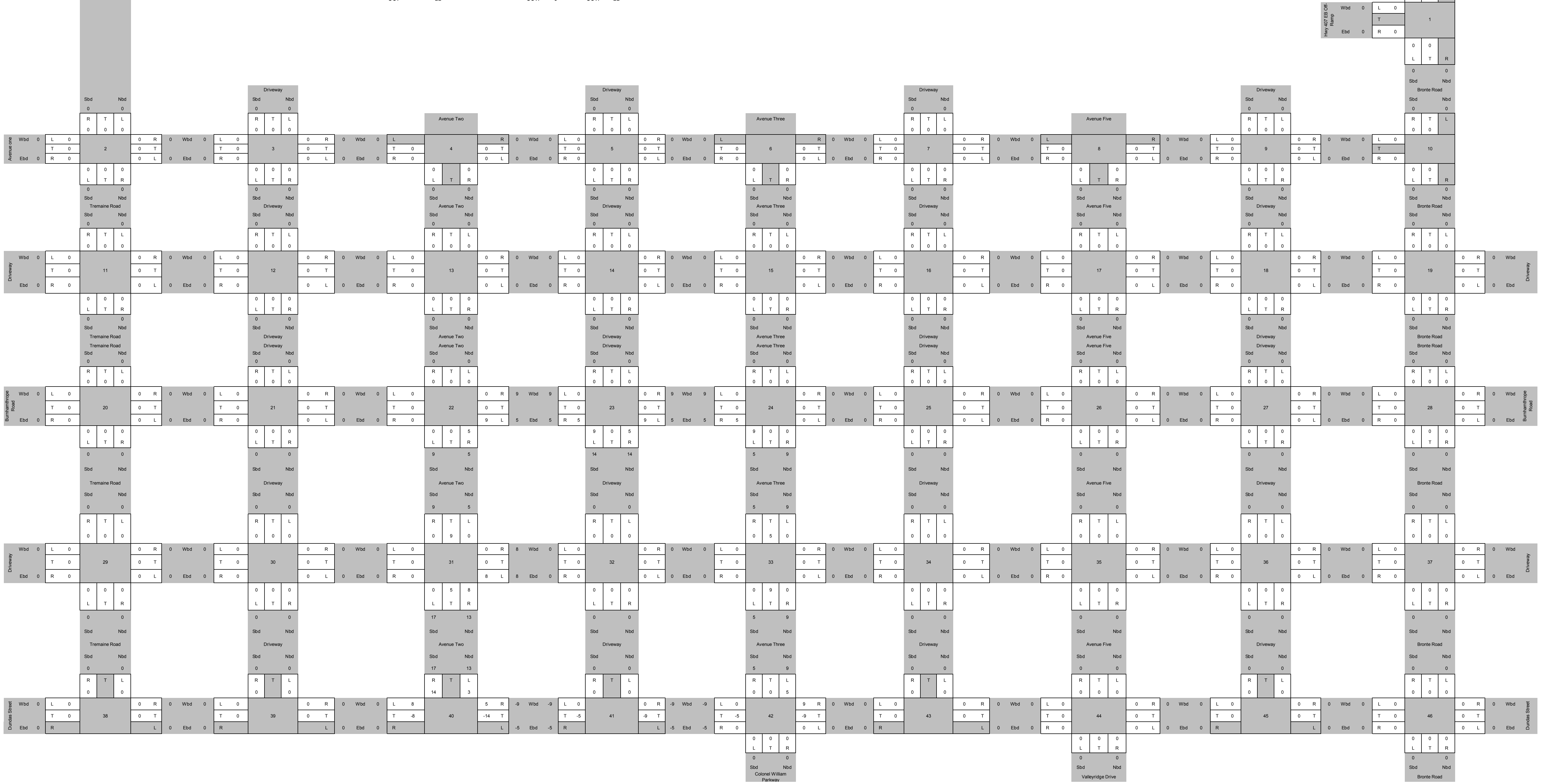
Scale: NTS

Figure X
Phase 2 Site Traffic - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Trip Generation:
PM Total:
IN: 22
OUT 22

Check:
Boundaries:
IN: 0
OUT: 0

Access:
IN: 22
OUT: 22



Scale: NTS

Figure X
Phase 2A&3 Pass-By Site Generated Traffic - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

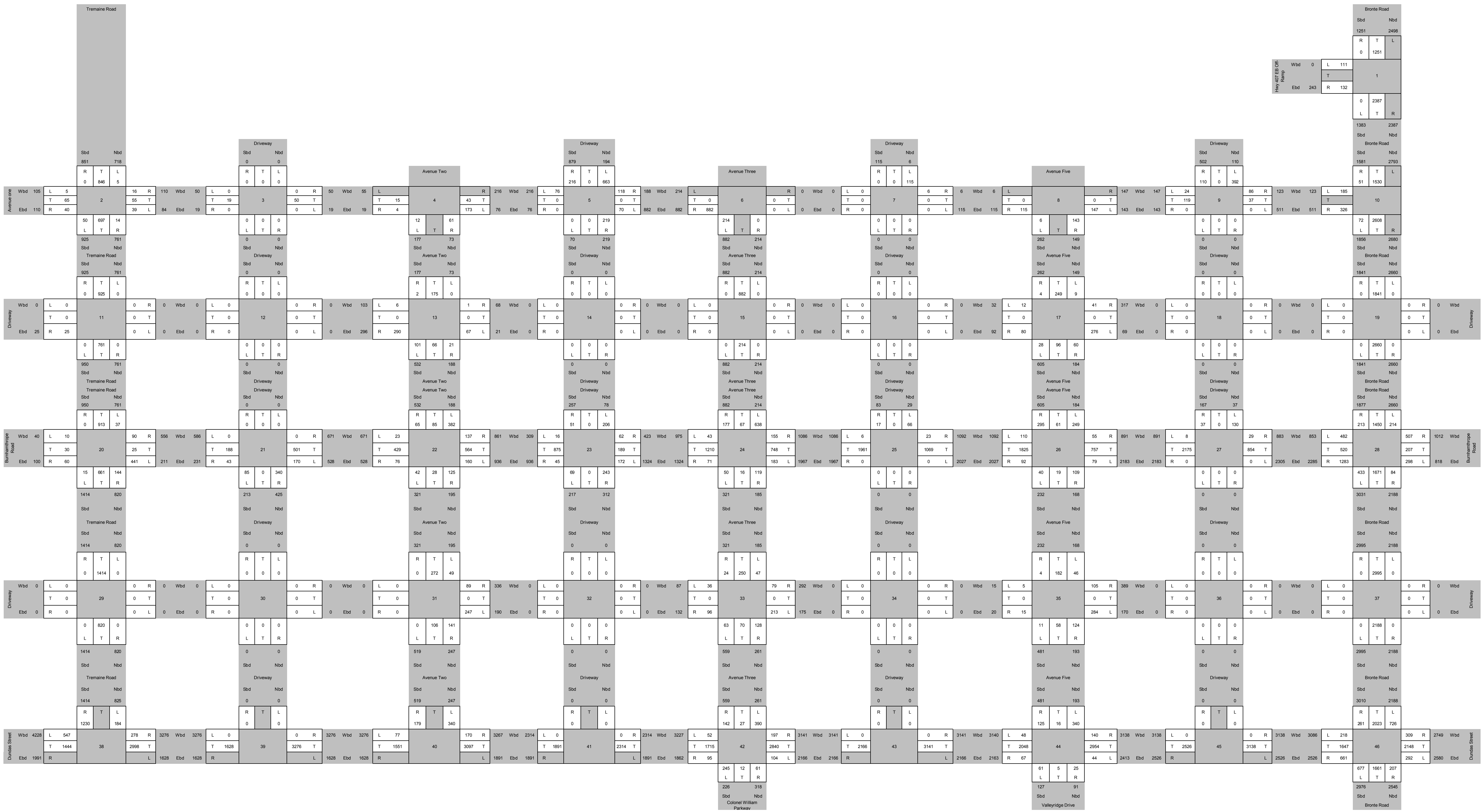
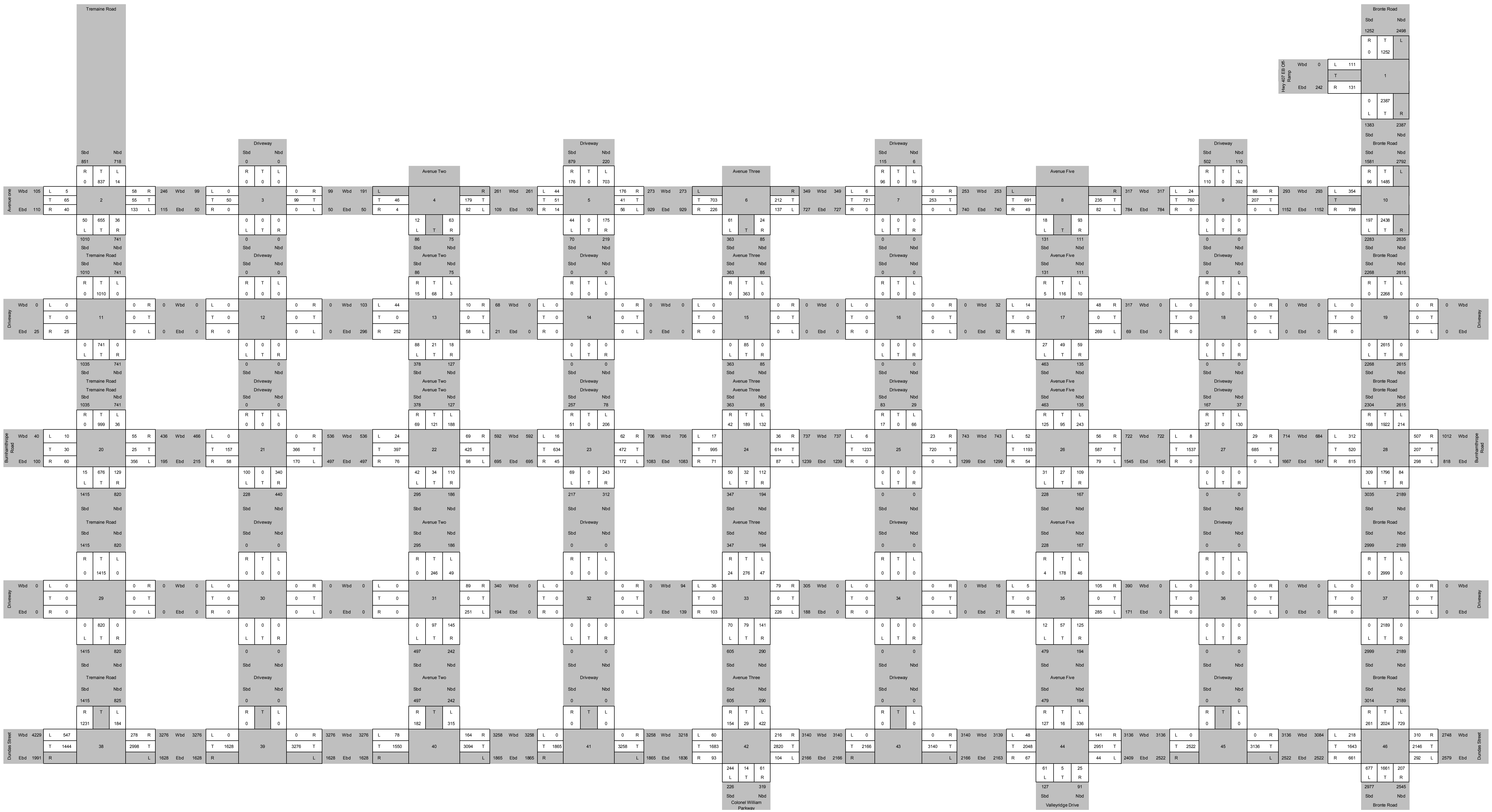
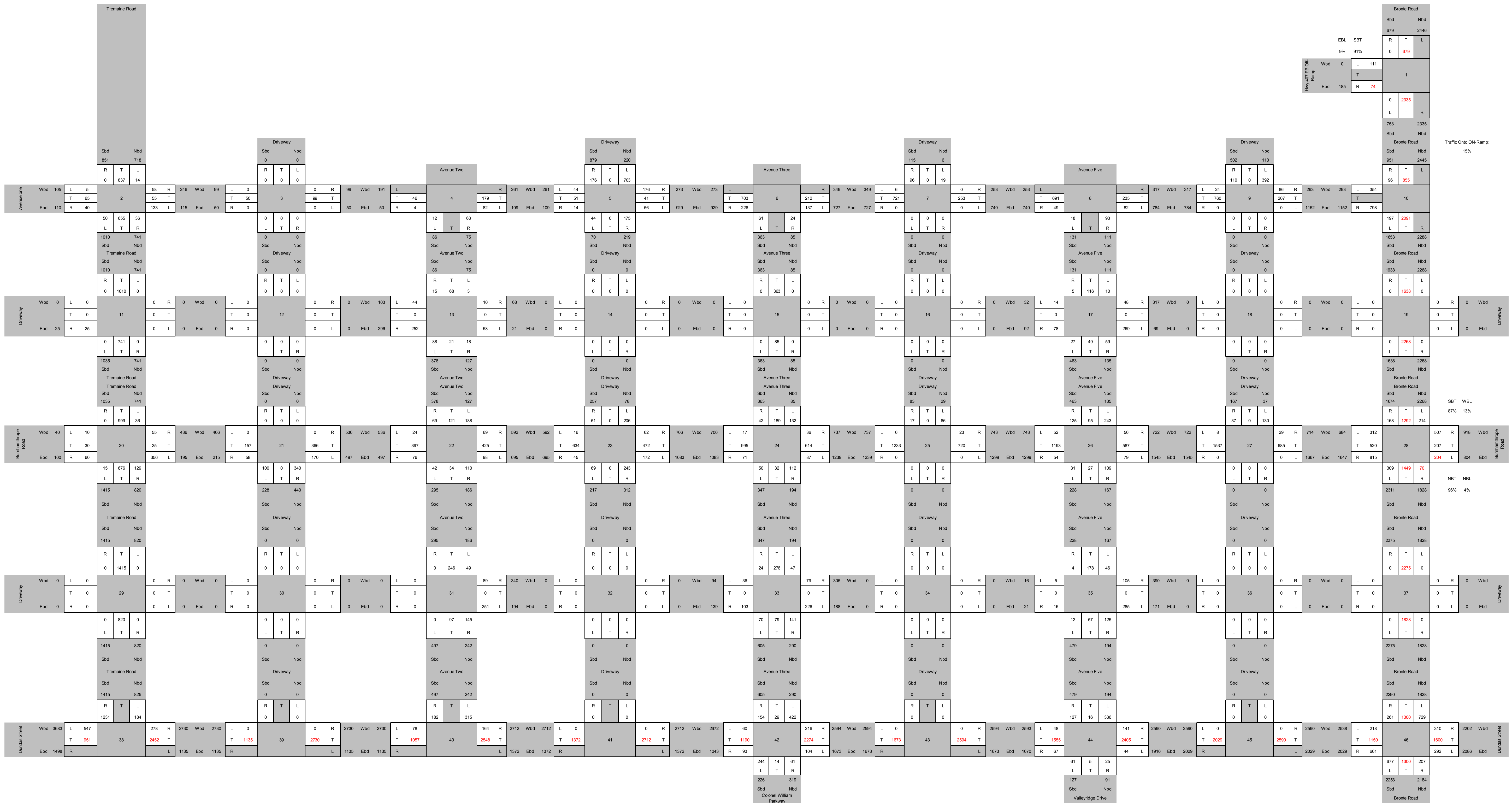


Figure X
Phase 2A (2031) Future Total Traffic Volumes - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study



Scale: NTS

Figure X
Phase 2 (2031) Future Total Traffic Volumes - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study



Scale: NTS

Figure X
Phase 2 (2031) Future Total Traffic Volumes with Sensitivity Adjustment - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

Modified Volumes

14-56022_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

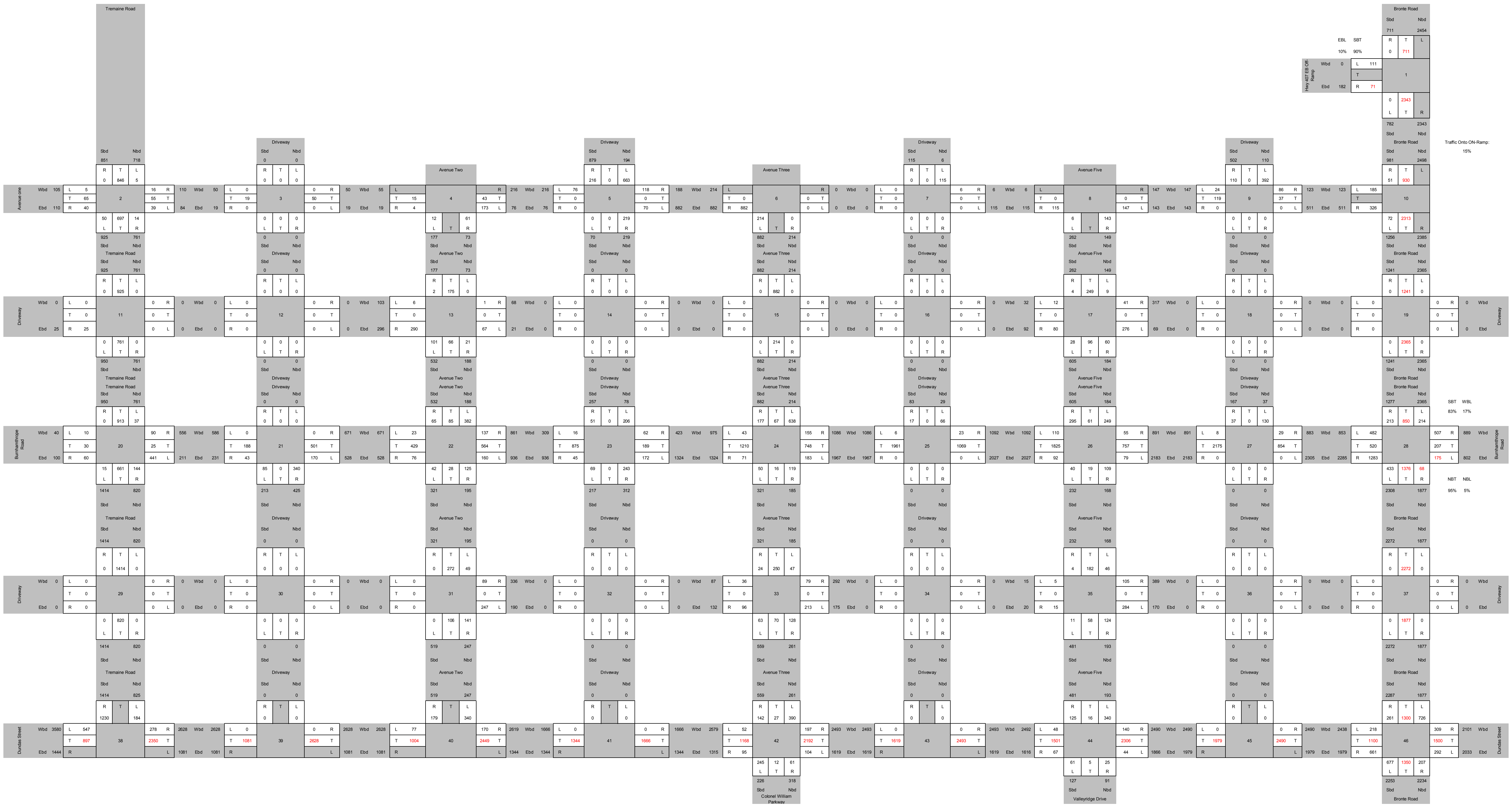


Figure X
Phase 2A (2031) Future Total Traffic Volumes with Sensitivity Adjustment - Weekday PM Peak Hour
407 West Employment Lands - North Oakville Transportation Study

14-08222_Traffic Model PM_20181207 (with proper Phase names for Appendix).xlsx

APPENDIX

E WARRANTS AND STOP-CONTROL OPERATIONS

APPENDIX

APPENDIX

E-1 TRAFFIC SIGNAL WARRANTS

APPENDIX

TRAFFIC SIGNAL WARRANTS -
JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION **FUTURE WEEKDAY PEAK HOUR**

Analyst	NK	**Jurisdiction**	Town of Oakville
Agency or Company	WSP Canada Inc.	**Date**	March 12, 2019
Analysis Period	2031 (Phase 2) Total	**East-West Street**	Avenue One
		North-South Street	Avenue Two
Flow Conditions	Restricted flow (urban)	**Major Street**	East-West
'T' Intersection	Yes	**Approach lanes per direction**	1 Major Street
Existing Intersection	No	**Approach lanes per direction**	1 Minor Street
Additional Comments			

TRAFFIC & PEDESTRIAN VOLUMES

Hour Ending	Main Road Approaches							Minor Road Approaches							Pedestrian Crossing Major Road	Pedestrian Crossing Minor Road
	Eastbound			Westbound			Total	Northbound			Southbound			Total		
	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT			
AM Peak Hour	0	214	16	74	31	0	**335**	2	0	89	0	0	0	**91**		
PM Peak Hour	0	46	4	82	179	0	**311**	12	0	63	0	0	0	**75**		
Total	**0**	**260**	**20**	**156**	**210**	**0**	**646**	**14**	**0**	**152**	**0**	**0**	**0**	**166**	**0**	**0**

Parameter	AM	PM	Average Hourly Volume (AHV)
Vehicle volume, all approaches	426	386	203
Vehicle volume, along minor street	91	75	42
Vehicle volume, along major street	335	311	162
Combined vehicle and pedestrian volume crossing from minor streets	2	12	4

NOTES

1. The traffic control signal justification was done as per criteria defined in Ontario Traffic Manual, Book: 12 (March 2012) Justification 7 - Projected Volumes.

	AM	PM
2. Traffic crossing MAJOR street defined as:		
a. Left turns from both minor street approaches	2	12
b. The heaviest through volume from the minor street	0	0
c. 50% of the heavier left turn movement from the major street when both of the following are met:	0	0
1. the left turn volume > 120	No	No
2. the left turn volume + opposing volume > 720	No	No
d. Pedestrians crossing the major street	0	0

3. Justifications 1 and 2 are required to be met to 120% in the case of an existing intersection and 150% in the case of a new intersection
4. For 'T' intersection, the threshold values to be increased by 50%

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION **FUTURE WEEKDAY PEAK HOUR**

Analyst	NK	**Jurisdiction**	Town of Oakville	
Agency or Company	WSP Canada Inc.	**Date**	March 12, 2019	
Analysis Period	2031 (Phase 2) Total	**East-West Street**	Avenue One	
		North-South Street	Avenue Two	
Flow Conditions	Restricted flow (urban)	**Major Street**	East-West	
'T' Intersection	Yes	**Approach lanes per direction**	1	Major Street
Existing Intersection	No	**Approach lanes per direction**	1	Minor Street
Additional Comments				

Justification 1: Minimum Vehicle Volumes **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			150% Satisfied
	1 Lanes		2 or More Lanes		Sectional		Entire %	
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, all approaches		720			**203**	19%	19%	No
B. Vehicle volume, along minor streets		170			**42**	16%	16%	No

Justification 2: Delay To Cross Traffic **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			150% Satisfied
	1 Lanes		2 or More Lanes [1]		Sectional		Entire %	
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, major street		720			**162**	15%	15%	No
B. Combined vehicle and pedestrian volume crossing artery from minor streets		75			**4**	3%	3%	No

CONCLUSION

The results of the calculations show that justifications are not met.

Therefore traffic control signal is not justified at this intersection for the horizon year 2031 (Phase 2) Total

Note: 1. The minimum volumes were corrected from 120 vehicles and 170 vehicles in OTM, March 2012 to 50 vehicles and 70 vehicles to match Justification 2B.

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION **FUTURE WEEKDAY PEAK HOUR**

Analyst	NK	**Jurisdiction**	Town of Oakville
Agency or Company	WSP Canada Inc.	**Date**	March 12, 2019
Analysis Period	2031 (Phase 2) Total	**East-West Street**	Avenue One
		North-South Street	Avenue Three
Flow Conditions	Restricted flow (urban)	**Major Street**	East-West
'T' Intersection	Yes	**Approach lanes per direction**	1 Major Street
Existing Intersection	No	**Approach lanes per direction**	1 Minor Street
Additional Comments			

TRAFFIC & PEDESTRIAN VOLUMES

Hour Ending	Main Road Approaches							Minor Road Approaches							Pedestrian Crossing Major Road	Pedestrian Crossing Minor Road
	Eastbound			Westbound			Total	Northbound			Southbound			Total		
	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT			
AM Peak Hour	0	156	41	23	853	0	**1073**	272	0	179	0	0	0	**451**		
PM Peak Hour	0	703	226	137	212	0	**1278**	61	0	24	0	0	0	**85**		
Total	**0**	**859**	**267**	**160**	**1065**	**0**	**2351**	**333**	**0**	**203**	**0**	**0**	**0**	**536**	**0**	**0**

Parameter	AM	PM	Average Hourly Volume (AHV)
Vehicle volume, all approaches	1524	1363	722
Vehicle volume, along minor street	451	85	134
Vehicle volume, along major street	1073	1278	588
Combined vehicle and pedestrian volume crossing from minor streets	272	130	100

NOTES

1. The traffic control signal justification was done as per criteria defined in Ontario Traffic Manual, Book: 12 (March 2012) Justification 7 - Projected Volumes.

	AM	PM
2. Traffic crossing MAJOR street defined as:		
a. Left turns from both minor street approaches	272	61
b. The heaviest through volume from the minor street	0	0
c. 50% of the heavier left turn movement from the major street when both of the following are met:	0	69
1. the left turn volume > 120	No	Yes
2. the left turn volume + opposing volume > 720	No	Yes
d. Pedestrians crossing the major street	0	0

3. Justifications 1 and 2 are required to be met to 120% in the case of an existing intersection and 150% in the case of a new intersection
4. For 'T' intersection, the threshold values to be increased by 50%

TRAFFIC SIGNAL WARRANTS -
JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION **FUTURE WEEKDAY PEAK HOUR**

Analyst	NK	**Jurisdiction**	Town of Oakville	
Agency or Company	WSP Canada Inc.	**Date**	March 12, 2019	
Analysis Period	2031 (Phase 2) Total	**East-West Street**	Avenue One	
		North-South Street	Avenue Three	
Flow Conditions	Restricted flow (urban)	**Major Street**	East-West	
'T' Intersection	Yes	**Approach lanes per direction**	1	Major Street
Existing Intersection	No	**Approach lanes per direction**	1	Minor Street
Additional Comments				

Justification 1: Minimum Vehicle Volumes **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			150% Satisfied
	1 Lanes		2 or More Lanes		Sectional		Entire %	
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, all approaches		720			**722**	67%	67%	No
B. Vehicle volume, along minor streets		170			**134**	53%	53%	No

Justification 2: Delay To Cross Traffic **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			150% Satisfied
	1 Lanes		2 or More Lanes [1]		Sectional		Entire %	
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, major street		720			**588**	54%	54%	No
B. Combined vehicle and pedestrian volume crossing artery from minor streets		75			**100**	89%	89%	No

CONCLUSION

The results of the calculations show that justifications are not met.

Therefore traffic control signal is not justified at this intersection for the horizon year 2031 (Phase 2) Total

Note: 1. The minimum volumes were corrected from 120 vehicles and 170 vehicles in OTM, March 2012 to 50 vehicles and 70 vehicles to match Justification 2B.

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION **FUTURE WEEKDAY PEAK HOUR**

Analyst	NK	**Jurisdiction**	Town of Oakville
Agency or Company	WSP Canada Inc.	**Date**	March 12, 2019
Analysis Period	2031 (Phase 2) Total	**East-West Street**	Avenue One
		North-South Street	Avenue Five
Flow Conditions	Restricted flow (urban)	**Major Street**	East-West
'T' Intersection	Yes	**Approach lanes per direction**	1 Major Street
Existing Intersection	No	**Approach lanes per direction**	1 Minor Street
Additional Comments			

TRAFFIC & PEDESTRIAN VOLUMES

Hour Ending	Main Road Approaches							Minor Road Approaches							Pedestrian Crossing Major Road	Pedestrian Crossing Minor Road
	Eastbound			Westbound			Total	Northbound			Southbound			Total		
	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT			
AM Peak Hour	0	186	16	95	838	0	**1135**	61	0	77	0	0	0	**138**		
PM Peak Hour	0	691	49	82	235	0	**1057**	18	0	93	0	0	0	**111**		
Total	**0**	**877**	**65**	**177**	**1073**	**0**	**2192**	**79**	**0**	**170**	**0**	**0**	**0**	**249**	**0**	**0**

Parameter	AM	PM	Average Hourly Volume (AHV)
Vehicle volume, all approaches	1273	1168	610
Vehicle volume, along minor street	138	111	62
Vehicle volume, along major street	1135	1057	548
Combined vehicle and pedestrian volume crossing from minor streets	61	18	20

NOTES

1. The traffic control signal justification was done as per criteria defined in Ontario Traffic Manual, Book: 12 (March 2012) Justification 7 - Projected Volumes.

	AM	PM
2. Traffic crossing MAJOR street defined as:		
a. Left turns from both minor street approaches	61	18
b. The heaviest through volume from the minor street	0	0
c. 50% of the heavier left turn movement from the major street when both of the following are met:	0	0
1. the left turn volume > 120	No	No
2. the left turn volume + opposing volume > 720	No	Yes
d. Pedestrians crossing the major street	0	0

3. Justifications 1 and 2 are required to be met to 120% in the case of an existing intersection and 150% in the case of a new intersection

4. For 'T' intersection, the threshold values to be increased by 50%

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION **FUTURE WEEKDAY PEAK HOUR**

Analyst	NK	**Jurisdiction**	Town of Oakville	
Agency or Company	WSP Canada Inc.	**Date**	March 12, 2019	
Analysis Period	2031 (Phase 2) Total	**East-West Street**	Avenue One	
		North-South Street	Avenue Five	
Flow Conditions	Restricted flow (urban)	**Major Street**	East-West	
'T' Intersection	Yes	**Approach lanes per direction**	1	Major Street
Existing Intersection	No	**Approach lanes per direction**	1	Minor Street
Additional Comments				

Justification 1: Minimum Vehicle Volumes **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			
	1 Lanes		2 or More Lanes		Sectional		Entire %	150% Satisfied
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, all approaches		720			**610**	57%	57%	No
B. Vehicle volume, along minor streets		170			**62**	24%	24%	No

Justification 2: Delay To Cross Traffic **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			
	1 Lanes		2 or More Lanes [1]		Sectional		Entire %	150% Satisfied
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, major street		720			**548**	51%	51%	No
B. Combined vehicle and pedestrian volume crossing artery from minor streets		75			**20**	18%	18%	No

CONCLUSION

The results of the calculations show that justifications are not met.
Therefore traffic control signal is not justified at this intersection for the horizon year 2031 (Phase 2) Total

Note: 1. The minimum volumes were corrected from 120 vehicles and 170 vehicles in OTM, March 2012 to 50 vehicles and 70 vehicles to match Justification 2B.

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION **FUTURE WEEKDAY PEAK HOUR**

Analyst	NK	**Jurisdiction**	Town of Oakville
Agency or Company	WSP Canada Inc.	**Date**	March 12, 2019
Analysis Period	2031 (Phase 2) Total	**East-West Street**	Street Four
		North-South Street	Avenue Two
Flow Conditions	Restricted flow (urban)	**Major Street**	North-South
'T' Intersection	Yes	**Approach lanes per direction**	1 Major Street
Existing Intersection	No	**Approach lanes per direction**	1 Minor Street
Additional Comments			

TRAFFIC & PEDESTRIAN VOLUMES

Hour Ending	Main Road Approaches							Minor Road Approaches							Pedestrian Crossing Major Road	Pedestrian Crossing Minor Road
	Northbound			Southbound			Total	Eastbound			Westbound			Total		
	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT			
AM Peak Hour	0	253	191	71	49	0	**564**	0	0	0	51	0	19	**70**		
PM Peak Hour	0	97	145	49	246	0	**537**	0	0	0	251	0	89	**340**		
Total	**0**	**350**	**336**	**120**	**295**	**0**	**1101**	**0**	**0**	**0**	**302**	**0**	**108**	**410**	**0**	**0**

Parameter	AM	PM	Average Hourly Volume (AHV)
Vehicle volume, all approaches	634	877	378
Vehicle volume, along minor street	70	340	103
Vehicle volume, along major street	564	537	275
Combined vehicle and pedestrian volume crossing from minor streets	51	251	76

NOTES

1. The traffic control signal justification was done as per criteria defined in Ontario Traffic Manual, Book: 12 (March 2012) Justification 7 - Projected Volumes.

	AM	PM
2. Traffic crossing MAJOR street defined as:		
a. Left turns from both minor street approaches	51	251
b. The heaviest through volume from the minor street	0	0
c. 50% of the heavier left turn movement from the major street when both of the following are met:	0	0
1. the left turn volume > 120	No	No
2. the left turn volume + opposing volume > 720	No	No
d. Pedestrians crossing the major street	0	0

3. Justifications 1 and 2 are required to be met to 120% in the case of an existing intersection and 150% in the case of a new intersection
4. For 'T' intersection, the threshold values to be increased by 50%

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION **FUTURE WEEKDAY PEAK HOUR**

Analyst	NK	**Jurisdiction**	Town of Oakville	
Agency or Company	WSP Canada Inc.	**Date**	March 12, 2019	
Analysis Period	2031 (Phase 2) Total	**East-West Street**	Street Four	
		North-South Street	Avenue Two	
Flow Conditions	Restricted flow (urban)	**Major Street**	North-South	
'T' Intersection	Yes	**Approach lanes per direction**	1	Major Street
Existing Intersection	No	**Approach lanes per direction**	1	Minor Street
Additional Comments				

Justification 1: Minimum Vehicle Volumes **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			150% Satisfied
	1 Lanes		2 or More Lanes		Sectional		Entire %	
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, all approaches		720			**378**	35%	35%	No
B. Vehicle volume, along minor streets		170			**103**	40%	40%	No

Justification 2: Delay To Cross Traffic **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			150% Satisfied
	1 Lanes		2 or More Lanes [1]		Sectional		Entire %	
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, major street		720			**275**	25%	25%	No
B. Combined vehicle and pedestrian volume crossing artery from minor streets		75			**76**	67%	67%	No

CONCLUSION

The results of the calculations show that justifications are not met.
Therefore traffic control signal is not justified at this intersection for the horizon year 2031 (Phase 2) Total

Note: 1. The minimum volumes were corrected from 120 vehicles and 170 vehicles in OTM, March 2012 to 50 vehicles and 70 vehicles to match Justification 2B.

APPENDIX

E-2 TURNING LANE WARRANTS

APPENDIX

Intersection: Avenue One at Avenue Two
Major Street: Avenue One
Major Street Approach Lanes (Per Direction): 1
Minor Street Approach Lanes (Per Direction): 1
Design Speed (km/h): 50
Scenario: 2031 (Phase 2)

Left-Turn Warrant

Movement	AM Peak Hour						PM Peak Hour						Turning Lane Warranted?
	Left-Turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	Left-turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	
WBL	74	105	230	70%	EA-5	NO	82	261	50	31%	EA-4	NO	**NO**

Right-Turn Warrant

Movement	AM Peak Hour				PM Peak Hour				Turning Lane Warranted?
	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	
EBR	16	230	7%	NO	4	50	8%	NO	**NO**
NBR	89	91	98%	YES	63	75	84%	YES	**YES**

Note: Right-Turn lane is warranted if the right-turn volumes is 60 veh/h or more and the right-turn percentage exceeds 10%.

Intersection: Avenue One at Avenue Three
Major Street: Avenue One
Major Street Approach Lanes (Per Direction): 1
Minor Street Approach Lanes (Per Direction): 1
Design Speed (km/h): 50
Scenario: 2031 (Phase 2)

Left-Turn Warrant

Movement	AM Peak Hour						PM Peak Hour						Turning Lane Warranted?
	Left-Turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	Left-turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	
WBL	23	876	197	3%	EA-2	YES	137	349	929	39%	EA-5	YES	**YES**

Right-Turn Warrant

Movement	AM Peak Hour				PM Peak Hour				Turning Lane Warranted?
	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	
EBR	41	197	21%	NO	226	929	24%	YES	YES
NBR	179	451	40%	YES	24	85	28%	NO	YES

Note: Right-Turn lane is warranted if the right-turn volumes is 60 veh/h or more and the right-turn percentage exceeds 10%.

Intersection:	Avenue One at Avenue Five
Major Street:	Avenue One
Major Street Approach Lanes (Per Direction):	1
Minor Street Approach Lanes (Per Direction):	1
Design Speed (km/h):	50
Scenario:	2031 (Phase 2)

Left-Turn Warrant

Movement	AM Peak Hour						PM Peak Hour						Turning Lane Warranted?
	Left-Turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	Left-turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	
WBL	95	933	202	10%	EA-2	YES	82	317	740	26%	EA-4	YES	**YES**

Right-Turn Warrant

Movement	AM Peak Hour				PM Peak Hour				Turning Lane Warranted?
	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	
EBR	16	202	8%	NO	49	740	7%	NO	**NO**
NBR	77	138	56%	YES	93	111	84%	YES	**YES**

Note: Right-Turn lane is warranted if the right-turn volumes is 60 veh/h or more and the right-turn percentage exceeds 10%.

Intersection: Avenue Two at Street Four
Major Street: Avenue Two
Major Street Approach Lanes (Per Direction): 1
Minor Street Approach Lanes (Per Direction): 1
Design Speed (km/h): 50
Scenario: 2031 (Phase 2)

Left-Turn Warrant

Movement	AM Peak Hour						PM Peak Hour						Turning Lane Warranted?
	Left-Turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	Left-turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	
SBL	71	120	444	59%	EA-5	NO	49	295	242	17%	EA-3	NO	NO

Right-Turn Warrant

Movement	AM Peak Hour				PM Peak Hour				Turning Lane Warranted?
	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	
NBR	191	444	43%	YES	145	242	60%	YES	YES
WBR	19	70	27%	NO	89	340	26%	YES	YES

Note: Right-Turn lane is warranted if the right-turn volumes is 60 veh/h or more and the right-turn percentage exceeds 10%.

Intersection: Burnhamthorpe Road at Avenue Two
Major Street: Burnhamthorpe Road
Major Street Approach Lanes (Per Direction): 2
Minor Street Approach Lanes (Per Direction): 1
Design Speed (km/h): 50
Scenario: 2031 (Phase 2)

Left-Turn Warrant

Movement	AM Peak Hour						PM Peak Hour						Turning Lane Warranted?
	Left-Turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	Left-turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	
EBL	92	N/A	607	N/A	EB-1	YES	24	N/A	592	N/A	EB-1	YES	**YES**
WBL	76	N/A	472	N/A	EB-1	YES	98	N/A	497	N/A	EB-1	YES	**YES**
NBL	65	272	90	24%	EA-4	NO	42	186	378	23%	EA-4	NO	**NO**
SBL	49	90	272	54%	EA-5	NO	188	378	186	50%	EA-5	YES	**YES**

Right-Turn Warrant

Movement	AM Peak Hour				PM Peak Hour				Turning Lane Warranted?
	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	
EBR	19	472	4%	NO	76	497	15%	YES	**YES**
WBR	246	607	41%	YES	69	592	12%	YES	**YES**
NBR	59	272	22%	NO	110	186	59%	YES	**YES**
SBR	16	90	18%	NO	69	378	18%	YES	**YES**

Note: Right-Turn lane is warranted if the right-turn volumes is 60 veh/h or more and the right-turn percentage exceeds 10%.

Intersection:	Burnhamthorpe Road at Avenue Three
Major Street:	Burnhamthorpe Road
Major Street Approach Lanes (Per Direction):	2
Minor Street Approach Lanes (Per Direction):	1
Design Speed (km/h):	50
Scenario:	2031 (Phase 2)

Left-Turn Warrant

Movement	AM Peak Hour						PM Peak Hour						Turning Lane Warranted?
	Left-Turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	Left-turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	
EBL	1	N/A	1169	N/A	EB-1	NO	17	N/A	737	N/A	EB-1	YES	YES
WBL	87	N/A	420	N/A	EB-1	YES	87	N/A	1083	N/A	EB-1	YES	YES
NBL	58	356	58	16%	EA-3	NO	50	194	363	26%	EA-4	NO	NO
SBL	23	58	356	40%	EA-5	NO	132	363	194	36%	EA-5	YES	YES

Right-Turn Warrant

Movement	AM Peak Hour				PM Peak Hour				Turning Lane Warranted?
	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	
EBR	21	420	5%	NO	71	1083	7%	NO	NO
WBR	159	1169	14%	YES	36	737	5%	NO	YES
NBR	51	356	14%	NO	112	194	58%	YES	YES
SBR	10	58	17%	NO	42	363	12%	NO	NO

Note: Right-Turn lane is warranted if the right-turn volumes is 60 veh/h or more and the right-turn percentage exceeds 10%.

Intersection: Burnhamthorpe Road at Avenue Five
Major Street: Burnhamthorpe Road
Major Street Approach Lanes (Per Direction): 2
Minor Street Approach Lanes (Per Direction): 1
Design Speed (km/h): 50
Scenario: 2031 (Phase 2)

Left-Turn Warrant

Movement	AM Peak Hour						PM Peak Hour						Turning Lane Warranted?
	Left-Turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	Left-turn Volume	Advancing Volume	Opposing Volume	Left-Turn Percentage	Reference Figure	Warranted?	
EBL	131	N/A	1538	N/A	EB-1	YES	52	N/A	722	N/A	EB-1	YES	**YES**
WBL	101	N/A	464	N/A	EB-1	YES	79	N/A	1299	N/A	EB-1	YES	**YES**
NBL	56	227	100	25%	EA-4	NO	31	167	463	19%	EA-3	NO	**NO**
SBL	41	100	227	41%	EA-5	NO	243	463	167	52%	EA-5	YES	**YES**

Right-Turn Warrant

Movement	AM Peak Hour				PM Peak Hour				Turning Lane Warranted?
	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	Right-turn Volume	Advancing Volume	Right-Turn Percentage	Warrranted?	
EBR	18	464	4%	NO	54	1299	4%	NO	**NO**
WBR	283	1538	18%	YES	56	722	8%	NO	**YES**
NBR	54	227	24%	NO	109	167	65%	YES	**YES**
SBR	42	100	42%	NO	125	463	27%	YES	**YES**

Note: Right-Turn lane is warranted if the right-turn volumes is 60 veh/h or more and the right-turn percentage exceeds 10%.

E-3 *STOP-CONTROLLED OPERATIONS AT AVENUE ONE AND AVENUE THREE*

APPENDIX

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Volume (veh/h)	156	41	23	853	272	179
Future Volume (Veh/h)	156	41	23	853	272	179
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	156	41	23	853	272	179
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			197		1055	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			197		1055	156
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		0	80
cM capacity (veh/h)			1376		246	890

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	156	41	23	853	272	179
Volume Left	0	0	23	0	272	0
Volume Right	0	41	0	0	0	179
cSH	1700	1700	1376	1700	246	890
Volume to Capacity	0.09	0.02	0.02	0.50	1.11	0.20
Queue Length 95th (m)	0.0	0.0	0.4	0.0	90.3	5.7
Control Delay (s)	0.0	0.0	7.7	0.0	132.5	10.1
Lane LOS			A		F	B
Approach Delay (s)	0.0		0.2		83.9	
Approach LOS					F	

Intersection Summary			
Average Delay	24.9		
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Volume (veh/h)	703	226	137	212	61	24
Future Volume (Veh/h)	703	226	137	212	61	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	703	226	137	212	61	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)						
pX, platoon unblocked						
vC, conflicting volume			929		1189	703
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			929		1189	703
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			81		64	95
cM capacity (veh/h)			736		169	438

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	703	226	137	212	61	24
Volume Left	0	0	137	0	61	0
Volume Right	0	226	0	0	0	24
cSH	1700	1700	736	1700	169	438
Volume to Capacity	0.41	0.13	0.19	0.12	0.36	0.05
Queue Length 95th (m)	0.0	0.0	5.2	0.0	11.6	1.3
Control Delay (s)	0.0	0.0	11.0	0.0	37.9	13.7
Lane LOS			B		E	B
Approach Delay (s)	0.0		4.3		31.0	
Approach LOS					D	

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

APPENDIX

F

COST-ESTIMATE BREAKDOWN

APPENDIX

Exclusive Westbound Right-Turn at Dundas Street West and Bronte Road Preliminary Construction Cost Estimate For Recommended Roadway/Intersection Improvements					
1. Civil Works					
Item No.	**Description**	**Units**	**Quantity**	**Unit Price**	**Total**
00001	Road Construction (inlcuding asp. removals, supply asp., Gran A, Gran B, road base)	t	1200	$ 75.00	$ 90,000.00
00002	Pavement markings and signage	LS	1	$ 10,000.00	$ 10,000.00
00003	Catchbasin (lead and reconstruction)	each	4	$ 7,000.00	$ 28,000.00
Subtotal (Civil Works)					**$ 128,000.00**
Contingency @ 30% (Including Utilities)					$ 38,400.00
Total (Civil Works)					**$ 166,400.00**
2. Signal and Streetlighting Works					
00004	Signal works at the northwest quadrant of the intersection	each	1	$ 50,000.00	$ 50,000.00
00005	Streetlighting relocations	each	1	$ 30,000.00	$ 30,000.00
Subtotal (Signal and Streetlighting Works)					**$ 80,000.00**
Contingency @ 30% (Including Utilities)					$ 24,000.00
Total (Signal and Streetlighting Works)					**$ 104,000.00**
Total (Civil Works and Signal and Streetlighting Works) Excluding HST					**$ 270,400.00**
Total (-25%)					**$ 202,800.00**
Total (+25%)					**$ 338,000.00**

Conversion of the Existing Single Southbound Left Turn Lane to Double Left Turn Lanes - Dundas Street West and Bronte Road

Preliminary Construction Cost Estimate For Recommended Roadway/Intersection Improvements

Item No.	Description	Units	Quantity	Unit Price	Total
1. Civil Works					
00001	Pavement markings and signage	LS	1	$ 15,000.00	$ 15,000.00
Subtotal (Civil Works)					**$ 15,000.00**
Contingency @ 30% (Including Utilities)					$ 4,500.00
Total (Civil Works)					**$ 19,500.00**
2. Signal Works					
00002	Signal phasing works	each	1	$ 20,000.00	$ 20,000.00
Subtotal (Signal Works)					**$ 20,000.00**
Contingency @ 30% (Including Utilities)					$ 6,000.00
Total (Signal Works)					**$ 26,000.00**
Total (Civil Works and Signal and Streetlighting Works) Excluding HST					**$ 45,500.00**
Total (-25%)					**$ 34,125.00**
Total (+25%)					**$ 56,875.00**

Channelized Southbound Right-Turn Lane - Dundas Street West and Tremaine Road

Preliminary Construction Cost Estimate For Recommended Roadway/Intersection Improvements

Item No.	Description	Units	Quantity	Unit Price	Total
1. Civil Works					
00001	Road Construction (inlcuding asp. removals, supply asp., Gran A, Gran B, road base)	t	1200	$ 75.00	$ 90,000.00
00002	Construct channelized refuge island (including curbs, grading and drainage)	LS	1	$ 60,000.00	$ 60,000.00
00003	Pavement markings and signage	LS	1	$ 15,000.00	$ 15,000.00
Subtotal (Civil Works)					**$ 165,000.00**
Contingency @ 30% (Including Utilities)					$ 49,500.00
Total (Civil Works)					**$ 214,500.00**
2. Signal Works					
00004	Signal works at the northeast quadrant of the intersection	each	1	$ 50,000.00	$ 50,000.00
Subtotal (Signal Works)					**$ 50,000.00**
Contingency @ 30% (Including Utilities)					$ 15,000.00
Total (Signal Works)					**$ 65,000.00**
Total (Civil Works and Signal Works) Excluding HST					**$ 279,500.00**
Total (-25%)					**$ 209,625.00**
Total (+25%)					**$ 349,375.00**

Conversion of Existing Two Eastbound Left Turn Lanes to a Left Turn Eastbound Lane and Shared Left/ Right Eastbound Lane - Bronte Road at the Hwy 407 Eastbound Off-Ramp					
Preliminary Construction Cost Estimate For Recommended Roadway/Intersection Improvements					
1. Civil Works					
Item No.	**Description**	**Units**	**Quantity**	**Unit Price**	**Total**
00001	Pavement markings and signage	LS	1	$ 15,000.00	$ 15,000.00
Subtotal (Civil Works)					**$ 15,000.00**
Contingency @ 30%					$ 4,500.00
Total (Civil Works) Excluding HST					**$ 19,500.00**
Total (-25%)					**$ 14,625.00**
Total (+25%)					**$ 24,375.00**