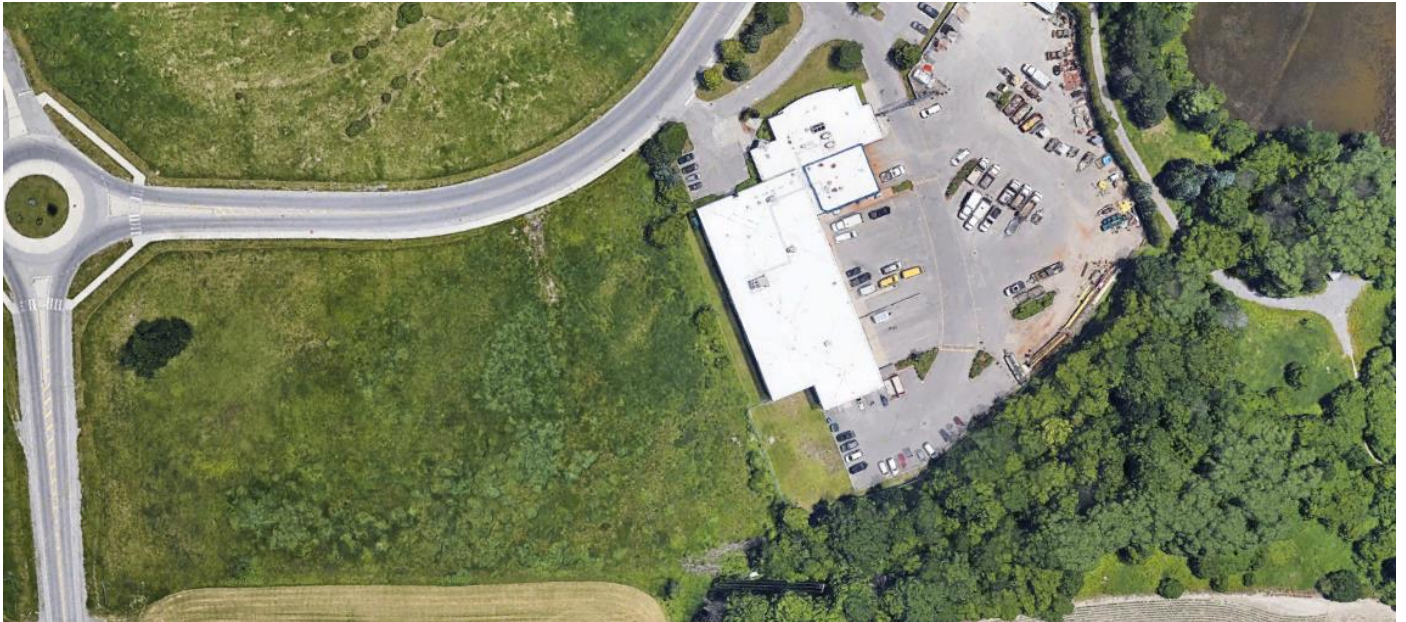


# TRAFFIC IMPACT ASSESSMENT (DRAFT)



## 2 Bill Leathem Drive – SPC Office with Warehouse

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## 1.0 SCREENING FORM

The following section describes the initial assessment of the proposal with respect to the Traffic Impact Assessment (TIA) Screening Form and will provide reasoning for potential triggers. The TIA screening form is attached in [Appendix A](#).

### 1.1 Trips Generation Triggers

The volume of development-generated vehicular traffic was calculated in accordance with the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10<sup>th</sup> Edition. The City of Ottawa TIA Guidelines (2017) recommends that when using ITE Trip Generation Manual, assume a 10% non-auto mode share and an average vehicle occupancy of 1.15. As such, a factor of 1.28 was applied to the site generated trips in order to estimate the total site generated person-trips.

**Table 1.1.1** Illustrates the total person-trip generation for the AM and PM peak hour.

**Table 1.1.1 ITE Development-Generated Trips**

ITE Land Use	Unit of Measure	Quantity	Rate		AM Peak Hour			PM Peak Hour		
			AM	PM	In	Out	Total	In	Out	Total
Warehousing (Code 150)	Ksf	20	*	**	27	9	36	10	28	38

\* Fitted Curve Equation:  $T=0.12(X) + 25.32$ , Trips multiplied by 1.28 As per TIA Guidelines

\*\* Fitted Curve Equation:  $T=0.12(X) + 27.82$ , Trips multiplied by 1.28 As per TIA Guidelines

It is anticipated due to the use of the proposed development that there will not be any pass-by trips associated with the proposed development. As such, the development is expected to generate 36 person-trips in the AM peak hour and 38 in the PM peak hour

### 1.2 Location Trigger

The development is neither located within a Design Priority Area (DPA) or a Transit-oriented Development (TOD) zone. The development also does not propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks. As such, the criteria for a location trigger has not been met.

### 1.3 Safety Trigger

The development includes two proposed driveway providing access to Bill Leathem Drive, both within 150 m from the roundabout to the north of the proposed development, connecting Longfields Drive and Bill Leathem Drive. As such, the criteria for a safety trigger is met.



## 2.0 DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed development will be located at 2 Bill Leatham Drive in Nepean with a lot area of over 21,000 m<sup>2</sup> (2.1 ha). The proposed development will be a one-story office with warehouse space which will have a total Gross Floor Area (GFA) of 1,858 m<sup>2</sup> (20,000 ft<sup>2</sup>). The proposed development will have two accesses on Bill Leatham Drive and a total of 42 on-site parking spaces. The build-out date is expected to be in 2020. [Figure 2.1](#) shows the location of the proposed development, subject lands, and surrounding area. Site plans have been attached in [Appendix B](#).



*Figure 1.3.1 Proposed Development Location*

The development is located in a light Industrial zone with the subzone code of IL9. The zone permits the development of day cares, hotel, instructional facility, light industrial uses, medical facility, office, park, place of assembly, research and development centre, technology industry, training centre and warehouse uses.

## 3.0 EXISTING CONDITIONS

The following outlines the existing site characteristics and a summary of the expected development transportation conditions.

### 3.1 Roadways

The following section outlines the existing roadways in the study area obtained from the City of Ottawa Plan, Annex 1 – Road Classification and Right-of-Way. MP performed a field review on February 5<sup>th</sup>, 2020, to confirm roadway geometries, lane configurations and existing conditions carried forward in the TIS.

Within the vicinity of the proposed development, Leikin Drive is a two-lane undivided major collector urban roadway, with a 26 m protected right-of-way. The road has a posted speed of 60 km/h to the north of the intersection of Bill Leatham Drive. The posted speed transitions to 50 km/h to the south due to the residential

zone approximately 250 m of Bill Leathem Drive. There are paved bike lanes on both sides of the road with posted designated bike lane signage and a sidewalk on the east side of the road only. Leikin Drive runs north-south connecting Merivale Road to the north and Crestway Drive to the south.

Within the vicinity of the proposed development, Bill Leathem Drive is a two-lane undivided major collector urban roadway, with a 26 m protected right-of-way. Bill Leathem Drive runs east-west from Longfields Drive in the west and Leikin Street in the east. The road has an unposted speed limit of 50 km/h with a concrete sidewalk and curb on the south side of the roadway, and no sidewalk on the north side.

Within the vicinity of the proposed development, Longfields Drive is a two-lane undivided arterial urban roadway, with a 37.5 m protected right-of-way. Longfields Drive runs east-west, from Bill Leathem Drive in the east to Jockvale in the south 5.3 km away. The road has a posted speed of 70 km/h, with a paved shoulder to the east of Woodroffe Avenue. To the west of Woodroffe Avenue, the road has a posted speed of 60 km/h, paved bike lanes with posted designated bike lane signage, concrete sidewalks and curbs on both sides of the road. The designated bike lane ends at the intersection of Woodroffe Avenue and Longfields Drive.

Within the vicinity of the proposed development, Woodroffe Avenue is a four-lane divided arterial urban roadway, with a 44.5 m protected right-of-way. Woodroffe Avenue runs from north-south, 4.3 km to the south and 9.4 km to the north to Carling Avenue. The road has a posted speed of 80 km/h, with designated bike lanes with pavement markings on each side of the road with a sidewalk on the west side of the road. Towards the north and south of the intersection at Longfields Drive there is a multiuse path on the east side of the roadway.

### 3.2 Intersections

The following section documents the existing intersections within the study area, their control type, lane configurations, turning restrictions, and any other relevant data. The following three intersections were identified within the study area:

- Bill Leathem Drive at Leikin Drive;
- Longfields Drive at Woodroffe Avenue, and;
- Longfields Drive at Bill Leathem Drive (roundabout)

Bill Leathem Drive at Leikin Drive is a four leg, two way stop controlled intersection, located to the southeast of the proposed development. [Figure 3.2.1](#) illustrates the intersection.

*[Section left intentionally blank]*





Figure 3.2.1 Bill Leatham Drive/ RCMP Driveway at Leikin Drive

- Bill Leatham Drive – EB: one lane cross-section, one left-through-right shared lane with no pavement markings, and a concrete sidewalk and barrier curb. Lane width of 5.2 m.
- Leikin Drive – NB: two lane cross section, one through left-turn shared lane of 3.5 m in width and one auxiliary right-turn lane 3.4 m in width, with 35 m of storage. Paved bike lane with posted designated bike lane signage of 1.7 m in width, and a concrete sidewalk and barrier curb.
- Leikin Drive – SB: two lane cross section, one through right-turn shared lane of 3.5 m in width and one auxiliary left-turn lane of 3.6 m in width, with 30 m of storage. Paved bike lane with posted designated bike lane signage of 1.7 m in width, with a concrete Barrier curb.
- RCMP Driveway: one lane cross section, one left-through-right shared lane.

Longfields Drive at Woodroffe Avenue is a four-legged, signalized intersection to the west of the proposed development. Figure 3.2.2 illustrates the intersection





Figure 3.2.2 Longfields Drive at Woodroffe Avenue

- Woodroffe Ave – NB: four lane cross section, one channelized right-turn lane, two through lanes, one auxiliary left-turn lane. Paved shoulder, bike lane with pavement markings and pedestrian crossing.
- Woodroffe Ave – SB: four lane cross section, one auxiliary right-turn lane, two through lanes, one auxiliary left-turn lane. Paved shoulder, bike lane with pavement markings, concrete sidewalk, barrier curb and pedestrian crossing.
- Longfields Dr – WB: three lane cross section, one through lane, auxiliary left-turn lane with 150 m of storage length, and one channelized right-turn lane with a storage length of 60 m. Paved shoulder, sidewalk starting approximately 25 m from the intersection, and pedestrian crossing.
- Longfields Dr – EB: three lane cross section, one shared through-right turn lane, two auxiliary left-turn lanes with 60 m of storage length respectively. Designated bike lane ends at the intersection, concrete sidewalk, barrier curb, and pedestrian crossing.



There is a roundabout connecting Longfields Drive with Bill Leathem Drive approximately 150 m from the proposed development to the north. **Figure 3.2.3** illustrates the intersection.



*Figure 3.2.3 Longfields Drive at Bill Leathem Drive Roundabout*

- Bill Leathem Dr – NB: One lane cross section, of 5.4 m in width. Concrete barrier curb raised median with pedestrian crossing.
- Longfields Dr – EB: One lane cross section, of 3.5 m in width. Paved shoulder of 1.3 m of width, raised median with pedestrian crossing.
- Longfields Dr – WB: Currently incomplete, dead ends immediately to the east of the intersection.
- Roundabout is fully equipped with sidewalks and pedestrian crossing on all approaches and sides
- Roundabout has a pavement width of 5.6 m with a total diameter of 40 m

### 3.3 Existing Driveways

The following section documents the existing driveway entrances within a 200m of the proposed site access. There currently are three driveway access that have been identified. **Figure 3.3.1** illustrate the locations.



Figure 3.3.1 Adjacent Driveways

There are two adjacent driveways entering the Canada post Depo on the south side of the roadway, and one adjacent driveway servicing the JDS Uniphase Inc building on the north side of the roadway.

### 3.4 Existing Multi-Use Pathways

Currently, there are several pedestrian and cycling related facilities within the study area. There is a multi-use pathway that runs along Woodroffe Avenue on the east side of the road. There are paved shoulders on both sides of Longfields Drive, with the westbound shoulder turns into a bike lane as it approaches the intersection at Longfields Drive and Woodroffe Avenue. There are sidewalks along the roundabout with pedestrian crossing markings at each leg. There is also a sidewalk along the south side of Bill Leatham Drive. Figure 3.4.1 below provides a view of the local multiuse pathways and cycle networks in the area.

*[Section left intentionally blank]*



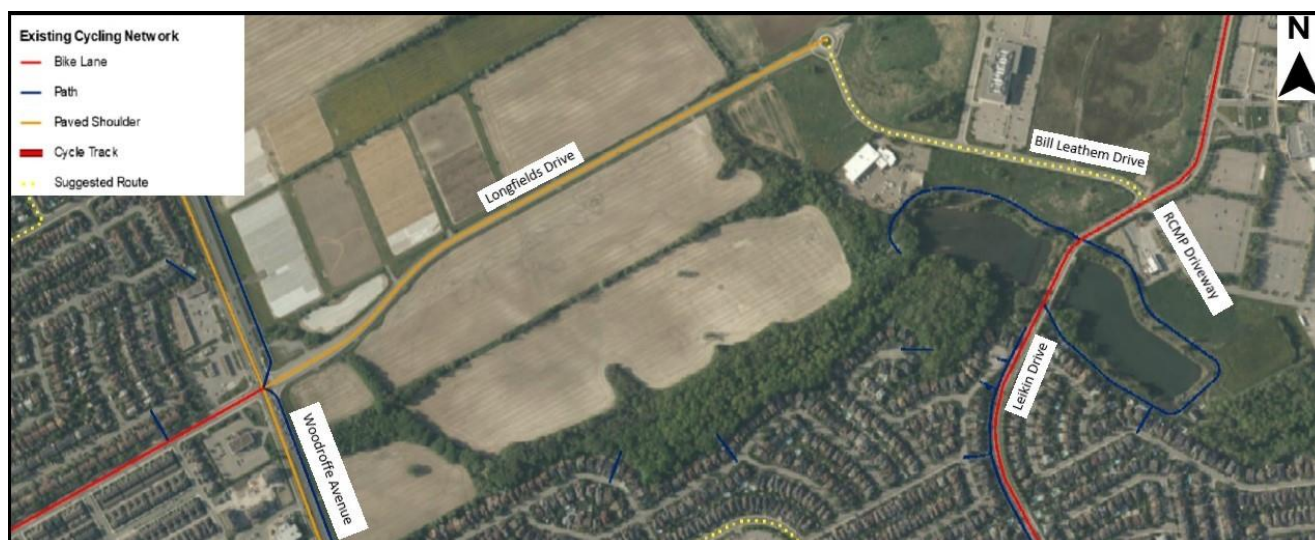


Figure 3.4.1 Existing Multi-use Pathway and Cycle Network Near Site

Figure 3.4.2 illustrates the proposed and ultimate cycle and multi-use pathway networks within the area of the purposed development. A designated bike lane will be added to Longfields Drive and Bill Leatham Drive where currently there is only paved shoulders on Longfields Drive. A new multi-use pathway will be added (dark green) connected the current multi-use pathway along Woodroffe Avenue, towards Leikin Drive to the southeast.

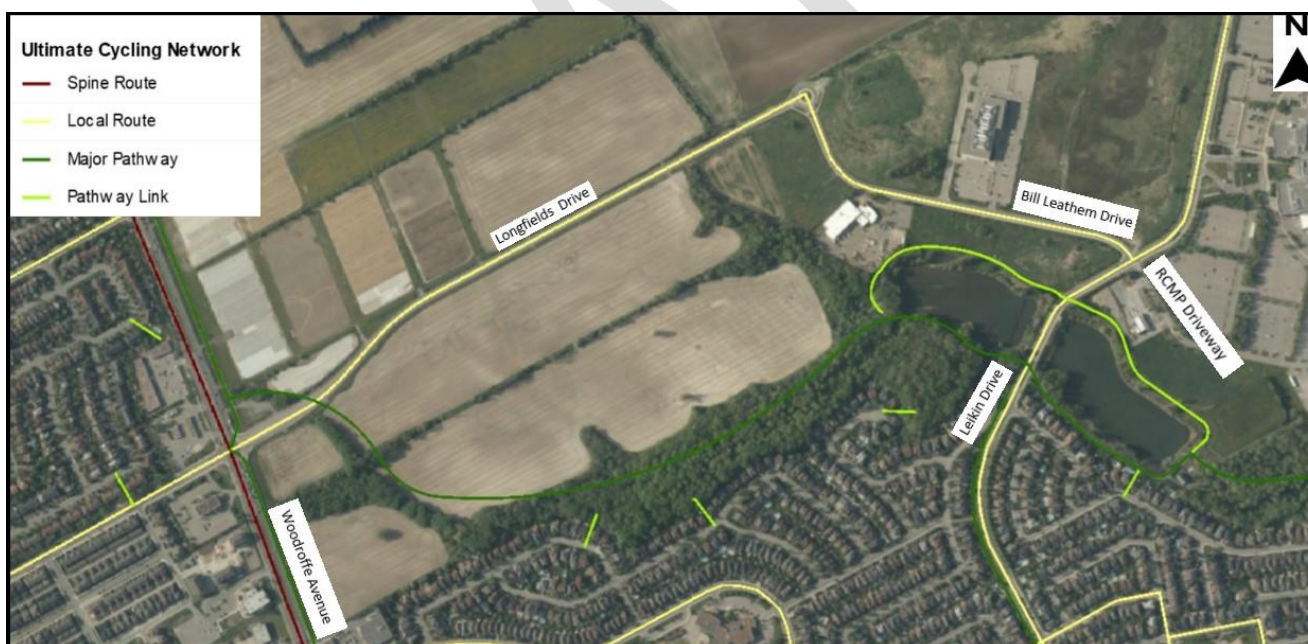


Figure 3.4.2 Ultimate Multi-use Pathway and Cycle Network Near Site

### 3.5 Existing Transit System

The following section documents the existing transit networks within the surrounding area. Figure 3.5.1 illustrates the existing bus routes within the study area of the proposed site.



Figure 3.5.1 Existing Transit Routes

There are five transit routes that commuters may choose to use to and from the planned development, including:

- Route 73: Provides access from Leikin Dr. to Tunney's Pasture Station giving access to the Ottawa Light Rail Transit (O-LRT). The route also provides service to Fallowfield Station, Baseline Station, Lincoln Fields Station and Westboro Station. The route gives direct access to Bill Leatham Drive being within walking distance to the proposed site.
- Route 278: Provides access from Riverside South Earl Armstrong Rd. to Tunney's Pasture Station giving access to the O-LRT. The route also provides service to Fallowfield Station and Baseline Station. The route gives direct access to Bill Leatham Drive being walking distance from the proposed site.
- Route 80: Provides access from Barrhaven Center to Tunney's Pastor Station giving access to the O-LRT. The route also provides service to Leikin Drive, Merivale Road, Westgate Mall and Holland Avenue. The closest stop is on Leikin Drive within walking distance from the proposed site.
- Route 199: Provides access from Leiking Drive to Hurdman Station Giving access to the O-LRT. The route also provides service to Greenboro Station and Huntclub Rd. at Riverside Dr. Giving access to Bill Leatham Dr. via Leikin Dr within walking distance to the proposed site.



- Route 74: Provides access from Riverview Park and Ride to Tunney's Pasture Station giving access to the O-LRT. The route also provides service to Fallowfield Station, Baseline Station, Lincoln Fields Station, and Westboro Station. Giving access to Bill Leathem Dr via Longfields.

Figure 3.5.2 Illustrates the location of the transit stops within the vicinity of the proposed development.

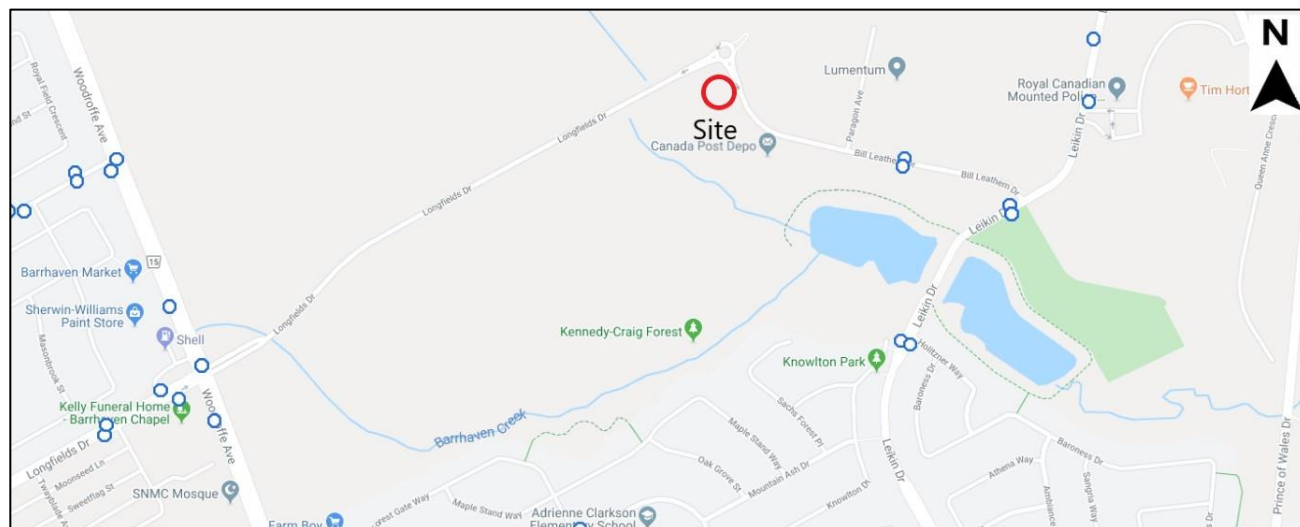


Figure 3.5.2 Transit Stop Locations (OC Transpo)

There are two Transit stops giving direct access to Bill Leathem Drive (route 73 and 278), approximately 300m south of the proposed development. There are also 2 transit stops along Leikin Drive (route 80 and 199), approximately 500m away providing potential access to the proposed development.

### 3.6 Existing Traffic Management Measures

As the area is relatively undeveloped there are no local traffic management measures.

### 3.7 Existing Peak Hour Travel Demand by Mode

The proposed site is in Ottawa's outer suburb of Barrhaven. Transit mode shares leaving Barrhaven to other areas of Ottawa account for 20% of morning peak period trips as of 2011, where the 2031 target for transit mode shares leaving is 26%. The 2011 transit mode shares of the morning peak trips arriving to Barrhaven is 6% where the target 2031 rate is 11%.

The observed 2011 mode shares city-wide was 45.3% for sustainable modes and broken down as follows; walking 9.5%; cycling 2.7%; Transit 22.4%; and automobile passenger 10.7%. The automobile driver mode share of 54.5% throughout the City of Ottawa.

### 3.8 Existing Collision History

Collision data was provided by the city for the years 2014-2018. The data was reviewed for boundary roads within the study area, as identified in Section 3.0. The data was divided into the following four sections:

- Bill Leathem Dr at Leikin Dr;

- Bill Leathem Dr between Paragon Ave and Leikin Dr;
- Longfields Dr at Woodroffe Ave, and;
- Longfields Dr between Bill Leathem Dr and Woodroffe Ave.

The data was analyzed and summarized with respect to collision severity, road surface, light conditions and impact type. The summarized data is shown in [table 3.8.1](#).

**Table 3.8.1 Summary of Vehicular Collisions**

		Longfields Dr @ Woodroffe Ave	Longfields Dr btw Bill Leathem Dr & Woodroffe Avenue	Bill leathem Dr at Leikin Dr	Bill Leathem Dr btw Paragon Ave & Leikin Dr
Number of Collisions	2014	10	0	1	0
	2015	10	1	0	0
	2016	3	0	2	2
	2017	15	0	1	0
	2018	6	1	2	0
	Total	44	2	6	2
Collision Type	P.D only	33 (75%)	0%	5 (83%)	2 (100%)
	Injury Only	11 (25%)	2 (100%)	1 (17%)	0%
	Fatal	0%	0%	0%	0%
Impact Type	Angle	2 (5%)	0%	3 (50%)	0%
	Rear End	16 (36%)	0%	1 (17%)	0%
	Turning Movement	11 (25%)	0%	0%	0%
	SMV Other	8 (18%)	1 (50%)	1 (17%)	1 (50%)
	Other	7 (16%)	1 (50%)	1 (17%)	1 (50%)
Environment	Clear	34 (77%)	2 (100%)	3 (50%)	0%
	Rain	2 (5%)	0%	1 (17%)	1 (50%)
	Freezing Rain	7 (16%)	0%	0%	0%
	Snow	1 (2%)	0%	2 (33%)	1 (50%)
Light Condition	Daylight	26 (59%)	2 (100%)	5 (83%)	2 (100%)
	Dusk	10 (23%)	0%	0%	0%
	Dawn	7 (16%)	0%	0%	0%
	Dark	1 (2%)	0%	1 (17%)	0%
Road Surface	Dry	28 (64%)	2 (100%)	2 (33%)	0%
	Wet	4 (9%)	0%	2 (33%)	1 (50%)
	Winter Conditions*	12 (27%)	0%	2 (33%)	1 (50%)

\* Winter conditions includes all: snow, slush, ice

The conclusions of the analysis are as followed:

- There was a total of 44 collisions at the intersection of Woodroffe Avenue and Longfields Drive, 2 collisions on Longfields Drive between Bill Leathem Drive and Woodroffe Avenue, 6 Collisions at the

intersection of Bill Leathem Drive and Leikin Drive, and 2 collisions on Bill Leathem Drive between Leikin Drive and Paragon Avenue.

- At the intersection of Woodroffe Avenue and Longfields Drive, 75% of collisions resulted in property damage only, 25% resulted in non-fatal injury. Both collisions between Woodroffe Avenue and Bill Leathem Drive resulted in injury. At the intersection of Bill Leathem Drive and Leikin Drive 83% of collisions resulted in property damage only, while 17% resulted in injury. All collision between Paragon Avenue and Leikin Drive resulted in property damages only.
- The most common types of collisions at the intersection of Woodroffe Avenue and Longfields Drive was rear-ends, followed by other and turning movements, which is not uncommon at intersections.
- The most common types of collisions at the intersection of Bill Leathem Drive and Leikin Drive was angled collisions.
- The most common types of collisions on Longfields Drive between Bill Leathem Drive and Woodroffe Avenue was SMV and other type of collisions.
- The most common types of collisions on Bill Leathem Drive between Leikin Drive and Paragon Avenue was SMV and other type of collisions.
- No collisions recorded including pedestrians or cyclists.

### 3.9 Existing Traffic Volumes

All available traffic data can be found in [Appendix C](#). MP obtained TMC data from the City of Ottawa for the intersections of:

- Bill Leathem Drive at Leikin Drive (Thursday March 2, 2017);
- Longfields Drive at Woodroffe Avenue (Wednesday June 12, 2019), and;
- Bill Leathem Drive at Longfields Drive (June 10, 2015).

In order to use these counts, MP utilized an annual growth factor of 1.5% to adjust the values to 2020. This factor was based on the City of Ottawa Transportation Master Plan which states that the city of Ottawa is expected to increase its population from 922,000 to 1.14 million residents from 2011 to 2031. This results in a growth rate of 23% which in turn is an annual growth rate of 1.1%. Since traffic growth rate is a function of both population and employment growth, a growth rate of 1.5% was used to ensure that a both background population and employment growth is taken into account. [Figure 3.9.1](#) Illustrates the traffic volumes at the study area intersections

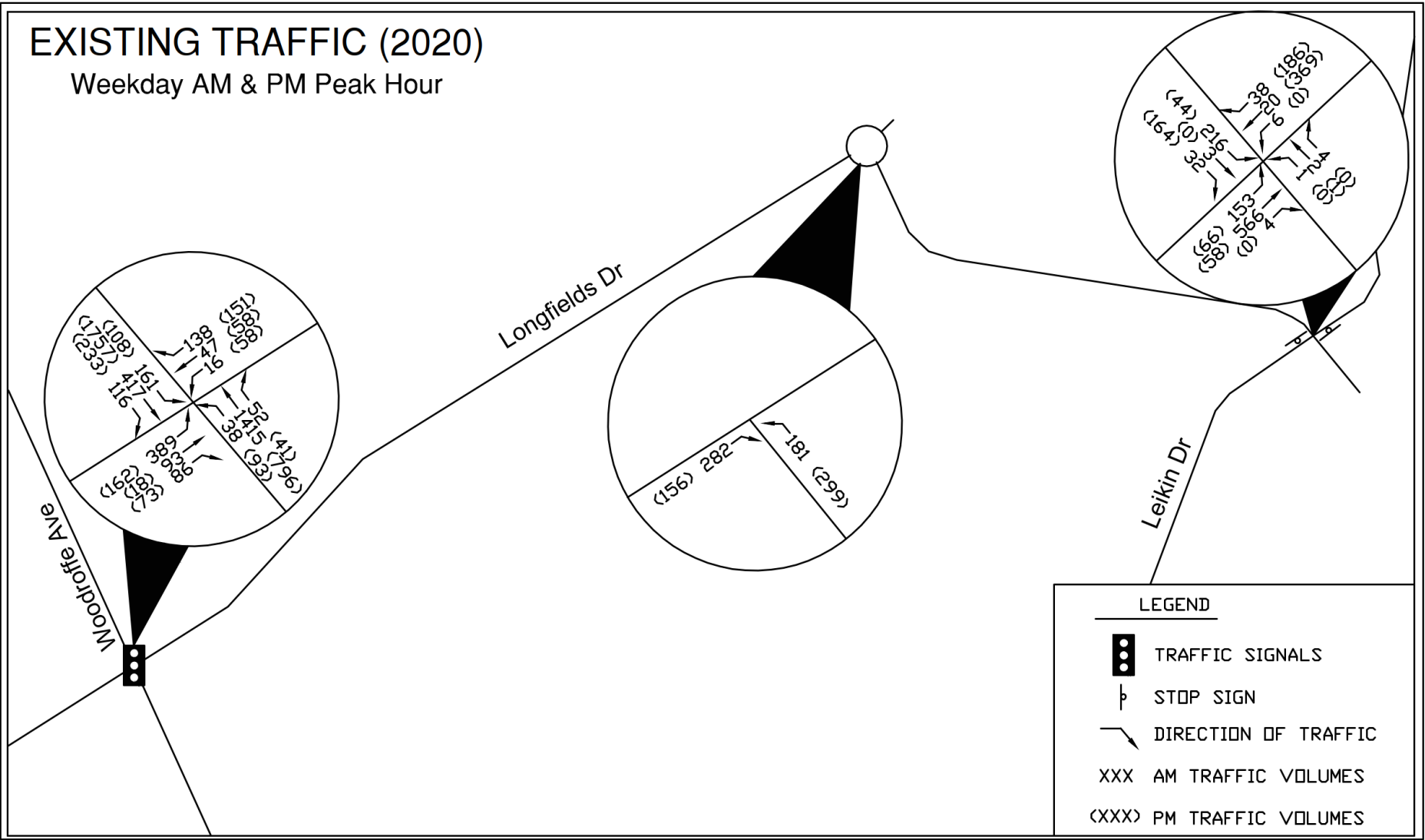


Figure 3.9.1: Existing (2020) Traffic Volumes

Table 3.9.1 shows the expected travel mode percentages based on the most recent Capital Region Origin-Destination Survey which was conducted in Fall 2011 for the Ottawa South Nepean area and can be found in Appendix C.

**Table 3.9.1 South Nepean, Origin Destination Survey Travel Mode Percentages**

Travel Mode	% of Person Trips		
	AM Peak	PM Peak	% of Person Trips - Average of AM and PM Peak Hour
<b>Auto Drive</b>	53%	57%	<b>55%</b>
<b>Auto Passenger</b>	12%	17%	<b>15%</b>
<b>Transit</b>	16%	14%	<b>15%</b>
<b>Bicycle</b>	1%	1%	<b>1%</b>
<b>Walk</b>	6%	7%	<b>7%</b>
<b>Other</b>	12%	4%	<b>8%</b>
<b>Total</b>	100%	100%	<b>100%</b>

It should be noted that the documented other category accounts for trips such as taxis, school buses, motorcycles and scooters. As such for the purposes of modelling the traffic conditions and projections of future conditions, the percentages of other trips will be distributed between auto driver and auto passenger mode shares illustrated in Table 3.9.2.

**Table 3.9.2 South Nepean, Origin Destination Adjusted Mode Share Percentages**

Travel Mode	% of Person Trips		
	AM Peak	PM Peak	% of Person Trips - Average of AM and PM Peak Hour
<b>Auto Drive</b>	63%	60%	<b>61%</b>
<b>Auto Passenger</b>	14%	18%	<b>16%</b>
<b>Transit</b>	16%	14%	<b>15%</b>
<b>Bicycle</b>	1%	1%	<b>1%</b>
<b>Walk</b>	6%	7%	<b>7%</b>
<b>Other</b>	0%	0%	<b>0%</b>
<b>Total</b>	100%	100%	<b>100%</b>

## 4.0 PLANNED CONDITIONS

### 4.1 Roadway Network Modifications

According to the City of Ottawa Transportation Master plan there are no roadway network modifications within the study area.

## 4.2 Other Study Area Developments

The following section documents other developments within the study area of the proposed development.

Figure 4.2.1 illustrates the location of the other developments in the area.



Figure 4.2.1 Background Area Development

- 102 Bill Leatham Drive: The Development will be a multi-purpose facility including a place of worship, place of assembly and community centre uses, operated by the salvation army. The anticipated buildout year is 2023.

There are no other proposed developments within the vicinity of the study area of the proposed development.

## 5.0 STUDY AREA

The proposed study area is limited to the following intersections:

- Longfields Drive at Woodroffe Avenue;
- Bill Leatham Drive at Leikin Drive, and;
- Bill Leatham Drive at Longfields Drive.

## 6.0 TIME PERIODS

The Proposed time periods for the analysis are:

- AM peak hour of adjacent roadway; and,
- PM peak hour of adjacent roadway.



## 7.0 HORIZON YEARS

At the time of writing, the date of occupancy and build-out is anticipated to occur in 2020. As such, the horizon years to be analyzed will include 2020 and 2025.

## 8.0 EXEMPTION REVIEW

Since the development-generated person trips are not expected to exceed 60, Modules 3.1, 3.3 and 4.5 to 4.9 of the TIA guidelines are expected to be omitted from this report. Refer to [Table 8.0.1](#) for additional exemptions.

**Table 4.2.1 Exemptions Review**

Module	Element	Exempted	Reasoning
<b>Design Review Component</b>			
<b>4.1 Development Design</b>	4.1.2 Circulation and Access	No	Not exempted due to being a Site Plan
	4.1.3 New Street Networks	Yes	The development is not a subdivision
<b>4.2 Parking</b>	4.2.1 Parking Supply	No	Not exempted due to being a Site Plan
	4.2.2 Spillover Parking	Yes	The development has more parking spots than needed (0.8/100m <sup>2</sup> of gross floor area)
<b>Network Impact Component</b>			
<b>4.5 Transportation Demand Management</b>	All elements	Yes	Exempted due to low development generated traffic volume.
<b>4.6 Neighbourhood Traffic Management</b>	4.6.1 Adjacent Neighbours	Yes	Exempted due to low development generated traffic volume.
<b>4.8 Network Concept</b>	All Elements	Yes	Exempted due to low development generated traffic volume.
<b>4.9 Intersection Design</b>	All Elements	Yes	Exempted due to low development generated traffic volume

## 9.0 DEVELOPMENT GENERATED TRAFFIC

As stated in [Section 1.1](#), the development-generated person trips are expected to be 36 in the AM peak hour and 38 in the PM peak hour. As such, this section has been omitted from this report.

## 10.0 BACKGROUND NETWORK TRAFFIC

As stated previously in [Section 3.9](#), MP received turning movement counts from the City of Ottawa taken at the intersection of Longfields Drive at Woodroffe Avenue (2019), Longfields Drive at Bill Leathem Drive (2015), and Bill Leathem Drive at Leikin Drive/RCMP access (2017). The traffic volumes were projected to 2020, applied to the network and balanced accordingly.

### 10.1 Transportation Network Plans

As stated previously in this report, the expected build out and occupancy year is 2020. Additionally, the proposed development and surrounding study area is serviced by public transit, has adequate pedestrian and cycling facilities, and a number of multi-use pathways. The City of Ottawa Long Range Financial Plan (2011) estimates a transit ridership increase of 3.8% from 2016 to 2020 and 2.0% increase from 2021-2025. The City of Ottawa Transportation Master Plan has also identified mode share targets for the year 2031. [Table 10.1.1](#) shows the mode share targets expected for the background traffic within the study area. [Table 10.1.1](#) shows the mode share targets expected for the background traffic within the study area.

**Table 10.1.1: Future Background Mode Share Targets**

Travel Mode	Mode Share Target	Rationale
Auto Driver	58%	Currently average of 62 % of person trips. This is expected to decrease in the future as more transit options become available
Auto Passenger	15%	% of auto passenger person trips is not expected to significantly change in proportion to Auto Drivers.
Transit	29%	Transit person trips are expected to increase over time, as predicted by City of Ottawa Long Range Financial Plan
Bicycle	1%	% of cycling is not expected to significantly change
Walk	7%	% of walking person trips is not expected to increase.

### 10.2 General Background Growth

To project the traffic volume to the current and future years, a growth rate of 1.5% was applied to the existing vehicle traffic volumes to project them to the year 2025. The vehicle traffic volumes were then adjusted according to the future background mode share targets illustrated in [Table 10.1.1](#). The growth rate is considered appropriate as it is to include both the population and employment growth within the City of Ottawa. [Figure 10.2.1](#) shows the expected future background traffic volume during the 2025 horizon year.

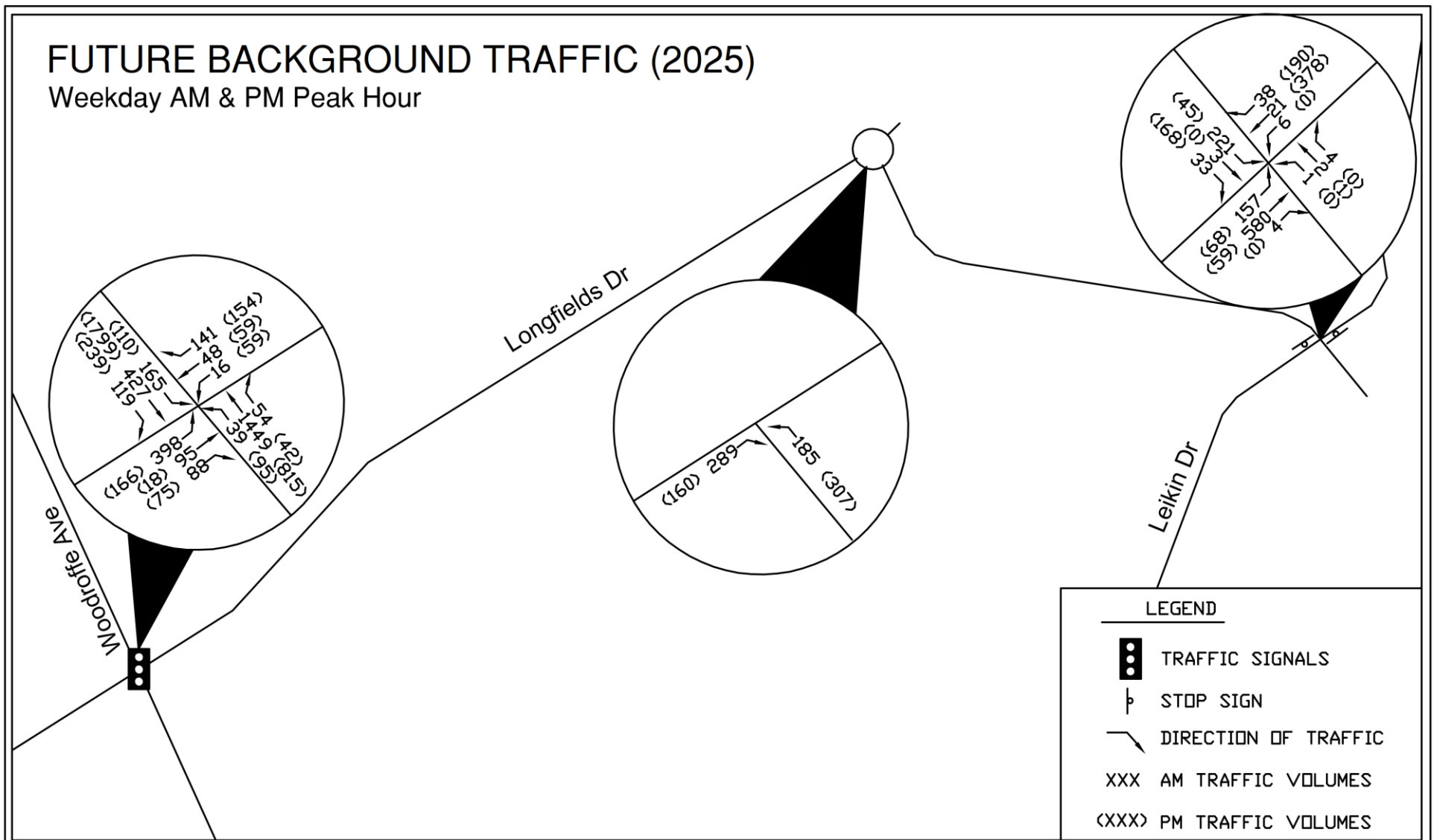


Figure 10.2.1: Future Background Traffic Volumes (2025)

### 10.3 Other Area Development

As stated in [Section 4.2](#), there is only one other proposed development within the study area. It is expected, however that the additional development-generated trips would be captured in the 1.5% annual growth rate applied to the peak hour volumes.

## 11.0 DEMAND RATIONALIZATION

As stated in [Section 1.1](#) of this report, the development-generated person-trips are expected to be 36 in the AM peak hour and 38 in the PM peak hour. As such, this section has been omitted from this TIA.

## 12.0 DEVELOPMENT DESIGN

This section will review the proposed development and its transportation network elements in order to ensure that a safe and efficient design has been proposed, that will encourage walking, cycling, and transit use. The City of Ottawa's TDM-supportive Development Design and Infrastructure checklist has been completed and attached in [Appendix F](#) for reference. The TDM-supportive Development Design and Infrastructure checklist outlines the TDM elements expected to be included in the proposed development.

### 12.1 Design for Suitable Modes

The proposed development is expected to provide a total of 42 parking spaces, two (2) barrier free parking spaces, one (1) loading space and six (6) loading docks. One (1) bicycle post and ring is expected to be provided on site.

As described in [Section 3.5](#), the closest transit stops to the proposed development are located along Bill Leatham Drive, approximately 300 m east from the proposed primary access to the development.

### 12.2 Circulation and Access

The proposed development is anticipated to have two (2) full-movement accesses on the east side of Bill Leatham Drive. Both accesses will have an offset of approximately 70 m.

Loading and/or short-stay deliveries are anticipated to be accommodated in the rear of the proposed development, towards the loading docks, as the proposed development includes adequate on-site loading spaces. The proposed accesses and on-site parking will facilitate circulation through the site.

## 13.0 PARKING

The site plan shows a total of 42 parking spaces, which includes two (2) barrier free parking spaces. The City of Ottawa Zoning By-Law 2008-250, Section 101, Schedule 1A lists the proposed development as being in Area C (Suburban). Table 101 within the City of Ottawa By-law gives the minimum parking rates for varying land uses. The proposed development is located further than 600 m from rapid transit and given there is no limit on the number of parking spaces imposed on the development. [Table 13.0.1](#) illustrates the City of Ottawa By-Law minimum number of parking spaces for the proposed development.

**Table 13.0.1: City of Ottawa By-Law Parking Requirements**

Land Use	Minimum Parking Spaces Rate	Gross Floor Area (m <sup>2</sup> )	Minimum Number of Spaces Required
Light Industrial Use	0.8 per 100 m <sup>2</sup>	1,858	15

The proposed development exceeds the minimal number of parking spaces required (15) and is expected to be able to accommodate any potential additional parking demand from the proposed development.

Bicycle parking spaces must be provided in accordance with the City of Ottawa Zoning By-Law, Section 111. Table 13.0.2 illustrates the bicycle parking spaces required as per the City of Ottawa's By-Law.

**Table 13.0.2: City of Ottawa By-Law Bicycle Parking Requirements**

Land Use	Minimum Bicycle Parking Spaces Rate	Gross Floor Area (m <sup>2</sup> )	Minimum Number of Spaces Required
Warehouse	1 per 2000 m <sup>2</sup>	1,858	1*

As Stated previously the proposed development is anticipated to have one (1) ring and post which would accommodate two (2) bicycles exceeding the by-law requirement.

## 14.0 BOUNDARY STREETS

This section will examine the design elements of the noted boundary streets and their ability to accommodate the proposed development as well as being consistent with the City of Ottawa's Complete Streets design philosophy as well as its urban design objectives.

### 14.1 Segment Mobility

#### 14.1.1 Pedestrian Level of Service (PLOS)

Table 14.1.1.1 illustrates the PLOS for Bill Leathem Drive.

**Table 14.1.1.1 Pedestrian Level of Service – Bill Leathem Drive**

Side of Roadway	Sidewalk Width (m)	Boulevard Width (m)	Motor Vehicle Traffic Volume (AADT)	Presence of On-Street Parking	Operating Speed	LOS
North	No Sidewalk	N/A	N/A	N/A	50	F
South	2.15	N/A	2709	N/A	50	A

The north side of Bill Leathem Drive is not equipped with a sidewalk and has an operating speed of 50 km/h, resulting in a PLOS of F. The south side of the roadway has a sidewalk wider than 2 m, an AADT below 3000, no on street parking, and an operating speed of 50 km/h resulting in a PLOS of A. However, the overall segment scores shall be based on the lowest quality facilities, the overall PLOS of Bill Leathem Drive is F based on Exhibit 4 of the City of Ottawa's Multi-Modal Level of Service (MMLOS) Guidelines.

### 14.1.2 Bicycle Level of Service (BLOS)

Table 14.1.2.1 illustrates the BLOS on Bill Leathem Drive

**Table 14.1.2.1 Bicycle Level of Service – Bill Leathem Drive**

Bike Lane Facility	Number of Travel Lanes	Operating Speed (km/h)	BLOS
Mixed Traffic	2	50 (no marked centerline)	B

Bill Leathem Drive is classified as Mixed Traffic with two lanes of traffic, an operating speed of 50 km/h with no marked centerline. In accordance with Exhibit 11 of the City of Ottawa's MMLOS Guidelines, Bill Leathem Drive has a BLOS of B.

### 14.1.3 Transit Level of Service (TLOS)

The TLOS methodology is intended primarily to be used for roadways with existing or planned rapid transit networks/priority measures. However, this segment of roadway does not fall into either of the categories. As such, the TLOS can be still analysed, however, to a lesser extent. Bill Leathem Drive is classified as mixed, with low parking/driveway friction resulting in an TLOS of D when utilizing Exhibit 15 in the MMLOS Guidelines.

### 14.1.4 Truck Level of Service (tkLOS)

Table 14.1.4.1 illustrates the tkLOS on Bill Leathem Drive.

**Table 14.1.4.1 truck Level of Service – Bill Leathem Drive**

Side of Roadway	Curb Lane Width (m)	Number of Travel Lanes	tkLOS
North	5.2	2	B
South	5.2	2	B

Bill Leathem Drive has a curb lane width of larger than 3.7m, and two travels lanes in both the north and south side of the roadway resulting in a tkLOS of B based upon Exhibit 20 of the City of Ottawa's MMLOS Guidelines.

### 14.1.5 Vehicular Level of Service (LOS)

The vehicular LOS for Bill Leathem Drive was calculated using McTrans HCS 2010 software which utilizes HCM 2010 methodology. Bill Leathem Drive was reviewed as a Class 3 (local road) two-lane roadway. A LOS was assigned to each approach based on the V/C calculated by the HCS software and compared to the LOS according to the City of Ottawa TIA Guidelines, illustrated in Table 19.2.1.1. Table 14.1.5.1 summarizes the approach LOS. All HCS Reports can be found in Appendix D.



Table 14.1.5.1: Vehicular LOS by Approach

Analysis Period	Approach	AM Peak Hour		PM Peak Hour	
		LOS	V/C	LOS	V/C
Existing Conditions (2020)	EB	A	0.17	A	0.17
	WB	A	0.17	A	0.17
Background Future Traffic (2025)	EB	A	0.18	A	0.18
	WB	A	0.08	A	0.19

As shown, Bill Leathem Drive is currently expected to operate at a LOS A and is expected to continue to operate at a LOS A during the 2025 horizon year.

## 14.2 Road Safety

Available collision data within the study area was reviewed and is presented in [Section 3.7](#). No road safety concerns were identified on boundary streets or within the study area. As City of Ottawa collision records do not indicate direction of travel for vehicles involved, collision diagrams are not feasible.

## 15.0 ACCESS INTERSECTION DESIGN

This section will examine design elements of the proposed development's access points and assess their alignment with the City of Ottawa's Complete Street philosophy, MMLoS Guidelines and urban design objectives.

### 15.1 Location and Design of Access

The proposed development is anticipated have two full-move accesses located on Bill Leathem Drive, south of the roundabout at Bill Leathem Drive and Longfields Drive. Both accesses will have a throat width of approximately 9 m and are separated by approximately 90 m from one another.

#### 15.1.1 Access Sight Lines

MP staff performed a field visit to review the sight lines in the field February 5, 2020 for the proposed development site access.

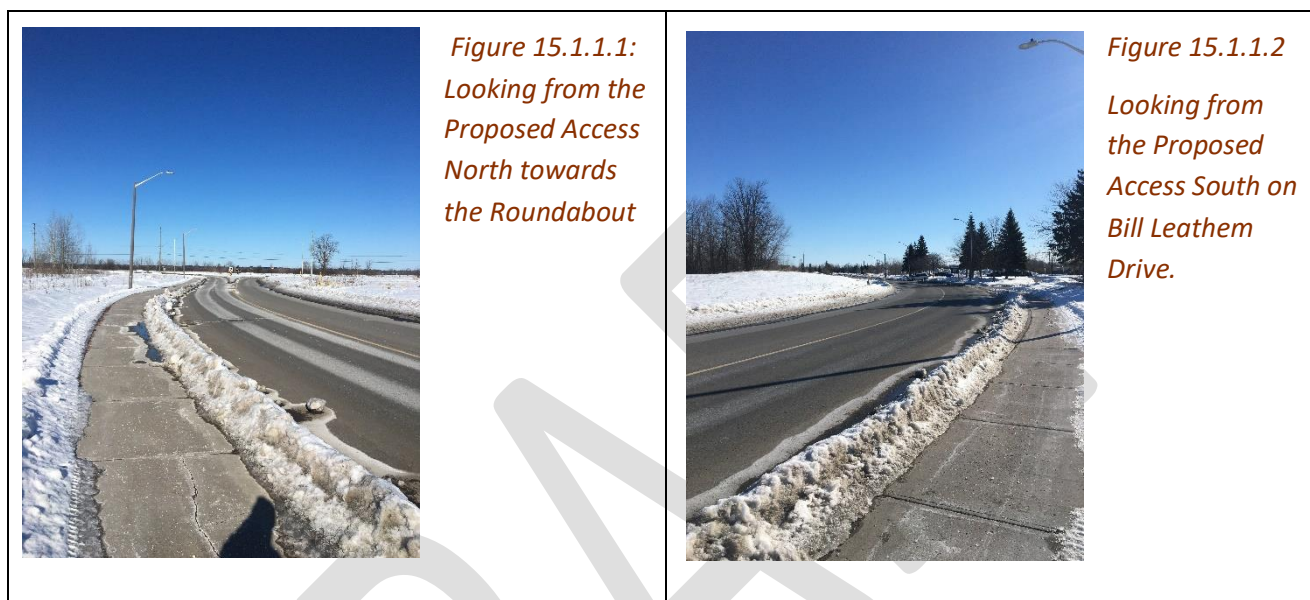
TAC Geometric Design Guide for Canadian Roads, June 2017, was used to determine the required sight distance. Section 9.9.2 Departure Sight Triangles (Stop Controlled) Table 9.9.1 Length of Sight Triangle Leg – Case A was used in the review of the sight lines for the access of the proposed development.

Table 15.1.1.1 shows the minimum required Length of Sight Triangle Leg. Bill Leathem Drive has a design speed of 70 km/h, as such 70 km/h will be the design speed analysed.

**Table 15.1.1.1 Length of Sight Triangle Leg – Case A, No Traffic Control**

Design Speed (km/h)	Length of Leg (m)
70	65

As stated previously, the proposed development will have two accesses onto Bill Leathem Drive, with the first being approximately 100 m south of the roundabout at Bill Leathem Drive and Lognfields Drive. **Figure 15.1.1.1** and **Figure 15.1.1.2** show the sightlines of the from the approximate access of the proposed development.



Based on the site review done and a desktop review, it is anticipated that the sight lines from the proposed development access driveways will be adequate. The sightline from the proposed access closest to the roundabout, towards the roundabout is approximately 100 m, where the sightline to the south of the proposed development is adequate.

## 15.2 Access Intersection Control

In consideration of existing and projected volumes of traffic anticipated to utilize the site access, stop control at the minor approach (site driveways) is recommended. No other traffic control measures are warranted at the proposed site access.

## 15.3 Access Intersection Design

No concerns are anticipated due to the low volumes of both the proposed development-generated trips and background traffic on Bill Leathem Drive. As the site access will not be signalized, the MMLOS for all modes at the intersection of Bill Leathem Drive and the site access will be the same as that for the boundary road segments presented in **Section 13.0**.

## 16.0 TRANSPORTATION DEMAND MANAGEMENT

As stated previously, the proposed development is expected to generate a total of 36 trips in the AM peak hour and 38 trips in the PM peak hour. As such, since the proposed development is expected to generate fewer than 60 trips, this section is exempt from this TIA report.

## 17.0 TRANSIT

This section will review the potential impacts of the proposed development on existing and planned transit networks and services in order to ensure TLOS is not negatively impacted.

### 17.1 Route Capacity

As noted in [Section 9.1.2](#), it is anticipated that the proposed development will generate approximately 6 and 7 transit trips during the AM and PM peak hours, respectively. The relatively low number of development-generated transit trips are expected to be adequately accommodated by the existing transit routes and is not anticipated to result in any requirements for additional transit capacity. Further, it is not anticipated that the existing transit routes will require modification as a result of the proposed development.

### 17.2 Transit Priority

As noted in [Section 3.3](#), there are four routes in the area, namely Route 73, 80, 199, and 278, which travelers may use to travel to and from the development. It is anticipated that the relatively low number of development-generated transit trips can be accommodated and it is not anticipated that any additional transit trips will result in impacts to travel time.

As noted previously, there are two transit routes along Bill Leathem however the transit stops are 300 m away from the proposed site access. As such, the proposed development accesses would have no impact on transit travel times.

## 18.0 REVIEW OF NETWORK CONCEPT

Since the proposed development is not expected to generate more than 200 peak hour person trips, this section has been omitted from this TIA report.

## 19.0 INTERSECTION DESIGN

This section will determine the design elements of the study area intersections required to accommodate the proposed development, ensuring they are consistent with the City of Ottawa Complete Streets philosophy and MMLOS practices.

### 19.1 Intersection Control

Signal warrants were completed for the intersection of Bill Leathem Drive and Leikin Drive. The warrants were completed in accordance with the Ontario Traffic Manual Book 12 – Traffic Signals (July 2001) for justifications 1 through 6. Signals were found not to be warranted at the intersection of Bill Leathem Drive and Leikin Drive.

The warrant calculations can be found in [Appendix E](#). Additionally, MP reviewed this intersection in Synchro 10 as an All-Way Stop Controlled (AWSC) intersection. This resulted in a LOS F for the NB approach during the AM peak hour and is not recommended.

## 19.2 Intersection Design

### 19.2.1 Intersection Vehicular Level of Service (LOS)

Analysis of vehicular LOS was performed in accordance with the City of Ottawa's TIA Guidelines (2017) and MMLOS Guidelines. LOS descriptions for the analysis are provided in [Table 19.2.1.1](#). All existing and projected traffic operations were modelled in Synchro 10.

**Table 19.2.1.1: Level of Service vs. Volume to Capacity Ratio**

Level of Service	Volume to Capacity Ratio (V/C)
A	0 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	> 1.00

Volume to Capacity ratios (V/C) were analyzed for all signalized intersections overall as well as by individual movements. For unsignalized intersections with a LOS of F, the capacity was based on gap analysis.

Existing signal timing information such as phasing, pedestrian minimums and clearance intervals were provided by the City of Ottawa and used in the analysis of existing conditions for all critical intersections within the study area. The traffic Signal Timing forms can be found in [Appendix C](#). Signal timings were optimized for future conditions with all Synchro 10 parameters taken in accordance with Appendix C: Synchro Analysis Parameters of the City of Ottawa TIA Guidelines (2017). Additionally, all pedestrian clearance timings as well as Amber and All Red times that were provided by the City of Ottawa were used in the analysis of future operating conditions.

MP reviewed the existing 2018 and background 2025 operating conditions at all study area intersections. Synchro 10 reports for all analysis periods can be found in [Appendix D](#), while [Table 19.2.1.2](#) summarizes the V/C and LOS according to the City of Ottawa TIA methodology. It should be noted, that at this time (2020), the roundabout at Bill Leathem Drive and Longfields Drive currently has two operational legs. As such, no delays are currently imposed on drivers and the intersection would operate at a LOS A for all scenarios and as such, has been excluded from the analysis.

Table 19.2.1.2: Existing Operating Conditions (2020)

	AM Peak		PM Peak	
	LOS	v/c	LOS	v/c
<b>Bill Leathem Dr and Leikin Dr/RCMP Access</b>				
NB-Left Turn	A	0.11	A	0.08
NB-Right-Through	-	-	-	-
EB-Left-Through-Right	F	1.55	A	0.45
SB-Left Turn	A	0.01	A	0.02
SB-Through-Right	-	-	-	-
WB-Left-Through-Right	A	0.07	A	0.00
<b>Longfields Dr and Woodroffe Ave</b>				
NB-Left Turn	A	0.10	A	0.54
NB-Through	F	1.02	A	0.49
NB-Right Turn	A	0.08	A	0.05
EB-Left Turn	F	1.27	C	0.75
EB-Through	A	0.58	A	0.41
EB-Right Turn	-	-	-	-
SB-Left Turn	A	0.60	A	0.32
SB-Through	A	0.25	F	1.08
SB-Right Turn	A	0.15	A	0.28
WB-Left Turn	A	0.20	A	0.55
WB-Through	A	0.32	A	0.42
WB-Right Turn	A	0.57	B	0.63

As shown, the EB Left/Through/Right movement at the intersection of Bill Leathem Drive and Leikin Drive/RCMP Access is expected to be operating significantly above capacity during the AM peak hour with a V/C of 1.55. As such drivers can expect to experience, significant delays and queues. This indicates insufficient gaps in the traffic stream on Leikin Drive for vehicles to enter from Bill Leathem Drive. While traffic signals were not found to be warranted at this intersection and AWSC was found to also result in failures, consideration should be given to monitoring the safety operations at this intersection. It is expected that with the significant delays imposed on drivers in the EB approach, drivers may accept unsafe gaps in traffic resulting in increased potential for collisions.

The NB through and EB left turning movements at the intersection of Longfields Drive and Woodroffe Avenue are expected to be operating above capacity at a LOS F during the AM peak hour. During the PM peak hour, the SB through movement is also expected to be above capacity. Of note, is that during the AM peak hour all movements except those with a LOS F are expected to be operating at a LOS A. Adjustments to the signal cycle length and splits were reviewed however, despite the EB approach currently having dual left turn lanes, MP was unable to achieve adequate operating conditions for the failing movements. As such consideration should be made to reviewing alternates such as geometric changes or performing a more thorough review of signal

operations at this intersection. Similarly, in the PM peak hour, all movements with the exception of the SB through movement are expected to operate at a LOS C or better.

Table 19.2.1.2 illustrates the intersection operating conditions with the projected 2025 background traffic applied to the roadway network.

**Table 19.2.1.2: Future Background Operating Conditions (2023)**

	AM Peak		PM Peak	
	LOS	V/C	LOS	V/C
<b>Bill Leathem Dr and Leikin Dr</b>				
NB-Left Turn	A	0.12	A	0.09
NB-Right-Through	-	-	-	-
EB-Left-Through-Right	F	1.91	A	0.51
SB-Left Turn	A	0.02	A	0.00
SB-Through-Right	-	-	-	-
WB-Left-Through-Right	A	0.08	A	0.02
<b>Longfields Dr and Woodroffe Ave</b>				
NB-Left Turn	A	0.11	A	0.55
NB-Through	F	1.11	A	0.53
NB-Right Turn	A	0.08	A	0.05
EB-Left Turn	F	1.37	D	0.81
EB-Through	A	0.60	A	0.43
EB-Right Turn	-	-	-	-
SB-Left Turn	B	0.65	A	0.37
SB-Through	A	0.27	F	1.19
SB-Right Turn	A	0.16	A	0.31
WB-Left Turn	A	0.21	A	0.58
WB-Through	A	0.34	A	0.43
WB-Right Turn	A	0.60	A	0.09

As shown, no significant changes are expected to occur from the existing 2020 to the 2025 horizon year. All approaches are expected to continue to operate well and under capacity with the exception of the movements which are currently expected to be above capacity. As expected, these movements are shown to be operating with slightly higher V/C ratios in the projected 2025 horizon year.

### 19.2.2 Intersection Pedestrian Level of Service (PLOS)

The PLOS for the intersection of Woodroffe Avenue and Longfields Drive was determined in accordance with The City of Ottawa's MMLOS Guidelines. The Pedestrian Exposure at Signalized Intersection (PETS), average delay to pedestrians, and corresponding levels of service at the signalized intersection are summarized in Table 19.2.2.1. Since the intersection of Bill Leathem Drive and Longfields Drive is not signalized, it was not reviewed in this section.



Table 19.2.2.1: Signalized Intersection Pedestrian Level of Service

Intersection / Approach (crossing)	PETS I Evaluation		Pedestrian Delay Evaluation		Critical PLOS
	Total Points	LOS	Delay (sec)	LOS	
Longfields Drive (EB/WB) at Woodroffe Avenue (NB/SB)					
Northbound (E-W)	73	C	44	E	E
Southbound (E-W)	51	D	44	E	E
Eastbound (N-S)	48	D	42	E	E
Westbound (N-S)	35	E	42	E	E

Upon review of Exhibit 5 to 7 of the City of Ottawa's MMLOS Guidelines, the signalized intersection of Woodroffe Avenue and Longfields Drive has a PLOS of E which is a result of the delay the pedestrians experience.

### 19.2.3 Intersection Bicycle Level of Service (BLOS)

The Bicycle Level of Service (BLOS) for the study area intersections was determined in accordance with the City of Ottawa's Multi-Modal level of Service (MMLOS) Guidelines. Table 19.2.3.1 illustrates the BLOS. Since the intersection of Bill Leathem Drive and Longfields Drive is not signalized, it was not reviewed in this section.

Table 19.2.3.1: Signalized Intersection Bicycle Level of Service

Intersection / Approach (crossing)	Bike Lane Facility	Lanes crossed to turn left	Speed (km/h)	LOS
<b>Longfields Drive (EB/WB) at Woodroffe Avenue (NB/SB)</b>				
Northbound (E-W)	Bike Lane	2	80	F
Southbound (E-W)	Bike Lane	2	80	F
Eastbound (N-S)	Bike Lane	2	60	F
Westbound (N-S)	Bike Lane	1	60	E

As seen above the BLOS of the intersection of Longfields Drive at Woodroffe Avenue result in a BLOS of F except for the westbound approach. As such, the intersection is operating at a BLOS of F. Since the intersection of Bill Leathem Drive and Longfields Drive is not signalized, it was not reviewed in this section.

### 19.2.4 Intersection Transit Level of Service (TLOS)

In order to evaluate Transit Level of Service at the intersection within the study area, average delays at approaches were determined based on the intersection analysis completed as part of this investigation. Detailed analysis reports are presented in Appendix D.

Upon Review of Exhibit 16 of the City of Ottawa's MMLOS Guidelines, the signalized intersection of Longfields Drive at Woodroffe Avenue has a TLOS F.

### 19.2.5 Intersection Truck Level of Service (tkLOS)

The Truck level of Service (tkLOS) for the study are intersections was determined in accordance with the City of Ottawa's MMLOS Guidelines. The effective radii, receiving lane parameters and corresponding levels of service at the signalized intersection of Longfields Drive and Woodroffe Avenue is summarized in Table 19.2.5.1. Since the intersection of Bill Leatham Drive and Longfields Drive is not signalized, it was not reviewed in this section.

**Table 19.2.5.1 Signalized Intersection Truck Level of Service**

Intersection / Approach (crossing)	Effective Corner Radius (m)	Number of Receiving Lanes	LOS
<b>Longfields Drive (EB/WB) at Woodroffe Avenue (NB/SB)</b>			
Northbound (E-W)	22	1	F
Southbound (E-W)	19	1	F
Eastbound (N-S)	12	2	B
Westbound (N-S)	14	2	B

Upon review of Exhibit 21 of the City of Ottawa's MMLOS Guidelines, the signalized intersection of Longfields Drive at Woodroffe Avenue has a tkLOS of F.

## 20.0 SUMMARY AND RECOMMENDATIONS

This TIA Strategy Report evaluated the proposed development and its expected impact on the surrounding transportation network. Overall, all the roadways within the project study area are operating at acceptable levels of service except for a few movements. The EB approach at the two-way stop-controlled intersection of Bill Leatham and Leikin Drive/ RCMP access is currently expected to operate at a LOS F. This intersection currently does not warrant signals; however, consideration should be given to monitoring operations and safety in the future. Additionally, the EB left, NB through, and SB through movements at the intersection of Longfield Drive and Woodroffe Avenue are expected to be operating at a LOS F. Consideration should be given to reviewing the signal timings at this intersection to better accommodate the failing movements.

The proposed development is expected to generate a total of 36 person-trips in the AM peak hour and 38 person trips in the PM peak hour. As such, this TIA report is exempt from Modules 3.1, 3.3 and 4.5-4.9 of the City of Ottawa TIA guidelines and a detailed traffic analysis including the development-generated trips was not required. It is expected that the proposed development will have little impact on the surrounding transportation network and is expected to provide adequate facilities to meet the City of Ottawa's Complete Streets design philosophy. The proposed development is expected to exceed the by-law requirements and no spillover parking is expected.

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# TRAFFIC IMPACT ASSESSMENT



## APPENDIX A – TIA SCREENING FORM



## City of Ottawa 2017 TIA Guidelines Screening Form

### 1. Description of Proposed Development

Municipal Address	<b>2 Bill Leathem Drive, Ottawa, ON K2J 0P7</b>
Description of Location	<b>"PART OF LOTS 17 AND 18 CONCESSION 1 RIDEAU FRONT PART 18 PLAN 4R9089 SAVE AND EXCEPT PART 1 PLAN 4R11133 AND THAT PART OF PART 18 PLAN 4R9089 LYING EAST OF PART 1 PLAN 4R11133, NEPEAN."</b>
Land Use Classification	<b>Light Industrial (IL9)</b>
Development Size (units)	<b>1 unit (one-storey office with warehouse)</b>
Development Size (m <sup>2</sup> )	<b>1,858 m<sup>2</sup> (20,000 ft<sup>2</sup>)</b>
Number of Accesses and Locations	<b>Two driveways are proposed east of the subject lands, providing access to Bill Leathem Drive.</b>
Phase of Development	<b>Site Plan Control Application</b>
Buildout Year	<b>2020</b>

If available, please attach a sketch of the development or site plan to this form.

### 2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m <sup>2</sup>
Industrial	5,000 m <sup>2</sup>
Fast-food restaurant or coffee shop	100 m <sup>2</sup>
Destination retail	1,000 m <sup>2</sup>
Gas station or convenience market	75 m <sup>2</sup>

*\* If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

### 3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		NO
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		NO

\*DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

### 4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		NO
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		NO
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	YES	
Is the proposed driveway within auxiliary lanes of an intersection?		NO
Does the proposed driveway make use of an existing median break that serves an existing site?		NO
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		
Does the development include a drive-thru facility?		NO

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

### 5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?		No
Does the development satisfy the Location Trigger?		No

***Transportation Impact Assessment Screening Form***

Does the development satisfy the Safety Trigger?	Yes	
--	-----	--

**If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).**

# TRAFFIC IMPACT ASSESSMENT



## APPENDIX B – SITE PLAN

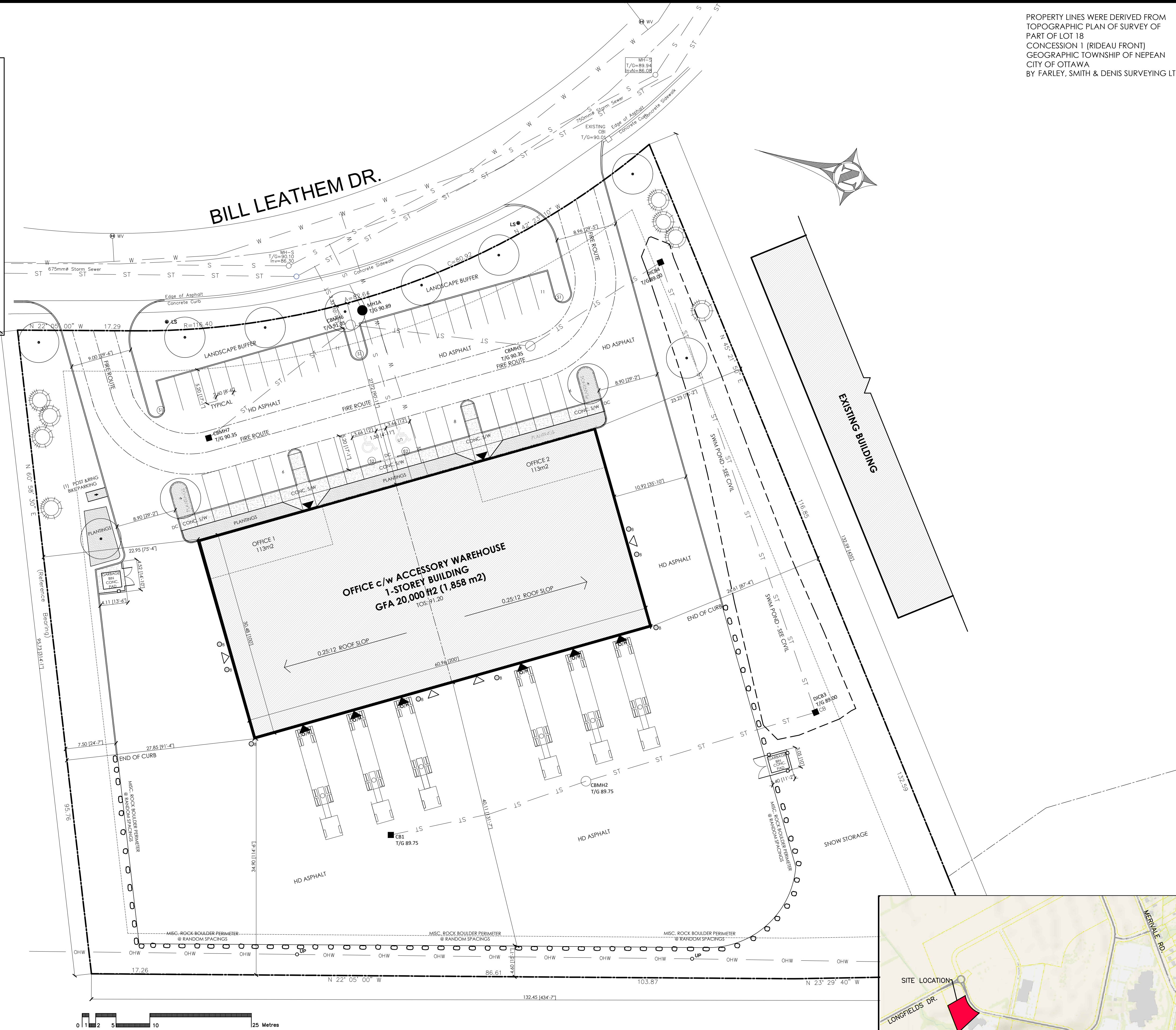
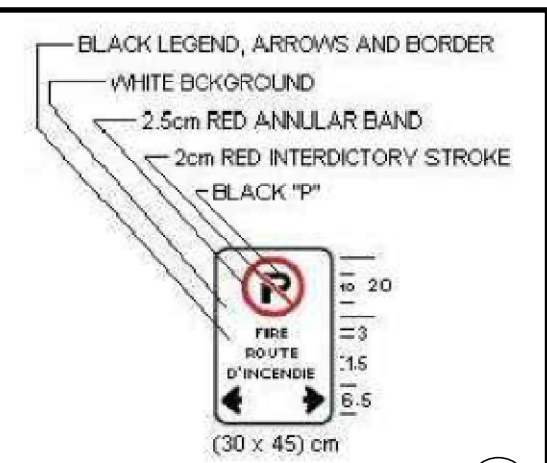


**ZONING PROVISIONS:**  
**ZONE:** L-9 LIGHT INDUSTRIAL  
1 STOREY OFFICE C/W ACCESSORY WAREHOUSE USE  
OFFICE AREA: 226 m<sup>2</sup>  
ACCESSORY WAREHOUSE: 1,632 m<sup>2</sup>  
1,858m<sup>2</sup> GFA

MECHANISM	REQUIRED	PROPOSED
MIN. LOT AREA	3,000m <sup>2</sup>	12,114m
MIN. LOT WIDTH	30.0m	119.3m
MAX. LOT COVERAGE	60%	15%
MIN. FRONT SETBACK	6.0m	27.6m
INT. YARD SETBACK	6.0m	22.9m
MIN. REAR YARD SETBACK	6.0m	34.9m
MAX. BUILDING HEIGHT	22.0m	8.9m
MIN. WIDTH OF LANDSCAPE BUFFER ABUTTING STREET	3.0m	3.3+m
PARKING:		
MIN. REQUIRED SPACES WAREHOUSE	(0.8/100m <sup>2</sup> )=13	
OFFICE	(2.4/100m <sup>2</sup> )=6	42
TOTAL PARKING 2.4mX5.2m	19	
TOTAL BARRIER FREE SPACES 3.7m X 5.2m	2	2
LOADING SPACES 9mX3.5m	1	6 LOADING DOCKS
BICYCLE PARKING	1	1 POST & RING

**NOTES & LEGEND**

TOF	TOP OF FOUNDATION
TOS	TOP OF SLAB
USF	UNDERSIDE OF FOOTING
ME	MAIN ENTRANCE
LOC	LOCATION
OH	OVERHEAD DOOR
EL	EXIT LOCATIONS
BO	BOLLARD
DC	DEPRESSED CURB
PL	PROPERTY LINE
LS	LINE OF SETBACKS
FD	FIRE HYDRANT
CBMH	CATCH BASIN MAN HOLE
CB	CATCH BASIN
LCB	LANDSCAPE CATCH BASIN
FRS	FIRE ROUTE SIGN - SEE SIGN DETAIL BELOW
BFS	BARRIER FREE PARKING SIGN
ELF	EXTERIOR LED WALL PACK FIXTURE ON PHOTO CELL SENSOR (D-SERIES) SEE 2 LUMINAIRE (SEE OPTIC SHEET)



PROPERTY LINES WERE DERIVED FROM  
TOPOGRAPHIC PLAN OF SURVEY OF  
PART OF LOT 18  
CONCESSION 1 (RIDEAU FRONT)  
GEOGRAPHIC TOWNSHIP OF NEPEAN  
CITY OF OTTAWA  
BY FARLEY, SMITH & DENIS SURVEYING LTD. 2020

REVISION		
NO.	DATE	REVISION
1		
2		
3		
4		
5		

CIVIL ENGINEERING:  
**MINTOSH PERRY** 115 Walgreen Rd.  
Corp, ON K0A 1L0  
www.GJALA.com  
110 Didsbury Road Unit # 9 | Ottawa Ontario | K2T 0C2  
Gino@GJALA.com (613) 852 1343

LANDSCAPE ARCHITECT:  
**Gino J. Aiello landscape architect**

SURVEYOR:  
**FARLEY, SMITH & DENIS SURVEYING LTD.**  
ONTARIO LAND SURVEYORS  
CANADA LAND SURVEYORS  
190 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J5  
TEL: (613) 727-8216 FAX: (613) 727-1826

GEOTECHNICAL ENGINEER:  
Patterson Group Inc.  
Consulting Engineers  
28 Concourse Gate - Unit 1  
Ottawa (Nepean), Ontario  
Canada K2E 7I7

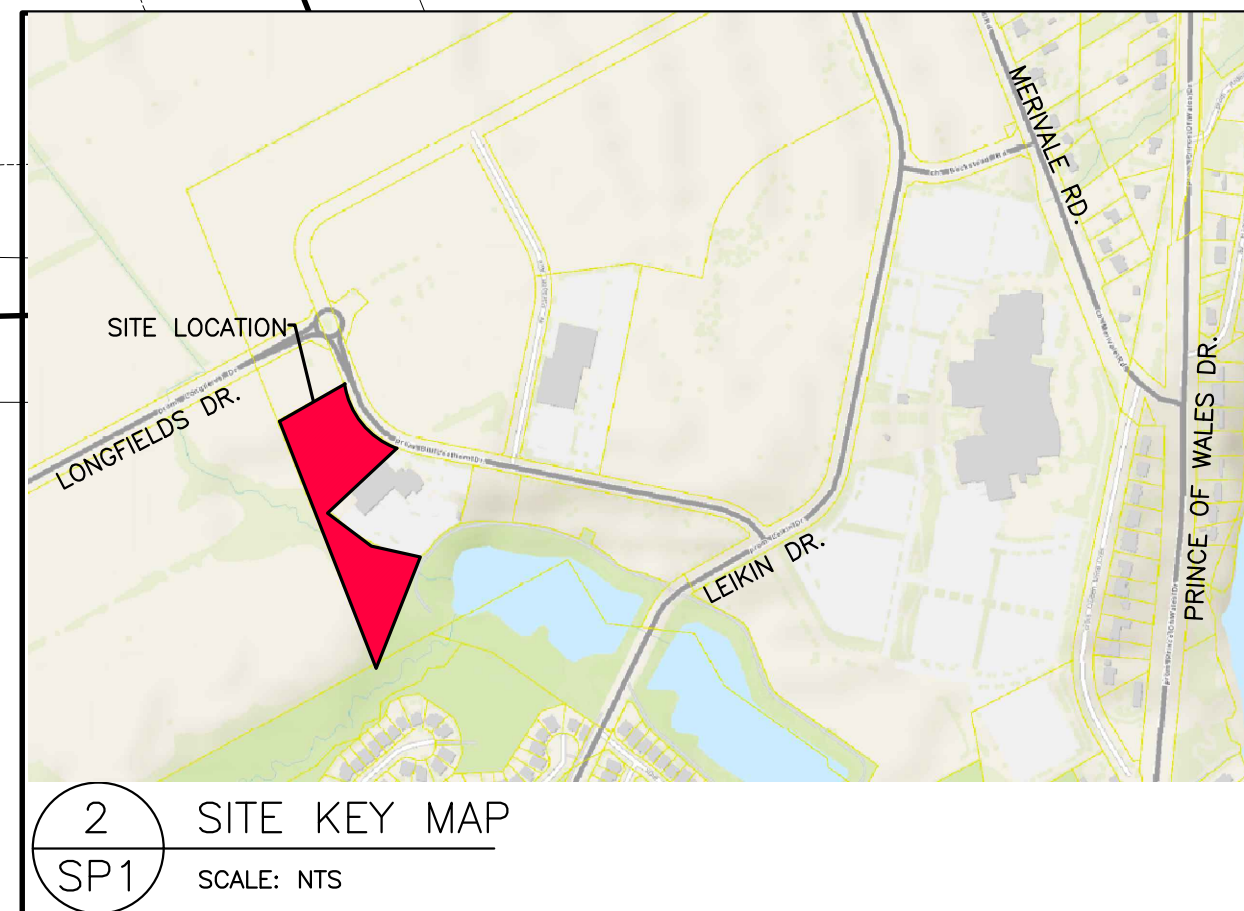
DESIGN BUILDER:  
**BBS**  
BUILDING A REPUTATION ON EXCELLENCE  
BBS CONSTRUCTION (ONTARIO) LTD.  
1805 WOODWARD DRIVE,  
OTTAWA, ON K2C 0P9  
TEL: 613-226-8830 FAX: 613-226-7709  
www.bbsconstruction.ca

OWNER:  
1850591 Ontario Ltd

PROJECT:  
WAREHOUSE PROJECT  
2 BILL LEATHEM DR.  
OTTAWA ON

DRAWING TITLE:  
SITE PLAN

PROJECT N°:	492-19	DRAWING NO.
SCALE:	AS NOTED	<b>SP1</b>
DRAWN BY:	MK	
DATE:	6/4/2020	



1 SITE PLAN  
SP1 SCALE: 1:300

2 SITE KEY MAP  
SP1 SCALE: NTS

FILE # D07-XXXXXX



# TRAFFIC IMPACT ASSESSMENT



## APPENDIX C – TRAFFIC DATA

# South Nepean

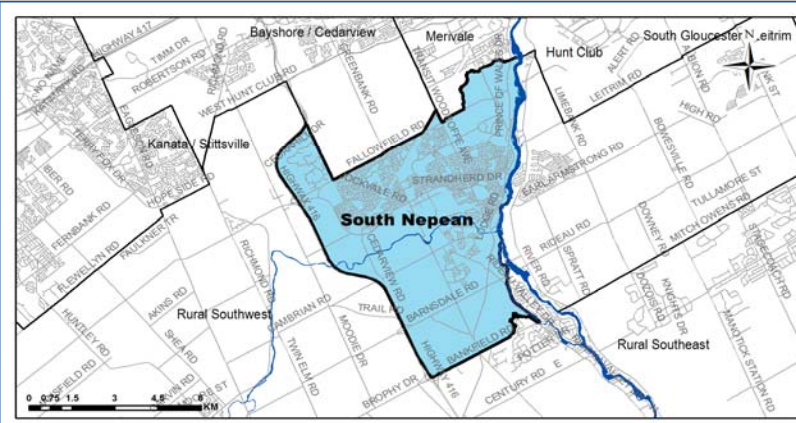
## Demographic Characteristics

Population	72,750	Actively Travelled	57,830
Employed Population	35,540	Number of Vehicles	44,130
Households	26,260	Area (km <sup>2</sup> )	54.8

Occupation Status (age 5+)	Male	Female	Total
Full Time Employed	17,630	14,730	32,350
Part Time Employed	620	2,570	3,190
Student	9,910	9,420	19,340
Retiree	3,420	4,200	7,620
Unemployed	720	500	1,220
Homemaker	180	2,390	2,570
Other	270	540	810
Total:	32,750	34,350	67,100

Traveller Characteristics	Male	Female	Total
Transit Pass Holders	5,590	6,100	11,700
Licensed Drivers	24,480	25,260	49,740
Telecommuters	60	310	370
Trips made by residents	88,180	97,380	185,550

Selected Indicators	
Daily Trips per Person (age 5+)	2.77
Vehicles per Person	0.61
Number of Persons per Household	2.77
Daily Trips per Household	7.07
Vehicles per Household	1.68
Workers per Household	1.35
Population Density (Pop/km <sup>2</sup> )	1330

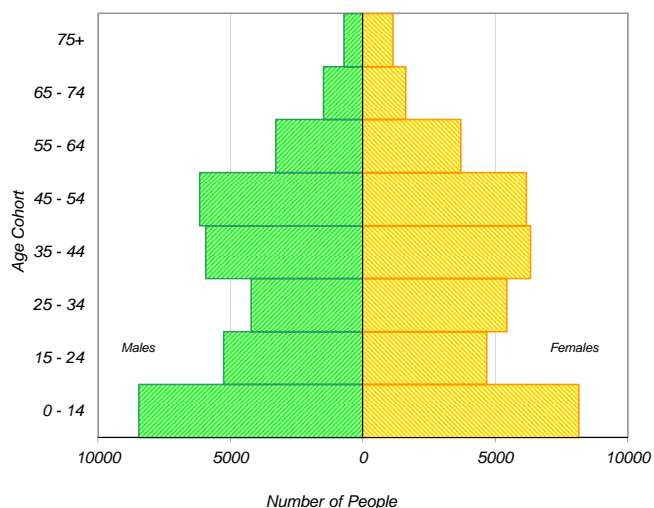


Household Size		
1 person	3,560	14%
2 persons	7,300	28%
3 persons	5,500	21%
4 persons	6,320	24%
5+ persons	3,590	14%
Total:	26,260	100%

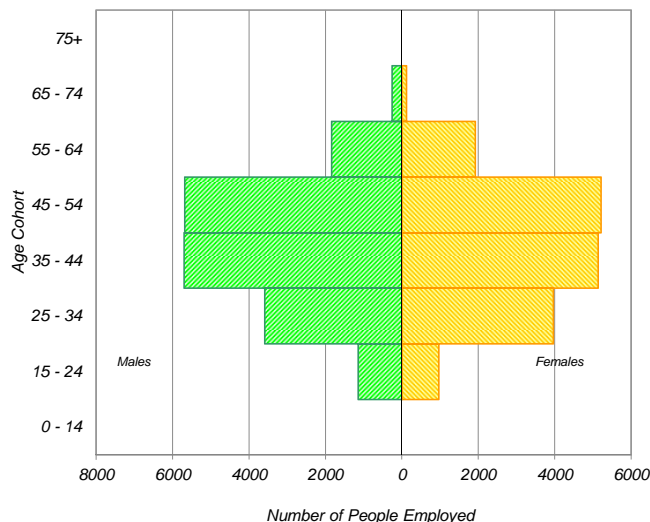
Households by Vehicle Availability		
0 vehicles	810	3%
1 vehicle	9,500	36%
2 vehicles	13,800	53%
3 vehicles	1,730	7%
4+ vehicles	410	2%
Total:	26,260	100%

Households by Dwelling Type		
Single-detached	14,530	55%
Semi-detached	3,090	12%
Townhouse	7,770	30%
Apartment/Condo	870	3%
Total:	26,260	100%

Population



Employed Population

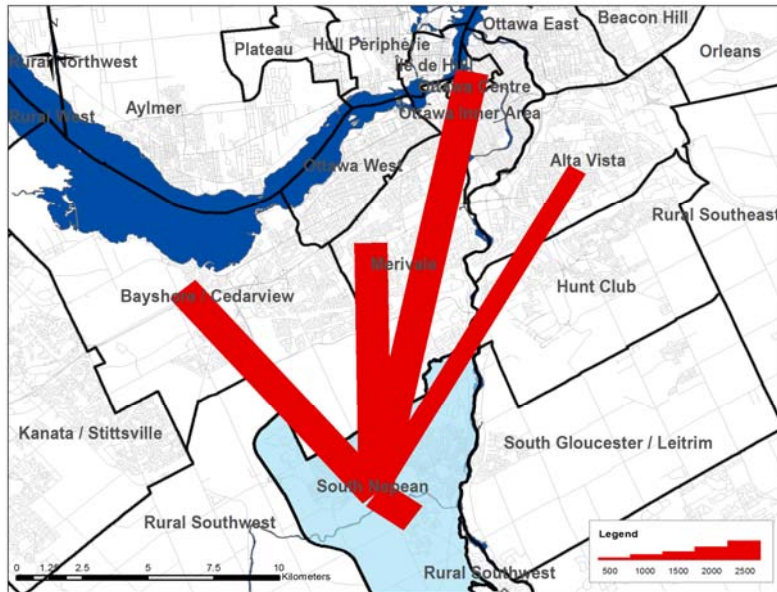


\* In 2005 data was only collected for household members aged 11+ therefore these results cannot be compared to the 2011 data.

## Travel Patterns

### Top Five Destinations of Trips from South Nepean

#### AM Peak Period



### Summary of Trips to and from South Nepean

#### AM Peak Period (6:30 - 8:59)

Districts	Destinations of Trips From		Origins of Trips To	
	District	% Total	District	% Total
Ottawa Centre	3,820	9%	30	0%
Ottawa Inner Area	2,270	5%	340	1%
Ottawa East	630	2%	50	0%
Beacon Hill	370	1%	50	0%
Alta Vista	2,360	6%	460	2%
Hunt Club	920	2%	440	2%
Merivale	4,310	10%	790	3%
Ottawa West	1,830	4%	160	1%
Bayshore / Cedarview	3,230	8%	700	3%
Orléans	330	1%	200	1%
Rural East	20	0%	60	0%
Rural Southeast	250	1%	580	2%
South Gloucester / Leitrim	100	0%	310	1%
South Nepean	17,260	42%	17,260	74%
Rural Southwest	580	1%	970	4%
Kanata / Stittsville	1,800	4%	690	3%
Rural West	80	0%	30	0%
Île de Hull	840	2%	50	0%
Hull Périphérie	260	1%	40	0%
Plateau	0	0%	40	0%
Aylmer	60	0%	40	0%
Rural Northwest	40	0%	40	0%
Pointe Gatineau	0	0%	0	0%
Gatineau Est	0	0%	20	0%
Rural Northeast	10	0%	20	0%
Buckingham / Masson-Angers	20	0%	0	0%
Ontario Sub-Total:	40,160	97%	23,120	99%
Québec Sub-Total:	1,230	3%	250	1%
Total:	41,390	100%	23,370	100%

### Trips by Trip Purpose

24 Hours	From District		To District		Within District	
Work or related	25,640	41%	5,290	8%	4,680	6%
School	5,310	8%	1,430	2%	10,610	13%
Shopping	4,940	8%	4,220	7%	12,840	16%
Leisure	6,960	11%	4,020	6%	5,760	7%
Medical	1,720	3%	900	1%	840	1%
Pick-up / drive passenger	4,040	6%	3,920	6%	7,530	9%
Return Home	11,460	18%	40,960	65%	34,630	43%
Other	2,640	4%	2,090	3%	3,020	4%
Total:	62,710	100%	62,830	100%	79,910	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Work or related	18,160	75%	2,890	47%	2,120	12%
School	3,280	14%	1,170	19%	9,180	53%
Shopping	180	1%	70	1%	720	4%
Leisure	350	1%	230	4%	220	1%
Medical	400	2%	60	1%	100	1%
Pick-up / drive passenger	1,060	4%	770	13%	2,860	17%
Return Home	210	1%	640	10%	1,070	6%
Other	520	2%	290	5%	990	6%
Total:	24,160	100%	6,120	100%	17,260	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Work or related	410	5%	290	1%	410	2%
School	250	3%	0	0%	50	0%
Shopping	900	11%	1,090	5%	2,090	11%
Leisure	1,420	17%	790	3%	1,840	10%
Medical	190	2%	230	1%	90	0%
Pick-up / drive passenger	820	10%	1,700	7%	1,610	9%
Return Home	3,800	47%	18,990	81%	11,810	64%
Other	360	4%	490	2%	540	3%
Total:	8,150	100%	23,580	100%	18,440	100%

Peak Period (%)	Total:	% of 24 Hours	Within District (%)
24 Hours	205,450		39%
AM Peak Period	47,540	23%	36%
PM Peak Period	50,170	24%	37%

### Trips by Primary Travel Mode

24 Hours	From District		To District		Within District	
Auto Driver	41,340	66%	41,280	66%	39,110	49%
Auto Passenger	9,400	15%	10,030	16%	15,320	19%
Transit	9,990	16%	9,520	15%	2,260	3%
Bicycle	310	0%	320	1%	960	1%
Walk	80	0%	170	0%	13,060	16%
Other	1,600	3%	1,520	2%	9,210	12%
Total:	62,720	100%	62,840	100%	79,920	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Auto Driver	14,570	60%	4,360	71%	5,800	34%
Auto Passenger	1,930	8%	780	13%	3,210	19%
Transit	6,610	27%	330	5%	730	4%
Bicycle	80	0%	50	1%	320	2%
Walk	20	0%	10	0%	3,000	17%
Other	930	4%	590	10%	4,200	24%
Total:	24,140	100%	6,120	100%	17,260	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Auto Driver	5,840	72%	14,640	62%	8,420	46%
Auto Passenger	1,730	21%	2,680	11%	3,930	21%
Transit	350	4%	5,770	24%	650	4%
Bicycle	80	1%	110	0%	150	1%
Walk	30	0%	0	0%	3,680	20%
Other	100	1%	380	2%	1,590	9%
Total:	8,130	100%	23,580	100%	18,420	100%

Avg Vehicle Occupancy	From District		To District		Within District	
24 Hours	1.23		1.24		1.39	
AM Peak Period	1.13		1.18		1.55	
PM Peak Period	1.30		1.18		1.47	

Transit Modal Split	From District		To District		Within District	
24 Hours	16%		16%		4%	
AM Peak Period	29%		6%		7%	
PM Peak Period	4%		25%		5%	



# Traffic Signal Timing

City of Ottawa, Public Works & Services Department

## Traffic Operations Unit

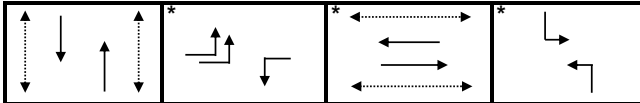
<b>Intersection:</b>	<i>Main:</i> Woodroffe	<i>Side:</i> Longfields
<b>Controller:</b>	ATC3	<b>TSD:</b> 6543
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 13-Feb-20

## Existing Timing Plans†

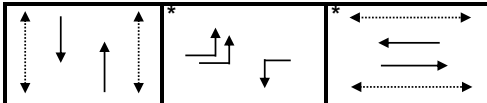
	Plan						Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Weekend 5	AM Heavy 11	Walk	DW	A+R
<b>Cycle</b>	110	105	115	80	90	130			
<b>Offset</b>	80	88	92	X	72	86			
NB Thru	50	46	55	30	42	65	7	16	4.6+1.9
SB Thru	50	46	55	30	42	65	7	16	4.6+1.9
EB Left (fp)	15	14	15	17	15	20	-	-	3.7+2.8
WB Left (fp)	15	14	15	17	15	20	-	-	3.7+2.8
EB Thru	33	33	33	33	33	33	7	19	3.7+2.8
WB Thru	33	33	33	33	33	33	7	19	3.7+2.8
SB Left	12	12	12	-	-	12	-	-	4.6+1.9
NB Left	12	12	12	-	-	12	-	-	4.6+1.9

## Phasing Sequence‡

Plans: 1,2,3,11



Plans: 4,5



## Schedule

Weekday		Weekend	
Time	Plan	Time	Plan
0:15	4	0:15	4
6:00	1	8:30	5
7:00	11	22:30	4
9:00	1		
9:30	2		
15:00	3		
18:30	2		
22:30	4		

## Notes

†: Time for each direction includes amber and all red intervals  
‡: Start of first phase should be used as reference point for offset  
Asterisk (\*) Indicates actuated phase  
(fp): Fully Protected Left Turn

◄.....► Pedestrian signal

Cost is \$58.78 (\$52.02 + HST)

**Survey Date:** Wednesday, June 10, 2015

**Start Time:** 07:00

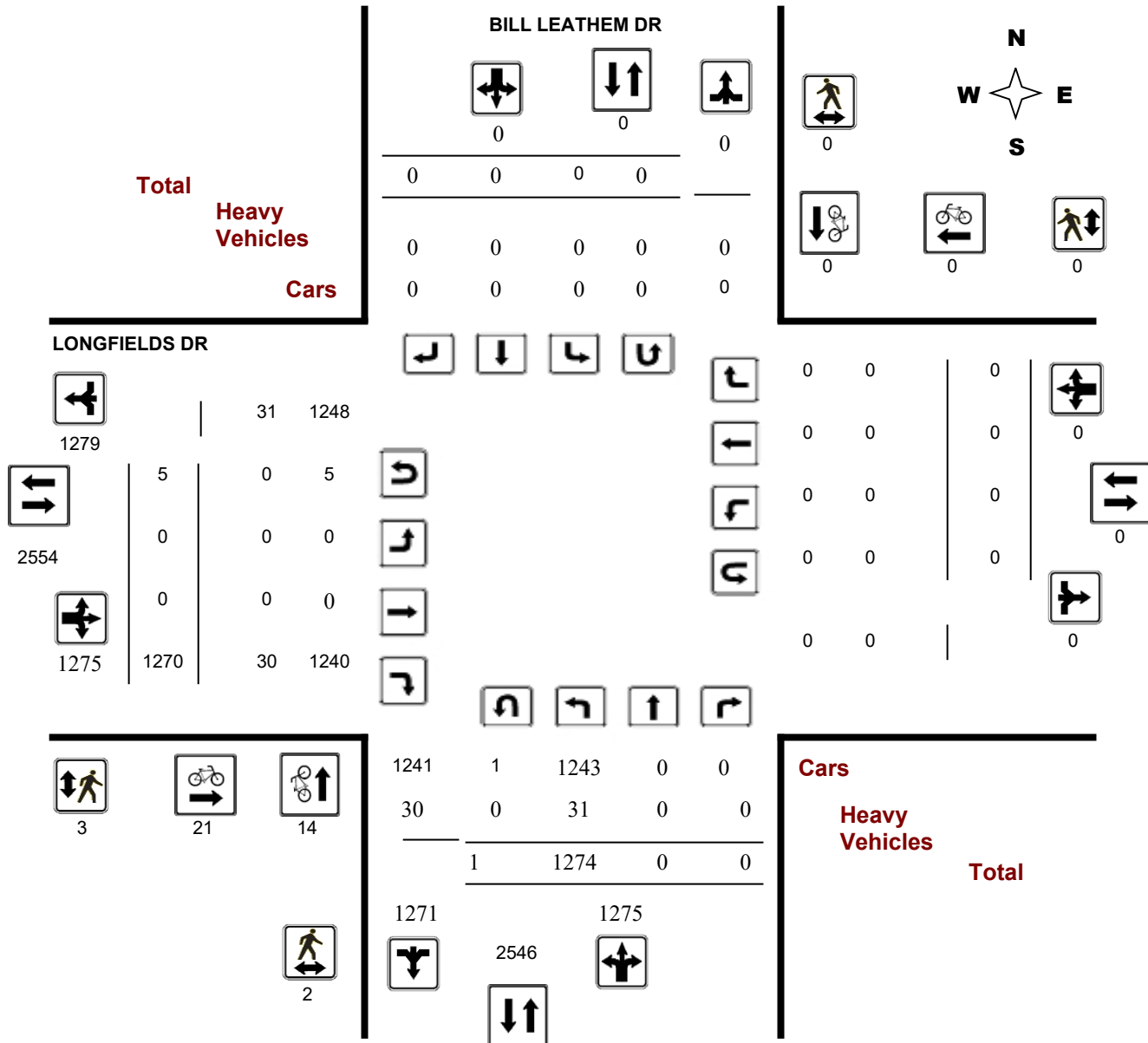
**WO No:**

35082

**Device:**

Miovision

### Full Study Diagram



## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:**

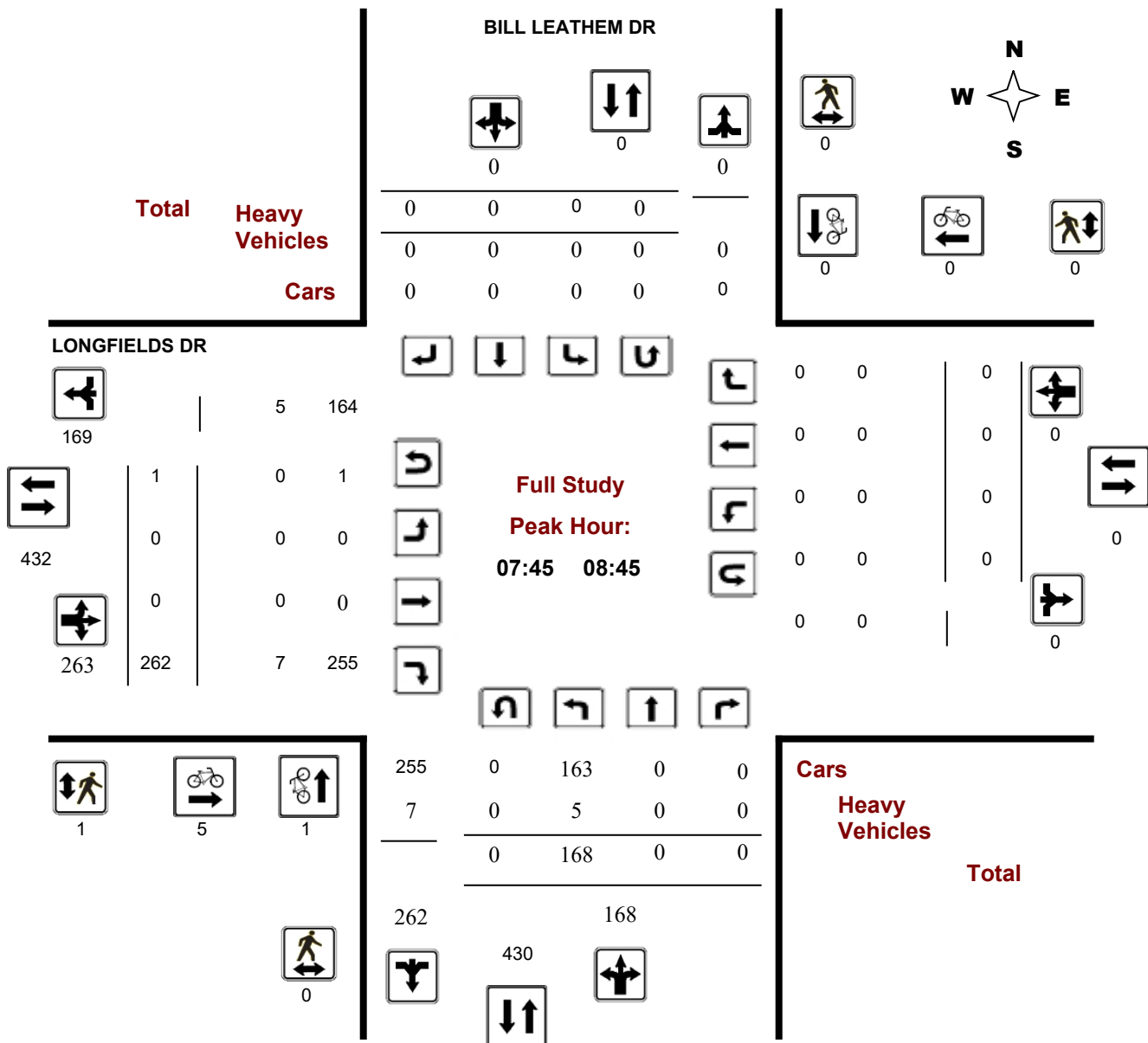
35082

**Start Time:** 07:00

**Device:**

Miovision

### Full Study Peak Hour Diagram



## Turning Movement Count - Peak Hour Diagram

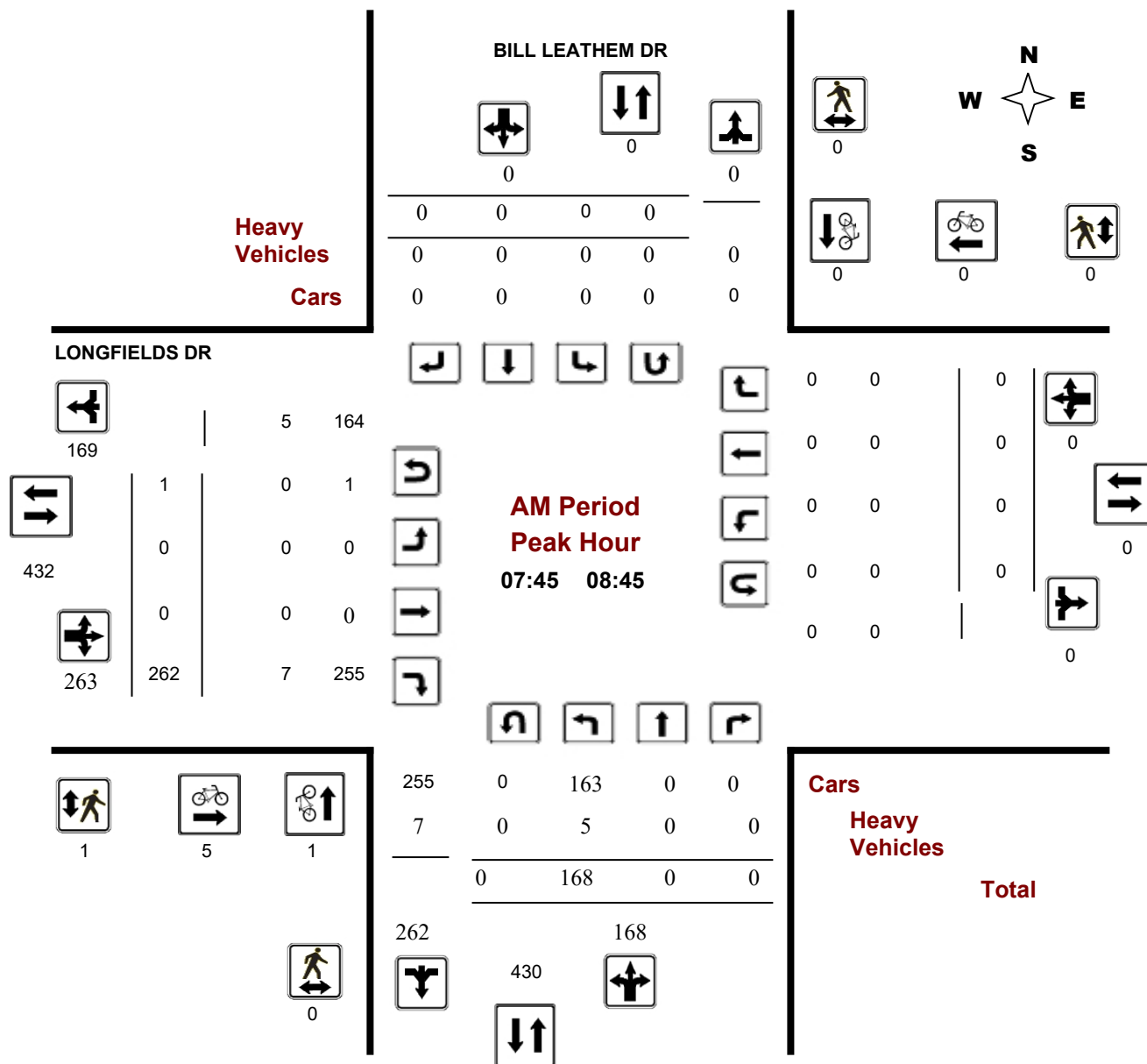
**BILL LEATHEN DR @ LONGFIELDS DR**

**Survey Date:** Wednesday, June 10, 2015

**Start Time:** 07:00

**WO No:** 35082

**Device:** Miovision



## Comments



## Turning Movement Count - Peak Hour Diagram

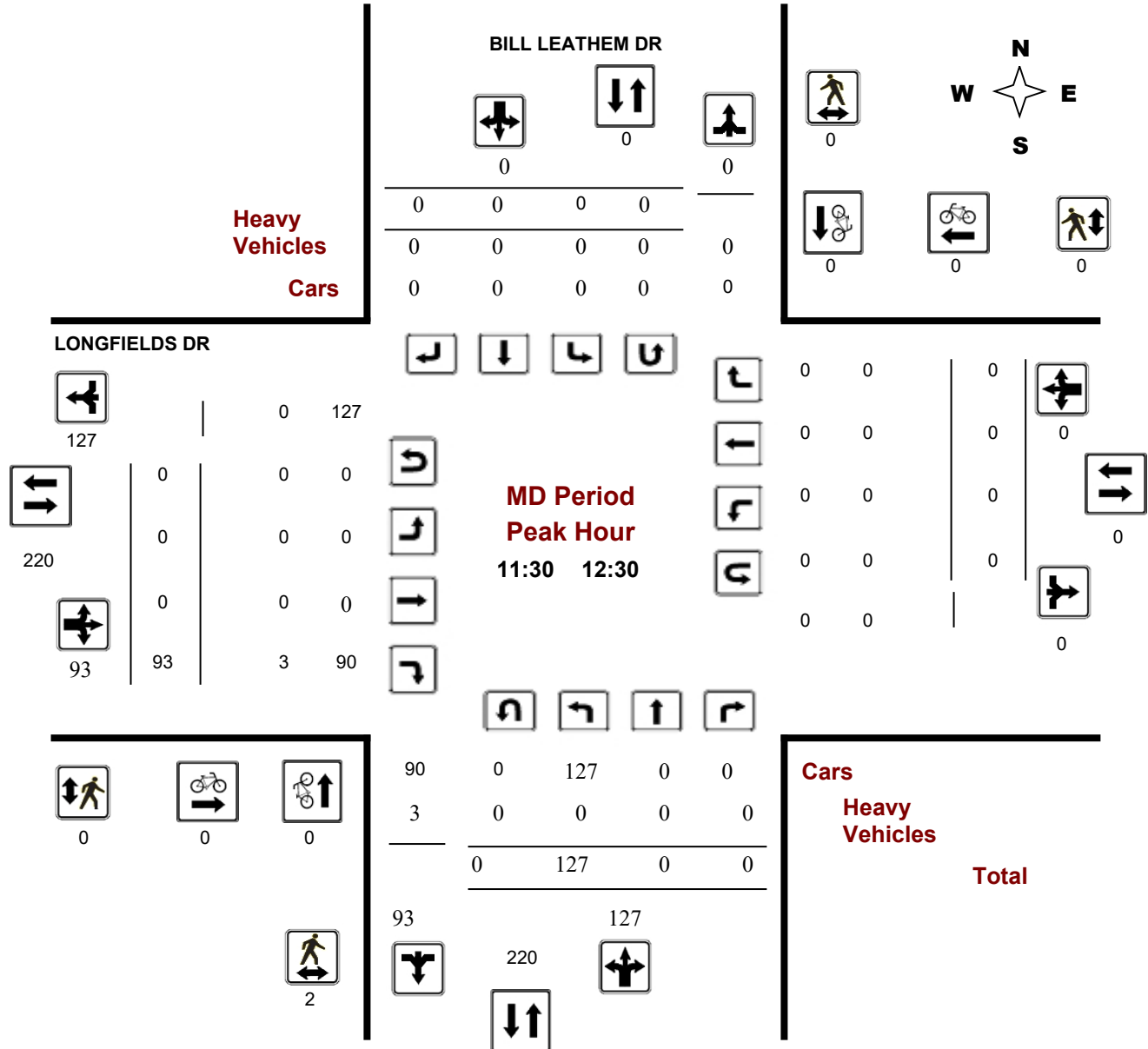
### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**Start Time:** 07:00

**WO No:** 35082

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

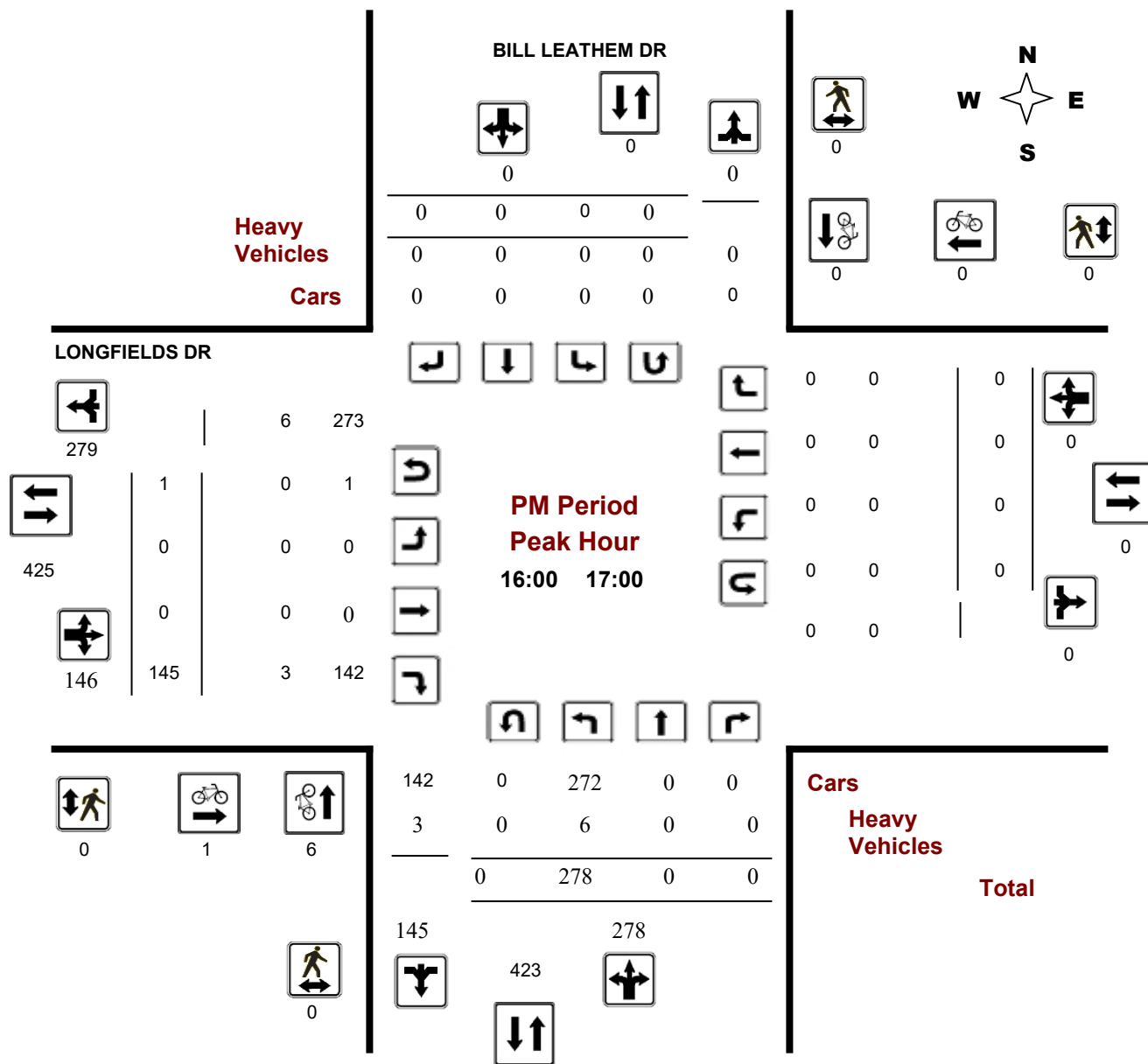
### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**Start Time:** 07:00

**WO No:** 35082

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

**Survey Date:** Wednesday, June 10, 2015

#### Total Observed U-Turns

#### AADT Factor

Northbound: 1 Southbound: 0

.90

Eastbound: 5 Westbound: 0

#### BILL LEATHEM DR

#### LONGFIELDS DR

Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT		LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT		LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	123	0	0	123		0	0	0	0	123	0	0	231	231		0	0	0	0	231	354
08:00 09:00	159	0	0	159		0	0	0	0	159	0	0	255	255		0	0	0	0	255	414
09:00 10:00	89	0	0	89		0	0	0	0	89	0	0	141	141		0	0	0	0	141	230
11:30 12:30	127	0	0	127		0	0	0	0	127	0	0	93	93		0	0	0	0	93	220
12:30 13:30	66	0	0	66		0	0	0	0	66	0	0	117	117		0	0	0	0	117	183
15:00 16:00	210	0	0	210		0	0	0	0	210	0	0	128	128		0	0	0	0	128	338
16:00 17:00	278	0	0	278		0	0	0	0	278	0	0	145	145		0	0	0	0	145	423
17:00 18:00	222	0	0	222		0	0	0	0	222	0	0	160	160		0	0	0	0	160	382
<b>Sub Total</b>	1274	0	0	1274		0	0	0	0	1274	0	0	1270	1270		0	0	0	0	1270	2544
<b>U Turns</b>				1					0	1				5					0	5	6
<b>Total</b>	1274	0	0	1275		0	0	0	0	1275	0	0	1270	1275		0	0	0	0	1275	2550
<b>EQ 12Hr</b>	1771	0	0	1772		0	0	0	0	1772	0	0	1765	1772		0	0	0	0	1772	3544
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.															<b>1.39</b>						
<b>AVG 12Hr</b>	1502	0	0	1503		0	0	0	0	1595	0	0	1497	1503		0	0	0	0	1595	3190
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.															<b>0.9</b>						
<b>AVG 24Hr</b>	1968	0	0	1969		0	0	0	0	1969	0	0	1962	1969		0	0	0	0	1969	3938

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.

**1.31**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

## Full Study 15 Minute Increments

### BILL LEATHEM DR

### LONGFIELDS DR

#### Northbound

#### Southbound

#### Eastbound

#### Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	24	0	0	24	0	0	0	0	0	0	0	45	45	0	0	0	0	69
07:15	07:30	28	0	0	28	0	0	0	0	0	0	0	58	58	0	0	0	0	86
07:30	07:45	32	0	0	32	0	0	0	0	1	0	0	57	57	0	0	0	1	89
07:45	08:00	39	0	0	39	0	0	0	0	0	0	0	71	72	0	0	0	0	111
08:00	08:15	44	0	0	44	0	0	0	4	0	0	0	57	57	0	0	0	4	101
08:15	08:30	45	0	0	45	0	0	0	1	0	0	0	66	66	0	0	0	1	111
08:30	08:45	40	0	0	40	0	0	0	0	0	0	0	68	68	0	0	0	0	108
08:45	09:00	30	0	0	30	0	0	0	2	0	0	0	64	64	0	0	0	2	94
09:00	09:15	31	0	0	31	0	0	0	1	0	0	0	55	55	0	0	0	1	86
09:15	09:30	16	0	0	16	0	0	0	1	0	0	0	40	41	0	0	0	1	57
09:30	09:45	31	0	0	31	0	0	0	2	0	0	0	29	29	0	0	0	2	60
09:45	10:00	11	0	0	11	0	0	0	1	0	0	0	17	17	0	0	0	1	28
11:30	11:45	38	0	0	38	0	0	0	0	0	0	0	20	20	0	0	0	0	58
11:45	12:00	33	0	0	33	0	0	0	0	0	0	0	23	23	0	0	0	0	56
12:00	12:15	35	0	0	35	0	0	0	0	0	0	0	26	26	0	0	0	0	61
12:15	12:30	21	0	0	21	0	0	0	0	0	0	0	24	24	0	0	0	0	45
12:30	12:45	17	0	0	17	0	0	0	0	0	0	0	39	39	0	0	0	0	56
12:45	13:00	17	0	0	17	0	0	0	1	0	0	0	35	35	0	0	0	1	52
13:00	13:15	14	0	0	14	0	0	0	0	0	0	0	23	24	0	0	0	0	38
13:15	13:30	18	0	0	18	0	0	0	0	0	0	0	20	20	0	0	0	0	38
15:00	15:15	50	0	0	50	0	0	0	2	0	0	0	27	27	0	0	0	2	77
15:15	15:30	41	0	0	41	0	0	0	2	0	0	0	30	31	0	0	0	2	72
15:30	15:45	55	0	0	55	0	0	0	3	0	0	0	42	42	0	0	0	3	97
15:45	16:00	64	0	0	64	0	0	0	1	0	0	0	29	29	0	0	0	1	93
16:00	16:15	87	0	0	87	0	0	0	2	0	0	0	35	35	0	0	0	2	122
16:15	16:30	59	0	0	59	0	0	0	0	0	0	0	38	39	0	0	0	0	98
16:30	16:45	64	0	0	64	0	0	0	3	0	0	0	31	31	0	0	0	3	95
16:45	17:00	68	0	0	68	0	0	0	1	0	0	0	41	41	0	0	0	1	109
17:00	17:15	70	0	0	70	0	0	0	0	0	0	0	37	37	0	0	0	0	107
17:15	17:30	57	0	0	58	0	0	0	1	0	0	0	44	44	0	0	0	1	102
17:30	17:45	52	0	0	52	0	0	0	0	0	0	0	35	35	0	0	0	0	87
17:45	18:00	43	0	0	43	0	0	0	2	0	0	0	44	44	0	0	0	2	87
Total:		1274	0	0	1275	0	0	0	31	0	0	0	1270	1275	0	0	0	31	2,550

Note: U-Turns are included in Totals.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

## Full Study Cyclist Volume

### BILL LEATHEM DR

### LONGFIELDS DR

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	3	0	3	3
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	2	0	2	2
07:45 08:00	1	0	1	0	0	0	1
08:00 08:15	0	0	0	2	0	2	2
08:15 08:30	0	0	0	1	0	1	1
08:30 08:45	0	0	0	2	0	2	2
08:45 09:00	1	0	1	3	0	3	4
09:00 09:15	0	0	0	2	0	2	2
09:15 09:30	0	0	0	1	0	1	1
09:30 09:45	2	0	2	2	0	2	4
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	0	0	0	1	0	1	1
15:30 15:45	1	0	1	0	0	0	1
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	1	0	1	0	0	0	1
16:15 16:30	2	0	2	0	0	0	2
16:30 16:45	1	0	1	0	0	0	1
16:45 17:00	2	0	2	1	0	1	3
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	1	0	1	1	0	1	2
17:30 17:45	1	0	1	0	0	0	1
17:45 18:00	1	0	1	0	0	0	1
Total	14	0	14	21	0	21	35





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

### Full Study Pedestrian Volume

#### BILL LEATHEM DR

#### LONGFIELDS DR

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	1	0	1	1
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	1	0	1	0	0	0	1
12:15 12:30	1	0	1	0	0	0	1
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	1	0	1	1
13:00 13:15	0	0	0	1	0	1	1
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
<b>Total .....</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>5</b>



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

### Full Study Heavy Vehicles

#### BILL LEATHEM DR

#### LONGFIELDS DR

Northbound

Southbound

Eastbound

Westbound

Time Period		Northbound			N TOT	Southbound			S TOT	STR TOT	Eastbound			E TOT	Westbound			W TOT	STR TOT	Grand Total
		LT	ST	RT		LT	ST	RT			LT	ST	RT		LT	ST	RT			
07:00	07:15	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
07:15	07:30	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	4	4
07:30	07:45	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
07:45	08:00	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
08:00	08:15	4	0	0	4	0	0	0	0	4	0	0	2	2	0	0	0	0	2	6
08:15	08:30	1	0	0	1	0	0	0	0	1	0	0	2	2	0	0	0	0	2	3
08:30	08:45	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	2	2
08:45	09:00	2	0	0	2	0	0	0	0	2	0	0	2	2	0	0	0	0	2	4
09:00	09:15	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
09:15	09:30	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
09:30	09:45	2	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
09:45	10:00	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
11:30	11:45	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
11:45	12:00	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
12:00	12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
12:30	12:45	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
12:45	13:00	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
13:00	13:15	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
13:15	13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	15:15	2	0	0	2	0	0	0	0	2	0	0	4	4	0	0	0	0	4	6
15:15	15:30	2	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
15:30	15:45	3	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
15:45	16:00	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
16:00	16:15	2	0	0	2	0	0	0	0	2	0	0	1	1	0	0	0	0	1	3
16:15	16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	16:45	3	0	0	3	0	0	0	0	3	0	0	1	1	0	0	0	0	1	4
16:45	17:00	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
17:00	17:15	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
17:15	17:30	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	18:00	2	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Total:	None	31	0	0	31	0	0	0	0	31	0	0	30	30	0	0	0	0	30	61



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute U-Turn Total

#### BILL LEATHEM DR

#### LONGFIELDS DR

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	1	0	1
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	1	0	1
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	1	0	1
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	1	0	1
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	1	0	1
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	1	0	0	0	1
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		1	0	5	0	6

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LEIKIN DR S

**Survey Date:** Wednesday, June 12, 2019

**Start Time:** 07:00

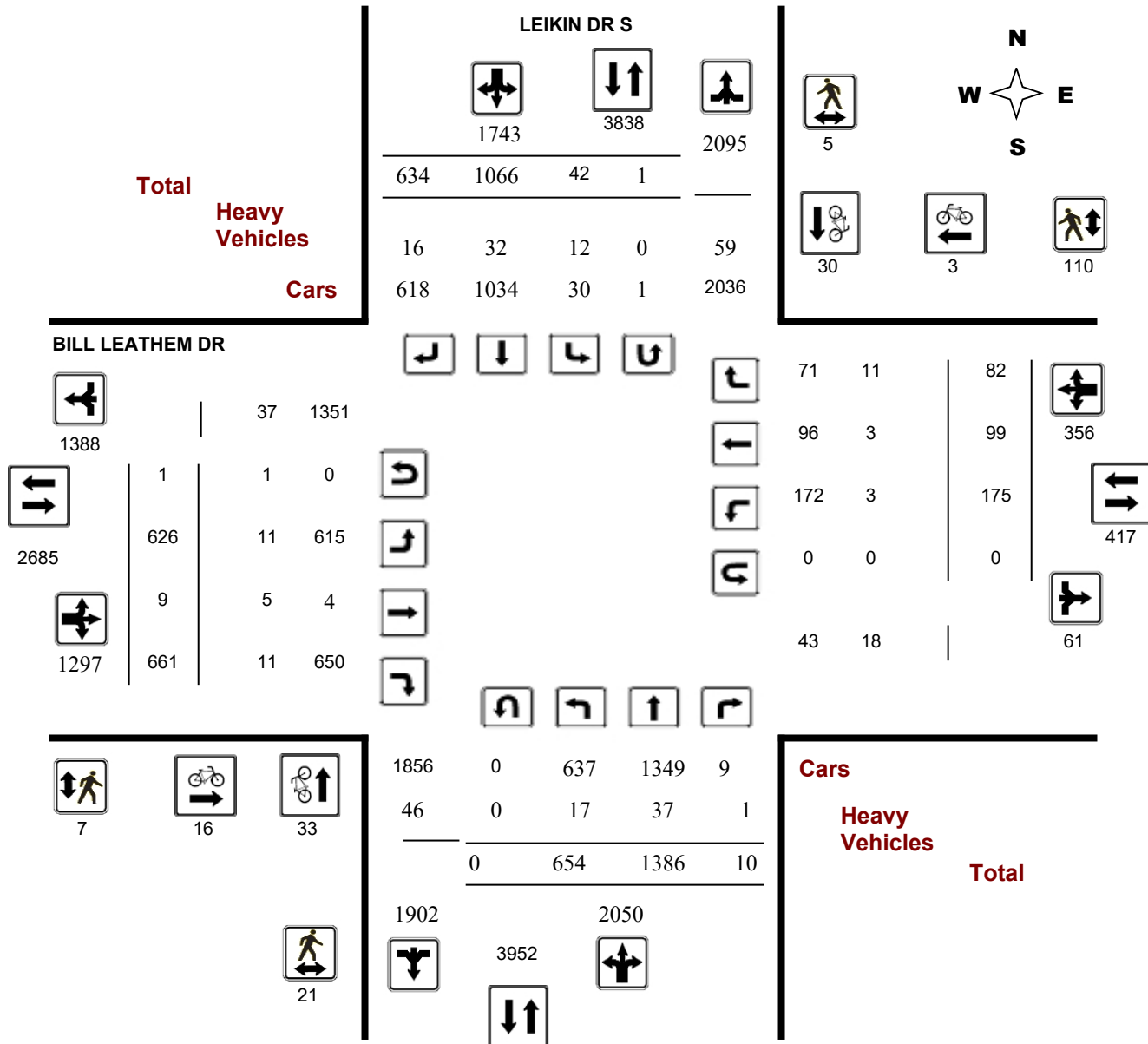
**WO No:**

38659

**Device:**

Miovision

### Full Study Diagram



## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LEIKIN DR S

**Survey Date:** Wednesday, June 12, 2019

**WO No:**

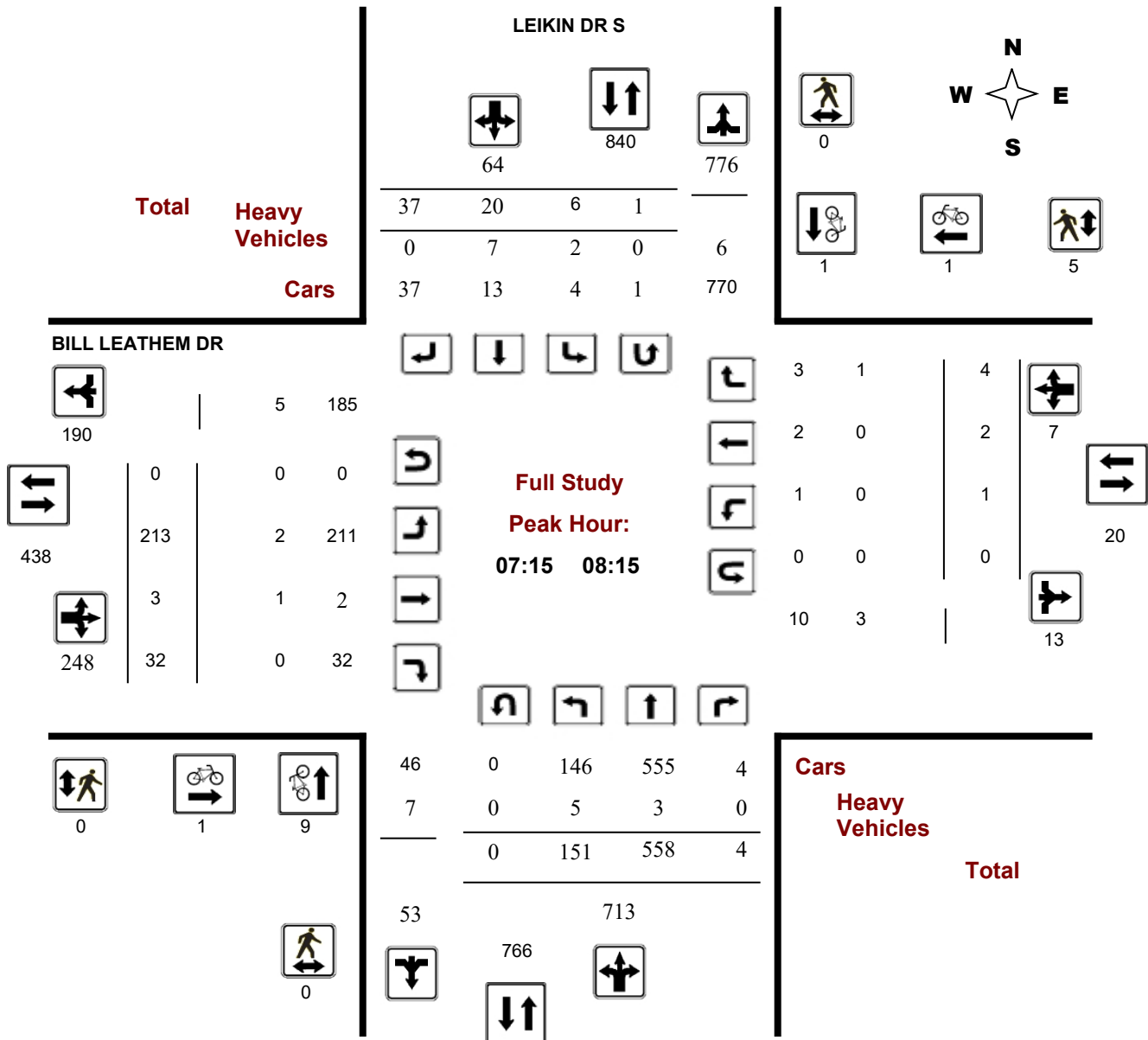
38659

**Start Time:** 07:00

**Device:**

Miovision

### Full Study Peak Hour Diagram





## Turning Movement Count - Peak Hour Diagram

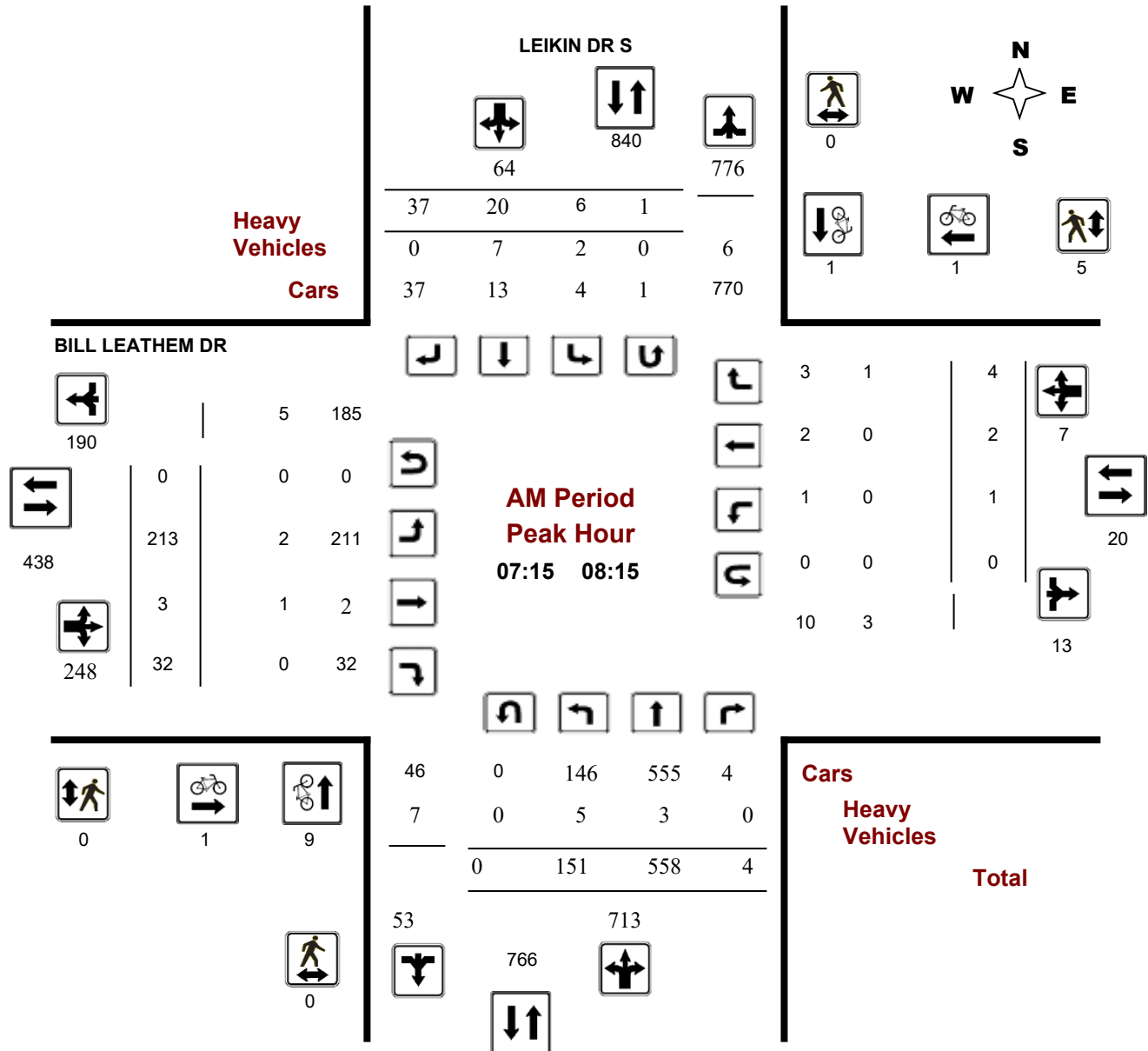
### BILL LEATHEM DR @ LEIKIN DR S

**Survey Date:** Wednesday, June 12, 2019

**Start Time:** 07:00

**WO No:** 38659

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

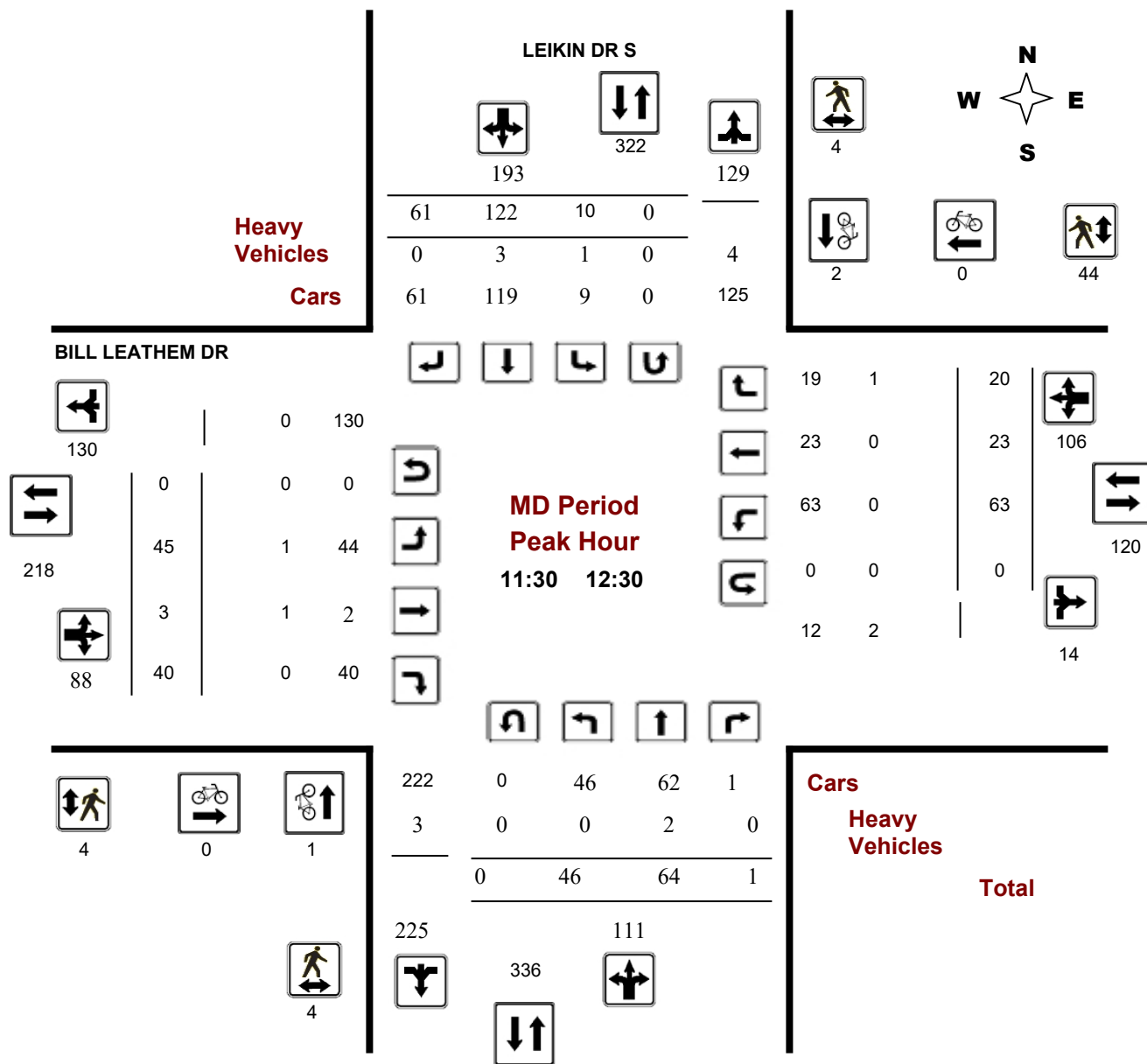
### BILL LEATHEM DR @ LEIKIN DR S

**Survey Date:** Wednesday, June 12, 2019

**Start Time:** 07:00

**WO No:** 38659

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

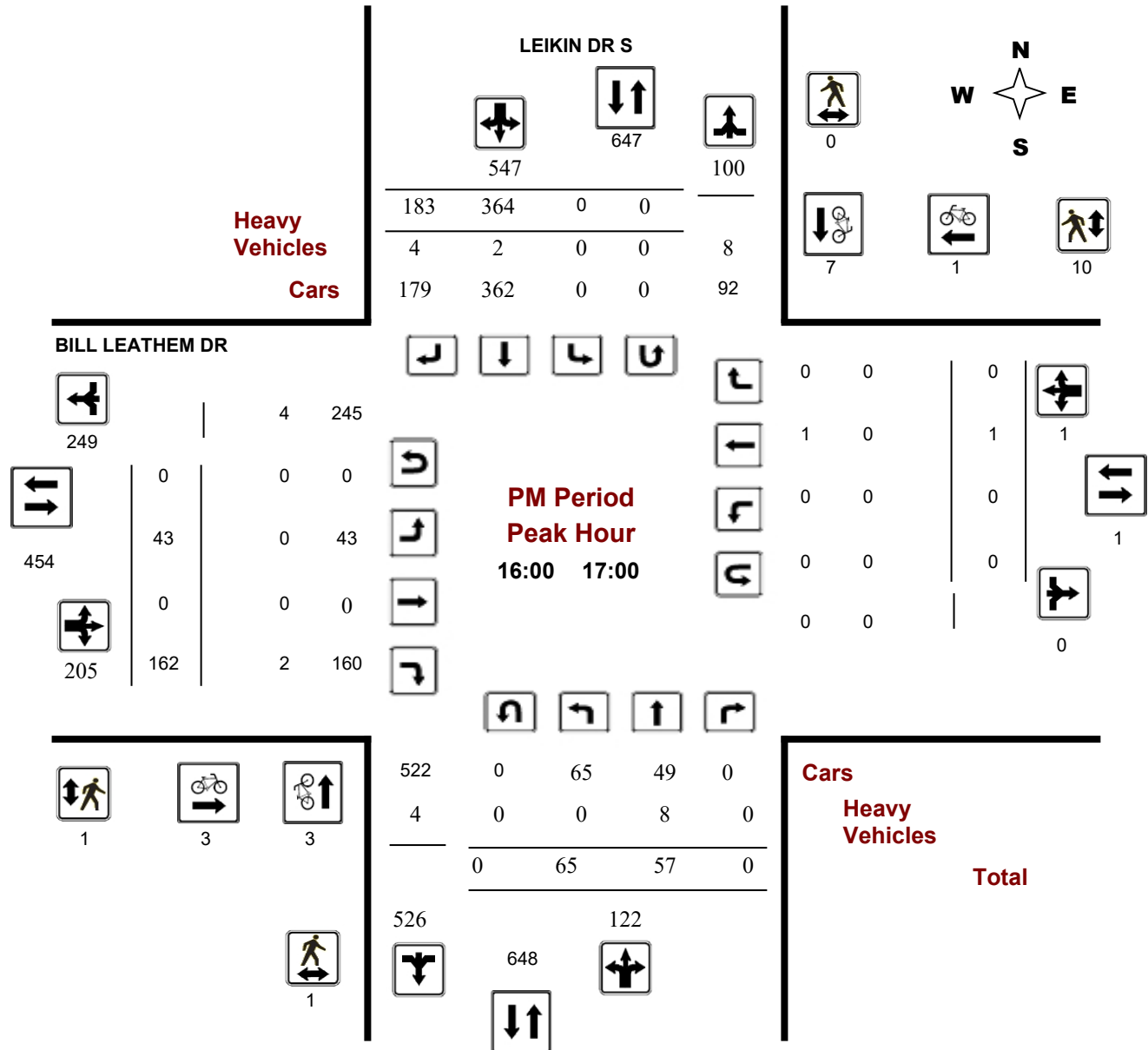
### BILL LEATHEM DR @ LEIKIN DR S

**Survey Date:** Wednesday, June 12, 2019

**Start Time:** 07:00

**WO No:** 38659

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LEIKIN DR S

**Survey Date:** Wednesday, June 12, 2019

**WO No:** 38659

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

**Survey Date:** Wednesday, June 12, 2019

#### Total Observed U-Turns

#### AADT Factor

Northbound: 0 Southbound: 1

1.25

Eastbound: 1 Westbound: 0

#### LEIKIN DR S

#### BILL LEATHEM DR

Period	Northbound				Southbound				STR TOT	Eastbound				Westbound				STR TOT	Grand Total
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT		LT	ST	RT	EB TOT	LT	ST	RT	WB TOT		
07:00 08:00	141	553	4	698	7	17	24	48	746	178	3	28	209	0	0	2	2	211	957
08:00 09:00	156	372	2	530	9	32	56	97	627	165	2	54	221	2	6	7	15	236	863
09:00 10:00	82	129	3	214	6	38	45	89	303	61	0	35	96	6	5	14	25	121	424
11:30 12:30	46	64	1	111	10	122	61	193	304	45	3	40	88	63	23	20	106	194	498
12:30 13:30	32	111	0	143	9	64	34	107	250	64	0	48	112	10	9	11	30	142	392
15:00 16:00	55	44	0	99	1	187	141	329	428	32	1	107	140	94	55	28	177	317	745
16:00 17:00	65	57	0	122	0	364	183	547	669	43	0	162	205	0	1	0	1	206	875
17:00 18:00	77	56	0	133	0	242	90	332	465	38	0	187	225	0	0	0	0	225	690
<b>Sub Total</b>	654	1386	10	2050	42	1066	634	1742	3792	626	9	661	1296	175	99	82	356	1652	5444
<b>U Turns</b>				0				1	1				1				0	1	2
<b>Total</b>	654	1386	10	2050	42	1066	634	1743	3793	626	9	661	1297	175	99	82	356	1653	5446
<b>EQ 12Hr</b>	909	1927	14	2850	58	1482	881	2423	5272	870	13	919	1803	243	138	114	495	2298	7570
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																		<b>1.39</b>	
<b>AVG 12Hr</b>	818	1734	13	2565	53	1334	793	2180	4745	783	11	827	1623	219	124	103	445	2068	6813
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																		<b>0.9</b>	
<b>AVG 24Hr</b>	1072	2271	16	3360	69	1747	1039	2856	6216	1026	15	1083	2126	287	162	134	583	2709	8925

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LEIKIN DR S

**Survey Date:** Wednesday, June 12, 2019

**WO No:** 38659

**Start Time:** 07:00

**Device:** Miovision

## Full Study 15 Minute Increments

### LEIKIN DR S

### BILL LEATHEM DR

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total	
07:00	07:15	34	121	1	156	3	5	3	11	329	32	0	4	36	0	0	0	0	329	203
07:15	07:30	33	143	0	176	2	3	4	9	376	41	1	3	45	0	0	1	1	376	231
07:30	07:45	37	158	0	195	2	4	10	17	426	42	1	9	52	0	0	0	0	426	264
07:45	08:00	37	131	3	171	0	5	7	12	395	63	1	12	76	0	0	1	1	395	260
08:00	08:15	44	126	1	171	2	8	16	26	409	67	0	8	75	1	2	2	5	409	277
08:15	08:30	44	102	0	146	1	6	9	16	324	40	2	13	55	0	2	1	3	324	220
08:30	08:45	41	81	0	122	5	6	9	20	279	30	0	16	46	1	1	3	5	279	193
08:45	09:00	27	63	1	91	1	12	22	35	247	28	0	17	46	0	1	1	2	247	174
09:00	09:15	29	74	2	105	0	10	13	23	253	22	0	11	33	2	1	6	9	253	170
09:15	09:30	24	27	0	51	2	8	19	29	147	16	0	11	27	2	0	3	5	147	112
09:30	09:45	14	15	1	30	3	12	8	23	101	10	0	6	16	2	1	3	6	101	75
09:45	10:00	15	13	0	28	1	8	5	14	85	13	0	7	20	0	3	2	5	85	67
11:30	11:45	12	7	0	19	0	28	20	48	136	6	0	13	19	11	4	4	19	136	105
11:45	12:00	10	20	0	30	2	35	14	51	189	13	2	6	21	28	5	6	39	189	141
12:00	12:15	13	18	0	31	5	34	15	54	184	15	0	10	25	17	9	5	31	184	141
12:15	12:30	11	19	1	31	3	25	12	40	149	11	1	11	23	7	5	5	17	149	111
12:30	12:45	9	23	0	32	1	10	7	18	121	22	0	11	33	4	4	1	9	121	92
12:45	13:00	7	31	0	38	3	17	13	33	151	13	0	14	27	1	2	4	7	151	105
13:00	13:15	8	38	0	46	2	26	7	35	176	15	0	11	26	2	2	3	7	176	114
13:15	13:30	8	19	0	27	3	11	7	21	110	14	0	12	26	3	1	3	7	110	81
15:00	15:15	19	12	0	31	0	35	50	85	240	7	1	25	33	34	18	11	63	240	212
15:15	15:30	11	9	0	20	0	41	21	62	204	8	0	29	37	25	13	10	48	204	167
15:30	15:45	11	11	0	22	0	49	33	82	225	9	0	26	35	21	10	5	36	225	175
15:45	16:00	14	12	0	26	1	62	37	100	251	8	0	27	35	14	14	2	30	251	191
16:00	16:15	17	11	0	28	0	90	59	149	331	15	0	38	53	0	1	0	1	331	231
16:15	16:30	12	16	0	28	0	78	44	122	293	10	0	39	49	0	0	0	0	293	199
16:30	16:45	17	14	0	31	0	98	40	138	332	11	0	40	51	0	0	0	0	332	220
16:45	17:00	19	16	0	35	0	98	40	138	339	7	0	45	52	0	0	0	0	339	225
17:00	17:15	14	11	0	25	0	70	27	97	275	18	0	54	72	0	0	0	0	275	194
17:15	17:30	21	12	0	33	0	75	24	99	280	9	0	52	61	0	0	0	0	280	193
17:30	17:45	26	17	0	43	0	57	18	75	246	8	0	46	54	0	0	0	0	246	172
17:45	18:00	16	16	0	32	0	40	21	61	187	3	0	35	38	0	0	0	0	187	131
Total:		654	1386	10	2050	42	1066	634	1743	7790	626	9	661	1297	175	99	82	356	7790	5,446

Note: U-Turns are included in Totals.





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LEIKIN DR S

**Survey Date:** Wednesday, June 12, 2019

**WO No:** 38659

**Start Time:** 07:00

**Device:** Miovision

### Full Study Cyclist Volume

		LEIKIN DR S			BILL LEATHEM DR			Grand Total
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00	07:15	5	0	5	0	0	0	5
07:15	07:30	1	0	1	0	0	0	1
07:30	07:45	3	0	3	1	1	2	5
07:45	08:00	4	1	5	0	0	0	5
08:00	08:15	1	0	1	0	0	0	1
08:15	08:30	4	0	4	0	0	0	4
08:30	08:45	2	3	5	0	0	0	5
08:45	09:00	0	1	1	0	0	0	1
09:00	09:15	0	1	1	0	1	1	2
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	1	2	3	0	0	0	3
11:30	11:45	0	1	1	0	0	0	1
11:45	12:00	0	1	1	0	0	0	1
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	1	0	1	0	0	0	1
12:30	12:45	1	0	1	2	0	2	3
12:45	13:00	0	1	1	2	0	2	3
13:00	13:15	2	0	2	0	0	0	2
13:15	13:30	0	0	0	1	0	1	1
15:00	15:15	1	0	1	0	0	0	1
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	2	2	0	0	0	2
15:45	16:00	1	3	4	0	0	0	4
16:00	16:15	1	3	4	2	0	2	6
16:15	16:30	0	2	2	0	1	1	3
16:30	16:45	0	1	1	1	0	1	2
16:45	17:00	2	1	3	0	0	0	3
17:00	17:15	0	0	0	0	0	0	0
17:15	17:30	2	2	4	3	0	3	7
17:30	17:45	0	4	4	1	0	1	5
17:45	18:00	1	1	2	3	0	3	5
Total		33	30	63	16	3	19	82



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LEIKIN DR S

**Survey Date:** Wednesday, June 12, 2019

**WO No:** 38659

**Start Time:** 07:00

**Device:** Miovision

### Full Study Pedestrian Volume

#### LEIKIN DR S

#### BILL LEATHEM DR

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	1	1	1
07:15 07:30	0	0	0	0	1	1	1
07:30 07:45	0	0	0	0	1	1	1
07:45 08:00	0	0	0	0	1	1	1
08:00 08:15	0	0	0	0	2	2	2
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	2	2	2
08:45 09:00	0	0	0	0	1	1	1
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	1	1	1
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	1	2	3	2	5	7	10
11:45 12:00	0	0	0	0	4	4	4
12:00 12:15	1	0	1	0	14	14	15
12:15 12:30	2	2	4	2	21	23	27
12:30 12:45	6	0	6	2	15	17	23
12:45 13:00	5	0	5	0	11	11	16
13:00 13:15	5	0	5	0	7	7	12
13:15 13:30	0	0	0	0	6	6	6
15:00 15:15	0	0	0	0	2	2	2
15:15 15:30	0	0	0	0	1	1	1
15:30 15:45	0	0	0	0	1	1	1
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	1	0	1	0	4	4	5
16:15 16:30	0	0	0	1	1	2	2
16:30 16:45	0	0	0	0	2	2	2
16:45 17:00	0	0	0	0	3	3	3
17:00 17:15	0	0	0	0	1	1	1
17:15 17:30	0	0	0	0	2	2	2
17:30 17:45	0	1	1	0	0	0	1
17:45 18:00	0	0	0	0	0	0	0
<b>Total .....</b>	<b>21</b>	<b>5</b>	<b>26</b>	<b>7</b>	<b>110</b>	<b>117</b>	<b>143</b>



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LEIKIN DR S

**Survey Date:** Wednesday, June 12, 2019

**WO No:** 38659

**Start Time:** 07:00

**Device:** Miovision

## Full Study Heavy Vehicles

### LEIKIN DR S

### BILL LEATHEM DR

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	1	0	0	2	0	1	0	1	3	0	0	0	1	0	0	0	0	1	2
07:15 07:30	1	2	0	3	1	0	0	4	7	0	1	0	2	0	0	1	3	5	6
07:30 07:45	1	0	0	3	0	2	0	3	6	1	0	0	2	0	0	0	0	2	4
07:45 08:00	1	1	0	4	0	2	0	3	7	0	0	0	1	0	0	0	0	1	4
08:00 08:15	2	0	0	5	1	3	0	5	10	1	0	0	3	0	0	0	1	4	7
08:15 08:30	2	1	0	7	1	4	0	8	15	1	2	0	6	0	1	1	5	11	13
08:30 08:45	1	0	0	3	2	1	1	8	11	2	0	1	6	0	1	2	5	11	11
08:45 09:00	1	1	0	4	1	2	1	8	12	2	0	0	6	0	0	1	2	8	10
09:00 09:15	0	1	1	4	0	1	0	4	8	0	0	0	0	1	0	2	4	4	6
09:15 09:30	0	1	0	2	1	0	0	4	6	1	0	0	1	1	0	1	3	4	5
09:30 09:45	0	1	0	2	1	1	0	4	6	1	0	0	1	0	0	0	1	2	4
09:45 10:00	0	1	0	3	0	2	0	4	7	1	0	0	2	0	1	0	1	3	5
11:30 11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 12:00	0	1	0	2	0	1	0	3	5	1	1	0	2	0	0	0	1	3	4
12:00 12:15	0	0	0	1	0	1	0	1	2	0	0	0	0	0	0	0	0	0	1
12:15 12:30	0	1	0	2	1	1	0	4	6	0	0	0	0	0	0	1	2	2	4
12:30 12:45	1	0	0	2	1	0	0	1	3	0	0	1	2	0	0	0	1	3	3
12:45 13:00	0	2	0	4	2	1	0	6	10	0	0	1	1	0	0	1	3	4	7
13:00 13:15	0	0	0	2	0	2	0	2	4	0	0	0	0	0	0	0	0	0	2
13:15 13:30	0	1	0	1	0	0	0	2	3	0	0	0	0	0	0	1	1	1	2
15:00 15:15	3	2	0	9	0	1	1	4	13	0	1	2	7	1	0	0	2	9	11
15:15 15:30	1	1	0	3	0	1	2	4	7	0	0	0	3	0	0	0	0	3	5
15:30 15:45	0	2	0	2	0	0	1	3	5	0	0	0	1	0	0	0	0	1	3
15:45 16:00	1	4	0	7	0	1	1	6	13	0	0	1	3	0	0	0	0	3	8
16:00 16:15	0	3	0	4	0	0	1	4	8	0	0	1	2	0	0	0	0	2	5
16:15 16:30	0	1	0	1	0	0	2	3	4	0	0	0	2	0	0	0	0	2	3
16:30 16:45	0	2	0	4	0	1	1	4	8	0	0	1	2	0	0	0	0	2	5
16:45 17:00	0	2	0	3	0	1	0	3	6	0	0	0	0	0	0	0	0	0	3
17:00 17:15	1	1	0	2	0	0	2	3	5	0	0	0	3	0	0	0	0	3	4
17:15 17:30	0	2	0	3	0	0	1	3	6	0	0	1	2	0	0	0	0	2	4
17:30 17:45	0	2	0	5	0	1	2	5	10	0	0	2	4	0	0	0	0	4	7
17:45 18:00	0	1	0	2	0	1	0	2	4	0	0	0	0	0	0	0	0	0	2
Total: None	17	37	1	101	12	32	16	119	220	11	5	11	65	3	3	11	35	100	160



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LEIKIN DR S

**Survey Date:** Wednesday, June 12, 2019

**WO No:** 38659

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute U-Turn Total

LEIKIN DR S

BILL LEATHEM DR

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	1	0	0	1
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	1	0	1
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	1	1	0	2

**Survey Date:** Thursday, March 02, 2017

**Start Time:** 07:00

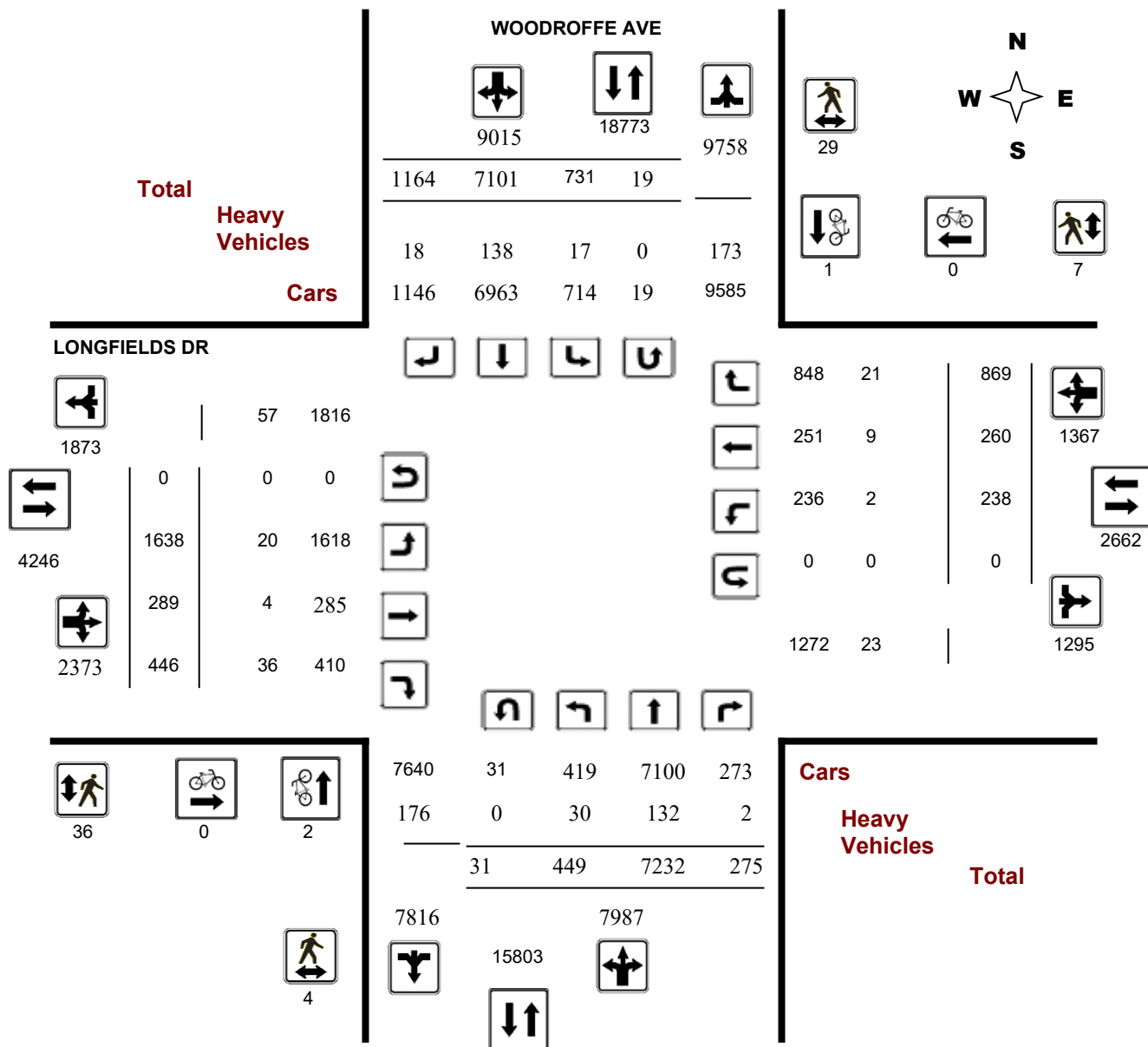
**WO No:**

36732

**Device:**

Miovision

### Full Study Diagram



## Turning Movement Count - Study Results

**LONGFIELDS DR @ WOODROFFE AVE**

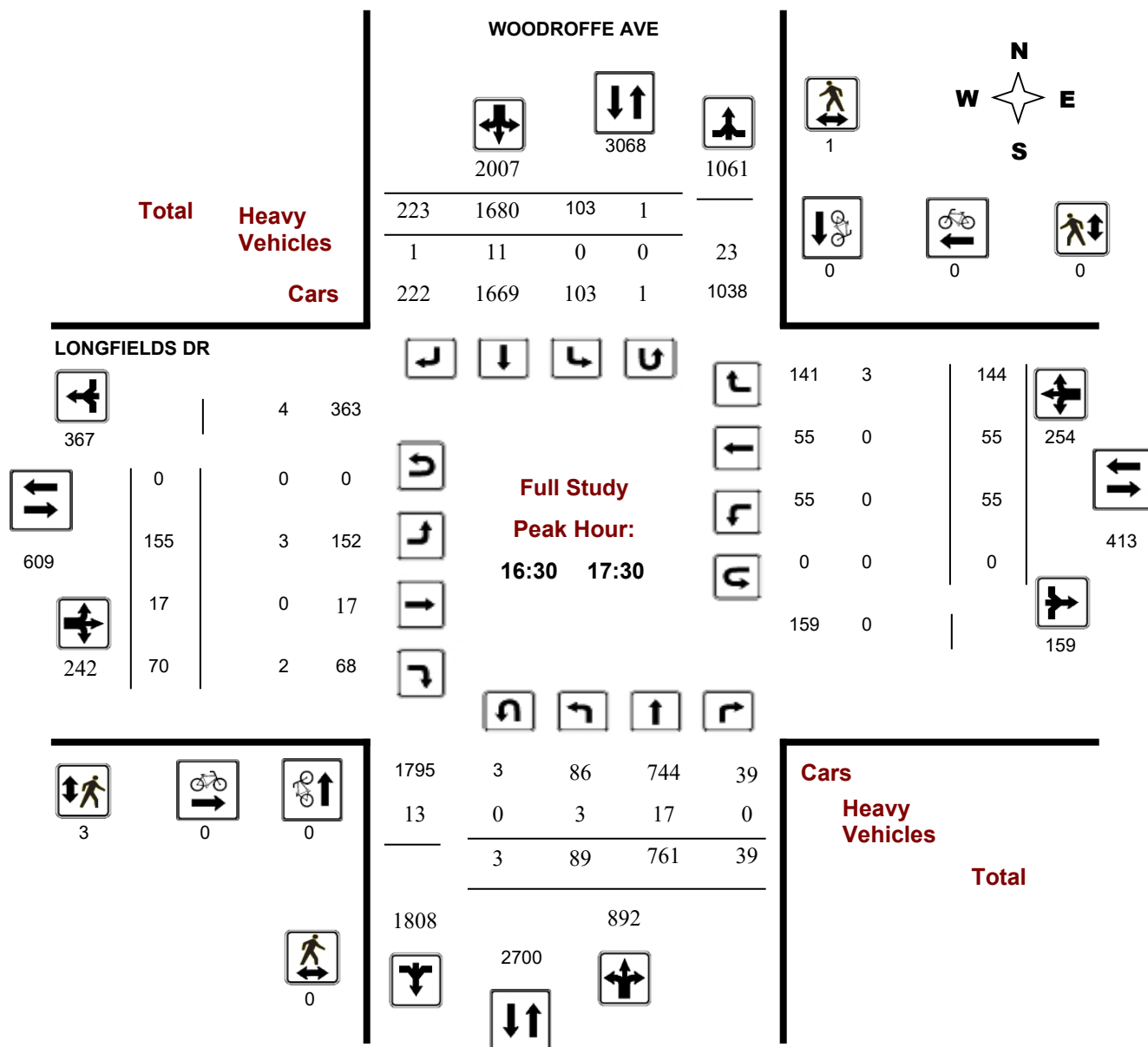
**Survey Date:** Thursday, March 02, 2017

WO No: 36732

**Start Time:** 07:00

Device: Miovision

## Full Study Peak Hour Diagram





## Turning Movement Count - Peak Hour Diagram

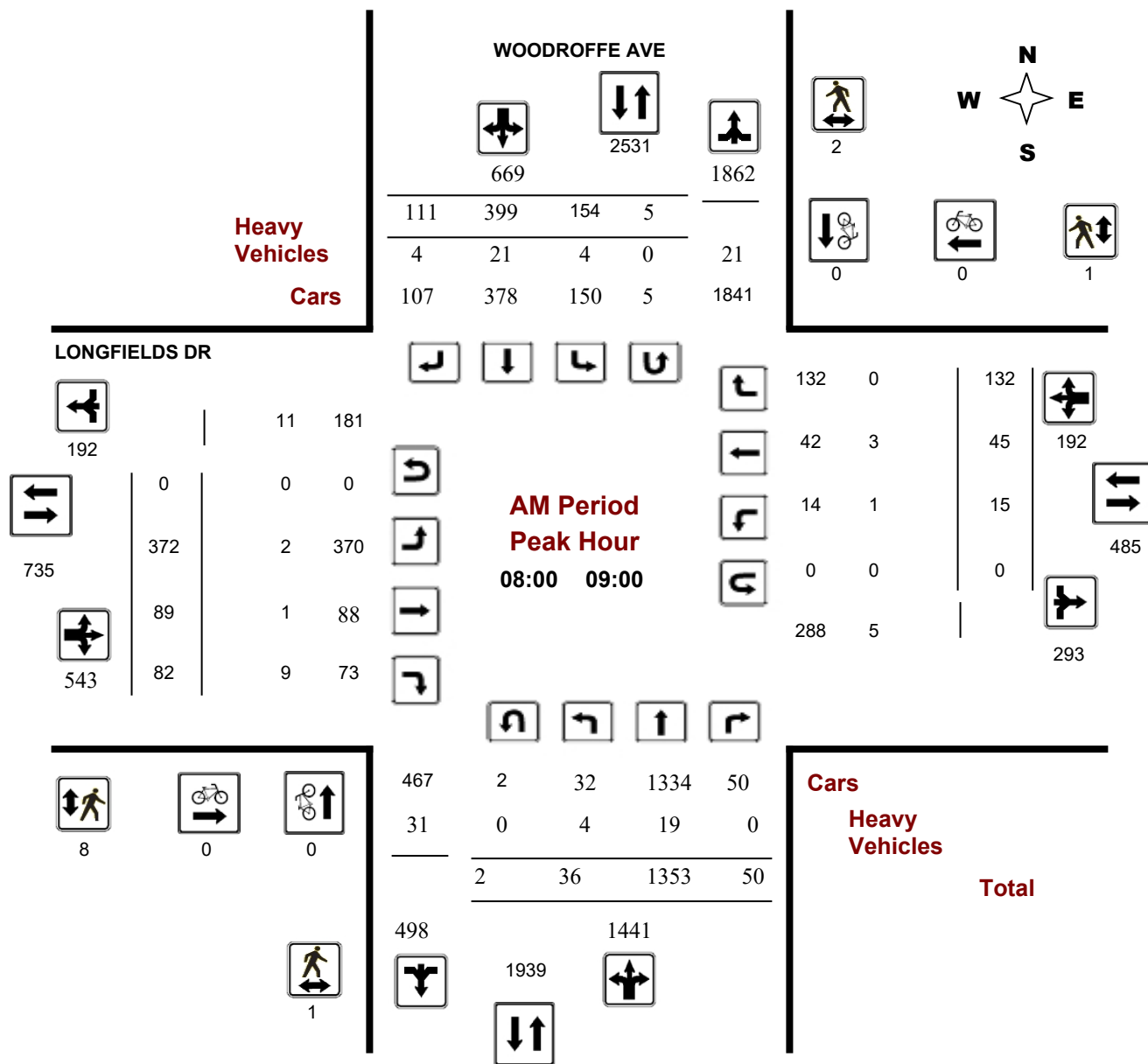
### LONGFIELDS DR @ WOODROFFE AVE

**Survey Date:** Thursday, March 02, 2017

**Start Time:** 07:00

**WO No:** 36732

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

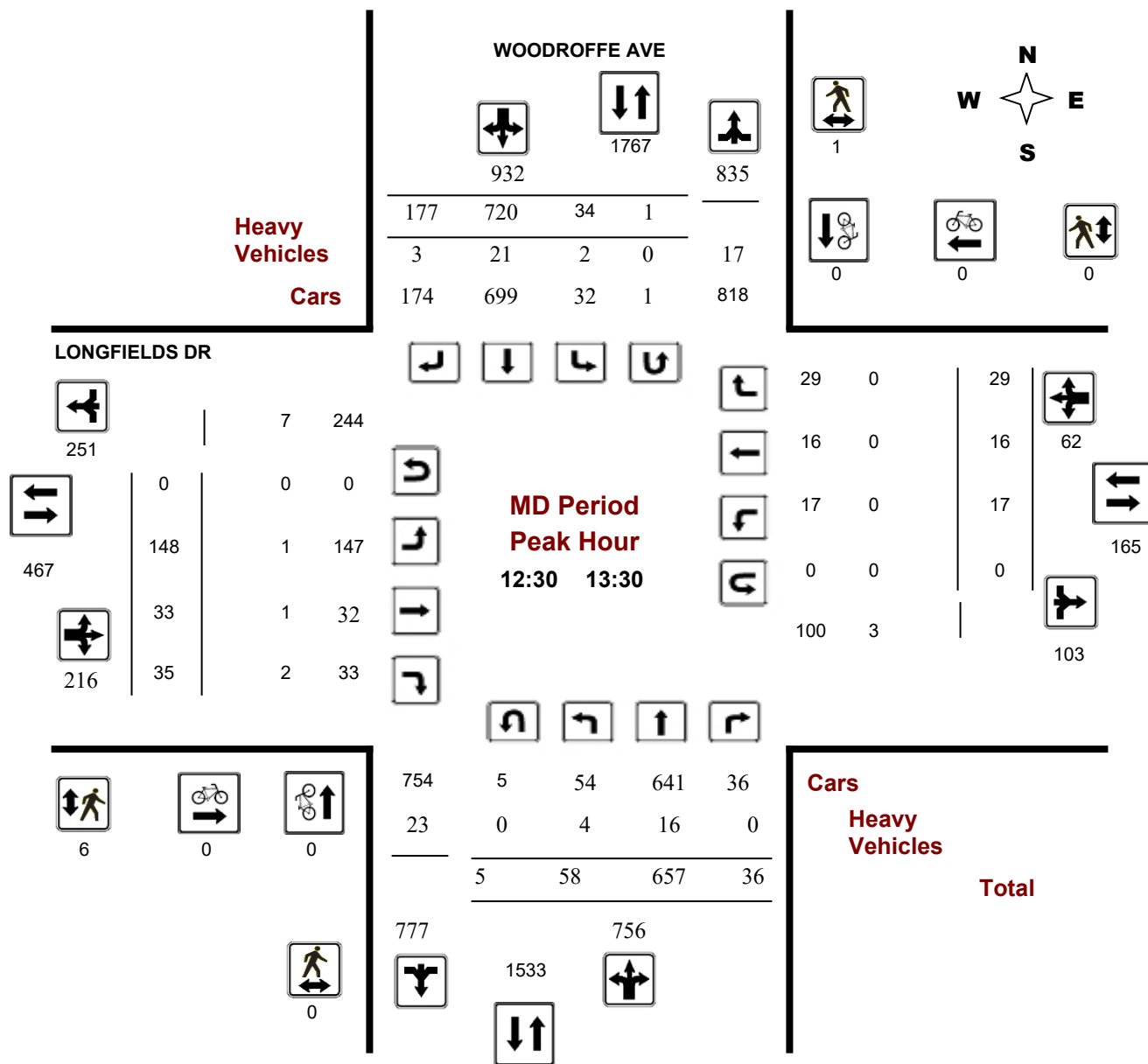
### LONGFIELDS DR @ WOODROFFE AVE

**Survey Date:** Thursday, March 02, 2017

**Start Time:** 07:00

**WO No:** 36732

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

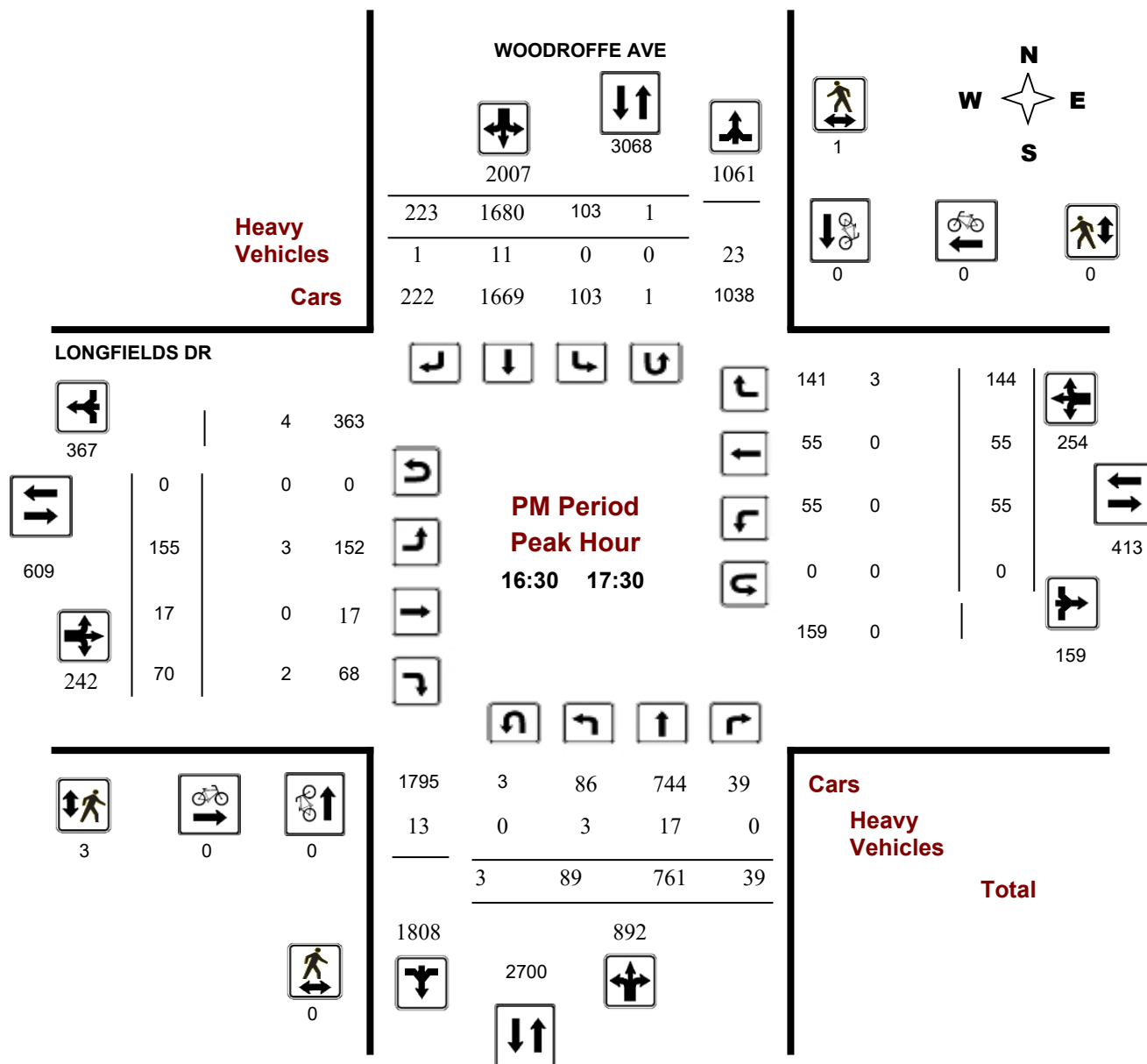
**LONGFIELDS DR @ WOODROFFE AVE**

**Survey Date:** Thursday, March 02, 2017

**Start Time:** 07:00

**WO No:** 36732

**Device:** Miovision



## Comments



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### LONGFIELDS DR @ WOODROFFE AVE

**Survey Date:** Thursday, March 02, 2017

**WO No:** 36732

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

**Survey Date:** Thursday, March 02, 2017

#### Total Observed U-Turns

Northbound: 31      Southbound: 19  
Eastbound: 0      Westbound: 0

#### AADT Factor

1.39

#### WOODROFFE AVE

#### LONGFIELDS DR

		Northbound				Southbound				Eastbound				Westbound				STR TOT	Grand Total					
		LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT			WB TOT				
07:00	08:00	24	1460	46	1530	132	355	91	578	2108	287	52	28	367	11	21	120	152	519	2627				
08:00	09:00	36	1353	50	1439	154	399	111	664	2103	372	89	82	543	15	45	132	192	735	2838				
09:00	10:00	43	916	31	990	112	462	79	653	1643	164	24	46	234	16	9	65	90	324	1967				
11:30	12:30	53	636	32	721	45	655	100	800	1521	140	17	39	196	32	19	67	118	314	1835				
12:30	13:30	58	657	36	751	34	720	177	931	1682	148	33	35	216	17	16	29	62	278	1960				
15:00	16:00	76	672	22	770	58	1317	200	1575	2345	196	32	86	314	48	36	137	221	535	2880				
16:00	17:00	84	718	38	840	94	1619	186	1899	2739	172	23	61	256	47	67	183	297	553	3292				
17:00	18:00	75	820	20	915	102	1574	220	1896	2811	159	19	69	247	52	47	136	235	482	3293				
Sub Total		449	7232	275	7956	731	7101	1164	8996	16952	1638	289	446	2373	238	260	869	1367	3740	20692				
U Turns		31				19				50				0				0				0		50
Total		449	7232	275	7987	731	7101	1164	9015	17002	1638	289	446	2373	238	260	869	1367	3740	20742				
EQ 12Hr		624	10052	382	11102	1016	9870	1618	12531	23633	2277	402	620	3298	331	361	1208	1900	5199	28831				
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														1.39										
AVG 12Hr		624	10052	382	11102	1016	9870	1618	12531	23633	2277	402	620	3298	331	361	1208	1900	5199	28831				
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														1										
AVG 24Hr		818	13169	501	14544	1331	12930	2120	16415	30959	2983	526	812	4321	433	473	1582	2489	6810	37769				

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### LONGFIELDS DR @ WOODROFFE AVE

**Survey Date:** Thursday, March 02, 2017

**WO No:** 36732

**Start Time:** 07:00

**Device:** Miovision

## Full Study 15 Minute Increments

### WOODROFFE AVE

### LONGFIELDS DR

#### Northbound

#### Southbound

#### Eastbound

#### Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total	
07:00	07:15	10	396	15	422	24	87	18	129	1111	51	9	5	65	0	1	20	21	1111	637
07:15	07:30	6	409	13	428	27	78	17	122	1138	64	10	7	81	3	4	27	34	1138	665
07:30	07:45	7	344	8	360	33	79	21	134	1049	85	17	5	107	5	7	35	47	1049	648
07:45	08:00	1	311	10	322	48	111	35	195	1079	87	16	11	114	3	9	38	50	1079	681
08:00	08:15	3	341	13	357	35	77	35	148	1059	85	16	8	109	5	13	37	55	1059	669
08:15	08:30	6	330	10	347	33	109	25	170	1130	101	18	29	148	6	9	34	49	1130	714
08:30	08:45	14	330	12	357	44	93	20	157	1084	85	28	29	142	2	18	30	50	1084	706
08:45	09:00	13	352	15	380	42	120	31	194	1197	101	27	16	144	2	5	31	38	1197	756
09:00	09:15	13	282	11	309	54	116	25	195	1035	69	12	26	107	5	3	30	38	1035	649
09:15	09:30	10	228	9	247	30	128	17	175	829	34	4	7	45	1	3	9	13	829	480
09:30	09:45	13	234	5	252	13	102	22	138	786	30	2	7	39	5	1	17	23	786	452
09:45	10:00	7	172	6	186	15	116	15	146	672	31	6	6	43	5	2	9	16	672	391
11:30	11:45	11	165	9	185	9	150	27	187	766	43	1	11	55	4	3	20	27	766	454
11:45	12:00	16	156	10	183	11	155	30	196	747	26	5	7	38	6	5	17	28	747	445
12:00	12:15	10	154	6	172	9	170	22	202	780	40	3	12	55	13	6	14	33	780	462
12:15	12:30	16	161	7	187	16	180	21	217	813	31	8	9	48	9	5	16	30	813	482
12:30	12:45	13	196	7	217	5	156	19	180	822	45	5	12	62	5	3	10	18	822	477
12:45	13:00	13	152	11	177	7	194	68	269	851	34	7	8	49	6	2	10	18	851	513
13:00	13:15	18	159	9	186	8	174	46	228	800	37	14	8	59	4	9	4	17	800	490
13:15	13:30	14	150	9	176	14	196	44	255	827	32	7	7	46	2	2	5	9	827	486
15:00	15:15	23	172	6	201	19	267	41	329	1083	45	11	22	78	8	13	37	58	1083	666
15:15	15:30	17	185	3	205	11	305	48	366	1176	43	9	22	74	13	7	35	55	1176	700
15:30	15:45	15	161	7	184	11	401	59	472	1343	45	8	27	80	17	9	34	60	1343	796
15:45	16:00	21	154	6	185	17	344	52	413	1219	63	4	15	82	10	7	31	48	1219	728
16:00	16:15	15	179	4	198	25	393	37	455	1353	52	10	13	75	11	25	52	88	1353	816
16:15	16:30	22	166	5	193	19	404	51	474	1344	41	5	15	61	10	12	41	63	1344	791
16:30	16:45	30	202	15	248	24	430	45	500	1501	44	6	13	63	12	14	50	76	1501	887
16:45	17:00	17	171	14	204	26	392	53	471	1349	35	2	20	57	14	16	40	70	1349	802
17:00	17:15	20	190	4	214	26	441	57	524	1481	40	2	24	66	16	8	32	56	1481	860
17:15	17:30	22	198	6	226	27	417	68	512	1437	36	7	13	56	13	17	22	52	1437	846
17:30	17:45	19	215	4	240	19	364	56	439	1373	41	4	13	58	15	13	44	72	1373	809
17:45	18:00	14	217	6	239	30	352	39	423	1342	42	6	19	67	8	9	38	55	1342	784
Total:		449	7232	275	7987	731	7101	1164	9015	34576	1638	289	446	2373	238	260	869	1367	34576	20,742

Note: U-Turns are included in Totals.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### LONGFIELDS DR @ WOODROFFE AVE

**Survey Date:** Thursday, March 02, 2017

**WO No:** 36732

**Start Time:** 07:00

**Device:** Miovision

### Full Study Cyclist Volume

#### WOODROFFE AVE

#### LONGFIELDS DR

Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	0	0	0	0	0
07:15	07:30	0	0	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0	0
08:00	08:15	0	0	0	0	0	0	0
08:15	08:30	0	0	0	0	0	0	0
08:30	08:45	0	0	0	0	0	0	0
08:45	09:00	0	0	0	0	0	0	0
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	1	0	1	0	0	0	1
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0
15:00	15:15	1	0	1	0	0	0	1
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	1	1	0	0	0	1
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0
Total		2	1	3	0	0	0	3





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### LONGFIELDS DR @ WOODROFFE AVE

**Survey Date:** Thursday, March 02, 2017

**WO No:** 36732

**Start Time:** 07:00

**Device:** Miovision

### Full Study Pedestrian Volume

#### WOODROFFE AVE

#### LONGFIELDS DR

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	1	1	1	0	1	2
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	2	0	2	2
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	1	1	2	5	1	6	8
08:45 09:00	0	1	1	3	0	3	4
09:00 09:15	0	1	1	0	0	0	1
09:15 09:30	0	2	2	2	0	2	4
09:30 09:45	0	0	0	1	0	1	1
09:45 10:00	0	1	1	1	0	1	2
11:30 11:45	0	0	0	1	0	1	1
11:45 12:00	0	1	1	1	0	1	2
12:00 12:15	0	0	0	1	0	1	1
12:15 12:30	0	1	1	1	0	1	2
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	4	0	4	4
13:00 13:15	0	1	1	1	0	1	2
13:15 13:30	0	0	0	1	0	1	1
15:00 15:15	0	3	3	2	1	3	6
15:15 15:30	0	3	3	1	2	3	6
15:30 15:45	0	2	2	0	0	0	2
15:45 16:00	0	3	3	0	0	0	3
16:00 16:15	0	3	3	2	1	3	6
16:15 16:30	1	4	5	2	1	3	8
16:30 16:45	0	1	1	1	0	1	2
16:45 17:00	0	0	0	1	0	1	1
17:00 17:15	0	0	0	1	0	1	1
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	1	0	1	0	1	1	2
17:45 18:00	1	0	1	1	0	1	2
<b>Total .....</b>	<b>4</b>	<b>29</b>	<b>33</b>	<b>36</b>	<b>7</b>	<b>43</b>	<b>76</b>



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### LONGFIELDS DR @ WOODROFFE AVE

**Survey Date:** Thursday, March 02, 2017

**WO No:** 36732

**Start Time:** 07:00

**Device:** Miovision

### Full Study Heavy Vehicles

#### WOODROFFE AVE

#### LONGFIELDS DR

Northbound

Southbound

Eastbound

Westbound

Time Period		Northbound			N TOT	Southbound			S TOT	STR TOT	Eastbound			E TOT	Westbound			W TOT	STR TOT	Grand Total
		LT	ST	RT		LT	ST	RT			LT	ST	RT		LT	ST	RT			
07:00	07:15	1	2	0	9	1	5	0	9	18	0	0	1	2	0	0	1	2	4	11
07:15	07:30	1	5	0	13	0	6	1	12	25	0	0	1	4	0	1	0	1	5	15
07:30	07:45	2	1	1	8	2	4	4	11	19	0	1	0	8	0	1	0	5	13	16
07:45	08:00	0	4	0	13	3	6	1	16	29	1	0	3	6	0	1	1	5	11	20
08:00	08:15	1	1	0	11	1	6	0	8	19	0	0	2	5	1	2	0	4	9	14
08:15	08:30	1	4	0	20	1	9	0	16	36	2	1	6	10	0	0	0	2	12	24
08:30	08:45	1	7	0	12	2	3	1	13	25	0	0	1	4	0	1	0	3	7	16
08:45	09:00	1	7	0	11	0	3	3	13	24	0	0	0	4	0	0	0	0	4	14
09:00	09:15	0	5	0	12	3	3	0	12	24	1	0	4	5	0	0	0	3	8	16
09:15	09:30	1	7	0	11	0	3	0	11	22	1	0	0	2	0	0	0	0	2	12
09:30	09:45	2	6	0	12	1	3	0	12	24	1	0	1	4	0	0	1	2	6	15
09:45	10:00	1	5	0	13	0	6	0	15	28	3	1	1	6	0	0	1	2	8	18
11:30	11:45	1	4	0	12	0	5	1	10	22	0	0	2	4	0	0	0	0	4	13
11:45	12:00	0	7	0	10	1	3	0	12	22	1	0	0	1	0	0	0	1	2	12
12:00	12:15	1	5	0	14	0	6	0	12	26	1	0	2	4	0	0	0	0	4	15
12:15	12:30	0	2	0	5	0	3	1	10	15	1	0	0	2	0	0	3	3	5	10
12:30	12:45	1	4	0	8	0	2	0	7	15	1	0	1	3	0	0	0	0	3	9
12:45	13:00	0	5	0	13	0	8	2	15	28	0	0	0	2	0	0	0	0	2	15
13:00	13:15	3	4	0	12	1	4	1	10	22	0	1	1	6	0	0	0	2	8	15
13:15	13:30	0	3	0	10	1	7	0	11	21	0	0	0	0	0	0	0	1	1	11
15:00	15:15	1	0	0	9	0	7	1	9	18	0	0	0	3	1	1	1	3	6	12
15:15	15:30	3	6	0	17	0	7	0	14	31	0	0	1	6	0	2	1	3	9	20
15:30	15:45	1	5	0	13	0	4	1	12	25	1	0	3	6	0	0	1	1	7	16
15:45	16:00	1	6	1	12	0	2	0	13	25	1	0	2	4	0	0	4	5	9	17
16:00	16:15	1	3	0	7	0	2	0	6	13	0	0	1	2	0	0	1	1	3	8
16:15	16:30	1	4	0	10	0	5	0	11	21	1	0	0	2	0	0	1	1	3	12
16:30	16:45	1	3	0	7	0	2	0	8	15	2	0	1	4	0	0	1	1	5	10
16:45	17:00	1	6	0	11	0	4	0	11	22	0	0	0	1	0	0	1	1	2	12
17:00	17:15	0	4	0	10	0	5	0	9	19	0	0	1	1	0	0	0	0	1	10
17:15	17:30	1	4	0	5	0	0	1	7	12	1	0	0	3	0	0	1	1	4	8
17:30	17:45	0	2	0	7	0	4	0	9	16	1	0	1	2	0	0	2	2	4	10
17:45	18:00	1	1	0	3	0	1	0	2	5	0	0	0	1	0	0	0	0	1	3
Total:	None	30	132	2	340	17	138	18	346	686	20	4	36	117	2	9	21	55	172	429



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### LONGFIELDS DR @ WOODROFFE AVE

**Survey Date:** Thursday, March 02, 2017

**WO No:** 36732

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute U-Turn Total

#### WOODROFFE AVE

#### LONGFIELDS DR

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	1	0	0	0	1
07:15	07:30	0	0	0	0	0
07:30	07:45	1	1	0	0	2
07:45	08:00	0	1	0	0	1
08:00	08:15	0	1	0	0	1
08:15	08:30	1	3	0	0	4
08:30	08:45	1	0	0	0	1
08:45	09:00	0	1	0	0	1
09:00	09:15	3	0	0	0	3
09:15	09:30	0	0	0	0	0
09:30	09:45	0	1	0	0	1
09:45	10:00	1	0	0	0	1
11:30	11:45	0	1	0	0	1
11:45	12:00	1	0	0	0	1
12:00	12:15	2	1	0	0	3
12:15	12:30	3	0	0	0	3
12:30	12:45	1	0	0	0	1
12:45	13:00	1	0	0	0	1
13:00	13:15	0	0	0	0	0
13:15	13:30	3	1	0	0	4
15:00	15:15	0	2	0	0	2
15:15	15:30	0	2	0	0	2
15:30	15:45	1	1	0	0	2
15:45	16:00	4	0	0	0	4
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	1	1	0	0	2
16:45	17:00	2	0	0	0	2
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	2	0	0	0	2
17:45	18:00	2	2	0	0	4
Total		31	19	0	0	50

**Survey Date:** Wednesday, June 10, 2015

**WO No:**

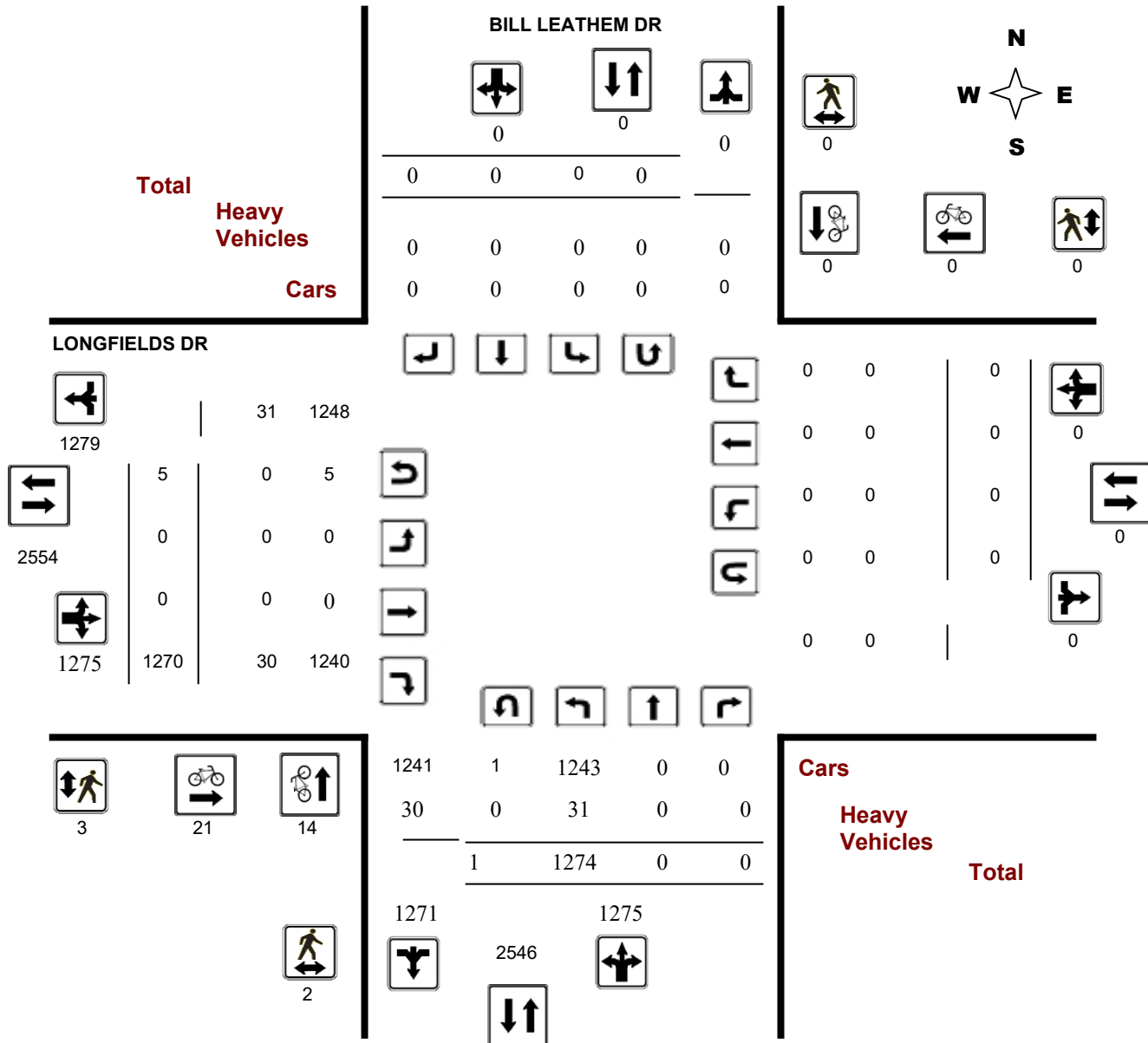
35082

**Start Time:** 07:00

**Device:**

Miovision

### Full Study Diagram



**Survey Date:** Wednesday, June 10, 2015

**WO No:**

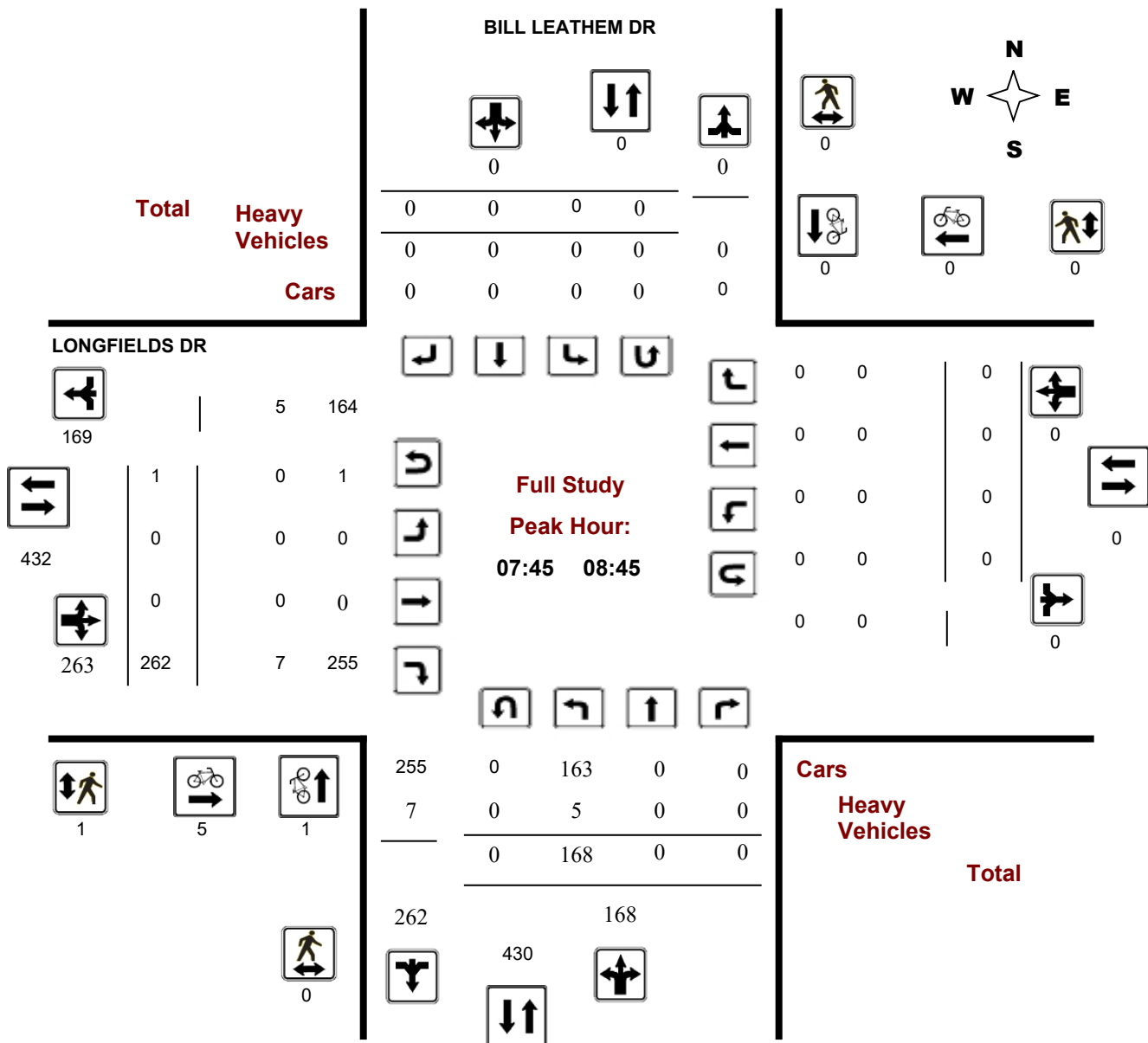
35082

**Start Time:** 07:00

**Device:**

Miovision

### Full Study Peak Hour Diagram



## Turning Movement Count - Peak Hour Diagram

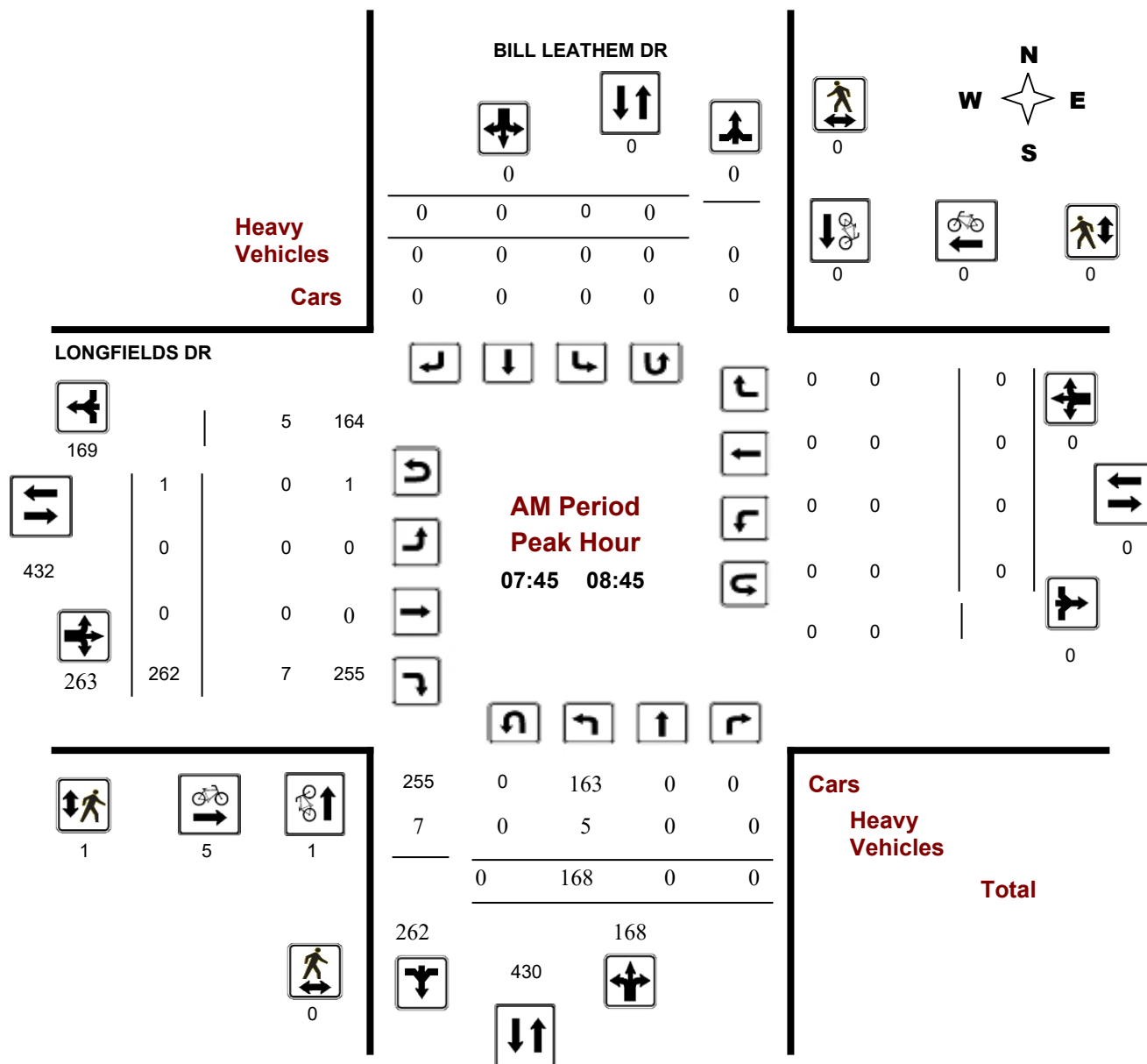
**BILL LEATHEN DR @ LONGFIELDS DR**

**Survey Date:** Wednesday, June 10, 2015

**Start Time:** 07:00

**WO No:** 35082

**Device:** Miovision



## Comments



## Turning Movement Count - Peak Hour Diagram

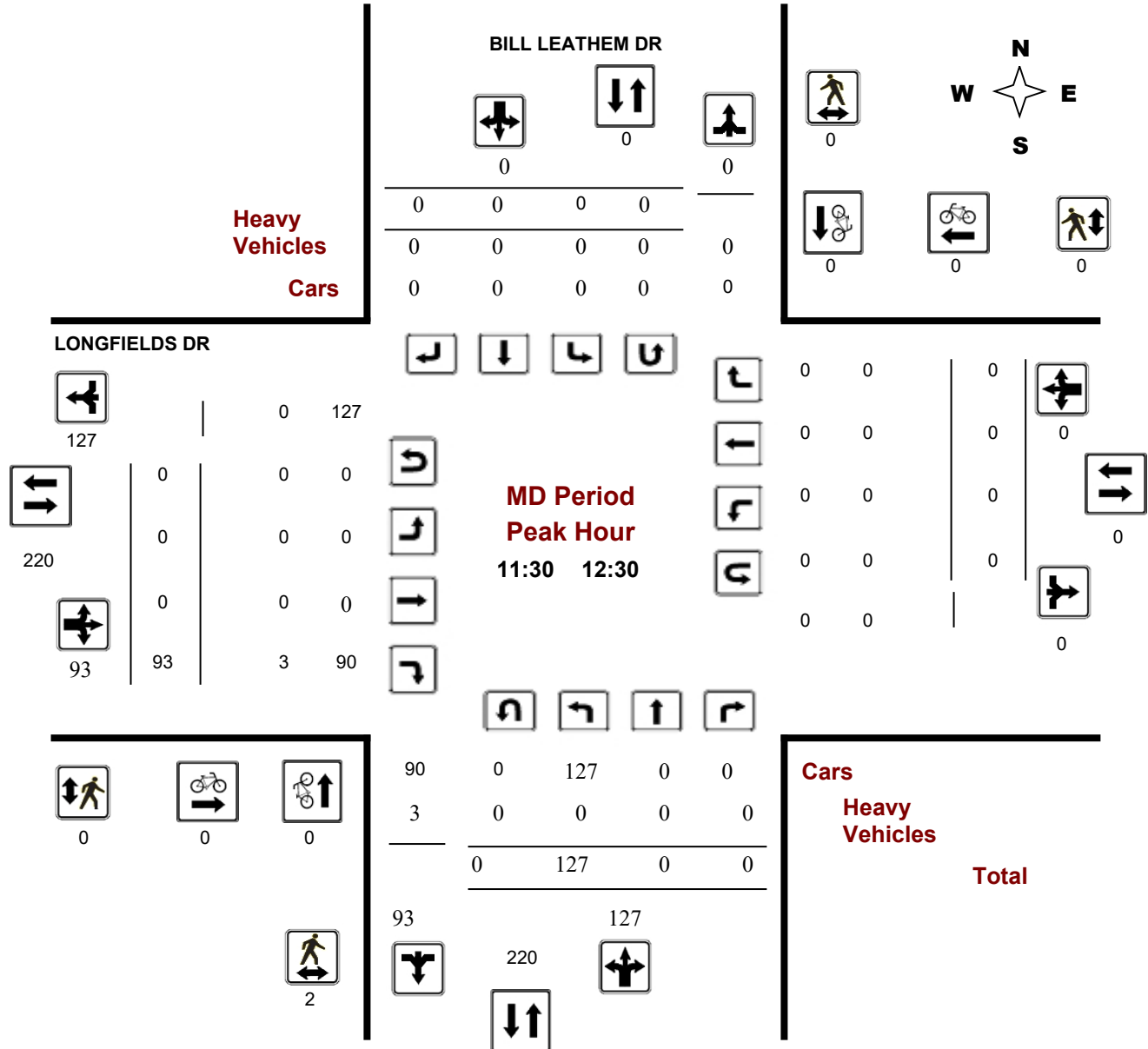
### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**Start Time:** 07:00

**WO No:** 35082

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

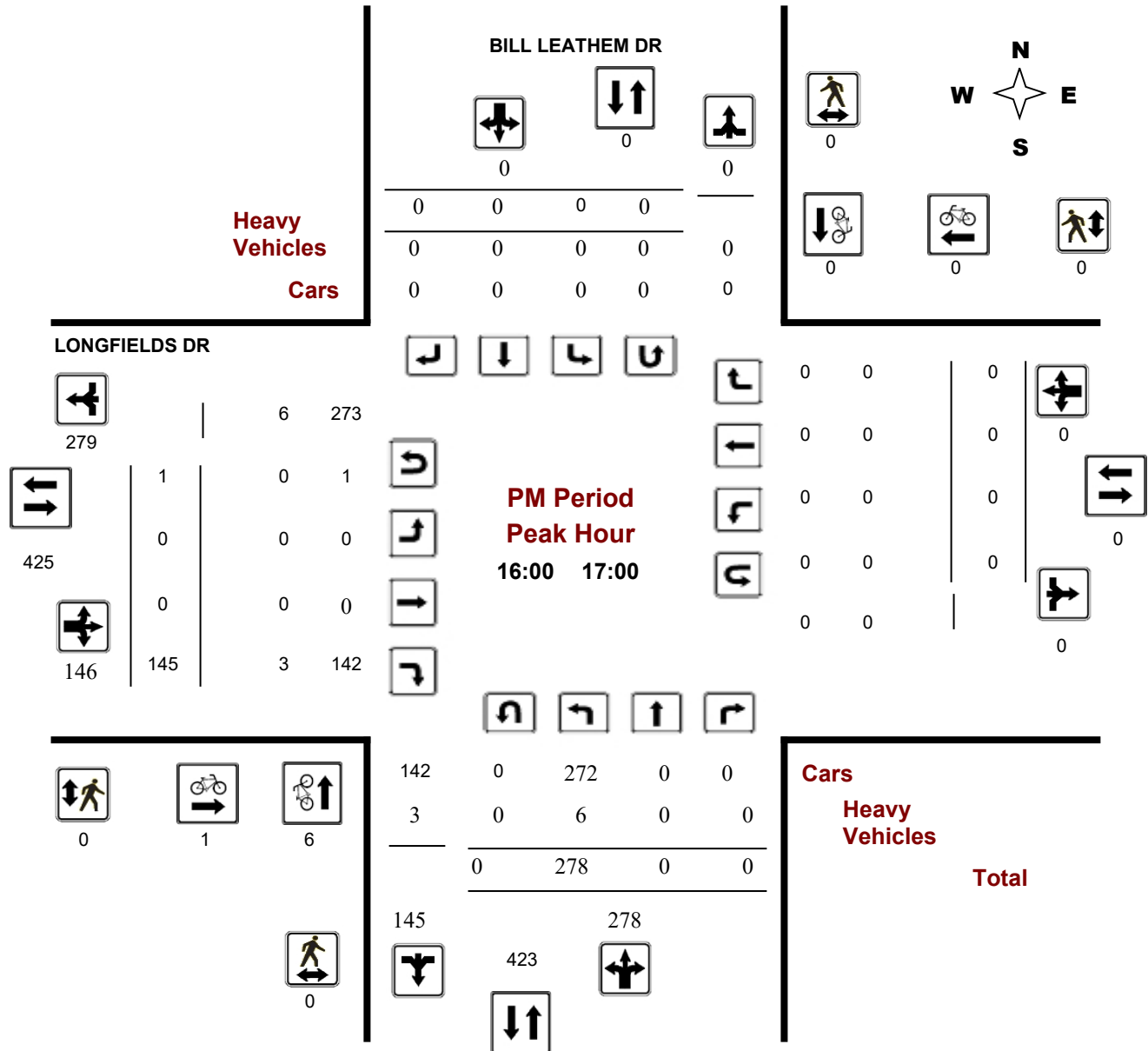
### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**Start Time:** 07:00

**WO No:** 35082

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

**Survey Date:** Wednesday, June 10, 2015

#### Total Observed U-Turns

#### AADT Factor

Northbound: 1 Southbound: 0

.90

Eastbound: 5 Westbound: 0

#### BILL LEATHEM DR

#### LONGFIELDS DR

Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT		LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT		LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	123	0	0	123		0	0	0	0	123	0	0	231	231		0	0	0	0	231	354
08:00 09:00	159	0	0	159		0	0	0	0	159	0	0	255	255		0	0	0	0	255	414
09:00 10:00	89	0	0	89		0	0	0	0	89	0	0	141	141		0	0	0	0	141	230
11:30 12:30	127	0	0	127		0	0	0	0	127	0	0	93	93		0	0	0	0	93	220
12:30 13:30	66	0	0	66		0	0	0	0	66	0	0	117	117		0	0	0	0	117	183
15:00 16:00	210	0	0	210		0	0	0	0	210	0	0	128	128		0	0	0	0	128	338
16:00 17:00	278	0	0	278		0	0	0	0	278	0	0	145	145		0	0	0	0	145	423
17:00 18:00	222	0	0	222		0	0	0	0	222	0	0	160	160		0	0	0	0	160	382
<b>Sub Total</b>	1274	0	0	1274		0	0	0	0	1274	0	0	1270	1270		0	0	0	0	1270	2544
<b>U Turns</b>				1					0	1				5					0	5	6
<b>Total</b>	1274	0	0	1275		0	0	0	0	1275	0	0	1270	1275		0	0	0	0	1275	2550
<b>EQ 12Hr</b>	1771	0	0	1772		0	0	0	0	1772	0	0	1765	1772		0	0	0	0	1772	3544
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.															<b>1.39</b>						
<b>AVG 12Hr</b>	1502	0	0	1503		0	0	0	0	1595	0	0	1497	1503		0	0	0	0	1595	3190
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.															<b>0.9</b>						
<b>AVG 24Hr</b>	1968	0	0	1969		0	0	0	0	1969	0	0	1962	1969		0	0	0	0	1969	3938

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.

**1.31**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute Increments

#### BILL LEATHEM DR

#### LONGFIELDS DR

##### Northbound

##### Southbound

##### Eastbound

##### Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	24	0	0	24	0	0	0	0	0	0	0	45	45	0	0	0	0	69
07:15	07:30	28	0	0	28	0	0	0	0	0	0	0	58	58	0	0	0	0	86
07:30	07:45	32	0	0	32	0	0	0	0	1	0	0	57	57	0	0	0	1	89
07:45	08:00	39	0	0	39	0	0	0	0	0	0	0	71	72	0	0	0	0	111
08:00	08:15	44	0	0	44	0	0	0	4	0	0	0	57	57	0	0	0	4	101
08:15	08:30	45	0	0	45	0	0	0	1	0	0	0	66	66	0	0	0	1	111
08:30	08:45	40	0	0	40	0	0	0	0	0	0	0	68	68	0	0	0	0	108
08:45	09:00	30	0	0	30	0	0	0	2	0	0	0	64	64	0	0	0	2	94
09:00	09:15	31	0	0	31	0	0	0	1	0	0	0	55	55	0	0	0	1	86
09:15	09:30	16	0	0	16	0	0	0	1	0	0	0	40	41	0	0	0	1	57
09:30	09:45	31	0	0	31	0	0	0	2	0	0	0	29	29	0	0	0	2	60
09:45	10:00	11	0	0	11	0	0	0	1	0	0	0	17	17	0	0	0	1	28
11:30	11:45	38	0	0	38	0	0	0	0	0	0	0	20	20	0	0	0	0	58
11:45	12:00	33	0	0	33	0	0	0	0	0	0	0	23	23	0	0	0	0	56
12:00	12:15	35	0	0	35	0	0	0	0	0	0	0	26	26	0	0	0	0	61
12:15	12:30	21	0	0	21	0	0	0	0	0	0	0	24	24	0	0	0	0	45
12:30	12:45	17	0	0	17	0	0	0	0	0	0	0	39	39	0	0	0	0	56
12:45	13:00	17	0	0	17	0	0	0	1	0	0	0	35	35	0	0	0	1	52
13:00	13:15	14	0	0	14	0	0	0	0	0	0	0	23	24	0	0	0	0	38
13:15	13:30	18	0	0	18	0	0	0	0	0	0	0	20	20	0	0	0	0	38
15:00	15:15	50	0	0	50	0	0	0	2	0	0	0	27	27	0	0	0	2	77
15:15	15:30	41	0	0	41	0	0	0	2	0	0	0	30	31	0	0	0	2	72
15:30	15:45	55	0	0	55	0	0	0	3	0	0	0	42	42	0	0	0	3	97
15:45	16:00	64	0	0	64	0	0	0	1	0	0	0	29	29	0	0	0	1	93
16:00	16:15	87	0	0	87	0	0	0	2	0	0	0	35	35	0	0	0	2	122
16:15	16:30	59	0	0	59	0	0	0	0	0	0	0	38	39	0	0	0	0	98
16:30	16:45	64	0	0	64	0	0	0	3	0	0	0	31	31	0	0	0	3	95
16:45	17:00	68	0	0	68	0	0	0	1	0	0	0	41	41	0	0	0	1	109
17:00	17:15	70	0	0	70	0	0	0	0	0	0	0	37	37	0	0	0	0	107
17:15	17:30	57	0	0	58	0	0	0	1	0	0	0	44	44	0	0	0	1	102
17:30	17:45	52	0	0	52	0	0	0	0	0	0	0	35	35	0	0	0	0	87
17:45	18:00	43	0	0	43	0	0	0	2	0	0	0	44	44	0	0	0	2	87
Total:		1274	0	0	1275	0	0	0	31	0	0	0	1270	1275	0	0	0	31	2,550

Note: U-Turns are included in Totals.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

## Full Study Cyclist Volume

### BILL LEATHEM DR

### LONGFIELDS DR

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	3	0	3	3
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	2	0	2	2
07:45 08:00	1	0	1	0	0	0	1
08:00 08:15	0	0	0	2	0	2	2
08:15 08:30	0	0	0	1	0	1	1
08:30 08:45	0	0	0	2	0	2	2
08:45 09:00	1	0	1	3	0	3	4
09:00 09:15	0	0	0	2	0	2	2
09:15 09:30	0	0	0	1	0	1	1
09:30 09:45	2	0	2	2	0	2	4
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	0	0	0	1	0	1	1
15:30 15:45	1	0	1	0	0	0	1
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	1	0	1	0	0	0	1
16:15 16:30	2	0	2	0	0	0	2
16:30 16:45	1	0	1	0	0	0	1
16:45 17:00	2	0	2	1	0	1	3
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	1	0	1	1	0	1	2
17:30 17:45	1	0	1	0	0	0	1
17:45 18:00	1	0	1	0	0	0	1
Total	14	0	14	21	0	21	35





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

### Full Study Pedestrian Volume

#### BILL LEATHEM DR

#### LONGFIELDS DR

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	1	0	1	1
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	1	0	1	0	0	0	1
12:15 12:30	1	0	1	0	0	0	1
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	1	0	1	1
13:00 13:15	0	0	0	1	0	1	1
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
<b>Total .....</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>5</b>



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

## Full Study Heavy Vehicles

### BILL LEATHEM DR

### LONGFIELDS DR

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1
07:15 07:30	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	4	4
07:30 07:45	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
07:45 08:00	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
08:00 08:15	4	0	0	4	0	0	0	0	4	0	0	2	2	0	0	0	0	2	6
08:15 08:30	1	0	0	1	0	0	0	0	1	0	0	2	2	0	0	0	0	2	3
08:30 08:45	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	2	2
08:45 09:00	2	0	0	2	0	0	0	0	2	0	0	2	2	0	0	0	0	2	4
09:00 09:15	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
09:15 09:30	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
09:30 09:45	2	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
09:45 10:00	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
11:30 11:45	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
11:45 12:00	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
12:00 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
12:30 12:45	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
12:45 13:00	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
13:00 13:15	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
13:15 13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00 15:15	2	0	0	2	0	0	0	0	2	0	0	4	4	0	0	0	0	4	6
15:15 15:30	2	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
15:30 15:45	3	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
15:45 16:00	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
16:00 16:15	2	0	0	2	0	0	0	0	2	0	0	1	1	0	0	0	0	1	3
16:15 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30 16:45	3	0	0	3	0	0	0	0	3	0	0	1	1	0	0	0	0	1	4
16:45 17:00	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
17:00 17:15	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
17:15 17:30	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
17:30 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45 18:00	2	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Total: None	31	0	0	31	0	0	0	0	31	0	0	30	30	0	0	0	0	30	61



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BILL LEATHEM DR @ LONGFIELDS DR

**Survey Date:** Wednesday, June 10, 2015

**WO No:** 35082

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute U-Turn Total

#### BILL LEATHEM DR

#### LONGFIELDS DR

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	1	0	1
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	1	0	1
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	1	0	1
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	1	0	1
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	1	0	1
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	1	0	0	0	1
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		1	0	5	0	6

## TRAFFIC IMPACT ASSESSMENT




## APPENDIX D – SYNCHRO 10 REPORTS

# Lanes, Volumes, Timings

## 3: Woodroffe Ave & Longfields Dr/Longfields Dr

AM Peak Hour  
Existing Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰↰	↰		↰	↰	↰		↰	↰↰	↰	↰	↰↰
Traffic Volume (vph)	389	93	86	16	47	138	2	38	1415	52	161	417
Future Volume (vph)	389	93	86	16	47	138	2	38	1415	52	161	417
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	80.0		0.0	63.0		100.0		75.0		55.0	85.0	
Storage Lanes	2		0	1		1		1		1	1	
Taper Length (m)	7.5			7.5				7.5			7.5	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	1.00	0.99		1.00		0.99		0.99		0.98		
Frt		0.928				0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3285	1568	0	1710	1682	1515	0	1548	3386	1530	1660	3257
Flt Permitted	0.950			0.950				0.486			0.065	
Satd. Flow (perm)	3269	1568	0	1708	1682	1492	0	782	3386	1495	114	3257
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		32				138				138		
Link Speed (k/h)		60			70				80			80
Link Distance (m)		897.6			1053.0				729.6			771.4
Travel Time (s)		53.9			54.2				32.8			34.7
Confl. Peds. (#/hr)	2		1	1		2	1	8		1	8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	11%	0%	7%	1%	0%	11%	1%	0%	3%	5%
Adj. Flow (vph)	432	103	96	18	52	153	2	42	1572	58	179	463
Shared Lane Traffic (%)												
Lane Group Flow (vph)	432	199	0	18	52	153	0	44	1572	58	179	463
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		7.2			7.2				3.6			3.6
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	2		1	2	1	1	1	2	1	1	2
Detector Template	Left	Thru		Left	Thru	Right	Left	Left	Thru	Right	Left	Thru
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0				0.0			0.0

Lanes, Volumes, Timings  
3: Woodroffe Ave & Longfields Dr/Longfields Dr

AM Peak Hour  
Existing Conditions


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	116
Future Volume (vph)	116
Ideal Flow (vphpl)	1800
Storage Length (m)	195.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.98
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1471
Flt Permitted	
Satd. Flow (perm)	1438
Right Turn on Red	Yes
Satd. Flow (RTOR)	138
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	0.90
Heavy Vehicles (%)	4%
Adj. Flow (vph)	129
Shared Lane Traffic (%)	
Lane Group Flow (vph)	129
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.07
Turning Speed (k/h)	15
Number of Detectors	1
Detector Template	Right
Leading Detector (m)	2.0
Trailing Detector (m)	0.0
Detector 1 Position(m)	0.0
Detector 1 Size(m)	2.0
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	



# Lanes, Volumes, Timings

## 3: Woodroffe Ave & Longfields Dr/Longfields Dr

AM Peak Hour  
Existing Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases						8	2	2		2	6	
Detector Phase	7	4		3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	20.0	33.0		20.0	33.0	33.0	12.0	12.0	65.0	65.0	12.0	65.0
Total Split (s)	20.0	33.0		20.0	33.0	33.0	12.0	12.0	65.0	65.0	12.0	65.0
Total Split (%)	15.4%	25.4%		15.4%	25.4%	25.4%	9.2%	9.2%	50.0%	50.0%	9.2%	50.0%
Maximum Green (s)	13.5	26.5		13.5	26.5	26.5	5.5	5.5	58.5	58.5	5.5	58.5
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	1.9	1.9	1.9	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	0.0	7.0		0.0	7.0	7.0	0.0	0.0	7.0	7.0	0.0	7.0
Flash Dont Walk (s)	0.0	19.0		0.0	19.0	19.0	0.0	0.0	16.0	16.0	0.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0	0	0	0
Act Effect Green (s)	13.5	26.5		7.0	12.5	12.5		65.8	58.9	58.9	83.4	73.5
Actuated g/C Ratio	0.10	0.20		0.05	0.10	0.10		0.51	0.45	0.45	0.64	0.57
v/c Ratio	1.27	0.58		0.20	0.32	0.57		0.10	1.02	0.08	0.60	0.25
Control Delay	187.5	46.5		63.2	57.3	19.2		11.4	64.8	0.2	36.8	16.6
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	187.5	46.5		63.2	57.3	19.2		11.4	64.8	0.2	36.8	16.6
LOS	F	D		E	E	B		B	E	A	D	B
Approach Delay		143.1			31.6				61.1			19.0
Approach LOS		F			C				E			B

### Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 80 (62%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.27

Intersection Signal Delay: 65.0

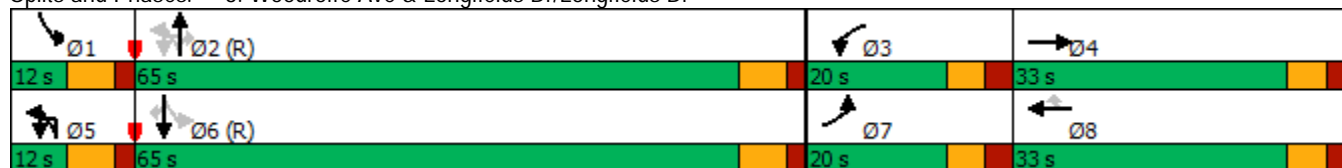
Intersection LOS: E

Intersection Capacity Utilization 85.4%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Woodroffe Ave & Longfields Dr/Longfields Dr



Lanes, Volumes, Timings  
3: Woodroffe Ave & Longfields Dr/Longfields Dr

AM Peak Hour  
Existing Conditions



Lane Group	SBR
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	65.0
Total Split (s)	65.0
Total Split (%)	50.0%
Maximum Green (s)	58.5
Yellow Time (s)	4.6
All-Red Time (s)	1.9
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.5
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	C-Max
Walk Time (s)	7.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	73.5
Actuated g/C Ratio	0.57
v/c Ratio	0.15
Control Delay	3.0
Queue Delay	0.0
Total Delay	3.0
LOS	A
Approach Delay	
Approach LOS	
Intersection Summary	

HCM 6th TWSC  
8: Leikin Dr & Bill Leathem/RCMP Entrance

AM Peak Hour  
Existing Conditions

Intersection												
Int Delay, s/veh	79.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	216	3	32	1	2	4	153	566	4	6	20	38
Future Vol, veh/h	216	3	32	1	2	4	153	566	4	6	20	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	350	-	-	350	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	35	35	35	91	91	91	61	61	61
Heavy Vehicles, %	1	33	0	0	0	25	3	1	0	33	35	0
Mvmt Flow	263	4	39	3	6	11	168	622	4	10	33	62

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1053	1051	64	1071	1080	629	95	0	0	631	0	0
Stage 1	84	84	-	965	965	-	-	-	-	-	-	-
Stage 2	969	967	-	106	115	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.83	6.2	7.1	6.5	6.45	4.13	-	-	4.43	-	-
Critical Hdwy Stg 1	6.11	5.83	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.83	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.297	3.3	3.5	4	3.525	2.227	-	-	2.497	-	-
Pot Cap-1 Maneuver	~ 205	200	1006	200	220	443	1493	-	-	819	-	-
Stage 1	927	769	-	309	336	-	-	-	-	-	-	-
Stage 2	306	295	-	905	804	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 177	175	1006	171	192	441	1493	-	-	816	-	-
Mov Cap-2 Maneuver	~ 177	175	-	171	192	-	-	-	-	-	-	-
Stage 1	822	760	-	273	297	-	-	-	-	-	-	-
Stage 2	~ 259	260	-	855	794	-	-	-	-	-	-	-

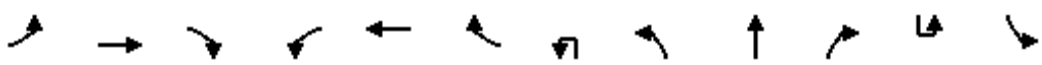
Approach	EB	WB	NB	SB
HCM Control Delay, s	312.6	19.1	1.6	0.9
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1493	-	-	198	276	816	-
HCM Lane V/C Ratio	0.113	-	-	1.546	0.072	0.012	-
HCM Control Delay (s)	7.7	-	-	312.6	19.1	9.5	-
HCM Lane LOS	A	-	-	F	C	A	-
HCM 95th %tile Q(veh)	0.4	-	-	19.4	0.2	0	-

Notes												
-: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

Lanes, Volumes, Timings  
3: Woodroffe Ave & Longfields Dr/Longfields Dr

PM Peak Hour  
Existing Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	162	18	73	58	58	151	3	93	796	41	1	108
Future Volume (vph)	162	18	73	58	58	151	3	93	796	41	1	108
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	80.0		0.0	63.0		100.0		75.0		55.0		85.0
Storage Lanes	2		0	1		1		1		1		1
Taper Length (m)	7.5			7.5				7.5				7.5
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00					0.99						1.00
Frt		0.880				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3252	1547	0	1710	1800	1500	0	1662	3353	1530	0	1710
Flt Permitted	0.950			0.950				0.066				0.260
Satd. Flow (perm)	3243	1547	0	1710	1800	1479	0	115	3353	1530	0	468
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		81				157				157		
Link Speed (k/h)		60			70				80			
Link Distance (m)		897.6			1053.0				729.6			
Travel Time (s)		53.9			54.2				32.8			
Confl. Peds. (#/hr)	1						1	3			1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	3%	0%	0%	2%	0%	3%	2%	0%	0%	0%
Adj. Flow (vph)	180	20	81	64	64	168	3	103	884	46	1	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	180	101	0	64	64	168	0	106	884	46	0	121
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(m)		7.2			7.2				3.6			
Link Offset(m)		0.0			0.0				0.0			
Crosswalk Width(m)		4.8			4.8				4.8			
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	15	25		15	15	25
Number of Detectors	1	2		1	2	1	1	1	2	1	1	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Left	Thru	Right	Left	Left
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	2.0	10.0	2.0	2.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	2.0	0.6	2.0	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			
Detector 2 Size(m)		0.6			0.6				0.6			
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0				0.0			

Lanes, Volumes, Timings  
3: Woodroffe Ave & Longfields Dr/Longfields Dr

PM Peak Hour  
Existing Conditions



Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	1757	233
Future Volume (vph)	1757	233
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		195.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.97
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3386	1530
Flt Permitted		
Satd. Flow (perm)	3386	1485
Right Turn on Red		Yes
Satd. Flow (RTOR)		259
Link Speed (k/h)	80	
Link Distance (m)	771.4	
Travel Time (s)	34.7	
Confl. Peds. (#/hr)		3
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	1%	0%
Adj. Flow (vph)	1952	259
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1952	259
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(m)	3.6	
Link Offset(m)	0.0	
Crosswalk Width(m)	4.8	
Two way Left Turn Lane		
Headway Factor	1.07	1.07
Turning Speed (k/h)		15
Number of Detectors	2	1
Detector Template	Thru	Right
Leading Detector (m)	10.0	2.0
Trailing Detector (m)	0.0	0.0
Detector 1 Position(m)	0.0	0.0
Detector 1 Size(m)	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex
Detector 1 Channel		
Detector 1 Extend (s)	0.0	0.0
Detector 1 Queue (s)	0.0	0.0
Detector 1 Delay (s)	0.0	0.0
Detector 2 Position(m)	9.4	
Detector 2 Size(m)	0.6	
Detector 2 Type	Cl+Ex	
Detector 2 Channel		
Detector 2 Extend (s)	0.0	

# Lanes, Volumes, Timings

## 3: Woodroffe Ave & Longfields Dr/Longfields Dr

PM Peak Hour  
Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8	2	2		2	6	6
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	15.0	33.0		15.0	33.0	33.0	12.0	12.0	50.0	50.0	12.0	12.0
Total Split (s)	15.0	33.0		15.0	33.0	33.0	12.0	12.0	55.0	55.0	12.0	12.0
Total Split (%)	13.0%	28.7%		13.0%	28.7%	28.7%	10.4%	10.4%	47.8%	47.8%	10.4%	10.4%
Maximum Green (s)	8.5	26.5		8.5	26.5	26.5	5.5	5.5	48.5	48.5	5.5	5.5
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	1.9	1.9	1.9	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		6.5	6.5	6.5		6.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0	0	0	0
Act Effect Green (s)	8.5	12.8		7.9	9.7	9.7		71.6	62.3	62.3		69.9
Actuated g/C Ratio	0.07	0.11		0.07	0.08	0.08		0.62	0.54	0.54		0.61
v/c Ratio	0.75	0.41		0.55	0.42	0.63		0.54	0.49	0.05		0.32
Control Delay	71.9	20.4		69.2	57.3	20.0		26.9	18.3	0.1		9.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	71.9	20.4		69.2	57.3	20.0		26.9	18.3	0.1		9.9
LOS	E	C		E	E	B		C	B	A		A
Approach Delay		53.4			38.7				18.4			
Approach LOS		D			D				B			

### Intersection Summary

Area Type: Other  
 Cycle Length: 115  
 Actuated Cycle Length: 115  
 Offset: 92 (80%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.08  
 Intersection Signal Delay: 48.5  
 Intersection Capacity Utilization 84.7%  
 Analysis Period (min) 15

Intersection LOS: D

ICU Level of Service E

### Splits and Phases: 3: Woodroffe Ave & Longfields Dr/Longfields Dr

	Ø1		Ø2 (R)		Ø3		Ø4
12 s		55 s		15 s		33 s	
	Ø5		Ø6 (R)		Ø7		Ø8
12 s		55 s		15 s		33 s	



Lanes, Volumes, Timings  
3: Woodroffe Ave & Longfields Dr/Longfields Dr

PM Peak Hour  
Existing Conditions
























Lane Group	SBT	SBR
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	50.0	50.0
Total Split (s)	55.0	55.0
Total Split (%)	47.8%	47.8%
Maximum Green (s)	48.5	48.5
Yellow Time (s)	4.6	4.6
All-Red Time (s)	1.9	1.9
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.5	6.5
Lead/Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	3.0	3.0
Recall Mode	C-Max	C-Max
Walk Time (s)	7.0	7.0
Flash Dont Walk (s)	11.0	11.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)	61.4	61.4
Actuated g/C Ratio	0.53	0.53
v/c Ratio	1.08	0.28
Control Delay	73.7	2.9
Queue Delay	0.0	0.0
Total Delay	73.7	2.9
LOS	E	A
Approach Delay	62.5	
Approach LOS	E	
Intersection Summary		

# Lanes, Volumes, Timings

## 3: Woodroffe Ave & Longfields Dr/Longfields Dr

PM Peak Hour  
2025 Background Traffic

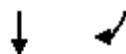
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	175	19	79	62	62	162	3	100	857	44	1	116
Future Volume (vph)	175	19	79	62	62	162	3	100	857	44	1	116
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	80.0		0.0	150.0		120.0		75.0		55.0		85.0
Storage Lanes	2		0	1		1		1		1		1
Taper Length (m)	50.0			77.0				40.0				7.5
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00					0.99						1.00
Frt		0.879				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3252	1545	0	1710	1800	1500	0	1661	3353	1530	0	1710
Flt Permitted	0.950			0.950				0.066				0.233
Satd. Flow (perm)	3246	1545	0	1710	1800	1480	0	115	3353	1530	0	419
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		88				157				157		
Link Speed (k/h)		60			70				80			
Link Distance (m)		897.6			1053.0				729.6			
Travel Time (s)		53.9			54.2				32.8			
Confl. Peds. (#/hr)	1						1		3		1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	3%	0%	0%	2%	0%	3%	2%	0%	0%	0%
Adj. Flow (vph)	194	21	88	69	69	180	3	111	952	49	1	129
Shared Lane Traffic (%)												
Lane Group Flow (vph)	194	109	0	69	69	180	0	114	952	49	0	130
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(m)		7.2			7.2				3.6			
Link Offset(m)		0.0			0.0				0.0			
Crosswalk Width(m)		4.8			4.8				4.8			
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	15	25		15	15	25
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8	2	2		2	6	6
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	15.0	33.0		15.0	33.0	33.0	12.0	12.0	50.0	50.0	12.0	12.0
Total Split (s)	15.0	33.0		15.0	33.0	33.0	12.0	12.0	55.0	55.0	12.0	12.0
Total Split (%)	13.0%	28.7%		13.0%	28.7%	28.7%	10.4%	10.4%	47.8%	47.8%	10.4%	10.4%
Maximum Green (s)	8.5	26.5		8.5	26.5	26.5	5.5	5.5	48.5	48.5	5.5	5.5
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	1.9	1.9	1.9	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		6.5	6.5	6.5		6.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Baseline

Synchro 10 Report  
Page 1

Lanes, Volumes, Timings  
3: Woodroffe Ave & Longfields Dr/Longfields Dr













PM Peak Hour  
2025 Background Traffic



Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	1893	251
Future Volume (vph)	1893	251
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		195.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.97
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3386	1530
Flt Permitted		
Satd. Flow (perm)	3386	1488
Right Turn on Red		Yes
Satd. Flow (RTOR)		279
Link Speed (k/h)	80	
Link Distance (m)	771.4	
Travel Time (s)	34.7	
Confl. Peds. (#/hr)		3
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	1%	0%
Adj. Flow (vph)	2103	279
Shared Lane Traffic (%)		
Lane Group Flow (vph)	2103	279
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(m)	3.6	
Link Offset(m)	0.0	
Crosswalk Width(m)	4.8	
Two way Left Turn Lane		
Headway Factor	1.07	1.07
Turning Speed (k/h)		15
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	50.0	50.0
Total Split (s)	55.0	55.0
Total Split (%)	47.8%	47.8%
Maximum Green (s)	48.5	48.5
Yellow Time (s)	4.6	4.6
All-Red Time (s)	1.9	1.9
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.5	6.5
Lead/Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes

Lanes, Volumes, Timings  
3: Woodroffe Ave & Longfields Dr/Longfields Dr

PM Peak Hour  
2025 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
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
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	None
Walk Time (s)	0.0	7.0		0.0	7.0	7.0	0.0	0.0	7.0	7.0	0.0	0.0
Flash Dont Walk (s)	0.0	19.0		0.0	19.0	19.0	0.0	0.0	16.0	16.0	0.0	0.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0	0	0	0
Act Effect Green (s)	8.5	13.2		8.0	10.2	10.2		71.6	61.5	61.5		69.0
Actuated g/C Ratio	0.07	0.11		0.07	0.09	0.09		0.62	0.53	0.53		0.60
v/c Ratio	0.81	0.43		0.58	0.43	0.66		0.55	0.53	0.05		0.37
Control Delay	77.5	19.8		71.3	57.0	22.6		28.2	19.6	0.1		11.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	77.5	19.8		71.3	57.0	22.6		28.2	19.6	0.1		11.0
LOS	E	B		E	E	C		C	B	A		B
Approach Delay	56.8			40.6				19.6				
Approach LOS	E			D				B				

Intersection Summary

Area Type: Other

Cycle Length: 115

Actuated Cycle Length: 115

Offset: 92 (80%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.19

Intersection Signal Delay: 70.8

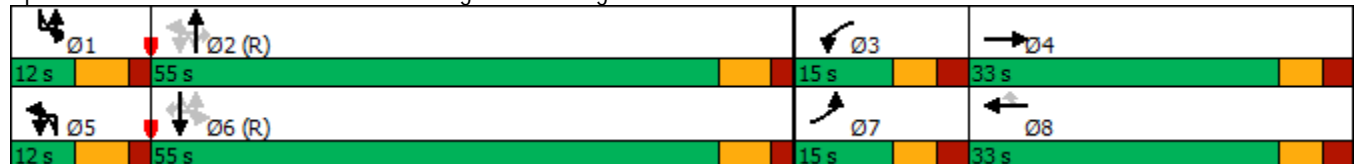
Intersection LOS: E

Intersection Capacity Utilization 89.4%

ICU Level of Service E

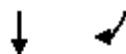
Analysis Period (min) 15

Splits and Phases: 3: Woodroffe Ave & Longfields Dr/Longfields Dr



Lanes, Volumes, Timings  
3: Woodroffe Ave & Longfields Dr/Longfields Dr

PM Peak Hour  
2025 Background Traffic



Lane Group	SBT	SBR
Vehicle Extension (s)	3.0	3.0
Recall Mode	C-Max	C-Max
Walk Time (s)	7.0	7.0
Flash Dont Walk (s)	16.0	16.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)	60.2	60.2
Actuated g/C Ratio	0.52	0.52
v/c Ratio	1.19	0.31
Control Delay	117.3	3.1
Queue Delay	0.0	0.0
Total Delay	117.3	3.1
LOS	F	A
Approach Delay	99.1	
Approach LOS	F	
Intersection Summary		

# Queuing and Blocking Report

## Baseline

PM Peak Hour  
2025 Background Traffic

### Intersection: 3: Woodroffe Ave & Longfields Dr/Longfields Dr

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	TR	L	T	UL	T	T	UL	T	T	R
Maximum Queue (m)	45.8	46.4	44.7	33.3	36.3	43.8	64.9	59.7	92.4	402.0	407.8	202.5
Average Queue (m)	21.4	25.9	19.0	15.6	13.7	18.8	34.9	31.5	34.1	197.3	197.5	65.8
95th Queue (m)	37.4	40.9	34.2	30.6	27.4	34.3	58.9	55.3	91.4	464.7	460.9	206.4
Link Distance (m)			881.1		1038.0		715.3	715.3		757.5	757.5	
Upstream Blk Time (%)										0	0	
Queuing Penalty (veh)										0	0	
Storage Bay Dist (m)	80.0	80.0		150.0		75.0			85.0			195.0
Storage Blk Time (%)							0	1	0	24	10	0
Queuing Penalty (veh)							0	0	0	29	25	1

### Intersection: 8: Leiking Dr & Bill Leathem/RCMP Entrance

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	TR
Maximum Queue (m)	35.4	6.7	20.9	20.2
Average Queue (m)	17.0	0.5	7.2	1.6
95th Queue (m)	28.2	3.6	15.5	9.9
Link Distance (m)	522.8	758.9		814.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			35.0	
Storage Blk Time (%)			0	0
Queuing Penalty (veh)			0	0







### Network Summary

Network wide Queuing Penalty: 55



HCM 6th TWSC  
8: Leiking Dr & Bill Leathem/RCMP Entrance

PM Peak Hour  
2025 Background Traffic

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	47	0	177	0	1	0	71	62	0	0	398	200
Future Vol, veh/h	47	0	177	0	1	0	71	62	0	0	398	200
Conflicting Peds, #/hr	4	0	4	4	0	4	4	0	48	48	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	350	-	-	350	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	25	25	25	87	87	87	92	92	92
Heavy Vehicles, %	0	0	1	0	0	0	0	14	0	0	1	2
Mvmt Flow	48	0	182	0	4	0	82	71	0	0	433	217
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	787	829	550	920	937	123	654	0	0	119	0	0
Stage 1	546	546	-	283	283	-	-	-	-	-	-	-
Stage 2	241	283	-	637	654	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.21	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.309	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	312	308	537	254	267	933	943	-	-	1482	-	-
Stage 1	526	521	-	728	681	-	-	-	-	-	-	-
Stage 2	767	681	-	469	466	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	285	269	533	149	233	892	940	-	-	1422	-	-
Mov Cap-2 Maneuver	285	269	-	149	233	-	-	-	-	-	-	-
Stage 1	479	519	-	638	597	-	-	-	-	-	-	-
Stage 2	693	597	-	307	465	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	21.1		20.7			4.9			0			
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	940	-	-	451	233	1422	-	-				
HCM Lane V/C Ratio	0.087	-	-	0.512	0.017	-	-	-				
HCM Control Delay (s)	9.2	-	-	21.1	20.7	0	-	-				
HCM Lane LOS	A	-	-	C	C	A	-	-				
HCM 95th %tile Q(veh)	0.3	-	-	2.9	0.1	0	-	-				

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Phone: Fax: E-Mail:

\_\_\_\_\_Directional Two-Lane Highway Segment

Analysis\_\_\_\_\_

Analyst MP Agency/Co. McIntosh Perry Date Performed 2020-06-12 Analysis  
Time Period EB AM Peak Highway Bill Leathem Drive From/To Lonfeilds Drive -  
Leikin Drive Jurisdiction Analysis Year 2020 Description Bill Leatehm  
Drive EB

\_\_\_\_\_Input

Data\_\_\_\_\_

Highway class Class 3 Peak hour factor, PHF 0.88 Shoulder width 6.0 ft %  
Trucks and buses 2 % Lane width 17.0 ft % Trucks crawling 0.0 % Segment  
length 0.4 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational  
vehicles 4 % Grade: Length - mi % No-passing zones 100 % Up/down - %  
Access point density 4 /mi

Analysis direction volume, Vd 251 veh/h Opposing direction volume, Vo 193  
veh/h

\_\_\_\_\_Average Travel

Speed\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.4 1.5 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.992 0.990 Grade  
adj. factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi 288 pc/h  
222 pc/h

Free-Flow Speed from Field Measurement: Field measured speed,(note-3) S FM  
35 mi/h Observed total demand,(note-3) V 0 veh/h Estimated Free-Flow Speed:  
Base free-flow speed,(note-3) BFFS - mi/h Adj. for lane and shoulder  
width,(note-3) fLS - mi/h Adj. for access point density,(note-3) fA - mi/h

Free-flow speed, FFSD 35.0 mi/h

Adjustment for no-passing zones, fnp 3.9 mi/h Average travel speed, ATSD  
27.2 mi/h Percent Free Flow Speed, PFFS 77.7 %

\_\_\_\_\_Percent Time-Spent-

Following\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.1 1.1 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adjustment factor, fHV 0.998 0.998 Grade  
adjustment factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi  
286 pc/h 220 pc/h Base percent time-spent-following,(note-4) BPTSFD 30.1 %  
Adjustment for no-passing zones, fnp 57.4 Percent time-spent-following,  
PTSFD 62.5 %

\_\_\_\_\_Level of Service and Other Performance

Measures\_\_\_\_\_

Level of service, LOS C Volume to capacity ratio, v/c 0.17 Peak 15-min  
vehicle-miles of travel, VMT15 29 veh-mi Peak-hour vehicle-miles of travel,  
VMT60 100 veh-mi Peak 15-min total travel time, TT15 1.1 veh-h Capacity  
from ATS, CdATS 1700 veh/h Capacity from PTSF, CdPTSF 1700 veh/h  
Directional Capacity 3010 veh/h

\_\_\_\_\_Passing Lane

Analysis\_\_\_\_\_

Total length of analysis segment, Lt 0.4 mi Length of two-lane highway upstream of the passing lane, Lu - mi Length of passing lane including tapers, Lpl - mi Average travel speed, ATSD (from above) 27.2 mi/h Percent time-spent-following, PTSFd (from above) 62.5 Level of service, LOSd (from above) C

\_\_\_\_\_Average Travel Speed with Passing  
Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld - mi Adj. factor for the effect of passing lane on average speed, fpl - Average travel speed including passing lane, ATSpl -  
\_\_\_\_\_Percent Time-Spent-Following with Passing

Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld - mi Adj. factor for the effect of passing lane on percent time-spent-following, fpl - Percent time-spent-following including passing lane, PTSFpl - %

\_\_\_\_\_Level of Service and Other Performance Measures with Passing Lane

\_\_\_\_\_

Level of service including passing lane, LOSpl - Peak 15-min total travel time, TT15 - veh-h

\_\_\_\_\_ Bicycle Level of Service

\_\_\_\_\_

Posted speed limit, Sp 55 Percent of segment with occupied on-highway parking 0 Pavement rating, P 3 Flow rate in outside lane, vOL 285.2 Effective width of outside lane, We 29.00 Effective speed factor, St 4.79 Bicycle LOS Score, BLOS 0.90 Bicycle LOS A

Notes: 1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain. 2. If  $v_i$  ( $v_d$  or  $v_o$ )  $\geq 1,700$  pc/h, terminate analysis-the LOS is F. 3. For the analysis direction only and for  $v > 200$  veh/h. 4. For the analysis direction only. 5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax: E-Mail:

\_\_\_\_\_ Directional Two-Lane Highway Segment  
Analysis\_\_\_\_\_

Analyst MP Agency/Co. McIntosh Perry Date Performed 2020-06-12 Analysis  
Time Period WB AM Peak Highway Bill Leathem Drive From/To Lonfeilds Drive -  
Leikin Drive Jurisdiction Analysis Year 2020 Description Bill Leatehm  
Drive EB

\_\_\_\_\_ Input  
Data\_\_\_\_\_

Highway class Class 3 Peak hour factor, PHF 0.88 Shoulder width 6.0 ft %  
Trucks and buses 2 % Lane width 17.0 ft % Trucks crawling 0.0 % Segment  
length 0.4 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational  
vehicles 4 % Grade: Length - mi % No-passing zones 100 % Up/down - %  
Access point density 4 /mi

Analysis direction volume, Vd 193 veh/h Opposing direction volume, Vo 251  
veh/h

\_\_\_\_\_ Average Travel  
Speed\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.5 1.4 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.990 0.992 Grade  
adj. factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi 222 pc/h  
288 pc/h

Free-Flow Speed from Field Measurement: Field measured speed,(note-3) S FM  
35 mi/h Observed total demand,(note-3) V 0 veh/h Estimated Free-Flow Speed:  
Base free-flow speed,(note-3) BFFS - mi/h Adj. for lane and shoulder  
width,(note-3) fLS - mi/h Adj. for access point density,(note-3) fA - mi/h

Free-flow speed, FFSD 35.0 mi/h

Adjustment for no-passing zones, fnp 3.4 mi/h Average travel speed, ATSD  
27.6 mi/h Percent Free Flow Speed, PFFS 78.9 %

\_\_\_\_\_ Percent Time-Spent-  
Following\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.1 1.1 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adjustment factor, fHV 0.998 0.998 Grade  
adjustment factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi  
220 pc/h 286 pc/h Base percent time-spent-following,(note-4) BPTSFD 25.0 %  
Adjustment for no-passing zones, fnp 57.4 Percent time-spent-following,  
PTSFD 50.0 %

\_\_\_\_\_ Level of Service and Other Performance  
Measures\_\_\_\_\_

Level of service, LOS C Volume to capacity ratio, v/c 0.17 Peak 15-min  
vehicle-miles of travel, VMT15 22 veh-mi Peak-hour vehicle-miles of travel,  
VMT60 77 veh-mi Peak 15-min total travel time, TT15 0.8 veh-h Capacity from  
ATS, CdATS 1700 veh/h Capacity from PTSF, CdPTSF 1700 veh/h Directional  
Capacity 3010 veh/h

\_\_\_\_\_ Passing Lane

Analysis\_\_\_\_\_

Total length of analysis segment, Lt 0.4 mi Length of two-lane highway upstream of the passing lane, Lu - mi Length of passing lane including tapers, Lpl - mi Average travel speed, ATSD (from above) 27.6 mi/h Percent time-spent-following, PTSFd (from above) 50.0 Level of service, LOSd (from above) C

\_\_\_\_\_Average Travel Speed with Passing  
Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld - mi Adj. factor for the effect of passing lane on average speed, fpl - Average travel speed including passing lane, ATSpl -  
\_\_\_\_\_Percent Time-Spent-Following with Passing

Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld - mi Adj. factor for the effect of passing lane on percent time-spent-following, fpl - Percent time-spent-following including passing lane, PTSFpl - %

\_\_\_\_\_Level of Service and Other Performance Measures with Passing Lane

\_\_\_\_\_

Level of service including passing lane, LOSpl - Peak 15-min total travel time, TT15 - veh-h

\_\_\_\_\_ Bicycle Level of Service

\_\_\_\_\_

Posted speed limit, Sp 55 Percent of segment with occupied on-highway parking 0 Pavement rating, P 3 Flow rate in outside lane, vOL 219.3 Effective width of outside lane, We 29.00 Effective speed factor, St 4.79 Bicycle LOS Score, BLOS 0.77 Bicycle LOS A

Notes: 1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain. 2. If  $v_i$  ( $v_d$  or  $v_o$ )  $\geq 1,700$  pc/h, terminate analysis-the LOS is F. 3. For the analysis direction only and for  $v > 200$  veh/h. 4. For the analysis direction only. 5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.1

Phone: Fax: E-Mail:

\_\_\_\_\_Directional Two-Lane Highway Segment

Analysis\_\_\_\_\_

Analyst MP Agency/Co. McIntosh Perry Date Performed 2020-06-12 Analysis  
Time Period EB AM Peak Highway Bill Leathem Drive From/To Lonfeilds Drive -  
Leikin Drive Jurisdiction Analysis Year 2025 Description Bill Leatehm  
Drive EB

\_\_\_\_\_Input

Data\_\_\_\_\_

Highway class Class 3 Peak hour factor, PHF 0.88 Shoulder width 6.0 ft %  
Trucks and buses 2 % Lane width 17.0 ft % Trucks crawling 0.0 % Segment  
length 0.4 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational  
vehicles 4 % Grade: Length - mi % No-passing zones 100 % Up/down - %  
Access point density 4 /mi

Analysis direction volume, Vd 271 veh/h Opposing direction volume, Vo 207  
veh/h

\_\_\_\_\_Average Travel

Speed\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.4 1.5 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.992 0.990 Grade  
adj. factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi 310 pc/h  
238 pc/h

Free-Flow Speed from Field Measurement: Field measured speed,(note-3) S FM  
35 mi/h Observed total demand,(note-3) V 0 veh/h Estimated Free-Flow Speed:  
Base free-flow speed,(note-3) BFFS - mi/h Adj. for lane and shoulder  
width,(note-3) fLS - mi/h Adj. for access point density,(note-3) fA - mi/h

Free-flow speed, FFSD 35.0 mi/h

Adjustment for no-passing zones, fnp 3.8 mi/h Average travel speed, ATSD  
27.0 mi/h Percent Free Flow Speed, PFFS 77.1 %

\_\_\_\_\_Percent Time-Spent-

Following\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.1 1.1 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adjustment factor, fHV 0.998 0.998 Grade  
adjustment factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi  
309 pc/h 236 pc/h Base percent time-spent-following,(note-4) BPTSFD 31.4 %  
Adjustment for no-passing zones, fnp 56.5 Percent time-spent-following,  
PTSFD 63.4 %

\_\_\_\_\_Level of Service and Other Performance

Measures\_\_\_\_\_

Level of service, LOS C Volume to capacity ratio, v/c 0.18 Peak 15-min  
vehicle-miles of travel, VMT15 31 veh-mi Peak-hour vehicle-miles of travel,  
VMT60 108 veh-mi Peak 15-min total travel time, TT15 1.1 veh-h Capacity  
from ATS, CdATS 1700 veh/h Capacity from PTSF, CdPTSF 1700 veh/h  
Directional Capacity 3005 veh/h

\_\_\_\_\_Passing Lane

Analysis\_\_\_\_\_

Total length of analysis segment, Lt 0.4 mi Length of two-lane highway upstream of the passing lane, Lu - mi Length of passing lane including tapers, Lpl - mi Average travel speed, ATSD (from above) 27.0 mi/h Percent time-spent-following, PTSFd (from above) 63.4 Level of service, LOSd (from above) C

\_\_\_\_\_Average Travel Speed with Passing  
Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld - mi Adj. factor for the effect of passing lane on average speed, fpl - Average travel speed including passing lane, ATSpl -  
\_\_\_\_\_Percent Time-Spent-Following with Passing

Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld - mi Adj. factor for the effect of passing lane on percent time-spent-following, fpl - Percent time-spent-following including passing lane, PTSFpl - %

\_\_\_\_\_Level of Service and Other Performance Measures with Passing Lane

\_\_\_\_\_

Level of service including passing lane, LOSpl - Peak 15-min total travel time, TT15 - veh-h

\_\_\_\_\_ Bicycle Level of Service

\_\_\_\_\_

Posted speed limit, Sp 55 Percent of segment with occupied on-highway parking 0 Pavement rating, P 3 Flow rate in outside lane, vOL 308.0 Effective width of outside lane, We 29.00 Effective speed factor, St 4.79 Bicycle LOS Score, BLOS 0.94 Bicycle LOS A

Notes: 1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain. 2. If  $v_i$  ( $v_d$  or  $v_o$ )  $\geq 1,700$  pc/h, terminate analysis-the LOS is F. 3. For the analysis direction only and for  $v > 200$  veh/h. 4. For the analysis direction only. 5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.



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Phone: Fax: E-Mail:

\_\_\_\_\_ Directional Two-Lane Highway Segment  
Analysis\_\_\_\_\_

Analyst MP Agency/Co. McIntosh Perry Date Performed 2020-06-12 Analysis  
Time Period EB PM Peak Highway Bill Leathem Drive From/To Lonfeilds Drive -  
Leikin Drive Jurisdiction Analysis Year 2025 Description Bill Leatehm  
Drive

\_\_\_\_\_ Input  
Data\_\_\_\_\_

Highway class Class 3 Peak hour factor, PHF 0.88 Shoulder width 6.0 ft %  
Trucks and buses 2 % Lane width 17.0 ft % Trucks crawling 0.0 % Segment  
length 0.4 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational  
vehicles 4 % Grade: Length - mi % No-passing zones 100 % Up/down - %  
Access point density 4 /mi

Analysis direction volume, Vd 224 veh/h Opposing direction volume, Vo 272  
veh/h

\_\_\_\_\_ Average Travel  
Speed\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.4 1.4 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.992 0.992 Grade  
adj. factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi 257 pc/h  
312 pc/h

Free-Flow Speed from Field Measurement: Field measured speed,(note-3) S FM  
35 mi/h Observed total demand,(note-3) V 0 veh/h Estimated Free-Flow Speed:  
Base free-flow speed,(note-3) BFFS - mi/h Adj. for lane and shoulder  
width,(note-3) fLS - mi/h Adj. for access point density,(note-3) fA - mi/h

Free-flow speed, FFSD 35.0 mi/h

Adjustment for no-passing zones, fnp 3.3 mi/h Average travel speed, ATSD  
27.3 mi/h Percent Free Flow Speed, PFFS 78.0 %

\_\_\_\_\_ Percent Time-Spent-  
Following\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.1 1.1 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adjustment factor, fHV 0.998 0.998 Grade  
adjustment factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi  
255 pc/h 310 pc/h Base percent time-spent-following,(note-4) BPTSFD 28.7 %  
Adjustment for no-passing zones, fnp 56.7 Percent time-spent-following,  
PTSFD 54.3 %

\_\_\_\_\_ Level of Service and Other Performance  
Measures\_\_\_\_\_

Level of service, LOS C Volume to capacity ratio, v/c 0.18 Peak 15-min  
vehicle-miles of travel, VMT15 25 veh-mi Peak-hour vehicle-miles of travel,  
VMT60 90 veh-mi Peak 15-min total travel time, TT15 0.9 veh-h Capacity from  
ATS, CdATS 1700 veh/h Capacity from PTSF, CdPTSF 1700 veh/h Directional  
Capacity 3100 veh/h

\_\_\_\_\_ Passing Lane

Analysis\_\_\_\_\_

Total length of analysis segment, Lt 0.4 mi Length of two-lane highway upstream of the passing lane, Lu - mi Length of passing lane including tapers, Lpl - mi Average travel speed, ATSD (from above) 27.3 mi/h Percent time-spent-following, PTSFd (from above) 54.3 Level of service, LOSd (from above) C

\_\_\_\_\_Average Travel Speed with Passing  
Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld - mi Adj. factor for the effect of passing lane on average speed, fpl - Average travel speed including passing lane, ATSpl -  
\_\_\_\_\_Percent Time-Spent-Following with Passing

Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld - mi Adj. factor for the effect of passing lane on percent time-spent-following, fpl - Percent time-spent-following including passing lane, PTSFpl - %

\_\_\_\_\_Level of Service and Other Performance Measures with Passing Lane

\_\_\_\_\_

Level of service including passing lane, LOSpl - Peak 15-min total travel time, TT15 - veh-h

\_\_\_\_\_ Bicycle Level of Service

\_\_\_\_\_

Posted speed limit, Sp 55 Percent of segment with occupied on-highway parking 0 Pavement rating, P 3 Flow rate in outside lane, vOL 254.5 Effective width of outside lane, We 29.00 Effective speed factor, St 4.79 Bicycle LOS Score, BLOS 0.84 Bicycle LOS A

Notes: 1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain. 2. If  $v_i$  ( $v_d$  or  $v_o$ )  $\geq 1,700$  pc/h, terminate analysis-the LOS is F. 3. For the analysis direction only and for  $v > 200$  veh/h. 4. For the analysis direction only. 5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax: E-Mail:

\_\_\_\_\_Directional Two-Lane Highway Segment

Analysis\_\_\_\_\_

Analyst MP Agency/Co. McIntosh Perry Date Performed 2020-06-12 Analysis  
Time Period EB PM Peak Highway Bill Leathem Drive From/To Lonfeilds Drive -  
Leikin Drive Jurisdiction Analysis Year 2020 Description Bill Leatehm  
Drive EB

\_\_\_\_\_Input

Data\_\_\_\_\_

Highway class Class 3 Peak hour factor, PHF 0.88 Shoulder width 6.0 ft %  
Trucks and buses 2 % Lane width 17.0 ft % Trucks crawling 0.0 % Segment  
length 0.4 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational  
vehicles 4 % Grade: Length - mi % No-passing zones 100 % Up/down - %  
Access point density 4 /mi

Analysis direction volume, Vd 208 veh/h Opposing direction volume, Vo 252  
veh/h

\_\_\_\_\_Average Travel

Speed\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.5 1.4 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.990 0.992 Grade  
adj. factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi 239 pc/h  
289 pc/h

Free-Flow Speed from Field Measurement: Field measured speed,(note-3) S FM  
35 mi/h Observed total demand,(note-3) V 0 veh/h Estimated Free-Flow Speed:  
Base free-flow speed,(note-3) BFFS - mi/h Adj. for lane and shoulder  
width,(note-3) fLS - mi/h Adj. for access point density,(note-3) fA - mi/h

Free-flow speed, FFSD 35.0 mi/h

Adjustment for no-passing zones, fnp 3.4 mi/h Average travel speed, ATSD  
27.5 mi/h Percent Free Flow Speed, PFFS 78.5 %

\_\_\_\_\_Percent Time-Spent-

Following\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.1 1.1 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adjustment factor, fHV 0.998 0.998 Grade  
adjustment factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi  
237 pc/h 287 pc/h Base percent time-spent-following,(note-4) BPTSFD 26.5 %  
Adjustment for no-passing zones, fnp 57.8 Percent time-spent-following,  
PTSFD 52.6 %

\_\_\_\_\_Level of Service and Other Performance

Measures\_\_\_\_\_

Level of service, LOS C Volume to capacity ratio, v/c 0.17 Peak 15-min  
vehicle-miles of travel, VMT15 24 veh-mi Peak-hour vehicle-miles of travel,  
VMT60 83 veh-mi Peak 15-min total travel time, TT15 0.9 veh-h Capacity from  
ATS, CdATS 1700 veh/h Capacity from PTSF, CdPTSF 1700 veh/h Directional  
Capacity 3105 veh/h

\_\_\_\_\_Passing Lane

Analysis\_\_\_\_\_

Total length of analysis segment, Lt 0.4 mi Length of two-lane highway upstream of the passing lane, Lu - mi Length of passing lane including tapers, Lpl - mi Average travel speed, ATSD (from above) 27.5 mi/h Percent time-spent-following, PTSFd (from above) 52.6 Level of service, LOSd (from above) C

\_\_\_\_\_Average Travel Speed with Passing  
Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld - mi Adj. factor for the effect of passing lane on average speed, fpl - Average travel speed including passing lane, ATSpl -  
\_\_\_\_\_Percent Time-Spent-Following with Passing

Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld - mi Adj. factor for the effect of passing lane on percent time-spent-following, fpl - Percent time-spent-following including passing lane, PTSFpl - %

\_\_\_\_\_Level of Service and Other Performance Measures with Passing Lane

\_\_\_\_\_

Level of service including passing lane, LOSpl - Peak 15-min total travel time, TT15 - veh-h

\_\_\_\_\_ Bicycle Level of Service

\_\_\_\_\_

Posted speed limit, Sp 55 Percent of segment with occupied on-highway parking 0 Pavement rating, P 3 Flow rate in outside lane, vOL 236.4 Effective width of outside lane, We 29.00 Effective speed factor, St 4.79 Bicycle LOS Score, BLOS 0.80 Bicycle LOS A

Notes: 1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain. 2. If  $v_i$  ( $v_d$  or  $v_o$ )  $\geq 1,700$  pc/h, terminate analysis-the LOS is F. 3. For the analysis direction only and for  $v > 200$  veh/h. 4. For the analysis direction only. 5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax: E-Mail:

\_\_\_\_\_Directional Two-Lane Highway Segment

Analysis\_\_\_\_\_

Analyst MP Agency/Co. McIntosh Perry Date Performed 2020-06-12 Analysis  
Time Period WB PM Peak Highway Bill Leathem Drive From/To Lonfeilds Drive -  
Leikin Drive Jurisdiction Analysis Year 2020 Description Bill Leatehm  
Drive EB

\_\_\_\_\_Input

Data\_\_\_\_\_

Highway class Class 3 Peak hour factor, PHF 0.88 Shoulder width 6.0 ft %  
Trucks and buses 2 % Lane width 17.0 ft % Trucks crawling 0.0 % Segment  
length 0.4 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational  
vehicles 4 % Grade: Length - mi % No-passing zones 100 % Up/down - %  
Access point density 4 /mi

Analysis direction volume, Vd 252 veh/h Opposing direction volume, Vo 208  
veh/h

\_\_\_\_\_Average Travel

Speed\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.4 1.5 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.992 0.990 Grade  
adj. factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi 289 pc/h  
239 pc/h

Free-Flow Speed from Field Measurement: Field measured speed,(note-3) S FM  
35 mi/h Observed total demand,(note-3) V 0 veh/h Estimated Free-Flow Speed:  
Base free-flow speed,(note-3) BFFS - mi/h Adj. for lane and shoulder  
width,(note-3) fLS - mi/h Adj. for access point density,(note-3) fA - mi/h

Free-flow speed, FFSD 35.0 mi/h

Adjustment for no-passing zones, fnp 3.7 mi/h Average travel speed, ATSD  
27.2 mi/h Percent Free Flow Speed, PFFS 77.6 %

\_\_\_\_\_Percent Time-Spent-

Following\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.1 1.1 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adjustment factor, fHV 0.998 0.998 Grade  
adjustment factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi  
287 pc/h 237 pc/h Base percent time-spent-following,(note-4) BPTSFD 29.6 %  
Adjustment for no-passing zones, fnp 57.8 Percent time-spent-following,  
PTSFD 61.3 %

\_\_\_\_\_Level of Service and Other Performance

Measures\_\_\_\_\_

Level of service, LOS C Volume to capacity ratio, v/c 0.17 Peak 15-min  
vehicle-miles of travel, VMT15 29 veh-mi Peak-hour vehicle-miles of travel,  
VMT60 101 veh-mi Peak 15-min total travel time, TT15 1.1 veh-h Capacity  
from ATS, CdATS 1700 veh/h Capacity from PTSF, CdPTSF 1700 veh/h  
Directional Capacity 3105 veh/h

\_\_\_\_\_Passing Lane

Analysis\_\_\_\_\_

Total length of analysis segment, Lt 0.4 mi Length of two-lane highway upstream of the passing lane, Lu - mi Length of passing lane including tapers, Lpl - mi Average travel speed, ATSD (from above) 27.2 mi/h Percent time-spent-following, PTSFd (from above) 61.3 Level of service, LOSd (from above) C

\_\_\_\_\_Average Travel Speed with Passing  
Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld - mi Adj. factor for the effect of passing lane on average speed, fpl - Average travel speed including passing lane, ATSpl -  
\_\_\_\_\_Percent Time-Spent-Following with Passing

Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld - mi Adj. factor for the effect of passing lane on percent time-spent-following, fpl - Percent time-spent-following including passing lane, PTSFpl - %

\_\_\_\_\_Level of Service and Other Performance Measures with Passing Lane

\_\_\_\_\_

Level of service including passing lane, LOSpl - Peak 15-min total travel time, TT15 - veh-h

\_\_\_\_\_ Bicycle Level of Service

\_\_\_\_\_

Posted speed limit, Sp 55 Percent of segment with occupied on-highway parking 0 Pavement rating, P 3 Flow rate in outside lane, vOL 286.4 Effective width of outside lane, We 29.00 Effective speed factor, St 4.79 Bicycle LOS Score, BLOS 0.90 Bicycle LOS A

Notes: 1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain. 2. If  $v_i$  ( $v_d$  or  $v_o$ )  $\geq 1,700$  pc/h, terminate analysis-the LOS is F. 3. For the analysis direction only and for  $v > 200$  veh/h. 4. For the analysis direction only. 5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax: E-Mail:

\_\_\_\_\_ Directional Two-Lane Highway Segment  
Analysis\_\_\_\_\_

Analyst MP Agency/Co. McIntosh Perry Date Performed 2020-06-12 Analysis  
Time Period WB AM Peak Highway Bill Leathem Drive From/To Lonfeilds Drive -  
Leikin Drive Jurisdiction Analysis Year 2025 Description Bill Leatehm  
Drive

\_\_\_\_\_ Input  
Data\_\_\_\_\_

Highway class Class 3 Peak hour factor, PHF 0.88 Shoulder width 6.0 ft %  
Trucks and buses 2 % Lane width 17.0 ft % Trucks crawling 0.0 % Segment  
length 0.4 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational  
vehicles 4 % Grade: Length - mi % No-passing zones 100 % Up/down - %  
Access point density 4 /mi

Analysis direction volume, Vd 207 veh/h Opposing direction volume, Vo 271  
veh/h

\_\_\_\_\_ Average Travel  
Speed\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.5 1.4 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.990 0.992 Grade  
adj. factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi 238 pc/h  
310 pc/h

Free-Flow Speed from Field Measurement: Field measured speed,(note-3) S FM  
35 mi/h Observed total demand,(note-3) V 0 veh/h Estimated Free-Flow Speed:  
Base free-flow speed,(note-3) BFFS - mi/h Adj. for lane and shoulder  
width,(note-3) fLS - mi/h Adj. for access point density,(note-3) fA - mi/h

Free-flow speed, FFSD 35.0 mi/h

Adjustment for no-passing zones, fnp 3.3 mi/h Average travel speed, ATSD  
27.5 mi/h Percent Free Flow Speed, PFFS 78.5 %

\_\_\_\_\_ Percent Time-Spent-  
Following\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.1 1.1 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adjustment factor, fHV 0.998 0.998 Grade  
adjustment factor,(note-1) fg 1.00 1.00 Directional flow rate,(note-2) vi  
236 pc/h 309 pc/h Base percent time-spent-following,(note-4) BPTSFD 27.1 %  
Adjustment for no-passing zones, fnp 56.5 Percent time-spent-following,  
PTSFD 51.6 %

\_\_\_\_\_ Level of Service and Other Performance  
Measures\_\_\_\_\_

Level of service, LOS C Volume to capacity ratio, v/c 0.18 Peak 15-min  
vehicle-miles of travel, VMT15 24 veh-mi Peak-hour vehicle-miles of travel,  
VMT60 83 veh-mi Peak 15-min total travel time, TT15 0.9 veh-h Capacity from  
ATS, CdATS 1700 veh/h Capacity from PTSF, CdPTSF 1700 veh/h Directional  
Capacity 3005 veh/h

\_\_\_\_\_ Passing Lane



Analysis\_\_\_\_\_

Total length of analysis segment, Lt 0.4 mi Length of two-lane highway upstream of the passing lane, Lu - mi Length of passing lane including tapers, Lpl - mi Average travel speed, ATSD (from above) 27.5 mi/h Percent time-spent-following, PTSFd (from above) 51.6 Level of service, LOSd (from above) C

\_\_\_\_\_Average Travel Speed with Passing  
Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld - mi Adj. factor for the effect of passing lane on average speed, fpl - Average travel speed including passing lane, ATSpl -  
\_\_\_\_\_Percent Time-Spent-Following with Passing

Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld - mi Adj. factor for the effect of passing lane on percent time-spent-following, fpl - Percent time-spent-following including passing lane, PTSFpl - %

\_\_\_\_\_Level of Service and Other Performance Measures with Passing Lane

\_\_\_\_\_

Level of service including passing lane, LOSpl - Peak 15-min total travel time, TT15 - veh-h

\_\_\_\_\_ Bicycle Level of Service

\_\_\_\_\_

Posted speed limit, Sp 55 Percent of segment with occupied on-highway parking 0 Pavement rating, P 3 Flow rate in outside lane, vOL 235.2 Effective width of outside lane, We 29.00 Effective speed factor, St 4.79 Bicycle LOS Score, BLOS 0.80 Bicycle LOS A

Notes: 1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain. 2. If  $v_i$  ( $v_d$  or  $v_o$ )  $\geq 1,700$  pc/h, terminate analysis-the LOS is F. 3. For the analysis direction only and for  $v > 200$  veh/h. 4. For the analysis direction only. 5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax: E-Mail:

\_\_\_\_\_ Directional Two-Lane Highway Segment  
Analysis\_\_\_\_\_

Analyst MP Agency/Co. McIntosh Perry Date Performed 2020-06-12 Analysis  
Time Period EB PM Peak Highway Bill Leathem Drive From/To Lonfeilds Drive -  
Leikin Drive Jurisdiction Analysis Year 2025 Description Bill Leatehm  
Drive

\_\_\_\_\_ Input  
Data\_\_\_\_\_

Highway class Class 3 Peak hour factor, PHF 0.88 Shoulder width 6.0 ft %  
Trucks and buses 2 % Lane width 17.0 ft % Trucks crawling 0.0 % Segment  
length 0.4 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational  
vehicles 4 % Grade: Length - mi % No-passing zones 100 % Up/down - %  
Access point density 4 /mi

Analysis direction volume, Vd 272 veh/h Opposing direction volume, Vo veh/  
h

\_\_\_\_\_ Average Travel  
Speed\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.4 1.4 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adj. factor, (note-5) fHV 0.992 0.992 Grade  
adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 312 pc/h  
312 pc/h

Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM  
35 mi/h Observed total demand, (note-3) V 0 veh/h Estimated Free-Flow Speed:  
Base free-flow speed, (note-3) BFFS - mi/h Adj. for lane and shoulder  
width, (note-3) fLS - mi/h Adj. for access point density, (note-3) fA - mi/h

Free-flow speed, FFSD 35.0 mi/h

Adjustment for no-passing zones, fnp 3.3 mi/h Average travel speed, ATSD  
26.9 mi/h Percent Free Flow Speed, PFFS 76.8 %

\_\_\_\_\_ Percent Time-Spent-  
Following\_\_\_\_\_

Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.1 1.1 PCE for  
RVs, ER 1.0 1.0 Heavy-vehicle adjustment factor, fHV 0.998 0.998 Grade  
adjustment factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi  
310 pc/h 310 pc/h Base percent time-spent-following, (note-4) BPTSFD 33.4 %  
Adjustment for no-passing zones, fnp 55.8 Percent time-spent-following,  
PTSFD 61.3 %

\_\_\_\_\_ Level of Service and Other Performance  
Measures\_\_\_\_\_

Level of service, LOS C Volume to capacity ratio, v/c 0.19 Peak 15-min  
vehicle-miles of travel, VMT15 31 veh-mi Peak-hour vehicle-miles of travel,  
VMT60 109 veh-mi Peak 15-min total travel time, TT15 1.2 veh-h Capacity  
from ATS, CdATS 1700 veh/h Capacity from PTSF, CdPTSF 1700 veh/h  
Directional Capacity 3200 veh/h

\_\_\_\_\_ Passing Lane

Analysis\_\_\_\_\_

Total length of analysis segment, Lt 0.4 mi Length of two-lane highway upstream of the passing lane, Lu - mi Length of passing lane including tapers, Lpl - mi Average travel speed, ATSD (from above) 26.9 mi/h Percent time-spent-following, PTSFd (from above) 61.3 Level of service, LOSd (from above) C

\_\_\_\_\_Average Travel Speed with Passing  
Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld - mi Adj. factor for the effect of passing lane on average speed, fpl - Average travel speed including passing lane, ATSpl -

\_\_\_\_\_Percent Time-Spent-Following with Passing  
Lane\_\_\_\_\_

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde - mi Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld - mi Adj. factor for the effect of passing lane on percent time-spent-following, fpl - Percent time-spent-following including passing lane, PTSFpl - %

\_\_\_\_\_Level of Service and Other Performance Measures with Passing Lane

\_\_\_\_\_Level of service including passing lane, LOSpl - Peak 15-min total travel time, TT15 - veh-h

\_\_\_\_\_Bicycle Level of Service

\_\_\_\_\_Posted speed limit, Sp 55 Percent of segment with occupied on-highway parking 0 Pavement rating, P 3 Flow rate in outside lane, vOL 309.1 Effective width of outside lane, We 29.00 Effective speed factor, St 4.79 Bicycle LOS Score, BLOS 0.94 Bicycle LOS A

Notes: 1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain. 2. If  $v_i$  ( $v_d$  or  $v_o$ )  $\geq 1,700$  pc/h, terminate analysis-the LOS is F. 3. For the analysis direction only and for  $v > 200$  veh/h. 4. For the analysis direction only. 5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

## TRAFFIC IMPACT ASSESSMENT



## APPENDIX E – SIGNAL WARRANTS

## Input Data Sheet

[Analysis Sheet](#)
[Results Sheet](#)
[Proposed Collision](#)
[GO TO Justification:](#)

What are the intersecting roadways?

Leiking Drive / Bill Leatham Drive

What is the direction of the Main Road street?

North-South

When was the data collected?

2019-06-12

### Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road?

2 or more

b.- Number of lanes on the Minor Road?

2 or more

c.- How many approaches?

4

d.- What is the operating environment?

Urban

Population &gt;= 10,000

AND

Speed &lt; 70 km/hr

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
8:00	178	3	28	141	553	4	0	0	2	7	17	24	4
9:00	165	2	54	156	372	2	2	6	7	9	32	56	5
10:00	61	0	35	82	129	3	6	5	14	6	38	45	1
12:30	45	3	40	46	64	1	63	23	20	10	122	61	56
13:30	64	0	48	32	111	0	10	9	11	9	64	34	57
16:00	32	1	107	55	44	0	94	55	28	1	187	141	4
17:00	43	0	162	65	57	0	0	1	0	0	364	183	12
18:00	38	0	187	77	56	0	0	0	0	0	242	90	4
Total	626	9	661	654	1,386	10	175	99	82	42	1,066	634	143

### Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	2
13-24	1
25-36	2

\* Include only collisions that are susceptible to correction through the installation of traffic signal control

### Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	21	0	5	0	0	0	0	
Factored 8 hour pedestrian volume	21		5		0		0		
% Assigned to crossing rate	100%		100%		100%		100%		
Net 8 Hour Pedestrian Volume at Crossing									26
Net 8 Hour Vehicular Volume on Street Being Crossed									3,793

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	21	0	5	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	0	0	0	0	0	0	0	0	
Factored volume of total pedestrians	21		5		0		0		
Factored volume of delayed pedestrians	0		0		0		0		
% Assigned to Crossing Rate	100%		100%		100%		100%		
Net 8 Hour Volume of Total Pedestrians									26
Net 8 Hour Volume of Delayed Pedestrians									0

# Analysis Sheet

Input Sheet

Results Sheet

Proposed Collision

GO TO Justification:

Intersection: Leiking Drive / Bill Leathem Drive

Count Date: 2019-06-12

## Justification 1: Minimum Vehicle Volumes

### Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	8:00	9:00	10:00	12:30	13:30	16:00	17:00	18:00		
1A	480	720	600	900	957	863	424	498	392	745	875	690		
	COMPLIANCE %				100	96	47	55	44	83	97	77	599	75
1B	120	170	120	170	746	627	303	304	250	428	669	465		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
Restricted Flow Signal Justification 1:					Both 1A and 1B 100% Fullfilled each of 8 hours Lesser of 1A or 1B at least 80% fulfilled each of 8 hours								Yes <input type="checkbox"/>	No <input type="checkbox"/>
													Yes <input type="checkbox"/>	No <input type="checkbox"/>

## Justification 2: Delay to Cross Traffic

### Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	<div>FREE FLOW</div>	<div>RESTR. FLOW</div>	<div>FREE FLOW</div>	<div>RESTR. FLOW</div>	8:00	9:00	10:00	12:30	13:30	16:00	17:00	18:00		
2A	480	720	600	900	211	236	121	194	142	317	206	225	184	23
	COMPLIANCE %				23	26	13	22	16	35	23	25		
2B	50	75	50	75	705	542	218	234	209	247	441	323	800	100
	COMPLIANCE %				100	100	100	100	100	100	100	100		
Restricted Flow Signal Justification 2:					Both 2A and 2B 100% Fullfilled each of 8 hours Lesser of 2A or 2B at least 80% fulfilled each of 8 hours						Yes Yes		No No	

## Justification 3: Combination

### Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimun Vehicular Volume	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/>	NO <input type="checkbox"/>
Justification 2	Delay Cross Traffic	<input type="checkbox"/>	<input type="checkbox"/>		NOT JUSTIFIED

## Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	8:00	211	698	670	100 %	72 %
	9:00	236	530	649	82 %	
	16:00	317	329	583	56 %	
	18:00	225	332	658	50 %	

# Analysis Sheet

Input Sheet

Results Sheet

Proposed Collision

GO TO Justification:

Intersection: Leiking Drive / Bill Leatham Drive

Count Date: 2019-06-12

## Justification 5: Collision Experience

Justification	Preceding Months	% Fulfillment	Overall % Compliance
Justification 5	1-12	40 %	33 %
	13-24	20 %	
	25-36	40 %	

## Justification 6: Pedestrian Volume

### Pedestrian Volume Analysis

8 Hour Vehicular Volume $V_8$		Net 8 Hour Pedestrian Volume				
		< 200	200 - 275	276 - 475	476 - 1000	>1000
Justification 6A	< 1440					
	1440 - 2600					
	2601 - 7000	Not Justified				
	> 7000					

### Pedestrian Delay Analysis

Net Total 8 Hour Volume of Total Pedestrians		Net Total 8 Hour Volume of Delayed Pedestrians		
		< 75	75 - 130	> 130
Justification 6B	< 200	Not Justified		
	200 - 300			
	> 300			



# Results Sheet

Input Sheet

Analysis Sheet

Proposed Collision

Intersection: Leiking Drive / Bill Leatham Drive

Count Date: 2019-06-12

## Summary Results

Justification		Compliance		Signal Justified?	
				YES	NO
1. Minimum Vehicular Volume	A Total Volume	75	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Volume	100	%	<input type="checkbox"/>	<input type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	23	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Road	100	%	<input type="checkbox"/>	<input type="checkbox"/>
3. Combination	A Justificaton 1	75	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Justification 2	23	%	<input type="checkbox"/>	<input type="checkbox"/>
4. 4-Hr Volume		72	%	<input type="checkbox"/>	<input type="checkbox"/>

5. Collision Experience	33	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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6. Pedestrians	A Volume	Justification not met	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Delay	Justification not met	<input type="checkbox"/>	<input type="checkbox"/>

## TRAFFIC IMPACT ASSESSMENT



## APPENDIX F – TDM INFRASTRUCTURE DESIGN CHECKLIST

## **TDM-Supportive Development Design and Infrastructure Checklist:** *Non-Residential Developments (office, institutional, retail or industrial)*

<b>Legend</b>	
<b>REQUIRED</b>	The Official Plan or Zoning By-law provides related guidance that must be followed
<b>BASIC</b>	The measure is generally feasible and effective, and in most cases would benefit the development and its users
<b>BETTER</b>	The measure could maximize support for users of sustainable modes, and optimize development performance

<b>TDM-supportive design &amp; infrastructure measures:</b> <i>Non-residential developments</i>		<b>Check if completed &amp; add descriptions, explanations or plan/drawing references</b>
<b>1. WALKING &amp; CYCLING: ROUTES</b>		
<b>1.1 Building location &amp; access points</b>		
<b>BASIC</b>	1.1.1 Locate building close to the street, and do not locate parking areas between the street and building entrances	<input type="checkbox"/> Building entrance located perpendicular to Bill Leatham Drive
<b>BASIC</b>	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input type="checkbox"/> Proposed development located close to the street and sidewalk
<b>BASIC</b>	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input type="checkbox"/> Doors and windows expected to provide visibility to sidewalks and parking area
<b>1.2 Facilities for walking &amp; cycling</b>		
<b>REQUIRED</b>	1.2.1 Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations ( <i>see Official Plan policy 4.3.3</i> )	<input type="checkbox"/>
<b>REQUIRED</b>	1.2.2 Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible ( <i>see Official Plan policy 4.3.12</i> )	<input type="checkbox"/>

<b>TDM-supportive design &amp; infrastructure measures: <i>Non-residential developments</i></b>		<b>Check if completed &amp; add descriptions, explanations or plan/drawing references</b>
<b>REQUIRED</b>	1.2.3 Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks ( <i>see Official Plan policy 4.3.10</i> )	<input type="checkbox"/> Concrete sidewalks to be provided
<b>REQUIRED</b>	1.2.4 Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps ( <i>see Official Plan policy 4.3.10</i> )	<input type="checkbox"/> Depressed curbs provided. Accessible parking spaces provided close to building entrances.
<b>REQUIRED</b>	1.2.5 Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians ( <i>see Official Plan policy 4.3.11</i> )	<input type="checkbox"/>
<b>BASIC</b>	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input type="checkbox"/> Sidewalks lead to transit stops on Bill Leatham Drive.
<b>BASIC</b>	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input type="checkbox"/> Area is to be lit with street lights.
<b>BASIC</b>	1.2.8 Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	<input type="checkbox"/>
<b>1.3 Amenities for walking &amp; cycling</b>		
<b>BASIC</b>	1.3.1 Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	<input type="checkbox"/> Lighting to be provided and landscaping to be done around sidewalks
<b>BASIC</b>	1.3.2 Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>2. WALKING &amp; CYCLING: END-OF-TRIP FACILITIES</b>		
<b>2.1 Bicycle parking</b>		
REQUIRED	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible ( <i>see Official Plan policy 4.3.6</i> )	<input type="checkbox"/>
REQUIRED	2.1.2 Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas ( <i>see Zoning By-law Section 111</i> )	<input type="checkbox"/> Bicycle parking not required under Zoning By-Law Section 111. One (1) Post and Ring to be provided.
REQUIRED	2.1.3 Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored ( <i>see Zoning By-law Section 111</i> )	<input type="checkbox"/>
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	<input type="checkbox"/> Approximately 1 commuter cyclist is expected during the AM and PM Peak hours
BETTER	2.1.5 Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	<input type="checkbox"/>
<b>2.2 Secure bicycle parking</b>		
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers ( <i>see Zoning By-law Section 111</i> )	<input type="checkbox"/>
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	<input type="checkbox"/>
<b>2.3 Shower &amp; change facilities</b>		
BASIC	2.3.1 Provide shower and change facilities for the use of active commuters	<input type="checkbox"/>
BETTER	2.3.2 In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	<input type="checkbox"/>
<b>2.4 Bicycle repair station</b>		
BETTER	2.4.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>3. TRANSIT</b>		
<b>3.1 Customer amenities</b>		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	<input type="checkbox"/>
BASIC	3.1.2 Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	<input type="checkbox"/>
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	<input type="checkbox"/>
<b>4. RIDESHARING</b>		
<b>4.1 Pick-up &amp; drop-off facilities</b>		
BASIC	4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	<input type="checkbox"/>
<b>4.2 Carpool parking</b>		
BASIC	4.2.1 Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	<input type="checkbox"/>
BETTER	4.2.2 At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	<input type="checkbox"/>
<b>5. CARSHARING &amp; BIKESHARING</b>		
<b>5.1 Carshare parking spaces</b>		
BETTER	5.1.1 Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces ( <i>see Zoning By-law Section 94</i> )	<input type="checkbox"/>
<b>5.2 Bikeshare station location</b>		
BETTER	5.2.1 Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	<input type="checkbox"/>



TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>6. PARKING</b>		
<b>6.1 Number of parking spaces</b>		
<b>REQUIRED</b>	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	<input type="checkbox"/> No limit on parking supply as proposed development not located within 600m of rapid transit
<b>BASIC</b>	6.1.2 Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	<input type="checkbox"/>
<b>BASIC</b>	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly ( <i>see Zoning By-law Section 104</i> )	<input type="checkbox"/>
<b>BETTER</b>	6.1.4 Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking ( <i>see Zoning By-law Section 111</i> )	<input type="checkbox"/>
<b>6.2 Separate long-term &amp; short-term parking areas</b>		
<b>BETTER</b>	6.2.1 Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	<input type="checkbox"/>
<b>7. OTHER</b>		
<b>7.1 On-site amenities to minimize off-site trips</b>		
<b>BETTER</b>	7.1.1 Provide on-site amenities to minimize mid-day or mid-commute errands	<input type="checkbox"/>