

1531 Stittsville Main Street

Transportation Impact Assessment Report

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TIA Report

1. SCREENING FORM

The City's TIA Screening Form for the subject development was submitted to City of Ottawa staff for review and confirmation of the need for a Transportation Impact Assessment (TIA). The need for a TIA study was confirmed as the Location trigger was met based on the site's location in a Design Priority Area (DPA) – Stittsville Traditional Mainstreet and the Safety trigger was met based on the site's location within 150 m of a signalized intersection. The Screening Form is provided as Appendix A.

2. SCOPING

2.1. EXISTING AND PLANNED CONDITIONS

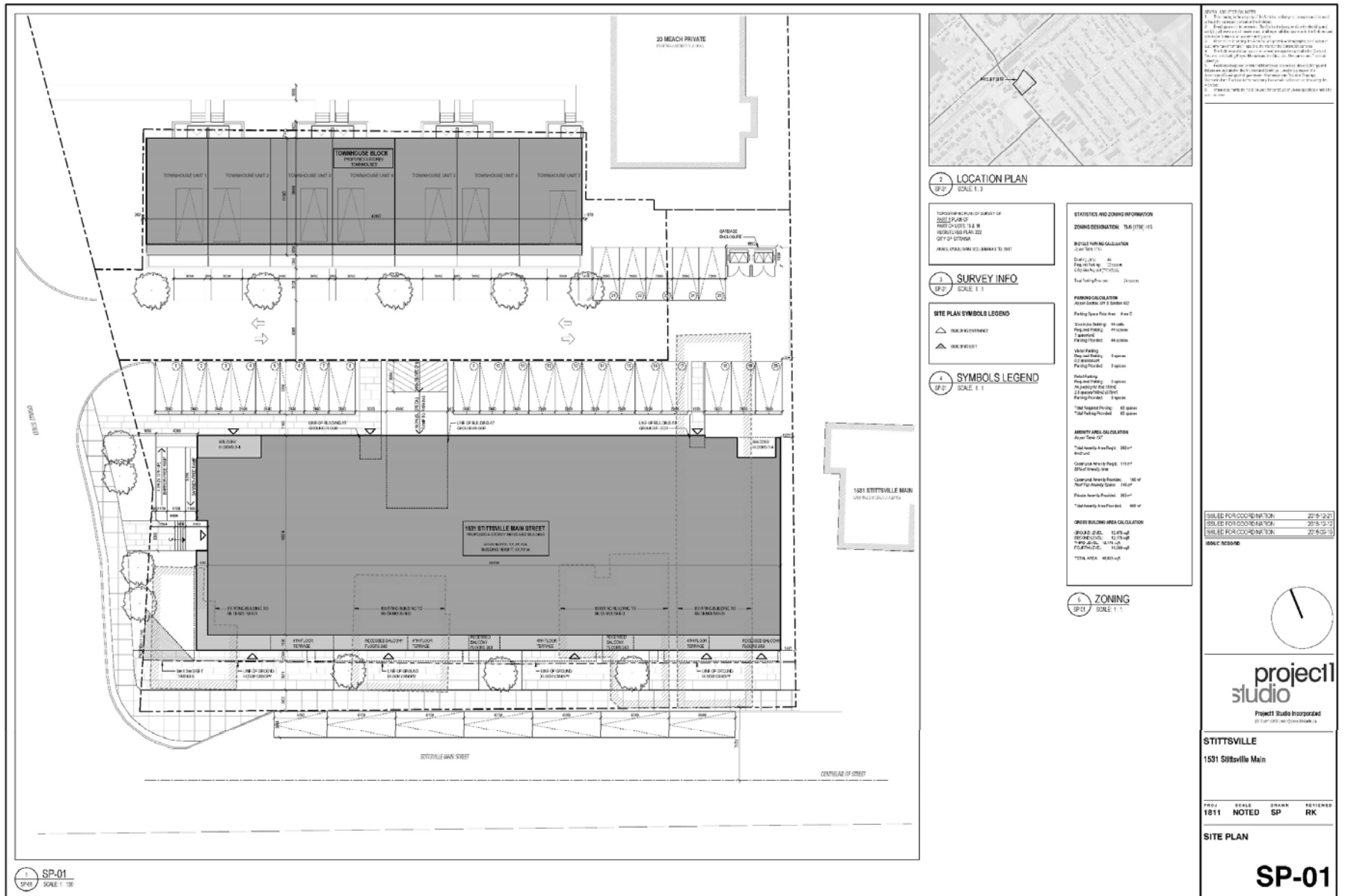
2.1.1. PROPOSED DEVELOPMENT

Based on the proposed Site Plan provided by project1Studio, it is our understanding that the proponent is proposing a one-phase residential development with ground floor commercial space located at 1531 Stittsville Mains Street with an expected date of occupancy of 2020. The proposed development will consist of four storeys with 44 units total, 270 m² of commercial space, 61 vehicle parking spaces and 24 bicycle parking spaces. Vehicular access to the site is proposed to/from Orville Street via a two-way, full/movement 6.0 m wide driveway to the surface parking and parking garage ramp. The adjacent Stittsville/Orville intersection is an unsignalized three-legged intersection with a STOP control on the minor approach. The westbound approach consists of a single full-movement lane. Non-motorized access to the commercial uses is proposed via Stittsville Main Street. The site is currently occupied by service uses such as Extra Mile Driving School, Ottawa Driving School, West End Music and DeMarco Construction General Contractor. It is zoned as TM – Traditional Main Street TM9[1736]H(15). The local context of the site is provided as Figure 1 and the proposed Site Plan is provided as Figure 2.

Figure 1: Local Context



Figure 2: Proposed Site Plan



2.1.2. EXISTING CONDITIONS

Area Road Network

Stittsville Main Street is a north-south City-owned arterial roadway that extends from Huntley Road in the south to west of Maple Grove Road in the north. Within the study area, Stittsville Main Street has a two-lane cross-section with auxiliary turn lanes provided at major intersections and a posted speed limit of 50 km/h.

Abbott Street E is an east-west City-owned major collector roadway, east of Stittsville Main Street, and a Minor Collector West of Stittsville. East of Stittsville, Abbott Street has a two-lane cross-section and auxiliary turn lanes at major intersections. Within the study area, the posted speed limit is 50 km/h.

Orville Street is an east-west City-owned local roadway with a 2-lane undivided cross-section. It extends from Stittsville Main Street in the west to Caribou Avenue in the east. The posted speed limit is 40 km/h.

Midnight Private is a north-south privately-owned local roadway with a 2-lane undivided 6.0m cross-section. It extends from Orville Street in the north to 55m to the south. The unposted speed limit is assumed to be 20 km/h given the parking access function of the roadway.

Existing Study Area Intersections

Stittsville/Abbott

The Stittsville/Abbott intersection is a signalized four-legged intersection. The eastbound approach consists of a single left-turn lane and a shared through/right-turn lane. The westbound approach consists of a single left-turn lane, a through lane and a channelized right-turn lane. The northbound approach consists of a single left-turn lane, a through lane and a channelized right-turn lane. The southbound approach consists of a single left-turn lane and a shared through/right-turn lane. All movements are permitted at this location.

Stittsville/Orville

The Stittsville/Orville intersection is an unsignalized three-legged intersection with a STOP control on the minor approach. The north and southbound approaches both consist of a single full-movement lane. The westbound approach consists of a single full-movement lane. All movements are permitted at this location.

Midnight Private/Orville

The Midnight/Orville intersection is an unsignalized three-legged intersection leading to the site surface parking lot. The west and eastbound approaches both consist of a single full-movement lane. All movements are permitted at this location.

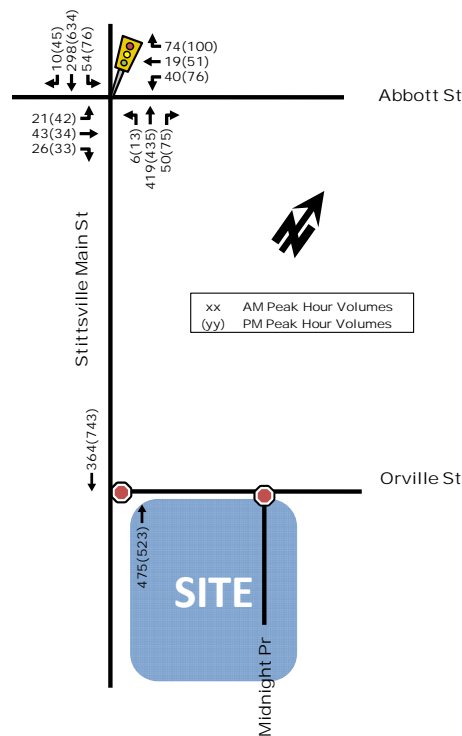
Existing Area Traffic Management Measures

No existing area traffic management measures have been identified within the area of study.

Existing Intersection Volumes

The existing peak hour traffic volumes (illustrated in Figure 3) were obtained from a 2015 count provided by the City of Ottawa and a January 2019 count conducted by Parsons at the Stittsville Main/Orville intersection. The full traffic volume counts are provided in Appendix B.

Figure 3: Existing Peak Hour Traffic Volumes



Existing Driveways to Adjacent Developments

The Midnight Private access is a shared access with the Pretty Village Community Centre. There are four private driveways located along the east side of Stittsville Mains Street corresponding to properties 1543 to 1557 Stittsville Main Street. There are three existing full-movement driveways located along the west side of Stittsville Main Street, adjacent to the site. The southernmost driveway along the west side of Stittsville Main Street serves a trailer parking lot and is located approximately 60 m to the south of the subject site.

Pedestrian/Cycling Network

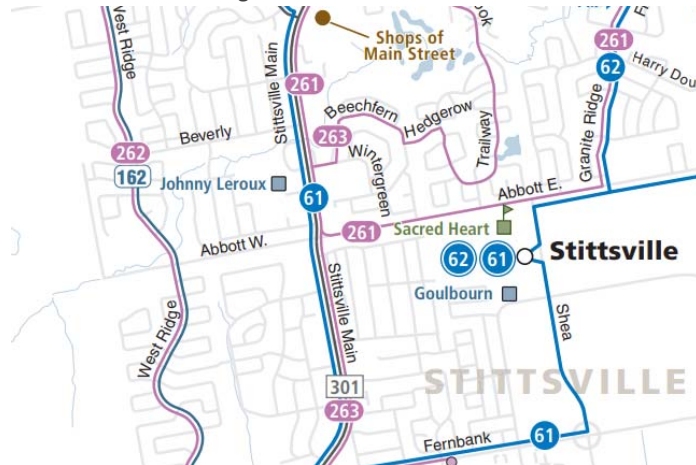
Sidewalk facilities in the vicinity of the site are provided along both sides of Stittsville Mains Street and along the south side of Orville Street. Sidewalks along both sides of Stittsville Main Street connect to sidewalks along the south side of Abbot Street, to the west of Stittsville Main Street and along the north side, to east of Stittsville Main Street. There is a 40m long sidewalk along the north side of Abbot Street, to the west of Stittsville Main Street, and a 41m long sidewalk along the south side, to the east of Stittsville Main Street.

According to the City's Cycling Plan, Stittsville Main Street is classified as "Spine Route" and Orville Street is classified as a "Local route". The Trans Canada Trail Major Pathway is also identified running parallel to Abbott Street, approximately 35 m to the south of Abbott Street.

Transit Network

Transit service within the vicinity of the site is currently provided by OC Transpo Routes #61, 261, 263 and 301. Route # 61 is a rapid route that provides service every 30 minutes 7 days a week. Connexion routes 261 and 263 provide weekdays morning and afternoon peak hour services and Shopper route #301 provides Monday services to Kanata Centrum, Bayshore, Lincoln Fields and Carlingwood Shopping Centres. Bus stops for Routes #61, 263 and 301 are located on Stittsville Main Street at Orville Street intersections. Bus Stops for Route # 261 are located on Abbott Street E at Stittsville Mains Street intersection. The current transit area network is provided as Figure 4.

Figure 4: Area Transit Network



Existing Road Safety Conditions

Collision history for study area intersections and roads (2013 to 2017, inclusive) was obtained from the City of Ottawa and most collisions (79%) involved only property damage, indicating low impact speeds, and 21% involved personal injuries. The primary causes of collisions cited by police include; rear end (52%), single vehicle other (22%), angle (17%), turning movement (4%) and other (4%) type collisions.

A standard unit of measure for assessing collisions at an intersection is based on the number collisions per million entering vehicles (MEV). At intersections within the study area, reported collisions have historically take place at a rate of:

- 0.37/MEV at the Abbott/Stittsville Main intersection;
- 0.22/MEV at the Stittsville Main/Orville intersection;
- 0.08/MEV at Stittsville Main between Abbott and Orville;
- 0.08/MEV at Stittsville Main between Orville and Bae Cres; and
- 0.04/MEV at the Bae Cres/Stittsville Main intersection.

It is noteworthy that within the five-years of recorded collision data there was 1 collision involving one pedestrian resulting in non-fatal injury at Abbott/Stittsville Main intersection. No collisions involving cyclists have were reported. The source collision data as provided by the City of Ottawa and related analysis is provided as Appendix C.

2.1.3. PLANNED CONDITIONS

Planned Study Area Transportation Network Changes

Within the study area, notable transportation network changes are illustrated in Figure 5 (excerpt from the 2013 TMP) and are described as follows.

Cycling

According to the City's Cycling Plan, Stittsville Main Street is classified as "Spine Route" and Orville Street is classified as a "Local route". The Trans Canada Trail Major Pathway is also identified running parallel to Abbott Street, approximately 35 m to the south of Abbot Street.

Transit

Within the TMP's affordable network, transit priority (isolated measures) are proposed along Stittsville Main Street between Fernbank Road and Hazeldean Road. The City of Ottawa 2018 budget has also identified intersection control measures on Stittsville Main Street.

Abbott Street – Resurfacing and Intersection Control Measures

Abbot Street is programmed to be resurfaced between Stittsville Main Street and Robert Grant Avenue during the 2018-2021 program period, according to the Ward construction Program. The City of Ottawa 2018 budget has also identified Abbot Street for intersection Control Measures.

Collector Roads Network

According to the Transportation Master Plan Affordable Road Network, no new collector roads are planned within the area of study (Figure 5).

Figure 5: Transportation Master Plan Road Network (Map 6)



Other Area Development

According to the City's development application search tool, no adjacent developments are planned within the vicinity of the subject site.

2.2. STUDY AREA AND TIME PERIODS

As the proposed site is largely a residential development, the time periods assessed will be the weekday morning and afternoon peak hours. The proposed study area is outlined below and highlighted in Figure 6.

- Stittsville/Abbott intersection;
- Stittsville/Orville Intersection; and
- Stittsville Main Street, adjacent to the site.

Figure 6: Study Area



2.3. HORIZON YEARS

The expected build-out date for the proposed development is assumed to be 2020. Depending on the growth rate of the study area, the horizon year 2025 will be assessed for 5-years beyond site build out.

2.4. EXEMPTION REVIEW

Based on the City's TIA guidelines and the subject site, the following modules/elements of the TIA process, summarized in Table 1, are recommended to be exempt in the subsequent steps of the TIA process:

Table 1: Exemptions Review Summary

Module	Element	Exemption Consideration
4.2 Parking	4.2.2 Spillover Parking	The proposed development is required to provide 61 parking spaces for residents, 9 visitor parking spaces, 9 retail parking and 23 bicycle spaces, as per City of Ottawa Zoning By-Law Section 101 and 102. With 61 proposed parking spaces and 24 bicycle parking spaces, the site is meeting By-Law requirements. As such, no parking spillover is anticipated.
4.5 Transportation Demand Management	All elements	Residential development with less than 60 auto trips.
4.6 Neighbourhood Traffic Management	All elements	Residential development with less than 60 auto trips, relying mostly on arterial roadways for access. Therefore, minimal impact anticipated on adjacent neighbourhood roads.
4.8 Review of Network Concept	All elements	The site is not expected to generate 200 trips more than the established zoning. This will be confirmed in Step 3.

In addition to the above recommendations of the Exemptions Review, the following exemptions are also proposed for both Step 3 – Forecasting and Step 4 – Analysis and are summarized in Table 2.

Table 2: Additional Recommended Exemptions Summary

Module	Element	Exemption Consideration
4.4 Access Intersection Design	4.4.2 Intersection Control	Site access will connect to a local road with minimal impact site-generated traffic. Therefore, intersection screening for a signal or roundabout is not required.
4.7 Transit	4.7.2 Transit Priority	Site access will connect to a local road with no transit service and two unsignalized intersections. Therefore, it will not require a transit priority measures analysis.
4.9 Intersection Design	All elements	The Site access will connect to a local road which has an unsignalized intersections to the adjacent Stittsville Main Street. Considering there are less than 60 site-generated vehicle trips, no further analysis will be performed at adjacent intersections.

3. FORECASTING

3.1. DEVELOPMENT GENERATED TRAVEL DEMAND

3.1.1. TRIP GENERATION AND MODE SHARES

The proposed development consists of 47 apartment units and 270 m² of ground retail. Appropriate trip generation rates for the proposed development were obtained from the TRANS Study report for residential uses and 10th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual for retail and office uses, which are summarized in Table 3.

Table 3: ITE Trip Generation Rates

Land Use	Data Source	Trip Rates	
		AM Peak	PM Peak
Mid-rise apartments – Suburban	TRANS	$T = 0.29(du)$	$T = 0.37(du)$
Shopping Center	ITE 820	$T = 0.94(X)$ $T = 0.50(X) + 151.78$	$T = 3.81(X);$ $\ln(T) = 0.74\ln(X) + 2.89$
Notes: T = Average Vehicle Trip Ends X = 1000 ft ² Gross Floor Area du = Dwelling unit Shopping Center average tip generation rates were used, as regression curves were found to overestimate trip generation for this size of retail uses			

As ITE trip generation surveys only record vehicle trips and typically reflect highly suburban locations (with little to no access by travel modes other than private automobiles), adjustment factors appropriate to the more urban study area context were applied to attain estimates of person trips for the proposed development. This approach is considered appropriate within the industry for urban infill developments.

To convert ITE vehicle trip rates to person trips, an auto occupancy factor and a non-auto trip factor were applied to the ITE vehicle trip rates. Our review of available literature suggests that a combined factor of approximately 1.28 is considered reasonable to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%. The person trip generation for the proposed development is summarized in Table 4.

Table 4: Proposed Development Modified Person Trip Generation

Land Use	Units/Area	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Mid-Rise Apartment	44 Units	3	11	14	10	7	17
Shopping Center	2,906 ft ²	1	2	3	6	8	14
Total Person Trips		4	13	17	16	15	31
<i>Note: 1.28 factor to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%</i>							

Based on the residential modal shares from the TRANS Trip generation study and the Ottawa West TRANS District Modal Shares, which were used for retail and office uses, appropriate modal splits were applied to the person trip generation. The following Table 5 provides the mode shares for residential trips, Table 6 provides mode shares for retail trips and Table 7 provides mode shares for total site.

Table 5: Mid-Rise Apartment Modal Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	60%	3	11	14	10	7	17
Auto Passenger	10%	0	2	2	2	1	3
Transit	25%	1	5	6	4	3	7
Non-motorized	5%	0	1	1	0	1	1
Total Person Trips	100%	4	19	23	16	12	28
Total 'New' Mid-Rise Apt Auto Trips		3	11	14	10	7	17

Table 6: Shopping Center Modal Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	60%	1	2	3	4	5	9
Auto Passenger	10%	0	0	0	0	1	1
Transit	25%	0	0	0	2	2	4
Non-motorized	5%	0	0	0	0	0	0
Total Person Trips	100%	1	2	3	6	8	14
Total 'New' Retail Auto Trips		1	2	3	4	5	9

The following Table 7 provides the mode shares for the total site-generated trips.

Table 7: Total Site Modal Trip Generation

Travel Mode	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
	In	Out	Total	In	Out	Total
Auto Driver	4	13	17	14	12	26
Auto Passenger	0	2	2	2	2	4
Transit	1	5	6	6	5	11
Non-motorized	0	1	1	0	1	1
Total Person Trips	5	21	26	22	20	42
Total 'New' Site Auto Trips		4	13	14	12	26

As shown in Table 7, the resulting number of potential 'new' two-way vehicle trips for the proposed development is approximately 17 and 26 veh/h during the weekday morning and afternoon peak hours, respectively. The potential "new" two-way transit trips are 6 to 11 persons/h and the potential "new" walking and cycling two-way trips are 26 to 42 persons/h.

3.1.2. TRIP DISTRIBUTION

Based on the TRANS OD Survey for the Kanata-Stittsville District and our knowledge of the area, the trip distribution is outlined next:

Residential

- (From/To) the North: 20%;
- (From/To) the Northeast: 60%;
- (From/To) the South: 10%; and,
- (From/To) the West: 10%.

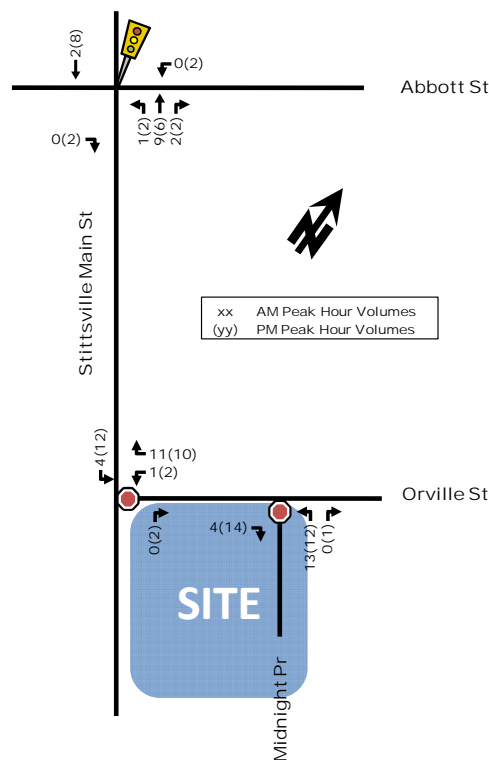
Retail (Community-scale)

- (From/To) the North: 50%;
- (From/To) the Northeast: 10%;
- (From/To) the South: 20%; and
- (From/To) the West: 20%.

3.1.3. TRIP ASSIGNMENT

Based on this distribution, site-generated traffic at build-out (2020) was assigned to the existing adjacent network and is illustrated in Figure 7.

Figure 7: Site-Generated Traffic (year 2020)



3.2. BACKGROUND NETWORK TRAVEL DEMANDS

3.2.1. BACKGROUND GROWTH

Based on City of Ottawa intersection traffic growth rates, the area of study has experienced a historical growth rate between 0.2 to 2% per year. To be conservative, a 2% background growth rate per annum will be used. Figure 8 illustrates projected background traffic at build-out and Figure 9 illustrates future background traffic at build-out plus five years.

Figure 8: Future Background Traffic at Build-Out (year 2020)

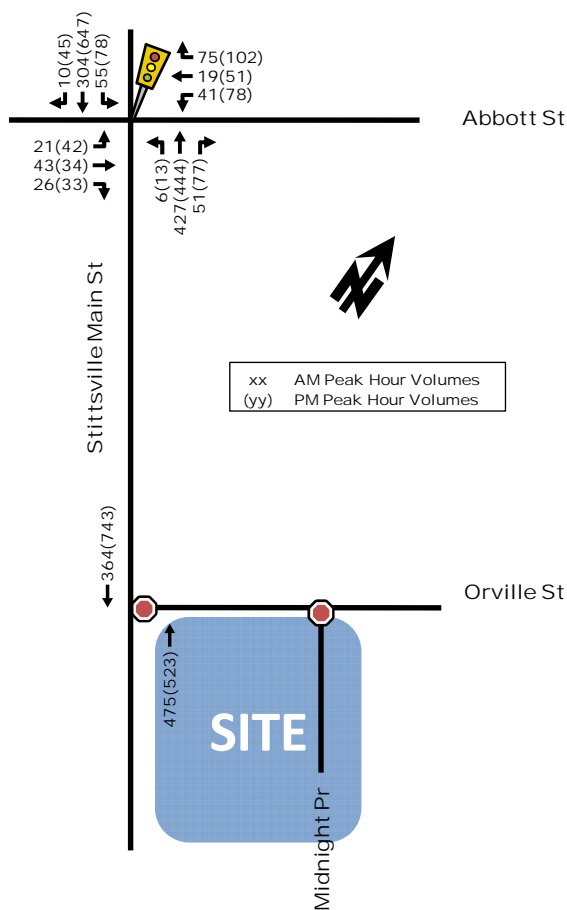
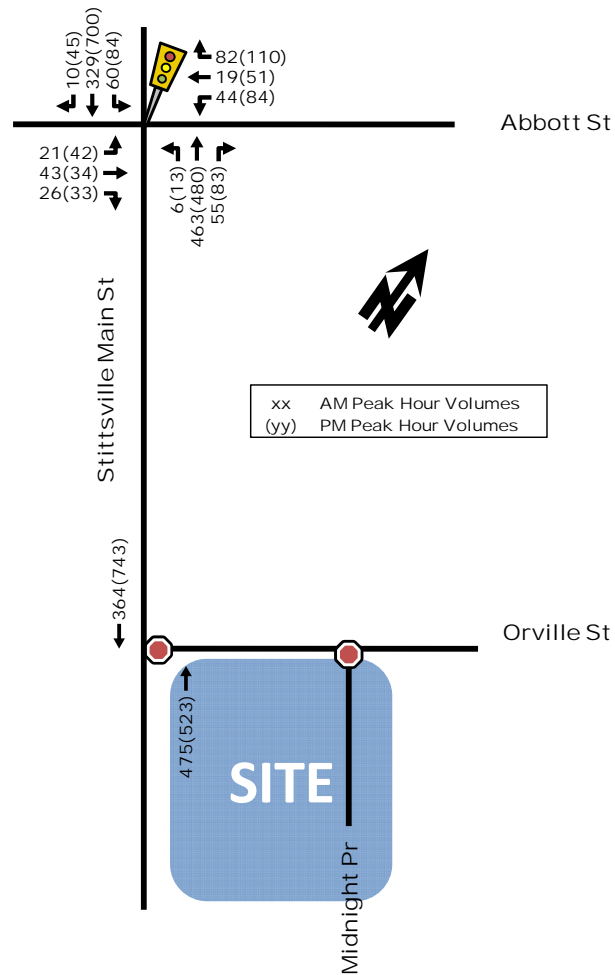


Figure 9: Future Background Traffic at Build-Out Plus Five Years (year 2025)



3.2.2. OTHER DEVELOPMENTS

Refer to Section 2.1.3 Planned Conditions – Other Area Developments.

3.3. DEMAND RATIONALIZATION

Section exempted as per Table 1.

4. ANALYSIS

4.1. DEVELOPMENT DESIGN

4.1.1. DESIGN FOR SUSTAINABLE MODES

Pedestrian connectivity

A sidewalk is provided along the south side of Orville Street, connecting to the east sidewalk along Stittsville Main Street, which leads into adjacent transit services and to the Trans Canada Trail to the north (Abbott Street south edge).

All building doors are noted to be within 300 m of transit service with interlocked pathways connecting to the adjacent sidewalk on Orville Street and on Main Street. From the information provided, it is our understanding that frontage to Stittsville Main Street includes a 1.8 m continuous sidewalk with interlocked hard surfaces at building entrances between the sidewalk and the building. Landscaping and green treatments are also identified. This constitutes an improvement to current walkability conditions. The proposed parking lay-by increases pedestrian comfort as it provides protection from Stittsville Main Street traffic. Given the proposed parking lay-by, the provision of a boulevard to minimize dooring issues with pedestrians would be desirable.

Vehicle and Bicycle Parking

Vehicle parking is proposed both in an underground garage and in a surface parking lot located at the rear (east side) of the property. Interlocked sidewalks connecting the surface parking spaces to the entrance of the building and the concrete sidewalk on the south side of Orville Street are noted. The majority of surface parking (27 stalls) are proposed to the rear of the building with a 6.0 m wide aisle connecting to the existing driveway on Orville Street. The amount of vehicle parking meets the City's By-Law minimum requirements.

Cycling Access and Parking

Cyclists can use the Stittsville Main Street vehicle roadway, which is a designated spine route, to access parking to the front of the site, or they can use Orville Street to access parking to the north or rear of the site. A MUP connection from the Trans Canada Trail to Orville Street is noted to the east of the site, at Caribou Avenue. Currently, this later route might provide safer conditions to people cycling from/to the site, as traffic volumes and vehicle speeds are expected to be lower and given no transit is present. As noted in section 4.3, conditions on Stittsville Main Street are not currently meeting level of service targets for bicycling.

24 Bicycle parking spaces are proposed, in accordance to City By-Law requirements. It is noted that bicycle parking spaces should be provided close to building entrances in well-used, lit areas and protected from weather wherever possible as per City By-Law requirements.

Transit

Transit service within the vicinity of the site is currently provided by OC Transpo Routes #61, 261, 263 and 301. Bus stops for Routes #61, 263 and 301 are located on Stittsville Main Street at Orville Street intersections. Bus Stops for Route #261 are located on Abbott Street E at Stittsville Main Street intersection. All building doors are within 300 m of the adjacent bus stops. Bus stop #5490 is located in front of the site where approximately three spaces of the parking lay-by will be located. Considering the bus stop requires a free length of 15 m to allow for bus approach, as per City of Ottawa bus stop design standards, it is recommended that the existing bus stop be relocated 50 m to the north on the far side of the Stittsville Main Street/Orville Street intersection (see Figure 10). This would result in more equal spacing between stops (approximately 300m to the south and north), with no driveway blockage issue anticipated at this location should the existing treatment remain in place. Relocating this bus stop also facilitates the planned Traditional Main Street treatment along the subject site's frontage, including on-street parking and landscaping elements.

Figure 10: Existing bus stop proposed relocation



4.1.2. CIRCULATION AND ACCESS

The proposed development includes a 6.0 m wide two-way driveway connection to Orville, which is a local street. The driveway's location and width meet City of Ottawa Private By-Law requirements. The access to the underground parking lot is provided via a 6.0 m wide ramp located approximately 30m south of Orville Street. Both 90° surface parking and driveways to 7 adjacent townhomes are provided off of this access driveway.

4.2. PARKING

4.2.1. PARKING SUPPLY

Vehicle Parking

A total of 61 vehicle parking spaces are proposed to serve the subject development, which meets the City of Ottawa By-Law provisions. Of the 61 total vehicle parking spaces, 34 are proposed as surface spaces and 27 as underground spaces. Of the surface parking spaces, 7 are proposed along Main Street and 27 are proposed to the rear of the property, connecting to Orville Street via a 6.0 m aisle. The proposed surface parking spaces are noted to be 2.6 m wide and 5.2 m long and, as such, are meeting City of Ottawa parking By-Law provisions.

It is noteworthy that 7 of the surface parking spaces are proposed to be located in a protected parking lane at the front of the subject development along the east side of Stittsville Main Street, which would require the existing OC Transpo bus stop #5490 to be relocated. Accordingly, it is recommended that this bus stop be relocated approximately 50 m to the north to the far side to the Stittsville Main Street/Orville Street intersection (see Figure 10). This relocation would result in more equal spacing between bus stops (approximately 300m to the south and north) and would facilitate the City's planned Traditional Main Street treatment along the subject site's frontage, including on-street parking and landscaping elements.

Regarding the garage parking, 6.0 m wide two-way ramp connects to the underground garage approximately 30 m south of Orville Street. The primary grade on the ramp is ____% with ____ m of ____ % transition grades at either end. While the primary grade exceeds By-Law requirements, it is considered acceptable assuming the exposed portion in heated.

Bicycle Parking

A total of 24 bicycle parking spaces are proposed for the subject development, meeting the City's By-Law requirements. As per City By-Law requirements, bicycle parking should be located in a well-lit area close to the main entrances.

4.3. BOUNDARY STREET DESIGN

The boundary street for the development is Stittsville Main Street. At this time, there has not been any complete street concepts prepared for Stittsville Main Street. The existing roadway's geometry consists of the following features:

- 1 vehicle travel lane in each direction;
- 1.8 m concrete sidewalk on both sides of the roadway;
- 0.5 m interlocked boulevards on both sides of the roadway;
- More than 3,000 vehicles per day along Stittsville Main Street;
- Posted speed limit of 50 km/h, assumed operating speed of 50 to 60 km/h;
- 4.5 m wide vehicle travel lanes;
- No dedicated cycling facilities;
- No dedicated transit facilities; and
- No on-street parking.

As part of the proposed development, the following facilities are planned along the site's frontage to Stittsville Main Street:

- 1.5 m wide sidewalk with approximately 4.0 m of interlocked landscaping fronting towards Stittsville Main Street;
- 2.5 m wide on-street parking bay, with bus stop #5490 being relocated to the far side of the Orville/Stittsville intersection.

Given the development's location at a designated Traditional Mainstreet Design Priority Area and a Cycling Spine Route, the target levels of service for pedestrians and cyclists are high (PLOS 'B' and BLOS 'C', respectively). Considering there are transit priority isolated measures planned for Stittsville Main Street, the TLOS target is TLOS 'D'. Stittsville Main Street is a designated truck route and, as such, has a truck level of service target of TkLOS 'D'. The multi-modal level of service analysis is summarized in Table 8 and the detailed analysis is included in Appendix D.

Table 8: MMLOS Segment Analysis- Stittsville Main Street (Adjacent to Site)

Road Segment	Level of Service							
	Pedestrian (PLOS)		Bicycle (BLOS)		Transit (TLOS)		Truck (TkLOS)	
	PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target
Existing								
Stittsville Main Street	E	B	E	C	D	D	B	D
Proposed								
Stittsville Main Street	D	B	E	C	D	D	B	D

As shown in Table 8, the existing conditions on Stittsville Main Street do not meet level of service area targets for pedestrians and cyclists.

With regard to pedestrians, the high traffic volumes on Stittsville Main Street and relatively high speeds (estimated to be 50 to 60 km/h), result in a lower level of service for pedestrians (PLOS 'E'). To achieve the target level of service, the operating speed would have to be reduced to 30 km/h to 50 km/h along Stittsville Main Street and a 2 m wide sidewalk with 0.5 m boulevard would have to be provided. The provision of a 2 m wide sidewalk with 2 m boulevard would also achieve the target MMLOS, while maintaining current operating speeds.

Regarding cyclists, the absence of dedicated cycling facilities along Stittsville Main Street, the high traffic volumes and relatively high operating speeds on Stittsville Main Street result in lower levels of service for cyclists (BLoS 'E'). Achieving the area target levels of service for cyclists would require the provision of curbside bike lanes for each direction along Stittsville Main Street.

4.4. ACCESS INTERSECTION DESIGN

4.4.1. LOCATION AND DESIGN OF ACCESS

Vehicular access to the site is proposed off to Orville Street local roadway via a two-way, full/movement 6.0 m driveway that connects to the surface parking and parking garage ramp (approximately 6.0 m wide). These widths are sufficient to accommodate the one-way and two-way vehicle movements of the proposed development and meet the City of Ottawa Private Approach By-Law requirements in terms of location. Also, as the proposed garage ramp is located approximately 30 m south of Orville, there will be no throat length issues. The site driveway will be STOP sign controlled on its approach to Orville.

The adjacent Stittsville/Orville unsignalized intersection is located 40 m to the west and is a three-legged intersection with a STOP control on the minor approach. The westbound approach consists of a single full-movement lane. Non-motorized access to the commercial uses is proposed via Stittsville Main Street. No issues are anticipated at this location due to site access operations.

With regard to garbage pick-up, it is proposed that garbage trucks will drive forward or back-up into the site to pick-up both townhome and apartment garbage. The reverse movement will be made leaving the site. This will require a 2-person garage truck with one person controlling traffic during the back-up maneuvers, and the curb return radii at Orville being 8 m to accommodate garbage and fire truck turn requirements.

5. SUMMARY OF FINDINGS AND IMPROVEMENTS

Proposed Development

- The proposed development will consist of four storeys with 44 units total, 270 m² of commercial space, 61 vehicle parking spaces and 24 bicycle parking spaces;
- The expected build-out date for the proposed development is assumed to be 2020. A background horizon year 2025 is assessed for 5-years beyond site build out;
- Vehicular access to the site is proposed to Orville Street via a two-way, full/movement 6.0 m wide driveway to the surface parking and parking garage ramp;
- The ramp to the garage is located approximately 30 m from Orville Street and the site driveway is located approximately 40 m from Stittsville Main Street; and;
- The site is zoned as TM – Traditional Main Street TM9[1736]H (15).

Trip Generation and Background Conditions

- Based on TRANS residential trip generation rates and ITE Trip Generation Manual 10th Edition rates:
 - The potential 'new' two-way vehicle trips for the proposed development is approximately 17 and 26 veh/h during the weekday morning and afternoon peak hours, respectively;
 - The potential "new" two-way transit trips are 6 to 11 persons/h, and;
 - the potential "new" walking and cycling two-way trips are 26 to 42 persons/h.
- Based on City of Ottawa intersection traffic growth rates, a 2% background growth rate per annum is used; and
- Given the low projected site-generated traffic volumes, traffic impact is considered negligible and analysis is focused on design review.

Site Design

- All building doors are noted to be within 300 m of transit service with interlocked pathways connecting to the adjacent network of sidewalks,
- The frontage proposal is noted to constitute and improvement to current conditions,
- The provision of a boulevard to minimize dooring issues with pedestrians would be desirable,
- A total of 24 bicycle parking spaces are proposed for the subject development, meeting the City's By-Law requirements, bicycle parking spaces should be provided close to building entrances in well-used, lit areas and protected from weather wherever possible,
- Vehicle parking is proposed in an underground garage (27 spaces), a surface parking lot to the rear of the property (27 stalls) and on a lay-by fronting Stittsville Main Street (7 spaces), meeting City of Ottawa Parking By-Law,
- Access to the underground garage is provided by a 6 m wide two-way ramp located in the middle of the site approximately 30 m from Orville Street, Surface parking (90°) and 7 townhome driveways also connect to the 6 m wide on-site driveway.
- The proposed garage ramp has a ___ % grade with ___ m of ___ % transition grades. The primary grade exceeds By-Law requirements however, it is considered acceptable if the exposed portion of the ramp is heated.

Parking

- A total of 61 vehicle parking spaces are proposed to serve the subject development, which meets the City of Ottawa By-Law provisions,
 - 27 are proposed as surface parking spaces to the rear of the property, connecting to Orville Street via a 6.0 m aisle;
 - 27 are proposed as underground parking spaces;
 - 7 are proposed in a parking lay-by fronting Stittsville Main Street, and;
 - All parking spaces are noted to be 2.6 m wide and 5.2 m long, meeting City of Ottawa parking By-Law provisions.

Boundary Street Design

- Given the development's location, the target levels of service for pedestrians and cyclists are high (PLoS 'B' and BLoS 'C', respectively), the Transit TLoS target is TLoS 'D' and the truck level of service target is TkLoS 'D',
- The existing conditions on Stittsville Main Street do not meet level of service area targets for pedestrians and cyclists,
 - The high traffic volumes on Stittsville Main Street and relatively high speeds (estimated to be 50 to 60 km/h), result in a lower level of service for pedestrians (PLoS 'E'),
 - The absence of dedicated cycling facilities along Stittsville Main Street, the high traffic volumes and relatively high operating speeds on Stittsville Main Street result in lower levels of service for cyclists (BLoS 'E'),
- Reducing the operating speed to 30 to 50 km/h along Stittsville Main Street and providing a 2 m wide sidewalk with 0.5 m boulevard would result in PLoS 'B', meeting area targets,
- The provision of curbside bike lanes on each direction along Stittsville Main Street would result in BLoS 'C', meeting area targets.

Transit

- Transit service within the vicinity of the site is currently provided by OC Transpo Routes #61, 261, 263 and 301. Bus stops for Routes #61, 263 and 301 are located on Stittsville Main Street at Orville Street intersections. Bus Stops for Route # 261 are located on Abbott Street E at Stittsville Mains Street intersection,
- Bus stop #5490 is currently located in front of the site using space that could accommodate an additional three parking spaces in the proposed parking lay-by. In keeping with the City's Traditional Main Street design principles, to maximize on-street parking and to improve spacing between adjacent bus stop, it is recommended that the subject bus stop be relocated approximately 50 m north to the far side of the Orville/Stittsville Main intersection.

Based on the foregoing findings and conclusions, this report satisfies the TIA requirements for the 1531 Stittsville Main Street development and accordingly the Site Plan is recommended from a transportation perspective.

Prepared By:

Reviewed By:

Andrés Pena, M.Sc.
Engineering Intern

Ronald Jack, P.Eng.
Senior Transportation Engineer

Attachments

Appendix A

Screening Form

City of Ottawa 2017 TIA Guidelines

TIA Screening Form

Date

Oct-10-18

Project

1539 Stittsville Main Street

Project Number

476889

Results of Screening	Yes/No
Development Satisfies the Trip Generation Trigger	No
Development Satisfies the Location Trigger	Yes
Development Satisfies the Safety Trigger	Yes

Module 1.1 - Description of Proposed Development

Municipal Address	1539 Stittsville Main Street, Ottawa, ON K2S 1P1
Description of location	Ward 6. CON 10 PT LOT 24 RP 5R-4717;PART 1 RP 4R-10461 PARTS 8 & 9. Zonning TM9[1736]H(15)
Land Use	Currently occupied by service uses: Extra Mile Driving School, Ottawa Driving School, West End Music and DeMarco Construction General Contractor.
Development Size	47 Dwelling Units, 270 Sq.m. of retail.
Number of Accesses and Locations	Vehicular access will be provided via Orville Street. Seven on-street parking spaces are proposed on Stittsville Main Street.
Development Phasing	N/A
Buildout Year	2020
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger

Land Use Type	Townhomes or Apartments	
Development Size	47	Units
Trip Generation Trigger Met?	No	Total peak h person-trips generated (retail+residential): 41 person trips.

Module 1.3 - Location Triggers

Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	No	
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	Yes	Stittsville Main Traditional Street DPA
Location Trigger Met?	Yes	

Module 1.4 - Safety Triggers

Posted Speed Limit on any boundary road	<80	50m km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No	
A proposed driveway is 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) or within auxiliary lanes of an intersection;	Yes	140 m to the south of the Stittsville/Abbott signalized intersection
A proposed driveway makes use of an existing median break that serves an existing site	No	
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	No	
The development includes a drive-thru facility	No	
Safety Trigger Met?	Yes	

Appendix B

Traffic Data



Turning Movement Count - 15 Minute Summary Report

ABBOTT ST @ STITTSTVILLE MAIN ST

Survey Date: Monday, June 29, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 0
Eastbound: 1 Westbound: 0

STITTSTVILLE MAIN ST

ABBOTT ST

Time Period	Northbound			Southbound			Eastbound			Westbound									Grand Total
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	
07:00 07:15	1	63	8	72	9	44	4	57	129	5	7	4	16	3	2	7	12	28	157
07:15 07:30	0	81	10	91	6	34	1	41	132	4	5	1	10	4	1	9	14	24	156
07:30 07:45	2	97	8	107	11	49	3	63	170	6	6	4	16	4	3	9	16	32	202
07:45 08:00	1	101	14	116	6	61	0	67	183	2	12	7	21	5	8	9	22	43	226
08:00 08:15	1	89	15	105	7	44	2	53	158	5	4	1	10	5	4	12	21	31	189
08:15 08:30	1	77	8	86	19	51	1	71	157	9	7	6	22	7	1	19	27	49	206
08:30 08:45	1	106	9	116	9	67	0	76	192	6	10	4	20	8	3	14	25	45	237
08:45 09:00	0	101	13	114	18	84	1	103	217	3	13	13	29	16	5	27	48	77	294
09:00 09:15	3	109	15	127	14	75	6	95	222	6	7	3	16	11	4	17	32	48	270
09:15 09:30	2	103	13	118	13	72	3	88	206	6	13	6	25	5	7	16	28	53	259
09:30 09:45	1	103	12	116	10	61	3	74	190	5	14	1	20	5	0	15	20	40	230
09:45 10:00	0	117	8	125	11	97	5	113	238	9	9	4	22	18	1	13	32	54	292
11:30 11:45	6	103	18	127	7	97	6	110	237	3	1	3	7	7	11	20	38	45	282
11:45 12:00	2	109	16	127	15	90	7	112	239	9	6	2	18	19	3	16	38	56	295
12:00 12:15	1	111	8	120	15	102	5	122	242	10	6	2	18	16	5	32	53	71	313
12:15 12:30	3	95	16	114	14	122	2	138	252	5	8	4	17	11	1	15	27	44	296
12:30 12:45	2	113	15	130	17	132	9	158	288	4	9	6	19	16	4	14	34	53	341
12:45 13:00	4	99	7	110	16	112	11	139	249	5	7	11	23	10	6	19	35	58	307
13:00 13:15	3	106	15	124	8	97	6	111	235	8	11	4	23	6	6	16	28	51	286
13:15 13:30	2	95	8	105	7	100	4	111	216	14	3	3	20	11	8	5	24	44	260
15:00 15:15	2	117	9	128	14	107	12	133	261	7	9	3	19	13	7	23	43	62	323
15:15 15:30	6	94	13	113	10	140	3	153	266	8	5	3	16	12	12	21	45	61	327
15:30 15:45	4	99	14	117	11	139	11	161	278	9	13	4	26	25	6	15	46	72	350
15:45 16:00	5	123	18	146	11	149	15	175	321	2	9	3	14	17	8	24	49	63	384
16:00 16:15	4	144	30	178	15	155	9	179	357	6	5	2	13	14	8	25	47	60	417
16:15 16:30	7	108	21	136	12	153	11	176	312	11	3	4	18	14	14	27	55	73	385
16:30 16:45	4	113	21	138	17	152	9	178	316	13	6	5	24	16	13	26	55	79	395
16:45 17:00	4	99	19	122	24	164	12	200	322	8	7	5	20	22	10	23	55	75	397
17:00 17:15	4	107	17	128	22	147	10	179	307	10	5	9	24	18	15	30	63	87	394
17:15 17:30	1	116	18	135	13	171	14	198	333	11	16	14	41	20	13	21	54	95	428
17:30 17:45	9	80	13	102	10	146	9	165	267	3	17	3	23	22	5	18	45	68	335
17:45 18:00	7	111	11	129	10	150	5	165	294	4	2	7	13	13	13	19	45	58	352
TOTAL:	93	3289	440	3822	401	3364	199	3964	7786	216	255	151	623	393	207	576	1176	1799	9585

Note: U-Turns are included in Totals.

Comment:



Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order
34795

ABBOTT ST @ STITTSVILLE MAIN ST

Count Date: Monday, June 29, 2015

Start Time: 07:00

Time Period	STITTSVILLE MAIN ST			ABBOTT ST			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 08:00	1	0	1	3	1	4	5
08:00 09:00	0	2	2	2	0	2	4
09:00 10:00	0	0	0	4	0	4	4
11:30 12:30	6	2	8	3	1	4	12
12:30 13:30	6	2	8	9	4	13	21
15:00 16:00	17	6	23	14	9	23	46
16:00 17:00	13	0	13	13	2	15	28
17:00 18:00	10	0	10	10	4	14	24
Total	53	12	65	58	21	79	144

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

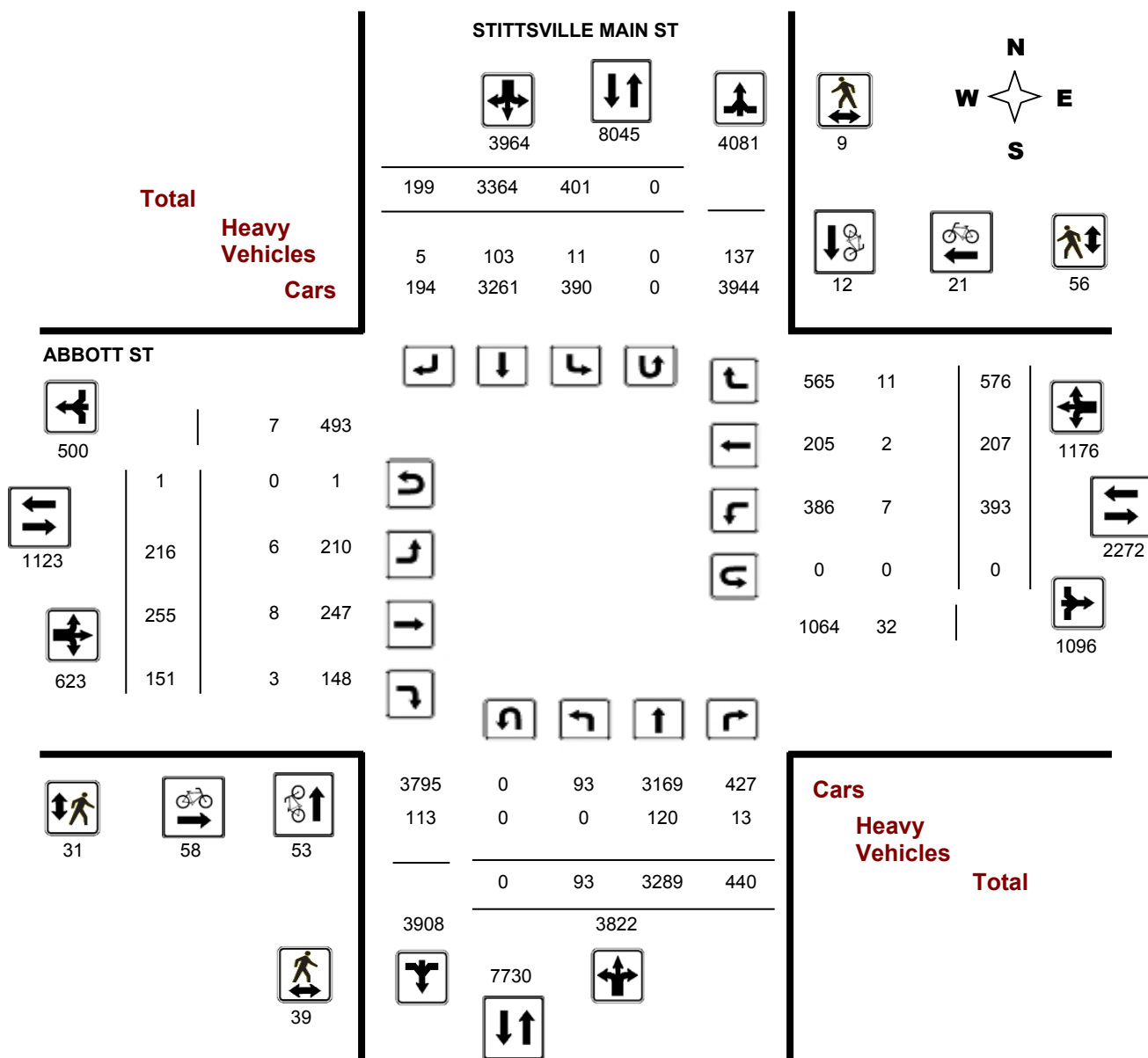
Transportation Services - Traffic Services

Turning Movement Count - Full Study Diagram

ABBOTT ST @ STITTSTVILLE MAIN ST

Survey Date: Monday, June 29, 2015

WO#: 34795
Device: Jamar Technologies, Inc





Transportation Services - Traffic Services

W.O.
34795

Turning Movement Count - Heavy Vehicle Report

ABBOTT ST @ STITTSVILLE MAIN ST

Survey Date: Monday, June 29, 2015

STITTSVILLE MAIN ST										ABBOTT ST										Grand Total
Time Period	Northbound			Southbound			S TOT	STR TOT	Eastbound			Westbound			W TOT	STR TOT				
	LT	ST	RT	N TOT	LT	ST			RT	LT	ST	RT	E TOT	LT			ST	RT		
07:00	08:00	0	18	1	19	7	14	0	21	40	0	0	0	0	0	0	0	0	0	40
08:00	09:00	0	19	4	23	1	9	0	10	33	1	0	0	1	2	1	1	4	5	38
09:00	10:00	0	21	3	24	1	13	2	16	40	2	0	0	2	1	0	1	2	4	44
11:30	12:30	0	13	1	14	1	15	2	18	32	2	2	1	5	1	1	2	4	9	41
12:30	13:30	0	15	1	16	1	13	0	14	30	0	0	0	0	2	0	1	3	3	33
15:00	16:00	0	17	2	19	0	11	0	11	30	1	5	0	6	0	0	2	2	8	38
16:00	17:00	0	13	1	14	0	11	1	12	26	0	0	2	2	0	0	2	2	4	30
17:00	18:00	0	4	0	4	0	17	0	17	21	0	1	0	1	1	0	2	3	4	25
Sub Total		0	120	13	133	11	103	5	119	252	6	8	3	17	7	2	11	20	37	289
U-Turns (Heavy Vehicles)					0				0	0				0				0	0	0
Total		0	120	13	0	11	103	5	119	252	6	8	3	17	7	2	11	20	37	289

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.



Transportation Services - Traffic Services

Work Order

34795

Turning Movement Count - Pedestrian Volume Report

ABBOTT ST @ STITTSTVILLE MAIN ST

Count Date: Monday, June 29, 2015

Start Time: 07:00

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	2	0	2	1	0	1	3
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	1	1	1	1	2	3
07:00 08:00	2	1	3	2	1	3	6
08:00 08:15	0	0	0	0	2	2	2
08:15 08:30	2	0	2	1	0	1	3
08:30 08:45	1	0	1	1	2	3	4
08:45 09:00	0	0	0	2	0	2	2
08:00 09:00	3	0	3	4	4	8	11
09:00 09:15	0	0	0	0	1	1	1
09:15 09:30	3	0	3	2	3	5	8
09:30 09:45	0	0	0	0	2	2	2
09:45 10:00	0	0	0	2	1	3	3
09:00 10:00	3	0	3	4	7	11	14
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	1	0	1	0	0	0	1
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	1	2	3	3
11:30 12:30	1	0	1	1	2	3	4
12:30 12:45	2	1	3	3	4	7	10
12:45 13:00	2	0	2	1	2	3	5
13:00 13:15	4	1	5	0	1	1	6
13:15 13:30	3	0	3	0	2	2	5
12:30 13:30	11	2	13	4	9	13	26
15:00 15:15	6	1	7	2	6	8	15
15:15 15:30	4	1	5	1	1	2	7
15:30 15:45	0	0	0	0	8	8	8
15:45 16:00	0	0	0	0	0	0	0
15:00 16:00	10	2	12	3	15	18	30
16:00 16:15	0	2	2	2	3	5	7
16:15 16:30	0	0	0	1	2	3	3
16:30 16:45	0	0	0	0	8	8	8
16:45 17:00	1	1	2	1	0	1	3
16:00 17:00	1	3	4	4	13	17	21
17:00 17:15	0	0	0	2	0	2	2
17:15 17:30	3	0	3	1	3	4	7
17:30 17:45	3	1	4	3	0	3	7
17:45 18:00	2	0	2	3	2	5	7
17:00 18:00	8	1	9	9	5	14	23
Total	39	9	48	31	56	87	135

Comment:

Turning Movement Count - Full Study Summary Report

ABBOTT ST @ STITTSVILLE MAIN ST

Survey Date: Monday, June 29, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 0
Eastbound: 1 Westbound: 0

AADT Factor

.90

Full Study

STITTSVILLE MAIN ST										ABBOTT ST									
Northbound					Southbound					Eastbound					Westbound				
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	4	342	40	386	32	188	8	228	614	17	30	16	63	16	14	34	64	127	741
08:00 09:00	3	373	45	421	53	246	4	303	724	23	34	24	81	36	13	72	121	202	926
09:00 10:00	6	432	48	486	48	305	17	370	856	26	43	14	83	39	12	61	112	195	1051
11:30 12:30	12	418	58	488	51	411	20	482	970	27	21	11	59	53	20	83	156	215	1185
12:30 13:30	11	413	45	469	48	441	30	519	988	31	30	24	85	43	24	54	121	206	1194
15:00 16:00	17	433	54	504	46	535	41	622	1126	26	36	13	75	67	33	83	183	258	1384
16:00 17:00	19	464	91	574	68	624	41	733	1307	38	21	16	75	66	45	101	212	287	1594
17:00 18:00	21	414	59	494	55	614	38	707	1201	28	40	33	101	73	46	88	207	308	1509
Sub Total	93	3289	440	3822	401	3364	199	3964	7786	216	255	151	622	393	207	576	1176	1798	9584
U Turns	0				0				0	1				0				1	1
Total	93	3289	440	3822	401	3364	199	3964	7786	216	255	151	623	393	207	576	1176	1799	9585
EQ 12Hr	129	4572	612	5313	557	4676	277	5510	10823	300	354	210	866	546	288	801	1635	2501	13324
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													1.39						
AVG 12Hr	116	4115	550	4781	502	4208	249	4959	9740	270	319	189	779	492	259	721	1471	2250	11990
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													.90						
AVG 24Hr	152	5390	721	6264	657	5513	326	6496	12760	354	418	247	1021	644	339	944	1927	2948	15708
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													1.31						

Comments:

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



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

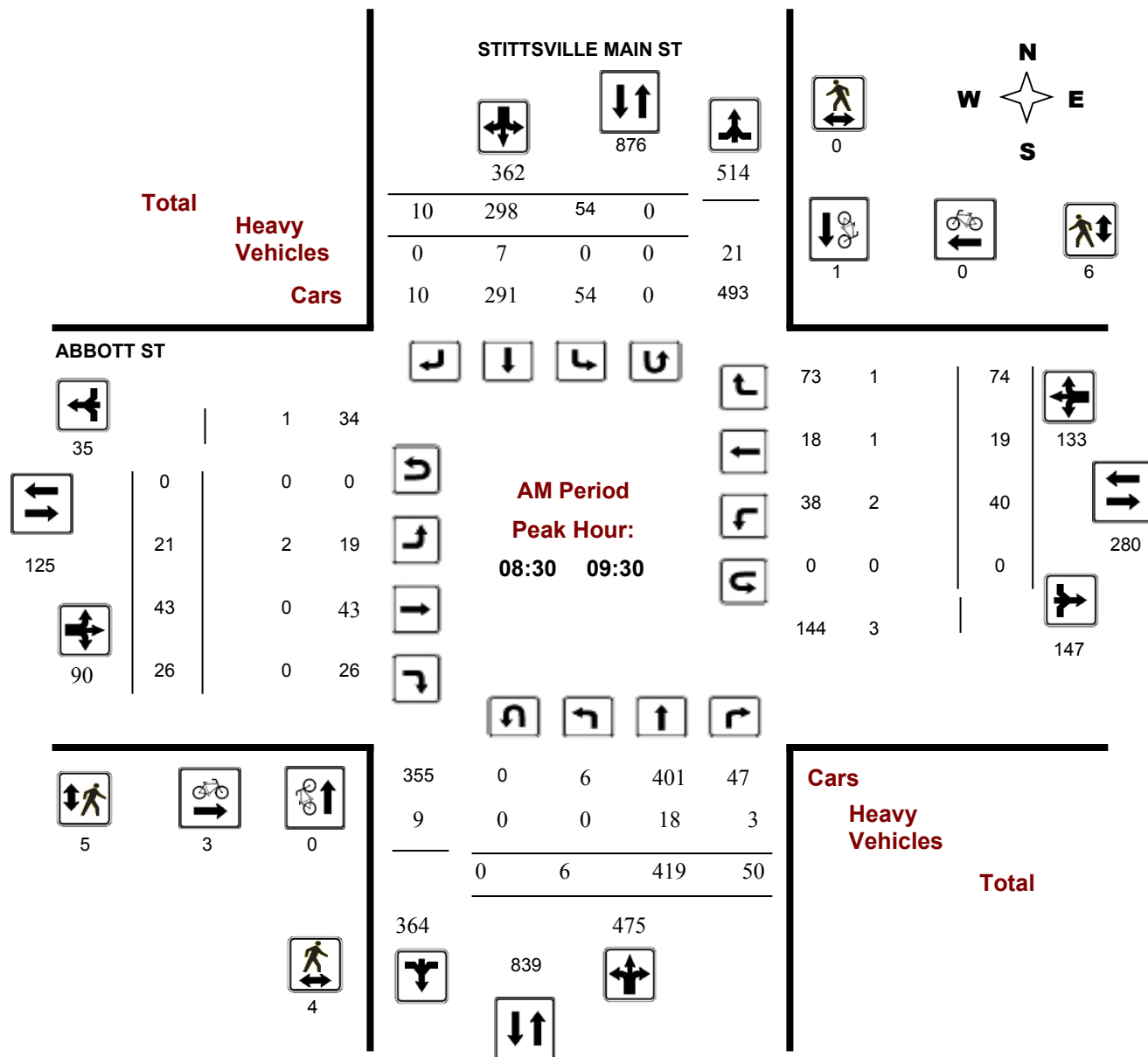
ABBOTT ST @ STITTSTVILLE MAIN ST

Survey Date: Monday, June 29, 2015

Start Time: 07:00

WO No: 34795

Device: Jamar Technologies, Inc





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

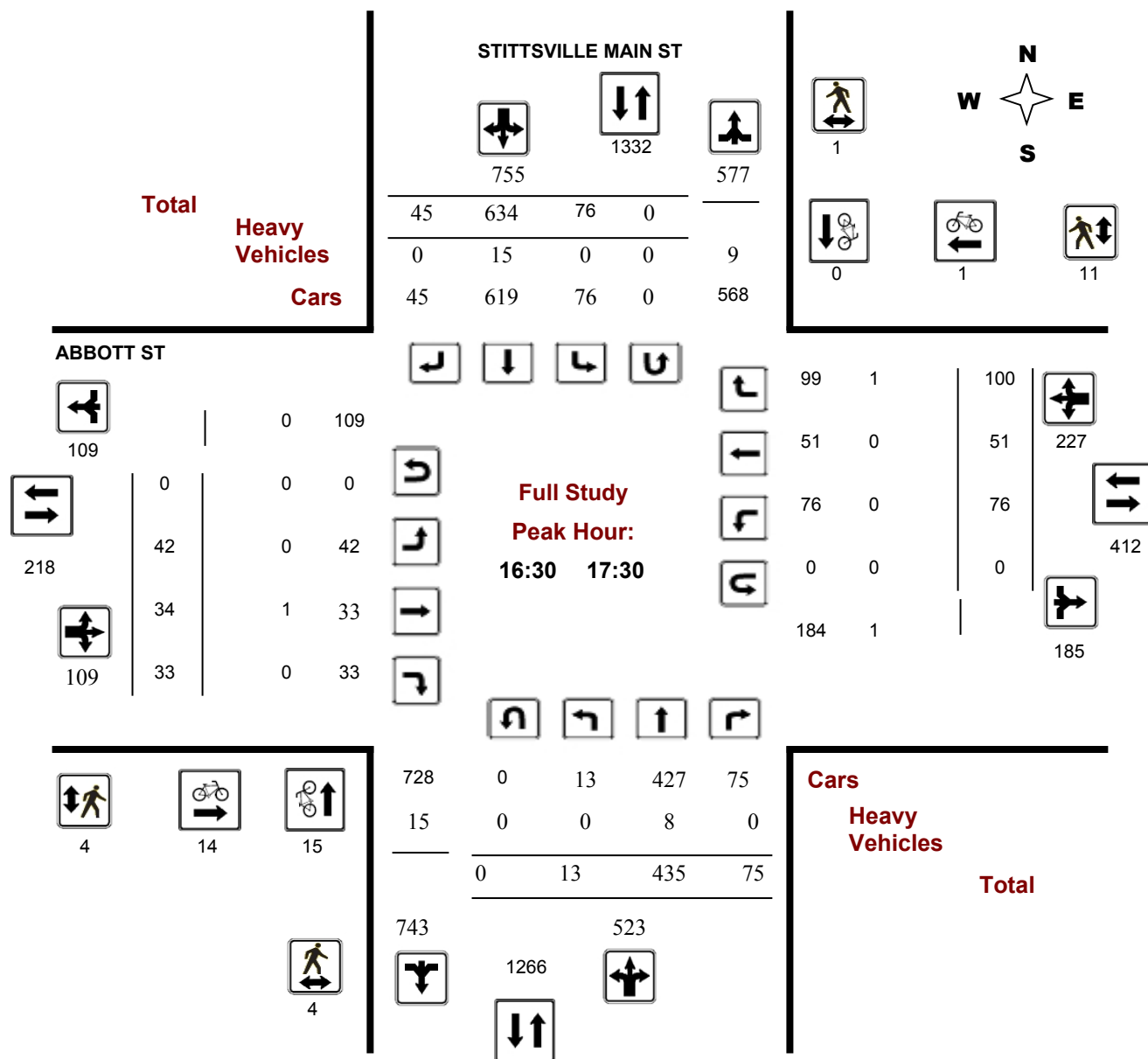
ABBOTT ST @ STITTVILLE MAIN ST

Survey Date: Monday, June 29, 2015

Start Time: 07:00

WO No: 34795

Device: Jamar Technologies, Inc





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

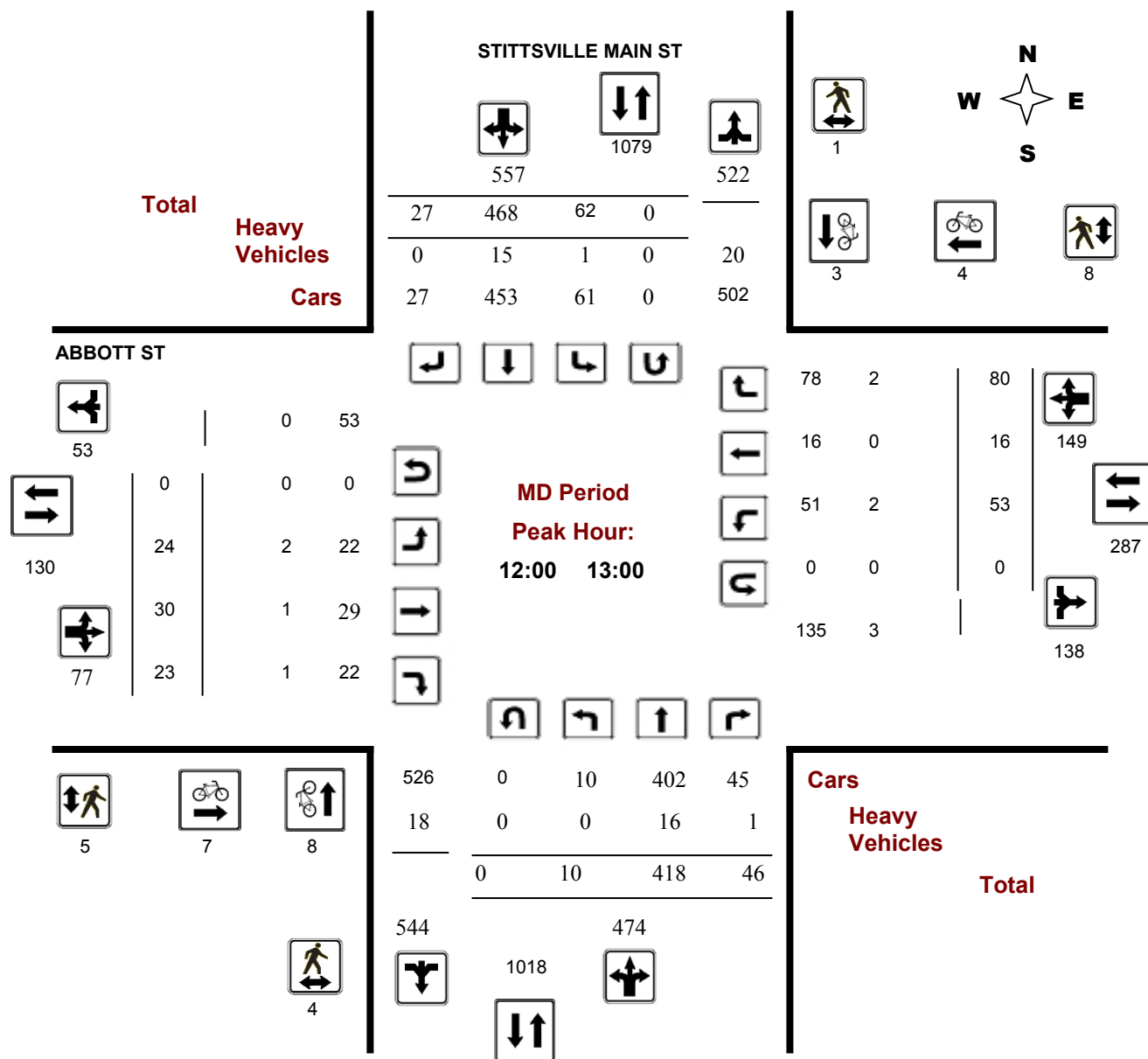
ABBOTT ST @ STITTSTVILLE MAIN ST

Survey Date: Monday, June 29, 2015

Start Time: 07:00

WO No: 34795

Device: Jamar Technologies, Inc





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

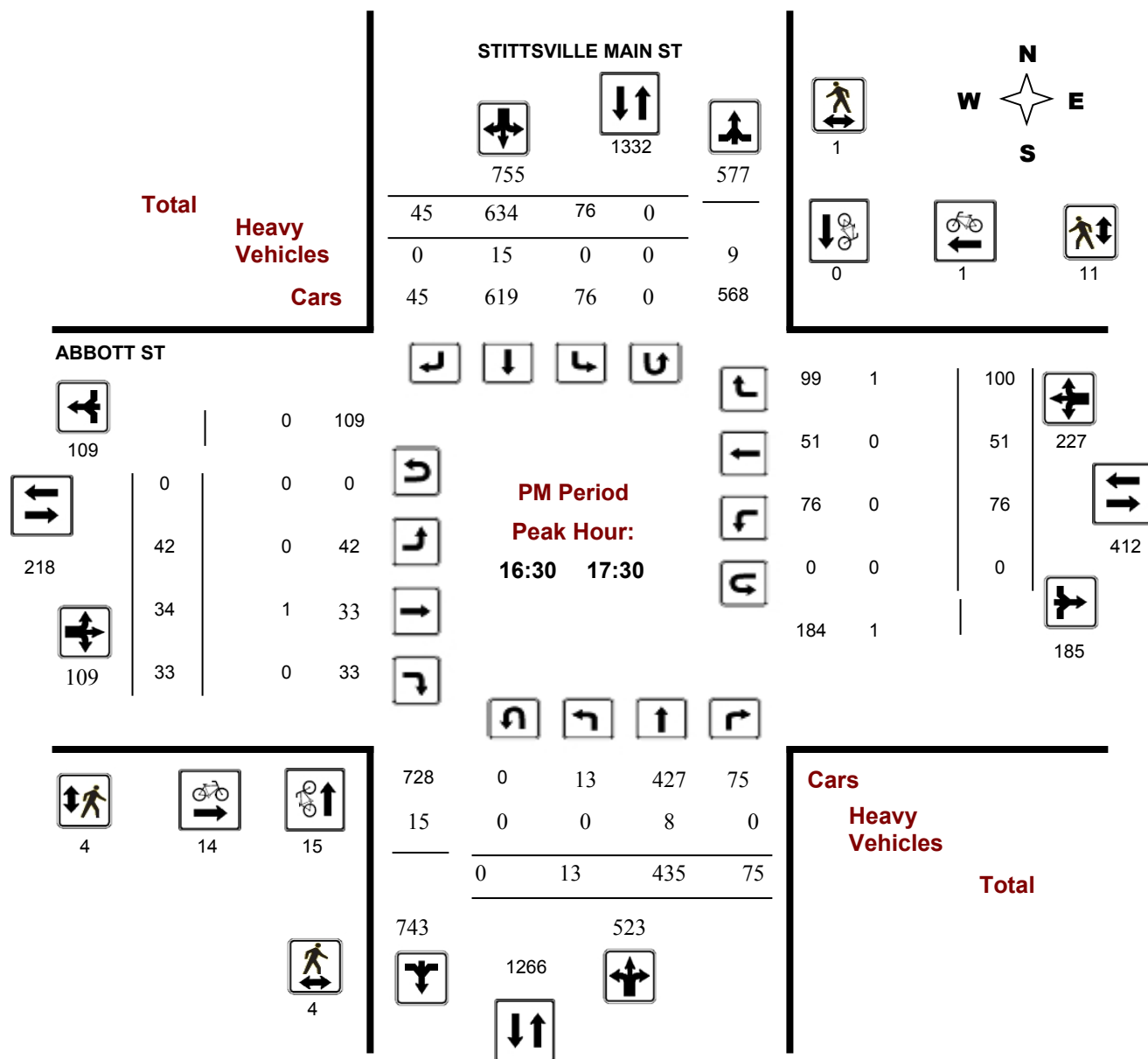
ABBOTT ST @ STITTVILLE MAIN ST

Survey Date: Monday, June 29, 2015

Start Time: 07:00

WO No: 34795

Device: Jamar Technologies, Inc



Turning Movement Count - 15 Min U-Turn Total Report

ABBOTT ST @ STITTVILLE MAIN ST

Survey Date: Monday, June 29, 2015

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	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	0	0	0
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	1	0	1
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	0	1	0	1

Appendix C

Collision Data



City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2013 **To:** December 31, 2017

Location: ABBOTT ST @ STITTSVILLE MAIN ST

Traffic Control: Traffic signal

Total Collisions: 12

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2013-Mar-02, Sat,14:42	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Nov-29, Fri,21:16	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Jul-24, Thu,16:24	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Pick-up truck	Other motor vehicle	
2014-Aug-21, Thu,18:40	Rain	Rear end	P.D. only	Wet	South	Going ahead	Pick-up truck	Other motor vehicle	
					South	Stopped	Pick-up truck	Other motor vehicle	
2015-Jul-22, Wed,17:26	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle	
					West	Turning right	Automobile, station wagon	Other motor vehicle	

2015-Sep-29, Tue,13:12	Rain	Angle	Non-fatal injury	Wet	West	Going ahead	Bicycle	Other motor vehicle	
					North	Turning right	Automobile, station wagon	Cyclist	
2015-Dec-07, Mon,18:12	Clear	SMV other	Non-fatal injury	Dry	West	Turning left	Unknown	Pedestrian	1
2016-May-09, Mon,09:32	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
2016-May-06, Fri,21:05	Clear	Angle	P.D. only	Dry	North	Going ahead	Motorcycle	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-May-25, Thu,07:07	Clear	SMV other	P.D. only	Dry	West	Turning left	Pick-up truck	Pole (utility, power)	
2017-Jun-30, Fri,12:16	Rain	Rear end	Non-fatal injury	Wet	North	Going ahead	Pick-up truck	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
2017-Sep-16, Sat,12:45	Clear	Other	P.D. only	Dry	East	Reversing	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	

Location: ELM CRES N @ STITTSVILLE MAIN ST

Traffic Control: Stop sign

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
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2014-Jul-10, Thu,11:51	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle

Location: STITTSVILLE MAIN ST @ ORVILLE ST

Traffic Control: Stop sign

Total Collisions: 6

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Nov-07, Fri,11:11	Clear	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Pick-up truck	Other motor vehicle	
2014-Nov-14, Fri,14:27	Clear	Angle	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Turning left	Pick-up truck	Other motor vehicle	
2014-Nov-28, Fri,11:15	Snow	Rear end	P.D. only	Wet	South	Going ahead	Passenger van	Other motor vehicle	
					South	Turning left	Pick-up truck	Other motor vehicle	
2015-Mar-24, Tue,16:53	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Pick-up truck	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Pick-up truck	Other motor vehicle	
2015-Jun-23, Tue,15:00	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	

2017-Aug-30, Wed,20:30	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Passenger van	Other motor vehicle
					South	Turning left	Automobile, station wagon	Other motor vehicle

Location: STITTSVILLE MAIN ST btwn ABBOTT ST W & ORVILLE ST

Traffic Control: No control

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jul-22, Wed,03:34	Clear	SMV other	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Pole (utility, power)	
2016-Feb-27, Sat,22:19	Clear	SMV other	P.D. only	Wet	South	Going ahead	Pick-up truck	Curb	

Location: STITTSVILLE MAIN ST btwn ORVILLE ST & ELM CRES

Traffic Control: No control

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-May-20, Wed,15:05	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
2017-May-31, Wed,13:26	Clear	SMV other	P.D. only	Dry	North	Reversing	Tow truck	Pole (utility, power)	

Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	10	1	0	2	0	3	0	1	17
Non-fatal injury	2	0	0	2	0	2	0	0	6
Non reportable	0	0	0	0	0	0	0	0	0
Total	12	1	0	4	0	5	0	1	23
	#1 or 52%	#4 or 4%	#6 or 0%	#3 or 17%	#6 or 0%	#2 or 22%	#6 or 0%	#4 or 4%	

74%
26%
0%
100%

ABBOTT ST/STITTSVILLE MAIN ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	12	17,633	1825	0.37

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	4	1	0	1	0	1	0	1	8
Non-fatal injury	1	0	0	2	0	1	0	0	4
Non reportable	0	0	0	0	0	0	0	0	0
Total	5	1	0	3	0	2	0	1	12
	42%	8%	0%	25%	0%	17%	0%	8%	

67%
33%
0%
100%

STITTSVILLE MAIN ST, ABBOTT ST W to ORVILLE ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	2	14,121	1825	0.08

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	0	0	0	0	0	1	0	0	1
Non-fatal injury	0	0	0	0	0	1	0	0	1
Non reportable	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	0	2
	0%	0%	0%	0%	0%	100%	0%	0%	

50%
50%
0%
100%

ELM CRES N/STITTSVILLE MAIN ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	1	15,121	1825	0.04

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	1	0	0	0	0	0	0	0	1
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non reportable	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	0	1
	100%	0%	0%	0%	0%	0%	0%	0%	

100%
0%
0%
100%

STITTSVILLE MAIN ST, ORVILLE ST to ELM CRES

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	2	14,121	1825	0.08

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	1	0	0	0	0	1	0	0	2
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non reportable	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	1	0	0	2
	50%	0%	0%	0%	0%	50%	0%	0%	

100%
0%
0%
100%

STITTSVILLE MAIN ST/ORVILLE ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	6	14,621	1825	0.22

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	4	0	0	1	0	0	0	0	5
Non-fatal injury	1	0	0	0	0	0	0	0	1
Non reportable	0	0	0	0	0	0	0	0	0
Total	5	0	0	1	0	0	0	0	6
	83%	0%	0%	17%	0%	0%	0%	0%	

83%
17%
0%
100%

Appendix D

Multi-Modal Level of Service Analysis

Multi-Modal Level of Service - Segments Form

Consultant	Parsons	Project	1531 Stittsville
Scenario	Existing and improvements	Date	12/13/2018
Comments	Adjacent to site		

SEGMENTS		Street A	Section Existing	Section Proposed	Section Improvements
Pedestrian	Sidewalk Width		1.8 m	≥ 2 m	≥ 2 m
	Boulevard Width		0.5 - 2 m	< 0.5	< 0.5
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000	> 3000
	Operating Speed		> 50 to 60 km/h	> 50 to 60 km/h	> 30 to 50 km/h
	On-Street Parking		no	yes	yes
	Exposure to Traffic PLoS		E	D	B
	Effective Sidewalk Width		2.0 m	2.0 m	2.0 m
	Pedestrian Volume		250 ped/hr	500 ped /hr	500 ped /hr
Bicycle	Crowding PLoS	E	B	B	B
	Level of Service		E	D	B
	Type of Cycling Facility		Mixed Traffic	Mixed Traffic	Curbside Bike Lane
	Number of Travel Lanes		2-3 lanes total	2-3 lanes total	≤ 1 each direction
	Operating Speed		≥ 50 to 60 km/h	≥ 50 to 60 km/h	>50 to 70 km/h
	# of Lanes & Operating Speed LoS		E	E	C
	Bike Lane (+ Parking Lane) Width				≥1.5 to <1.8 m
	Bike Lane Width LoS		-	-	B
Transit	Bike Lane Blockages	D			Rare
	Blockage LoS		-	-	A
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes	≤ 3 lanes
	Sidestreet Operating Speed		>40 to 50 km/h	>40 to 50 km/h	>40 to 50 km/h
	Unsignalized Crossing - Lowest LoS		B	B	B
	Level of Service		E	E	C
	Facility Type	D	Mixed Traffic	Mixed Traffic	Mixed Traffic
Truck	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8
	Level of Service		D	D	D
Truck	Truck Lane Width	B	> 3.7 m	> 3.7 m	> 3.7 m
	Travel Lanes per Direction		1	1	1
	Level of Service		B	B	B