Parish of St Helier

HAVRE DES PAS VILLAGE STUDY

Transport Study

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1 INTRODUCTION

1.1 BACKGROUND

1.1.1. WSP has been appointed by the Parish of St Helier (PoSH), Jersey to undertake a study of the Havre des Pas village area. The study is intended to:

- Gather data on the existing conditions and setting of the village area to understand how it relates to the rest of St Helier and wider Island community
- Consult with the local public and key stakeholders to identify key issues of concern, areas for improvement and community aspirations for the village area
- Consider and examine options for improvements to the local infrastructure, public realm and environment to enhance the area and provide benefit to the local community
- Consult the local community and key stakeholders on improvement options
- Develop a Masterplan for improvement of the village area

1.1.2. The study will provide the 'blueprint' for improvement of the area and help inform applications for future funding for development of the area.

1.2 STUDY OBJECTIVES

1.2.1. The following study objectives were developed and agreed by the Steering group:

- Reduce significantly the volume of traffic passing through the area, particularly on Havre des Pas and Green Street
- Redefine Havre des Pas as a residential 'village area' while also making it a more attractive destination for people to visit

1.3 REPORT LAYOUT

1.3.1. This report presents the existing and future traffic conditions for the Havre des Pas study area. The following areas are covered:

- Existing Situation
  - Road Network and Hierarchy
  - Public Transport Provision
  - Cycling and Pedestrian Provision
- Traffic Data Collection
- Option Testing
- Conclusions

2 EXISTING SERVICES

2.1 INTRODUCTION

2.1.1. This section outlines the existing transport provision within the Havre des Pas study area and is split into the following areas:

- Road Network and Hierarchy
- Public Transport Provision
- Cycle and Pedestrian Provision
- Collision mapping

2.1.2. The Havre des Pas area is in the south of the parish of St Helier, which accounts for over a third (34% / 33,522) of the total population of Jersey (Census 2011). St Helier and the Havre des Pas area is the highest population density with over 3,500 people per km^2.

2.2 ROAD NETWORK AND HIERARCHY

2.2.1. The road network for Havre de Pas is shown in Figure 1 below. The principal routes are shown in green, with the secondary roads shown in red. Other roads are shown in blue within Havre de Pas. The key roads within the study area (Primary and Secondary) are the responsibility of the Department for Infrastructure, while the more minor roads (largely those marked as tertiary) are the responsibility of the Parish. Therefore, it should be noted that DfI has ownership of Havre des Pas, Green St, St Clements and La Route du Fort which form the key roads for this study.

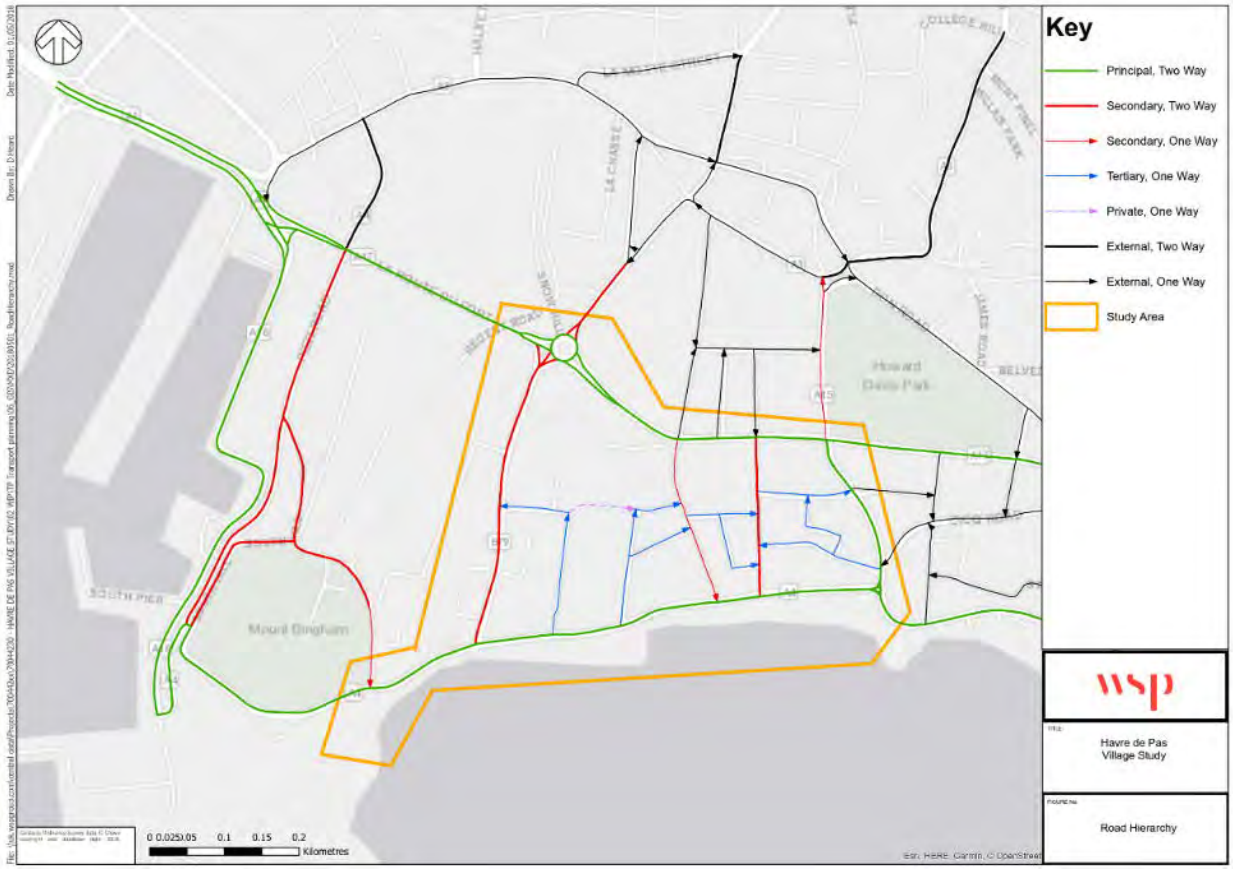


Figure 1 – Road Network within Havre de Pas

The road network within Havre de Pas

2.2.2. The principal road links through Havre de Pas are the east-west routes of La Route du Fort and Havre de Pas.

2.2.3. La Route du Fort is the most direct link from the east of Jersey to the centre of St Helier, the Port and west of the island. It is a single carriageway throughout, although the carriageway widens to two lanes on the approach to the key junctions of Green Street and St Clements Road. There are two pedestrian crossings on La Route du Fort. There is a limited number of properties which have direct vehicular access onto La Route du Fort, and on-street parking is not permitted through the presence of yellow lines.

2.2.4. Havre de Pas follows the Jersey shoreline between Green Street to the west and St Clements Road to the east. It provides access to the shoreline and beach at Havre de Pas, along with access to the La Collette industrial area to the west. It consists of a single lane carriageway throughout. There are two signalised pedestrian crossings on Havre de Pas. There are a number of properties which have direct vehicular access onto Havre de Pas, however on street parking is not permitted.

2.2.5. La Route du Fort and Havre de Pas are linked by the north-south roads of St Clements Road, Cleveland Road, Roseville Street and Green Street.

2.2.6. St Clements Road is the principal north-south route, located to the east of Havre de Pas. It is a single carriageway throughout. There are several properties and business with direct vehicular access onto St Clements Road, however on street parking is not permitted.

2.2.7. Cleveland Road and Green Street are the secondary north-south routes through Havre de Pas. Both roads are single carriageway throughout with several properties having direct vehicular access to the road in question. There is on-street parking along the entire length of Cleveland Road, reducing the available carriageway width; whereas for Green Street, the route is subject to traffic calming measures designed to discourage traffic travelling southbound from La Route du Fort and to manage vehicle speeds.

2.2.8. Roseville Street is the final road that links La Route du Fort and Havre de Pas. This road is a single carriageway road where traffic is only permitted to travel southbound. On street parking is permitted with some properties having direct vehicular access.

2.2.9. All of the remaining roads shown in Figure 1 are for access purposes only. Each road permits traffic in one direction only, carriageway width is often reduced to a single vehicle width, and there are numerous driveways and garages which have accesses from these roads. Of particular note is Marett Court, which is designated as a private road despite the fact that it connects Havre des Pas Gardens with Marett Road.

2.2.10. All other roads within Havre de Pas that are not shown in Figure 1 are no through roads, and therefore only have an access purpose to local properties and businesses.

The road network outside of Havre de Pas

2.2.11. La Route du Fort continues through the tunnel to La Route de la Liberation. La Route de la Liberation provides access to the rest of St Helier and the west of Jersey, including Jersey Airport.

2.2.12. Havre de Pas continues towards the south of Mont Bingham and around to Le Quai aux Marchands, which serves South Hill, the La Collette industrial area and the marina and English and French harbours.

2.2.13. These roads are linked by Pier Road and South Hill road. Pier Road runs parallel to Le Quai aux Marchands, crossing over La Route du Fort and linking to the road network to the north of the Fort at Mulcaster Street. South Hill spans across the top of the Mont Bingham, providing access to Fort Regent leisure centre.

2.2.14. To the north of Havre de Pas are several one-way roads that combine to form an alternative route for traffic travelling westbound towards the centre of St Helier. The route, however, is a convoluted route, and the road network itself has been designed with the needs of pedestrians ahead of motor vehicles, with several crossings, pedestrianised areas and traffic calming measures. This would suggest therefore that this route is not suitable as an alternative for westbound traffic that would otherwise use La Route du Fort.

2.2.15. Other routes to the north are Mont Millais and St James St, providing access to the Parish of St Saviours and the north of St Helier respectively.

2.3 PUBLIC TRANSPORT PROVISION

BUS ROUTES

2.3.1. Figure 2 shows the routes of the bus services through Havre de Pas. The figure shows that bus routes operate on La Route du Fort, Havre des Pas, Green Street and St Clements Road; all key roads within this study. The figure also shows there are no bus routes serving the La Collette, South Hill and Mount Bingham area.

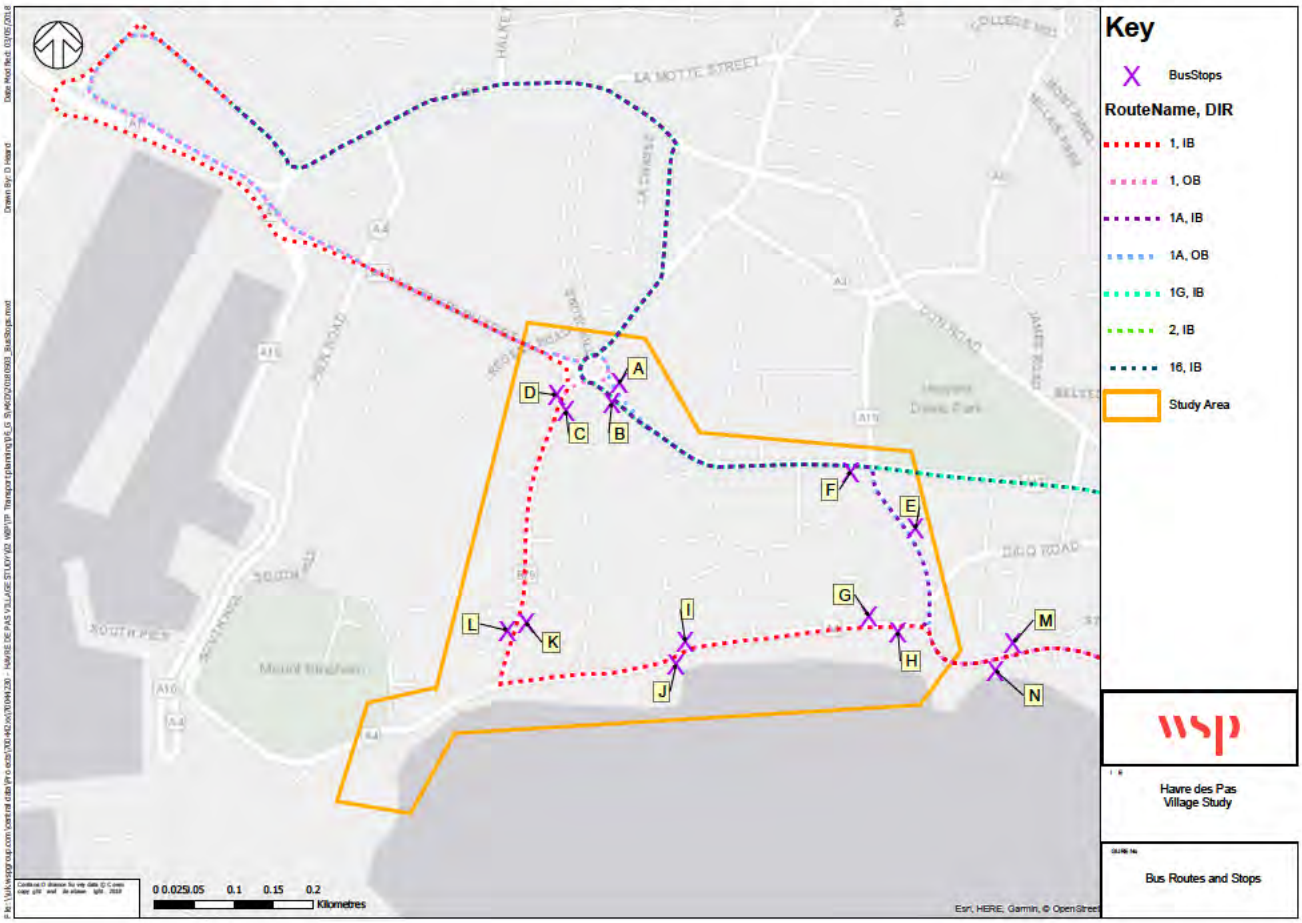


Figure 2 – Bus Routes serving the Havre de Pas area

2.3.2. Havre de Pas is mostly served by the Route 1 bus from Gorey Pier to St Helier. Route 1 enters Havre de Pas from Greve d'Azette and travels along Havre de Pas before turning north at Green Street. It then continues to Liberation Station via the tunnel. It returns to Gorey Pier following this route in reverse. Route 1 is a frequent service with approximately four buses per hour during the working day.

2.3.3. Route 1A and 1G are alternative routes that also travel from Gorey Pier to St Helier but traverse Havre de Pas in a different way. Route 1A enters from Greve d'Azette but travels north on St Clements Road; west on La Route du Fort; north on Green Street before heading towards Liberation Station via the one-way system. To return to Gorey Pier, Route 1A goes through the tunnel and continues on La Route du Fort until St Clements Road, whereupon it turns right and leaves via Greve d'Azette.

2.3.4. Route 1G enters Havre de Pas from La Route du Fort, before following the same route as 1A to get to Liberation Station.

2.3.5. Route 2 links St Helier with St Catherine. Busses traverse Havre de Pas via La Route du Fort, before turning north via Green Street so as to approach Liberation Station via the one-way system. Route 2 is an infrequent service with only one bus an hour during the working day and Saturdays; and only one bus every two hours on Sunday.

2.3.6. Route 16 links St Helier with St Clement. Busses follow the same route as route 2 to traverse Havre de Pas. Route 16 is a frequent service with at least two buses every hour.

2.3.7. Shown in grey on Figure 2 are the outbound bus routes that leave Liberation Station via La Route Du Fort before immediately turning north on Green Street. There are no bus stops (see Table 1 below) between the eastbound exit of the tunnel and Grenville Street which is outside of the Havre de Pas study area. These routes, therefore, do not directly serve Havre de Pas and are thus excluded from this report.

BUS STOPS

2.3.8. There are 14 bus stops in the study area, the locations of which are shown in Figure 2 above. Table 1 details which stops serve which routes in Havre de Pas.

Table 1 – List of Bus Stops within Havre de Pas

Bus Stop	Bus Stop No.	Name of Stop	Direction	Routes Served
A	4285	Lime Grove	From St Helier	1A
B	4286	Lime Grove	To St Helier	1A, 2, 16
C	3872	The Limes	From St Helier	1
D	3942	The Cedars	To St Helier	1
E	4374	Dunell Road	From St Helier	1A
F	3629	Cleveland Road	To St Helier	1A, 2, 16
G	3496	Havre des Pas E	From St Helier	1
H	3724	Havre des Pas W	To St Helier	1
I	2365	Marett Road E	From St Helier	1
J	2642	Marett Road W	To St Helier	1
K	2846	La Collette Shops	From St Helier	1
L	2728	La Collette Flats	To St Helier	1
M	3482	Beach Road E	From St Helier	1
N	2574	Beach Road W	To St Helier	1

2.3.9. Route 1 from Gorey Pier to St Helier is the key bus serving Havre de Pas, travelling through the study area between Greve d'Azette in the east and Green Street in the west. It is served by multiple (five) stops in both directions which are at regular intervals, with a maximum distance of less than 320m.

BUS USAGE

2.3.10. Bus patronage data has been obtained from the DfI for bus stops within the study area and is presented below. Table 2 provides a summary of average monthly patronage, while Figure 3 to Figure 16 provides bus patronage broken down into monthly ticket data for each stop between January 2016 and December 2017.

2.3.11. It should be noted bus patronage data represents monthly ticket sales data, providing numbers of tickets sold at the bus stop location, therefore indicating the number of travellers boarding a bus. Data is not available to confirm those alighting buses at each stop.

Table 2 - Average Monthly Bus Patronage Values (2017)

Stop Locations	Jan 2017	Feb 2017	Mar 2017	Apr 2017	May 2017	JuN 2017	Jul 2017	Aug 2017	Sep 2017	Oct 2017	Nov 2017	Dec 2017	Grand Total
A) Lime Grove E	221	170	241	147	184	271	248	177	242	266	298	223	2,688
B) Lime Grove W	40	61	12	75	24	143	64	116	123	46	31	20	755
C) The Limes	1,181	1,077	1,309	1,007	1,293	1,206	1,131	991	1,199	1,332	1,429	1,088	14,243
D) The Cedars	80	86	108	119	158	179	179	153	129	90	79	100	1,460
E) Dunell Road	57	73	113	33	70	83	71	37	38	35	72	76	758
F) Cleveland Road	74	89	104	113	200	185	211	244	263	197	172	179	2,031
G) Havre des Pas E	161	174	267	326	400	566	589	601	563	354	226	197	4,424
H) Havre des Pas W	145	154	138	220	404	349	474	434	529	214	224	209	3,494
I) Marett Road E	386	374	484	566	716	1,058	954	809	880	546	493	284	7,550
J) Marett Road W	166	245	383	956	1,590	2,273	2,562	2,916	2,616	834	234	264	15,039
K) La Collette Shops	375	331	430	276	311	424	345	373	370	287	325	302	4,149
L) La Collette Flats	535	498	583	597	627	707	658	650	599	516	391	423	6,784
M) Beach Road E	465	473	709	758	888	1,069	1,462	951	882	834	747	569	9,807
N) Beach Road W	569	672	881	1,090	1,394	1,894	2,141	1,956	2,017	1,210	758	738	15,320

2.3.12. Table 2 shows that bus stops N) Beach Road W and J) Marett Road W have the highest bus ticket sales with over 15,000 users travelling towards St Helier on average per month, closely followed by stop C) The Limes. Bus stops E) Dunell Road (Sb) and B) Lime Grove W have the lowest bus ticket sales with just over 750 on average per month.

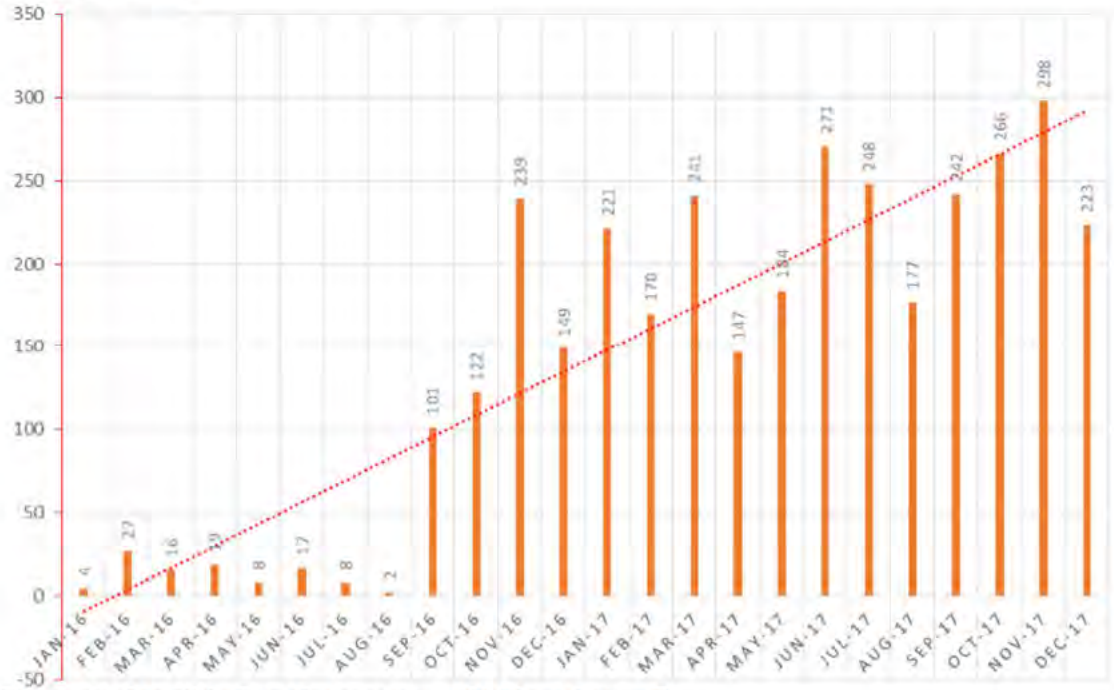


Figure 3 - Monthly Bus Patronage – (A) Lime Grove E

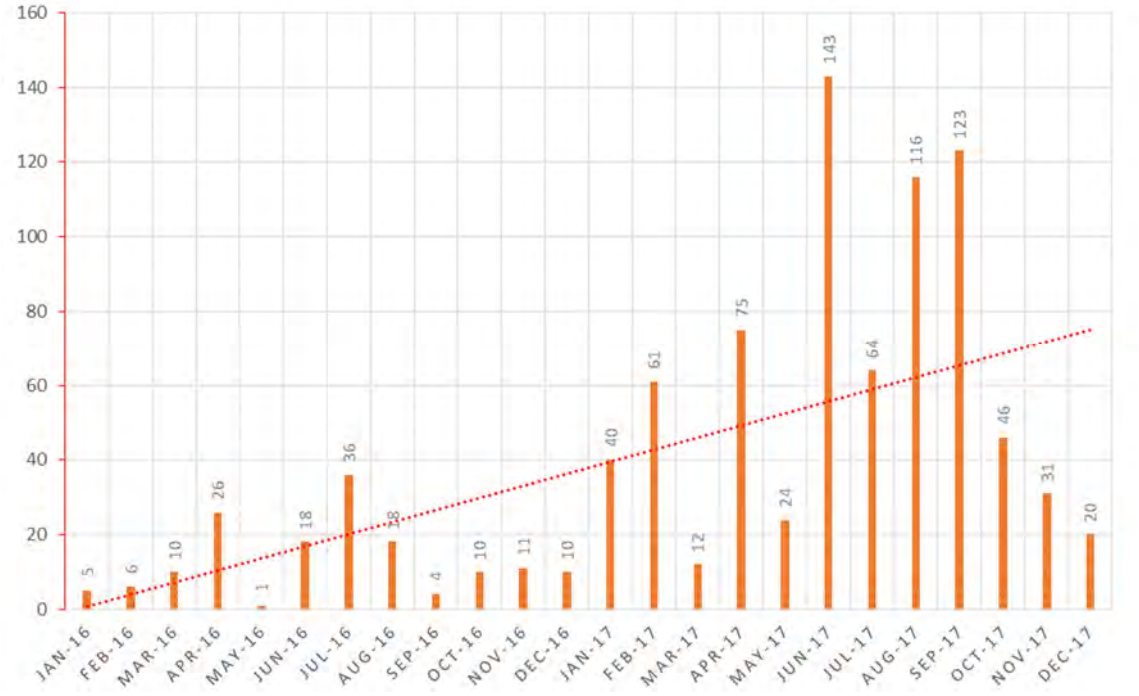


Figure 4 – Monthly Bus Patronage – (B) Lime Grove W

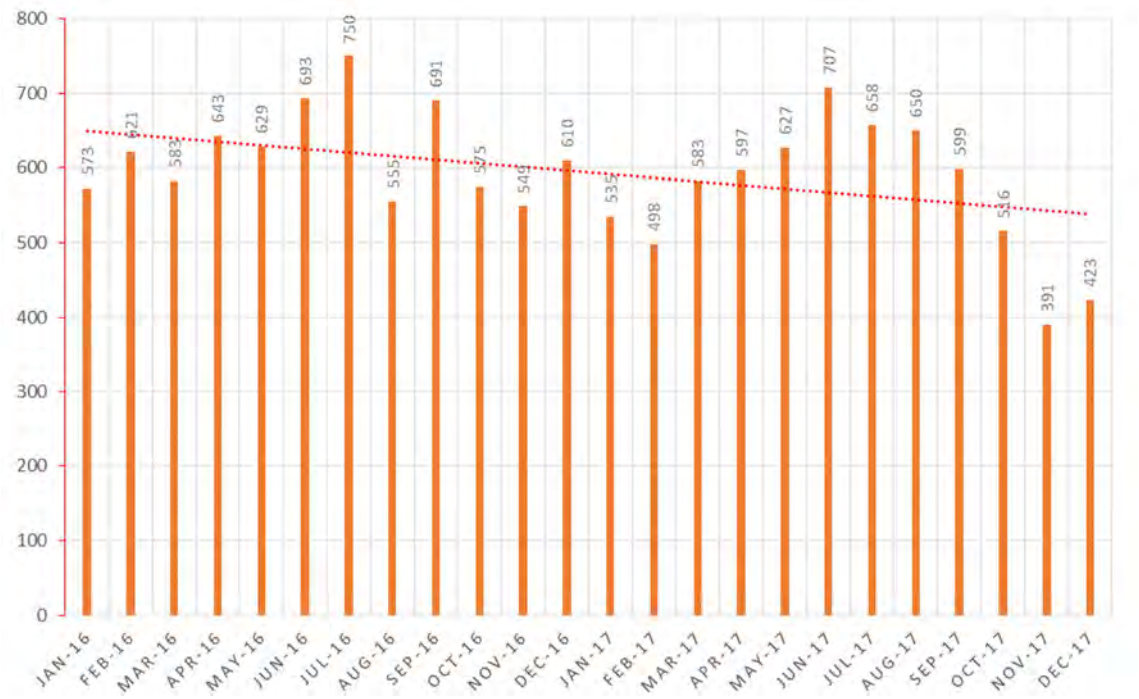


Figure 5 – Monthly Bus Patronage – (L) La Collette Flats

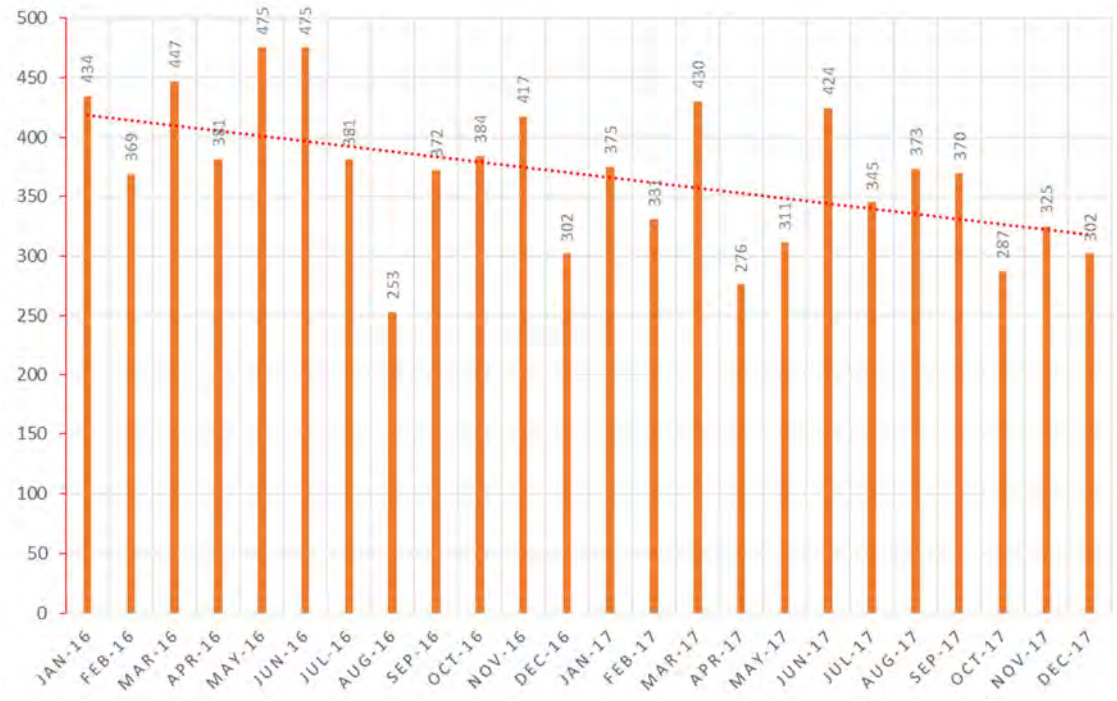


Figure 6 – Monthly Bus Patronage – (M) La Collette Shops

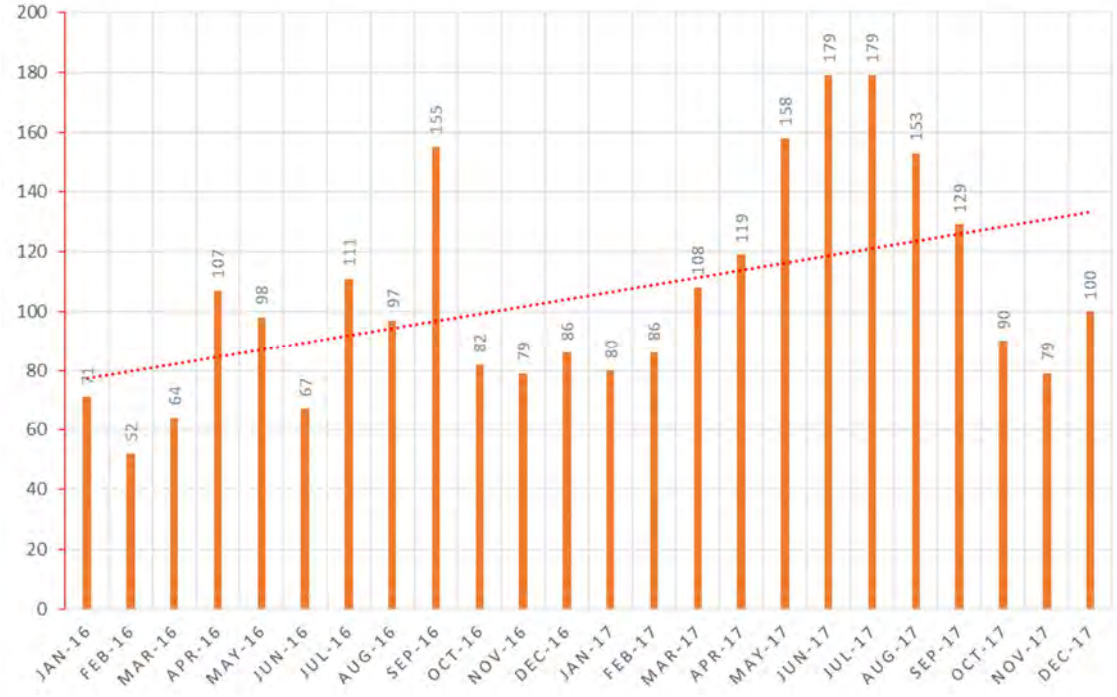


Figure 7 – Monthly Bus Patronage – (D) The Cedars

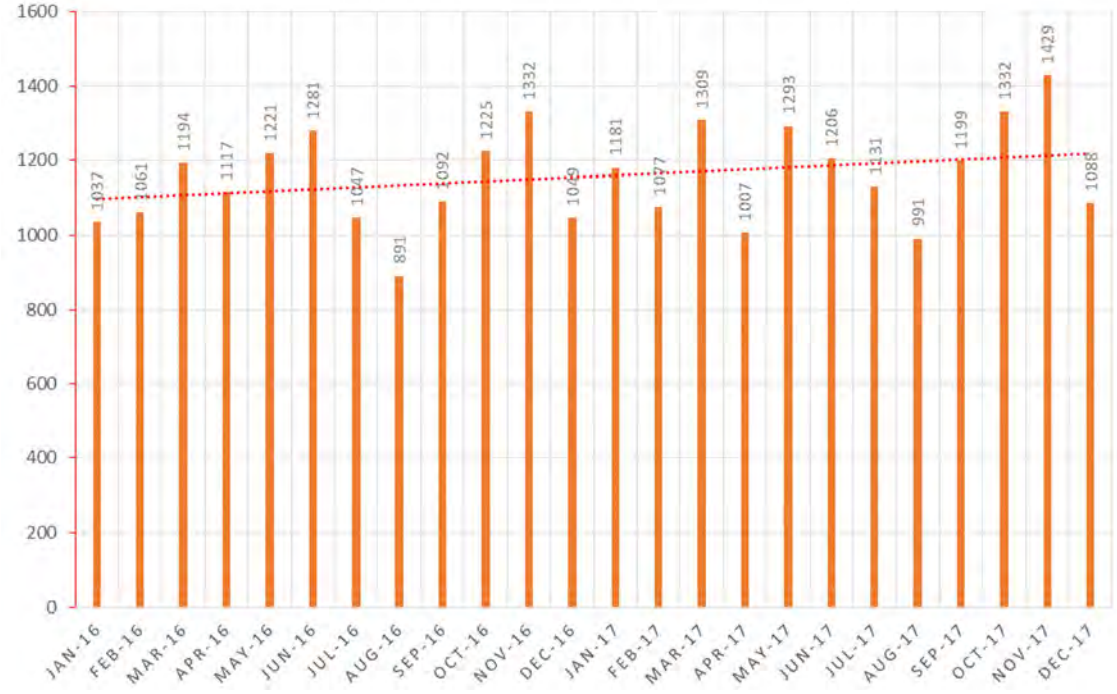


Figure 8 – Monthly Bus Patronage – (C) The Limes

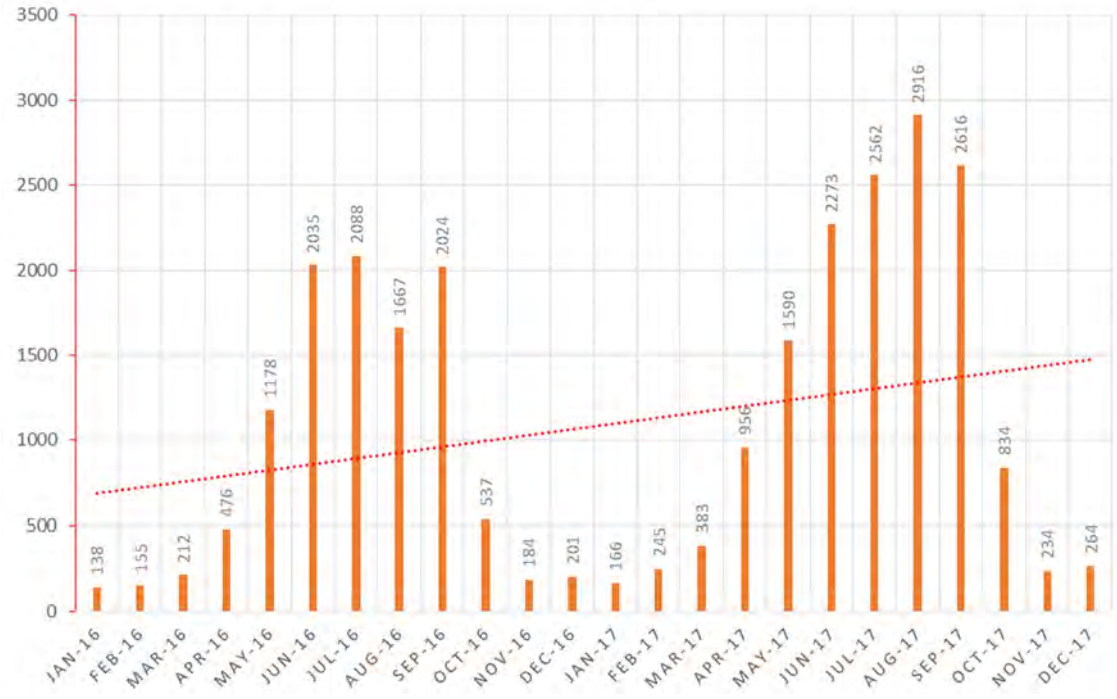


Figure 9 – Monthly Bus Patronage – (J) Marett Road W

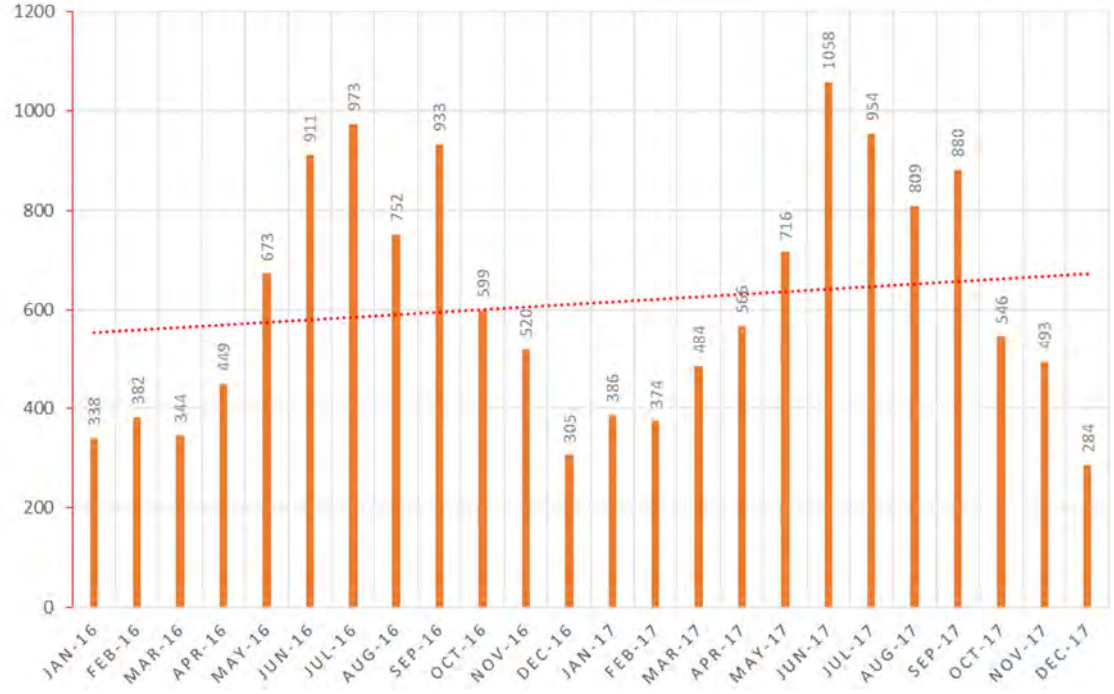


Figure 10 – Monthly Bus Patronage – (K) Marett Road E

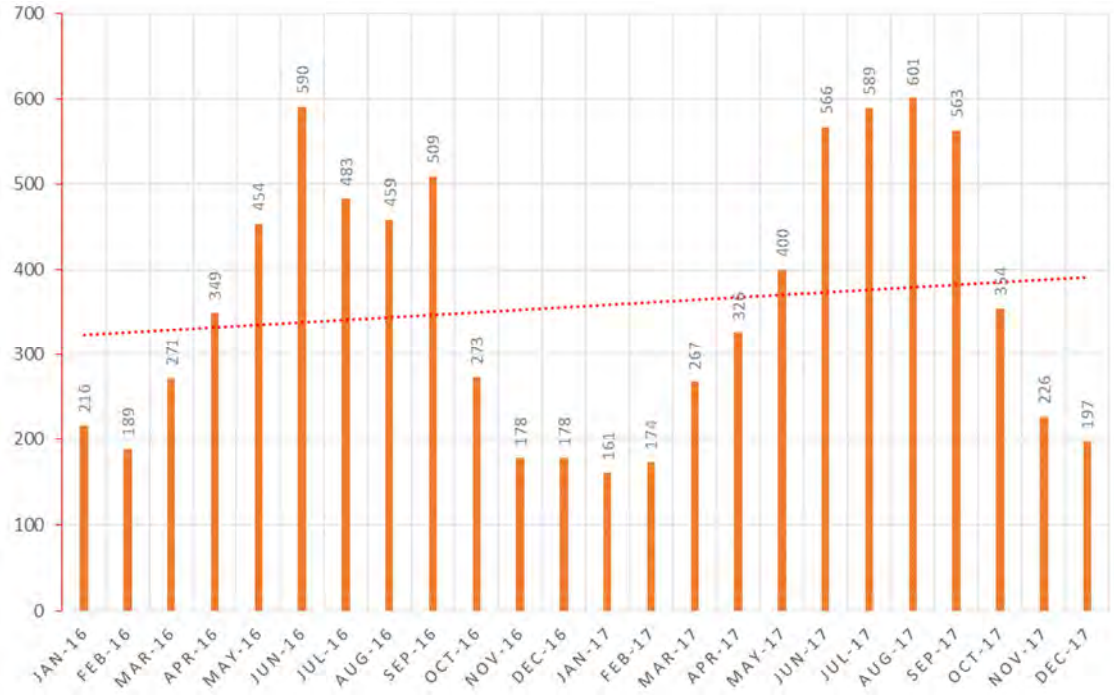


Figure 11 – Monthly Bus Patronage – (G) Havre des Pas E

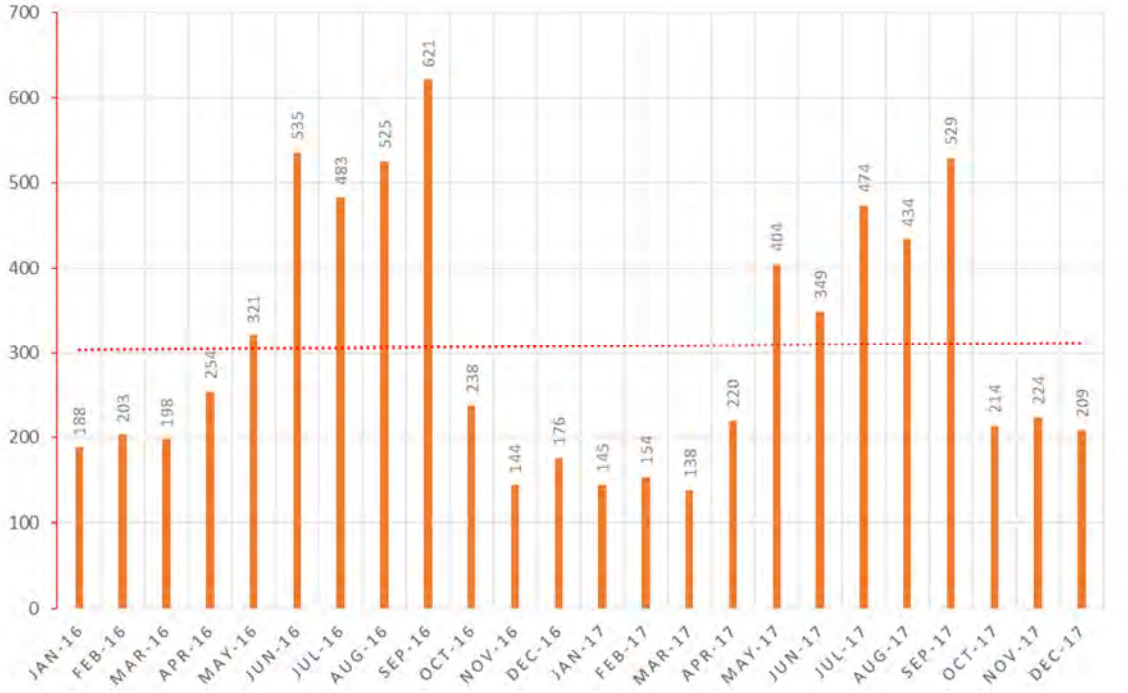


Figure 12 – Monthly Bus Patronage – (H) Havre des Pas W

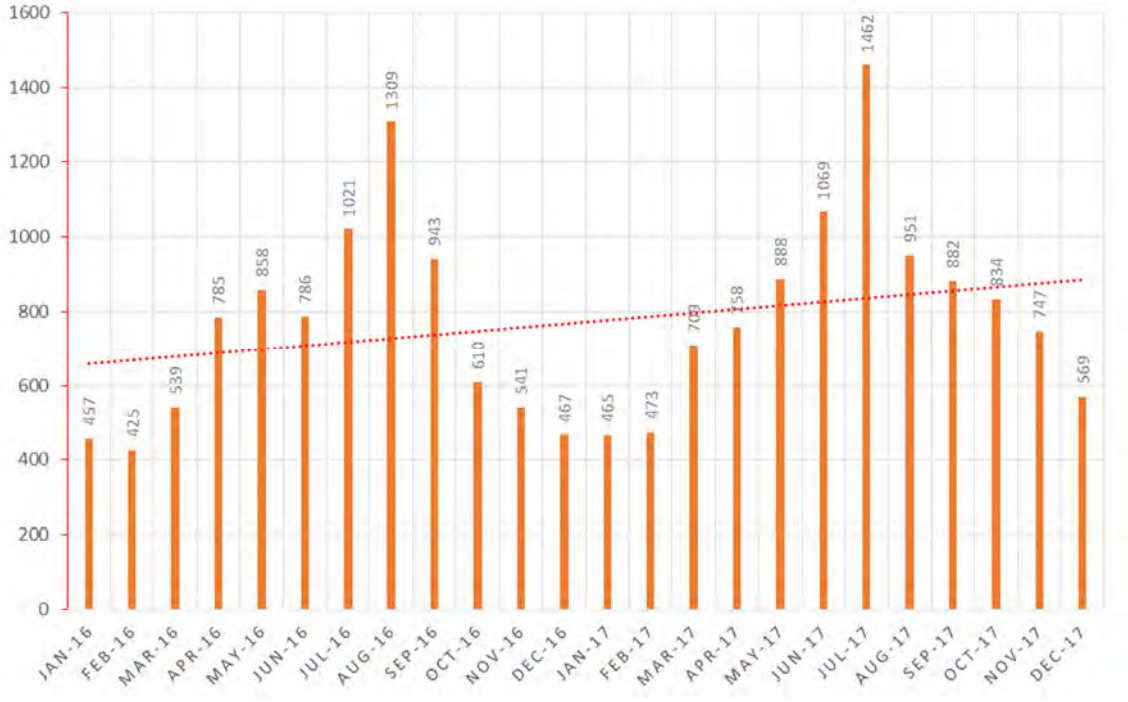


Figure 13 – Monthly Bus Patronage – (N) Beach Road E

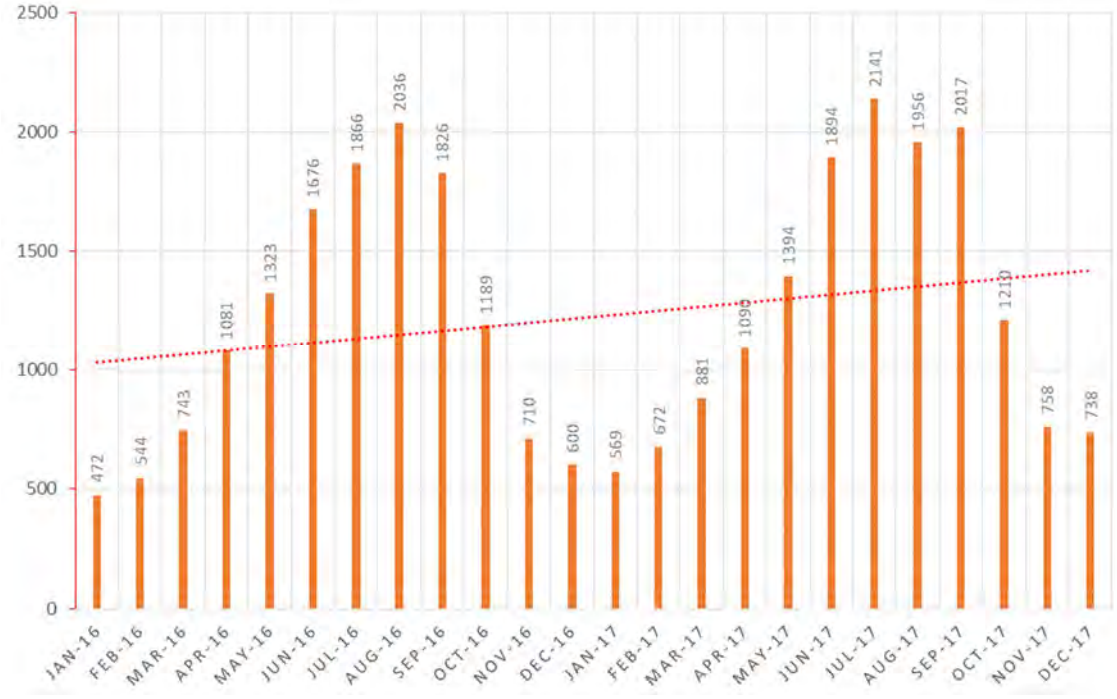


Figure 14 – Monthly Bus Patronage – (O) Beach Road W

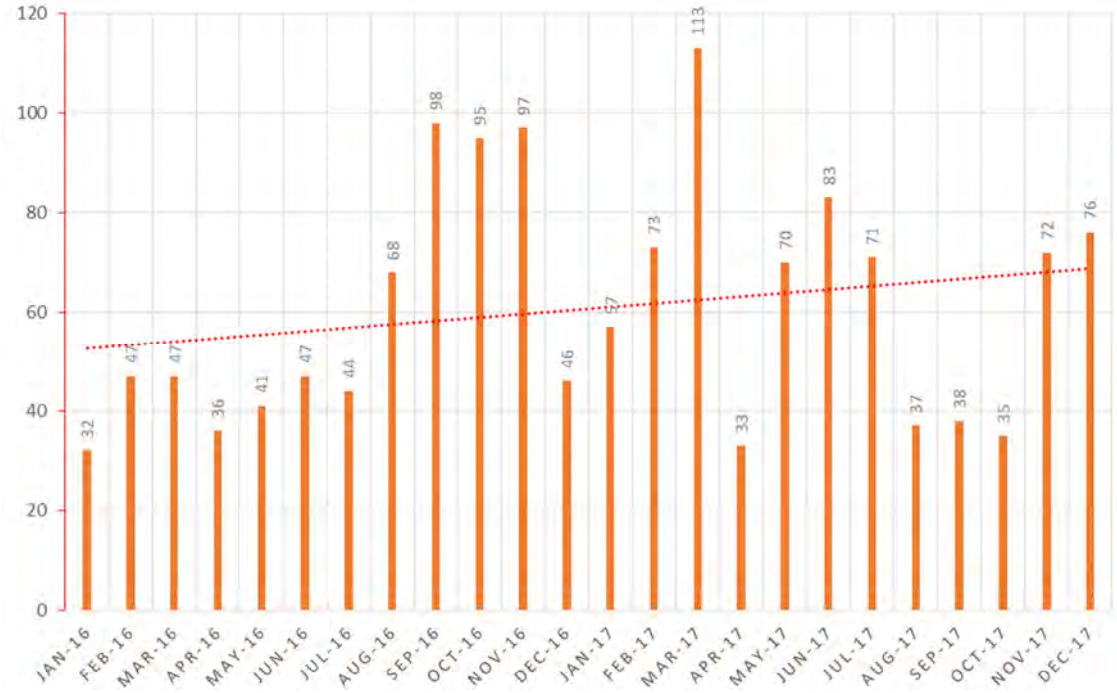


Figure 15 – Monthly Bus Patronage – (F) Dunell Road

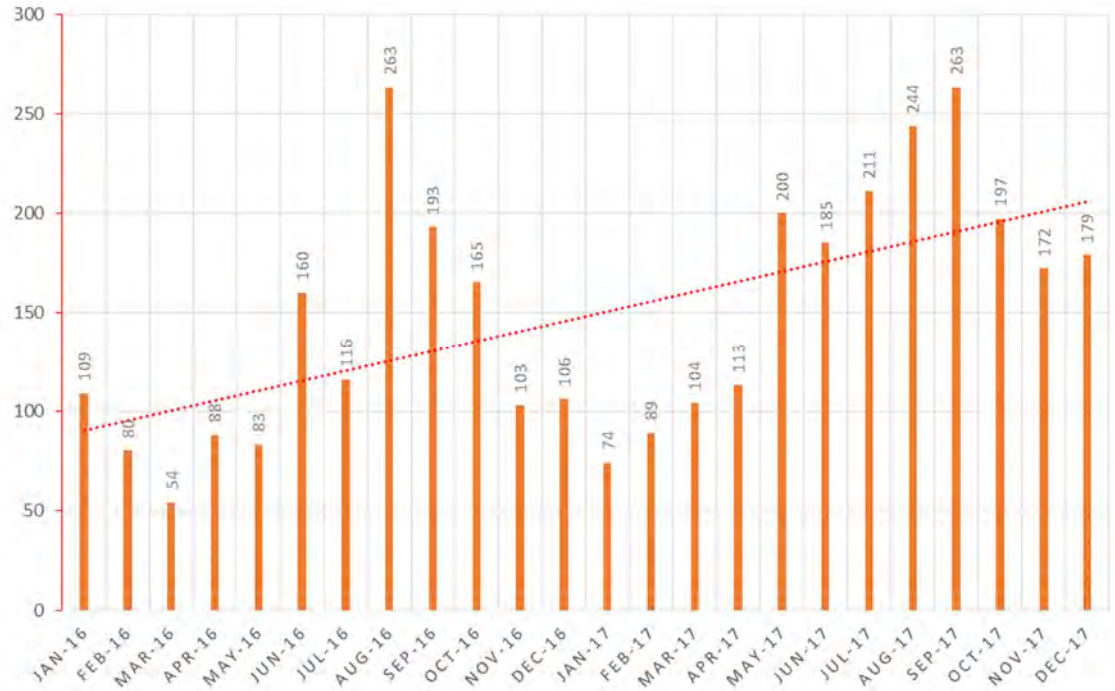


Figure 16 – Monthly Bus Patronage – (E) Cleveland Road

2.3.13. The bus patronage graphs above indicate the somewhat seasonal nature of bus usage in the Havre des Pas area, especially at stops such as Beach Road and Marett Road.

2.4 CYCLING AND PEDESTRIAN PROVISION

2.4.1. There are no dedicated cycling routes through the study area. However, there are sections of cycle paths and share pedestrian and cycle paths. As such the Eastern Cycle Network Route 1 runs along the dedicated seafront share pedestrian and cycle path section from La Collette (linking to the west of the island) in the west and through to the lido in the east before terminating. Cyclists wishing to travel further east, or coming from the east, are required to use the road. Figure 17 and Figure 18 outline the ECN Route 1 and show the dedicated seafront share path.

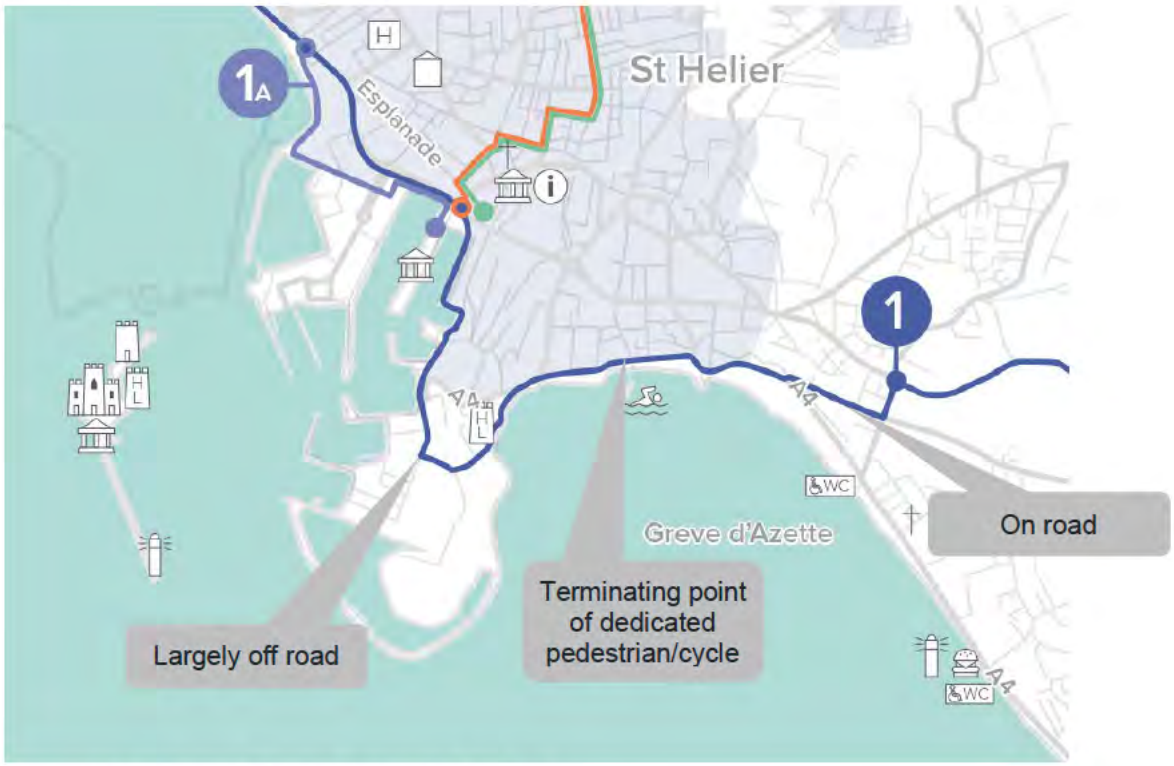


Figure 17 – Eastern Cycle Network, Route 1

Figure 18 – Shared pedestrian and cycle route along Havre des Pas seafront (looking towards La Collette)

2.5 COLLISION MAPPING

2.5.1. Figure 19 shows the recorded collisions in the study area for the latest available five-year period. Recorded slight collisions are shown in orange and serious in orange. There were no recorded fatal collisions in the area.

2.5.2. Overall there were 69 collisions recorded during the latest five years, with 17 recorded serious collisions and 52 recorded slight collisions.

Figure 19 – Collision Map

Table 3 – Collisions by year and severity

Year	Slight	Serious	Total
2013	9	6	15
2014	2	12	14
2015	1	16	17
2016	4	9	13
2017	4	6	10

2.5.3. Table 4 indicates the recorded primary collision factors, with the highest number attributed to unknown factors/ not recorded with 15 out of 69 collisions. The second highest grouping was attributed to 'Crossing Road Junction Carelessly' with 12 collisions, of these two were noted at the Havre des Pas/St Clements Road junction, one at the Havre des Pas/Green St junction and one at the St Clements/Cleveland Ave junction. The remainder were located at either La Route du Fort/St Clements Rd junction or the La Route du Fort/Green St roundabout. There is no clear trend associated with these collisions.

2.5.4. Only three of the 10 'Pedestrian Actions' factors were located along Havre des Pas, with two on Green St. Of these, one was a deliberate action. Of the remainder, there is no clear trend with all collisions occurring is distinctly different locations.

Table 4 – Collision by primary cause factor

Primary Factor	Count
Unknown Factors / Not recorded	15
Crossing Road Junction Carelessly	12
Pedestrian Actions	10
Shunted Stationary Vehicle	6
Drunk or Drugged	4
Turning Right Carelessly	4
Failing to Comply with Traffic Sign or Traffic Lights	2
Following Too Close	2
Hit object off-carriageway	2
Overtaking Improperly on Offside	2
Weather Conditions	2
Actions by Vehicle Passengers	1
Defective Vehicle	1
Illness	1
Misjudging Clearance	1
Other actions by cyclist	1
Reversing Carelessly	1
Road Surface Contaminants (e.g. Oil, Gravel etc.)	1
Stopping Suddenly	1

2.5.5. Table 5 presents the collisions by light condition and severity, indicating that twice as many (67%) collisions occurred during daylight conditions for both slight and serious.

Table 5 – Collision by light condition and severity

Severity	Darkness (Streetlights)	Daylight	Total
Serious	4 (24%)	13 (76%)	17
Slight	19 (37%)	33 (63%)	52
Total	23 (33%)	46 (67%)	69

3 TRAFFIC SURVEYS

3.1 INTRODUCTIONS

3.1.1. This section provides an overview of the traffic surveys that were undertaken across the Havre des Pas area between 0700–1900 on Tuesday 15 May 2018. This data has been used to support the analysis of the known issues and well as to inform the assessment of potential solutions within the study area.

3.1.2. Two types of survey were undertaken across the Havre des Pas area, each looking at a distinct element of the traffic picture within the study area. These included:

- Manual Classified Counts (MCC)
  - Junction Turn Counts
  - Queue Length Surveys
  - Pedestrian Crossing Surveys
- Automatic Number Plate Recognition (ANPR) cordon surveys

3.1.3. Figure 20 shows which junctions, crossings and roads were surveyed for this assessment. The red squares show the location of the MCC surveys, while the blue triangles show the location of the ANPR surveys.

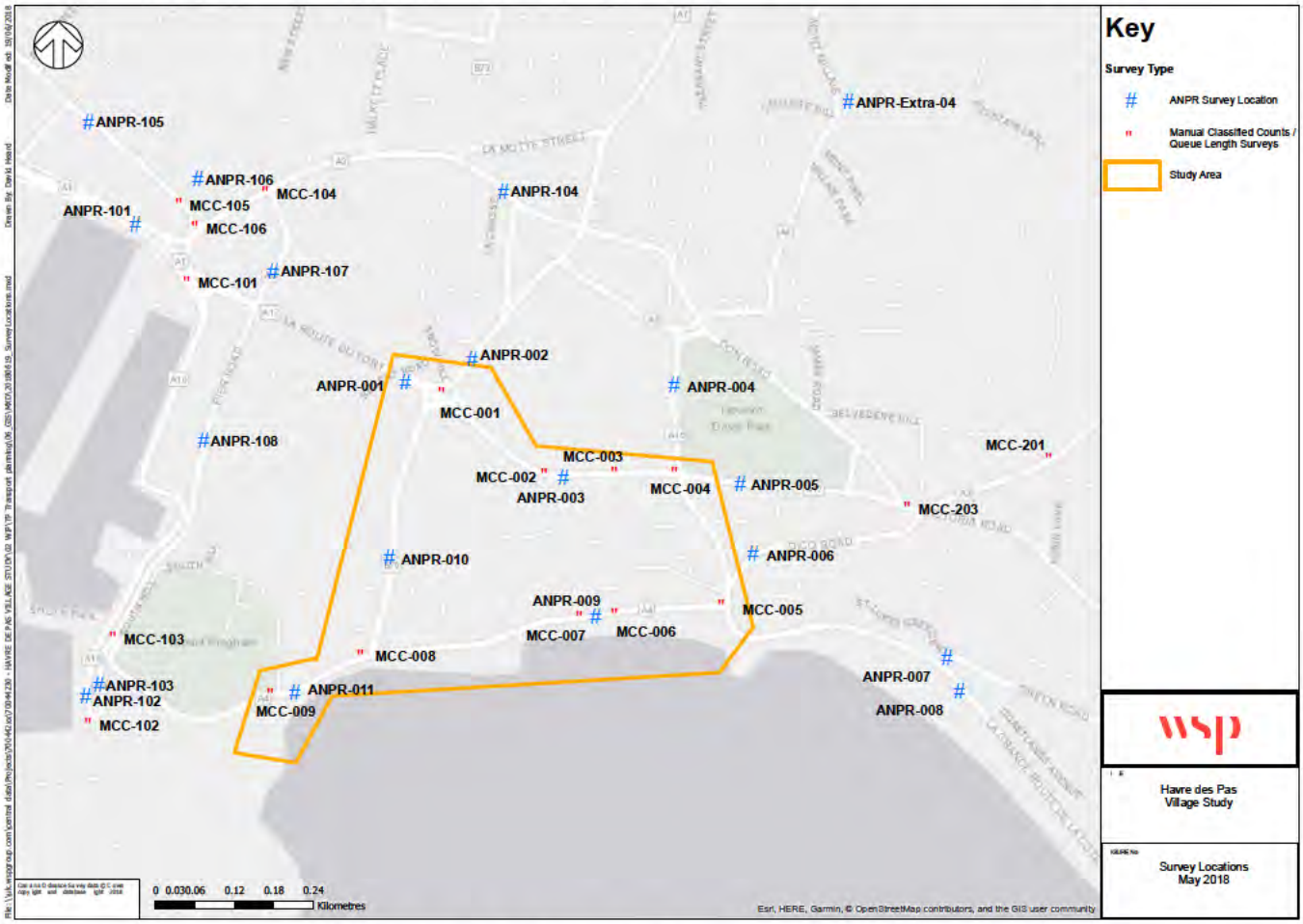


Figure 20 – Traffic Survey locations within Havre des Pas

3.1.4. It should be noted that in addition to the surveys undertaken specifically for this study additional surveys were undertaken in the wider area, including in Bagot and Liberation Square/Weighbridge Place. These were undertaken on behalf of the Department for Infrastructure to support studies they are undertaking; however, the data was used within this study to supplement the study specific surveys, i.e. those within the study area denoted by the orange polygon.

MANUAL CLASSIFIED COUNTS - JUNCTION TURN COUNTS

3.1.5. A Manual Classified Count (MCC) is a manual survey which records volumes, for junction turn counts these were classified to the type of vehicle, with all traffic movements to and from each arm of the junction.

3.1.6. For this study, video cameras were set up for each junction to enable each arm to be observed. Vehicles were observed entering each junction, after that, they were classified into specific vehicle types and then tracked through the junction to the exit arm which is identified. The survey period was a single neutral day, Tuesday 15 May 2018 between 0700 - 1900.

3.1.7. The following vehicle types were used to classify vehicles as part of these Manual Classified Counts:

- Pedal Cycle
- Motorcycle
- Cars
- Light Goods Vehicle (LGV) – typically a goods vehicle under 3.5 tonnes.
- Other Goods Vehicle Class 1 (OGV1) – typically a rigid goods vehicle over 3.5 tonnes.
- Other Goods Vehicle Class 2 (OGV2) – typically an articulated goods vehicle.
- Public Service Vehicle (PSV) – buses and coaches with over 16 seats

3.1.8. The following locations were surveyed:

Table 6 - List of Junction Turn Counts

Reference	Location
MCC-001	La Route du Fort / Green St
MCC-002	La Route du Fort / Roseville St
MCC-003	La Route du Fort / Cleveland Rd
MCC-004	La Route du Fort / St Clements Rd
MCC-005	Havre des Pas / St Clements Rd / Greve d'Azette
MCC-006	Havre des Pas / Cleveland Rd
MCC-007	Havre des Pas / Roseville St
MCC-008	Havre des Pas / Green St
MCC-009	Mount Bingham / South Hill
MCC-101	La Route du la Liberation / La Route du Fort / Commercial Buildings
MCC-102	La Route de Veulle / Mount Bingham
MCC-103	Mount Bingham / South Hill / Pier Rd
MCC-104	Hill St / Bond St / Pier Rd / Mulcaster St
MCC-105	Mulcaster St / Weighbridge Pl / Esplanade / Conway St
MCC-201	Bagot Rd / Aubin Ln / Belvedere Hill
MCC-202	Plat Douet Road/ La Blinerie/ Victoria Road
MCC-203	Georgetown Road / Mary Street/ Victoria Road/ Georgetown Park Estate/ Dicq Road/ La Route du Fort/ Don Road
MCC-204	Longueville Road / Plat Douet Road / Bagot Road

3.1.9. While MCC-101 – 105 and MCC-201 – 204 are listed above in relation to this study, it should be noted they were commissioned by DfI to inform studies they are undertaking in the wider area. The results have fed into this study. However, the raw data is not presented as part of this report.

MANUAL CLASSIFIED COUNTS - QUEUE LENGTH SURVEYS

3.1.10. A queue length survey was undertaken to capture the number of vehicles typically waiting at each arm of a junction. A snapshot was taken of the state of the junction at regular intervals (every 5 minutes), with the queue length then recorded for each lane and each arm.

3.1.11. Queues lengths were measured in the number of stationary vehicles, on a per lane basis and then extrapolated into distances in metres. Where queue lengths exceeded the view of the camera capturing the queue this was recorded and taken into account when analysing the data. IT should be noted that this was only the case in a small number of occasions for a short period.

3.1.12. Queue length surveys were undertaken at the same time and locations as the junction turn count surveys listed in Table 6.

MANUAL CLASSIFIED COUNTS - PEDESTRIAN CROSSING SURVEYS

3.1.13. A pedestrian crossing survey was undertaken to monitor the use of the crossing with both volumes and user recorded. Data on the number of pedestrians and cyclists using the crossing is captured by camera along with what time they crossed the road. For signalised pedestrian crossings data on the number of times the crossing is activated is also captured.

3.1.14. Pedestrian crossing surveys were undertaken at the following locations:

- Signalised crossing on Havre des Pas outside the Lido
- Signalised crossing on Havre des Pas at the Green St junction

AUTOMATIC NUMBER PLATE RECOGNITION (ANPR) CORDON SURVEYS

3.1.15. To further understand the flow of traffic through and to/from the area, we have also undertaken a cordon survey which records individual vehicles moving into and out of the study area. This survey was undertaken for the 12-hour period between 0700 - 1900 on Tuesday 15 May 2018.

3.1.16. The cordon generally matches the study area, with some differences in order to minimise the number of roads crossing the cordon. Each road crossing the cordon formed a node for the purpose of the survey, with cameras placed at each node to capture vehicle number plates using automated number plate recognition (ANPR) technology. Further nodes were placed on Havre des Pas, La Route du Fort, and Green Street in order to capture vehicles route choice through the area.

3.1.17. The ANPR data collected at different nodes have then been matched in order to provide trip chains for each recorded vehicle, hence describing the route of that vehicle as it crosses the various survey nodes. Along with an indicator of the node at which the vehicle was recorded, the surveys also record the direction of travel and the journey time for each segment of the trip—a journey can be thought of as being made of a series of segments from one site to the next.

3.1.18. Limitations associated with ANPR technology mean that it is impossible to capture the number plates of 100% of the vehicle crossing the cordon. As such, manual classified counts (MCCs) of vehicles crossing the cordon at each node provide information on the total number of vehicles passing through each survey node, along with the direction of travel. This enables the ANPR data to be 'factored up', in order to match the actual number of vehicles crossing the cordon.

3.1.19. It should, therefore, be noted that this factoring up process involves a degree of estimation, which means that the results will not exactly reflect actual conditions.

3.1.20. It is also important to note that this survey will only capture vehicles that pass each node. As such, vehicle trips that both start and end within the cordon, without passing any of the nodes, are not captured by this survey.

3.1.21. The information included in this section highlights some of the key results and findings from the origin-destination survey.

3.1.22. Table 7 shows the locations which were surveyed. These are also shown in Figure 20.

Table 7 - List of ANPR locations

Reference	Location
ANPR-001	La Route du Fort – Tunnel side of Green St
ANPR -002	Green St – north of roundabout
ANPR -003	La Route du Fort – between Roseville St and Cleveland Rd
ANPR -004	St Clements Rd – north of Hastings Rd
ANPR -005	La Route du Fort – between St Clements Rd and Beach Rd
ANPR -006	Dicq Rd – between Beach Rd and St Clements Rd
ANPR -007	Green Rd – near junction with Greve d'Azette
ANPR -008	Greve d'Azette – near junction with Green Rd
ANPR -009	Havre des Pas – between Roseville St and Cleveland Rd
ANPR -010	Green St
ANPR -011	Havre des Pas – between South Hill and Green St
ANPR -101	La Route du la Liberation / La Route du Fort / Commercial Buildings
ANPR -102	La Route de Veulle / Mount Bingham
ANPR -103	Mount Bingham / South Hill
ANPR -104	La Colomberie – prior to La Chasse
ANPR -105	Esplanade – between Conway St and Castle St
ANPR -106	Conway St – between Esplanade and Wharf St
ANPR -107 / 108	Pier Rd – town side of the multi-storey car park

3.2 RESULTS

3.2.1. This section presents the results of the surveys split into each survey type. Further data can be seen in Appendix A of this report.

MANUAL CLASSIFIED COUNTS

3.2.2. Figure 21 below shows the total junction flow for each junction, overlaid on the road hierarchy. It clearly indicates the junctions with the highest and lowest total junction flows. The highest total junction flows are seen on La Route du Fort/Green Street Roundabout, with almost 29,000 vehicle movements between 0700-1900. While the lowest total junction flow is seen on the Mount Bingham/South Hill junction with some 10,000 vehicles. Overall the figure shows total flows on La Route du Fort are significantly higher than those on Havre des Pas.

3.2.3. Results of the junction turn counts and queue lengths are presented below in Figure 22 to Figure 30 for each of the junctions within the study area. The figures show the hourly vehicle flow for each arm of the junction as lines on the primary axis, with average queue lengths for each arm, were recorded, as bar columns on the secondary access to enable the correlation between flow and queues to be seen.

3.2.4. Flows are presented in total vehicles per hour, while queues are presented in the average number of vehicles observed as queued (stationary) each hour, taken from counts every five minutes. It should be noted that queue lengths are likely to be lower than lengths from a driver's perception as they are average lengths and don't take account of any 'rolling' or slow-moving traffic which may be perceived by drivers as a queue.

3.2.5. Diagrams showing the individual observed turning movement flows for the AM (0800-0900) and PM (1700-1800) peak hours, along with the full 12-hour (0700-1900) demand are included in Appendix A of this report.

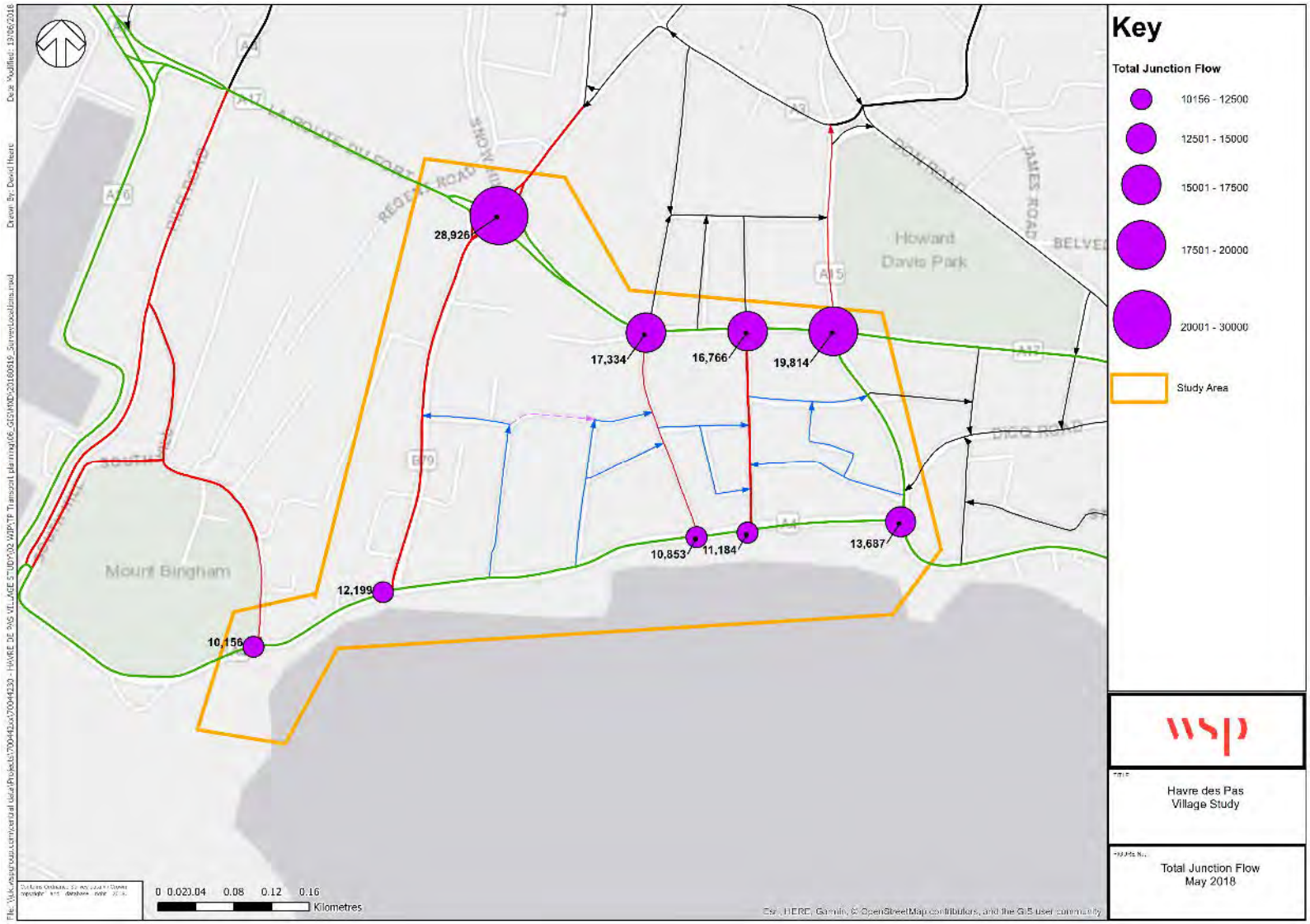


Figure 21 – Total Junction flow (12-hour)

MCC-001 - La Route du Fort / Green Street

3.2.6. Figure 22 presents the hourly vehicle flows at La Route du Fort / Green St roundabout. It confirms that La Route du Fort eastbound has the highest flow with 1,065 vehicles in the AM peak hour and 946 vehicles in the PM peak hour. La Route du Fort westbound is the next busiest approach with flows consistently between 580 – 709. Both approaches show reductions in flow during the peak hours due to congestion. Flow on Green St north is fairly consistent throughout the day, however, increases by around 100 vehicles in the evening peak. It can also be seen that flows on Green St south rise significantly during the peaks, especially the AM peak which is almost double the off-peak flow suggesting high commuter traffic. The access from Snow Hill car park, Regent Rd, is shown to be low through the day, peaking at 81 vehicles between 1700-1800 with commuters leaving.

3.2.7. Queue lengths are seen to be significant, especially during the AM and PM peak hours with an average hourly queue of some 30 plus vehicles on La Route du Fort westbound, and some 18-25 vehicles eastbound. Green St north into the roundabout is also shown to be high, with some 22 vehicles in the PM peak hour on average.

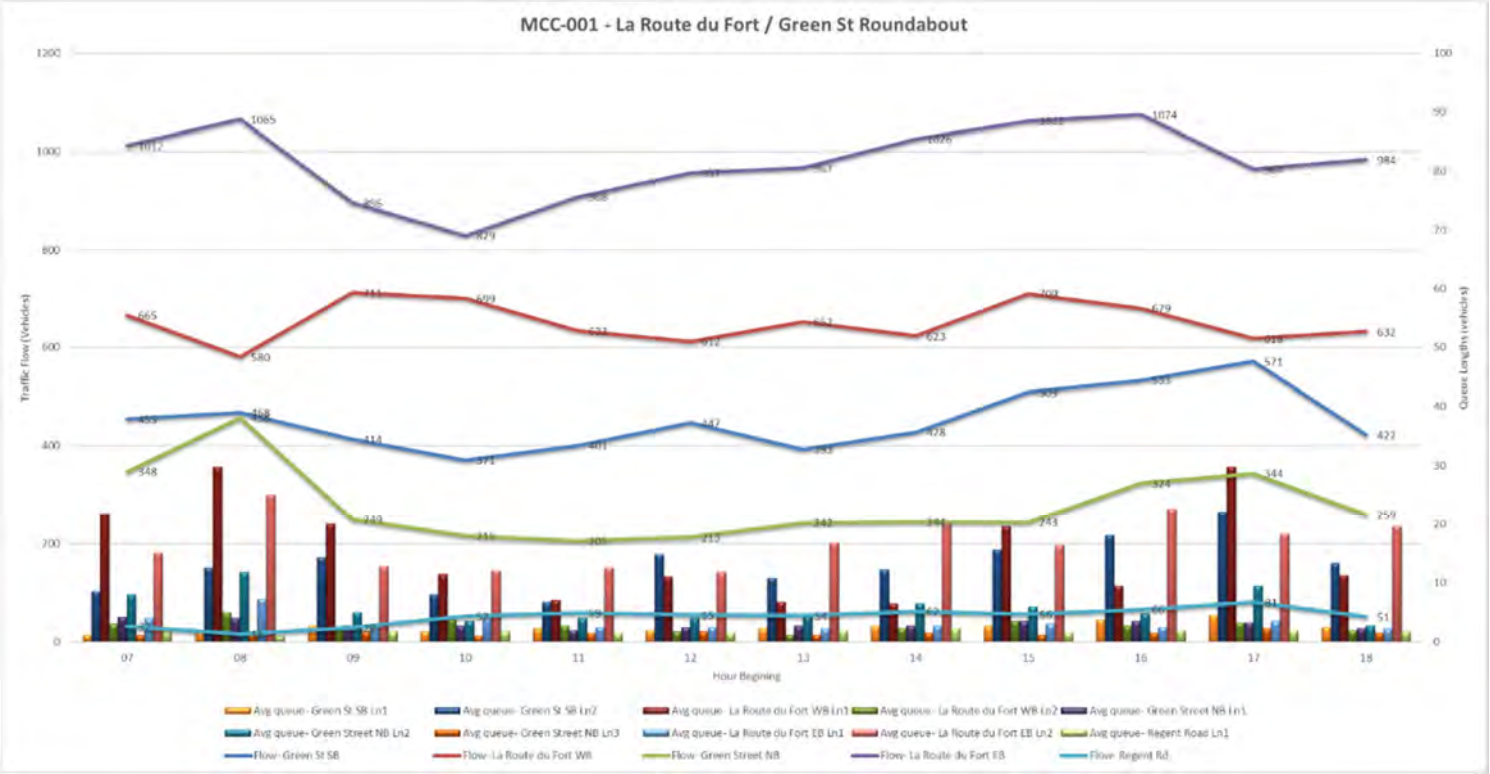


Figure 22 - MCC-001 - La Route du Fort / Green St – Junction flows and queue lengths

MCC-002 - La Route du Fort / Roseville St

3.2.8. Figure 23 presents the hourly vehicle flows at La Route du Fort/Roseville St junction. As Roseville St is one-way from the junction, they are not shown on the figure. The figure shows that the flows on La Route du Fort are similar during the AM peak and reduce to 605-620 vehicles from higher values throughout the rest of the day. However, during the PM eastbound flows increase significantly reaching some 900 vehicles, with 859 in the PM peak hour, showing the eastbound movement is higher than the westbound.

3.2.9. Queue lengths on the side roads are shown to be low, peaking at an average of 8 vehicles between 1700-1800.

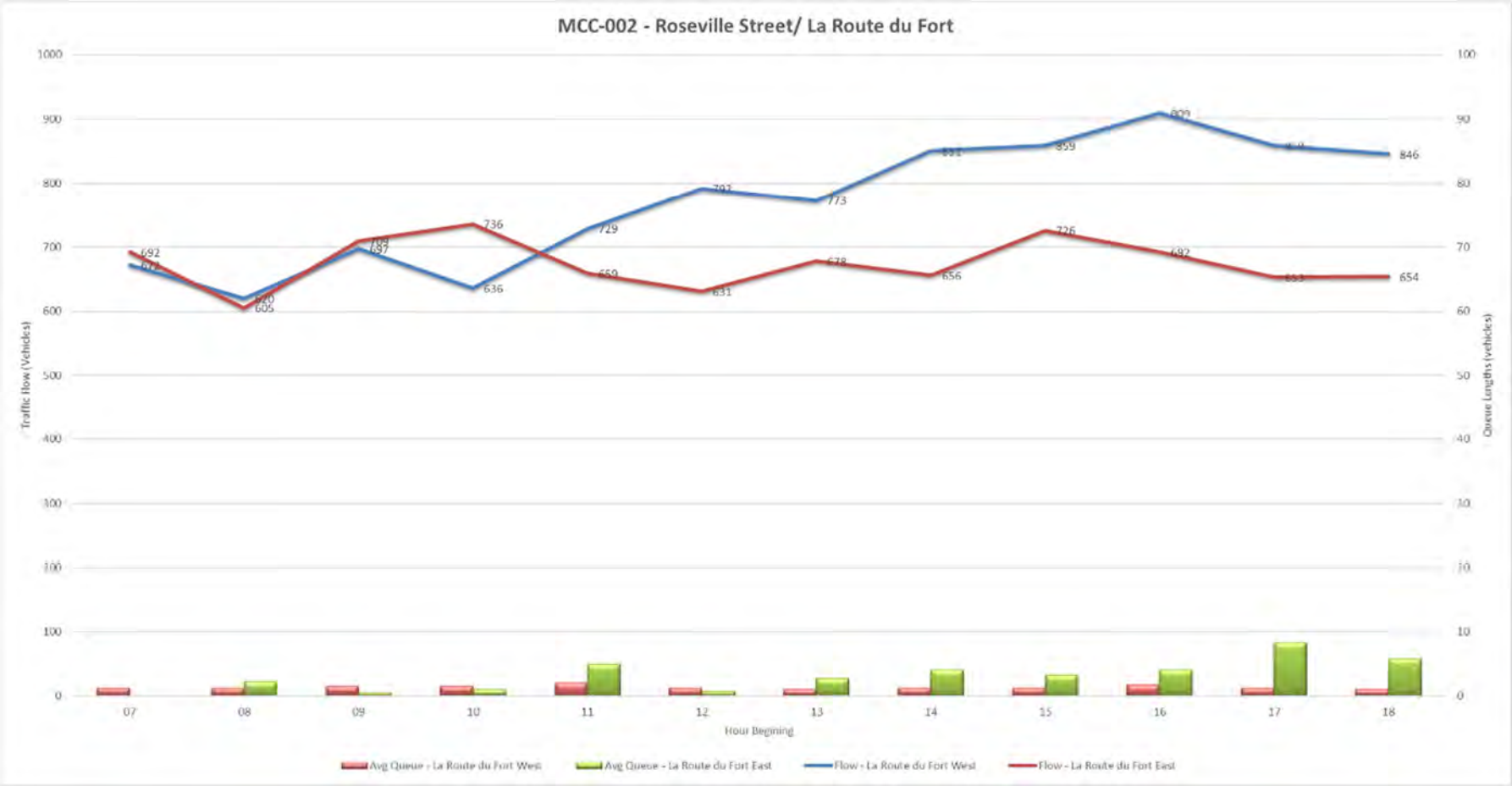


Figure 23 - MCC-002 - La Route du Fort / Roseville St – Junction flows and queue lengths

MCC-003 - La Route du Fort / Cleveland Rd

3.2.10. Figure 24 presents the hourly vehicle flows at La Route du Fort / Cleveland Rd junction. The figure shows that the flows on La Route du Fort are similar during the AM peak and reduce to 500-536 vehicles from higher values throughout the rest of the day. However, during the PM eastbound flows increase significantly reaching some 731 vehicles, showing the eastbound movement has more vehicles than the westbound.

3.2.11. Queue lengths on the side roads are shown to be relatively low and consistent throughout the day. However, the eastbound right turn from La Route du Fort shows an average queuing around 10 vehicles consistently throughout the day.

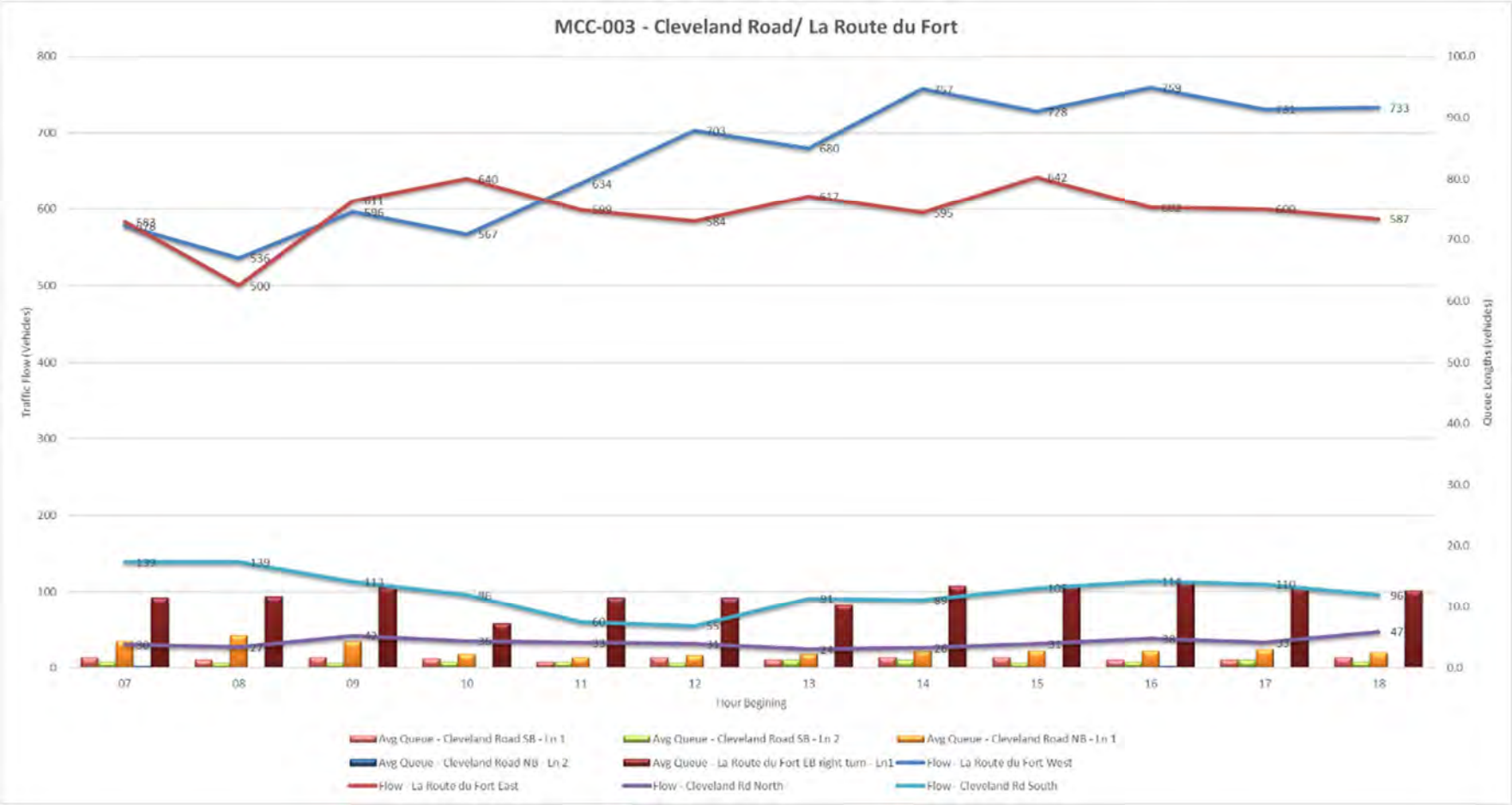


Figure 24 - MCC-003 - La Route du Fort / Cleveland Rd - Junction flows and queue lengths

MCC-004 - La Route du Fort / St Clements Rd

3.2.12. Figure 25 presents the hourly vehicle flows at La Route du Fort / St Clements Rd signal junction. It shows a similar trend to the previous diagrams for La Route du Fort flows, with the highest flows on La Route du Fort, again similar in the AM with both directions around 550 vehicles and the PM peak with the eastbound higher than the westbound. St Clements Rd south into the junction is generally consistent through the day with small increases in the AM and PM peak hour and also between 1200-1300.

3.2.13. Queue lengths are shown to be significant especially in the westbound direction in the AM peak between 0700-1100, and a peak hour average queue length of over 45 (~260m) vehicles. La Route du Fort is also relatively high throughout the day, with an average queue consistently over 10 vehicles indicating the level of delay due to the signal timings.

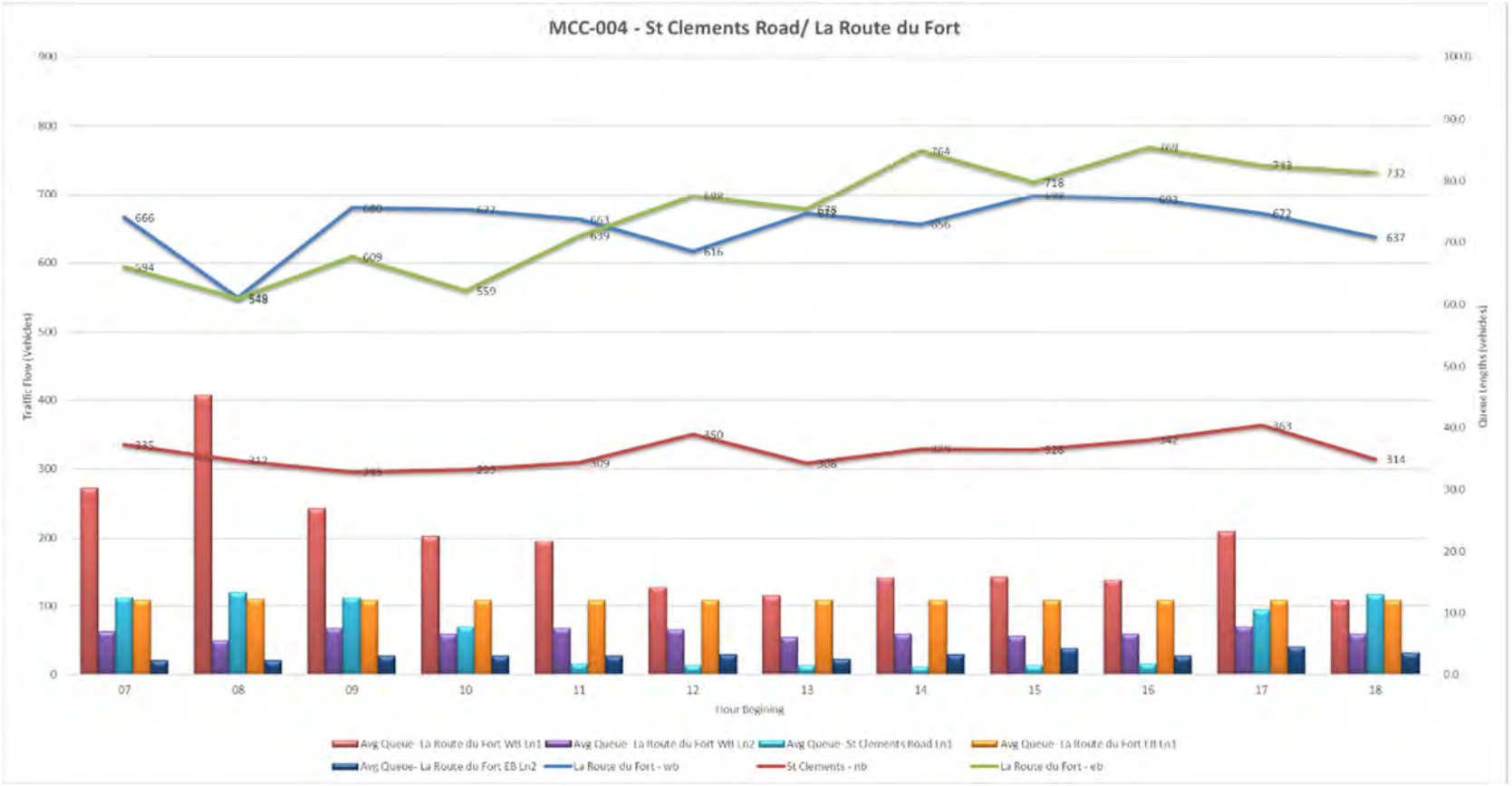


Figure 25 - MCC-004 - La Route du Fort / St Clements Rd - Junction flows and queue lengths

MCC-005 - Havre des Pas / St Clements Rd / Greve d'Azette

3.2.14. Figure 26 presents the hourly vehicle flows at Havre des Pas / St Clements Rd / Greve d'Azette mini roundabout. It shows a clear tidal flow on Havre des Pas / Greve d'Azette with the westbound direction highest in the AM peak hour and the eastbound highest in the PM peak hour. The southbound St Clements Rd is shown to be highest in the AM peak hour.

3.2.15. Queue lengths for the junction indicate the largest queuing is seen on Havre des Pas eastbound, which is highest in the PM peak hour with an average queue length 20, while the AM peak is 12 vehicles.

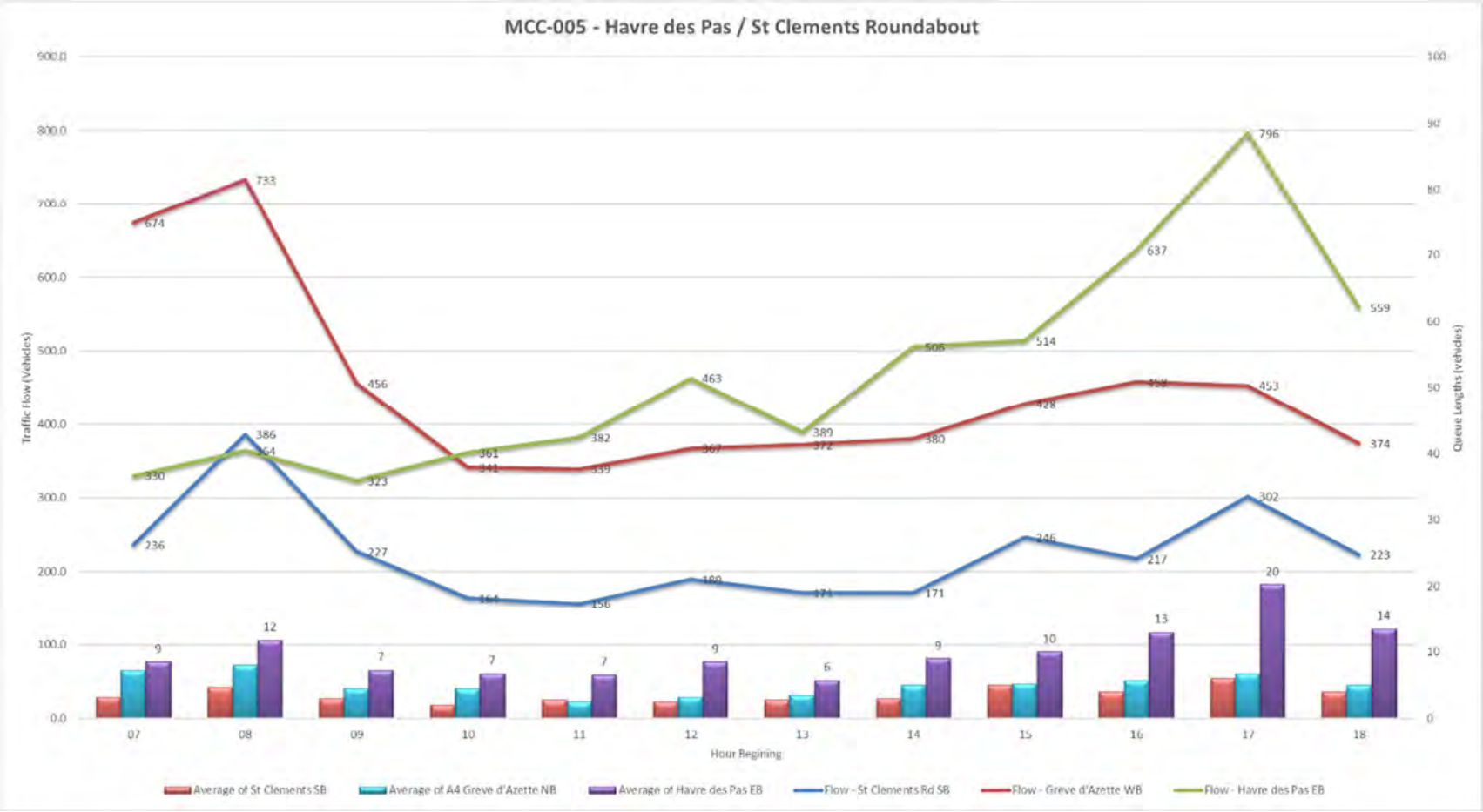


Figure 26 - MCC-005 - Havre des Pas / St Clements Rd / Greve d'Azette - Junction flows and queue lengths

MCC-006 - Havre des Pas / Cleveland Rd

3.2.16. Figure 27 presents the hourly vehicle flows at Havre des Pas / Cleveland Rd junction. It shows a clear tidal flow on Havre des Pas with the westbound direction highest in the AM peak hour (939 vehicles) and the eastbound highest in the PM peak hour (812 vehicles). It also shows that flows on Cleveland Rd are very low through the day with a maximum flow of 40 vehicles in the PM peak hour, while the AM peak hour is 26 vehicles.

3.2.17. Queue lengths for the junction indicate significant queueing during the AM peak period with the westbound Havre des Pas to Cleveland Rd right turn having an average queue length of 27 vehicles, while the remainder of the day has a maximum of 5 vehicles.

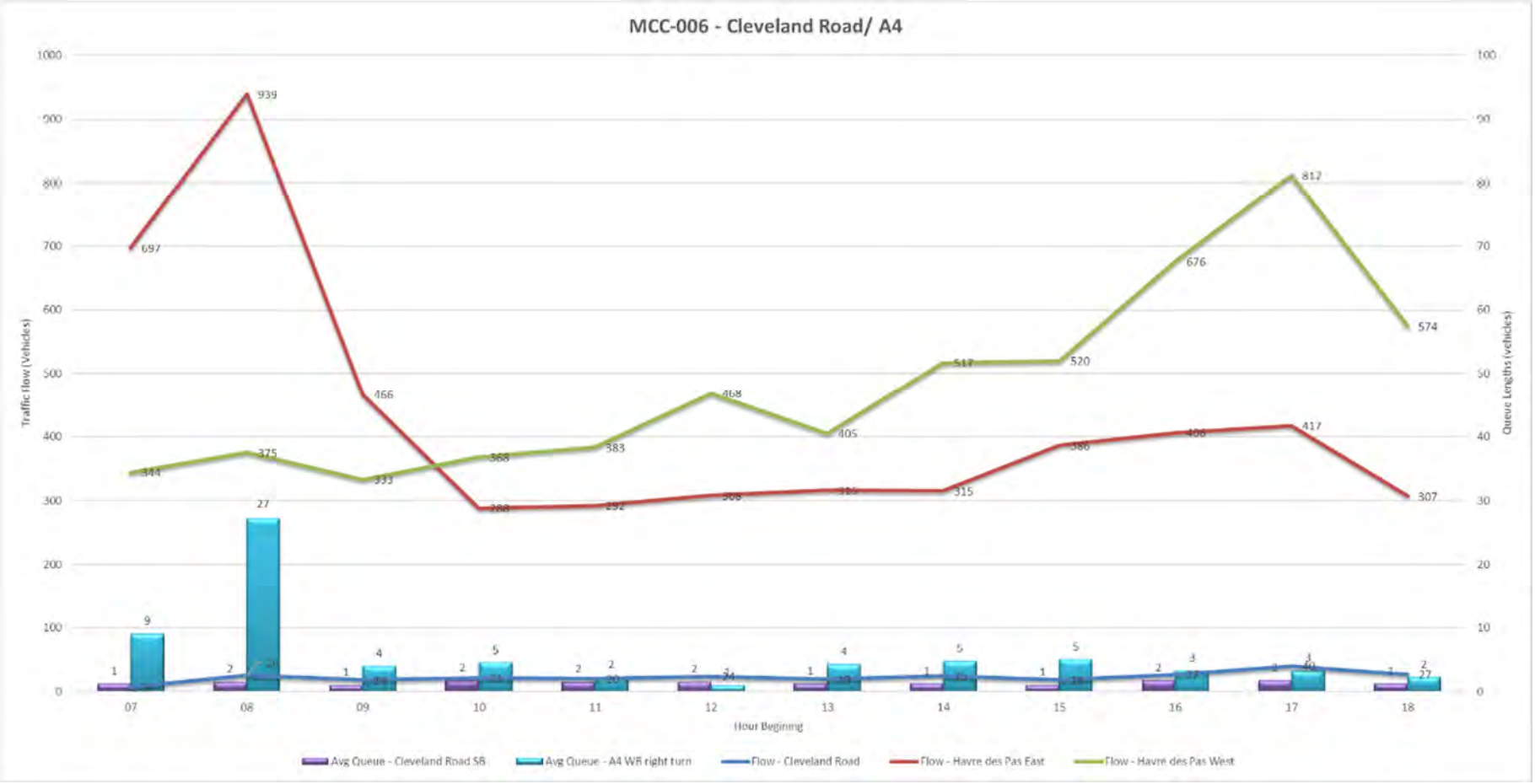


Figure 27 - MCC-006 - Havre des Pas / Cleveland Rd - Junction flows and queue lengths

MCC-007 - Havre des Pas / Roseville St

3.2.18. Figure 28 presents the hourly vehicle flows at Havre des Pas / Roseville St junction. It shows a clear tidal flow on Havre des Pas with the westbound direction highest in the AM peak hour (924 vehicles) and the eastbound highest in the PM peak hour (746 vehicles). It also shows that flows on Roseville St are low throughout the day with a maximum flow of 85 vehicles in the PM peak, while the AM peak hour is 74 vehicles.

3.2.19. Queue lengths for the junction indicate little queueing during the day, with a maximum average queue length of 3 vehicles.

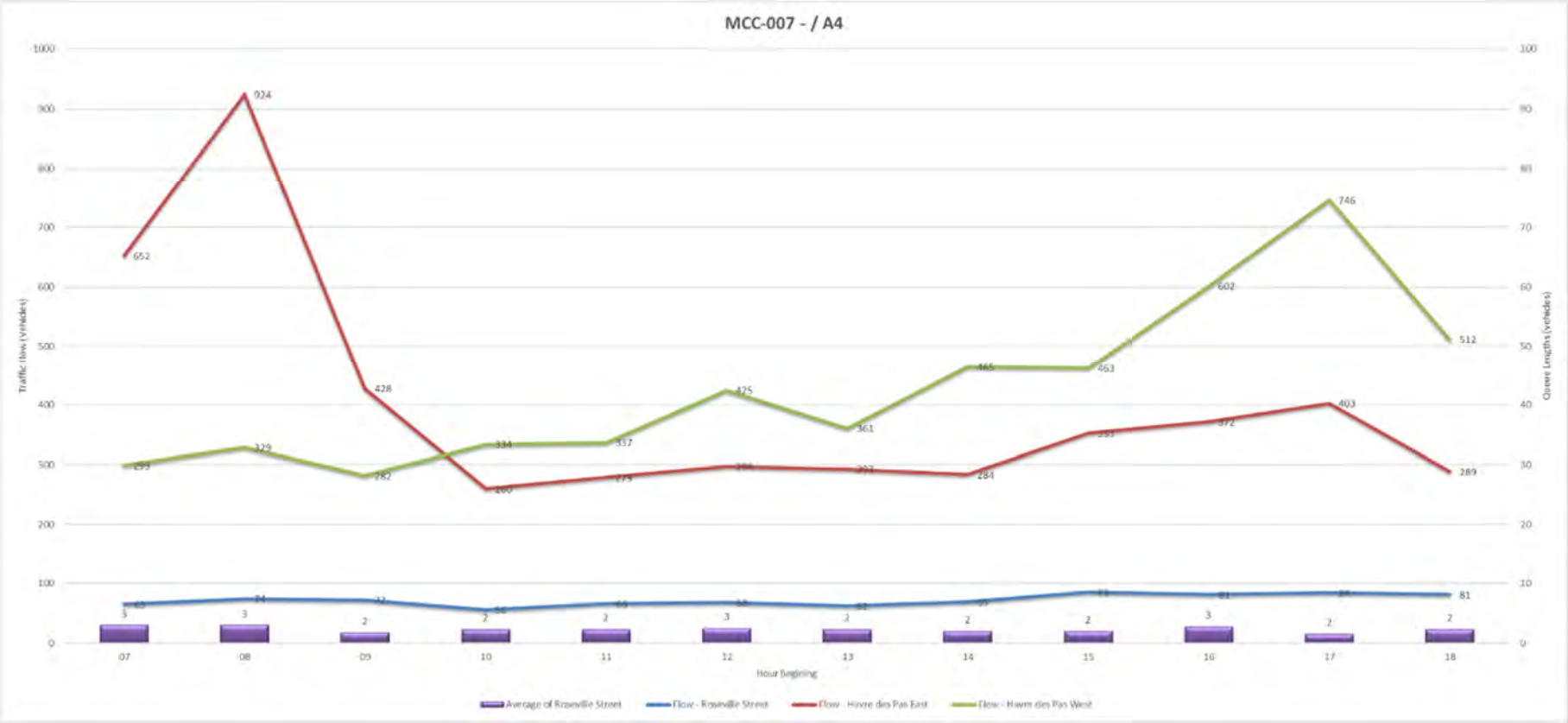


Figure 28 - MCC-007 - Havre des Pas / Roseville St - Junction flows and queue lengths

MCC-008 - Havre des Pas / Green St

3.2.20. Figure 29 presents the hourly vehicle flows at Havre des Pas/Green St junction. It clearly shows the tidal nature of the road, with the westbound the highest direction in the AM peak hour with 946 vehicles and the eastbound highest in the PM peak hour with 963 vehicles. While Green St southbound into the junction can clearly be seen to be very low, with a maximum of 99 vehicles in the PM peak hour.

3.2.21. Queue lengths for the junction indicate significant queuing in the AM peak hour for the Havre des Pas westbound movement, with an average of 33 vehicles queueing. There is only a small amount of queuing observed on Green St.

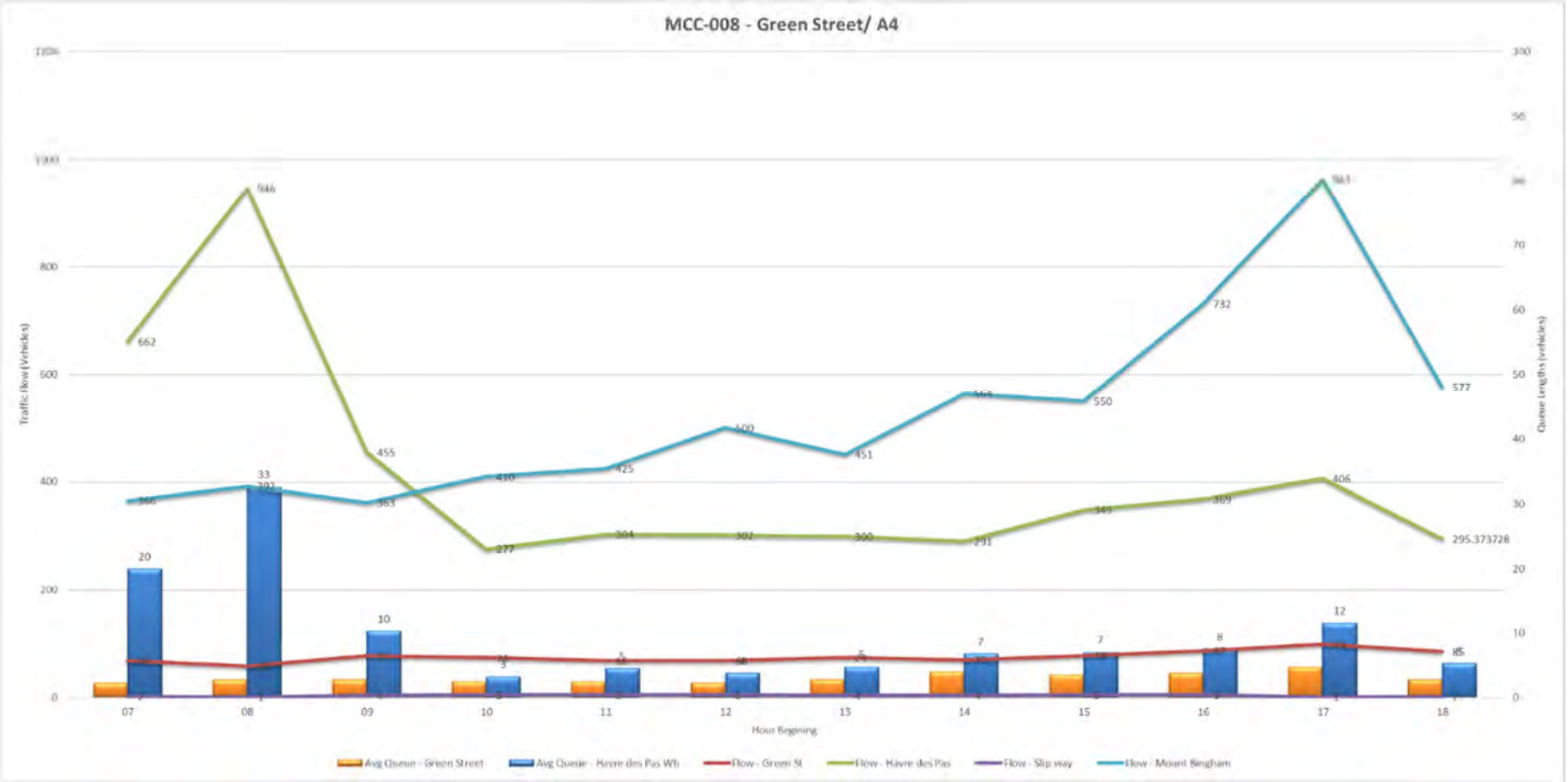


Figure 29 - MCC-008 - Havre des Pas / Green St - Junction flows and queue lengths

MCC-009 - Mount Bingham / South Hill

3.2.22. Figure 30 presents the hourly vehicle flows at Mount Bingham/South Hill junction. The figure clearly shows the westbound from Havre des Pas over Mont Bingham highest in the AM peak hour with 635 vehicles, while the PM peak hour is the highest for the other movements heading eastbound. The highest flow being 595 vehicles on Month Bingham followed by South Hill with 386 vehicles.

3.2.23. Queue lengths for the junction indicate moderate queuing in the PM peak hour for the South Hill movement with an average of 10 vehicles queuing. There is only a small amount of queuing observed during other periods.

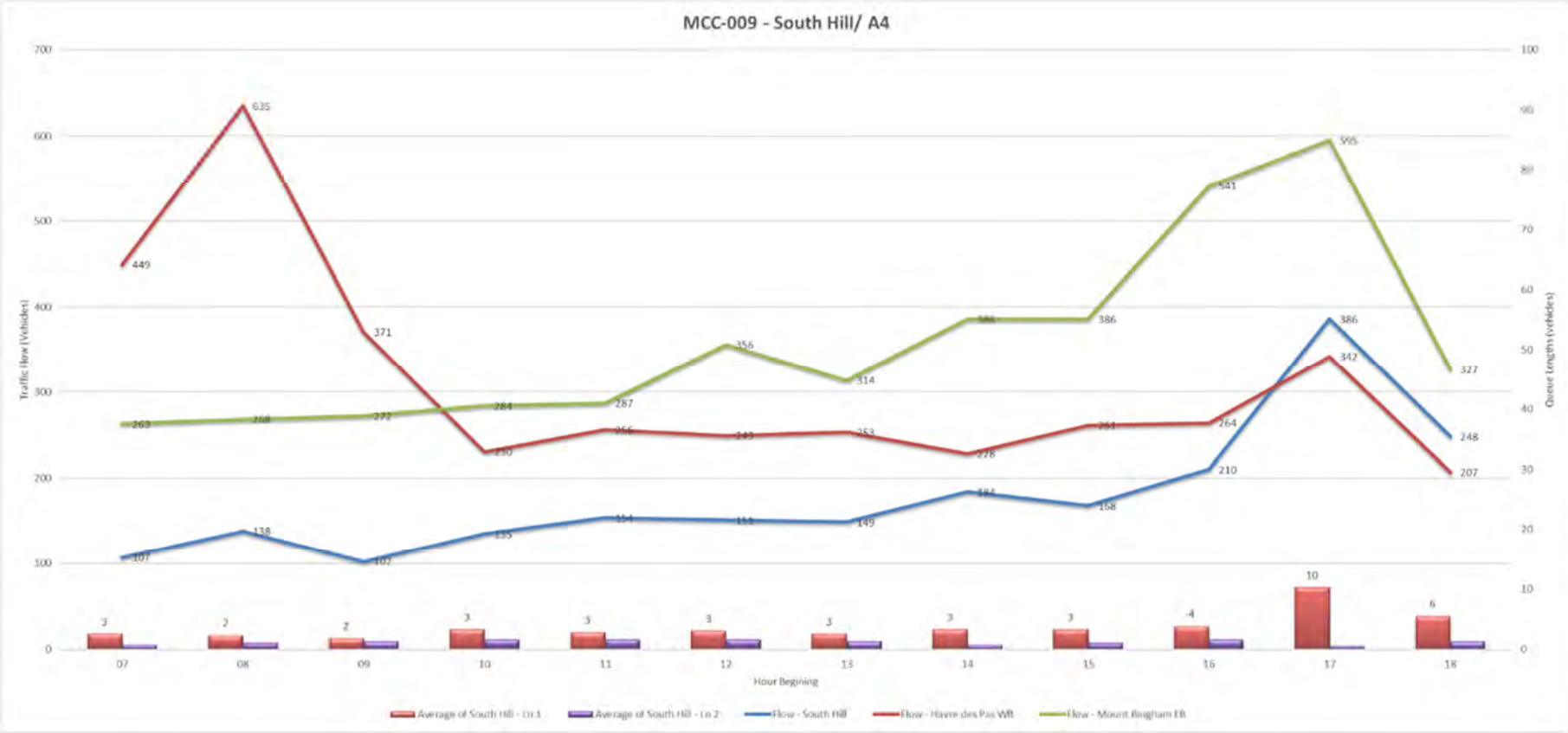


Figure 30 - MCC-009 - Mount Bingham / South Hill - Junction flows and queue lengths

3.2.24. Full results including junction turn count diagrams are presented in Appendix A of this report.

TRAFFIC COMPOSITION

3.2.25. Figure 31 presents the traffic composition for the key roads within the study area. It shows the percentage of the overall link flow (AM, PM peak hour and 12 hour) in each direction per vehicle type (cycle, motorbike, Car, LGV, HGV and bus).

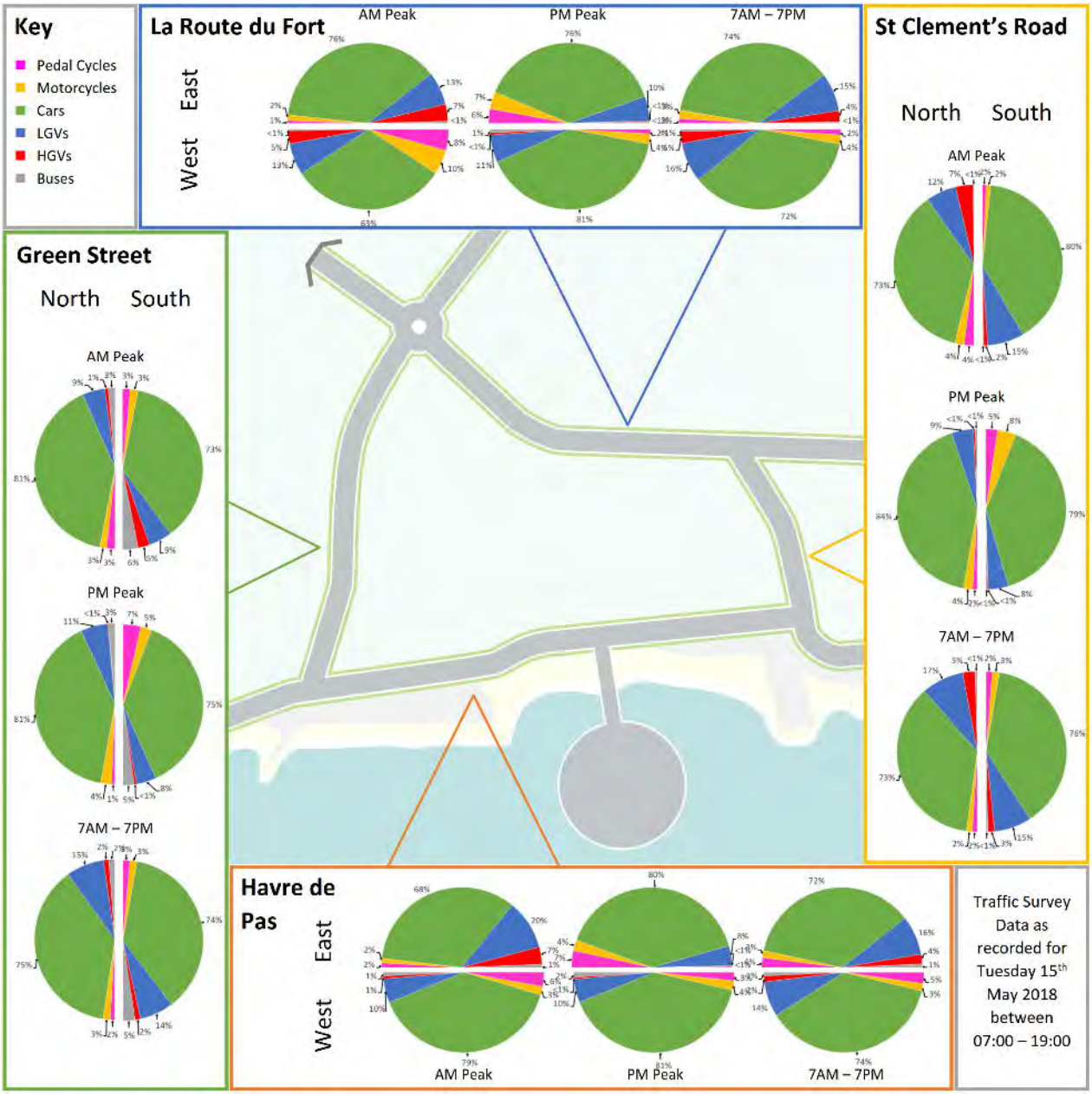


Figure 31 – Traffic composition

3.2.26. The figure shows a high LGV (20%) and HGV (7%) proportion on Havre des Pas eastbound which is significantly higher than the PM peak (LGV 8%, HGV <1%), however overall the 12-hour data indicates proportions similar to that of La Route du Fort. It is assumed the AM peak increases relate to commercial vehicles leaving the La Collette industrial area.

3.2.27. It can also be seen that bus proportions on Green Street are high compared to others. This is expected due to the high-frequency bus routes on this section and relatively low overall volume.

MANUAL CLASSIFIED COUNTS - PEDESTRIAN CROSSING SURVEYS

3.2.28. Pedestrian crossing surveys were undertaken on Havre des Pas outside the lido and at the Green Street junction. The surveys recorded the number of people using the crossings (pedestrians and cyclists) and the number of times the crossing was called.

Signalised crossing on Havre des Pas outside the Lido

3.2.29. Figure 32 shows the pedestrian and cycle count for the signalised crossing outside the lido on Havre des Pas. It clearly shows a high usage especially during the morning and evening peaks, with pedestrians being the main users while cyclists are seen to be low albeit with a noticeable increase between 1700 – 1800 with 13 crossing towards the beach. The figure also shows a significant increase in the volume of pedestrians and cyclists in the afternoon, with some 80 people per hour between 1600 and 1800.

3.2.30. Overall 513 people used the crossing between 0700-1900, with the total crossing in each direction almost exactly the same (256/257). However, the movement towards the beach was more heavily used by cyclists, with a total of 42 against a total of 10 for the from beach movement.

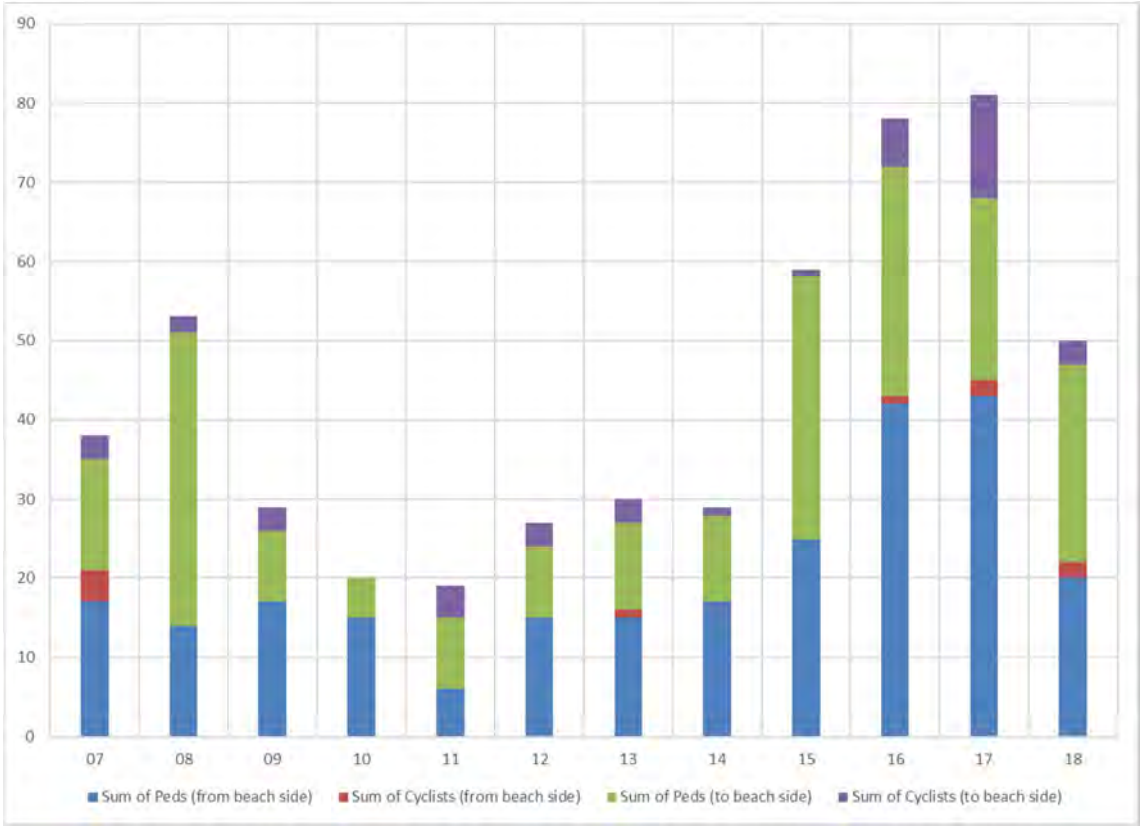


Figure 32 – Pedestrian and cycle count for the signalised crossing outside the Lido

3.2.31. Figure 33 shows the number of times the signalised crossing operated per hour as a result of the call button being pushed by a pedestrian or cyclist. Overall it was called 312 times. It can be clearly seen that the highest calls are in the morning and evening peak periods, with the highest number of calls in the evening with 45 calls between 1700-1800.

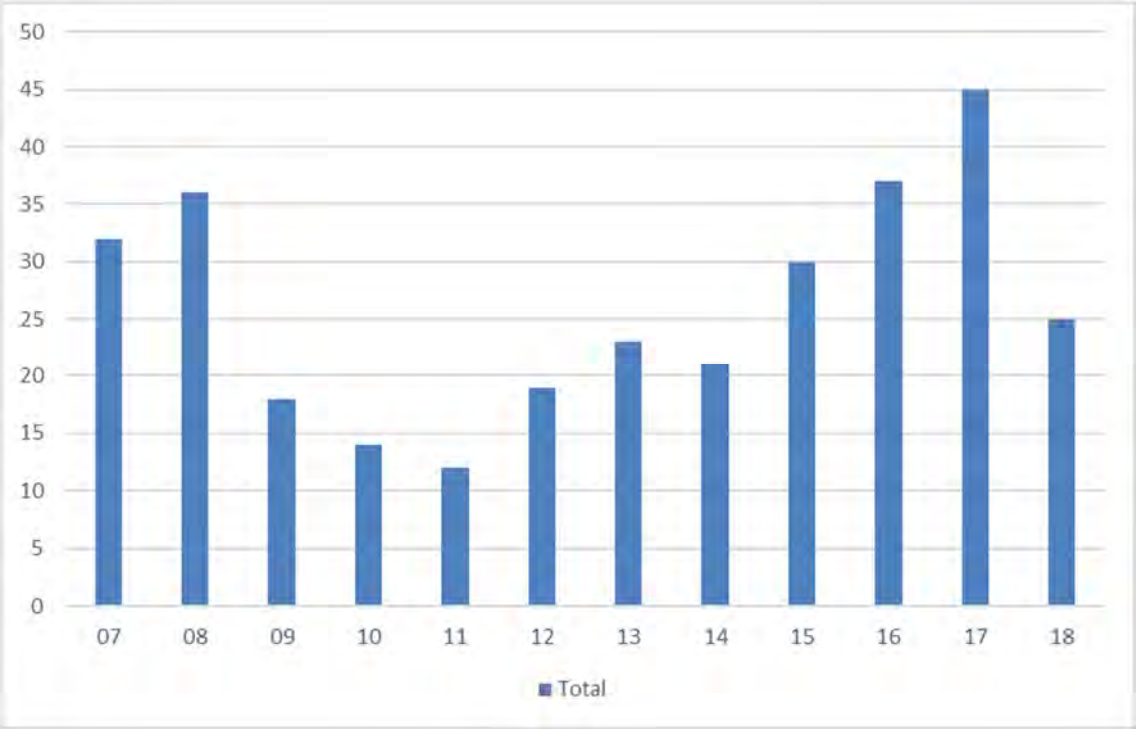


Figure 33 – Number of signal calls for the signalised crossing outside the Lido

3.2.32. Overall, it can be seen that this crossing is well used both in terms of the volume of people using the crossing and the number of times the crossing is called throughout the day but especially during the morning and evening peak periods.

Signalised crossing on Havre des Pas near the Green Street junction

3.2.33. Figure 32 shows the pedestrian and cycle count for the signalised crossing on Havre des Pas near Green St. It shows a high usage especially during the morning and evening peaks, with pedestrians being the main users while cyclists are seen to be low albeit with a noticeable increase between 0800–0900 with 9 crossing from the beach, towards the town side. The figure also shows a significant increase in the volume of pedestrians and cyclists in the evening, with 62 people crossing between 1700–1800.

3.2.34. Overall 447 people used the crossing between 0700-1900, with the total crossing in each direction very similar (220/227). However, the movement from the beach towards the town side was more heavily used by cyclists, with a total of 23 against a total of 8 for the to beach movement.

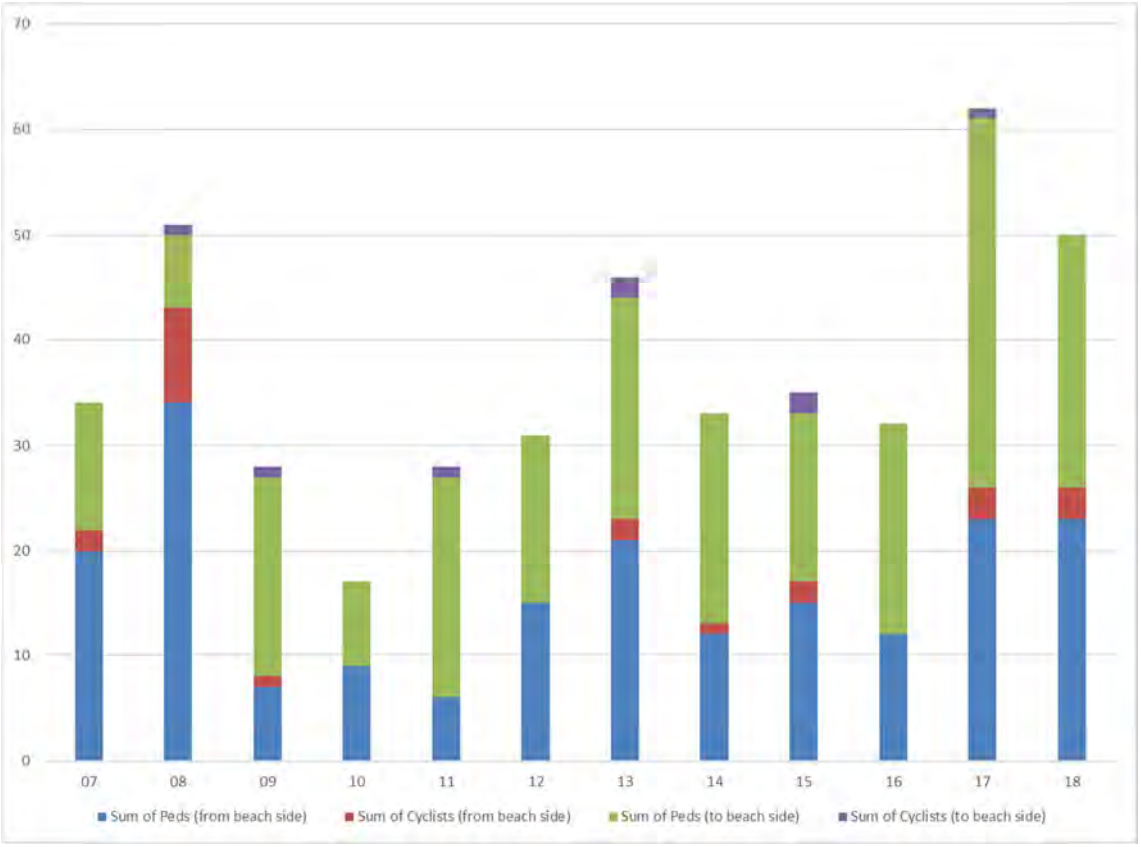


Figure 34 – Pedestrian and cycle count for the signalised crossing on Havre des Pas near Green St

3.2.35. Figure 33 shows the number of times the signalised crossing operated per hour as a result of the call button being pushed by a pedestrian or cyclist. Overall it was called 299 times. It can be seen that the highest calls are in the morning and evening peak periods, with the highest number of calls jointly between 0800-0900 and 1700-1800 with 36 calls.

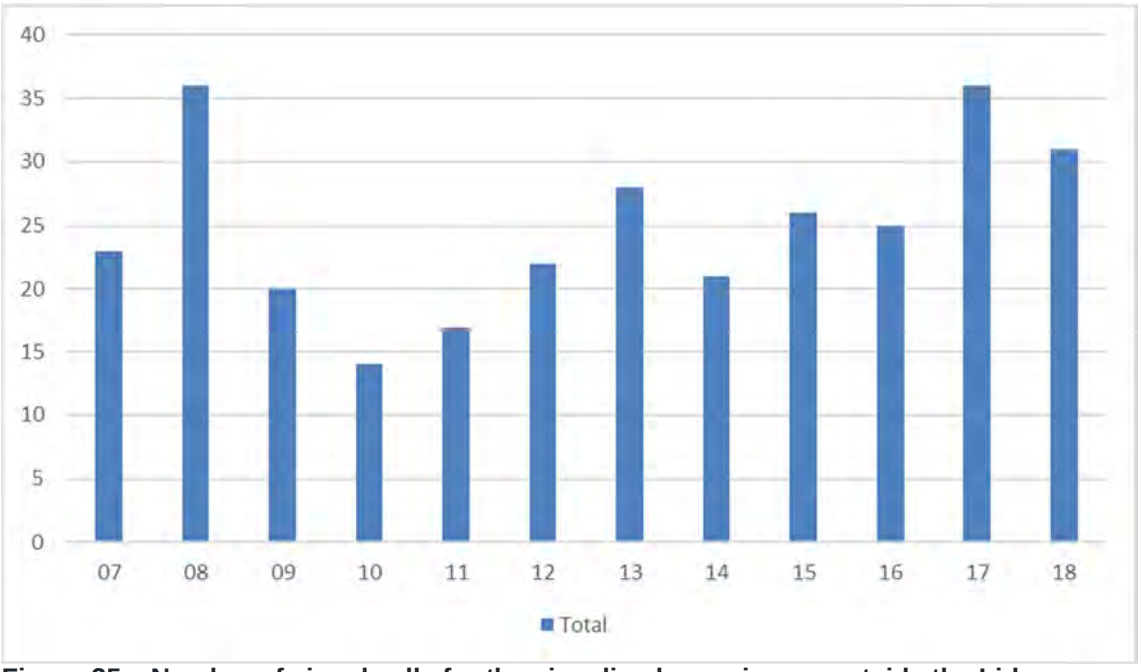


Figure 35 – Number of signal calls for the signalised crossing on outside the Lido

3.2.36. Overall, it can be seen that this crossing is well used both in terms of the volume of people using the crossing and the number of times the crossing is called throughout the day but especially during the morning and evening peak periods.

3.2.37. In summary, it can be seen that both signal crossings are well used and called a large number of times each hour during both the peak and off-peak periods. The crossing located near the lido can be seen to be slightly busier than the crossing near Green Street.

3.2.38. While total numbers using each crossing a very similar it can be seen that in terms of users, pedestrian numbers are highest in the from beach movement at the lido crossing, while at the crossing near Green Street sees pedestrian's numbers highest in the to beach movement. Cyclist reverse this trend.

3.2.39. Full results are presented in Appendix A of this report.

AUTOMATIC NUMBER PLATE RECOGNITION (ANPR) CORDON SURVEYS

3.2.40. Results of the ANPR surveys are presented below for each key movement or route through the study area in terms of the percentage of vehicles on each route through the area and average journeys for the associated routes.

3.2.41. Full results are presented in Appendix B of this report.

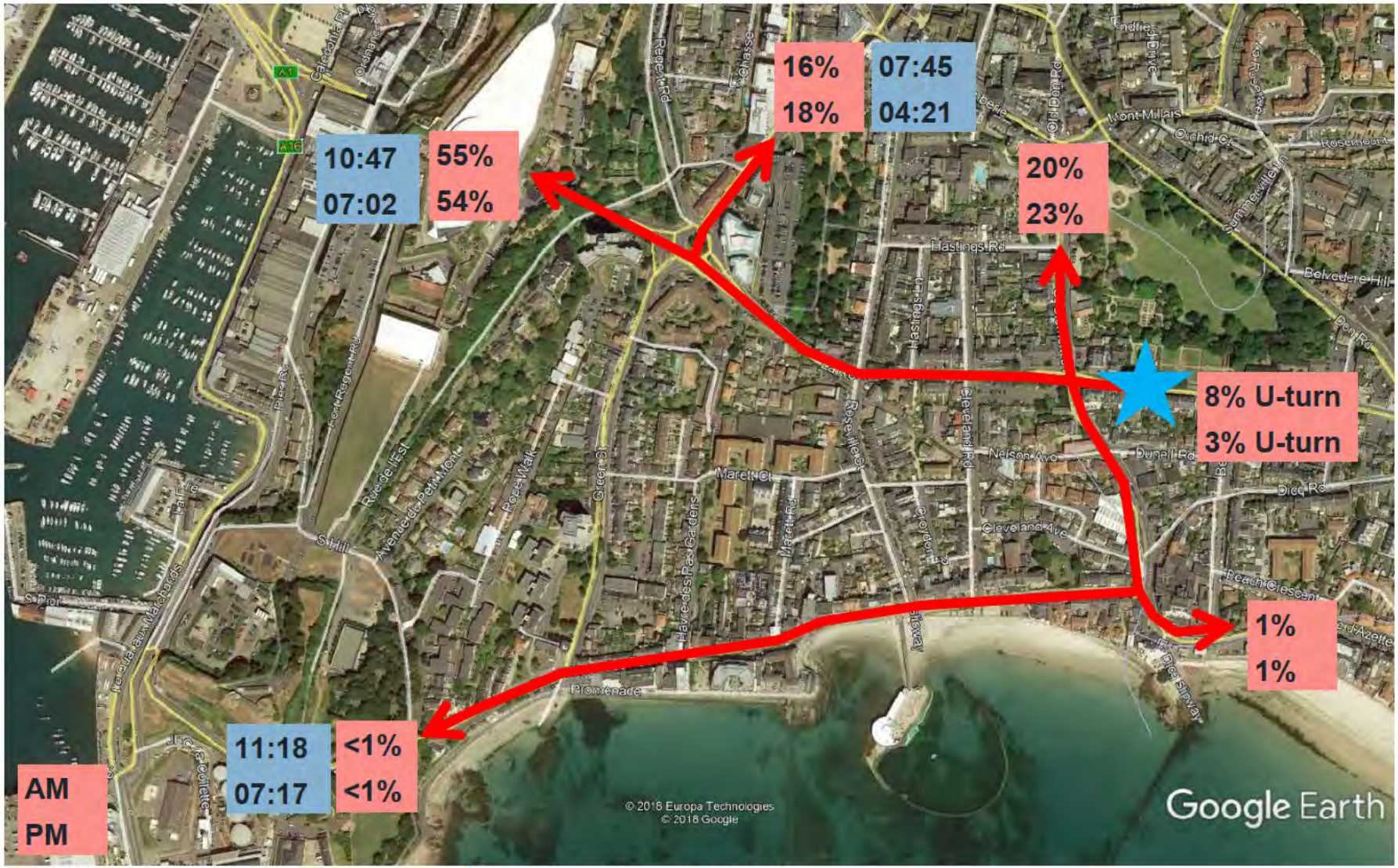


Figure 36 – ANPR 005 Percentage movements through the study area (approx.)

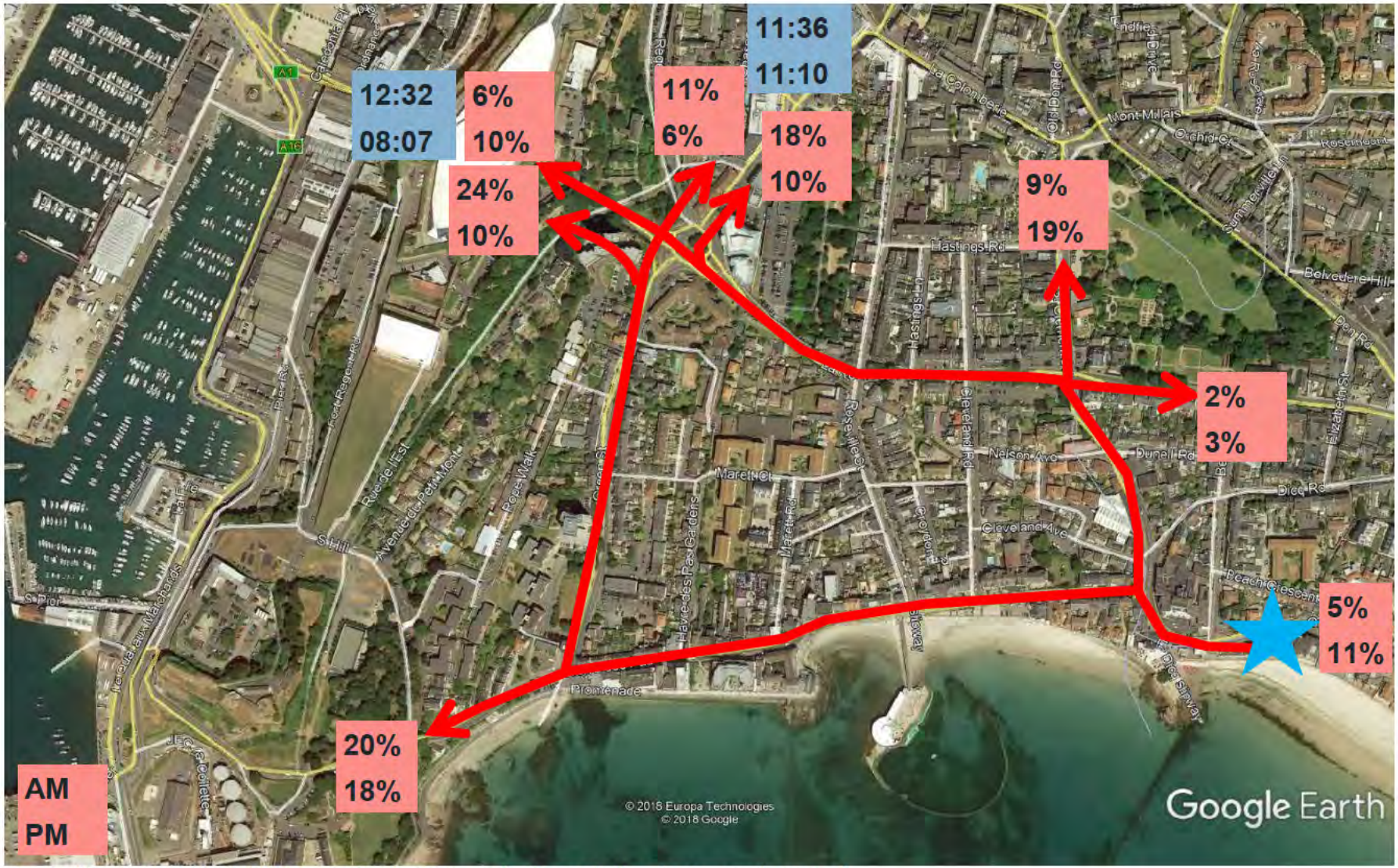


Figure 37 – ANPR 007 & 008 Percentage movements through the study area (approx.)

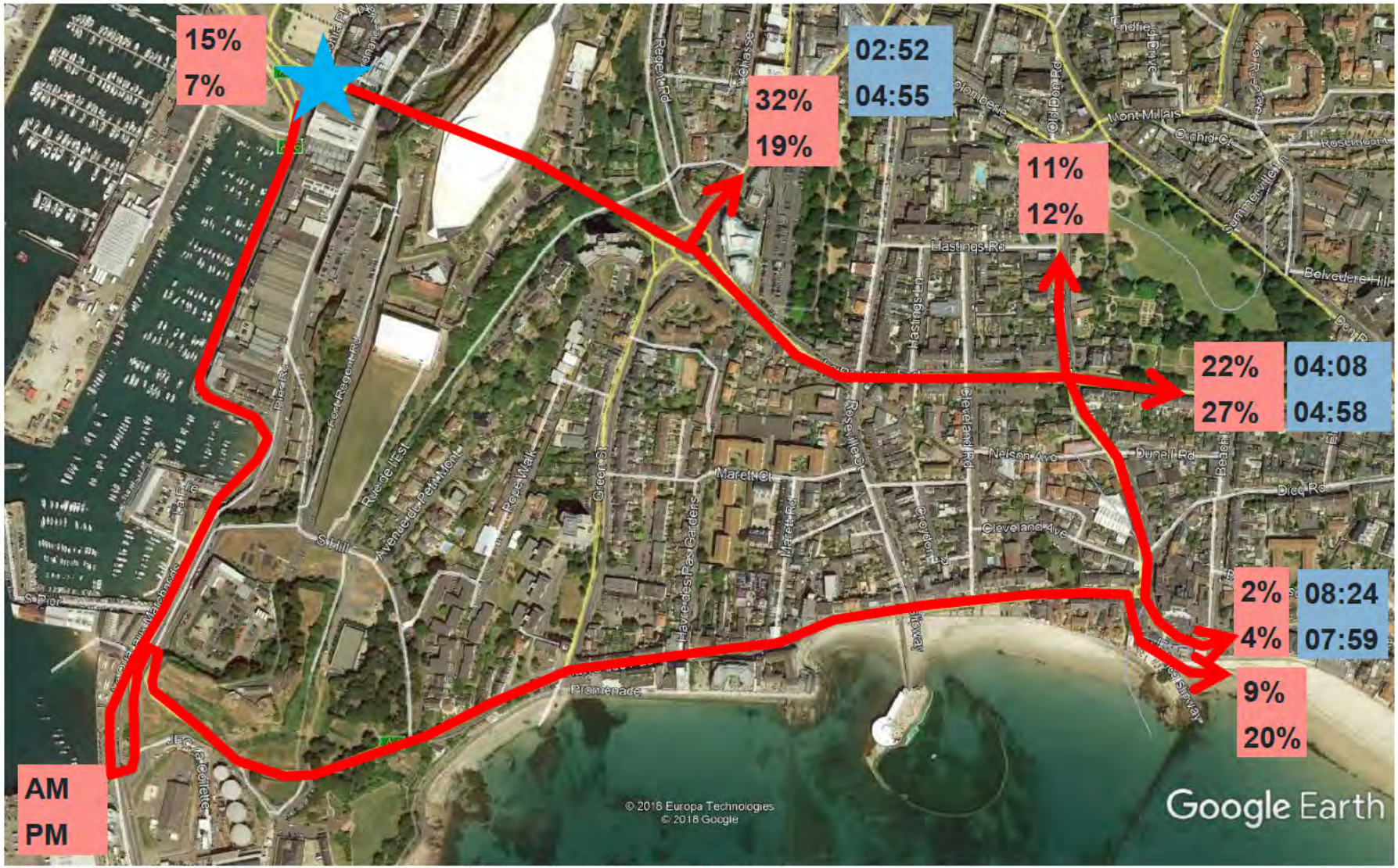


Figure 38 – ANPR 101 Percentage movements through the study area (approx.)

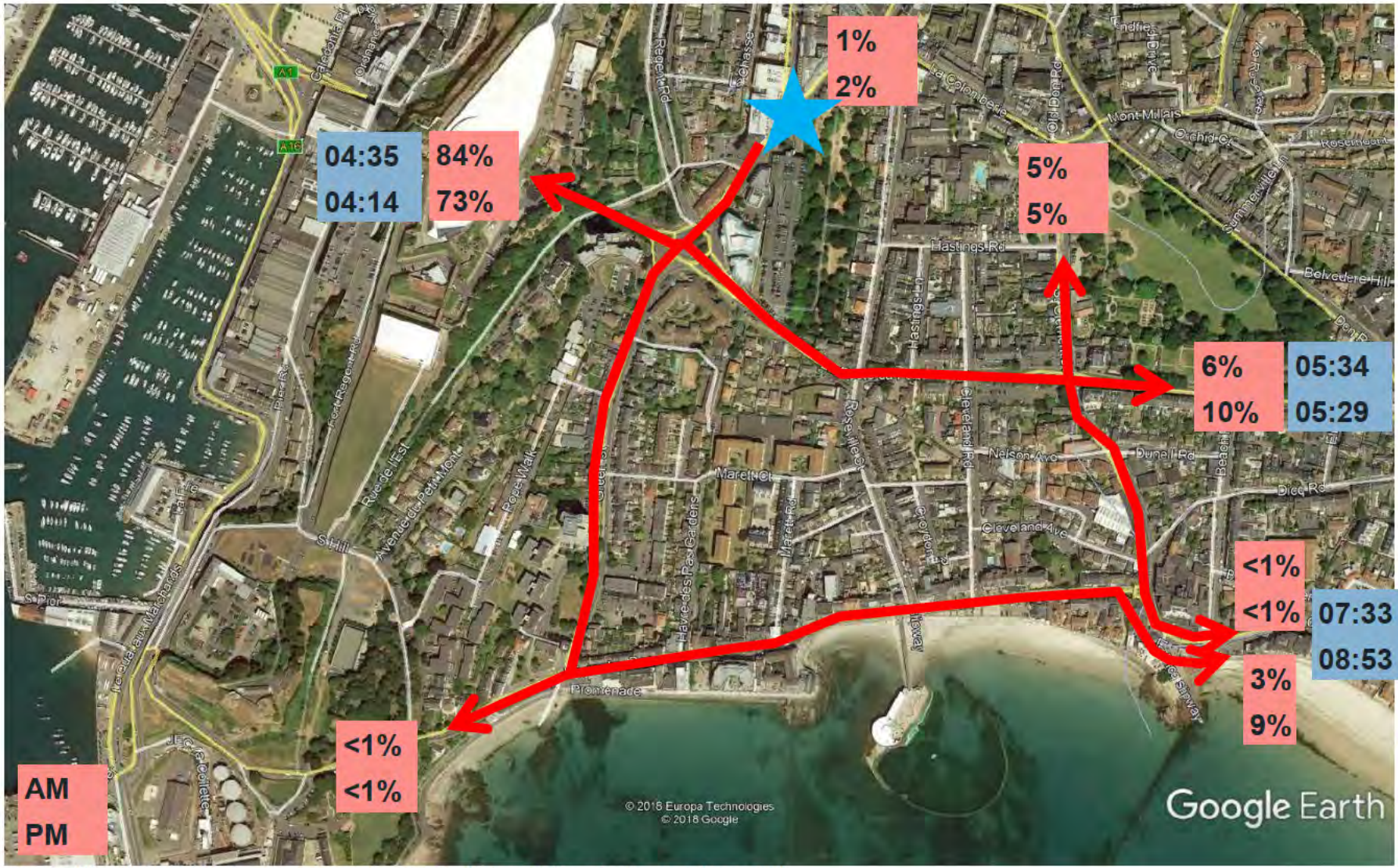


Figure 39 – ANPR 002 Percentage movements through the study area (approx.)

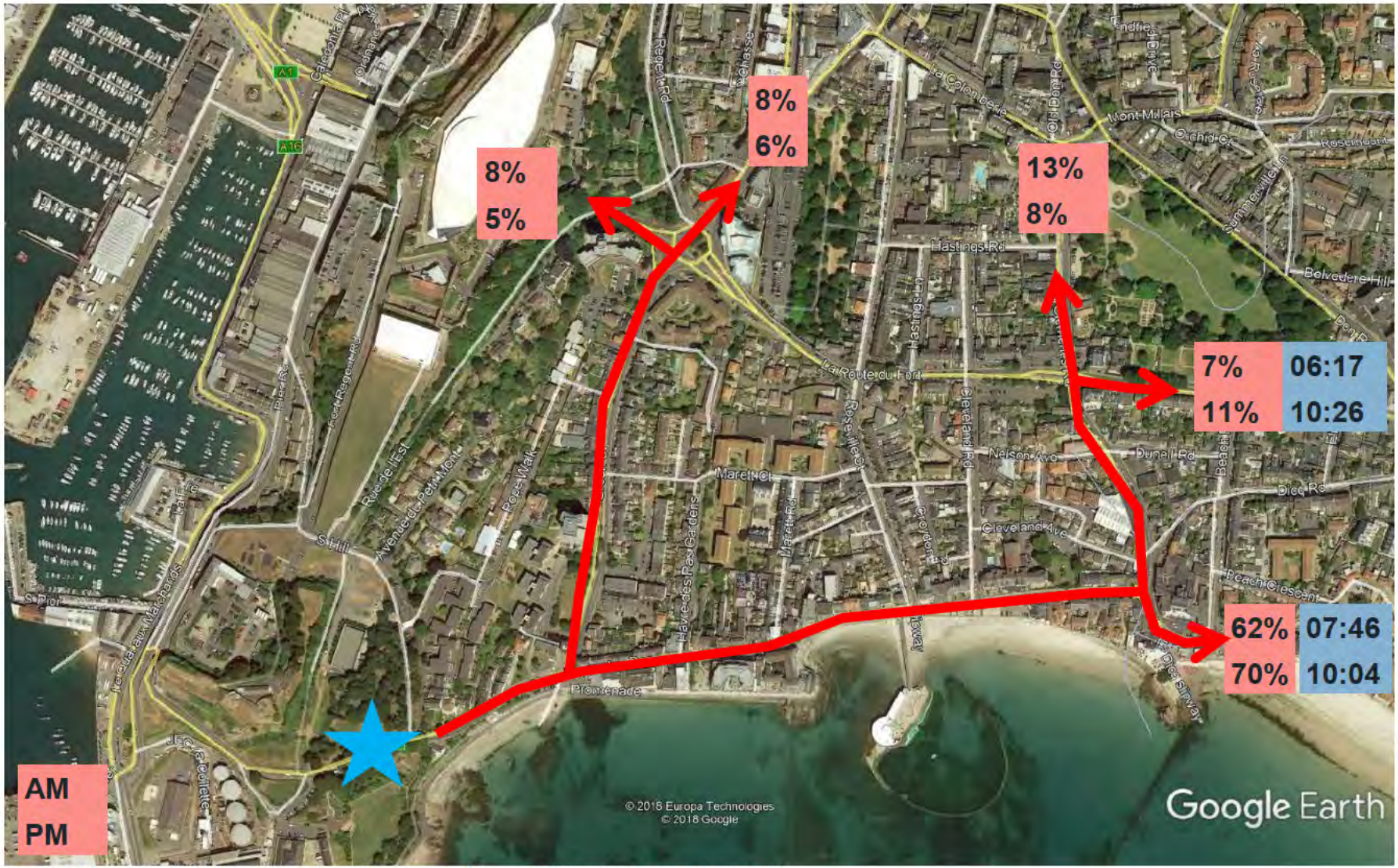


Figure 40 – ANPR 011 Percentage movements through the study area (approx.)

3.3 SUMMARY

3.3.1. Following the data collection exercise detailed above it is clear that the study area experiences a very dominate tidal traffic pattern with significant volumes of vehicles heading westbound in the AM peak and eastbound in the PM peak, largely related to commuting to/from St Helier town centre.

3.3.2. As a result of the data collection, it is it shows that traffic volumes along Route du Fort are consistently high throughout the 0700 – 1900 period. However, volumes on Havre des Pas are high during the peak hours (946 vehicles AM westbound, 963 eastbound PM) but significantly reduce during the interpeak period, reducing to between a half to a third of the volume.

3.3.3. It is also clear that as a result of these significant peak period volumes, extensive queuing occurs on both La Route du Fort and Havre des Pas. The highest queues are recorded on La Route du Fort in the AM peak., with an average queue length greater than 45 vehicles (stationary).

3.3.4. The ANPR movement surveys again confirm the major flow along Havre des Pas is westbound in the AM peak hour, and indicate trips largely originating from Greve d'Azette are travelling along the seafront before selecting either Green Street or Mount Bingham to head towards La Route du la Liberation, with a roughly a third using Green St and two-thirds using Mount Bingham. .

3.3.5. Traffic heading westbound and entering the study area from Bagot tends to remain on La Route du Fort, before going through the tunnel or Green Street north. Only low numbers of vehicles switch from La Route du Fort.

3.3.6. In the eastbound PM peak hour, again vehicles tend to stick to either La Route du Fort or Havre des Pas with only a small number of vehicles switching, for example using Mount Bingham, Havre des Pas and then La Route du Fort.

3.3.7. The figures also confirm due to the traffic flows; congestion is greatest in the AM peak heading westbound and eastbound in the PM peak hour with journey times generally longer in the key direction. For example, average times for the movement from La Route du La Liberation via Mount Bingham taking almost 2 minutes 30 seconds longer in the PM peak than the AM peak hour (7:45 AM, 10:04 PM). Similarly, for the movement from Greve d'Azette to La Route du la Liberation on average it takes some 4 minutes 30 seconds (12:32 AM, 08:07 PM) longer in the PM peak hour.

4 OPTIONS TESTING - TRAFFIC MODEL ANALYSIS

4.1 MODEL BACKGROUND

4.1.1. This section outlines the background to the traffic modelling undertaken to support the study and the scheme options assessment.

4.1.2. For the Havre Des Pas Village Study, the existing base model was updated to 2018 by carrying out minimal network updates and local recalibration within St. Helier to test the scheme options. Recalibration was undertaken to improve the models level of calibration whereby modelled flows are compared to observed flows. The count data collected for the study area, and presented in Section 3.2 above, was input in the model and used to furness the model to match, improving the calibration level from that found in the base model.

4.1.3. The primary area of interest is highlighted with a red perimeter within in Figure 41, with a blue perimeter highlighting the broad scheme options area.

Figure 41 – Area of interest and broad scheme location

4.1.4. The Havre Des Pas study model update utilised the network-wide parameters and trip demand distribution of the existing Jersey Transport Model. As the demand data of the existing Jersey Transport Model is largely based on 1992 matrices with infill from the 2007 RSI data, it should be noted that there are limitations to the 2018 model update that although the traffic flow level of the updated model might be representative of 2018 due to local recalibration, the trip demand distribution pattern has not been fully verified to represent the current traffic conditions.

4.1.5. It should also be noted that no validation exercise has been undertaken within the primary area of interest, and the performance of the model outside the primary area of interest as shown in Figure 1 is beyond the scope of this study but has been monitored at a high level to ensure the existing level of model performance is retained.

BASE MODEL UPDATES

4.1.6. The Jersey Transport Model network within the primary area of interest has been reviewed to understand the appropriateness to reasonably assess the proposed scheme options. Based on the review, necessary changes to link capacities and speeds have been identified as shown in Figure 42 that are essential to model realistic routing and delays in the model.

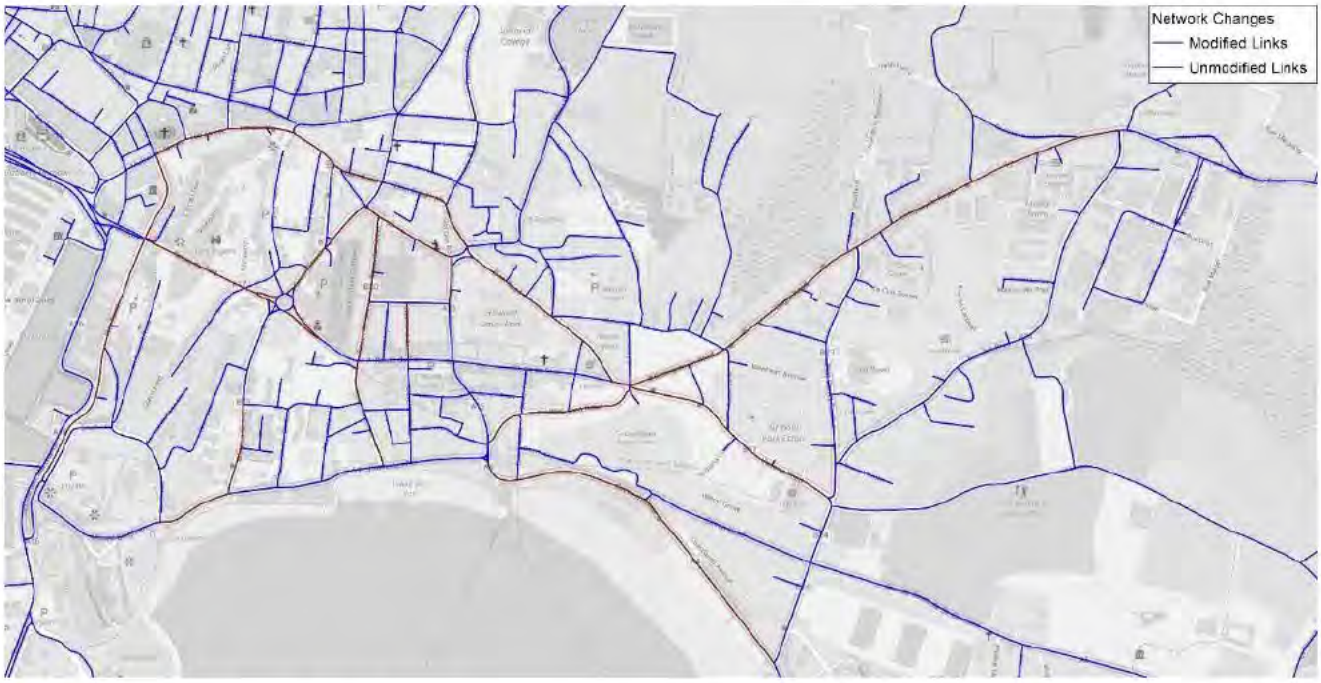


Figure 42 – Base Network Updates

4.1.7. As part of the model development, a calibration exercise has been performed using manual classified counts. Modelled flows were compared with survey volumes, and the GEH statistic has been used to compare observed and assigned flow. WebTAG advises that in ordinary circumstances the practitioner should aim to reach a state where 85% of modelled links have a GEH of less than 5. The GEH statistic is of the form:

$GEH = \sqrt{\frac{(M-C)^2}{(M+C)/2}}$ where M is the modelled flow and C is the observed count.

4.1.8. A total of 100 counts were used in the base model calibration. The comparison of modelled flows against these counts is summarised in Table 8.

Measure	AM Peak	PM Peak
No. of links with modelled flows meeting GEH < 5 criteria	79/100	90/100
% of links with modelled flows meeting criteria	79%	90%

Table 8 – Calibration link flow comparison with observed flows

4.1.9. The table demonstrated that the 85% criteria is achieved for the PM peak and for the AM peak it has slightly fell short of the criteria. However, given the scope of this assessment, the results are deemed appropriate and gives confidence that the modelled flows as a whole are representative of real-life traffic flows.

4.1.10. Although the modelled flows as a whole are representative of observed flows in the study area, it is important to ensure that the links in the immediate vicinity of the proposed options are well calibrated. The comparison of modelled flows against these counts is summarised in Table 9.

Measure	AM Peak	PM Peak
No. of links with modelled flows meeting GEH < 5 criteria	50/59	52/59
% of links with modelled flows meeting criteria	85%	88%

Table 9 – Calibration link flow comparison with observed flows

4.1.11. The table demonstrates that the sites within the broad scheme area meet the 85% criteria for AM and PM peak and are representative of real-life traffic flows.

4.2 SCHEME OPTIONS

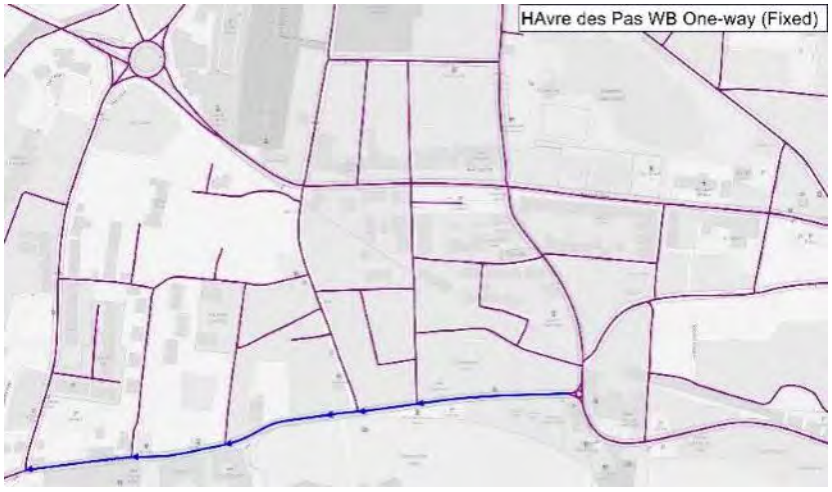
4.2.1. This section summarises the options testing undertaken to assess the impact of the scheme options within the study area.

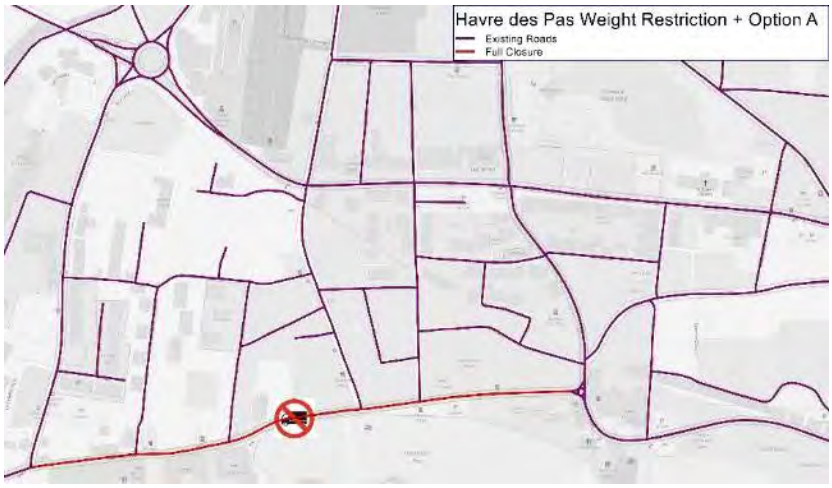
DESCRIPTION OF OPTIONS

4.2.2. Following consultations with the Parish of St. Helier and the study Steering group, the following options have been identified as a prioritised shortlist for testing:

Table 10 – Proposed Options

▪ **Do Minimum** – Base Model + 20 mph scheme on Green St, Havre des Pas, St Clements and local roads in the Havre des Pas area	
▪ **Option A** – **Full closure** of Havre des Pas between Green St and St Clements except for access	
▪ **Option B** – **Full closure** of Havre des Pas between Green St and St Clements except for access and Green Street between La Route du Fort and Havre des Pas	

▪ **Option C** – One way only on Green St Northbound	
▪ **Option D** – One way only on Havre des Pas Westbound	
▪ **Option E** – Option C + Option D	

▪ **Option F** – HGV ban on Havre des Pas/Green St + Option A **(Full closure)**	
▪ **Option G** – HGV ban on Havre des Pas + Option E (one-way on Havre des Pas and Green St)	

KEY OBSERVATIONS

4.2.3. The following section summarises the outputs from the options modelling which include overall model network statistics, traffic flow difference plots and journey time assessments within the primary area of interest.

Network Statistics

4.2.4. This section outlines the impact of network performance by comparing overall vehicle-hours travelled, vehicle-kilometres travelled and average delay per vehicle on the modelled option networks for the AM and PM peak hours.

4.2.5. In order to understand the impact of each option on the network within the primary area of interest, cordoned models were created, and the network statistics were derived from these models to assess the localised impact of network performance thereby removing wider background noise in the model. Table 11 and Table 12 present the network statistics comparison for each option against the Do Minimum model. The key observations are as follows:

- In the AM peak, Option B has the largest increase in average delay per vehicle of approximately 43% compared to the Do Minimum followed by Option A with an increase of approximately 33%. The results seem logical as Option B includes the full closure of Havre des Pas and Green Street, consequently vehicles travel for longer distance and duration resulting in an increase in total distance and travel time. Option C has the least impact with an increase of approximately 5% which shows that the Green St southbound closure has a marginal impact on network delays compared to other options.

- In the PM Peak, Option B has the largest increase in delays of approximately 64% followed by Options A, F, D with an increase of approximately 55%, 54% and 50% respectively. The increase in Option B can be attributed to the full closure of Havre des Pas and Green St, whereas in Options F and A the Havre des Pas eastbound closure has a significant impact on network delays. The Option D impact is observed particularly in the PM peak due to the tidal traffic flow nature of the study area wherein the eastbound traffic is higher in the evening peak compared to the morning peak, resulting in more delays in the PM peak with the Havre des Pas eastbound route closure. Option C with Green Street southbound closure has minimal impact in the PM peak as the alternate route choice in this peak is found to be much quicker in part due to the trip distribution compared to the AM peak.

AM Peak	DM	Option A		Option B		Option C		Option D		Option E		Option F		Option G	
Total Delay (hrs)	395	526	33.0%	566	43.1%	417	5.4%	449	13.7%	454	15.0%	515	30.3%	444	12.4%
Total Distance (km)	37,104	37,403	0.8%	37,461	1.0%	37,170	0.2%	37,310	0.6%	37,352	0.7%	36,992	-0.3%	36,939	-0.4%
Total Travel Time (hrs)	1,554	1,700	9.4%	1,742	12.2%	1,575	1.4%	1,616	4.0%	1,624	4.5%	1,678	8.0%	1,601	3.1%
Avg Delay per Veh (min)	1.38	1.83	32.8%	1.96	42.8%	1.45	5.3%	1.56	13.5%	1.58	14.7%	1.80	31.0%	1.56	13.1%

Table 11 – AM peak network statistics

PM Peak	DM	Option A		Option B		Option C		Option D		Option E		Option F		Option G	
Total Delay (hrs)	298	460	54.4%	490	64.4%	292	-1.9%	448	50.3%	443	48.6%	457	53.3%	442	48.1%
Total Distance (km)	36,741	37,213	1.3%	37,159	1.1%	36,776	0.1%	37,183	1.2%	37,218	1.3%	37,104	1.0%	37,161	1.1%
Total Travel Time (hrs)	1,437	1,621	12.8%	1,654	15.2%	1,432	-0.3%	1,611	12.1%	1,609	12.0%	1,613	12.3%	1,591	10.7%
Avg Delay per Veh (min)	1.10	1.70	54.5%	1.81	64.4%	1.08	-2.0%	1.65	50.4%	1.63	48.6%	1.69	53.6%	1.63	48.3%

Table 12 – PM peak network statistics

Flow Differences

4.2.6. This section provides a summary of the impact on traffic flows by comparing flows within the study area for each option against the Do Minimum. The outputs are presented in the form of flow difference plots where green indicates areas of flow decreases and red areas of flow increases.

4.2.7. Figure 43 to Figure 56 present the flow comparison plots for each option against the Do Minimum. The key observations are as follows:

Option A: Full closure of Havre des Pas

- With full closure of Havre des Pas, there is an increase in westbound traffic of approximately 530 vehicles on La Route du Fort in the AM peak, with reductions of similar magnitude on Havre de Pas in the westbound direction. In the PM peak, a reverse trend was observed, in that there is an increase in eastbound traffic of approximately 600 vehicles on La Route du Fort with similar flow reductions on Havre de Pas.
- There is an increase in flow on Victoria Road with traffic rerouting through this road to join La Route du Fort due to Havre de Pas westbound closure.
- There is an increase in flows on Hill Street/Pier Road as vehicles now reroute through these roads instead of La Route du la Liberation/Commercial Buildings due to road closures.

Option B: Full closure of Havre des Pas and Green Street

- With full closure of Havre des Pas and Green St, the impacts are akin to Option A. There is an increase in westbound traffic of approximately 580 vehicles on La Route du Fort in the AM peak, with reductions of similar magnitude on Havre de Pas in the westbound direction. In the PM peak, a reverse trend was observed, in that there is an increase in eastbound traffic of approximately 600 vehicles on La Route du Fort with similar flow reductions on Havre de Pas.

Option C: One way only on Green St Northbound

- With Green Street southbound closure, there is a flow reduction through the tunnel as vehicles route via Commercial Buildings, Mount Bingham instead of accessing Green Street southbound.
- Similarly, there is an increase in eastbound traffic on La Route du Fort between Green Street and St. Clement Road as traffic now reroutes through this section to reach Greve d'Azette/Havre des Pas instead of Green Street southbound and Havre des Pas west.
- Both AM and PM peaks have similar impacts in this option.

Option D: One way only on Havre des Pas Westbound

- With Havre des Pas eastbound closure, there is an increase in traffic on La Route du Fort as vehicles now use Commercial Buildings northbound and join Route du Fort Road eastbound traffic via La Route du la Liberation/La Route du Port Elizabeth roundabout.
- Due to increased delay on La Route du Fort with rerouted traffic with Havre des Pas eastbound closure, vehicles from the western part of the study area which would otherwise use Union St, Bath St and join A4 coast road via Victoria Rd.
- Due to the tidal flow nature of the study area, the impact is higher in the PM peak with larger increase in eastbound traffic on La Route du Fort compared to the AM peak.

Option E: Option C + Option D

- With Option E which is a combination of Options C and D (Havre des Pas and Green St one-way), the impacts are combined in this scenario. The AM and PM peaks have an increase in flows of approximately 400 and 500 vehicles respectively in the eastbound direction on La Route du Fort.
- There are some increases on parallel routes to La Route du Fort such as Union St and Bath St due to an increase in delay with vehicles joining from La Route du la Liberation//La Route du Port Elizabeth roundabout from zones (origins) to the south which would otherwise use Havre des Pas.

Option F: HGV ban on Havre des Pas/Green St + Option A

- With Option F, the impacts are similar to that of Option A. There is an increase in westbound traffic of approximately 560 vehicles on La Route du Fort in the AM peak, with reductions of similar magnitude on Havre de Pas in the westbound direction. In the PM peak, a reverse trend was observed, in that there is an increase in eastbound traffic of approximately 630 vehicles on La Route du Fort with similar flow reductions on Havre de Pas.

Option G: HGV ban on Havre des Pas/Green St + Option E

- With Option G, the impacts are similar to that of Option E. The PM peak has larger increase in flows of approximately 580 vehicles in the eastbound direction on La Route du Fort compared to the AM peak owing to the tidal nature of traffic in the study area.

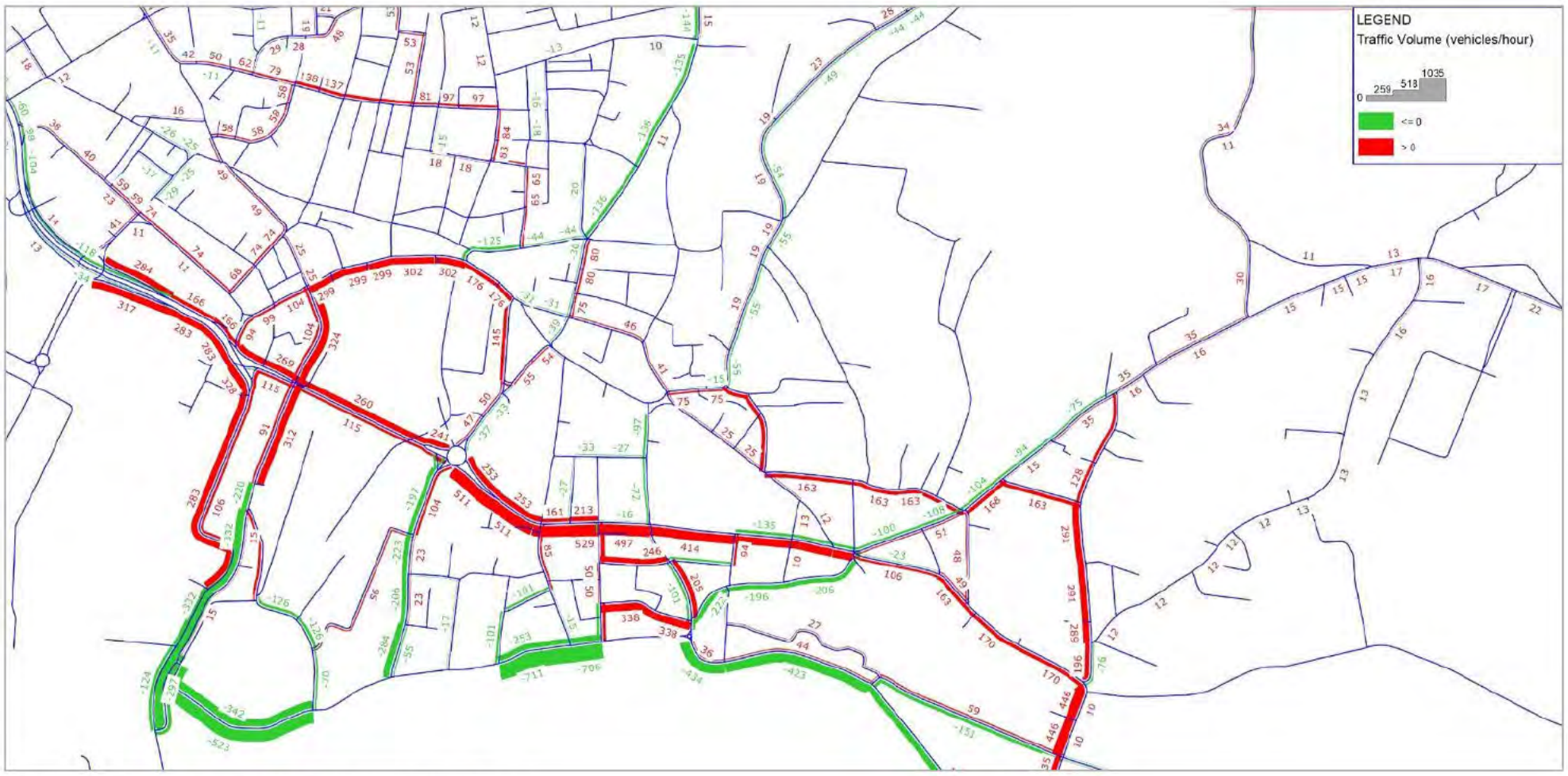


Figure 43 – Option A - DM flow difference, AM Peak

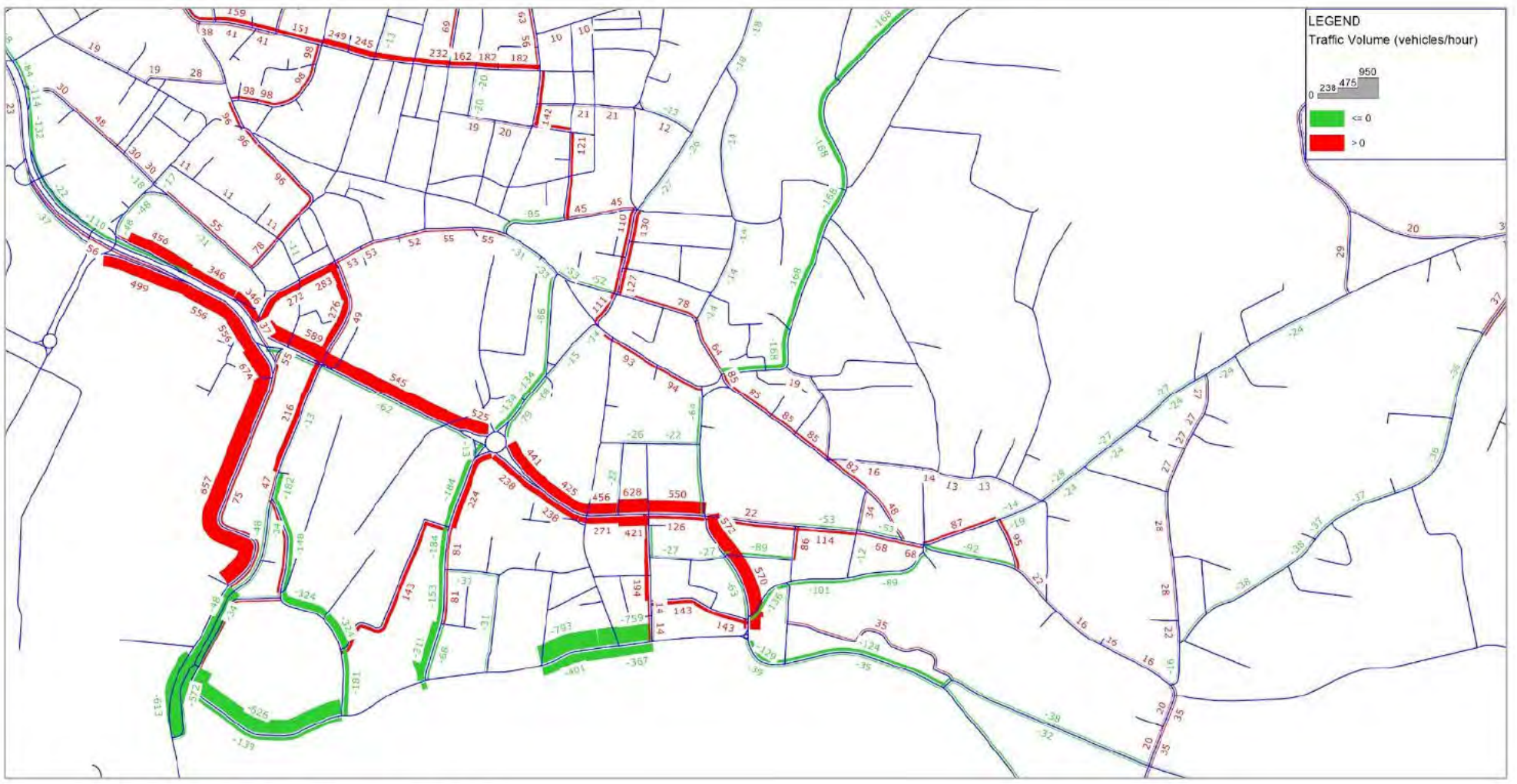


Figure 44 – Option A - DM flow difference, PM Peak

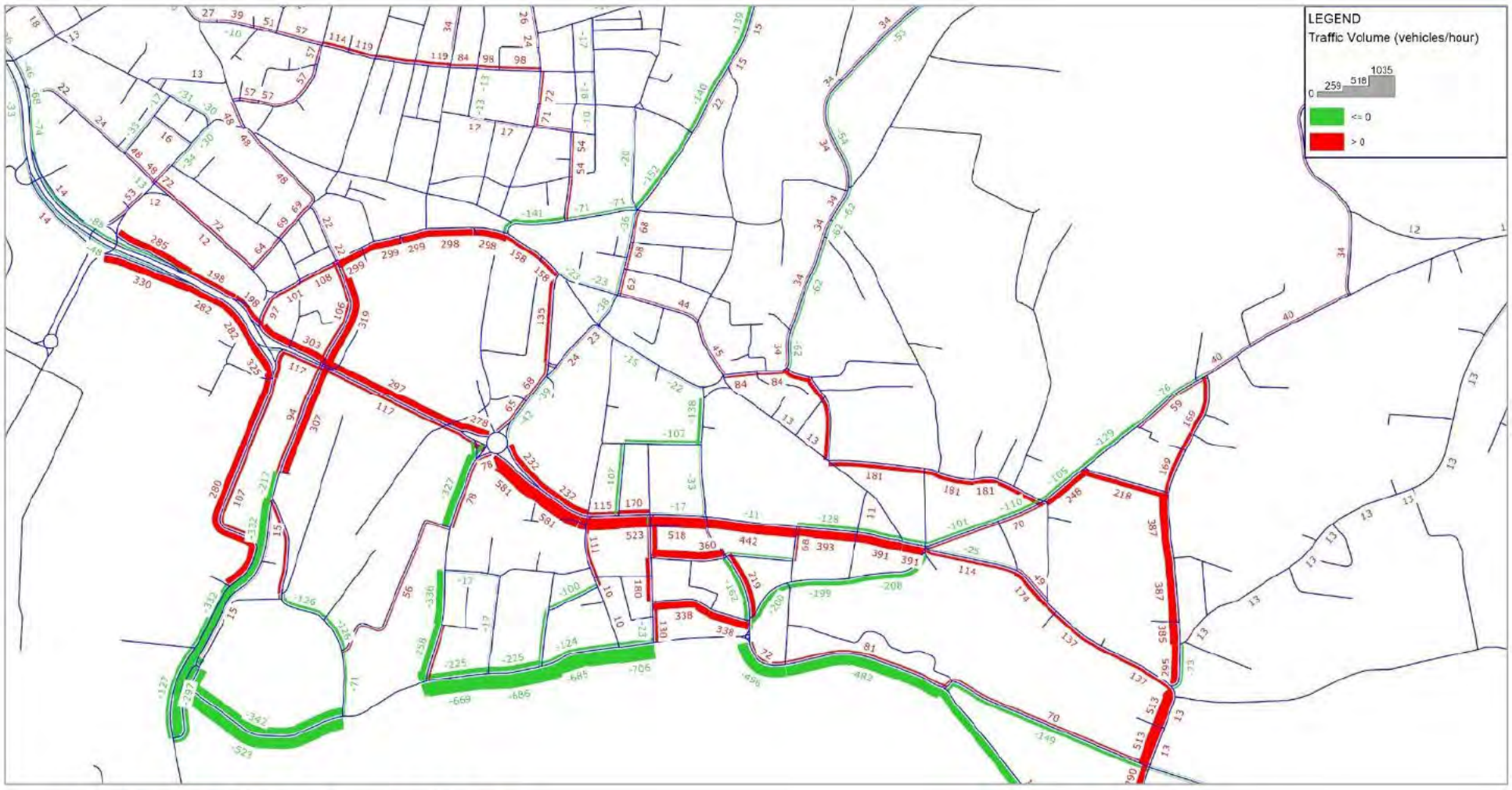


Figure 45 – Option B - DM flow difference, AM Peak

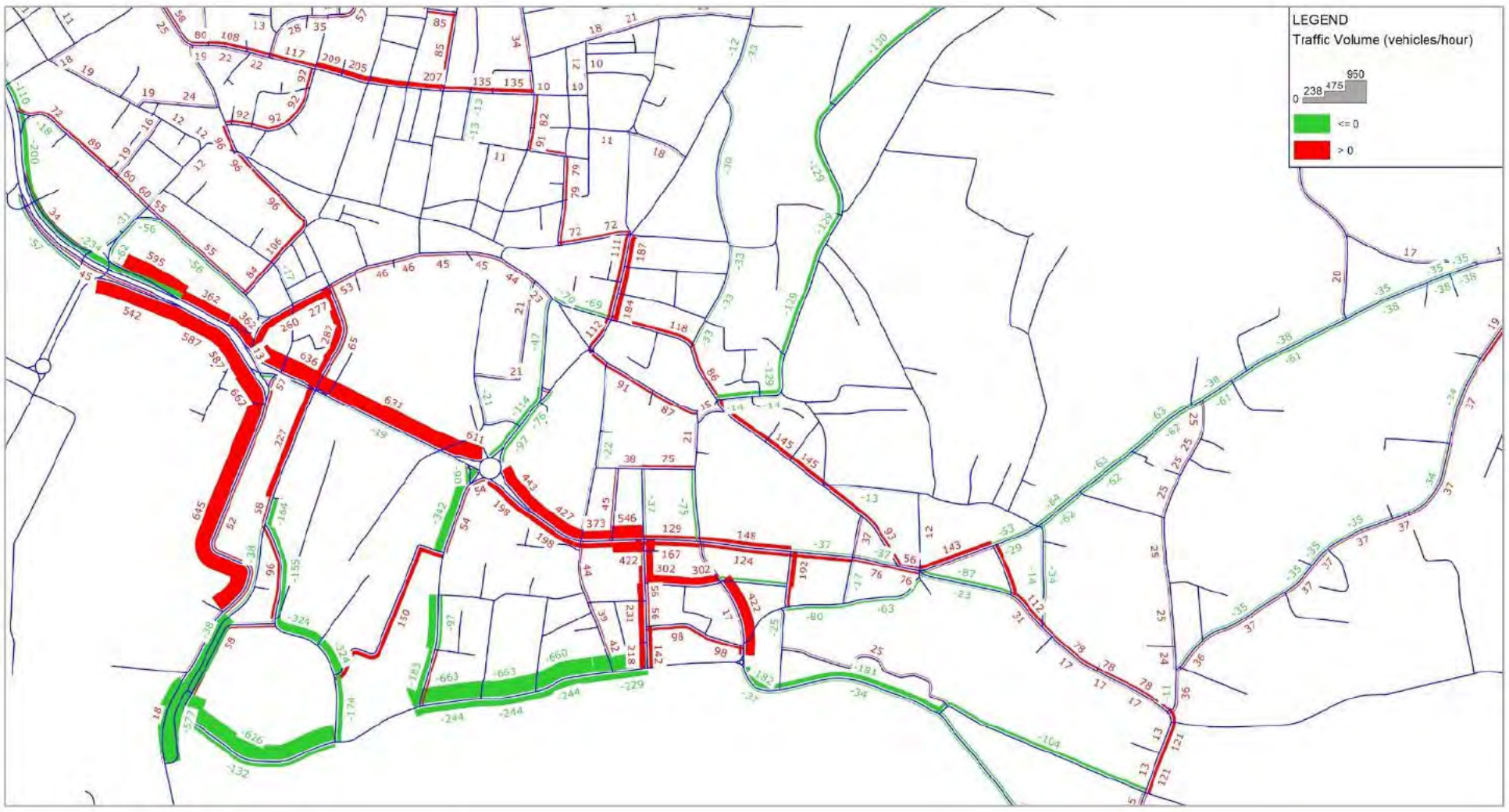


Figure 46 – Option B - DM flow difference, PM Peak

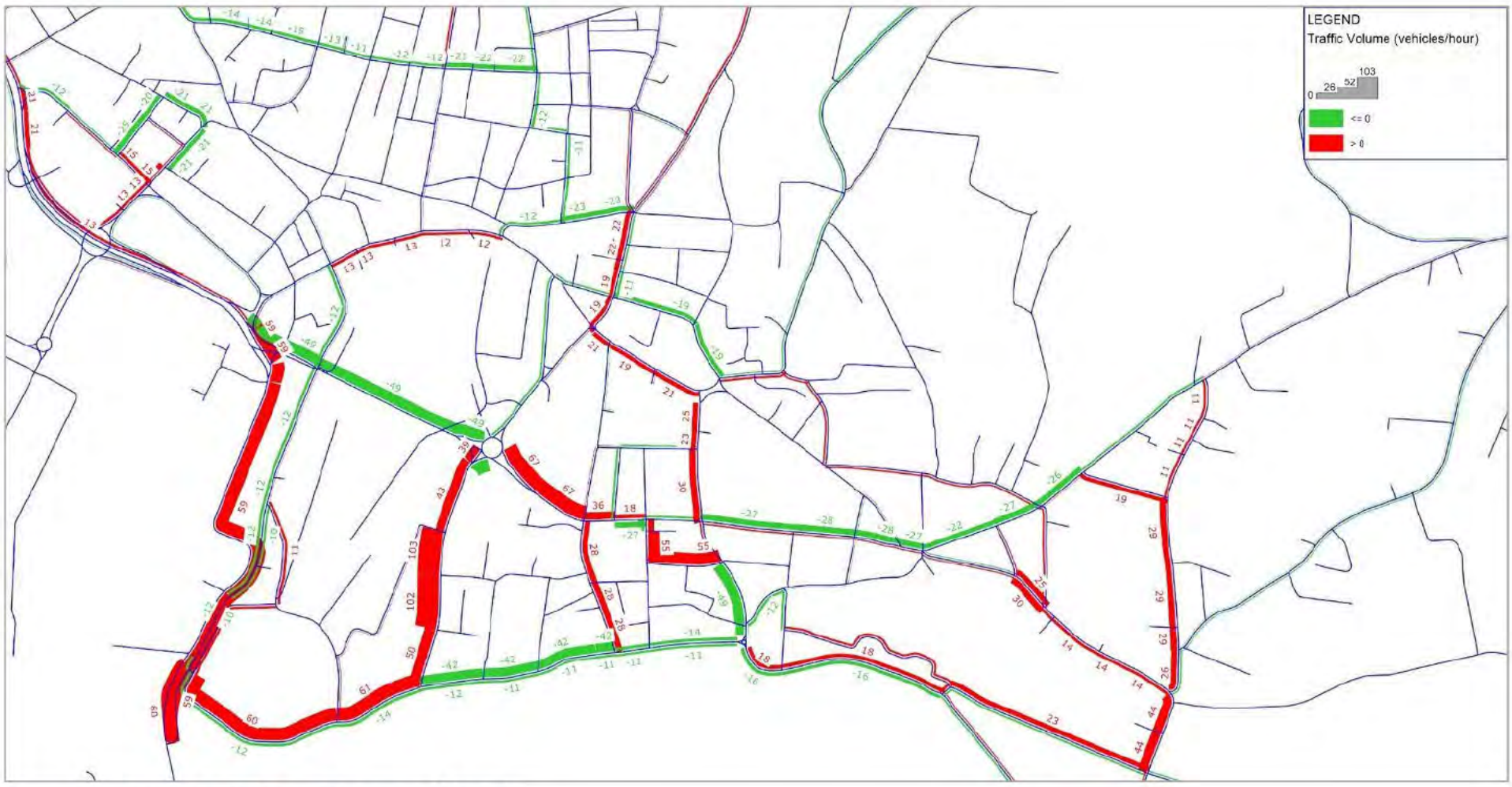


Figure 47 – Option C - DM flow difference, AM Peak

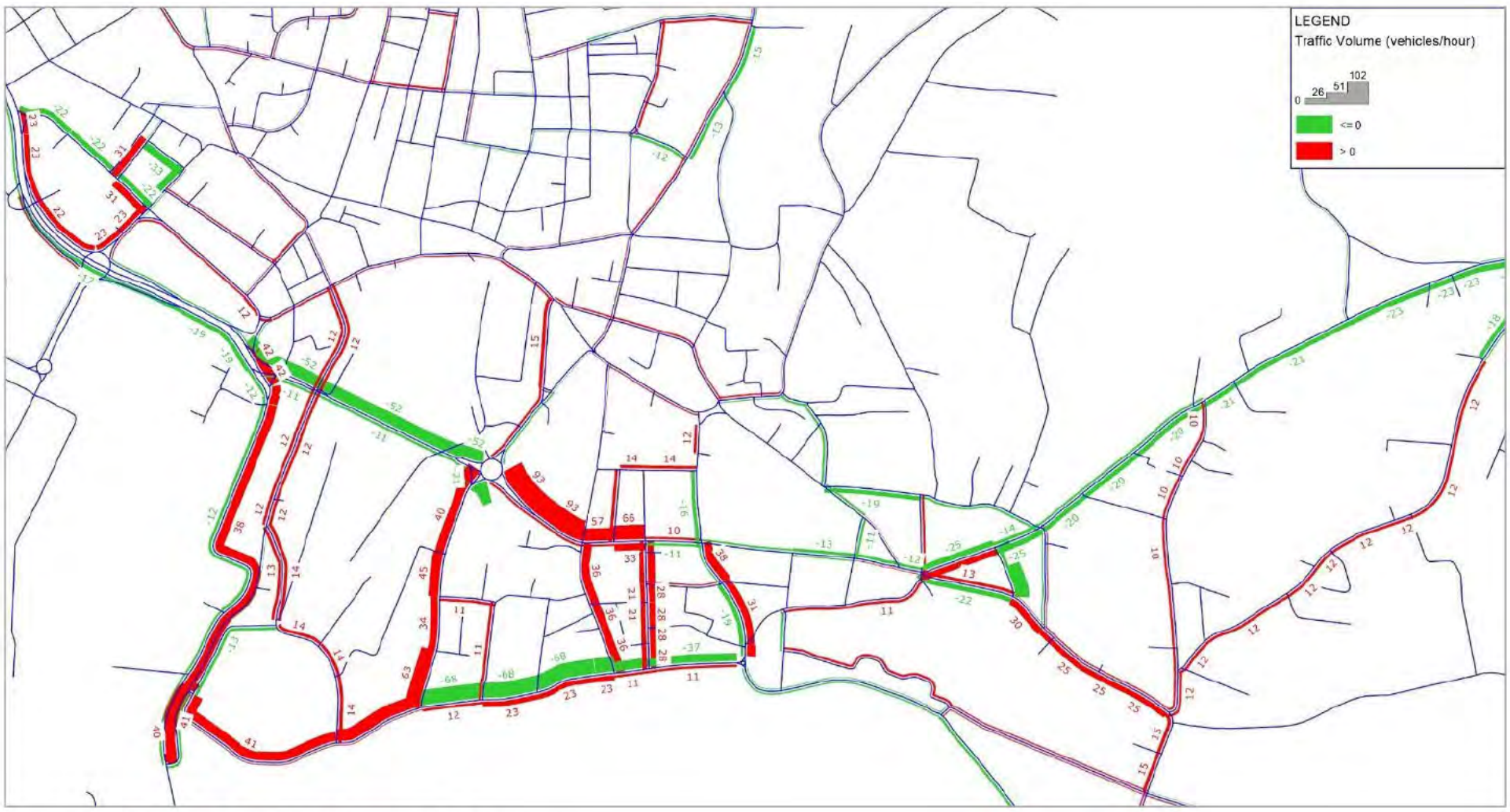


Figure 48 – Option C - DM flow difference, PM Peak

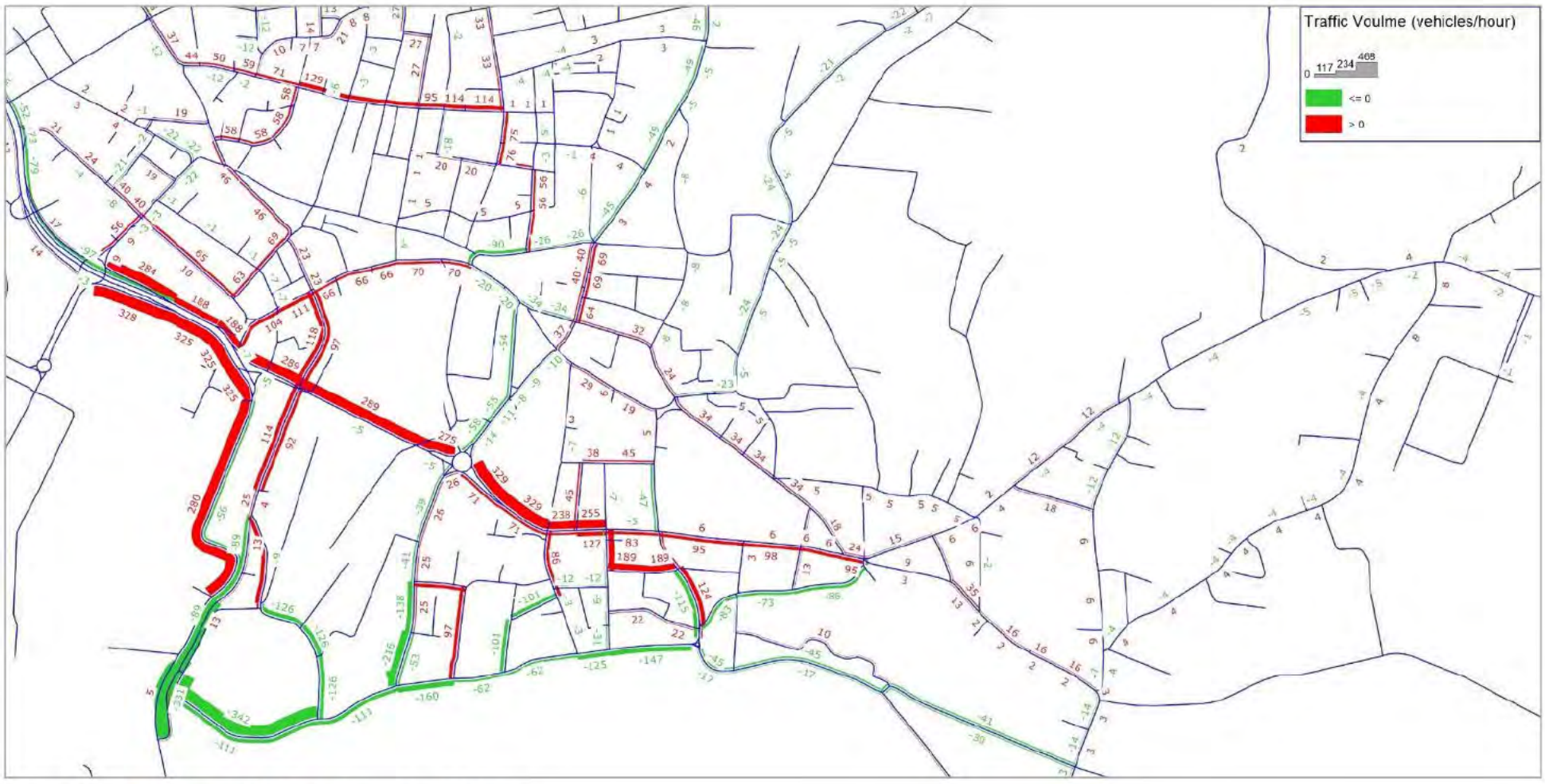


Figure 49 – Option D - DM flow difference, AM Peak

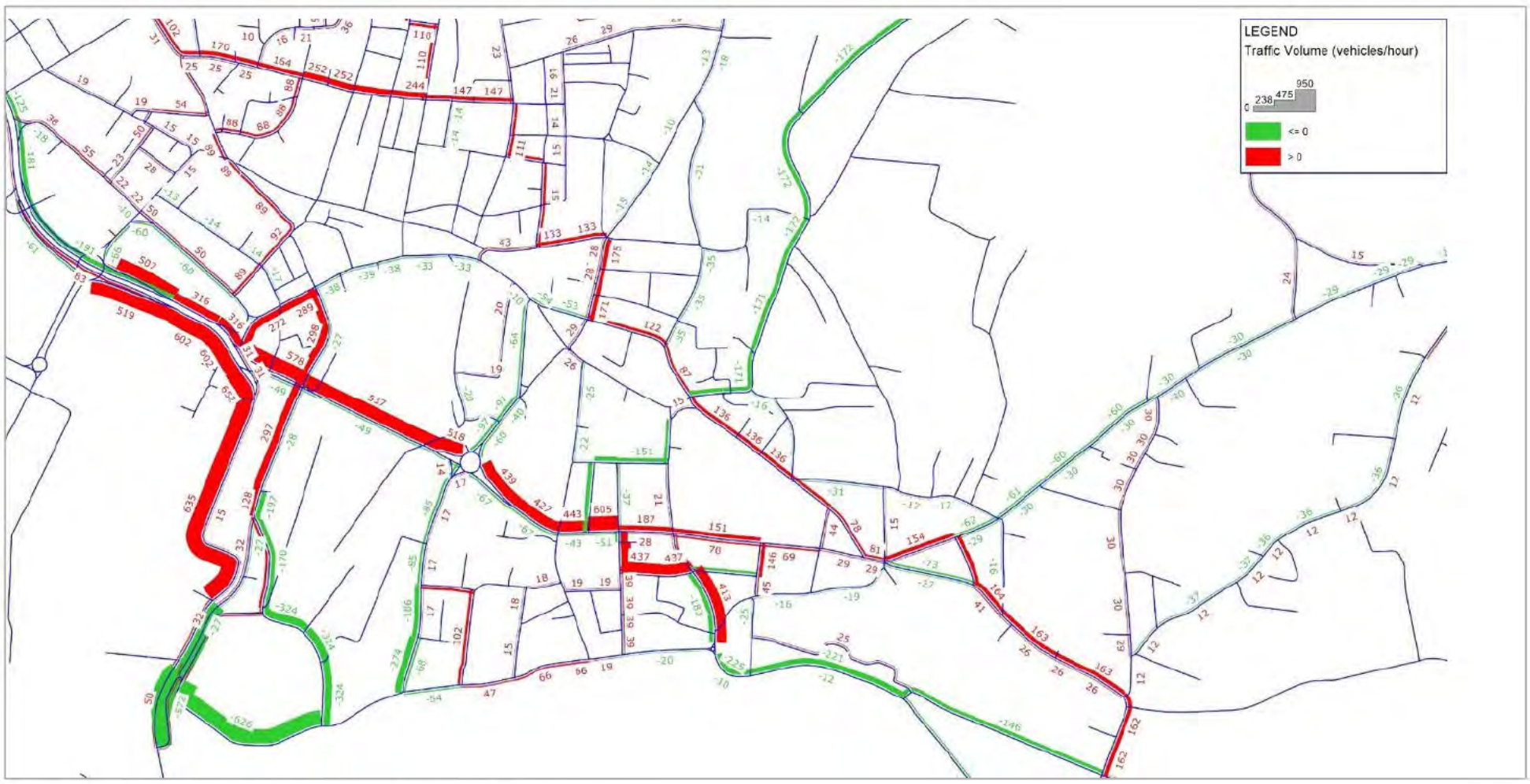


Figure 50 – Option D - DM flow difference, PM Peak

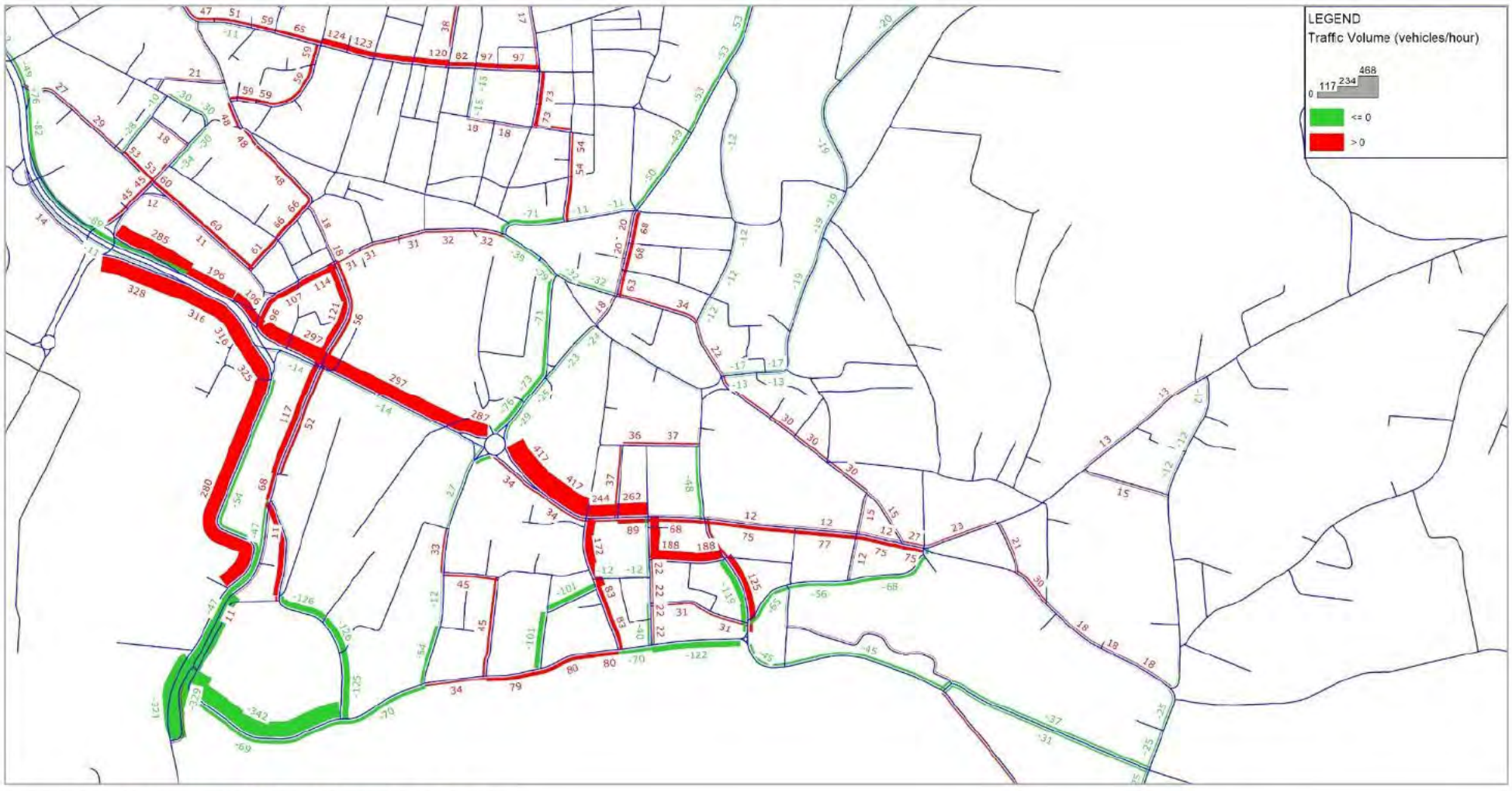


Figure 51 – Option E - DM flow difference, AM Peak

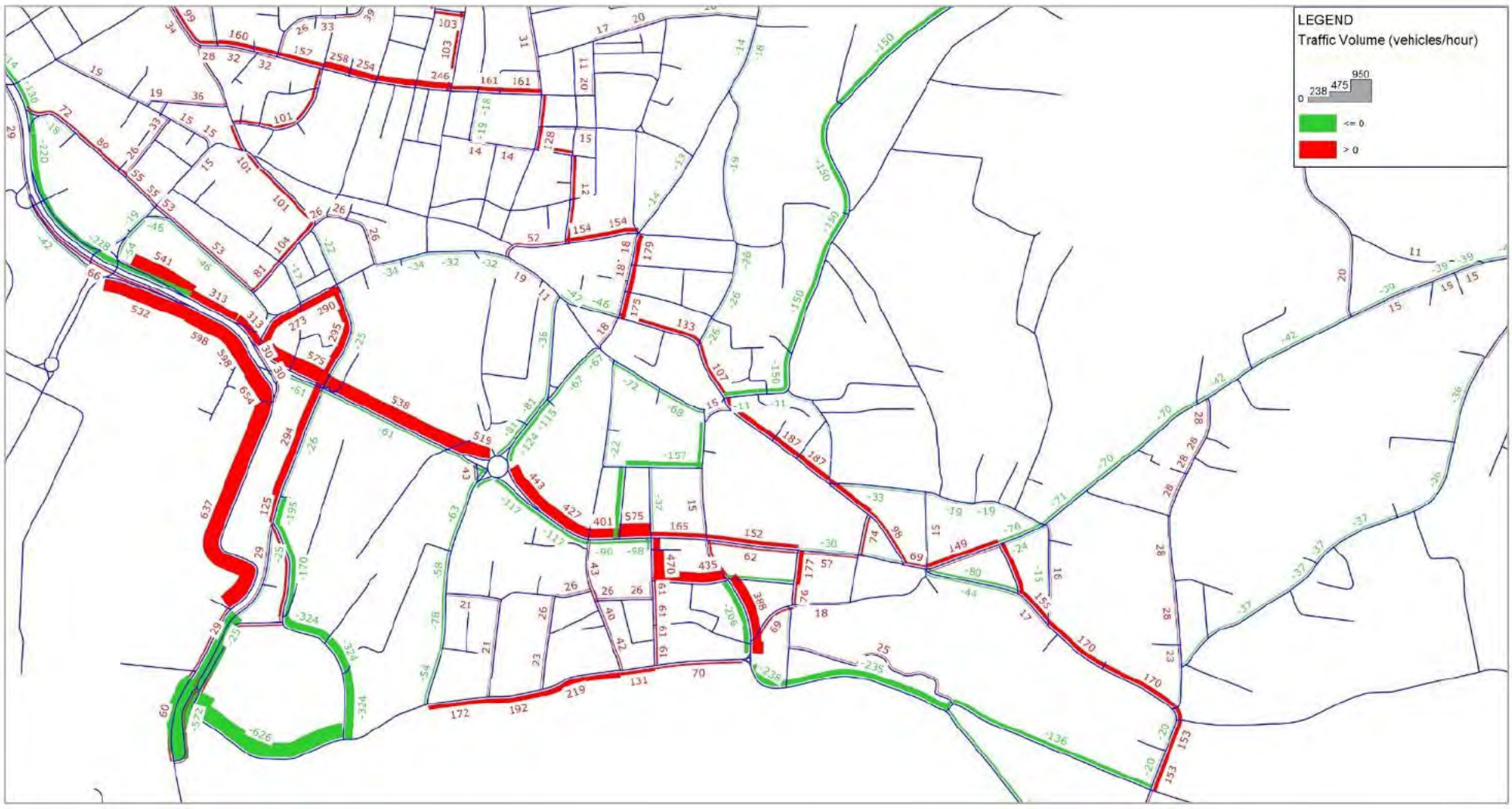


Figure 52 – Option E - DM flow difference, PM Peak

Figure 53 – Option F - DM flow difference, AM Peak

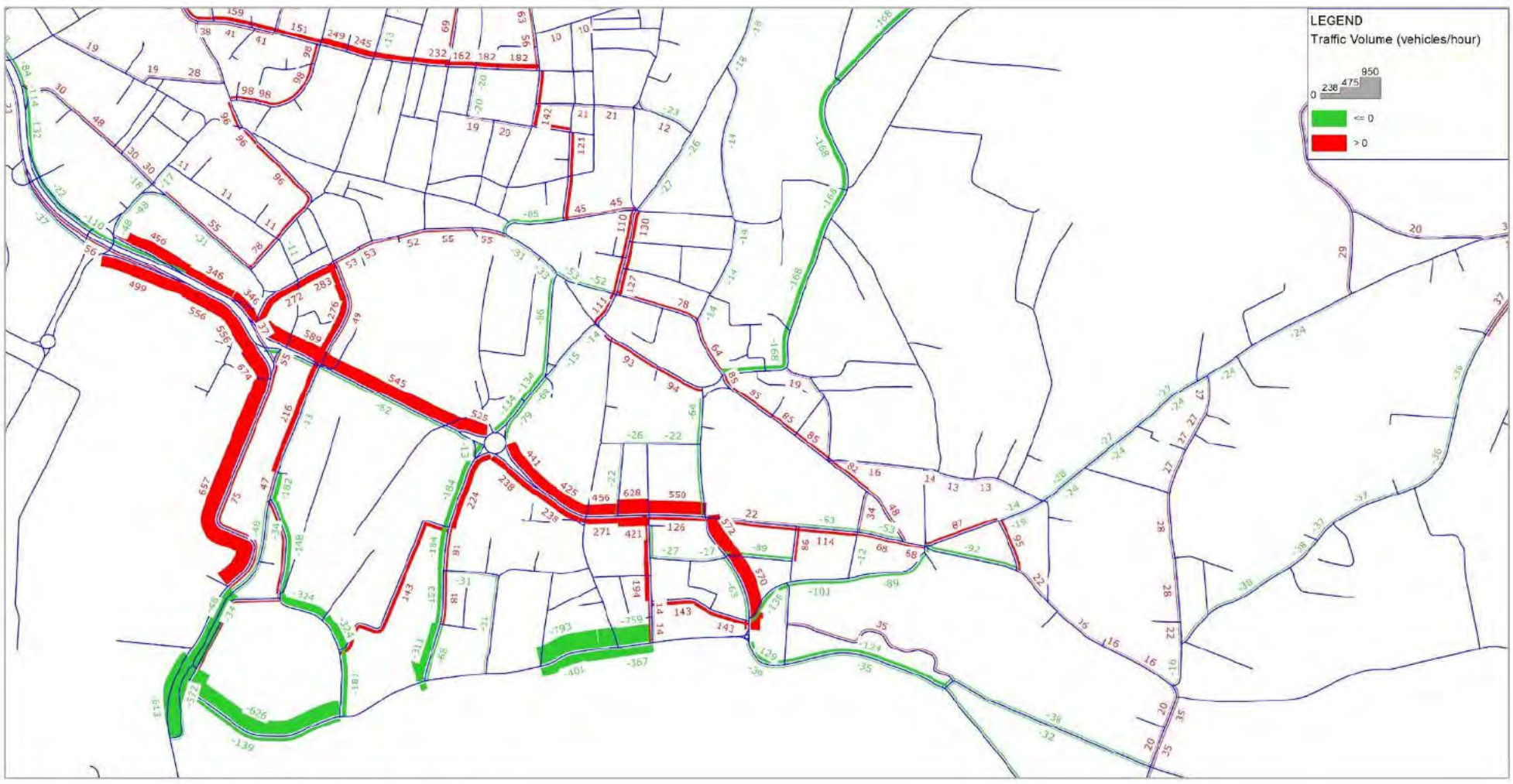


Figure 54 – Option F - DM flow difference, PM Peak

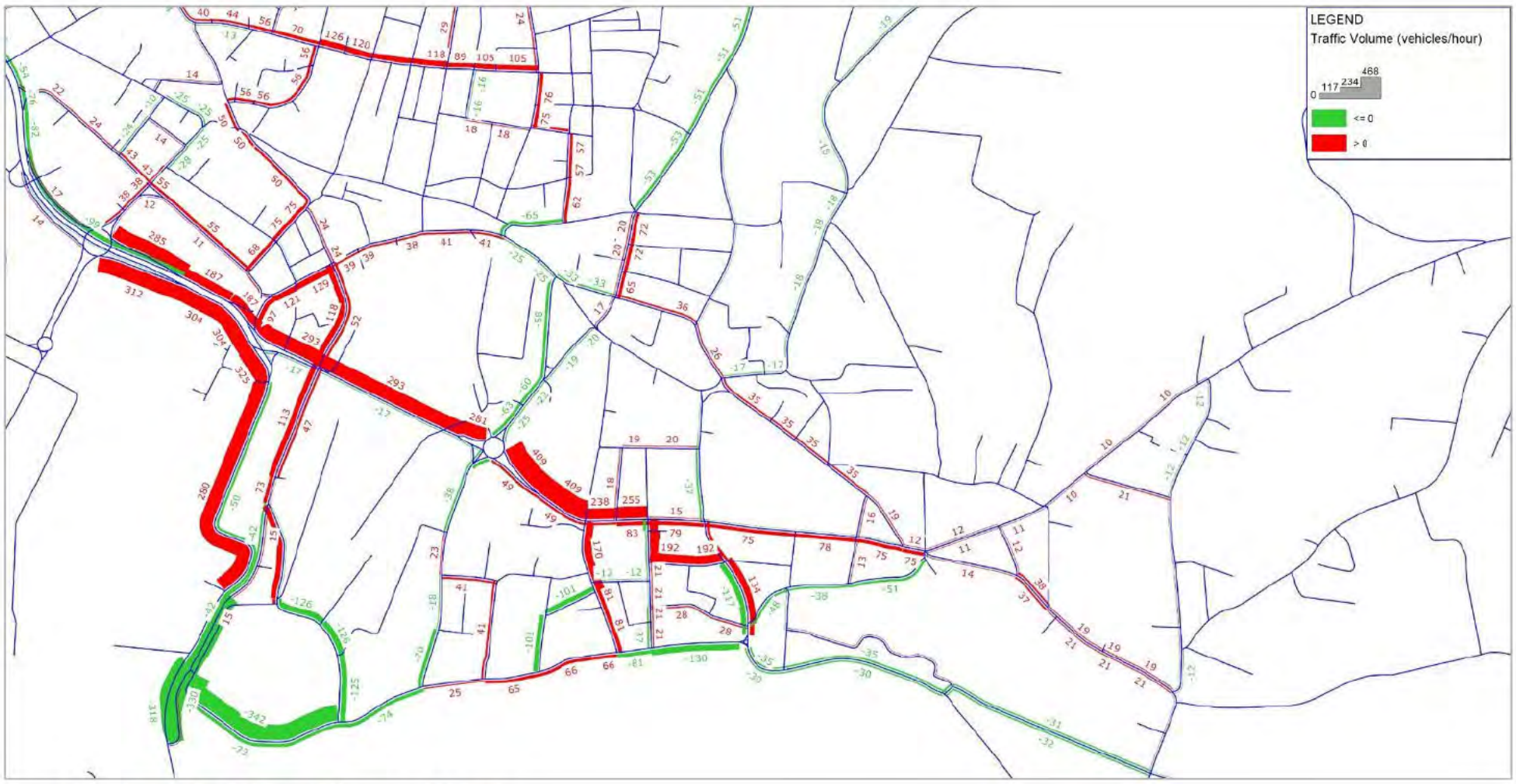


Figure 55 – Option G - DM flow difference, AM Peak

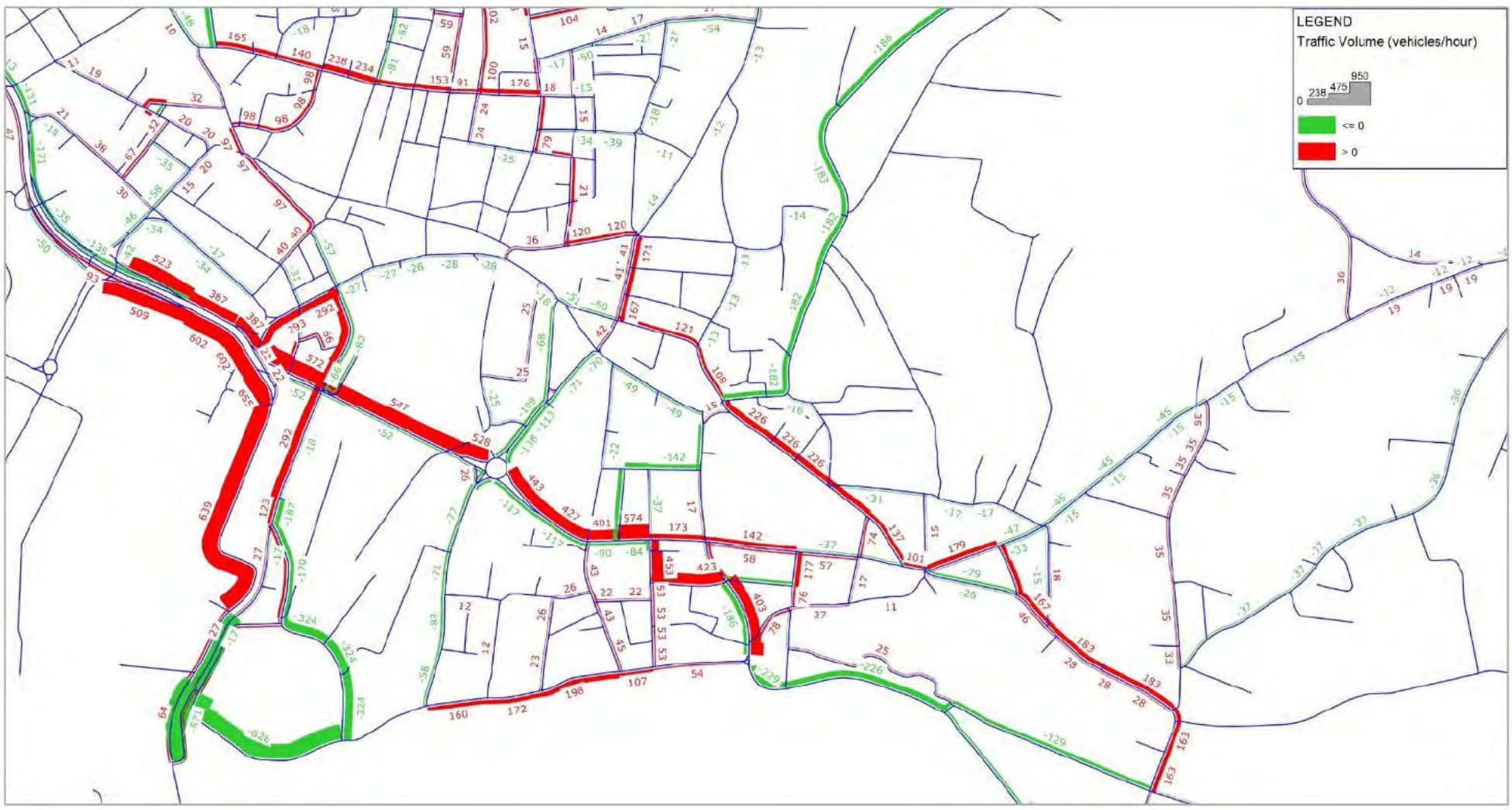


Figure 56 – Option G - DM flow difference, PM Peak

Journey Time Analysis

4.2.8. Journey time comparisons between the Do Minimum and scheme options have been undertaken to gain an understanding of the travel duration impact of each scheme. The journey time routes that have been used are shown in Figure 57.

4.2.9. Table 13 and Table 14 present the journey time comparison for each option against the Do Minimum model. The key observations are as follows:

Option A: Full closure of Havre des Pas

- With the full closure of Havre des Pas, there is an increase in westbound traffic of on La Route du Fort in the AM peak which resulted in an increase in journey time of approximately 62% between Greve d'Azette and Route du Fort via St Clement Road along Route 8. Route 7 saw an increase in journey time of approximately 59% while routes 9 to 12 which traverse through La Route du Fort saw an increase in the range of 13% to 21%. There are no comparable results for routes 1 to 6 as the routes were closed.
- In the PM peak, journey times have increased along Route du Fort akin to the morning peak. However, the magnitude of changes is larger in the PM peak. Route 7 between Greve d'Azette and Route du Fort in the eastbound direction has the largest increase of approximately 154% due to the tidal flow nature of the study area. Journey time along routes 9, 10 and 11 have increased in the range of 50-90%, and this is logical as vehicles now traverse through Route du Fort Rd with Havre des Pas closure.

Option B: Full closure of Havre des Pas and Green Street

- With the full closure of Havre des Pas and Green St, there is an increase in westbound traffic of on La Route du Fort in the AM peak which resulted in an increase in journey time of approximately 97% between Greve d'Azette and Route du Fort via St Clement Road along Route 8. Route 7 saw an increase in journey time of approximately 89% while routes 9 to 12 which traverse through La Route du Fort saw an increase in the range of 5% to 34%. There are no comparable results for routes 1 to 6 as the routes were closed.
- In the PM peak, journey times have increased along Route du Fort akin to the morning peak. However, the magnitude of changes is larger in the PM peak. Route 7 between Greve d'Azette and Route du Fort in the eastbound direction has the largest increase of approximately 144% due to the tidal flow nature of the study area. Journey time along routes 9, 10 and 11 have increased in the range of 50-90%, and this is logical as vehicles now traverse through Route du Fort Rd with Havre des Pas closure.

Option C: One way only on Green St Northbound

- The Green St southbound closure has a marginal impact on journey times in both AM and PM peaks. Journey time along Route 1 has the largest increase of approximately 2% in the AM peak and the PM peak; Route 8 has the largest increase of approximately 8%.

Option D: One way only on Havre des Pas Westbound

- With Havre des Pas eastbound closure, there is an increase in traffic on La Route du Fort as vehicles now use A6 northbound and join Route du Fort Road eastbound traffic via A1/La Rte du Port Elizabeth roundabout because of which the journey times along route 7 have increased significantly, with an increase of approximately 205% in the PM peak due to more eastbound traffic and 63% in the AM peak. Journey time across routes that traverse through Route du Fort Rd, i.e., routes 9 to 11 have increased due to the increase in traffic.

Option E: Option B + Option C

- With Option E which is a combination of Options C and D, the impacts are similar to Option D with journey time increase on Route du Fort across all peaks. Route 7 in the AM and PM peaks has the largest increase of approximately 61% and 205% respectively.

Option F: HGV ban on Havre des Pas + Option A

- With Option F, the impacts are similar to that of Option A. The PM peak has larger increase in journey time of approximately 156% on route 7 and an increase of approximately 57% in the AM peak.

Option G: HGV ban on Havre des Pas + Option E

- With Option G, the impacts are similar to that of Option E. Due to the tidal nature of the study area; the PM peak has larger increase in journey time of approximately 160% with Havre des Pas eastbound closure on route 7 and an increase of approximately 68% in the AM peak.

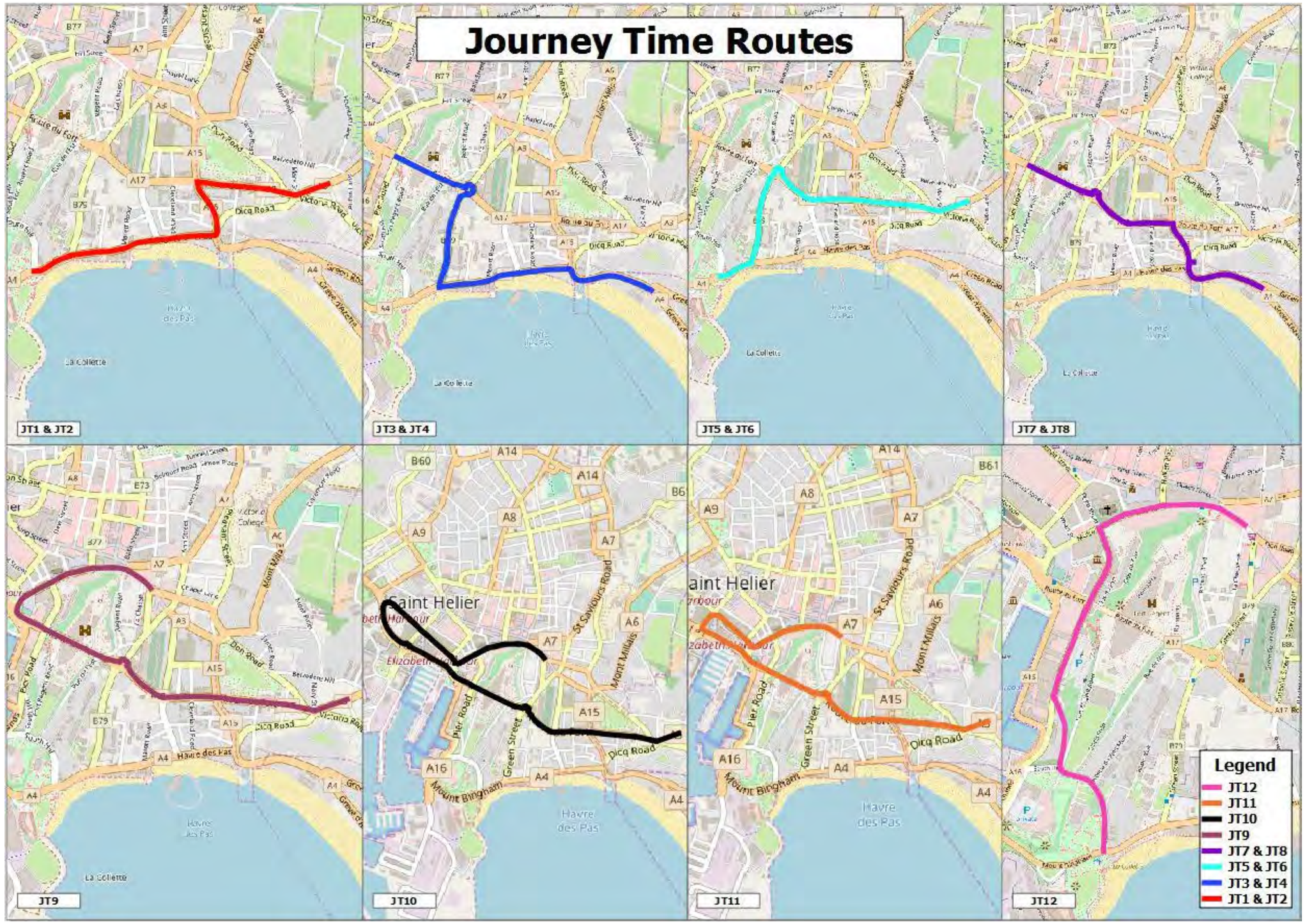


Figure 57 – Journey time routes

JT Route	DM	Option A		Option B		Option C		Option D		Option E		Option F		Option G	
Route 1	00:04:09	-	-	-	-	00:04:13	2%	-	-	-	-	-	-	-	-
Route 2	00:03:05	-	-	-	-	00:03:06	0%	00:03:26	11%	00:03:21	8%	-	-	00:03:20	8%
Route 3	00:03:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Route 4	00:03:26	-	-	-	-	00:03:29	1%	00:03:35	4%	00:03:33	3%	-	-	00:03:28	1%
Route 5	00:03:27	-	-	-	-	00:03:28	1%	-	-	-	-	-	-	-	-
Route 6	00:03:31	-	-	-	-	-	-	00:03:17	-7%	-	-	-	-	-	-
Route 7	00:02:26	00:03:53	59%	00:04:37	89%	00:02:27	0%	00:03:59	63%	00:03:56	61%	00:03:47	55%	00:03:32	45%
Route 8	00:03:56	00:06:23	62%	00:07:45	97%	00:03:59	1%	00:03:47	-4%	00:03:46	-4%	00:06:12	57%	00:03:49	-3%
Route 9	00:04:12	00:05:06	21%	00:05:39	34%	00:04:10	-1%	00:05:20	27%	00:05:17	25%	00:05:03	20%	00:04:48	14%
Route 10	00:07:05	00:08:01	13%	00:08:34	21%	00:07:00	-1%	00:08:17	17%	00:08:16	17%	00:08:02	13%	00:07:53	11%
Route 11	00:06:00	00:06:56	15%	00:07:30	25%	00:05:55	-1%	00:07:13	20%	00:07:12	20%	00:06:57	16%	00:06:48	13%
Route 12	00:02:09	00:02:16	5%	00:02:15	5%	00:02:09	0%	00:02:09	0%	00:02:09	0%	00:02:16	5%	00:02:09	0%

Table 13 – AM peak journey time differences

JT Route	DM	Option A		Option B		Option C		Option D		Option E		Option F		Option G	
Route 1	00:03:54	-	-	-	-	00:03:46	-3%	-	-	-	-	-	-	-	-
Route 2	00:03:23	-	-	-	-	00:03:20	-2%	00:03:38	7%	00:03:33	5%	-	-	00:03:35	6%
Route 3	00:03:09	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Route 4	00:03:09	-	-	-	-	00:03:10	1%	00:03:08	0%	00:03:05	-2%	-	-	00:03:04	-2%
Route 5	00:03:29	-	-	-	-	00:03:30	0%	-	-	-	-	-	-	-	-
Route 6	00:03:57	-	-	-	-	-	-	00:03:34	-10%	-	-	-	-	-	-
Route 7	00:02:37	00:06:39	154%	00:06:23	144%	00:02:50	8%	00:07:57	205%	00:07:58	205%	00:06:41	156%	00:06:48	160%
Route 8	00:03:18	00:03:59	21%	00:04:15	29%	00:03:11	-4%	00:03:44	13%	00:03:34	8%	00:03:36	9%	00:03:33	8%
Route 9	00:04:14	00:08:00	89%	00:07:56	88%	00:04:12	-1%	00:08:40	105%	00:08:43	106%	00:08:11	94%	00:07:37	80%
Route 10	00:06:54	00:10:39	54%	00:10:32	53%	00:06:56	1%	00:11:17	63%	00:11:20	64%	00:10:52	57%	00:10:17	49%
Route 11	00:05:55	00:09:42	64%	00:09:35	62%	00:05:58	1%	00:10:19	74%	00:10:24	75%	00:09:55	67%	00:09:18	57%
Route 12	00:02:18	00:02:16	-1%	00:02:16	-2%	00:02:19	0%	00:02:13	-4%	00:02:13	-4%	00:02:17	-1%	00:02:14	-4%

Table 14 – PM peak journey time differences

4.3 SENSITIVITY TEST

4.3.1. Following the option testing detailed above, it is clear that all options will have a negative impact on the level of congestion within the study area, leading to significant delays and increased journey times and either significant increases in highway capacity or reductions in the number of vehicles is required to achieve a situation whereby delays and journey times are no worse overall with the options.

4.3.2. It is not considered viable or part of this study to consider the potential infrastructure required to achieve a nil detriment, therefore a sensitivity test scenario has been developed to determine the level of reduction in vehicles required to achieve a nil detriment impact from Option G; One-way only on Green St Northbound and Havre des Pas Westbound along with a HGV ban on both roads.

4.3.3. To assess the levels required the model was analysed to determine all those trips through the study area with a trip distance of less than 8 km, reflecting a distance considered to be possible via cycle (and also by bus) with reductions of these vehicles by 10, 25 and 100 percent.

4.3.4. This sensitivity test was called Option H, reflecting an increase in sustainable travel through Havre des Pas with a reduction in short distance trips (<8 km) by 10%, 25% and 100% for Option G.

4.3.5. Table 15 and Table 16 present the overall model network statistics, outlining the impact of network performance by comparing overall vehicle-hours travelled, vehicle-kilometres travelled and average delay per vehicle on the modelled option networks for the AM and PM peak hours. The key observations are as follows:

- In the AM peak, in order to achieve nil detriment, whereby delay and travel time are no greater than the Do Minimum it can be seen a reduction in the short distance through the study area would need to be in the order of 10 - 25%, equating to over 550 vehicles.
- In the PM peak, in order to achieve nil detriment, whereby delay and travel time are no greater than the Do Minimum it can be seen a reduction in the short distance through the study area would need to over 25%, equating to over 600 vehicles.

Table 15 – AM Peak Sensitivity Test Results

AM Peak	DM	Option H (10% reduction)		Option H (25% reduction)		Option H (100% reduction)	
Total Delay (hrs)	395	417	5.6%	379	-4.1%	286	-27.6%
Total Distance (km)	37,104	36,276	-2.2%	35,204	-5.1%	28,840	-22.3%
Total Travel Time (hrs)	1,554	1,553	-0.1%	1,483	-4.5%	1,209	-22.2%
Avg Delay per Veh (min)	1.38	1.48	7.5%	1.37	-0.7%	1.16	-15.5%

Table 16 – PM Peak Sensitivity Test Results

PM Peak	DM	Option H (10% reduction)		Option H (25% reduction)		Option H (100% reduction)	
Total Delay (hrs)	298	401	34.5%	304	2.0%	226	-24.3%
Total Distance (km)	36,741	36,475	-0.7%	35,369	-3.7%	28,492	-22.5%
Total Travel Time (hrs)	1,437	1,527	6.3%	1,391	-3.2%	1,115	-22.4%
Avg Delay per Veh (min)	1.10	1.50	36.4%	1.16	5.7%	0.98	-10.8%
Total Vehicles	16,271	16,045	-1.4%	15,703	-3.5%	13,799	-15.2%

4.3.6. As a result of the sensitivity test, it can be seen that significant (>25% / >600 vehicles) reductions would be required to mitigate the overall adverse traffic impact the one-way closure of Havre des Pas and Green Street would have on the study area and the wider St Helier. This level of trip reduction would require an exceptional change in personal travel patterns. It should also be noted that it assumes any transference to alternative modes would have no additional impact on traffic congestion.

4.3.7. The infographic below indicates the types of initiatives typically applied to reduce travel demand across the spectrum, from not travelling or minimising the need to travel such as working from home to travelling during less busy times of the day such as before or after the current peak periods; to switching travel mode from the private car to car sharing, buses, cycling and walking, through to changing origin and/or destinations (home or work locations).

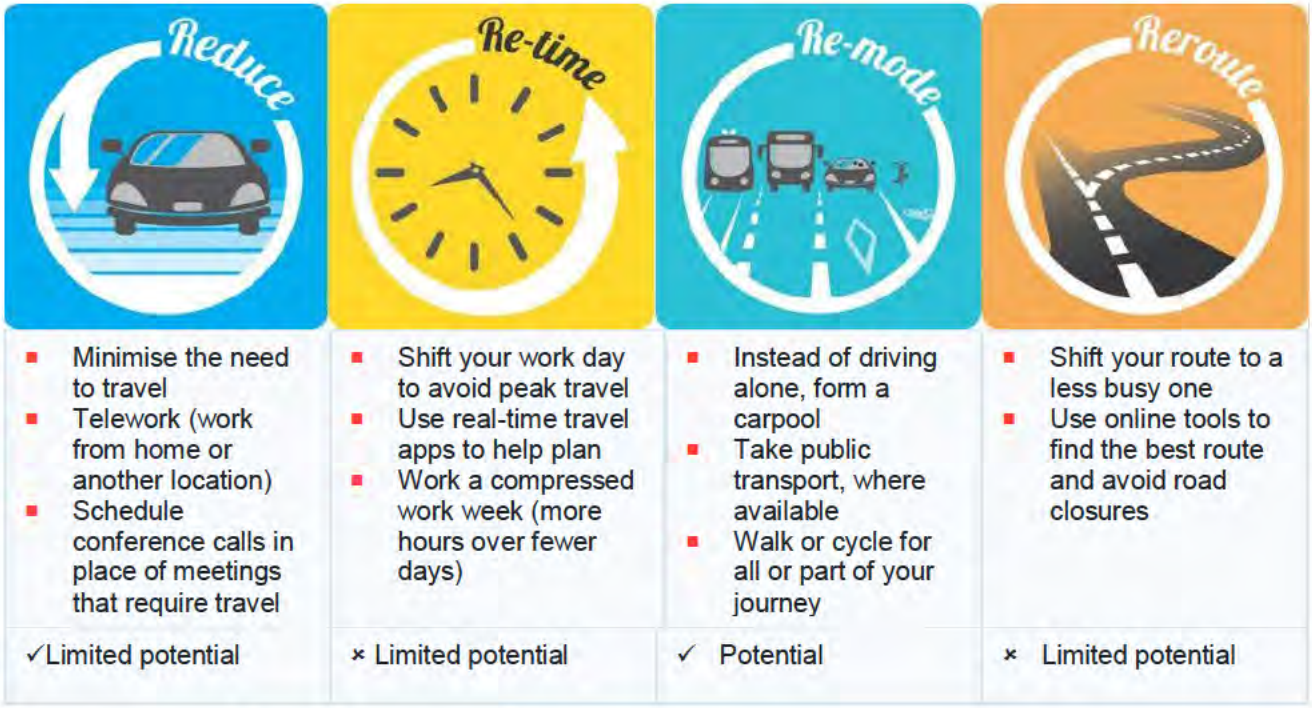


Figure 58 – Travel demand management

4.3.8. While there is a potential for positive changes in individuals travel behaviour, it is recognised that overall Jersey currently has a relatively good modal split, and it is therefore considered that reductions of over 25% in short distance trips through the study area may be difficult to achieve without extensive further high-level support from key champions and other island-wide change initiatives.

4.4 OVERALL SCHEME COMPARISON

4.4.1. Following the options assessment, detailed in the sections above for each option (Option A to Option G), results for network performance (delays, total travel time and total travel distance) have been used to assess overall option performance.

4.4.2. Monetary values in terms of performance have then been calculated for each option using the Cost-Benefit Analysis approach endorsed by the published UK Department of Transport (DfT) Transport Analysis Guidance. This approach applies a cost to the changes in travel in terms of travel time and in terms of total distance travelled.

4.4.3. Travel time costs are evaluated in terms of mode of travel and in terms of trip purpose. For example, it is assumed that business users, who are often working to strict schedules, will have a higher value of time than shoppers who are unlikely to have to arrive at their destination at a set time. For the purpose of this assessment, which models only the AM and PM peak hours it has been assumed that the vast majority of users are commuters, with the values of time given in Table 17.

Table 17 – Values of Time

Parameter	AM Peak	PM Peak	Source
Value of Time / £•hr-1	12.04	12.08	WebTAG databook (May 2018), Table A1.3.6

4.4.4. Distance-based costs are known as vehicles operation costs and are split into two components. The first component represents the costs of travel linked to the consumption of fuel, and are therefore calculated from information such as the expected price of petrol, expected changes in fuel efficiency and the expected split between petrol, diesel and electric cars. The second component represents the costs of travel not linked to fuel, such as the cost of replacing tires and servicing the vehicle.

4.4.5. Fuel based operating costs are calculated using the following formula:

$$L = (a + bv + cv^2 + dv^3)v^{-1}$$

Where:

L	=	Fuel costs, in pence per km
v	=	Average speed, in km per hour
a,b,c,d	=	Parameters defined for each vehicle

4.4.6. Table 18 shows the parameters used in this analysis. In the absence of information regarding the split of petrol, diesel and electric cars on the island it was deemed that parameters for the average car were most applicable for this high-level assessment. Values of time used for travel time costs represent commuters, however, exclude UK VAT which is not applicable to Jersey.

Table 18 –Vehicle operating costs – Fuel costs

a	b	c	d	Source
69.28275	4.60871	-0.02943	0.00031	WebTAG databook (May 2018), Table A1.3.12

4.4.7. Non-fuel based costs are determined via the following formula:

$$C = a_1 + \frac{b_1}{v}$$

Where

C	=	Non-Fuel costs, in pence per km
a_1	=	Parameter for distance based costs
b_1	=	Parameter for vehicle capital savings
v	=	Average speed, in km per hour

4.4.8. Table 19 shows the parameters used in this analysis. The capital depreciation costs only apply to vehicles that are an asset as part of a business. As the travel time costs were for commuters and not for business purposes, this parameter has been assumed to be zero.

Table 19 – Vehicle operating costs – Non-fuel costs

Distance based cost parameter	Vehicle capital saving parameter	Source
3.842	0.000	WebTAG databook (May 2018), Table A1.3.15

4.4.9. All options were assessed using the above parameters for both the AM and PM peak hours only. By comparing these costs against the costs in the Do Minimum scenario, it was possible to determine the (dis)benefits that would result from each option. These benefits were then annualised to represent all of the AM and PM peak hours in a given year. These costs were then extrapolated over the standard 60-year appraisal period and then discounted back to give the present value of benefits (PVB) for each option.

4.4.10. Table 20 shows the results of this assessment.

Table 20 – Summation of economic costs and benefits – Do Minimum; Option A - G

Scenario	DM	Option A	Option B	Option C	Option D	Option E	Option F	Option G
AM Peak								
Total Distance / km	98,370	98,879	98,999	98,445	98,585	98,648	98,242	98,028
Total Travel Time / hr	3,494	3,644	3,707	3,500	3,550	3,552	3,619	3,532
Average Speed / $kmhr^{-1}$	28.15	27.13	26.71	28.13	27.77	27.78	27.15	27.76
VoT Costs / £	£42,068.42	£43,876.72	£44,626.23	£42,136.92	£42,737.90	£42,758.17	£43,564.42	£42,518.34
VoC (Fuel) / £	£6,379.96	£6,517.01	£6,570.35	£6,387.22	£6,431.70	£6,435.35	£6,473.10	£6,396.81
VoC (Non-Fuel) / £	£3,779.46	£3,799.02	£3,803.63	£3,782.35	£3,787.71	£3,790.13	£3,774.56	£3,766.32
Total Costs / £	£52,227.84	£54,192.75	£55,000.21	£52,306.50	£52,957.30	£52,983.66	£53,812.07	£52,681.47
Benefits vs DM / £		**-£1,964.91**	**-£2,772.36**	**-£78.65**	**-£729.46**	**-£755.81**	**-£1,584.23**	**-£453.63**
PM Peak								
Total Distance / km	96,831	97,414	97,641	96,901	97,555	97,620	97,369	97,375
Total Travel Time / hr	3,117	3,305	3,344	3,112	3,289	3,291	3,287	3,264
Average Speed / kmhr-1	31.06	29.47	29.20	31.13	29.66	29.66	29.62	29.83
VoT Costs / £	£37,661.43	£39,926.83	£40,402.76	£37,599.31	£39,730.23	£39,757.45	£39,714.35	£39,435.40
VoC (Fuel) / £	£6,025.51	£6,195.34	£6,234.82	£6,023.99	£6,187.64	£6,191.82	£6,179.77	£6,161.72
VoC (Non-Fuel) / £	£3,720.33	£3,742.74	£3,751.46	£3,723.01	£3,748.15	£3,750.65	£3,741.01	£3,741.23
Total Costs / £	£47,407.28	£49,864.91	£50,389.05	£47,346.31	£49,666.02	£49,699.92	£49,635.12	£49,338.35
Benefits vs DM / £		**-£2,457.63**	**-£2,981.77**	**£60.97**	**-£2,258.75**	**-£2,292.65**	**-£2,227.85**	**-£1,931.07**
Benefits								
AM + PM Benefit / £		-£4,422.54	-£5,754.13	-£17.69	-£2,988.21	-£3,048.46	-£3,812.08	-£2,384.70
Annualised Benefits / £M		-£2.149 M	-£2.797 M	-£0.009 M	-£1.452 M	-£1.482 M	-£1.853 M	-£1.159 M
60-Year PVB / £M		**-£33.000 M**	**-£42.936 M**	**-£0.132 M**	**-£22.297 M**	**-£22.747 M**	**-£28.445 M**	**-£17.794 M**

4.4.11. As part of the sensitivity test described in Section 4.3, Option G was reassessed with the following parameters and named Option H:

- Two separate tests, with 10% and 25% of trips through the study area with travel distances less than 8km removed from the model.
- Trips were replaced with bicycle trips to represent a mode transfer away from the private car, assuming an average length of 5km and an average speed of 20kmh^{-1}. The same values of time were used as before, but vehicle operating costs were reduced to zero.

4.4.12. Table 21 shows the results of these sensitivity tests.

Table 21 – Sensitivity test results

Scenario	Option G	Option H (10%)		Option H (25%)	
AM Peak		Cars	Cycles	Cars	Cycles
Total Distance / km	98,028	97,180	1,576	95,894	3,132
Total Travel Time / hr	3,532	3,466	78.824	3,391	156.62025
Average Speed / kmhr^{-1}	27.76	28.04	20.00	28.28	20.00
Total Vehicles	20,496	20,289	315	19,978	626
VoT Costs / £	£42,518.34	£41,726.31	£948.98	£40,825.03	£1,885.58
VoC (Fuel) / £	£6,396.81	£6,313.69		£6,207.31	
VoC Non-Fuel / £	£3,766.32	£3,733.73		£3,684.35	
Total Costs / £	£52,681.47	£51,773.74	£948.98	£50,716.69	£1,885.58
Benefits vs DM / £	**-£453.63**		**-£494.87**		**-£374.43**
PM Peak					
Total Distance / km	97,375	96,465	1179.64	95,101	2798.255
Total Travel Time / hr	3,264	3,194	58.982	3,073	139.91275
Average Speed / kmhr-1	29.83	30.20	20.00	30.95	20.00
Total Vehicles	19,472	19,256	236	18,932	560
VoT Costs / £	£39,435.40	£38,589.29	£712.55	£37,119.83	£1,690.25
VoC (Fuel) / £	£6,161.72	£6,072.88		£5,926.45	
VoC Non-Fuel / £	£3,741.23	£3,706.29		£3,653.86	
Total Costs / £	£49,338.35	£48,368.46	£712.55	£46,700.14	£1,690.25
Benefits vs DM / £	**-£1,931.07**		**-£1,673.73**		**-£983.11**
Benefits					
AM + PM Benefit / £	**-£2,384.70**		**-£2,168.60**		**-£1,357.54**
Annualised Benefits / £M	-£1.159 M		-£1.054 M		-£0.660 M
60-Year PVB / £M	**-£17.794 M**		**-£16.181 M**		**-£10.130 M**

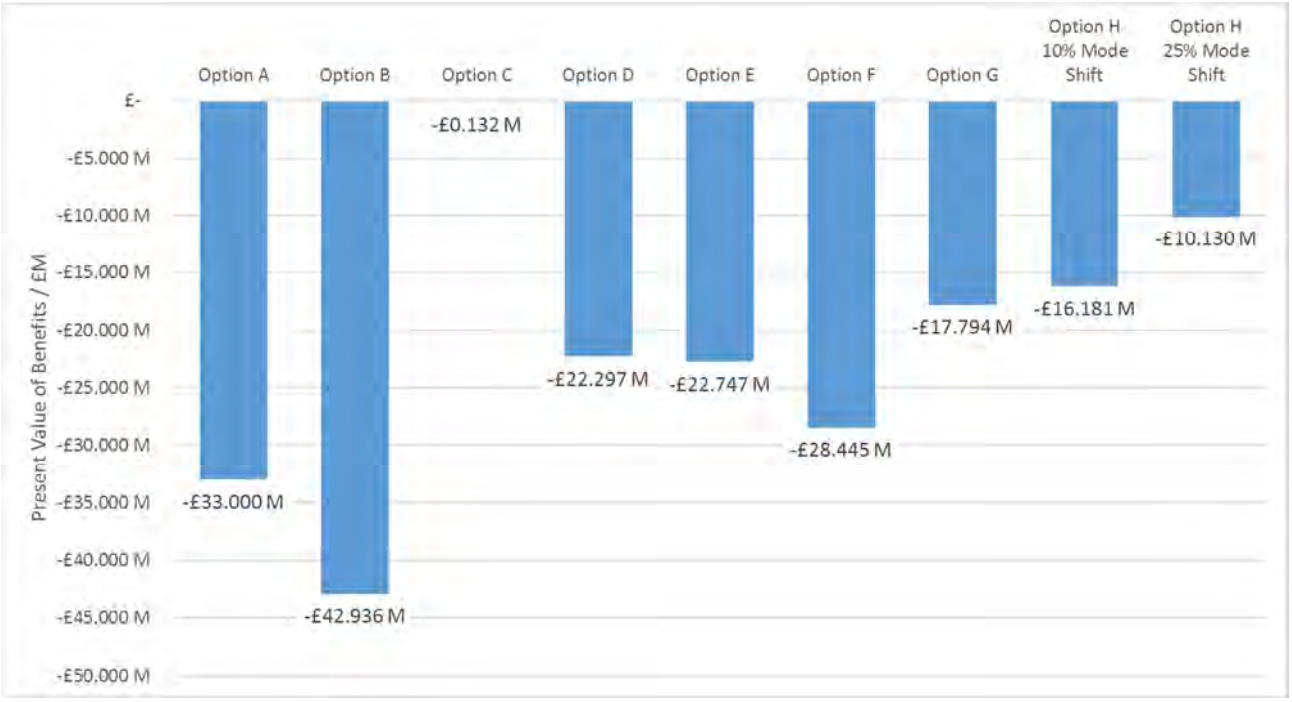


Figure 59 – Comparison of economic benefits for all proposed options

4.4.13. Figure 59 shows that as the scope of the proposed intervention increases, the bigger the potential detriment regarding economic benefits. Option A and Option B show that a full closure of Havre des Pas has the biggest detriment in terms of benefits whereas Option C (one-way closure of Green Street) has the smallest detriment.

4.4.14. Closing Havre des Pas in one direction only produces similar results: when this is broken down into individual peaks, it can be shown that a westbound closure has the biggest impact in the AM Peak whereas an eastbound closure has the biggest impact in the PM Peak.

4.4.15. Removing HGV's through Havre des Pas mitigates some of the impacts of closing Havre des Pas, as shown in options F and G. The sensitivity tests also show that if a significant level of modal shift can be achieved, these disbenefits can be reduced to below £10M over the sixty-year appraisal period.

CAVEATS AND LIMITATIONS

4.4.16. The economic analysis is constrained by several limitations of the strategic Jersey traffic model.

- The model only has an AM peak hour (0800-0900) and a PM peak hour (1700-1800). Therefore, only two hours out of a possible 24 are included in the economic analysis, and no allowance has been made for weekends and holidays or seasonality and impacts from tourism. The impact of only modelling the peak hours would be to underestimate any disbenefits related to road closures, as they would have a detrimental impact to a network that may not necessarily be congested.
- The model does not disaggregate by trip purpose, such as commuting, business trips and discretionary trips. Each of these trips have different values of time, and it can be supposed that each trip purpose would be impacted by each option differently. Given that the values of time between trip purposes can vary by factors of three or more this could have a significant bearing on the outcome of the analysis.
- For the sensitivity tests, a more thorough active mode and mode shift appraisal could have been undertaken, using a variable demand model to capture those switching to public transport, those switching to walking and those choosing to work from home. This could result in more benefits being unlocked by reducing the demand on the network.

4.5 SUMMARY

4.5.1. Following the option testing and appraisal using the strategic Jersey traffic model, as detailed above, it is clear that all options (Option A-G) are likely to have a negative impact on levels of congestion, leading to significant delays and increased journey times through the study area and wider St Helier. While vehicles seek alternative routes where possible or form more extensive queues on existing routes where no viable alternative route exists. The predominant movement is to town (westbound) in the AM peak period and from town (eastbound) in the PM peak period.

4.5.2. Following the assessment of Options A-G, a sensitivity test on Option G was undertaken to assess the level of transference away from the private car and to either more sustainable modes of transport, such as walking, cycling, and bus or to represent those choosing not to travel at peak times. The sensitivity tests looked at a range of responses by reducing short distance trips (<8 km) through the study area by 10%, 25% and 100%.

4.5.3. The sustainable travel sensitivity test made the key observations that during the AM peak, in order to achieve nil detriment, whereby delay and travel time are no greater than the Do Minimum, a reduction in trips, those <8 km, through the study area would need to be almost 25%, equating to over 550 vehicles either not travelling during the peak period or travelling by alternative modes. While during the PM peak the level of reduction required would be over 25%, equating to over 600 vehicles.

4.5.4. The modelling assessment indicates that full closure of Havre des Pas (Option A and Option B) is likely to result in significant congestion and queuing, with the least worst option being Option C, Option H and Option G in terms of congestion, these include proposals for some or all of these measures: Havre des Pas one-way westbound, Green St one-way northbound, Havre des Pas area HGV restriction on through traffic to remove them from travelling through the area.

Table 22 - Option Ranking

Rank	Option
1	Option C – One way only on Green St Northbound
2	Option H – Option G with 25% reduction in short distance through trips
3	Option H – Option G with 10% reduction in short distance through trips
4	Option G – HGV ban on Havre des Pas/Green St + Option E (one-way on Havre des Pas and Green St)
5	Option D – One way only on Havre des Pas Westbound
6	Option E – Option C + Option D
7	Option F – HGV ban on Havre des Pas/Green St + Option A (Full closure)
8	Option A – Full closure of Havre des Pas between Green St and St Clements except for access
9	Option B – Full closure of Havre des Pas between Green St and St Clements except for access and Green Street between La Route du Fort and Havre des Pas

5 CONCLUSIONS AND FURTHER WORK

5.1.1. This report presents a baseline of existing transport data for the Havre des Pas study area and detailed results of traffic modelling undertaken to assess the potential impacts of proposed improvement options upon both the study area and the wider St Helier area.

5.1.2. The background data review has indicated that the principal road links through Havre de Pas are the east-west routes of La Route du Fort and Havre de Pas. While key north-south routes are Green St and St Clements, and also by Roseville St and Cleveland Rd. All roads in the study area are currently subject to a 30mph speed limit.

5.1.3. The data has also shown that the area is served well in regard to public transport, with bus usage high especially from stops on Green St and Havre des Pas. The bus route 1 is the main service for the study area; serving Green St and Havre des Pas with approximately four buses per hour. While La Route du Fort is served by the bus route 1A and also route 2 and route 16.

5.1.4. The traffic survey data has clearly shown that the main routes through the study area, namely La Route du Fort and Havre des Pas experience significant congestion and delay and are at capacity heading to town (westbound) in the AM peak period and from town (eastbound) in the PM peak period. The data also shows that La Route du Fort is operating close to or at capacity throughout much of the day and therefore unable to accommodate much additional traffic. While congestion on Havre des Pas is largely confined to the AM and PM peak periods.

5.1.5. Following the background data review and assessment the short-listed options for the study area, as listed below, were tested in the strategic Jersey transport model. The model uses the PTV VISUM modelling software, version 17, and enables testing and comparisons of each option for a direct comparison.

- Do Minimum – Base Model + 20 mph scheme on Green St, Havre des Pas, St Clements and local roads in the Havre des Pas area
- Option A – Full closure of Havre des Pas between Green St and St Clements except for access
- Option B – Full closure of Havre des Pas between Green St and St Clements except for access and Green Street between La Route du Fort and Havre des Pas
- Option C – One way only on Green St Northbound
- Option D – One way only on Havre des Pas Westbound
- Option E – Option C + Option D
- Option F – HGV ban on Havre des Pas/Green St + Option A (Full closure)
- Option G – HGV ban on Havre des Pas/Green St + Option E (one-way on Havre des Pas and Green St)

5.1.6. The results of the option assessments indicated that all options would have a negative impact on levels of traffic congestion, leading to significant delays and increased journey times through the study area, with an increase of over 200%. Proposals to introduce closures or restrictions on the existing network, which is shown to experience significant peak time congestion and delay, all have a negative traffic impact due to lack of available highway capacity and limited opportunities for re-routing.

5.1.7. Table 23 outlines the ranking as a result of the high-level economic assessment of traffic impacts. It indicates that Option C, one-way only on Green St Northbound, and Option G (and Option H), HGV ban on Havre des Pas/Green St & one-way on Havre des Pas Westbound & one-way only on Green St Northbound are likely to cause the least adverse impact. While Option A and Option B, both involving the full closure of Havre des Pas, would see the largest adverse impact in traffic terms with an estimated £43m dis-benefit.

5.1.8. Following the assessment of Options A-G, a sensitivity test (Option H) was undertaken to assess the level of transference away from the private car and to more sustainable modes of transport, such as walking, cycling, and bus, or to represent those choosing not to travel at peak times. The sensitivity test looked at a range of responses by reducing short distance trips (<8 km) through the study area by 10%, 25% and 100%.

5.1.9. The sustainable travel sensitivity test indicated that a large shift in travel behaviour would be required, and would require over 25%, equating to over 600 vehicles in the PM peak hour.

Table 23 - Option Ranking

Rank	Option
1	Option C – One way only on Green St Northbound
2	Option H – Option G with 25% reduction in short distance through trips
3	Option H – Option G with 10% reduction in short distance through trips
4	Option G – HGV ban on Havre des Pas/Green St + Option E (one-way on Havre des Pas and Green St)
5	Option D – One way only on Havre des Pas Westbound
6	Option E – Option C + Option D
7	Option F – HGV ban on Havre des Pas/Green St + Option A (Full closure)
8	Option A – Full closure of Havre des Pas between Green St and St Clements except for access
9	Option B – Full closure of Havre des Pas between Green St and St Clements except for access and Green Street between La Route du Fort and Havre des Pas

5.1.10. In conclusion, all options are likely to have a negative impact on traffic congestion and delay, and therefore have a disbenefit in transport economic terms. The high-level transport economic assessment has assessed the economic impacts in terms of changes to vehicle distance travelled and travel time only for the AM and PM peak hour.

5.1.11. It should be noted that this assessment has made a number of assumptions which have been detailed in each relevant section. The key assumptions are that the strategic Jersey transport model has been used in this assessment and considered a robust tool for high-level assessment. The traffic model includes an AM and PM peak hour model only and as such analysis and economics only take account of the impact during these periods. This assumes that these periods experience the highest levels of congestion. It is therefore suggested that in terms of economic (dis)benefits this could underestimate the level of impact which could be greater.

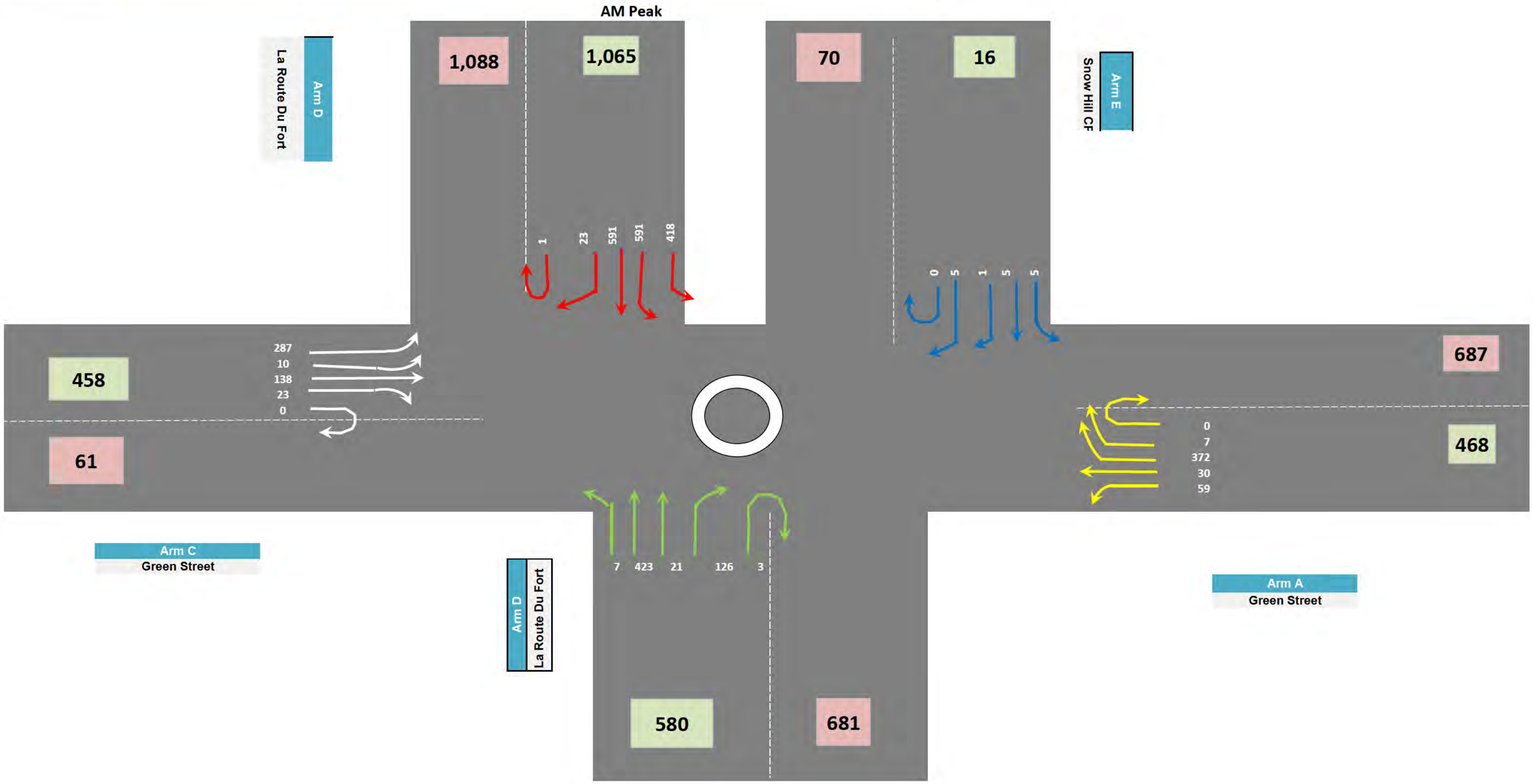
5.1.12. It should also be noted that no account has been taken for safety, wider economic, and social-economic impacts which could introduce some positive benefits to the scheme. It is suggested that this type of assessment could be undertaken as a future piece of work if required.

Appendix A

JUNCTION TURN COUNT SURVEYS

MCC Analysis Template

Project Name	Havre des Pas
Name of the Junction	MCC-001 - Regent Road/ Green Street/ La Route du Fort
Type of Junction	5 Arm roundabout
No. of Arms	5



PM Peak

Arm D

La Route Du Fort

1,030

964

50

81

Arm E

Snow Hill CF

0
42
703
703
199

0
32
0
32
17

117
8
160
59
0

344

97

492

571

0
3
417
39
112

16
464
19
116
3

Arm C

Green Street

Arm D

La Route Du Fort

618

909

Arm A

Green Street

12 HR (0700-1900)

Arm D
La Route Du Fort

11,694
11,744

6
431
8,412
8,412
2,629

605
613

Arm E
Snow Hill CP

0
197
19
235
162

1,481
66
1,423
374
0

3,344
1,017

5,678
5,412

10
114
3,978
418
892

Arm C
Green Street

Arm A
Green Street

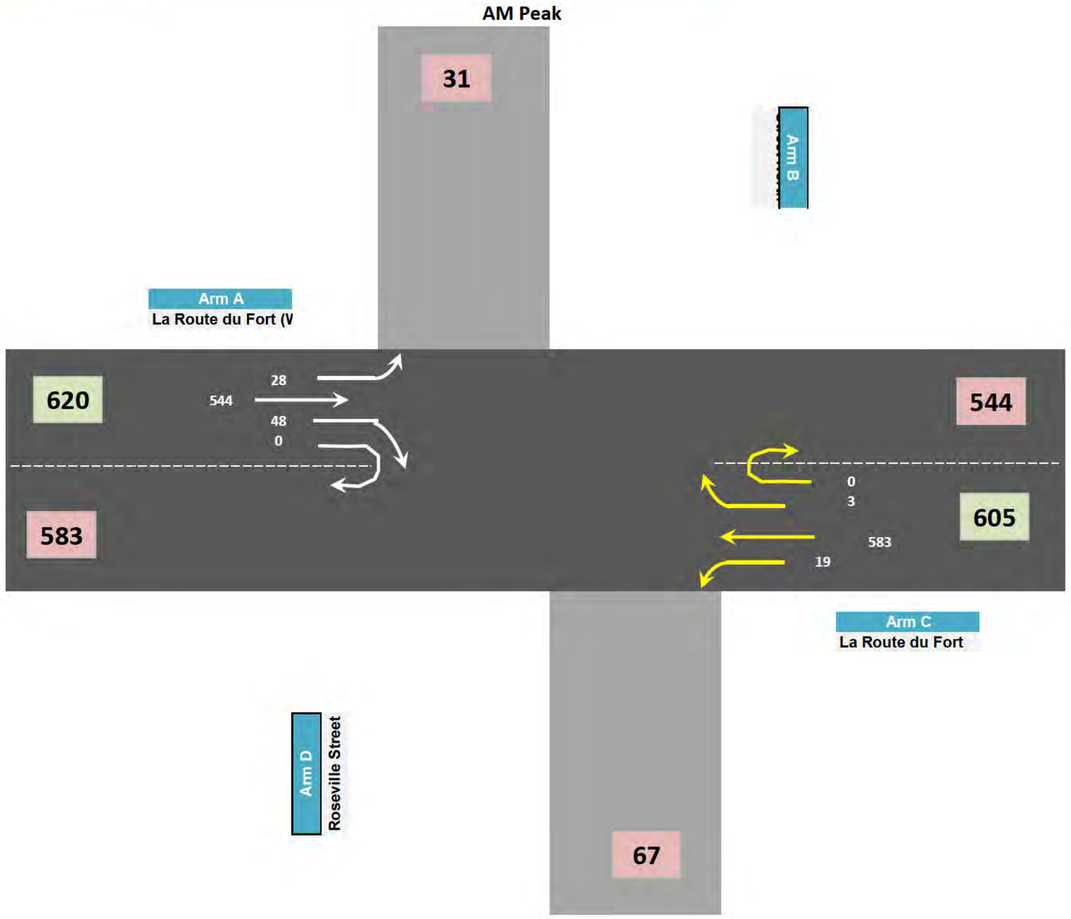
Arm D
La Route Du Fort

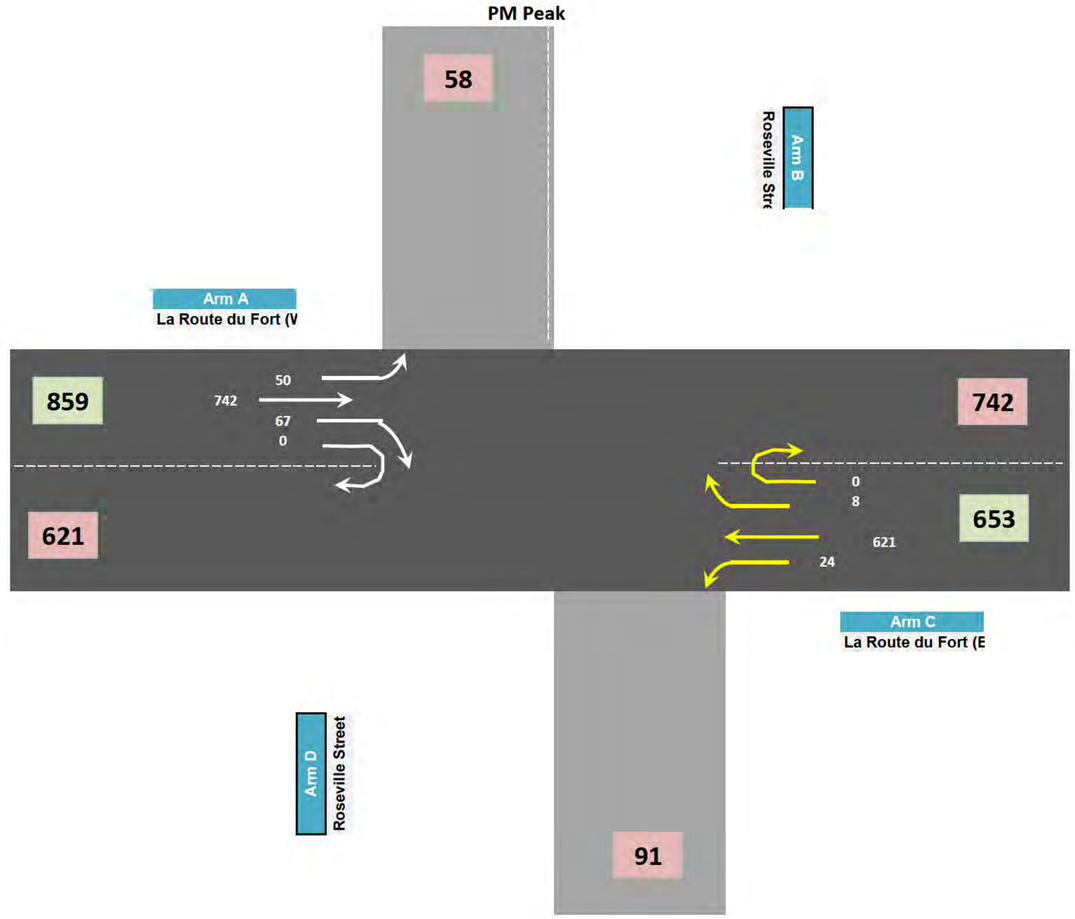
149
6,032
159
1,454
19

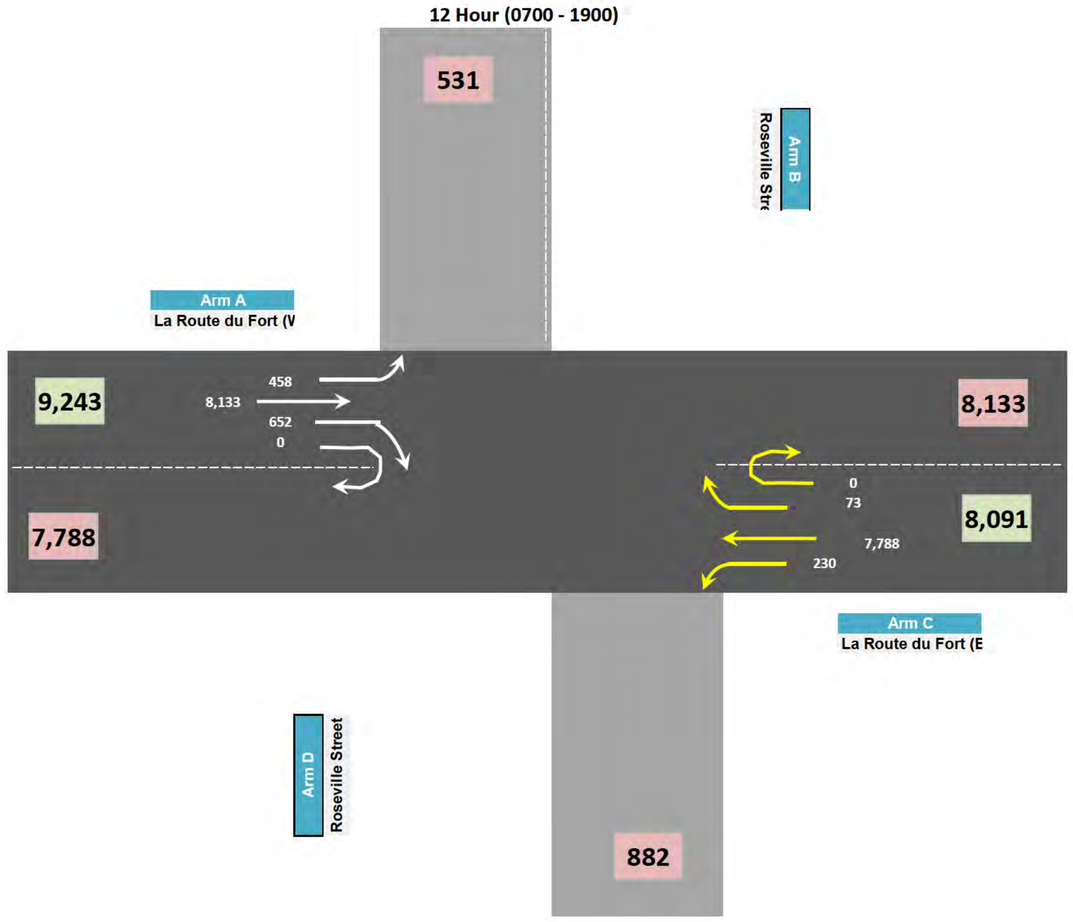
7,813
9,932

MCC Analysis Template

Project Name	Havre des Pas
Name of the Junction	MCC-002 - Roseville Street/ La Route du Fort
Type of Junction	4 Arm crossroads
No. of Arms	4



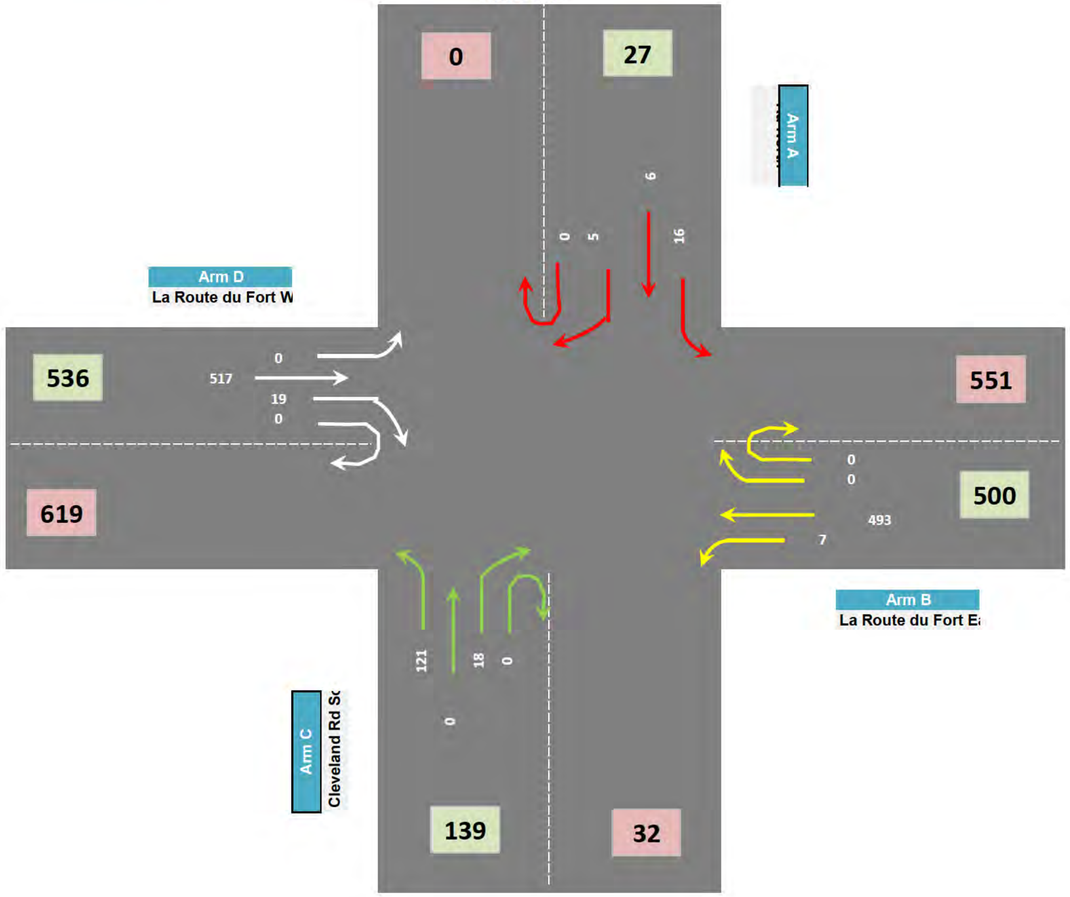



12 Hour (0700 - 1900)
531
Arm B
Roseville Stre
Arm A
La Route du Fort (V
9,243
458
8,133
652
0
8,133
0
73
8,091
7,788
7,788
230
Arm C
La Route du Fort (E
Arm D
Roseville Street
882

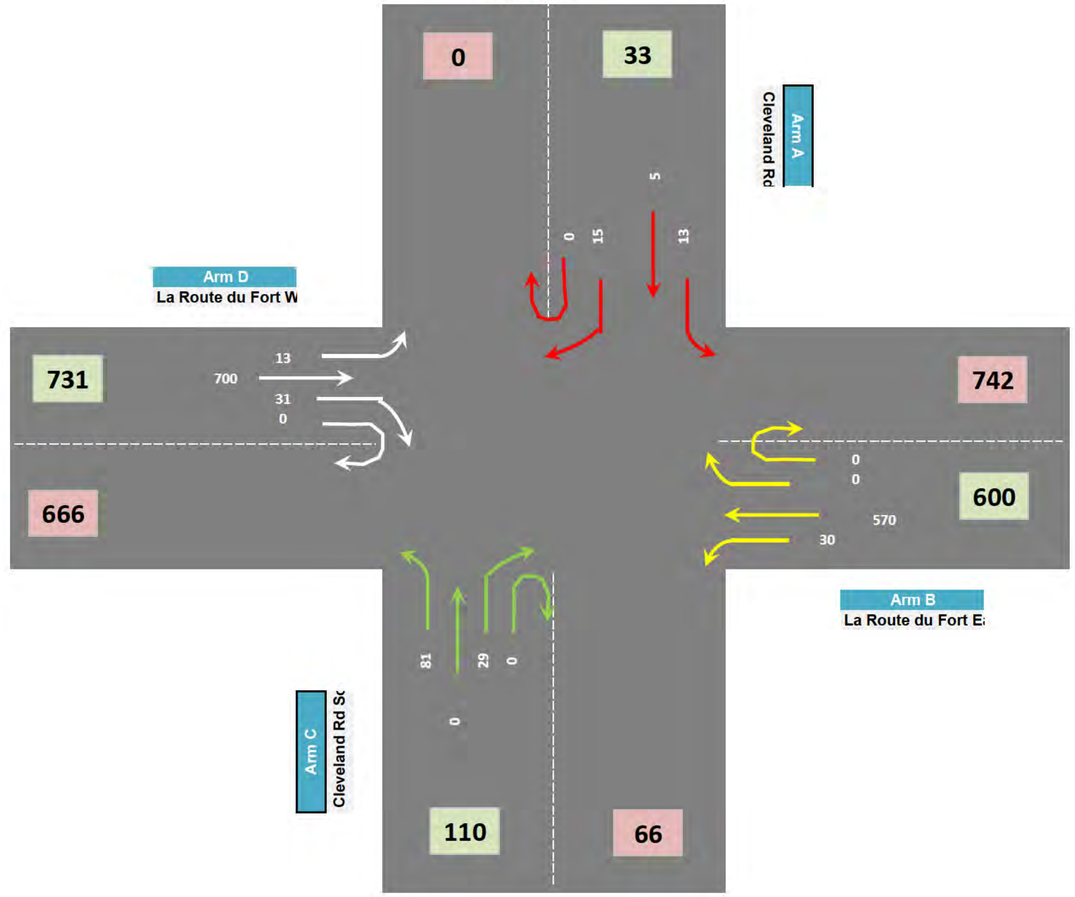
	MCC Analysis Template

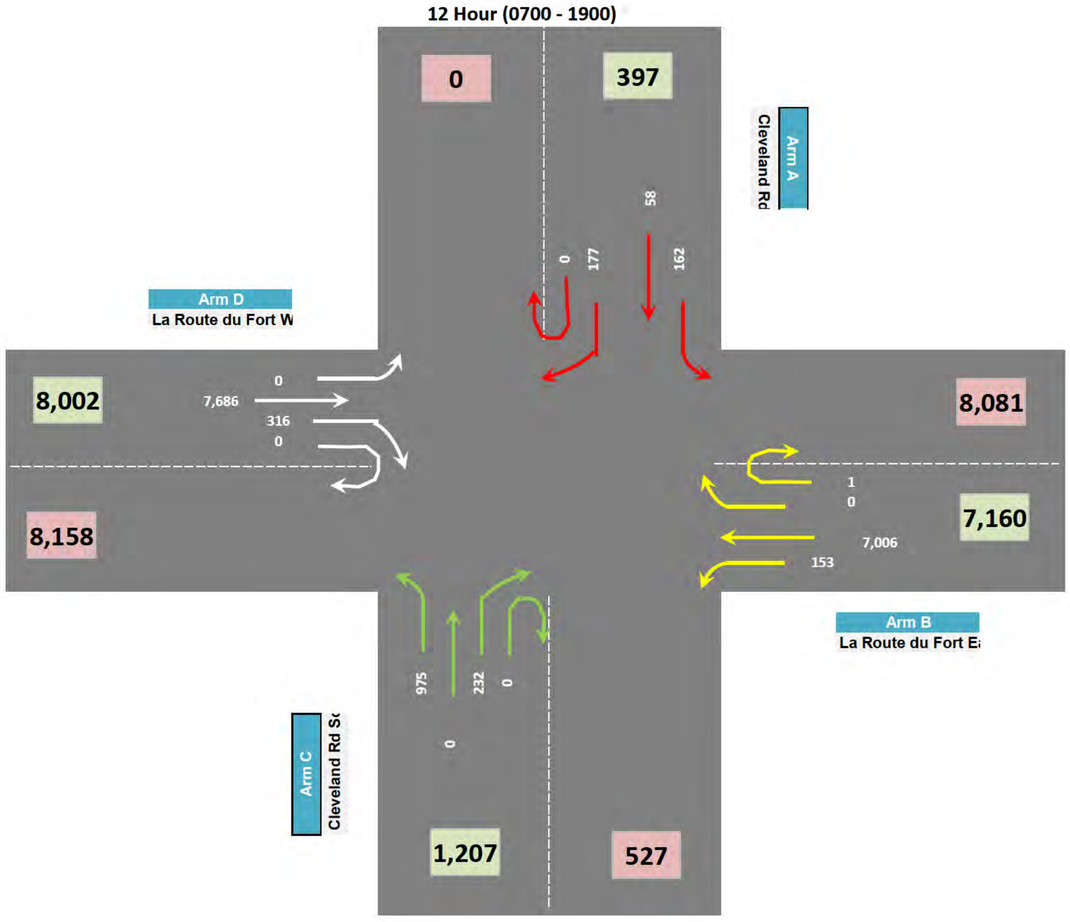
Project Name	Havre des Pas
Name of the Junction	MCC-003 - Cleveland Road/ La Route du Fort
Type of Junction	4 Arm Crossroads
No. of Arms	4

AM Peak



PM Peak

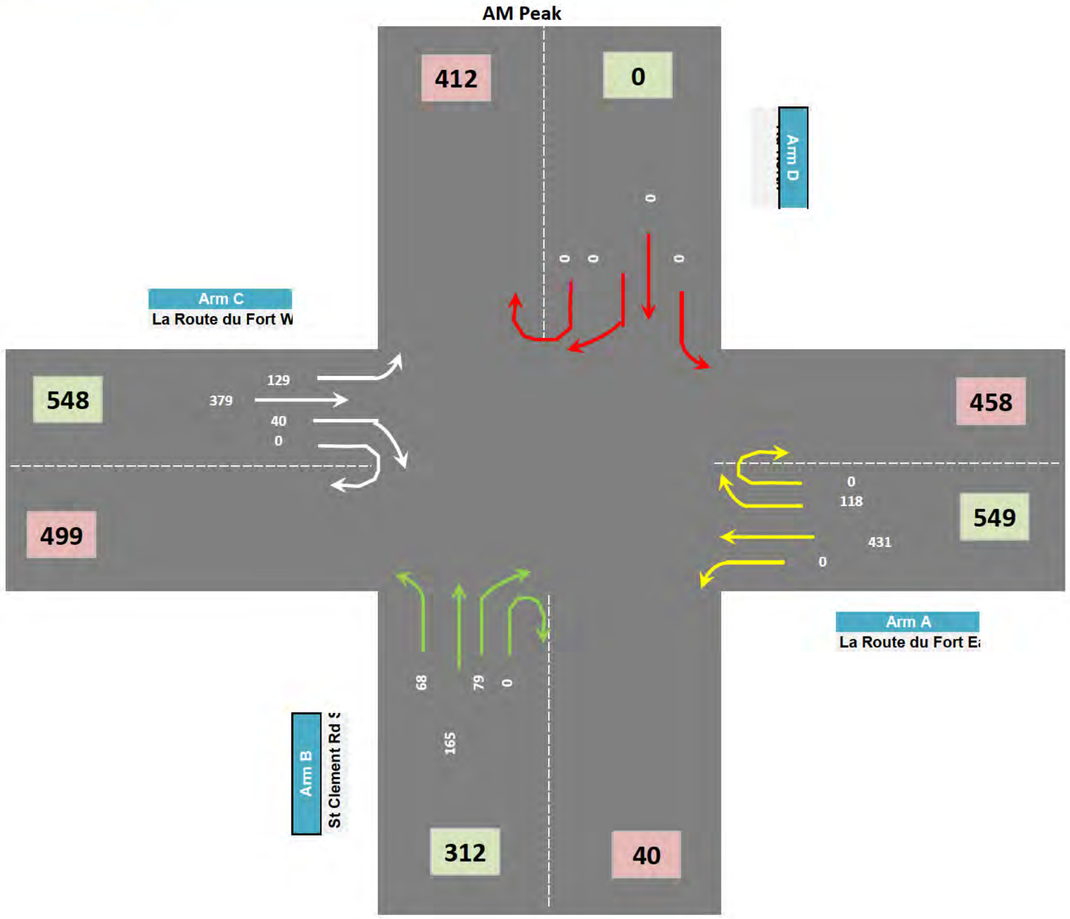



12 Hour (0700 - 1900)
0
397
Arm A
Cleveland Rd
58
0
177
162
Arm D
La Route du Fort W
8,002
0
7,686
316
0
8,081
1
0
7,160
8,158
7,006
153
Arm B
La Route du Fort E
975
232
0
0
Arm C
Cleveland Rd S
1,207
527

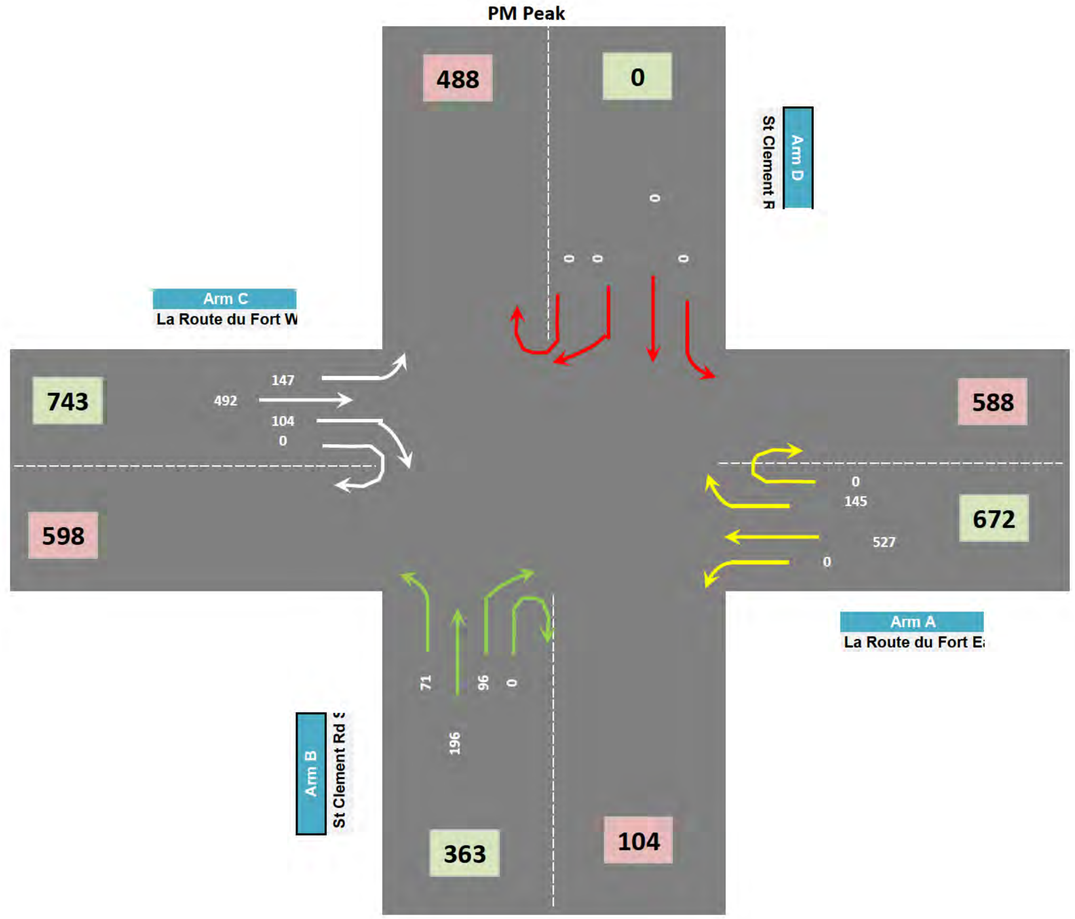
wsp	**MCC Analysis Template**

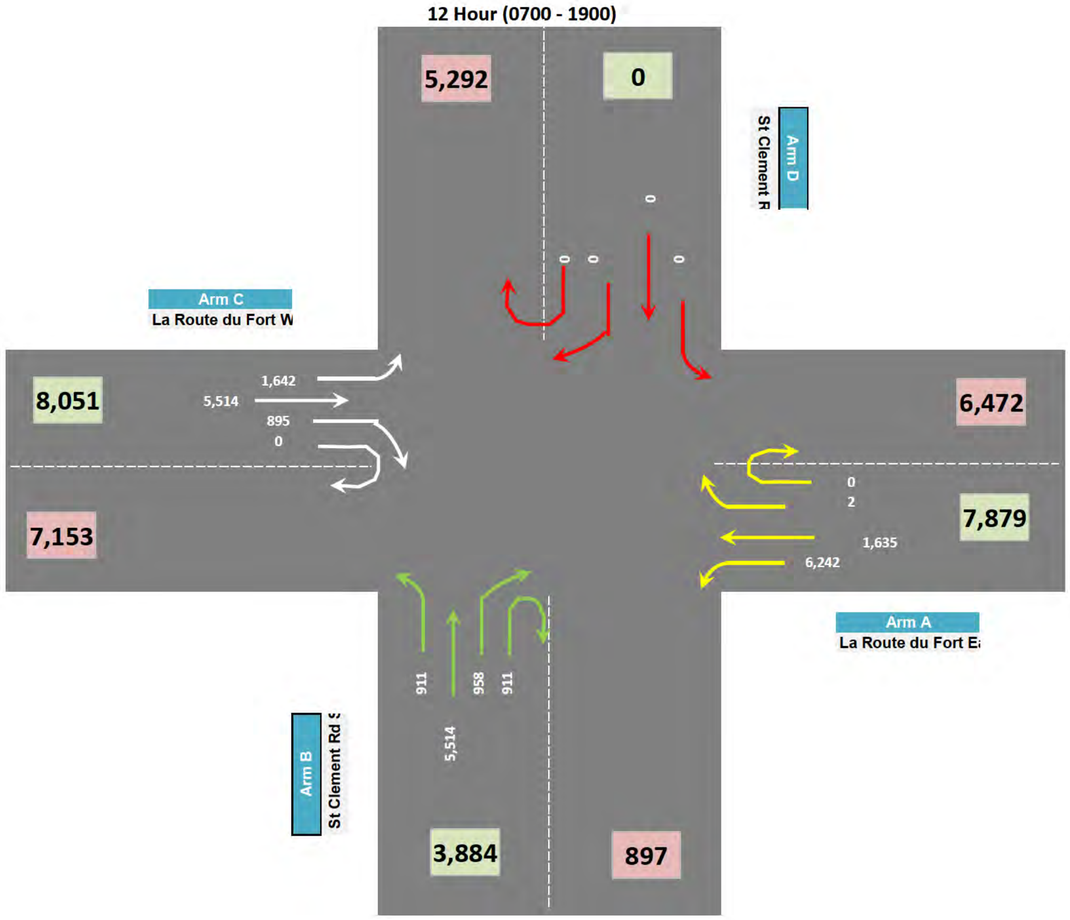
Project Name	Havre des Pas
Name of the Junction	MCC-004 - St Clements Road/ La Route du Fort
Type of Junction	4 Arm Crosssroads
No. of Arms	4

AM Peak



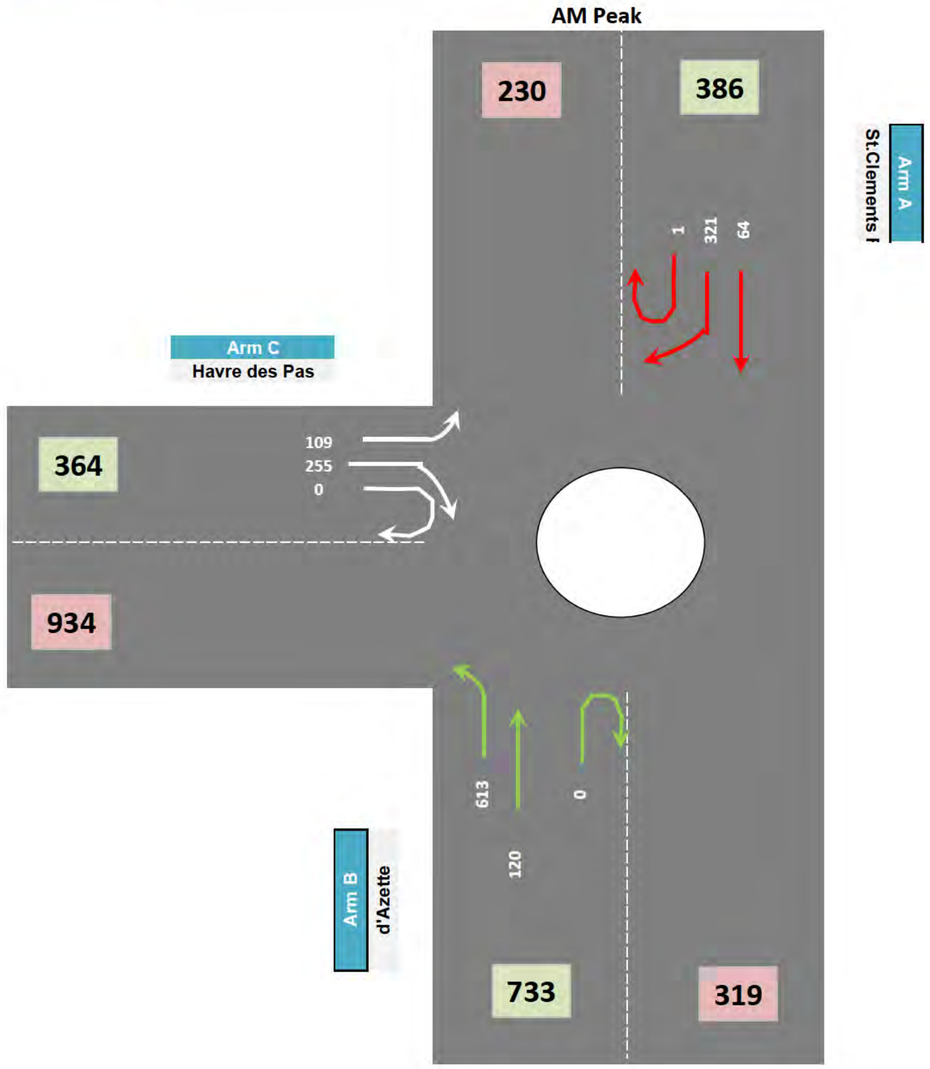
PM Peak

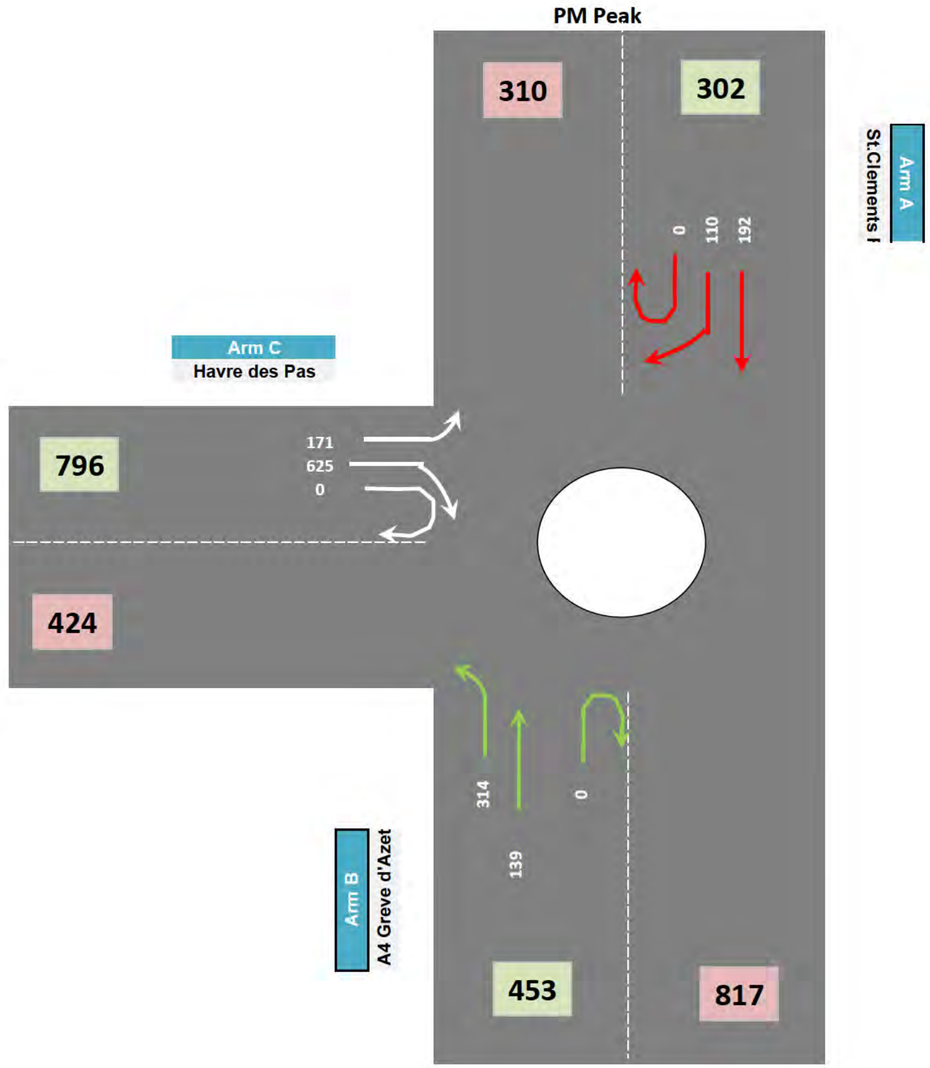


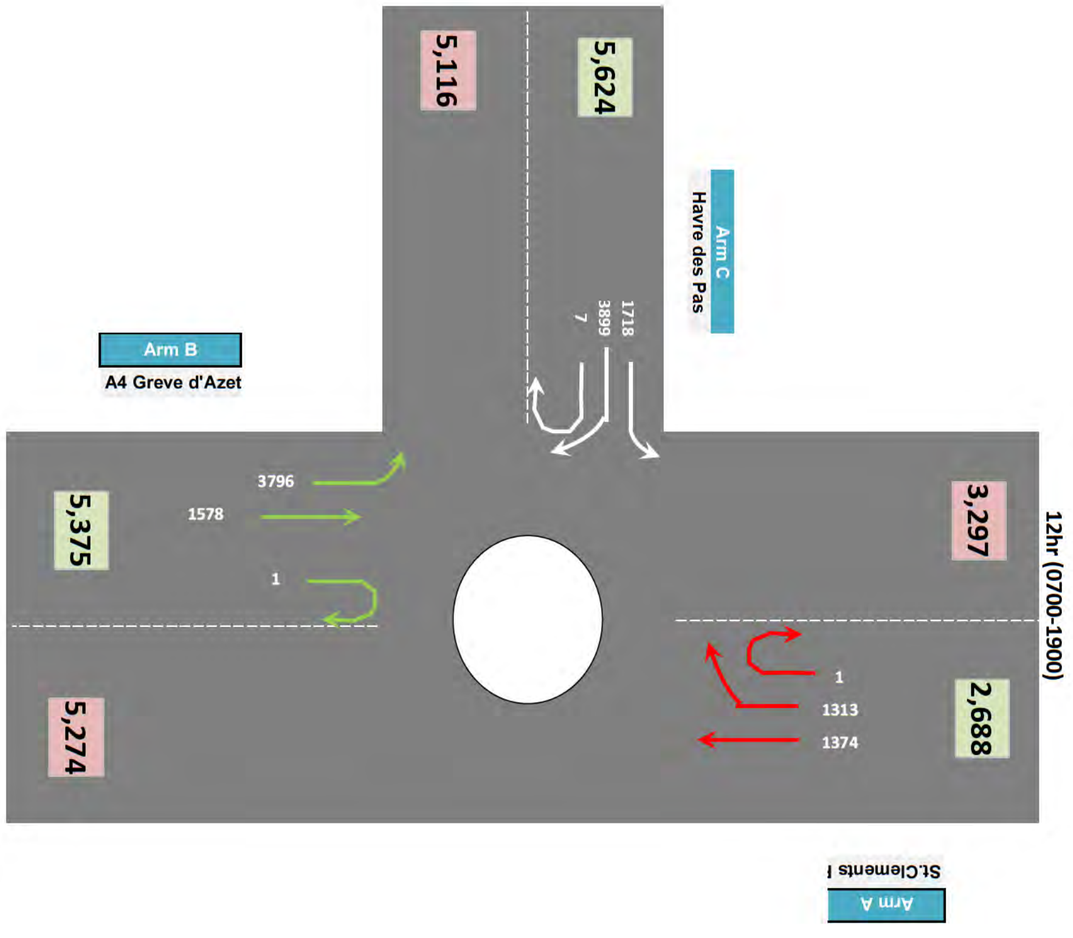

12 Hour (0700 - 1900)
5,292
0
Arm D
St Clement R
0
0
0
0
Arm C
La Route du Fort W
8,051
1,642
5,514
895
0
6,472
0
2
1,635
6,242
7,879
7,153
Arm A
La Route du Fort E
911
958
911
Arm B
St Clement Rd S
5,514
3,884
897

MCC Analysis Template

Project Name	Havre des Pas
Name of the Junction	MCC-005 - A4
Type of Junction	3 Arm Roundabout
No. of Arms	3



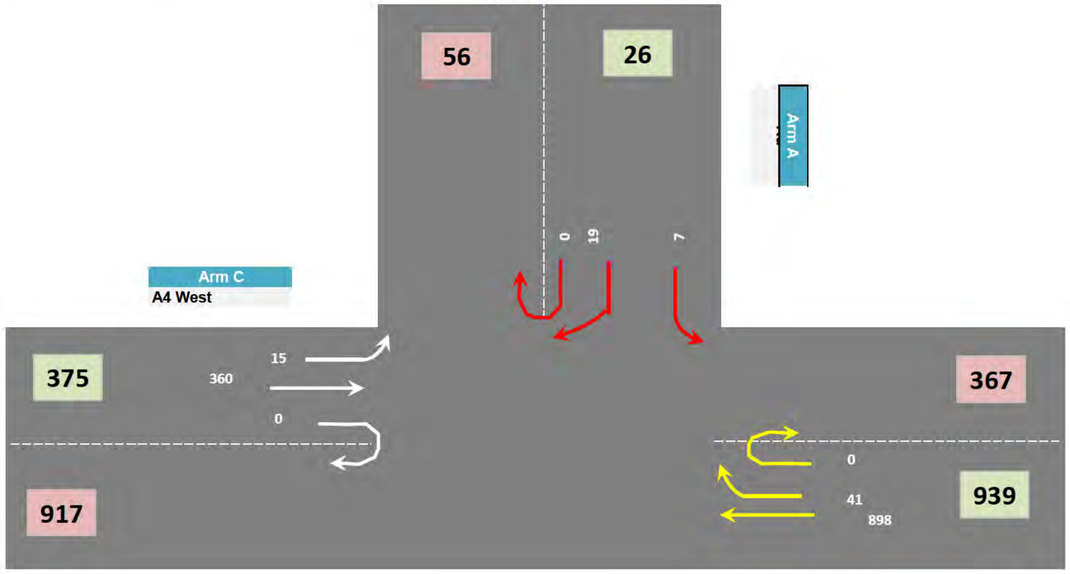



12hr (0700-1900)
Arm A
St.Clements I
Arm B
A4 Greve d'Azet
Arm C
Havre des Pas
5,116
5,624
5,375
5,274
3,297
2,688
1718
3899
7
3796
1578
1
1
1313
1374

MCC Analysis Template

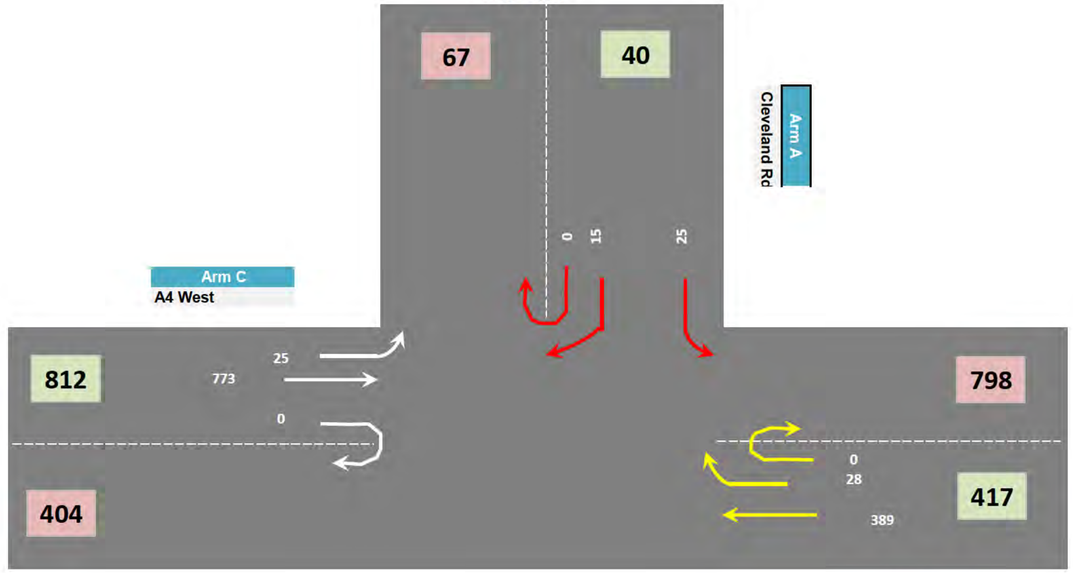
Project Name	Havre des Pas
Name of the Junction	MCC-006 - Cleveland Road/ A4
Type of Junction	3 Arm Junction
No. of Arms	3

AM Peak

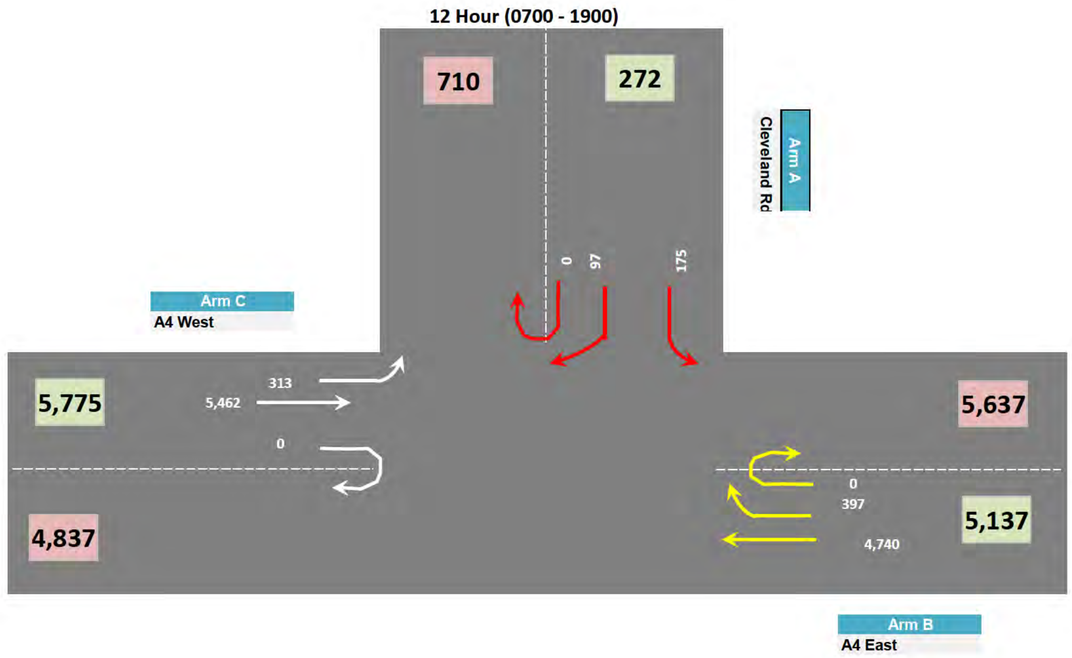


Arm B
A4 East

PM Peak



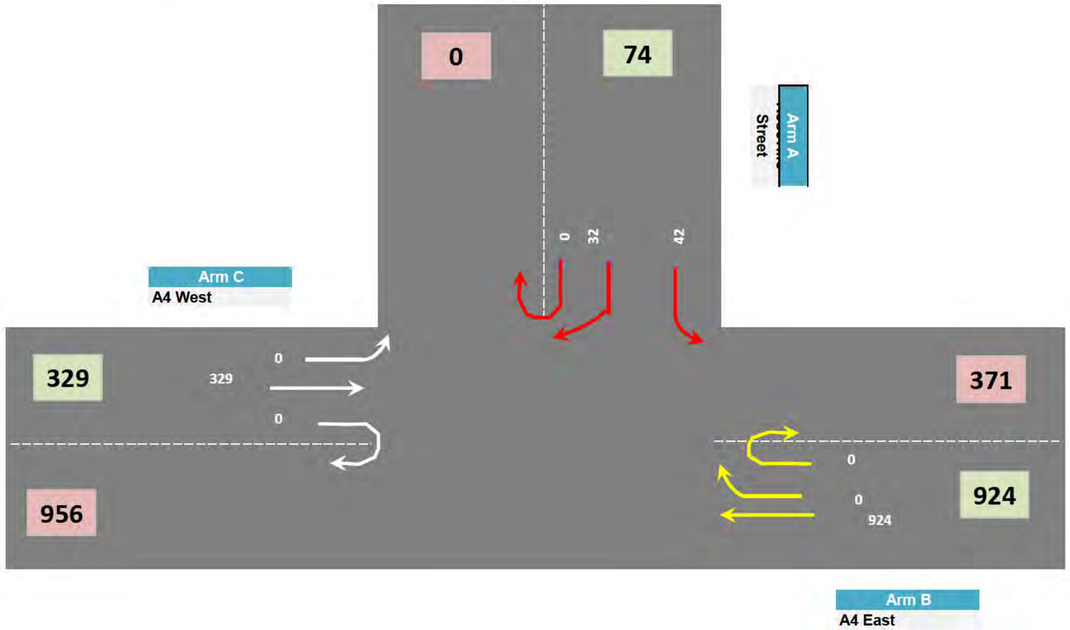
Arm B
A4 East


12 Hour (0700 - 1900)
710
272
Arm A
Cleveland Rd
0
97
175
Arm C
A4 West
5,775
313
5,462
0
4,837
5,637
0
397
4,740
5,137
Arm B
A4 East

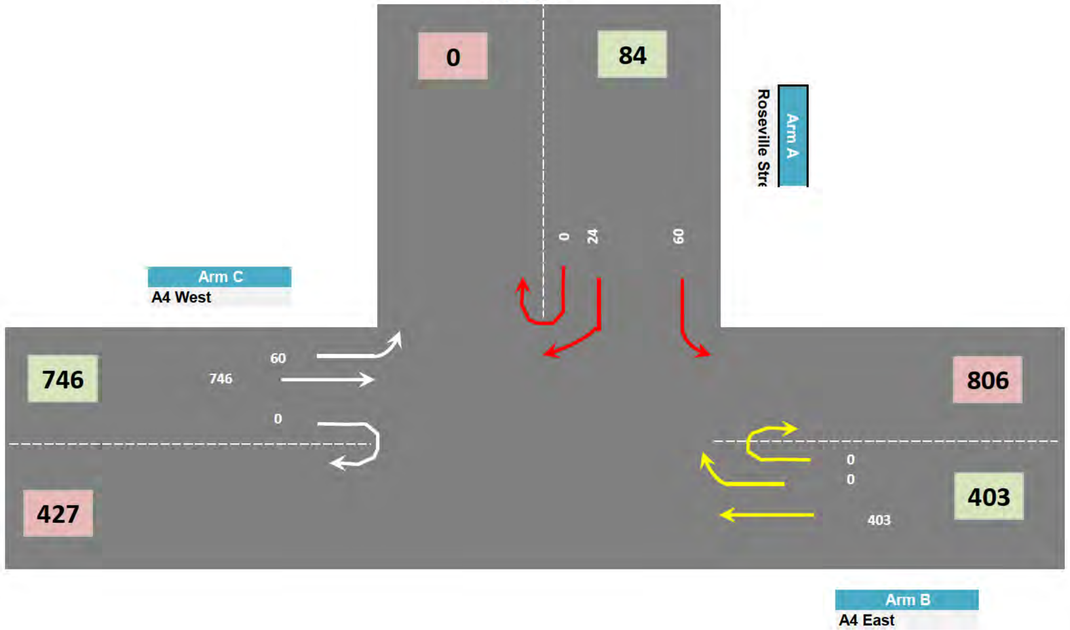
MCC Analysis Template

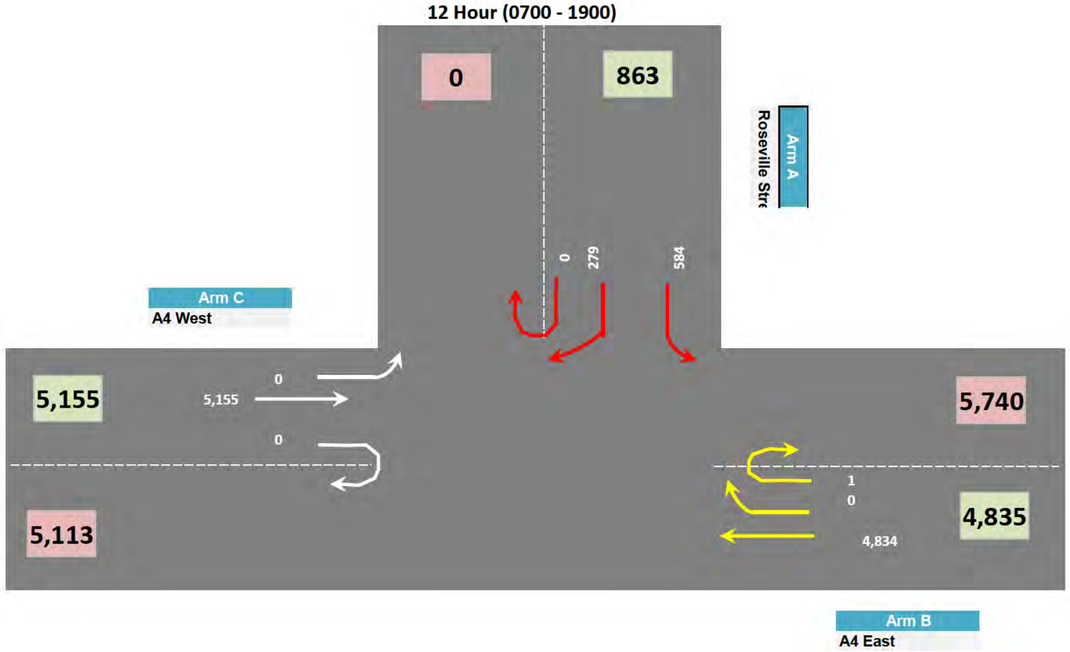
Project Name	Havre des Pas
Name of the Junction	MCC-007 - / A4
Type of Junction	3 Arm Junction
No. of Arms	3

AM Peak



PM Peak

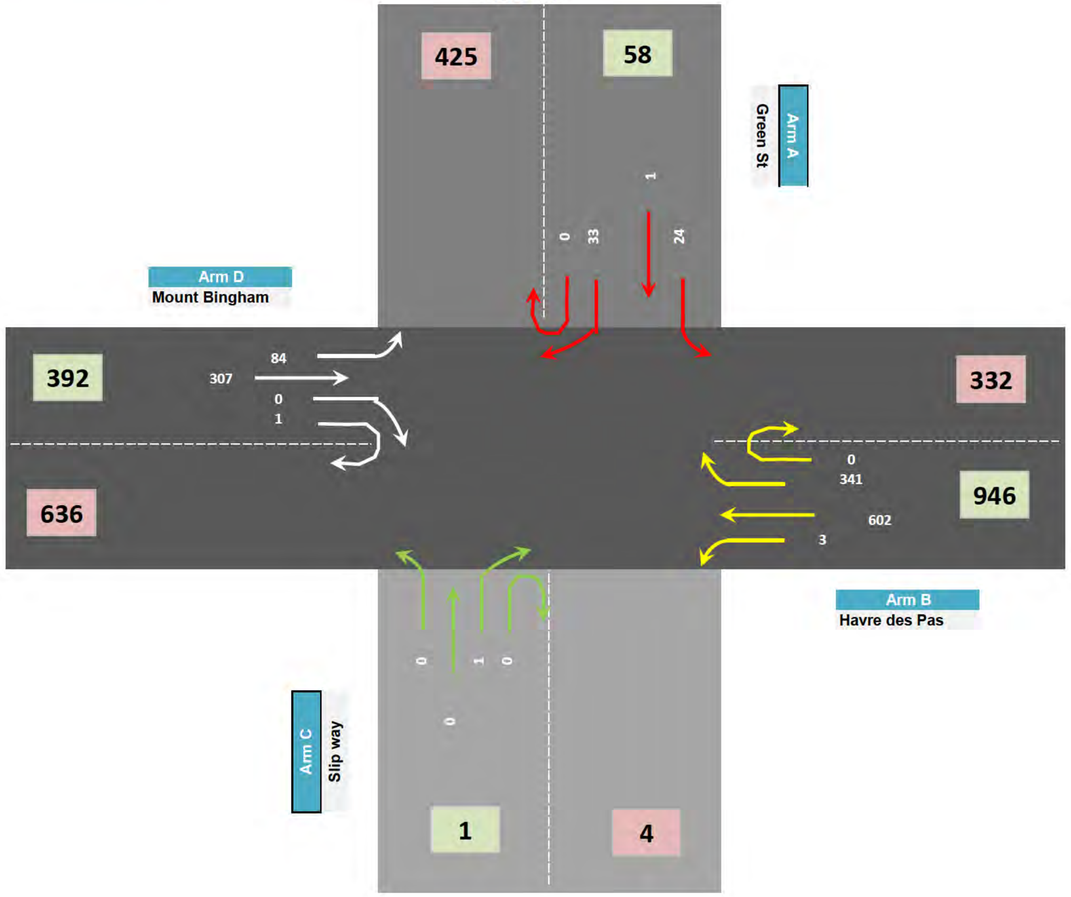



12 Hour (0700 - 1900)
0
863
Arm A
Roseville Stre
0
279
584
Arm C
A4 West
5,155
0
5,155
0
5,740
1
0
4,834
5,113
4,835
Arm B
A4 East

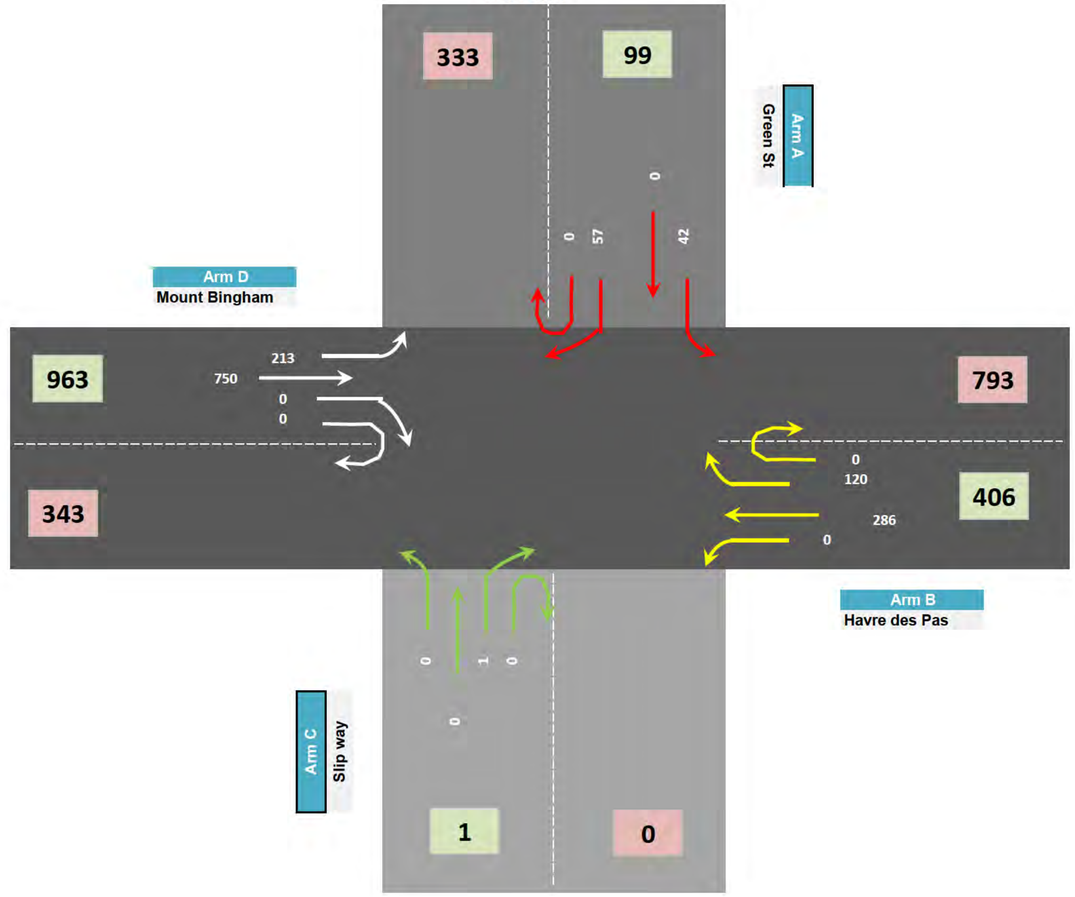
MCC Analysis Template

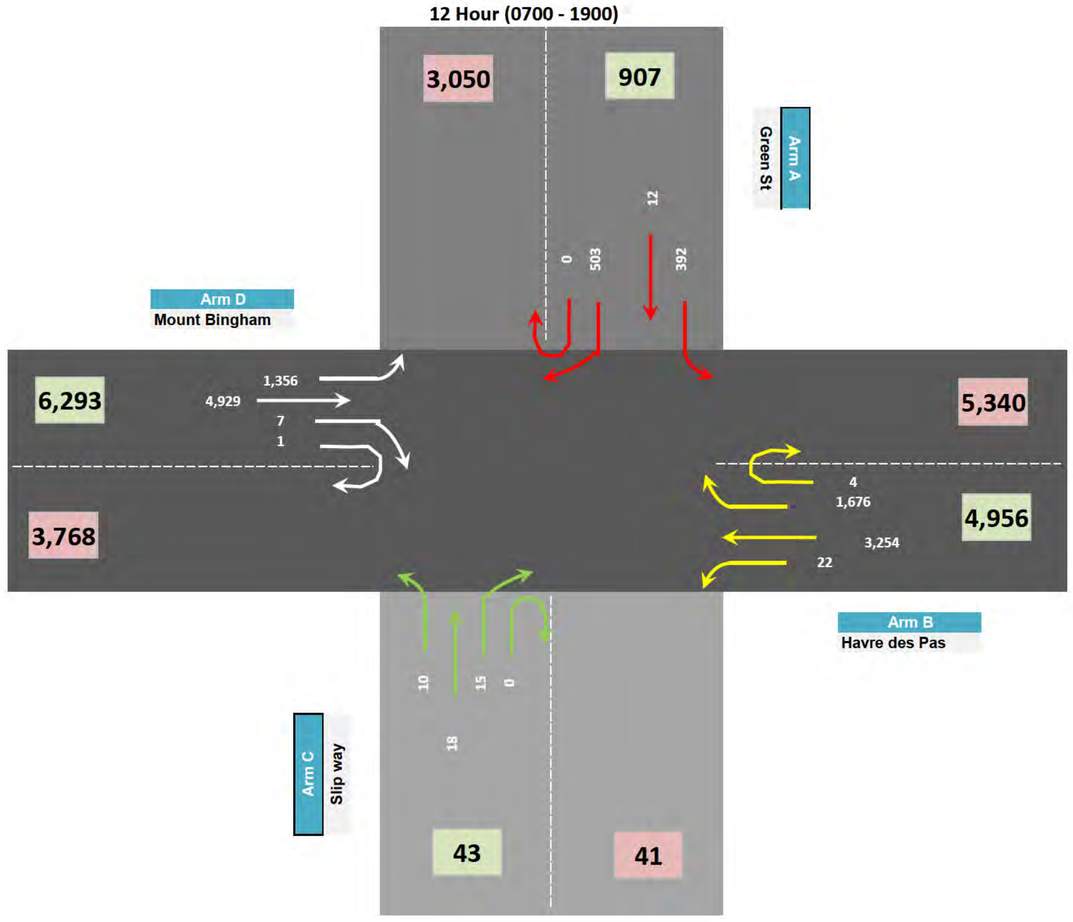
Project Name	Havre des Pas
Name of the Junction	MCC-008 - Green Street/ A4
Type of Junction	4 Arm crossroads
No. of Arms	4

AM Peak



PM Peak

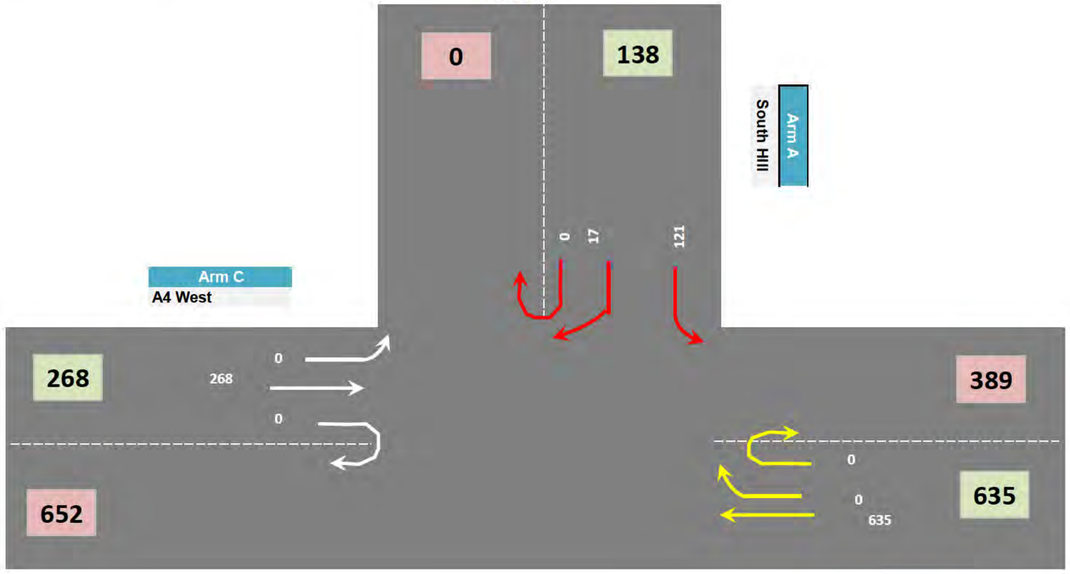



12 Hour (0700 - 1900)
3,050
907
Arm A
Green St
12
0
503
392
Arm D
Mount Bingham
6,293
1,356
4,929
7
1
5,340
4
1,676
3,254
22
4,956
3,768
Arm B
Havre des Pas
10
15
0
18
Arm C
Slip way
43
41

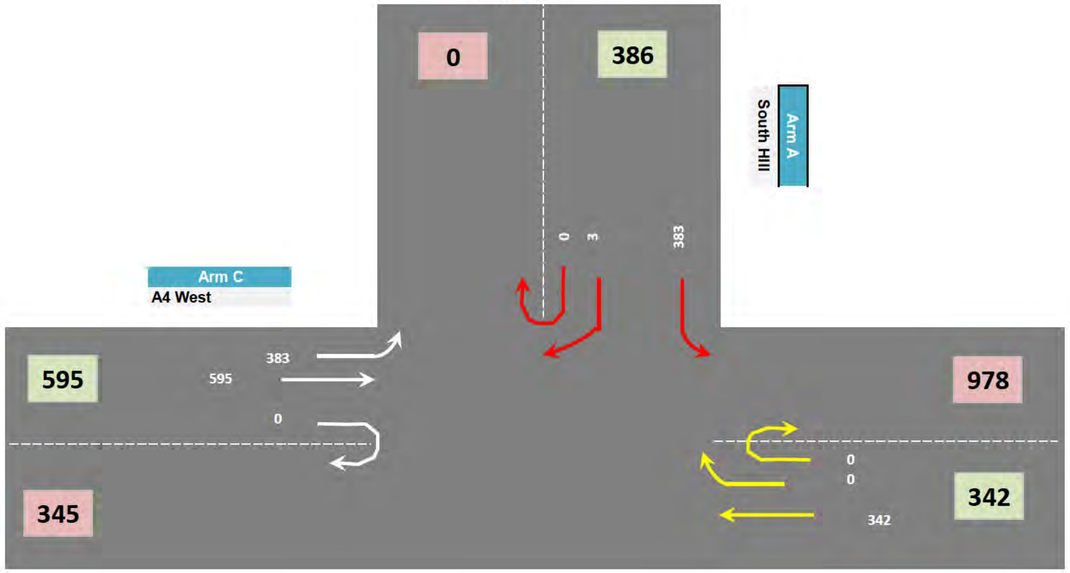
MCC Analysis Template

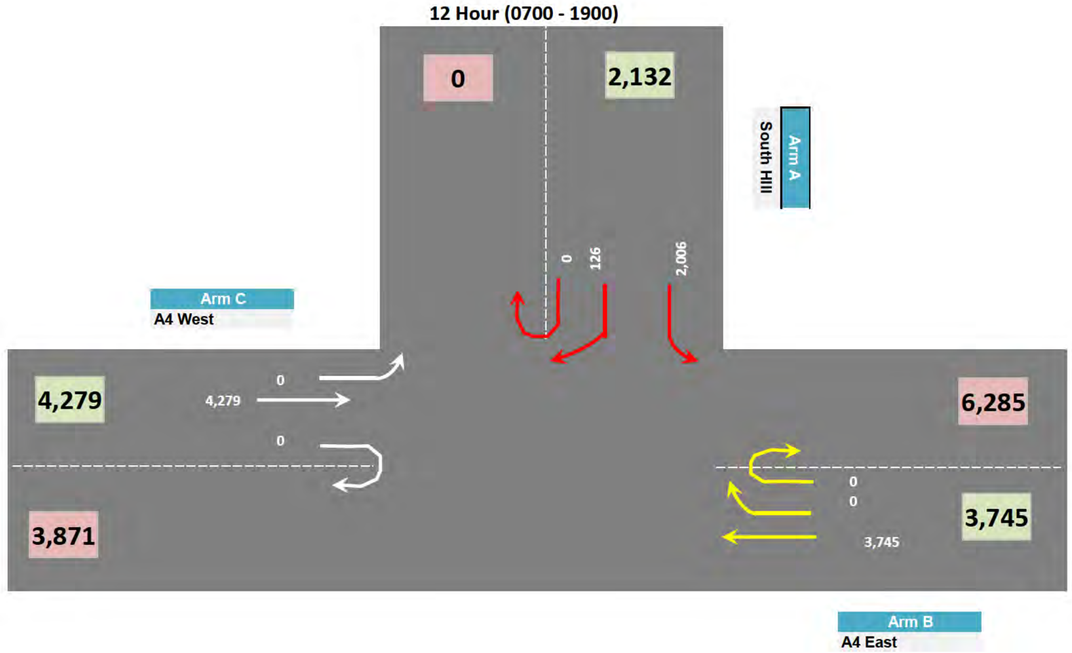
Project Name	Havre des Pas
Name of the Junction	MCC-009 - South Hill/ A4
Type of Junction	3 Arm Junction
No. of Arms	3

AM Peak



PM Peak




12 Hour (0700 - 1900)
0
2,132
Arm A
South Hill
0
126
2,006
Arm C
A4 West
4,279
0
4,279
0
6,285
0
0
3,745
3,871
Arm B
A4 East

2 London Square
Cross Lanes
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