

Preferred Options Local Plan Transport Evidence – Reference Case

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Preferred Options Local Plan Transport Evidence – Reference Case

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Acronyms and abbreviations

TDC	Tendring District Council
NEMo	North Essex Model
NPPF	National Planning Policy Framework
TCBGC	Tendring Colchester Borders Garden Community
TRICS	Trip Rate Information Computer System
VDM	Variable Demand Model

1. Introduction

1.1 North Essex Model

The North Essex Model (NEMo) is a strategic highway and public transport model with a base year of 2023. It is being used to assess the impact of local plans across north Essex. Forecast year assessments involve changing the network in the base model along with trip demand to reflect scenarios to be tested.

The NEMo base year model has been developed by expanding and updating the Colchester Transport Model (CTM), which has a base year of 2019. The detailed area of modelling in the CTM was expanded to include parts of Braintree and Tendring to align with options being considered in their local plan reviews. Updates were made to the highway and public transport networks to reflect 2023 conditions; and car, LGV, HGV, bus and rail demand was adjusted to reflect better 2023 travel patterns. The resulting NEMo was then validated against 2023 flow and journey time data to confirm it is a reasonable representation.

CTM, and hence NEMo, has been built following Department for Transport (DfT) Transport Analysis Guidance (TAG) guidance and best modelling practice, and the update process has followed DfT guidance on present day updates, in which models are refreshed rather than reconstructed entirely.

NEMo includes a variable demand model (VDM), also developed in line with DfT guidance, which allows trip makers to change destination and switch between car and public transport modes. The VDM considers trip purposes over a 24-hour period and predicts from where trips will be produced, to where they will be attracted and which mode will be used. It then produces origin and destination car, bus and rail matrices for the AM and PM peak hours and average interpeak hours.

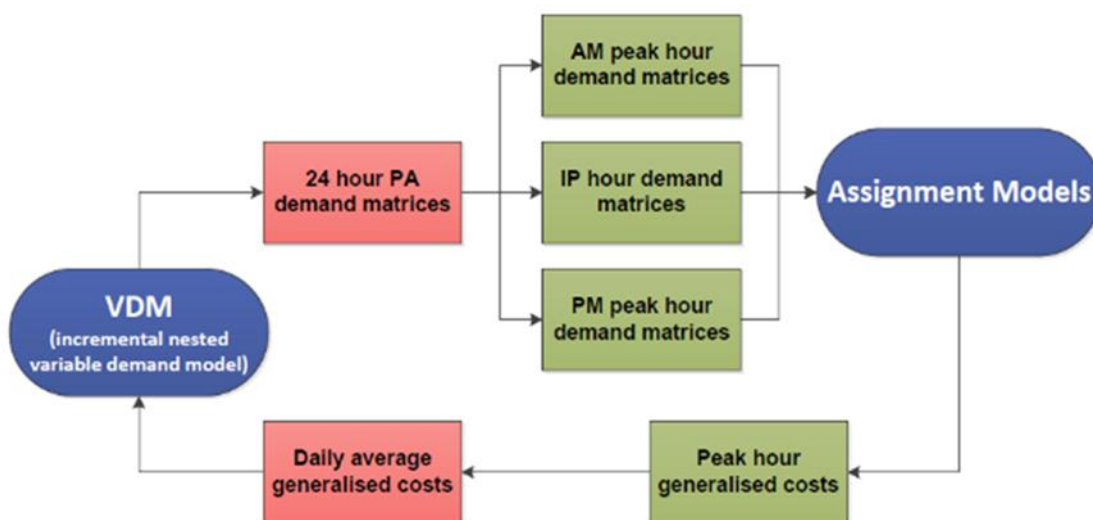


Figure 1-1: Relationship between demand and assignment models

The trips in the car matrix are subdivided into commuting, business and other trips and assigned onto the highway network alongside estimates of LGVs and HGVs using VISUM software. Buses, which travel on the highway network, are also included but follow designated routes. Meanwhile the bus and rail trips are assigned onto the public transport network using EMME software. Some public transport trips use both bus and rail to complete a journey.

The VDM and assignment models iterate with each other until they reach convergence - which means that a iteration of the model would not result in further changes in destination or mode choice. For information, the highway assignment model forecasts route choice and delay as more trips are added to the network. The

public transport assignment model allows buses to fall behind scheduled timetables as result of congestion on the highway network, but rail services are assumed always to run to schedule.

NEMo represents a typical mid-week day in month without major holidays; hence it is skewed towards days with heavier traffic flow. Choosing such conditions tends to maximise normal traffic flow through all parts of the transport network and follows modelling best practise¹. The highway assignment model shows traffic conditions in the AM peak hour 7.30-8.30 and the PM peak hour 4.30-5.30, since these are, overall, the busiest hours in 2023 across north Essex in the respective peaks. The highway model can also show traffic conditions for an average interpeak hour between 10am-4pm. The public transport model shows public transport trips for an average peak hours in the AM (7am-10am), interpeak and PM (4pm-7pm) periods.

The North Essex Model – 2023 Validation Technical Note, dated April 2025, details the changes and updates to NEMo and presents the updated validation information for the present-day base year model. This work has been reviewed by NH's sub-consultants, AECOM, with all comments closed. The validation statistics for Tendring are reproduced in Appendix A for convenience. The model achieves a good standard of validation across the district and provides a robust basis for assessing the impact of the Local Plan.

1.2 Purpose of report

In order to set a baseline against which the impact of preferred site allocations in Tendring can be assessed, a reference case forecast model for 2042 has been developed which represents the growth without the preferred site allocations.

This document outlines the key assumptions underpinning the growth and transport schemes included in the Reference Case scenario and explains how these assumptions have been applied within the transport model. It also presents a comparative analysis of model outputs:

- between the pre- and post- variable demand model (VDM) Reference Case outputs; and
- between the post-VDM Reference Case and Base Year model outputs.

¹ Transport for London. Traffic Modelling Guideline. London, UK, Sept. 2021. url: <https://content.tfl.gov.uk/traffic-modelling-guidelines.pdf>

2. Reference Case

2.1 Introduction

This chapter describes the approach to developing the Reference Case models. It includes details on the demand and network assumptions, and also the application of the Variable Demand Model (VDM).

2.2 Growth

2.2.1 Household and job assumptions

Without Tendring's preferred site allocations, some level of growth would reasonably be expected to occur in the district area and in surrounding areas. This growth has been called reference case growth. In Tendring reference case growth to 2042 has been assumed to include:

- housing sites that have been identified by Tendring District Council (TDC) as near certain or more than likely to come forward (see Appendix B)
- employment sites that have been identified by TDC as near certain or more than likely to come forward (see Appendix B)
- housing and employment growth at Tendring and Colchester Garden Community (TCBGC) to 2041

It is worth noting that TCBGC growth has been informed by latest developer assumptions, in which employment to 2041 is concentrated in the Colchester model zones and housing in the Tendring model zones.

Since Tendring will be particularly affected by growth in the North Essex authorities of Colchester and Braintree, planned development in these locations has also been identified.

Information on planned housing developments was available from Colchester Borough Council. "Near Certain" and "More Than Likely" housing development has been included in the Reference Case Model, as well as the emerging Local Plan allocations up to 2041. Since information on planned employment developments was not available at the time the modelling was being undertaken, NTEM8 forecasts up until 2033 have been used, as well as the emerging Local Plan allocations up to 2041. Since supporting mitigation measures for Colchester have been included in the Reference Case network (see Section 2.3), associated sustainable travel reductions have been applied in the Colchester area.

In Braintree, information on planned housing and employment developments was not available at the time the modelling was being undertaken. Therefore, NTEM8 forecasts for housing and employment have been used.

Growth in districts beyond North Essex is assumed to be at 2042 levels predicted by NTEM.

The Reference Case growth in each district is shown in Table 2-1 below. It should be noted that these numbers do not include the TCBGC growth. The TCBGC growth has been informed by latest developer assumptions, and trip ends have been added directly on top on the final demand.

Table 2-1: Increase in Dwellings and Jobs, 2042 compared to 2023

Council Area	2023 base	2042 Reference Case Growth	2023 base	2042 Reference Case Growth
	Households		Jobs	
Tendring	66,906	8,213 (+12%)	51,341	1,336 (+3%)
Colchester	81,086	17,153 (+21%)	97,188	15,285 (+16%)
Braintree	65,039	4,884 (+8%)	66,221	3,340 (+5%)

The size and location of the developments included in the Reference Case are shown in the figure below. The full list of developments is presented in Appendix B.

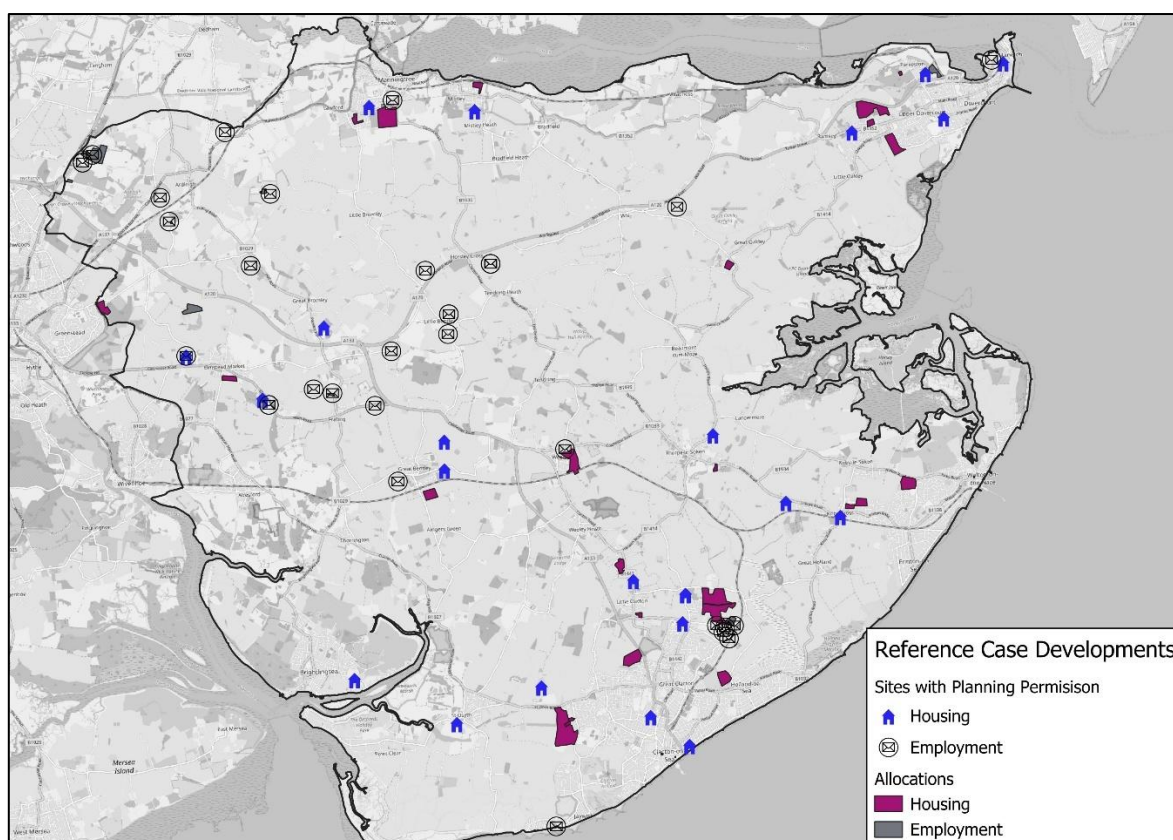


Figure 2-1: Reference Case Developments

2.2.2 Trip generation

Having established the growth in households and employment, the alternative planning assumptions module in TEMPro was used to provide an estimate of trip growth at the Middle Super Output Layer (MSOA) level. The alternative planning assumptions are shown in the table below.

Table 2-2: TEMPro Alternative Planning Assumptions for Tendring, 2042

MSOA	TEMPro Base (2023)		Uncertainty Log Growth (2023-2042)		TEMPro Forecast (2042)	
	Households	Jobs	Households	Jobs	Households	Jobs
Tendring 001	3,111	2,733	33	0	3,144	2,733
Tendring 002	3,368	3,495	54	484	3,422	3,979
Tendring 003	5,157	4,661	885	239	6,042	4,900
Tendring 004	4,014	1,801	680	0	4,694	1,801
Tendring 005	2,238	3,098	436	221	2,674	3,319
Tendring 006	3,701	2,710	50	0	3,751	2,710
Tendring 007	3,224	3,100	620	33	3,844	3,132
Tendring 008	5,971	2,580	428	0	6,399	2,580
Tendring 009	3,314	3,515	305	74	3,619	3,589
Tendring 010	3,438	4,262	1,144	184	4,582	4,446
Tendring 011	3,974	2,467	41	0	4,015	2,467
Tendring 012	3,457	1,270	0	87	3,457	1,357
Tendring 013	3,567	1,498	2,863	0	6,430	1,498
Tendring 014	3,920	3,487	132	0	4,052	3,487
Tendring 015	3,599	995	0	0	3,599	995
Tendring 016	3,280	5,959	144	0	3,424	5,959
Tendring 017	3,385	2,172	0	0	3,385	2,172
Tendring 018	4,190	1,540	398	13	4,588	1,553
Total	66,906	51,341	8,213	1,336	75,119	52,677

Growth in trips is output in the production/ attraction format over 24 hours, which is required by the VDM.

Often the Trip Rate Information Computer System (TRICS) database is used to provide historic trip rates from similar developments. However, since the NTEM core scenario reflects trends in car ownership and trip rates for each MSOA it was considered better to use for a strategic level assessment as it represents a BaU approach. It also suited the information that was provided, which for employment sometimes included jobs information but not land area. A comparison was carried out between NTEM and TRICS, which established car trip growth estimates were very similar.

Since TEMPro provides trip growth assumptions at the MSOA level, refinements were made to allocate a greater share of growth to the specific model zones within each MSOA where developments are actually located.

- For MSOAs in Colchester and Tendring that include developments, the following steps were undertaken:
 - **Step 1: Baseline Growth Without Development Assumptions** A TEMPro growth factor was applied to the base year trip ends, assuming no growth in dwellings or employment. This was achieved by modifying the default 2042 household and job figures in TEMPro to match the 2023 values. This adjustment isolates the background growth captured by TEMPro, excluding any development-related growth.
 - **Step 2: Incorporating Committed Developments** Alternative planning assumptions were then applied to the default 2042 household and job figures in TEMPro to reflect the committed developments included in the Reference Case. The adjusted 2042 figures were extracted, and the development-related trip ends were calculated as the difference between this output and the trip ends extracted from TEMPro from Step 1. These development trip ends were then added to the adjusted trip ends from Step 1 (i.e. base year trip ends multiplied with the adjusted growth factor from Step 1).
 - **Step 3: Spatial Allocation Within MSOAs** Where an MSOA spans multiple model zones (e.g. zones 1, 2, and 3), but development is known to occur only in a specific zone (e.g. zone 1), all development-related growth was allocated to that zone. No growth was assigned to the other zones within the same MSOA.
 - **Step 4: Additional Growth at TCBGC Zones** Additional trip growth was incorporated for the TCBGC zones based on emerging data from the developer's Masterplan.
- For all other areas of the model, default TEMPro growth factor (2023-2042) to base year demand have been applied for all model zones in MSOAs without developments

2.2.3 Trip distribution

Since the reference case is run with VDM, the VDM process handles the distribution of trip growth.

2.3 Committed Schemes

As well as identifying growth in trips ends, the reference model reflects changes in the highway network – that is, highway schemes that are reasonably expected to come forward because funding and decisions are in place.

The schemes included in the Reference Case network are listed in Table 2-3 below.

Table 2-3: Committed Schemes (Fully Modelled Area) included in the Reference Case

Council Area	Scheme Name	Scheme Description
Tendring	A120 scheme	New link road between A120 and Ramsey Rd to the west of Harwich
Colchester	A12 J29	Widened slip road and full signalization
Colchester	A12 J25	Widened approaches to Station Rd Roundabout and full signalization
Colchester	A12 J27	Full signalization
Colchester	Greenstead Roundabout	Reconfigured roundabout and full signalization
Colchester	Traffic signal upgrades	Platooning alterations on signalized corridors to reflect investment in new dynamic traffic management technologies

Since it is expected that Tendring and Colchester Garden Community (TCBGC) would promote or part fund solutions to mitigate its impact at A12 Junction 29 and Greenstead roundabout, improvement schemes for these junctions have been included in the Reference Case. Since details regarding the possible mitigation measures related to TCBGC are not yet known, assumptions have been made based on local knowledge and the best information available at the time.

Following the cancellation of the A12 J19-25 widening, this scheme has not been included in the Reference Case network.

While the reference case focusses on movements on the highway network, it is noted that there is correlation with parking pressures. Growth around Harwich due to Freeport plans would be expected to increase pressure for lorry parking along the A120 route. Consequently, the transport evidence base, as it moved into Regulation 19, is intended to be expanded to record existing and planned lorry parking in the reference case; and consider enhanced lorry parking requirements in assessment case mitigations.

2.4 Variable Demand Model

As shown in Figure 1-1, the Reference Case has been run through the VDM to produce a set of origin/destination assignment matrices for the AM and PM peak hours and average inter-peak hour. The flow differences between the post-VDM and pre-VDM Reference Case models are shown in the below figures.

Figure 2-2 illustrates the flow differences between the post-VDM and pre-VDM Reference Case models during the AM peak. The red bandwidths indicate an increase in traffic in the post-VDM flow compared to the pre-VDM, whilst the green bandwidths indicate a decrease. The most significant increases in traffic are northbound along the A12 between junctions 29 and 30 (up to 240 vehicles per hour) and westbound along the A120 between the A1331 link road and the A12 (200 vehicles per hour).

Figure 2-3 illustrates the flow differences between the post-VDM and pre-VDM Reference Case models during the PM peak. The most significant increases in traffic are along the A120 between the A1331 link road and the A12 (240 vehicles per hour eastbound and 200 vehicles per hour westbound).

The change in flow along the A12 is partially because A12 capacity and speed were reduced in the 2023 base model to reflect roadworks at the time. The removal of these restrictions in the Reference Case models has led to an increase in vehicles travelling along this road.

The change in flow along the A120 could be related to the inclusion of the A1331 link road in the Reference Case models, which causes traffic to re-route along the link road and the A120 instead of through Colchester City Centre.

There are also increases in traffic flow northbound through Manningtree and along strategic corridors in the district, for example the A133, the B1027 and the B1352.

As shown in Table 2-4 below, the overall change in car demand as a result of running the VDM is very small (0.45% and 0.27% increase in AM and PM respectively). It should be noted that LGV and HGV demand remains fixed.

Table 2-4: Pre-VDM and Post-VDM Car Matrix Totals

	AM Peak	PM Peak
Pre-VDM	395,611	440,346
Post-VDM	397,403 (+0.45%)	441,536 (+0.27%)

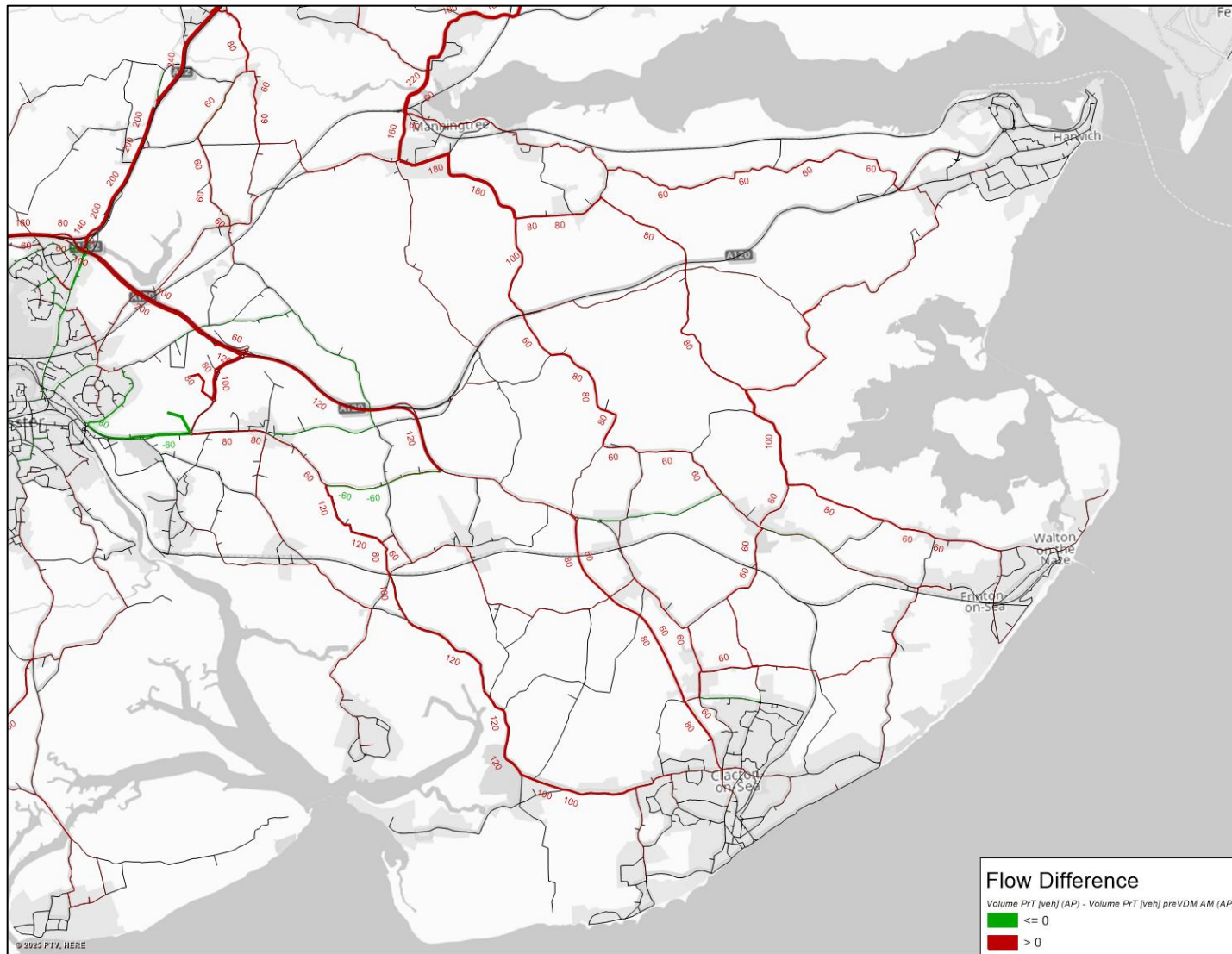


Figure 2-2: 2042 Post vs Pre Reference Case VDM - Flow Difference – AM

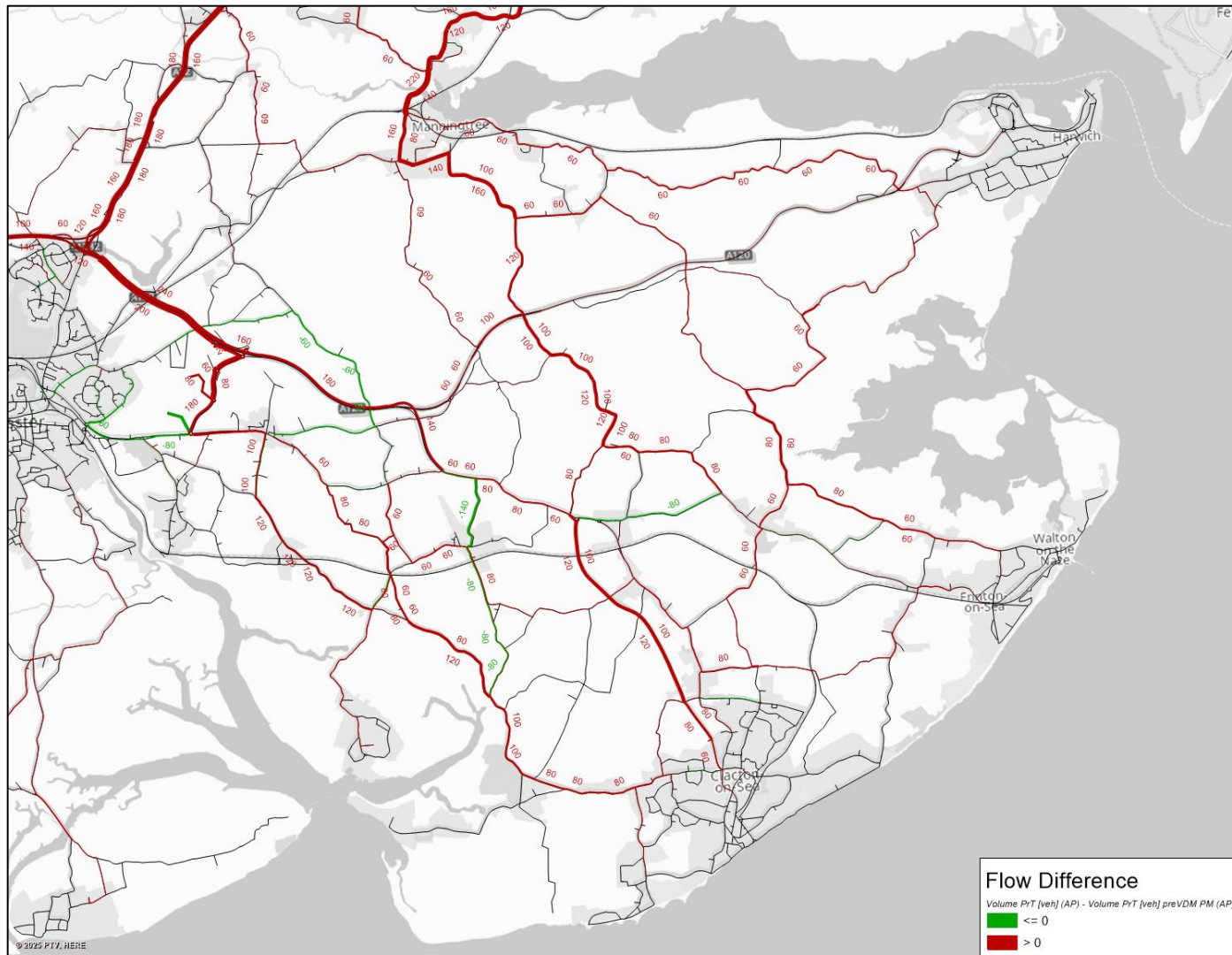


Figure 2-3: 2042 Post vs Pre Reference Case VDM - Flow Difference – PM

3. Reference Case vs Base Year

3.1 Introduction

This chapter presents the Reference Case model outputs, including changes in flow (Section 3.2), speed (Section 3.3) and queues (Section 3.4) compared to the base year. Travel conditions along selected routes in Tendring are analysed in Section 3.5 to understand the level of existing congestion and the scale of change between the Reference Case and Base year models. Finally, Section 3.6 presents the traffic flows and queue lengths on the Strategic Road Network (SRN) to understand the existing conditions at these junctions.

3.2 Flow Difference

Figure 3-1 and Figure 3-2 illustrate the flow differences between the post-VDM Reference Case and Base Year models during the AM and PM peak hours respectively.

The flow differences between the Reference Case and Base Year follow a similar pattern in both time periods. There are significant increases in traffic along the A120 to the west of the A1331 link road, as well as on the A12. This is partly due to the introduction of the A1331 link road in the Reference Case, which causes traffic to re-route along the link road and via the A120 instead of through Colchester City Centre, and partly due to the increased demand arising from the Tendring and Colchester Garden Community (TCBGC). There are also increases in traffic flow through Manningtree and along strategic corridors in the district, for example the A133, the B1027 and the B1352.

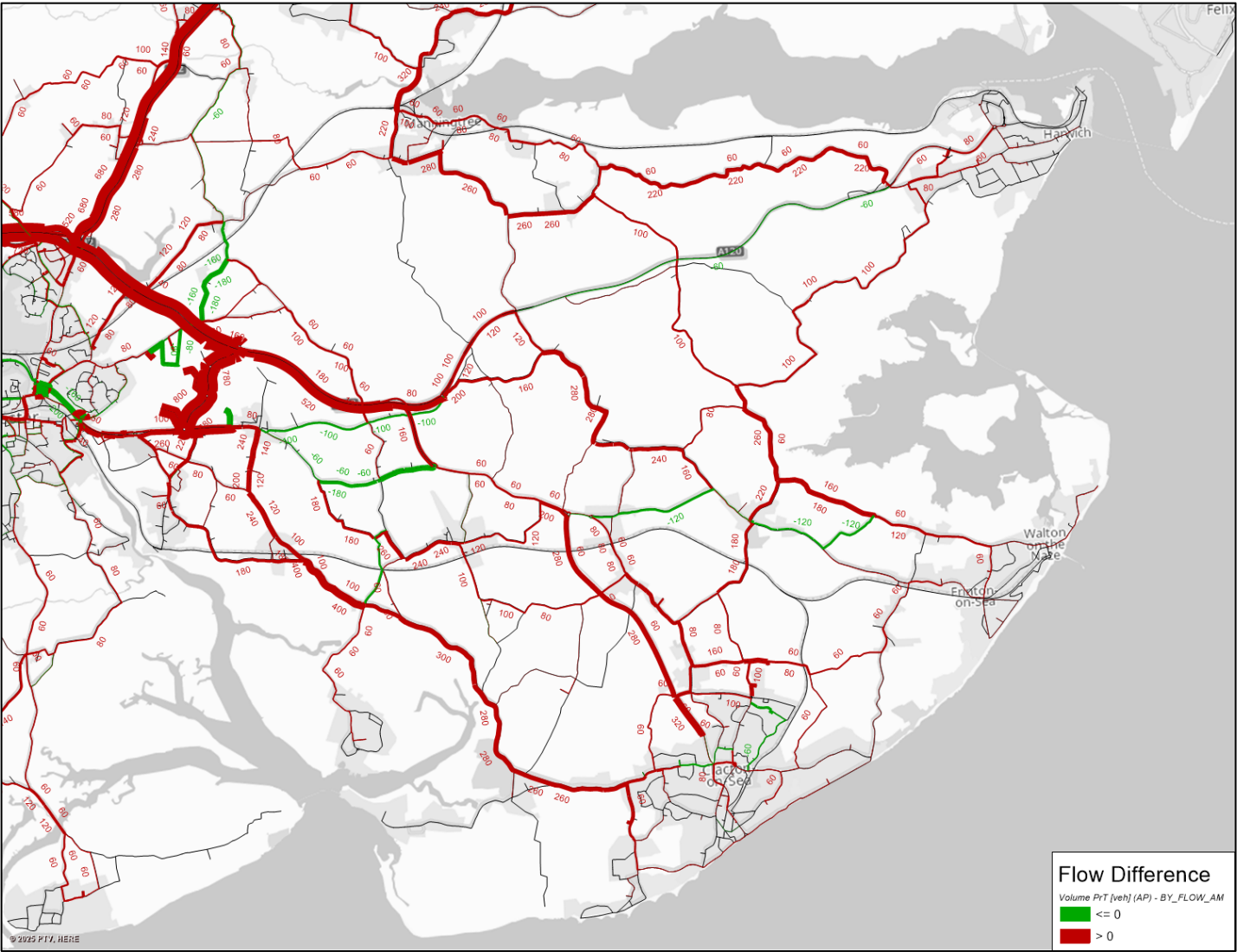


Figure 3-1: Reference Case (2042) vs Base Year (2023) - Flow difference – AM

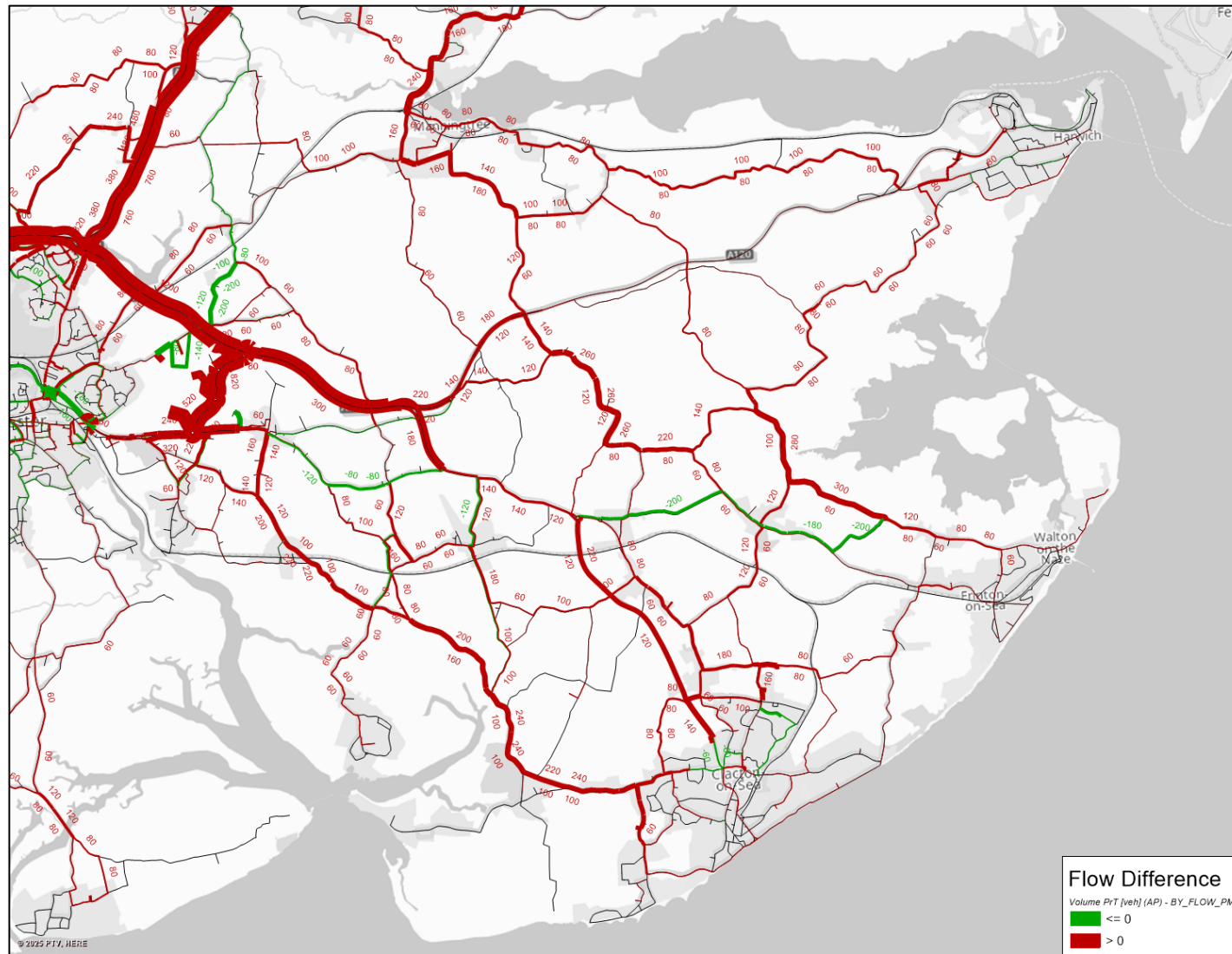


Figure 3-2: Reference Case (2042) vs Base Year (2023) - Flow difference – PM

3.3 Speed Ratio Changes

The speed ratio is a measure of modelled speed compared to the free-flow speed on a link, with lower speed ratios showing reduced speeds compared to free-flow conditions. The base year speed ratios have been compared against typical traffic in Google Maps in key areas in Appendix C. Although the two plots are not comparing the exact same measure and do not have the same graphic parameters in terms of colour/ scale, the comparison shows that the base year model generally reflects typical traffic conditions and congestion in Tendring.

Figure 3-3 and Figure 3-4 illustrate the speed ratio changes between the post-VDM Reference Case and Base Year models during the AM and PM peak hours respectively. The red links show a worsening of speed ratio and therefore an increase in congestion, whilst the green links show improvements in speed ratio and reduced congestion.

In the AM peak hour there is a slight worsening along A120 between link road and junction 29, as well as at junction 29. There is also slight worsening along the A133 to north of Clacton-on-Sea, the B1027 between Thorrington and Alresford, and the A137 through Manningtree. There is also slight worsening at the Colchester Road/ Brightlingsea Road junction.

In the PM peak hour there is slight worsening at junction 29, as well as along the A133 to north of Weeley, the A137 through Manningtree, and on Bromley Road near Parsons Heath.

There are improvements in speed and congestion around Greenstead Roundabout in Colchester, which can be explained by the inclusion of an improvement scheme in the Reference Case.

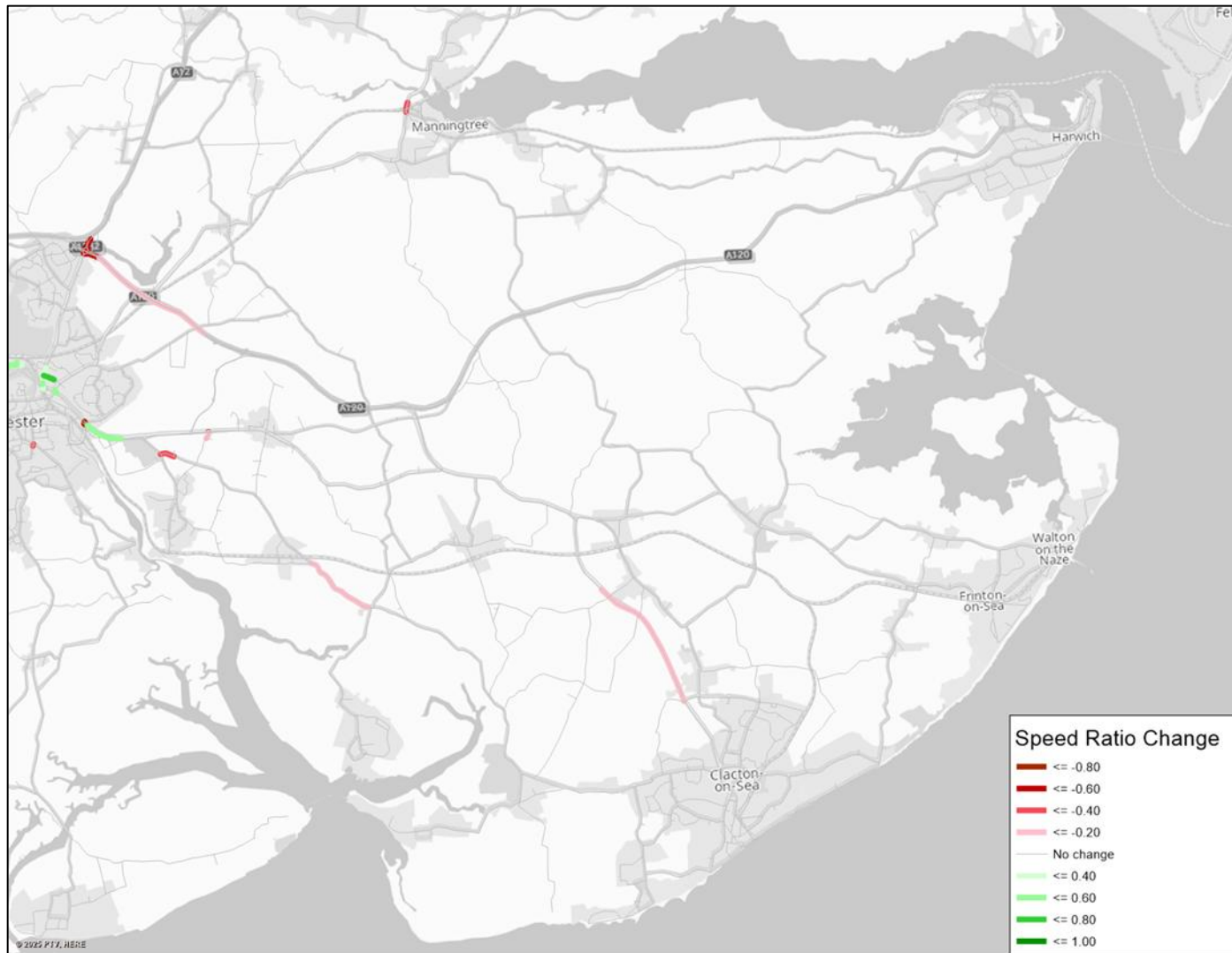


Figure 3-3: Reference Case (2042) vs Base Year (2023) – Speed Ratio changes – AM

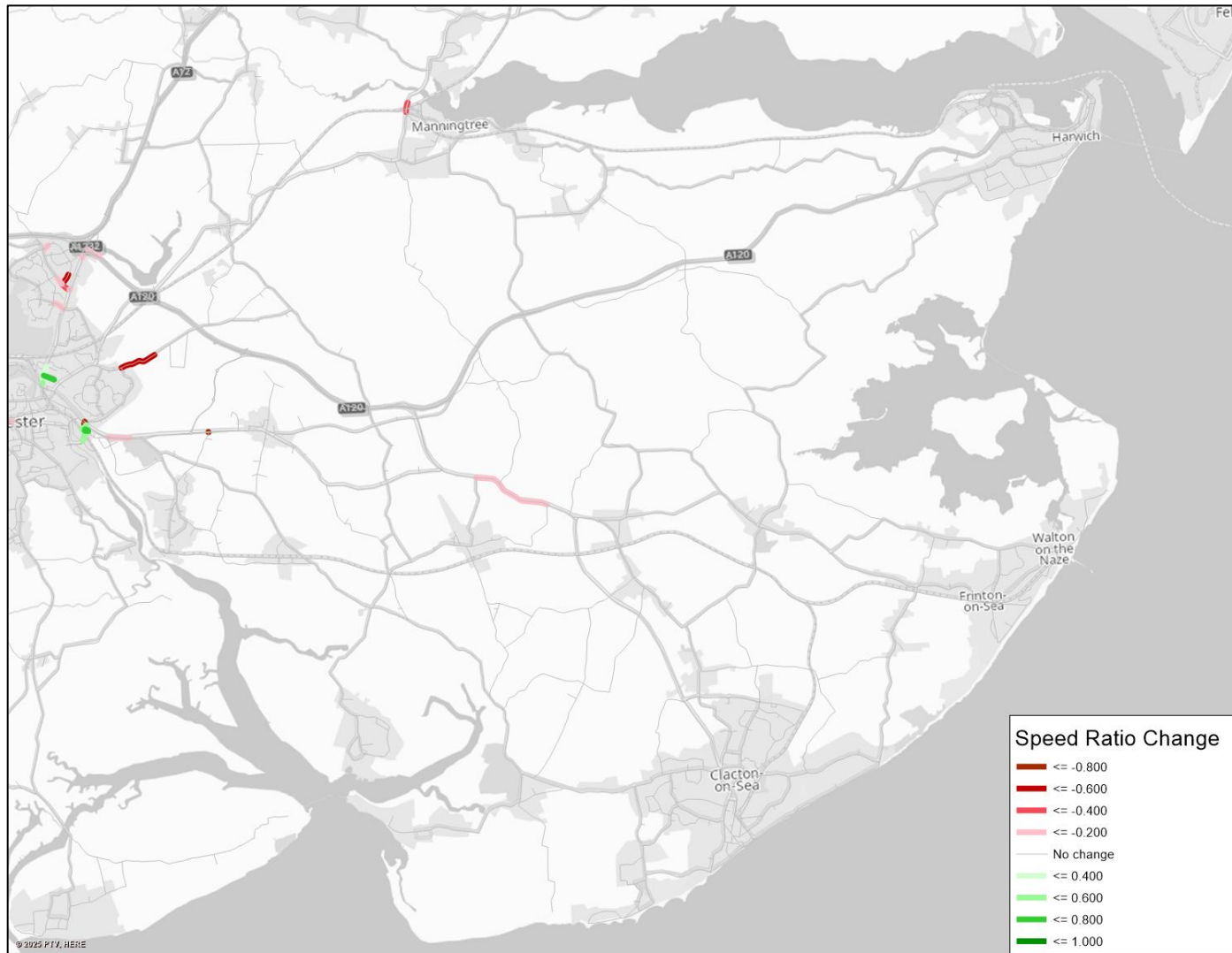


Figure 3-4: Reference Case (2042) vs Base Year (2023) – Speed Ratio changes – PM

3.4 Relative Queue Changes

The relative queue indicator shows blocking back of traffic on links – i.e. traffic that doesn't get through in the modelled time period which, therefore, causes queues to form. This indicator only appears on the worst performing parts of the modelled network.

Figure 3-5 and Figure 3-6 show the changes in relative queue between the Reference Case and Base year models during the AM peak and PM peak respectively.

In the AM peak hour there is an increase in relative queue at junction 29 in the Reference Case compared to the Base year model. There are also some improvements in central Colchester due to emerging, new Local Plan transport mitigation.

In the PM peak hour there are some changes (both increases and decreases) in relative queues in central Colchester, but negligible changes throughout Tendring and on the Strategic Road Network.

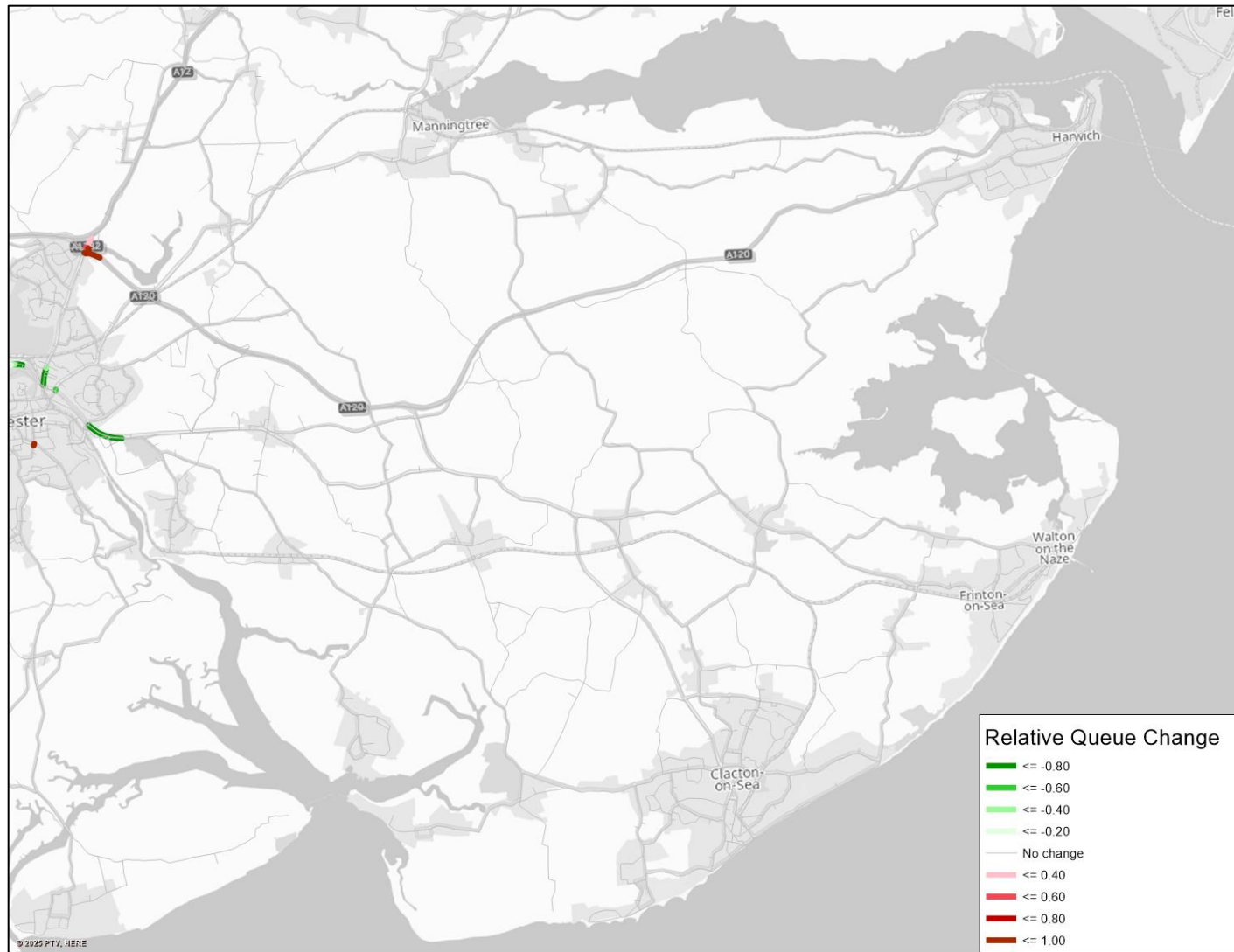


Figure 3-5: Reference Case (2042) vs Base Year (2023) – Relative Queue changes – AM

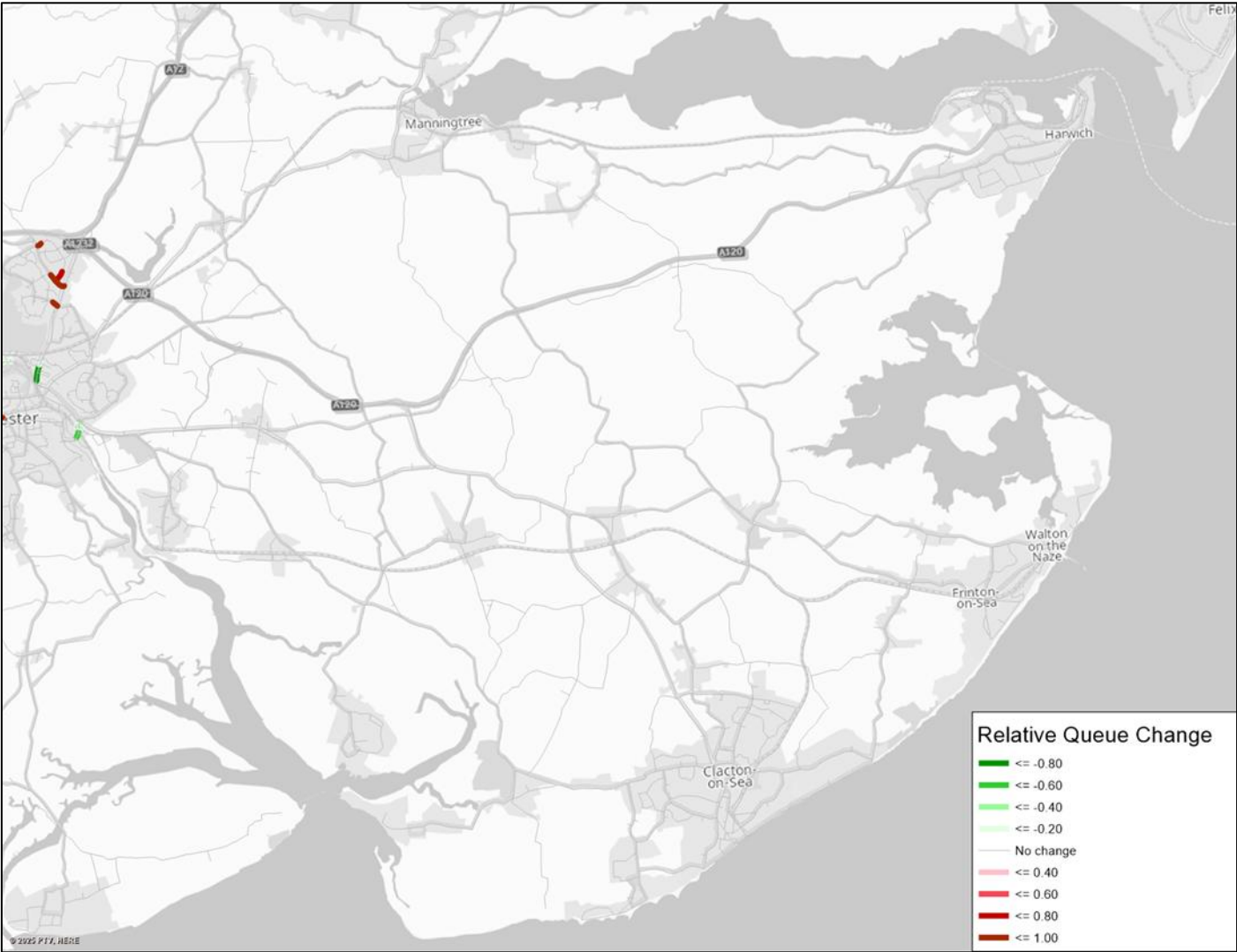


Figure 3-6: Reference Case (2042) vs Base Year (2023) – Relative Queue changes – PM

3.5 Tabular Analysis

The travel conditions along selected routes in Tendring have been examined to understand the level of existing congestion and the scale of change between the Reference Case and Base year models. The selected routes, which were identified by considering the location of preferred site allocations and local knowledge, are summarised in Figure 3-7 below.

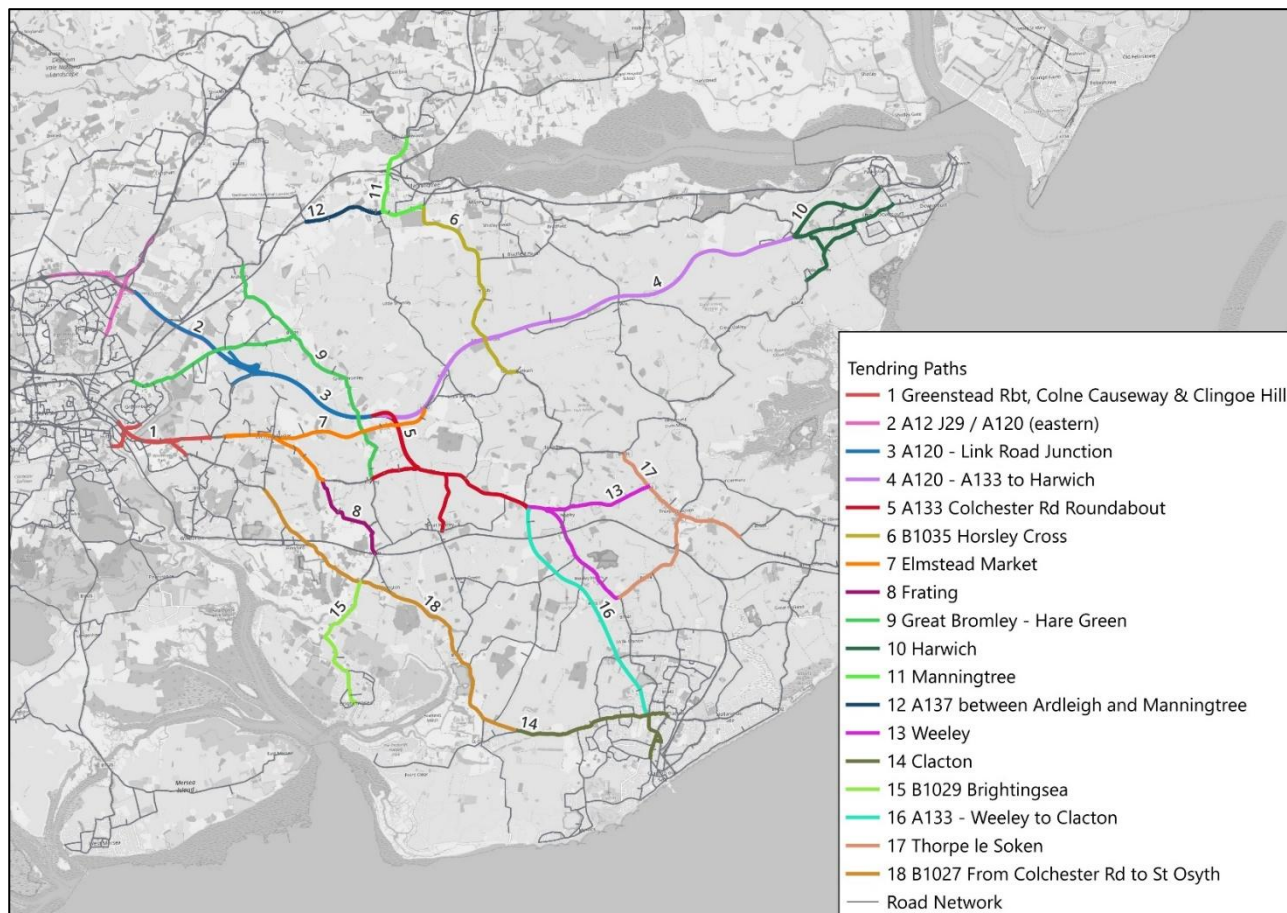


Figure 3-7: Tabular Analysis Routes

A movement indicator (I) was calculated for each route for each scenario and time period. This movement indicator was based on the relative queue (q), speed ratio (s) and ratio of actual flow compared to demand flow (d) as per the formula below:

$$I = \left(\frac{1+q}{s} \right)^d$$

The movement indicators range from 1 to 15 as shown in Table 3-1 below.

Table 3-1: Tabular Analysis Movement Scale

Description	Movement Scale
More or less free-flow	1
	2
	3
Travelling slower	4
	5
	6
Moderate congestion	7
	8
	9
Substantial congestion	10
	11
	12
Extreme congestion	13
	14
	15

In subsequent reporting where the impact of the Spatial Options is analysed, the movement scale will be used to understand the acceptability of change. However, for the purpose of this report, the movement indicators for the Reference Case and Base year models will be compared to establish the plausibility of the Reference Case models and understand the level of existing congestion.

Table 3-2: Reference Case (2042) vs Base Year (2023) – Tabular Analysis – AM and PM

Sector	Route	AM Peak		PM Peak	
		2023 Base	2042 RC	2023 Base	2042 RC
East Colchester	Greenstead Roundabout, Colne Causeway & Clingoe Hill	10	8	12	8
	A12 J29 / A120 (eastern)	7	9	7	9
North Tending	A120 - Link Road Junction	3	5	2	4
	A120 - A133 to Harwich	3	4	2	3
	A133 Colchester Rd Roundabout	9	10	9	10
	B1035 Horsley Cross	2	3	2	3
	Elmstead Market	3	4	3	3
	Frating	2	3	1	1
	Great Bromley - Hare Green	3	4	3	5
	Harwich	3	3	2	3
	Manningtree	8	9	9	9
	A137 - Between Ardleigh and Manningtree	4	5	4	5
South Tending	Weeley	2	2	2	2
	Clacton	4	4	4	5
	B1029 Brightingsea	3	4	3	4
	A133 Weeley - Clacton	4	5	4	5
	Thorpe le Soken	2	3	2	3
	B1027 From Colchester Rd to St Osyth	3	4	3	4
Overall assessment combining all areas		5	6	5	6

The tabular analysis shows that there is generally a slight increase in the movement indicators in the Reference Case models compared to the Base year, which is to be expected due to the increase in demand.

In the Reference Case models the A133 Colchester Rd Roundabout is the worst performing route, with a movement indicator of 10 ("Substantial congestion") in both the AM and PM time periods, however this is only a slight worsening compared to the Base year.

In East Colchester the A12 J29 / A120 (eastern) and increases from 7 to 9 in both time periods, which is due to the increased congestion at junction 29. The route through Manningtree also experiences "Moderate congestion", however this is more or less unchanged compared to the Base year.

The Greenstead Roundabout, Colne Causeway & Clingoe Hill route reduces to 8 in the Reference Case because of the improvement scheme at Greenstead Roundabout.

3.6 SRN Junctions

The traffic flows and queue lengths on the Strategic Road Network (SRN), including data for all SRN slip roads and any nearby links that could affect the SRN, have been presented in Appendix D. In subsequent reporting where the impact of the Spatial Options is analysed, this data will be used to understand the impact of the planned growth on the SRN. However, for the purpose of this report, the results will be compared to establish the plausibility of the Reference Case models and understand the level of existing congestion.

The figures in Appendix D show a general increase in traffic flows in the 2042 Reference Case models compared to the 2023 Base year models.

In the Base year models there are negligible queues on the network, with only slight queuing shown at A12 junction 28 in the AM peak. In the Reference Case models there are more substantial queues at A12 junction 29 in the AM peak and A12 junction 28 in the PM peak, but these are generally contained within the slip roads and do not block back onto the mainline.

It should be noted that the A120/ A1331 link road and the A120/ link road between A120 and Ramsey Rd to the west of Harwich are included in the forecast networks only.

4. Summary and Conclusion

This report summarises the approach to developing the 2042 Reference Case models, which are the baseline against which the impact of preferred site allocations in Tendring will be assessed.

The report details the growth assumptions for Tendring, Colchester and Braintree, as well as the committed network schemes which have been included.

It presents and compares a range of model outputs for the 2023 Base year and 2042 Reference Case models, including flow differences, speed ratio changes, relative queue changes and tabular analysis along selected routes to establish the plausibility of the Reference Case models and understand the level of existing congestion.

The results show significant increases in traffic along the A120 to the west of the A1331 link road, as well as on the A12 in the Reference Case Models compared to the Base year. This is partly due to the introduction of the A1331 link road in the Reference Case, which causes traffic to re-route along the link road and via the A120 instead of through Colchester City Centre, and partly due to the increased demand arising from the Tendring and Colchester Garden Community (TCBGC). There are also increases in traffic flow through Manningtree and along strategic corridors in the district, for example the A133, the B1027 and the B1352.

The increased traffic flows result in a slight worsening of speed ratios in these areas in the Reference Case models compared to the Base year. However, aside from an increase in relative queue at junction 29 in the AM peak, there are generally negligible changes in queues throughout Tendring and on the Strategic Road Network. The SRN junction data shows that the additional queues at junction 29 are generally contained within the slip roads and do not block back onto the mainline.

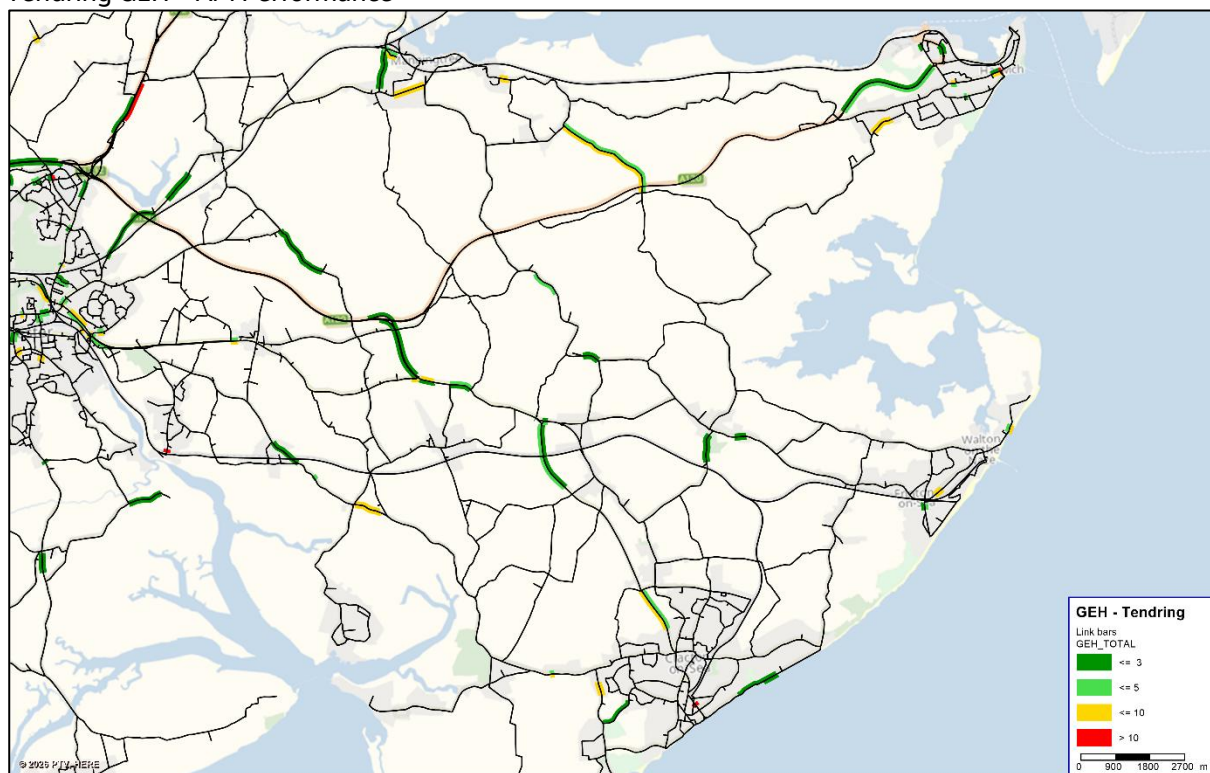
Appendix A. Base Year Model Validation

1. Summary of links with modelled flows meeting criteria in Tendring

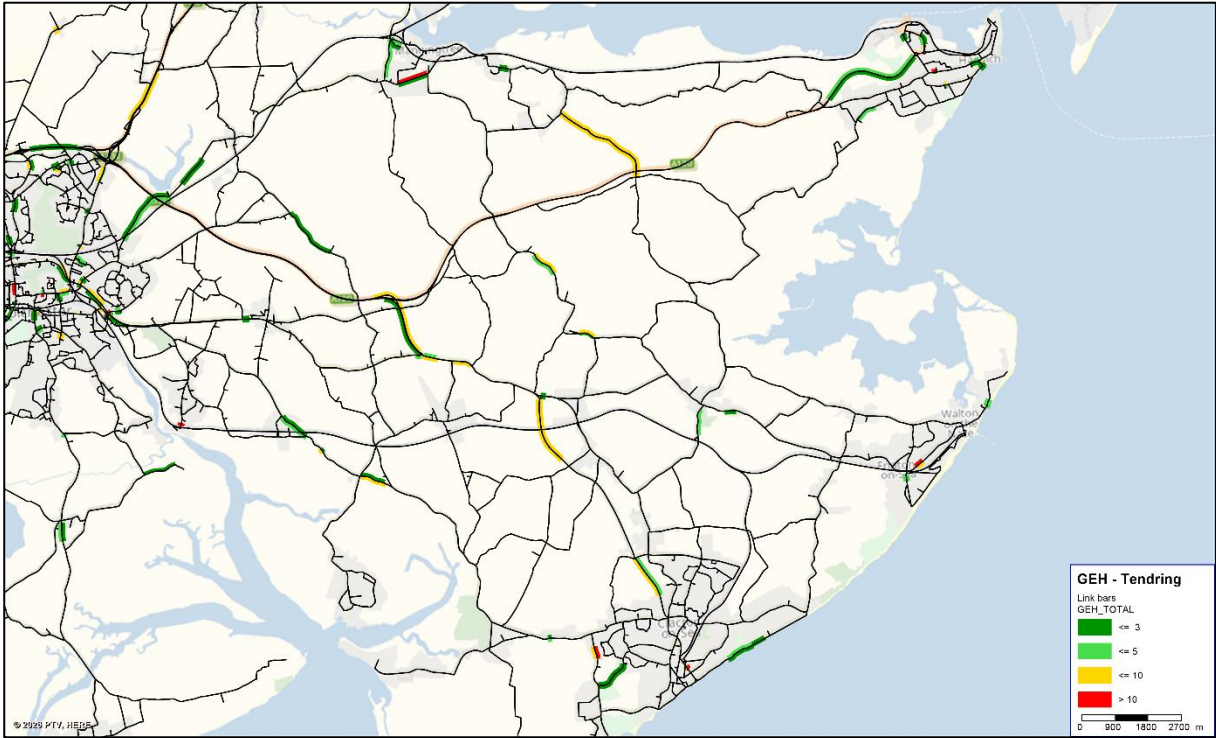
Measure	Peak Hour	No. of links with modelled flows meeting criteria				% of links with modelled flows meeting criteria			
		Cars	LGV	HGV	Total vehicles	Cars	LGV	HGV	Total vehicles
GEH	AM	35	36	42	56	80%	82%	95%	65%
	PM	31	35	39	58	70%	80%	89%	67%
DMRB	AM	37	43	44	63	84%	98%	100%	73%
	PM	35	44	44	65	80%	100%	100%	76%
Either Criteria	AM	37	43	44	67	84%	98%	100%	78%
	PM	38	44	44	66	86%	100%	100%	77%

2. GEH Performance in the AM and PM time periods

Tendring GEH – AM Performance



Tendring GEH – PM Performance



Appendix B. Tendring 2042 Uncertainty Log

Name	Model Zone	MSOA	Development Type	Dwl	Jobs
Hartley Gardens	315	Tendring 013	Housing	1700	0
Oakwood Park (Phase 1)	319	Tendring 010	Housing	122	0
Oakwood Park (Phase 2)	319	Tendring 010	Housing	900	0
Rouses Farm	316	Tendring 013	Housing	950	0
Low Road	330	Tendring 004	Housing	300	0
Lawford Green, Bromley Road	1	Tendring 003	Housing	235	0
Thorpe Road (Land South Of)	328	Tendring 007	Housing	280	0
Bromley Road	25	Tendring 005	Housing	99	0
West of The Street	328	Tendring 007	Housing	98	0
R/o 59 & 61 London Road	328	Tendring 007	Housing	30	0
Frinton Road/Lifehouse Drive	327	Tendring 007	Housing	49	0
Brook Park West	315	Tendring 013	Housing	200	0
Sladbury's Lane	311	Tendring 014	Housing	132	0
St Helena Hospice, Tendring Centre	310	Tendring 016	Housing	10	0
3 Marine Parade East	310	Tendring 016	Housing	14	0

Preferred Options Local Plan Transport Evidence – Reference Case

Waterworks Drive	316	Tendring 013	Housing	0	0
82 Jaywick Lane	316	Tendring 013	Housing	13	0
23-27 Brooklands	302	Tendring 018	Housing	15	0
32-37 Brooklands	302	Tendring 018	Housing	13	0
School Road East	14	Tendring 005	Housing	52	0
Station Field	28	Tendring 009	Housing	125	0
Turpins Farm, Frinton	321	Tendring 008	Housing	231	0
Finches Park, Kirby Cross	322	Tendring 008	Housing	136	0
Station Yard/Avon Works	326	Tendring 006	Housing	40	0
High Street (27-31)	326	Tendring 006	Housing	10	0
Harwich Valley	329	Tendring 004	Housing	297	0
SATO Site, Valley Road	329	Tendring 004	Housing	42	0
Una Road (Land rear of)	331	Tendring 002	Housing	30	0
Land adjoining Harwich & Parkeston FC	332	Tendring 002	Housing	24	0
Cliff Hotel	333	Tendring 001	Housing	20	0
Long Road/Clacton Road	4	Tendring 003	Housing	484	0
Stourview Avenue	336	Tendring 003	Housing	72	0
Thorn Quay Warehouse	336	Tendring 003	Housing	0	0

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Adj Great Oakley Primary School	329	Tendring 004	Housing	0	0
TDC Council Offices	328	Tendring 007	Housing	24	0
21/01000/FUL - St Johns Plant Centre	304	Tendring 018	Housing	180	0
20/01130/FUL - Foots Farm	318	Tendring 010	Housing	122	0
16/00421/FUL - Chicken Farm, Thorpe Road	328	Tendring 007	Housing	80	0
16/01916/FUL - Coppins Court, Coppins Road	309	Tendring 016	Housing	60	0
19/01598/FUL - Crossways Garden Centre, Thorpe Road	328	Tendring 007	Housing	21	0
19/00917/OUT - South of Ramsey Road/East of Mayes Lane	329	Tendring 004	Housing	27	0
23/01511/FUL - Fronks Road	330	Tendring 004	Housing	14	0
11/00301/FUL - Ferndale Road	333	Tendring 001	Housing	13	0
17/01988/FUL - Kirby Road, Great Holland	324	Tendring 008	Housing	41	0
18/01994/OUT - 'River Reach', Harwich Road (Phase 2)	336	Tendring 003	Housing	81	0
23/00929/FUL - Honeycroft & 2 Waldegrave Way	1	Tendring 003	Housing	13	0
19/00188/FUL - Lower Farm, East End Green	301	Tendring 011	Housing	41	0
20/00239/FUL - Lanswood Park	12	Tendring 005	Housing	65	0
20/01797/FUL - Land to The East of Tye Road	254	Tendring 005	Housing	15	0
22/01818/FUL - Hartford Green	28	Tendring 009	Housing	154	0
21/02176/FUL - Land at Moorlands Farm	28	Tendring 009	Housing	26	0

Preferred Options Local Plan Transport Evidence – Reference Case

16/00427/OUT - 24 The Street	328	Tendring 007	Housing	10	0
11/00333/OUT - Wellwick Field	304	Tendring 018	Housing	190	0
21/01397/FUL - Land East of Henderson Drive	327	Tendring 007	Housing	28	0
20/00547/OUT - Hamilton Lodge, Great Bromley	7	Tendring 005	Housing	79	0
22/02076/FUL - Land North and South of A133 Clacton Road at Finches Lane Elmstead Essex CO7 7FD	12	Tendring 005	Housing	126	0
24/01384/OUT - Colchester Institute The Clacton Campus Church Road Clacton On Sea Essex CO15 6JQ	310	Tendring 016	Housing	60	0
23/01221/OUT - Land to The rear of 173 - 203 Thorpe Road Kirby Cross Essex CO13 0NH	324	Tendring 008	Housing	20	0
Carless Extension, Harwich 1	331	Tendring 002	Employment, B1	0	19
Carless Extension, Harwich 2	331	Tendring 002	Employment, B2	0	25
Carless Extension, Harwich 3	331	Tendring 002	Employment, B8	0	13
Hartley Gardens, Clacton Gateway 1	314	Tendring 012	Employment, A1	0	25
Hartley Gardens, Clacton Gateway 2	314	Tendring 012	Employment, A3	0	2
Hartley Gardens, Clacton Gateway 3	314	Tendring 012	Employment, D2	0	2
Stanton Europark 1	331	Tendring 002	Employment, C1	0	6
Stanton Europark 2	331	Tendring 002	Employment, A3	0	9
Stanton Europark 3	331	Tendring 002	Employment, B2	0	24
Stanton Europark (Northern Site)	331	Tendring 002	Employment, B8	0	36

Preferred Options Local Plan Transport Evidence – Reference Case

Land South of Long Road, Mistley 1	2	Tendring 003	Employment, B1	0	16
Land South of Long Road, Mistley 2	2	Tendring 003	Employment, B2	0	21
Land South of Long Road, Mistley 3	2	Tendring 003	Employment, B8	0	11
Oakwood Extension ('Dalau Site') 1	314	Tendring 012	Employment, B1	0	20
Oakwood Extension ('Dalau Site') 2	314	Tendring 012	Employment, B2	0	26
Oakwood Extension ('Dalau Site') 3	314	Tendring 012	Employment, B8	0	13
Mercedes Site, Bathside Bay 1	331	Tendring 002	Employment, B1	0	60
Mercedes Site, Bathside Bay 2	331	Tendring 002	Employment, B2	0	78
Mercedes Site, Bathside Bay 3	331	Tendring 002	Employment, B8	0	40
Pond Hall Farm, Harwich 1	331	Tendring 002	Employment, B2	0	99
Pond Hall Farm, Harwich 2	331	Tendring 002	Employment, B8	0	51
Landswoodpark, Elmstead Market 1	15	Tendring 005	Employment, B1a/b	0	30
Landswoodpark, Elmstead Market 1 (MGA)	15	Tendring 005	Employment, D1	0	5
Land south of Thorpe Road, Weeley 1	327	Tendring 007	Employment, B1	0	14
TCBGC - housing	20	Tendring 005	Housing	2,960	0
TCBGC - housing	22	Tendring 005	Housing	0	0
TCBGC - housing	25	Tendring 005	Housing	1,040	0
TCBGC - employment	159	Colchester 017	Employment, B1	0	1,055

Preferred Options Local Plan Transport Evidence – Reference Case

TCBGC - employment	159	Colchester 018	Employment, B2	0	156
Extension to Gorse Lane, Clacton	319	Tendring 010	Employment, B1a/b	0	35
Extension to Gorse Lane, Clacton	319	Tendring 010	Employment, B1	0	9
Extension to Gorse Lane, Clacton	319	Tendring 010	Employment, B1	0	9
Extension to Gorse Lane, Clacton	319	Tendring 010	Employment, B2	0	35
Extension to Gorse Lane, Clacton	319	Tendring 010	Employment, B8	0	18
Crown Business Centre (phase 1), Ardleigh	27	Tendring 005	Employment , B1a/b	0	17
Crown Business Centre (phase 1), Ardleigh	27	Tendring 005	Employment , B1	0	4
Crown Business Centre (phase 1), Ardleigh	27	Tendring 005	Employment , B1	0	4
Crown Business Centre (phase 1), Ardleigh	27	Tendring 005	Employment , B2	0	17
Crown Business Centre (phase 1), Ardleigh	27	Tendring 005	Employment , B8	0	9
Crown Business Centre (phase 2), Ardleigh	27	Tendring 005	Employment , B1a/b	0	2
Crown Business Centre (phase 2), Ardleigh	27	Tendring 005	Employment , B1	0	1
Crown Business Centre (phase 2), Ardleigh	27	Tendring 005	Employment , B1	0	1
Crown Business Centre (phase 2), Ardleigh	27	Tendring 005	Employment , B2	0	2
Crown Business Centre (phase 2), Ardleigh	27	Tendring 005	Employment , B8	0	1
21/00871/FUL_The Sunspot	302	Tendring 018	Employment , B1a/b	0	13
18/00930/FUL_Green Farm	6	Tendring 003	Employment , B8	0	2

Preferred Options Local Plan Transport Evidence – Reference Case

21/00486/FUL_Gorse Ln Industrial Estate	319	Tendring 010	Employment , B1	0	3
21/00186/FUL_Crossways Centre	7	Tendring 005	Employment , B8	0	4
20/00704/FUL_Badley Hall	24	Tendring 005	Employment , B8	0	1
20/00704/FUL_Badley Hall	24	Tendring 005	Employment , B1a/b	0	12
20/00704/FUL_Badley Hall	24	Tendring 005	Employment , B1	0	1
19/01140/DETAIL_Hills Building Group	12	Tendring 005	Employment , B1a/b	0	7
18/00824/FUL_	5	Tendring 003	Employment , B8	0	1
21/00712/FUL_Gorse Ln Industrial Estate	319	Tendring 010	Employment , B1a/b	0	5
19/00544/FUL_Allens Farm	254	Tendring 005	Employment , B8	0	3
21/01982/FUL_Gorse Lane Industrial Estate	319	Tendring 010	Employment , B1a/b	0	39
21/01691/FUL_Telford Business Park	319	Tendring 010	Employment , B2	0	10
21/01691/FUL_Telford Business Park	319	Tendring 010	Employment , B8	0	5
21/01691/FUL_Telford Business Park	319	Tendring 010	Employment , B1a/b	0	10
21/01691/FUL_Telford Business Park	319	Tendring 010	Employment , B1	0	3
21/01691/FUL_Telford Business Park	319	Tendring 010	Employment , B1	0	3
23/01699/OUT_	28	Tendring 009	Employment , B2	0	32
23/01699/OUT_	28	Tendring 009	Employment , B1a/b	0	41
21/01523/FUL_Brand Art	5	Tendring 003	Employment , B1	0	13

Preferred Options Local Plan Transport Evidence – Reference Case

22/01782/FUL_Allens Farm	7	Tendring 005	Employment , B8	0	3
20/00594/FUL_Surya Foods	27	Tendring 005	Employment , B8	0	52
20/01783/FUL_Systematic Business Park	27	Tendring 005	Employment , B1a/b	0	25
19/01939/OUT_Land at Crown Quarry	27	Tendring 005	Employment ,	0	0
22/01042/DETAIL_Horsley Cross	6	Tendring 003	Employment , B2	0	39
22/01042/DETAIL_Horsley Cross	6	Tendring 003	Employment , B8	0	20
22/01042/DETAIL_Horsley Cross	6	Tendring 003	Employment , B1a/b	0	39
22/01042/DETAIL_Horsley Cross	6	Tendring 003	Employment , B1	0	10
22/01042/DETAIL_Horsley Cross	6	Tendring 003	Employment , B1	0	10
22/01047/FUL_Horsley Cross	6	Tendring 003	Employment , B2	0	31
22/01047/FUL_Horsley Cross	6	Tendring 003	Employment , B8	0	16
21/01240/FUL_Stanton Europark	332	Tendring 002	Employment , B2	0	16
21/01240/FUL_Stanton Europark	332	Tendring 002	Employment , B8	0	8
19/00432/DETAIL_Hills Building Group	12	Tendring 005	Employment , B1a/b	0	10
20/01393/FUL_Pump Farm	5	Tendring 003	Employment , B8	0	1
21/00582/FUL_Pond Barns	7	Tendring 005	Employment , B8	0	1
19/00282/FUL_Pump Farm	5	Tendring 003	Employment , B8	0	1
19/00282/FUL_Pump Farm	5	Tendring 003	Employment , B1a/b	0	2

Preferred Options Local Plan Transport Evidence – Reference Case

20/01288/FUL_Gorse Lane Industrial Estate	319	Tendring 010	Employment , B8	0	1
23/01295/FUL_Martells Industrial Estate	24	Tendring 005	Employment , B1	0	3
22/00121/FUL_DTE Scaffolding	27	Tendring 005	Employment , B2	0	1
22/00121/FUL_DTE Scaffolding	27	Tendring 005	Employment , B8	0	0
22/00121/FUL_DTE Scaffolding	27	Tendring 005	Employment , B1a/b	0	1
22/00121/FUL_DTE Scaffolding	27	Tendring 005	Employment , B1	0	0
22/00121/FUL_DTE Scaffolding	27	Tendring 005	Employment , B1	0	0
22/00468/FUL_Kellys Farm	6	Tendring 003	Employment , B8	0	7
24/00667/FUL_Gorse Lane Industrial Estate	319	Tendring 010	Employment , B8	0	0
24/01075/FUL_Philip Liverton Ltd	27	Tendring 005	Employment , B1	0	2
24/01121/FUL_Plough Road Centre	36	Tendring 009	Employment , B8	0	0
24/01121/FUL_Plough Road Centre	36	Tendring 009	Employment , B1a/b	0	1
24/01121/FUL_Plough Road Centre	36	Tendring 009	Employment , B1	0	0
24/01121/FUL_Plough Road Centre	36	Tendring 009	Employment , B1	0	0
24/01121/FUL_Plough Road Centre	36	Tendring 009	Employment , B1	0	1
24/01189/FUL_Land North West of The Ranch	257	Tendring 005	Employment , B1	0	1
24/01332/FUL_Red House Farm	5	Tendring 003	Employment , B2	0	0
21/00197/DETAIL_	4	Tendring 003	Employment ,	0	0

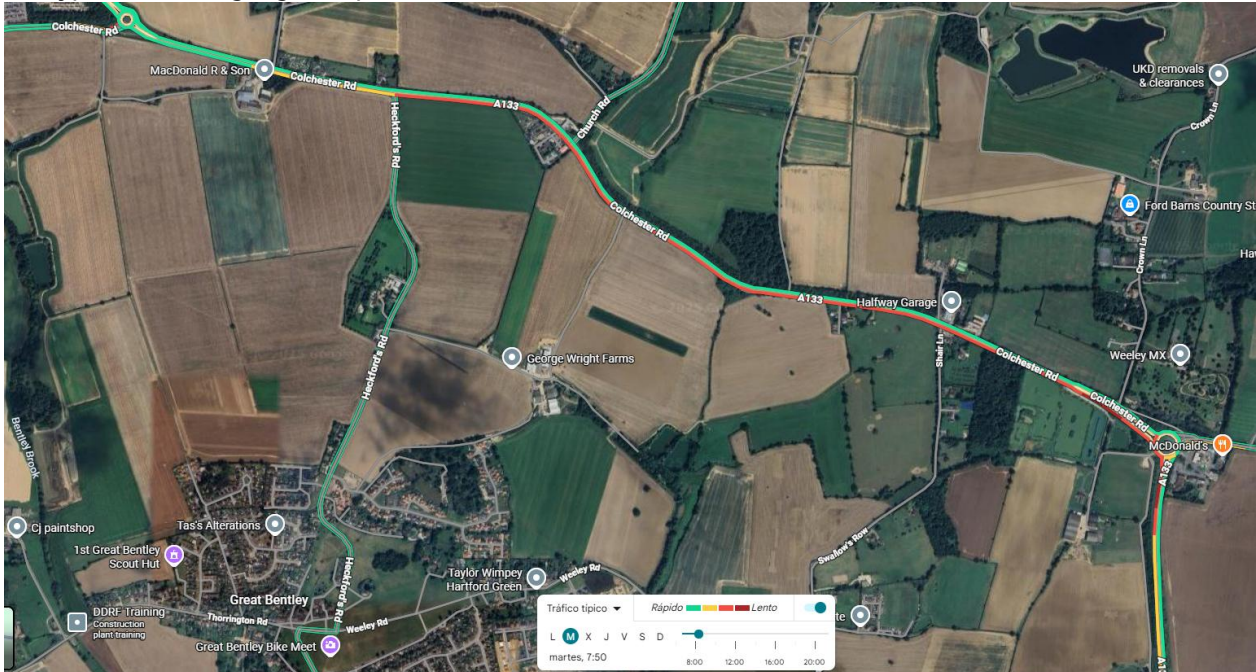
Preferred Options Local Plan Transport Evidence – Reference Case

22/00979/DETAIL_	328	Tendring 007	Employment , B1a/b	0	12
22/00979/DETAIL_	328	Tendring 007	Employment , B1	0	3
22/00979/DETAIL_	328	Tendring 007	Employment , B1	0	3
23/01594/FUL_Bathside Bay	333	Tendring 001	Employment , B8	0	0

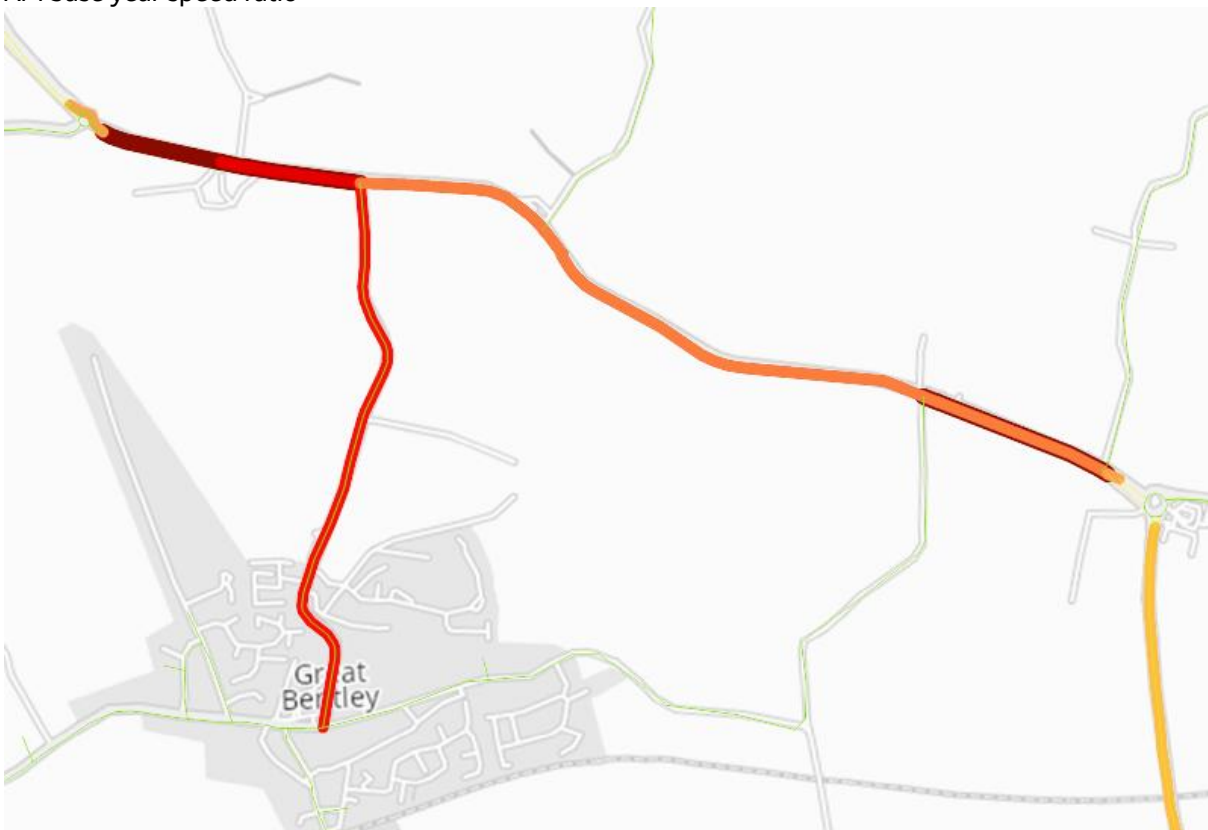
Appendix C. Base Year Speed Ratios vs Google Maps Traffic

Frating roundabout – Colchester Rd/Heckford's Rd

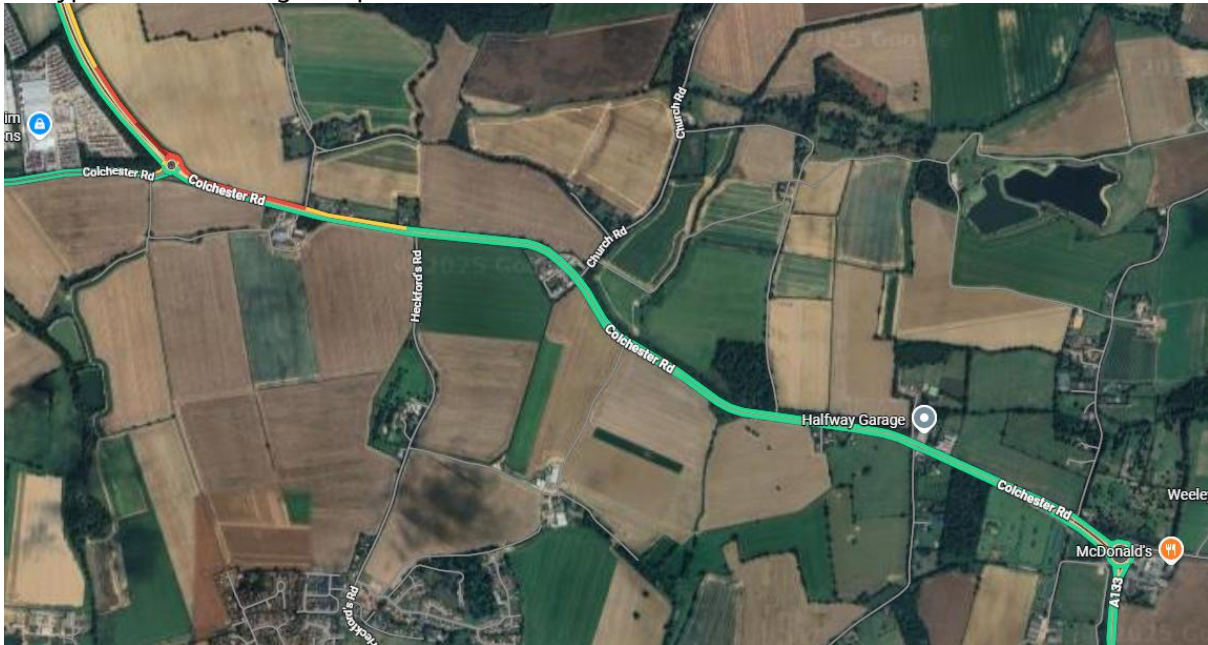
AM typical traffic – google maps



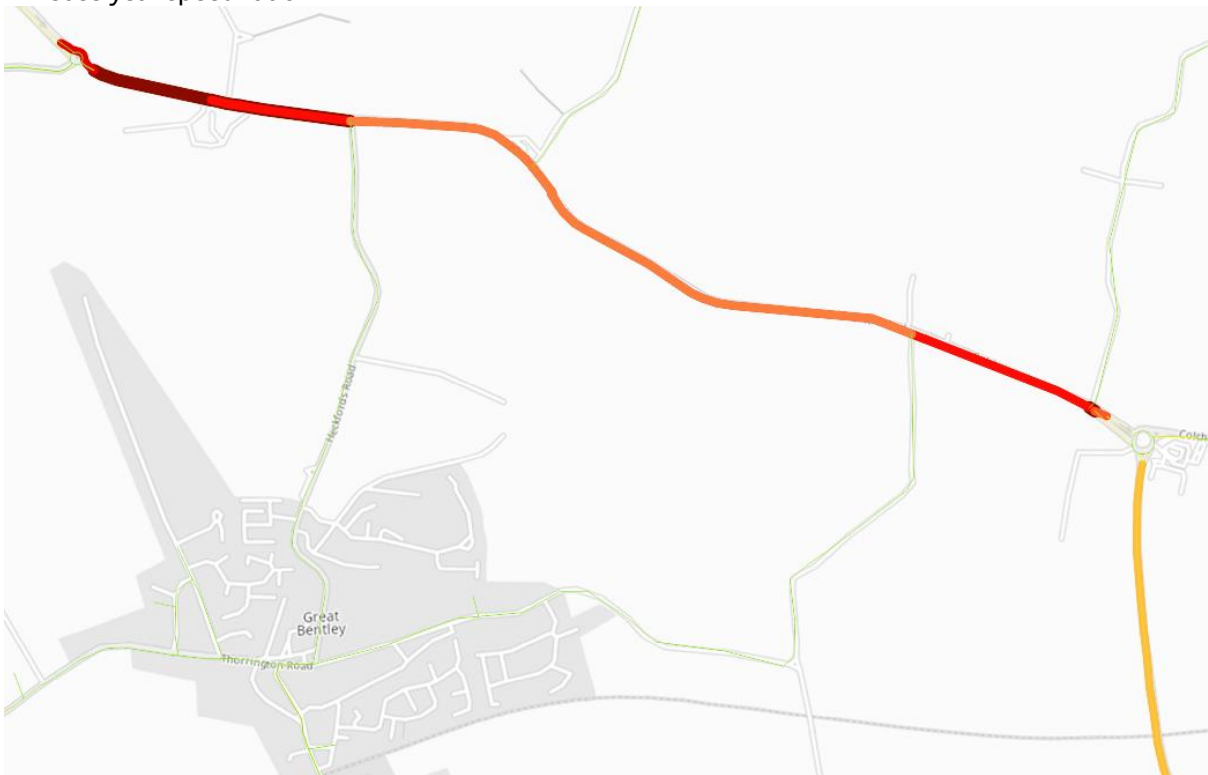
AM base year speed ratio



PM typical traffic – Google maps

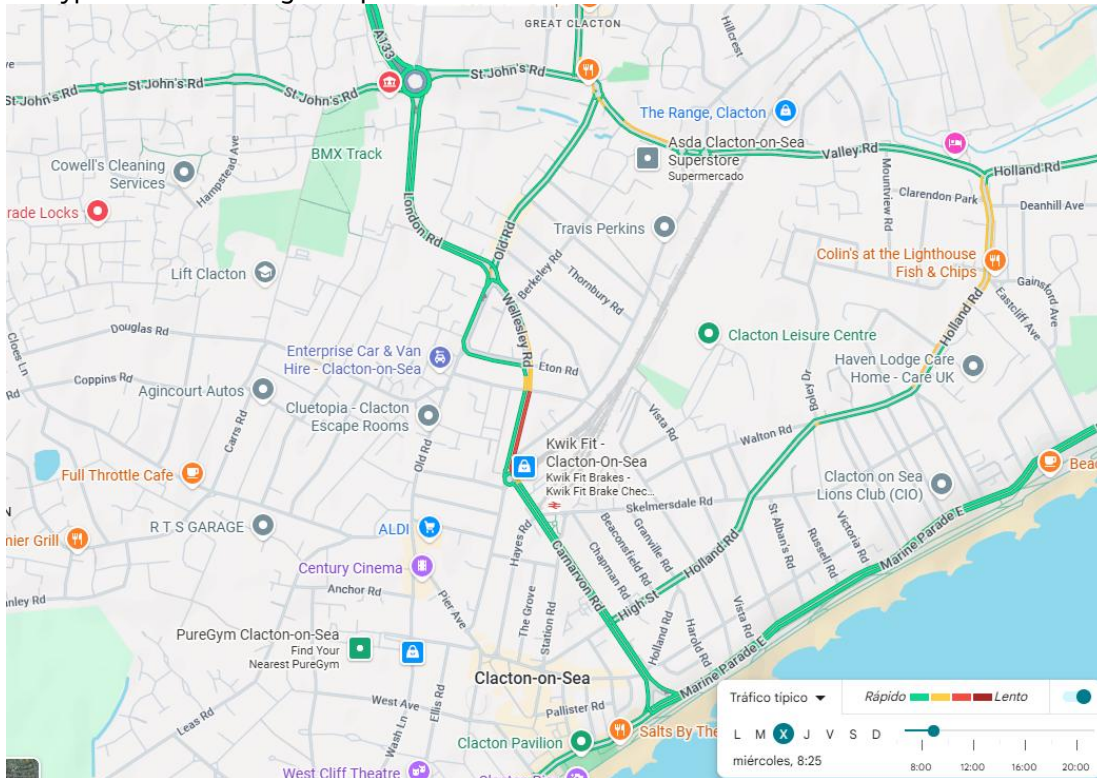


PM base year speed ratio

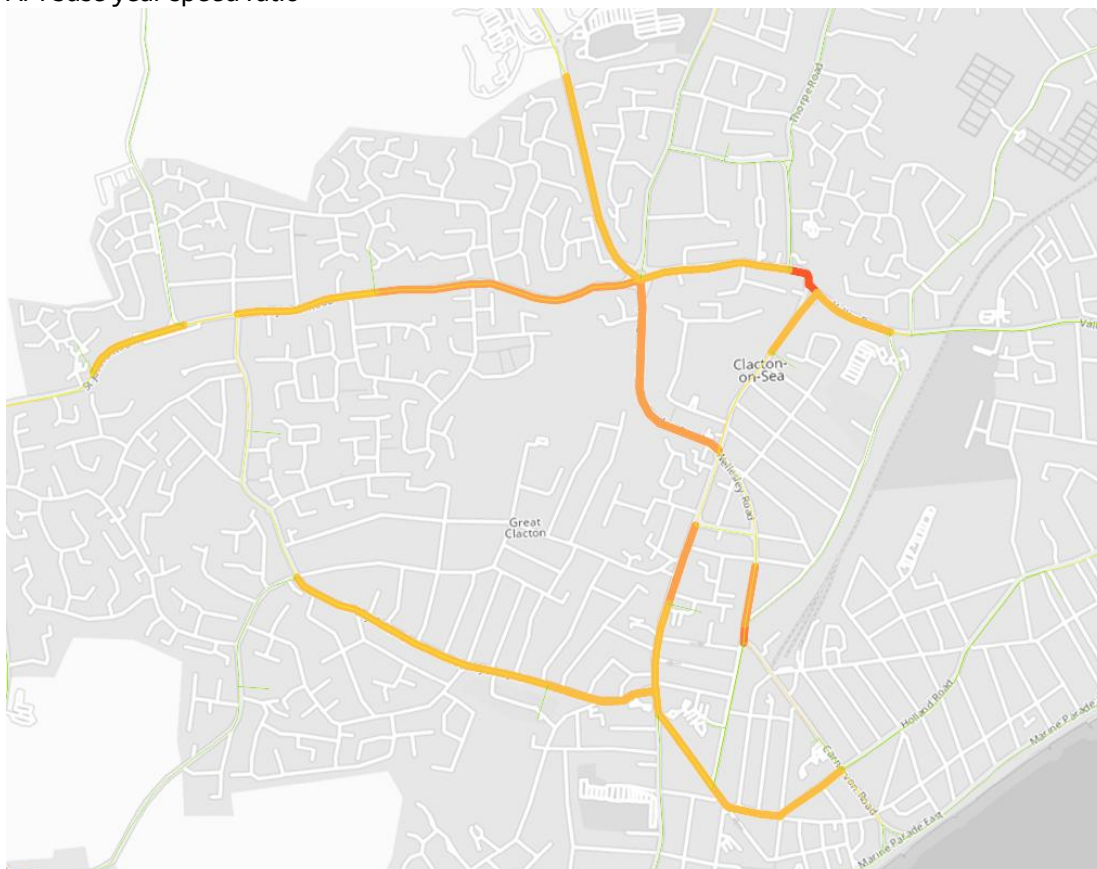


Clacton Town Centre

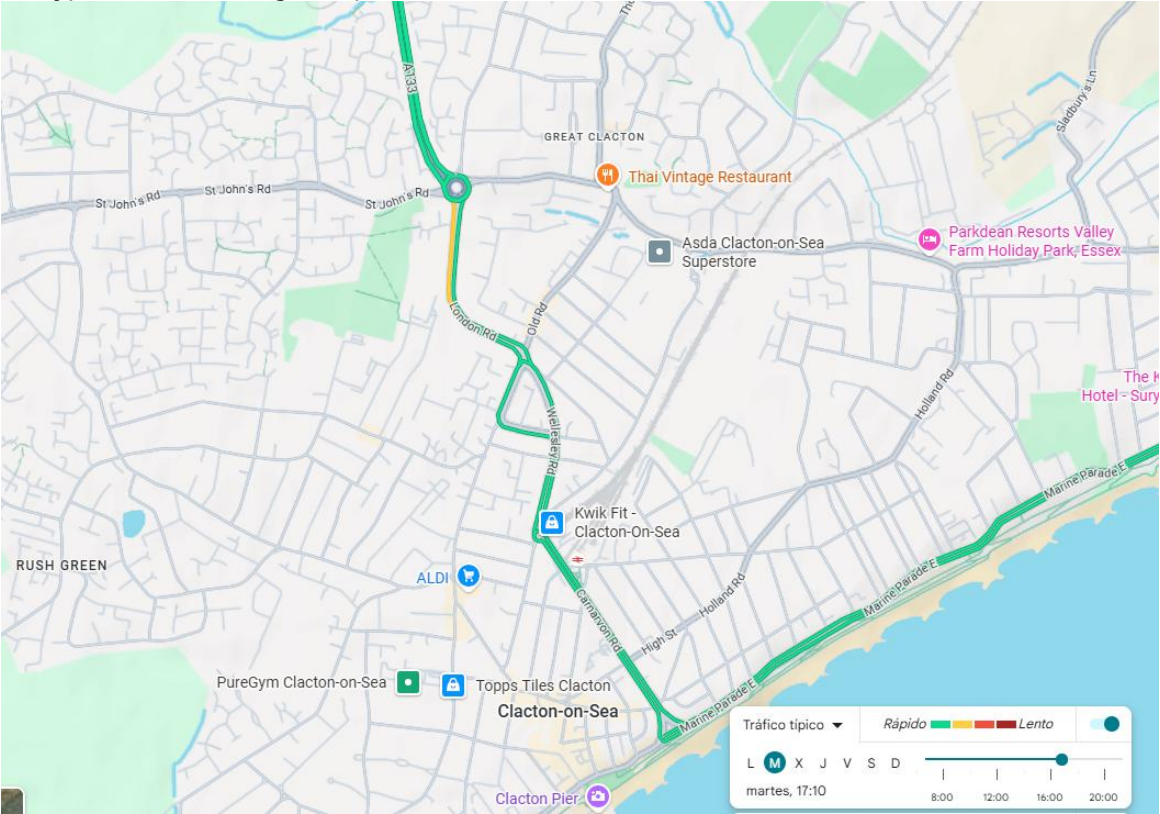
AM typical traffic – Google maps



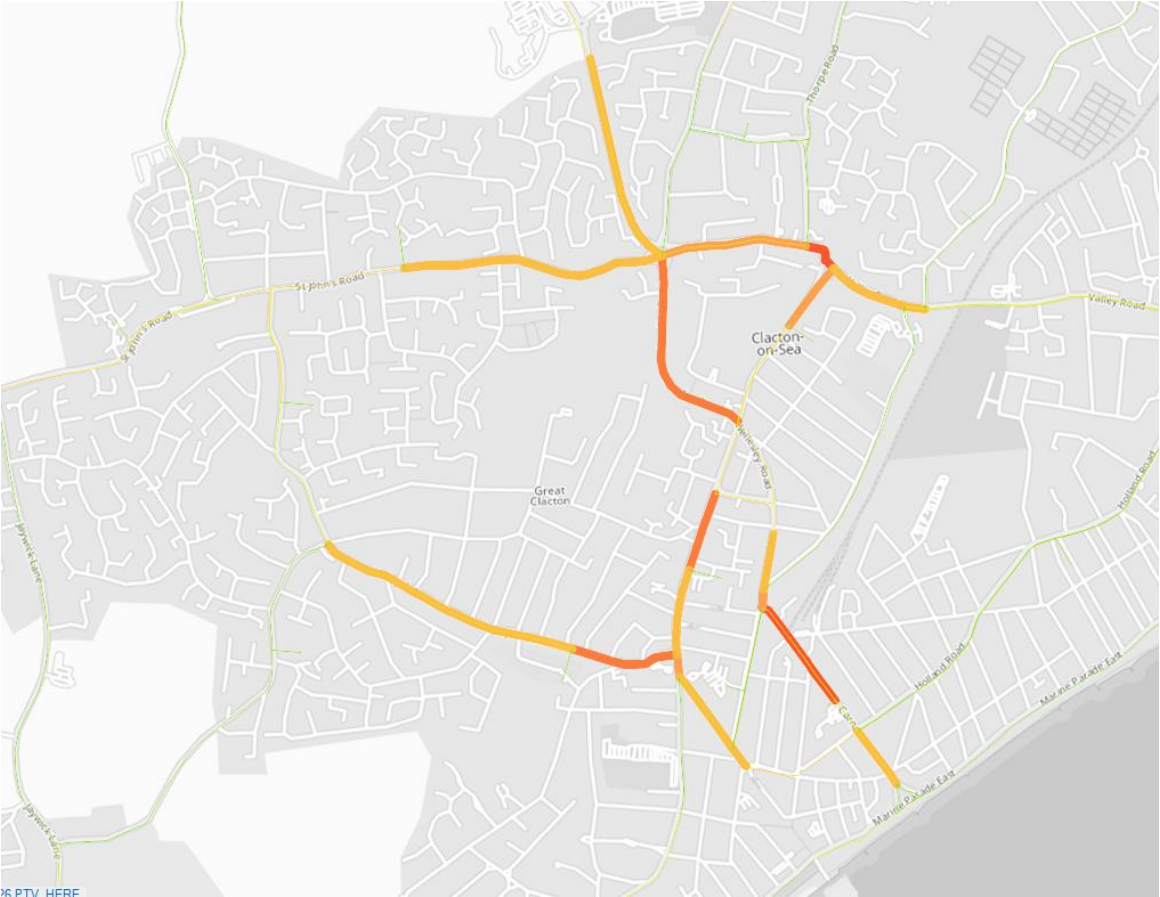
AM base year speed ratio



PM typical traffic – Google maps

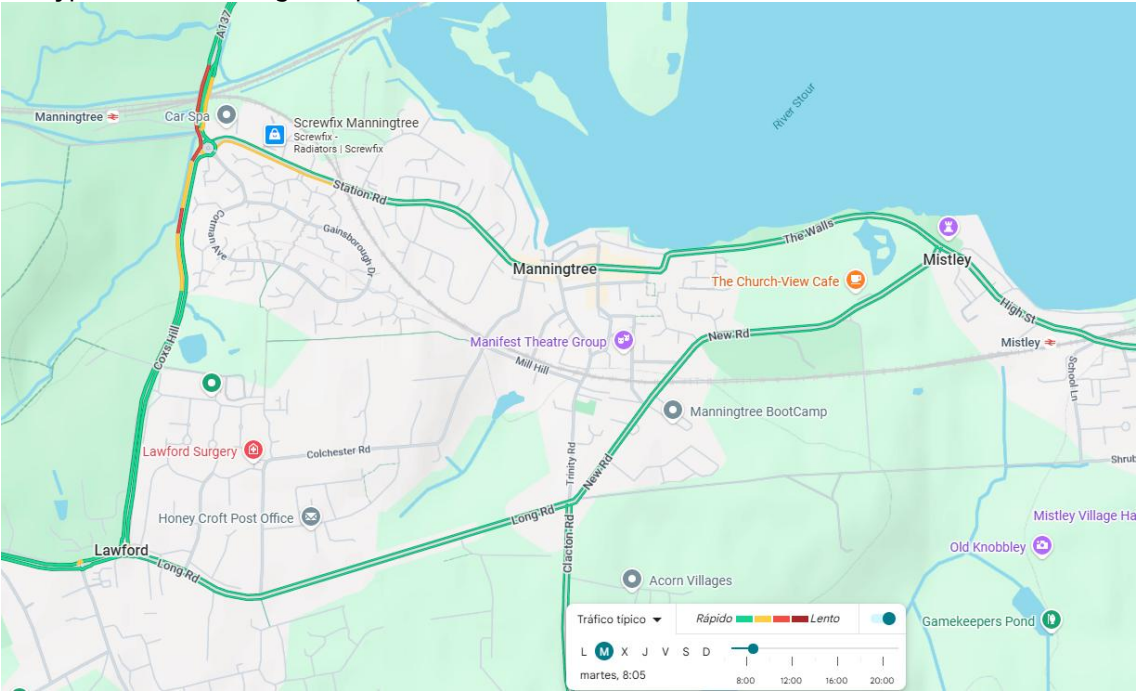


PM base year speed ratio

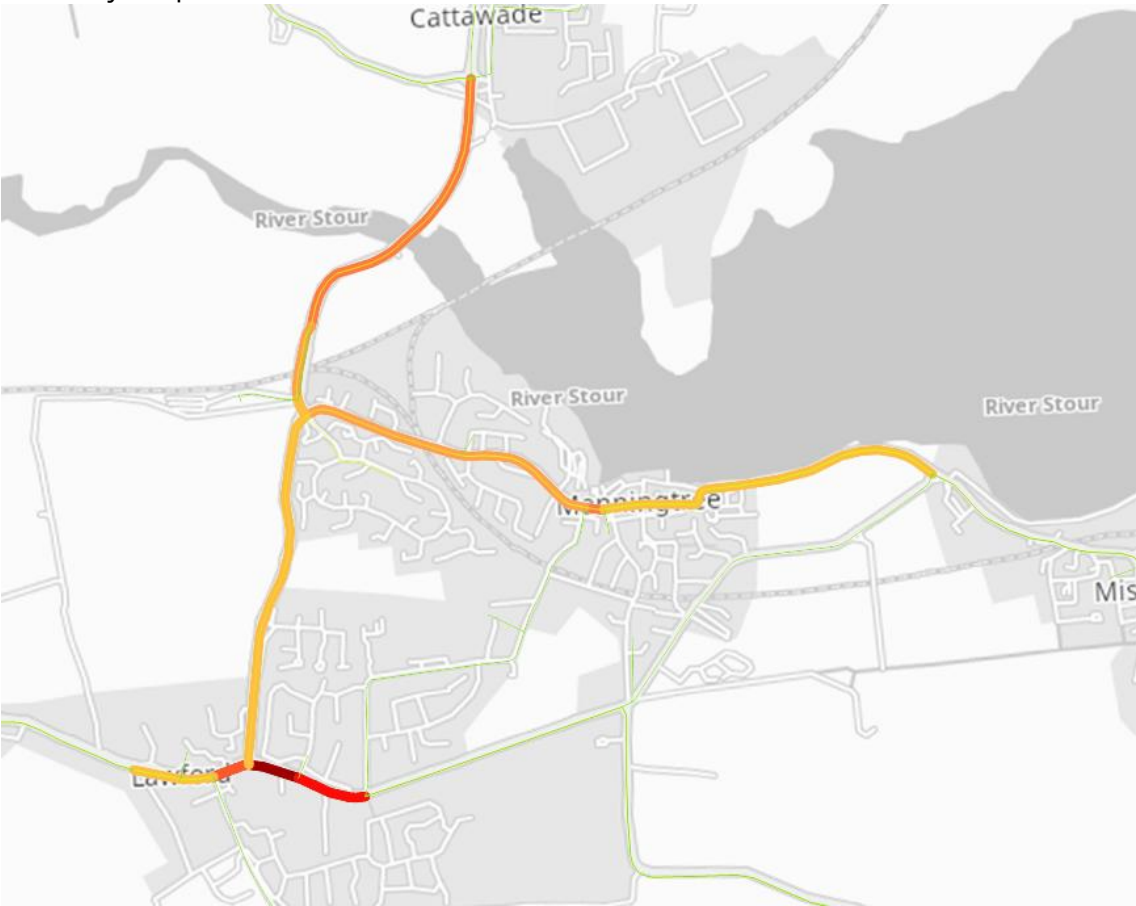


Manningtree Town Centre

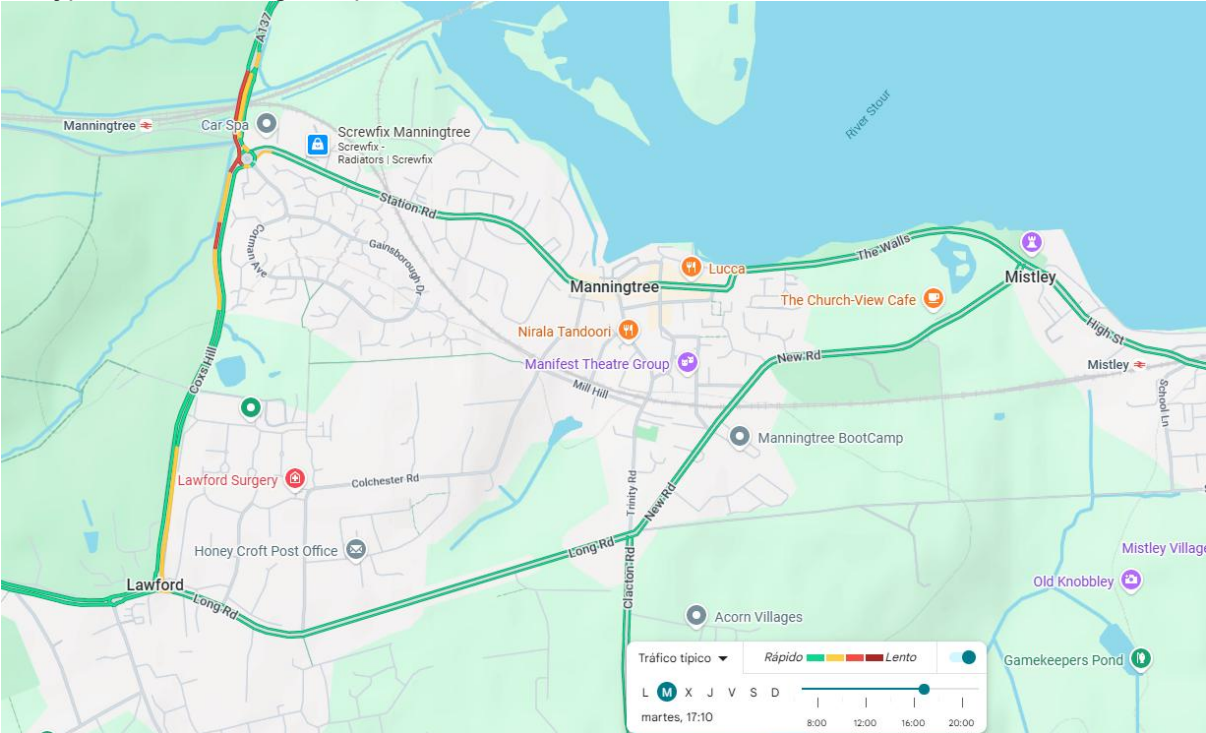
AM typical traffic – Google maps



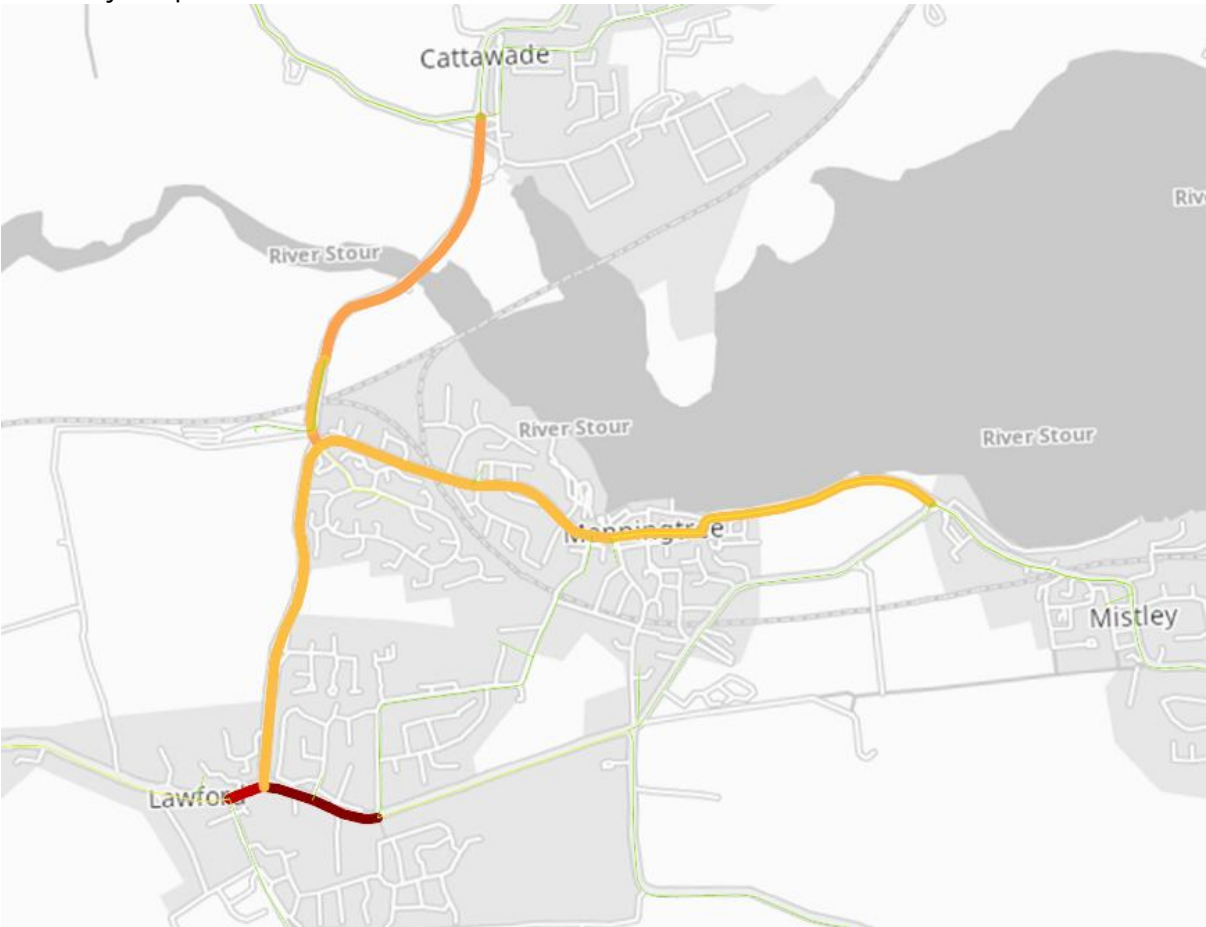
AM base year speed ratio



PM typical traffic – Google maps

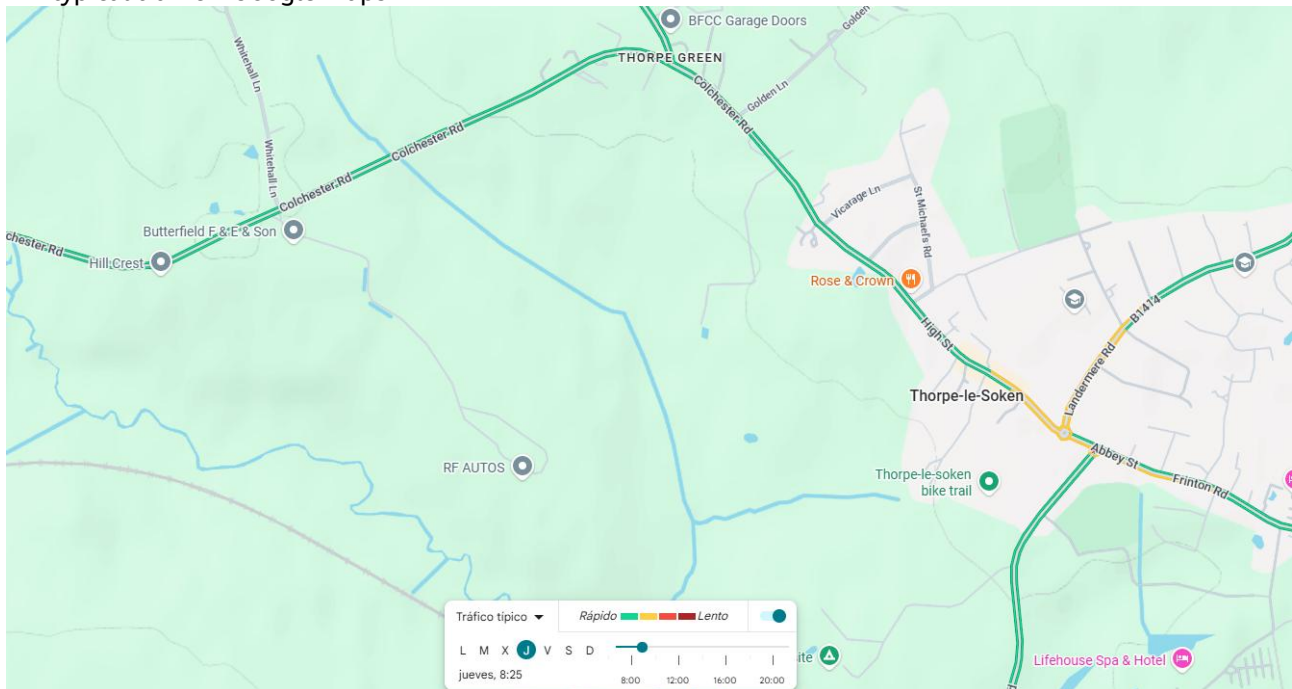


PM base year speed ratio

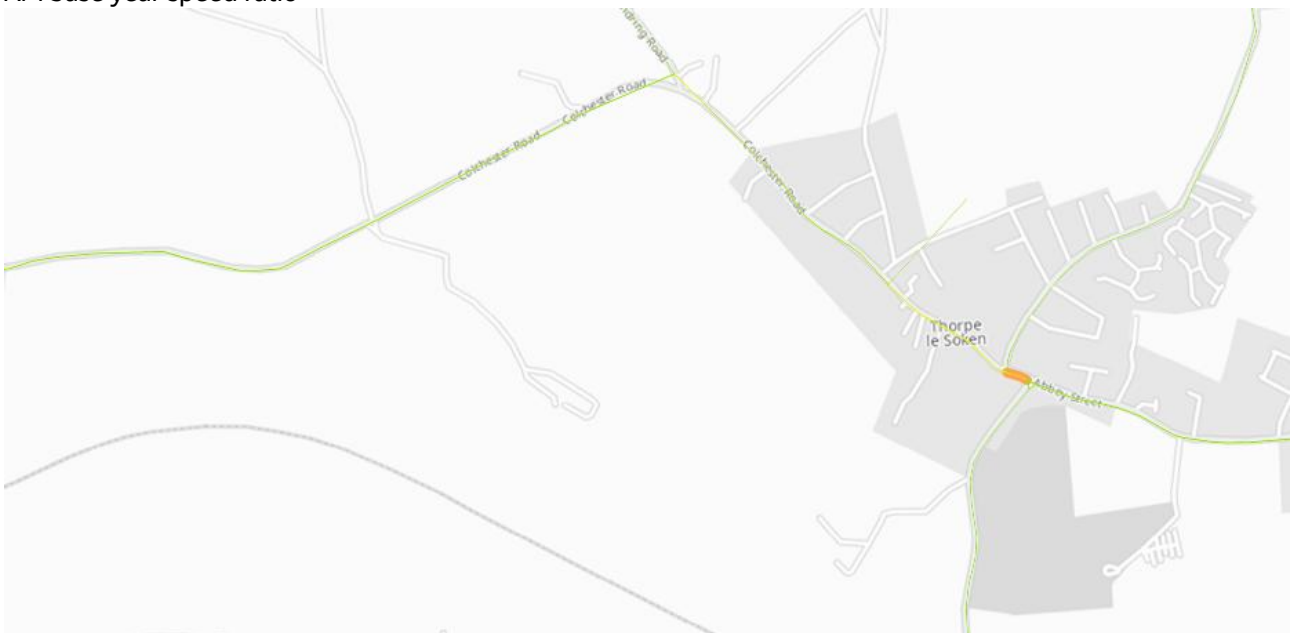


Thorpe-le-Soken and B1033

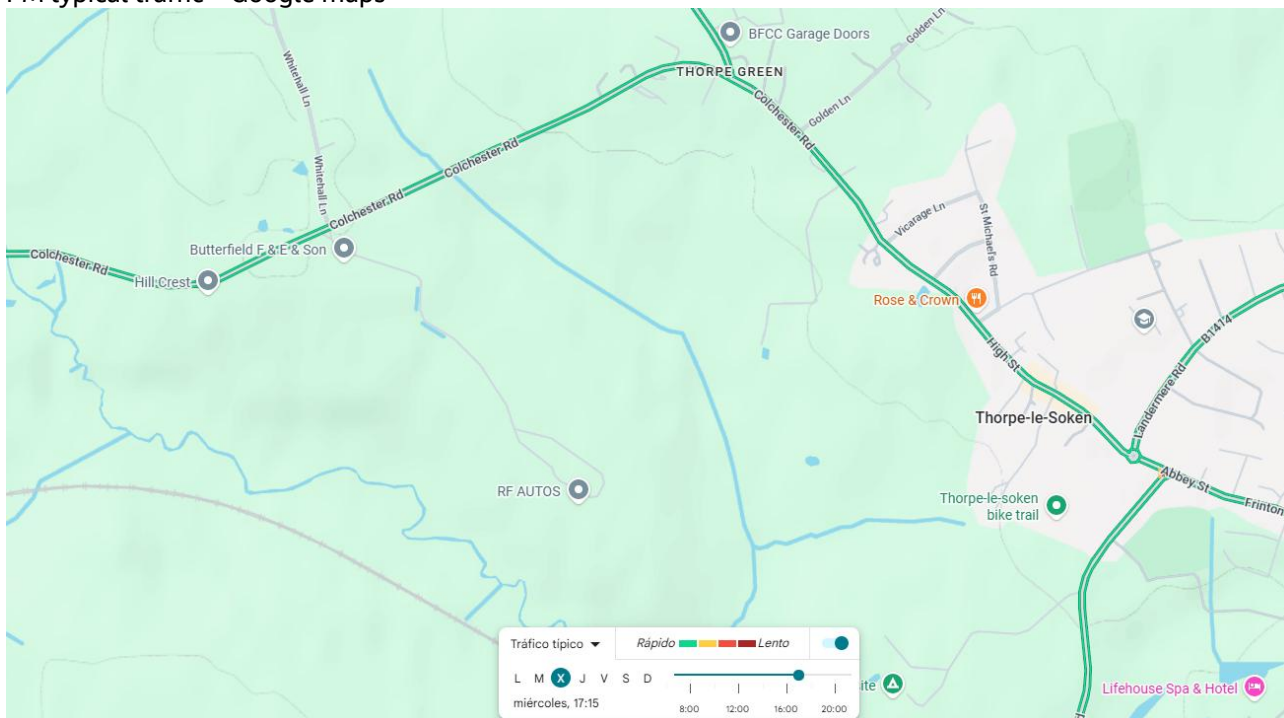
AM typical traffic – Google maps



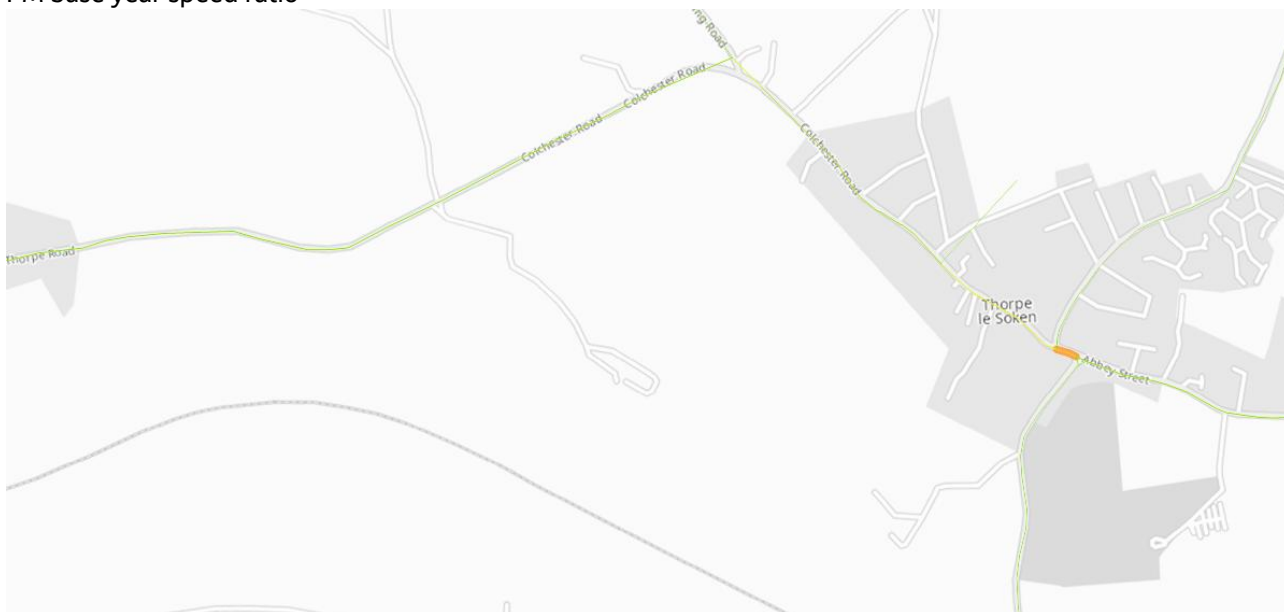
AM base year speed ratio



PM typical traffic – Google maps

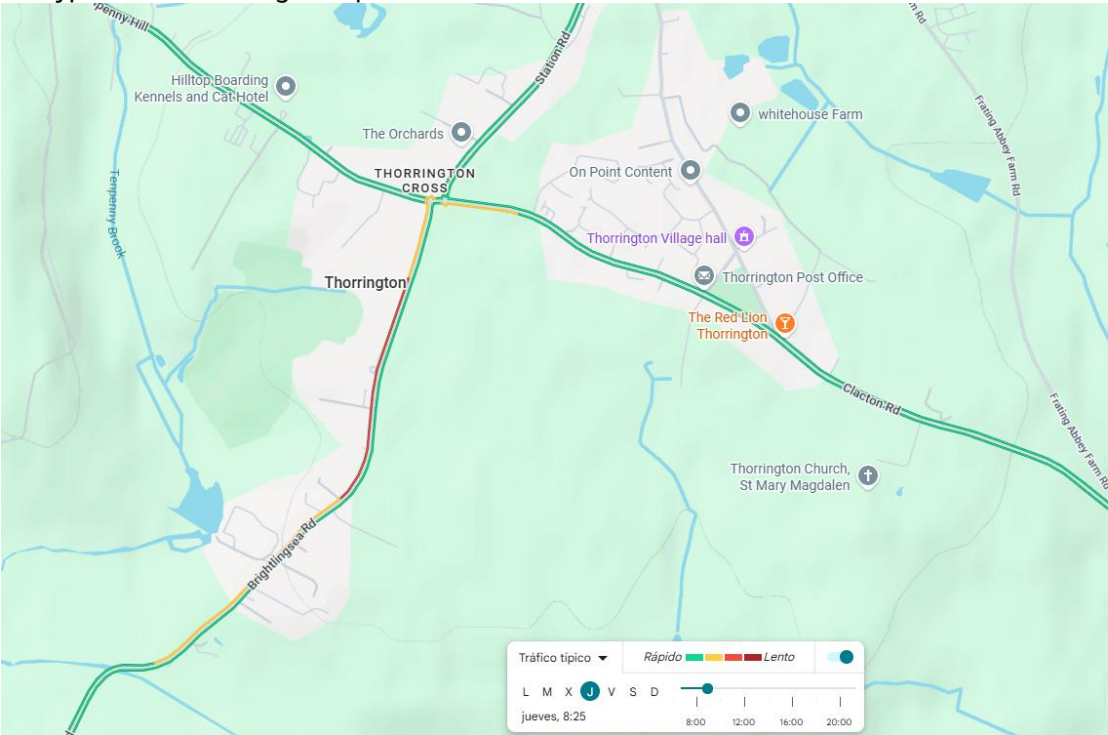


PM base year speed ratio

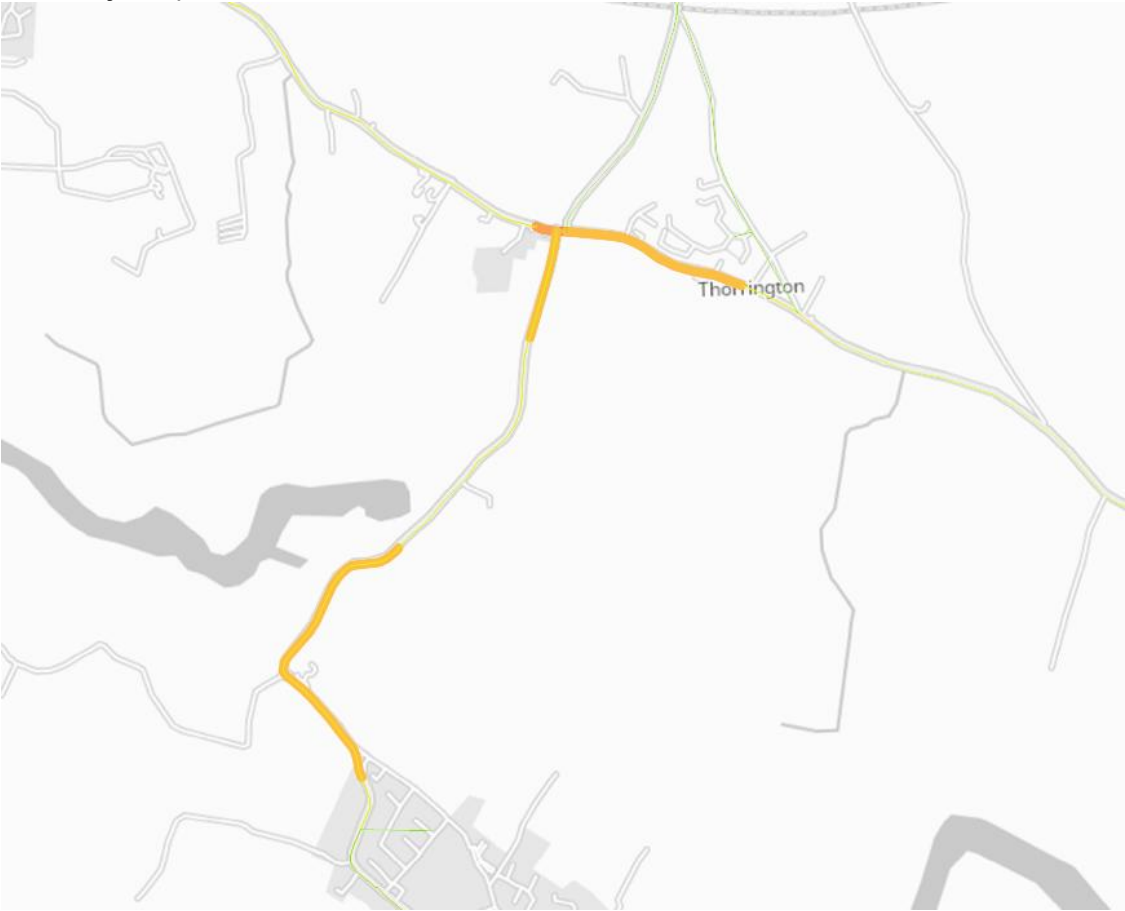


B1029 Thorrington - Brightlingsea

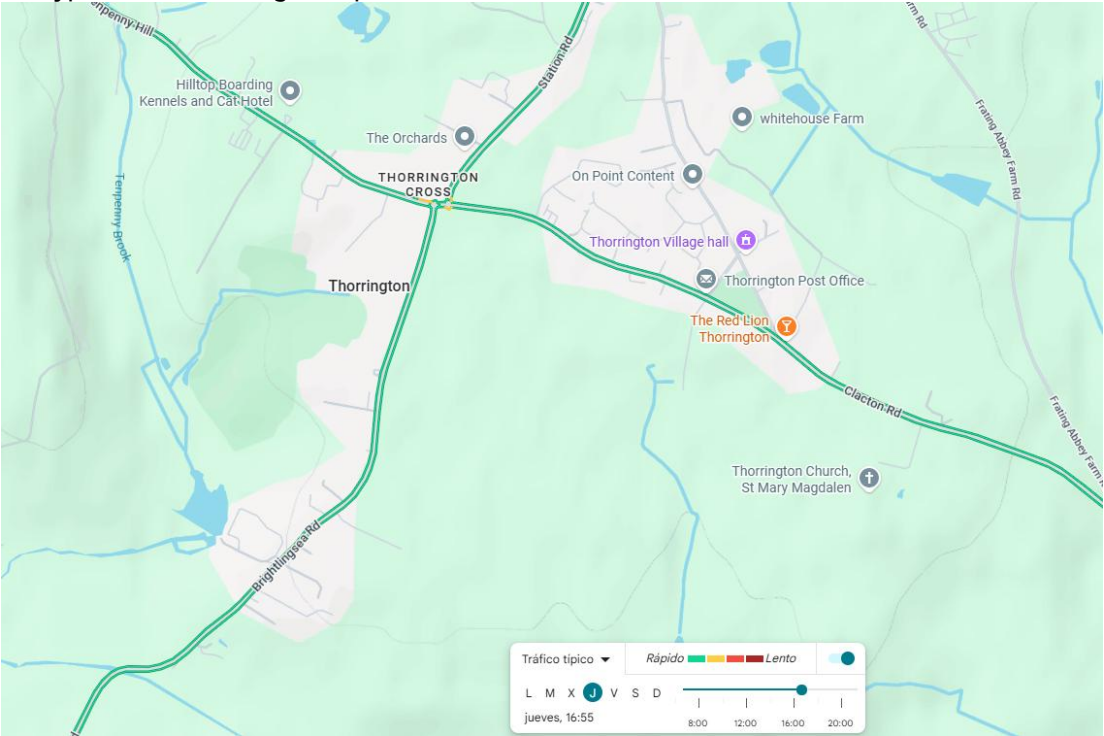
AM typical traffic – Google maps



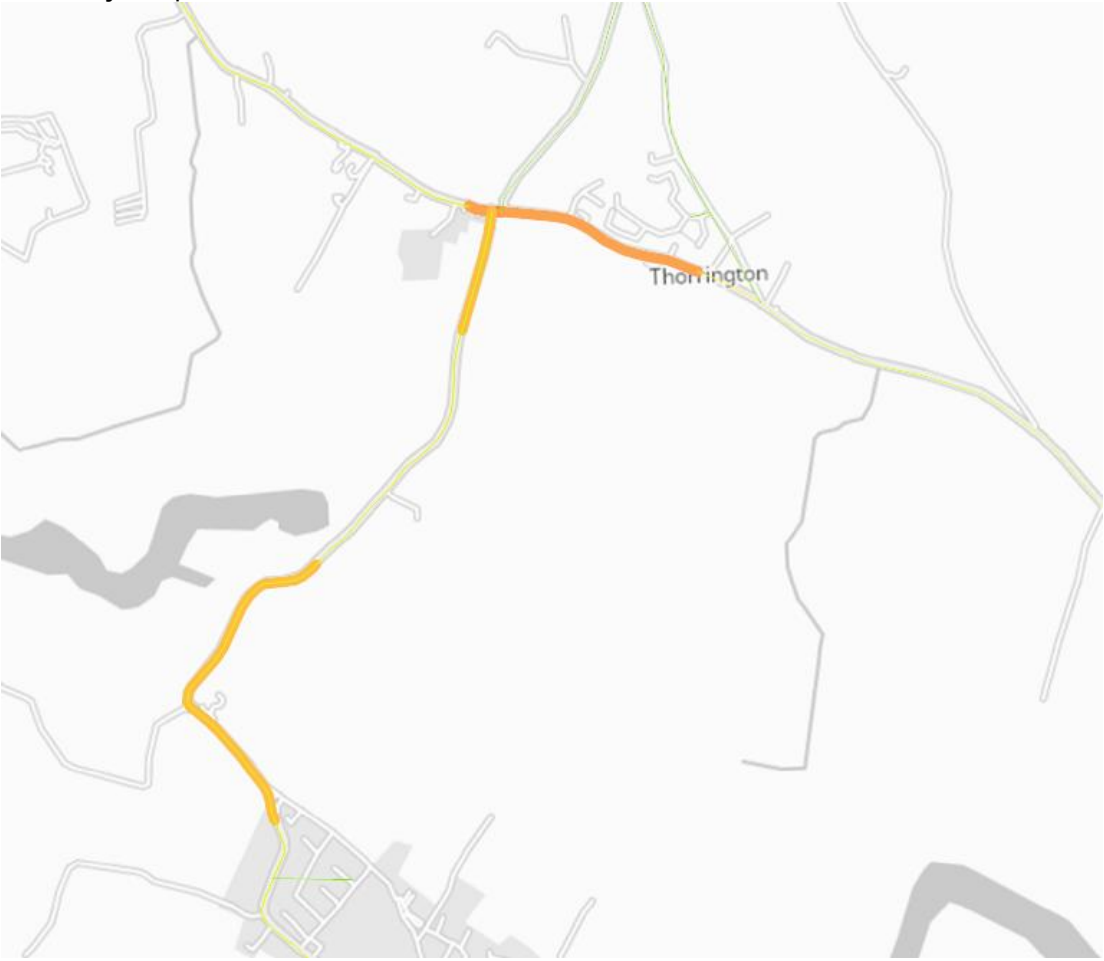
AM base year speed ratio



PM typical traffic – Google maps

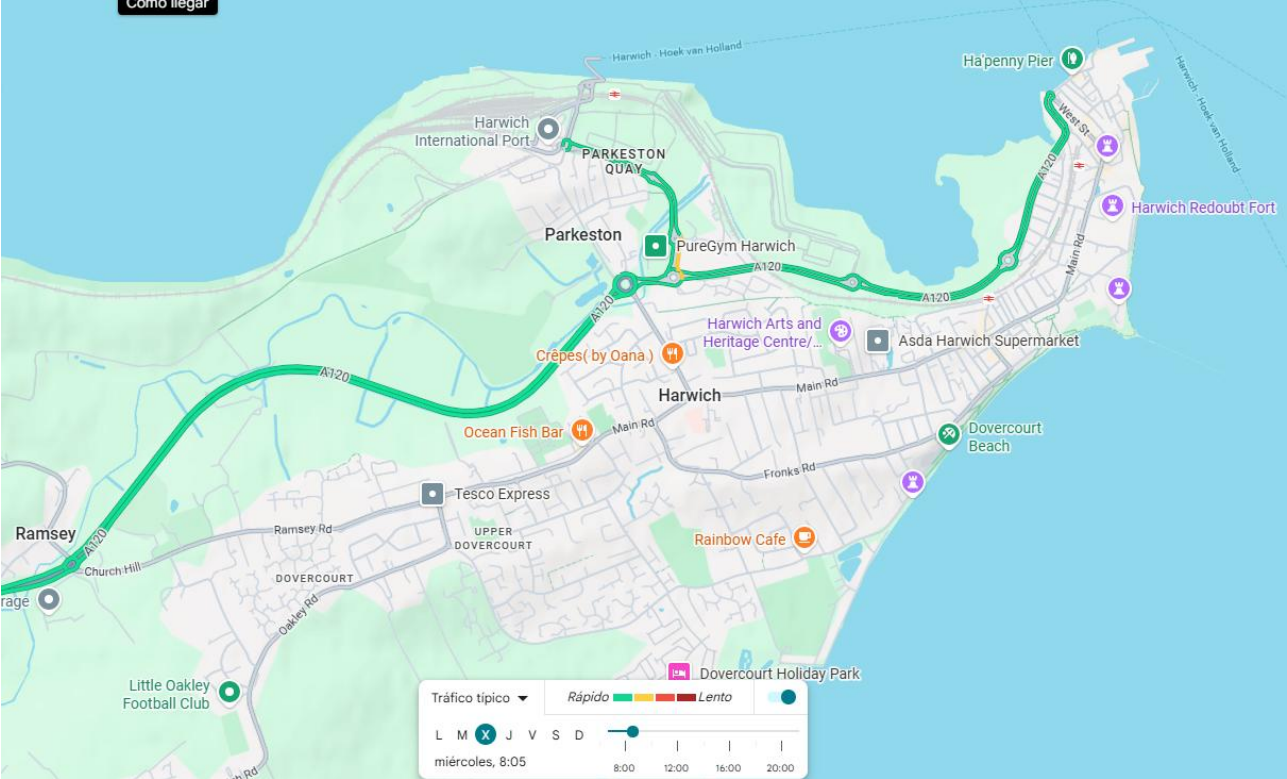


PM base year speed ratio



Harwich

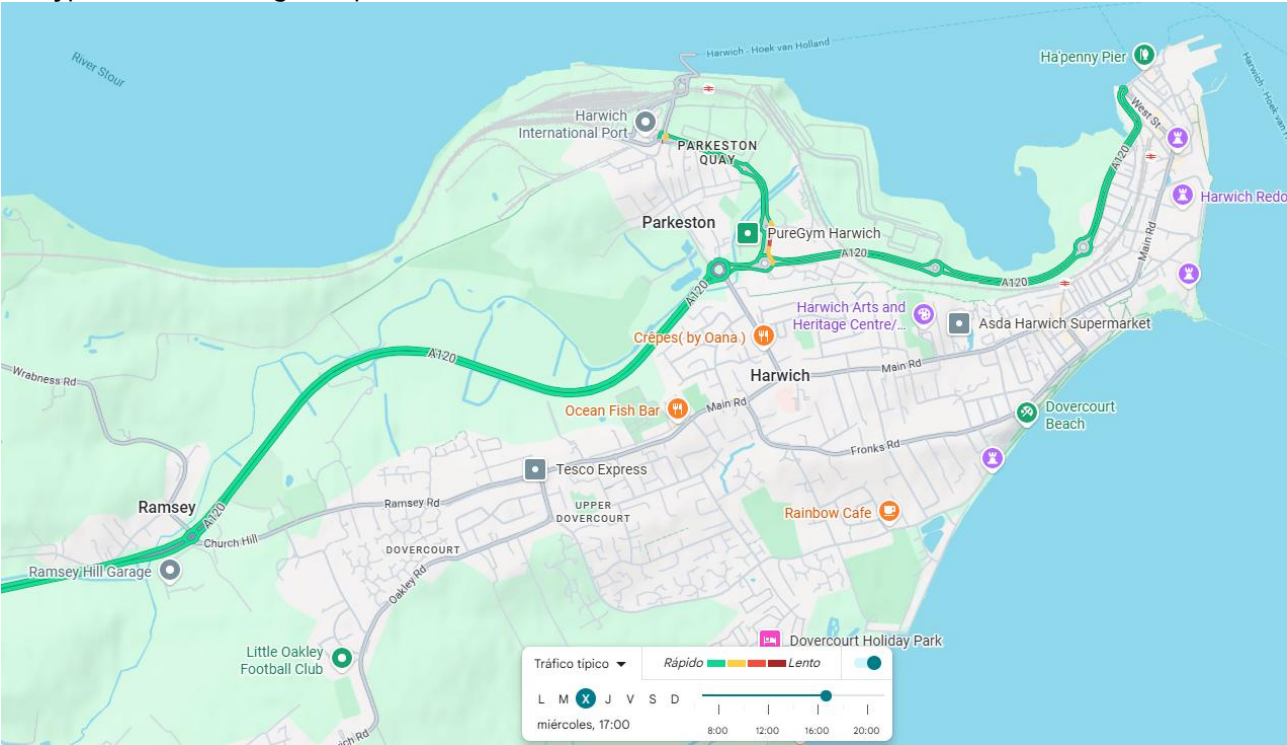
AM typical traffic – Google maps



AM base year speed ratio



PM typical traffic – Google maps



PM base year speed ratio



Appendix D. SRN Data

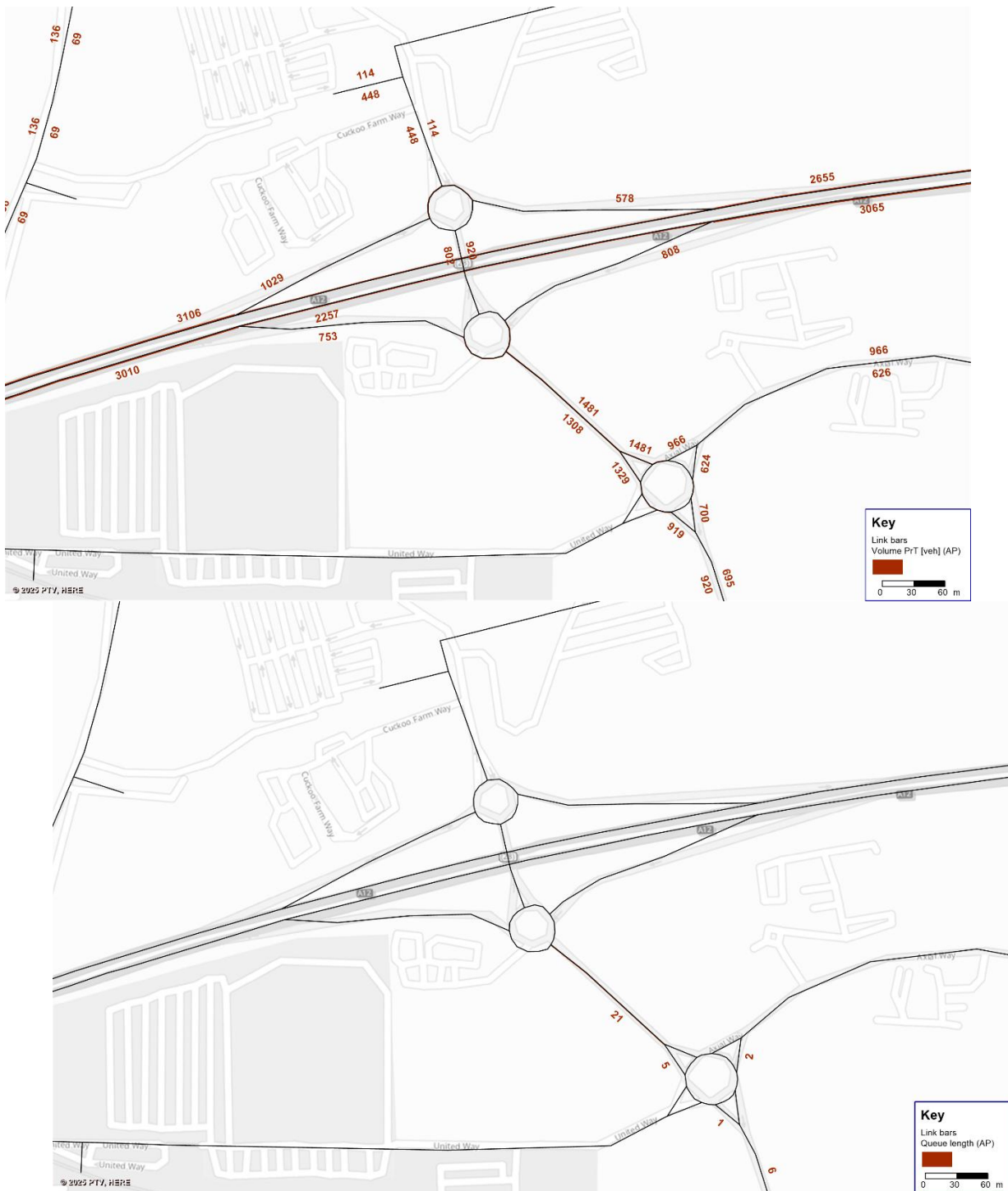


Figure B-1: A12 J28 – 2023 AM – Total vehicle flows and Queues

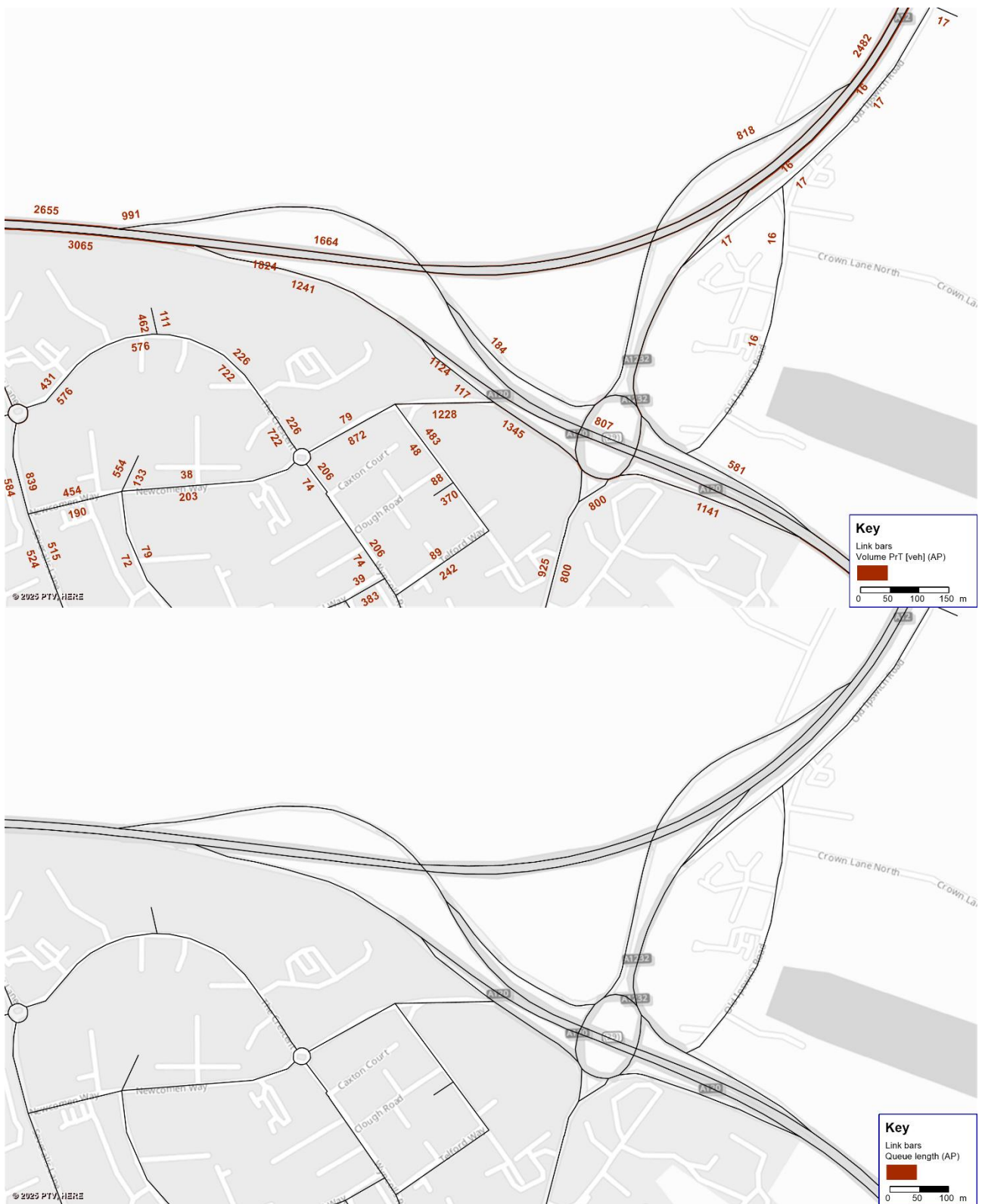


Figure B-2: A12 J29 – 2023 AM – Total vehicle flows and Queues

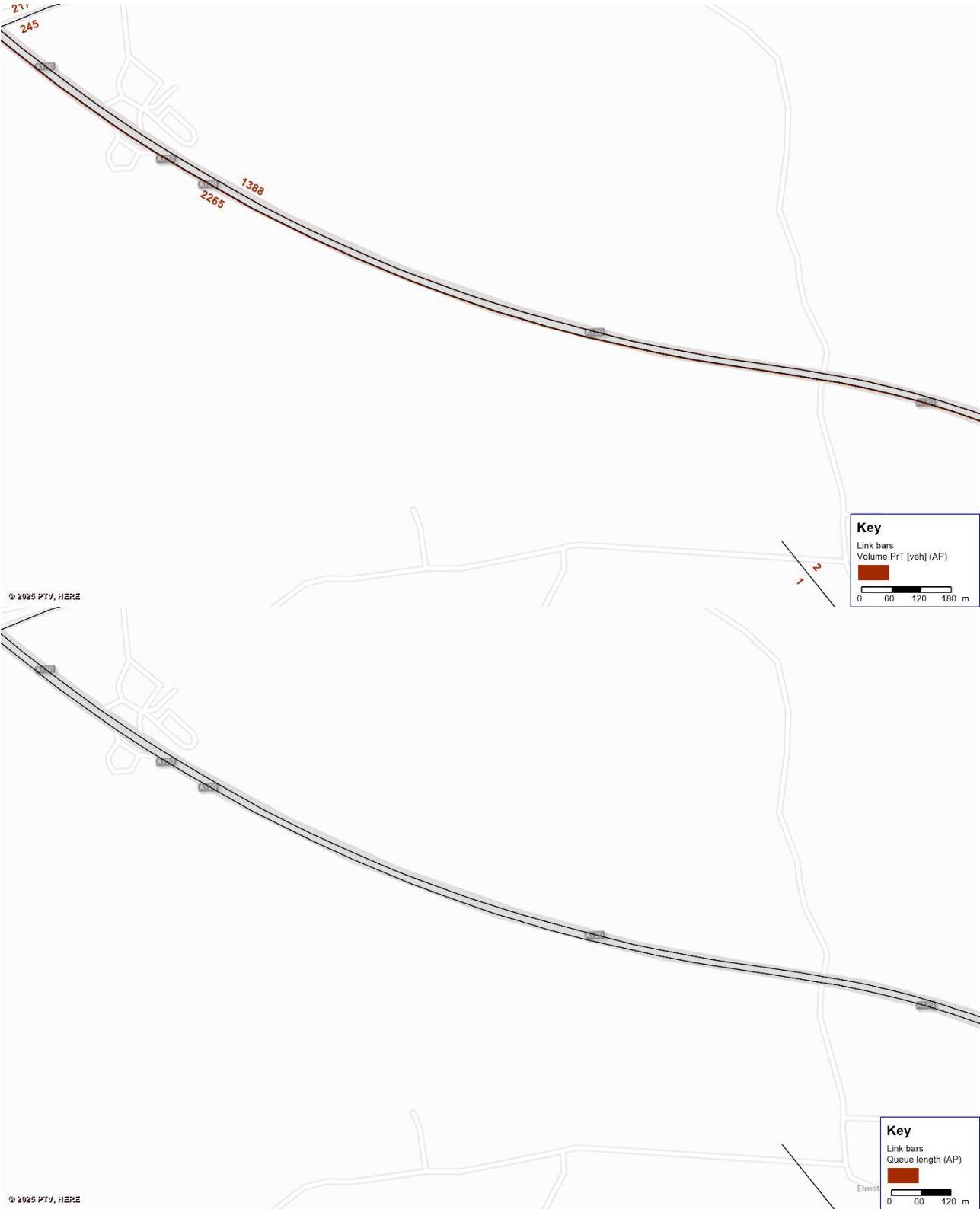


Figure B-3: A120 / A1331 – 2023 AM – Total vehicle flows and Queues

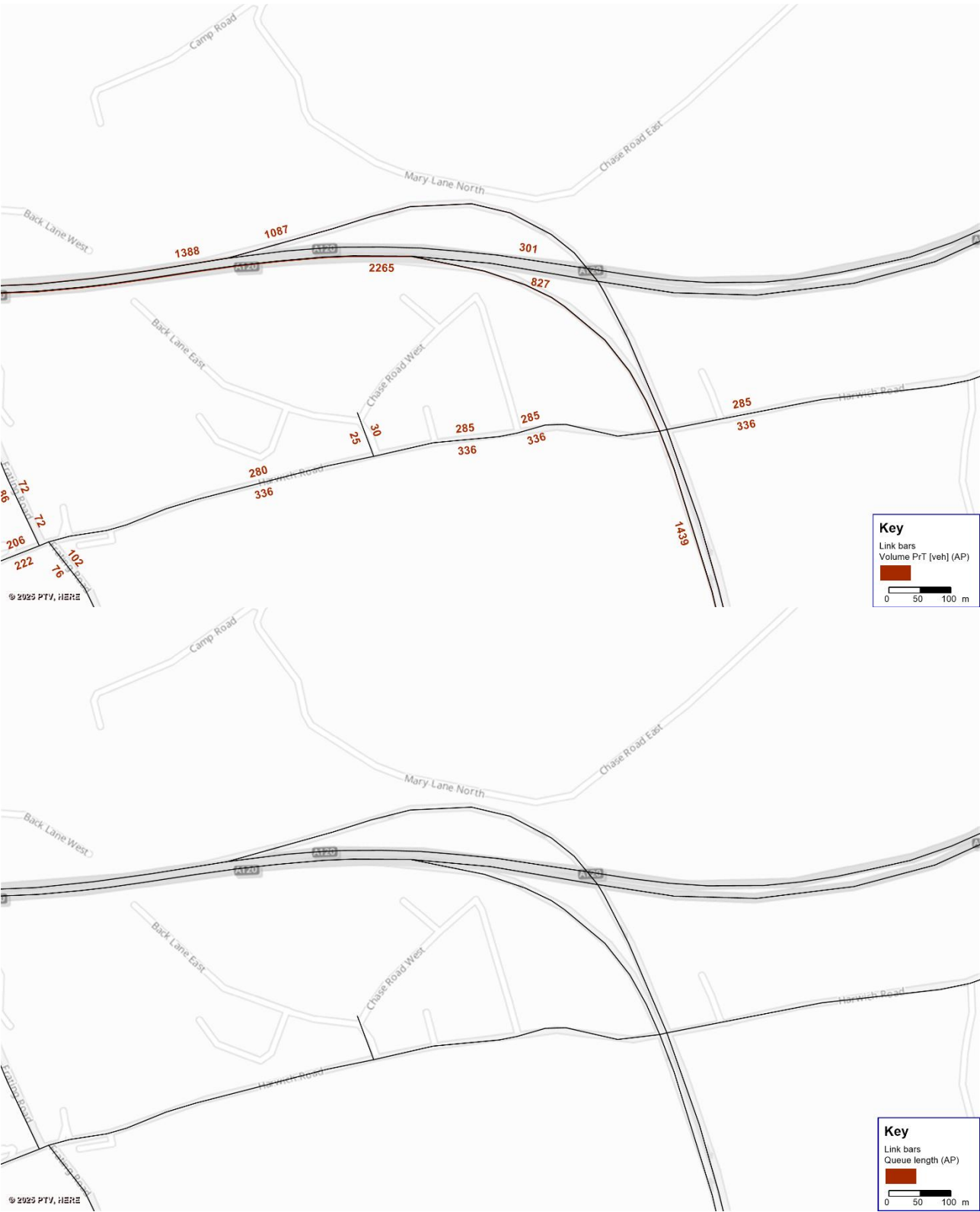


Figure B-4: A120 / A133 – 2023 AM – Total vehicle flows and Queues

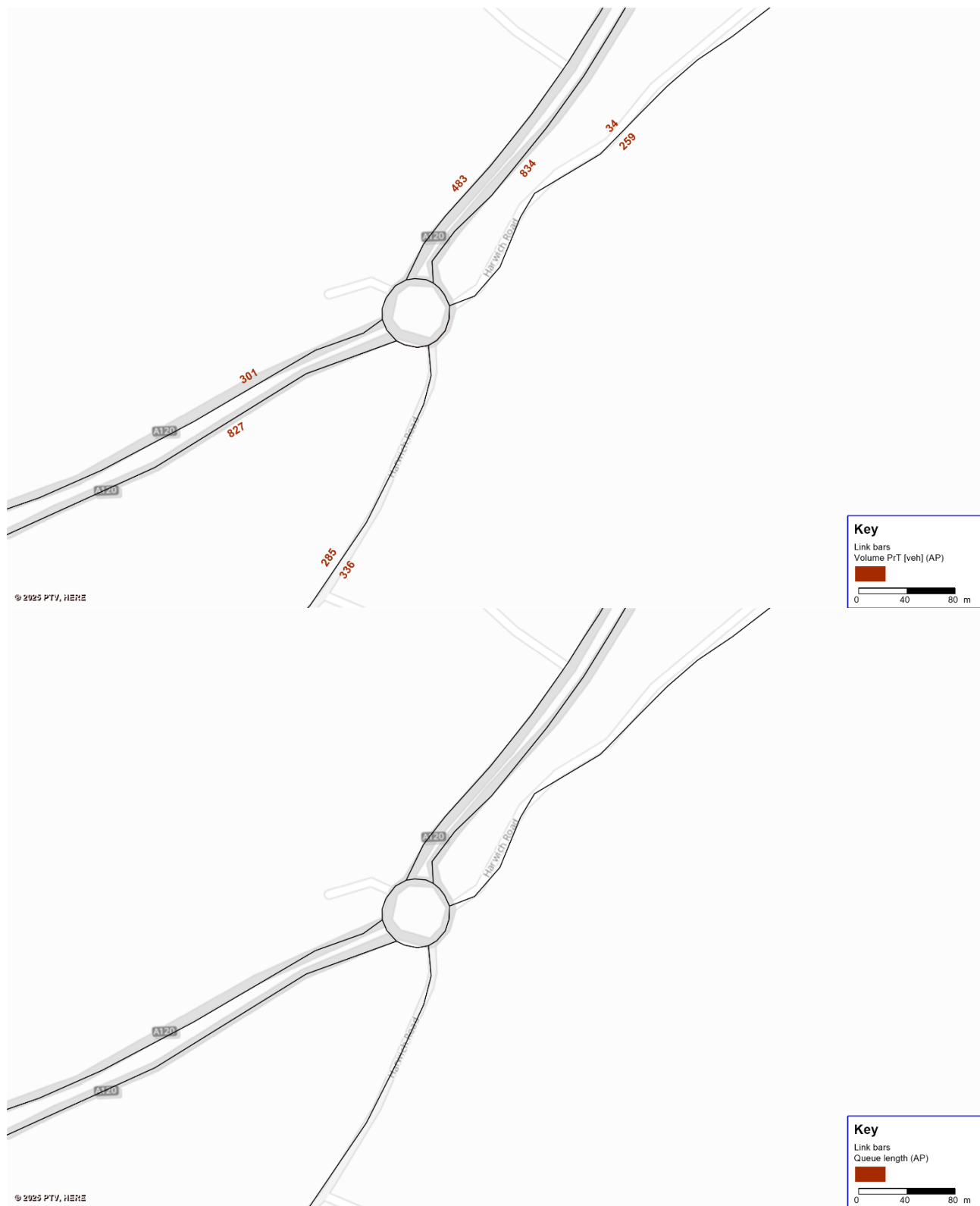


Figure B-5: A120 / Harwich Road – 2023 AM – Total vehicle flows and Queues

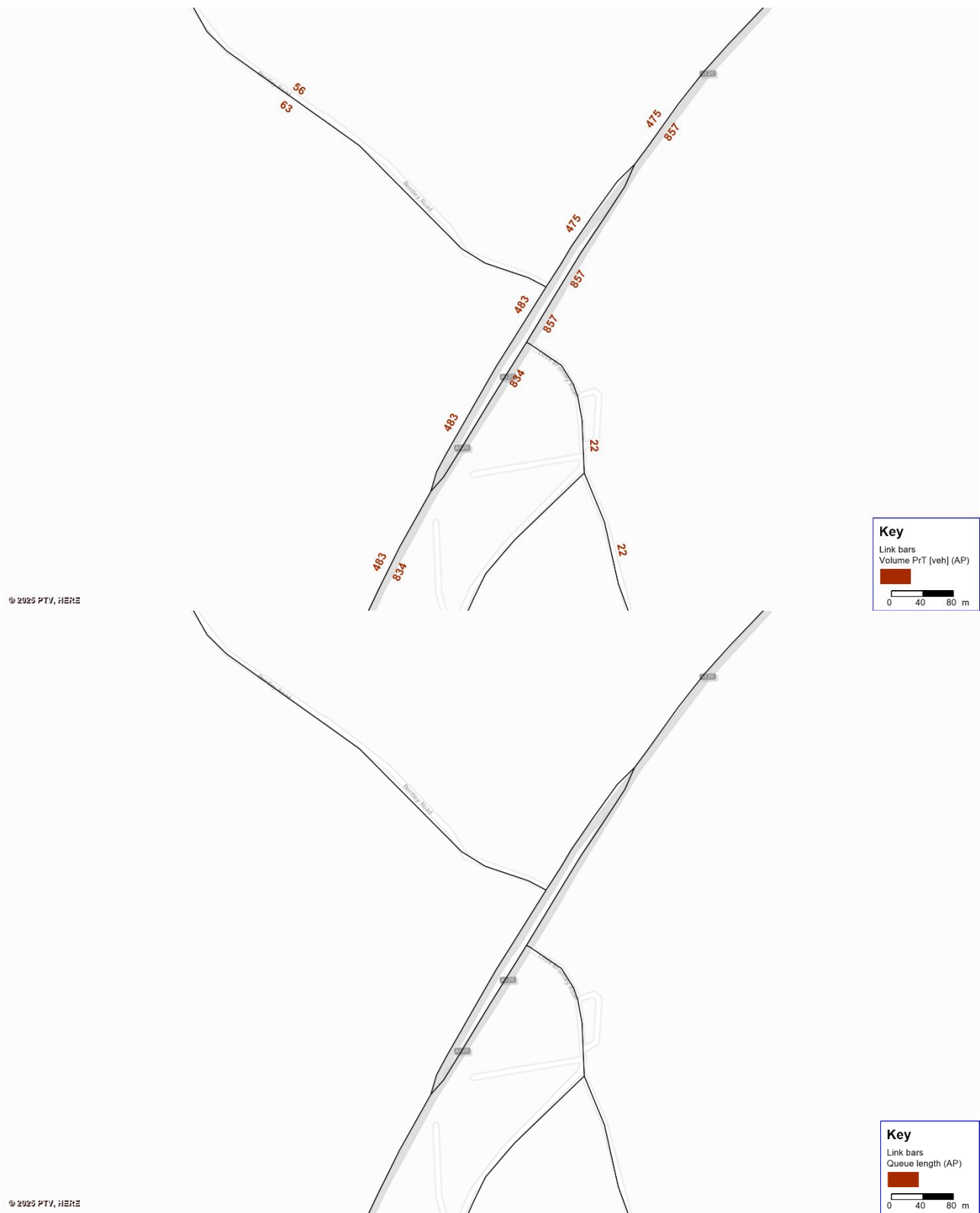


Figure B-6: A120 / Bentley Rd / Little Bromley Rd – 2023 AM – Total vehicle flows and Queues

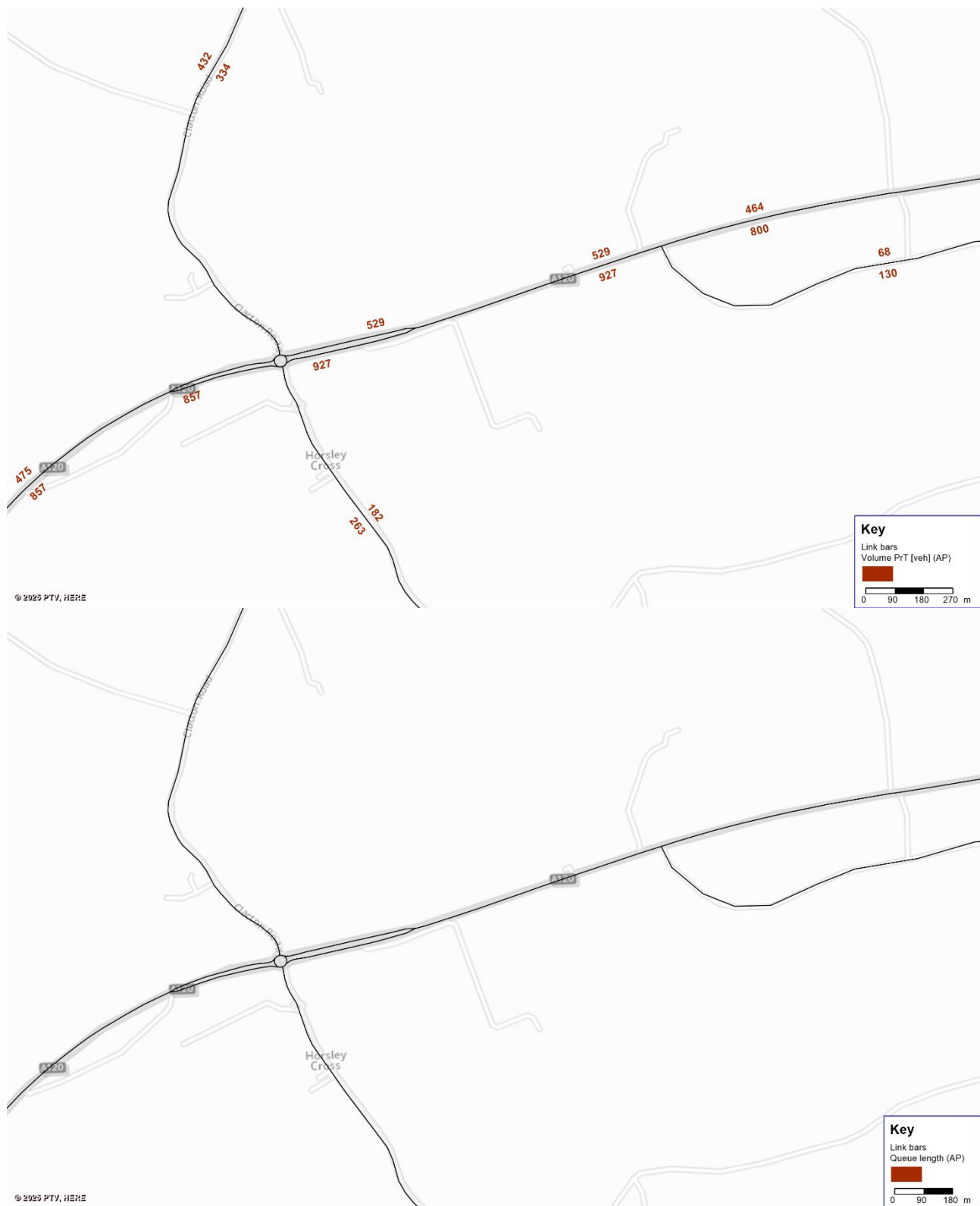


Figure B-7: A120 / B1035 and A120 / Colchester Road – 2023 AM – Total vehicle flows and Queues

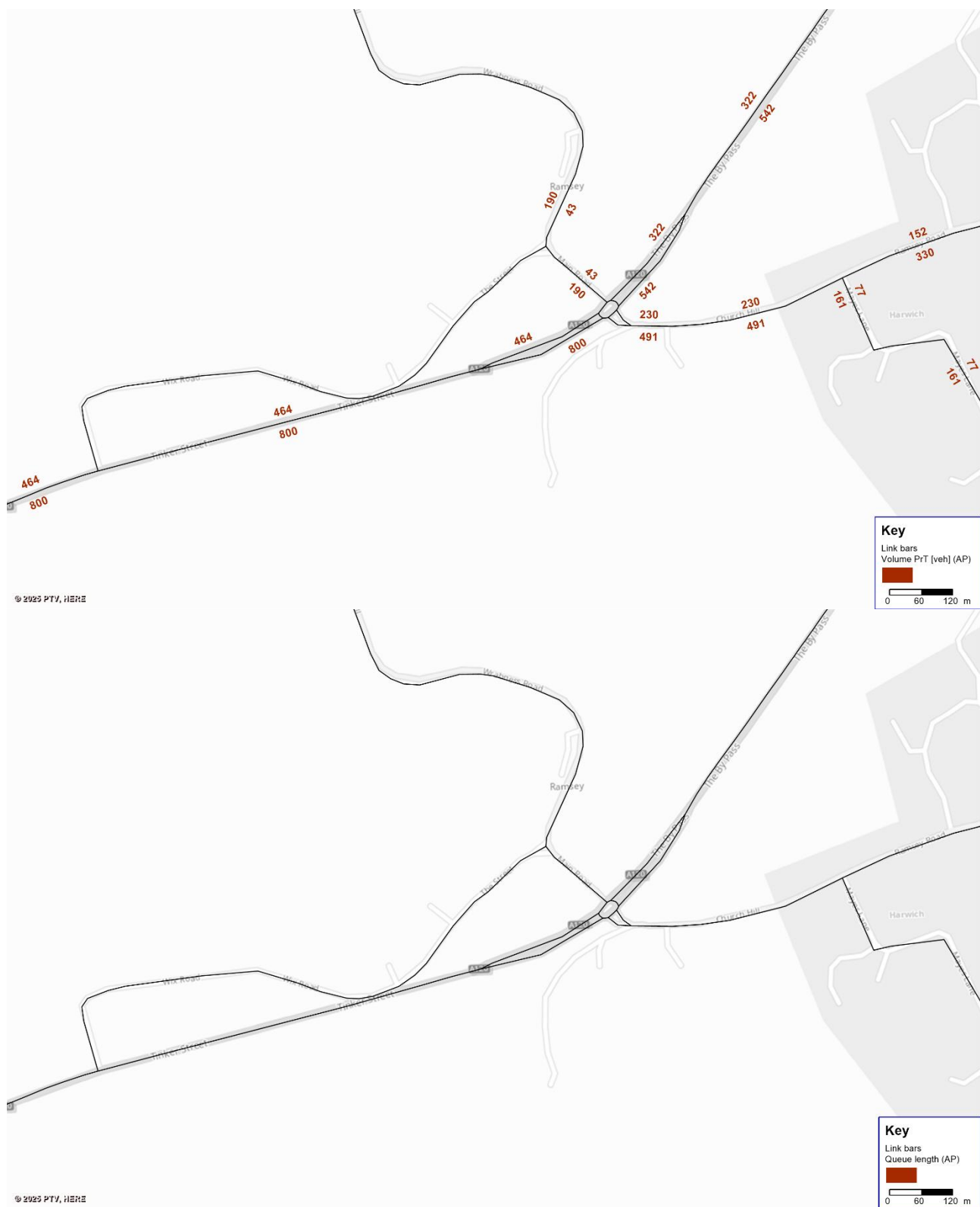


Figure B-8: A120 / Wix Road and A120 / Main Road / Church Hill – 2023 AM – Total vehicle flows and Queues

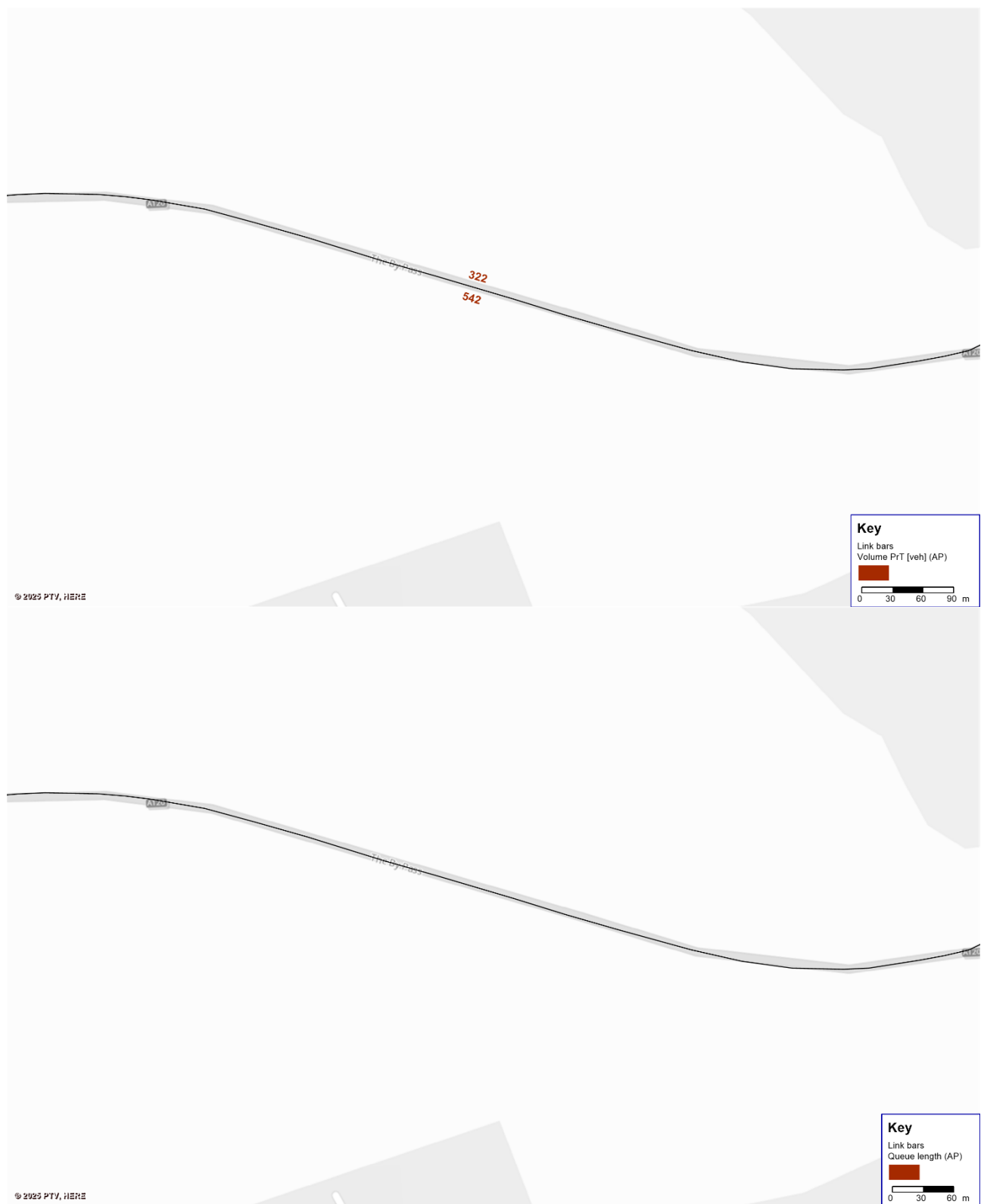


Figure B-9: A120/ Link Rd – 2023 AM – Total vehicle flows and Queues

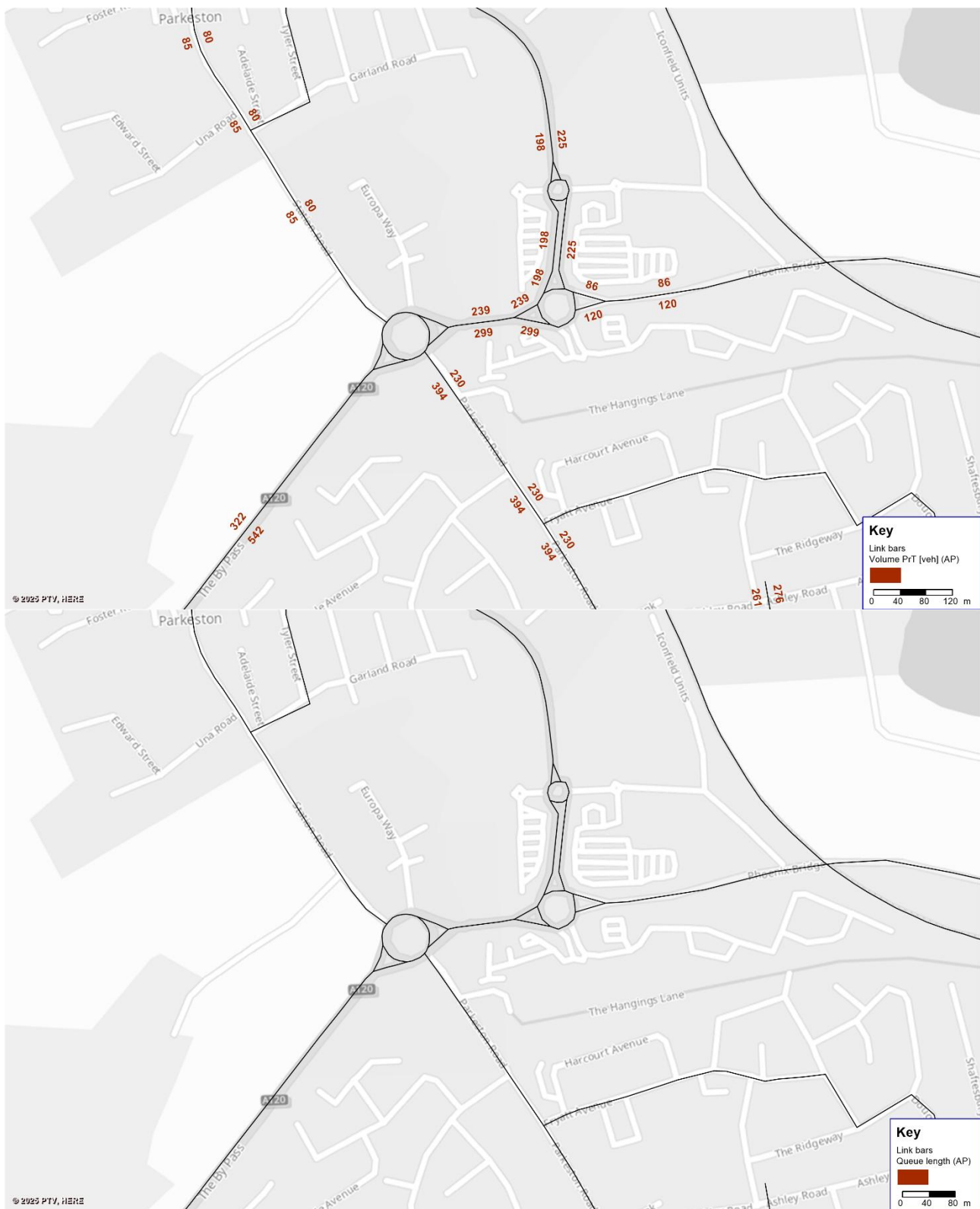


Figure B-10: A120 Parkeston Rbt and A120 St Nicholas Rbt – 2023 AM – Total vehicle flows and Queues

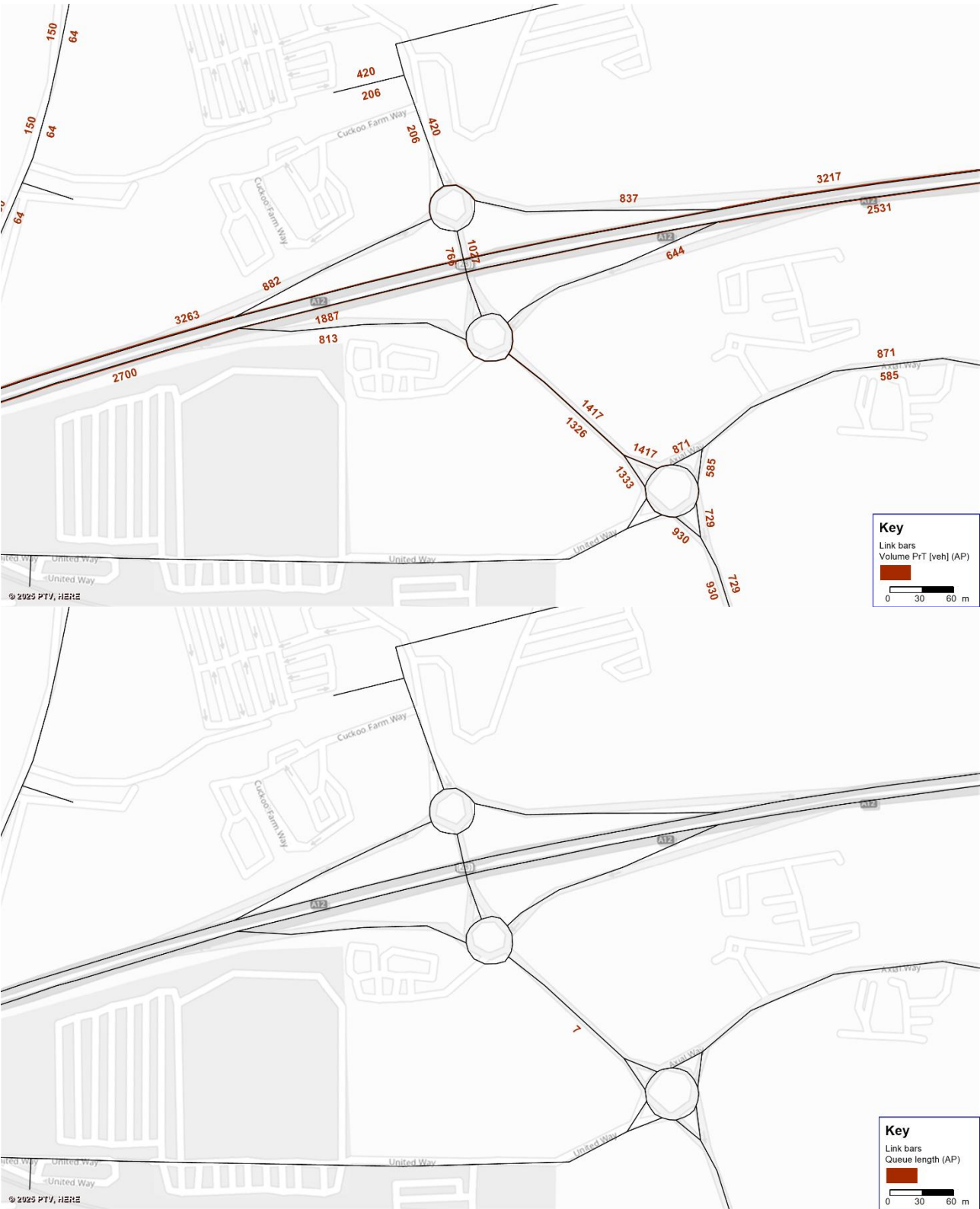


Figure B-11: A12 J28 – 2023 PM – Total vehicle flows and Queues

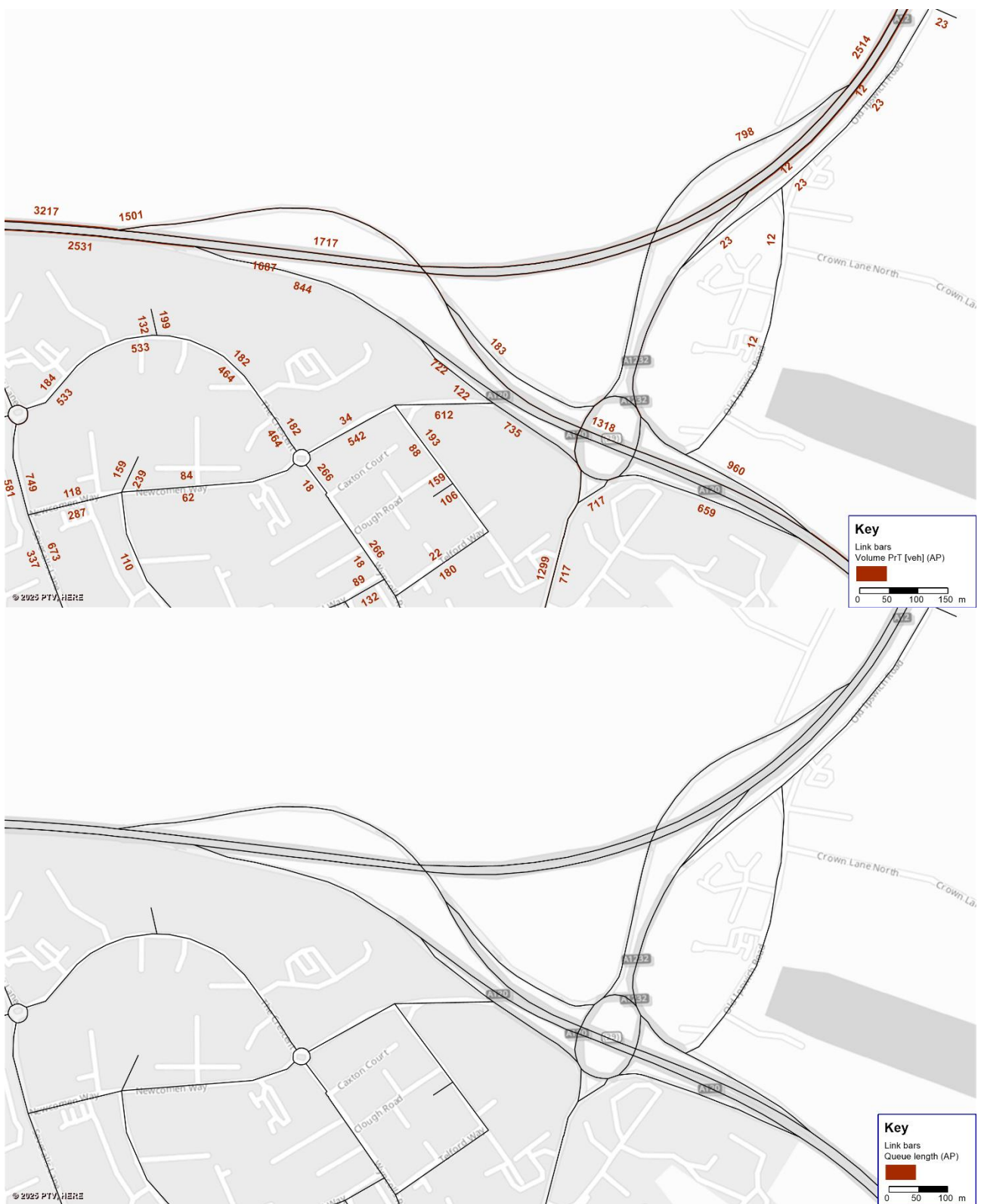


Figure B-12: A12 J29 – 2023 PM – Total vehicle flows and Queues

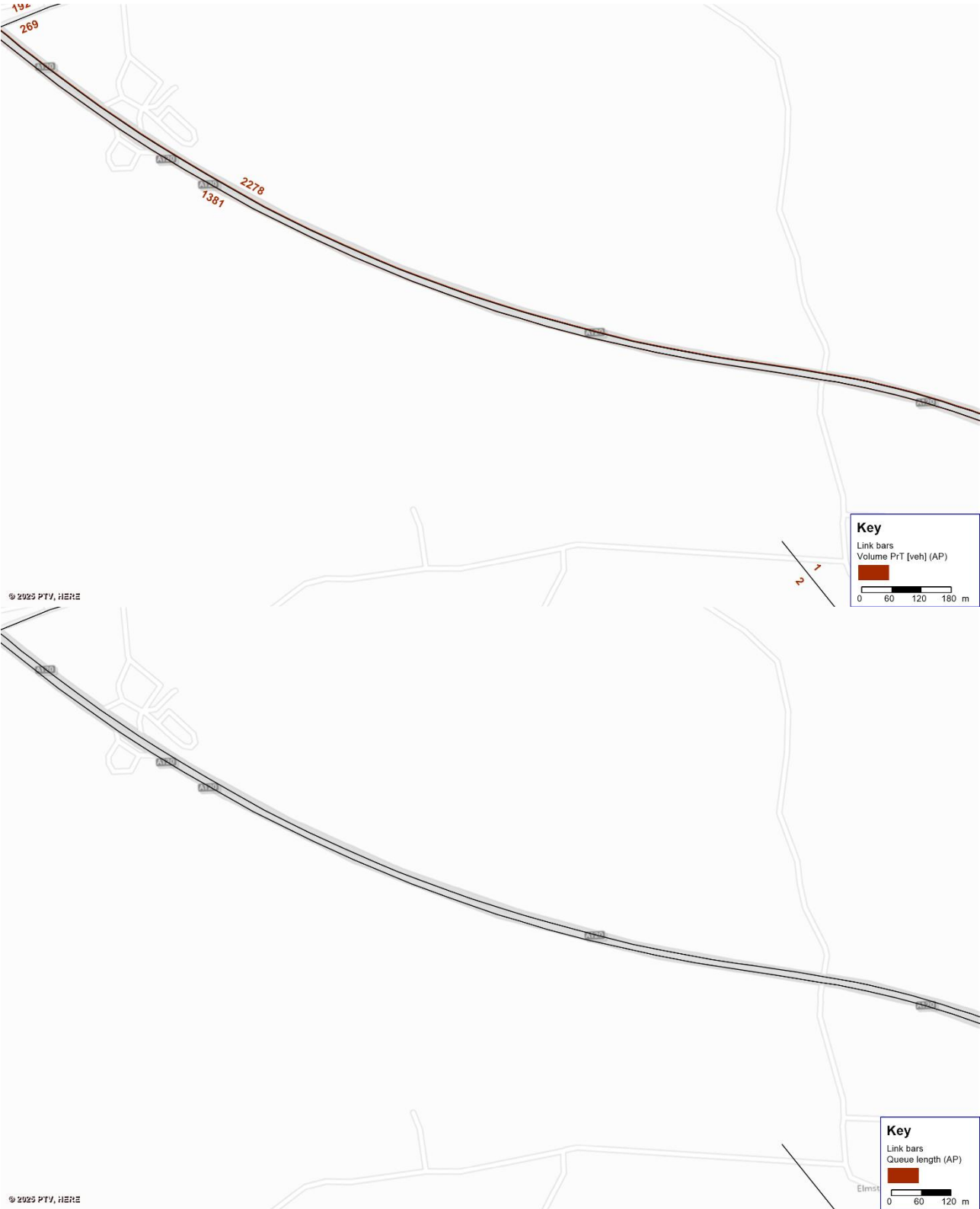


Figure B-13: A120 / A1331 – 2023 PM – Total vehicle flows and Queues

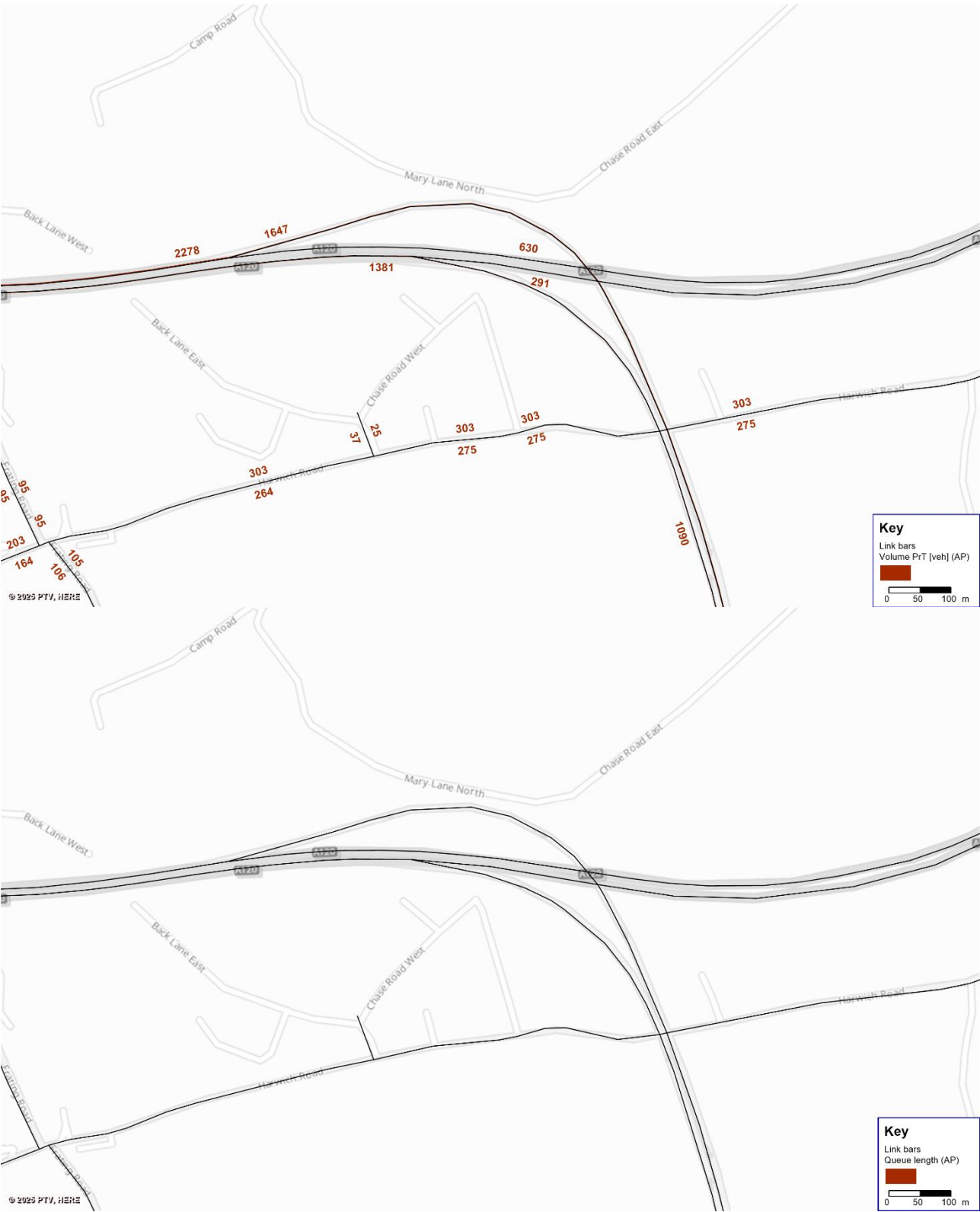


Figure B-14: A120 / A133 – 2023 PM – Total vehicle flows and Queues



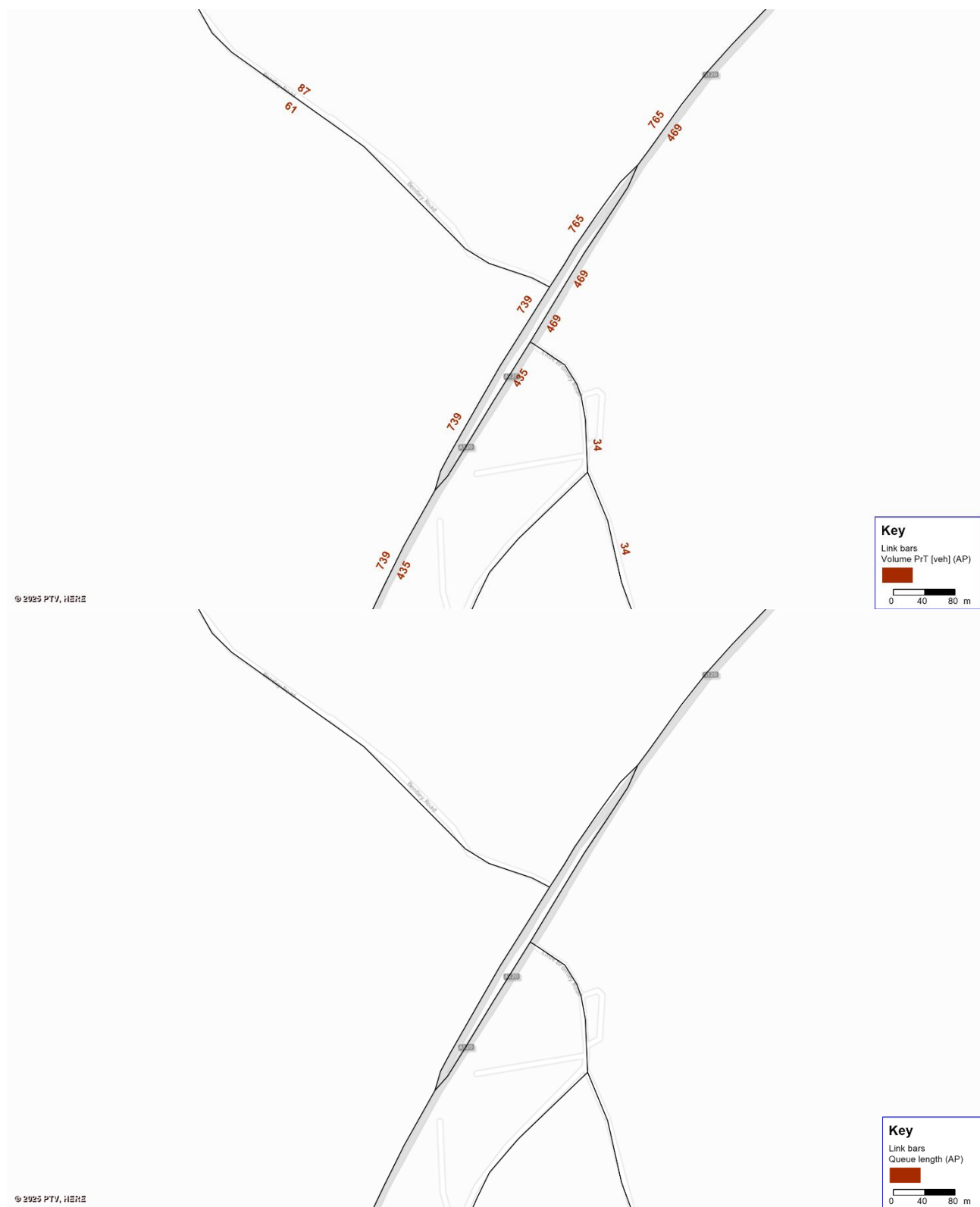


Figure B-16: A120 / Bentley Rd / Little Bromley Rd – 2023 PM – Total vehicle flows and Queues

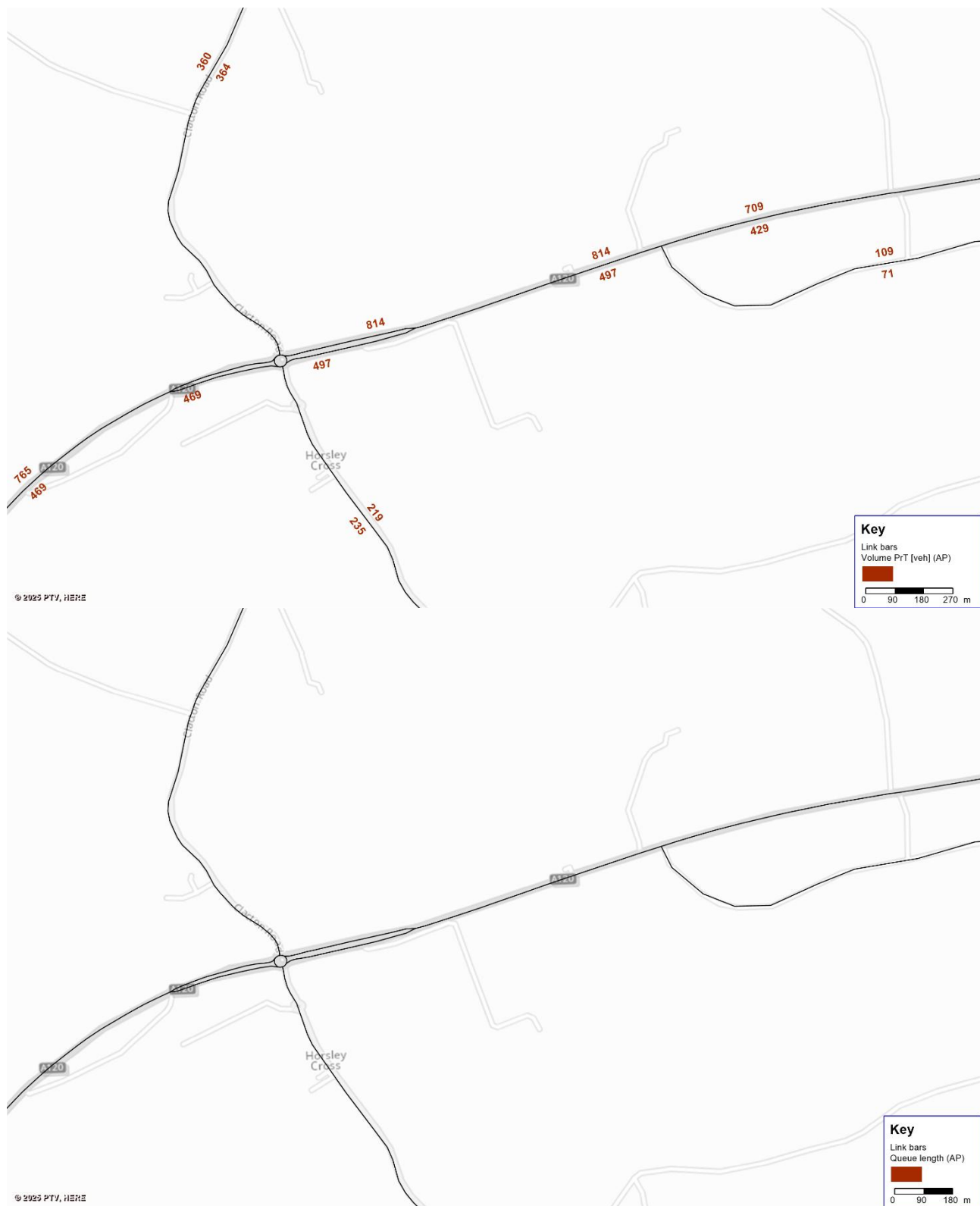


Figure B-17: A120 / B1035 and A120 / Colchester Road – 2023 PM – Total vehicle flows and Queues

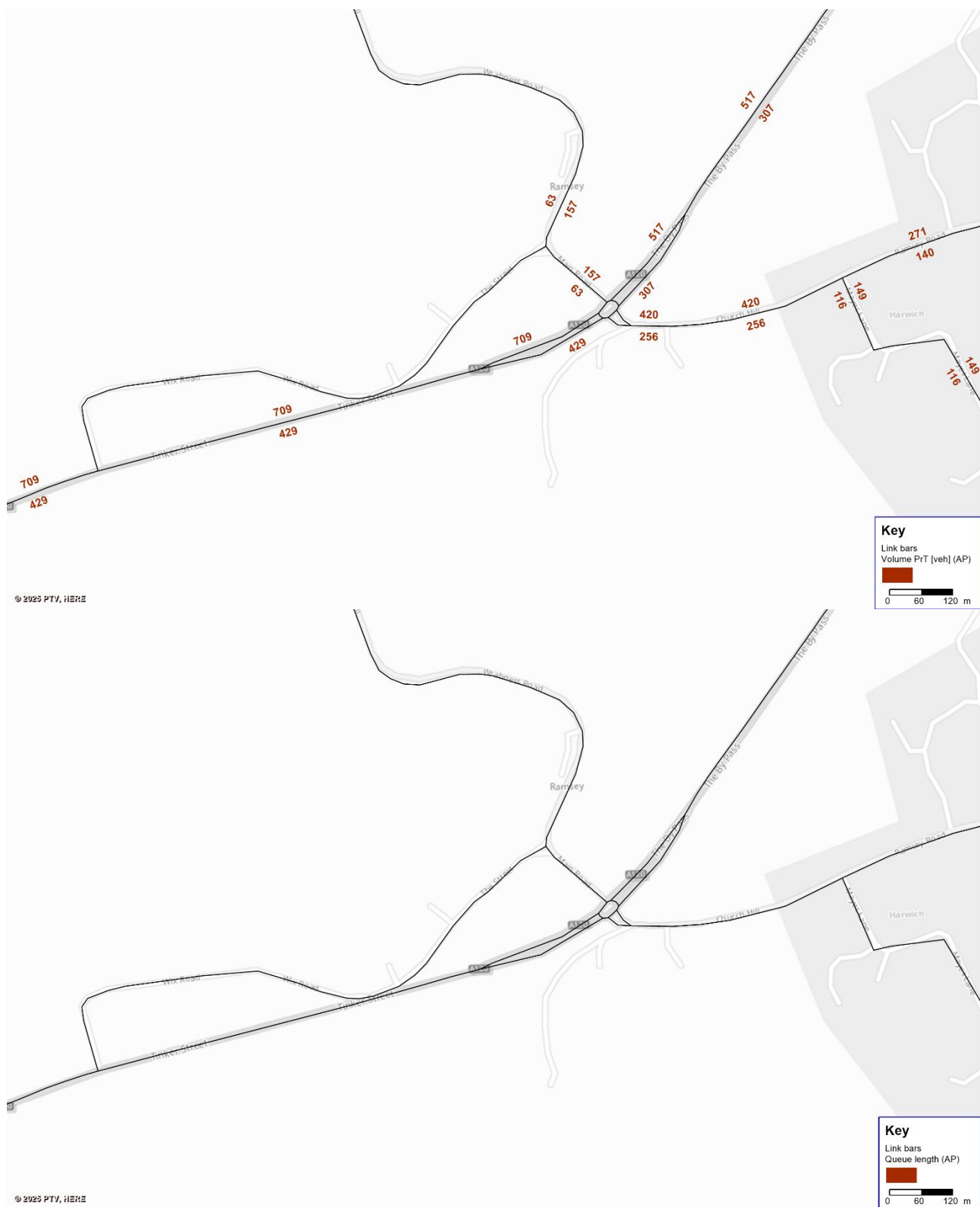


Figure B-18: A120 / Wix Road and A120 / Main Road / Church Hill – 2023 PM – Total vehicle flows and Queues

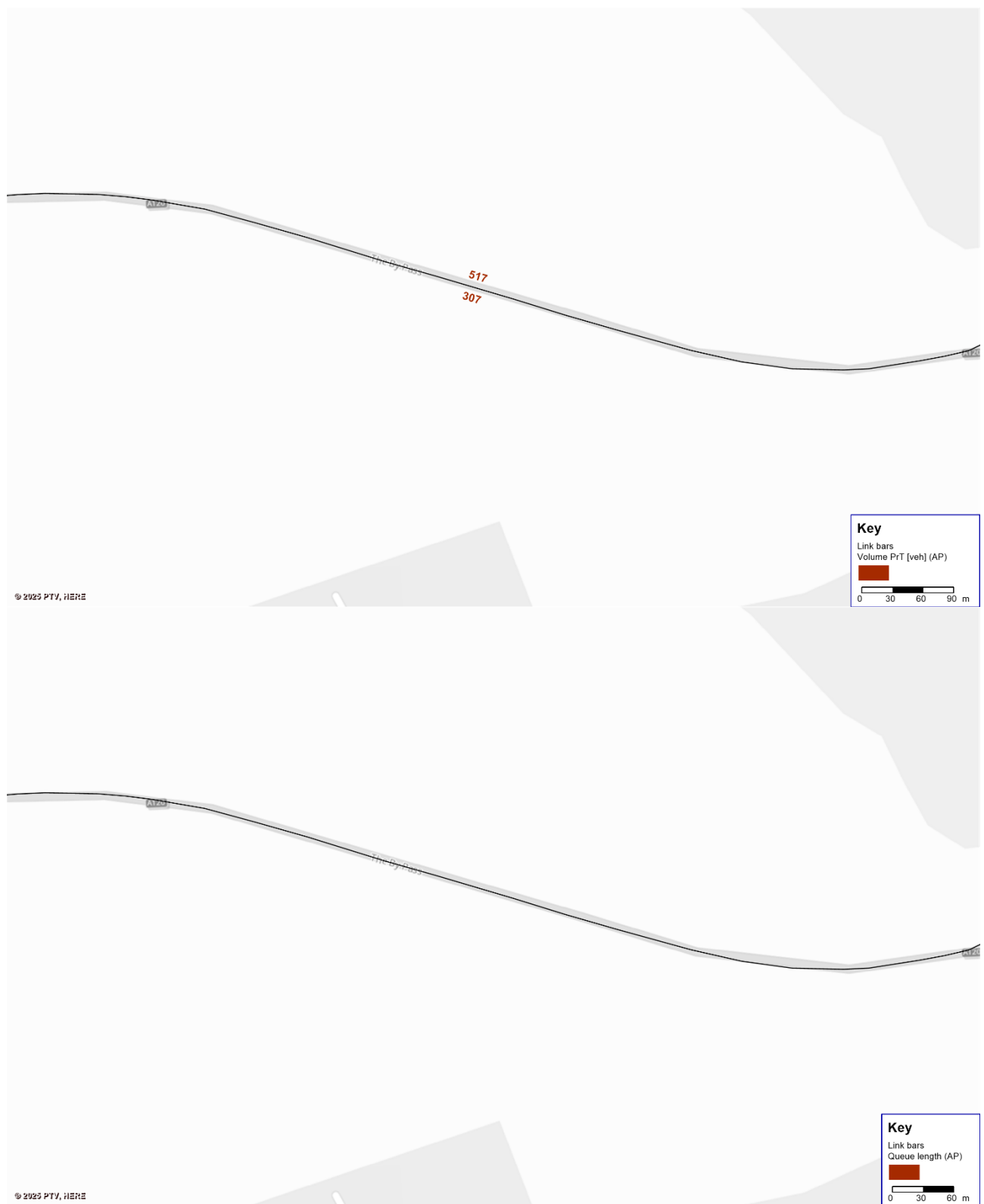


Figure B-19: A120/ Link Rd – 2023 PM – Total vehicle flows and Queues



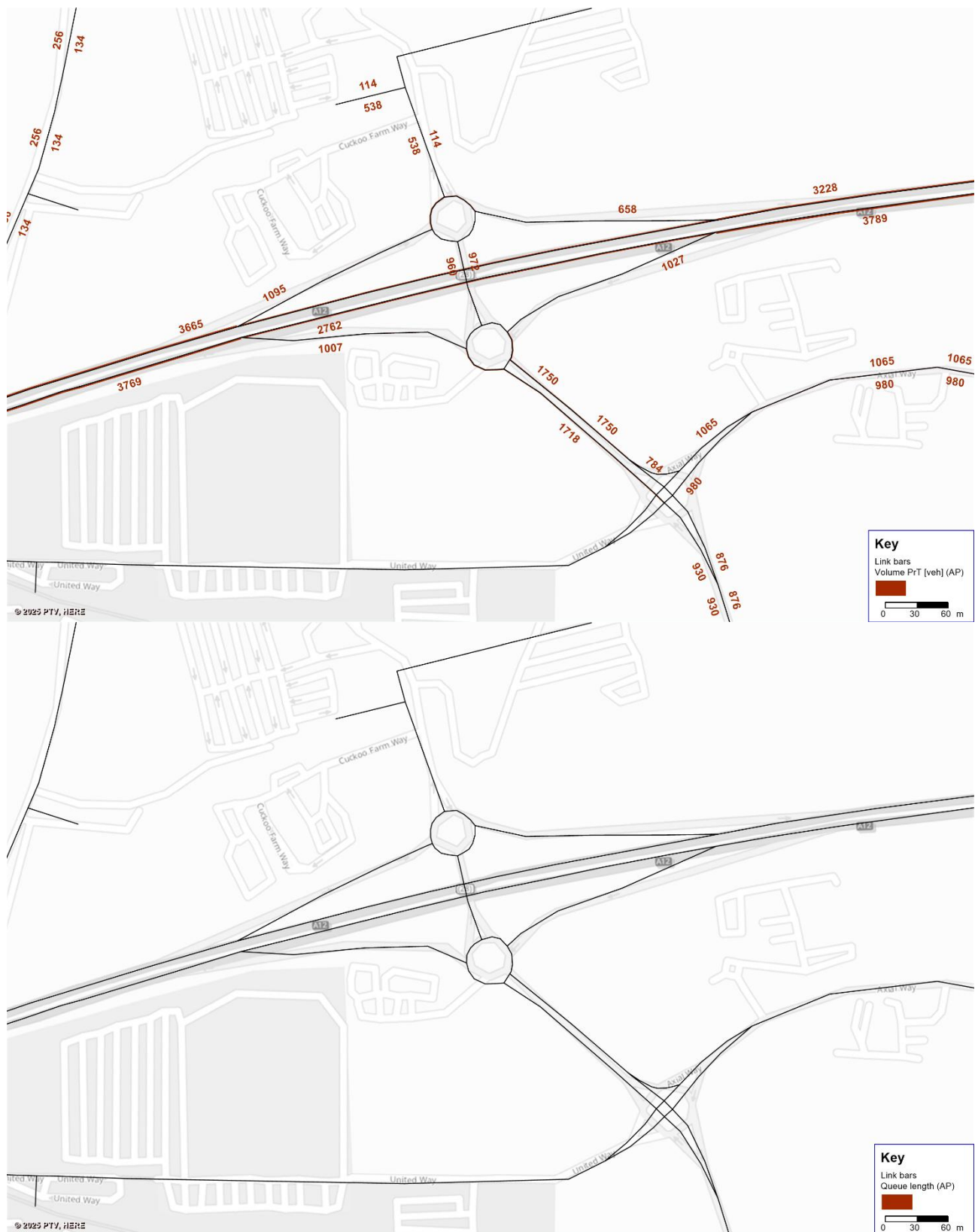


Figure B-21: A12 J28 – 2042 RC AM – Total vehicle flows and Queues



Figure B-22: A12 J29 – 2042 RC AM – Total vehicle flows and Queues

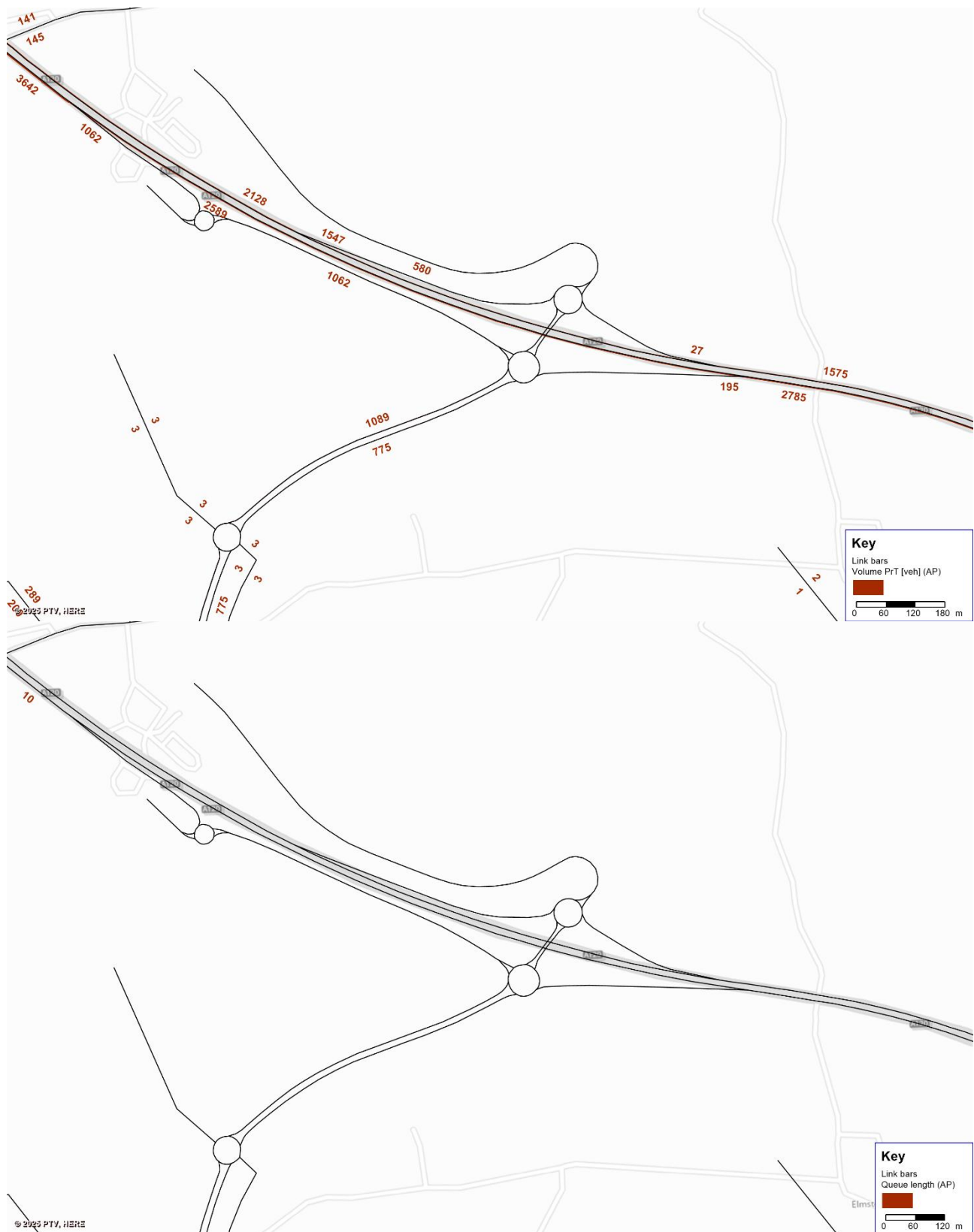


Figure B-23: A120 / A1331 – 2042 RC AM – Total vehicle flows and Queues

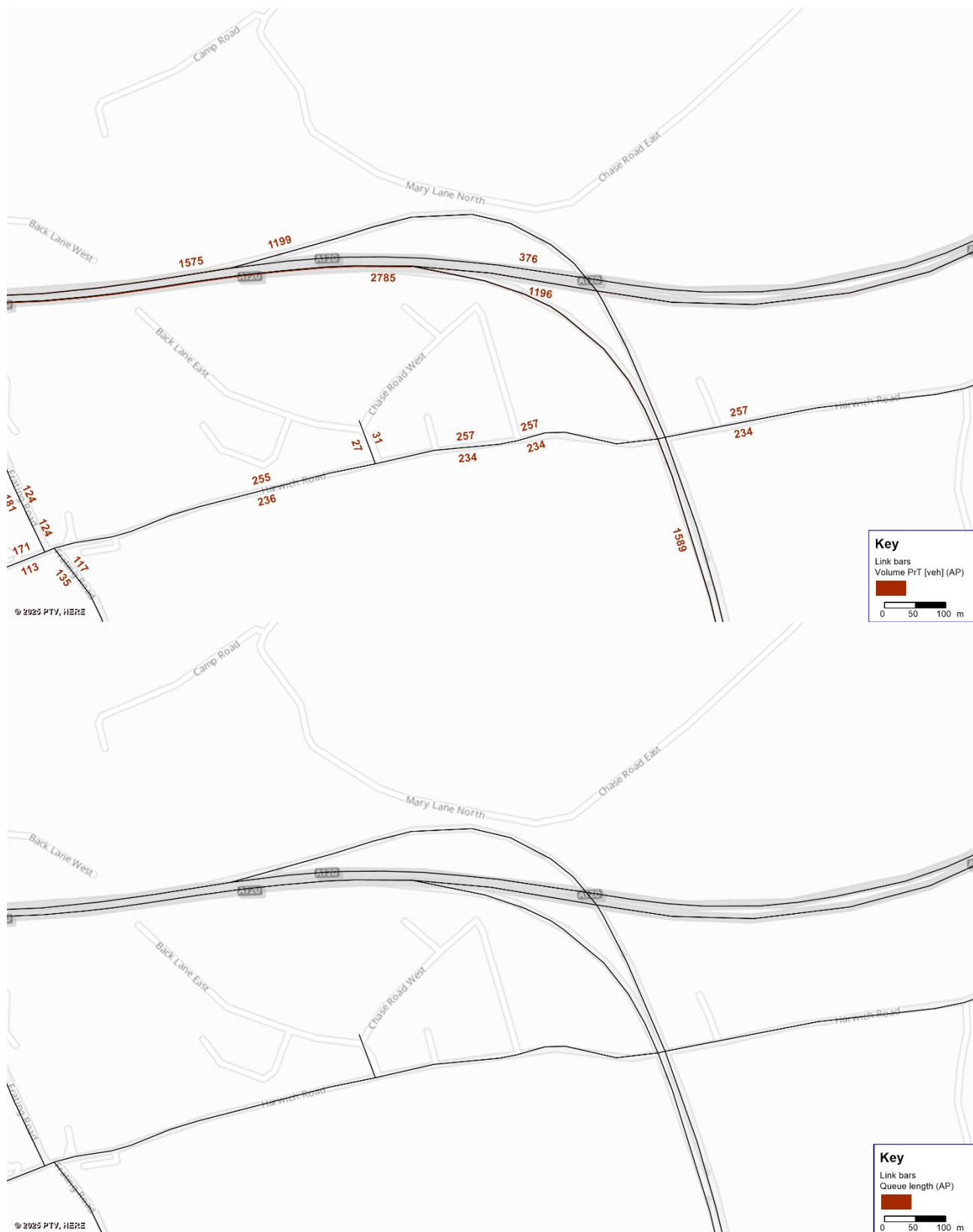


Figure B-24: A120 / A133 – 2042 RC AM – Total vehicle flows and Queues

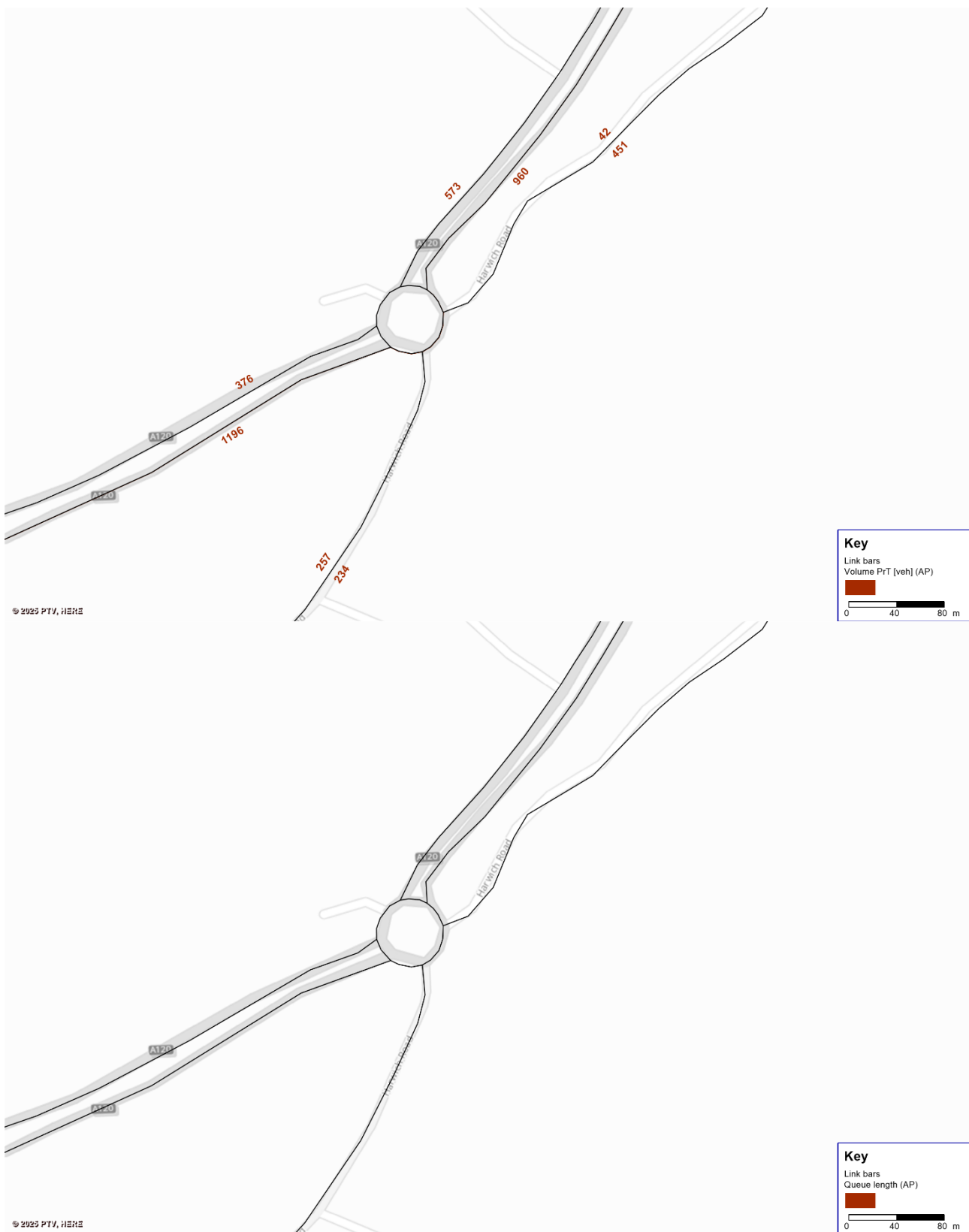


Figure B-25: A120 / Harwich Road – 2042 RC AM – Total vehicle flows and Queues

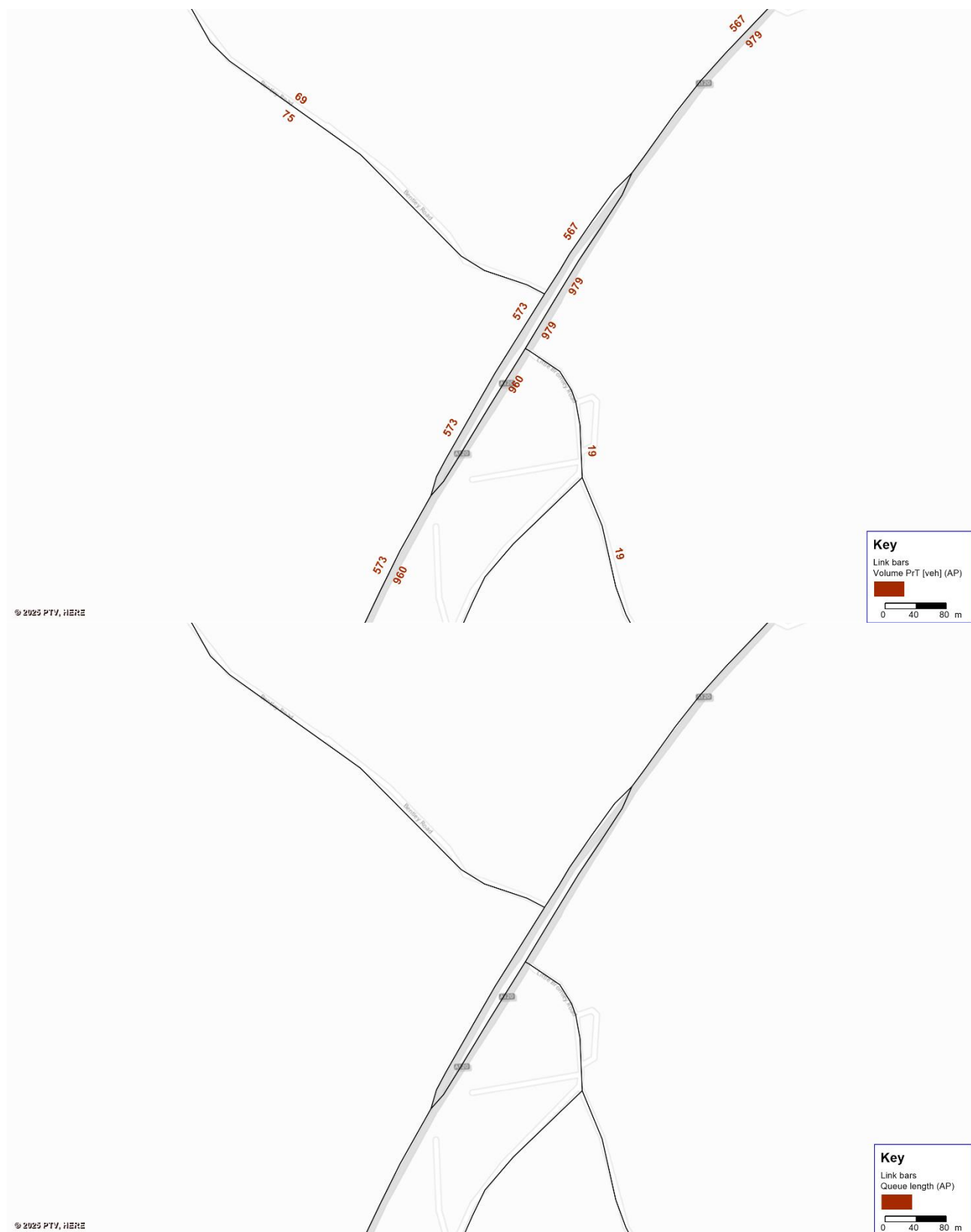


Figure B-26: A120 / Bentley Rd / Little Bromley Rd – 2042 RC AM – Total vehicle flows and Queues

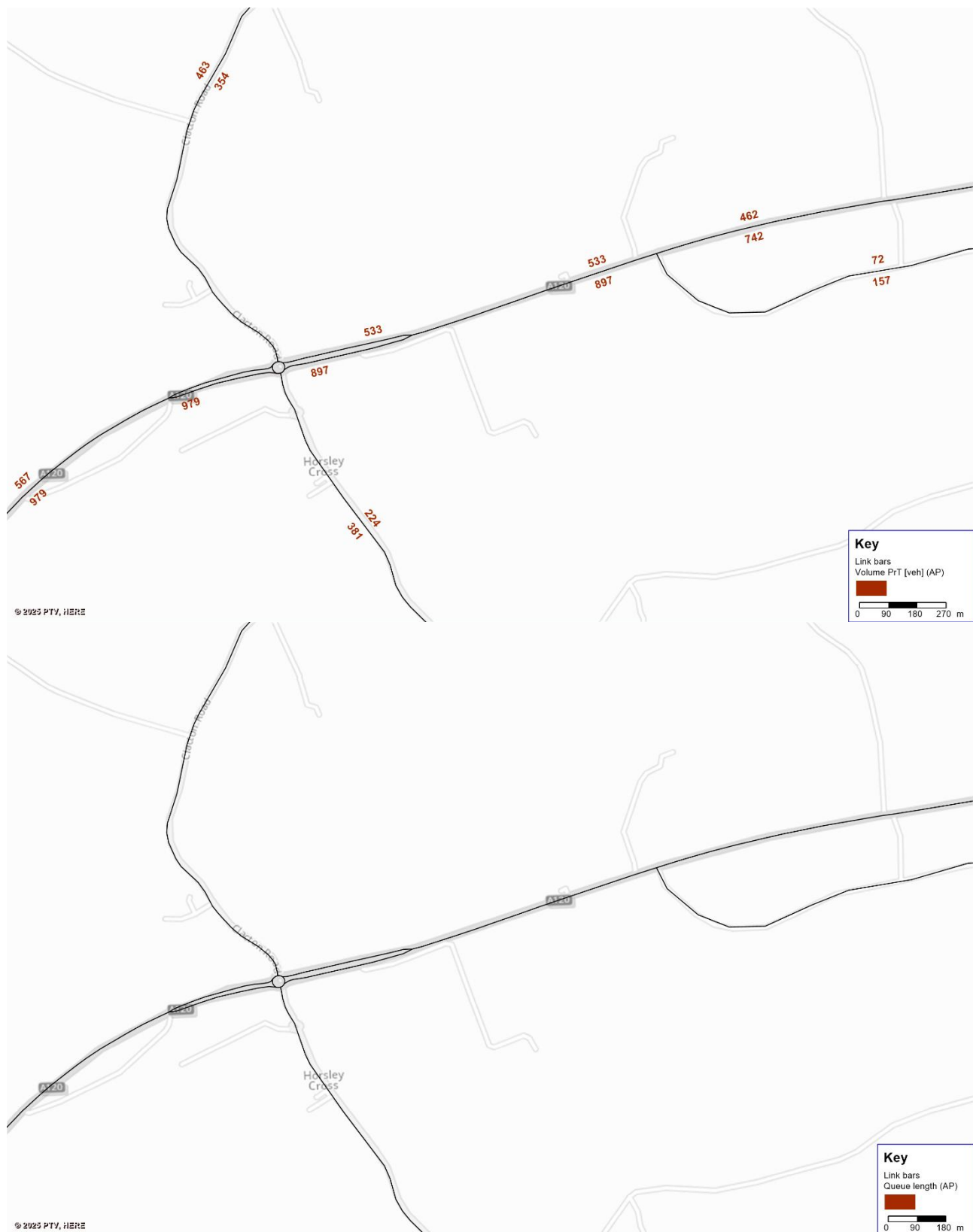


Figure B-27: A120 / B1035 and A120 / Colchester Road – 2042 RC AM – Total vehicle flows and Queues

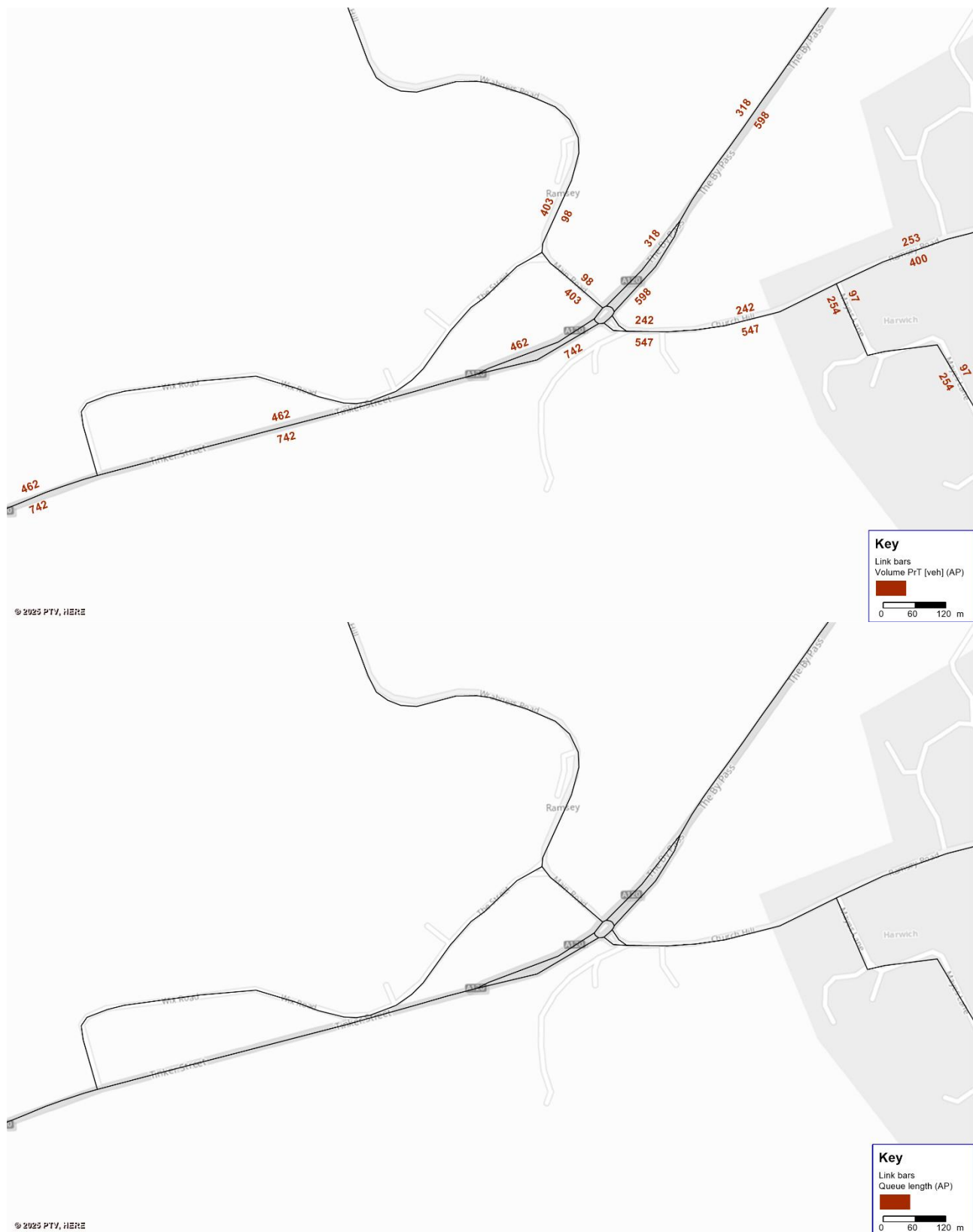
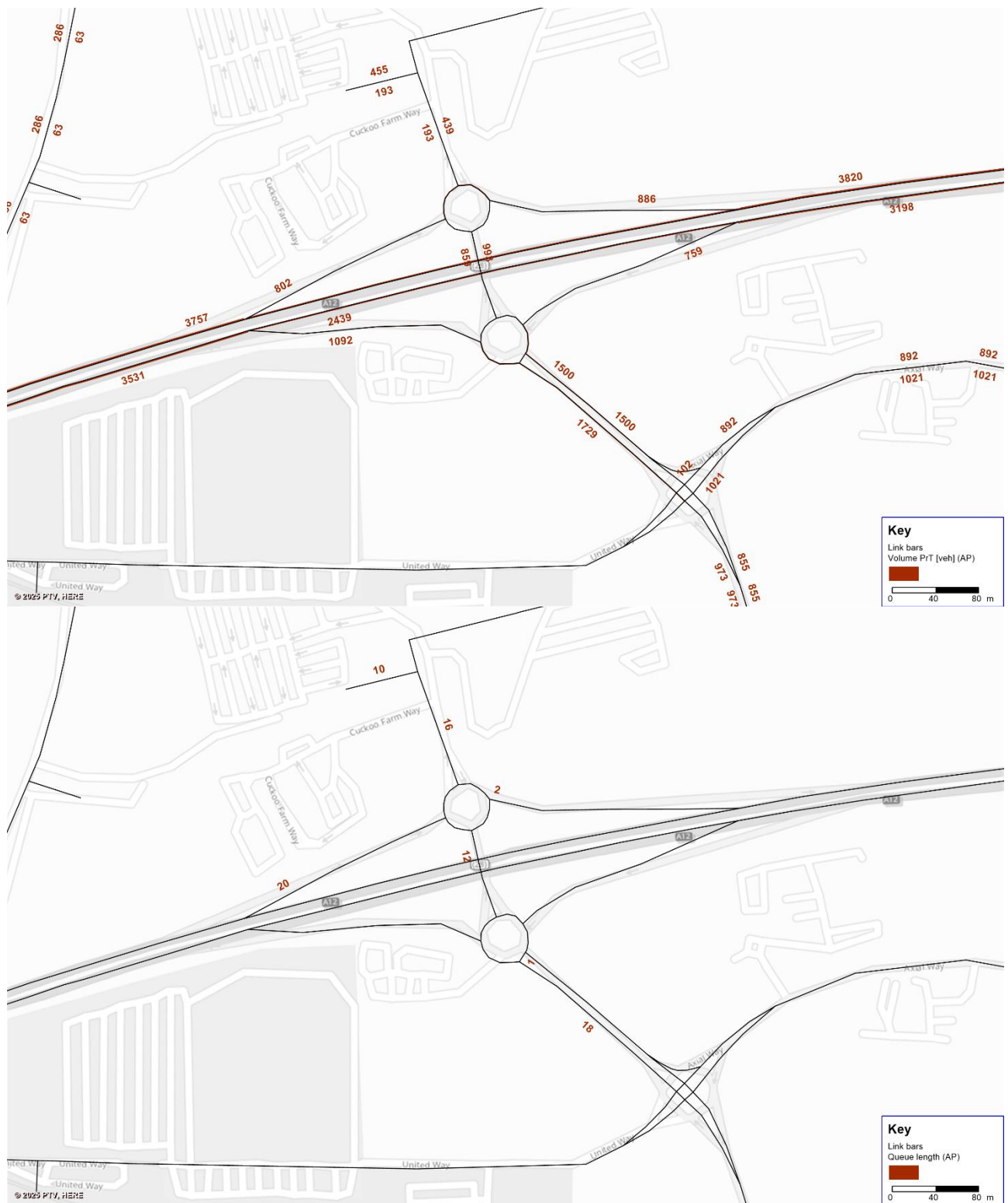


Figure B-28: A120 / Wix Road and A120 / Main Road / Church Hill – 2042 RC AM – Total vehicle flows and Queues



Figure B-29: A120/ Link Rd – 2042 RC AM – Total vehicle flows and Queues





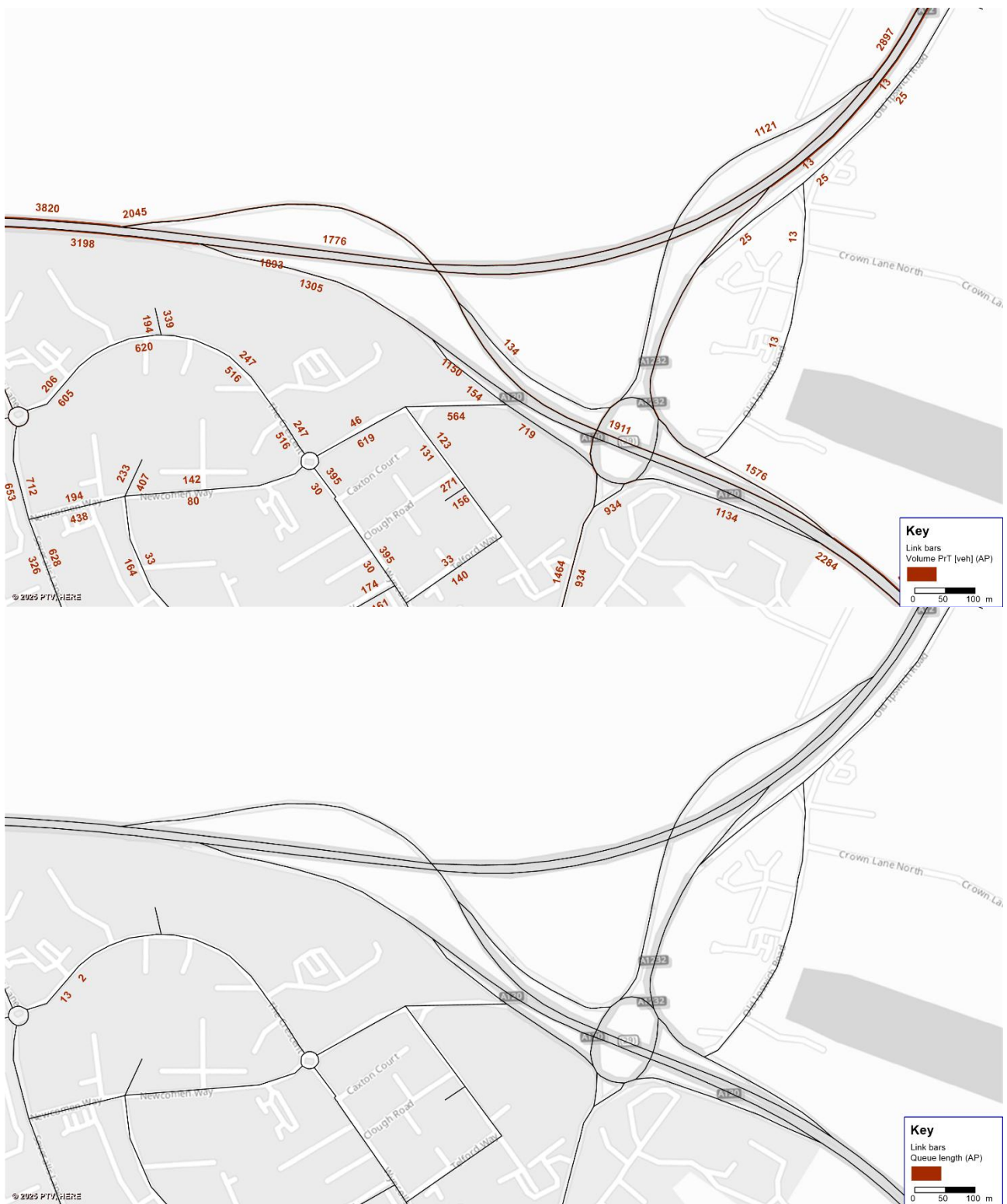


Figure B-32: A12 J29 – 2042 RC PM – Total vehicle flows and Queues

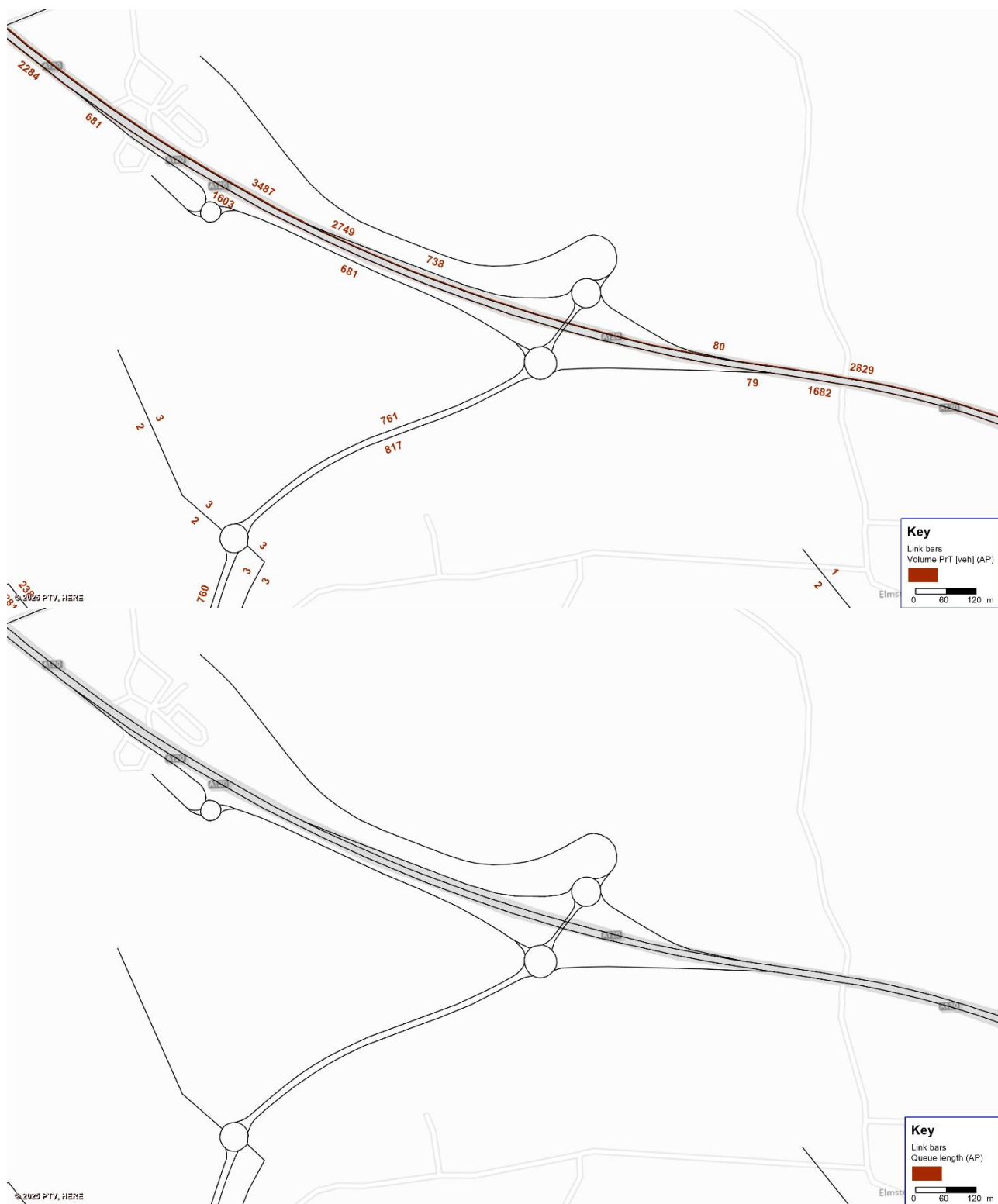


Figure B-33: A120 / A1331 – 2042 RC PM – Total vehicle flows and Queues

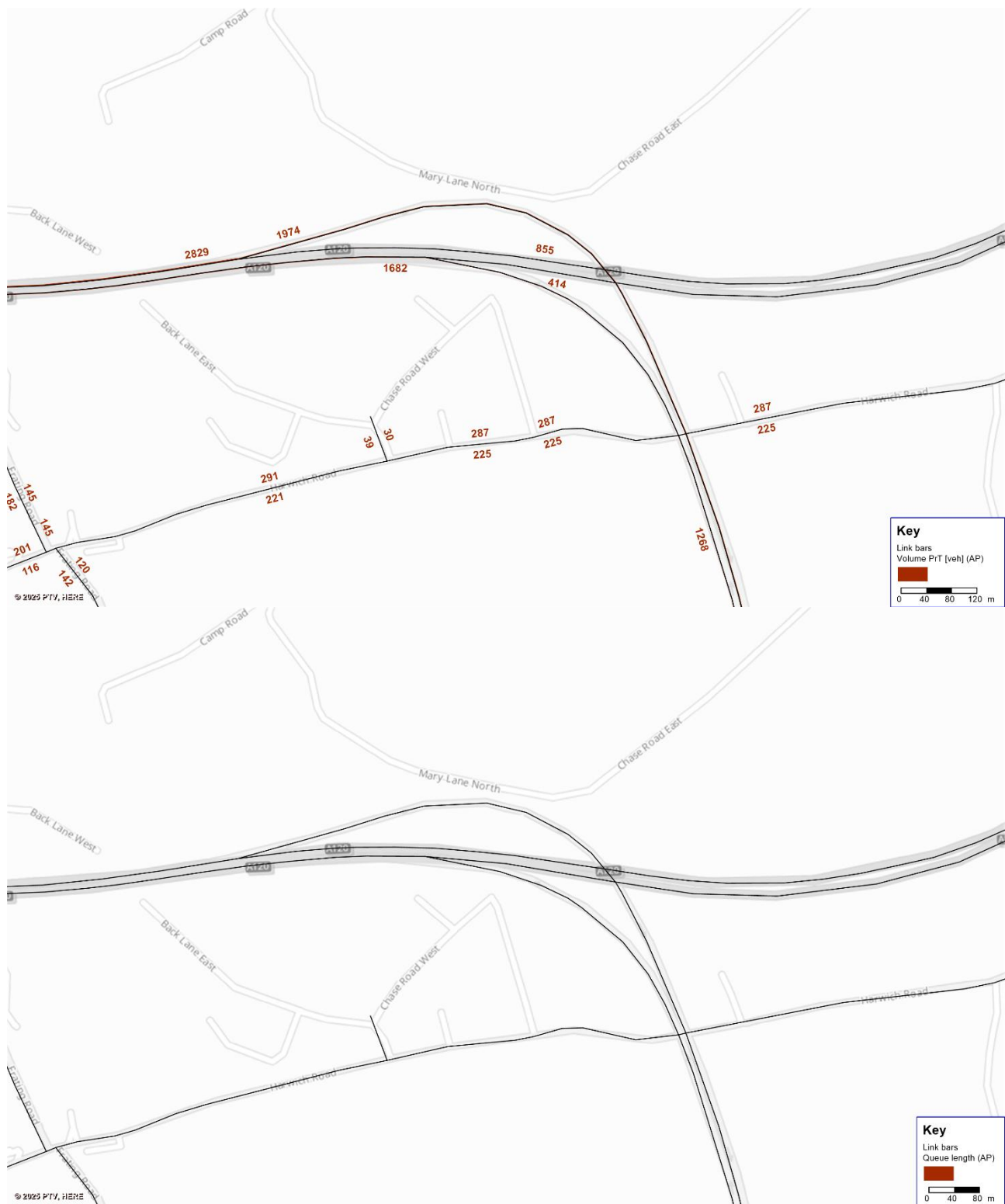


Figure B-34: A120 / A133 – 2042 RC PM – Total vehicle flows and Queues

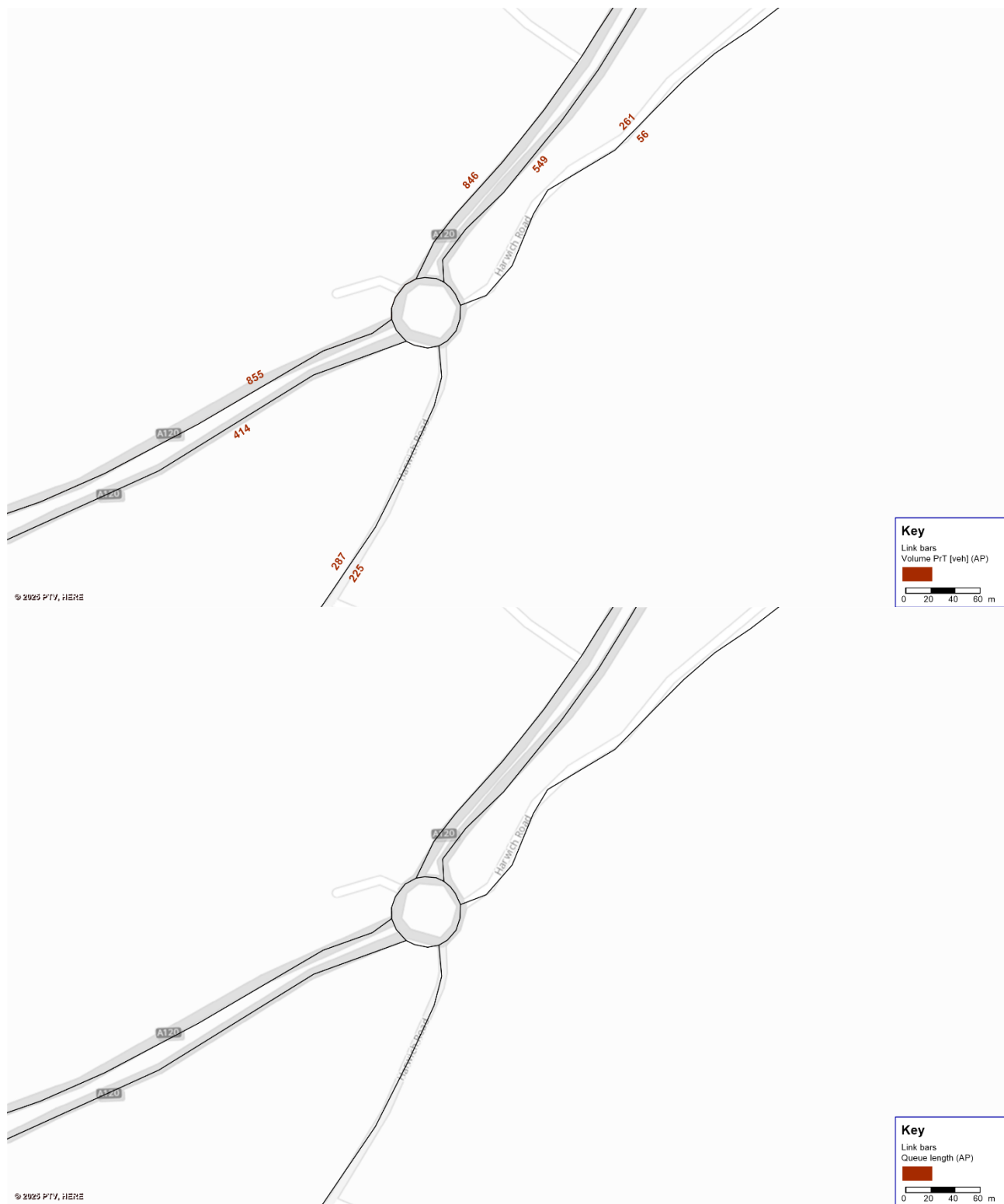


Figure B-35: A120 / Harwich Road – 2042 RC PM – Total vehicle flows and Queues

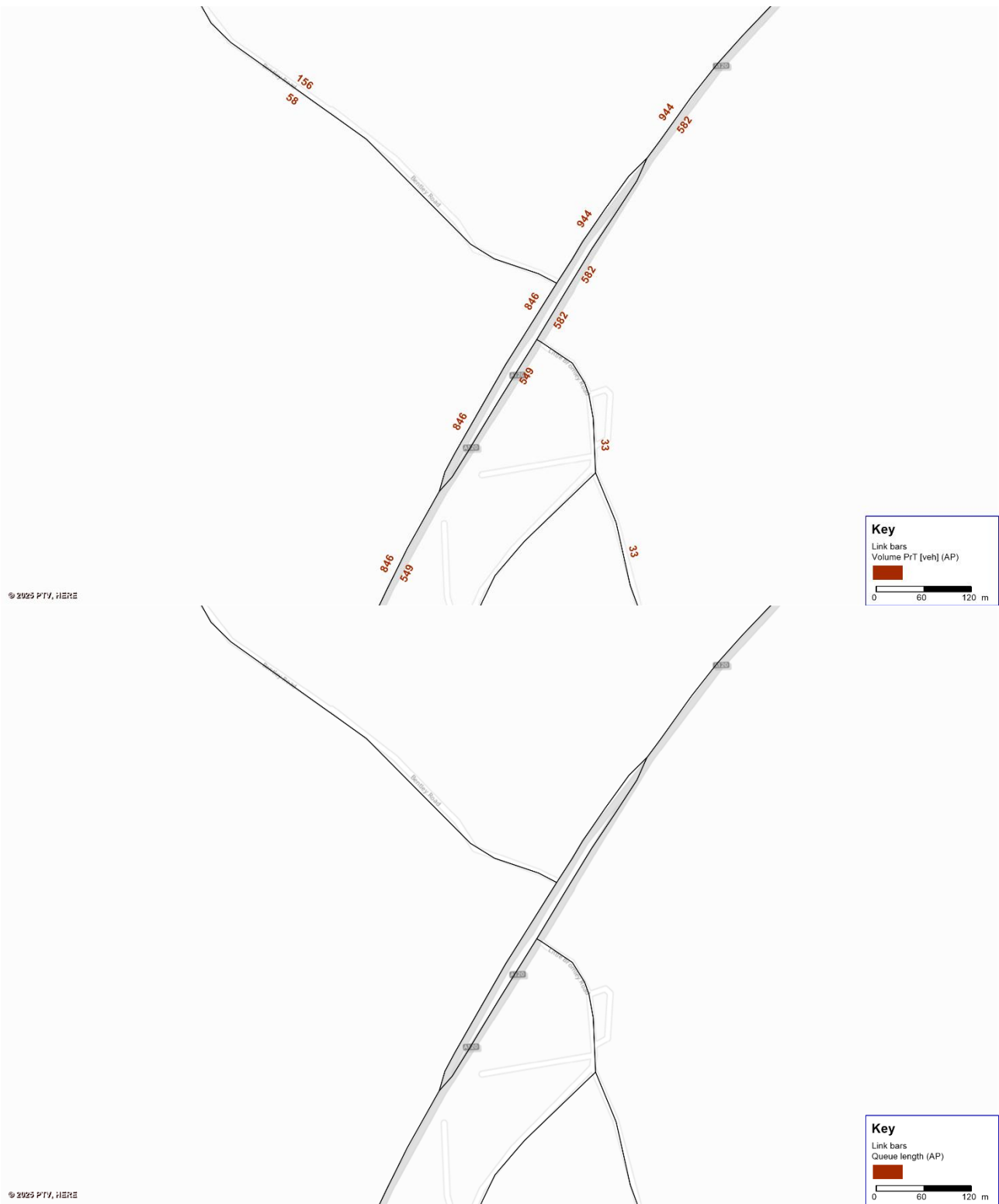


Figure B-36: A120 / Bentley Rd / Little Bromley Rd – 2042 RC PM – Total vehicle flows and Queues

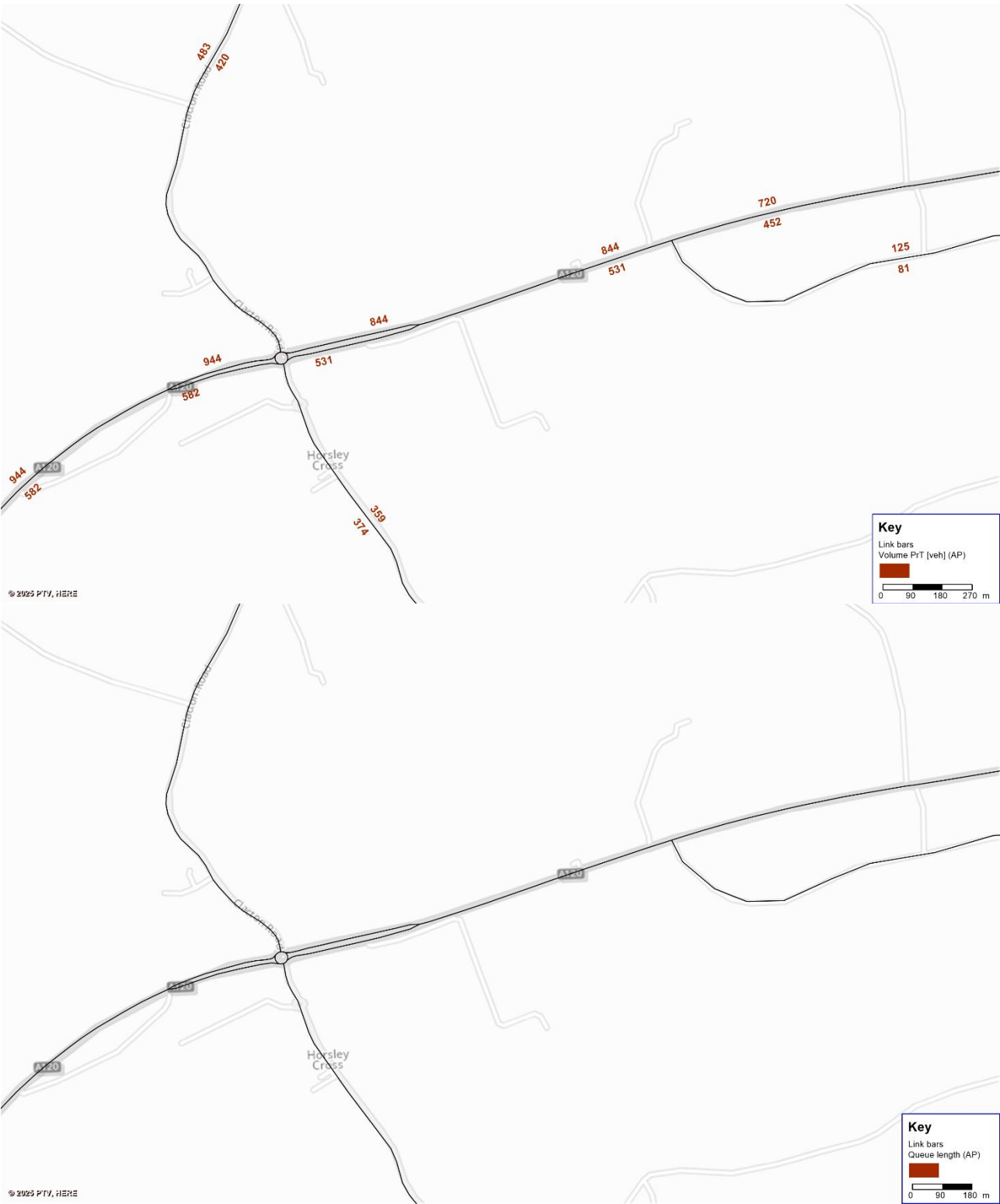


Figure B-37: A120 / B1035 and A120 / Colchester Road – 2042 RC PM – Total vehicle flows and Queues

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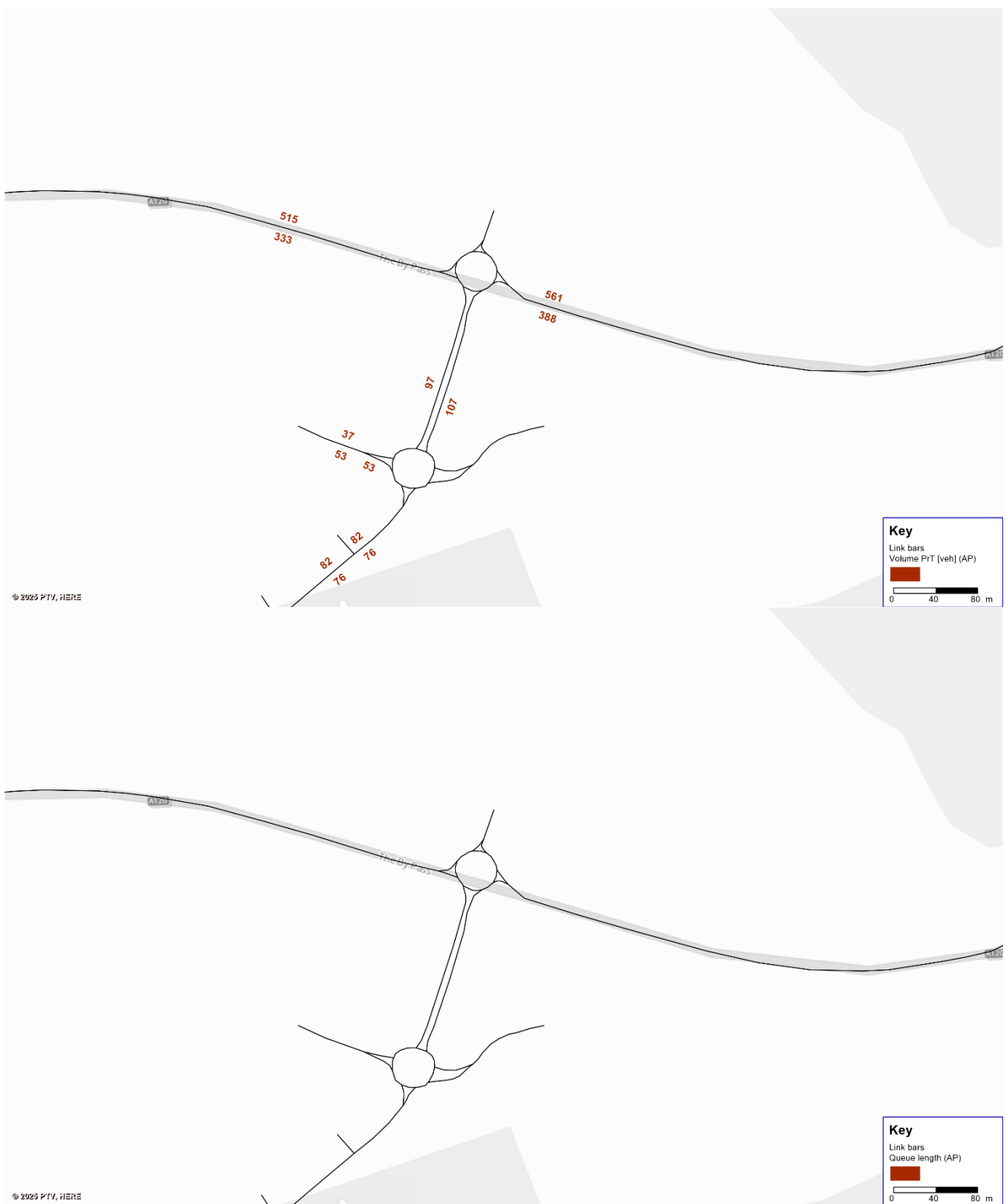


Figure B-39: A120/ Link Rd – 2042 RC PM – Total vehicle flows and Queues

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