

Appendix 61

WSP Review of SATURN Forecasting Report and HTp Response

MEMO

TO	Mike Taylor, WBC	FROM	Colin Wright / Andy Carpenter, WSP
DATE	27 November 2017	CONFIDENTIALITY	Confidential
SUBJECT	Peel Hall Farm – Forecasting Report Review		

Introduction

WSP have been commissioned by Warrington Borough Council (WBC) to review a suite of modelling documents that have been submitted to WBC as part of the planning application for a major residential development at Peel Hall Farm.

The Planning Application was submitted by Satnam Group in 2016 and rejected by WBC on the grounds of insufficient information relating to highway matters, namely a functioning traffic model and a set of mitigation measures to cope with the development traffic.

The following documents have been submitted to WBC in order to address the shortcoming of the planning application. These are:

- Local Model Validation Report (LMVR), Aecom, September 2017;
- Peel Hall Forecasting Report, Aecom, September 2017;
- Technical Note – Impact Summary, Highgate Transportation, September 2017.

The proposed method of review by WSP is to produce a short summary “memo style” report for each of the above documents. This document will review the information provided within the Peel Hall Forecasting Report. The purpose of this report is to summarise the key points of the Forecasting Report and raise queries where additional information may need to be sought.

Overview

The forecast modelling report details the scenarios modelled and methodology applied. It reports on the SATURN model outputs from the forecast models, comparing with and without scheme.

A total of five forecast scenarios were modelled:

- 2025 Do Minimum – Base traffic flow + Background growth+ Committed developments;
- 2025 Do Something – Base traffic flow + Background growth+ Committed developments + Peel Hall partial build out;
- 2030 – Do Minimum – Base traffic flow + Background growth+ Committed developments;
- 2030 Do Something – Base traffic flow + Background growth+ Committed developments + Peel Hall full build out;
- 2030 Do Something with through route – Base traffic flow + Background growth+ Committed developments + Peel Hall full build out + spine road connecting Mill Lane to A49.

Future Year Highway Networks

The Do Minimum network contains one committed scheme, the part signalisation of the Birchwood Way EB approach to Oakwood Gate roundabout.

The Do Something network contains the access arrangements for the Peel Hall development. These are:

- 6 new zones for development traffic; and
- Three new junctions tying into the exiting network – two priority junctions on Poplars Avenue (one for employment, one for 330 residential (in 2030)) and a roundabout at Mill Lane / Blackbrook Avenue (for 700 residential (in 2030)).

The Do Minimum and Do Something networks do not change between 2025 and 2030.

A variation of the Do Something network was coded with a through route connecting A49 to Mill Lane / Blackbrook Avenue. A signalised junction permitting all movements was coded to allow access to/from the through route via Birch Avenue onto A49. A total of 7 new zones were added (compared to Do Minimum) for development traffic. The zone serving Poplars Avenue central now represents 180 residential units. Three zones load directly onto the through route (this is inferred from the SATURN plots in the appendices).

- 1. Provide detail regarding the level of development represented by the three zones along the through route. The location of the trip loading point may have an influence on where it accesses onto the existing highway network.**
- 2. Can confirmation be made that signal timings are consistent between Do Minimum and Do Something options and signal optimisation has not been applied?**

Future Year Trip Matrix Development

Background Growth

Background traffic growth is detailed in Technical Note HTp/1107/TN/20. A single growth factor has been calculated for each forecast year and time period using the NTM functionality in TEMPRO. The single growth factor has been based on car driver growth for Warrington 006 MSOA, with the NTM road type selected being Urban Motorway. It is stated that the combination of Warrington 006 MSOA and Urban Motorway has been selected as it produces the highest growth factors and “represents an over-estimate for traffic growth over much of the model network”.

- 3. What is the benefit for over predicting the background growth? If anything this may dilute the impact of the development trips.**
- 4. The forecasting methodology, specifically the use of the NTM function, is not normally applied when forecasting from a strategic model. Typically TEMPRO OD factors for each trip type would be used for the fully observed trips and NTM for trips that have an origin or destination in the external area.**
- 5. TEMPRO and NTM will only provide growth factors for cars. How has LGV and HGV growth been defined?**

Two employment sites are listed as committed developments:

- Land at Benson Road, Birchwood; and
- Birchwood Shopping Centre.

It is assumed that these developments are include within TEMPRO forecasts, so no additional account is made for them within forecasting.

6. Are these developments small enough to exclude from explicit modelling?
7. Comparison of the number of jobs each site will create and the growth predicted by TEMPRO for the relevant MSOA should be provided. Then a decision should be made on whether they are accounted for within TEMPRO.
8. Neither of these sites are in Warrington 006. The current forecasting methodology will not model any changes in trip patterns brought about by these developments.

Trip Generation

The trips generated by the developments at Peel Hall are detailed in Technical Note HTp/1107/TN/19 and summarised in the Peel Hall Forecasting Report.

The trip rates have been derived using the TRICS database and the TRICS outputs are contained in HTp/1107/TN02 Revision A. The trip rates and selected sites in the TRICS outputs appear to be suitable. However, it should be noted the date range selected for surveys for the food store was between 01/01/07 to 19/07/13 and only 3 sites were used in calculating the trip rate.

A summary of the 2030 peak hour trip generation set out in the report (Table 4.3) is summarised in Table 1.

Table 1: Summary of 2030 Vehicle Trip Generation (Source: HTp/1107/TN/19 and Peel Hall Forecasting Report)

Access	Quantum of Development	AM Arrival	AM Departure	PM Arrival	PM Departure
Poplars Avenue (Central)	330 dwellings	74	173	163	101
	care home	7	7	8	8
	food store	92	61	181	191
	local shops	30	29	36	39
	family pub	0	0	23	15
	<i>Total</i>	<i>203</i>	<i>270</i>	<i>411</i>	<i>354</i>
Poplars Avenue (West)	employment land	69	39	20	47
Mill Lane	150 dwellings	34	79	74	46
Mill Lane/Blackbrook Avenue	700 dwellings	158	366	347	215
	primary school	113	79	19	27
Birch Avenue	20 dwellings	5	11	10	6
Grasmere Avenue	community uses	10	5	7	8
Total		592	849	888	703

A number of discounts have applied to the values shown in Table 1. The discount rates are as follows with the discounted development trips shown in Table 2.

- Residential 0%
- Care Home 0%
- Employment 0%
- Food Store 100% (70% discount and 30% pass-by)
- Local Centre 100%

- Family Pub/Restaurant 0%
- Primary School 50%
- Community uses 0%

Table 2: Summary of 2030 discounted Vehicle Trip Generation (Source: HTP/1107/TN/19)

Access	Quantum of Development	AM Arrival	AM Departure	PM Arrival	PM Departure
Poplars Avenue (Central)	330 dwellings	74	173	163	101
	care home	7	7	8	8
	food store*	28	18	54	57
	local shops	0	0	0	0
	family pub	0	0	23	15
	<i>Total</i>	<i>109</i>	<i>198</i>	<i>248</i>	<i>181</i>
Poplars Avenue (West)	employment land	69	39	20	47
Mill Lane	150 dwellings	34	79	74	46
Mill Lane/Blackbrook Avenue	700 dwellings	158	366	347	215
	primary school	57	40	10	14
Birch Avenue	20 dwellings	5	11	10	6
Grasmere Avenue	community uses	10	5	7	8
Total		442	738	716	517

* pass-by trips only

Technical Note HTP/1107/TN/19 states that food store trips will be discounted by 100% in the Saturn Model, with the 30% of pass-by trips being re-distributed from existing traffic on the network passing by Poplars Avenue.

- 9. The re-distribution of the traffic may change the turning proportions at the junction which may affect the operation of Poplars Avenue. No evidence has been provided to demonstrate no impact due to pass-by trips. Are these pass by trips modelled in the SATURN model?**
- 10. The 30% by-pass trip rate has been derived by assuming the same trip reduction as the Omega development. Can a justification for the 30% reduction be provided based on current best practice? 'TRICS Research Report 14/1: Pass-By & Diverted Trips Report' states that a standard trip rate reduction for pass-by and converted trips is no longer considered applicable and that a first principles approach should be undertaken. No evidence has been provided to suggest this is the case.**
- 11. No account for has been provided for transferred or diverted trips. For example traffic may divert from the A49 which may impact upon the operation of the local network. Can more information be provided to explain why these trip types have not been included in the analysis?**

It is assumed that 100% of trips to the local centre will be internal and that there will be no external trips generated.

- 12. Technical Note HTP/1107/TN/13 which is the applicant's response to the HE contradicts this and states that 30% of trips will be pass-by (Table 6-1). More information should be provided to explain**

the inconsistencies between the discounting rates between the applicant's response to the HE and Technical Note HTP/1107/TN/19.

An internalisation discount of 50% has been applied to the primary school trips based on an estimation that 85% of pupils will be from the development site.

13. More information should be provided on the rationale for the 50% value as there appears to be no evidence submitted to substantiate this proportion.

14. Are trips from the 330 dwellings accessed via Poplars Avenue to the west of the site included in the internalisation discount? Access to the primary school from these 330 dwellings will be restricted due to the proposed bus gate and the vehicle trips will have to travel on the local highway network to access the school. Has this been accounted for in the modelling?

Tables 4.2 and 4.3 summarise the final trips generated by the Peel Hall development for 2025 and 2030 respectively.

15. Table 4.3 represents undiscounted trips from 2030 scenario without through route. The discounted trips should be shown as this is the number of trips that are loaded onto the network. The correct tables are Table 5.2 (HTP/1107/TN/19, without through route) and Table 3.10 (HTP/1107/TN/21, with through route).

16. At this stage of the report, it would be beneficial to present some matrix totals. This would show base year and forecast years with and without developments.

Trip Distribution

The trip distribution applied for the development trips is detailed in AECOM's Technical Note "Proposed Distribution for Peel Hall Development" included in Appendix E. Parent zones have been chosen for distribution depending on land use type, i.e. residential, employment or other. Distribution percentages for the Peel Hall developments are shown based on the original zone structure in Figures 1-20.

17. Can the trips groupings be defined? Are they:

- a. Residential – all trips to/from a residential property (including commuting)**
- b. Employment – employers business trips (non-home based only?)**
- c. Other – other trips (non-home based only?)**

18. Do the parent zones provide a realistic distribution? Looking at Fig 4 (AM from PH), Fig 8 (AM to PH), Fig 12 (PM from PH) and Fig 16 (PM to PH) it can be seen that roughly 20% of the trips stay within Hulme and Orford (original model zones 67, 69, 70 and 152).

19. Census JTW information for Warrington 006 and 007 (included in Appendix A) shows largest proportions are to Warrington town centre, Birchwood and Woolston Grange industrial park? The AM Residential from PH and PM Employment to PH distribution plots should reflect this.

20. Zone 405 (land north of M62 bounded by Winwick Link) shows trips in Fig 13 Residential trips to Peel Hall. Is this correct? There are no development trips at any other time period or trip type.

21. The distributions are taken from the multi modal model with full zone structure. Has any change in routing for forecast Do Minimum scenarios been taken in to account? There are quite a number of routes to Warrington town centre, the distribution may change, e.g. increase of traffic on A49 transferring trips to A50.

Covergence is stated to be satisfactory, with delta round 0.15%.

22. Can the convergence statistics be provided, in line with DfT WebTAG Unit M3.1 Table 4.

Assessment of Impact on Journey Times

The journey times assessed are given in Figure 5.1. This is shown below.

Figure 5.1, Journey Times used in the Analysis



The analysis is then presented without the journey times on the M62.

23. Provide explanation for omission of M62 journey route from analysis.

24. Analysis of the residential access roads, e.g. Poplars Avenue, would have been useful especially with regard to through route analysis.

The addition of the development traffic results in increases in journey times along the four routes assessed. Biggest increases 2030 no through route (DS-DM) are:

- Mill Lane SB AM +165secs,
- A49 SB AM +87 secs,
- Birchwood Way EB AM +74secs,
- A50 WB PM +74secs,
- Birchwood Way WB PM +63secs

Addition of the through route relieves A50 and A574 (partially) but increases on Mill Lane & A49.

25. Can a narrative be provided to explain why the journey times are changing, e.g. is it link capacity, green times, opposing turning movements etc. How are the development trips and their distribution impacting on journey times?

26. The through route decreases journey time NB on A49, this seems counter intuitive as a new signalised junction will add delay. Can this be explained?

Impacts on Delay

Difference plots of delay from the SATURN model are presented for all scenarios without the through route. A difference plot for the through route was not produced due to structural changes between the networks with the through route and those without the through route. For each scenario comparison link delays are stated at key junctions.

- 27. As with the journey times section, can a narrative be provided explaining the increases and how development trips influence changes in link delay? The same junctions are mentioned for each scenario yet there are other links with increases in delay greater than 40 seconds that are not discussed.**
- 28. The total delay plots provided for the through route assessment reveal very large delays entering the model at Oakwood Gate (AM and PM), Birchwood Way (PM) and M62 J9 EB off slip (PM). This could have an effect on model stability and result in trips not being able to enter the network. The calibration and coding in these areas should be reviewed.**

The total delay time for each model is also presented. Logically the Do Something models have more delay than the Do Minimum models.

- 29. The total delay in the PM models is about 50% higher than the AM models. Is this solely due to the delay identified above at Oakwood Gate / Birchwood Way junction. It would be expected that the models carry similar amounts of delay.**
- 30. The introduction of the through route increases delay in the AM model but reduces delay in the PM when compared to the Do Something models without the link road. Can a narrative be provided to explain this?**

Queuing

Similar to the delay assessment, queue lengths are compared between Do Minimum and Do Something scenarios. Compared to the delay assessment there are not many areas of queue length change. The changes in queue length are concentrated around the major junctions; M62 J9, A49 / Cromwell Avenue, College Place Roundabout and Oakwood Gate roundabout.

- 31. As with journey times and delay can an explanatory narrative be provided?**
- 32. The through route total queue length plots show large queues (greater than 100 pcus) in the PM on the approaches to Oakwood Gate roundabout, M6 J9 EB off slip and A49 NB approach to Long Lane junction? Are these realistic? Is all traffic getting through the network? Total queue length plots would be useful for Do Minimum and Do Something without through route.**

Assessment of Impact of Volume over Capacity

Link Volume over Capacity is compared between Do Minimum and Do Something scenarios. The increases due to the development seem low and overall there are not too many links with V/C greater than 85%. Difference plots and total V/C plots have been provided.

- 33. Again can a narrative be provided?**
- 34. What is the capacity of each link? Is it appropriate for the link type? No flows have been provided so cannot infer what increase in 13% V/C on Poplars Avenue means for flow.**
- 35. Large V/C occur M62 WB after J9 merge, M62 J9 EB off slip, and the approaches to Oakwood Gate roundabout. Coding should be checked in these areas.**

36. The difference plots are difficult to read with many labels overlapping especially around multi-node junctions. Can there appearance be improved? Also all plots are labelled Volume of Capacity, should be Volume over Capacity.

Other

37. It would be beneficial to see some flow plots, both total and difference. Also select link analysis plots to show the routing to and from the developments, and also to identify the non-development traffic using the through route.

Summary

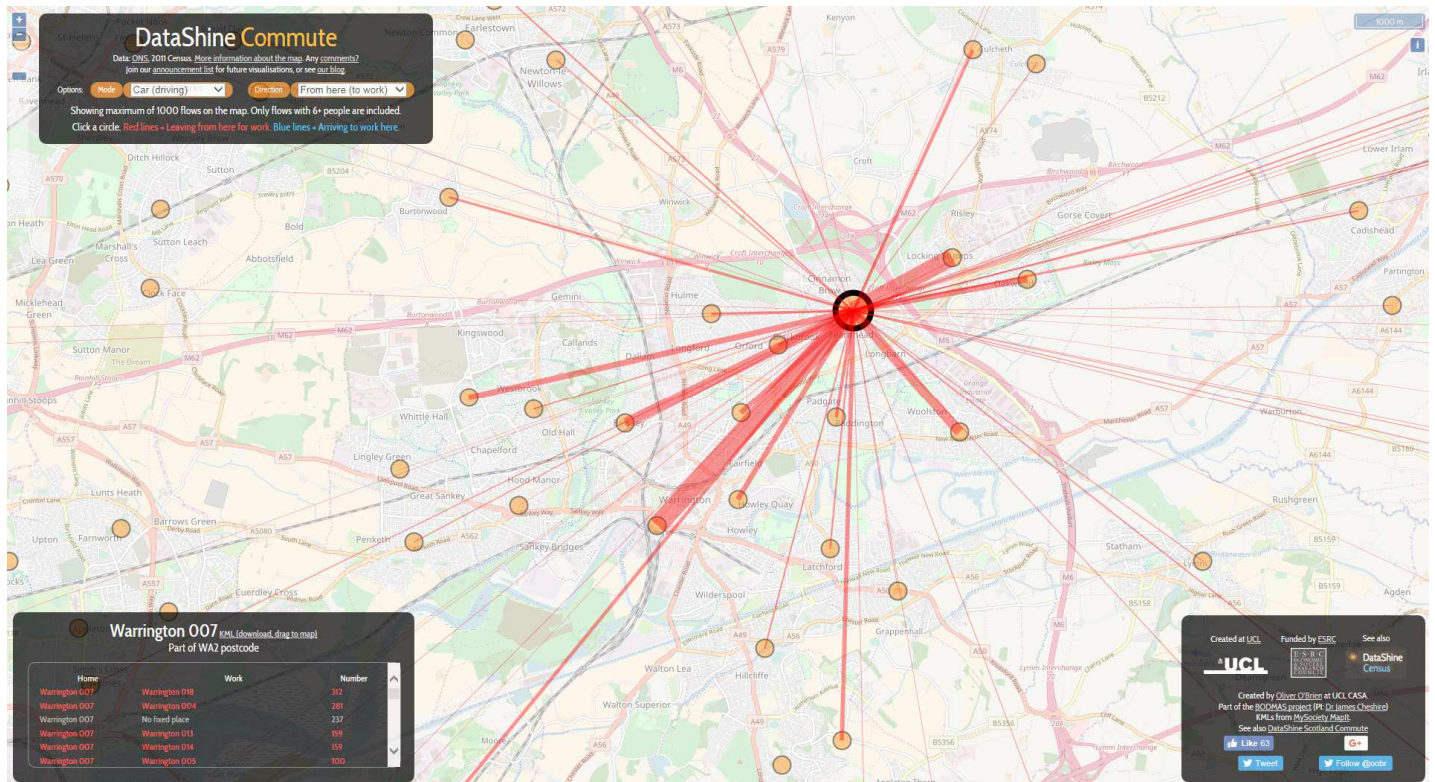
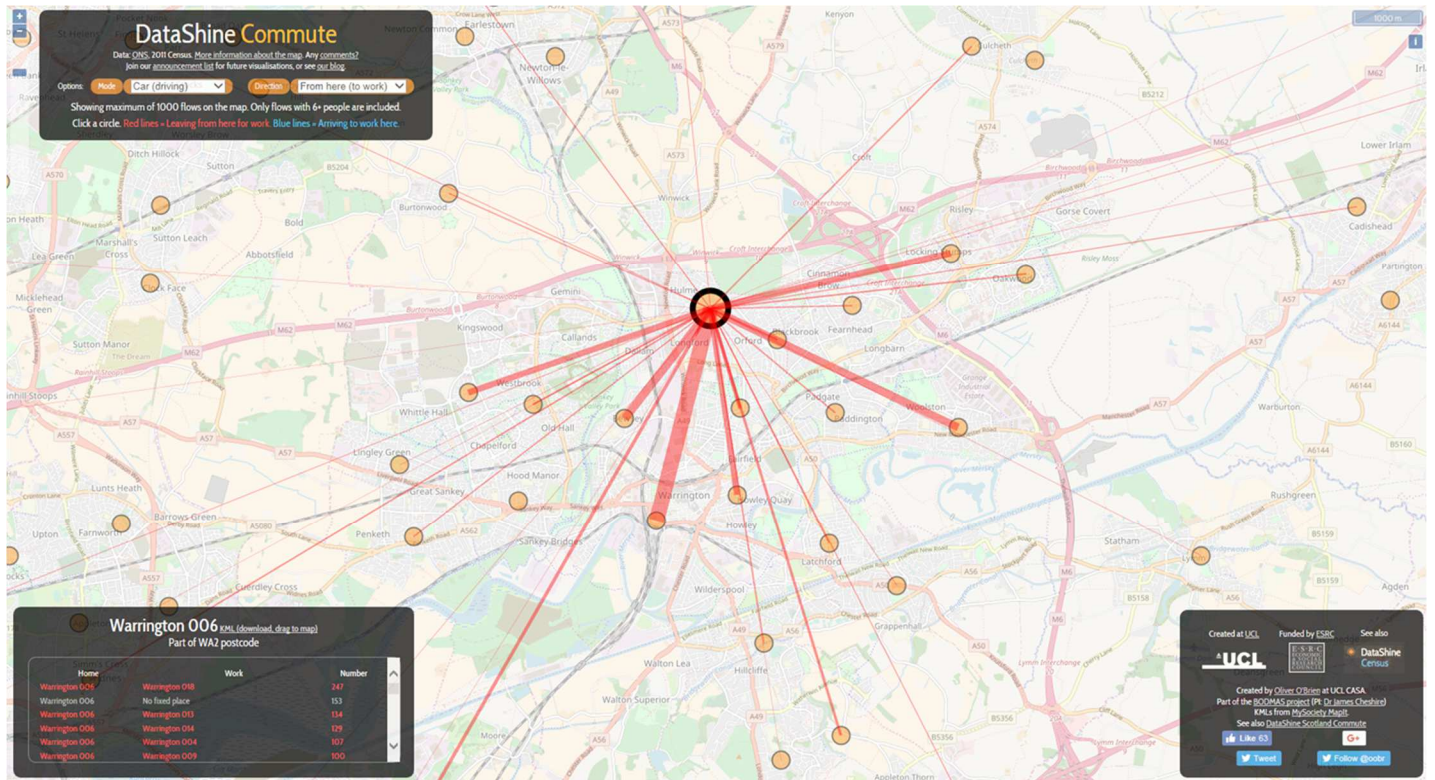
The SATURN model of the area around Peel Hall Farm has been used to provide with and without development models for 2025 (partial development build out) and 2030 (full build out). An additional 2030 scenario was tested with full build out and a through route connecting the A49 and Mill Lane / Blackbrook Avenue.

A summary of the main issues that require further attention are:

- Background growth – has an appropriate level of background growth been applied for all trip purposes and vehicle types. Have committed developments been modelled correctly?
- Trip distribution – are the parent zones selected suitable (actual modelled distribution and age of OD data)? Comparison with census JTW data would suggest that the distribution is not wide reaching enough, with 20% of development trips going to / from other residential areas in Hulme and Orford.
- Trip rates – the assumptions and evidence base behind the discounting, internalisation, pass-by and transfer needs to be made clearer. The trips rates themselves seem reasonable, though for some land use type the number and age of surveys may be questioned.
- Model stability – the delays, queues and V/C information all highlighted a problem around Oakwood Gate roundabout, on the Oakwood Gate and Birchwood Way WB approaches, and at other areas where traffic enters the model. The PM model had 50% more delay than the AM model. Links operating way over 100% V/C can cause the model to be unstable as small changes in flow lead to big changes in delay.
- Reporting – a descriptive narrative is required to explain exactly what is causing changes to journey times, delays, queues and V/C rather than just reporting the change itself. How does the development traffic interact with existing traffic? Also flow plots would be beneficial.

Colin Wright
Principal Transport Planner

Appendix A



RESPONSE TO WSP FORECASTING REPORT REVIEW (Rev. A)

PROJECT: Peel Hall, Warrington

REVIEW DATE: 27 November 2017

REF.: APP/M0655/W/17/3178530

Land at Peel Hall, Warrington

Outline application for a new residential neighbourhood including C2 and C3 uses; local employment (B1 uses); local centre including food store up to 2,000m², A1-A5 (inclusive) and D1 use class units of up to 600m² total (with no single unit of more than 200m²) and family restaurant/pub of up to 800m² (A3/A4 use); site for primary school; open space including sports pitches with ancillary facilities; means of access and supporting infrastructure at Peel Hall, Warrington.

Future Year Highway Networks

1. Provide detail regarding the level of development represented by the three zones along the through route. The location of the trip loading point may have an influence on where it accesses onto the existing highway network.?

The through route has been constructed within the SATURN model based on the masterplan. The loading points are as per Technical Note HTP/TN/21 with the addition of splitting the 850 dwellings which load onto the through route equally into two zones, one to the east and one to the west of the through route.

An annotated screen shot of the through route in SATURN is contained in Appendix 1.

2. Can confirmation be made that signal timings are consistent between Do Minimum and Do Something options and signal optimisation has not been applied?

Signal timing are not optimised in any of the future year scenarios and remain consistent between the Do Something and the Do Minimum.

Future Year Trip Matrix Development*Background Growth*

3. What is the benefit for over predicting the background growth? If anything this may dilute the impact of the development trips?

This is as per previous agreements from 2016, and was reduced twice; once in terms of committed developments and once in terms of updated NTEM data.

4. The forecasting methodology, specifically the use of the NTM function, is not normally applied when forecasting from a strategic model. Typically TEMPRO OD factors for each trip type would be used for the fully observed trips and NTM for trips that have an origin or destination in the external area.

Data used as per previously agreed strategy.

5. TEMPRO and NTM will only provide growth factors for cars. How has LGV and HGV growth been defined?

Scope agreed early 2016.

6. Are these developments small enough to exclude from explicit modelling?

This is as per agreement with WBC and HE, and set out in HTp/TN/07/Addendum.

7. Comparison of the number of jobs each site will create and the growth predicted by TEMPRO for the relevant MSOA should be provided. Then a decision should be made on whether they are accounted for within TEMPRO.

Previous methodology agreed.

8. Neither of these sites are in Warrington 006. The current forecasting methodology will not model any changes in trip patterns brought about by these developments.

Previous methodology agreed.

Trip Generation

9. The re-distribution of the traffic may change the turning proportions at the junction which may affect the operation of Poplars Avenue. No evidence has been provided to demonstrate no impact due to pass-by trips. Are these pass by trips modelled in the SATURN model?

Pass-by as per previous agreed strategy.

Our stand alone site access modelling to account for impact of pass-by trips and the pass-by trips are accounted for in the SATURN model.

10. The 30% by-pass trip rate has been derived by assuming the same trip reduction as the Omega development. Can a justification for the 30% reduction be provided based on current best practice? 'TRICS Research Report 14/1: Pass-By & Diverted Trips Report' states that a standard trip rate reduction for pass-by and converted trips is no longer considered applicable and that a first principles approach should be undertaken. No evidence has been provided to suggest this is the case.

As per agreed strategy dating from 2016.

11. No account for has been provided for transferred or diverted trips. For example traffic may divert from the A49 which may impact upon the operation of the local network. Can more information be provided to explain why these trip types have not been included in the analysis?

Approach already agreed.

12. Technical Note HTp/1107/TN/13 which is the applicant's response to the HE contradicts this and states that 30% of trips will be pass-by (Table 6-1). More information should be provided to explain the inconsistencies between the discounting rates between the applicant's response to the HE and Technical Note HTp/1107/TN/19.

HTp/TN/13 dated July 2016 was superseded by responding to WBC December 2016 consultation comments on trip discounting.

13. More information should be provided on the rationale for the 50% value as there appears to be no evidence submitted to substantiate this proportion.

Response in HTp/TN/13.

14. Are trips from the 330 dwellings accessed via Poplars Avenue to the west of the site included in the internalisation discount? Access to the primary school from these 330 dwellings will be restricted due to the proposed bus gate and the vehicle trips will have to travel on the local highway network to access the school. Has this been accounted for in the modelling?

The local centre car park can be reached from both the Poplars Avenue central access junction and the Birchwood Avenue/Mill Lane main site access junction. It was agreed with highway officers at WBC in March 2016 meeting that this was acceptable.

15. Table 4.3 represents undiscounted trips from 2030 scenario without through route. The discounted trips should be shown as this is the number of trips that are loaded onto the network. The correct tables are Table 5.2 (HTp/1107/TN/19, without through route) and Table 3.10 (HTp/1107/TN/21, with through route).

It has been confirmed that the correct discounted trips were loaded into the model. Table 4.3 of the forecasting report has been updated accordingly with these discounted values and an updated Forecasting Report provided.

16. At this stage of the report, it would be beneficial to present some matrix totals. This would show base year and forecast years with and without developments.

This can be provided going forward.

Trip Distribution

17. Can the trips groupings be defined? Are they:
 - a. Residential – all trips to/from a residential property (including commuting)
 - b. Employment – employers business trips (non-home based only?)

- c. Other – other trips (non-home based only?)

This is confirmed; the trips have been split out in SATURN to provide an improved response to routing within the model.

18. Do the parent zones provide a realistic distribution? Looking at Fig 4 (AM from PH), Fig 8 (AM to PH), Fig 12 (PM from PH) and Fig 16 (PM to PH) it can be seen that roughly 20% of the trips stay within Hulme and Orford (original model zones 67, 69, 70 and 152).

The distribution was carried through from the WS VISUM model, into the VISSIM and subsequently the SATURN model. Zone locations from the VISSIM model remain in the same locations, but where required have been disaggregated.

19. Census JTW information for Warrington 006 and 007 (included in Appendix A) shows largest proportions are to Warrington town centre, Birchwood and Woolston Grange industrial park? The AM Residential from PH and PM Employment to PH distribution plots should reflect this.

The approach and gravity model has already been agreed back in 2016; however consideration can be given to updating this and providing a sensitivity test in a future run of the SATURN model.

20. Zone 405 (land north of M62 bounded by Winwick Link) shows trips in Fig 13 Residential trips to Peel Hall. Is this correct? There are no development trips at any other time period or trip type.

Trip distribution Taken from the gravity model.

21. The distributions are taken from the multi modal model with full zone structure. Has any change in routing for forecast Do Minimum scenarios been taken in to account? There are quite a number of routes to Warrington town centre, the distribution may change, e.g. increase of traffic on A49 transferring trips to A50.

No change in routing for forecast Do Minimum scenarios has been taken into account.

22. Can the convergence statistics be provided, in line with DfT WebTAG Unit M3.1 Table 4.

Yes, this will be provided going forward.

23. Provide explanation for omission of M62 journey route from analysis.

The M62 journey time information is provided in the updated Forecasting Report (eastbound and westbound directions).

24. Analysis of the residential access roads, e.g. Poplars Avenue, would have been useful especially with regard to through route analysis.

This can be provided going forward.

25. Can a narrative be provided to explain why the journey times are changing, e.g. is it link capacity, green times, opposing turning movements etc. How are the development trips and their distribution impacting on journey times?

Almost all journey times are forecast to experience an increase as a result of the additional development trips upon the network. Traffic signal timings have remained the same between the Do-Minimum and Do-Something. So as the volume of development trips increases through junctions, delays also increase, since it takes vehicles longer to traverse the network.

The largest impact on journey times is experienced during the AM peak along Blackbrook Avenue / Mill Lane because the route has a number of roundabout junctions and a single signalised junction. Roundabout junctions are more sensitive to changes in traffic flows and so a greater increase in delays is forecast compared to other routes such as the A49, which is predominately signal controlled.

26. The through route decreases journey time NB on A49, this seems counter intuitive as a new signalised junction will add delay. Can this be explained?

The quicker journey times forecast along the A49 in the 'Through Route' models compared to the 'Do-Something' models are a direct result of the reduction in traffic on the A49 north of the M62. The reduction in traffic results in less delay on the A49 Newton Road northbound approach to its junction with the A49 Winwick Link Road and the link to the north of the roundabout up to its junction with Golborne Road.

Providing the 'Through Route' opens up an alternative route from the A49 south of the M62 to destinations accessed off Myddleton Lane and the A573 Golborne Road. Traffic is forecast to transfer to the through route, and route via Delph Lane, consequently reducing delays to vehicles waiting at the northbound stop line of the A49 Newton Road, traffic signals at the A49 Winwick Link Road roundabout junction, and those completing the right turn to Golbourne Road from the A49 Newton Road.

Impacts on Delay

27. As with the journey times section, can a narrative be provided explaining the increases and how development trips influence changes in link delay? The same junctions are mentioned for each scenario yet there are other links with increases in delay greater than 40 seconds that are not discussed.

AECOM to review/as above.

28. The total delay plots provided for the through route assessment reveal very large delays entering the model at Oakwood Gate (AM and PM), Birchwood Way (PM) and M62 J9 EB off slip (PM). This could have an effect on model stability and result in trips not being able to enter the network. The calibration and coding in these areas should be reviewed.

It is recognised that the junction was forecast to experience large queues within the VISSIM model also, which were confirmed by observations made during site visits. As the traffic flows increase in the forecast years, the queues increase.

We consider the model is more than adequate to assess the development impact.

29. The total delay in the PM models is about 50% higher than the AM models. Is this solely due to the delay identified above at Oakwood Gate / Birchwood Way junction. It would be expected that the models carry similar amounts of delay.

The forecast delays at Oakwood Gate accounts for almost all of the additional 50% in the AM peak hour model.

30. The introduction of the through route increases delay in the AM model but reduces delay in the PM when compared to the Do Something models without the link road. Can a narrative be provided to explain this?

To be provided in more detail going forward – attributed to tidal nature of traffic flows entering and leaving Warrington on this route.

Queuing

31. As with journey times and delay can an explanatory narrative be provided?

As above/to be reviewed going forward.

32. The through route total queue length plots show large queues (greater than 100 pcus) in the PM on the approaches to Oakwood Gate roundabout, M6 J9 EB off slip and A49 NB approach to Long Lane junction? Are these realistic? Is all traffic getting through the network? Total queue length plots would be useful for Do Minimum and Do Something without through route.

Difference in Queue length plots have been provided as part of Appendix F of the Forecasting Report, these are supported by total queue length plots also provided in Appendix 2 of this document.

The Oakwood Gate junction currently experiences significant delays and queueing in the PM peak on the eastbound Birchwood Way approach and northbound Oakwood Gate approach, so it is expected delays at the junction would be significant in the future year models. The forecast year VISSIM models predict similar queue lengths and delays across the junction.

In reality it is likely drivers may reroute to avoid the Oakwood Gate junction if delays of such magnitude were realised. However, as this forms the edge of the study area, and the alternative routes fall outside of the study area the model does not reflect this behaviour and so the demand remains fixed.

Checks between demand and actual flows at Oakwood Gate are forecast to experience minor differences suggesting all trips are getting through the network.

Given the level of queueing across the existing network within the the study area, the forecast queue lengths are believed to be reasonable in the future years of 2025 and 2030.

Assessment of Impact of Volume over Capacity

33. Again can a narrative be provided?

As above/to be reviewed going forward.

34. What is the capacity of each link? Is it appropriate for the link type? No flows have been provided so cannot infer what increase in 13% V/C on Poplars Avenue means for flow.

The calculated link capacities have been extracted from SATURN and placed alongside the actual flows in the supporting spreadsheet.

35. Large V/C occur M62 WB after J9 merge, M62 J9 EB off slip, and the approaches to Oakwood Gate roundabout. Coding should be checked in these areas.

The coding of Junction 9 and the M62 motorway has been checked and is believed to be representative of the existing motorway layout. V/C values above 90% are forecast on the M62 mainline in a westbound direction underneath Junction 9. The eastbound direction M62 mainline is forecast to experience V/Cs approaching 90%.

These values do not differ between the Do-Minimum and Do-Something models.

Westbound on and off slips are forecast to experience a small 1% increase in V/C between the Do-Minimum and Do-Something models, however forecast V/C values are all forecast to be lower than 61%. Eastbound the forecast increases in V/C on the off slip to the M62 is a 4% increase from 119% in the Do-Nothing scenario, highlighting the approach is already at capacity and the development traffic has a minimal impact.

The high V/C values on the eastbound M62 link are because it is coded as an external link and should benefit from the same / higher than the preceding link as the section of motorway benefits from an additional lane. The coding of the motorway link to avoid the high V/C will be updated within the sensitivity test models.

It should be noted the eastbound motorway link is forecast to experience a V/C of 139% in the Do-Minimum, and 140% in the Do-Something scenarios, highlighting that the development traffic is forecast to have a small impact on the motorway network.

The coding of Oakwood Gate roundabout has been checked and is believed to be representative of the existing junction layout. Sporadic hostile driver behaviour has been observed at the junction, where drivers were observed utilising the hatched areas to access the circulatory lanes, however the junction has not been coded to reflect this behaviour, since it is considered not to be consistent.

36. The difference plots are difficult to read with many labels overlapping especially around multi-node junctions. Can there appearance be improved? Also all plots are labelled Volume of Capacity, should be Volume over Capacity.

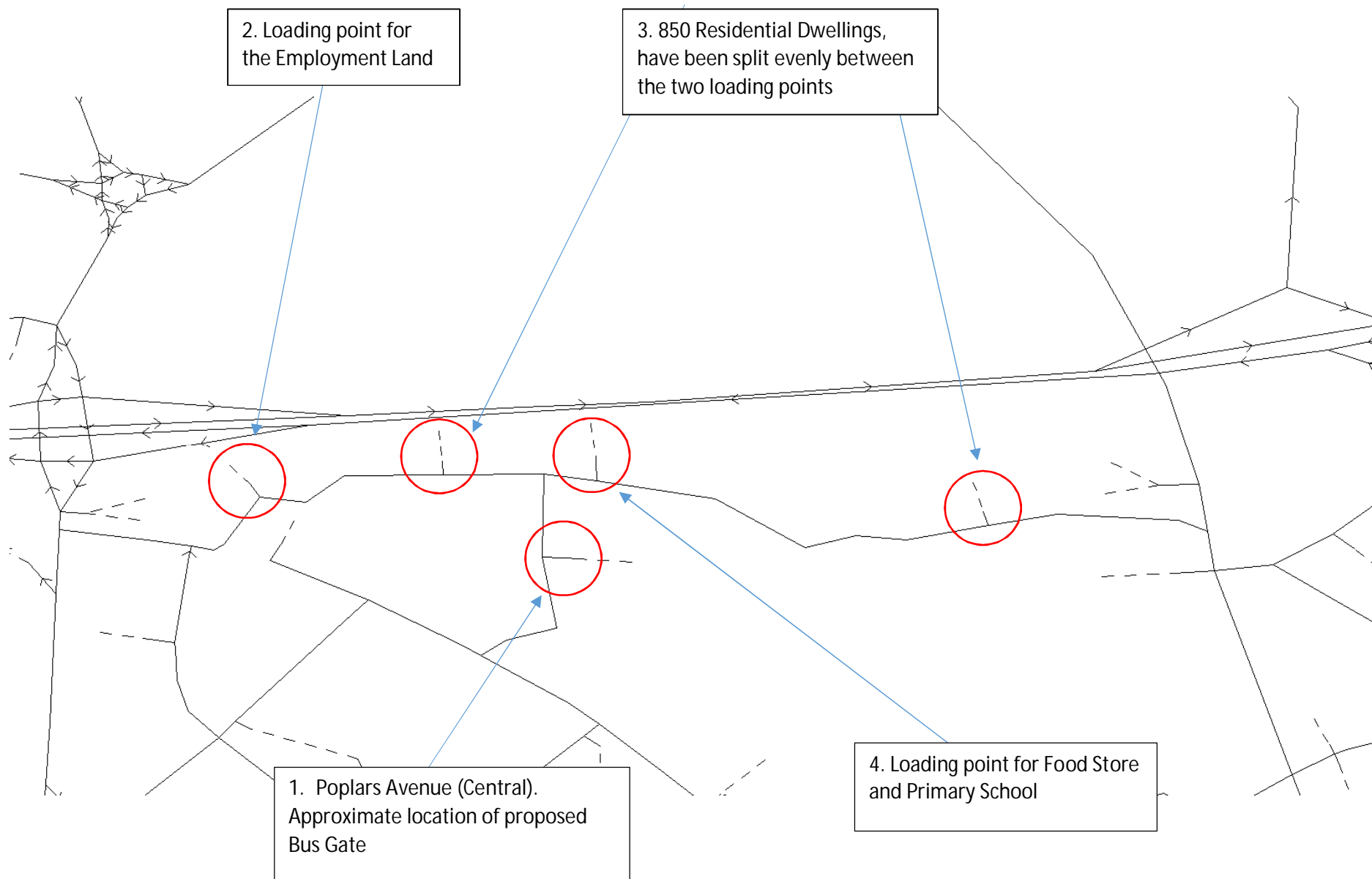
This will be taken into account going forward.

Other

37. It would be beneficial to see some flow plots, both total and difference. Also select link analysis plots to show the routing to and from the developments, and also to identify the non-development traffic using the through route.

To be provided going forward.

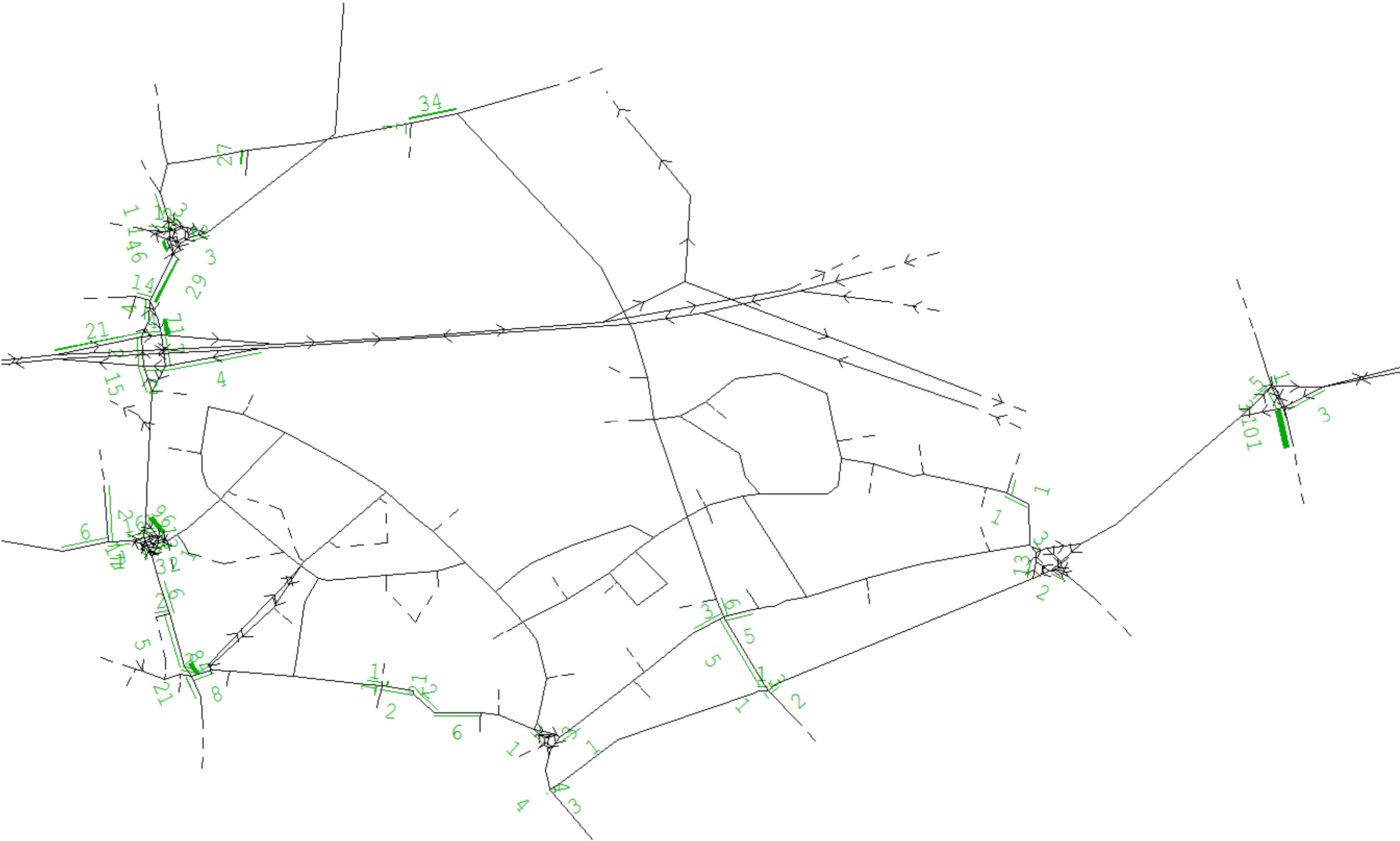
Appendix 1



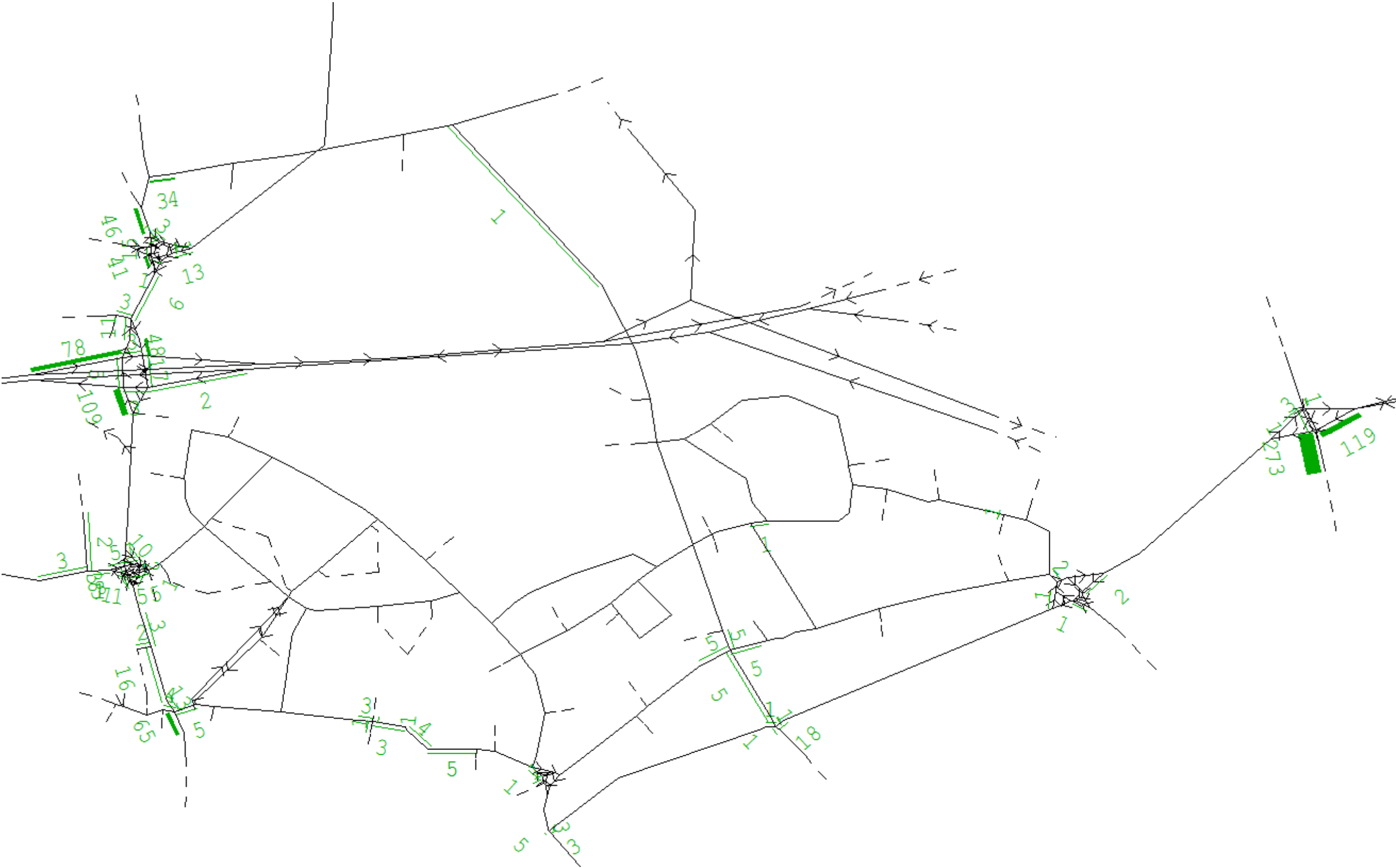
Appendix E, Through Route Trip Loading Points

Appendix 2

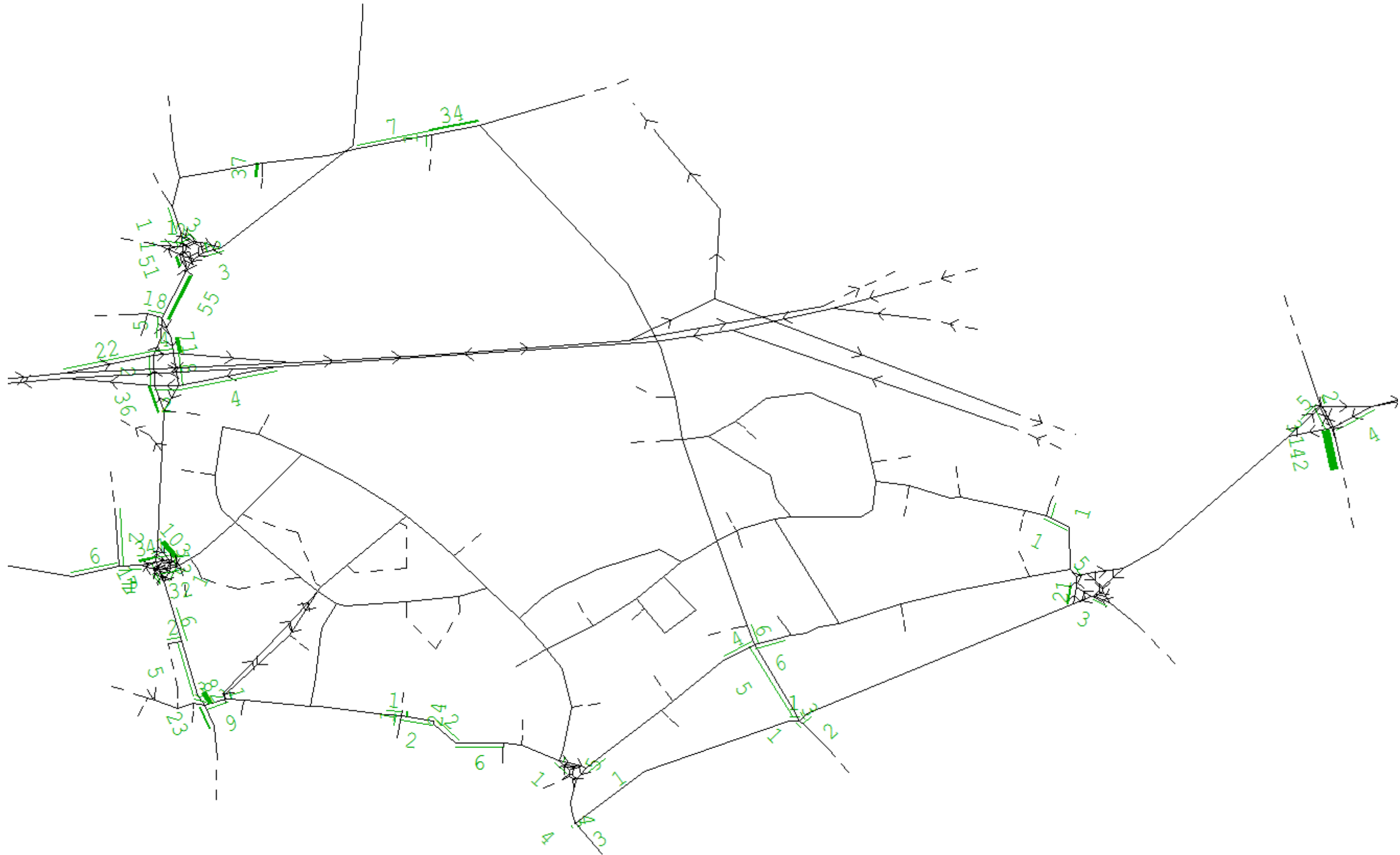
2025 Do-Minimum AM Peak Period Average Queue Plot



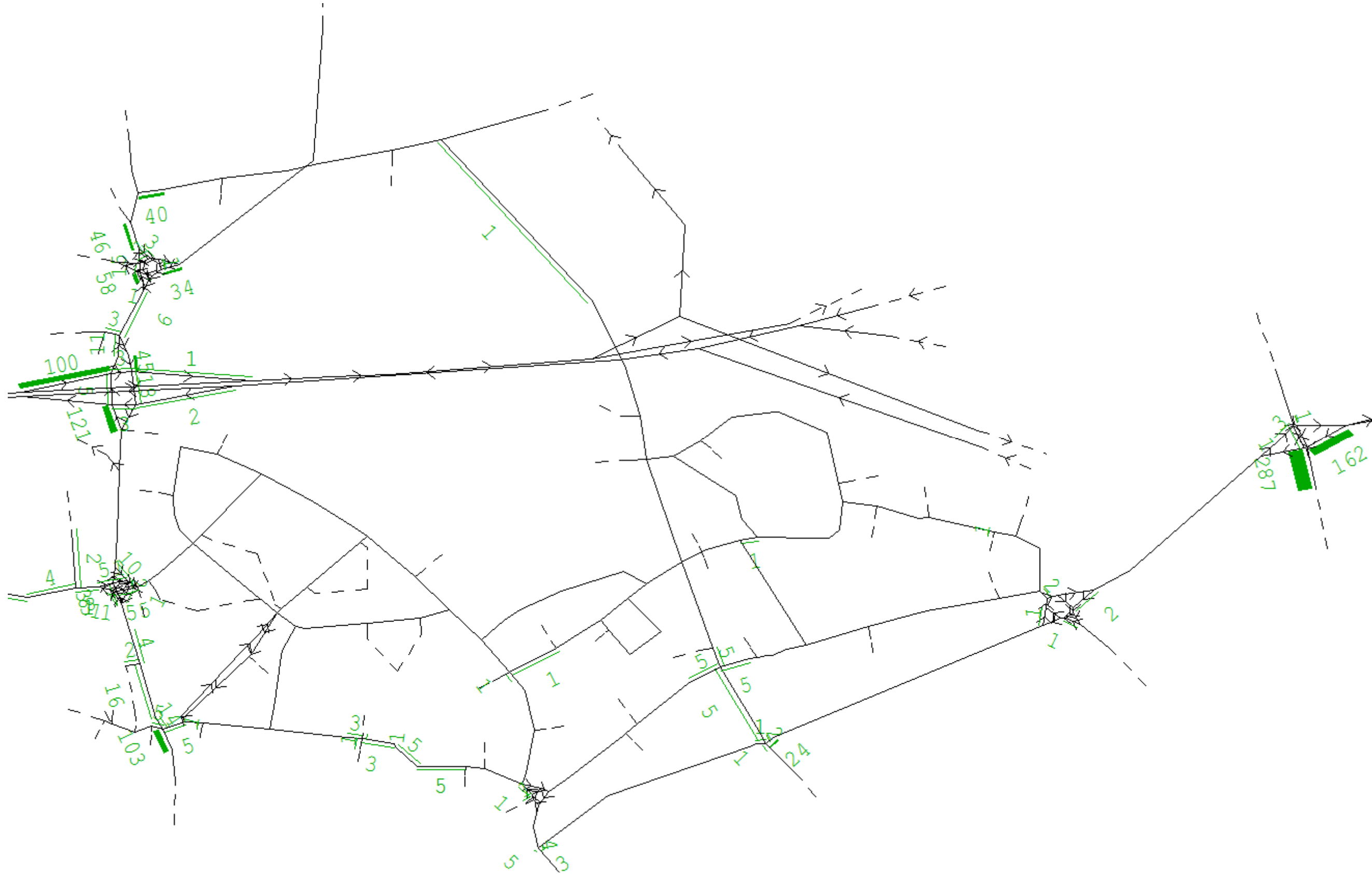
2025 Do-Minimum PM Peak Period Average Queue Plot



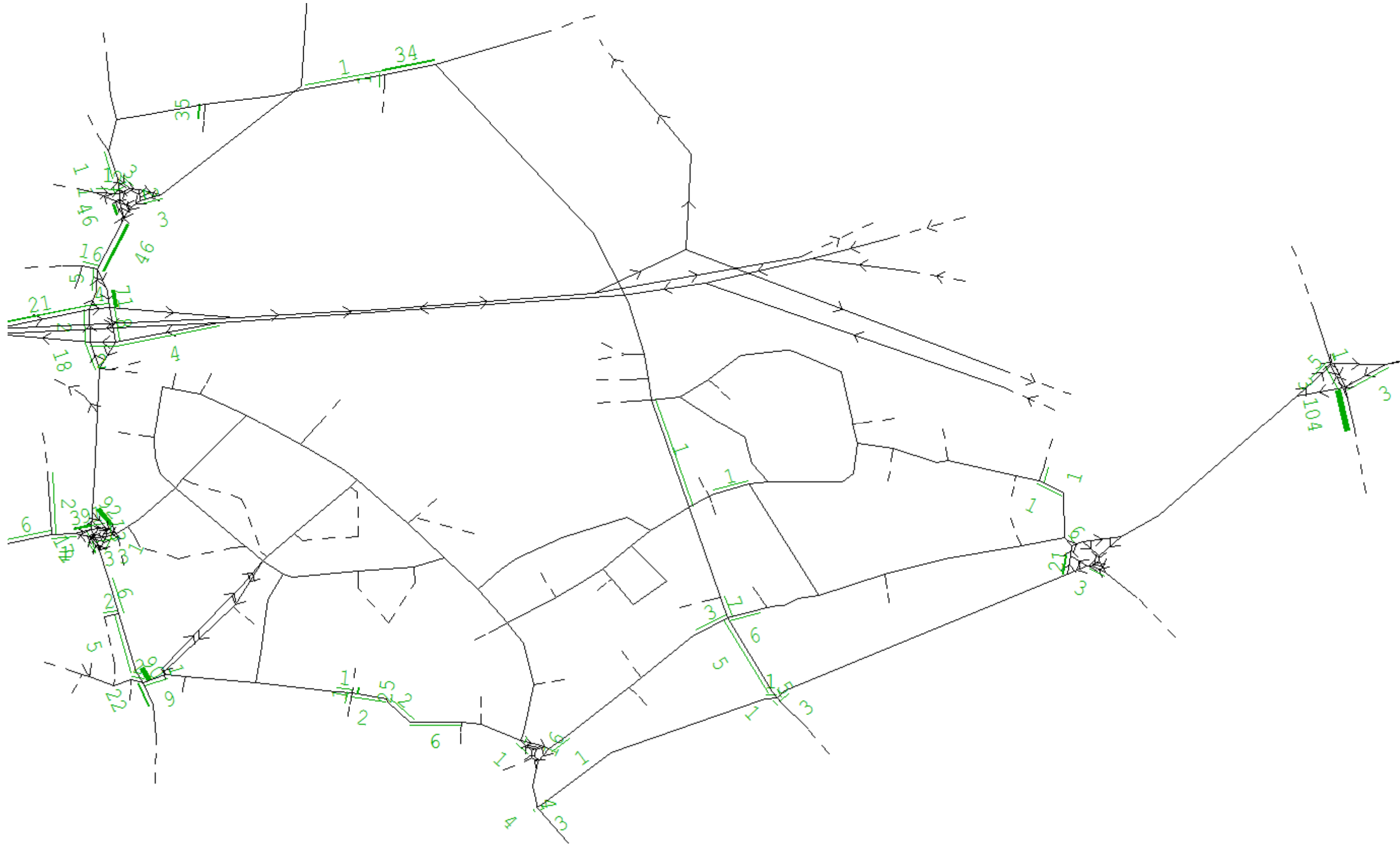
2030 Do-Minimum AM Peak Period Average Queue Plot



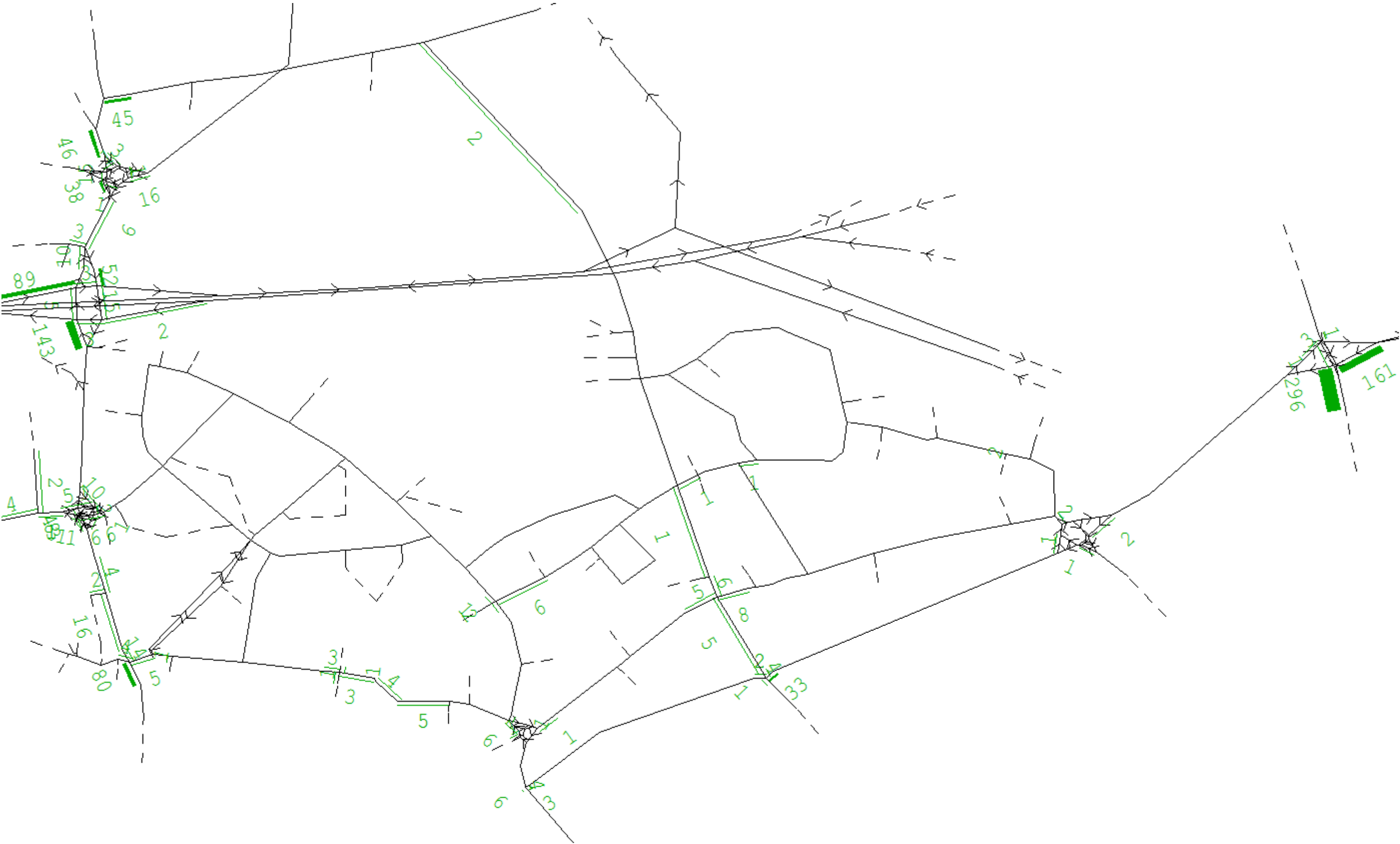
2030 Do-Minimum PM Peak Period Average Queue Plot



2025 Do-Something AM Peak Period Average Queue Plot



2025 Do-Something PM Peak Period Average Queue Plot



2030 Do-Something AM Peak Period Average Queue Plot



2030 Do-Something PM Peak Period Average Queue Plot

