Appendix E – Local Model Validation Report (LMVR)

REPORT N^{O} 3

LAKE LOTHING THIRD CROSSING

LOCAL MODEL VALIDATION REPORT

CONFIDENTIAL

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LOCAL MODEL VALIDATION REPORT

Suffolk County Council

Type of document (version)
Confidential

Project no: 70012367
Date:

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QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks				
Date	15/12/2015			
Prepared by	Michael Johns			
Signature				
Checked by	Alan Cowan			
Signature				
Authorised by	Craig Drennan			
Signature				
Project number	70012367			
Report number	3			
File reference	S:\70012367 - Lowestoft Traffic Model Update\C Documents\Reports\LMVR\151215 Lake Lothing Lowestoft LMVR.docx			

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 WSP | Parsons Brinckerhoff has been commissioned by Suffolk County Council (SCC) to undertake traffic modelling in support of a Transport Business Case (TBC) for a third crossing of Lake Lothing in Suffolk.

1.1.2 There is an existing Lowestoft SATURN highway assignment model representing a base year of 2001. It is therefore considerably outside the Department for Transport (DfT) Transport Analysis Guidance (TAG) requirement (TAG Unit M3.1, January 2014) that trips with both trip ends within the Fully Modelled Area are based on survey data that is less than six years old. The existing model has sub-optimal demand segmentation and assignment, with a single user class matrix representing all cars assigned on top of an HGV pre-load and there is no interpeak model.

1.1.3 There have also been improvements in software, techniques and best practice in the intervening period, which, combined with advice provided by SCC, make the existing model unsuitable for use as the basis for assessment.

1.1.4 The existing network and zone system will serve as the starting point for development of the updated Lowestoft model, with further refinement where necessary. Given their age, the existing matrices will not be used, but matrices will be rebuilt from new survey data.

1.2 REPORT STRUCTURE

1.2.1 This Local Model Validation Report (LMVR) sets out information relating to the development, calibration and validation of the updated highway assignment model. It is structured as follows:

- Section 2 – Proposed uses of the model and key design considerations
- Section 3 – Model standards
- Section 4 – Key features of the model
- Section 5 – Calibration and validation data
- Section 6 – Network development
- Section 7 – Trip matrix development
- Section 8 – Network calibration and validation
- Section 9 – Route choice calibration and validation
- Section 10 – Trip matrix calibration and validation
- Section 11 – Assignment calibration and validation
- Section 12 – Summary of model development, standards achieved and fitness for purpose

1.3 DISCLAIMER

1.3.1 This report, and information or advice which it contains, has been prepared for the purposes set out in the instructions commissioning it (June 2015) and has been prepared with reasonable skill, care and diligence. This report has been prepared by WSP | Parsons Brinckerhoff in their professional capacity as Consultants and in performance of WSP | Parsons Brinckerhoff's duties and liabilities under its contract with Suffolk County Council. Any advice, opinions, or recommendations within this report should be read and relied upon only in the context of the report as a whole. The advice and opinions in this report are based upon the information made available to WSP | Parsons Brinckerhoff at the date of this report and on current UK standards, codes, technology and construction practices as at the date of this report. The contents of the report do not, in any way, purport to include any manner of legal advice or opinion.

1.3.2 The transport modelling that has been carried out under the terms of our appointment (June 2015) and described in this report has been carried out using SATURN (version 11.3.12F). Transport modelling software of this type provides predictions of transport flows on the basis of a number of assumptions. The assumptions made in developing the transport model have been identified within this report.

1.3.3 The liability of WSP | Parsons Brinckerhoff in respect of the information contained in the report will not extend to any third party. WSP | Parsons Brinckerhoff accept no responsibility for any costs or losses howsoever incurred as a result of the use of the output from this report unless it is proved to have failed to exercise the degree of skill and care embodied in the terms and conditions of the governing appointment (June 2015) having regard to the use of the software and the assumptions made.

2 PROPOSED USES OF THE MODEL AND KEY DESIGN CONSIDERATIONS

2.1 SCENARIOS TO BE FORECAST AND INTERVENTIONS TO BE TESTED

2.1.1 The Lowestoft Traffic Model (LTM) has been developed and validated for the sole purpose of assessing a third crossing of Lake Lothing in Lowestoft. The town centre currently has two river crossings as shown in figure 2.1.

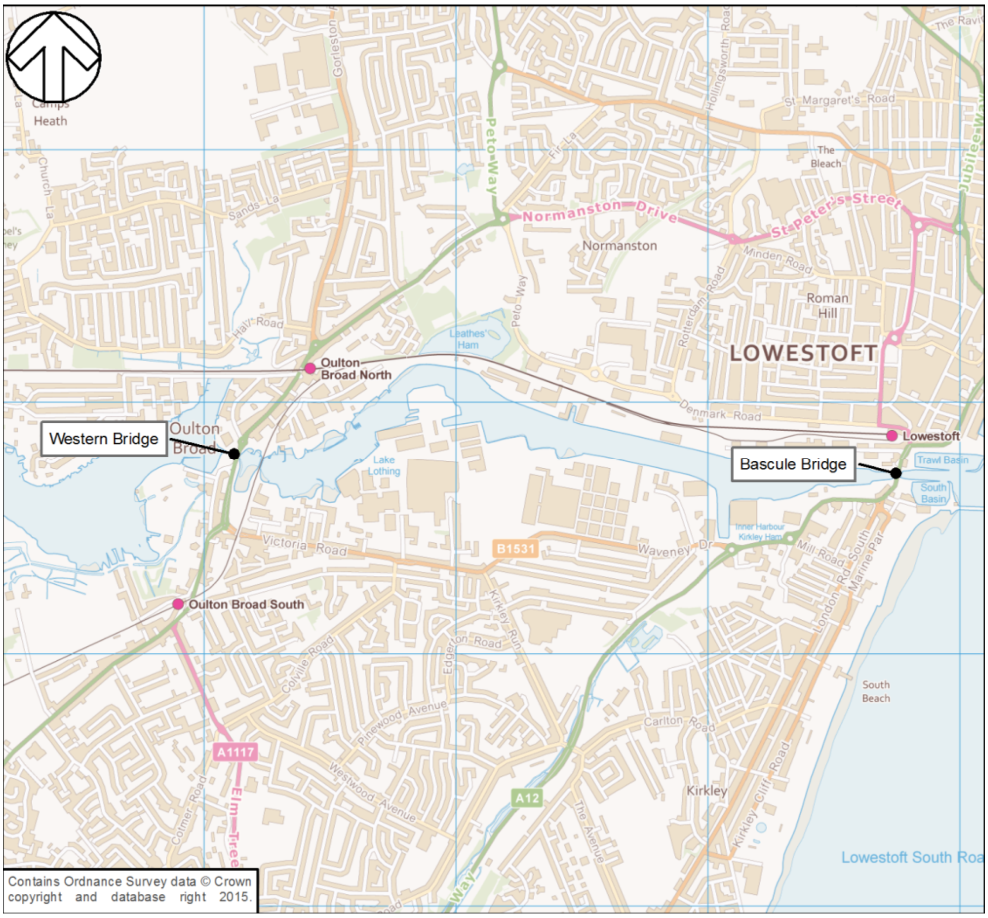


Figure 2.1 - Bridge locations

2.1.2 Various options regarding a third crossing are under consideration, and these will be discussed in the relevant reports relating to scheme design and the Transport Business Case (TBC).

2.1.3 In addition, the updated LTM may be used to for other assessment purposes subsequent to work relating to the third crossing, but this will require further review of validation to ensure it is fit for other purposes.

2.2 KEY MODEL DESIGN CONSIDERATIONS

2.2.1 There are a number of key characteristics of Lowestoft town centre that require particular treatment, and these predominantly relate to the operation of the existing bridges.

2.2.2 The western bridge carries the A146 over Lake Lothing, and is significantly constrained by a level crossing to the north of the bridge. Barriers are frequently closed for long periods, leading to lengthy queues that block back across the bridge and other junctions.

2.2.3 The eastern Bascule bridge is a lifting bridge which, when raised, can lead to similarly long queues in the town centre. The majority of bridge openings occur in the interpeak period, but not exclusively so. The low height of this bridge and its proximity to the harbour mouth means that it is required to be opened for relatively small craft on a fairly frequent basis. Observations carried out between 14 and 16 April 2015, provided by AECOM, indicate the eastern bridge lifted once during the AM peak (0800-0900) and once during the PM peak (1700-1800) during the days surveyed. In the interpeak (1000-1600) the bridge lifted a maximum of three times during the observed period.

2.2.4 An additional design consideration for the traffic model is that there is a tidal flow lane running across the bridge along the A12 between Belvedere Road and Station Square. This was handled by changing the capacity and number of lanes in each direction according to the time of day.

2.2.5 Observed data for the tidal flow section was provided to WSP | Parsons Brinckerhoff by AECOM, covering 14 to 16 April 2015, detailing the direction of the central lane between 07:00-10:00 and 16:00-19:00. For the AM peak (08:00-09:00) the central lane was modelled as allowing northbound traffic, in the PM peak (17:00-18:00) the central lane is southbound. No observed information was available for the interpeak, however journey time information covering the Bascule Bridge indicated delays similar to the PM peak, and therefore the central lane was modelled as allowing southbound traffic in the interpeak.

2.2.6 A key issue that has arisen from previous work on this scheme is that it is important to understand the broad origins and destinations of the users of each bridge, and if there is any difference in the split between long-distance strategic users and local users at each bridge crossing that may inform the impacts of a third crossing.

3 MODEL STANDARDS

3.1 VALIDATION CRITERIA AND ACCEPTABILITY GUIDELINES

3.1.1 The validation of specific aspects of the model is discussed in following sections of this report. In general, the following criteria will apply, drawn from WebTAG Unit M3.1, section 3.2 (January 2014):

SCREENLINE VALIDATION

3.1.2 Screenline validation is undertaken as a check on the trip matrix, and is assessed in terms of the percentage difference between observed and modelled flows as shown in table 3.1.

Table 3.1 - Screenline acceptability

Criteria	Description of Criteria	Acceptability Guideline
1	Differences between modelled flows and counts should be less than 5% of counts	All or nearly all screenlines

3.1.3 Screenlines are presented for each time period, for cars and total vehicles. Although TAG requires information for all vehicle types to be presented, counts of LGV and HGV are not sufficiently high in this study area to allow useful comparisons to be made.

3.1.4 "Nearly all" is interpreted here as relating to 85% of cases, in keeping with link validation standards.

LINK FLOW AND TURNING MOVEMENT VALIDATION

3.1.5 Measures used for link validation are:

- Absolute and percentage differences between absolute and modelled flows
- GEH statistic

3.1.6 The GEH statistic is a modified Chi-squared statistic incorporating both relative and absolute errors, defined as follows:

$$GEH = \sqrt{\frac{(M-C)^2}{(M+C)/2}}$$

3.1.7 The link flow and turning movement validation criteria are shown in table 3.2.

Table 3.2 - Link acceptability

Criteria	Description of Criteria	Acceptability Guideline
1	Individual flows within 100 veh/hr of counts for flows less than 700 veh/hr	> 85% of cases
	Individual flows within 15% of counts for flows from 700 veh/hr to 2,700 veh/hr	> 85% of cases
	Individual flows within 400 veh/hr of counts for flows more than 2,700 veh/hr	> 85% of cases
2	GEH < 5 for individual flows	> 85% of cases

3.1.8 Both link flows and turning movements are presented using the above criteria, although turning movements are not generally expected to fully meet the criteria.

3.1.9 Information is presented for cars and total vehicles in all modelled time periods.

JOURNEY TIME VALIDATION

3.1.10 Criteria for journey time validation are presented in table 3.3.

Table 3.3 - Journey time acceptability

Criteria	Description of Criteria	Acceptability Guideline
1	Modelled times along routes should be within 15% of surveyed times (or minute, if higher than 15%)	> 85% of routes

3.1.11 The model does not feature different speed/flow relationships or link speeds for different vehicle types, the comparisons are presented for all vehicles combined.

3.1.12 Comparisons are presented separately for all modelled time periods.

3.2 CONVERGENCE CRITERIA AND STANDARDS

3.2.1 An element of calibrating the model is ensuring that a satisfactory convergence is achieved. Model convergence is needed to ensure traffic flows remain stable between successive iterations of the model. This is particularly important when model outputs are used to inform the economic benefits of scheme appraisal, as it is critical that calculated benefits arise from the impact of the scheme and not as a result of difference in convergence.

3.2.2 In accordance with criteria set out in TAG Unit M3.1 (January 2014), the parameters %Flow, %GAP and Delta (δ) have been monitored to determine the level of convergence. %Flow measures the proportion of links in the network with flows changing by less than 1% from the previous iteration. δ is the difference between costs on chosen routes and costs on minimum cost paths. %GAP is a generalisation of the δ function to include the interaction effects within the simulation.

3.2.3 The convergence criteria used to assess when a model is considered to have converged is shown in table 3.4.

Table 3.4 - Convergence criteria

Measure of Convergence	Acceptable Value
'Delta' and %GAP	Less than 0.1% or at least stable with convergence fully documented and all other criteria met
Percentage of links with flow change < 1%	Four consecutive iterations greater than 98%
Percentage of links with cost change < 1%	Four consecutive iterations greater than 98%
Percentage change in total user costs	Four consecutive iterations less than 0.1%

3.2.4 TAG Unit M3.1 indicates that delta (δ) and %GAP values of less than 0.1% is the most fundamental indicator of model convergence and should be achieved as a minimum.

4 KEY FEATURES OF THE MODEL

4.1 FULLY MODELLED AREA AND EXTERNAL AREA

4.1.1 The hierarchy of the model area is shown in figure 4.1

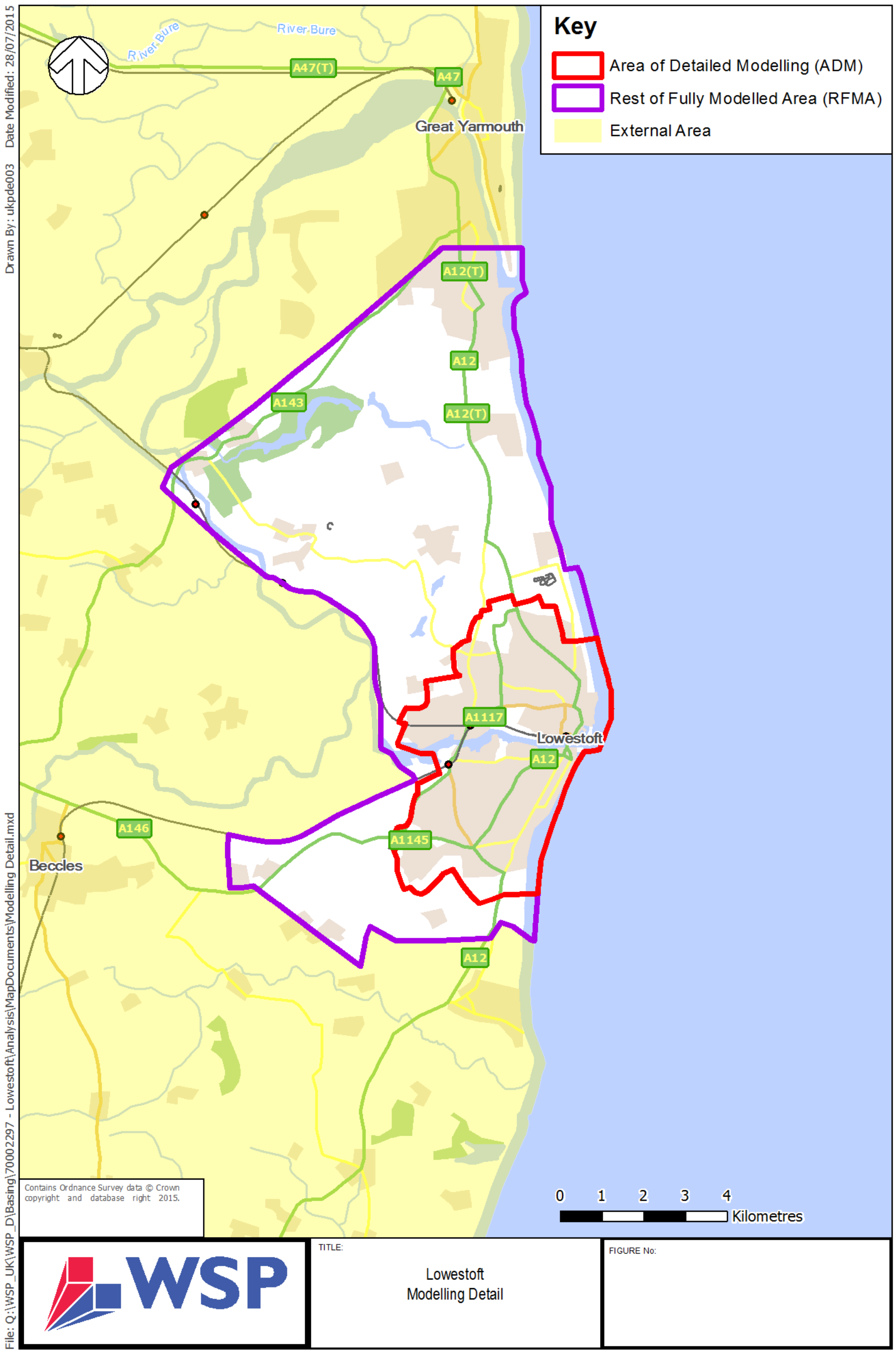


Figure 4.1 - Modelled area

4.2 ZONING SYSTEM

4.2.1 The zoning system is based initially on census LSOA and MSOA boundaries, split to better fit realistic zoning points. The zones within the area of detailed modelling are shown in figure 4.2.

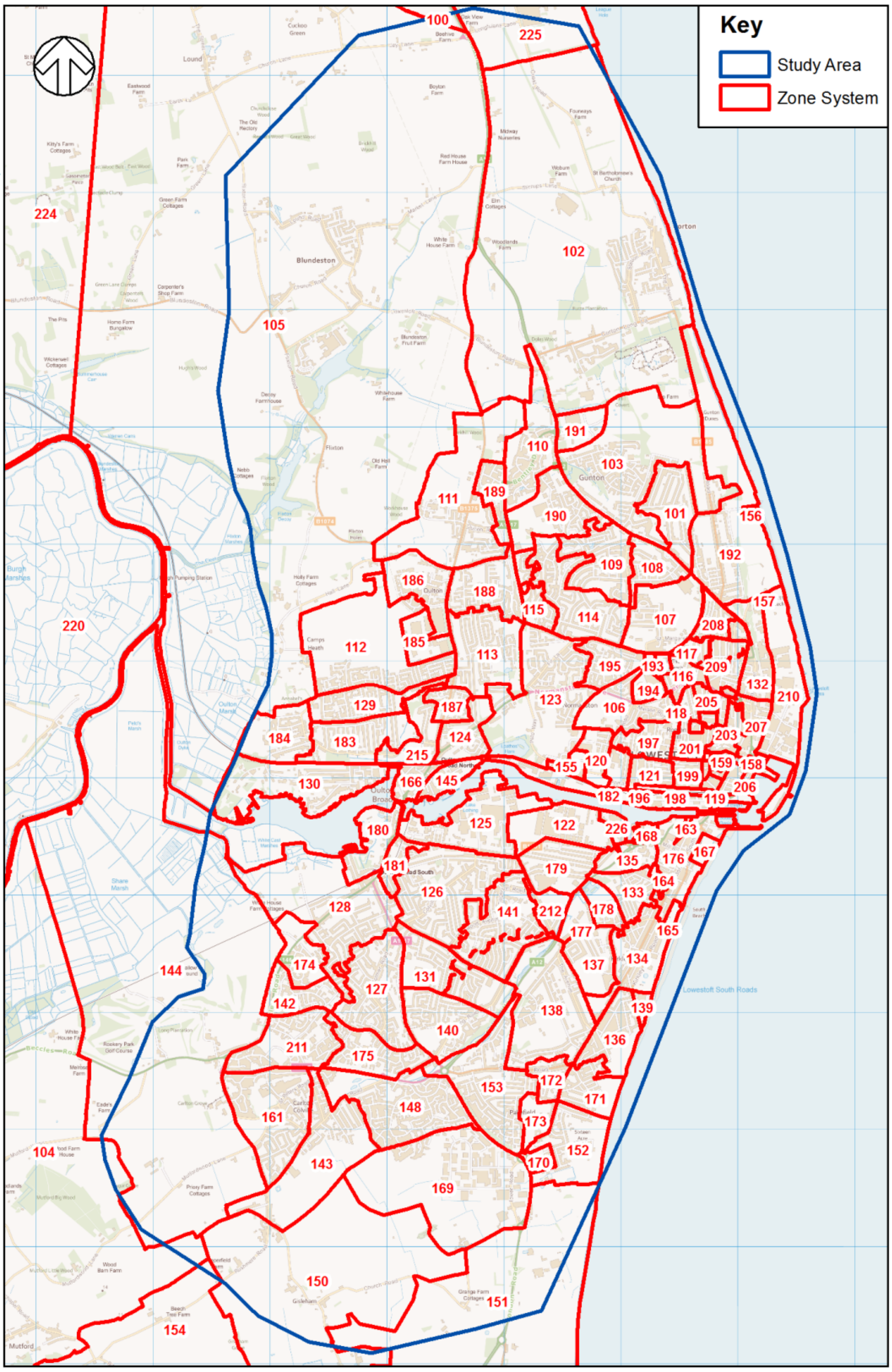


Figure 4.2 - Zoning in area of detailed modelling

4.2.2 Figure 4.3 shows the zoning in the rest of the fully modelled area and the external area.

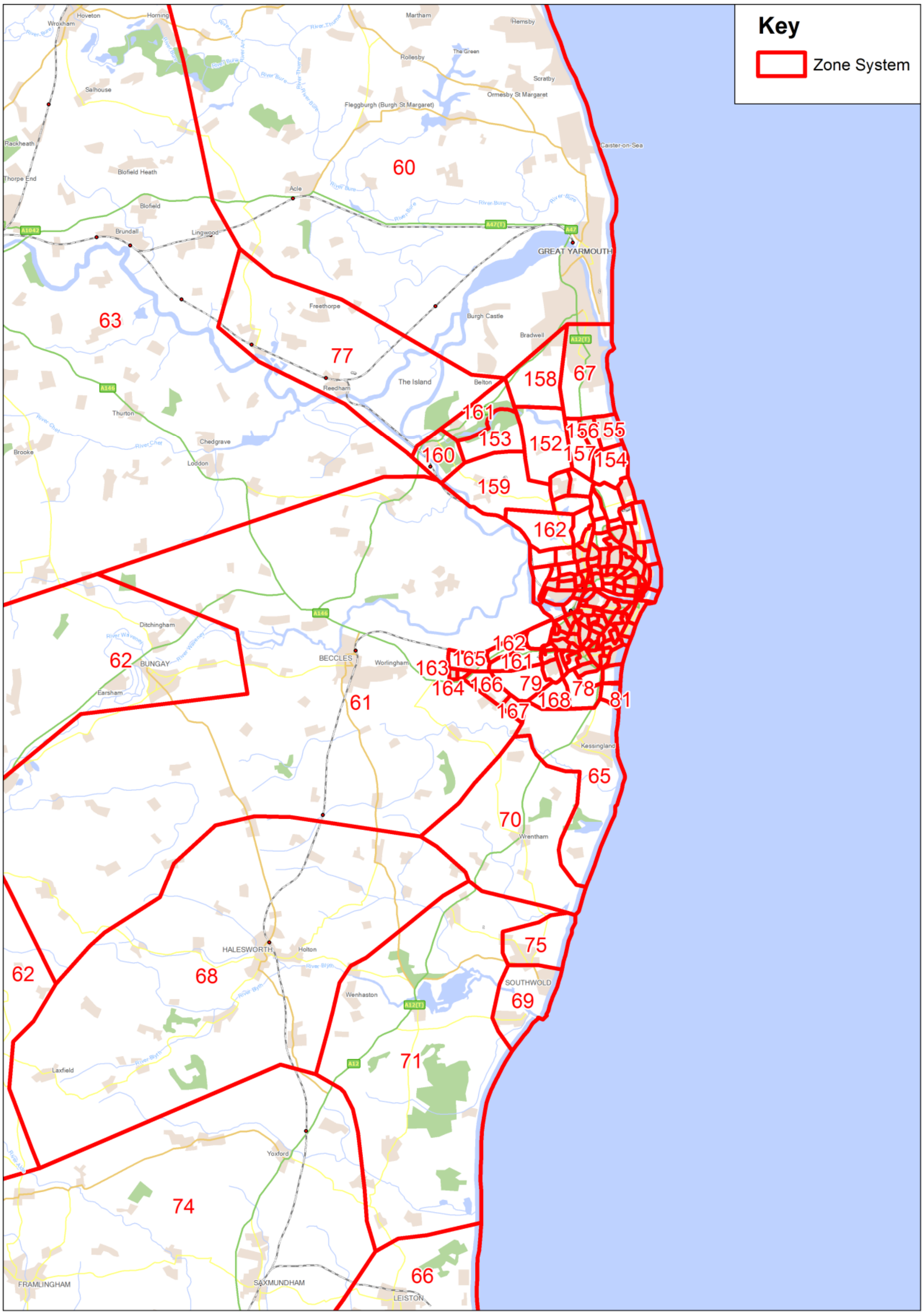


Figure 4.3 - Zoning in external area

4.2.3 The zones have been grouped to create five sectors. The locations of these can be seen in Figure 4.4.

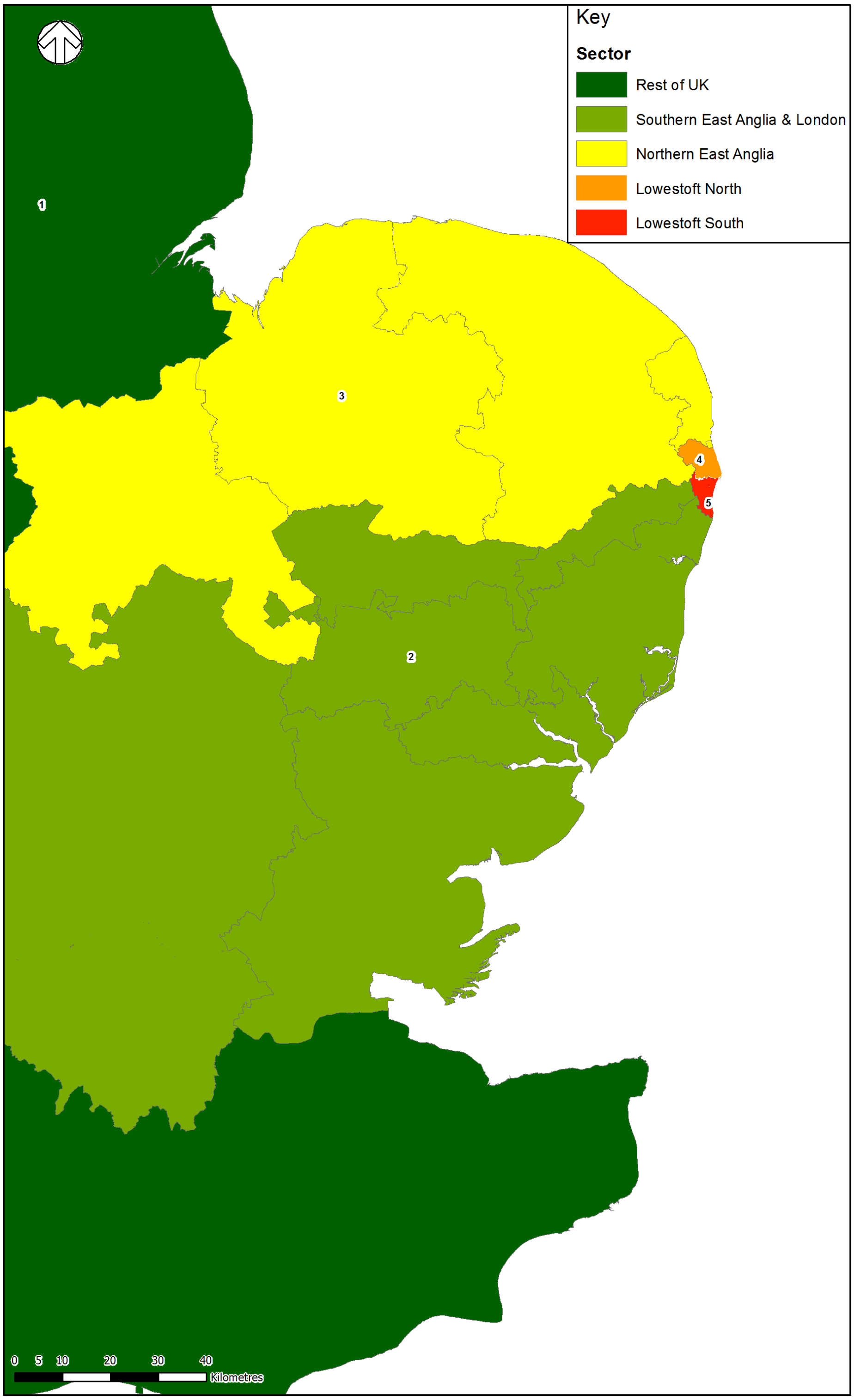


Figure 4.4 - Sector Plan

4.3 NETWORK STRUCTURE

4.3.1 The area of detailed modelling covers the town of Lowestoft. In this area, the extent of the network is sufficient to cover all roads with significant traffic volumes and all realistic route choice available to drivers. All major junctions are modelled. In the Rest of the Fully Modelled Area, detail is reduced, with all principal strategic routes modelled and capacity restraint characterised through the use of speed/flow relationships as well as strategically important junctions.

4.3.2 In the External Area, the network is simplified to the extent that traffic is able to enter the Fully Modelled Area at the correct locations, without capacity restraint.

4.3.3 The network structure is shown in Figure 4.5.

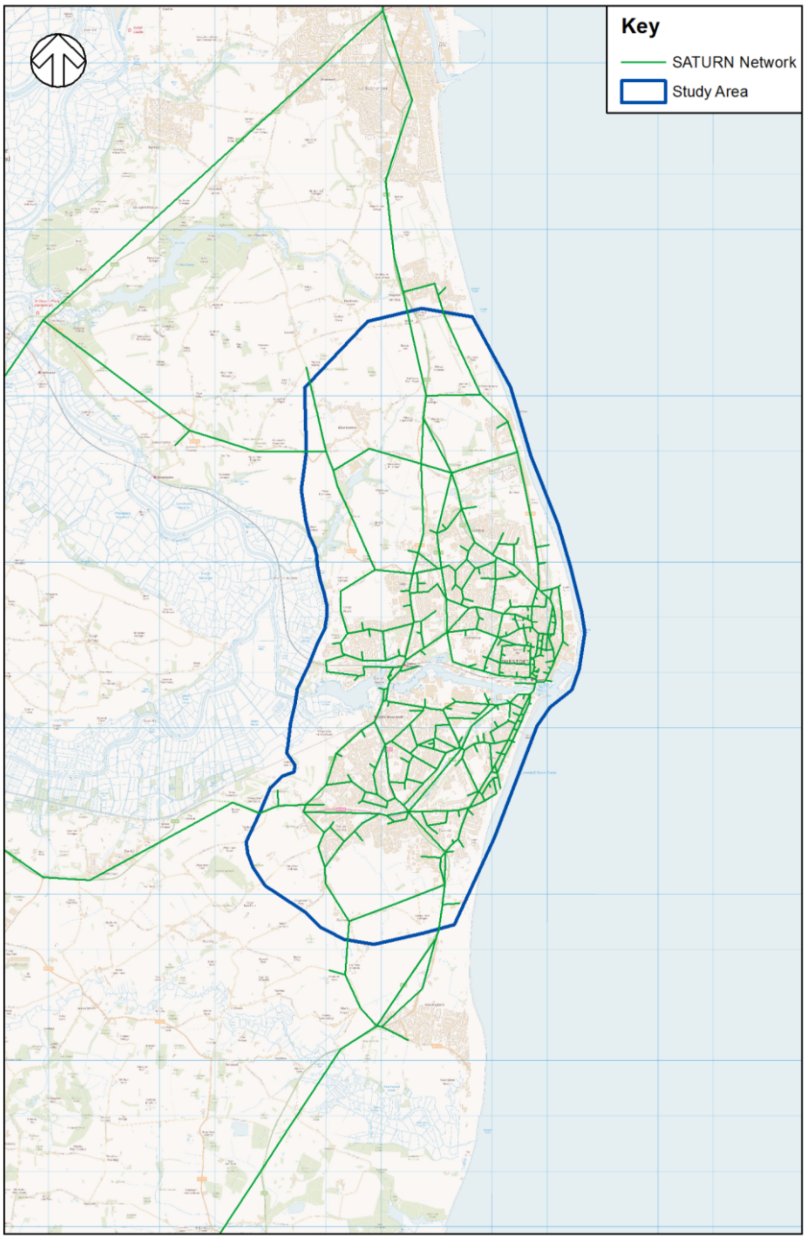


Figure 4.5 - Network structure

4.4 CENTROID CONNECTORS

4.4.1 Centroid connectors connect the zoning system to the model network, allowing trips to load onto the network for assignment. It is critical that centroids connectors represent realistic loading points, particularly in the fully modelled area. Centroid connectors in the fully modelled area have been designed to represent actual loading points to specific residential and commercial areas, generally via a spur link to represent the actual access point. In this way, turns into and out of zones can be clearly understood.

4.4.2 The number of centroid connectors has been minimised, with most zones having a single centroid connector except in cases where a zone has clear multiple points of access, and sub-dividing the zone would not be realistic.

4.4.3 Centroid connectors have been designed so that they do not cross the network, further ensuring that loading is realistic. Connectors for different zones are loaded at different points, to ensure trips between adjacent zones are loaded on to the network. Centroid connectors are also loaded away from count locations, to avoid inconsistencies between the counted flow and loaded trips.

4.4.4 In the fully modelled area, zones are sufficiently small such that average costs to access the model are sufficiently represented by the spur access links, so centroids themselves do not have costs associated with them.

4.4.5 In the external area, centroid connectors are linked to the network with appropriate parameters for distance and average speed to represent the average cost of accessing the network.

4.5 TIME PERIODS

4.5.1 The following time periods are modelled:

- AM peak (08:00 – 09:00)
- Average interpeak (10:00 – 16:00)
- PM peak (17:00 – 18:00)

This is consistent with advice presented in Section 2.5 of TAG Unit M3.1 (January 2014). The choice of peak hour has been confirmed through analysis of the available long term ATC sites obtained through the Highways England TRADS database. Average counts are presented in Table 4.1 across each hour of the peak period, with the maximum peak identified in red.

Table 4.1 - Peak hour identification

Month	AM Peak			PM Peak		
	0700-0800	0800-0900	0900-1000	1600-1700	1700-1800	1800-1900
January	1714	3020	2321	2495	2508	1624
February	1780	2679	2330	2462	2460	1724
March	1901	3078	2491	2620	2,594	1818
April	1818	2865	2470	2679	2772	1918
May	1837	2895	2438	2581	2677	1946
June	1858	3026	2466	2600	2735	1952
July	1766	2776	2424	2558	2700	1966
August	1629	2455	2351	2584	2746	2056
September	1850	2867	2387	2529	2591	1912
October	1817	2812	2350	2512	2565	1813
November	1797	2928	2399	2521	2476	1770
December	1548	2628	2380	2425	2275	1654

4.6 USER CLASSES

4.6.1 The following user classes are modelled:

- UC1: Car – Commuting
- UC2: Car – Employer’s Business
- UC3: Car – Other
- UC4: LGV
- UC5: HGV

4.6.2 This is consistent with advice presented in Section 2.6 of TAG Unit M3.1 (January 2014).

4.7 ASSIGNMENT METHODOLOGY

4.7.1 Model assignment of trips to the highway network was undertaken using a standard approach based on a ‘Wardrop User Equilibrium’, which seeks to minimise travel costs for all vehicles in the network. The Wardrop User Equilibrium is based on the following proposition:

“Traffic arranges itself on congested networks such that the cost of travel on all routes used between each origin-destination pair is equal to the minimum cost of travel and unused routes have equal or greater costs.”

4.7.2 The Wardrop User Equilibrium as implemented in SATURN is based on the 'Frank-Wolfe Algorithm', which employs an iterative process. This process is based on successive 'All or Nothing' iterations, which are combined to minimise an 'Objective Function'. The travel costs are recalculated after each iteration and compared to those from the previous iteration. The process is terminated once successive iteration costs have not changed significantly. This process enables multi-routeing between any origin-destination pair.

4.8 GENERALISED COST FORMULATIONS AND PARAMETER VALUES

4.8.1 Generalised cost is defined in keeping with the guidance in section 2.8 of TAG Unit M3.1 (January 2014), and is as follows:

$$Generalised\ cost = Time + \left(\frac{Vehicle\ operating\ cost}{Value\ of\ time}\right) Distance$$

4.8.2 Value of time is calculated in pence per minute (PPM) and vehicle operating cost is calculated in pence per kilometre (PPK). The adopted parameters were calculated from the WebTAG databook (November 2014).

4.8.3 The parameters adopted for a 2015 base year are shown in Table 4.2. For the HGV class, local ATC data was used to determine the split of vehicles which could be classified as OGV1 and OGV2 by peak hour. This split was used to calculate average generalised cost parameters for HGV.

Table 4.2 – 2015 generalised cost parameters

User Class	AM		IP		PM	
	PPM	PPK	PPM	PPK	PPM	PPK
Car Commuting	13.74	6.70	13.63	6.70	13.44	6.70
Car Business	46.57	13.38	45.51	13.38	44.78	13.38
Car Other	17.49	6.70	18.18	6.70	18.72	6.70
LGV	20.98	13.66	20.98	13.66	20.98	13.66
HGV	21.25	37.35	21.25	37.35	21.25	37.35

4.9 CAPACITY RESTRAINT MECHANISMS: JUNCTION MODELLING AND SPEED/FLOW RELATIONSHIPS

JUNCTION MODELLING

4.9.1 The following key junctions were directly measured in terms of their geometric characteristics with accurate saturation flows included within the model:

- Normanston Drive / Peto Way
- Normanston Drive / Bridge Road / B1375
- Bridge Road / A146
- A12 / A146

- A12 / Mill Road
- A12 / A1145

SPEED/FLOW RELATIONSHIPS

4.9.2 Speed flow curves consistent with COBA 10 values were allocated to specific links, detailed in section 6.3

4.10 RELATIONSHIPS WITH DEMAND MODELS AND PUBLIC TRANSPORT ASSIGNMENT MODELS

4.10.1 The highway assignment model will be used as a component of a DIADEM-based variable demand model. No public transport assignment model is included, as it is not required for this assessment. The Traffic Forecasting Report sets out the interactions between the highway assignment model and the demand model, as well as providing further consideration of the need for public transport assignment modelling.

5 CALIBRATION AND VALIDATION DATA

5.1 INTRODUCTION

5.1.1 WSP | Parsons Brinckerhoff commissioned a range of surveys which are detailed in the data collection report (October 2015). This included the types of data shown in Table 5.2.

Table 5.1 – Commissioned survey data

SURVEY TYPE	SURVEY PERIOD	TIME
Automatic Number Plate Recognition (ANPR)	Tuesday 14 July 2015	07:00-19:00
Automatic Traffic Counts (ATC)	Monday 29 June 2015 to Monday 27 July 2015	All day
Manual Classified Counts (MCC)	Tuesday 14^{h} July 2015	07:00-19:00

5.1.2 Manual Classified Counts (MCC) were also obtained from AECOM which were carried out between Tuesday 14 April 2015 and Thursday 16 April 2015, count data was only available at these sites for 0700-1000 and 1600-1900.

5.2 TRAFFIC COUNTS AT ANPR SITES

5.2.1 Traffic counts were collected via Automatic Number Plate Recognition (ANPR) cameras at 29 locations described in

5.2.2 Table 5.2. The ANPR were located:

- on links at key entry points into the study area and on links within the study area including the western Mutford Bridge and eastern Bascule Bridge
- at car parks within the study area.

5.2.3 The purpose of this data was to observe the major origin-destination movements within the study area from which to build the prior matrix.

5.2.4 MCC were conducted at each ANPR location to capture the total volume of traffic with vehicles classified into the following types:

- Car
- LGV
- OGV1
- OGV2
- Bus / Coach

5.2.5 Overall the sample rates at each of the external ANPR locations in both inbound and outbound directions were consistently high at around 95%. The overall match rate compared the ANPR trips to the total number of inbound trips recorded by the associated MCC was 51%. Matched trips represented inbound trips into the study area which are then picked up by another ANPR within the cordon. The overall match rate achieved was considered acceptable from which to produce a prior matrix though entails inferring the distribution for 49% of the traffic from the matched trips.

5.2.6 As detailed in the data collection report, there were a number of issues with the ANPR surveys. At Site 3, on the A12 Yarmouth Road to the north of the study area there was a low inbound sample rate of 36%. The survey company reported the camera at this location appears to have been moved by a member of the public during the survey report which caused the ANPR camera to be at an angle which affected the ability to capture vehicle number plates.

5.2.7 As detailed in the data collection report, there were a number of issues with the ANPR surveys. At site 13 on Flixton Road, the survey company reported that the ANPR camera failed and no vehicle number plates were captured at this location during the survey period. However an MCC was still carried out at this location.

5.2.8 At site 17, Swimming Pool car park, the MCC camera failed and no classified data could be provided at this location.

5.2.9 At Site 18 (Battery Green Road Car Park), Intelligent Data reported a corruption of the MCC recording which lead to some data loss leading to the sample rate calculated being above 100%. The ANPR data was therefore scaled to match the MCC data.

5.2.10 As detailed in the data collection report, the inbound sample rate and subsequent match rate were low at this site, 36% and 26% respectively. The survey company explained this occurred due to a member of the public moving the camera during the survey period.

Table 5.2 – ANPR count location descriptions

ID	Description	Type
1	A12 London Road	Link
2	A146 Beccles Road	Link
3	A12 Yarmouth Road	Link
4	Coast Road	Link
5	A12 Pier Terrace (Eastern Bascule bridge)	Link
6	A146 Bridge Road (Western Mutford bridge)	Link
7	B1375 Gorleston Road	Link
8	A1117 Millennium Way	Link
9	A12 Yarmouth Road	Link
10	A12 Tom Crisp Way	Link
11	B1532 London Road South	Link
12	B1074 Blundeston Road	Link
13	Flixton Road	Link
14	B1531 Waveney Drive	Link
15	North Quay Retail Park	Car Park

ID	DESCRIPTION	TYPE
16	Links Road Car Park	Car Park
17	Swimming Pool Road Car Park	Car Park
18	Shopping Centre Car Park (Battery Green Rd exit)	Car Park
19	Shopping Centre Car Park (Gordon Road entry)	Car Park
20	Surrey St Car Park entry	Car Park
21	Surrey St Car Park exit (onto Clapham Road)	Car Park
22	Clapham Road Car Park	Car Park
23	St Johns Rd Car Park	Car Park
24	Kirkley Rise Car Park (Northern access)	Car Park
25	Kirkley Rise Car Park (Southern access)	Car Park
26	Kirkley Cliff Road Car Park	Car Park
27	Claremont Road Car Park	Car Park
28	Marine Parade Car Park	Car Park
29	Asda Car Park	Car Park

5.2.11 Figure 5.1 shows the locations of the ANPR counts located on links within the study area.

Figure 5.1 – ANPR traffic counts on links

5.2.12 Figure 5.2 shows the locations of ANPR counts carried out at car parks.

Figure 5.2 – ANPR traffic counts at car parks

5.3 TRAFFIC COUNTS FOR MATRIX ESTIMATION

5.3.1 Table 5.3 describes the count locations which were used for matrix estimation.

5.3.2 The count locations used for matrix estimation were predominantly Automatic Traffic Counts (ATC). Monday to Thursday data was taken from the ATC data to provide an average flow at each location as per section 3.3 of TAG Unit M1.2. The majority of sites provided at least two continuous weeks of data, however data loss occurred at some sites as detailed in the data collection report, most notably at ATC Site 4 (A146 Beccles) Road for which only one observation was available.

5.3.3 The ANPR at site 3 (A12 Yarmouth Road) was used for matrix estimation; this site was located on a national speed limit dual carriageway. It was not possible for the survey company to safely lay an ATC at this location. The MCC count associated with ANPR site 3 (A12 Yarmouth Road) was used for matrix estimation at this location as it represents a key route for traffic entering and exiting the main study area.

Table 5.3 – Description of traffic counts used for matrix estimation

ID	DESCRIPTION	TYPE
3	Gisleham Road	ATC
4	A146 Beccles Road	ATC
7	London Road South	ATC
8	A12 Tom Crisp Way	ATC
9	A1117 Elm Tree Road	ATC
11	Kirkley Run	ATC
12	A146 Waveney Drive	ATC
15	Katwijk Way	ATC
16	A12 Battery Green Road	ATC
19	Denmark Road	ATC
21	Peto Way	ATC
22	A1117 Normanston Drive	ATC
23	A1144 Normanston Drive	ATC
24	Oulton Road	ATC
25	B1375 Gorleston Road	ATC
26	A1117 Millennium Way	ATC
27	A12 Yarmouth Road	ATC

ID	DESCRIPTION	TYPE
28	B1385 Corton Road	ATC
29	A12 Yarmouth Road	ATC
30	B1375 Parkhill	ATC
31	B1074 Blundeston Road	ATC
32	Flixton Road	ATC
3	A12 Yarmouth Road	ANPR - MCC

5.3.4 Figure 5.3 shows the locations of the counts used for matrix estimation and the calibration screenlines.

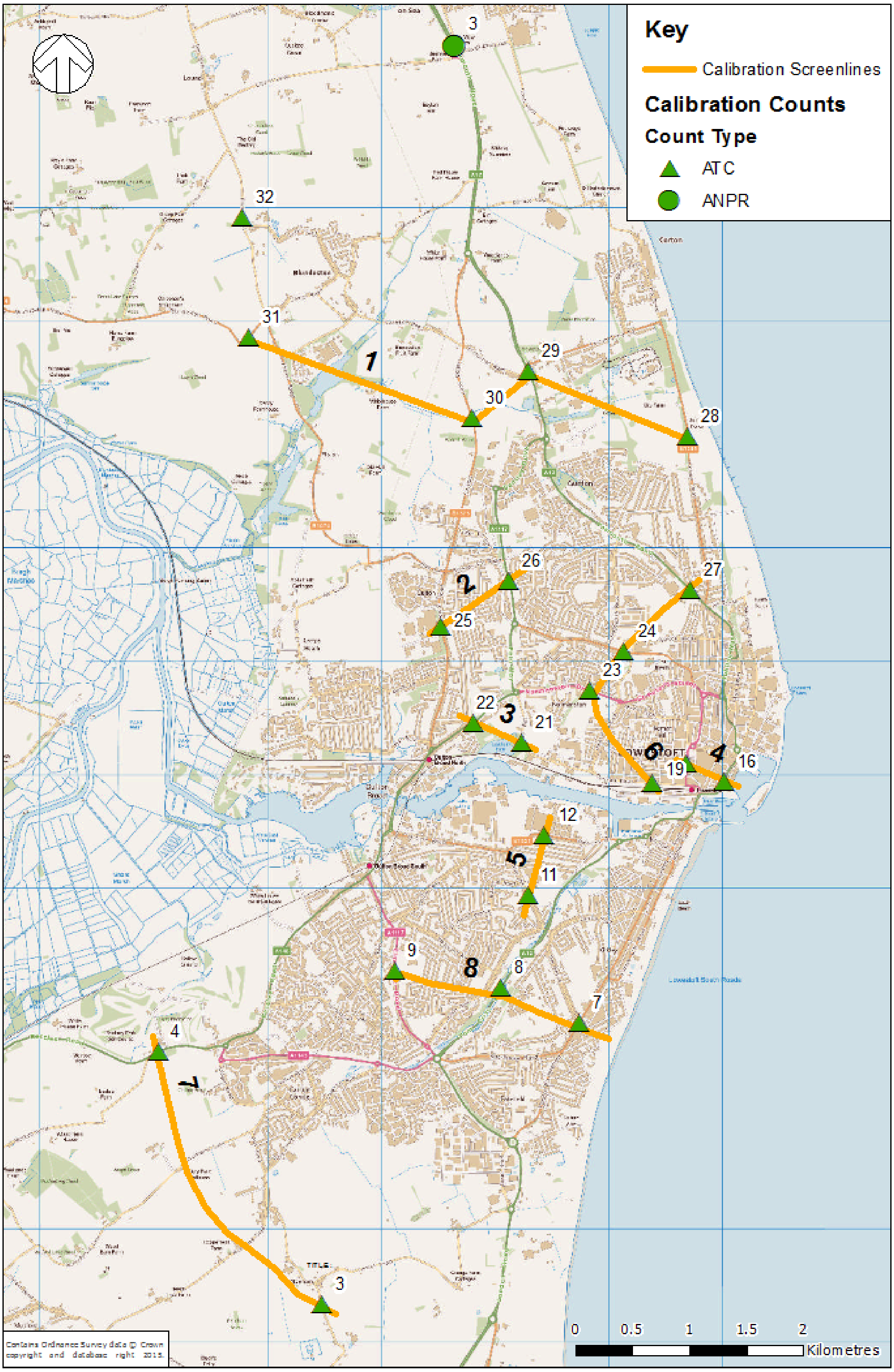


Figure 5.3 – Counts and screenlines used for calibration

5.4 TRAFFIC COUNTS FOR VALIDATION

LINK COUNTS

5.4.1 Table 5.4 describes the count locations which were used for validation. As with the calibration counts the ATC data was processed to provide a Monday to Thursday average. For counts located at ANPR sites, the associated MCC link count / car park access count was used.

Table 5.4 – Description of traffic counts used for validation

ID	Description	Type
5	A1145 Castleton Avenue	ATC
6	A12 London Road	ATC
10	A146 Beccles Road	ATC
17	A12 Old Nelson Street	ATC
18	St Peter's Street	ATC
20	Rotterdam Road	ATC
33	Coast Road	ATC
6053	Katwijk Way	TRADS
5	A12 Pier Terrace (eastern Bascule Bridge)	ANPR - Link
6	A146 Saltwater Way (western Mutford Bridge)	ANPR - Link
15	North Quay Retail Park	ANPR – Car Park
16	Links Road Car Park	ANPR – Car Park
17	Swimming Pool Road Car Park	ANPR – Car Park
18	Shopping Centre Car Park (Battery Green Rd exit)	ANPR – Car Park
19	Shopping Centre Car Park (Gordon Road entry)	ANPR – Car Park
20	Surrey St Car Park entry	ANPR – Car Park
21	Surrey St Car Park exit (onto Clapham Road)	ANPR – Car Park
22	Clapham Road Car Park	ANPR – Car Park
23	St Johns Rd Car Park	ANPR – Car Park
24	Kirkley Rise Car Park (Northern access)	ANPR – Car Park
25	Kirkley Rise Car Park (Southern access)	ANPR – Car Park
26	Kirkley Cliff Road Car Park	ANPR – Car Park

ID	Description	Type
28	Marine Parade Car Park	ANPR – Car Park
29	Asda Car Park	ANPR – Car Park

5.4.2 At ANPR site 5 (A12 Pier Terrace) on the eastern Bascule Bridge, only the MCC was available. The survey company were unable to find a suitable location at which to place an ATC.

5.4.3 At ANPR site 6 (A146 Saltwater Way) on the western Mutford Bridge, the MCC was used for validation. This was because the ATC laid at this location showed a notable difference in traffic flow southbound in the AM peak and PM peak, compared to the MCC (see Table 5.5). As discussed in section 7, regarding matrix development, the prior matrix was developed using the ANPR data, therefore the flow on the western Mutford Bridge would be more closely aligned to the MCC associated with the ANPR rather than the ATC data.

Table 5.5 – Comparison of ATC and MCC at western Mutford Bridge (A146 Saltwater Way)

ID	ATC Count Total - NB	MCC Count Total - NB	ATC Count Total - SB	MCC Count Total - SB
AM peak	942	944	777	904
Interpeak	920	983	861	931
PM peak	1064	1114	997	1133

5.4.4 The vehicle split for the western Mutford Bridge observed data was taken from the ATC data on the A146 Saltwater Way. This is because ATC was used for matrix estimation throughout the model. There was a notable difference in the vehicle splits between Car and LGV for the MCC and ATC at the western Mutford Bridge. This meant in terms of validation by vehicle type, the modelled flow was not ideally matched compared to the observed data if the MCC splits were used, which was out of keeping with adjacent counts based on ATC data. The comparison is shown in Table 5.6.

Table 5.6 – Comparison of ATC and MCC vehicle split for observed count total at western Mutford Bridge (A146 Saltwater Way)

ID	Count Total	Car Total – MCC	LGV Total – MCC	HGV Total - MCC	Car Total – ATC	LGV Total – ATC	HGV Total - ATC
AM - NB	**944**	780	139	25	656	242	46
AM - SB	**904**	716	152	36	506	367	31
IP - NB	**983**	819	130	35	718	228	38
IP - SB	**931**	780	120	31	575	329	27
PM - NB	**1114**	957	140	17	852	228	34
PM - SB	**1133**	1003	119	11	749	370	13

5.4.5 This issue was also prevalent for the MCC observed data on the eastern Bascule Bridge. As no ATC was available at this location, ATC 16 (A12 Battery Green Road) was used to provide the vehicular split to the observed data, as shown in Table 5.7.

Table 5.7 – Comparison of ATC and MCC vehicle split for observed count total at eastern Bascule Bridge (A12 Pier Terrace)

ID	Count Total	Car Total – MCC	LGV Total – MCC	HGV Total - MCC	Car Total – ATC	LGV Total – ATC	HGV Total - ATC
AM - NB	**1531**	1324	164	43	656	810	65
AM - SB	**898**	691	169	38	530	322	46
IP - NB	**1041**	870	127	44	453	532	56
IP - SB	**1051**	875	125	31	612	394	45
PM - NB	**1104**	966	110	28	582	499	24
PM - SB	**1591**	1419	147	25	1014	539	38

5.4.6 Figure 5.4 shows the locations of the counts used for validation and the validation screenlines.

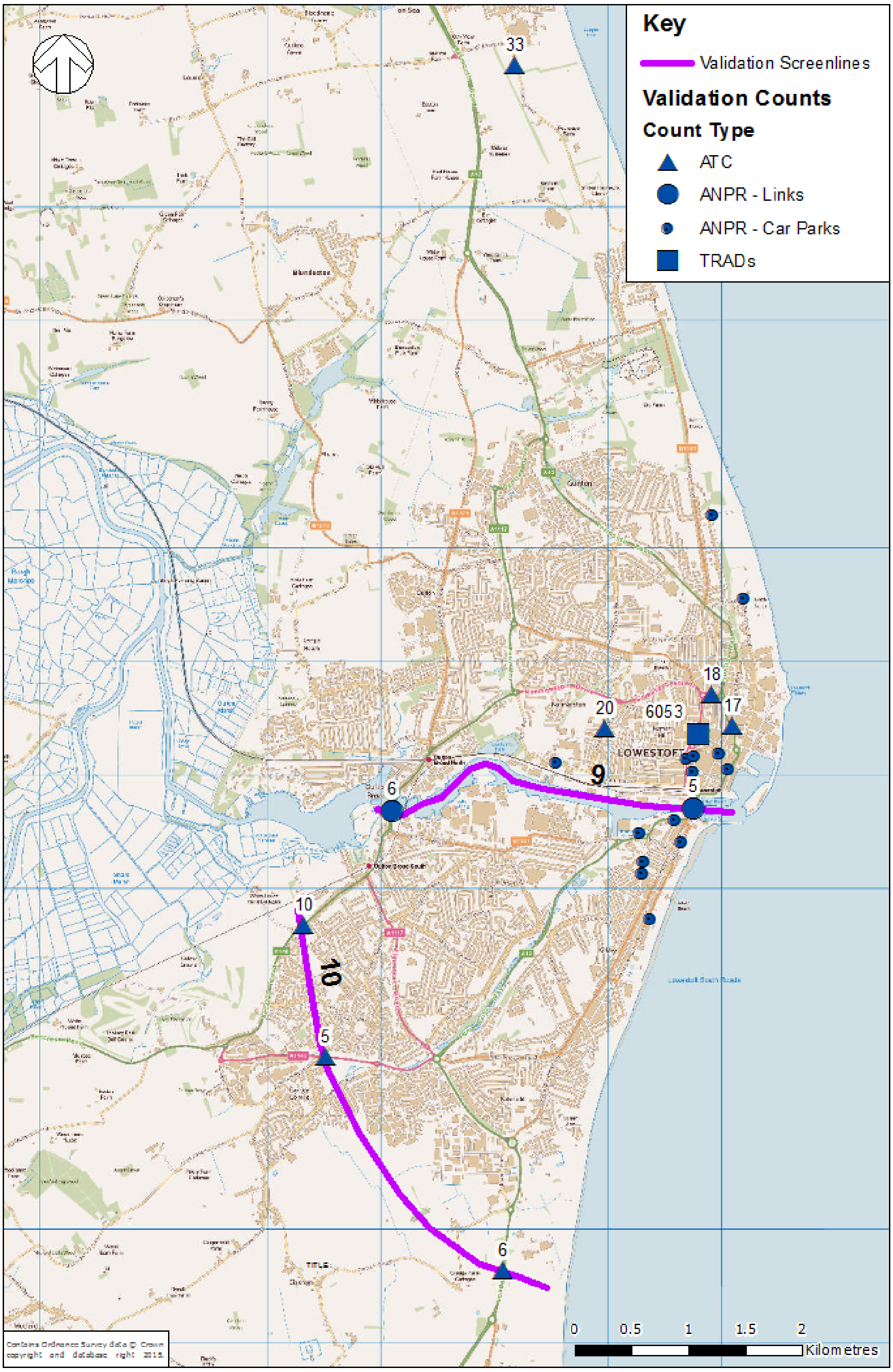


Figure 5.4 – Counts and screenlines used for validation

MANUAL CLASSIFIED COUNTS

5.4.7 Manual classified counts were used for validation of turning movements at key junctions. Table 5.8 describes the locations of the turning counts.

Table 5.8 – Manual classified count locations

ID	DESCRIPTION
1	London Road/Arbor Lane/A12/Tower Road
2	Tom Crisp Way/Stadbroke Road/Elm Tree Road
3	Somerleyton Road/Oulton Street/Hall Lane/Gorleston Road
4	Yarmouth Road/Gorleston Road
5	Yarmouth Road/Leisure Way/Foxburrow Hill/Bentley Drive
6	Yarmouth Road/Corton Road
7	Millennium Way/Oulton Road/Peto Way
8	Horn Hill/Maconochie Way/A12/Waveney Drive
9	A12/Corton Long Lane/A12/Lowestoft Link Road
10	A12 Waveney Road/Station Square
11	Commercial Road/Station Square
12	A12 Pier Terrace/London Road South/Belvedere Road
13	A12 Belvedere Road/Kirkley Rise
14	Denmark Road/Katwijk Way
15	Katwijk Way/Raglan Street
16	A12 Waveney Road/Suffolk Road
17	A12 Tom Crisp Way/Blackheath Road
18	Saltwater Way/Victoria Road
19	Normanston Drive/Gorleston Road
20	Fir Lane/A117 Normanston Drive/Peto Way
21	A12/Gordon Road/Whapload Road
22	A12/St Peters Street
23	A1144/Katwijk Way
24	A146 Beccles Road/Cotmer Road

5.4.8 Figure 5.5 shows the location of the MCCs commissioned for this study.

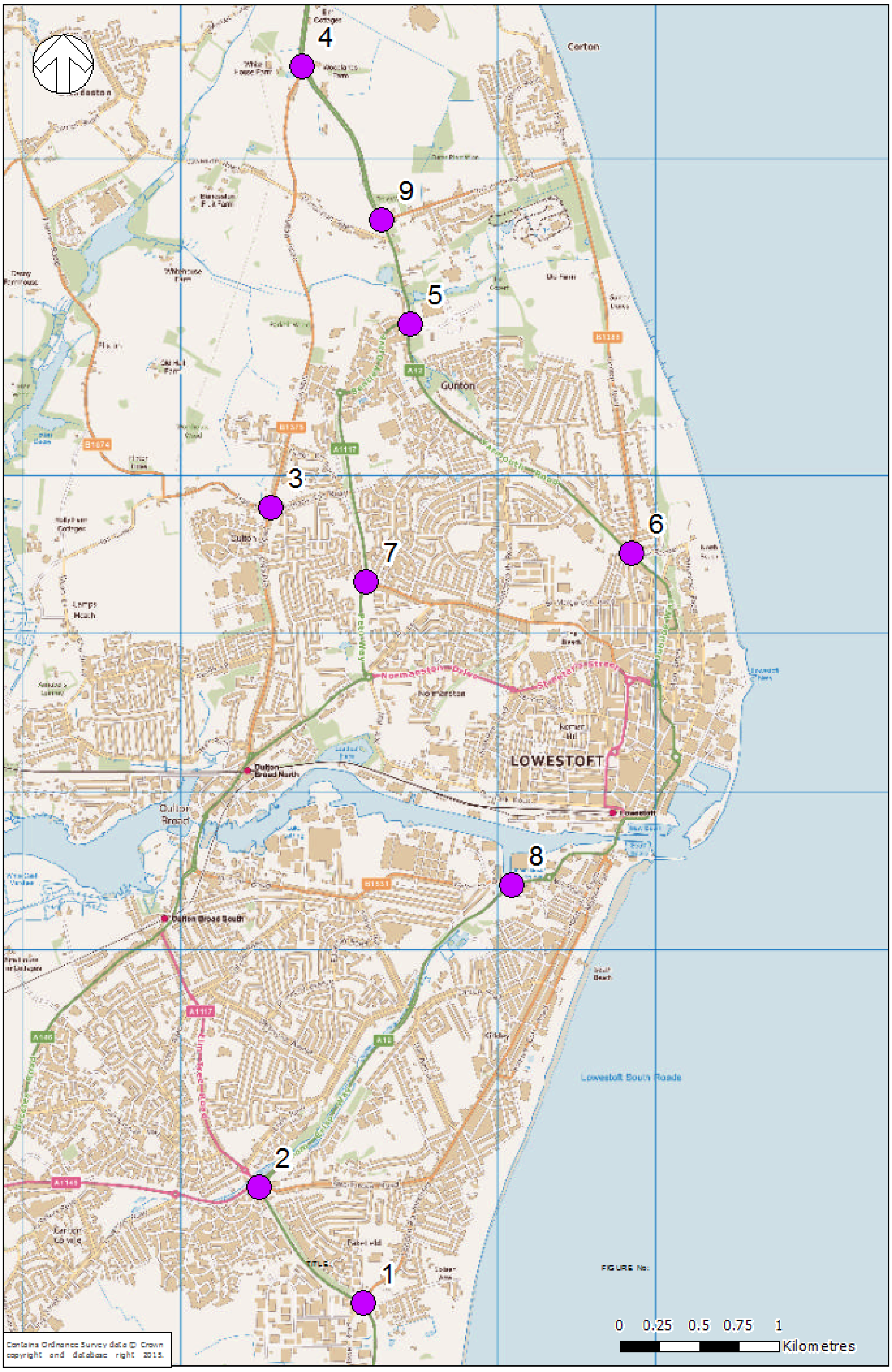


Figure 5.5 – Wider network MCC

5.4.9 Figure 5.6 shows the location of the MCCs carried out by AECOM.

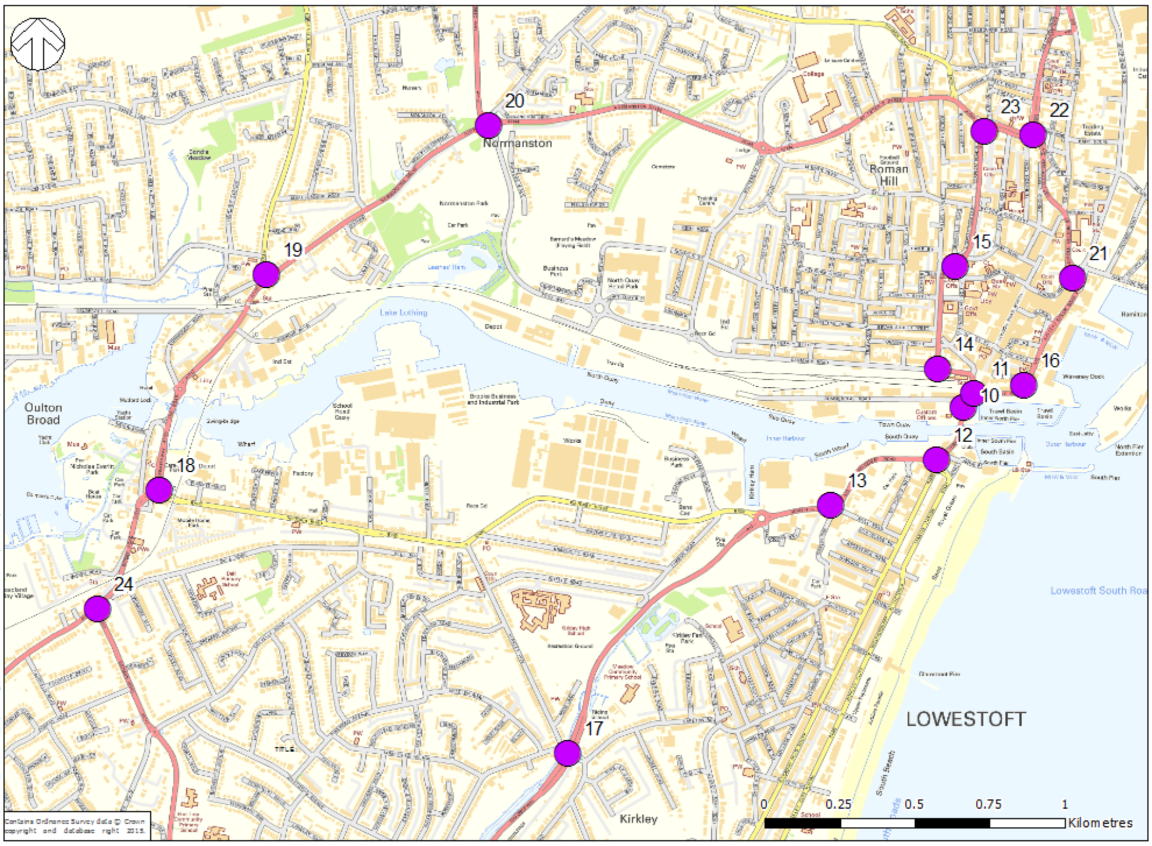


Figure 5.6 – AECOM town centre MCC

5.5 JOURNEY TIME SURVEYS FOR CALIBRATION AND VALIDATION

5.5.1 Table 5.9 describes the journey time routes which were used for calibrating and validating the model. These represent the key routes through the model study area

Table 5.9 – Description of journey time routes

ID	Description	Length
1	B1375 Gorleston Road	4.5km
2	A12 Yarmouth Road / Katwijk Way	6.2km
3	A1117 Normanston Drive / A1144 St Peter's Street	3.3km
4	A1117 Bentley Drive / Millennium Way / Peto Way	2.5km
5	A12 London Road / B1532 London Road South	6.7km
6	A1145 Castleton Avenue / A12 Tom Crisp Way / A12 Belvedere Road	6.7km
7	B1074 / A1117 Millennium Way / Oulton Road	3.9km
8	A146 Beccles Road / A146 Waveney Drive	9.5km
9	A12 Bloodmoor Road / A1117 Elm Tree Road	3.6km

5.5.2 Trafficmaster journey time data covering key links within Suffolk was obtained from the DfT with the average journey time calculated from June 2015 data, for Monday to Thursdays only. The Trafficmaster data was related to an ITN road network, using ArcGIS this network was related to the SATURN network to allow the comparison of observed and modelled journey time.

5.5.3 Due to the variability of the data, the average and standard deviation of the data was analysed in order to determine the high and low confidence interval for the data. Observations outside these high and low intervals were deemed to be outliers and excluded. This ensured the average travel time was not unduly distorted by unusually high or low values.

5.5.4 Figure 5.7 shows the extent of the journey time routes.

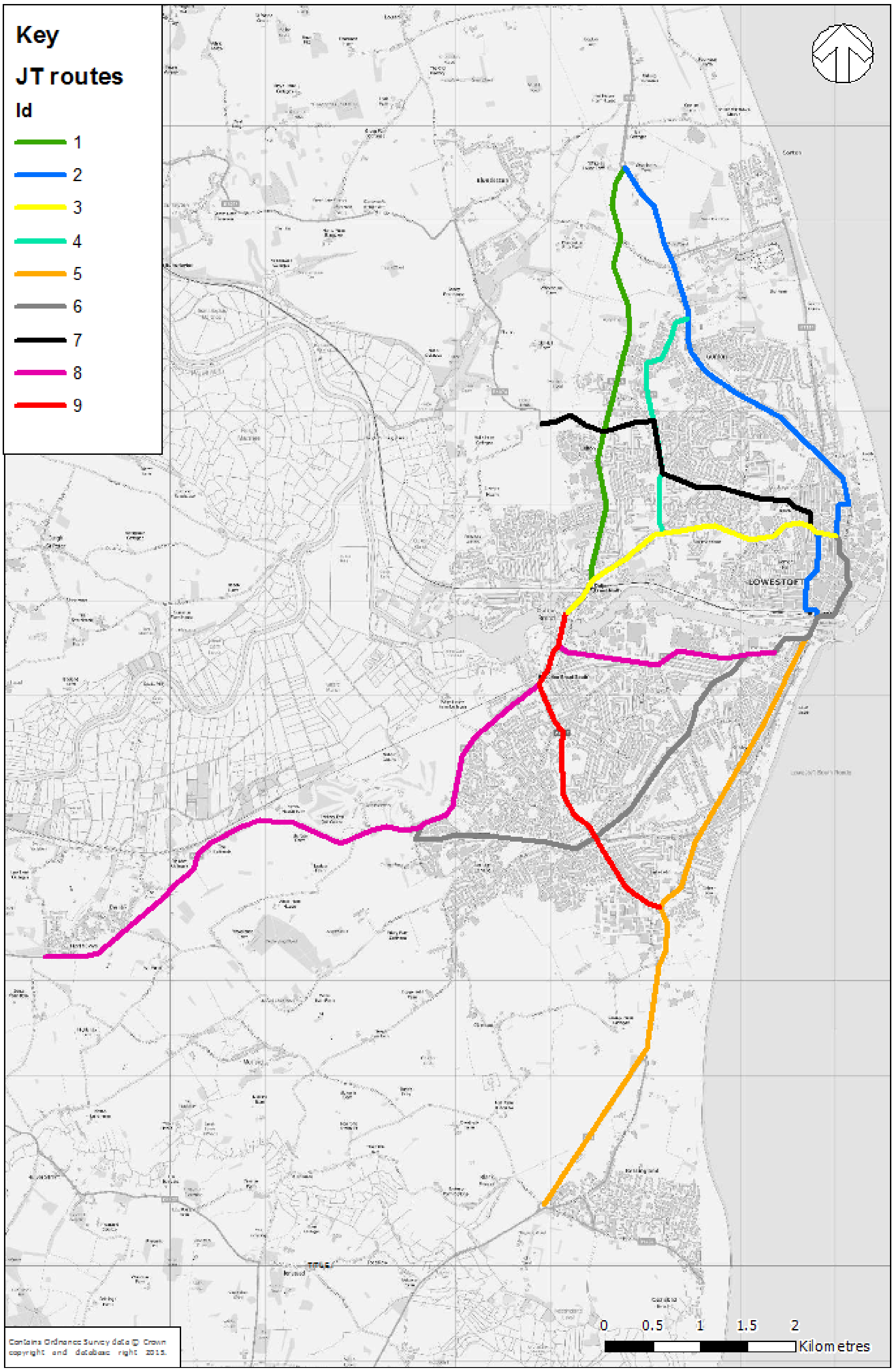


Figure 5.7 – Journey time routes

6 NETWORK DEVELOPMENT

6.1 NETWORK DATA, CODING AND CHECKING

6.1.1 The model network was based on the existing Lowestoft SATURN model network, updated to take account of any changes to the network that had occurred since the original Lowestoft model was built, or any significant coding errors.

6.1.2 The network was verified through the use of ArcGIS, site visits and aerial photography. In particular, checks were carried out to verify:

- Node co-ordinates
- Link length check against measured GIS distance
- Speed/flow relationship
- Link type
- Link capacity
- One way/two way operation
- Number of (effective) lanes
- Length and position of flares
- Any observed turn delays/penalties
- Location of public transport routes
- Access points.

6.1.3 The network errors and warnings generated by SATURN were checked to ensure the model network is free of coding errors.

6.1.4 Traffic loads onto the model network from zones in the form of centroid connectors. The centroid zone connectors in the updated Lowestoft model have been reviewed and refined to realistically represent the way in which traffic joins the road network. In the Fully Modelled Area, where the zoning system is fine, specific access roads from residential and commercial areas have been used as a basis for connecting zones to the network via centroid connectors.

6.1.5 Zones in the External Area, which have a large geographical coverage and significant demand associated with them, are generally connected to major routes to enter the network.

6.2 JUNCTIONS

6.2.1 Each junction included in the ADM network required several parameters as detailed below:

- Lane allocations
- Junction type
- Saturation flows at signal-controlled and priority-controlled junctions
- Signal times, stages and phases
- Circulation and saturation flows at roundabouts
- Gap times.

FLOW/DELAY RELATIONSHIPS

6.2.2 Observations on when the eastern Bascule Bridge and western Mutford Bridge were lifted and not open to road traffic were obtained. This information was covered Tuesday 14 April 2015 to Thursday 16 April 2015. Table 6.1 details the observed data for the eastern bridge.

Table 6.1 – Eastern Bascule Bridge observed lifting times

Peak Hour	AM Obs Opening	Opening Time	IP Obs Opening	Opening Time	PM Obs Opening	Opening Time
Tues 14 April 2015	0	00:00:00	1	00:04:42	1	00:06:54
Weds 15 April 2015	0	00:00:00	3	00:12:22	0	00:00:00
Thurs 16 April 2015	1	00:04:17	0	00:00:00	0	00:00:00

6.2.3 The western Mutford Bridge was observed to only open once during the observation period, for 2 minutes 40 seconds on Wednesday 15 April 2015 at 09:51. As this occurred outside the modelled time periods, no swing bridge delay was included in the model for the western bridge.

6.2.4 Table 6.2 shows the timings input into the model for the eastern Bascule Bridge. The delay was coded as a signalised node with a single stage, the red time representing when the swing bridge was lifted and with overall cycle time adding up to 3,600 seconds (1 hour). During the validation process, the AM peak bridge timings were initially coded as 257 seconds of red time to match the observed data, however during the validation process this was reduced to 227 seconds to ensure the flow validation improved on the bridge.

Table 6.2 – Eastern Bascule Bridge timings input into model

Peak Hour	Green Time (Seconds)	Red Time (Seconds)
AM peak	3,373	227
Inter peak	3,344	256
PM peak	3,186	414

6.2.5 Observations were also obtained for the two level crossings in the vicinity of the western Mutford Bridge – Bridge Road and Victoria Road. As with the swing bridge opening observations, the level crossings were observed between Tuesday 14 April 2015 and Thursday 16 April 2015. Table 6.3 shows the timings input for the Bridge Road level crossing. On average the barrier was down three times in the AM peak at this crossing, therefore the cycle time was set to 1,200 seconds (20 minutes), whereas in the interpeak and PM peak the barrier was down twice in an hour on average, the cycle time was therefore set to 1,800 seconds (30 minutes).

Table 6.3 – Bridge Road level crossing timings input into the model

Peak Hour	Green Time (Seconds)	Red Time (Seconds)
AM peak	1,017	183
Inter peak	1,485	315
PM peak	1,653	147

6.2.6 Table 6.4 outlines the timings input for the Victoria Road level crossing. On average the barrier was down twice in an hour at this location, therefore the cycle time was set to 1,800 seconds (30 minutes).

Table 6.4 – Victoria Road level crossing timings input into the model

Peak Hour	Green Time (Seconds)	Red Time (Seconds)
AM peak	1,693	107
Inter peak	1,553	247
PM peak	1,676	124

SIGNAL TIMINGS

6.2.7 Signal timings were extracted from controlled specs which were provided for eight key junctions within the study area, the junctions comprising of:

- Station Square / Denmark Road / Waveney Road
- London Road South / Belvedere Road
- Katwijk Way / Denmark Road
- Waveney Road / Suffolk Road / Battery Green Road
- Tom Crisp Way / Blackheath Road
- Beccles Road / Cotmer Road
- St Peters Street / Boston Road
- London Road / Mill Road.

6.2.8 The data from the controller specs were put into basic LinSig models to obtain realistic signal timings, stages and phases. The output results were inputted into the SATURN model for each time period.

SATURATION FLOWS

6.2.9 Default saturation flows were used for all junctions within the model. The default saturation flows per lane for priority junctions are:

- Major straight ahead movement (unopposed) – 1,980 pcu/hr
- Major left turn movement (unopposed) – 1,500 pcu/hr
- Major right turn movement (opposed) – 745 pcu/hr
- Minor left turn movement (opposed) 700 pcu/hr
- Minor right turn movement (opposed) – 800 pcu/hr
- Minor straight ahead movement (opposed) – 600 pcu/hr

6.2.10 Default saturation flows at signalised junctions are set to:

- Straight ahead movement – 1,980 pcu/hr
- Left or right turn movement – 1,740 pcu/hr

6.2.11 By default, SATURN assumes that opposing right turns at signalised junctions are “hooked” i.e. they interfere with each other. At larger junctions where there is sufficient space for traffic to turn right without being affected by the opposing right turn, it is possible to code these turns in the model so they do not interfere with each other. This was implemented at relevant junctions.

6.2.12 Roundabouts require special consideration. Unlike with other junction types, each turn needs to be given the total saturation flow for the approach e.g. if a roundabout has a two-lane approach, with one lane to turn left and one to turn right, each turn should be coded with a saturation flow of 2,200. Default saturation flows (pcu/hr) adopted for roundabouts are given in Table 6.5. These values have been adopted to replicate typical ARCADY capacity estimates and have previously been utilised.

Table 6.5 - Roundabout entry capacity saturation flows

Approach lanes	Number of entry lanes			
	1	2	3	4
Single (3.5m)	1,130	1,670	2,030	
Single (5.0m)	1,510	1,940	2,250	2,450
Dual 2 lane		2,200	2,780	3,190
Dual 3 lane			3,330	3,940

6.2.13 Equivalent gap acceptance parameters are provided in Table 6.6.

Table 6.6- Roundabout gap acceptance parameters (seconds)

Approach lanes	Number of entry lanes			
	1	2	3	4
Single (3.5m)	1.8	1.3	1.2	
Single (5.0m)	1.4	1.2	1.1	1.1
Dual 2 lane		1.1	1.0	0.9
Dual 3 lane			0.9	0.8

6.2.14 The overall circulatory saturation flow was set to be the same as the highest saturation flow on the approach arms of the roundabout. Large gyratory systems were coded as a series of priority junctions for a better representation of journey times through the junction

6.3 LINKS

6.3.1 Each link included in the ADM network required several parameters as detailed below:

- Distance
- Speed

- Speed flow curve
- Number of lanes
- Penalties/bans.

SPEED/FLOW RELATIONSHIPS

6.3.2 Highway capacity is restrained by junctions and by the speed-flow curves allocated to links in the study area. Speed flow curves are based on standard COBA 10 values and allocated to specific links based on assessment of the road speed, width and capacity. Speed-flow curves have generally only been used on rural or inter-urban links where the characteristics of the link itself, rather than junction capacity, have an impact on traffic speed. It has been necessary in some circumstances to use speed-flow curves in suburban areas to replicate the impacts of un-modelled minor junctions.

6.3.3 The speed flow curves that were used are shown in Table 6.7.

Table 6.7 - Model speed flow curves

DESCRIPTION	ID	FREE FLOW SPEED	SPEED AT CAPACITY	CAPACITY	POWER VALUE
Rural - D4M Motorway - 4 lanes	1	116	45	9,999	3.8
Rural - D3M Motorway - 3 lanes	2	116	45	7,560	3.8
Rural - D2M Motorway - 2 lanes	3	112	45	4,860	3.9
Rural - D3AP All-purpose - 3 lanes	4	109	45	6,780	3.7
Rural – D2AP All-purpose - 2 lanes	5	105	45	4,360	3.7
Rural - S10(Good) - 2 lanes	6	91	45	3,720	2.2
Rural - S10(Good) - 1 lane	7	91	45	1,860	2.2
Rural - S10(Typical) - 2 lanes	8	84	45	3,320	2.2
Rural - S10(Typical) - 1 lane	9	84	45	1,660	3.1
Rural - S7.3(Good) - 2 lanes	10	87	45	3,280	2.2
Rural - S7.3(Good) - 1 lane	11	87	45	1,640	2.2
Rural - S7.0(Typical) - 2 lanes	12	78	45	2,760	2.1
Rural - S7.0(Typical) - 1 lane	13	78	45	1,380	2.1
Rural - S6.5(Bad) - 2 lanes	14	67	45	2,020	1.8
Rural - S6.5(Bad) - 1 lane	15	67	45	1,010	1.8
Suburban - Dual(Slight devel)	16	78	35	3,460	3.3
Suburban - Single(Slight devel)	19	68	25	3,460	3.7

Description	ID	Free flow speed	Speed at capacity	Capacity	Power value
Suburban - Single(Slight devel)	20	68	25	1,730	3.7
Suburban - Dual(Typical devel)	21	61	25	2,540	2.3
Suburban - Dual(Typical devel)	22	61	25	1,570	2.3
Suburban - Dual(Heavy devel)	23	48	25	1,000	1.6
Suburban - Dual(Heavy devel)	24	48	25	500	1.6
Urban - Non-central(Good) - 2 lanes	25	54	25	1,960	1.7
Urban - Non-central(Good) - 1 lane	26	54	25	980	1.7
Urban - Non-central(Typical) - 2 lanes	27	49	25	1,560	1.6
Urban - Non-central(Typical) - 1 lane	28	49	25	780	1.6
Urban - Non-central(Poor) - 2 lanes	29	45	25	1,300	1.5
Urban - Non-central(Poor) - 1 lane	30	45	25	650	1.5
Urban - Central(Good) - 2 lanes	31	37	15	1,480	1.8
Urban - Central(Good) - 1 lane	32	37	15	740	1.8
Urban - Central(Typical) - 2 lanes	33	34	15	1,260	1.7
Urban - Central(Typical) - 1 lane	34	34	15	630	1.7
Urban - Central(Poor) - 2 lanes	35	29	15	900	1.6
Urban - Central(Poor) - 1 lane	36	29	15	450	1.6
Small Town - Light devel - 2 lanes	37	66	30	2,600	3.0
Small Town - Light devel - 1 lane	38	66	30	1,300	3.0
Small Town - Typical devel - 2 lanes	39	57	30	2,000	3.4
Small Town - Typical devel - 1 lane	40	57	30	1,000	3.4
Small Town - Heavy devel - 2 lanes	41	47	30	1,760	2.5
Small Town - Heavy devel - 1 lane	42	47	30	880	2.5
Suburban - Single(Slight devel)	43	78	35	1,730	3.7
Centroid Connector - Internal	50	87	87	9,999	3.3

FIXED SPEEDS

6.3.4 Within the urban area of the model speed flow curves were not necessary due to capacity restraints from the junctions at either end of the link.

6.3.5 These links were given fixed speeds based on their individual speed limit as obtained from imagery and site visits.

6.3.6 These speeds will reflect the free flow speed whilst the delay at junctions will reflect the conditions in busier periods.

7 TRIP MATRIX DEVELOPMENT

7.1 TRAVEL DEMAND DATA

7.1.1 The matrix was initially built from observed data based on the ANPR surveys detailed in section 5. ANPR data was filtered and factored to match the associated MCC. Following assignment of the observed matrix using select link analysis, a gravity model was devised utilising synthetic trip ends based on NTEM version 6.2 and the 2011 census. The gravity model produced a synthetic matrix which was then combined with the observed matrix to produce the initial prior matrix.

7.2 PARTIAL TRIP MATRICES FROM SURVEYS

7.2.1 For each site, trip chains were split into the following peak periods:

- AM peak period (07:00-10:00)
- Inter peak period (10:00-16:00)
- PM peak period (16:00-19:00)

7.2.2 Peak periods were used for the AM peak and PM peak rather than peak hours to increase the size of the sample which would be used to infer O-D movements within the study area.

7.2.3 Timestamps were available which detailed the exact time a vehicle was detected by an ANPR camera. Each unique matched vehicle was given an anonymised Vehicle Registration Number (VRN) and its data split into the different ANPR locations based on the first site at which the vehicle was detected. The site at which the vehicle was first detected was taken to be its origin for the purposes of matrix building.

7.2.4 The peak period for a vehicle was based on the timestamp for when it was first detected.

7.2.5 The total travel time for a trip chain was provided within the ANPR data, journeys taking longer than 60 minutes were excluded from the matrix building process. This was done because examination of the data highlighted many instances when vehicles were initially tracked at one location during a specific peak. However the next detection of the vehicle occurred over an hour later, often falling within a later peak period making such examples problematic to infer the origin-destination movement within the prescribed peak periods.

7.2.6 Table 7.1 shows the total number of observed trips with a duration of 60 minutes or less by peak period by the ANPR location at which they were first detected (for matrix purposes taken to be their origin).

Table 7.1 – Total observed ANPR trips (Less than 60 minutes in duration)

SITE	SITE DESCRIPTION	AM PEAK PERIOD (07:00-10:00)			INTER PEAK PERIOD (10:00-16:00)			PM PEAK PERIOD (16:00-19:00)		
		CAR	LGV	HGV	CAR	LGV	HGV	CAR	LGV	HGV
1	A12 London Road	907	156	80	1,569	220	152	927	150	63
2	A146 Beccles Road	788	100	95	1,173	196	175	975	127	69
3	A12 Yarmouth Road	375	42	13	745	97	24	902	75	9
4	Coast Road	36	0	7	79	7	17	48	2	8
5	A12 Pier Terrace (Eastern Bascule bridge)	494	51	27	1,089	102	53	1,044	100	13
6	A146 Bridge Road (Western Mutford bridge)	1,293	175	68	1,488	155	87	806	80	31
7	B1375 Gorleston Road	680	124	40	926	100	60	640	67	23
8	A1117 Millennium Way	449	41	31	695	81	44	412	33	9
9	A12 Yarmouth Road	628	100	70	1,271	133	116	835	84	32
10	A12 Tom Crisp Way	787	96	32	711	70	46	508	37	16
11	B1532 London Road South	379	60	26	499	51	30	326	28	14
12	B1074 Blundeston Road	159	20	9	211	35	20	142	42	6
13	Flixton Road	0	0	0	0	0	0	0	0	0
14	B1531 Waveney Drive	341	34	12	375	22	10	240	18	3
15	North Quay Retail Park	60	6	2	280	12	4	122	12	0
16	Links Road Car Park	4	1	0	13	1	0	3	0	0
17	Swimming Pool Road Car Park	1	0	0	12	0	0	20	0	0
18	Shopping Centre Car Park (Battery Green Rd exit)	0	1	0	48	1	0	25	1	0
19	Shopping Centre Car Park (Gordon Road entry)	0	0	0	5	0	0	0	0	0
20	Surrey St Car Park entry	7	0	0	43	2	0	4	0	0

Site	Site Description	AM Peak Period (07:00-10:00)			Inter Peak Period (10:00-16:00)			PM Peak Period (16:00-19:00)		
		Car	LGV	HGV	Car	LGV	HGV	Car	LGV	HGV
21	Surrey St Car Park exit (onto Clapham Road)	0	0	0	38	1	0	9	2	0
22	Clapham Road Car Park	3	0	1	56	0	0	10	0	0
23	St Johns Rd Car Park	1	0	0	4	1	0	4	0	0
24	Kirkley Rise Car Park (Northern access)	3	0	0	12	0	0	10	0	1
25	Kirkley Rise Car Park (Southern access)	1	0	0	2	0	0	2	0	0
26	Kirkley Cliff Road Car Park	0	0	0	0	0	0	1	0	0
27	Claremont Road Car Park	0	0	0	8	1	0	11	0	0
28	Marine Parade Car Park	0	1	0	44	0	0	17	1	0
29	Asda Car Park	135	11	1	282	14	3	161	8	3
Total		7,531	1,019	514	11,678	1,302	841	8,204	867	300

7.2.7 The observed ANPR trips were then factored using MCC totals for the peak hour carried out at each of the ANPR sites. The relevant direction for the MCC was used for factor the ANPR trips depending on whether it was an origin or a destination. For ANPR trips internal to the study area, the MCC directions had to be split proportionally based on the origin and destination totals at each site. Appendix A details the MCC totals used at each site

7.2.8 The MCC totals were used by site for doubly constrained furnessing of the observed ANPR trips taking an average of the origin and destination factor. This produced the observed peak hour matrix totals shown in Table 7.2.

Table 7.2 – Observed ANPR matrix totals following furnessing to MCC totals

User Class	AM Peak Hour (08:00-09:00)			Inter Peak Avg. Hour (10:00-16:00)			PM Peak Hour (17:00-18:00)		
	Total	Inter-Zonals	Intra-Zonals	Car	LGV	HGV	Car	LGV	HGV
UC1 – Car	7,175	7,100	75	7,602	7,489	112	9,286	9,239	48
UC2 – LGV	1,115	1,110	5	980	973	7	1,039	1,031	7
UC3 – HGV	298	298	0.00	301	297	4.	148	147	2
Total	8,587	8,508	80	8,882	8,759	123	10,473	10,417	57

7.2.9 In order to distribute the ANPR matrices within the model, select link analysis at each ANPR site location was carried out using the 2001 Lowestoft SATURN model. This meant the observed data was distributed within the old zone system used for the 2001 Lowestoft SATURN model.

7.2.10 Analysis of the demand for each zone in this matrix showed that two zones adjacent to the eastern Bascule bridge had high numbers of trips associated with them relative to observed data available at these locations:

- Zone 2: covering the docks east of the A12 Battery Green Road / Waveney Road, linking to a single access at the A12 / Suffolk Road signals
- Zone 9: covering the commercial developments linking onto Commercial Road, linking on to a single access at the A12 Pier Terrace / Commercial Road.

7.2.11 Origin and destination totals for these zones were factored to match the arm in the respective MCC site 10 and site 11. The excess traffic was then distributed using select link analysis of the A12 Pier Terrace to ensure the overall matrix total was retained.

7.2.12 The observed trip matrix was then converting into the new zone system used for the 2015 Lowestoft SATURN model. Correspondence between the old 2001 zone system and new 2015 zone system was done based on area, but took into account an urban outline boundary covering all built-up areas within the study area. This ensured that for instances in which zones contained large amounts of open space, the trip totals were concentrated only in the built-up area. This ensured land-use density was taken into account when the correspondence between the old and new zone system was carried out.

7.2.13 Following this process there was a small loss in the overall number of trips due to rounding issues as shown in Table 7.3

Table 7.3 – Observed ANPR matrix totals following correspondence between 2001 zone system and 2015 zone system

User Class	AM Peak Hour (08:00-09:00)			Inter Peak Avg. Hour (10:00-16:00)			PM Peak Hour (17:00-18:00)		
	Total	Inter-Zonals	Intra-Zonals	Car	LGV	HGV	Car	LGV	HGV
UC1 – Car	7,173	6,952	221	7,609	7,322	286	9,286	9,024	262
UC2 – LGV	1,114	1,083	31	981	948	33	1038	1,011	28
UC3 – HGV	298	287	11	301	292	9	149	145	4
Total	8,585	8,322	263	8,891	8,563	323	10,473	10,179	293

7.2.14 Intra-zonal trips were removed from the matrix, prior to splitting the car user class into the following three user classes:

- Car commuting
- Car employers business
- Car other

7.2.15 This was carried out based on trip synthesis factors derived on a zone by zone basis as detailed in section 7.3. As factors were applied to both row and column values on a zone by zone basis this lead to a change in the overall size of the matrix.

Table 7.4 - Summary ANPR matrix totals

User Class	AM Peak Hour (08:00-09:00)	Inter Peak Avg. Hour (10:00-16:00)	PM Peak Hour (17:00-18:00)
UC1 – Car Commuting	4,079	1,417	3,259
UC2 – Car EmpBus	485	499	524
UC3 – Car Other	2,373	5,391	5,232
UC4 – LGV	1,083	948	1,011
UC5 – HGV	287	292	145
Total	**8,307**	**8,548**	**10,171**

7.3 TRIP SYNTHESIS

7.3.1 To account for trips that were otherwise unobserved by the ANPR surveys, a synthetic gravity model was created.

7.3.2 Peak period trip end totals were calculated for each model zone using trip end information from NTEM version 6.2 accessed via TEMPRO. Intersecting the model zoning system with the NTEM zones, NTEM trip ends were split proportionally to create synthetic trip ends totals for each model zone. 2011 work place zones and census output areas were used to determine the employment and housing numbers in the model zone system, these totals were used to help proportion the NTEM synthetic trip end totals.

7.3.3 NTEM trips were output by trip purpose. Three car user classes were made up of the following NTEM trip purposes:

- Car commuting:
  - Home-Based Work
  - Home-Based Education
- Car employers business:
  - Home-Based Employers Business
  - Non-Home-Based Employers Business
- Car other:
  - Home-Based Shopping
  - Home-Based Recreation / Social
  - Home-Based Personal Business
  - Home-Based Visiting Friends & Relatives
  - Home-Based Holiday / Day Trip
  - Non-Home-Based Work

- Non-Home-Based Education
- Non-Home-Based Shopping
- Non-Home-Based Recreation / Social
- Non-Home-Based Personal Business
- Non-Home-Based Holiday / Day Trip

7.3.4 The trips were factored from the peak periods available within NTEM to represent a peak hour using factors from local ATC as shown in Table 7.5.:

Table 7.5 – Peak period to peak hour factors

USER CLASS	FACTOR
AM peak period (07:00-10:00) to AM peak hour factor (08:00-09:00)	2.63
Inter peak period (10:00-16:00) to average hour factor	6.00
PM peak period (16:00-18:00) to PM peak hour factor (17:00-18:00)	1.84

7.4 MERGING DATA FROM SURVEYS AND TRIP SYNTHESIS

7.4.1 The observed trip matrix was combined with the synthetic matrix using the gravity model.

7.4.2 The SATURN model was skimmed to produce generalised cost matrices, which were then used to distribute the synthetic trip end totals according to the following formula:

$$T_{ij} = O_i * D_j * \exp(-\beta * C_{ij})$$

7.4.3 Thus a trip (T) between any given origin-destination pair is defined as a function of total origin trips (O), total destination trips (D), generalised cost (C), and a deterrence parameter (β). The resultant trip matrices were assigned, and the costs re-skimmed. This process was repeated until the relative gap between the matrices was less than 1% on three successive iterations.

7.4.4 Due to there being few zero values in the observed matrix, a threshold was set at which trip ends within the gravity model would replace the values in the observed matrix. The thresholds for each peak were set as shown in Table 7.6.

Table 7.6 – Gravity model infill thresholds

PEAK	THRESHOLD
AM peak (08:00-09:00)	5
Inter peak (10:00-16:00)	0.1
PM peak (17:00-18:00)	0.05

7.4.5 Trip length distributions were calculated and compared for known movements in the observed ANPR matrix. The results were analysed and the beta value adjusted with the gravity model re-run to produce an optimal fit between synthetic and observed trips. Attention was also paid to the distribution of the full matrix of synthetic trips to ensure close approximation to likely trip lengths.

7.4.6 The β values used within the gravity model are shown in Table 7.7.

Table 7.7 – Beta (β) values used within gravity model

User Class	AM Peak Hour (0800-0900)	Inter Peak Avg. Hour (1000-1600)	PM Peak Hour (1700-1800)
Car commuting	0.91	0.39	0.9
Car emp business	0.96	0.33	0.9
Car other	0.71	0.3	0.9

7.4.7 The r-squared values that were achieved for each car user class across the three peaks are shown in Table 7.8.

Table 7.8 – R-square results from gravity model

User Class	AM Peak Hour (0800-0900)	Inter Peak Avg. Hour (1000-1600)	PM Peak Hour (1700-1800)
Car commuting	0.729	0.887	0.592
Car emp business	0.697	0.872	0.629
Car other	0.911	0.881	0.838
Car overall	**0.816**	**0.892**	**0.761**

7.4.8 Appendix B contains details of the trip length distribution and changes applied to the matrix by the gravity model.

7.4.9 Following the gravity model infill, the prior matrix totals are shown in Table 7.9.

Table 7.9 – Prior matrix totals

User Class	AM Peak Hour (0800-0900)	Inter Peak Avg. Hour (1000-1600)	PM Peak Hour (1700-1800)
UC1 – Car Commuting	6716	1970	4631
UC2 – Car EmpBus	7401	723	1034
UC3 – Car Other	3529	6513	6850
UC4 – LGV	1083	948	1011
UC5 – HGV	287	292	145
Total	**12355**	**10447**	**13672**

8 NETWORK CALIBRATION AND VALIDATION

8.1 NETWORK CALIBRATION

8.1.1 Network calibration was carried out using the initial prior matrix to assist with checks of the network. The initial checks included:

- Link speeds
- Link flows
- Junction delays
- Volume over Capacity (V/C) ratios.

8.1.2 The junctions were also checked to ensure that the capacity of the junction was not less than the counts at any arms.

8.1.3 The modelled delay was not analysed due to no observed data being collected.

8.1.4 Following on from these adjustments the initial matrix was re-run and in addition the observed flows were checked against the modelled flow to ensure they were not significantly higher or lower.

8.1.5 The delays were rechecked to isolate any that were unacceptably lower than the observed delays.

8.1.6 The routes through the network were checked which focussed on ensuring that the routing over the two existing bridges are correct as well as the other main strategic routes through Lowestoft.

8.1.7 The routes taken by HGV were also checked to confirm that certain links with weight or height restrictions had the appropriate ban on them.

8.1.8 The route choice will be discussed in greater detail in Section 9 of this report.

8.2 NETWORK VALIDATION

8.2.1 The journey time routes were assessed with the initial prior matrix to sense check the time it takes to travel on certain links. This indicated any junctions that had unexpected delays or link speeds that were consistently less than the speed limit.

8.2.2 Journey times that had a difference of greater than 25% versus the observed time were checked to confirm that all the characteristics as set out in Section 6 for both links and junctions were consistent with the actual road network.

8.2.3 The link characteristics were also checked on any links where the observed count and modelled flow had a difference of 25% or more.

8.2.4 These checks allowed full confidence that the model reflected the real situation as close as possible.

9 ROUTE CHOICE CALIBRATION AND VALIDATION

9.1 ROUTE CHOICE CALIBRATION

9.1.1 The generalised costs have an effect on the route choice made by different user class and trip purposes.

9.1.2 Generalised costs were calculated using values of time, GDP growth rates, purpose splits, and vehicle operating costs recommended by the DfT for use in economic appraisals of transport projects in England. These values are presented in the November 2014 TAG data book and follow the guidance within the latest version of WebTAG Unit A1.3. The values calculated for use in the base year models are shown in Table 9.1 and Table 9.2. Table 9.1 outlines the Pence per Minute (PPM) values by peak period and vehicle class, whilst Table 9.2 shows this in terms of Price per Kilometre (PPK).

Table 9.1 - Generalised cost parameters - pence per minute (PPM)

Peak	Car – Commuting	Car – Employers Business	Car – Other	LGV	HGV
AM	13.74	46.57	17.49	20.98	21.25
IP	13.63	45.51	18.18	20.98	21.25
PM	13.44	44.78	18.72	20.98	21.25

Table 9.2 - Generalised cost parameters - pence per kilometre (PPK)

Peak	Car – Commuting	Car – Employers Business	Car – Other	LGV	HGV
AM	6.70	13.38	6.70	13.66	37.35
IP	6.70	13.38	6.70	13.66	37.35
PM	6.70	13.38	6.70	13.66	37.35

9.1.3 Due to heavy goods vehicles favouring shorter slower routes over the longer faster routes such as trunk roads the HGV routes were looked at in greater detail.

9.1.4 The HGV route check looked at any roads that were unsuitable for HGV such as London Road and the appropriate ban was added to these.

9.2 ROUTE CHOICE VALIDATION

9.2.1 The routes that were chosen to validate the route choice were based on the criteria set out in TAG Unit M3.1 (January 2014):

- Relate to significant number of trips
- Are of significant length or cost

- Pass through areas of interest
- Include both directions of travel
- Link different compass areas
- Coincide with journey time routes as appropriate.

9.2.2 Routes were plotted for all user classes. Guidance presented in section 7.3 of TAG Unit M3.1 (January 2014), with the number of OD pairs determined as follows:

Number of OD pairs = (number of zones)$^{0.25}$ x number of user classes

Based on the initial proposed zoning system, this equates to 14 routes. The routes that were chosen in the appraisal specification report (Sept 2015) and can be seen in Table 9.3 were used to validate the route choice.

Table 9.3 - OD route checks

Route	Origin	Origin Name	Destination	Destination Name
1	102	Corton	119	Katwijk Way, Lowestoft
2			122	Waveney Drive (between A12 & Kirkley Run)
3			130	Borrow Road, Oulton
4			131	Windward Way, Lowestoft
5			136	Pakefield Street, Pakefield
6			143	The Street, Carlton Colville
7			149	Kessingland
8	149	Kessingland	101	Corton Road, Gunton
9			104	Blundeston
10			113	Higher Drive, Normanston
11			114	Spashett Road, Lowestoft
12			120	Rotterdam Road, Lowestoft
13			122	Waveney Drive (between A12 & Kirkley Run)
14			128	A146 Beccles Road (near Burnt Hill Lane), Oulton Broad

9.2.3 The results of these routes can be seen in Appendix C.

9.2.4 The routes were assessed based on the best fit route taking particular interest in which bridge was used and if the key strategic routes were being utilised for the longer journeys.

9.2.5 The O-D trees in Appendix C look at user class 1 (Car – Commuting) for the three time periods.

9.2.6 In the AM peak all the routes starting from zone 102 use a logical route. The choice of bridges is accurate especially between Corton to Pakefield (zone 102 and zone 136) and Corton to Oulton (zone 102 and zone 130) while longer trips are using the strategic links for example between Corton to Kessingland (zone 102 and zone 149) and Corton to Carlton Colville (zone 102 and zone 143). The trips between Corton and Waveney Drive (zone 102 and zone 122) use the eastern bascule bridge when either bridge would be appropriate for these trips.

9.2.7 The routes starting from Kessingland (zone 149) use the most strategic routes especially for longer journeys such as Kessingland to Gunton (zone 149 and zone 101) and Kessingland to Blundeston (zone 149 and zone 104). The split between the bridges is also acceptable with trips included between Kessingland to Normanston (zone 149 and zone 113) and Kessingland to Rotterdam Road (zone 149 and zone 120) uses the bridge which provides the best fit route.

9.2.8 The inter peak shows that some routes have multiple options with traffic using more than one route in some of the OD pairs for example between Corton to Oulton (zone 102 and zone 130) and Kessingland to Gunton (zone 149 and zone 101). The route between Kessingland to Normanston (zone 149 and zone 113) shows a split between both the eastern and western bridges.

9.2.9 The PM peak routes also show some route choice between certain OD pairs. All of the routes in the PM peak match the routes in either the AM peak or the interpeak if not both.

9.2.10 All of the routes generally remain consistent between the three peaks.

9.2.11 User class 2 and user class 3 (Car – Employer’s Business & Car – Other) show the same route choices as user class 1 for all routes in the AM peak and PM peak.

9.2.12 The interpeak shows an increase amount of route choice for user class 2 and user class 3. These are all minor route choices and the main strategic routes remain consistent.

9.2.13 User class 4 (LGV) has only one small difference compared to the car user classes within the AM peak and PM peak. In the interpeak two routes show a change in local route whilst retaining the same strategic routes.

9.2.14 HGV (user class 5) show increased variance in their route choice which is expected. The HGV user class will prioritise distance over time as well as having to avoid banned turns and therefore show some alternative route choice.

10 TRIP MATRIX CALIBRATION AND VALIDATION

10.1 TRIP MATRIX VALIDATION

10.1.1 The initial prior matrix was created as explained in Section 7 of this report. The initial prior matrix was assigned within the model and the screenline performance analysed.

10.1.2 The observed data was split into calibration and validation counts, the validation counts were not used in any matrix adjustment or matrix estimation.

10.1.3 Section 3.2 of TAG Unit M3.1 (January 2014) stipulates modelled flows across screenlines for each vehicle type should be within 5% of observed flows. WebTAG recommends that this should apply to “all, or nearly all” screenlines. However, due to the relatively low overall flows through the screenlines a difference between the modelled and observed flow of within 5% was considered difficult to. Therefore in this instance a GEH across the screenline of 4.0 or below has been considered in this report when looking at screenline performance. This approach is compliant with previous versions of WebTAG. We have applied a threshold of 85% of screenline totals to meet this criterion.

10.1.4 There are six screenlines which are used as part of the validation process and five which is part of the calibration process as set out in section 5 of this report. The results of the screenlines for the AM peak can be seen in Table 10.1.

Table 10.1 - Initial prior matrix screenline validation and calibration results - AM Peak

Screenline			Observed	Modelled	Difference	GEH
ID	Name	Type				
1	Screenline 1 - NB	Calibration	1,304	761	-42%	16.893
2	Screenline 1 - SB	Calibration	1,032	1,019	-1%	0.419
3	Screenline 2 - NB	Calibration	959	1,007	5%	1.525
4	Screenline 2 - SB	Calibration	933	781	-16%	5.202
5	Screenline 3 - NB	Calibration	1,082	1,233	14%	4.434
6	Screenline 3 - SB	Calibration	824	833	1%	0.330
7	Screenline 4 - NB	Calibration	1,086	965	-11%	3.778
8	Screenline 4 - SB	Calibration	705	761	8%	2.078
9	Screenline 5 - EB	Calibration	440	380	-14%	2.982
10	Screenline 5 - WB	Calibration	313	224	-28%	5.438
11	Screenline 6 - EB	Calibration	1,749	1,703	-3%	1.109
12	Screenline 6 - WB	Calibration	1,200	917	-24%	8.691
13	Screenline 7 - EB	Calibration	660	1,199	82%	17.694
14	Screenline 7 - WB	Calibration	687	1,075	56%	13.055
15	Screenline 8 - NB	Calibration	1,585	1,702	7%	2.883
16	Screenline 8 - SB	Calibration	1,096	1,364	24%	7.644
19	Screenline 9 - NB	Validation	2,475	2,682	8%	4.076
20	Screenline 9 - SB	Validation	1,802	1,959	9%	3.620
21	Screenline 10 - NB	Validation	1,639	1,895	16%	6.096
22	Screenline 10 - SB	Validation	1,373	1,586	16%	5.543

10.1.5 The results for the Interpeak can be seen in Table 10.2.

Table 10.2: Initial prior matrix screenline validation and calibration results - Inter Peak

Screenline			Observed	Modelled	Difference	GEH
ID	Name	Type				
1	Screenline 1 - NB	Calibration	963	470	**-51%**	**18.406**
2	Screenline 1 - SB	Calibration	935	695	**-26%**	**8.411**
3	Screenline 2 - NB	Calibration	884	718	**-19%**	**5.852**
4	Screenline 2 - SB	Calibration	864	667	**-23%**	**7.136**
5	Screenline 3 - NB	Calibration	1,086	1,247	**15%**	**4.720**
6	Screenline 3 - SB	Calibration	1,200	981	**-18%**	**6.621**
7	Screenline 4 - NB	Calibration	788	587	**-25%**	**7.659**
8	Screenline 4 - SB	Calibration	814	782	-4%	**1.142**
9	Screenline 5 - EB	Calibration	367	193	**-47%**	**10.407**
10	Screenline 5 - WB	Calibration	398	300	**-25%**	**5.254**
11	Screenline 6 - EB	Calibration	1,353	1,190	**-12%**	**4.578**
12	Screenline 6 - WB	Calibration	1,391	752	**-46%**	**19.530**
13	Screenline 7 - EB	Calibration	609	1,089	**79%**	**16.491**
14	Screenline 7 - WB	Calibration	610	955	**57%**	**12.328**
15	Screenline 8 - NB	Calibration	1,257	1,239	-1%	**0.511**
16	Screenline 8 - SB	Calibration	1,304	1,456	**12%**	**4.085**
19	Screenline 9 - NB	Validation	2,024	1,944	-4%	**1.803**
20	Screenline 9 - SB	Validation	1,982	2,126	**7%**	**3.181**
21	Screenline 10 - NB	Validation	1,365	1,512	**11%**	**3.864**
22	Screenline 10 - SB	Validation	1,385	1,615	**17%**	**5.942**

10.1.6 The screenline results for the PM peak can be seen in Table 10.3.

Table 10.3 - Initial prior matrix screenline validation and calibration results - PM Peak

Screenline			Observed	Modelled	Difference	GEH
ID	Name	Type				
1	Screenline 1 - NB	Calibration	1,294	751	-42%	16.969
2	Screenline 1 - SB	Calibration	1,450	1,005	-31%	12.704
3	Screenline 2 - NB	Calibration	1,088	985	-9%	3.199
4	Screenline 2 - SB	Calibration	1,212	1,003	-17%	6.287
5	Screenline 3 - NB	Calibration	1,031	1,586	54%	15.353
6	Screenline 3 - SB	Calibration	1,257	1,413	12%	4.265
7	Screenline 4 - NB	Calibration	764	615	-20%	5.676
8	Screenline 4 - SB	Calibration	1,136	1,013	-11%	3.756
9	Screenline 5 - EB	Calibration	404	278	-31%	6.823
10	Screenline 5 - WB	Calibration	650	472	-27%	7.502
11	Screenline 6 - EB	Calibration	1,470	1,618	10%	3.757
12	Screenline 6 - WB	Calibration	1,783	1,340	-25%	11.214
13	Screenline 7 - EB	Calibration	938	1,294	38%	10.648
14	Screenline 7 - WB	Calibration	690	1,086	57%	13.271
15	Screenline 8 - NB	Calibration	1,443	1,434	-1%	0.234
16	Screenline 8 - SB	Calibration	1,624	1,999	23%	8.817
19	Screenline 9 - NB	Validation	2,218	2,354	6%	2.844
20	Screenline 9 - SB	Validation	2,724	2,988	10%	4.940
21	Screenline 10 - NB	Validation	1,753	1,854	6%	2.367
22	Screenline 10 - SB	Validation	1,713	2,049	20%	7.748

10.2 TRIP MATRIX CALIBRATION

ADJUSTED PRIOR MATRIX

10.2.1 To improve on these results scaling was used on a selection of the calibration counts to produce an adjusted prior matrix. This looked at the difference between the modelled and observed data and adjusted the matrix to either add or remove trips between OD pairs which used those routes.

10.2.2 The counts on the eastern and western bridge were not scaled as these already had acceptable GEH values and could act as a check that the matrix was not being distorted by the scaling process.

10.2.3 Table 10.4 shows the number of trips in each user class for the initial and adjusted prior matrix.

Table 10.4 - Pre and post prior matrix adjustment trip totals

User Class	AM Peak Hour (08:00-09:00)		Inter Peak Avg. Hour (10:00-16:00)		PM Peak Hour (17:00-18:00)	
	Initial Prior	Adj Prior	Initial Prior	Adj Prior	Initial Prior	Adj Prior
UC1 – Car Commuting	6,716	5,735	1,970	1,724	4,631	4,019
UC2 – Car EmpBus	741	646	723	693	1,034	932
UC3 – Car Other	3,529	3,491	6,513	6,183	6,850	6,166
UC4 – LGV	1,083	2,454	948	2,760	1,011	3,019
UC5 – HGV	287	842	292	814	145	416
Total	**12,355**	**13,167**	**10,447**	**12,174**	**13,672**	**14,553**

10.2.4 Table 10.5 to Table 10.7 show the screenline performance of the adjusted prior matrix. These results show a major improvement in how the modelled flows match the observed screenlines, with the majority of screenlines showing a GEH of 4.0 or below.

Table 10.5 - Adjusted prior matrix screenline validation and calibration results - AM Peak

Screenline			Observed	Modelled	Difference	GEH
ID	Name	Type				
1	Screenline 1 - NB	Calibration	1,304	1,157	-11%	4.185
2	Screenline 1 - SB	Calibration	1,032	1,352	31%	9.256
3	Screenline 2 - NB	Calibration	959	897	-6%	2.041
4	Screenline 2 - SB	Calibration	933	951	2%	0.576
5	Screenline 3 - NB	Calibration	1,082	960	-11%	3.823
6	Screenline 3 - SB	Calibration	824	840	2%	0.572
7	Screenline 4 - NB	Calibration	1,086	1,003	-8%	2.568
8	Screenline 4 - SB	Calibration	705	723	3%	0.683
9	Screenline 5 - EB	Calibration	440	422	-4%	0.886
10	Screenline 5 - WB	Calibration	313	263	-16%	2.953
11	Screenline 6 - EB	Calibration	1,749	1,701	-3%	1.157
12	Screenline 6 - WB	Calibration	1,200	1,232	3%	0.925
13	Screenline 7 - EB	Calibration	660	747	13%	3.296
14	Screenline 7 - WB	Calibration	687	695	1%	0.287
15	Screenline 8 - NB	Calibration	1,585	1,503	-5%	2.090
16	Screenline 8 - SB	Calibration	1,096	1,075	-2%	0.634
19	Screenline 9 - NB	Validation	2,475	2,370	-4%	2.133
20	Screenline 9 - SB	Validation	1,802	1,812	1%	0.235
21	Screenline 10 - NB	Validation	1,639	1,540	-6%	2.477
22	Screenline 10 - SB	Validation	1,373	1,289	-6%	2.297

Table 10.6 - Adjusted prior matrix screenline validation and calibration results - Inter Peak

Screenline			Observed	Modelled	Difference	GEH
ID	Name	Type				
1	Screenline 1 - NB	Calibration	963	1,076	12%	3.551
2	Screenline 1 - SB	Calibration	935	918	-2%	0.562
3	Screenline 2 - NB	Calibration	884	996	13%	3.666
4	Screenline 2 - SB	Calibration	864	943	9%	2.613
5	Screenline 3 - NB	Calibration	1,086	1,117	3%	0.940
6	Screenline 3 - SB	Calibration	1,200	1,163	-3%	1.066
7	Screenline 4 - NB	Calibration	788	697	-12%	3.332
8	Screenline 4 - SB	Calibration	814	828	2%	0.480
9	Screenline 5 - EB	Calibration	367	281	-23%	4.786
10	Screenline 5 - WB	Calibration	398	422	6%	1.177
11	Screenline 6 - EB	Calibration	1,353	1,162	-14%	5.393
12	Screenline 6 - WB	Calibration	1,391	1,386	0%	0.144
13	Screenline 7 - EB	Calibration	609	697	15%	3.462
14	Screenline 7 - WB	Calibration	610	642	5%	1.273
15	Screenline 8 - NB	Calibration	1,257	1,360	8%	2.846
16	Screenline 8 - SB	Calibration	1,304	1,419	9%	3.110
19	Screenline 9 - NB	Validation	2,024	1,899	-6%	2.830
20	Screenline 9 - SB	Validation	1,982	2,181	10%	4.366
21	Screenline 10 - NB	Validation	1,365	1,350	-1%	0.418
22	Screenline 10 - SB	Validation	1,385	1,281	-8%	2.845

Table 10.7 - Adjusted prior matrix screenline validation and calibration results - PM Peak

Screenline			Observed	Modelled	Difference	GEH
ID	Name	Type				
1	Screenline 1 - NB	Calibration	1,294	1,385	7%	2.499
2	Screenline 1 - SB	Calibration	1,450	1,180	-19%	7.448
3	Screenline 2 - NB	Calibration	1,088	1,142	5%	1.618
4	Screenline 2 - SB	Calibration	1,212	1,235	2%	0.650
5	Screenline 3 - NB	Calibration	1,031	1,071	4%	1.244
6	Screenline 3 - SB	Calibration	1,257	1,268	1%	0.305
7	Screenline 4 - NB	Calibration	764	719	-6%	1.654
8	Screenline 4 - SB	Calibration	1,136	1,126	-1%	0.301
9	Screenline 5 - EB	Calibration	404	404	0%	0.000
10	Screenline 5 - WB	Calibration	650	596	-8%	2.150
11	Screenline 6 - EB	Calibration	1,470	1,357	-8%	3.015
12	Screenline 6 - WB	Calibration	1,783	1,692	-5%	2.186
13	Screenline 7 - EB	Calibration	938	1,006	7%	2.172
14	Screenline 7 - WB	Calibration	690	640	-7%	1.957
15	Screenline 8 - NB	Calibration	1,443	1,483	3%	1.049
16	Screenline 8 - SB	Calibration	1,624	1,682	4%	1.433
19	Screenline 9 - NB	Validation	2,218	2,203	-1%	0.319
20	Screenline 9 - SB	Validation	2,724	2,765	2%	0.783
21	Screenline 10 - NB	Validation	1,753	1,608	-8%	3.548
22	Screenline 10 - SB	Validation	1,713	1,529	-11%	4.570

10.3 TRIP MATRIX ESTIMATION

10.3.1 The matrix estimation process employed as part of the calibration process is designed to modify the travel patterns using the observed traffic counts. Trips are adjusted in the matrix to produce the estimated matrix, which is most likely to be consistent with the traffic counts. The matrix of trips input to matrix estimation is known as the prior matrix, while the output matrix from matrix estimation is known as the post matrix. The calibration process has used matrix estimation procedures as contained in the SATME2 program in the SATURN suite of software.

10.3.2 SATME2 requires a PIJA file which represents the proportion (P) of trips between a particular origin-destination pair (IJ) which uses the counted link (A). The PIJA data is obtained through the program SATPIJA following a SATURN assignment using the SAVEIT option.

10.3.3 This produces PIJA output files for each user class which are used by SATME2 along with the prior matrix to produce an updated 2015 estimated highway demand matrices which were then combined into a ‘stacked’ estimated matrix for assignment. No cells were frozen and there were no zonal constraints applied.

10.3.4 Matrix estimation often involves an iterative process, where the first post matrix is assigned to the network and is used to update assignment costs, creating a new set of PIJA factors to create a second post matrix. This process can continue to be repeated, updating assignment costs but retaining the original prior matrix each time to prevent undue distortion of observed trip patterns. The benefit of this approach is that the post matrix will contain a better representation of the PIJA factors on counted links than the prior matrix assignment, which should result in an improved post matrix the second time around.

10.3.5 Further iterations can be undertaken, but typically after 3 or 4 iterations the additional benefits in terms of improved goodness of fit are small. There are no specific convergence criteria for matrix estimation, but the aim of the procedure is to improve the goodness of fit between modelled flows and counts.

10.3.6 The matrix estimation was carried out using the calibration counts only based on the scaled matrices for each time period.

10.3.7 Table 10.8 compares the matrix totals for the adjusted prior and post matrix estimation matrices for each modelled peak hour by user class. Overall, following matrix estimation, the matrix increased by 0.76% in the AM peak, there was a decrease of 1% in the inter peak and an increase of 0.87% in the PM peak.

Table 10.8: Prior and Post Matrix Totals

User Class	AM Peak Hour (0800-0900)		Inter Peak Avg. Hour (1000-1600)		PM Peak Hour (1700-1800)	
	Adj Prior	Post ME	Adj Prior	Post ME	Adj Prior	Post ME
UC1 – Car Commuting	5,735	5,447	1,724	1,696	4,019	3,964
UC2 – Car EmpBus	646	622	693	658	932	904
UC3 – Car Other	3,491	3,474	6,183	5,954	6,166	6,141
UC4 – LGV	2,454	2,855	2,760	2,919	3,019	3,215
UC5 – HGV	842	868	814	825	416	456
Total	**13,167**	**13,267**	**12,174**	**12,052**	**14,553**	**14,680**

10.3.8 Appendix D contains a breakdown of the individual count performance within the screenlines for the final post-ME assignment.

10.3.9 Table 10.9 to Table 10.11 detail the screenline performance of the post ME assignment.

Table 10.9: Post ME screenline validation and calibration results - AM Peak

SCREENLINE			OBSERVED	MODELLED	DIFFERENCE	GEH
ID	Name	Type				
1	Screenline 1 - NB	Calibration	1,304	1,277	-2%	**0.746**
2	Screenline 1 - SB	Calibration	1,032	1,139	**10%**	**3.235**
3	Screenline 2 - NB	Calibration	959	960	0%	**0.027**
4	Screenline 2 - SB	Calibration	933	937	0%	**0.121**
5	Screenline 3 - NB	Calibration	1,082	1,085	0%	**0.086**
6	Screenline 3 - SB	Calibration	824	795	-3%	**1.002**
7	Screenline 4 - NB	Calibration	1,086	1,041	-4%	**1.380**
8	Screenline 4 - SB	Calibration	705	693	-2%	**0.444**
9	Screenline 5 - EB	Calibration	440	438	-1%	**0.114**
10	Screenline 5 - WB	Calibration	313	298	-5%	**0.864**
11	Screenline 6 - EB	Calibration	1,749	1,599	**-9%**	**3.668**
12	Screenline 6 - WB	Calibration	1,200	1,238	3%	**1.096**
13	Screenline 7 - EB	Calibration	660	644	-2%	**0.611**
14	Screenline 7 - WB	Calibration	687	688	0%	**0.020**
15	Screenline 8 - NB	Calibration	1,585	1,581	0%	**0.103**
16	Screenline 8 - SB	Calibration	1,096	1,097	0%	**0.033**
19	Screenline 9 - NB	Validation	2,475	2,368	-4%	**2.174**
20	Screenline 9 - SB	Validation	1,802	1,670	**-7%**	**3.168**
21	Screenline 10 - NB	Validation	1,639	1,518	**-7%**	**3.040**
22	Screenline 10 - SB	Validation	1,373	1,293	**-6%**	**2.186**

Table 10.10: Post ME screenline validation and calibration results - Inter Peak

Screenline			Observed	Modelled	Difference	GEH
ID	Name	Type				
1	Screenline 1 - NB	Calibration	963	926	-4%	**1.192**
2	Screenline 1 - SB	Calibration	935	894	-4%	**1.360**
3	Screenline 2 - NB	Calibration	884	887	0%	**0.114**
4	Screenline 2 - SB	Calibration	864	907	5%	**1.430**
5	Screenline 3 - NB	Calibration	1,086	1,127	4%	**1.238**
6	Screenline 3 - SB	Calibration	1,200	1,198	0%	**0.047**
7	Screenline 4 - NB	Calibration	788	764	-3%	**0.854**
8	Screenline 4 - SB	Calibration	814	781	-4%	**1.177**
9	Screenline 5 - EB	Calibration	367	368	0%	**0.044**
10	Screenline 5 - WB	Calibration	398	400	0%	**0.092**
11	Screenline 6 - EB	Calibration	1,353	1,289	-5%	**1.768**
12	Screenline 6 - WB	Calibration	1,391	1,381	-1%	**0.278**
13	Screenline 7 - EB	Calibration	609	627	3%	**0.742**
14	Screenline 7 - WB	Calibration	610	612	0%	**0.075**
15	Screenline 8 - NB	Calibration	1,257	1,291	3%	**0.951**
16	Screenline 8 - SB	Calibration	1,304	1,305	0%	**0.021**
19	Screenline 9 - NB	Validation	2,024	1,912	**-6%**	**2.532**
20	Screenline 9 - SB	Validation	1,982	2,064	4%	**1.827**
21	Screenline 10 - NB	Validation	1,365	1,285	**-6%**	**2.209**
22	Screenline 10 - SB	Validation	1,385	1,228	**-11%**	**4.340**

Table 10.11: Post ME screenline validation and calibration results - PM Peak

Screenline			Observed	Modelled	Difference	GEH
ID	Name	Type				
1	Screenline 1 - NB	Calibration	1,294	1,324	2%	0.842
2	Screenline 1 - SB	Calibration	1,450	1,368	-6%	2.187
3	Screenline 2 - NB	Calibration	1,088	1,092	0%	0.122
4	Screenline 2 - SB	Calibration	1,212	1,256	4%	1.245
5	Screenline 3 - NB	Calibration	1,031	999	-3%	0.994
6	Screenline 3 - SB	Calibration	1,257	1,229	-2%	0.798
7	Screenline 4 - NB	Calibration	764	749	-2%	0.547
8	Screenline 4 - SB	Calibration	1,136	1,102	-3%	1.020
9	Screenline 5 - EB	Calibration	404	399	-1%	0.250
10	Screenline 5 - WB	Calibration	650	623	-4%	1.057
11	Screenline 6 - EB	Calibration	1,470	1,332	-9%	3.697
12	Screenline 6 - WB	Calibration	1,783	1,755	-2%	0.669
13	Screenline 7 - EB	Calibration	938	951	1%	0.414
14	Screenline 7 - WB	Calibration	690	673	-3%	0.669
15	Screenline 8 - NB	Calibration	1,443	1,480	3%	0.971
16	Screenline 8 - SB	Calibration	1,624	1,699	5%	1.846
19	Screenline 9 - NB	Validation	2,218	2,185	-1%	0.703
20	Screenline 9 - SB	Validation	2,724	2,600	-5%	2.403
21	Screenline 10 - NB	Validation	1,753	1,570	-10%	4.501
22	Screenline 10 - SB	Validation	1,713	1,477	-14%	5.909

10.3.10 In the AM peak, all screenlines are shown to perform well with a GEH below 4.

10.3.11 The interpeak performs similarly with all the calibration screenlines achieving a GEH of less than 4. Screenline 10 southbound does not meet these criteria is close with a GEH value of 4.340.

10.3.12 The PM peak again has all the calibration screenlines meeting the criteria whilst validation screenline 10 is slightly over with a GEH of 4.501 in the northbound direction. In the southbound direction, screenline 10 has a higher GEH of 5.909. This is due to ATC 10 (A146 Beccles Road) showing a high GEH in the south-west bound direction. The other two ATCs (ATC 5 on A1145 Castleton and A12 London Road) show the modelled flow closely matches the observed flow with GEH of 0.3 and 2.2 respectively.

10.3.13 Overall the screenline results echo the results of the link flows in indicating that the model represents and accurately reflects the observed data and indicates that the key movements around the model are accurate.

IMPACT OF MATRIX ESTIMATION

10.3.14 It is important to look at the different in the trip length distribution between the adjusted prior matrix assignment and post ME matrix assignment.

10.3.15 Figure 10.1, Figure 10.2 and Figure 10.3 show the trip length distributions for each peak hour model graphically comparing the adjusted prior assignment to the post matrix estimation assignment. The graphs show matrix estimation does not fundamentally alter the trip length distribution between the two assignments.

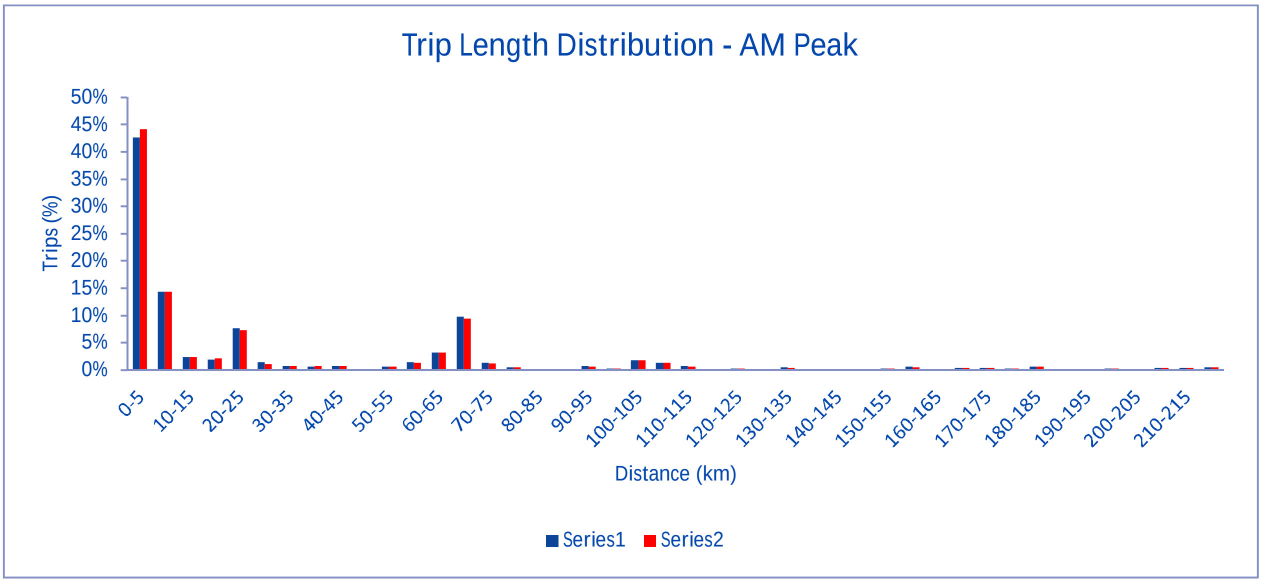


Figure 10.1: AM peak trip length distribution

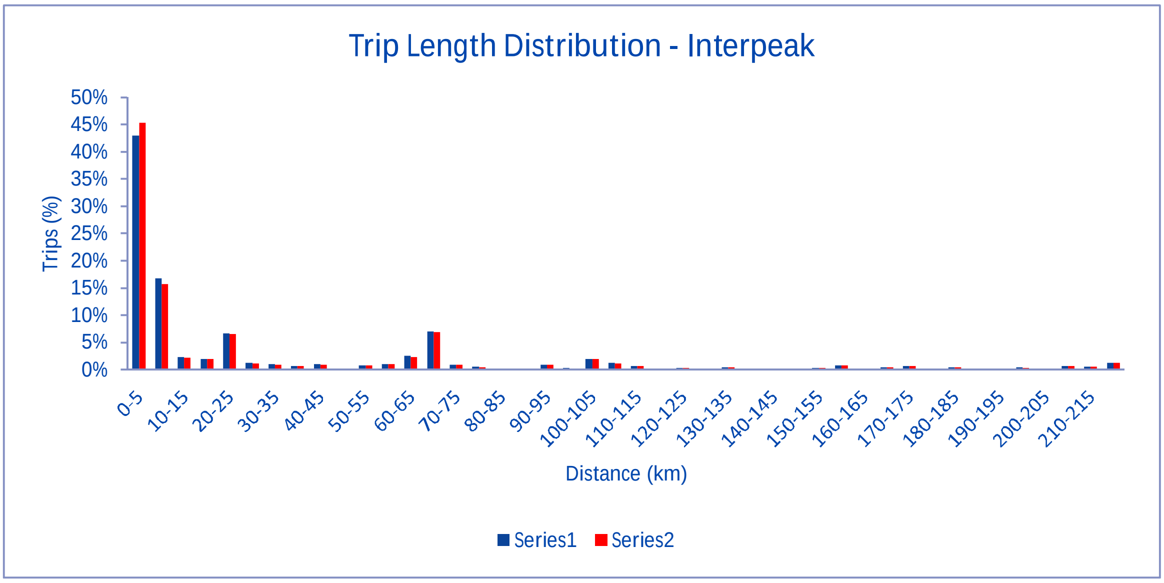


Figure 10.2: Inter peak trip length distribution

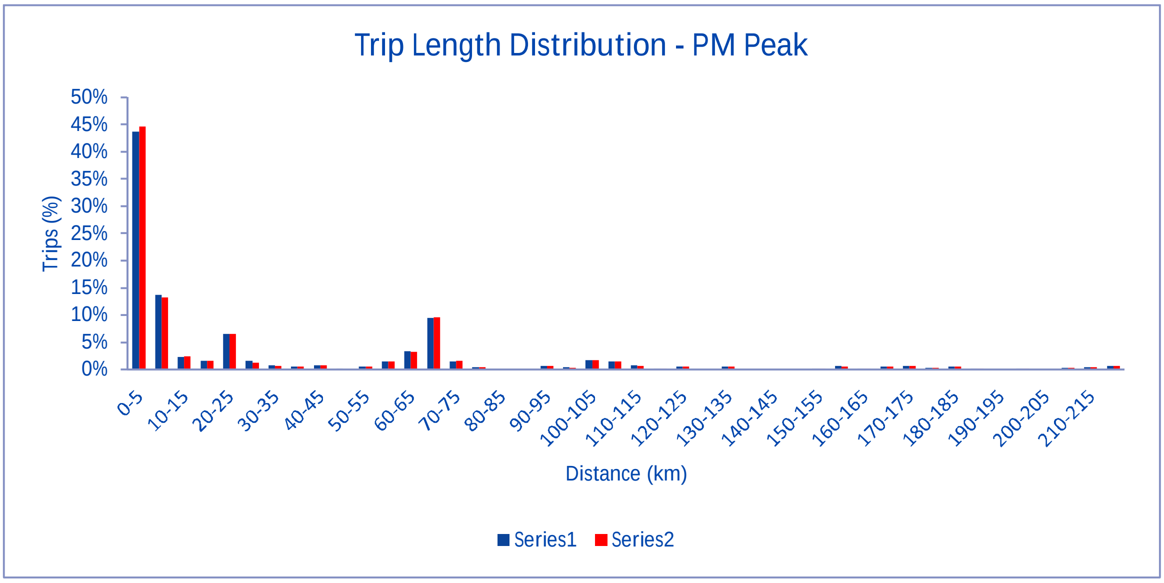


Figure 10.3: PM peak trip length distribution

Table 10.12: Regression statistics AM Peak

Measurement		Requirement	Value	Pass?
Cells	Slope	Within 0.98 and 1.02	0.965	No
	Intercept	Near 0	0.035	Yes
	R-Sq	> 0.95	0.8341	No
Rows	Slope	Within 0.99 and 1.01	1.007	Yes
	Intercept	Near 0	0.019	Yes
	R-Sq	> 0.98	0.9752	No
Columns	Slope	Within 0.99 and 1.01	0.938	No
	Intercept	Near 0	7.221	No
	R-Sq	> 0.98	0.9569	No
Mean	Prior	Within 5%	32.033	Yes
	Post		30.914	
	Diff		3.5%	
SD	Prior	Within 5%	54.763	Yes
	Post		54.353	
	Diff		0.7%	

Table 10.13: Regression statistics Inter Peak

Measurement		Requirement	Value	Pass?
Cells	Slope	Within 0.98 and 1.02	0.944	No
	Intercept	Near 0	0.034	Yes
	R-Sq	> 0.95	0.9304	No
Rows	Slope	Within 0.99 and 1.01	0.96	No
	Intercept	Near 0	2.876	No
	R-Sq	> 0.98	0.99	Yes
Columns	Slope	Within 0.99 and 1.01	0.959	No
	Intercept	Near 0	2.942	No
	R-Sq	> 0.98	0.9854	Yes
Mean	Prior	Within 5%	33.083	Yes
	Post		31.943	
	Diff		3.4%	
SD	Prior	Within 5%	57.523	Yes
	Post		54.353	
	Diff		0.7%	

Table 10.14: Regression statistics PM Peak

Measurement		Requirement	Value	Pass?
Cells	Slope	Within 0.98 and 1.02	0.989	Yes
	Intercept	Near 0	0.02	Yes
	R-Sq	> 0.95	0.8325	No
Rows	Slope	Within 0.99 and 1.01	0.959	No
	Intercept	Near 0	5.983	No
	R-Sq	> 0.98	0.9782	No
Columns	Slope	Within 0.99 and 1.01	1.036	No
	Intercept	Near 0	-2.913	No
	R-Sq	> 0.98	0.975	No
Mean	Prior	Within 5%	32.999	Yes
	Post		32.688	
	Diff		0.9%	
SD	Prior	Within 5%	52.491	Yes
	Post		52.143	
	Diff		0.7%	

10.3.16 The regression statistics show that for all three time periods both the mean and standard deviation are both within the criteria of 5%.

10.3.17 The sector to sector movements were analysed to ensure the matrix estimation process did not distort the matrix.

10.3.18 Table 10.15 shows the percentage difference in sector to sector movements for the AM peak.

Table 10.15: Sector to sector movement results - AM Peak

	1	2	3	4	5	TOTAL
1	0%	-13%	0%	0%	-4%	**-2%**
2	0%	-10%	-8%	-9%	11%	**-3%**
3	0%	-6%	0%	9%	-7%	**2%**
4	-6%	-4%	-7%	4%	-11%	**-2%**
5	2%	2%	-18%	8%	8%	**5%**
Total	**-2%**	**-3%**	**-9%**	**4%**	**1%**	**1%**

10.3.19 The interpeak results can be seen in Table 10.16.

Table 10.16: Sector to sector movement results - Inter Peak

	1	2	3	4	5	TOTAL
1	0%	-6%	0%	2%	-13%	**-3%**
2	0%	-5%	-5%	-6%	-3%	**-5%**
3	-3%	-7%	0%	3%	-10%	**-2%**
4	-6%	-9%	-2%	1%	-5%	**-2%**
5	-6%	-3%	-12%	5%	3%	**2%**
Total	**-5%**	**-6%**	**-4%**	**2%**	**-2%**	**-1%**

10.3.20 The results for the PM peak can be seen in Table 10.17.

Table 10.17: Sector to sector movement results - PM Peak

	1	2	3	4	5	TOTAL
1	0%	-8%	0%	-1%	-15%	**-5%**
2	10%	2%	4%	-12%	-2%	**-5%**
3	0%	-9%	0%	9%	-18%	**-3%**
4	7%	-2%	6%	5%	-2%	**2%**
5	7%	7%	6%	0%	3%	**3%**
Total	**6%**	**-1%**	**5%**	**3%**	**-2%**	**1%**

11 ASSIGNMENT CALIBRATION AND VALIDATION

11.1 MODEL CONVERGENCE

11.1.1 The model convergence criterion has been set out in Section 3.2.

11.1.2 Table 11.1, table 11.2 and table 11.3 show the convergence statistics for the AM peak, interpeak and PM peak respectively. The results show that all the models converge within the guidance that was set out in Table 3.4.

Table 11.1 - AM peak convergence results

ITERATION	DELTA	%FLOW	%GAP
11	0.0006	95.4	0.00045
12	0.0002	96.8	0.00026
13	0.0001	98.4	0.00023
14	0.0001	99	0.00013
15	0.0002	99.6	0.00009
16	0.0001	99.5	0.00006

Table 11.2 - Inter peak convergence results

ITERATION	DELTA	%FLOW	%GAP
9	0.0136	95.3	0.01
10	0.0071	97.3	0.012
11	0.0083	98.4	0.0064
12	0.0046	99.2	0.008
13	0.0062	99.1	0.0043
14	0.0033	99.4	0.0058

Table 11.3 - PM peak convergence results

ITERATION	DELTA	%FLOW	%GAP
26	0.0016	99.5	0.0042
27	0.0044	97.2	0.0017
28	0.0011	98.3	0.0018
29	0.0015	99.1	0.0027
30	0.0017	99.8	0.00089
31	0.0009	98.5	0.0013

11.2 ASSIGNMENT CALIBRATION

11.2.1 Assignment calibration involved steps to identify any issues that prevented an acceptable level of calibration of the network, route choice and trip matrix. This will included:

- Checking appropriateness of centroid connectors
- Production of forests to understand nature of competing routes between OD pairs
- Checking representation of queues on surveyed journey time routes

11.3 ASSIGNMENT VALIDATION

11.3.1 Link flow validation and calibration results for the final post-matrix estimation show an improved situation compared to the scaled matrix.

OVERALL MODEL PERFORMANCE

11.3.2 The calibration and validation results for all user classes in the AM peak are shown in table 11.4. The results for the car as an individual user class are shown in table 11.5.

Table 11.4 - AM Peak hour all user classes calibration and validation results

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
Flow Criteria								
< 700 vph	±100 vph	> 85 % of links	43	43	**100%**	38	32	**84%**
700 - 2,700 vph	±15%	> 85 % of links	3	3	**100%**	5	5	**100%**
> 2,700 vph	±400 vph	> 85 % of links	0	0	**0%**	0	0	**0%**
GEH Criteria								
GEH Statistic for individual links < 5		> 85 % of links	46	46	**100%**	43	36	**84%**

11.3.3 The AM peak results show that 100% of the calibration links and 84% of the validation links pass the criteria set out in WebTAG to achieve GEH values with a value of less than 5. The car only results show a very similar pattern.

Table 11.5 - AM Peak hour car only calibration and validation results

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
Flow Criteria								
< 700 vph	±100 vph	> 85 % of links	44	44	**100%**	43	38	**88%**
700 - 2,700 vph	±15%	> 85 % of links	2	2	**100%**	0	0	**0%**
> 2,700 vph	±400 vph	> 85 % of links	0	0	**0%**	0	0	**0%**
GEH Criteria								
GEH Statistic for individual links < 5		> 85 % of links	46	46	**100%**	43	36	**84%**

11.3.4 The interpeak results for all user classes can be seen in Table 11.6 whilst car only is seen in Table 11.7.

Table 11.6 - Inter Peak hour all user classes calibration and validation results

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
Flow Criteria								
< 700 vph	±100 vph	> 85 % of links	44	44	100%	39	34	87%
700 - 2,700 vph	±15%	> 85 % of links	2	2	100%	4	4	100%
> 2,700 vph	±400 vph	> 85 % of links	0	0	0%	0	0	0%
GEH Criteria								
GEH Statistic for individual links < 5		> 85 % of links	46	46	100%	43	38	88%

11.3.5 The Interpeak results show that both the calibration and validation counts have at least 85% of links with a GEH value of less than 5. However, for cars the validation percentage is at 79% of links with a GEH below 5. This is not considered an issue as in terms of flow validation the car user class is at 88% of links within 100 pcus of the observed count.

Table 11.7 - Inter Peak hour car only calibration and validation results

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
Flow Criteria								
< 700 vph	±100 vph	> 85 % of links	44	44	100%	42	37	88%
700 - 2,700 vph	±15%	> 85 % of links	2	2	100%	1	0	0%
> 2,700 vph	±400 vph	> 85 % of links	0	0	0%	0	0	0%
GEH Criteria								
GEH Statistic for individual links < 5		> 85 % of links	46	46	100%	43	34	79%

11.3.6 The PM results below show that all of the calibration links have a GEH of less than 5. The car only also shows a good level of calibration and can be seen in Table 11.9. In terms of validation, 77% of links have a GEH below 5 which is marginally outside of WebTAG criteria.

Table 11.8 - PM Peak hour all user classes calibration and validation results

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
Flow Criteria								
< 700 vph	±100 vph	> 85 % of links	38	38	**100%**	37	28	**76%**
700 - 2,700 vph	±15%	> 85 % of links	8	8	**100%**	6	5	**83%**
> 2,700 vph	±400 vph	> 85 % of links	0	0	**0%**	0	0	**0%**
GEH Criteria								
GEH Statistic for individual links < 5		> 85 % of links	46	46	**100%**	43	33	**77%**

Table 11.9 - PM peak hour car only calibration and validation results

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
Flow Criteria								
< 700 vph	±100 vph	> 85 % of links	44	44	**100%**	40	33	**83%**
700 - 2,700 vph	±15%	> 85 % of links	2	2	**100%**	3	3	**100%**
> 2,700 vph	±400 vph	> 85 % of links	0	0	**0%**	0	0	**0%**
GEH Criteria								
GEH Statistic for individual links < 5		> 85 % of links	46	44	**96%**	43	36	**84%**

11.3.7 The matrix estimation process has increased the calibration counts to 100% of links having a GEH value of less than 5 for all three peaks. Despite the percentage of validation counts with a GEH below 5 not reaching 85% across all three peaks, the model is considered to be matched well to the observed data as taking the calibration and validation counts combined, the percentage of links with a GEH is at 92% for the AM peak, 94% for the interpeak and 89% for the PM peak

11.3.8 Table 11.10, table 11.11 and table 11.12 show the GEH breakdown for AM peak, interpeak and PM peak respectively.

Table 11.10 - AM Peak GEH summary

GEH Range	Calibration		Validation		Combined	
GEH < 2	40	**87%**	19	**44%**	59	**66%**
GEH < 4	44	**96%**	34	**79%**	78	**88%**
GEH < 6	46	**100%**	37	**86%**	83	**93%**
GEH < 8	46	**100%**	41	**95%**	87	**98%**
GEH < 10	46	**100%**	41	**95%**	87	**98%**
GEH <5	46	**100%**	36	**84%**	82	**92%**

Table 11.11 - Inter Peak GEH summary

GEH Range	Calibration		Validation		Combined	
GEH < 2	42	**91%**	25	**58%**	67	**75%**
GEH < 4	46	**100%**	34	**79%**	80	**90%**
GEH < 6	46	**100%**	39	**91%**	85	**96%**
GEH < 8	46	**100%**	40	**93%**	86	**97%**
GEH < 10	46	**100%**	40	**93%**	86	**97%**
GEH <5	46	**100%**	38	**88%**	84	**94%**

Table 11.12 - PM Peak GEH summary

GEH Range	Calibration		Validation		Combined	
GEH < 2	36	**78%**	17	**40%**	53	**60%**
GEH < 4	44	**96%**	30	**70%**	74	**83%**
GEH < 6	46	**100%**	36	**84%**	82	**92%**
GEH < 8	46	**100%**	37	**86%**	83	**93%**
GEH < 10	46	**100%**	39	**91%**	85	**96%**
GEH <5	46	**100%**	33	**77%**	79	**89%**

11.3.9 The GEH summaries show that all three peaks have at least 85% of the combined counts have a GEH value of less than 5.These results show that the model is well validated and calibrated.

11.3.10 Appendix E contains all link counts used for validation and calibration. Plots are also provided showing the GEH performance of counts near the bridge crossings.

JOURNEY TIME PERFORMANCE

11.3.11 Appendix F contains journey time graphs across all three time periods.

11.3.12 The journey time routes which can be seen in Figure 5.7 also indicate that the model reflects the observed data.

11.3.13 A summary of the modelled journey times compared to the observed is given for the AM peak in table 11.13.

Table 11.13 - AM peak journey time route comparison

ID	NAME	OBSERVED (S)	MODELLED (S)	DIFF	%	PASS?
1	1 - Northbound	341	367	-26	-8%	Yes
2	1 - Southbound	367	338	29	8%	Yes
3	2 - Northbound	521	583	-62	-12%	Yes
4	2 - Southbound	599	538	61	10%	Yes
5	3 - Eastbound	290	308	-17	-6%	Yes
6	3 - Westbound	289	287	2	1%	Yes
7	4 - Northbound	216	183	33	15%	Yes
8	4 - Southbound	222	187	36	16%	Yes
9	5 - Northbound	637	648	-11	-2%	Yes
10	5 - Southbound	553	537	16	3%	Yes
11	6 - Eastbound	689	608	81	12%	Yes
12	6 - Westbound	598	541	57	10%	Yes
13	7 - Eastbound	449	419	30	7%	Yes
14	7 - Westbound	391	344	46	12%	Yes
15	8 - Eastbound	723	698	25	3%	Yes
16	8 - Westbound	712	725	-13	-2%	Yes
17	9 - Northbound	462	354	107	23%	No
18	9 - Southbound	390	332	57	15%	Yes

11.3.14 The results show that seventeen of the eighteen journey times pass the criteria set out in Table 3.3. Journey time route 9 in the northbound direction is marginally outside the required criteria. Along the majority of this route the modelled travel time matches well to the observed travel time, the section between the A146 Beccles Road / Cotmer Road signals and western Mutford Bridge is shown to be modelled faster compared to the observed data leading to the journey time route falling outside the 15% band.

11.3.15 Table 11.14 shows that sixteen of the eighteen journey times pass the criteria in the inter peak. Both routes outside the criteria are shown in the journey time graphs to generally match well between the modelled travel time and observed travel time for the majority of the route.

Table 11.14 - Inter peak journey time route comparison

ID	Name	Observed (s)	Modelled (s)	Diff	%	Pass?
1	1 - Northbound	345	341	3	1%	Yes
2	1 - Southbound	373	331	42	11%	Yes
3	2 - Northbound	549	506	42	8%	Yes
4	2 - Southbound	669	526	143	21%	No
5	3 - Eastbound	305	340	-35	-11%	Yes
6	3 - Westbound	369	317	52	14%	Yes
7	4 - Northbound	216	185	31	14%	Yes
8	4 - Southbound	210	188	23	11%	Yes
9	5 - Northbound	846	821	25	3%	Yes
10	5 - Southbound	600	540	60	10%	Yes
11	6 - Eastbound	705	718	-13	-2%	Yes
12	6 - Westbound	646	539	107	17%	No
13	7 - Eastbound	396	419	-24	-6%	Yes
14	7 - Westbound	394	351	43	11%	Yes
15	8 - Eastbound	721	707	15	2%	Yes
16	8 - Westbound	745	738	7	1%	Yes
17	9 - Northbound	430	377	52	12%	Yes
18	9 - Southbound	346	329	17	5%	Yes

11.3.16 The results of the PM peak journey times can be seen in Table 11.15. Journey time route 1 southbound is shown to be marginally outside the required criteria.

11.3.17 Journey time route 3 westbound is outside the criteria, however the modelled journey time along this route is relatively consistent along this route across all three peaks, however there are notable differences in the observed journey time along this route. The section of the route between Peto Way and the western Mutford Bridge is shown to be modelled faster in the model compared to the observed data.

11.3.18 Journey time route 9 shows a notable increase the observed journey time in the PM peak, whereas the modelled journey time remains relatively consistent between the three peaks. The PM peak model does capture some of the delay along this route, with this route slowest in the PM peak model. The section of the route on the A12 Bloodmoor Road between the A12 Tower Road and A12 Tom Crisp Way shows a delay in the observed data which is not fully replicated in the model.

Table 11.15 - PM peak journey time route comparison

ID	Name	Observed (s)	Modelled (s)	Diff	%	Pass?
1	1 - Northbound	335	353	-18	-5%	Yes
2	1 - Southbound	449	354	95	21%	No
3	2 - Northbound	525	511	14	3%	Yes
4	2 - Southbound	592	537	55	9%	Yes
5	3 - Eastbound	287	294	-7	-3%	Yes
6	3 - Westbound	440	274	165	38%	No
7	4 - Northbound	202	188	14	7%	Yes
8	4 - Southbound	193	191	3	1%	Yes
9	5 - Northbound	910	772	138	15%	Yes
10	5 - Southbound	508	549	-40	-8%	Yes
11	6 - Eastbound	710	674	36	5%	Yes
12	6 - Westbound	597	618	-21	-4%	Yes
13	7 - Eastbound	392	421	-29	-7%	Yes
14	7 - Westbound	376	349	28	7%	Yes
15	8 - Eastbound	861	730	131	15%	Yes
16	8 - Westbound	825	824	1	0%	Yes
17	9 - Northbound	623	417	206	33%	No
18	9 - Southbound	312	351	-39	-13%	Yes

11.3.19 The journey times show that the link speeds and delays are accurately modelled on the key routes for all three time periods.

MANUAL CLASSIFIED COUNTS

11.3.20 Table 11.16 to table 11.18 show the performance of the manual classified counts across all three peaks. Overall, the model matches well to the observed turning movements in terms of GEH for individual turns.

Table 11.16 - AM peak manual classified count performance

ID	Description	GEH < 5	GEH < 7.5	GEH < 10
1	London Road/Arbor Lane/A12/Tower Road	76%	80%	88%
2	Tom Crisp Way/Stadbroke Road/Elm Tree Road	69%	94%	97%
3	Somerleyton Road/Oulton Street/Hall Lane/Gorleston Road	81%	88%	88%
4	Yarmouth Road/Gorleston Road	67%	78%	100%
5	Yarmouth Road/Leisure Way/Foxburrow Hill/Bentley Drive	88%	94%	94%
6	Yarmouth Road/Corton Road	56%	78%	89%
7	Millennium Way/Oulton Road/Peto Way	63%	81%	88%
8	Horn Hill/Maconochie Way/A12/Waveney Drive	88%	94%	100%
9	A12/Corton Long Lane/A12/Lowestoft Link Road	56%	75%	88%
10	A12 Waveney Road/Station Square	100%	100%	100%
11	Commercial Road/Station Square	78%	100%	100%
12	A12 Pier Terrace/London Road South/Belvedere Road	89%	89%	89%
13	A12 Belvedere Road/Kirkley Rise	36%	48%	52%
14	Denmark Road/Katwijk Way	67%	89%	89%
15	Katwijk Way/Raglan Street	56%	81%	81%
16	A12 Waveney Road/Suffolk Road	67%	78%	100%
17	A12 Tom Crisp Way/Blackheath Road	88%	100%	100%
18	Saltwater Way/Victoria Road	100%	100%	100%
19	Normanston Drive/Gorleston Road	67%	89%	100%
20	Fir Lane/A117 Normanston Drive/Peto Way	80%	100%	100%
21	A12/Gordon Road/Whapload Road	50%	69%	88%
22	A12/St Peters Street	56%	72%	92%

ID	DESCRIPTION	GEH < 5	GEH < 7.5	GEH < 10
23	A1144/Katwijk Way	22%	44%	78%
24	A146 Beccles Road/Cotmer Road	100%	100%	100%

11.3.21 As detailed in section 5, interpeak turning movements were not carried out at junctions 10 to 24.

Table 11.17 - Interpeak manual classified count performance

ID	DESCRIPTION	GEH < 5	GEH < 7.5	GEH < 10
1	London Road/Arbor Lane/A12/Tower Road	76%	84%	92%
2	Tom Crisp Way/Stadbroke Road/Elm Tree Road	61%	97%	97%
3	Somerleyton Road/Oulton Street/Hall Lane/Gorleston Road	88%	94%	100%
4	Yarmouth Road/Gorleston Road	89%	100%	100%
5	Yarmouth Road/Leisure Way/Foxburrow Hill/Bentley Drive	81%	100%	100%
6	Yarmouth Road/Corton Road	67%	89%	100%
7	Millennium Way/Oulton Road/Peto Way	63%	81%	100%
8	Horn Hill/Maconochie Way/A12/Waveney Drive	81%	94%	100%
9	A12/Corton Long Lane/A12/Lowestoft Link Road	63%	69%	100%

Table 11.18 - PM peak manual classified count performance

ID	Description	GEH < 5	GEH < 7.5	GEH < 10
1	London Road/Arbor Lane/A12/Tower Road	76%	88%	92%
2	Tom Crisp Way/Stadbroke Road/Elm Tree Road	64%	78%	97%
3	Somerleyton Road/Oulton Street/Hall Lane/Gorleston Road	69%	75%	88%
4	Yarmouth Road/Gorleston Road	78%	78%	89%
5	Yarmouth Road/Leisure Way/Foxburrow Hill/Bentley Drive	75%	94%	100%
6	Yarmouth Road/Corton Road	56%	78%	89%
7	Millennium Way/Oulton Road/Peto Way	31%	56%	88%
8	Horn Hill/Maconochie Way/A12/Waveney Drive	81%	81%	94%
9	A12/Corton Long Lane/A12/Lowestoft Link Road	63%	69%	81%
10	A12 Waveney Road/Station Square	67%	89%	100%
11	Commercial Road/Station Square	67%	89%	100%
12	A12 Pier Terrace/London Road South/Belvedere Road	78%	89%	89%
13	A12 Belvedere Road/Kirkley Rise	40%	48%	56%
14	Denmark Road/Katwijk Way	78%	78%	89%
15	Katwijk Way/Raglan Street	69%	81%	100%
16	A12 Waveney Road/Suffolk Road	78%	78%	100%
17	A12 Tom Crisp Way/Blackheath Road	69%	94%	100%
18	Saltwater Way/Victoria Road	33%	78%	89%
19	Normanston Drive/Gorleston Road	56%	78%	89%
20	Fir Lane/A117 Normanston Drive/Peto Way	60%	80%	92%
21	A12/Gordon Road/Whapload Road	50%	69%	88%
22	A12/St Peters Street	64%	88%	88%
23	A1144/Katwijk Way	56%	67%	89%
24	A146 Beccles Road/Cotmer Road	78%	78%	89%

11.4 MODELLED FLOW AND JUNCTION DELAY

11.4.1 Appendix G contains plots of the link flow and junction performance in the vicinity of the river crossings

12 SUMMARY OF MODEL DEVELOPMENT, STANDARDS ACHIEVED AND FITNESS FOR PURPOSE

12.1 SUMMARY OF MODEL DEVELOPMENT

12.1.1 The previous 2001 Lowestoft Traffic Model was rebuilt with a comprehensive check of the model network and a revised zone system of sufficient detail based on 2011 census geography.

12.1.2 An observed prior matrix was derived from ANPR data which formed a cordon around the main study area and major internal locations. A gravity model was then used to form a synthetic matrix based on NTEM version 6.2 trip ends and 2011 census data. The synthetic matrix was used to infill the prior matrix for traffic movements not represented in the ANPR matrix.

12.1.3 Adjustments were made to the prior matrix using scaling of calibration counts to match the modelled flow to the observed flow. Matrix estimation was then carried out to produce a final assignment.

12.2 SUMMARY OF STANDARDS ACHIEVED

12.2.1 The base year model validation has been developed closely following TAG M3.1 'Highway Assignment Modelling' guidance (January 2014).

12.2.2 The model is shown to satisfactorily converge across all three peaks which is important as the model will be taken forward for testing of a major scheme business case. In these instances it is required that models are converged so that the benefits of the scheme are the result of the infrastructure improvements and not changes to model convergence.

12.2.3 Screenlines within the model which capture the key strategic movements within the model have been shown to closely match the observed flows to the modelled flows. Across all three peaks, all calibration screenlines are shown to achieve a GEH below 4, with the majority of validation screenlines also achieving this standard.

12.2.4 Link validation is show to be consistently high in terms of both flow and GEH across all three peaks. Combining the observed counts within calibration and validation, 92% of counts in the AM peak, 94% of counts in the interpeak and 89% of counts in the PM peak achieve a GEH of 5 or lower above the minimum threshold of 85%.

12.2.5 Journey time performance reaches the required standard of 85% of modelled journey time routes being within 15% of the observed journey time data in the AM peak and interpeak. In the AM peak, 94% of journey time routes achieve this standard, whilst 89% achieve this in the inter-peak. In the PM peak, journey time performance is marginally below the required standard at 83%, however this is not deemed a significant concern.

12.2.6 Manual classified turning counts were carried out a major junctions across the network, with the model shown to align well with the observed movements at these junctions.

12.3 ASSESSMENT OF FITNESS FOR PURPOSE

12.3.1 The latest 2015 Lowestoft Transport Model is deemed fit for purpose in terms of its ability to replicate existing strategic traffic movements within the Area of Detailed Modelling (ADM). The base year model forms a suitable basis from which forecast year models can be built to create reference case, do minimum and do something scheme testing.

12.3.2 The model provides a suitable evidence base to underpin a major scheme business case and determine the benefits of a third crossing in Lowestoft.

Appendix A

MCC TOTALS USED TO FACTOR ANPR DATA

Table A-1 – AM peak MCC totals used for doubly constrained furness of ANPR matrix

	Site Description	Dir	Car		LGV		HGV	
			Origin	Dest	Origin	Dest	Origin	Dest
1	A12 London Road	Inbound	608	0	117	0	30	0
		Outbound	0	430	0	150	0	44
2	A146 Beccles Road	Inbound	587	0	85	0	45	0
		Outbound	0	625	0	125	0	56
3	A12 Yarmouth Road	Inbound	746	0	142	0	44	0
		Outbound	0	1178	0	135	0	40
4	Coast Road	Inbound	61	0	7	0	2	0
		Outbound	0	54	0	4	0	3
5	A12 Pier Terrace (Eastern Bascule bridge)	NB	326	998	44	120	18	25
		SB	369	322	113	56	28	10
6	A146 Bridge Road (Western Mutford bridge)	NB	545	235	90	49	17	8
		SB	442	274	105	47	18	18
7	B1375 Gorleston Road	NB	334	234	45	31	3	6
		SB	276	81	65	7	10	1
8	A1117 Millennium Way	NB	218	110	27	13	8	8
		SB	234	189	29	16	13	2
9	A12 Yarmouth Road	NB	302	204	43	24	23	7
		SB	347	234	77	15	21	0
10	A12 Tom Crisp Way	NB	525	192	64	23	12	6
		SB	199	100	59	19	17	11
11	B1532 London Road South	NB	233	205	29	27	9	6
		SB	199	110	47	18	10	4
12	B1074 Blundeston Road	Inbound	164	0	40	0	4	0
		Outbound	0	99	0	15	0	1
13	Flixton Road	Inbound	78	0	11	0	2	0
		Outbound	0	49	0	9	0	3
14	B1531 Waveney Drive	EB	258	85	28	7	9	0
		WB	40	96	9	11	3	2
15	North Quay Retail Park	Entry	36	107	6	9	0	0
		Exit	0	71	0	0	0	0
16	Links Road Car Park	Entry	3	0	0	0	0	0
		Exit	1	3	0	0	0	0
17	Swimming Pool Road Car Park	Entry	0	1	0	0	0	0
		Exit	0	0	0	0	0	0
18	Shopping Centre Car Park (Battery Green Rd exit)	Entry	0	0	0	0	0	0
		Exit	0	0	1	0	0	0
19	Shopping Centre Car Park (Gordon Road entry)	Entry	0	32	0	0	0	0
		Exit	0	0	0	0	0	0
20	Surrey St Car Park entry	Entry	8	14	0	0	0	0
		Exit	0	0	0	0	0	0
21	Surrey St Car Park exit (onto Clapham Road)	Entry	0	0	0	0	0	0
		Exit	0	3	0	0	0	0
22	Clapham Road Car Park	Entry	3	24	0	0	0	0
		Exit	3	6	0	0	0	0
23	St Johns Rd Car Park	Entry	0	0	0	0	0	0
		Exit	0	2	0	0	0	0
24	Kirkley Rise Car Park (Northern access)	Entry	4	21	0	0	0	0
		Exit	0	9	0	0	0	0
25	Kirkley Rise Car Park (Southern access)	Entry	2	3	0	0	0	0
		Exit	0	0	0	0	0	0
26	Kirkley Cliff Road Car Park	Entry	0	0	0	0	0	0
		Exit	0	0	0	0	0	0
27	Claremont Road Car Park	Entry	0	0	0	0	0	0
		Exit	0	0	0	0	0	0
28	Marine Parade Car Park	Entry	0	5	0	0	0	0
		Exit	0	0	0	0	0	0
29	Asda Car Park	Entry	155	60	12	2	0	0
		Exit	23	132	13	0	0	0

Table A-2 – Inter peak MCC totals used for doubly constrained furness of ANPR matrix

	Site Description	Dir	Car		LGV		HGV	
			Origin	Dest	Origin	Dest	Origin	Dest
1	A12 London Road	Inbound	511	0	90	0	33	0
		Outbound	0	526	0	85	0	38
2	A146 Beccles Road	Inbound	457	0	93	0	38	0
		Outbound	0	467	0	86	0	39
3	A12 Yarmouth Road	Inbound	704	0	119	0	37	0
		Outbound	0	711	0	118	0	35
4	Coast Road	Inbound	52	0	5	0	2	0
		Outbound	0	58	0	7	0	3
5	A12 Pier Terrace (Eastern Bascule bridge)	NB	323	547	40	87	12	32
		SB	624	252	86	39	37	14
6	A146 Bridge Road (Western Mutford bridge)	NB	428	390	60	70	22	13
		SB	391	389	61	59	13	18
7	B1375 Gorleston Road	NB	163	207	29	33	1	15
		SB	292	106	52	10	13	1
8	A1117 Millennium Way	NB	220	161	30	15	6	8
		SB	217	120	35	11	11	3
9	A12 Yarmouth Road	NB	292	183	45	26	15	8
		SB	344	116	52	16	25	3
10	A12 Tom Crisp Way	NB	297	137	41	31	13	5
		SB	179	254	31	33	11	15
11	B1532 London Road South	NB	143	138	25	26	13	5
		SB	180	149	31	15	10	8
12	B1074 Blundeston Road	Inbound	90	0	20	0	3	0
		Outbound	0	80	0	18	0	3
13	Flixton Road	Inbound	57	0	9	0	1	0
		Outbound	0	41	0	7	0	1
14	B1531 Waveney Drive	EB	169	44	22	5	4	4
		WB	53	163	8	21	4	5
15	North Quay Retail Park	Entry	147	230	9	19	1	0
		Exit	0	373	0	0	0	0
16	Links Road Car Park	Entry	7	3	0	0	0	0
		Exit	4	5	0	1	0	0

	Site Description	Dir	Car		LGV		HGV	
			Origin	Dest	Origin	Dest	Origin	Dest
17	Swimming Pool Road Car Park	Entry	0	7	0	0	0	0
		Exit	5	0	0	0	0	0
18	Shopping Centre Car Park (Battery Green Rd exit)	Entry	0	0	0	0	0	0
		Exit	48	0	1	0	0	0
19	Shopping Centre Car Park (Gordon Road entry)	Entry	6	39	0	1	0	0
		Exit	0	0	0	0	0	0
20	Surrey St Car Park entry	Entry	34	26	1	0	0	0
		Exit	0	0	0	0	0	0
21	Surrey St Car Park exit (onto Clapham Road)	Entry	0	0	0	0	0	0
		Exit	33	33	1	1	0	0
22	Clapham Road Car Park	Entry	25	78	0	0	0	0
		Exit	82	24	0	3	0	0
23	St Johns Rd Car Park	Entry	0	4	2	0	0	0
		Exit	2	1	0	1	0	0
24	Kirkley Rise Car Park (Northern access)	Entry	6	4	0	0	0	0
		Exit	11	0	0	0	0	0
25	Kirkley Rise Car Park (Southern access)	Entry	2	1	0	0	0	0
		Exit	0	0	0	0	0	0
26	Kirkley Cliff Road Car Park	Entry	0	0	0	0	0	0
		Exit	0	0	0	0	0	0
27	Claremont Road Car Park	Entry	1	11	0	0	0	0
		Exit	6	5	2	0	0	0
28	Marine Parade Car Park	Entry	4	34	0	3	0	0
		Exit	29	7	0	0	0	1
29	Asda Car Park	Entry	265	72	15	1	1	1
		Exit	81	259	3	13	1	0

Table A-3 – PM peak MCC totals used for doubly constrained furness of ANPR matrix

	Site Description	Dir	Car		LGV		HGV	
			Origin	Dest	Origin	Dest	Origin	Dest
1	A12 London Road	Inbound	611	0	104	0	14	0
		Outbound	0	668	0	103	0	15
2	A146 Beccles Road	Inbound	871	0	136	0	19	0
		Outbound	0	673	0	53	0	17
3	A12 Yarmouth Road	Inbound	1388	0	173	0	18	0
		Outbound	0	909	0	91	0	19
4	Coast Road	Inbound	84	0	7	0	3	0
		Outbound	0	52	0	5	0	3
5	A12 Pier Terrace (Eastern Bascule bridge)	NB	358	608	32	78	5	23
		SB	1086	333	107	40	15	10
6	A146 Bridge Road (Western Mutford bridge)	NB	419	538	52	88	6	11
		SB	331	672	40	79	4	7
7	B1375 Gorleston Road	NB	115	277	17	49	1	3
		SB	455	188	65	35	6	1
8	A1117 Millennium Way	NB	247	221	12	25	2	5
		SB	227	247	34	30	4	1
9	A12 Yarmouth Road	NB	429	265	44	26	7	8
		SB	397	167	46	11	17	3
10	A12 Tom Crisp Way	NB	232	217	31	40	5	4
		SB	297	471	19	44	3	6
11	B1532 London Road South	NB	187	239	14	25	7	4
		SB	222	229	19	23	8	3
12	B1074 Blundeston Road	Inbound	167	0	32	0	1	0
		Outbound	0	111	0	15	0	0
13	Flixton Road	Inbound	59	0	13	0	1	0
		Outbound	0	61	0	6	0	0
14	B1531 Waveney Drive	EB	164	50	16	6	4	2
		WB	117	290	6	33	1	5
15	North Quay Retail Park	Entry	99	175	7	17	0	0
		Exit	0	309	0	0	0	0
16	Links Road Car Park	Entry	5	4	0	0	0	0
		Exit	0	8	0	0	0	0
17	Swimming Pool Road Car Park	Entry	0	5	0	0	0	0
		Exit	15	0	0	0	0	0
18	Shopping Centre Car Park (Battery Green Rd exit)	Entry	0	0	0	0	0	0
		Exit	25	0	1	0	0	0
19	Shopping Centre Car Park (Gordon Road entry)	Entry	0	1	0	0	0	0
		Exit	0	0	0	0	0	0
20	Surrey St Car Park entry	Entry	3	0	0	0	0	0
		Exit	0	0	0	0	0	0
21	Surrey St Car Park exit (onto Clapham Road)	Entry	0	0	0	0	0	0
		Exit	11	4	0	0	0	0
22	Clapham Road Car Park	Entry	7	15	0	0	0	0
		Exit	35	12	0	3	0	0
23	St Johns Rd Car Park	Entry	8	0	0	0	0	0
		Exit	3	1	0	0	0	0
24	Kirkley Rise Car Park (Northern access)	Entry	0	2	0	0	0	0
		Exit	10	0	0	0	0	0
25	Kirkley Rise Car Park (Southern access)	Entry	0	0	0	0	0	0
		Exit	1	1	0	0	0	0
26	Kirkley Cliff Road Car Park	Entry	0	0	0	0	0	0
		Exit	1	0	0	0	0	0
27	Claremont Road Car Park	Entry	5	10	0	2	0	0
		Exit	9	1	0	0	0	0
28	Marine Parade Car Park	Entry	1	16	0	0	0	0
		Exit	22	1	4	0	0	0
29	Asda Car Park	Entry	184	104	11	8	0	0
		Exit	61	254	6	15	0	0

Appendix B

GRAVITY MODEL TLD AND MATRIX CHANGES

AM peak gravity model

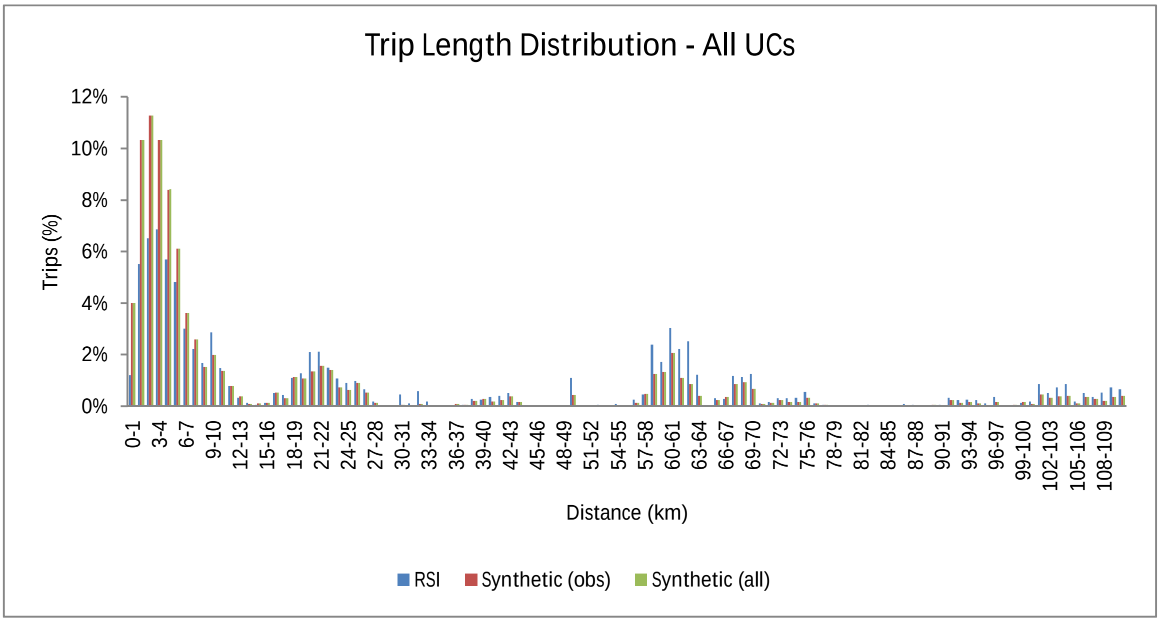


Figure B.1 – AM peak - Overall trip length distribution (UC1 to UC3)

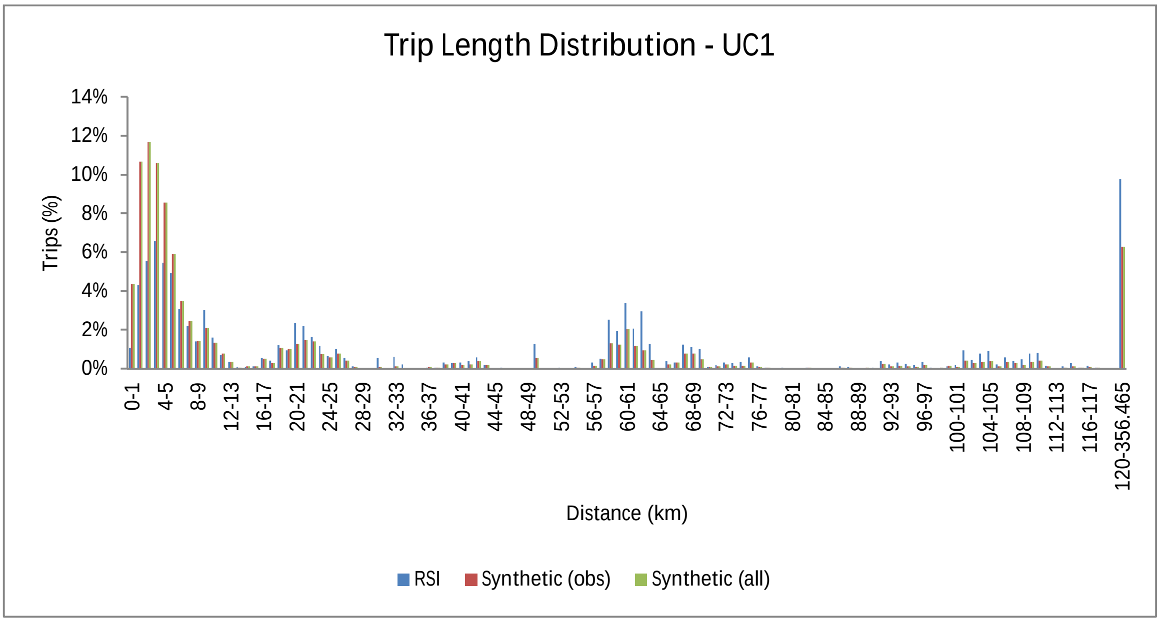


Figure B.2 – AM peak – UC1 trip length distribution

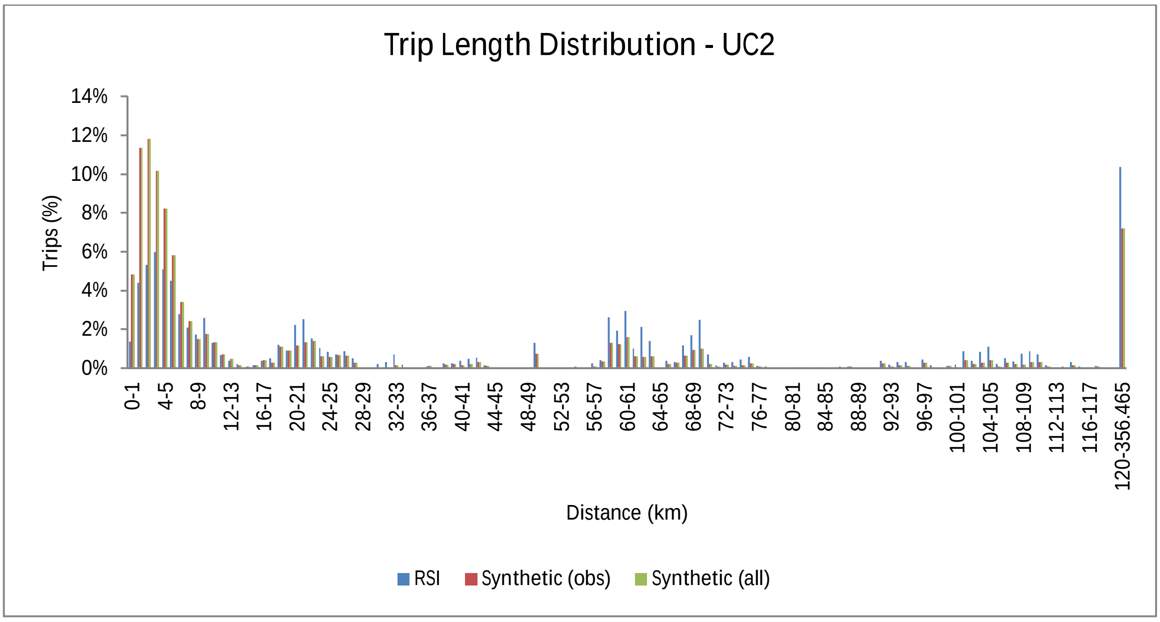


Figure B.3 – AM peak – UC2 trip length distribution

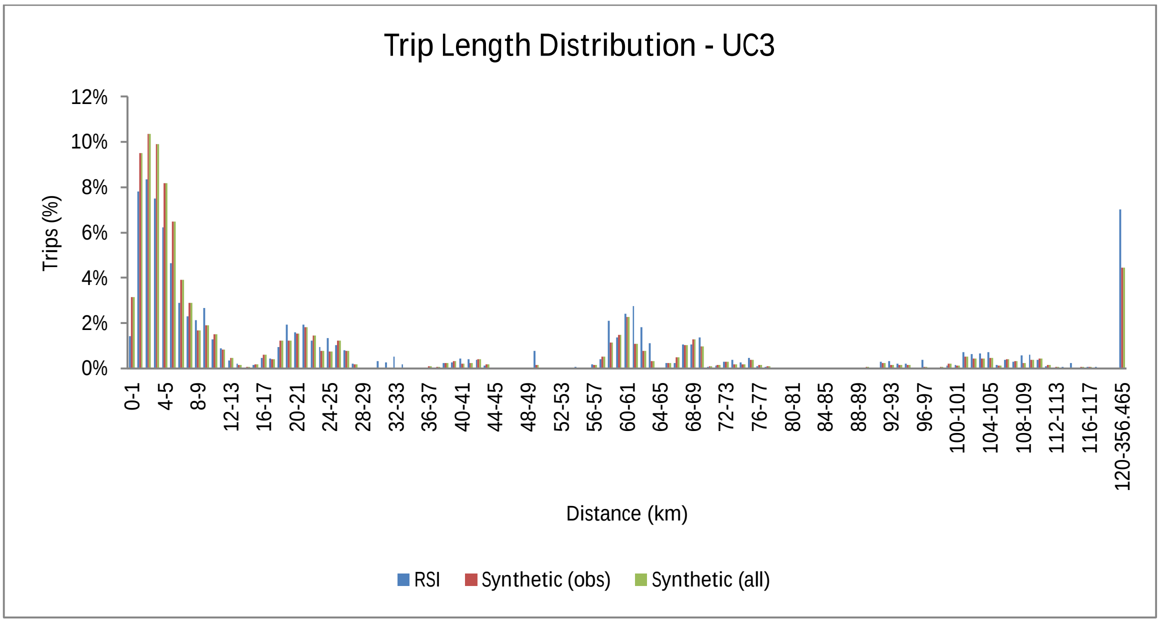


Figure B.4 – AM peak – UC3 trip length distribution

SATURN Gravity Model - Sectors - UC1

NB - Intra-zonals are removed

RSI Matrix - Total Trips

	1	2	3	4	5	Total
1	0	0	0	31	16	**47**
2	0	0	0	326	145	**471**
3	0	0	0	301	153	**454**
4	42	188	260	361	239	**1090**
5	35	172	236	622	400	**1465**
Total	**77**	**360**	**496**	**1641**	**953**	**3527**

RSI Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	0%	**1%**
2	0%	0%	0%	9%	4%	**13%**
3	0%	0%	0%	9%	4%	**13%**
4	1%	5%	7%	10%	7%	**31%**
5	1%	5%	7%	18%	11%	**42%**
Total	**2%**	**10%**	**14%**	**47%**	**27%**	**100%**

Synthetic (Observed) Matrix - Total Trips

	1	2	3	4	5	Total
1	2	13	16	17	10	**58**
2	28	69	101	243	154	**595**
3	27	77	43	273	148	**568**
4	32	202	317	1483	530	**2564**
5	36	226	307	957	1040	**2566**
Total	**125**	**587**	**784**	**2973**	**1882**	**6351**

Synthetic (Observed) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	0%	1%	2%	4%	2%	**9%**
3	0%	1%	1%	4%	2%	**9%**
4	1%	3%	5%	23%	8%	**40%**
5	1%	4%	5%	15%	16%	**40%**
Total	**2%**	**9%**	**12%**	**47%**	**30%**	**100%**

Synthetic (Full) Matrix - Total Trips

	1	2	3	4	5	Total
1	2	13	16	17	10	**58**
2	28	69	101	244	154	**596**
3	27	77	43	273	148	**568**
4	32	202	317	1484	530	**2565**
5	36	226	307	958	1040	**2567**
Total	**125**	**587**	**784**	**2976**	**1882**	**6354**

Synthetic (Full) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	0%	1%	2%	4%	2%	**9%**
3	0%	1%	1%	4%	2%	**9%**
4	1%	3%	5%	23%	8%	**40%**
5	1%	4%	5%	15%	16%	**40%**
Total	**2%**	**9%**	**12%**	**47%**	**30%**	**100%**

SATURN Gravity Model - Sectors - UC2

NB - Intra-zonals are removed

RSI Matrix - Total Trips

	1	2	3	4	5	Total
1	0	0	0	4	2	**6**
2	0	0	0	40	18	**58**
3	0	0	0	36	19	**55**
4	6	27	36	44	35	**148**
5	4	19	26	64	41	**154**
Total	**10**	**46**	**62**	**188**	**115**	**421**

RSI Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	0%	**1%**
2	0%	0%	0%	10%	4%	**14%**
3	0%	0%	0%	9%	5%	**13%**
4	1%	6%	9%	10%	8%	**35%**
5	1%	5%	6%	15%	10%	**37%**
Total	**2%**	**11%**	**15%**	**45%**	**27%**	**100%**

Synthetic (Observed) Matrix - Total Trips

	1	2	3	4	5	Total
1	0	2	2	2	1	**7**
2	4	11	16	26	17	**74**
3	4	12	7	29	17	**69**
4	3	22	36	184	66	**311**
5	3	23	32	102	116	**276**
Total	**14**	**70**	**93**	**343**	**217**	**737**

Synthetic (Observed) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	1%	1%	2%	4%	2%	**10%**
3	1%	2%	1%	4%	2%	**9%**
4	0%	3%	5%	25%	9%	**42%**
5	0%	3%	4%	14%	16%	**37%**
Total	**2%**	**9%**	**13%**	**47%**	**29%**	**100%**

Synthetic (Full) Matrix - Total Trips

	1	2	3	4	5	Total
1	0	2	2	2	1	**7**
2	4	11	16	26	17	**74**
3	4	12	7	29	17	**69**
4	3	22	36	185	66	**312**
5	3	23	32	102	116	**276**
Total	**14**	**70**	**93**	**344**	**217**	**738**

Synthetic (Full) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	1%	1%	2%	4%	2%	**10%**
3	1%	2%	1%	4%	2%	**9%**
4	0%	3%	5%	25%	9%	**42%**
5	0%	3%	4%	14%	16%	**37%**
Total	**2%**	**9%**	**13%**	**47%**	**29%**	**100%**

SATURN Gravity Model - Sectors - UC3

NB - Intra-zonals are removed

RSI Matrix - Total Trips

	1	2	3	4	5	Total
1	0	0	0	12	12	**24**
2	0	0	0	134	130	**264**
3	0	0	0	132	147	**279**
4	17	87	121	177	297	**699**
5	14	75	114	313	352	**868**
Total	**31**	**162**	**235**	**768**	**938**	**2134**

RSI Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	1%	**1%**
2	0%	0%	0%	6%	6%	**12%**
3	0%	0%	0%	6%	7%	**13%**
4	1%	4%	6%	8%	14%	**33%**
5	1%	4%	5%	15%	16%	**41%**
Total	**1%**	**8%**	**11%**	**36%**	**44%**	**100%**

Synthetic (Observed) Matrix - Total Trips

	1	2	3	4	5	Total
1	0	2	2	15	12	**31**
2	4	9	14	171	144	**342**
3	4	11	7	200	150	**372**
4	20	112	179	642	381	**1334**
5	18	102	145	412	552	**1229**
Total	**46**	**236**	**347**	**1440**	**1239**	**3308**

Synthetic (Observed) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	0%	0%	0%	5%	4%	**10%**
3	0%	0%	0%	6%	5%	**11%**
4	1%	3%	5%	19%	12%	**40%**
5	1%	3%	4%	12%	17%	**37%**
Total	**1%**	**7%**	**10%**	**44%**	**37%**	**100%**

Synthetic (Full) Matrix - Total Trips

	1	2	3	4	5	Total
1	0	2	2	15	12	**31**
2	4	9	14	171	144	**342**
3	4	11	7	200	150	**372**
4	20	112	179	642	382	**1335**
5	18	102	145	412	552	**1229**
Total	**46**	**236**	**347**	**1440**	**1240**	**3309**

Synthetic (Full) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	0%	0%	0%	5%	4%	**10%**
3	0%	0%	0%	6%	5%	**11%**
4	1%	3%	5%	19%	12%	**40%**
5	1%	3%	4%	12%	17%	**37%**
Total	**1%**	**7%**	**10%**	**44%**	**37%**	**100%**

Inter peak gravity model

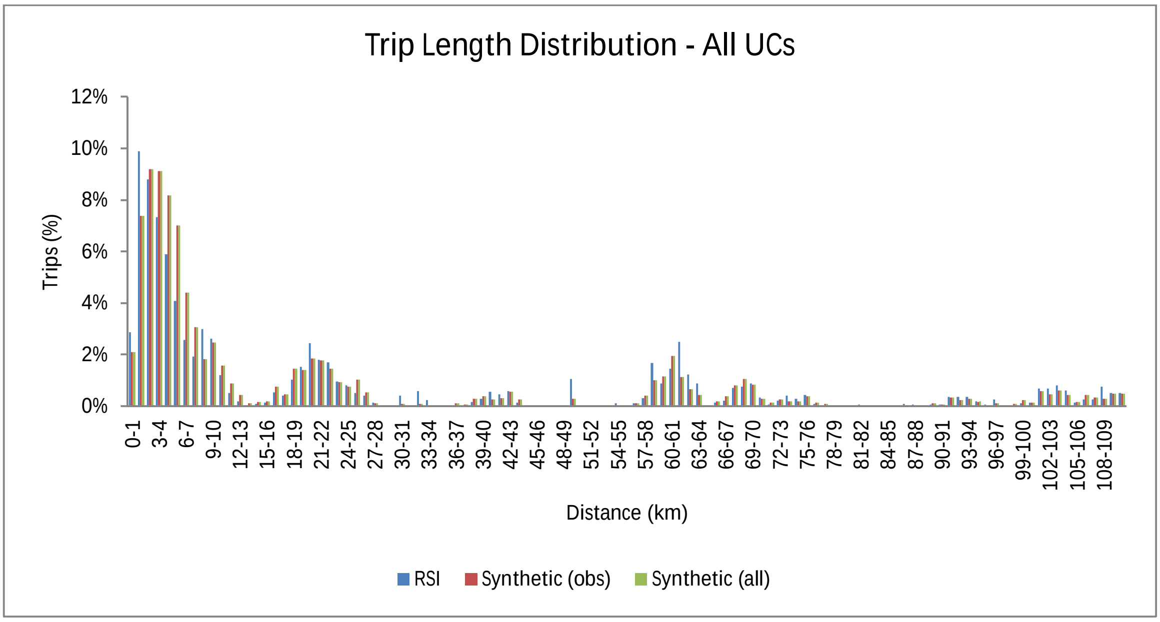


Figure B.5 – Interpeak - Overall trip length distribution (UC1 to UC3)

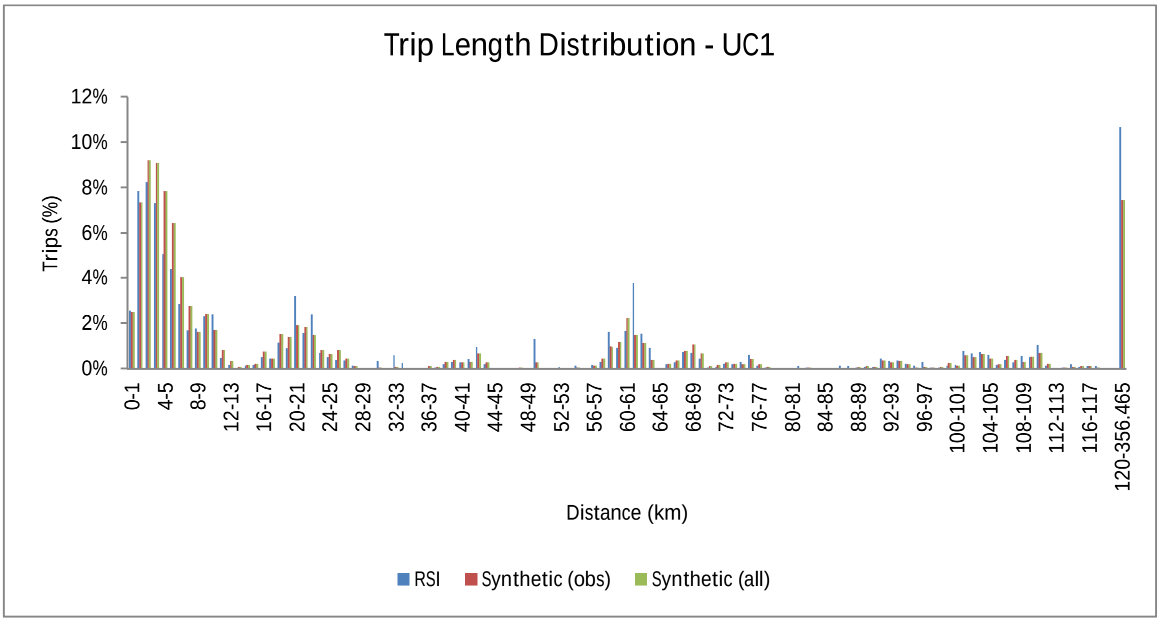


Figure B.6 – Interpeak – UC1 trip length distribution

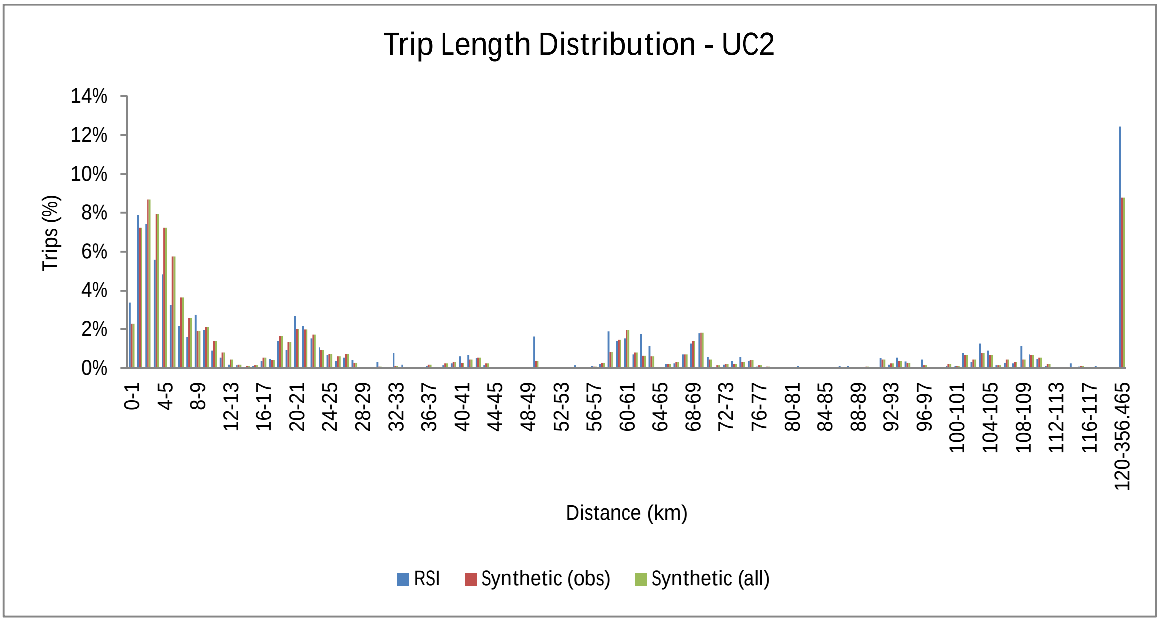


Figure B.7 – Interpeak – UC2 trip length distribution

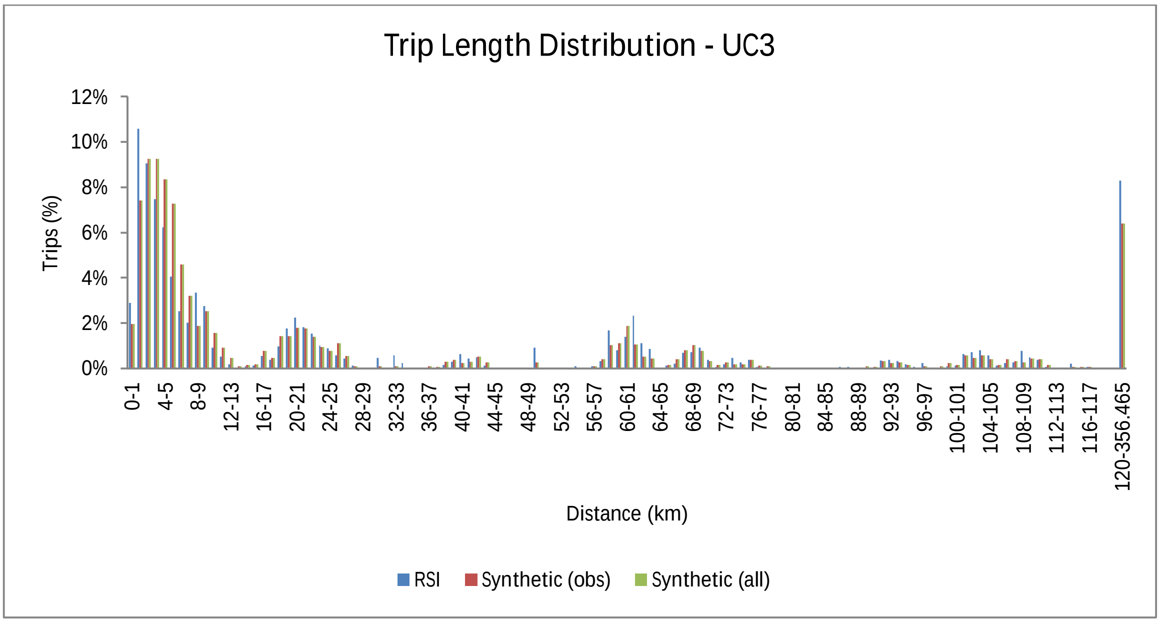


Figure B.8 – Interpeak – UC3 trip length distribution

SATURN Gravity Model - Sectors - UC1

NB - Intra-zonals are removed

RSI Matrix - Total Trips

	1	2	3	4	5	Total
1	0	0	0	18	7	**25**
2	0	0	0	117	39	**156**
3	0	0	0	126	37	**163**
4	12	68	50	228	79	**437**
5	12	59	38	224	126	**459**
Total	**24**	**127**	**88**	**713**	**288**	**1240**

RSI Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	1%	**2%**
2	0%	0%	0%	9%	3%	**13%**
3	0%	0%	0%	10%	3%	**13%**
4	1%	5%	4%	18%	6%	**35%**
5	1%	5%	3%	18%	10%	**37%**
Total	**2%**	**10%**	**7%**	**58%**	**23%**	**100%**

Synthetic (Observed) Matrix - Total Trips

	1	2	3	4	5	Total
1	0	3	2	17	10	**32**
2	3	10	9	108	67	**197**
3	3	12	5	116	68	**204**
4	18	99	76	327	172	**692**
5	18	100	72	281	235	**706**
Total	**42**	**224**	**164**	**849**	**552**	**1831**

Synthetic (Observed) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	1%	**2%**
2	0%	1%	0%	6%	4%	**11%**
3	0%	1%	0%	6%	4%	**11%**
4	1%	5%	4%	18%	9%	**38%**
5	1%	5%	4%	15%	13%	**39%**
Total	**2%**	**12%**	**9%**	**46%**	**30%**	**100%**

Synthetic (Full) Matrix - Total Trips

	1	2	3	4	5	Total
1	0	3	2	17	10	**32**
2	3	10	9	108	67	**197**
3	3	12	5	116	68	**204**
4	18	99	76	328	172	**693**
5	18	100	72	281	235	**706**
Total	**42**	**224**	**164**	**850**	**552**	**1832**

Synthetic (Full) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	1%	**2%**
2	0%	1%	0%	6%	4%	**11%**
3	0%	1%	0%	6%	4%	**11%**
4	1%	5%	4%	18%	9%	**38%**
5	1%	5%	4%	15%	13%	**39%**
Total	**2%**	**12%**	**9%**	**46%**	**30%**	**100%**

SATURN Gravity Model - Sectors - UC2

NB - Intra-zonals are removed

RSI Matrix - Total Trips

	1	2	3	4	5	Total
1	0	0	0	5	2	**7**
2	0	0	0	29	15	**44**
3	0	0	0	29	15	**44**
4	8	43	29	76	51	**207**
5	4	22	16	44	39	**125**
Total	**12**	**65**	**45**	**183**	**122**	**427**

RSI Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	0%	**2%**
2	0%	0%	0%	7%	4%	**10%**
3	0%	0%	0%	7%	4%	**10%**
4	2%	10%	7%	18%	12%	**48%**
5	1%	5%	4%	10%	9%	**29%**
Total	**3%**	**15%**	**11%**	**43%**	**29%**	**100%**

Synthetic (Observed) Matrix - Total Trips

	1	2	3	4	5	Total
1	0	1	1	6	3	**11**
2	1	5	5	36	23	**70**
3	1	6	3	39	23	**72**
4	8	47	36	117	70	**278**
5	6	36	27	81	65	**215**
Total	**16**	**95**	**72**	**279**	**184**	**646**

Synthetic (Observed) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	0%	**2%**
2	0%	1%	1%	6%	4%	**11%**
3	0%	1%	0%	6%	4%	**11%**
4	1%	7%	6%	18%	11%	**43%**
5	1%	6%	4%	13%	10%	**33%**
Total	**2%**	**15%**	**11%**	**43%**	**28%**	**100%**

Synthetic (Full) Matrix - Total Trips

	1	2	3	4	5	Total
1	0	1	1	6	3	**11**
2	1	5	5	36	23	**70**
3	1	6	3	39	23	**72**
4	8	47	36	117	70	**278**
5	6	36	27	81	65	**215**
Total	**16**	**95**	**72**	**279**	**184**	**646**

Synthetic (Full) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	0%	**2%**
2	0%	1%	1%	6%	4%	**11%**
3	0%	1%	0%	6%	4%	**11%**
4	1%	7%	6%	18%	11%	**43%**
5	1%	6%	4%	13%	10%	**33%**
Total	**2%**	**15%**	**11%**	**43%**	**28%**	**100%**

SATURN Gravity Model - Sectors - UC3

NB - Intra-zonals are removed

RSI Matrix - Total Trips

	1	2	3	4	5	Total
1	0	0	0	34	34	**68**
2	0	0	0	234	237	**471**
3	0	0	0	269	241	**510**
4	49	293	241	702	782	**2067**
5	39	219	142	494	817	**1711**
Total	**88**	**512**	**383**	**1733**	**2111**	**4827**

RSI Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	1%	**1%**
2	0%	0%	0%	5%	5%	**10%**
3	0%	0%	0%	6%	5%	**11%**
4	1%	6%	5%	15%	16%	**43%**
5	1%	5%	3%	10%	17%	**35%**
Total	**2%**	**11%**	**8%**	**36%**	**44%**	**100%**

Synthetic (Observed) Matrix - Total Trips

	1	2	3	4	5	Total
1	1	8	7	45	38	**99**
2	10	35	34	312	268	**659**
3	10	47	21	367	297	**742**
4	54	326	273	1063	860	**2576**
5	49	297	236	864	967	**2413**
Total	**124**	**713**	**571**	**2651**	**2430**	**6489**

Synthetic (Observed) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	1%	**2%**
2	0%	1%	1%	5%	4%	**10%**
3	0%	1%	0%	6%	5%	**11%**
4	1%	5%	4%	16%	13%	**40%**
5	1%	5%	4%	13%	15%	**37%**
Total	**2%**	**11%**	**9%**	**41%**	**37%**	**100%**

Synthetic (Full) Matrix - Total Trips

	1	2	3	4	5	Total
1	1	8	7	45	38	**99**
2	10	35	34	312	268	**659**
3	10	47	21	367	297	**742**
4	54	326	273	1064	860	**2577**
5	49	297	236	864	967	**2413**
Total	**124**	**713**	**571**	**2652**	**2430**	**6490**

Synthetic (Full) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	1%	**2%**
2	0%	1%	1%	5%	4%	**10%**
3	0%	1%	0%	6%	5%	**11%**
4	1%	5%	4%	16%	13%	**40%**
5	1%	5%	4%	13%	15%	**37%**
Total	**2%**	**11%**	**9%**	**41%**	**37%**	**100%**

PM peak gravity model

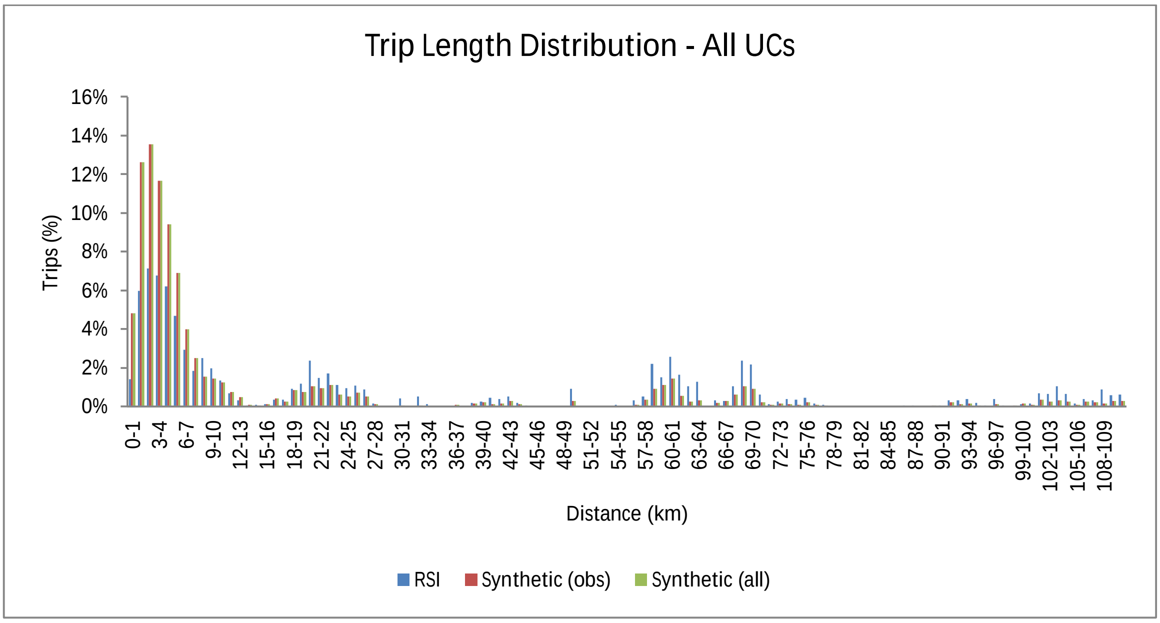


Figure B.9 – PM peak - Overall trip length distribution (UC1 to UC3)

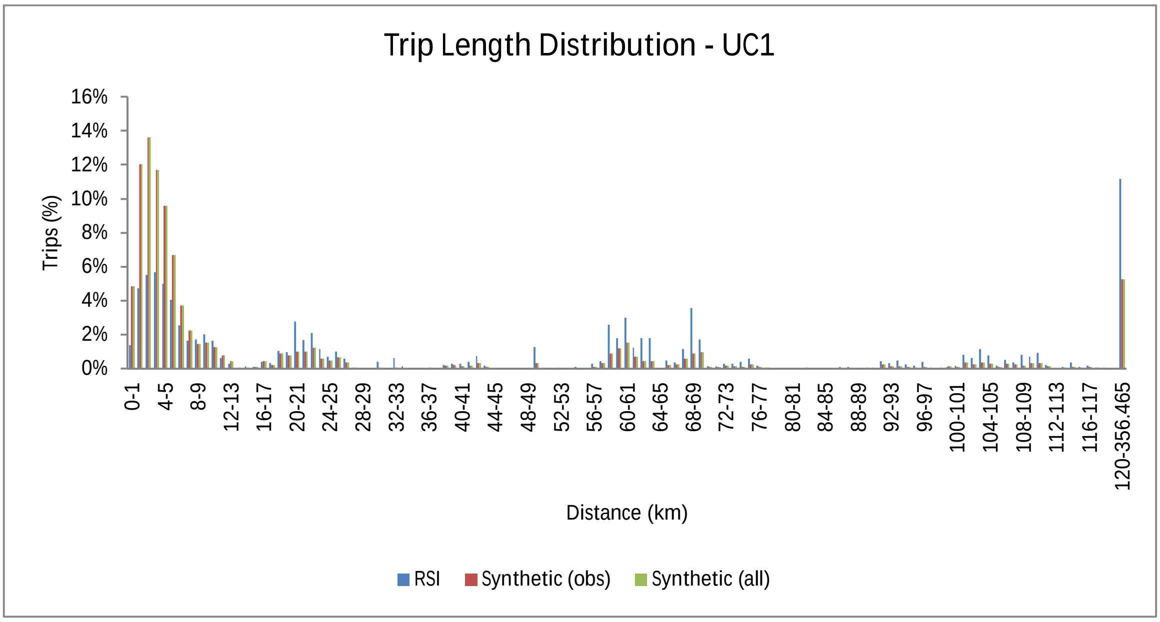


Figure B.10 – PM peak – UC1 trip length distribution

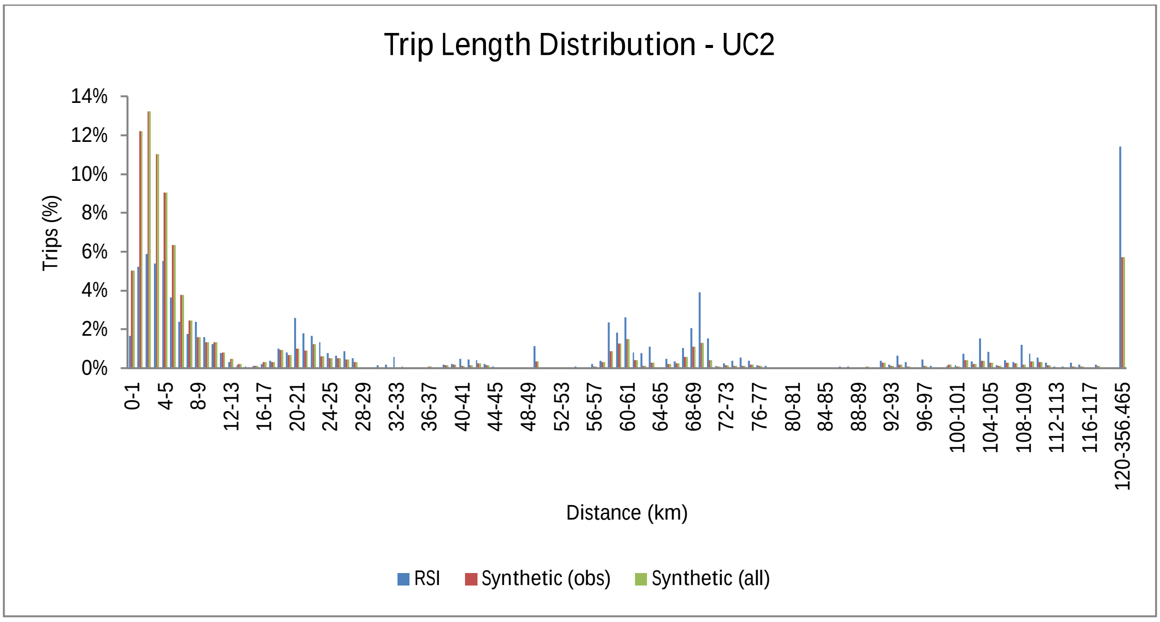


Figure B.11 – PM peak – UC2 trip length distribution

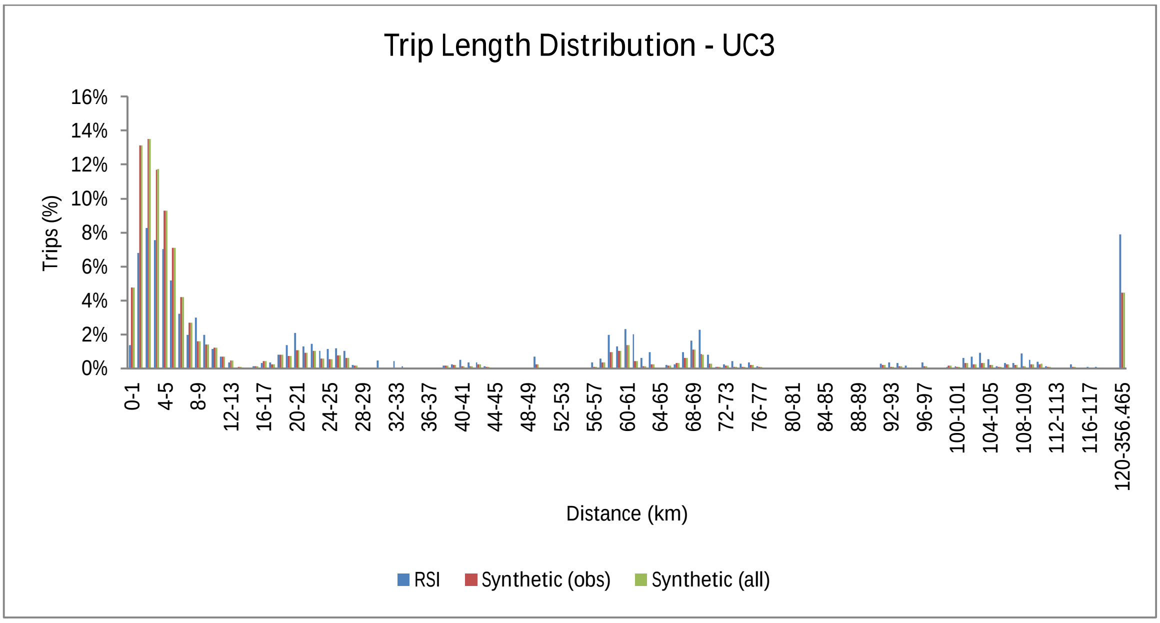


Figure B.12 – PM peak – UC3 trip length distribution

SATURN Gravity Model - Sectors - UC1

NB - Intra-zonals are removed

RSI Matrix - Total Trips

	1	2	3	4	5	Total
1	0	0	0	38	14	**52**
2	0	0	0	255	96	**351**
3	0	0	0	341	176	**517**
4	34	196	180	320	282	**1012**
5	27	135	133	352	240	**887**
Total	**61**	**331**	**313**	**1306**	**808**	**2819**

RSI Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	0%	**2%**
2	0%	0%	0%	9%	3%	**12%**
3	0%	0%	0%	12%	6%	**18%**
4	1%	7%	6%	11%	10%	**36%**
5	1%	5%	5%	12%	9%	**31%**
Total	**2%**	**12%**	**11%**	**46%**	**29%**	**100%**

Synthetic (Observed) Matrix - Total Trips

	1	2	3	4	5	Total
1	2	14	12	21	13	**62**
2	16	47	49	192	121	**425**
3	22	78	32	311	171	**614**
4	29	201	219	1786	617	**2852**
5	30	217	207	1050	1183	**2687**
Total	**99**	**557**	**519**	**3360**	**2105**	**6640**

Synthetic (Observed) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	0%	1%	1%	3%	2%	**6%**
3	0%	1%	0%	5%	3%	**9%**
4	0%	3%	3%	27%	9%	**43%**
5	0%	3%	3%	16%	18%	**40%**
Total	**1%**	**8%**	**8%**	**51%**	**32%**	**100%**

Synthetic (Full) Matrix - Total Trips

	1	2	3	4	5	Total
1	2	14	12	21	13	**62**
2	16	47	49	192	121	**425**
3	22	78	32	311	171	**614**
4	29	201	219	1787	618	**2854**
5	30	217	207	1051	1183	**2688**
Total	**99**	**557**	**519**	**3362**	**2106**	**6643**

Synthetic (Full) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	0%	1%	1%	3%	2%	**6%**
3	0%	1%	0%	5%	3%	**9%**
4	0%	3%	3%	27%	9%	**43%**
5	0%	3%	3%	16%	18%	**40%**
Total	**1%**	**8%**	**8%**	**51%**	**32%**	**100%**

SATURN Gravity Model - Sectors - UC2

NB - Intra-zonals are removed

RSI Matrix - Total Trips

	1	2	3	4	5	Total
1	0	0	0	5	2	**7**
2	0	0	0	32	14	**46**
3	0	0	0	43	25	**68**
4	8	46	41	59	64	**218**
5	4	20	21	41	35	**121**
Total	**12**	**66**	**62**	**180**	**140**	**460**

RSI Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	0%	**2%**
2	0%	0%	0%	7%	3%	**10%**
3	0%	0%	0%	9%	5%	**15%**
4	2%	10%	9%	13%	14%	**47%**
5	1%	4%	5%	9%	8%	**26%**
Total	**3%**	**14%**	**13%**	**39%**	**30%**	**100%**

Synthetic (Observed) Matrix - Total Trips

	1	2	3	4	5	Total
1	0	2	2	3	2	**9**
2	3	8	8	26	17	**62**
3	4	13	5	43	24	**89**
4	5	37	40	279	101	**462**
5	5	37	35	148	172	**397**
Total	**17**	**97**	**90**	**499**	**316**	**1019**

Synthetic (Observed) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	0%	1%	1%	3%	2%	**6%**
3	0%	1%	0%	4%	2%	**9%**
4	0%	4%	4%	27%	10%	**45%**
5	0%	4%	3%	15%	17%	**39%**
Total	**2%**	**10%**	**9%**	**49%**	**31%**	**100%**

Synthetic (Full) Matrix - Total Trips

	1	2	3	4	5	Total
1	0	2	2	3	2	**9**
2	3	8	8	26	17	**62**
3	4	13	5	43	24	**89**
4	5	37	40	280	101	**463**
5	5	37	35	148	172	**397**
Total	**17**	**97**	**90**	**500**	**316**	**1020**

Synthetic (Full) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	0%	1%	1%	3%	2%	**6%**
3	0%	1%	0%	4%	2%	**9%**
4	0%	4%	4%	27%	10%	**45%**
5	0%	4%	3%	15%	17%	**39%**
Total	**2%**	**10%**	**9%**	**49%**	**31%**	**100%**

SATURN Gravity Model - Sectors - UC3

NB - Intra-zonals are removed

RSI Matrix - Total Trips

	1	2	3	4	5	Total
1	0	0	0	31	30	**61**
2	0	0	0	228	223	**451**
3	0	0	0	320	394	**714**
4	42	279	282	497	987	**2087**
5	34	189	189	406	635	**1453**
Total	**76**	**468**	**471**	**1482**	**2269**	**4766**

RSI Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	1%	1%	**1%**
2	0%	0%	0%	5%	5%	**9%**
3	0%	0%	0%	7%	8%	**15%**
4	1%	6%	6%	10%	21%	**44%**
5	1%	4%	4%	9%	13%	**30%**
Total	**2%**	**10%**	**10%**	**31%**	**48%**	**100%**

Synthetic (Observed) Matrix - Total Trips

	1	2	3	4	5	Total
1	2	15	14	24	22	**77**
2	17	55	60	238	222	**592**
3	24	92	42	411	325	**894**
4	30	235	276	2312	1164	**4017**
5	27	224	229	1165	1933	**3578**
Total	**100**	**621**	**621**	**4150**	**3666**	**9158**

Synthetic (Observed) Matrix - % of Total

	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	0%	1%	1%	3%	2%	**6%**
3	0%	1%	0%	4%	4%	**10%**
4	0%	3%	3%	25%	13%	**44%**
5	0%	2%	3%	13%	21%	**39%**
Total	**1%**	**7%**	**7%**	**45%**	**40%**	**100%**

Synthetic (Full) Matrix - Total Trips

	1	2	3	4	5	Total
1	2	15	14	24	22	**77**
2	17	55	60	238	222	**592**
3	24	92	42	411	325	**894**
4	30	235	276	2314	1164	**4019**
5	27	224	229	1166	1933	**3579**
Total	**100**	**621**	**621**	**4153**	**3666**	**9161**

Synthetic (Full) Matrix - % of Total

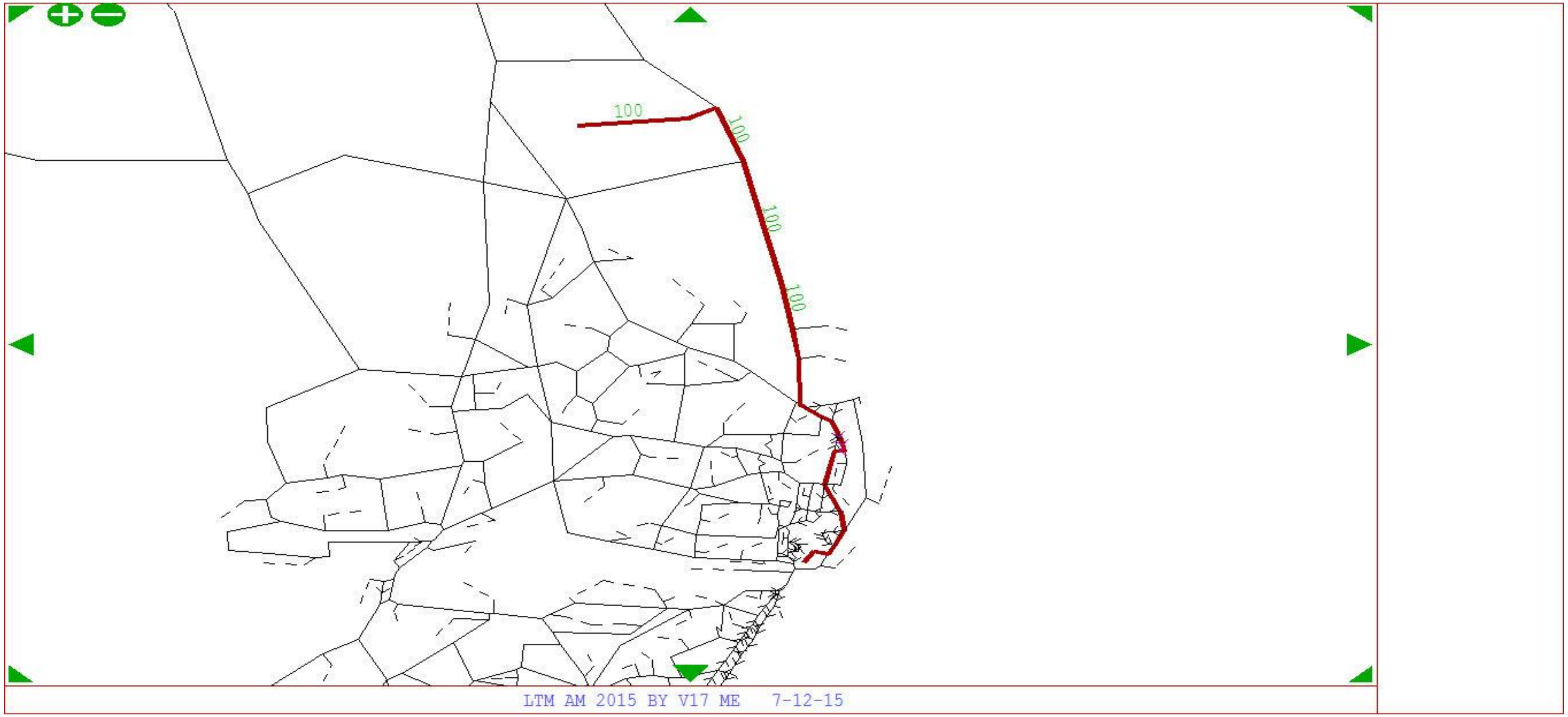
	1	2	3	4	5	Total
1	0%	0%	0%	0%	0%	**1%**
2	0%	1%	1%	3%	2%	**6%**
3	0%	1%	0%	4%	4%	**10%**
4	0%	3%	3%	25%	13%	**44%**
5	0%	2%	2%	13%	21%	**39%**
Total	**1%**	**7%**	**7%**	**45%**	**40%**	**100%**

Appendix C

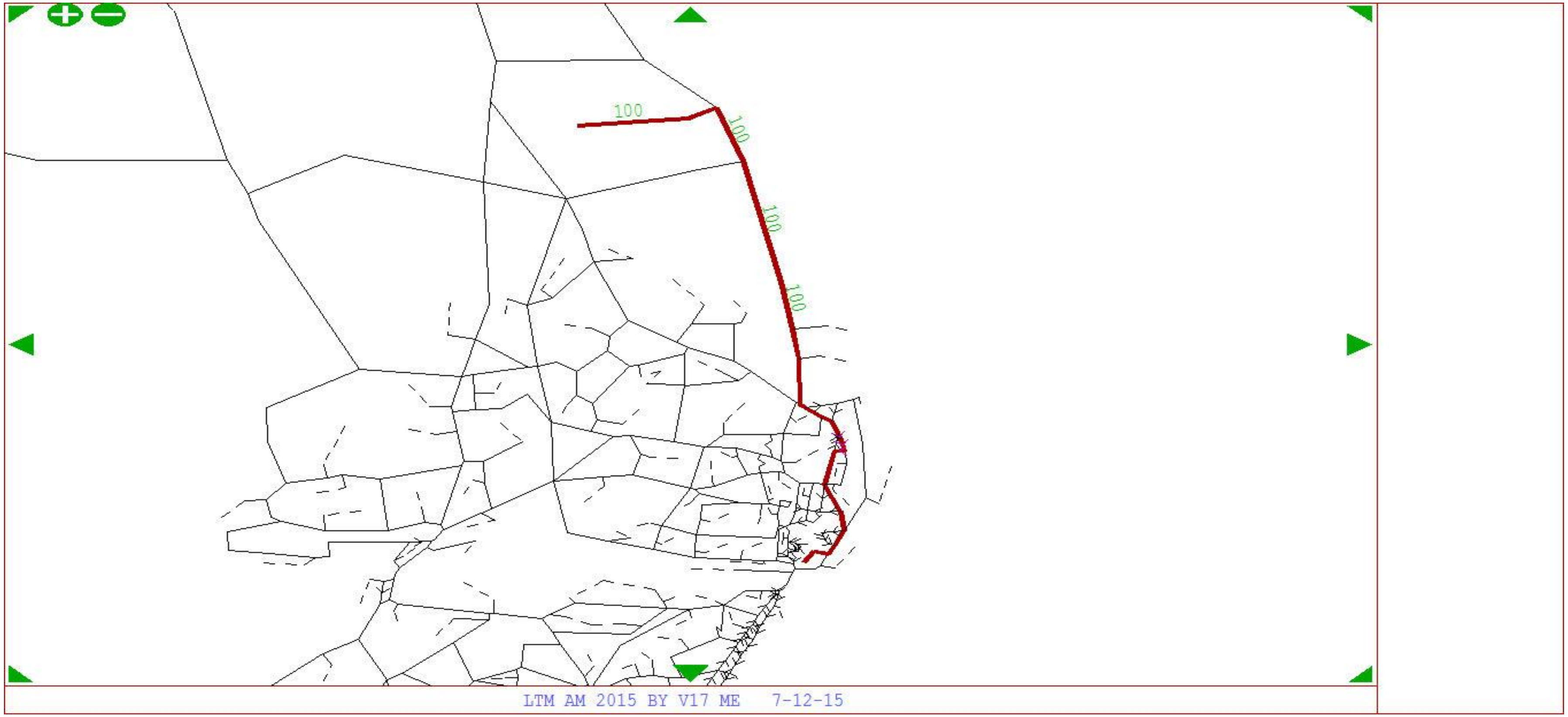
ORIGIN-DESTINATION TREES

Lowestoft: OD Tree Plots - AM Peak

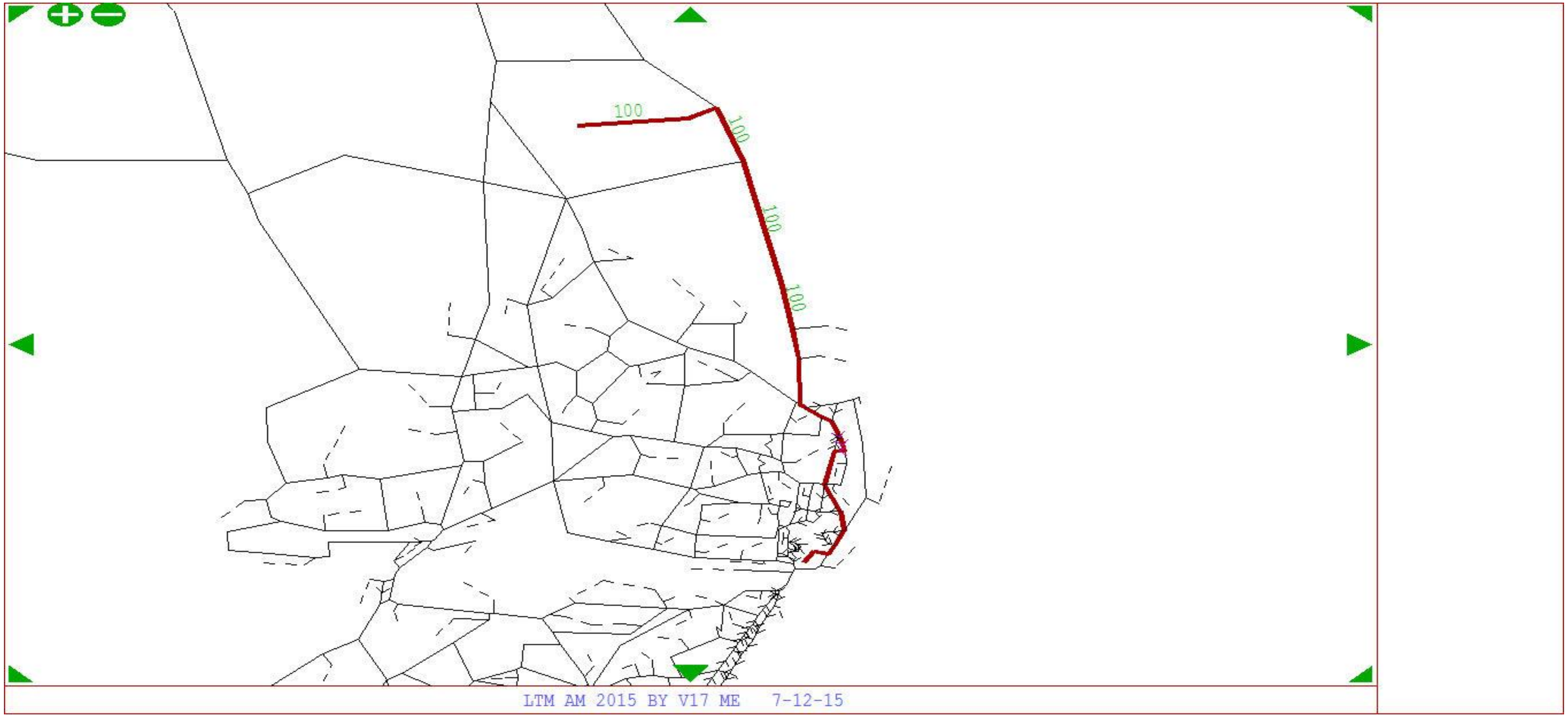
From Zone 102 To Zone 119 - User Class 1



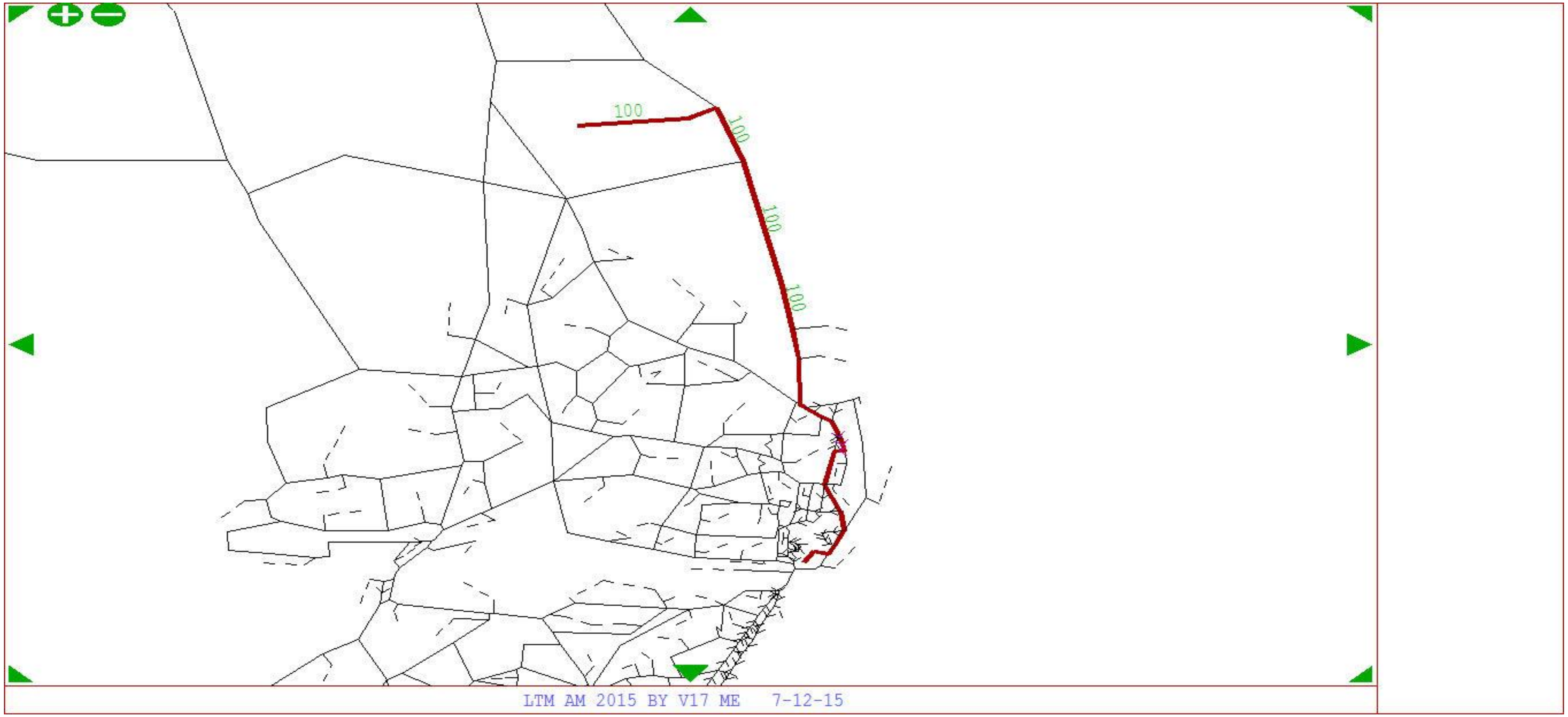
From Zone 102 To Zone 119 - User Class 2



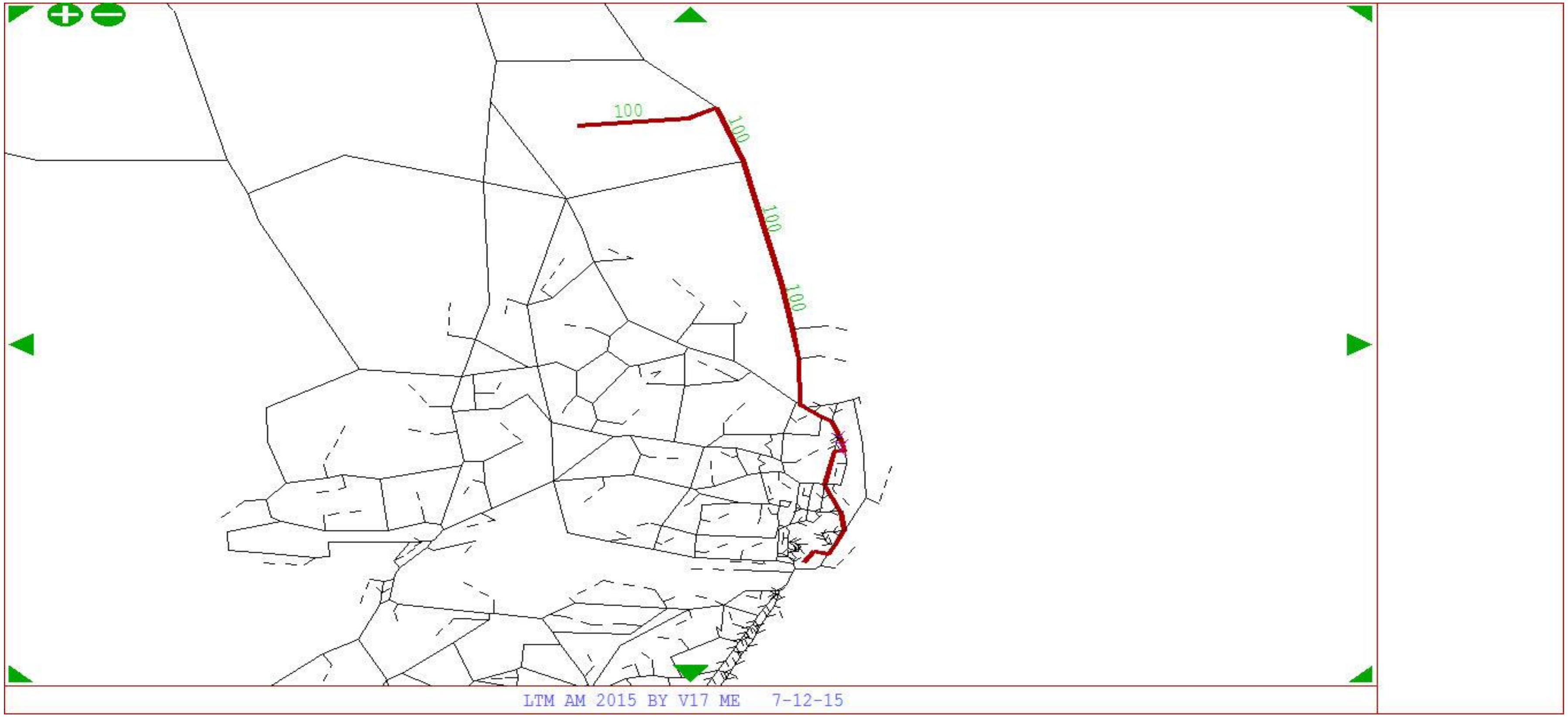
From Zone 102 To Zone 119 - User Class 3



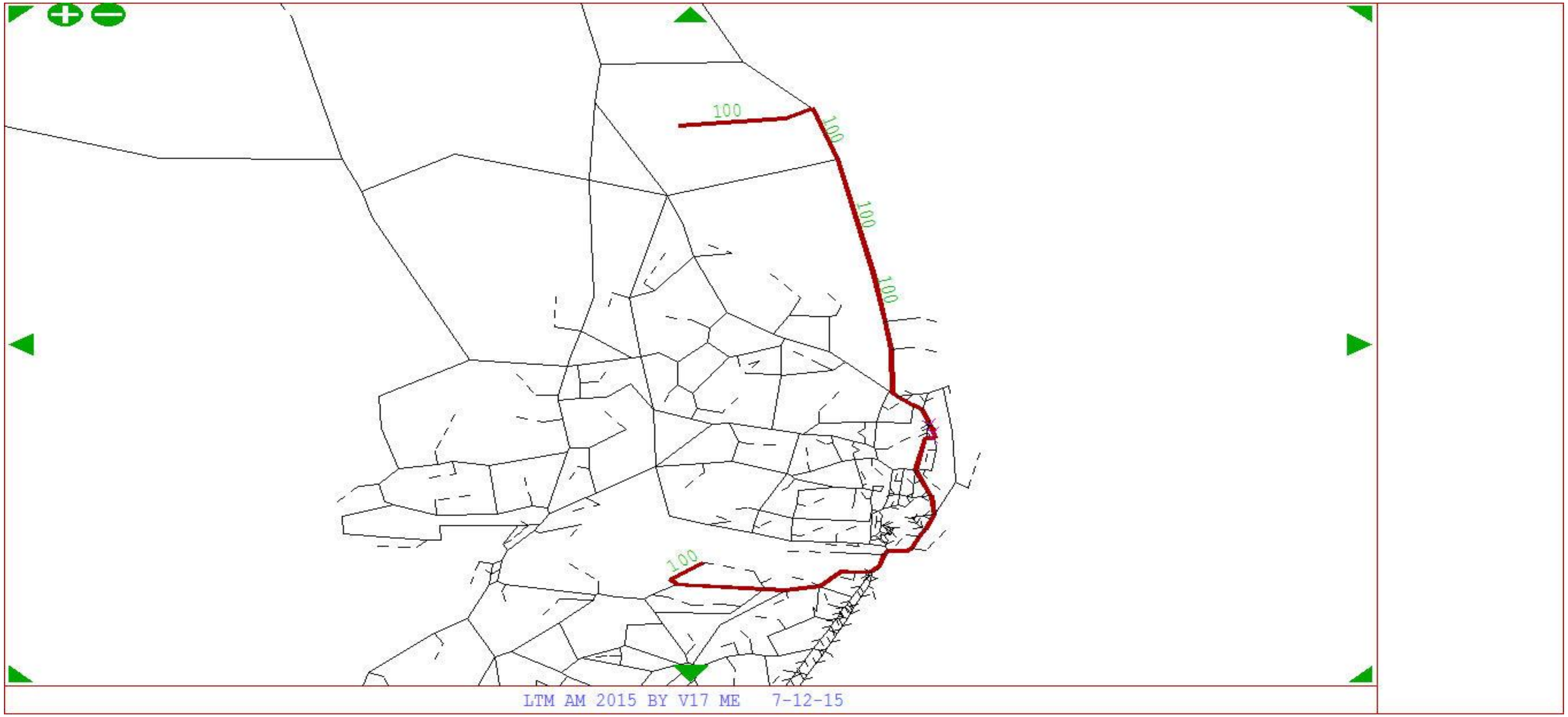
From Zone 102 To Zone 119 - User Class 4



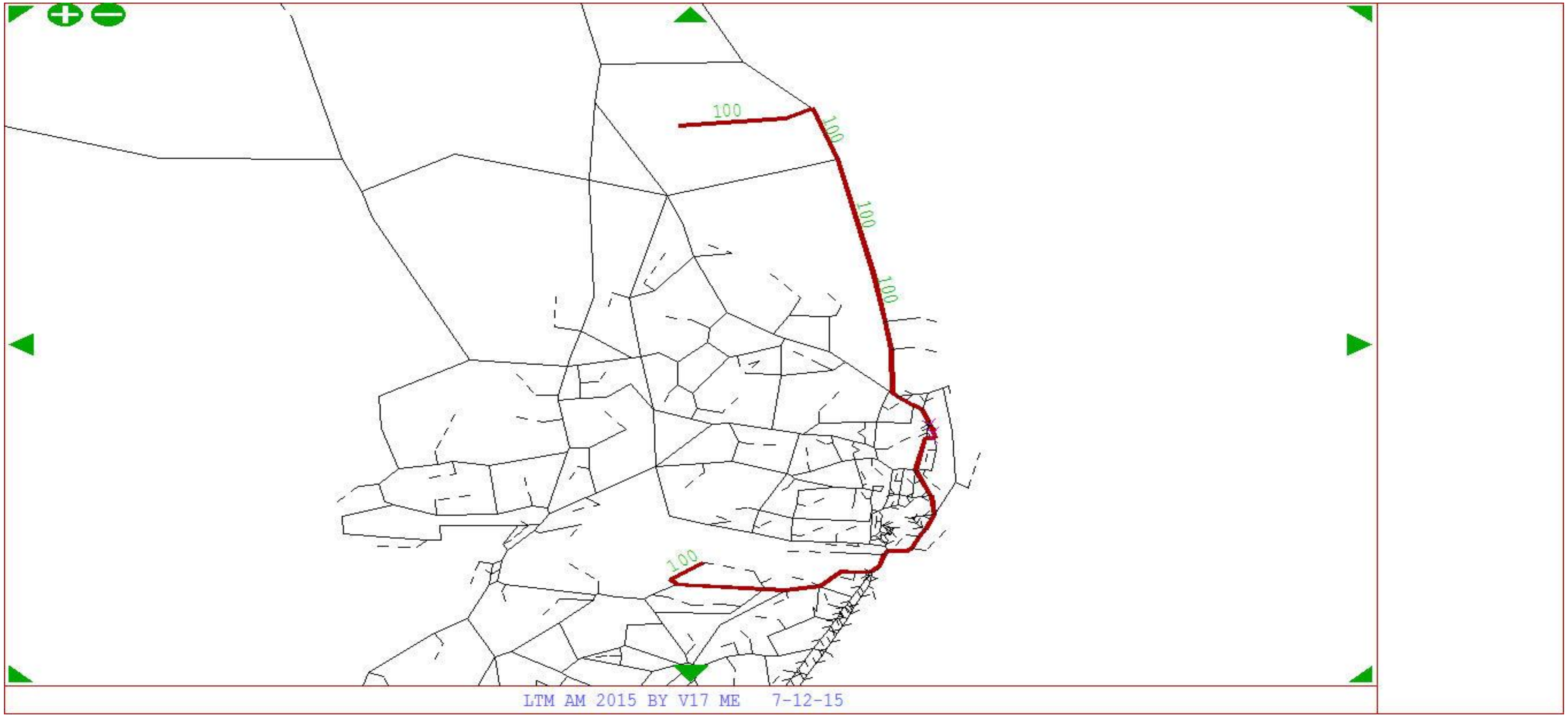
From Zone 102 To Zone 119 - User Class 5



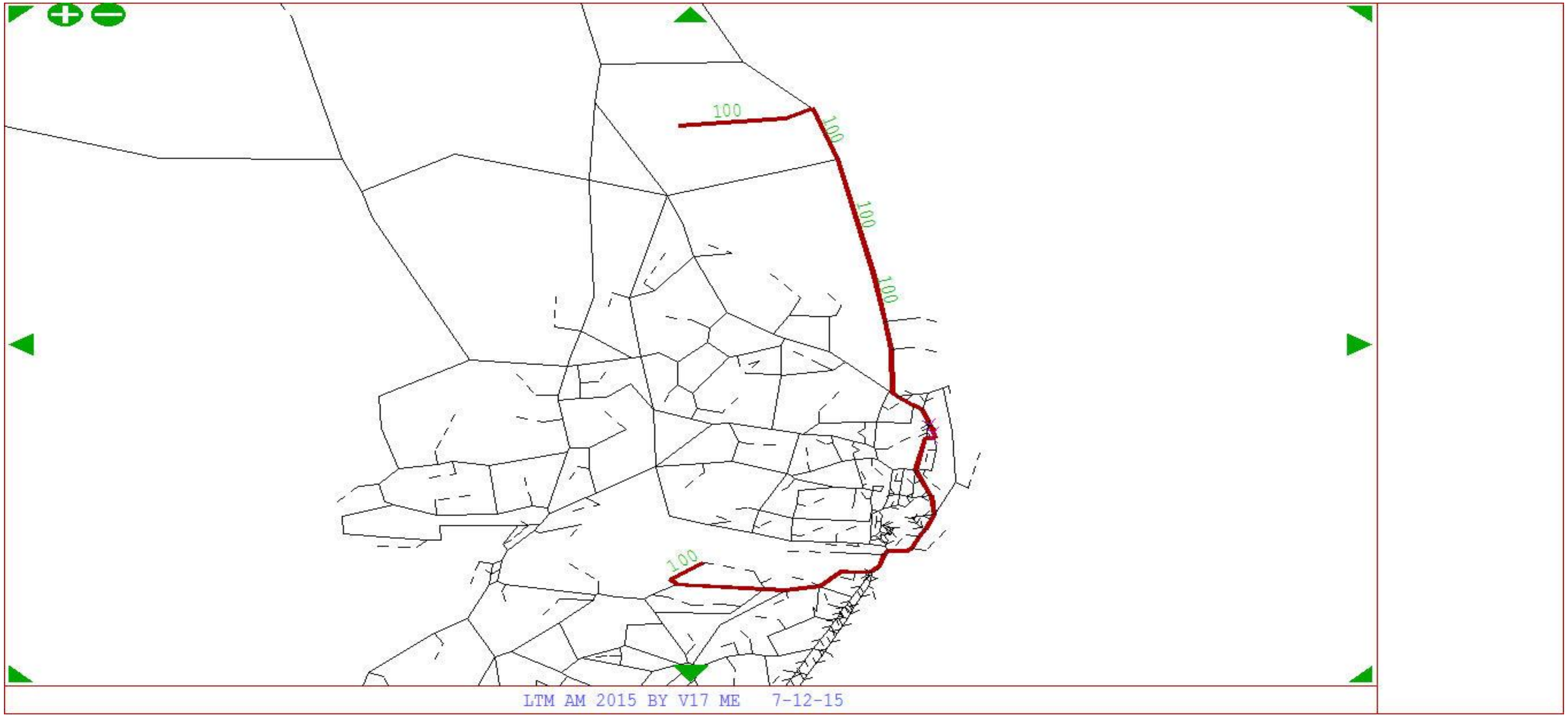
From Zone 102 To Zone 122 - User Class 1



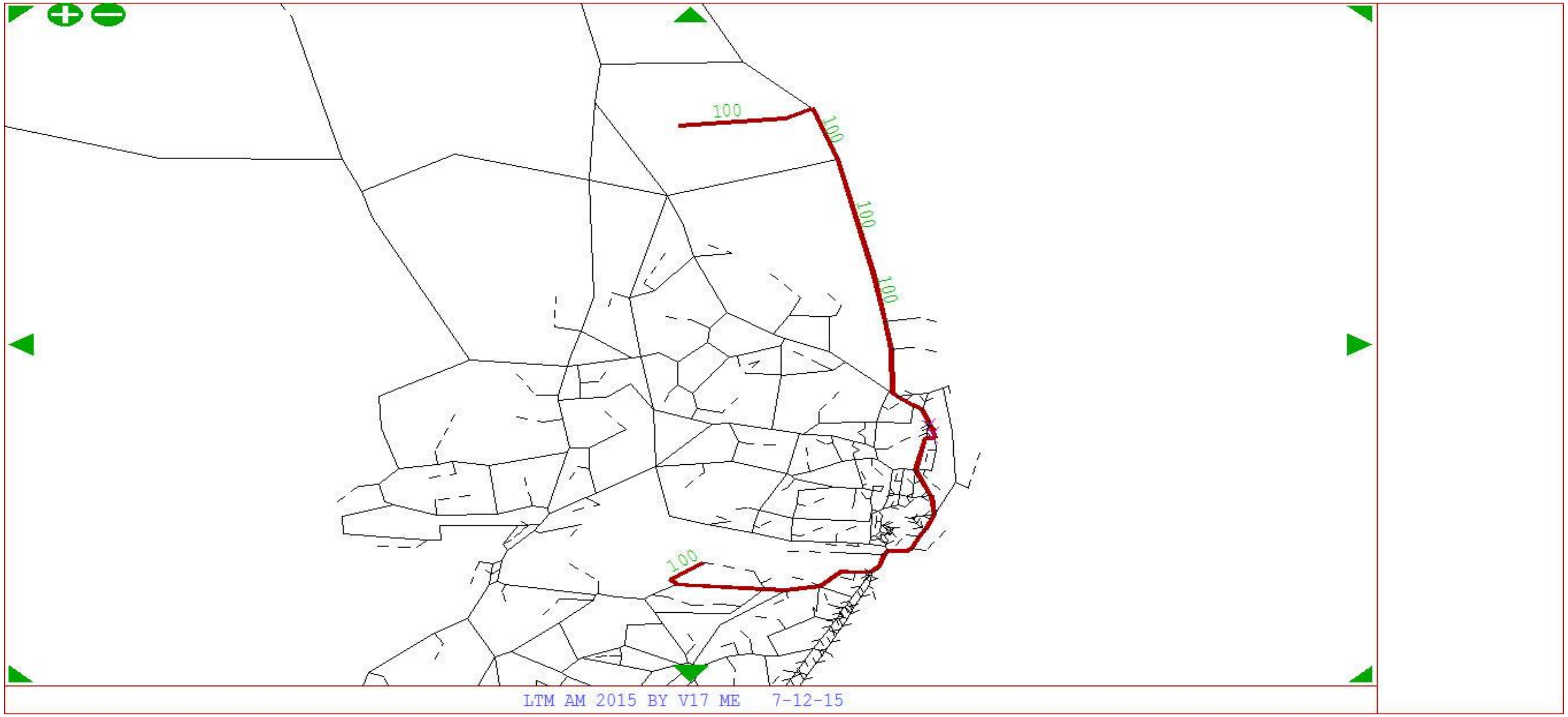
From Zone 102 To Zone 122 - User Class 2



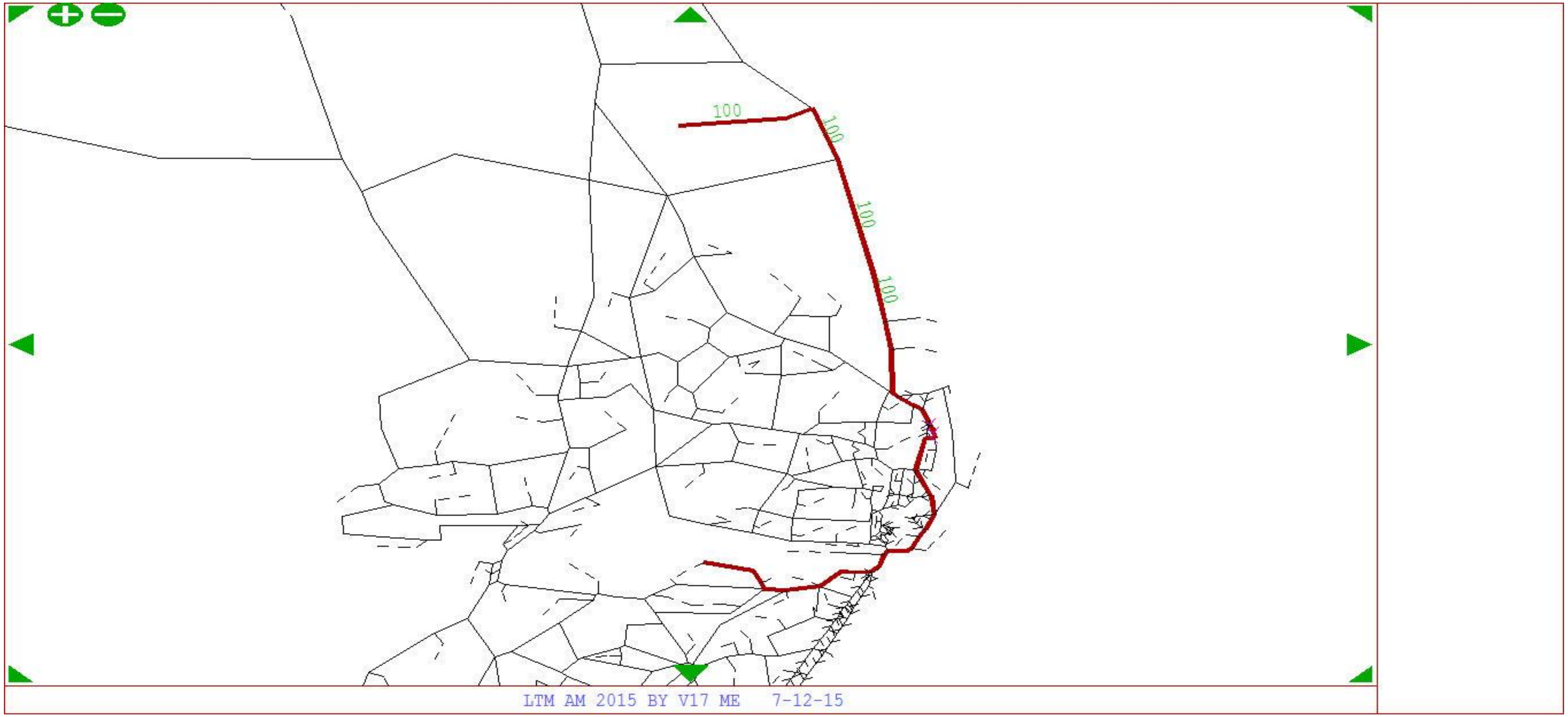
From Zone 102 To Zone 122 - User Class 3



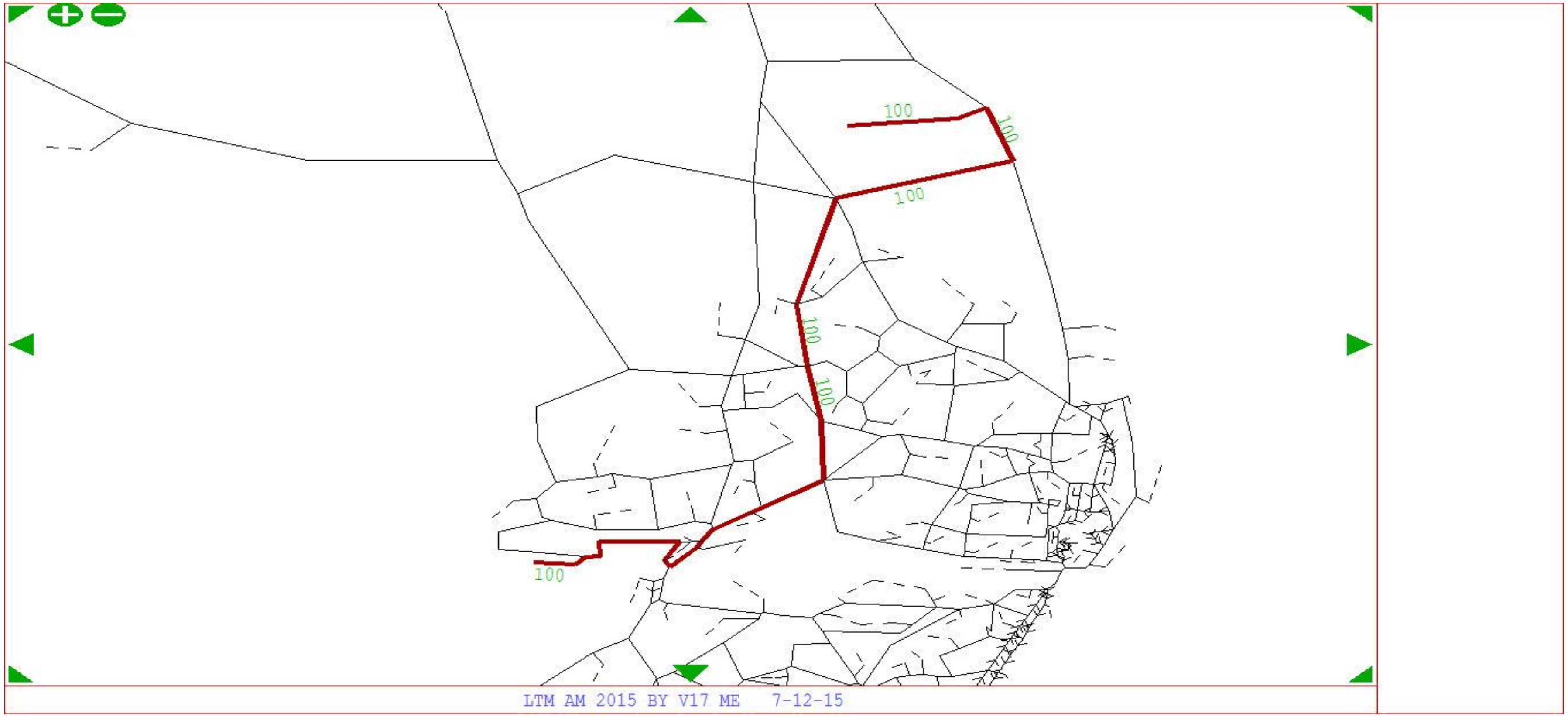
From Zone 102 To Zone 122 - User Class 4



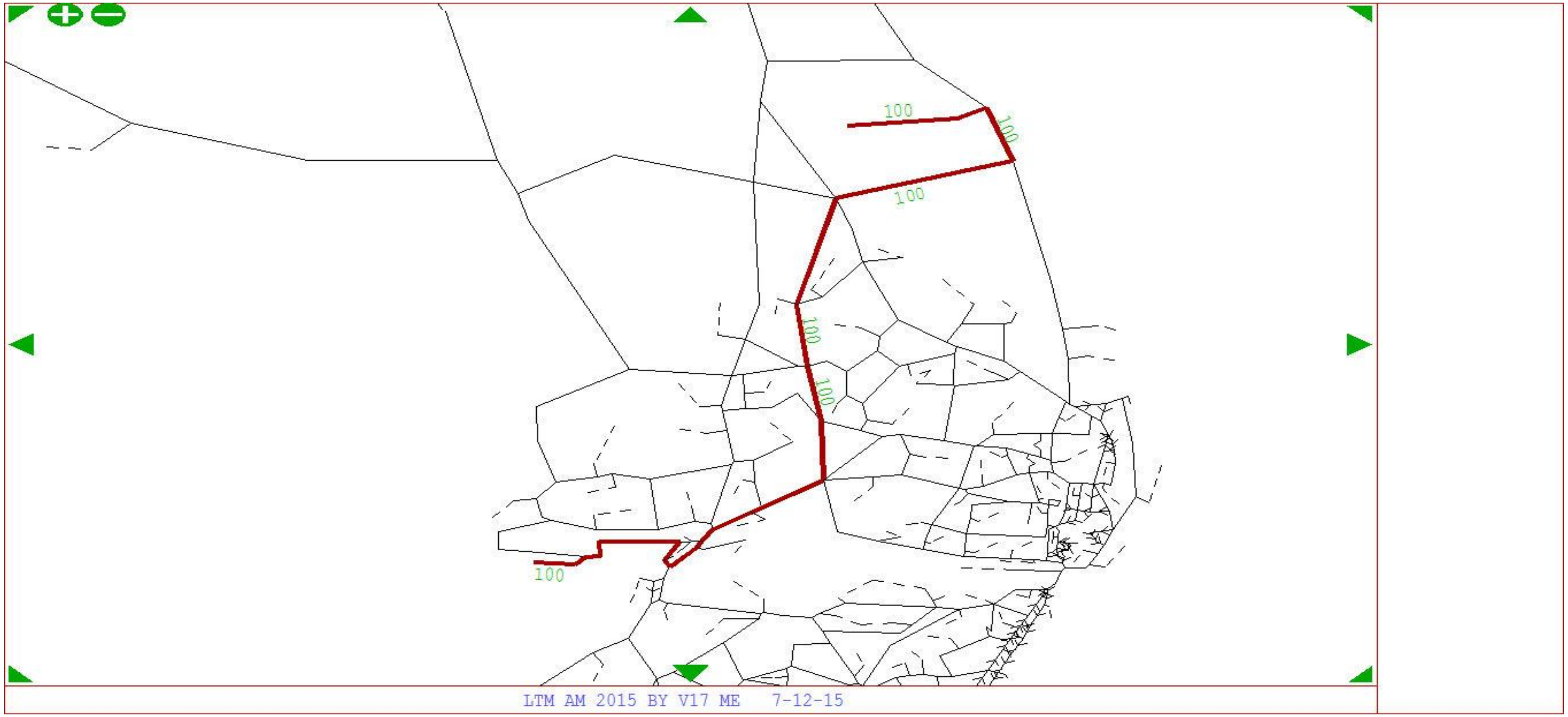
From Zone 102 To Zone 122 - User Class 5



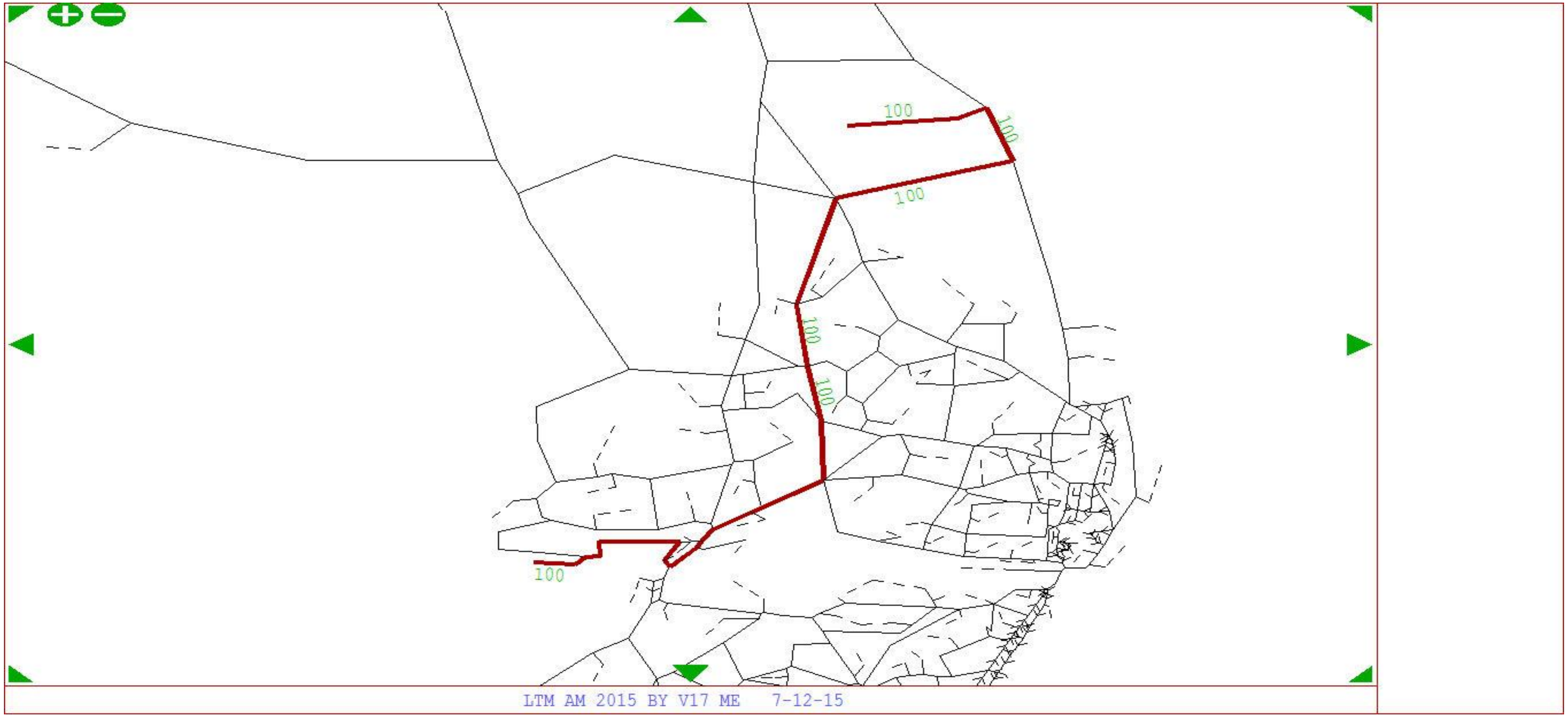
From Zone 102 To Zone 130 - User Class 1



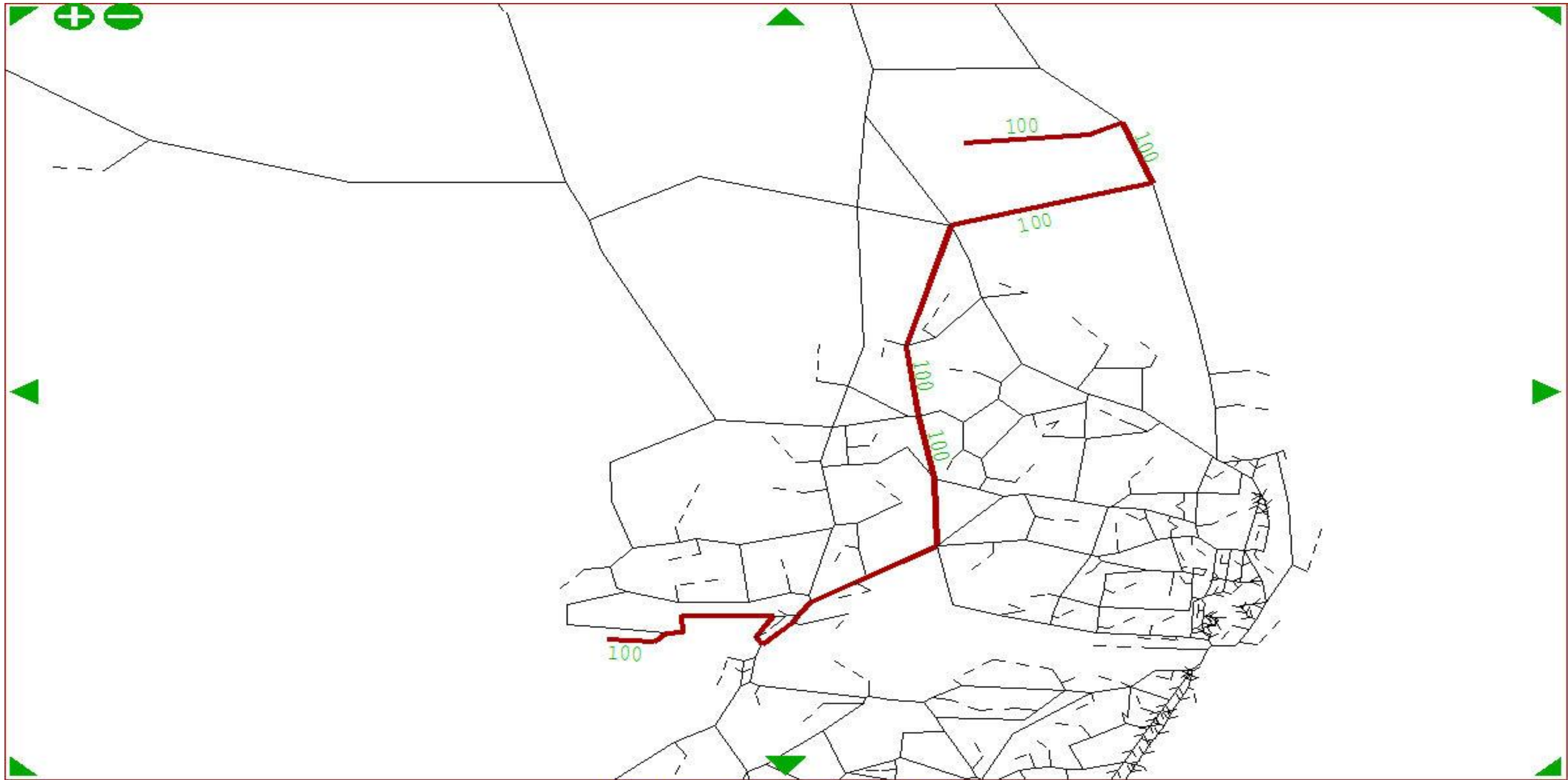
From Zone 102 To Zone 130 - User Class 2



From Zone 102 To Zone 130 - User Class 3



From Zone 102 To Zone 130 - User Class 4



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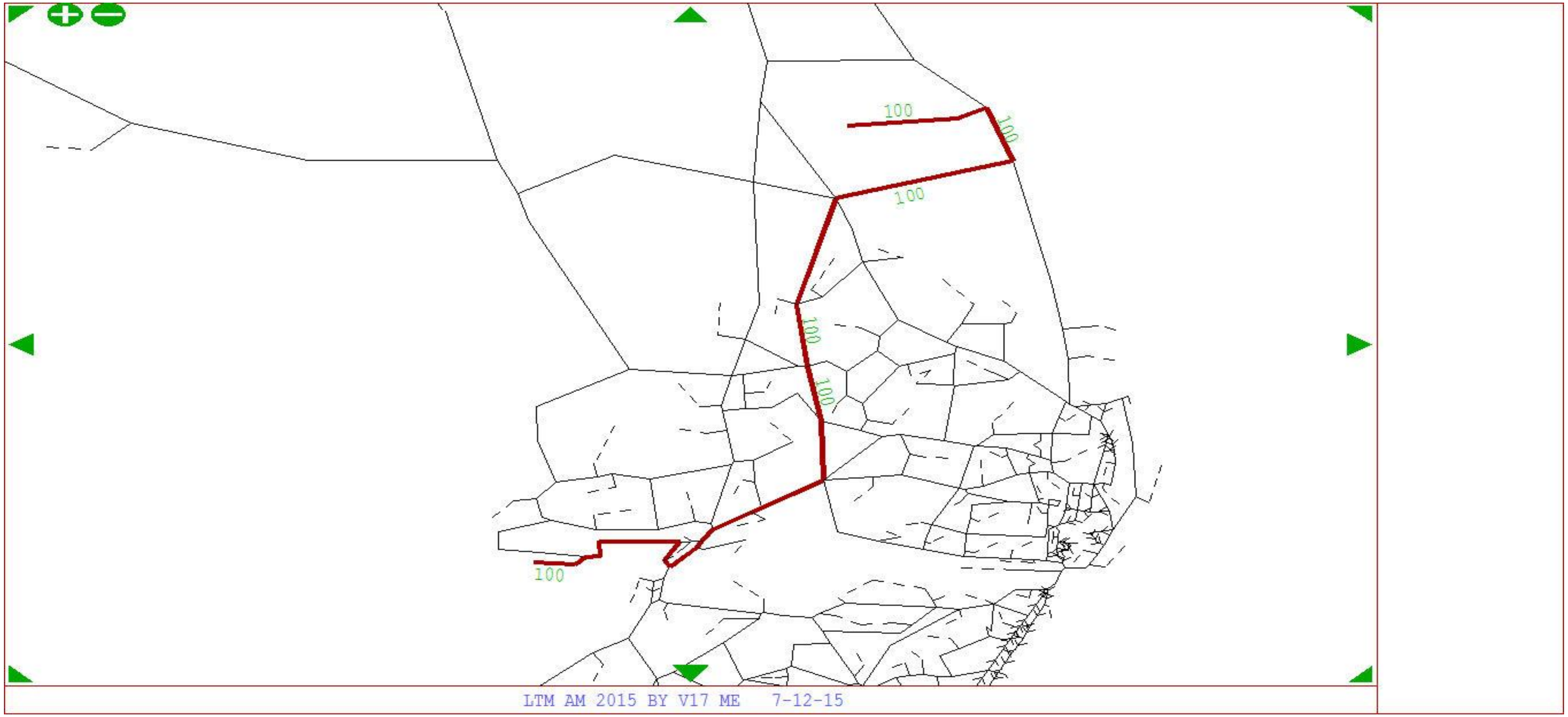
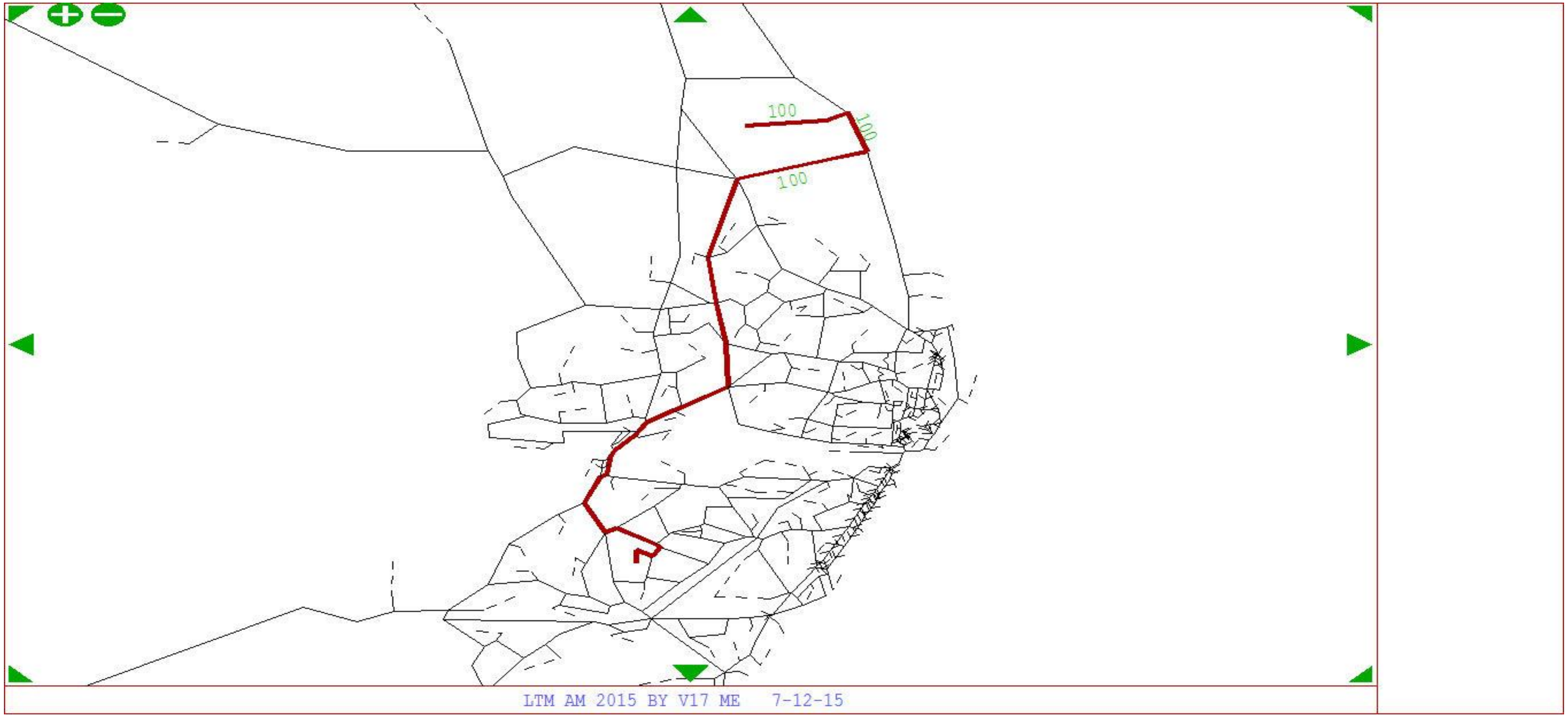
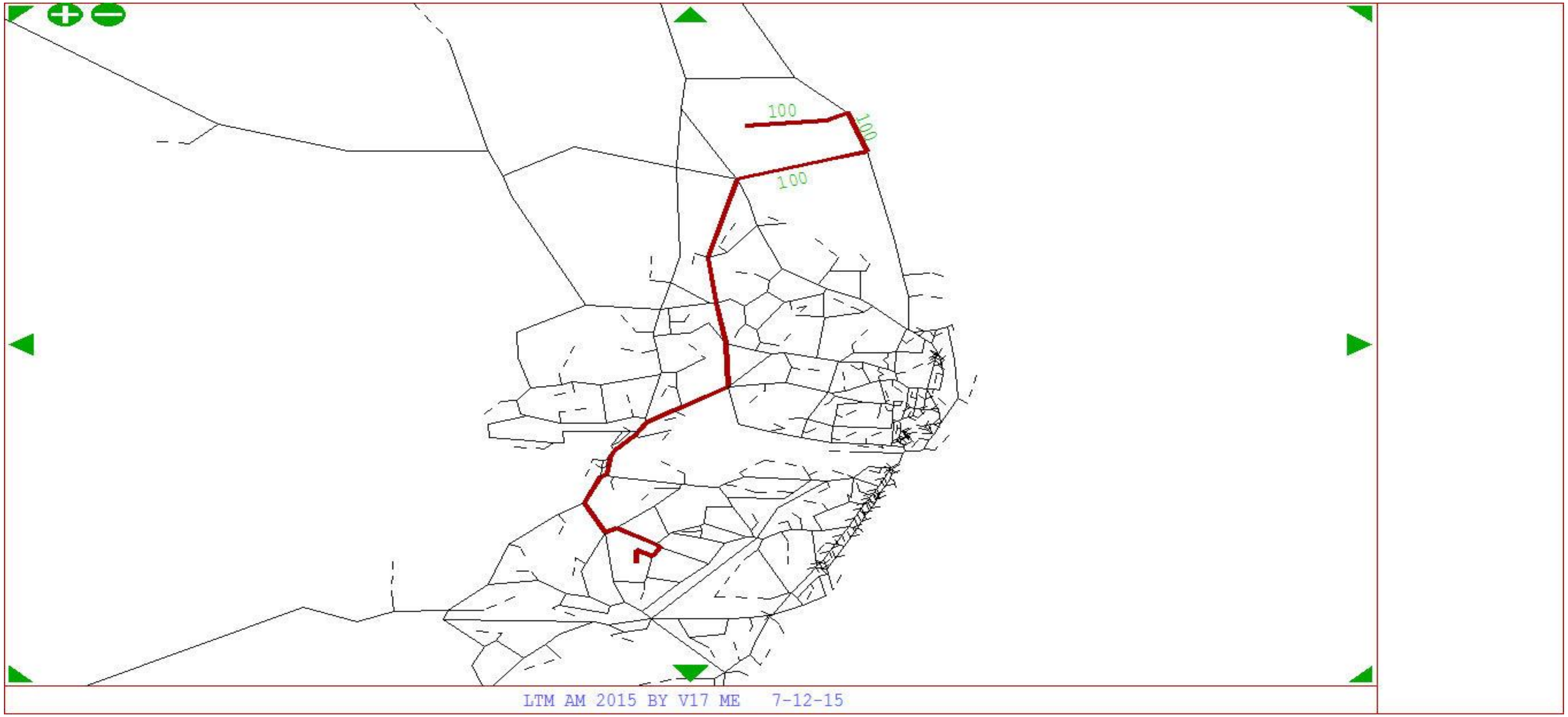
From Zone 102 To Zone 130 - User Class 5



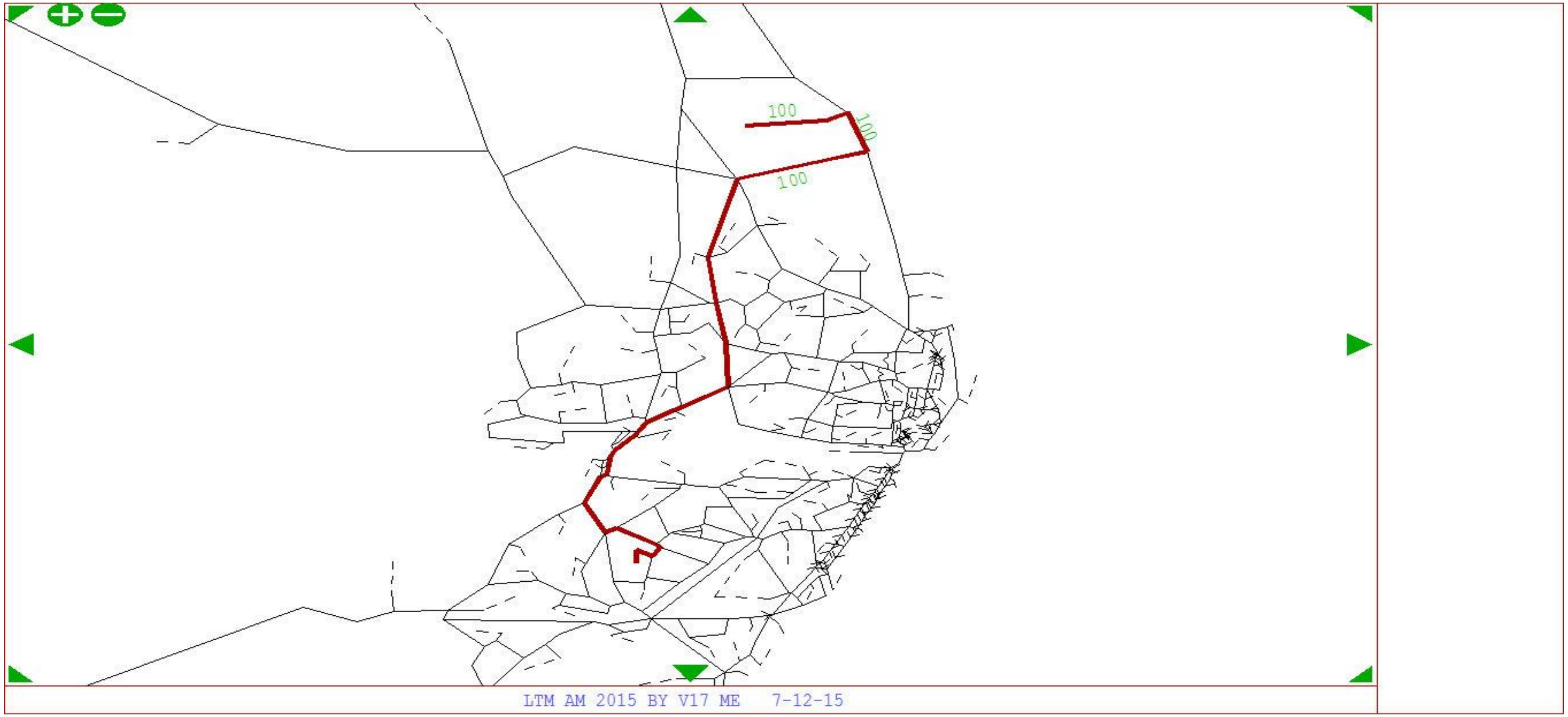
From Zone 102 To Zone 131 - User Class 1



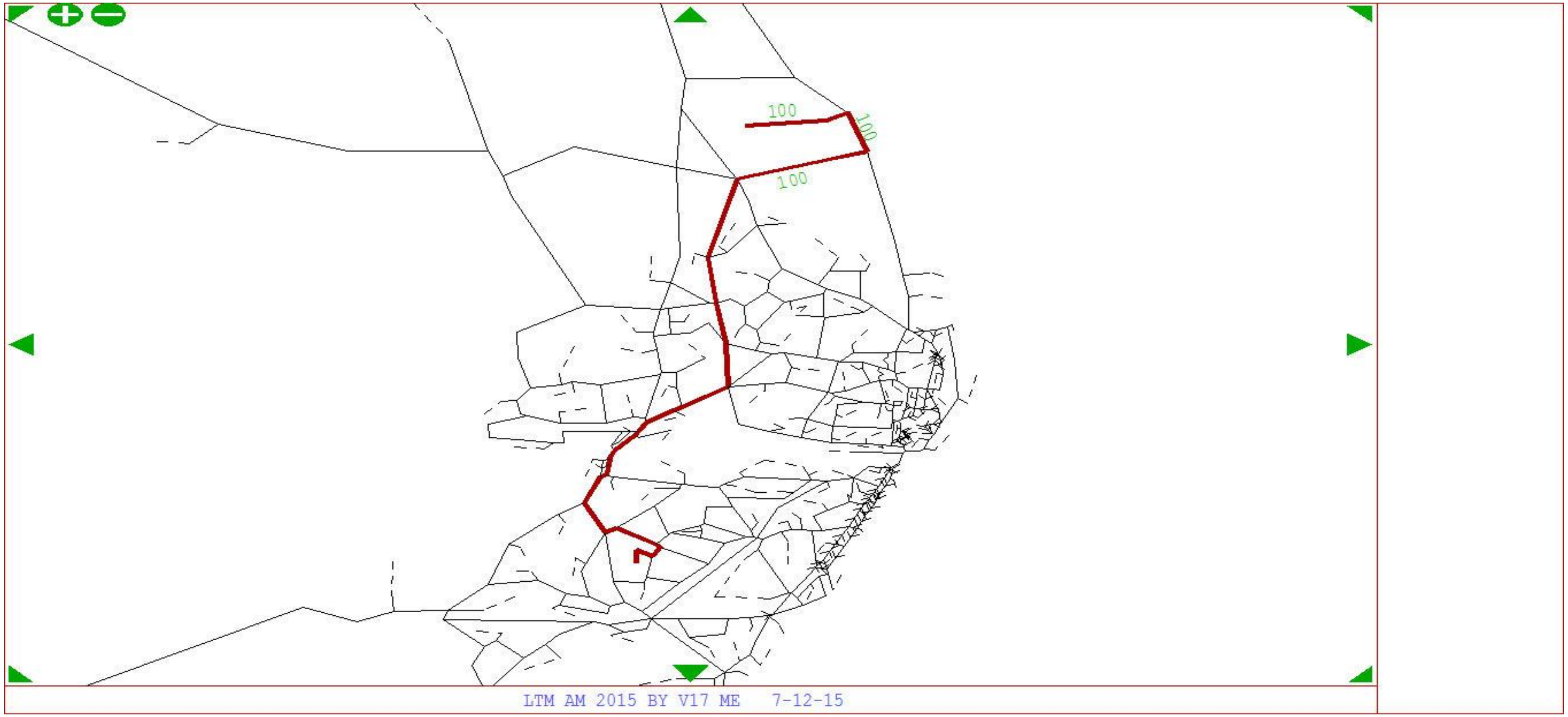
From Zone 102 To Zone 131 - User Class 2



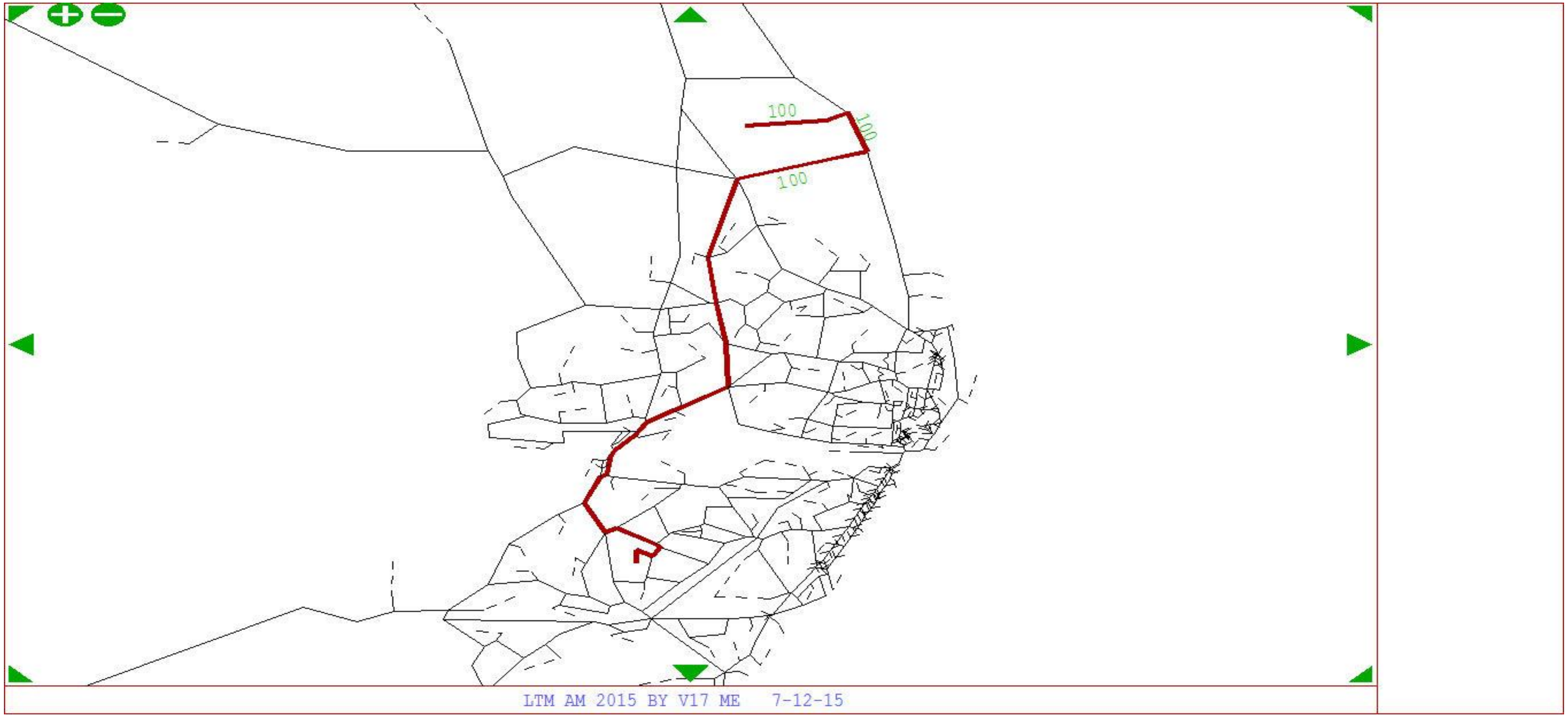
From Zone 102 To Zone 131 - User Class 3



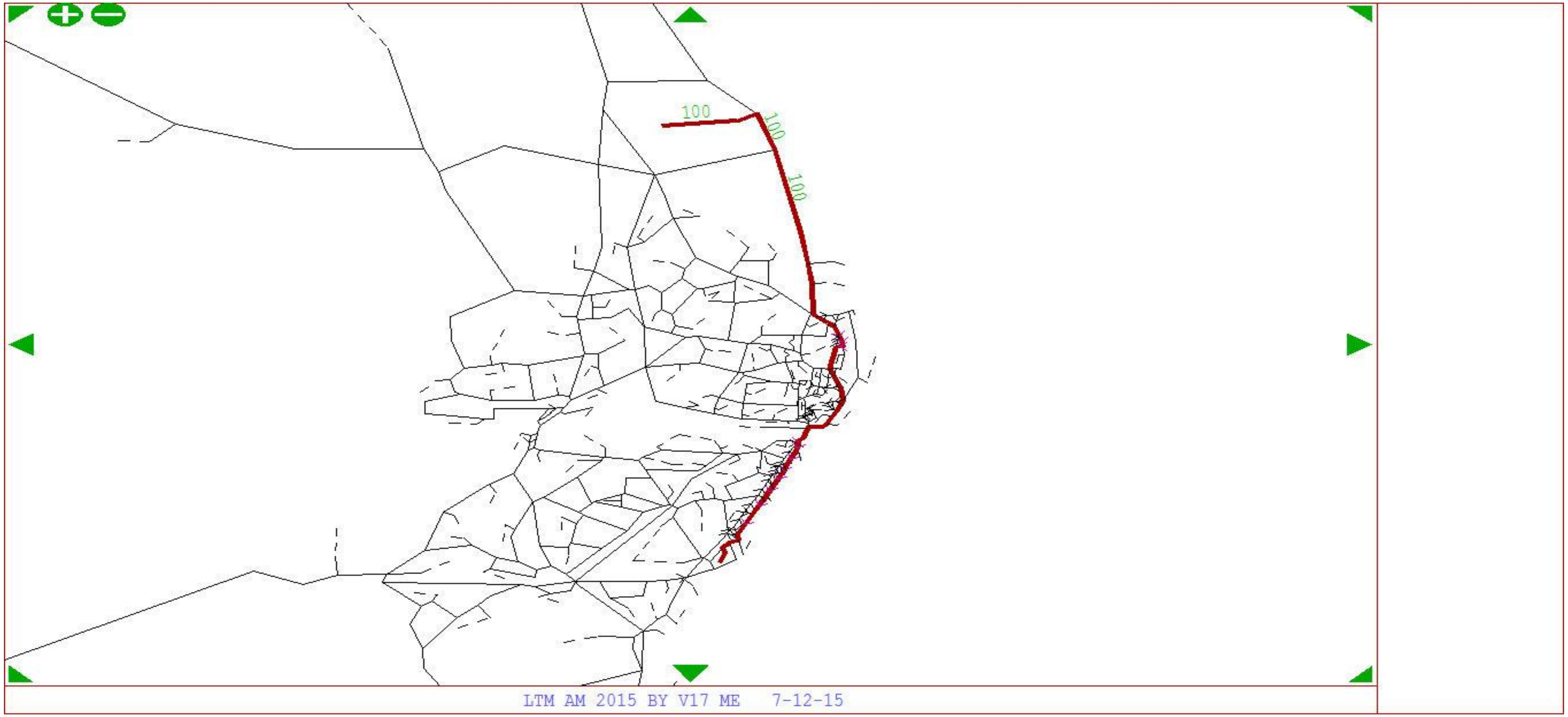
From Zone 102 To Zone 131 - User Class 4



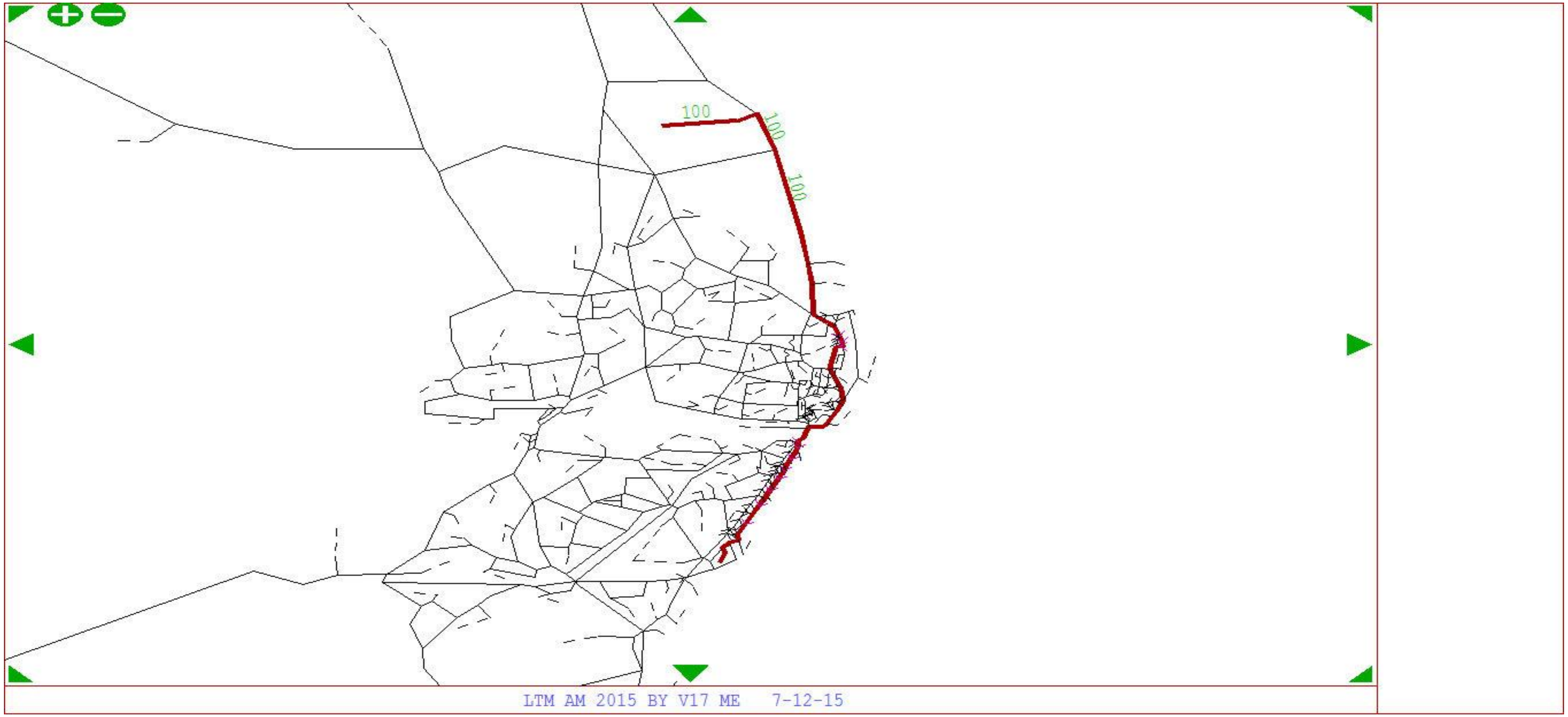
From Zone 102 To Zone 131 - User Class 5



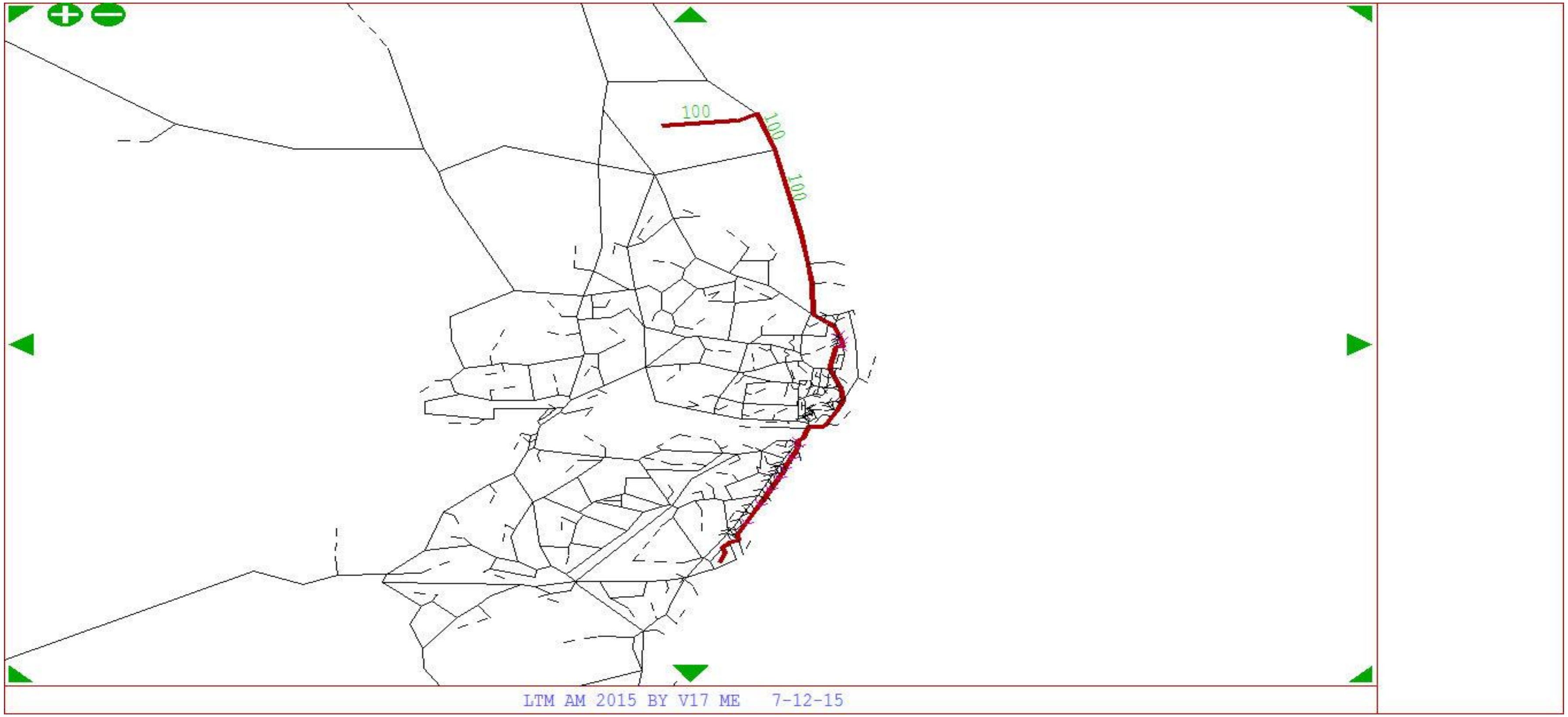
From Zone 102 To Zone 136 - User Class 1



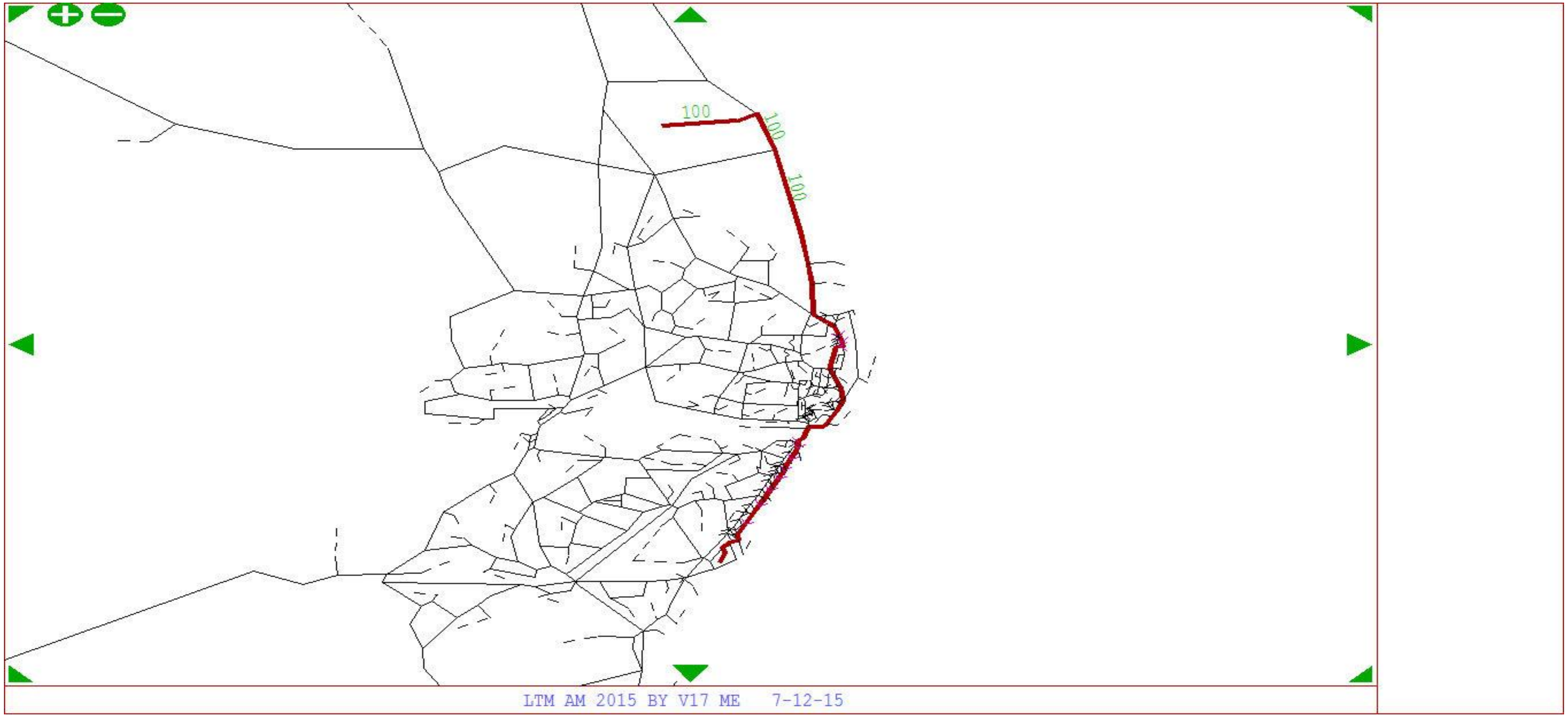
From Zone 102 To Zone 136 - User Class 2



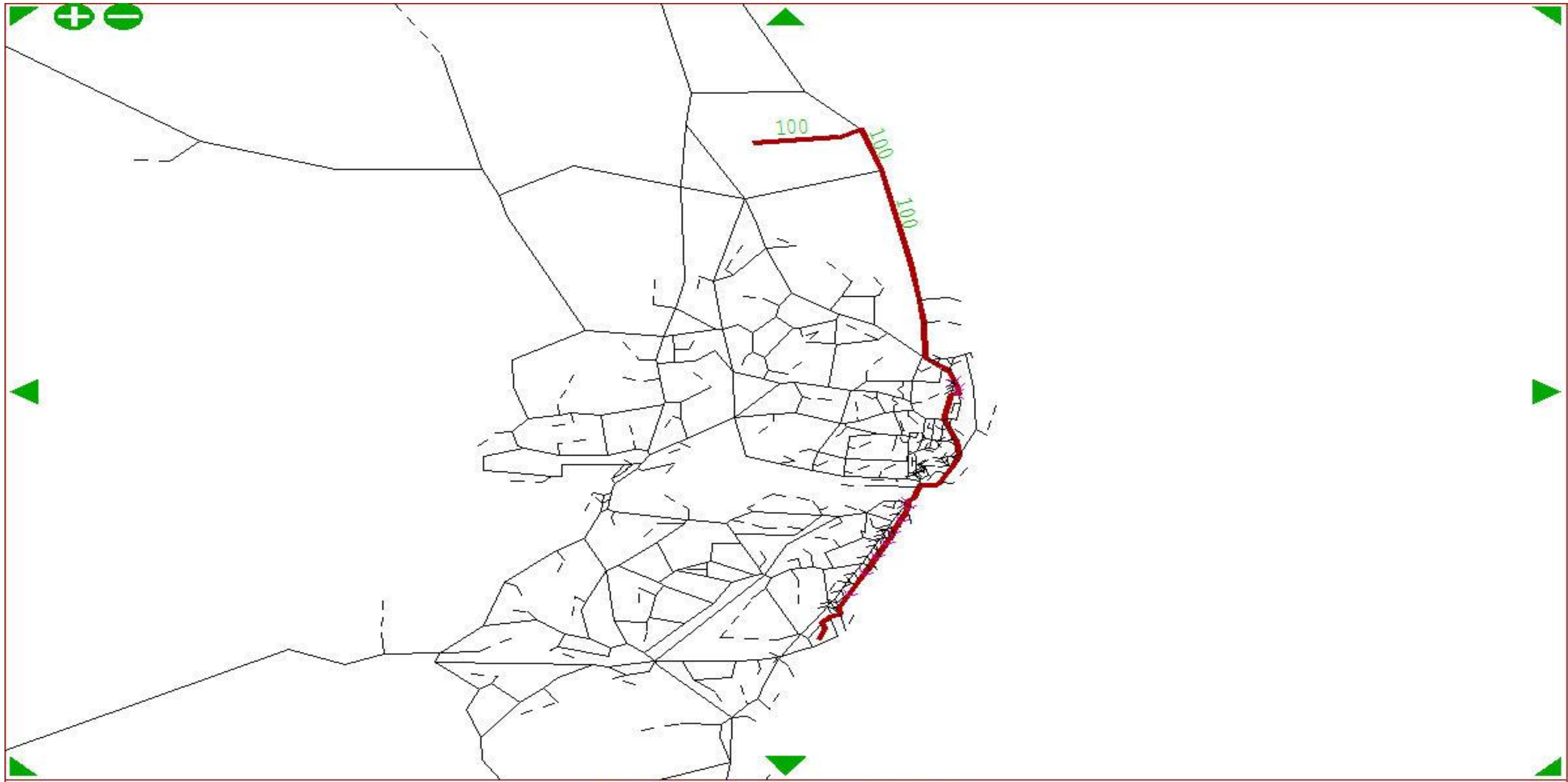
From Zone 102 To Zone 136 - User Class 3



From Zone 102 To Zone 136 - User Class 4



From Zone 102 To Zone 136 - User Class 5



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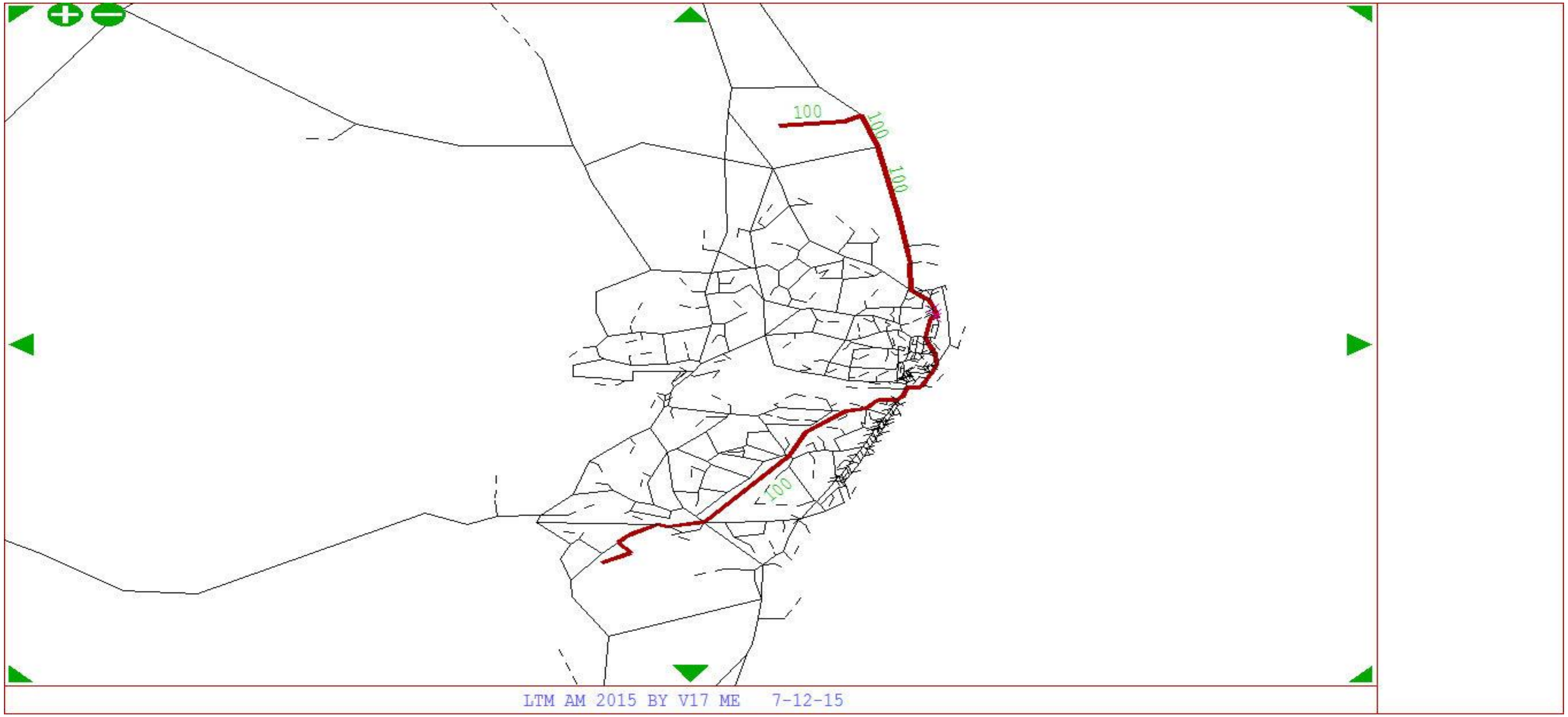
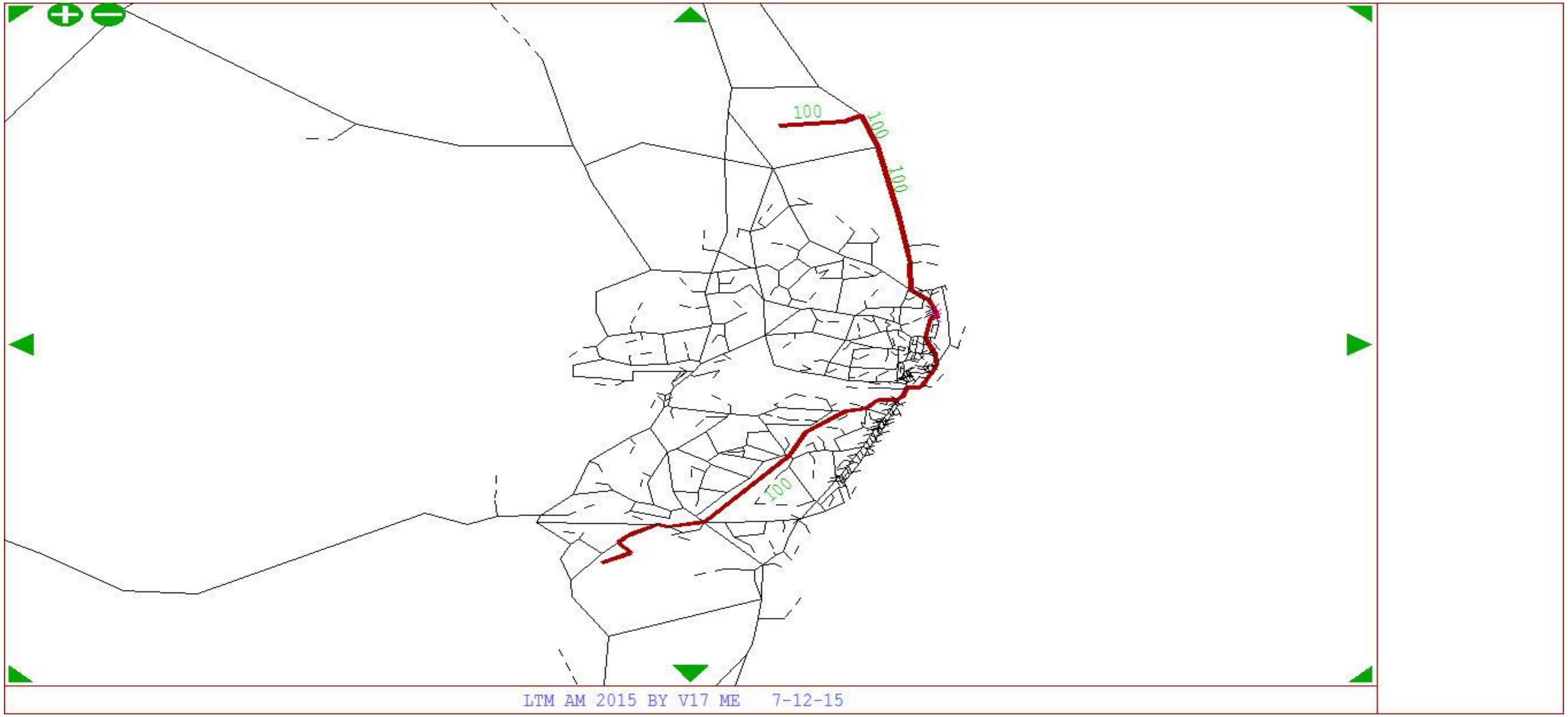
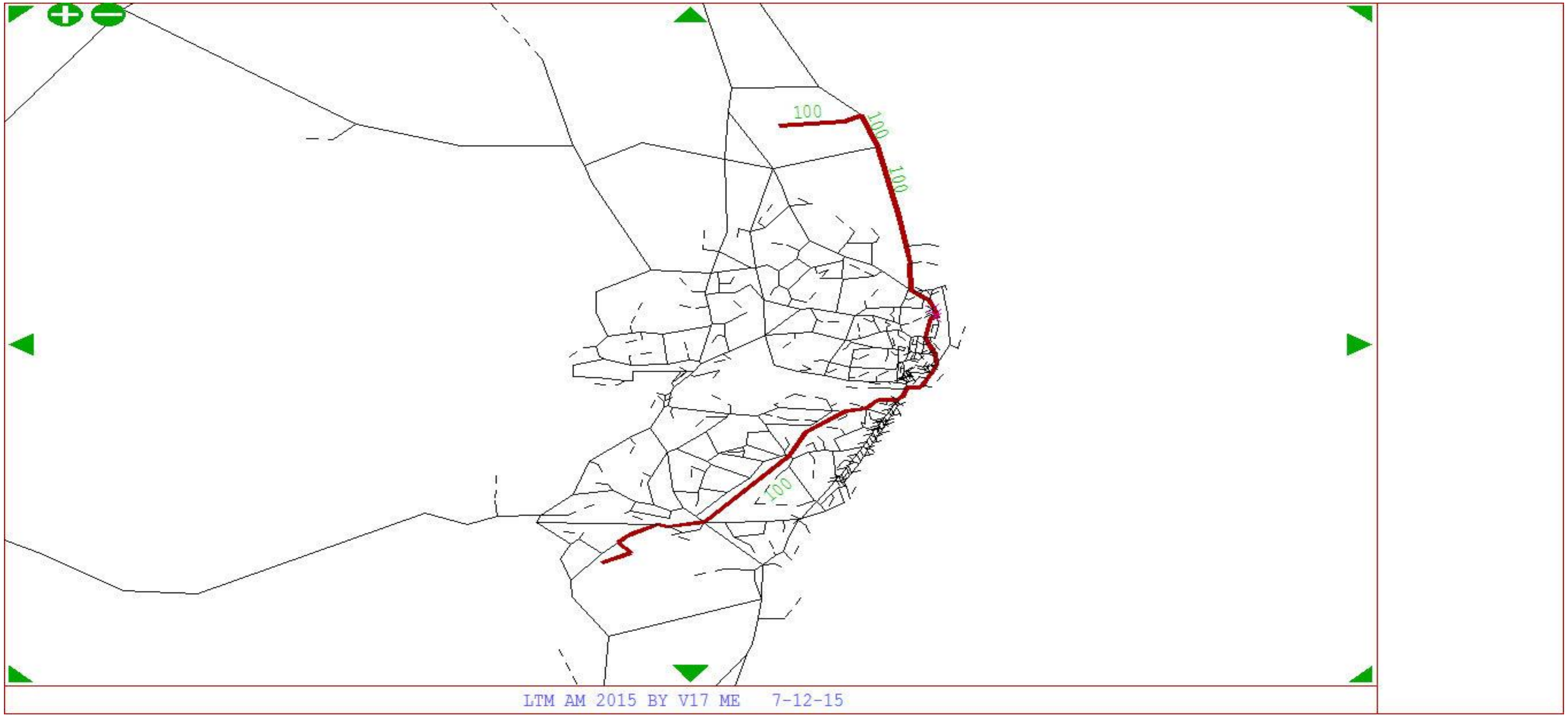
From Zone 102 To Zone 143 - User Class 1



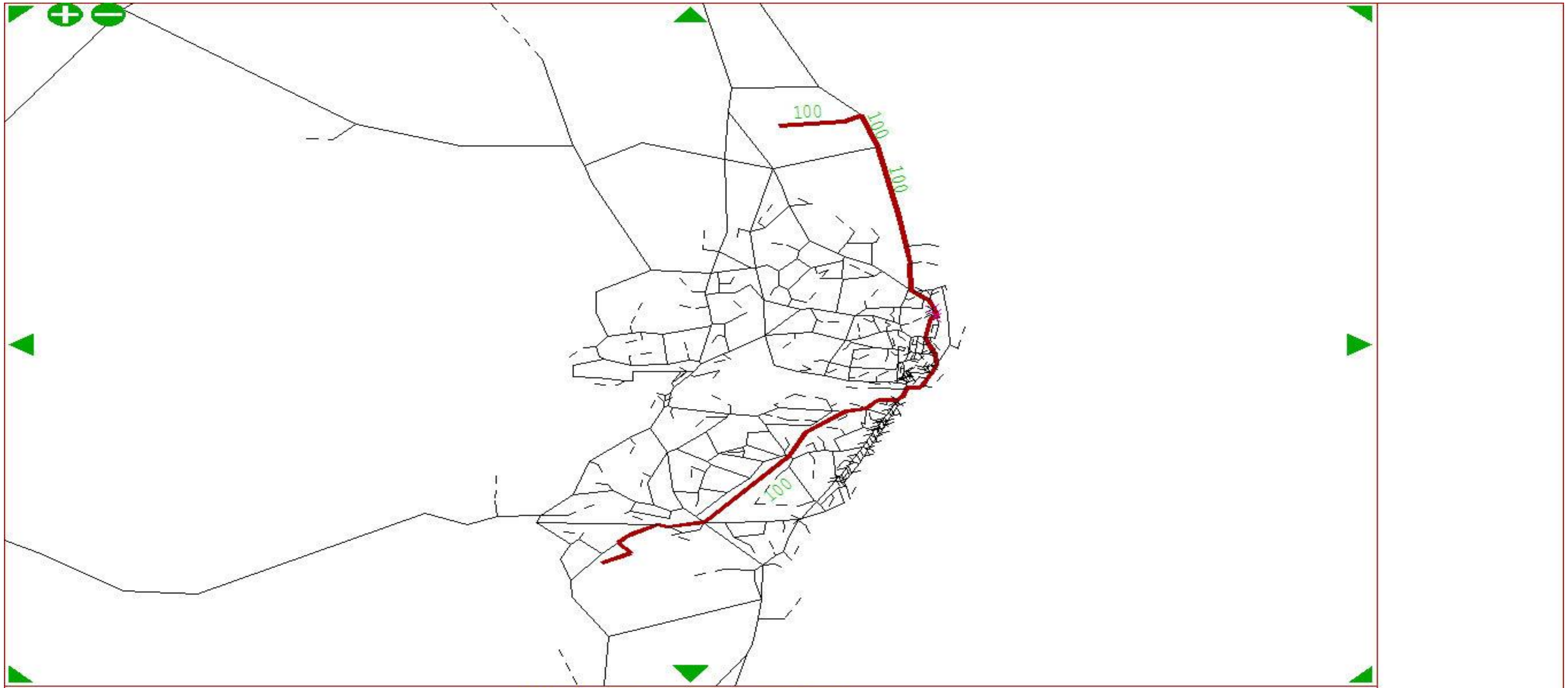
From Zone 102 To Zone 143 - User Class 2



From Zone 102 To Zone 143 - User Class 3

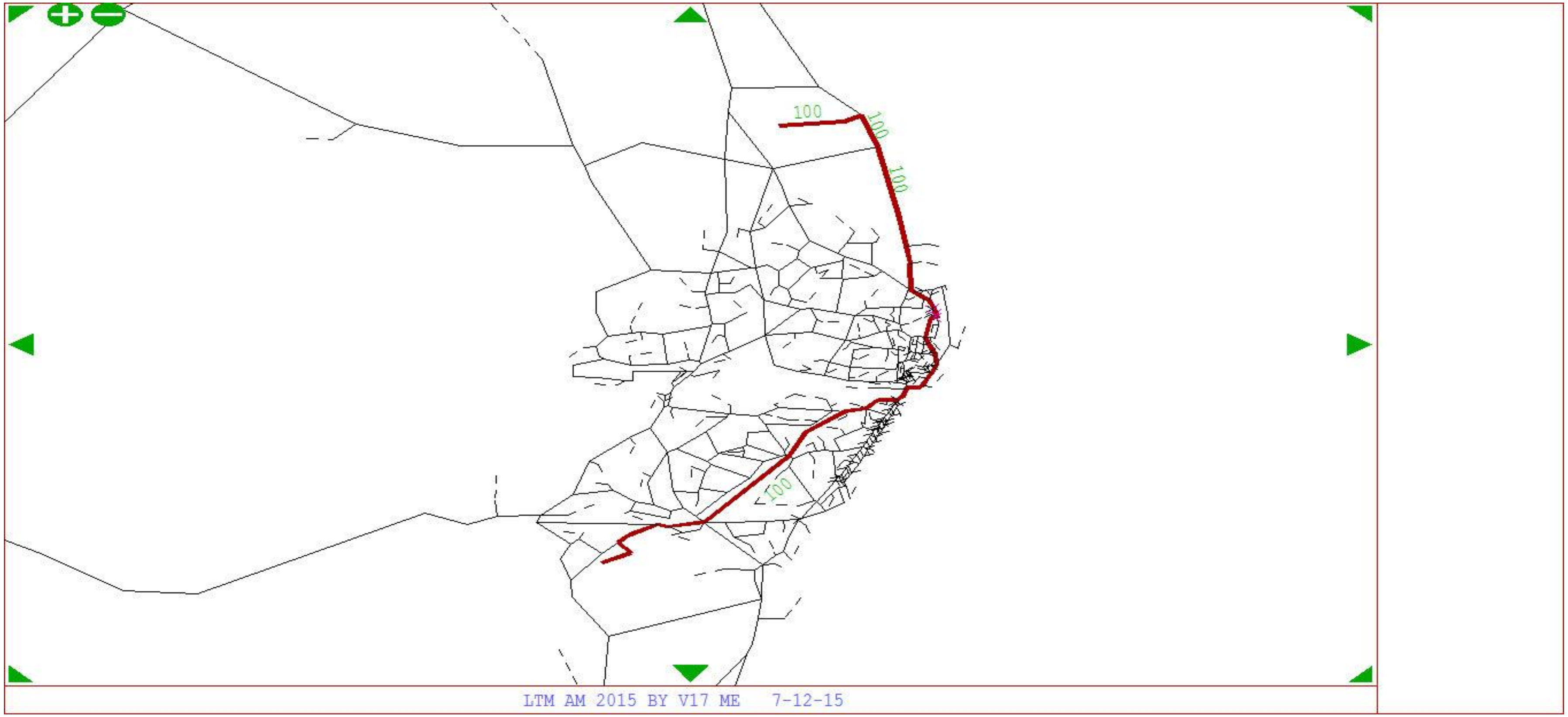


From Zone 102 To Zone 143 - User Class 4

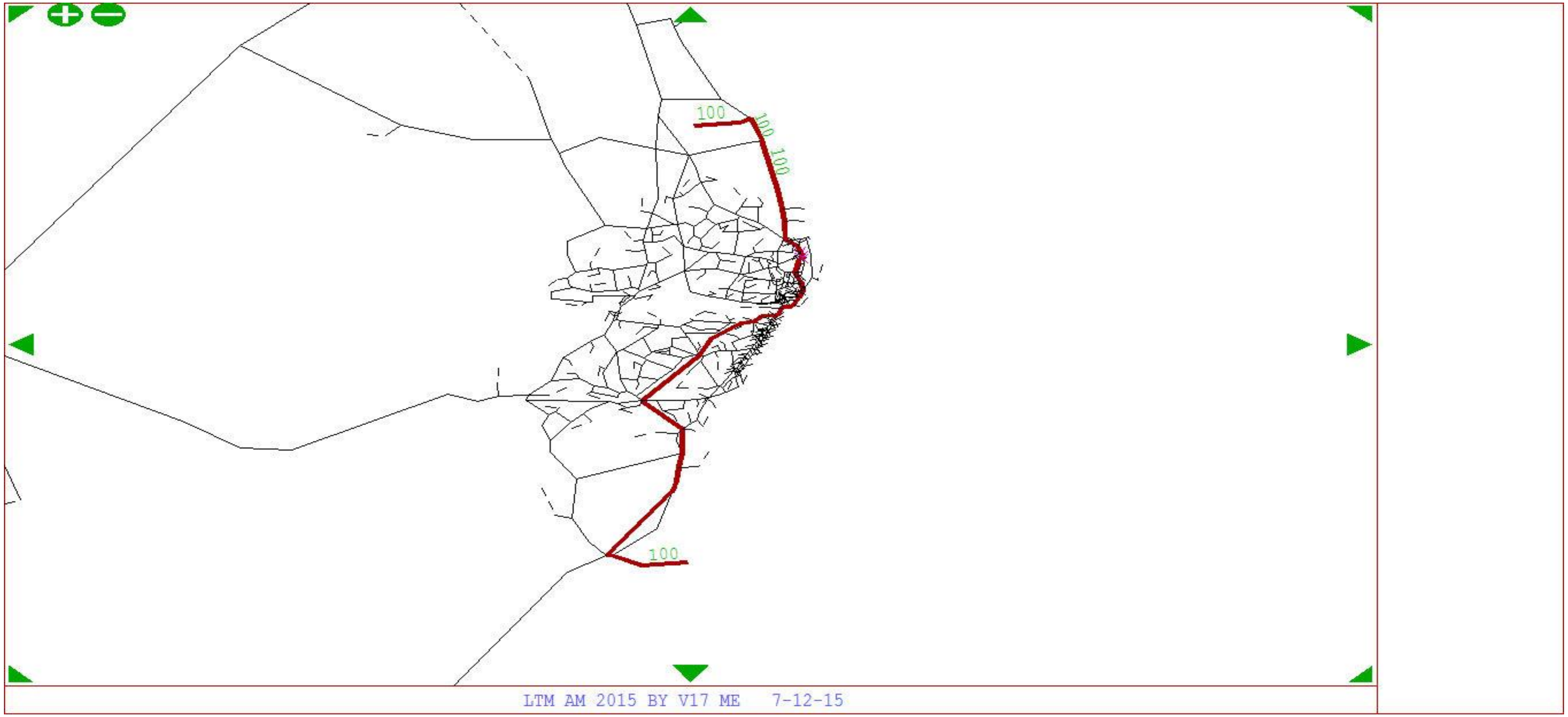


LTM AM 2015 BY V17 ME 7-12-15

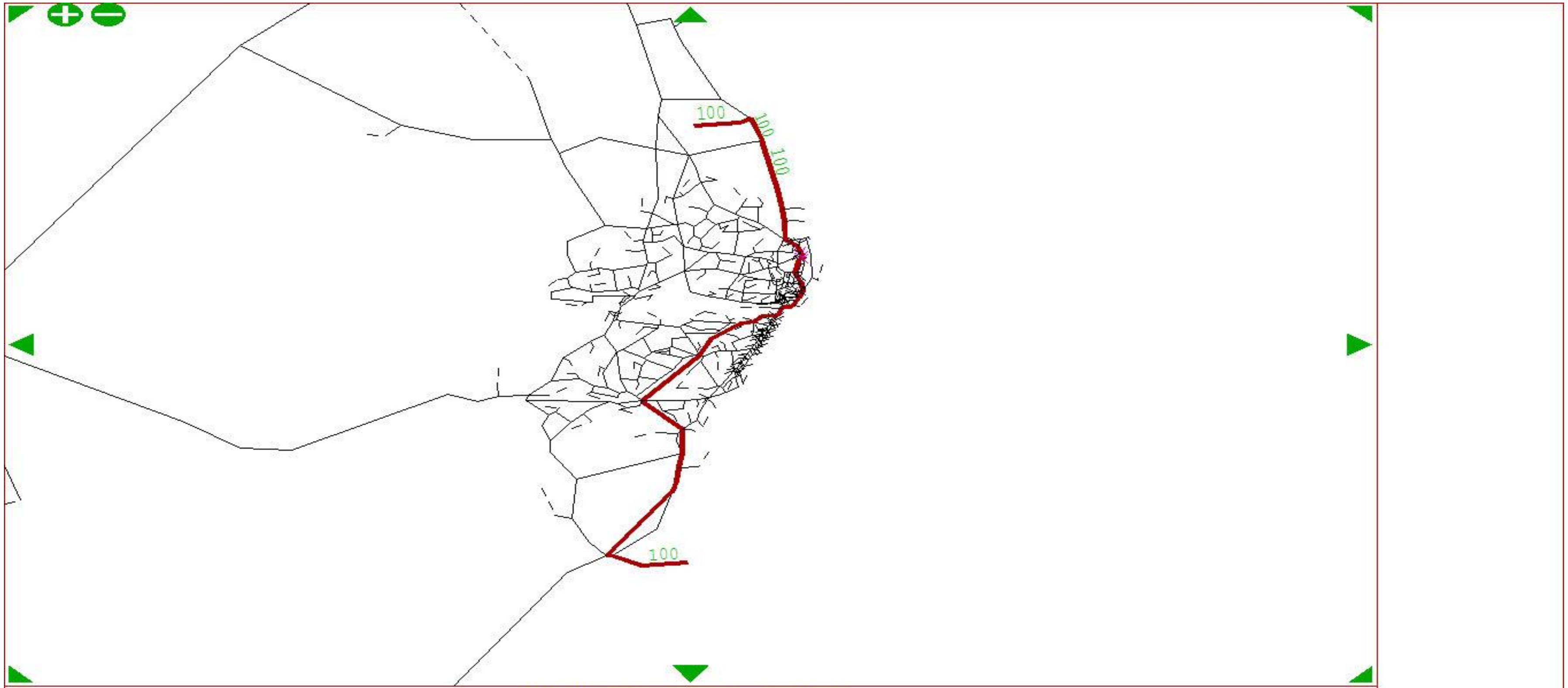
From Zone 102 To Zone 143 - User Class 5



From Zone 102 To Zone 149 - User Class 1

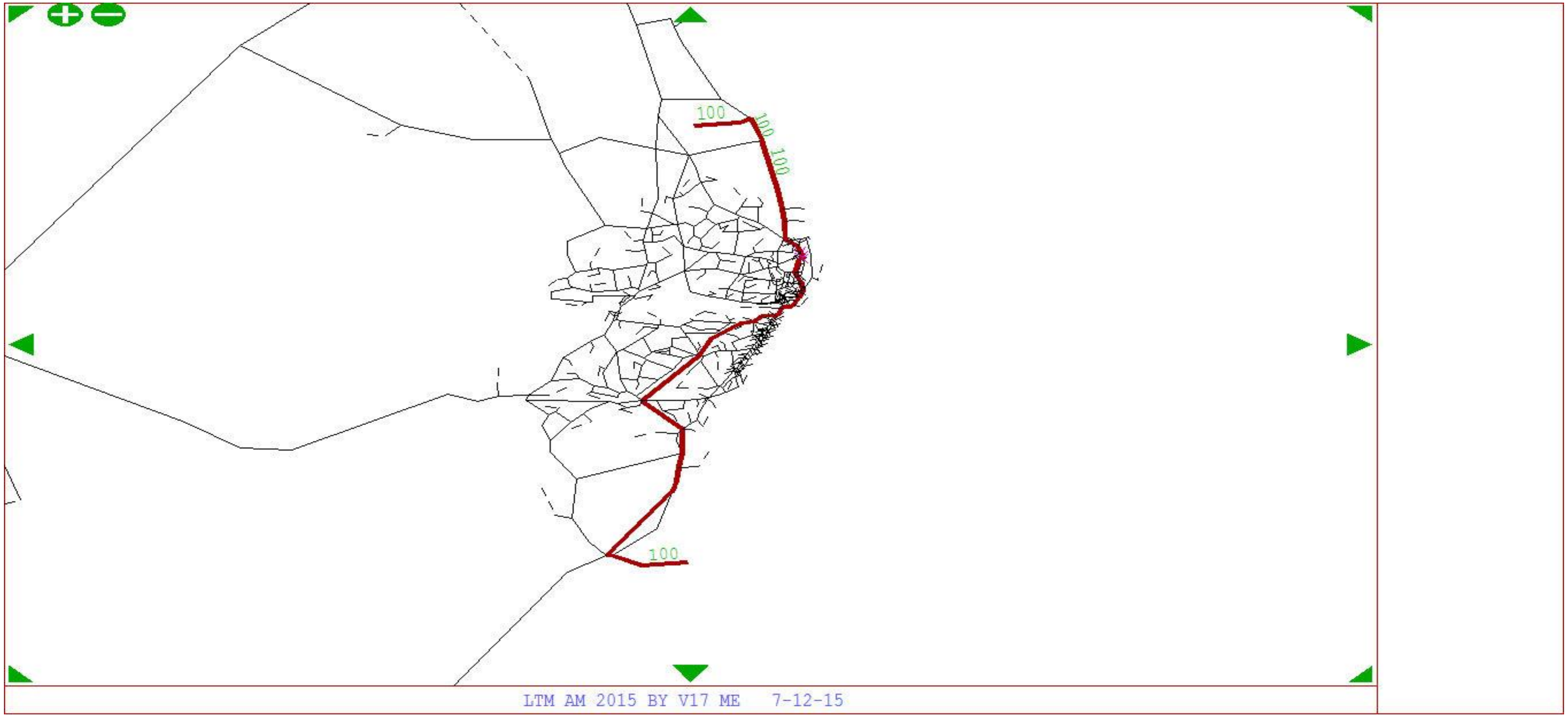


From Zone 102 To Zone 149 - User Class 2

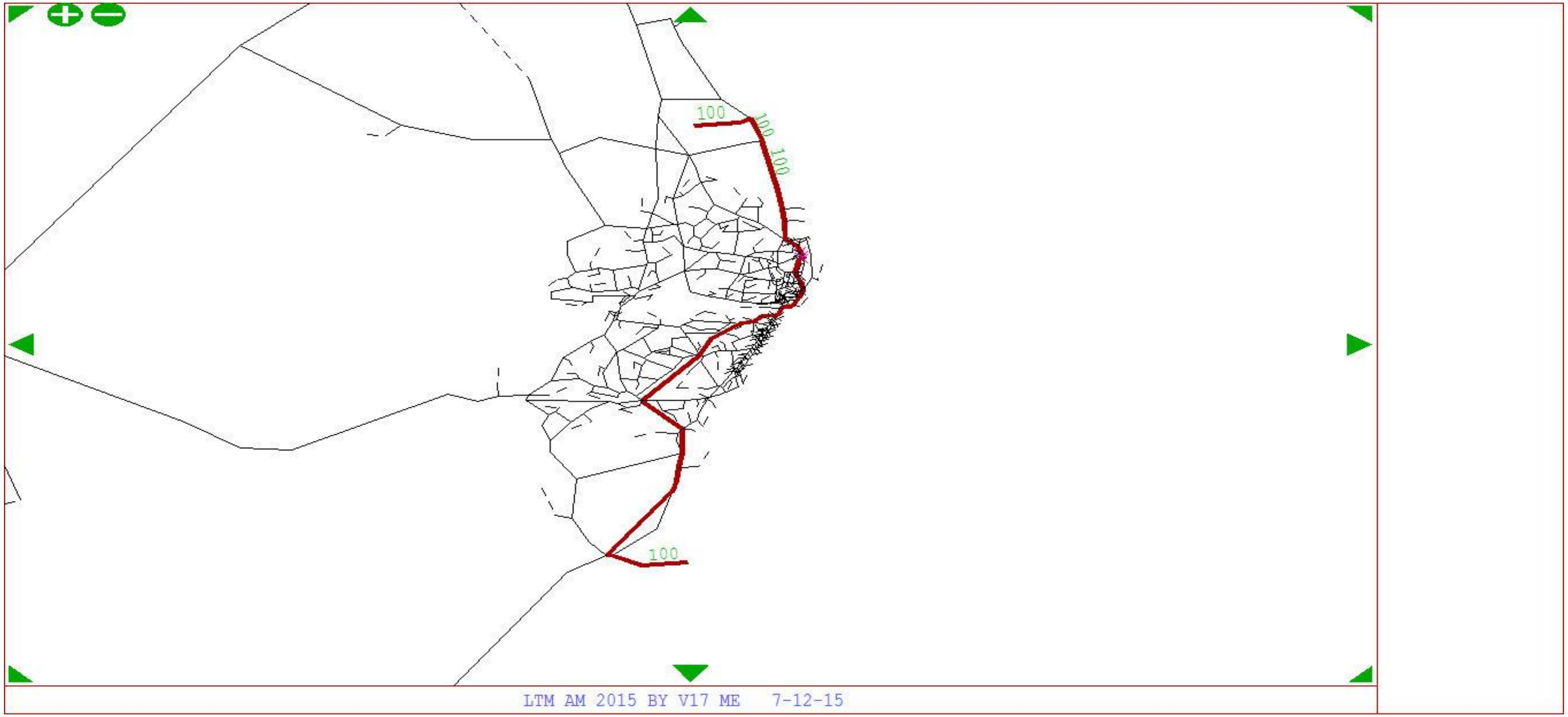


LTM AM 2015 BY V17 ME 7-12-15

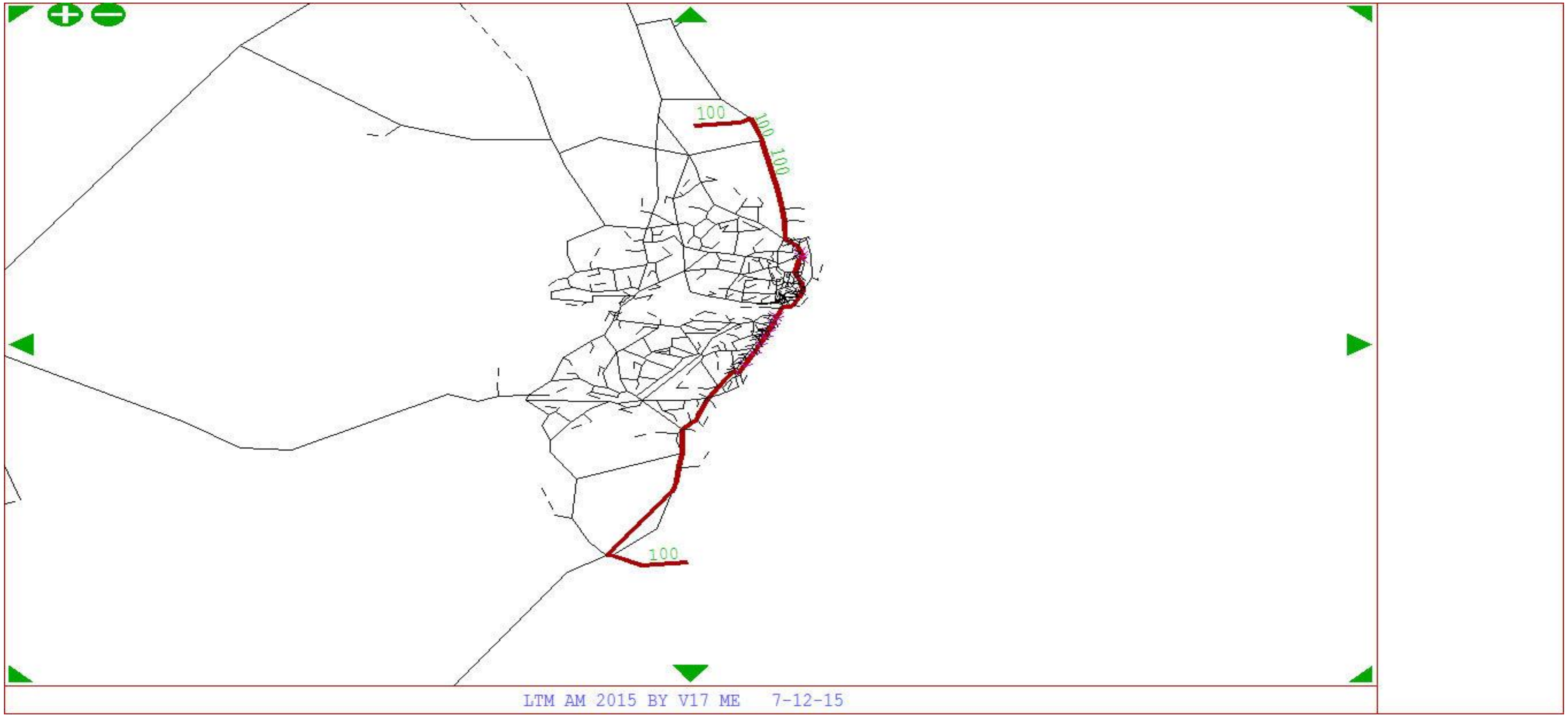
From Zone 102 To Zone 149 - User Class 3



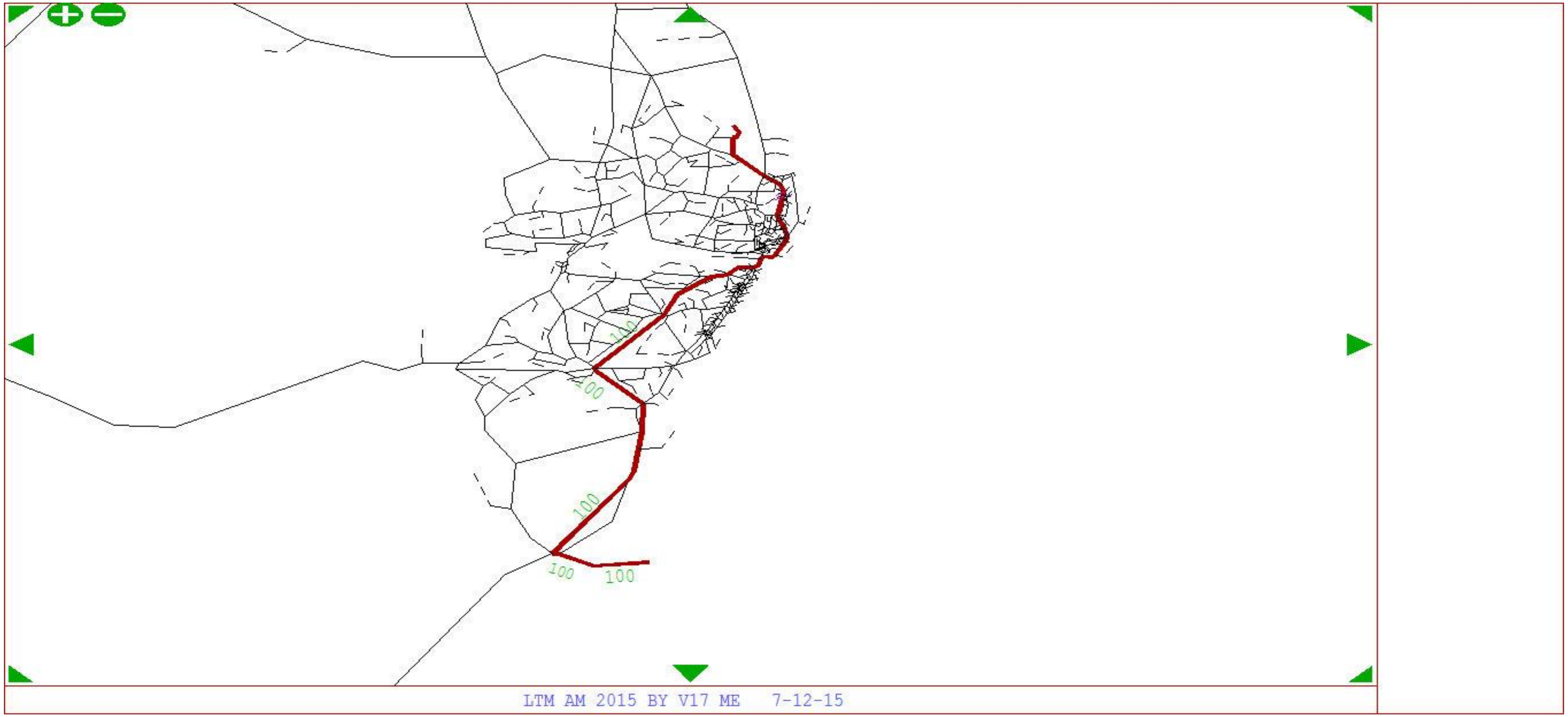
From Zone 102 To Zone 149 - User Class 4



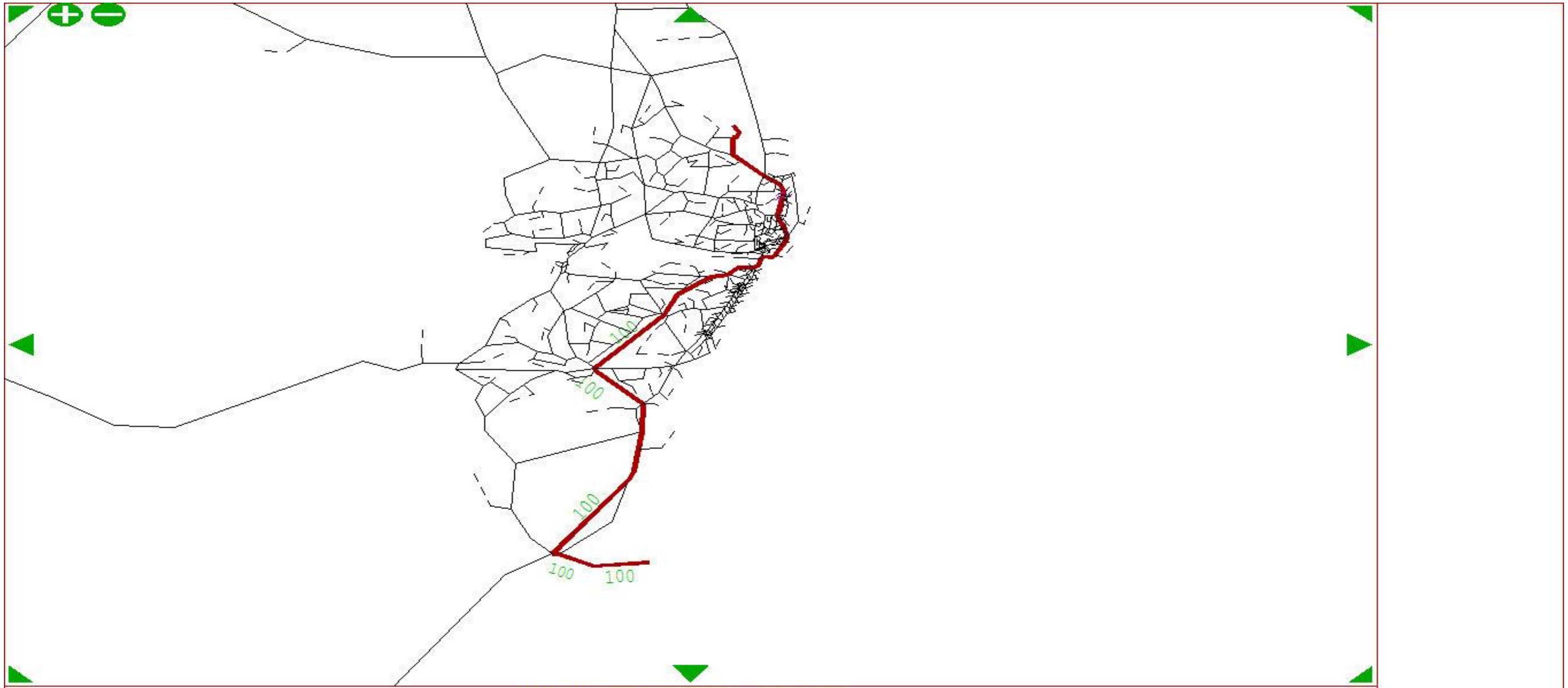
From Zone 102 To Zone 149 - User Class 5



From Zone 149 To Zone 101 - User Class 1

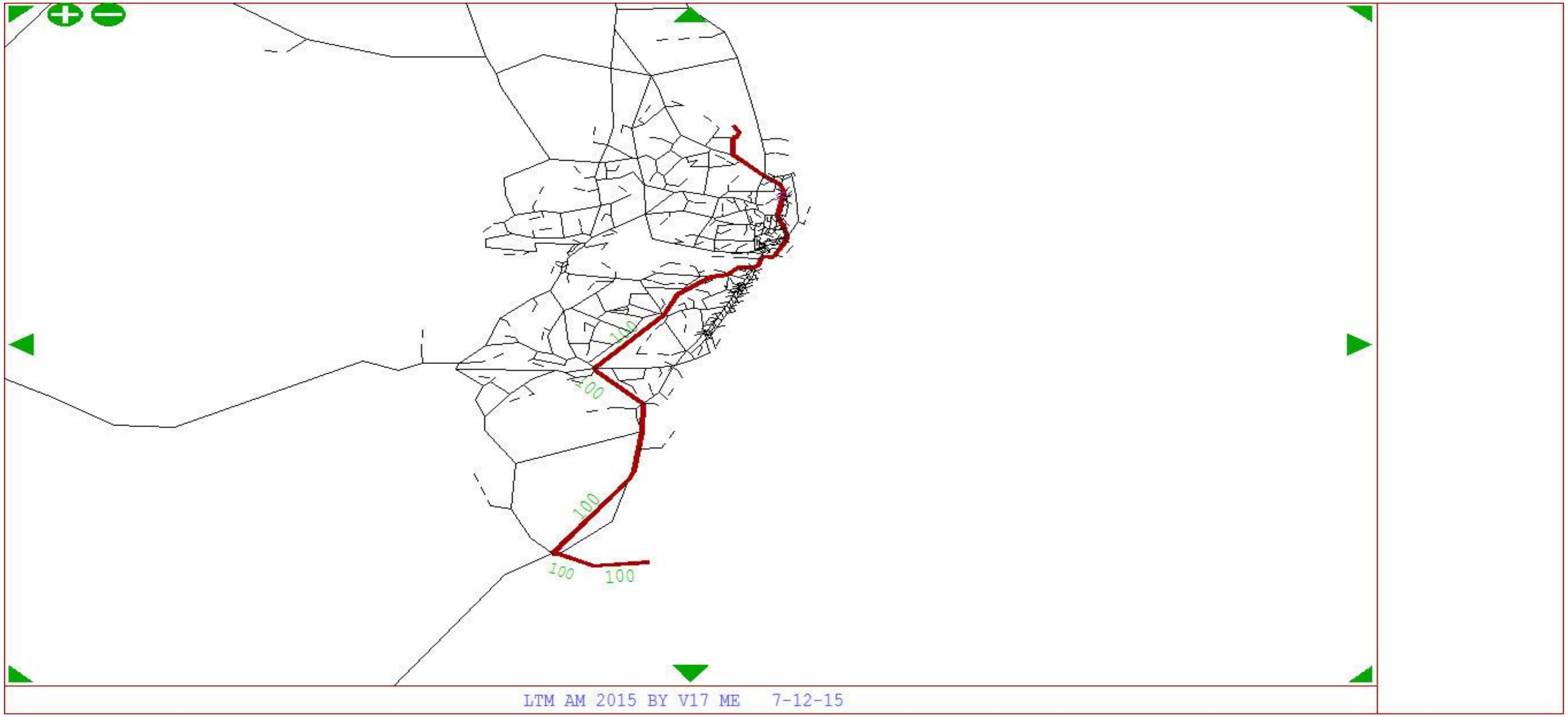


From Zone 149 To Zone 101 - User Class 2

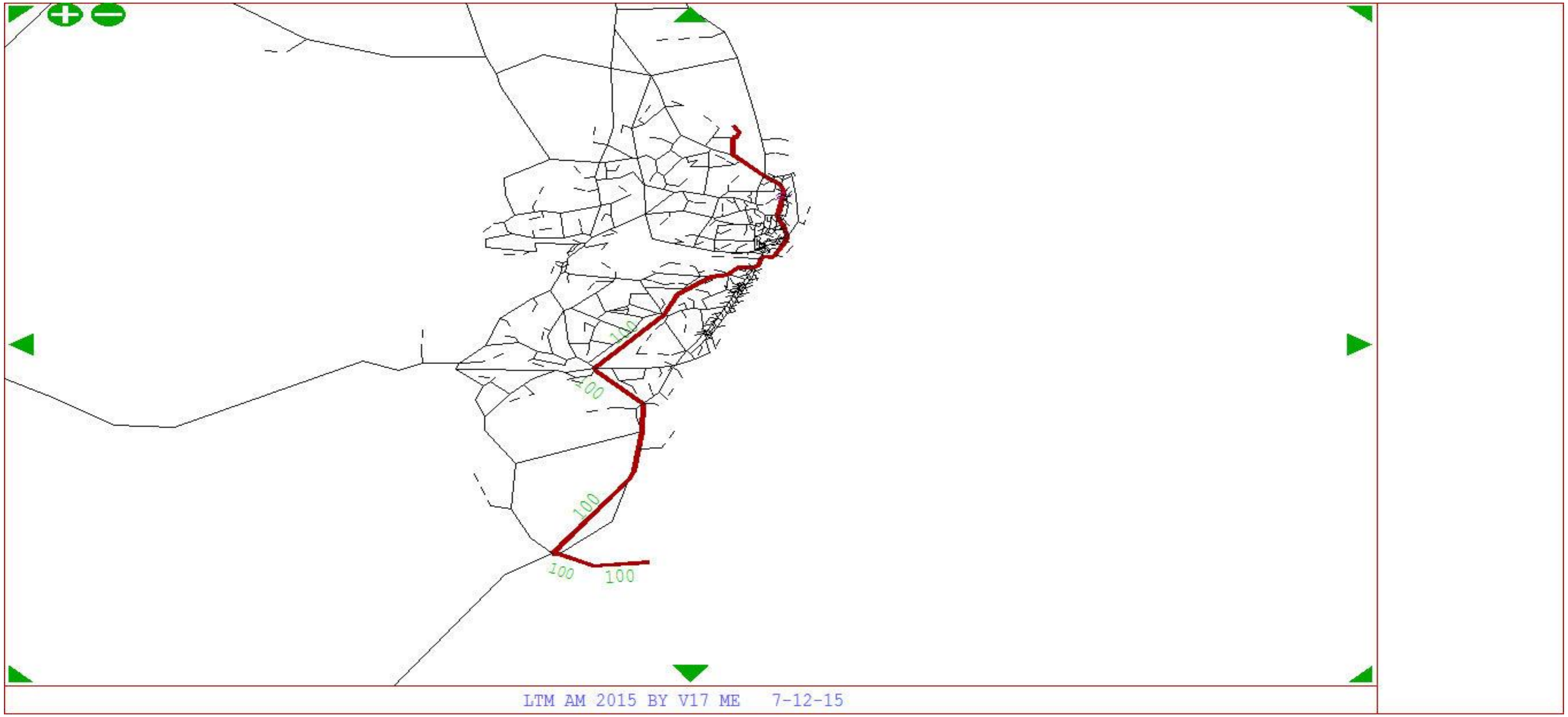


LTM AM 2015 BY V17 ME   7-12-15

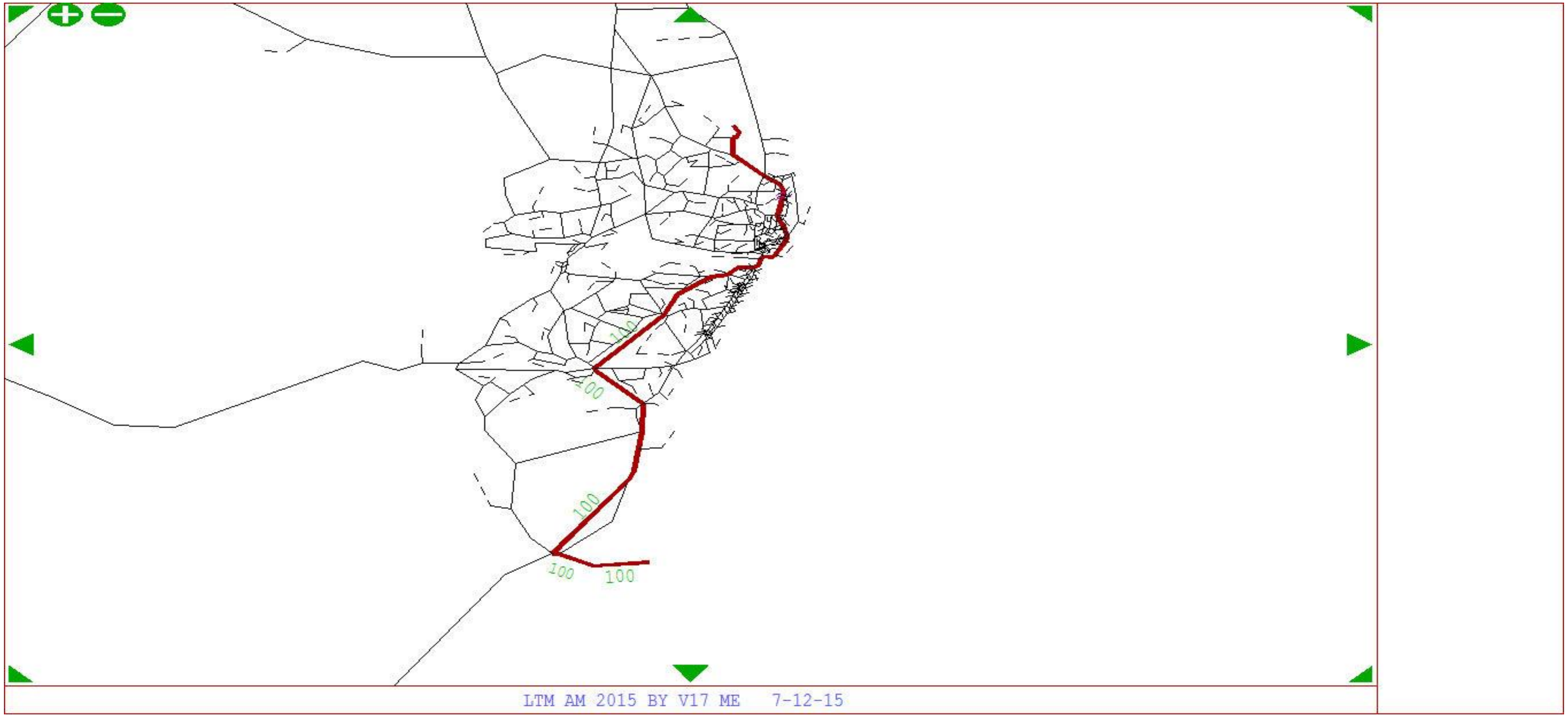
From Zone 149 To Zone 101 - User Class 3



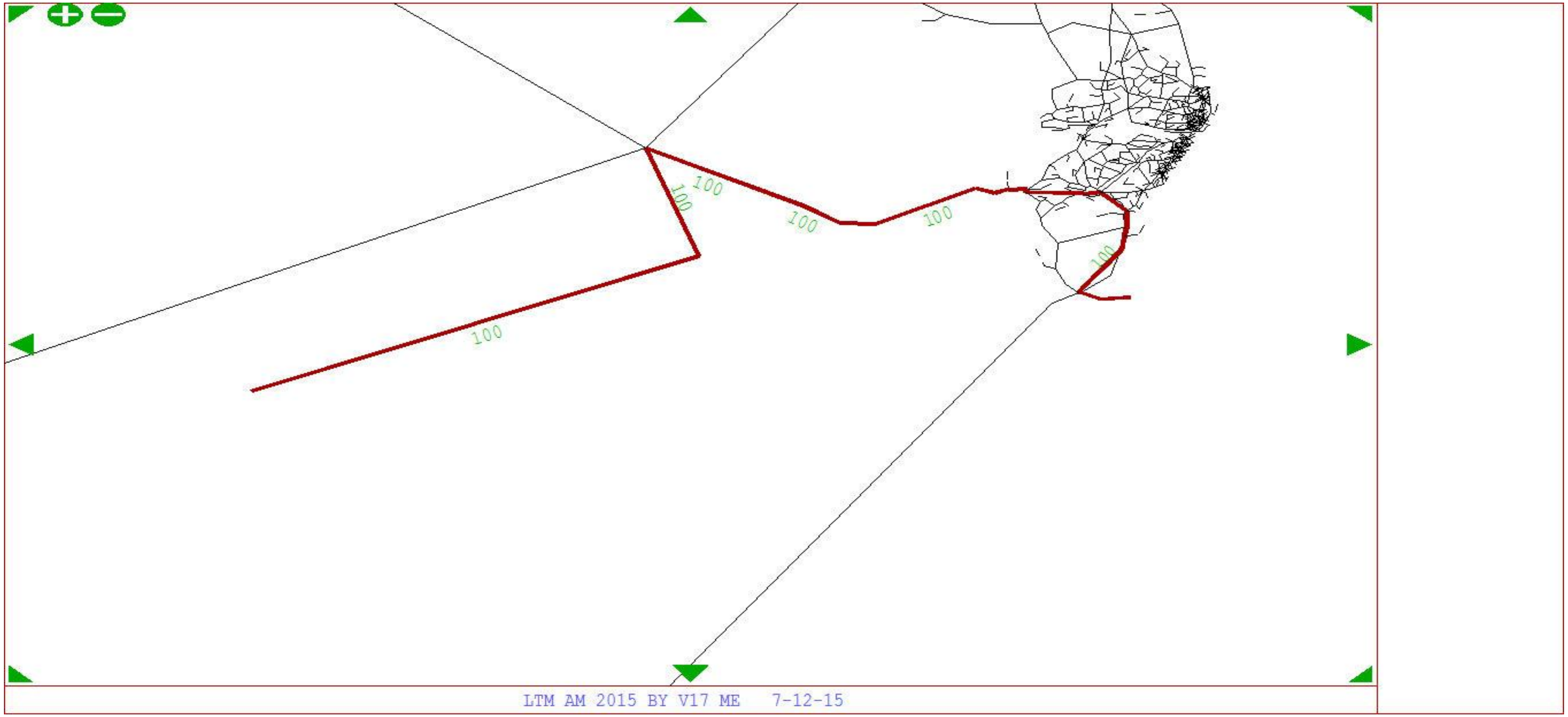
From Zone 149 To Zone 101 - User Class 4



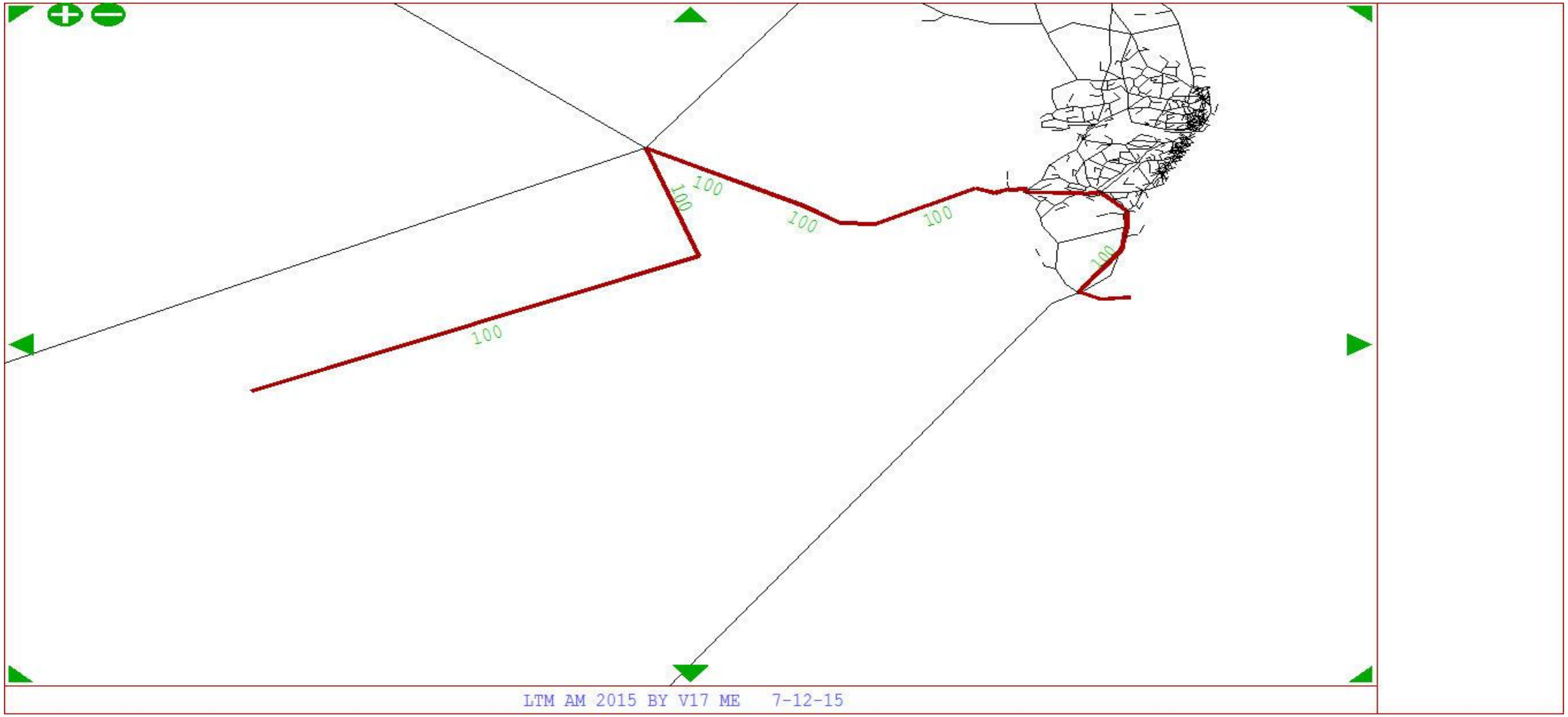
From Zone 149 To Zone 101 - User Class 5



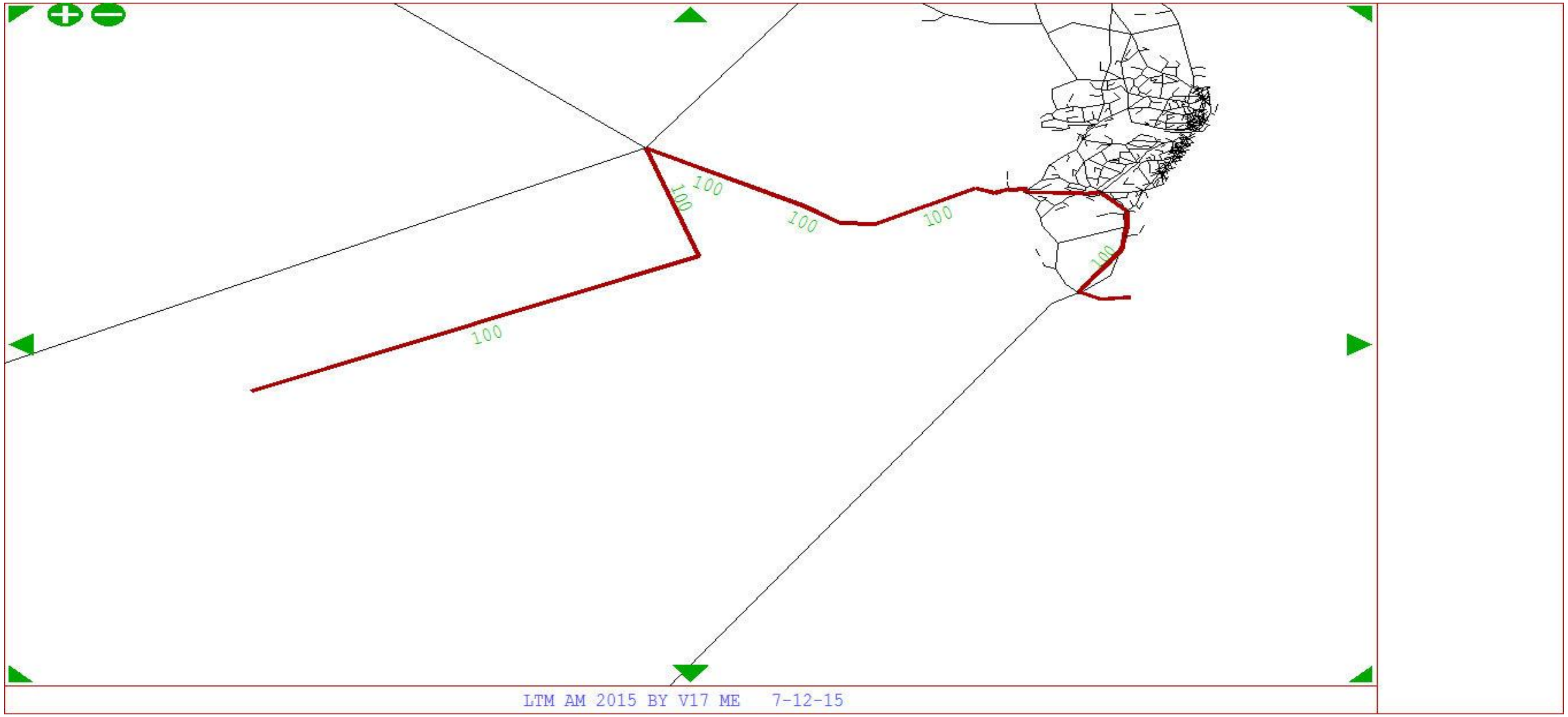
From Zone 149 To Zone 104 - User Class 1



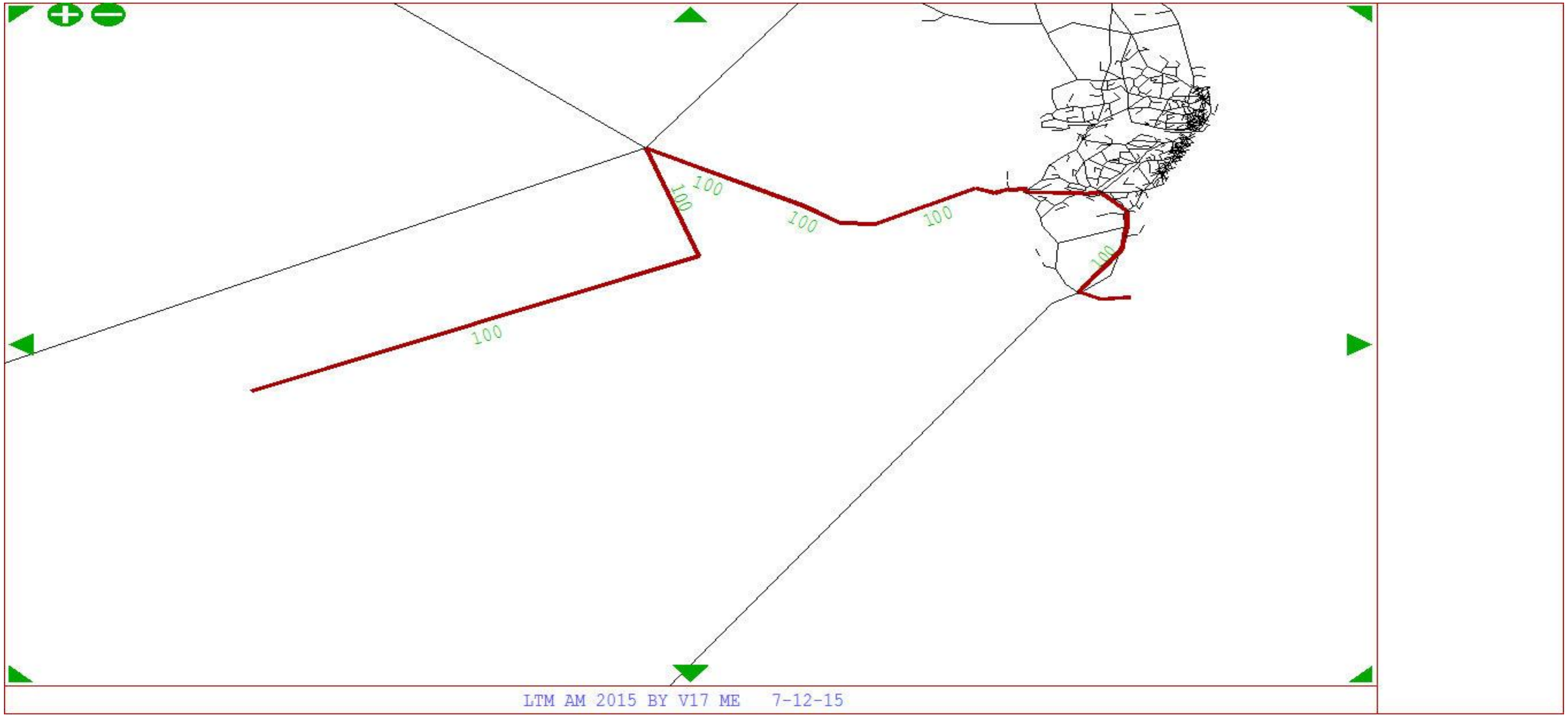
From Zone 149 To Zone 104 - User Class 2



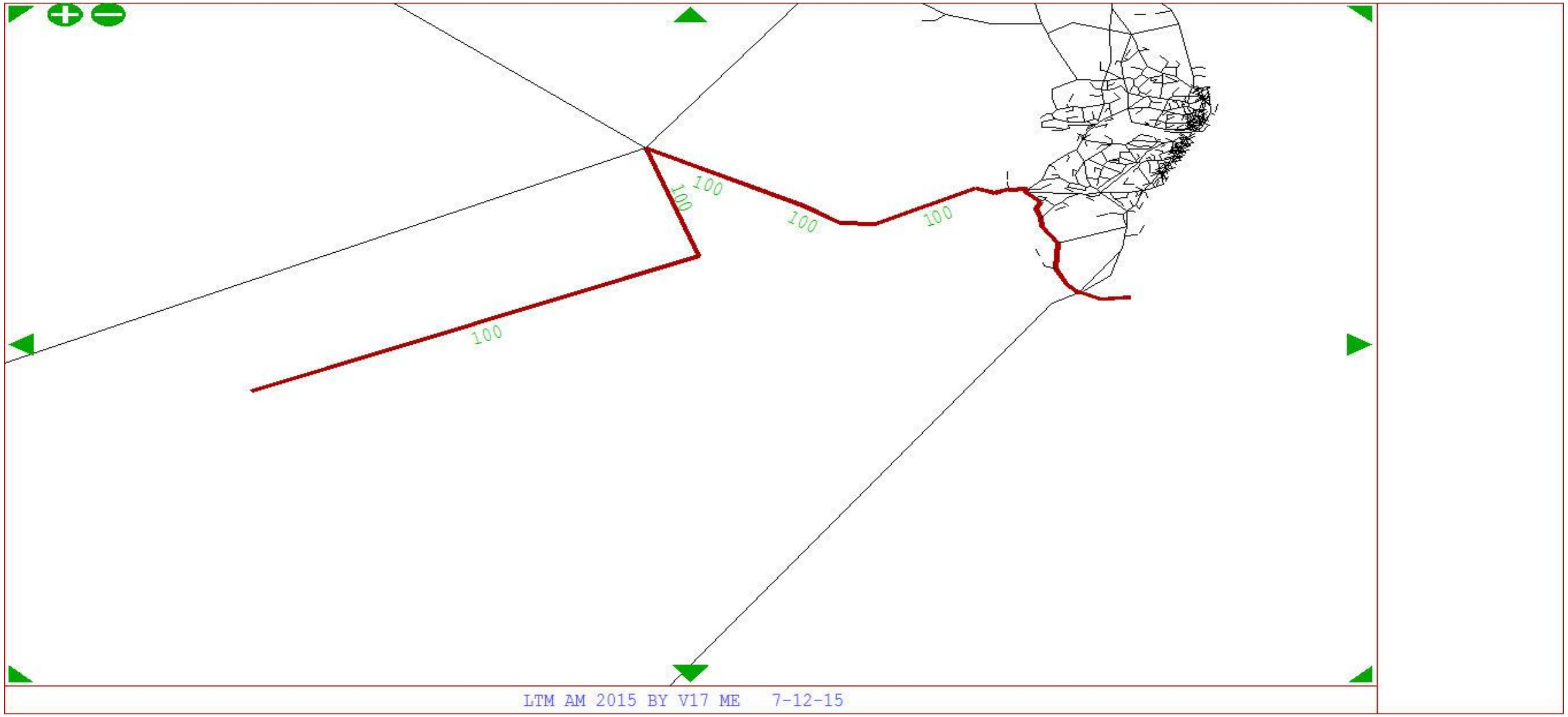
From Zone 149 To Zone 104 - User Class 3



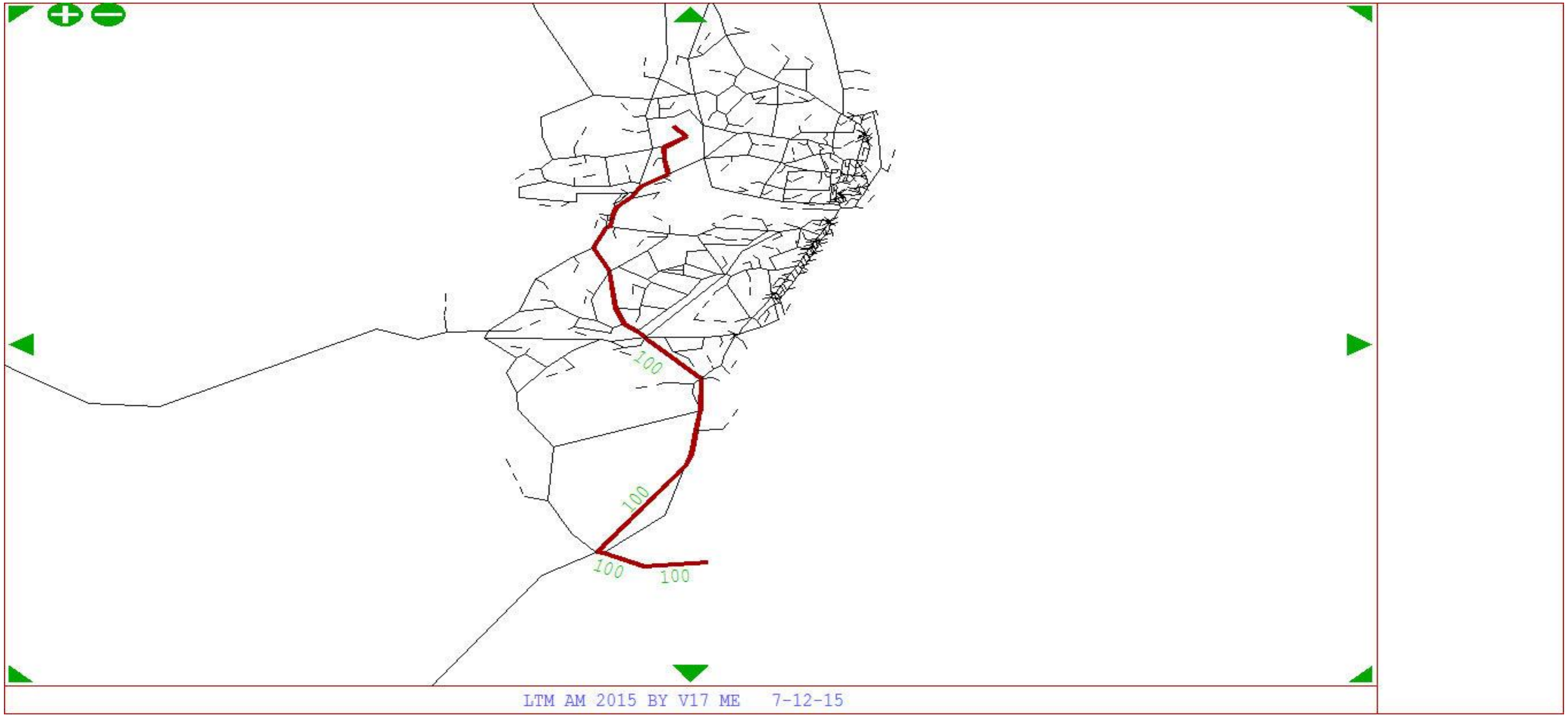
From Zone 149 To Zone 104 - User Class 4



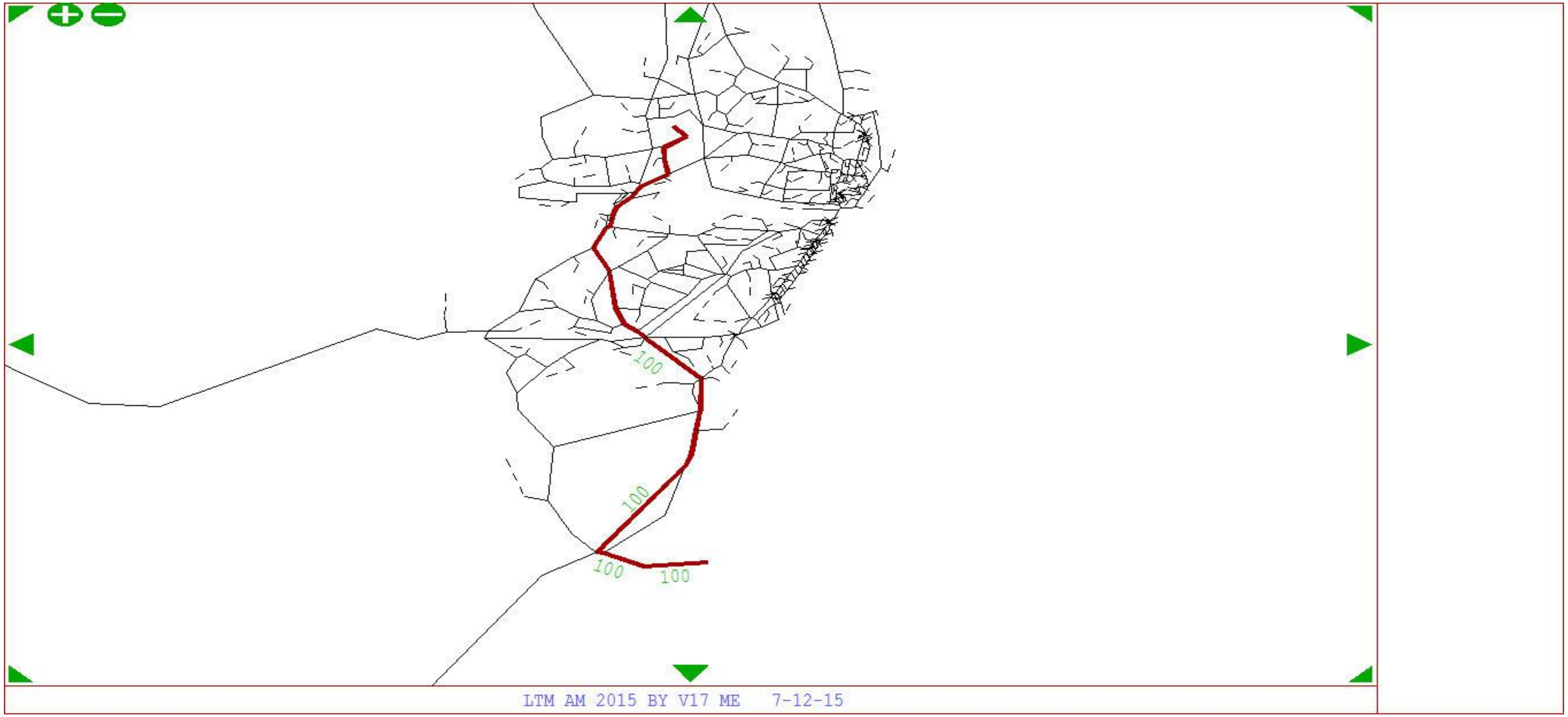
From Zone 149 To Zone 104 - User Class 5



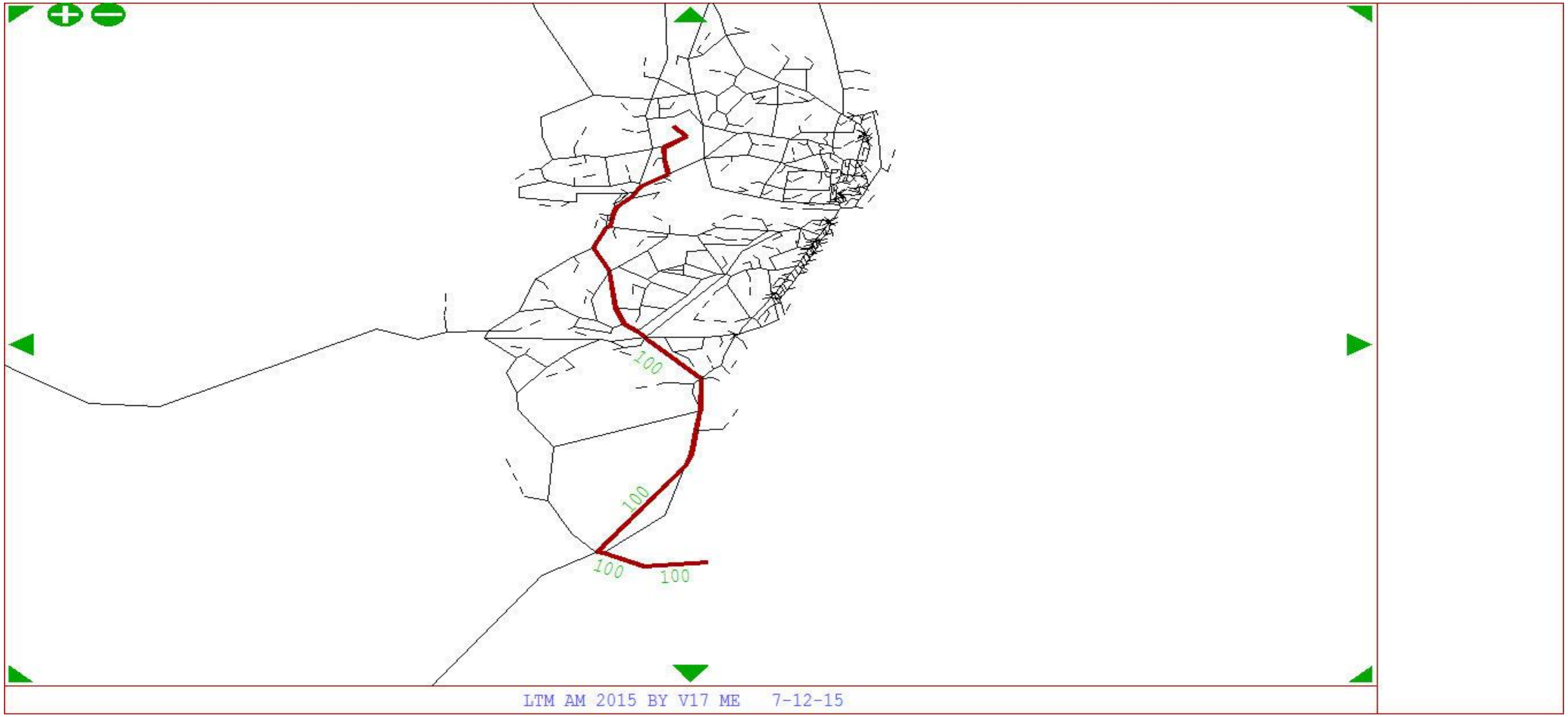
From Zone 149 To Zone 113 - User Class 1



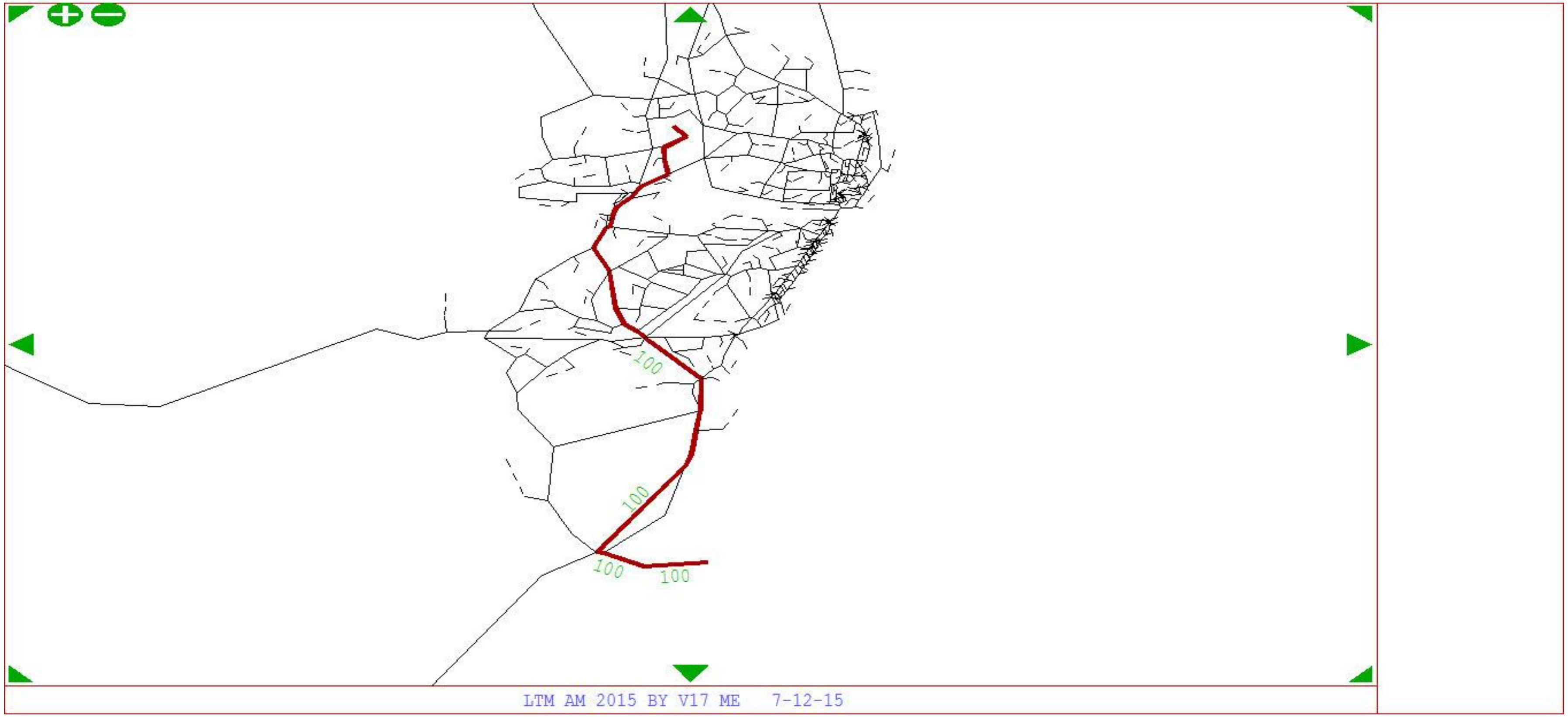
From Zone 149 To Zone 113 - User Class 2



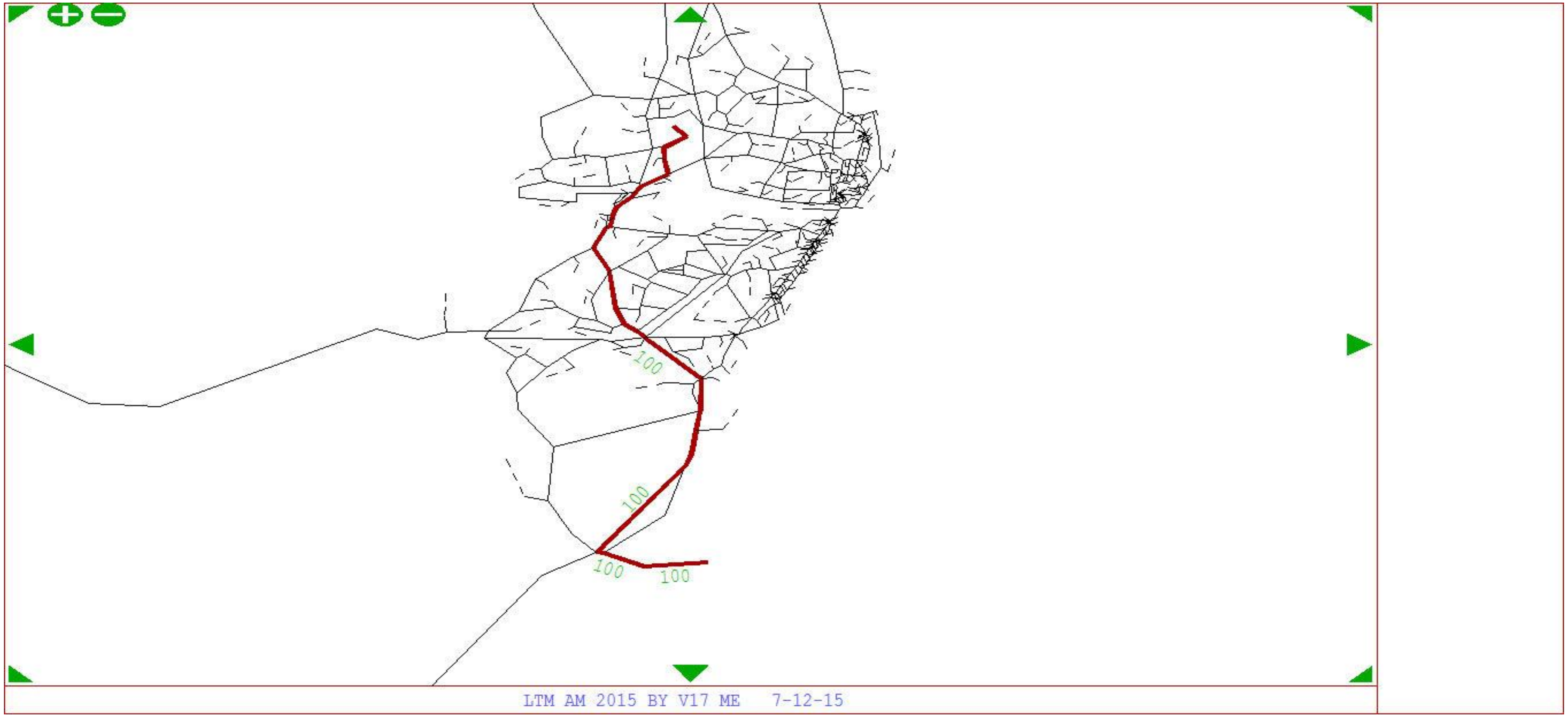
From Zone 149 To Zone 113 - User Class 3



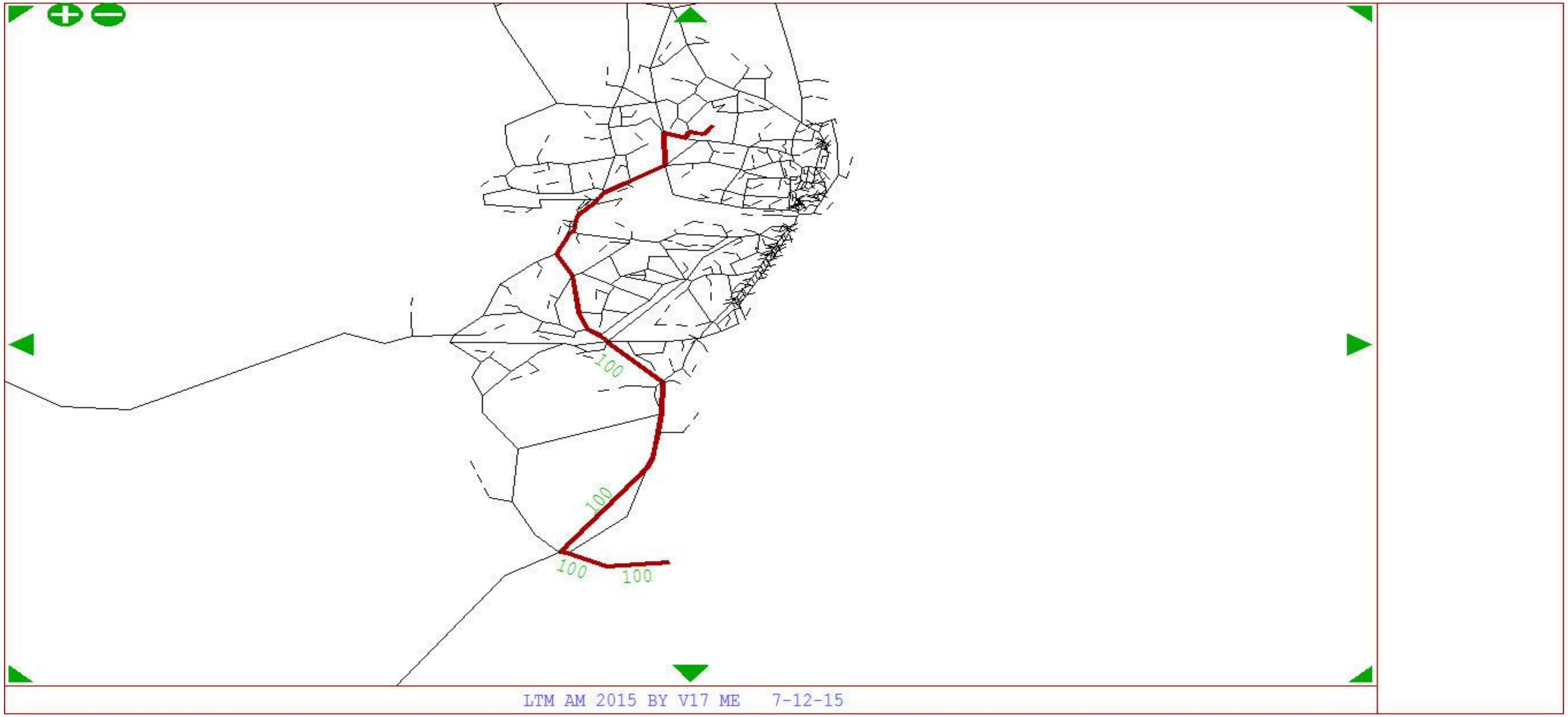
From Zone 149 To Zone 113 - User Class 4



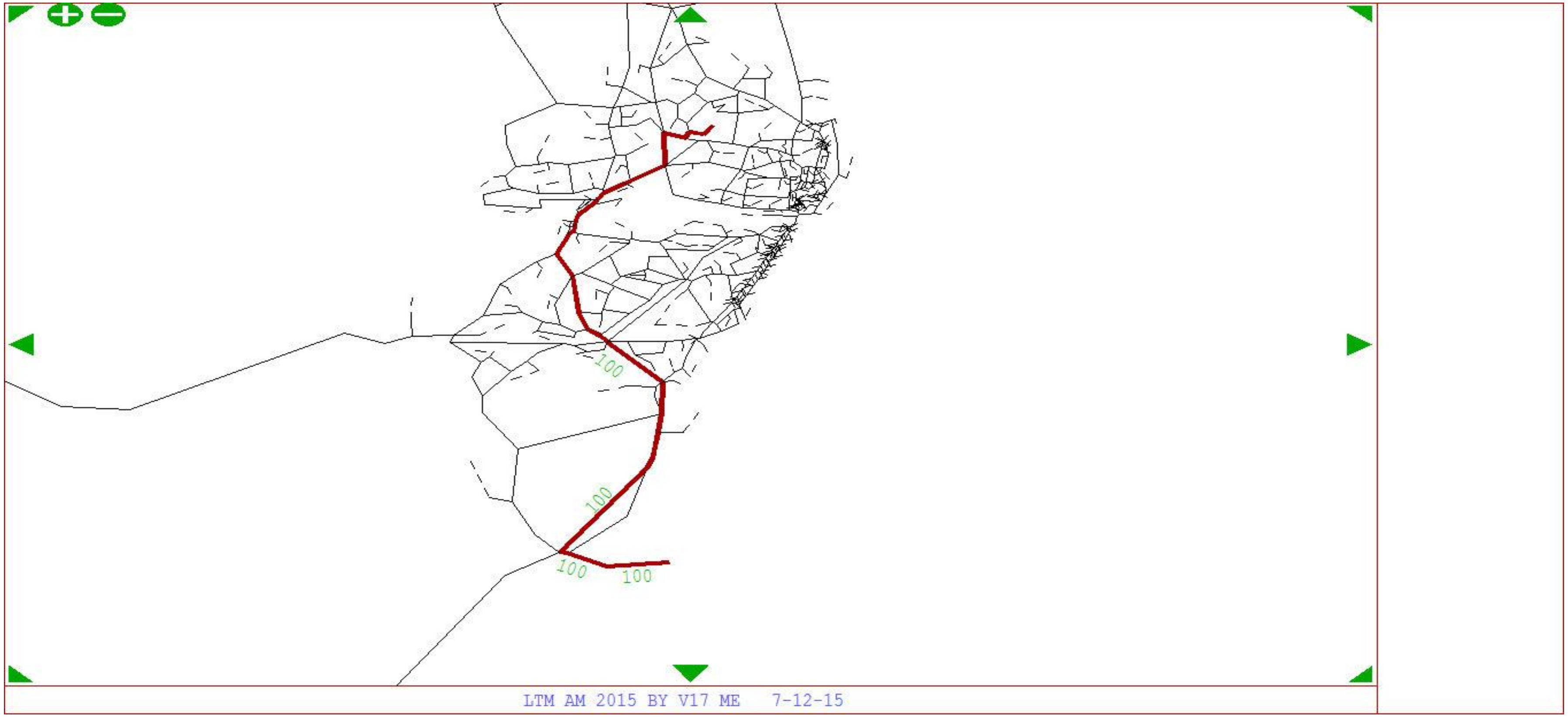
From Zone 149 To Zone 113 - User Class 5



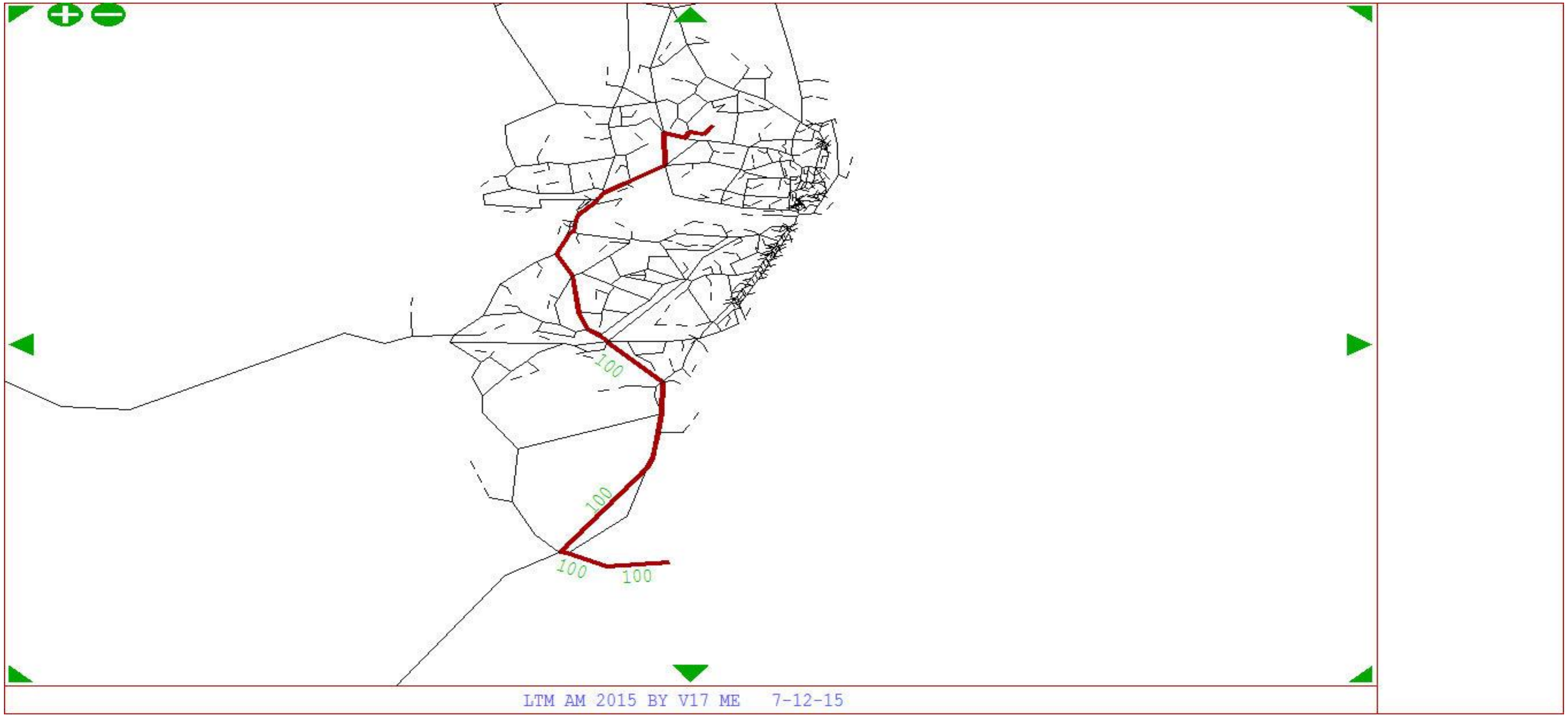
From Zone 149 To Zone 114 - User Class 1



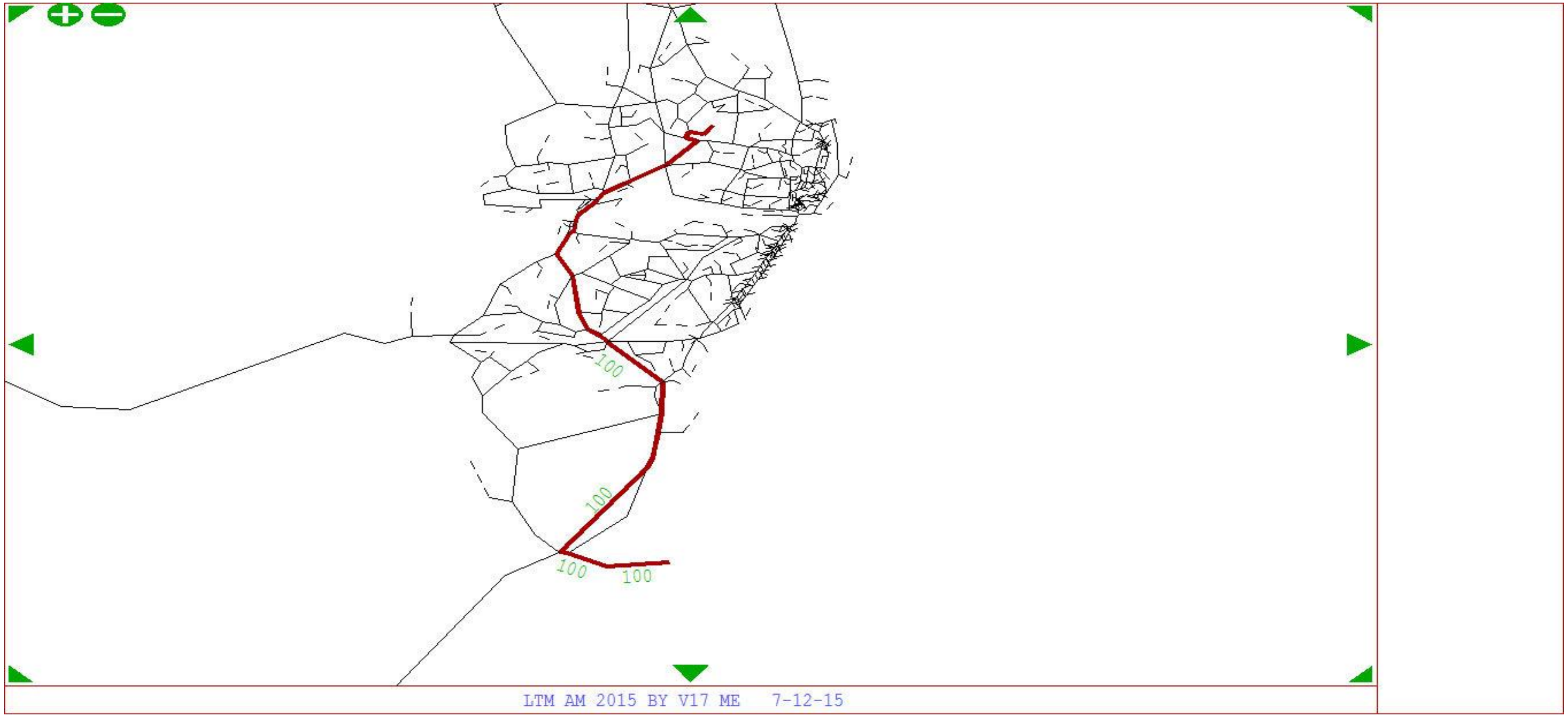
From Zone 149 To Zone 114 - User Class 2



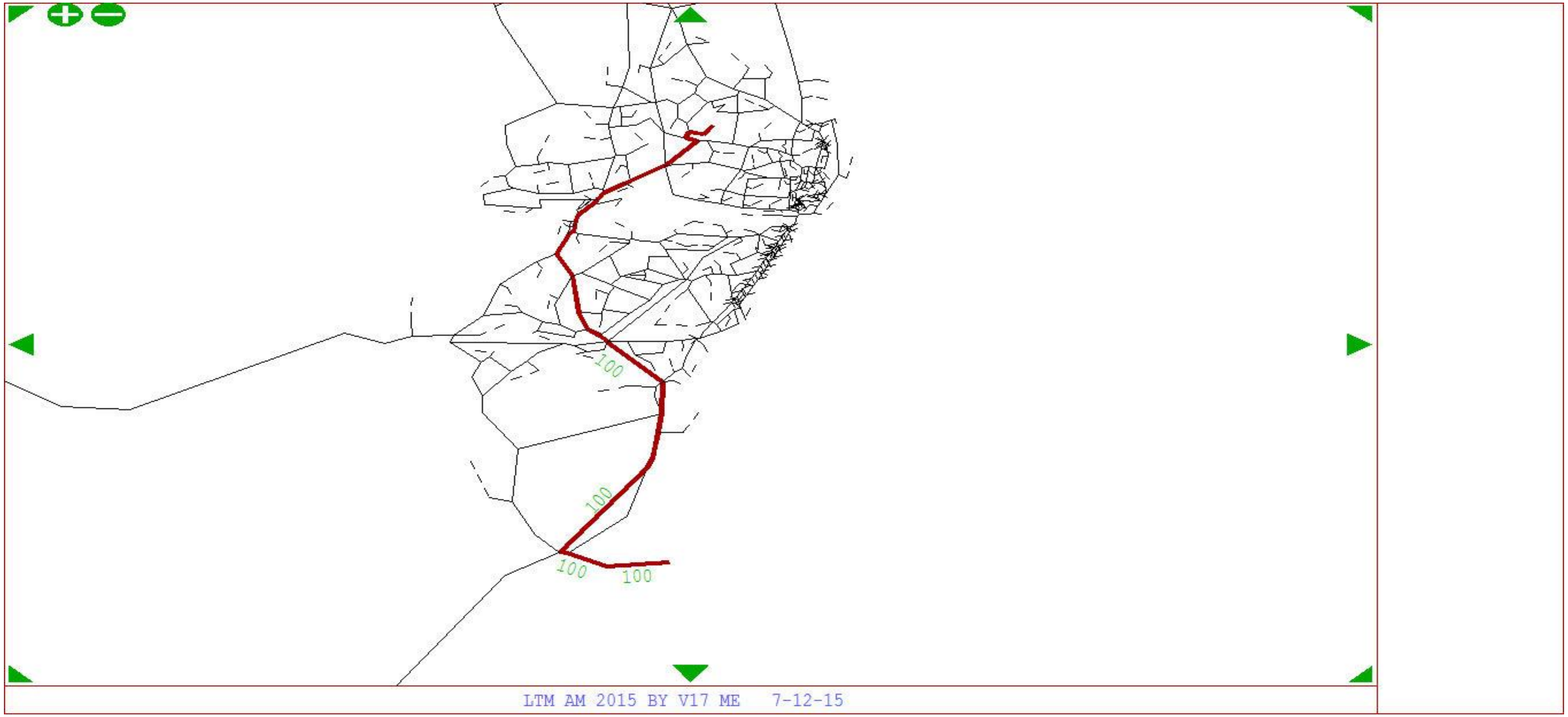
From Zone 149 To Zone 114 - User Class 3



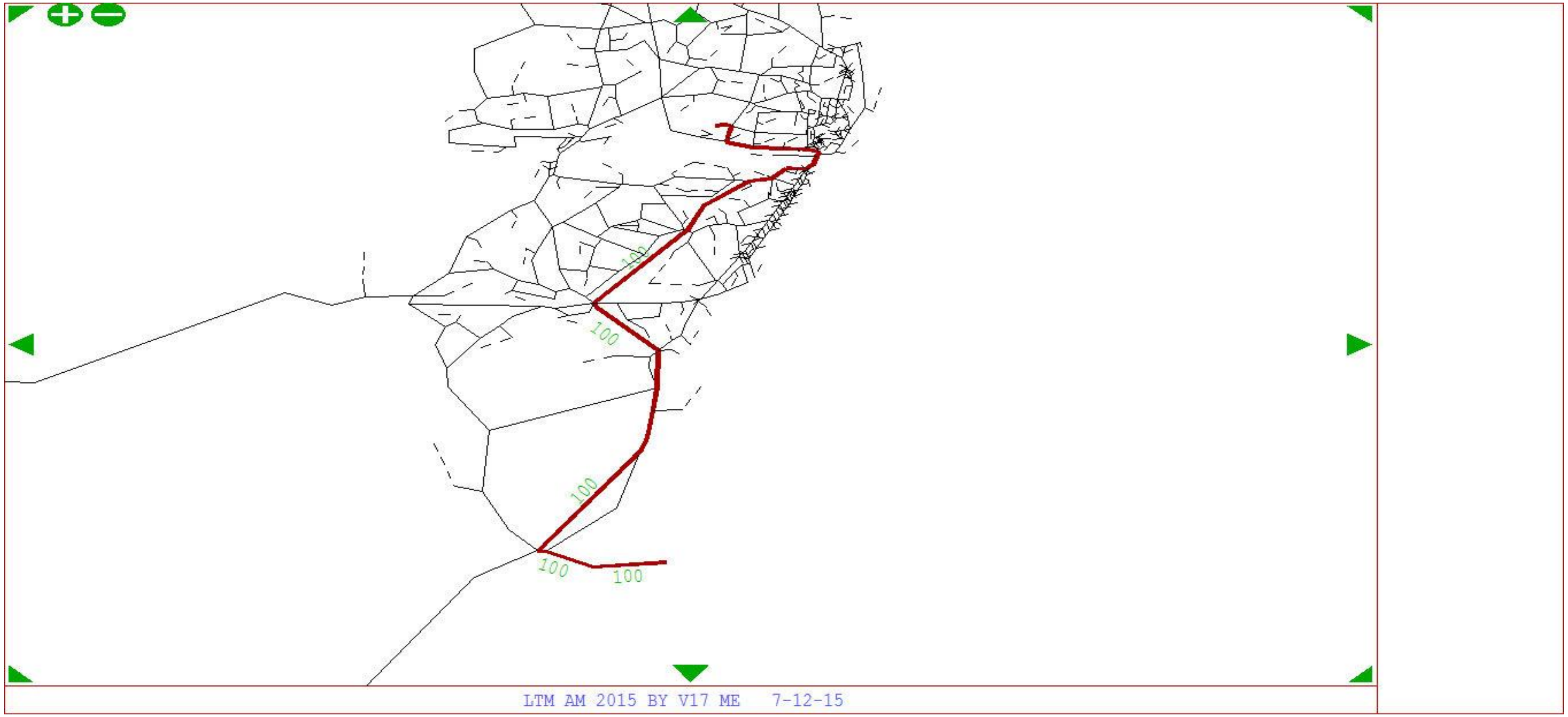
From Zone 149 To Zone 114 - User Class 4



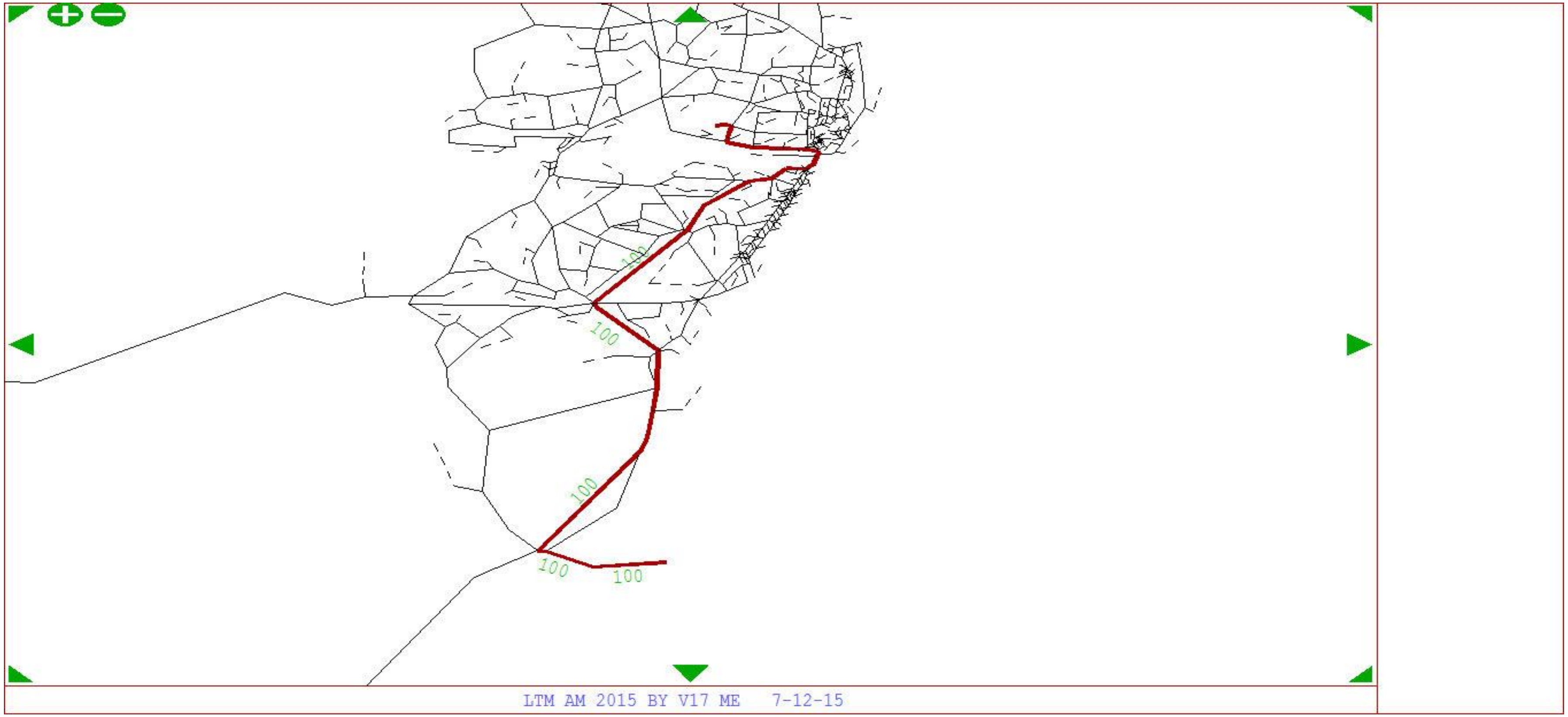
From Zone 149 To Zone 114 - User Class 5



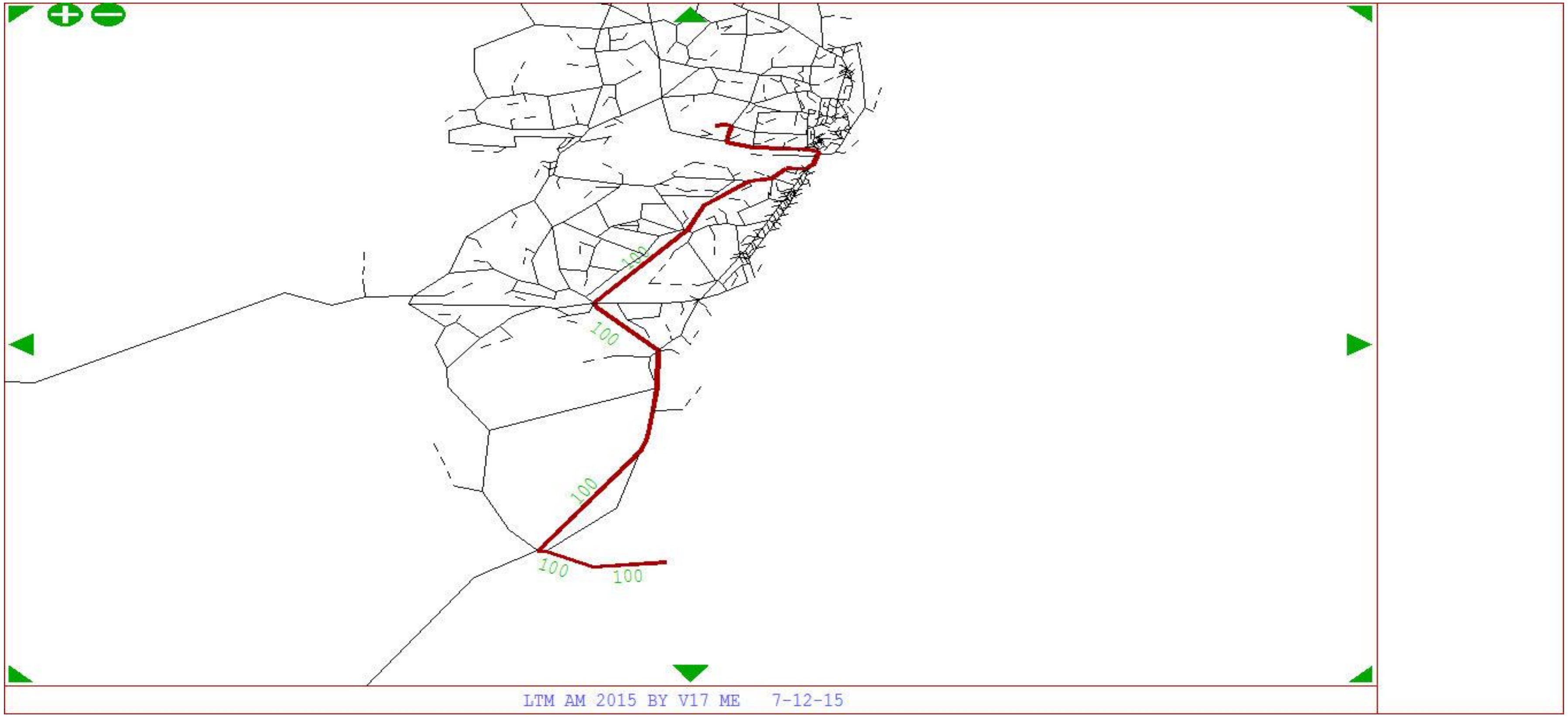
From Zone 149 To Zone 120 - User Class 1



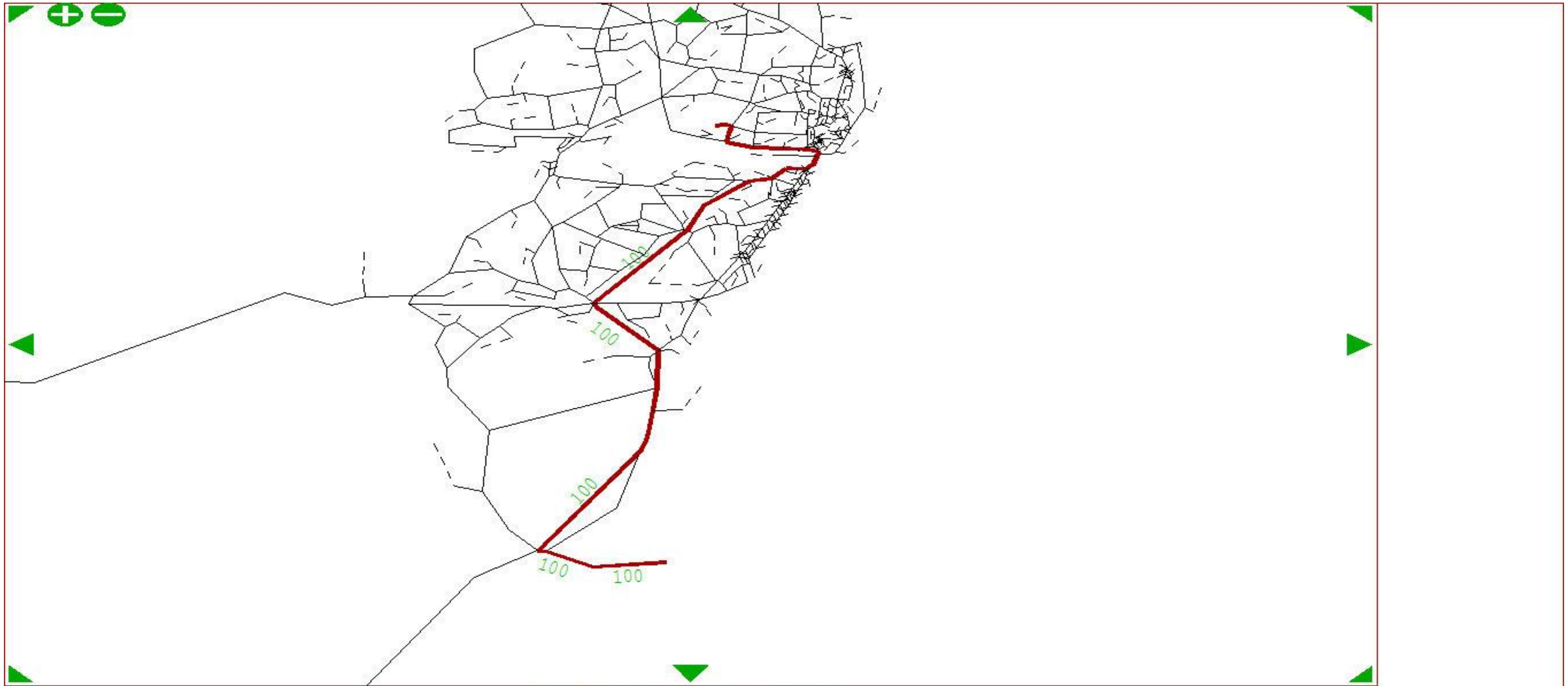
From Zone 149 To Zone 120 - User Class 2



From Zone 149 To Zone 120 - User Class 3



From Zone 149 To Zone 120 - User Class 4



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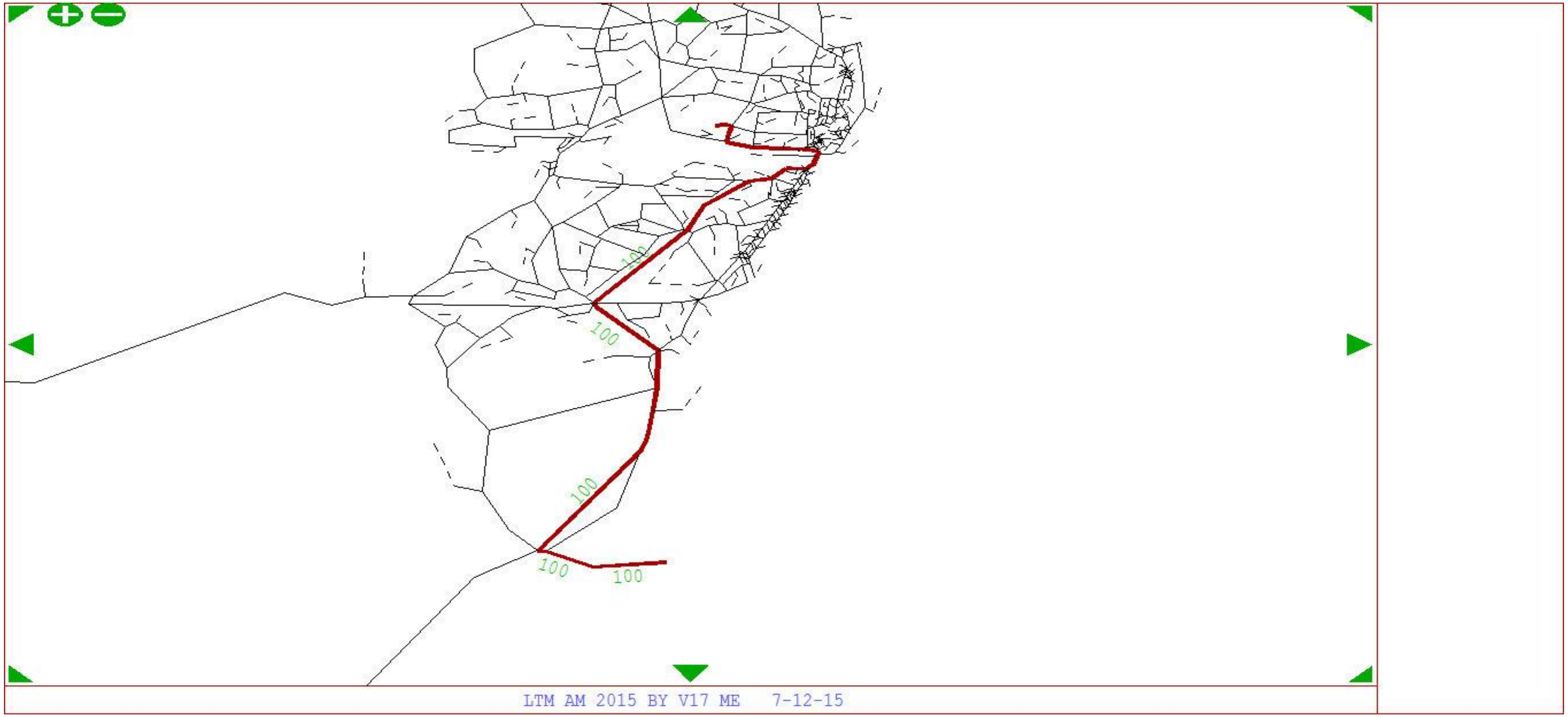
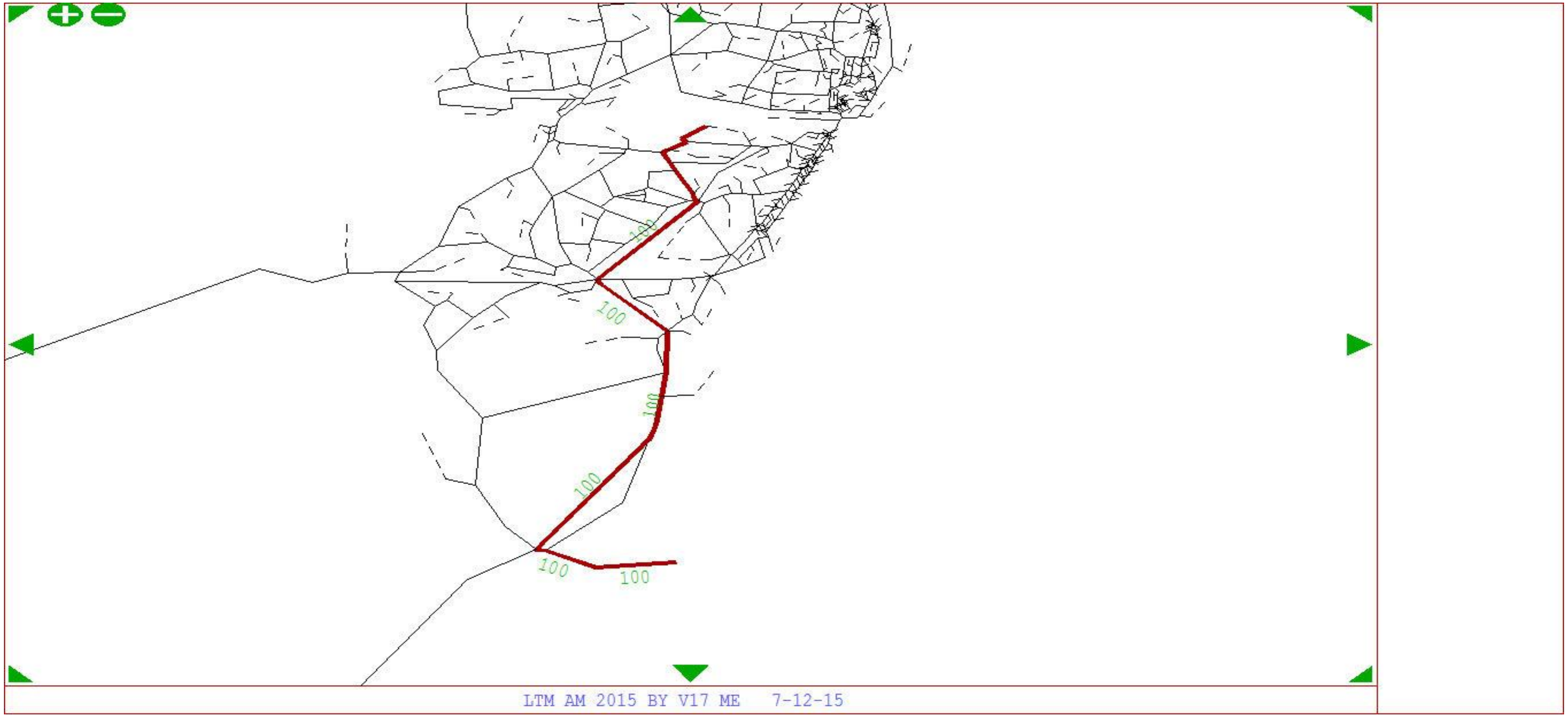
From Zone 149 To Zone 120 - User Class 5



From Zone 149 To Zone 122 - User Class 1



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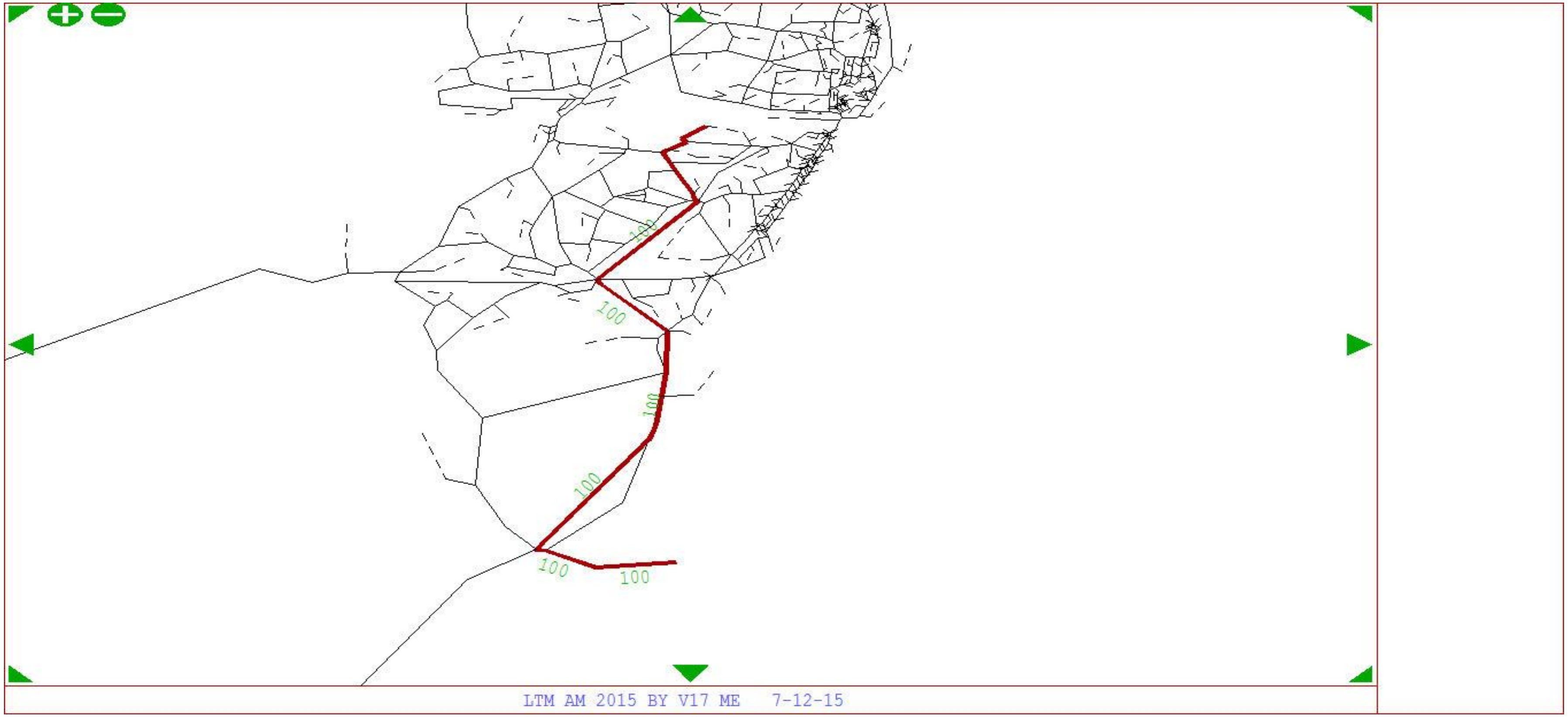
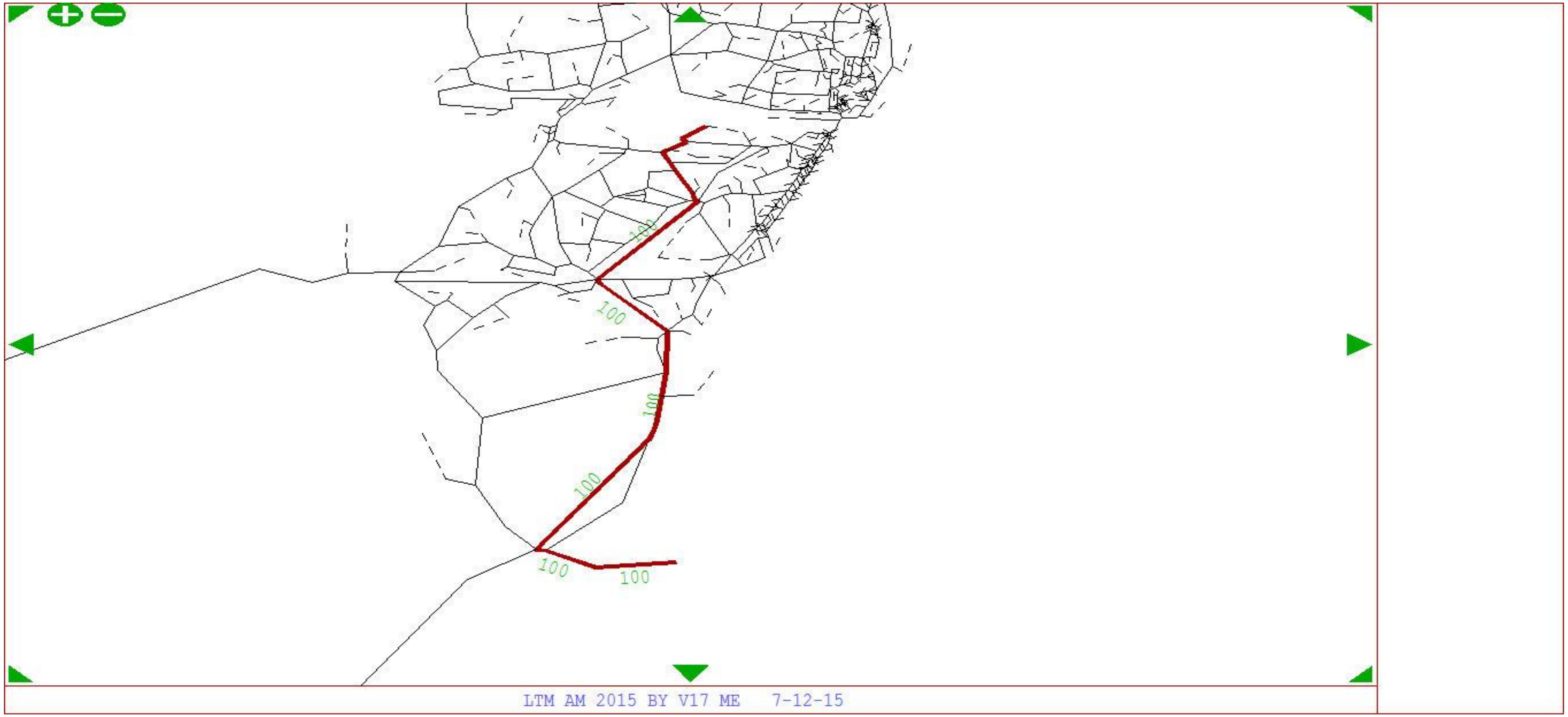
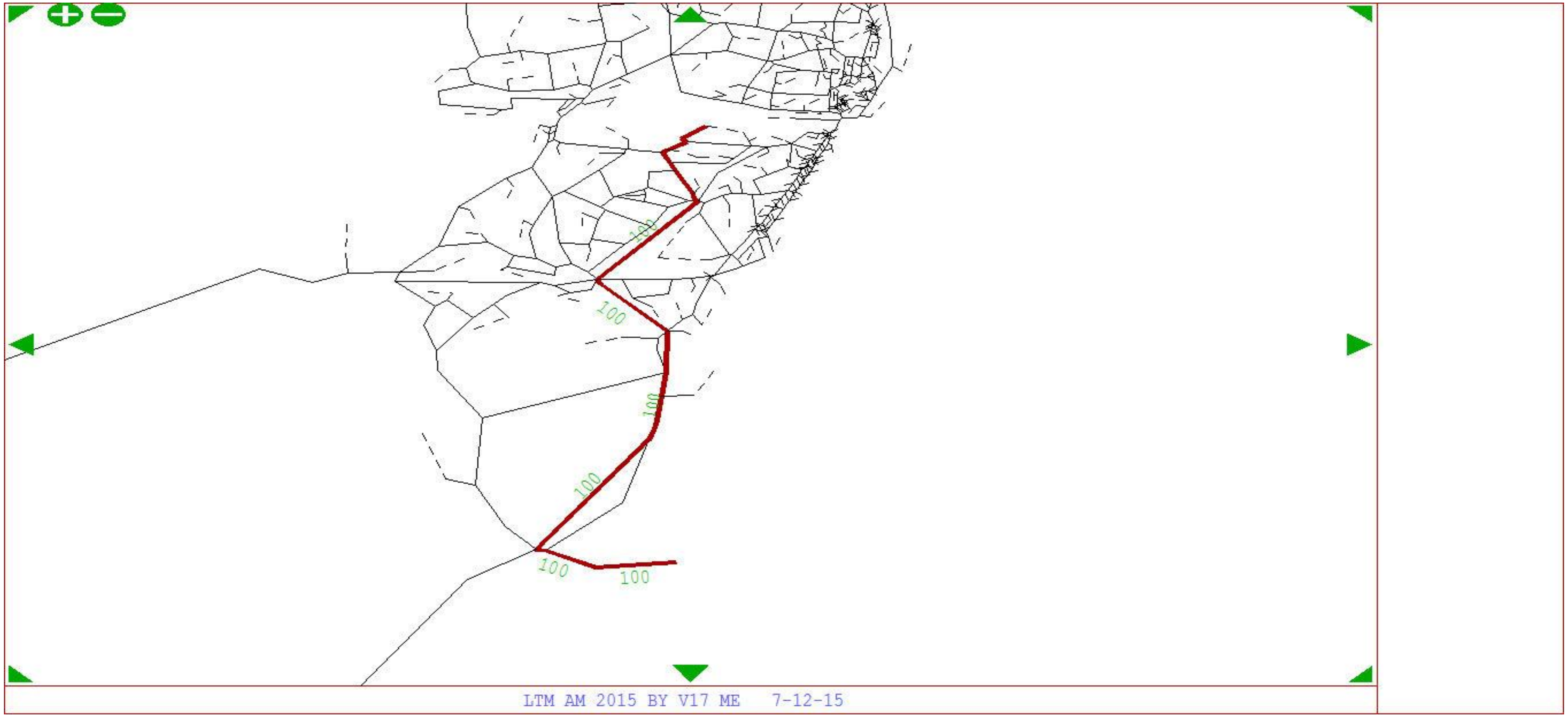


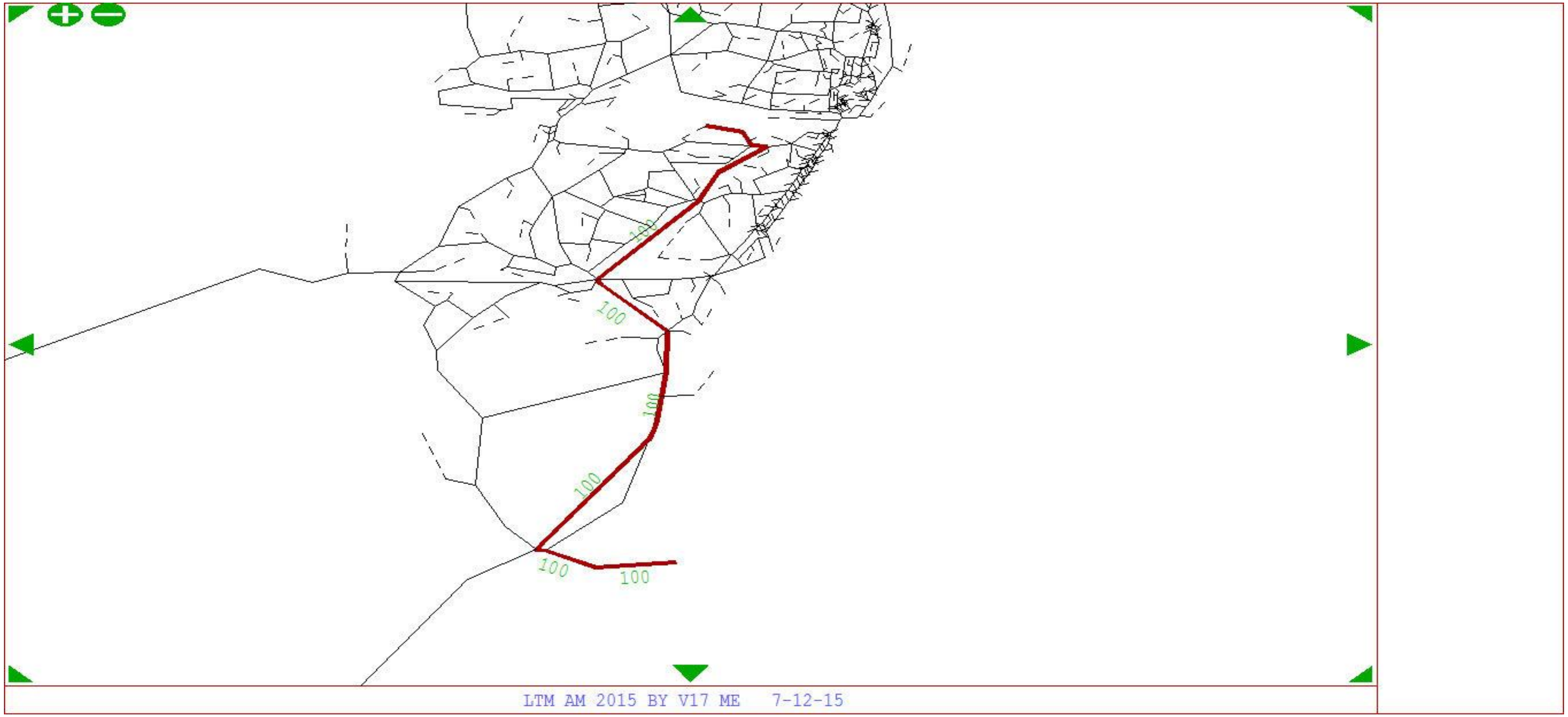
From Zone 149 To Zone 122 - User Class 3



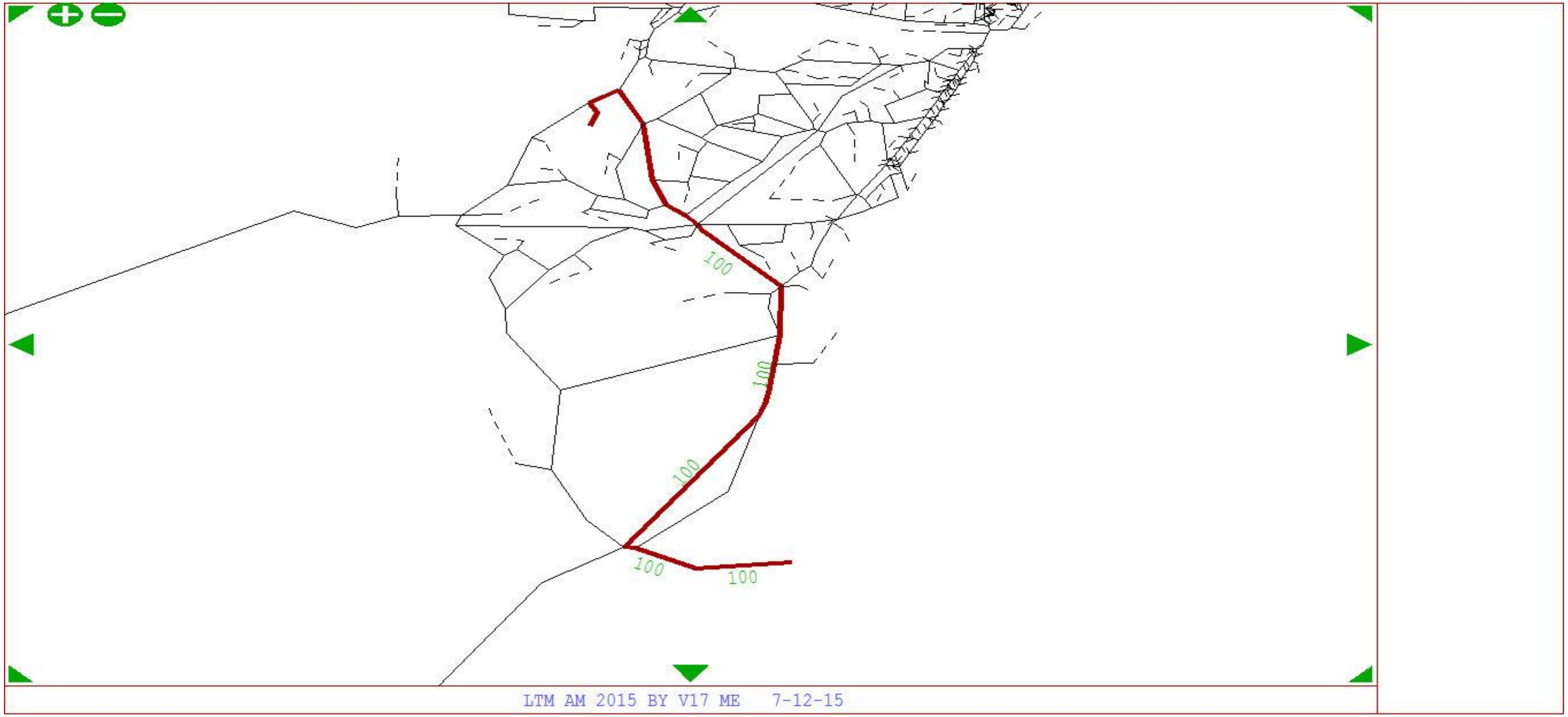
From Zone 149 To Zone 122 - User Class 4



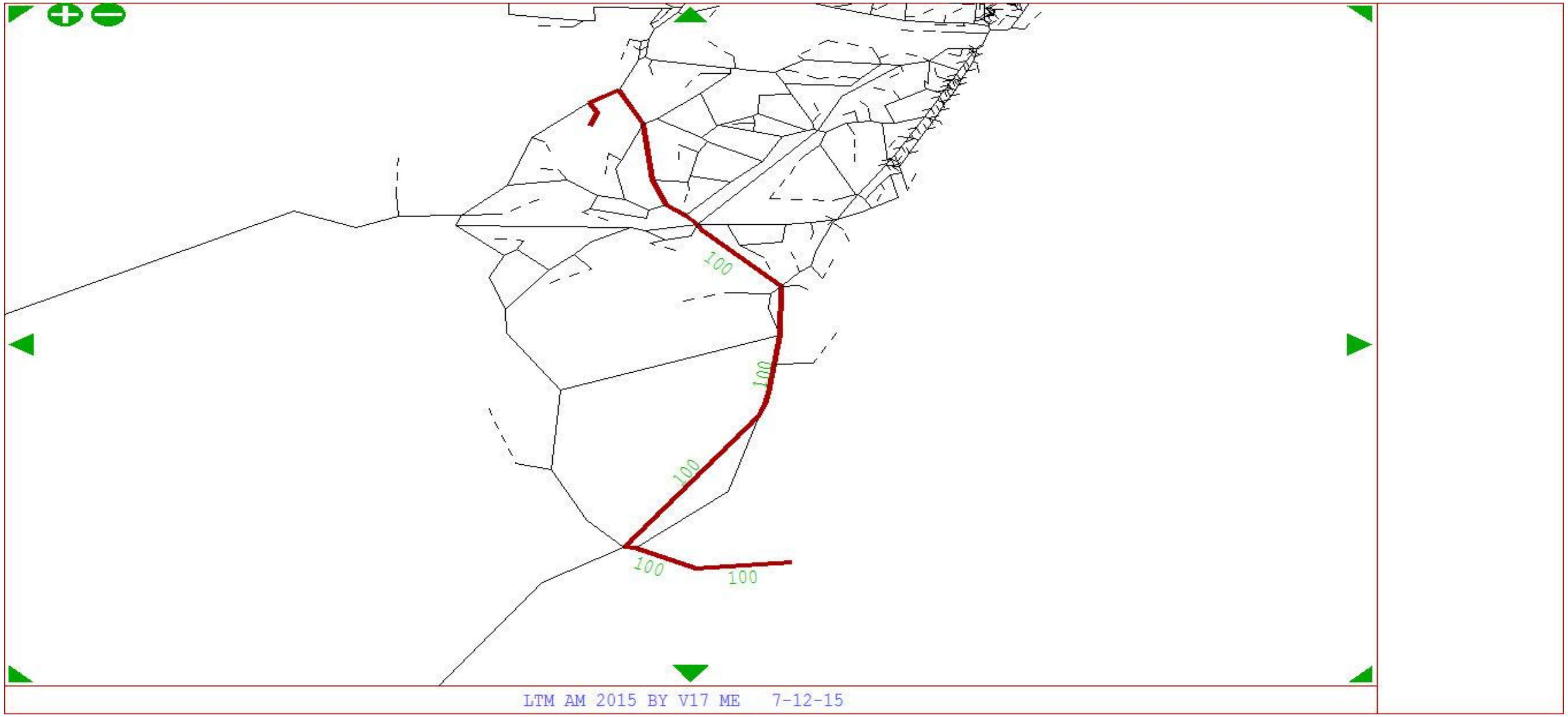
From Zone 149 To Zone 122 - User Class 5



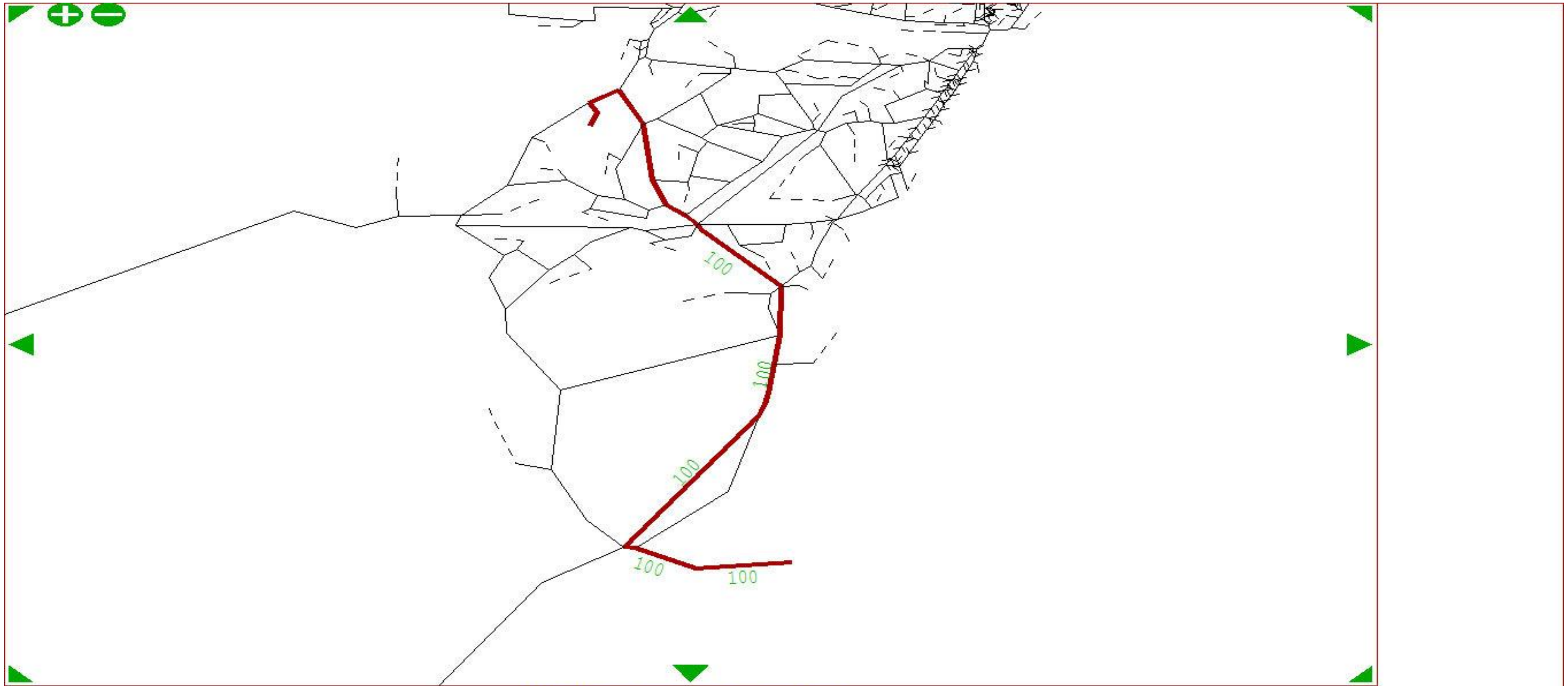
From Zone 149 To Zone 128 - User Class 1



From Zone 149 To Zone 128 - User Class 2



From Zone 149 To Zone 128 - User Class 3



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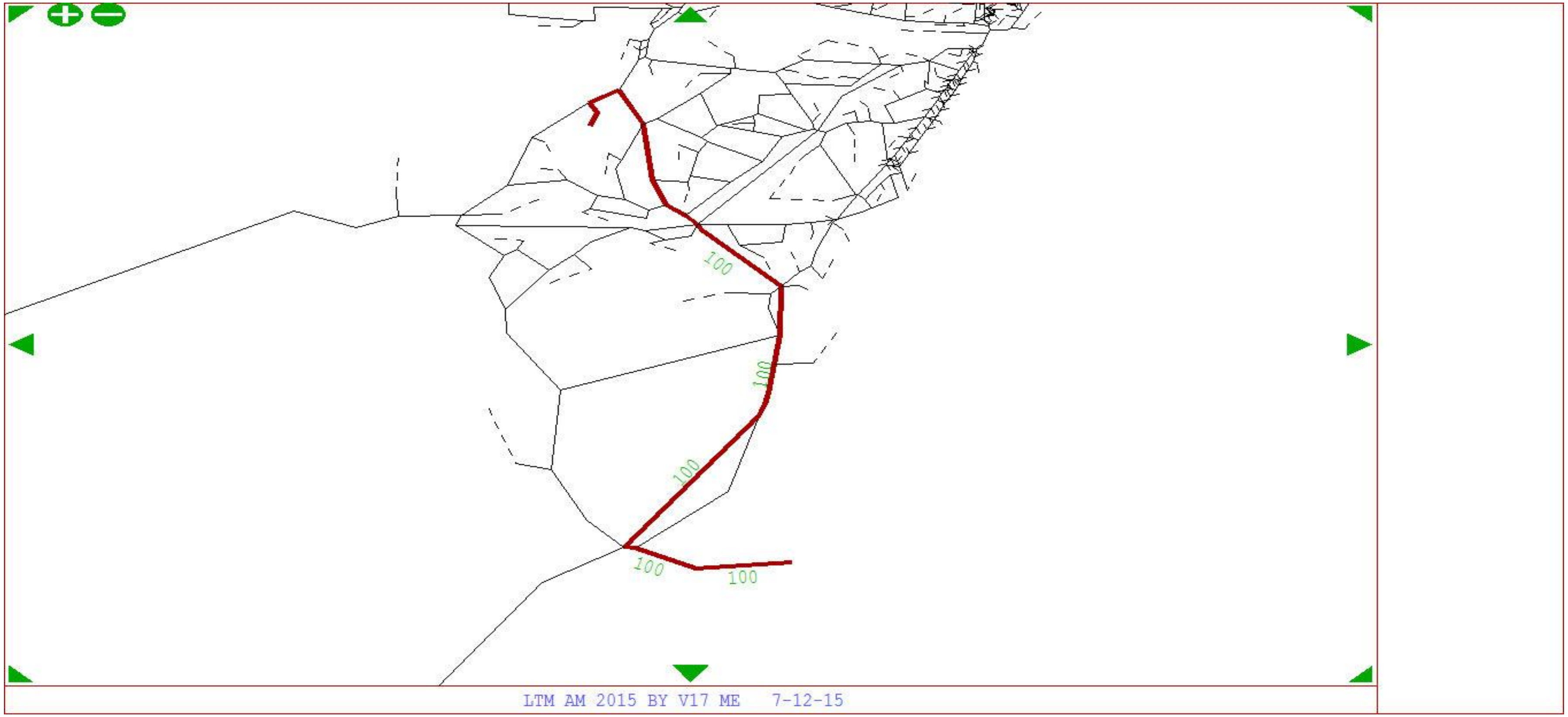
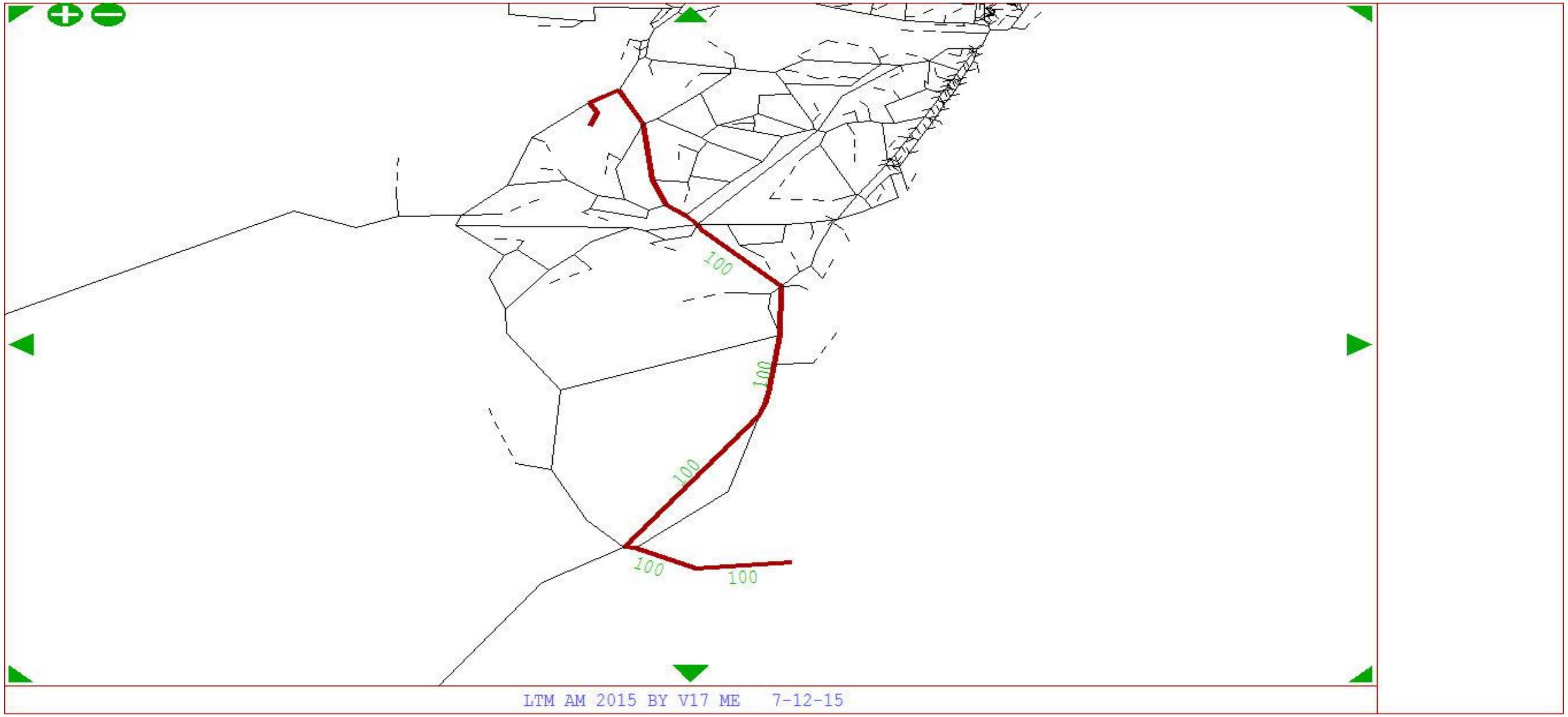
From Zone 149 To Zone 128 - User Class 4

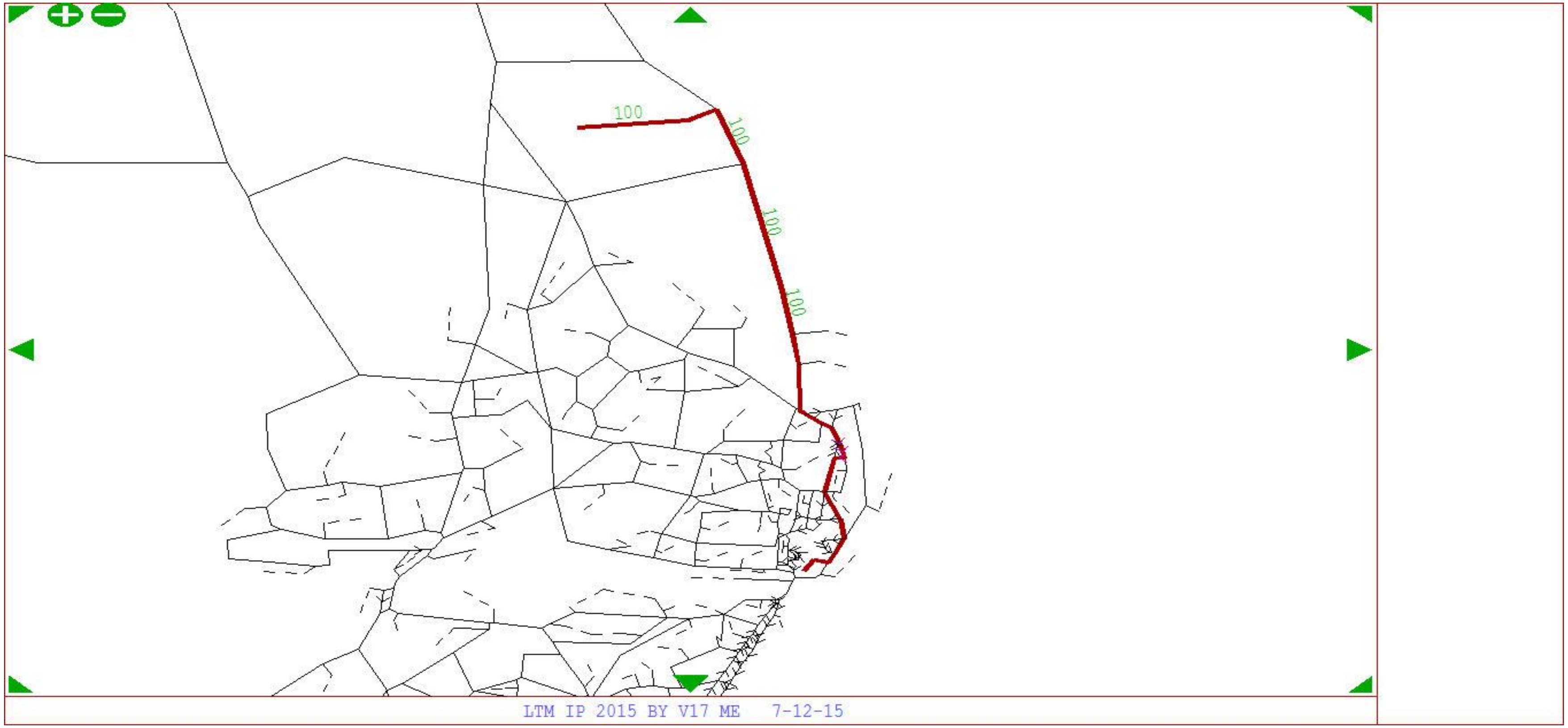


From Zone 149 To Zone 128 - User Class 5

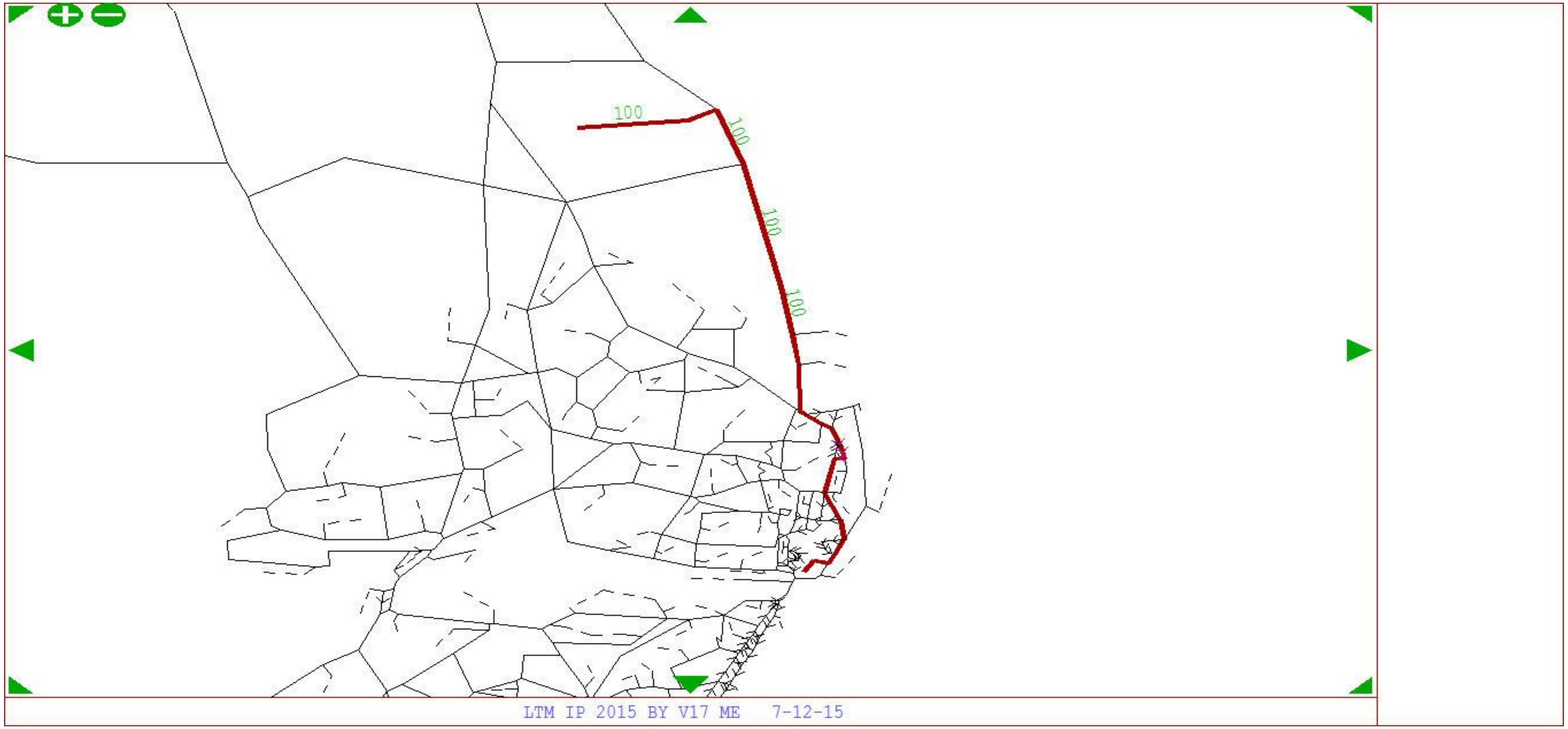


Lowestoft: OD Tree Plots - Interpeak

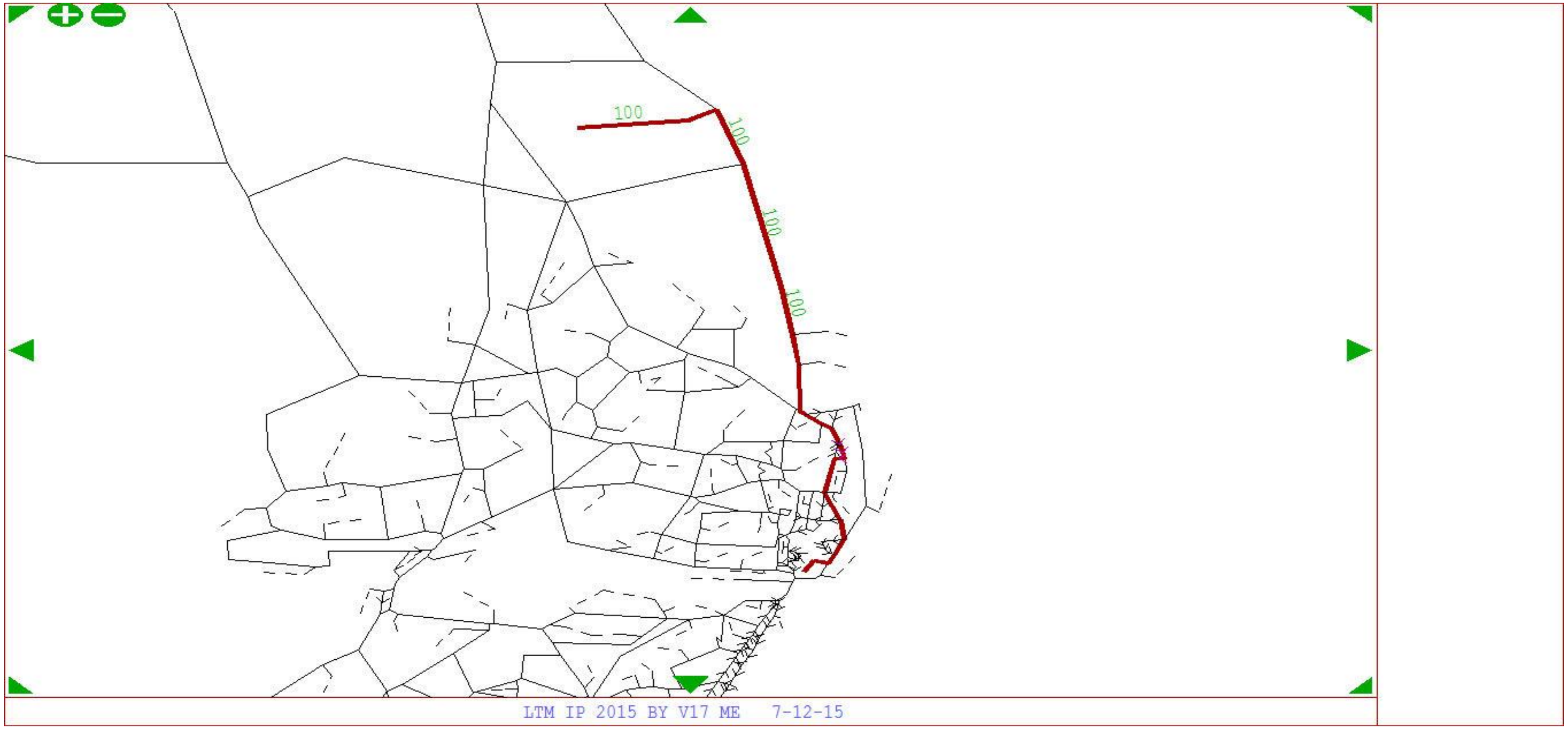
From Zone 102 To Zone 119 - User Class 1



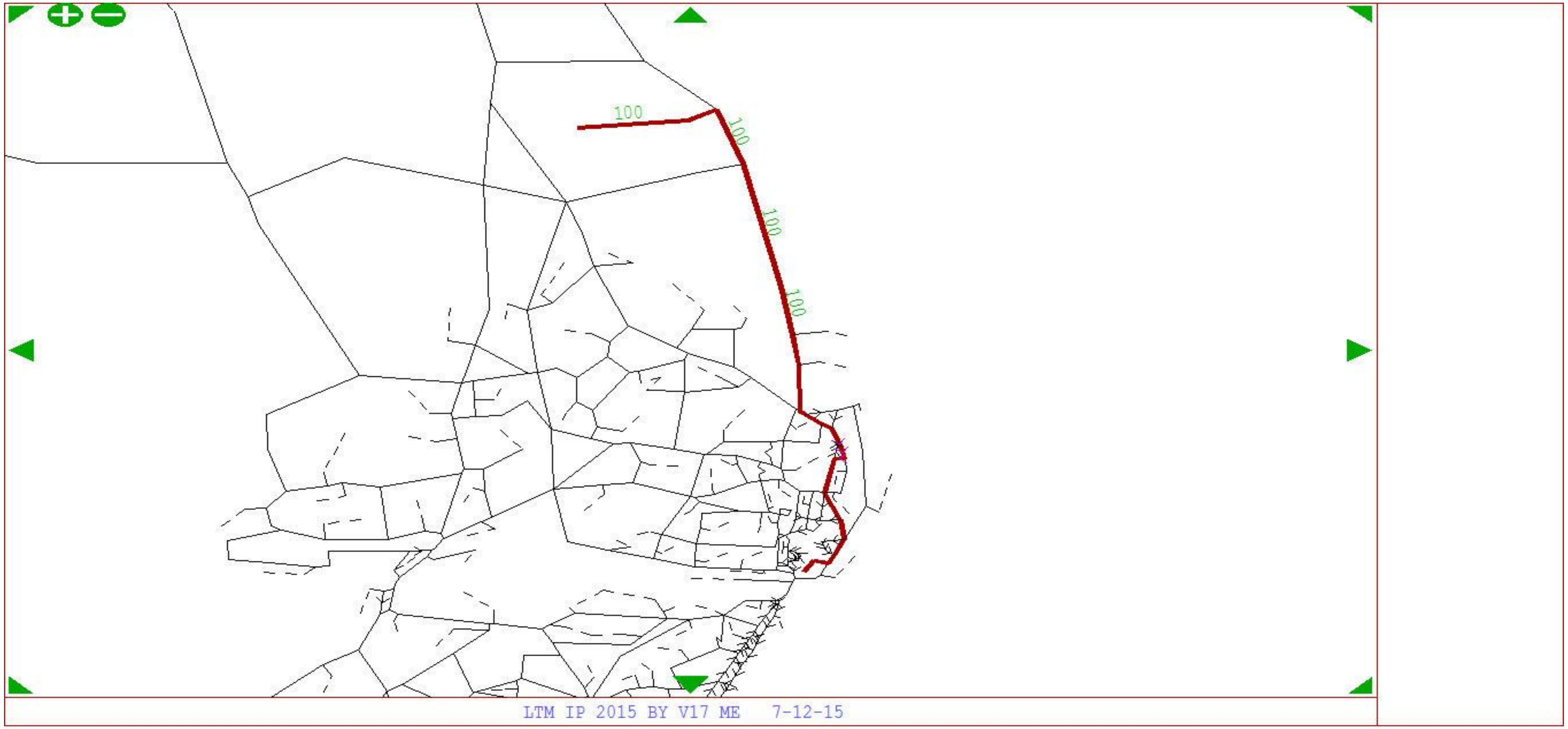
From Zone 102 To Zone 119 - User Class 2



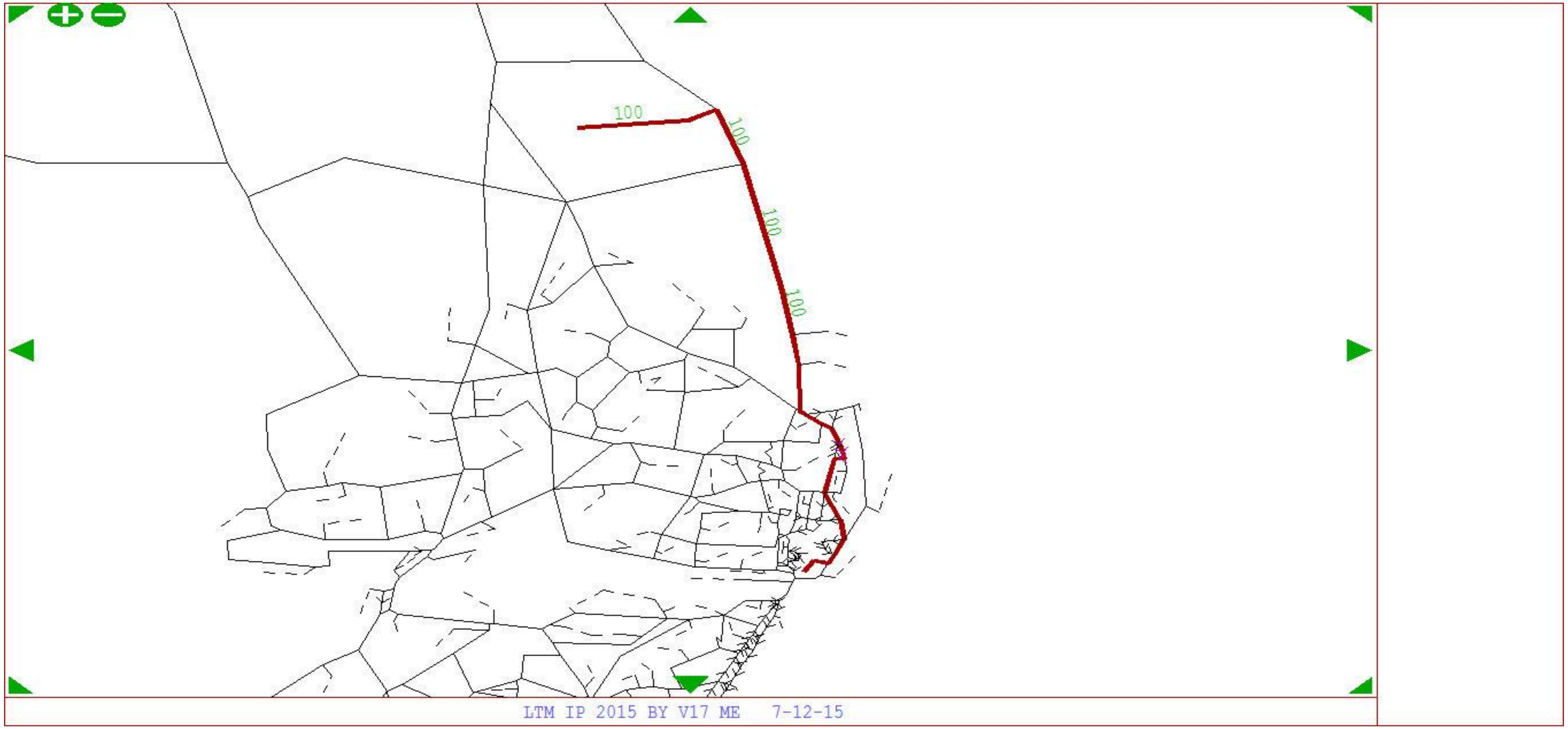
From Zone 102 To Zone 119 - User Class 3



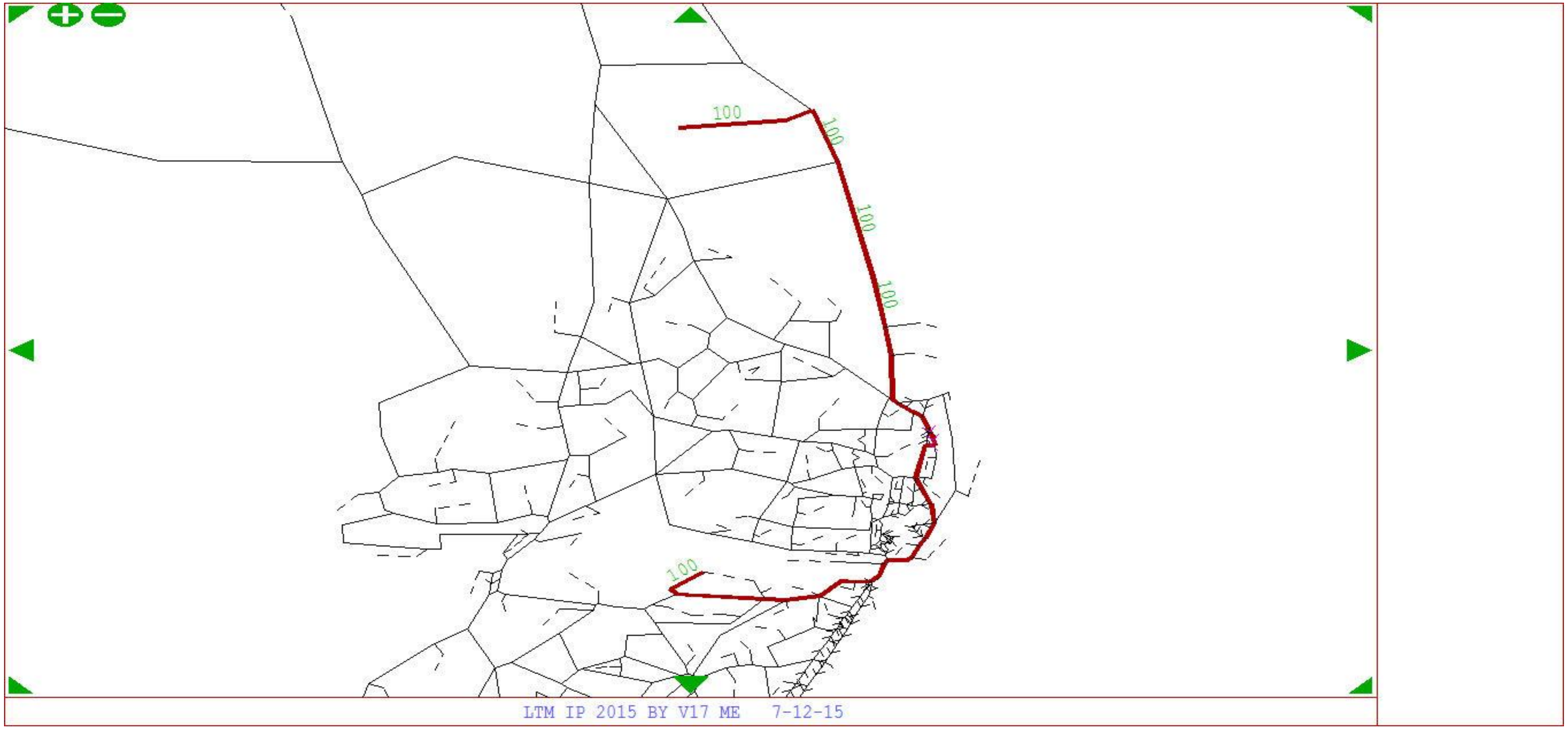
From Zone 102 To Zone 119 - User Class 4



From Zone 102 To Zone 119 - User Class 5



From Zone 102 To Zone 122 - User Class 1



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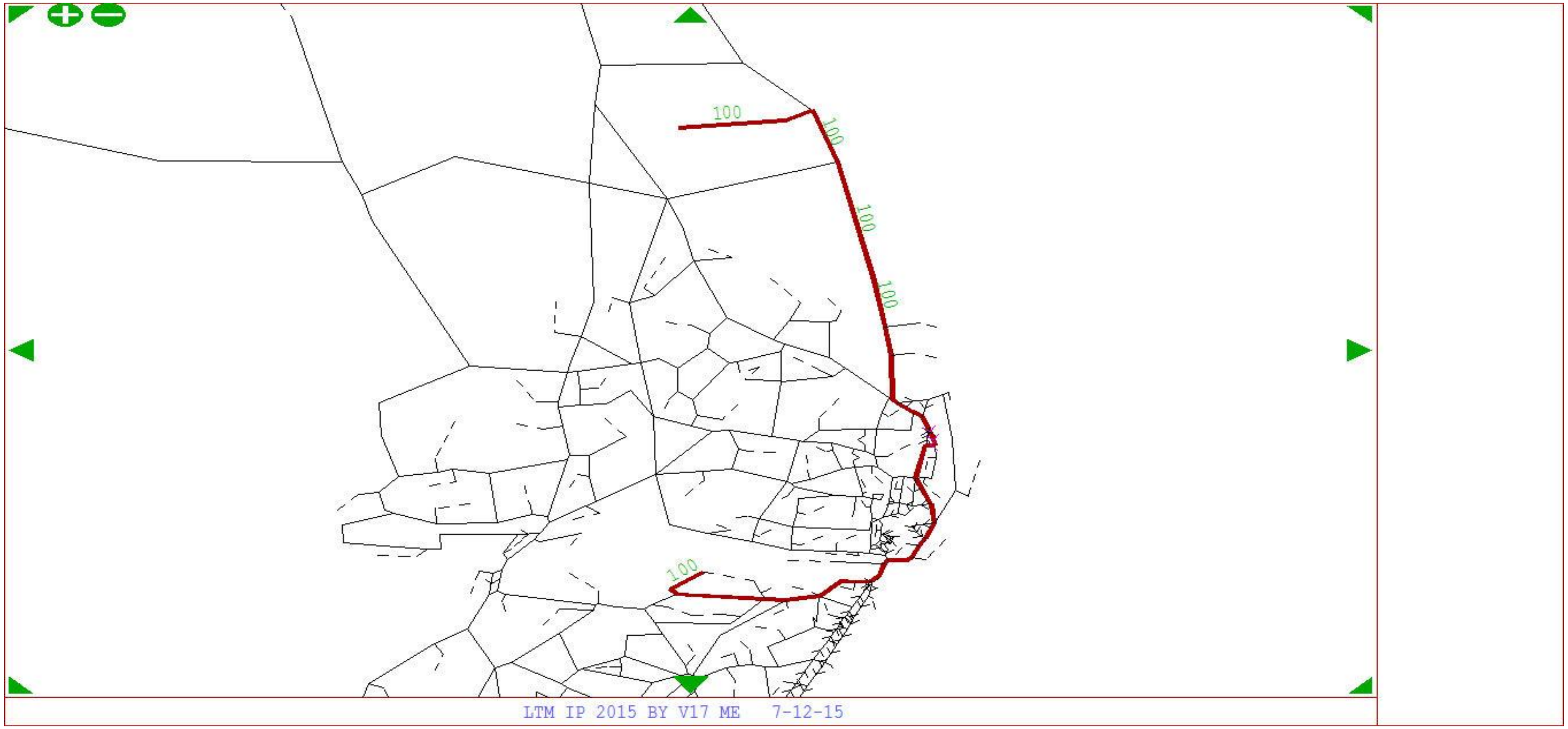
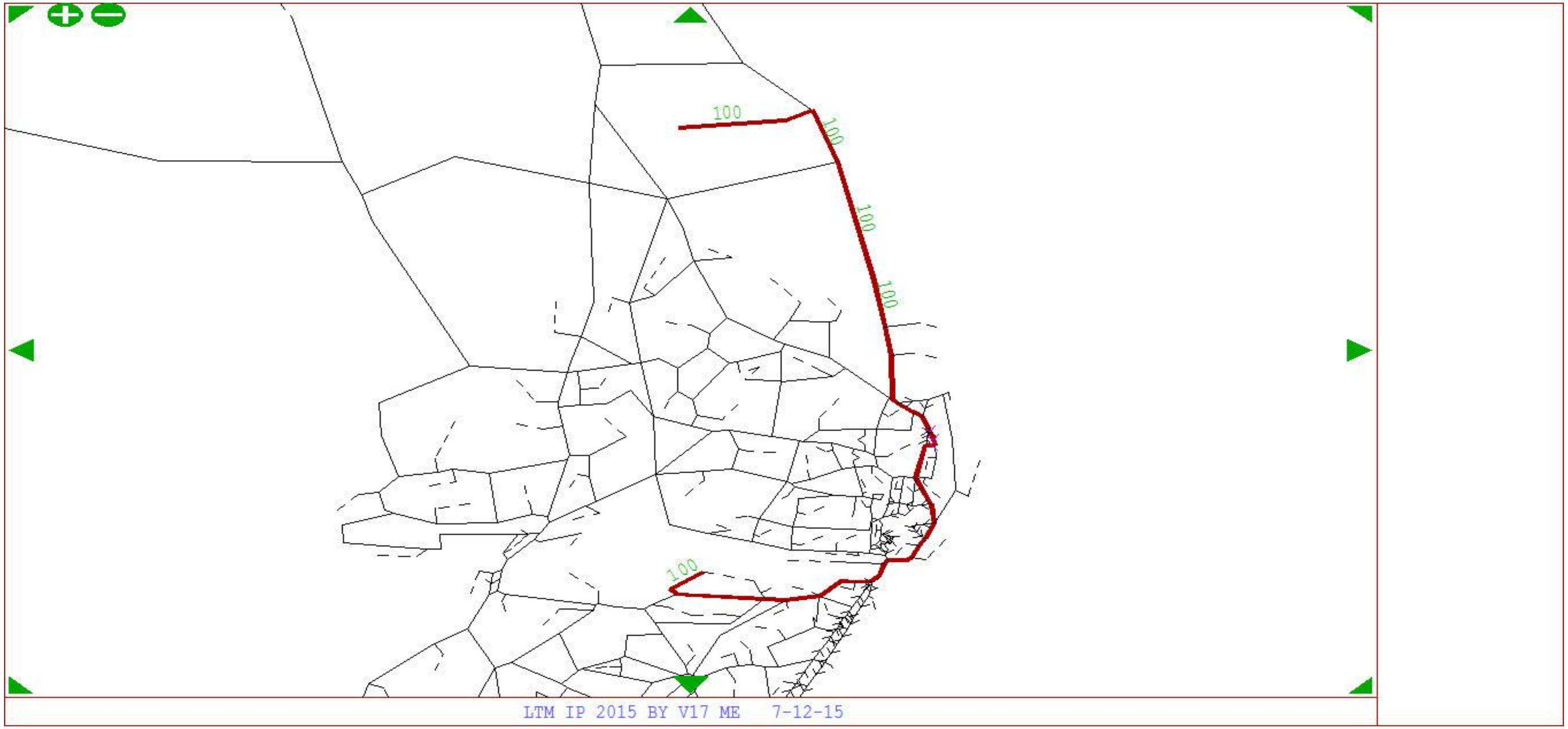
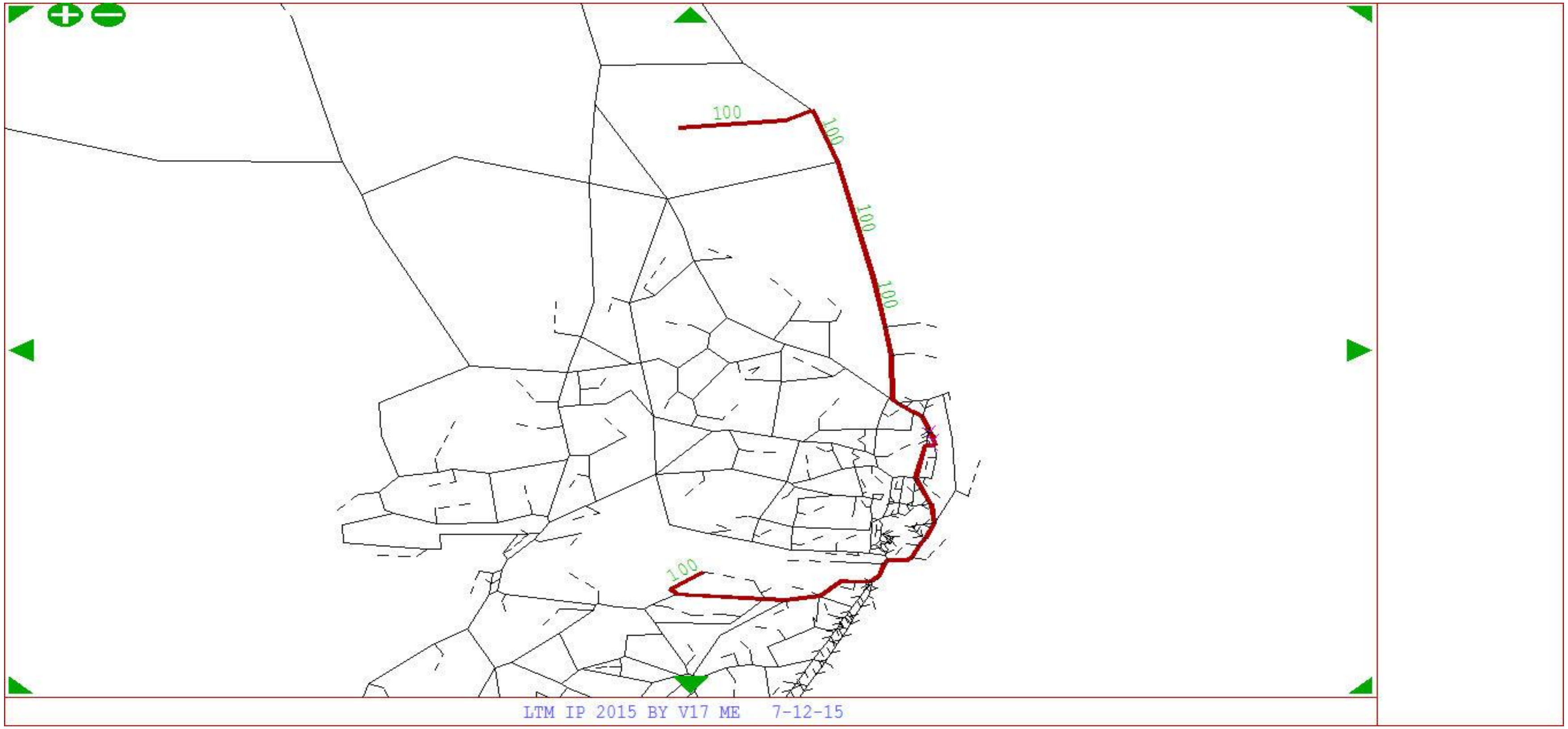


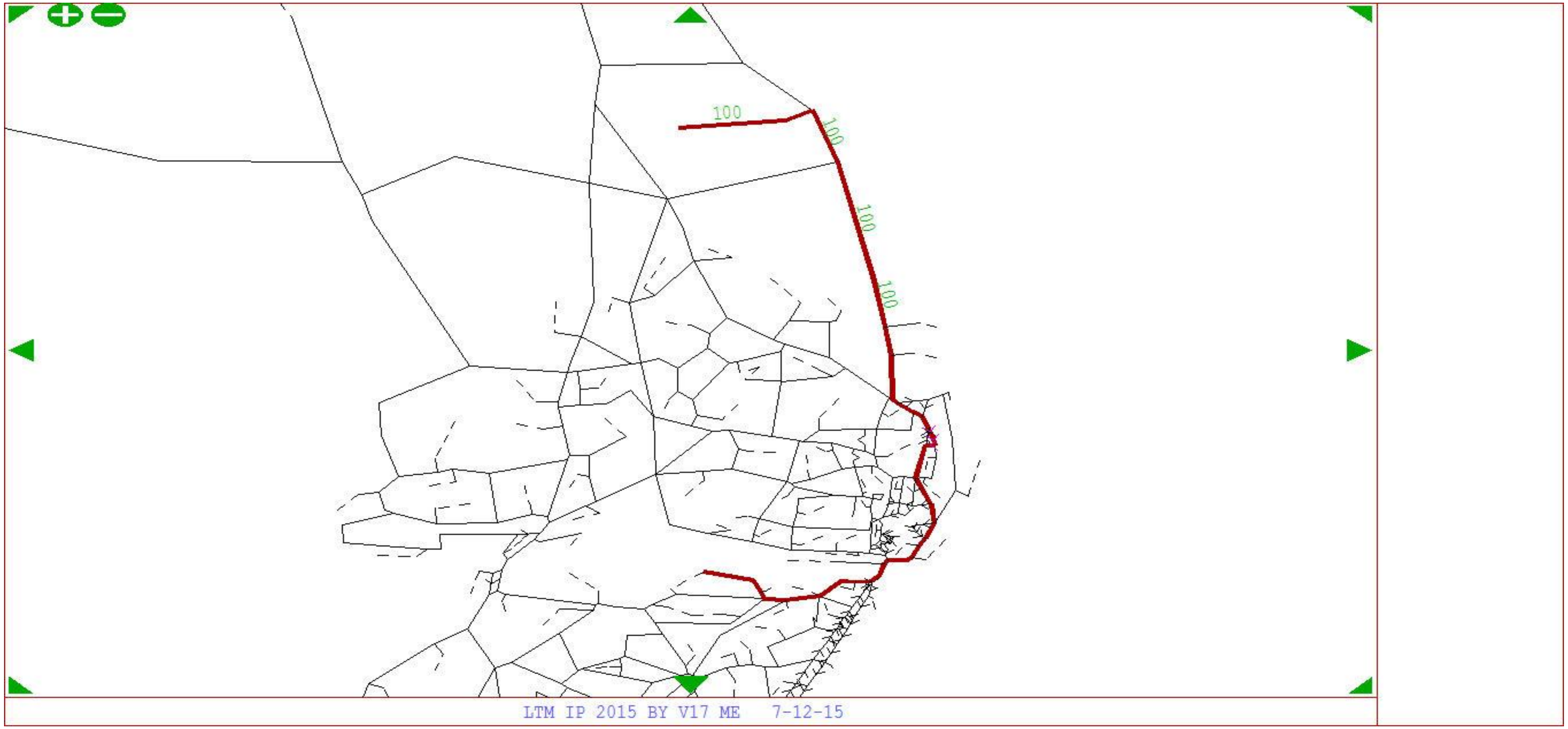
From Zone 102 To Zone 122 - User Class 3



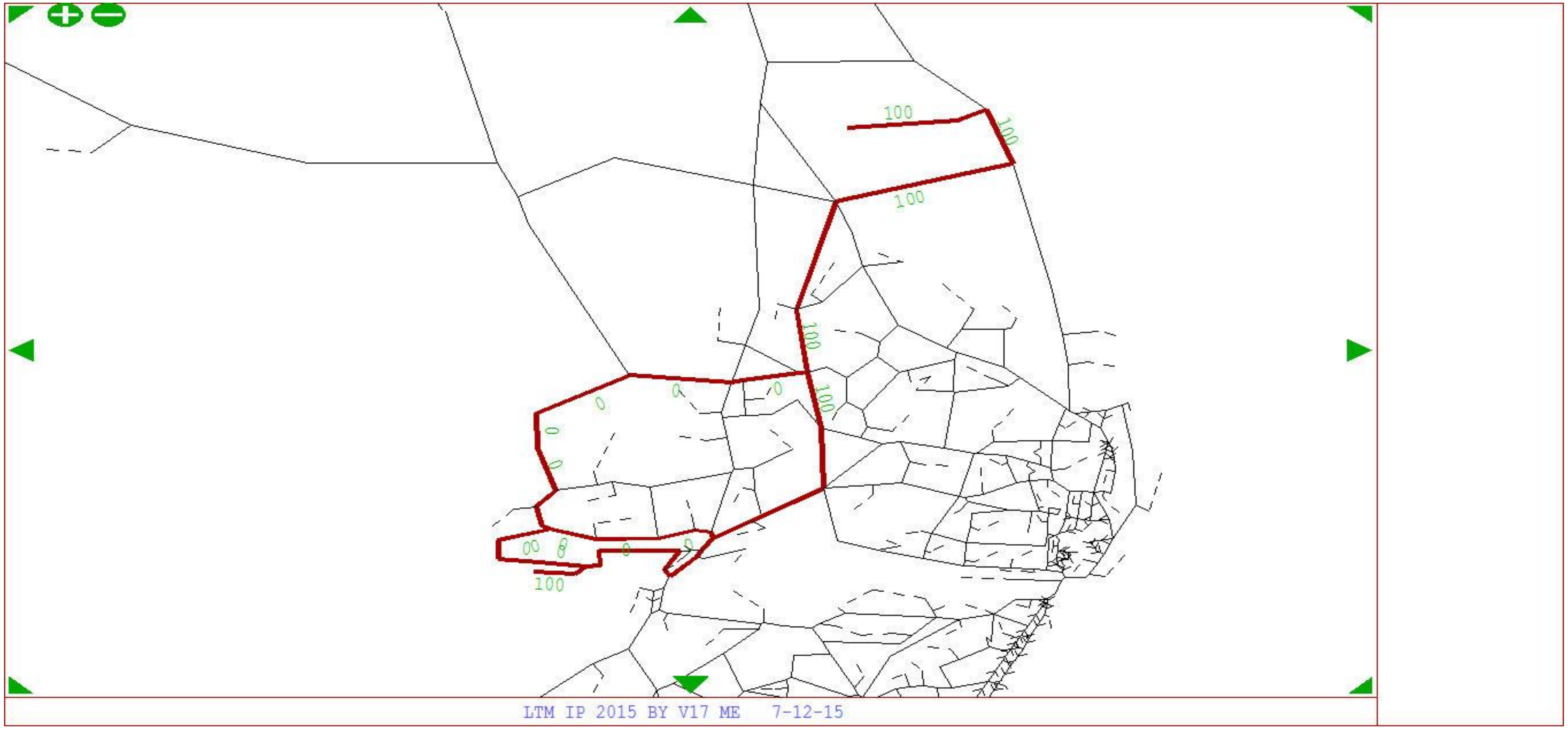
From Zone 102 To Zone 122 - User Class 4



From Zone 102 To Zone 122 - User Class 5



From Zone 102 To Zone 130 - User Class 1



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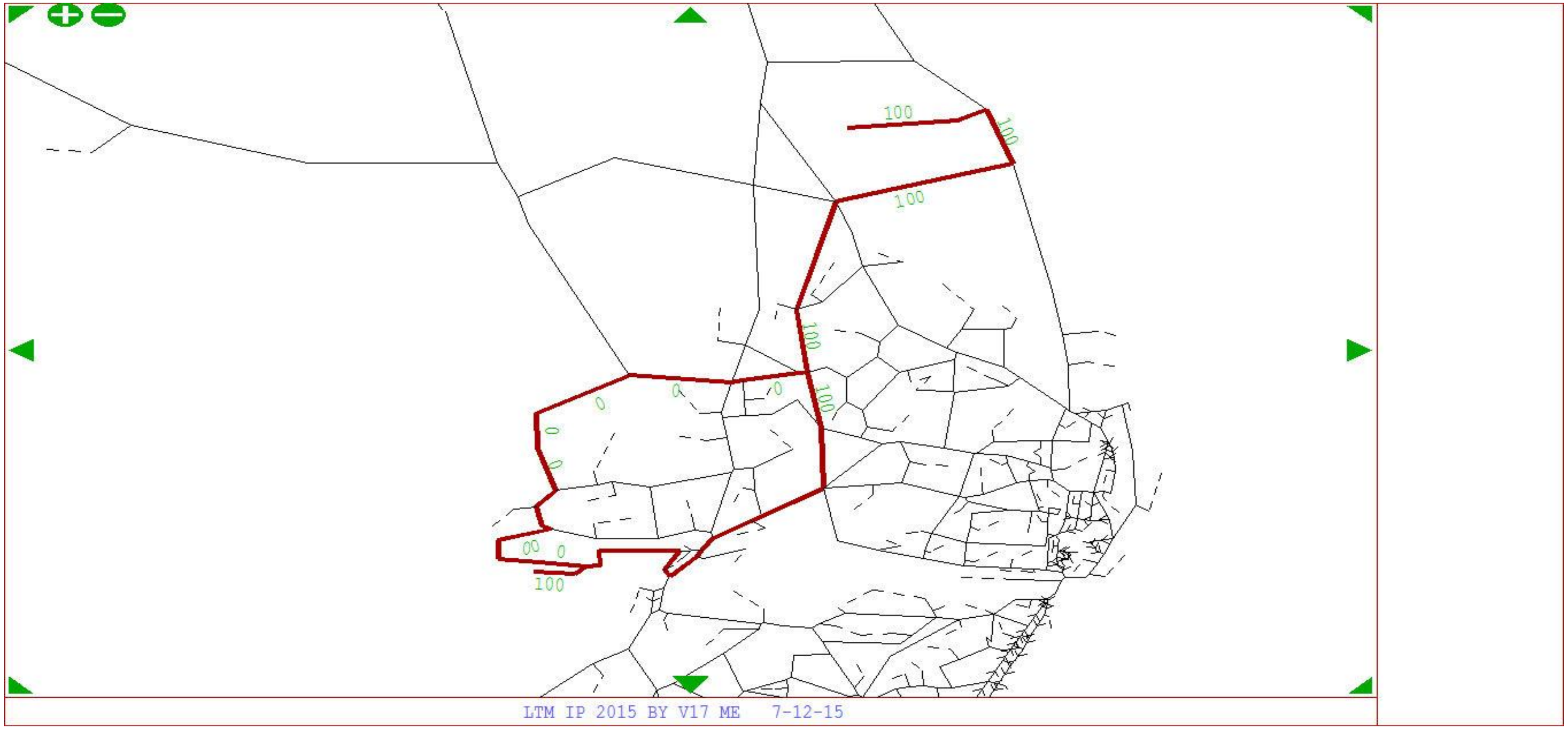
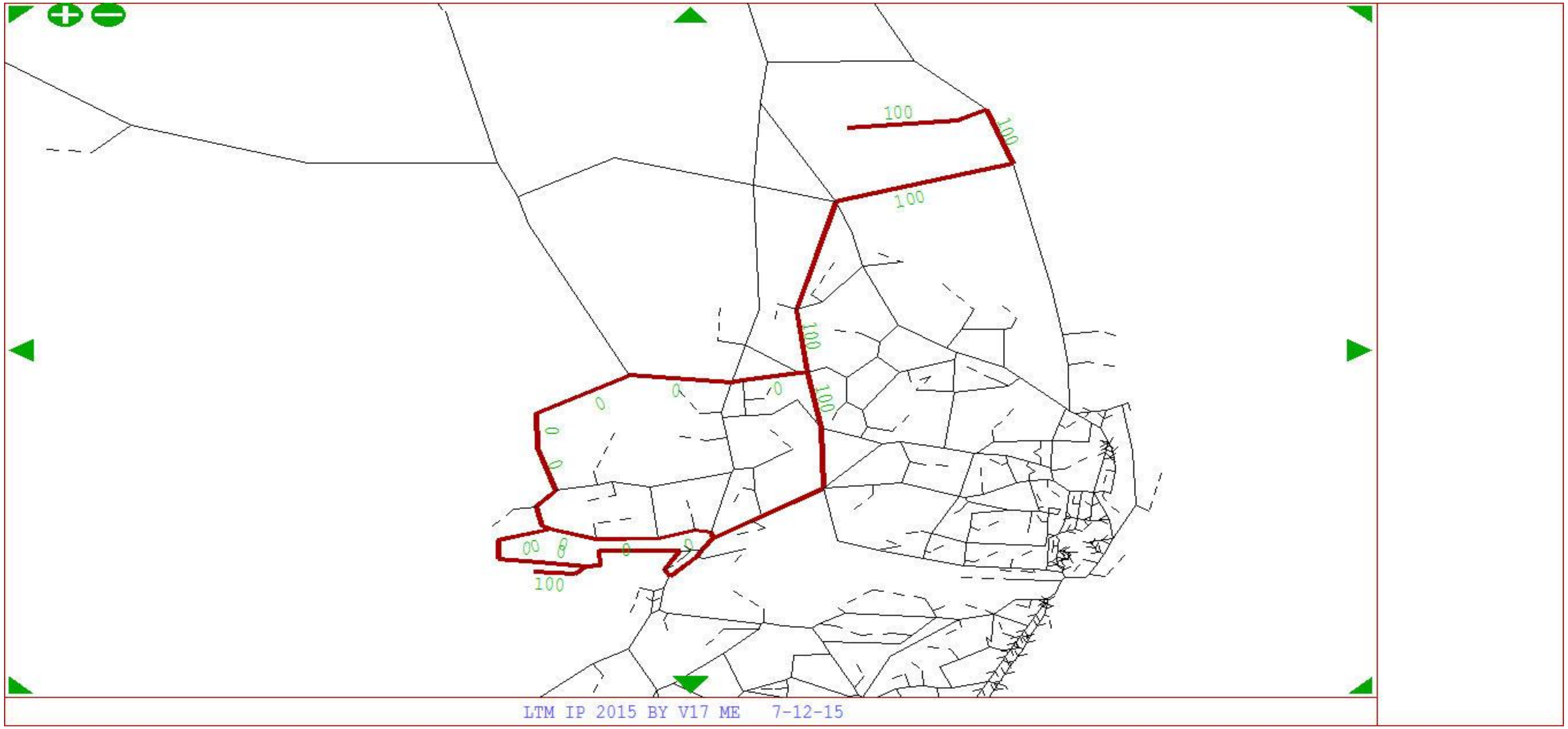
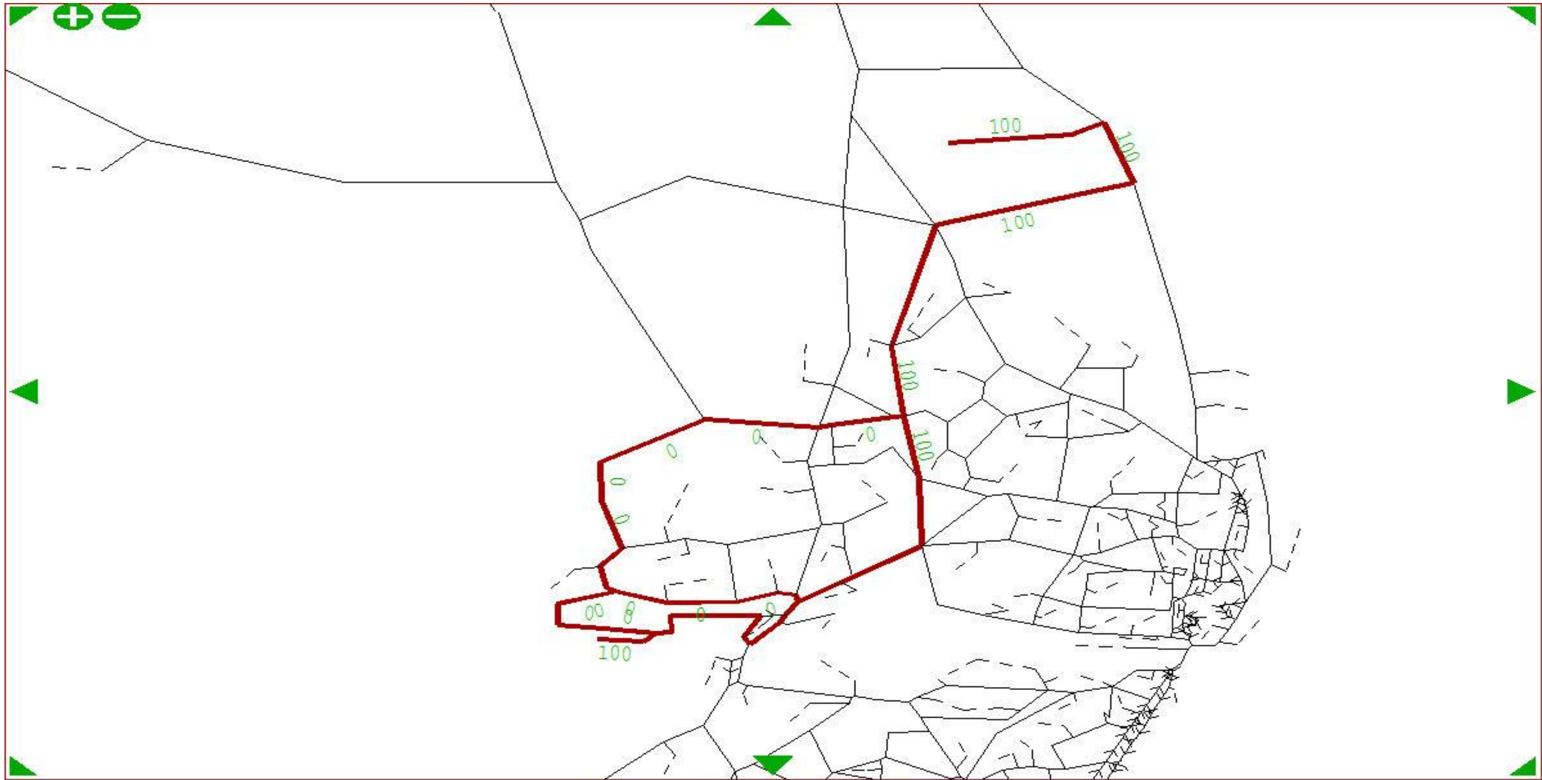


From Zone 102 To Zone 130 - User Class 3



From Zone 102 To Zone 130 - User Class 4



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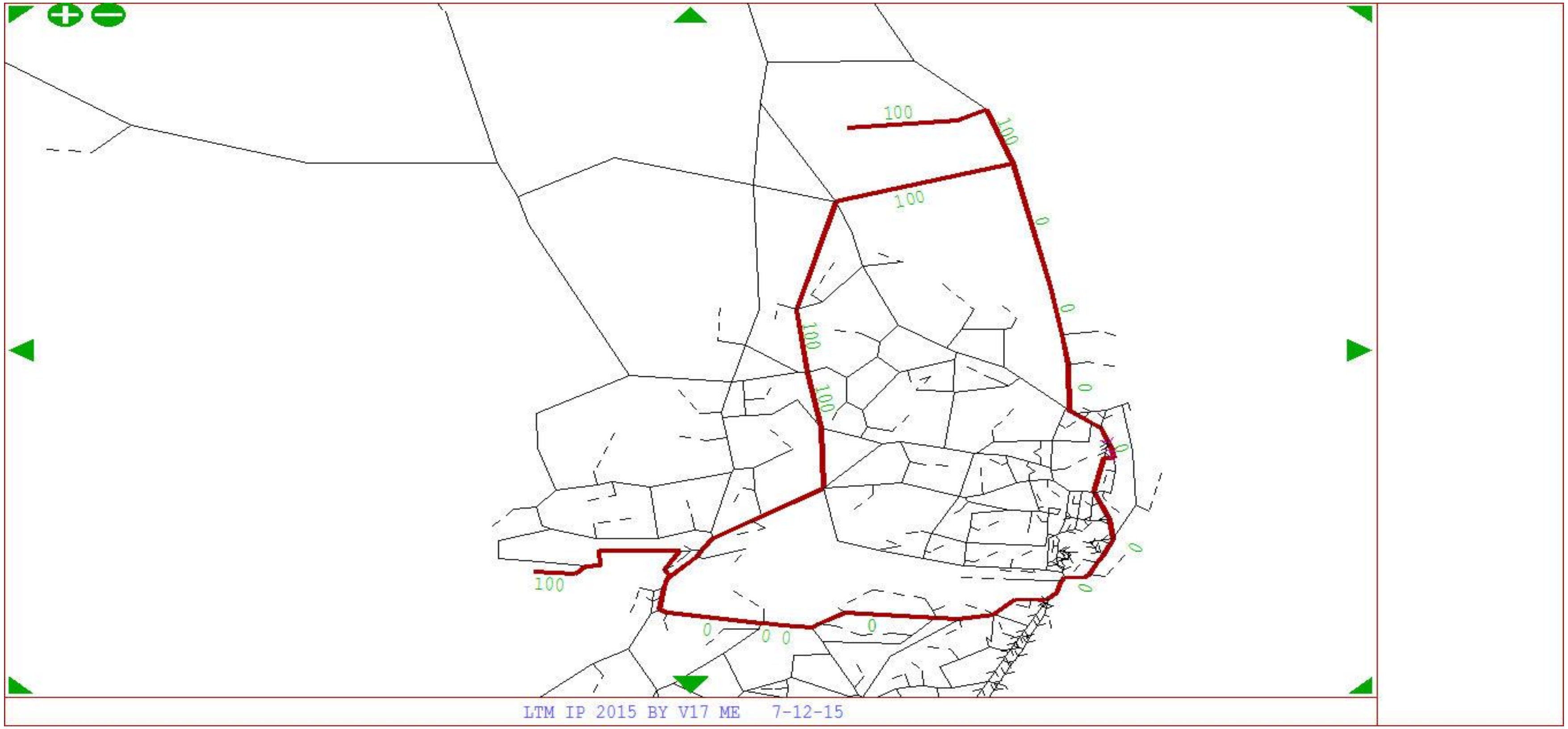
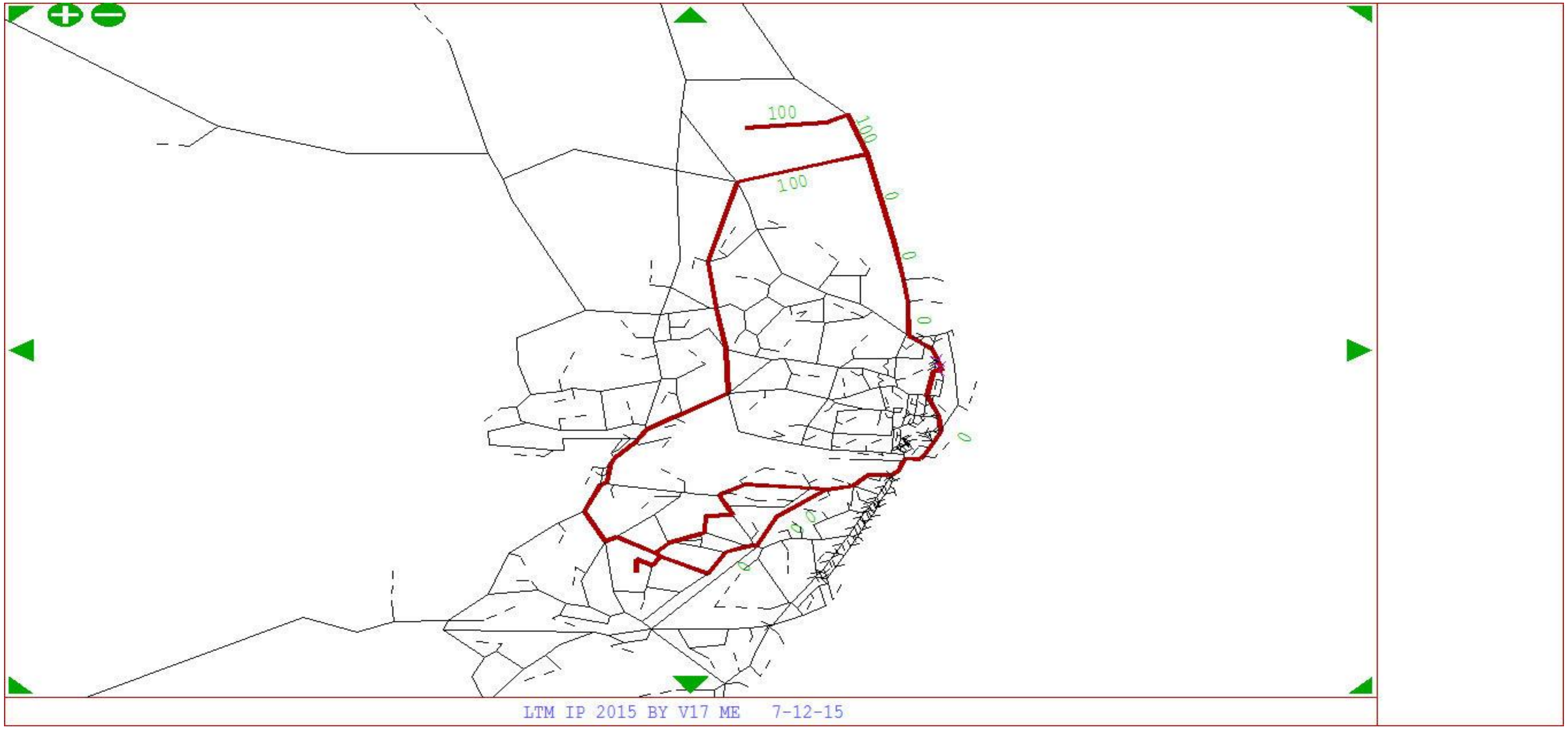
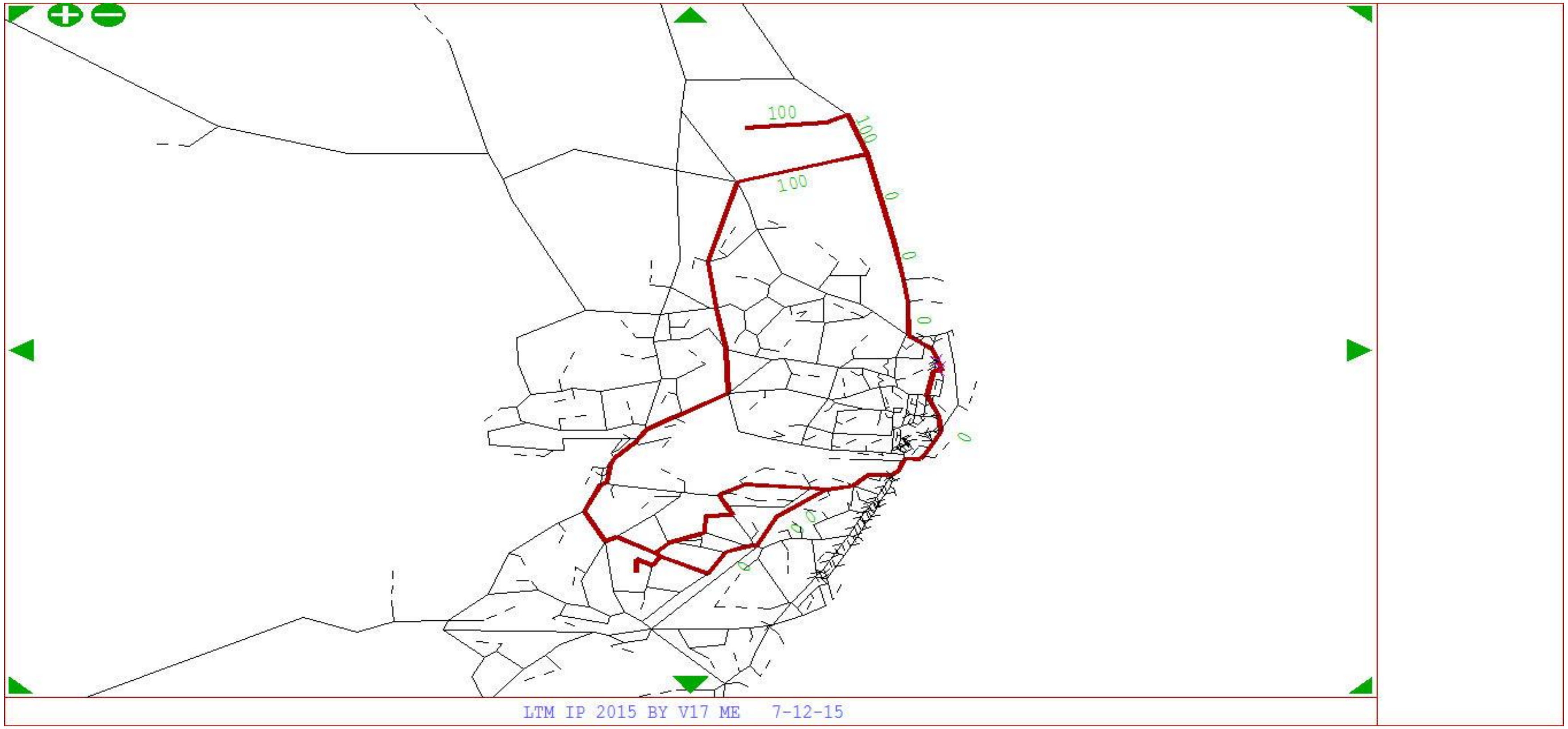
From Zone 102 To Zone 130 - User Class 5



From Zone 102 To Zone 131 - User Class 1



From Zone 102 To Zone 131 - User Class 2



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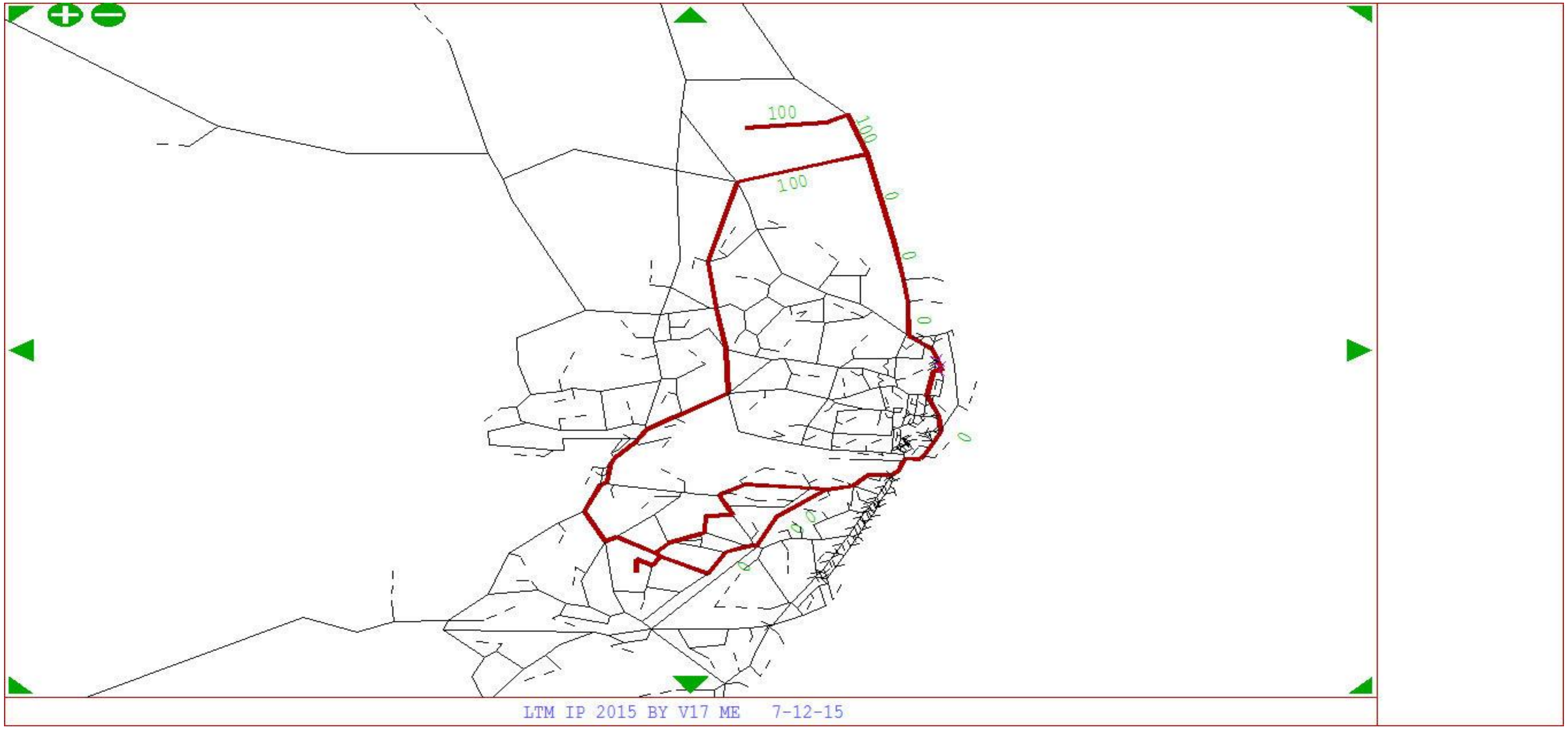
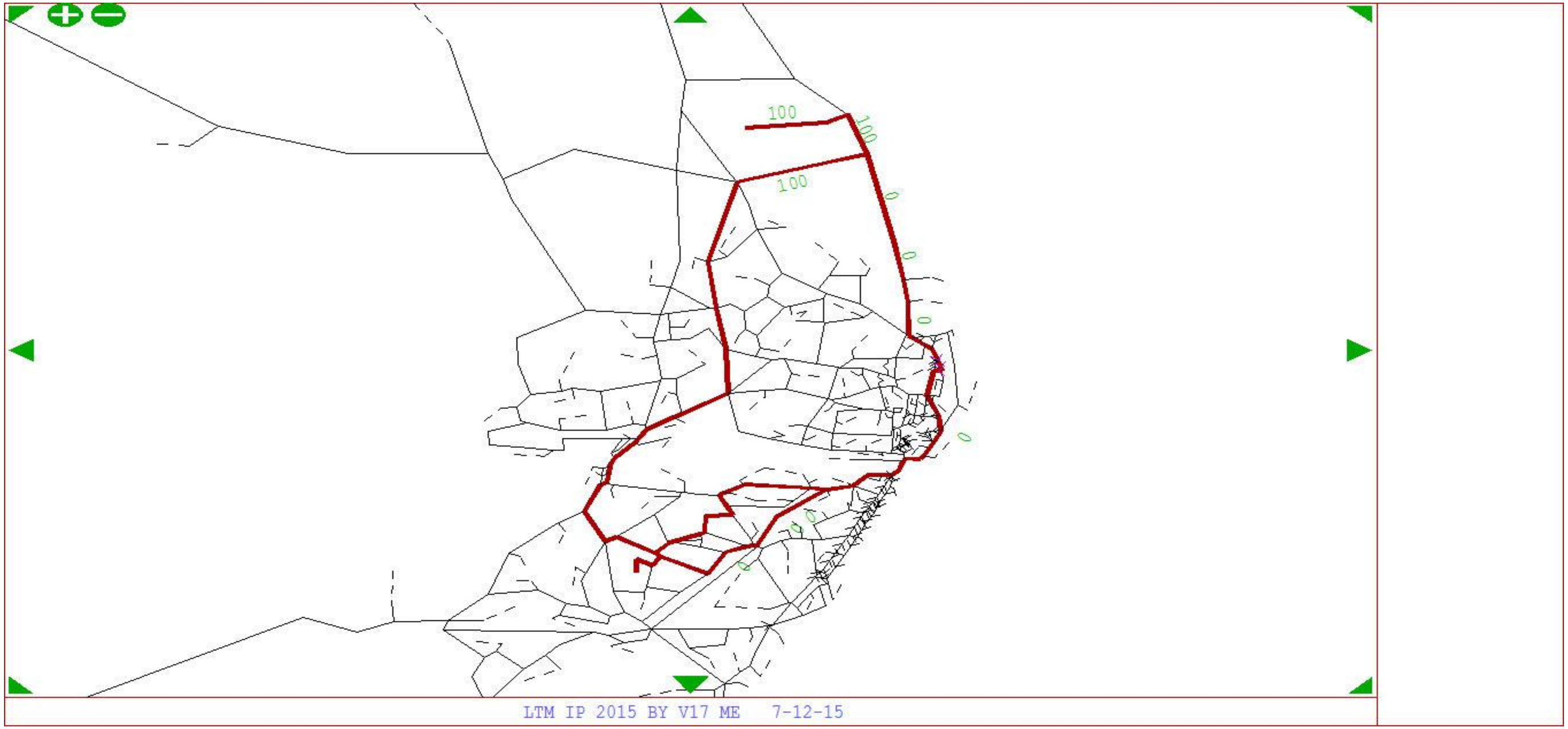


From Zone 102 To Zone 131 - User Class 4



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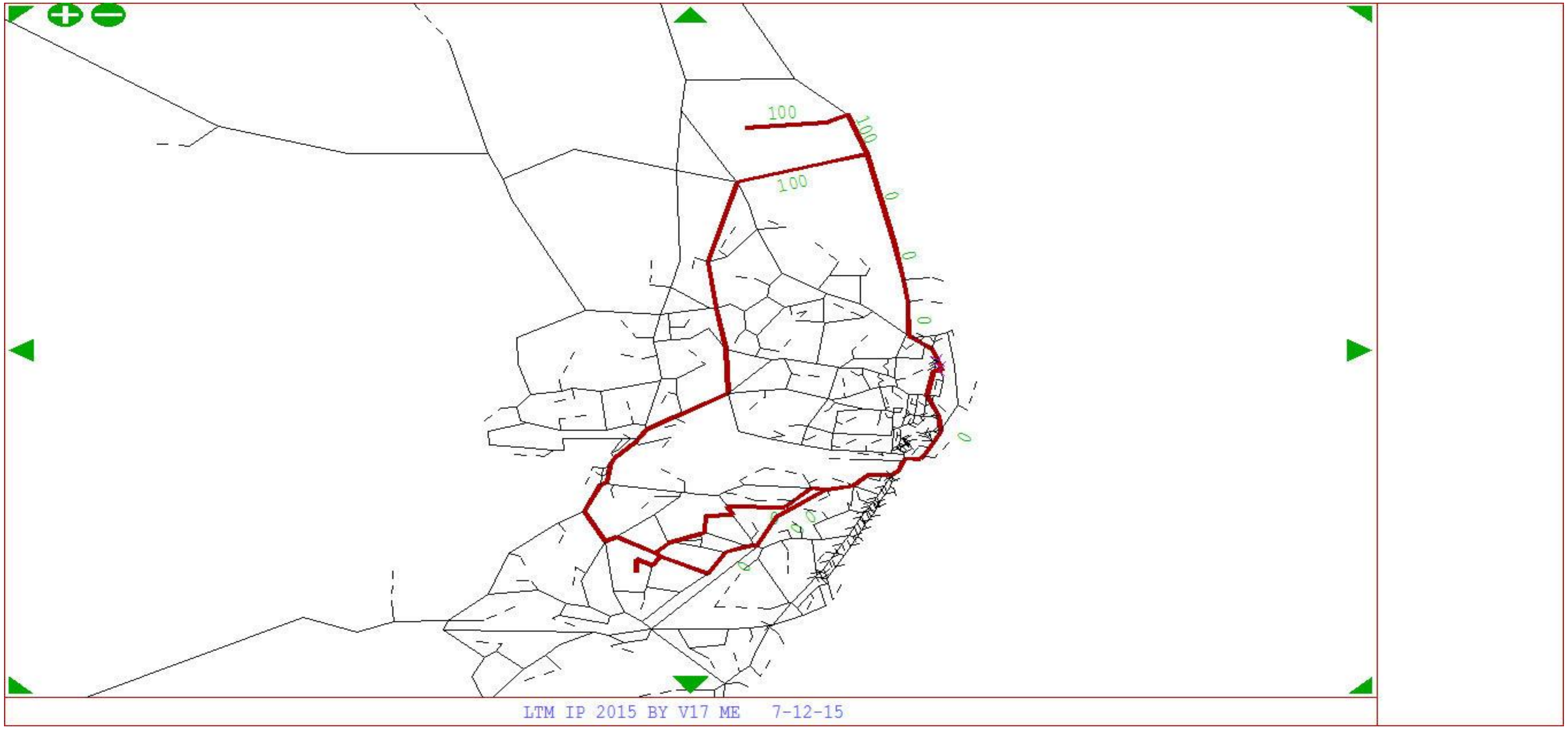
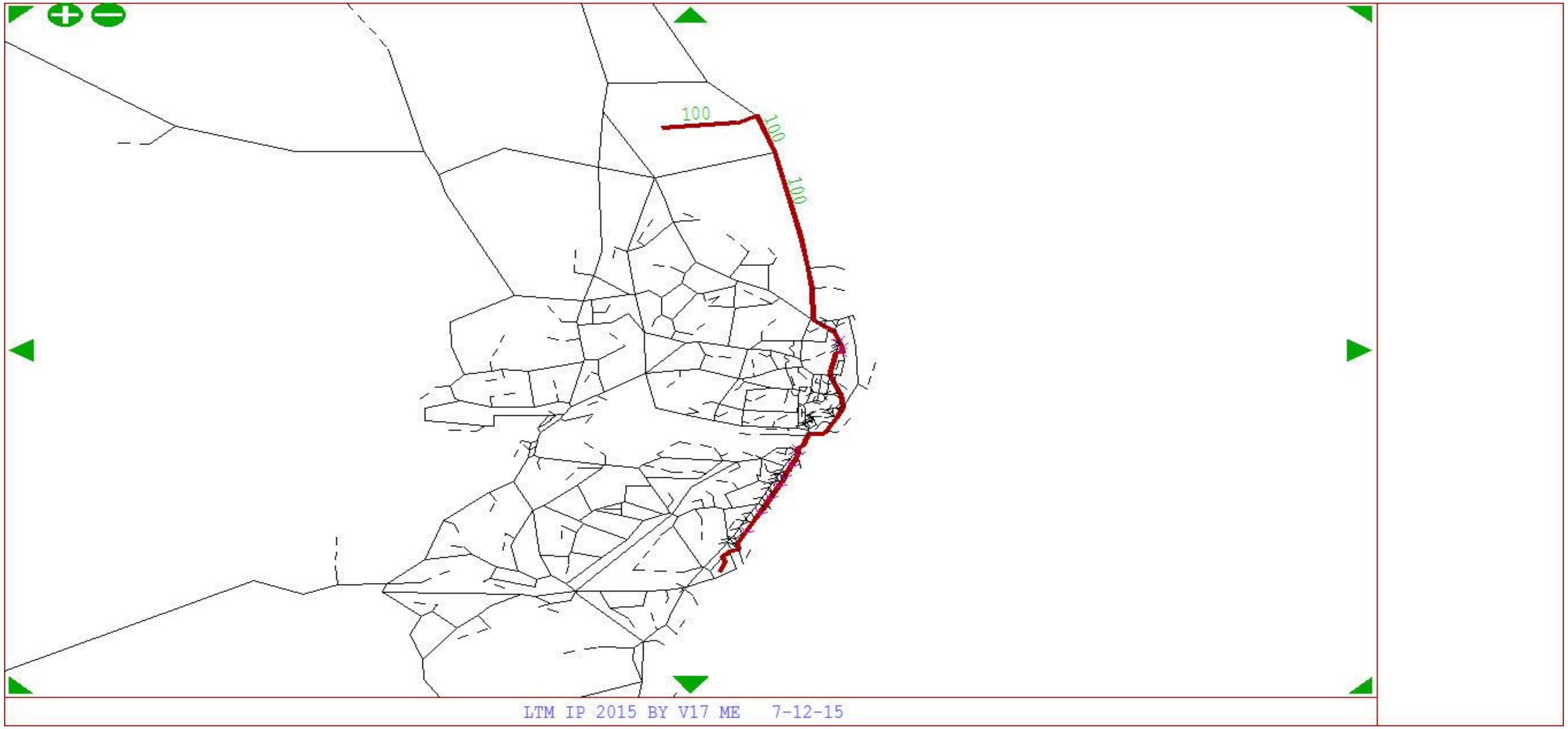
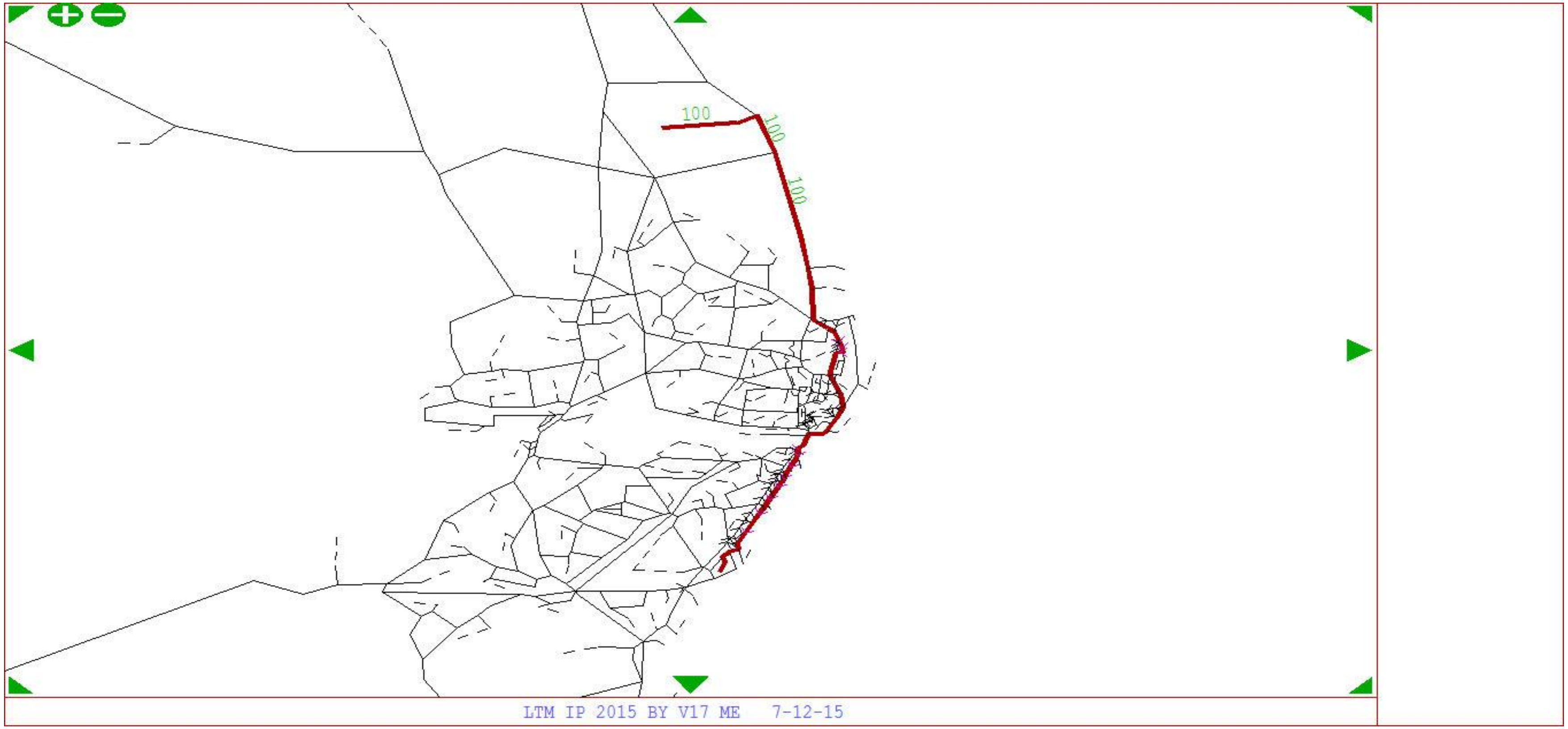


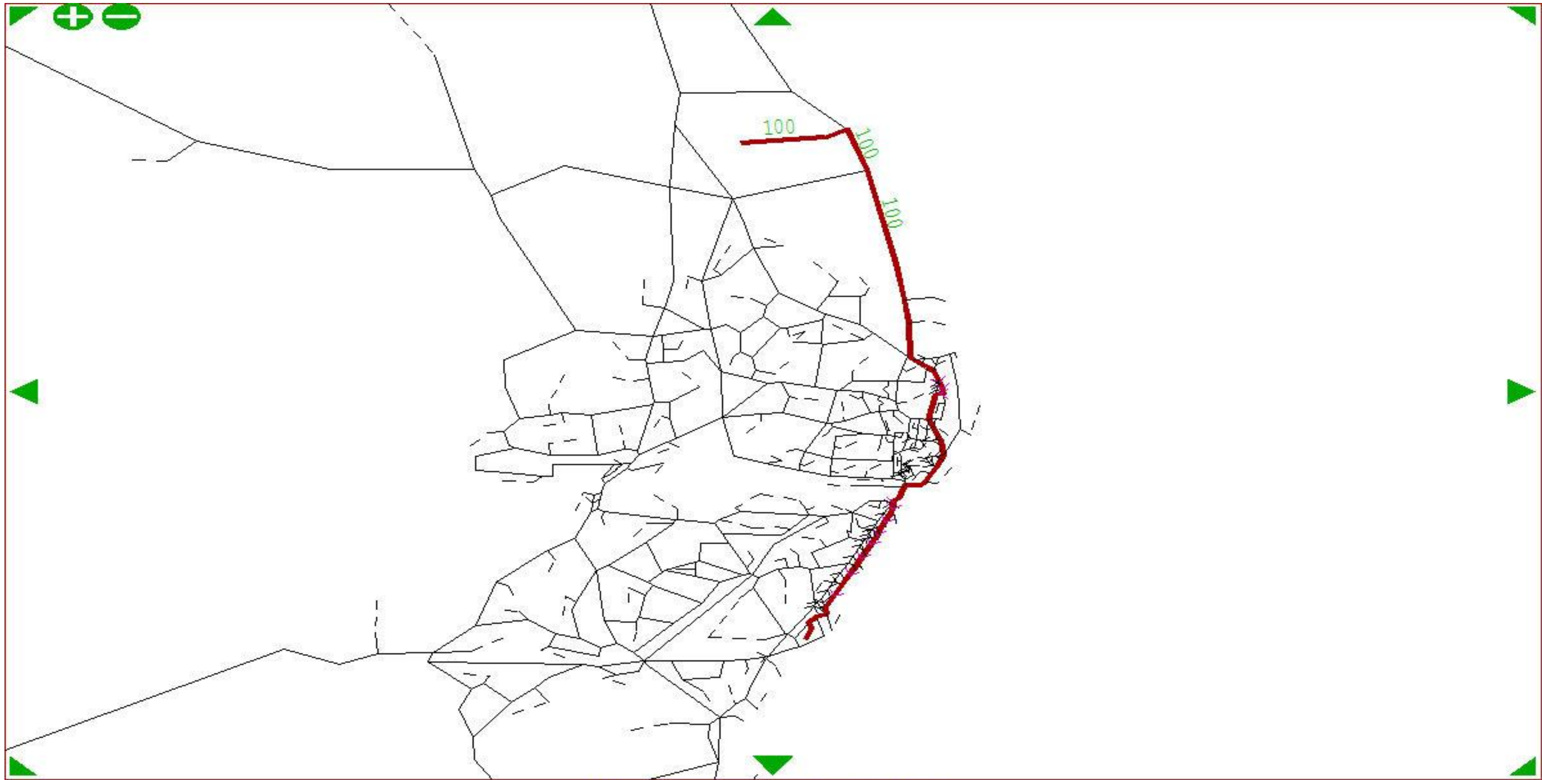
From Zone 102 To Zone 136 - User Class 1



From Zone 102 To Zone 136 - User Class 2



From Zone 102 To Zone 136 - User Class 3



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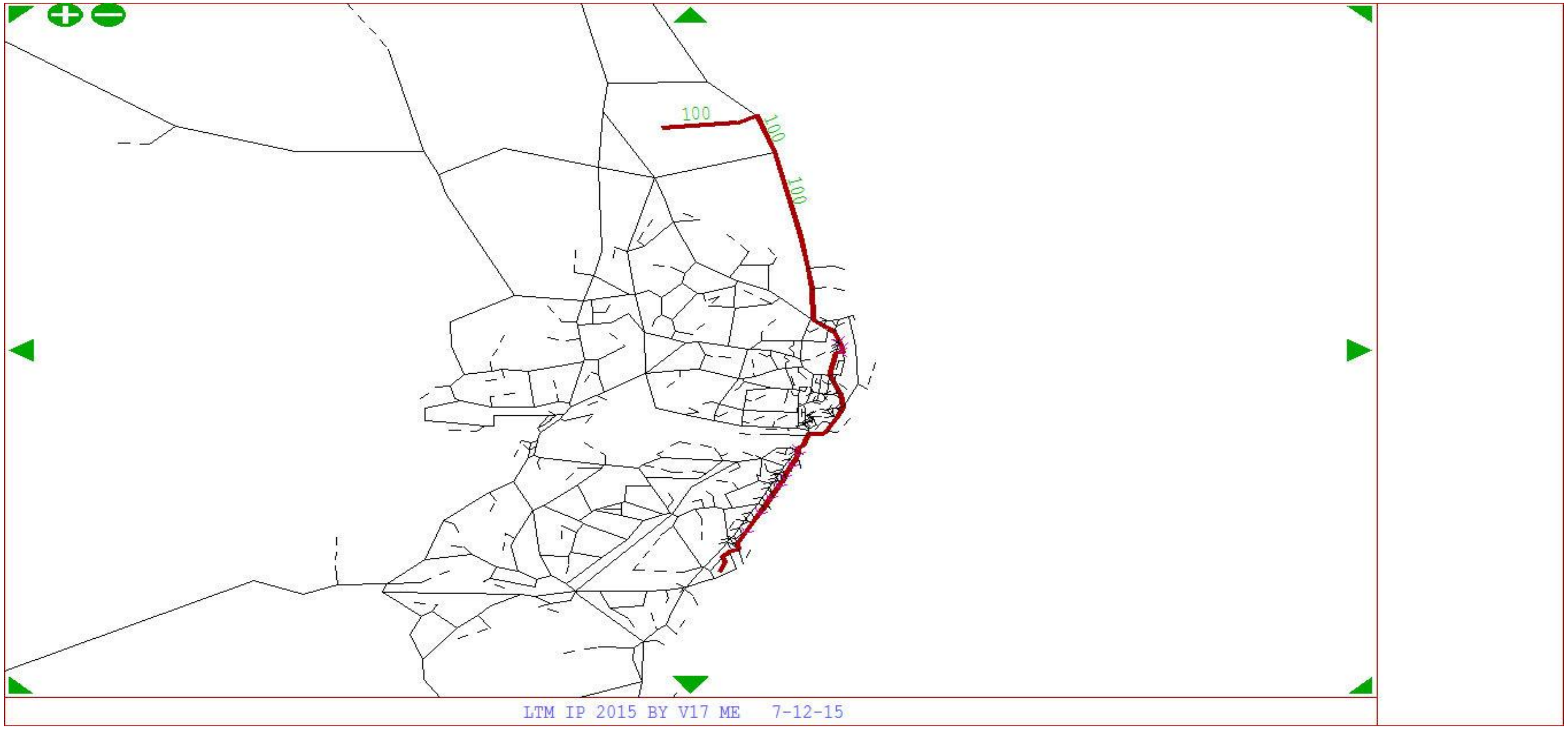
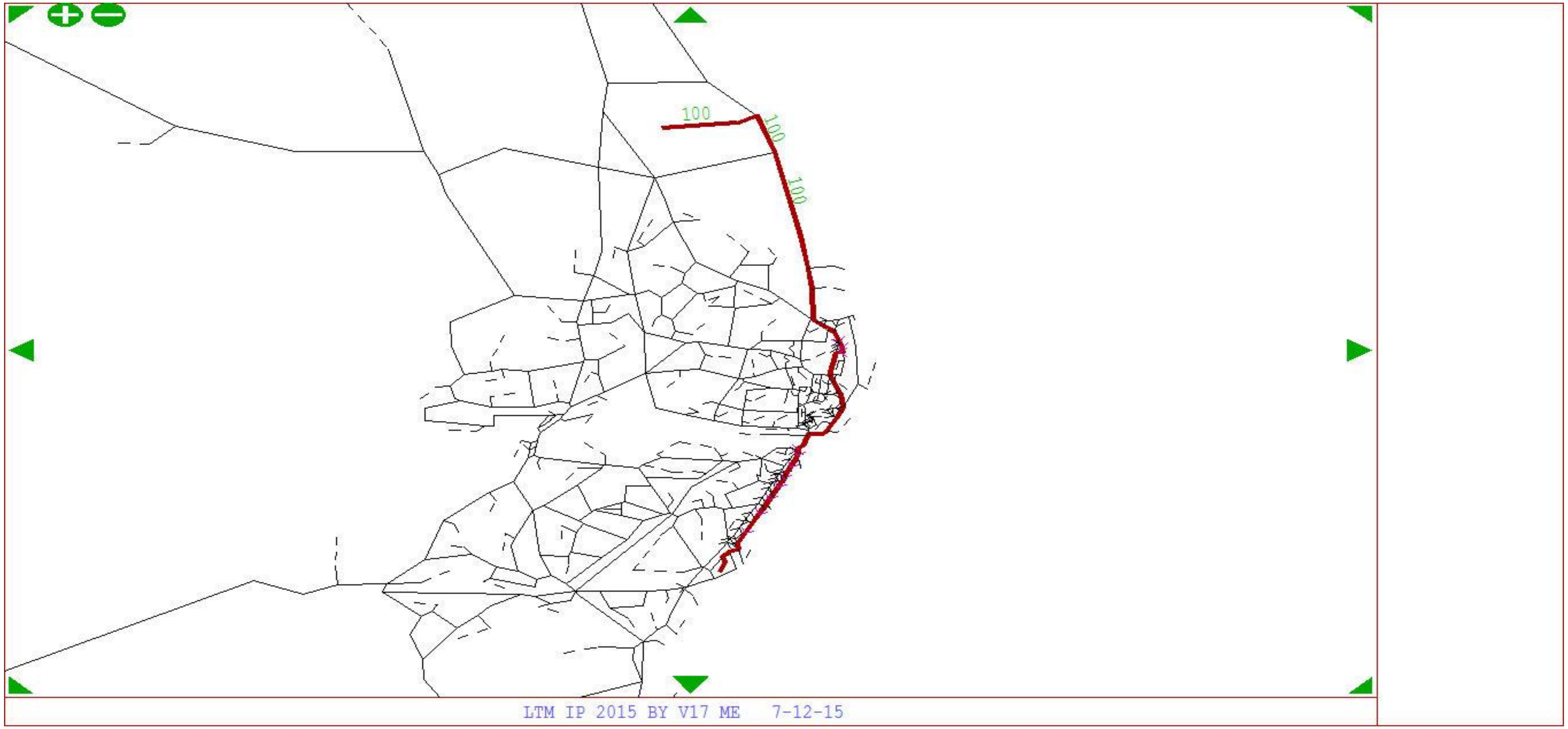
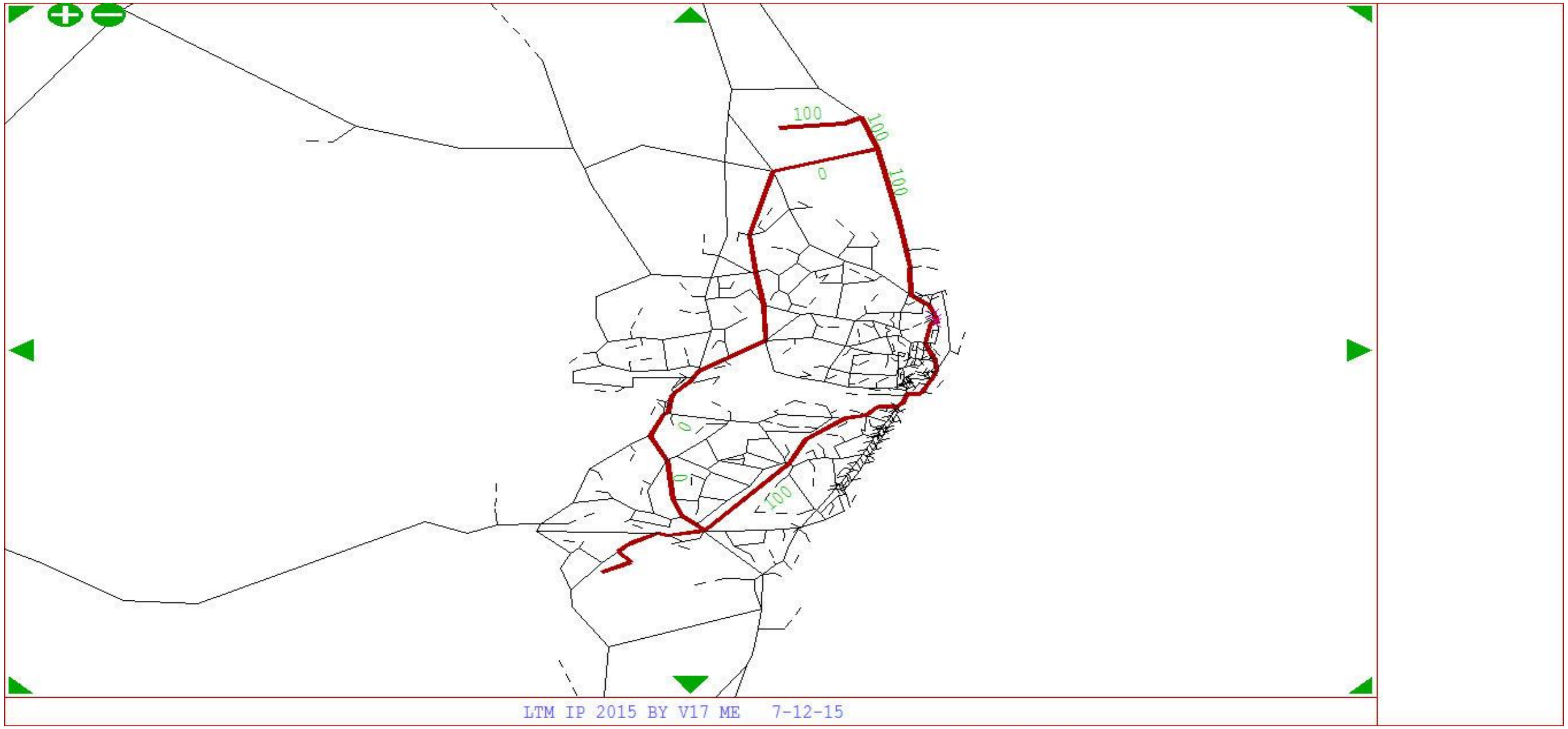
From Zone 102 To Zone 136 - User Class 4



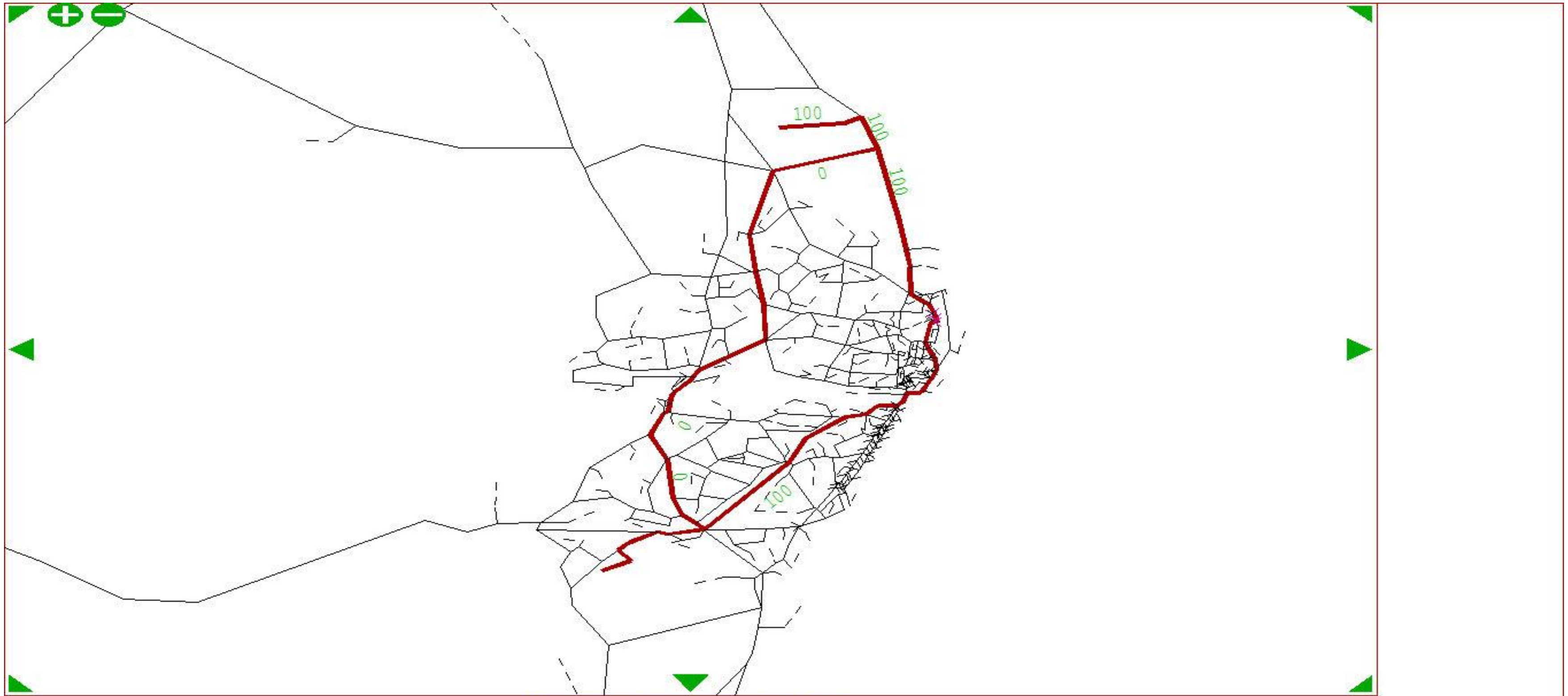
From Zone 102 To Zone 136 - User Class 5



From Zone 102 To Zone 143 - User Class 1



From Zone 102 To Zone 143 - User Class 2



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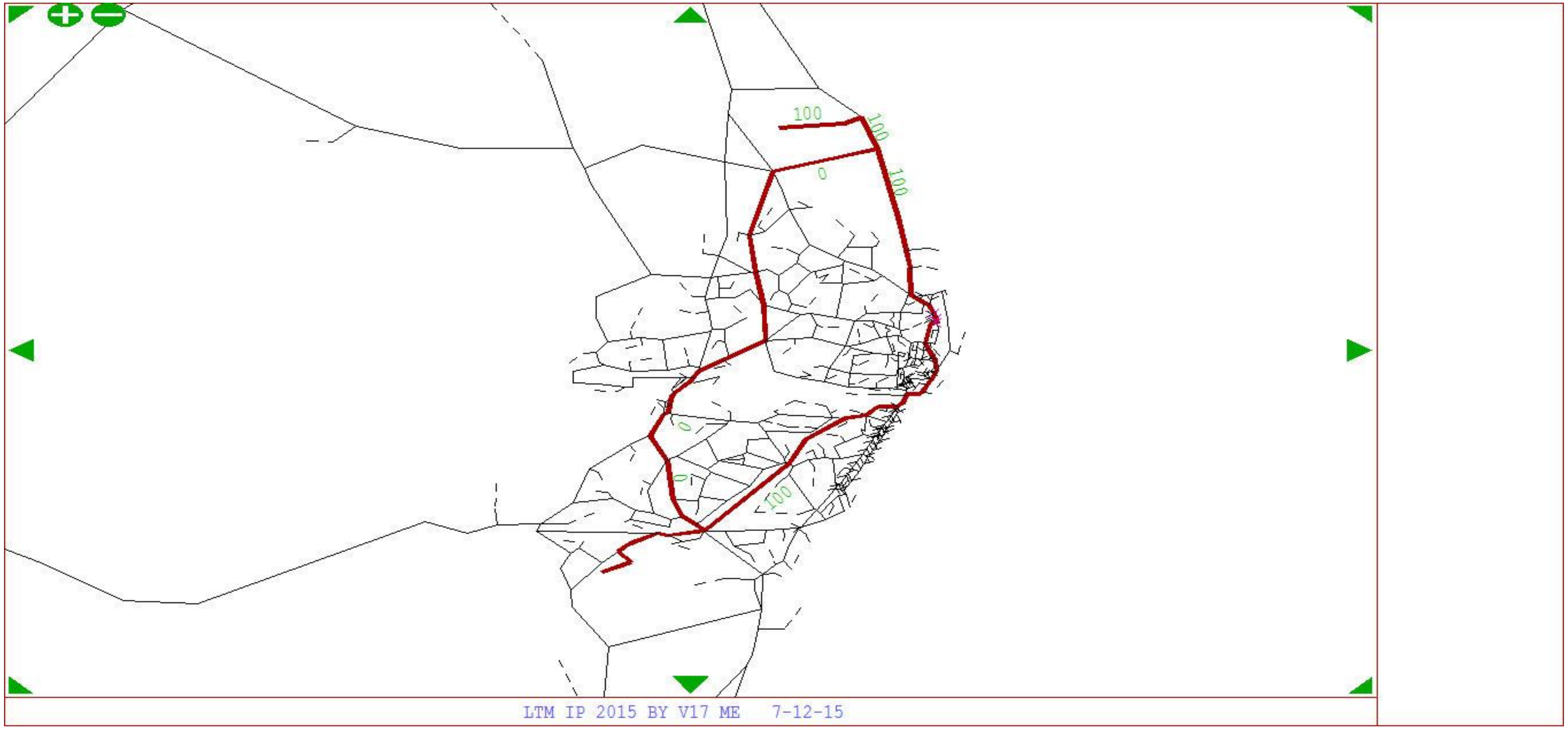
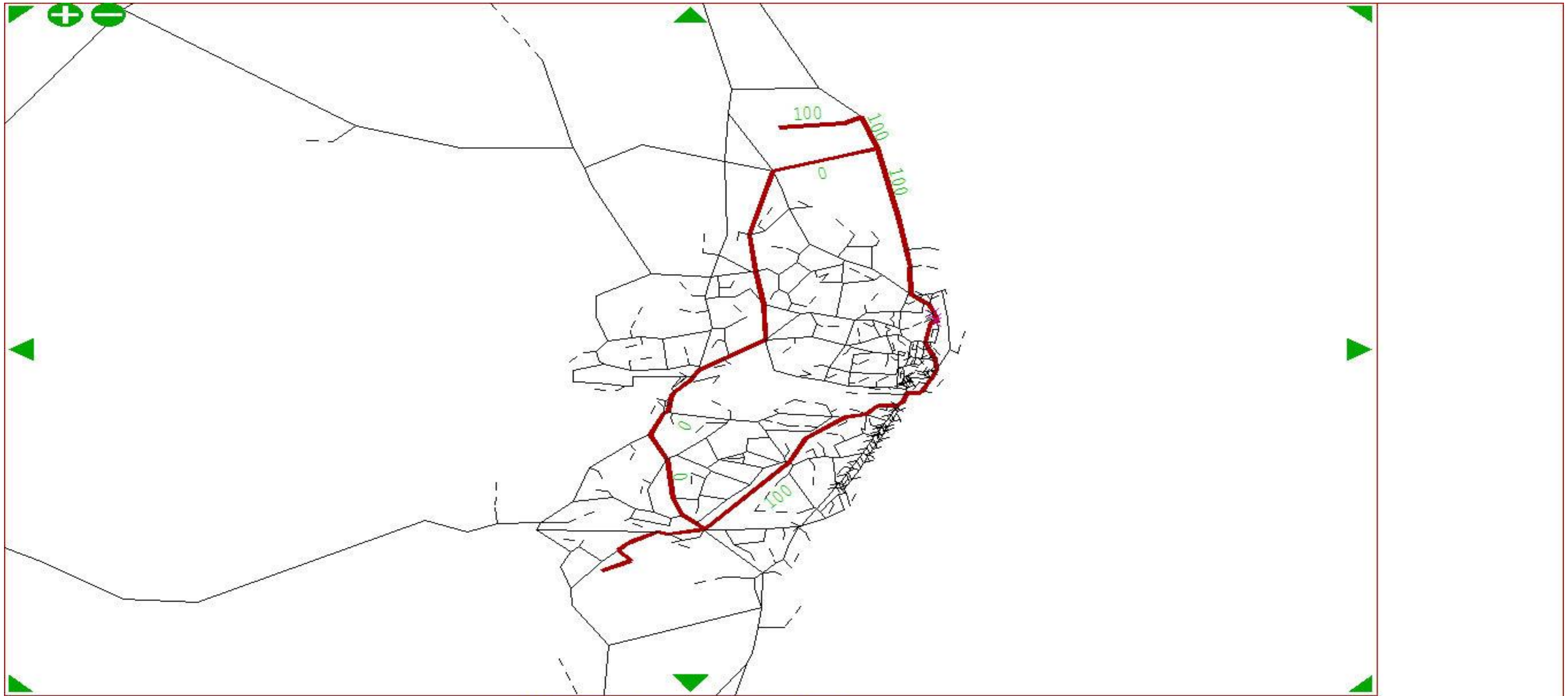
From Zone 102 To Zone 143 - User Class 3

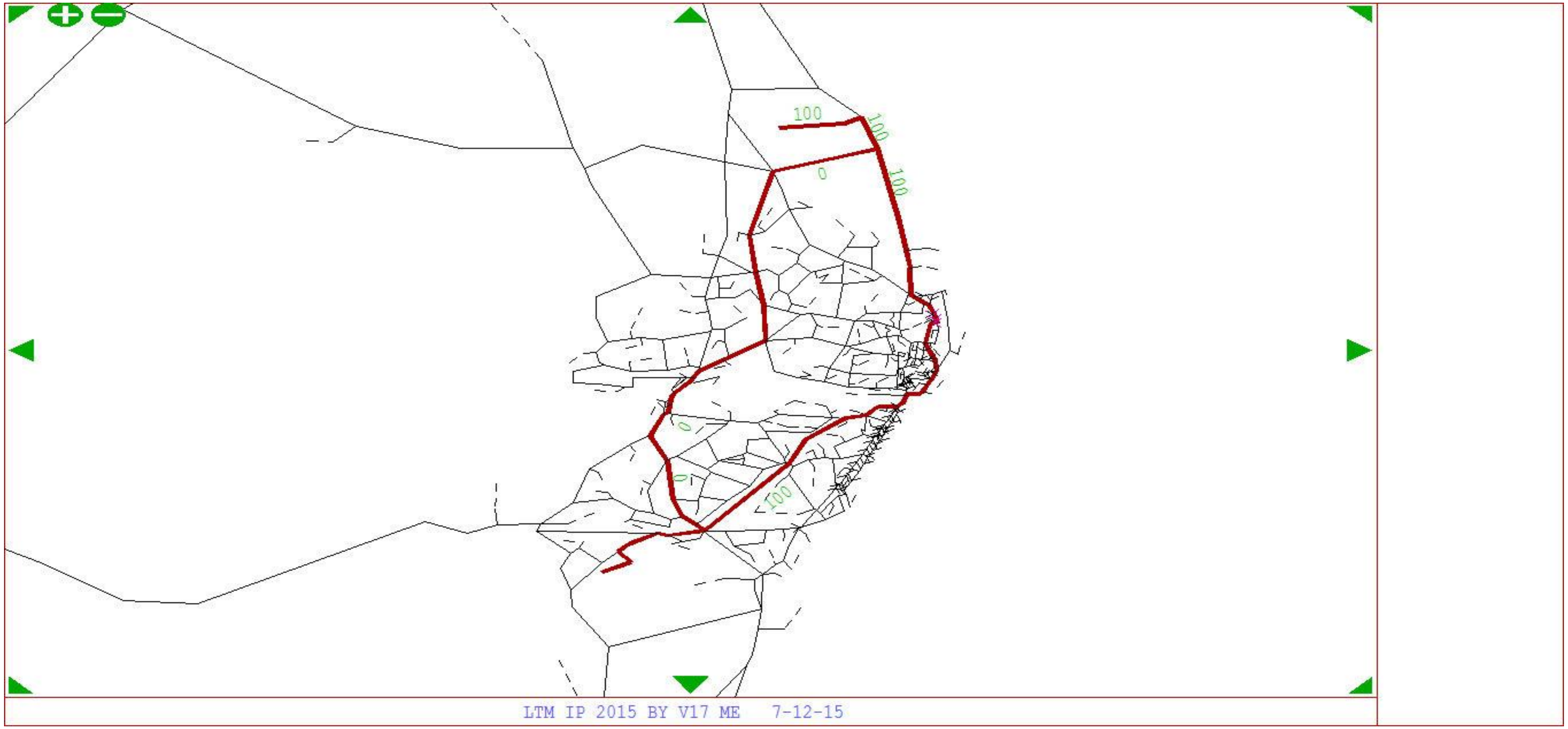


From Zone 102 To Zone 143 - User Class 4

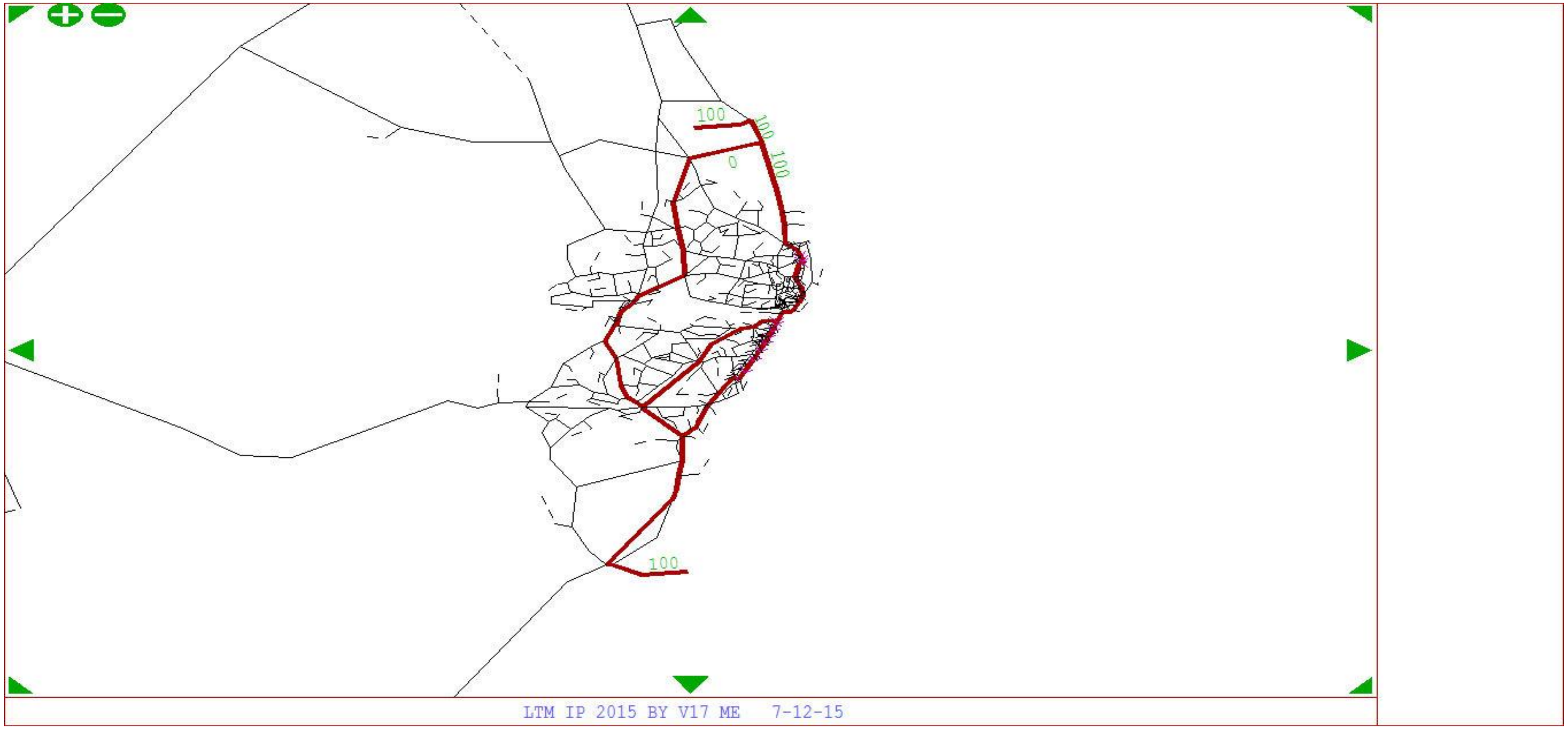


LTM IP 2015 BY V17 ME 7-12-15

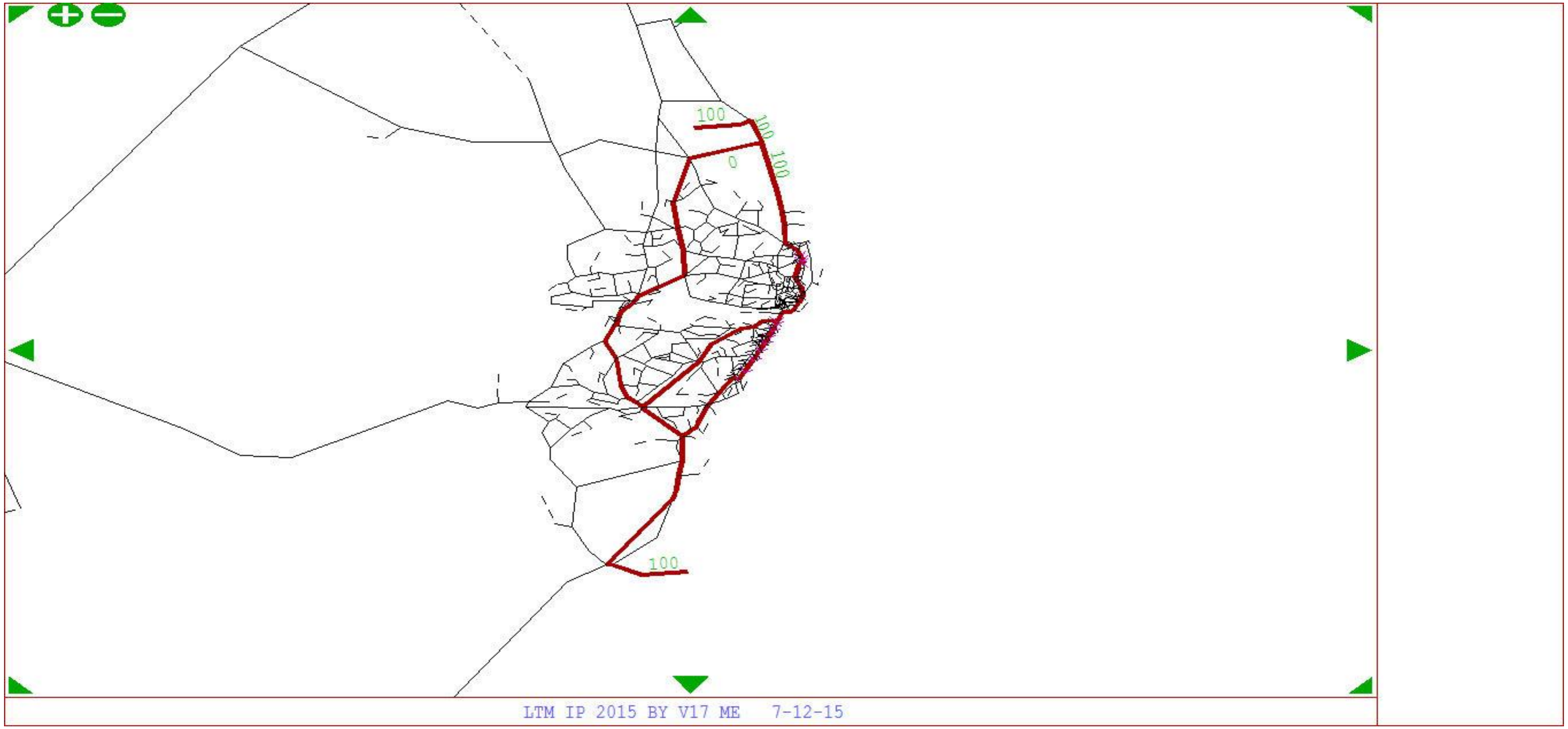
From Zone 102 To Zone 143 - User Class 5



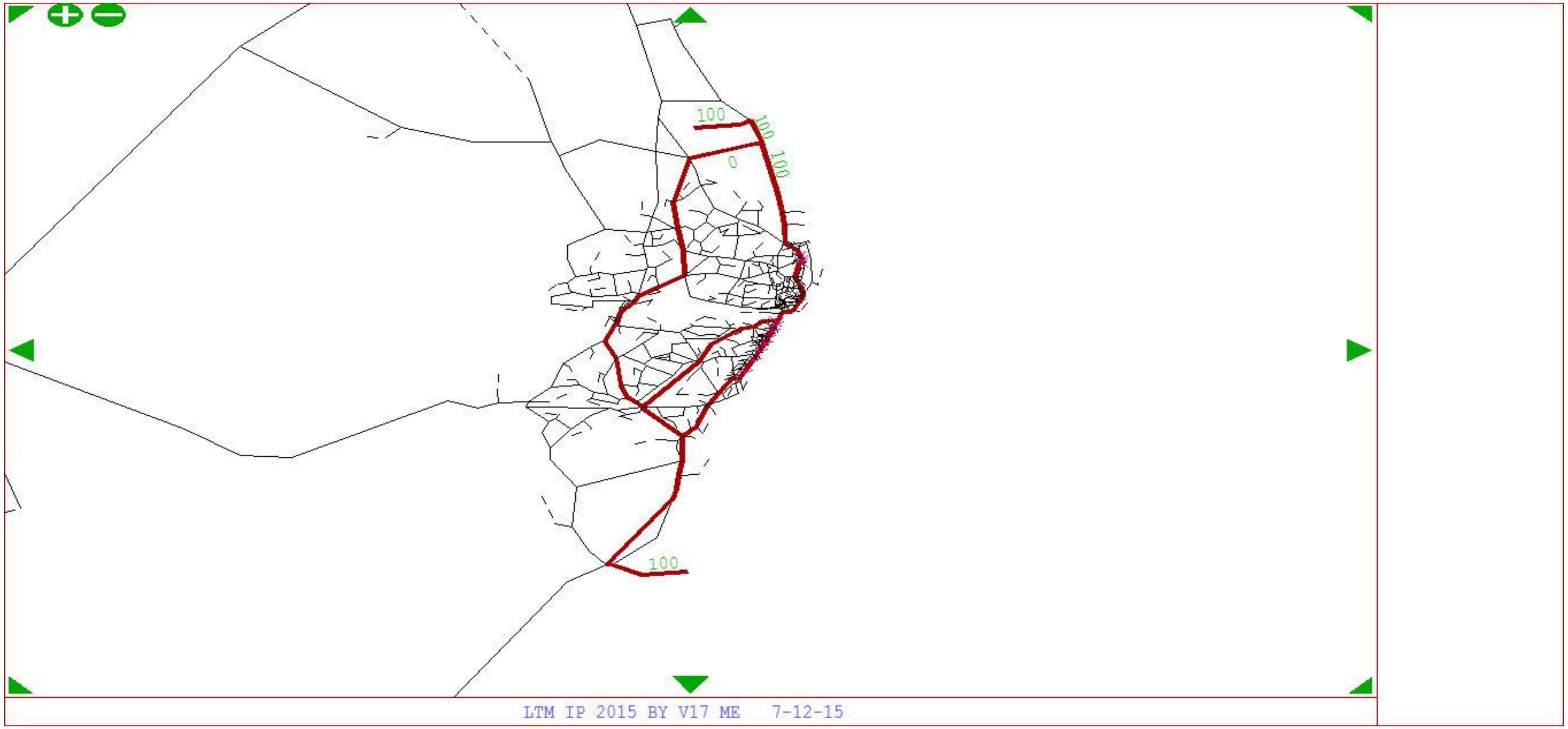
From Zone 102 To Zone 149 - User Class 1



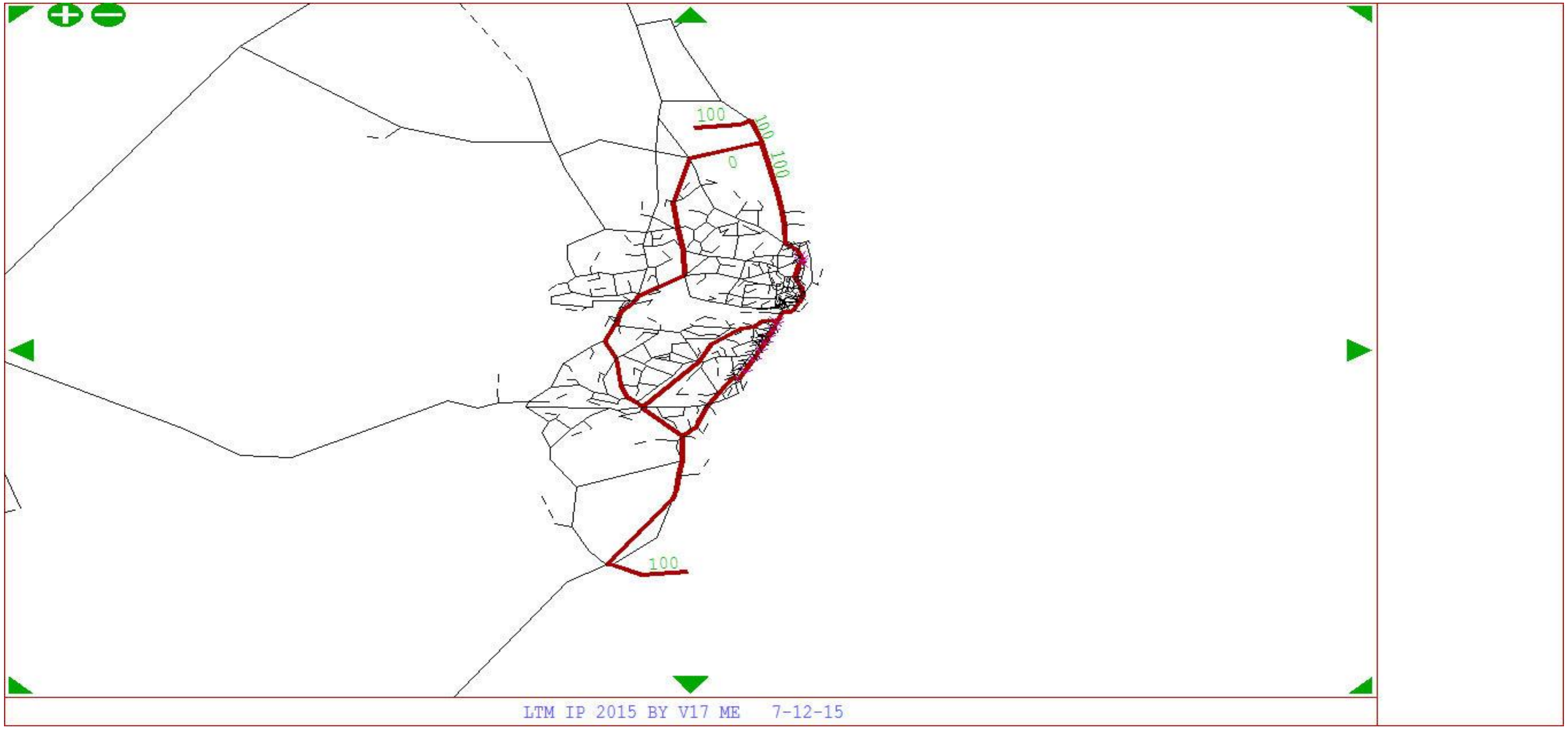
From Zone 102 To Zone 149 - User Class 2



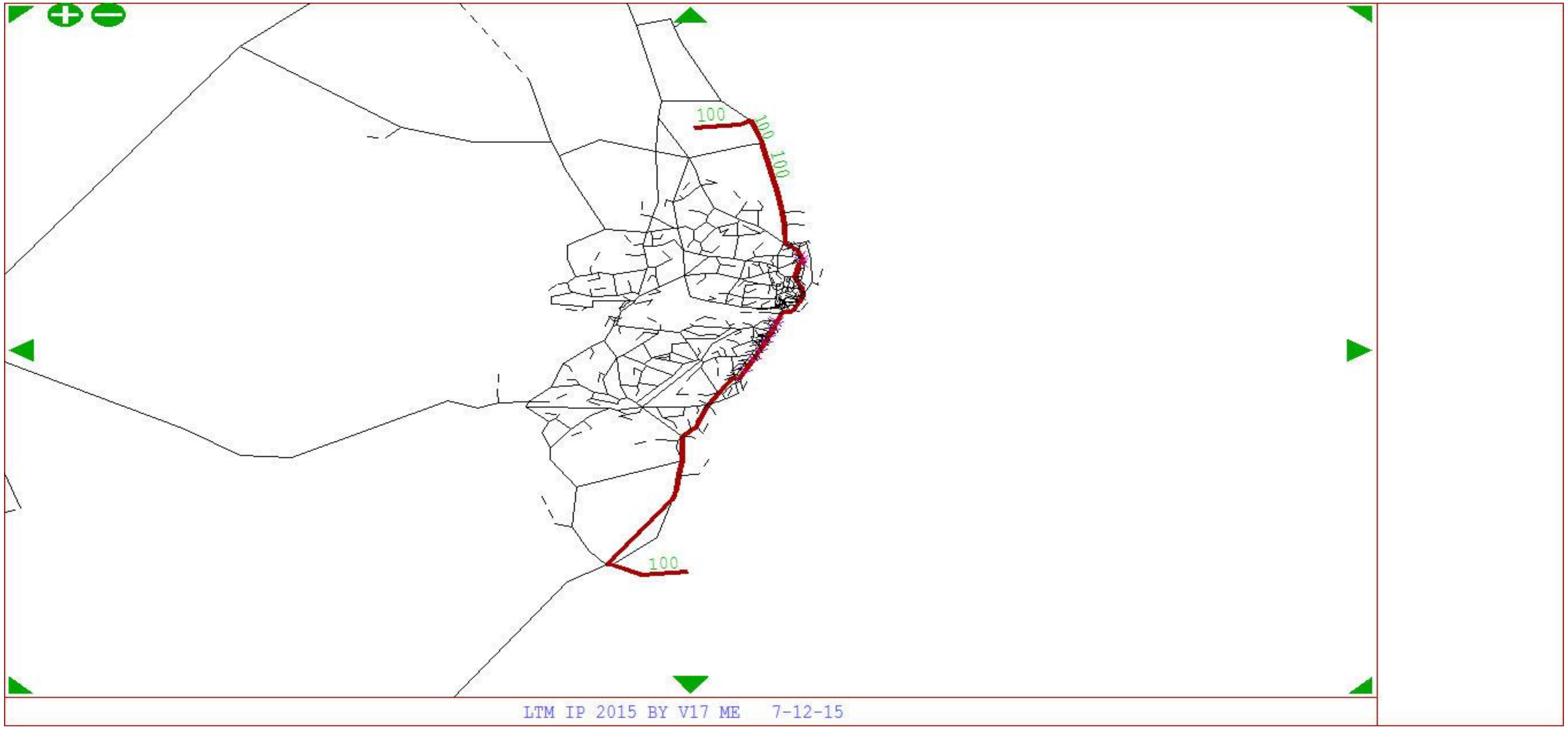
From Zone 102 To Zone 149 - User Class 3



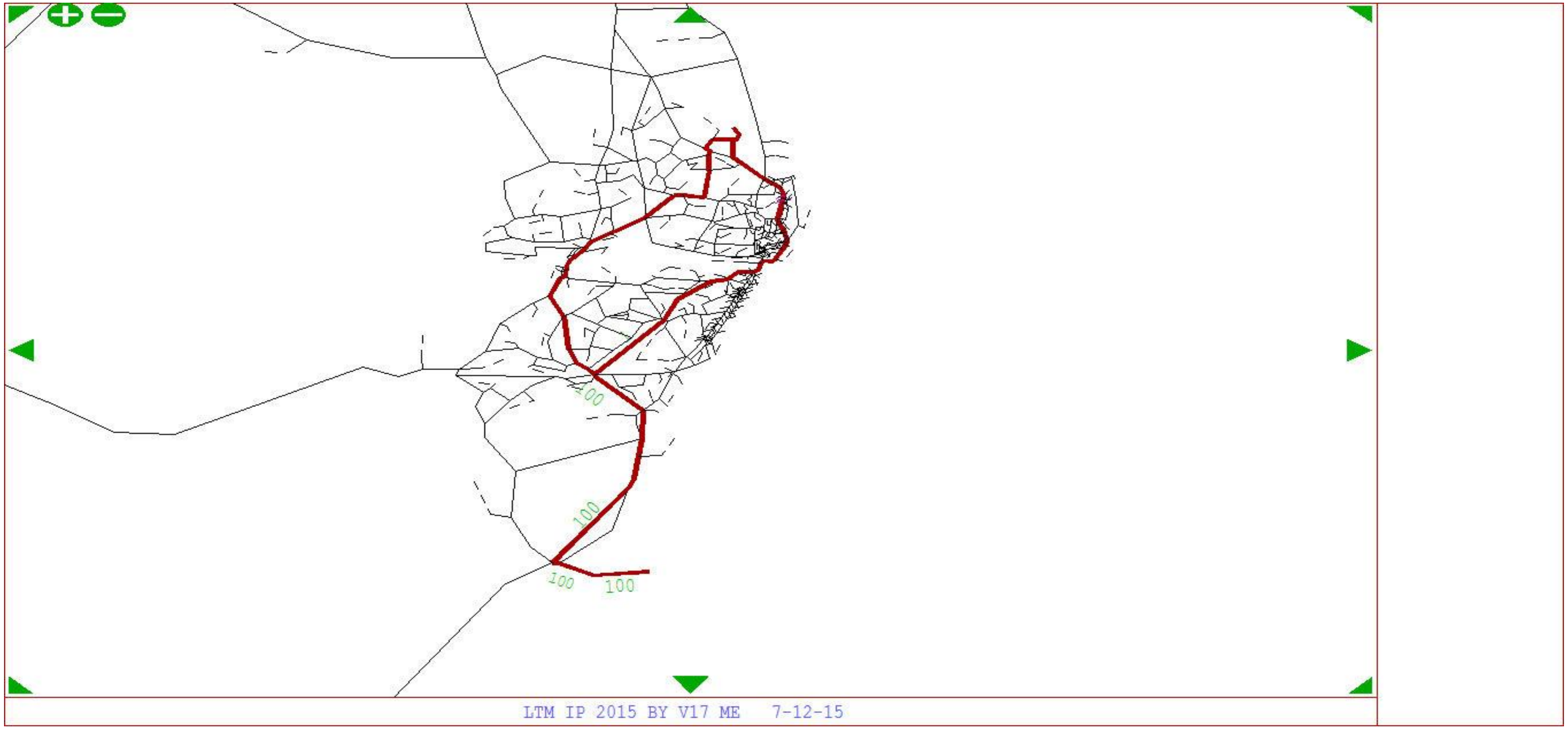
From Zone 102 To Zone 149 - User Class 4



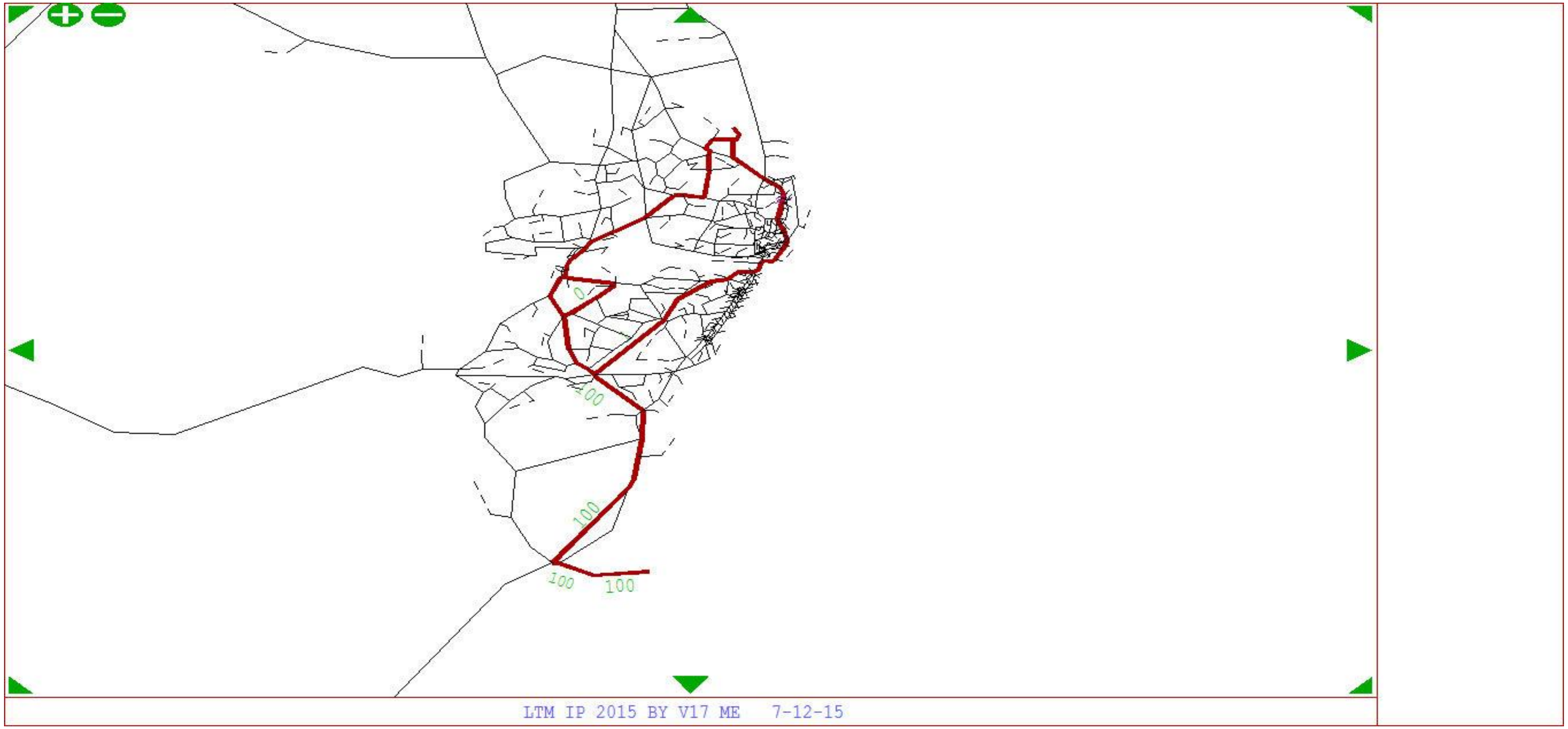
From Zone 102 To Zone 149 - User Class 5



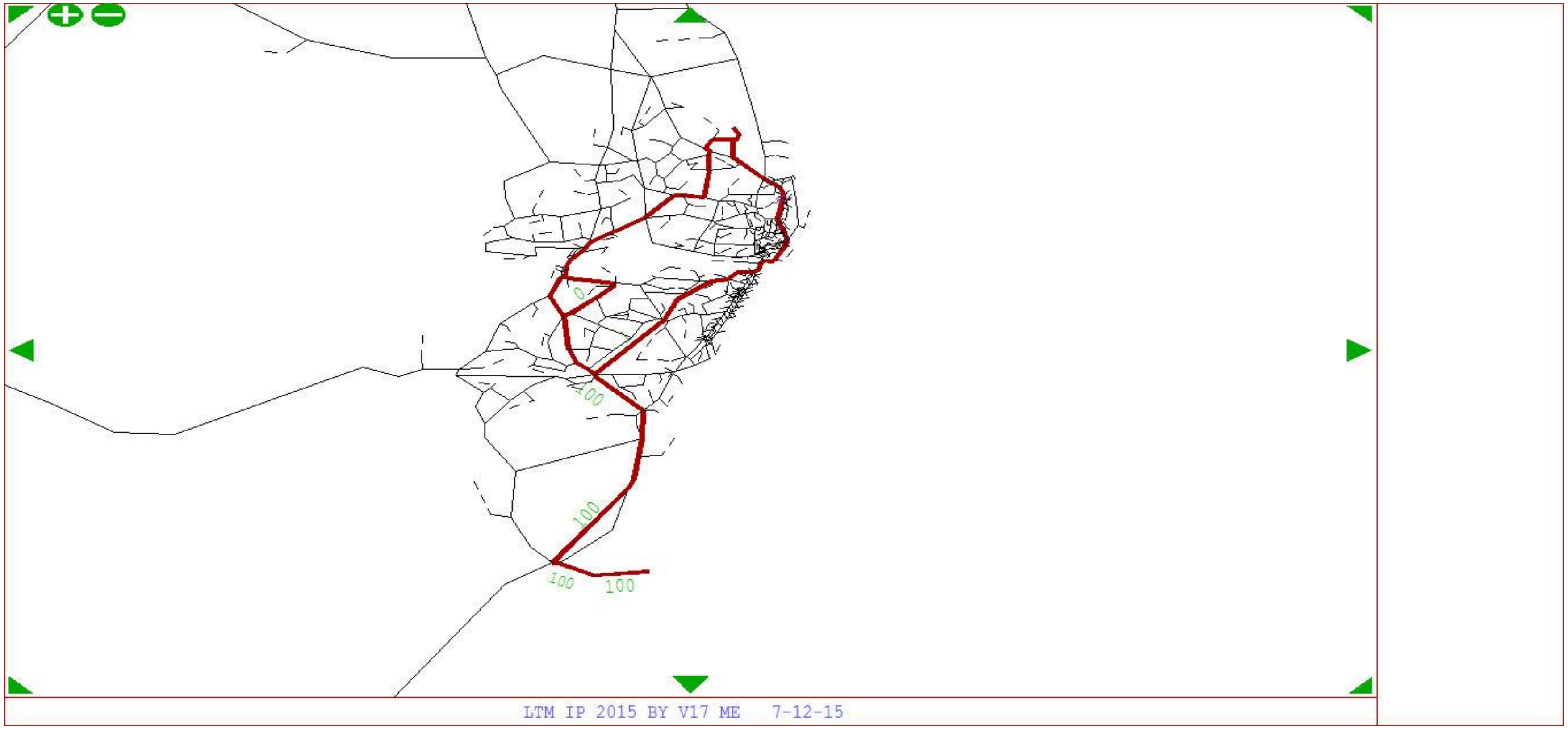
From Zone 149 To Zone 101 - User Class 1



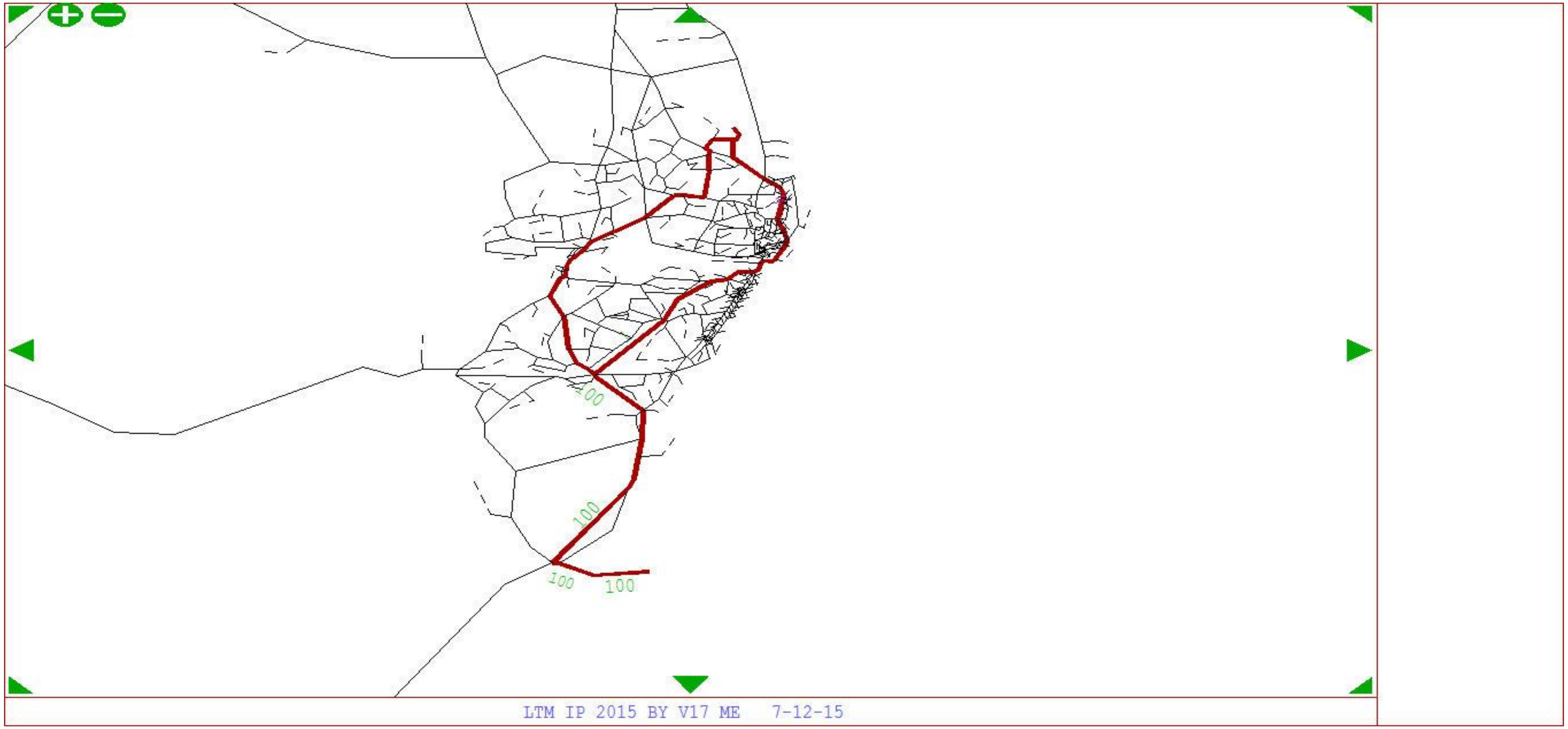
From Zone 149 To Zone 101 - User Class 2



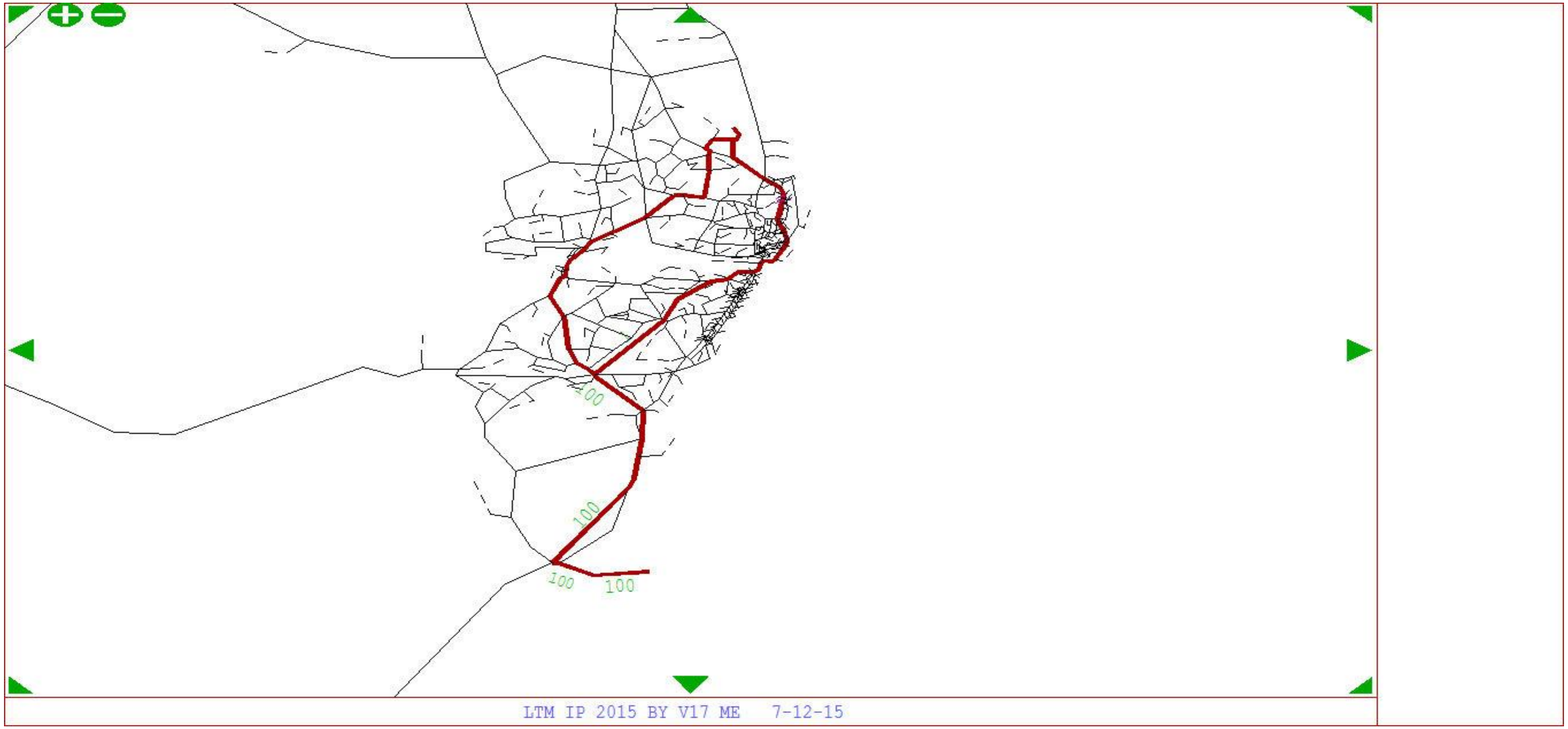
From Zone 149 To Zone 101 - User Class 3



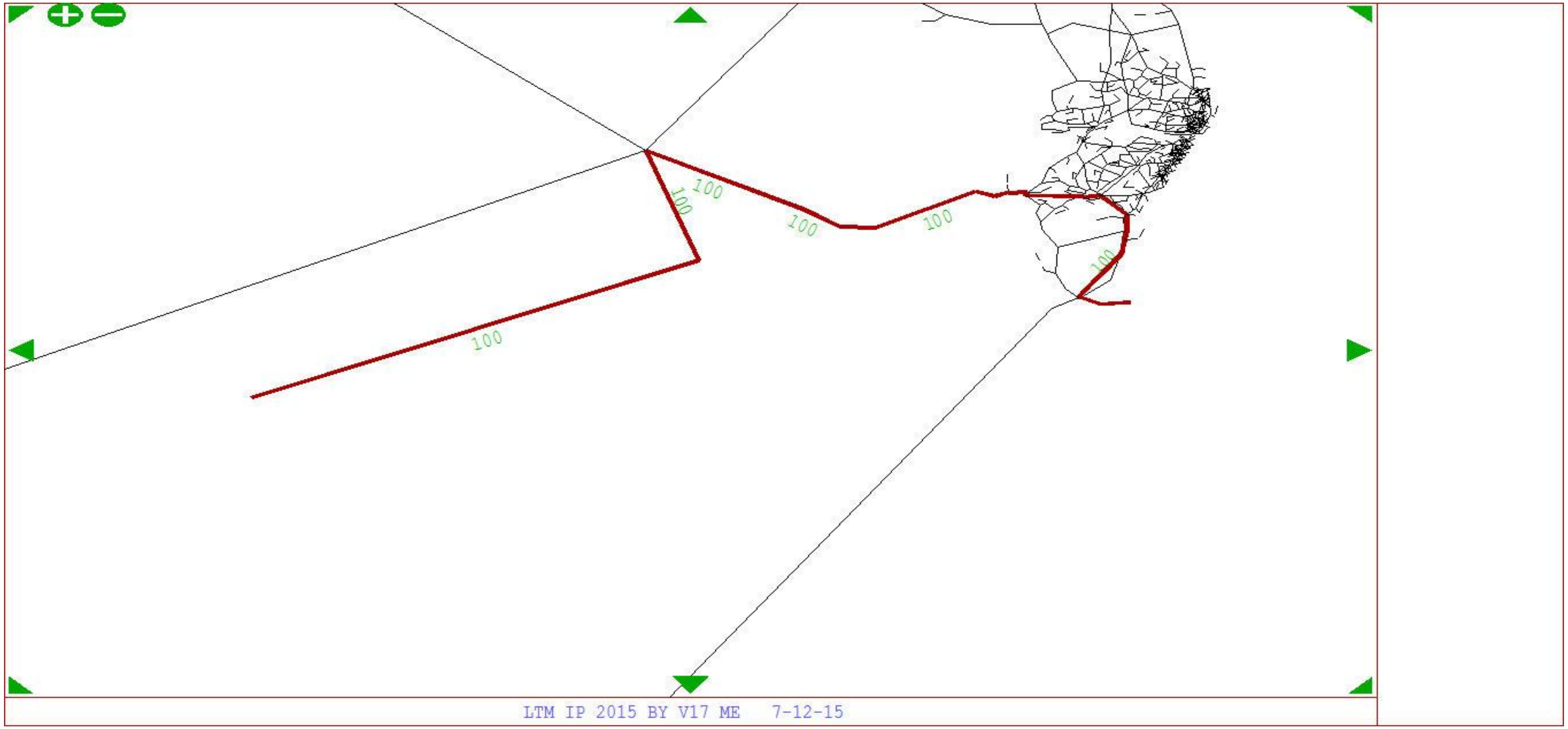
From Zone 149 To Zone 101 - User Class 4



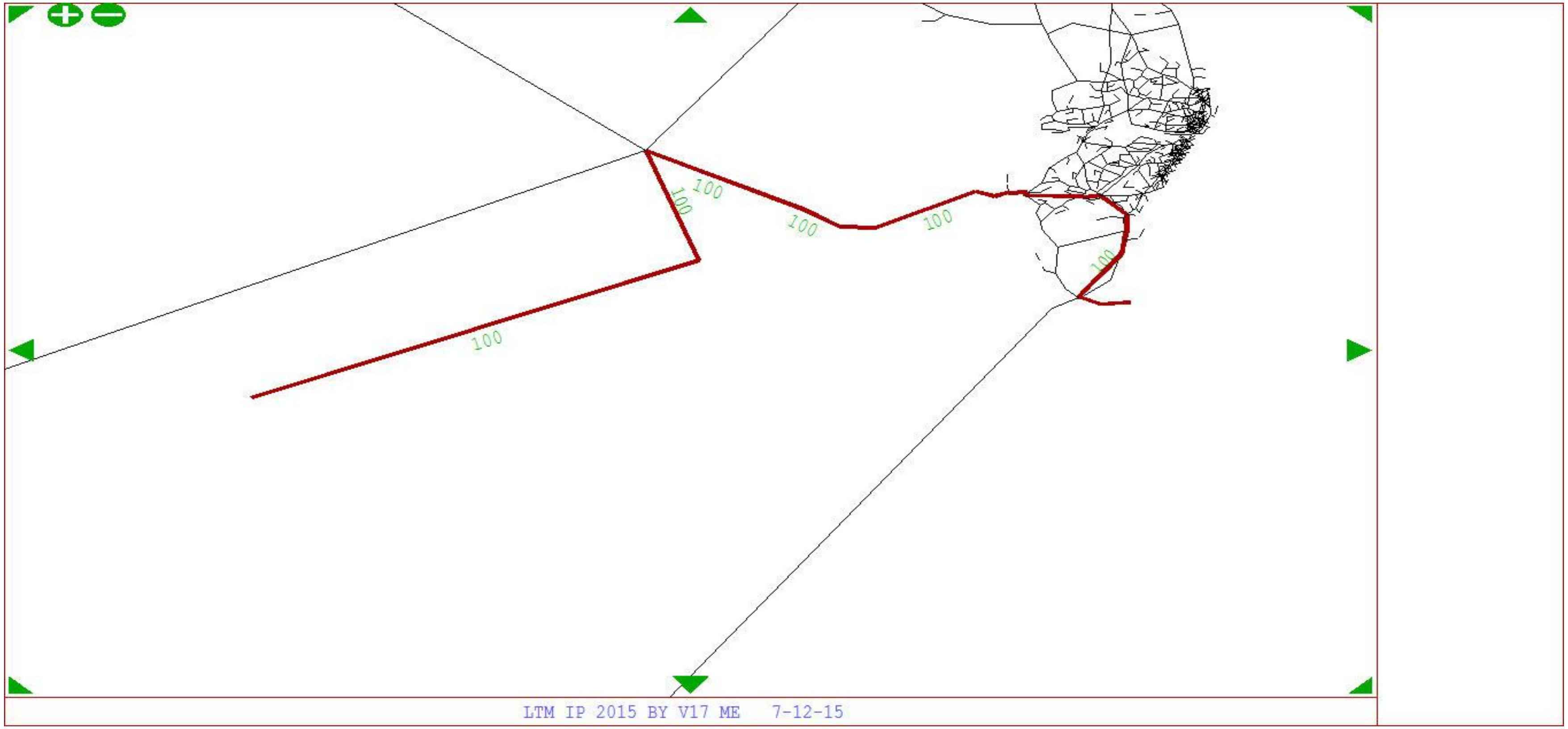
From Zone 149 To Zone 101 - User Class 5



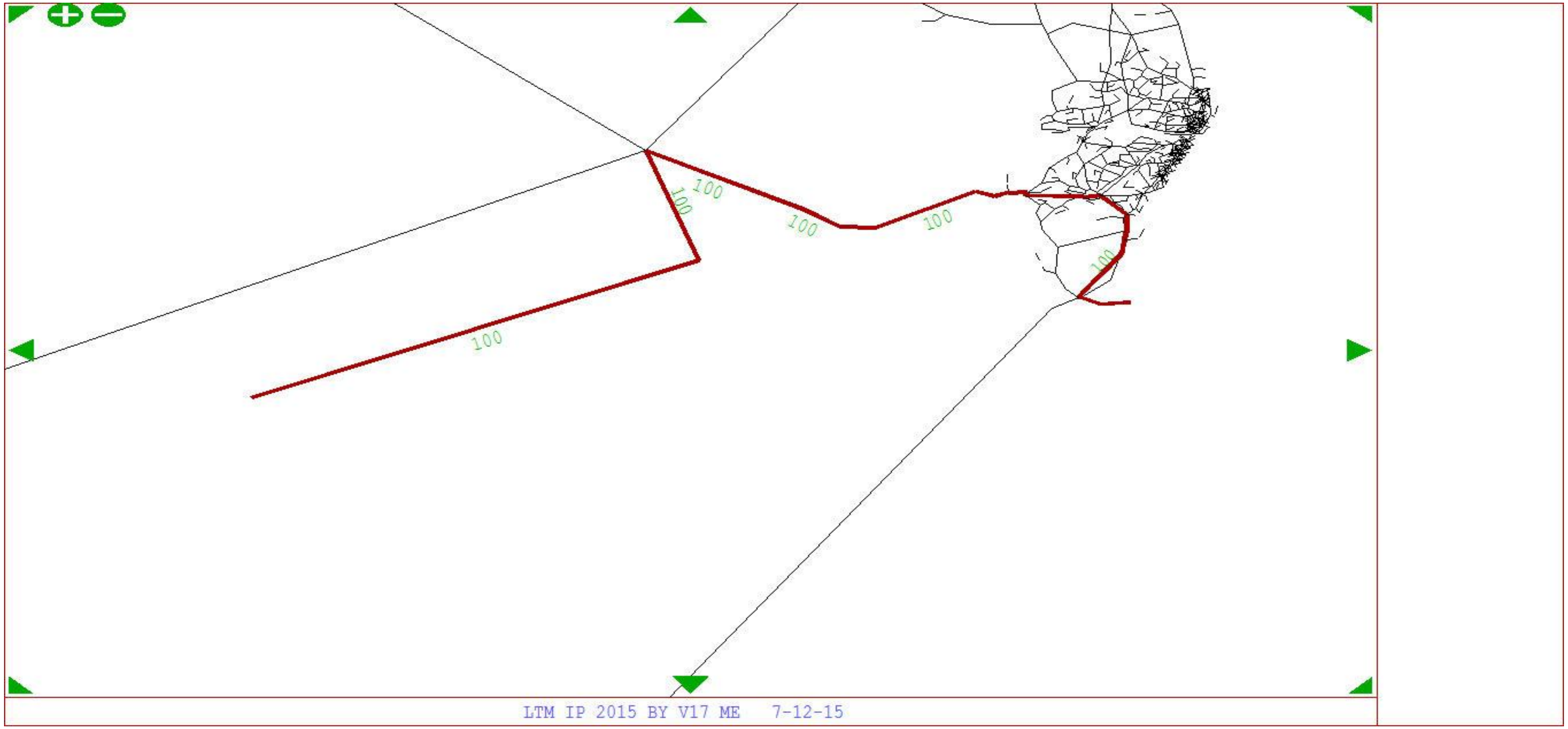
From Zone 149 To Zone 104 - User Class 1



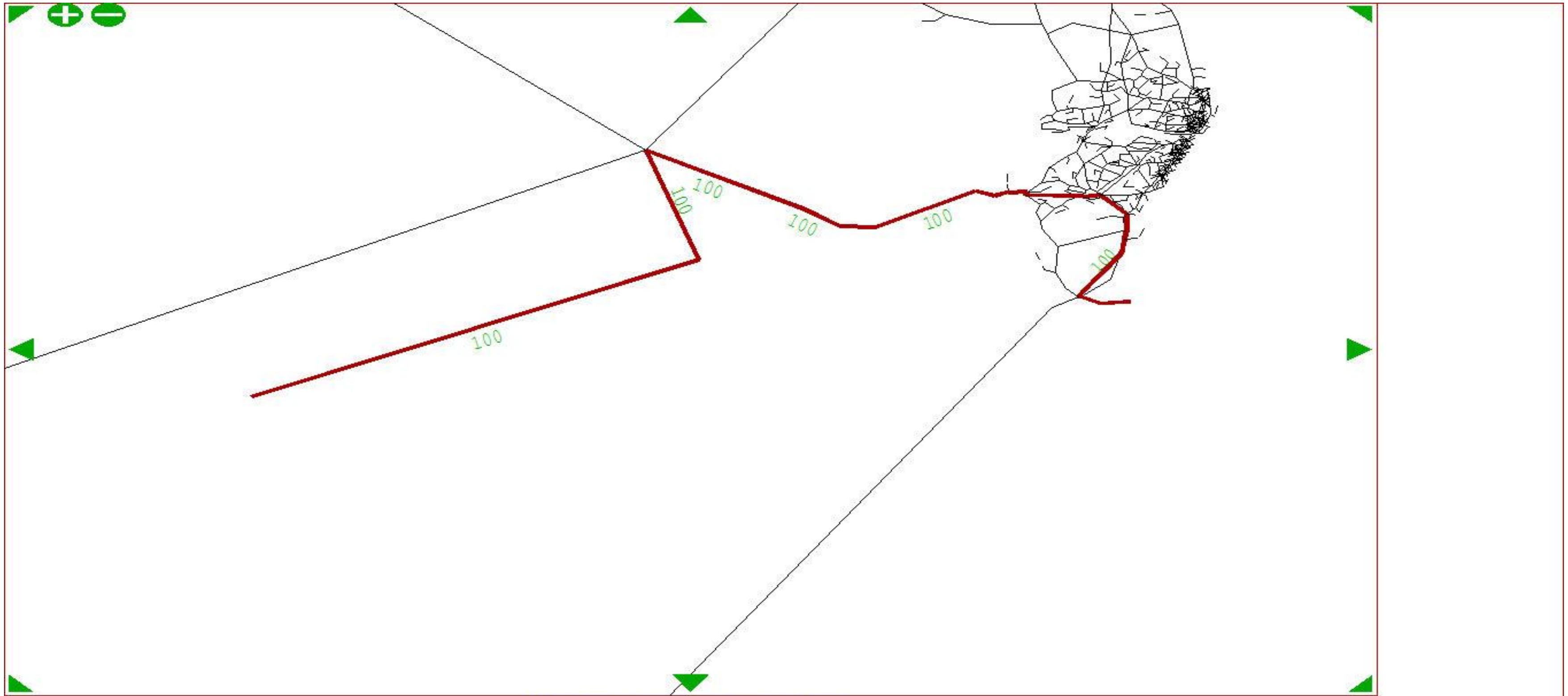
From Zone 149 To Zone 104 - User Class 2



From Zone 149 To Zone 104 - User Class 3



From Zone 149 To Zone 104 - User Class 4



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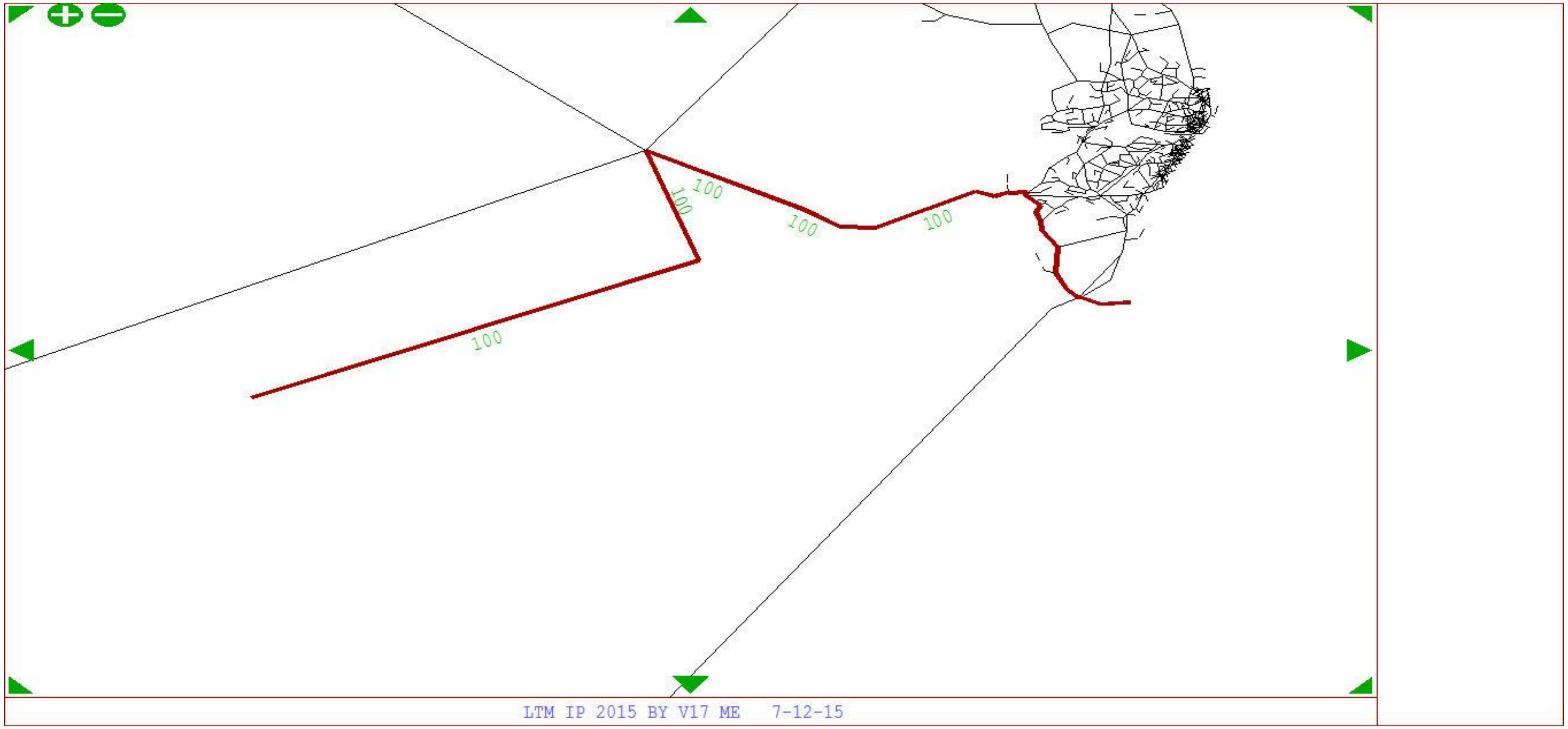
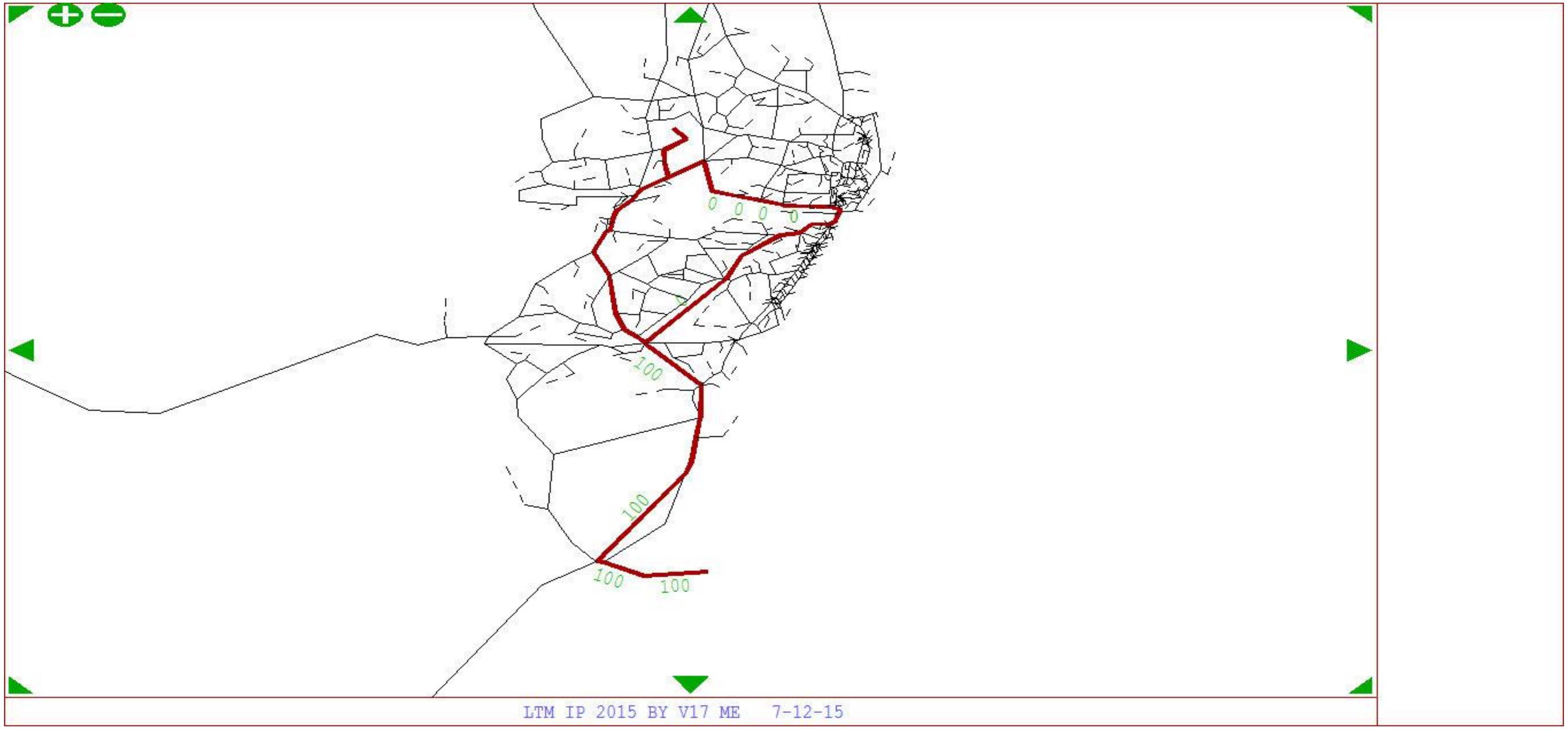
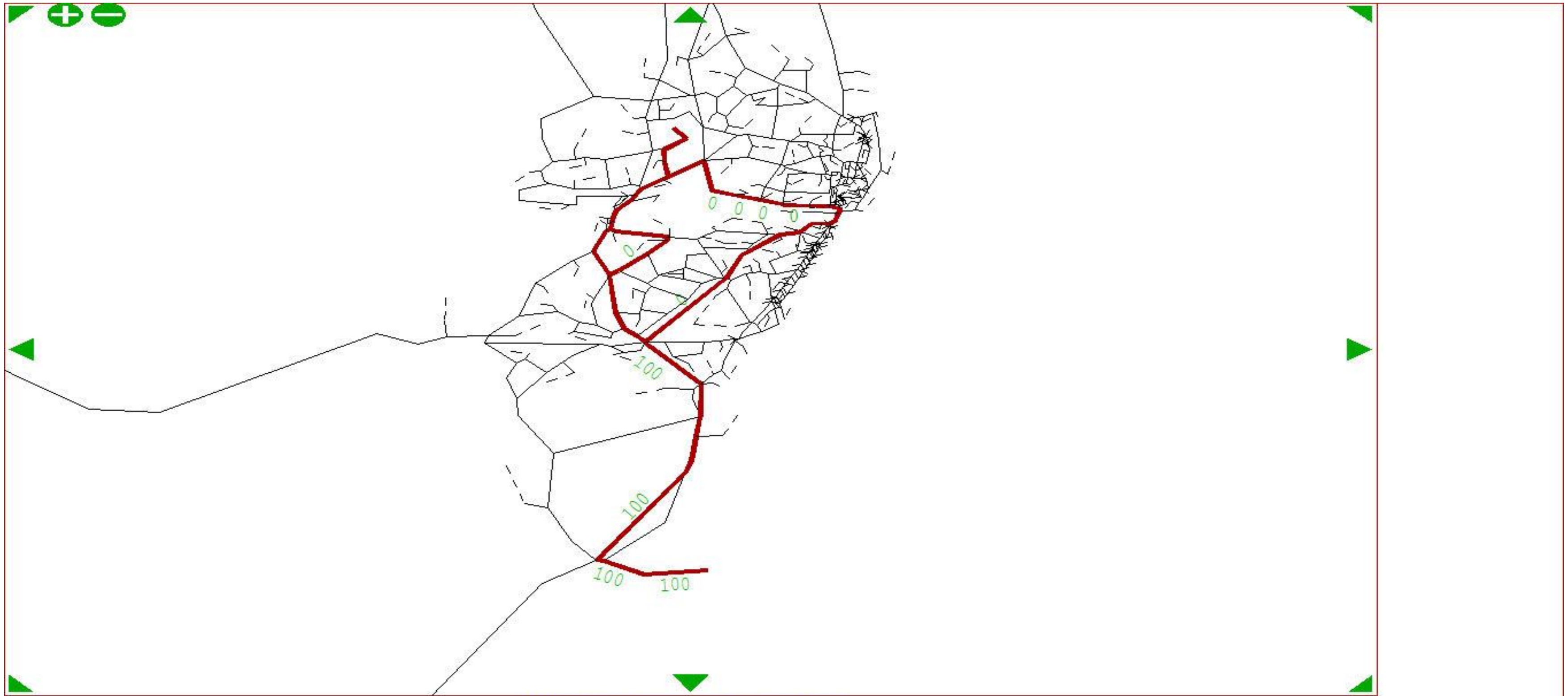
From Zone 149 To Zone 104 - User Class 5



From Zone 149 To Zone 113 - User Class 1



From Zone 149 To Zone 113 - User Class 2



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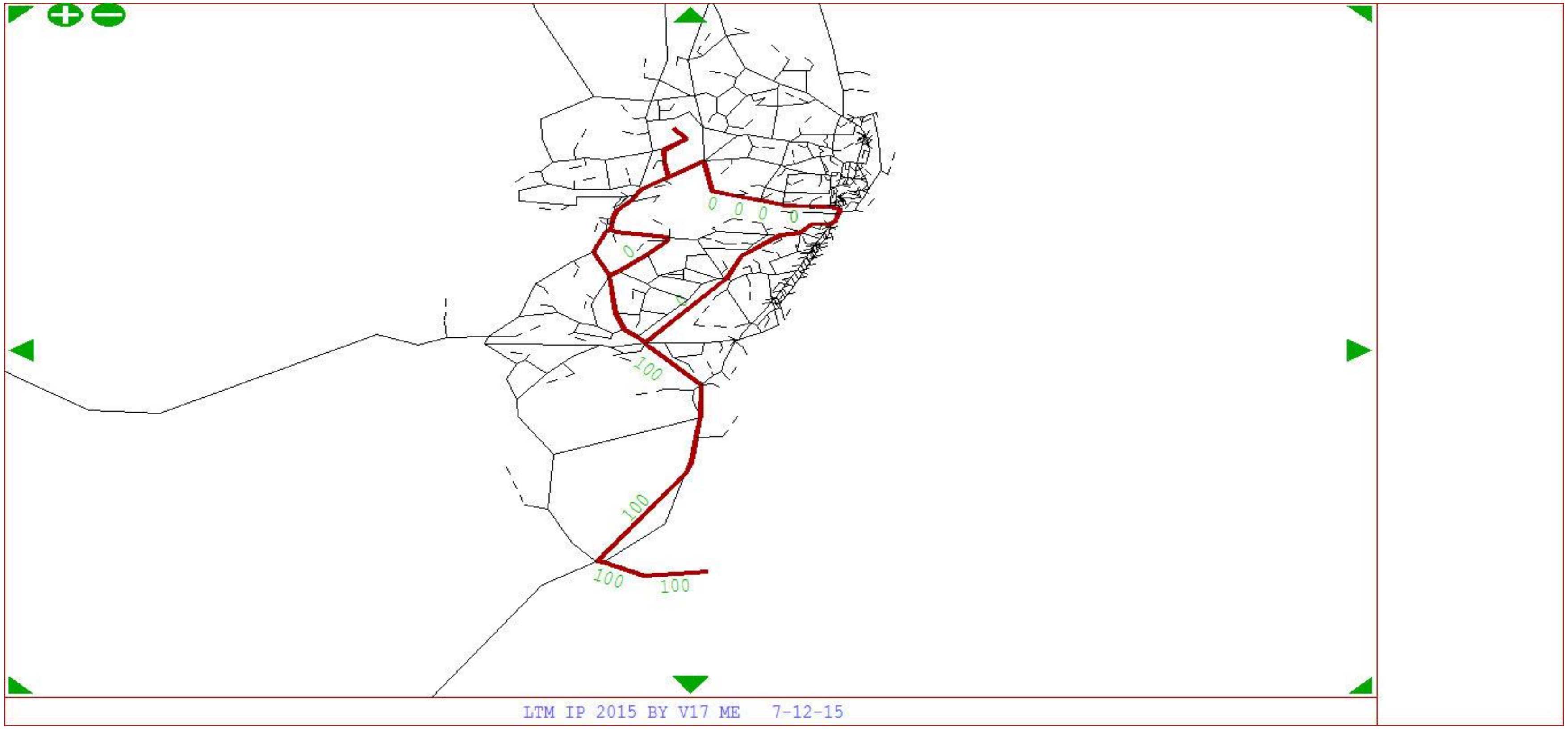
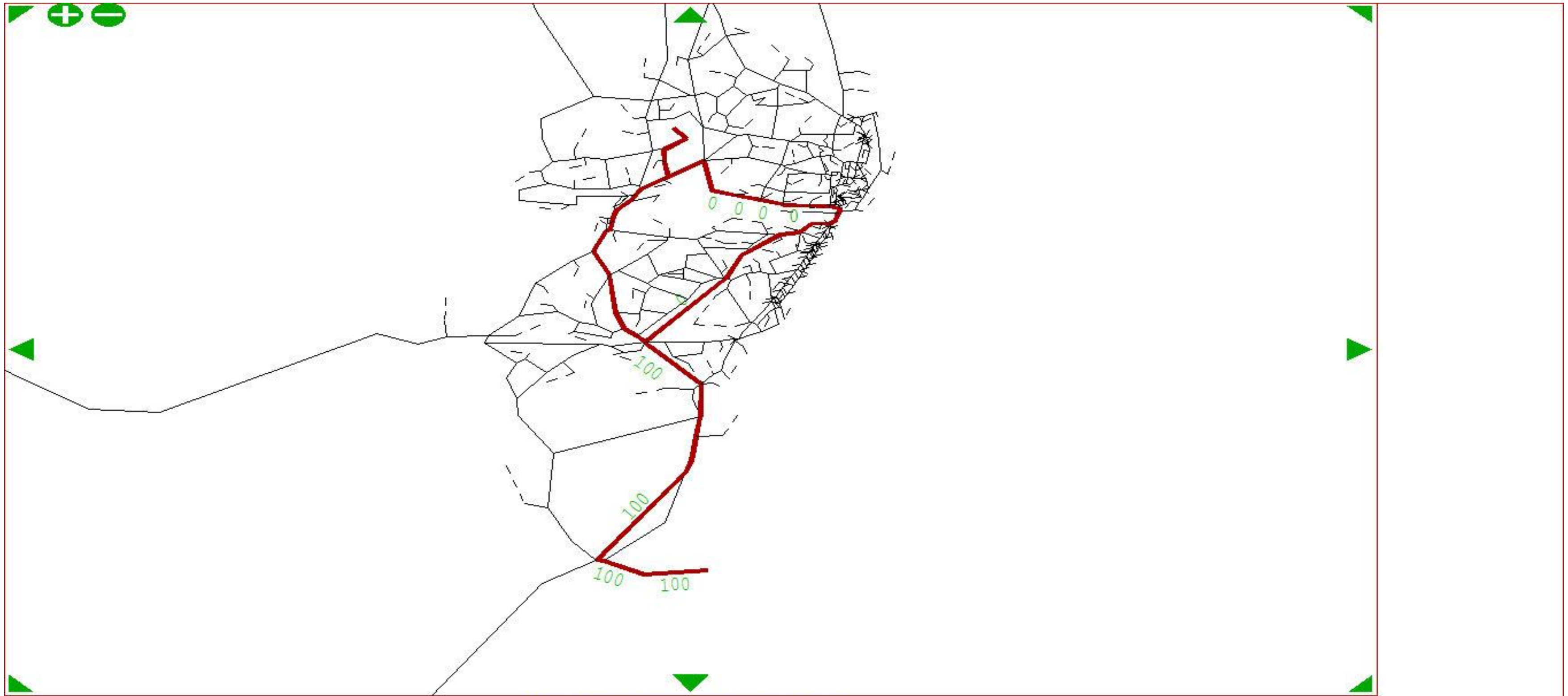
From Zone 149 To Zone 113 - User Class 3

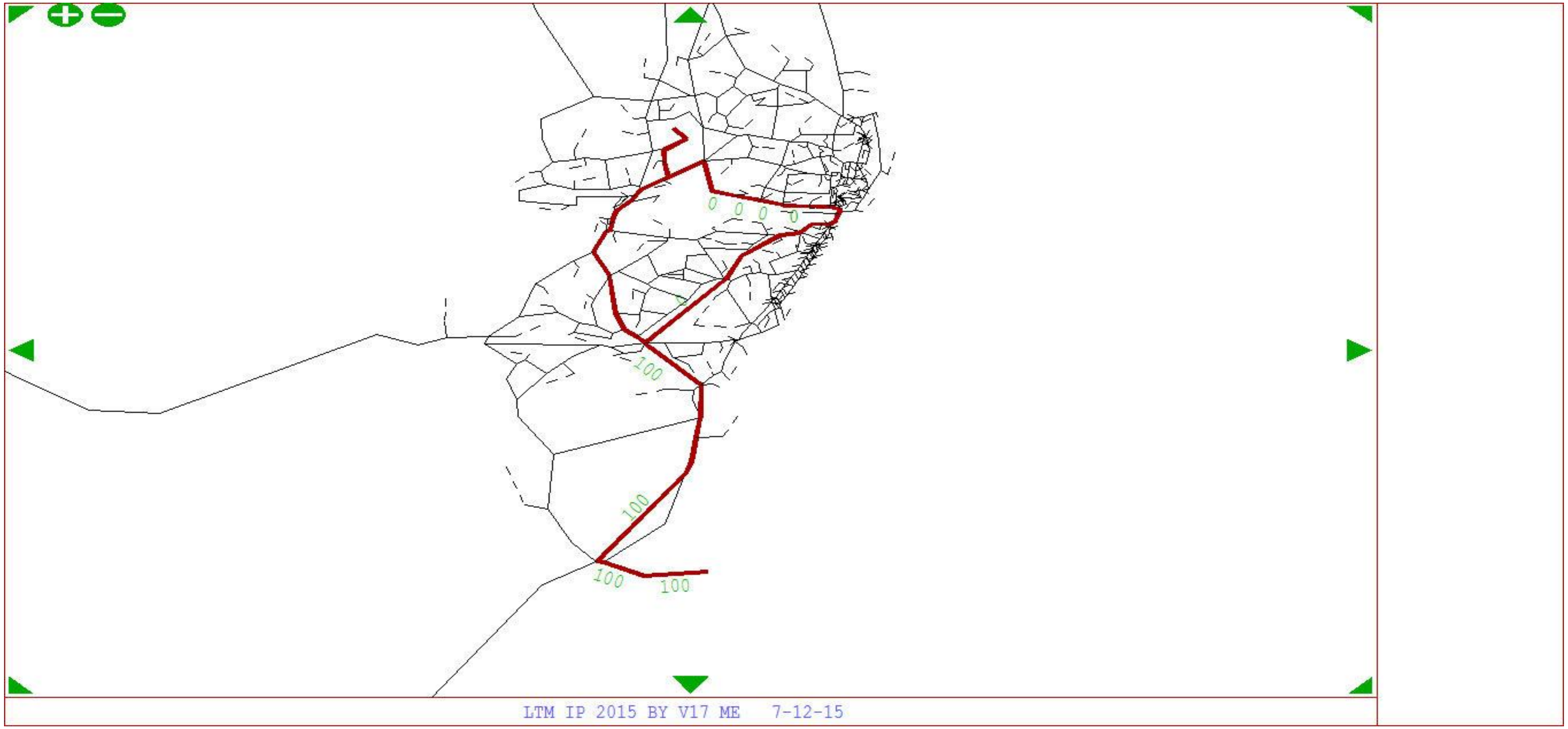


From Zone 149 To Zone 113 - User Class 4

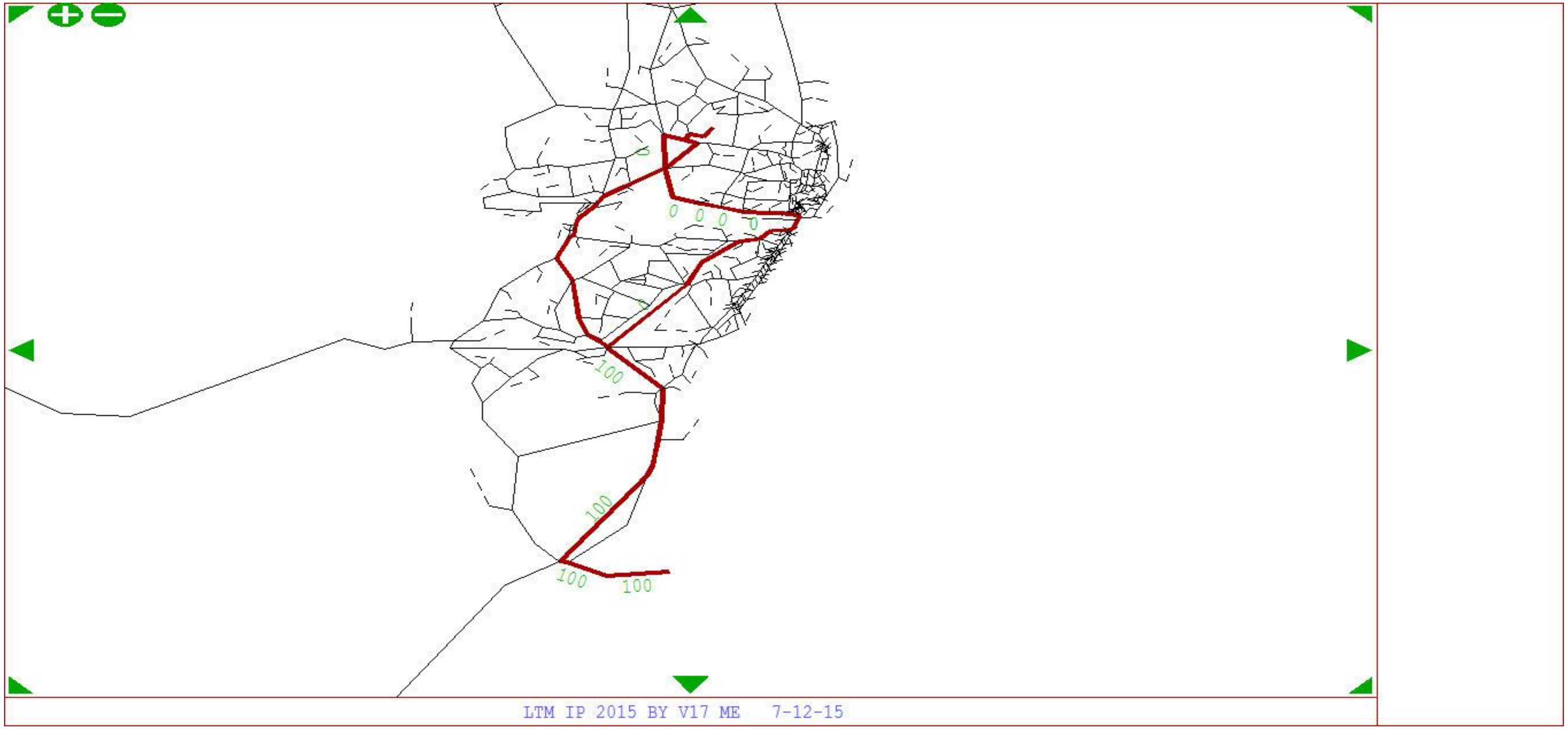


LTM IP 2015 BY V17 ME 7-12-15

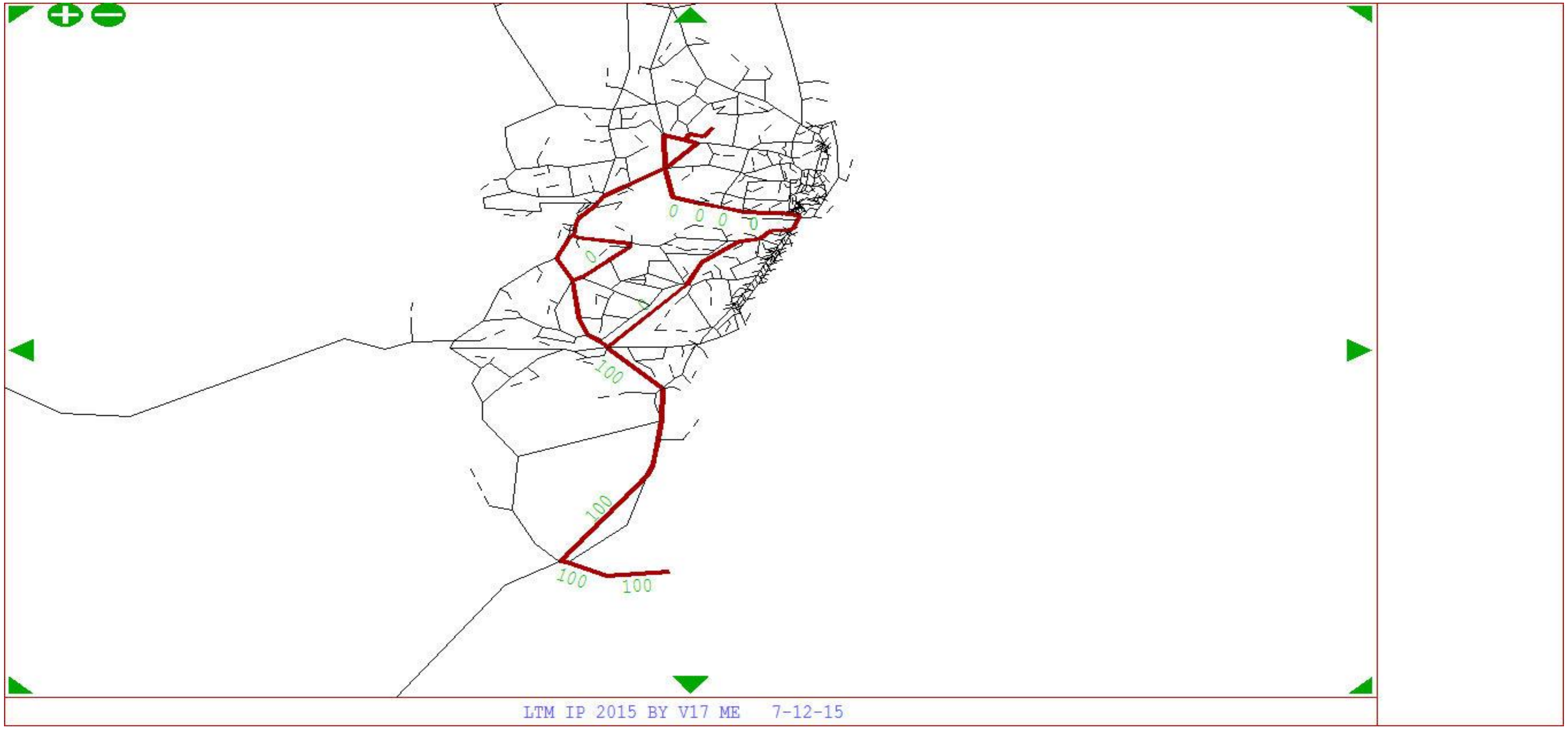
From Zone 149 To Zone 113 - User Class 5



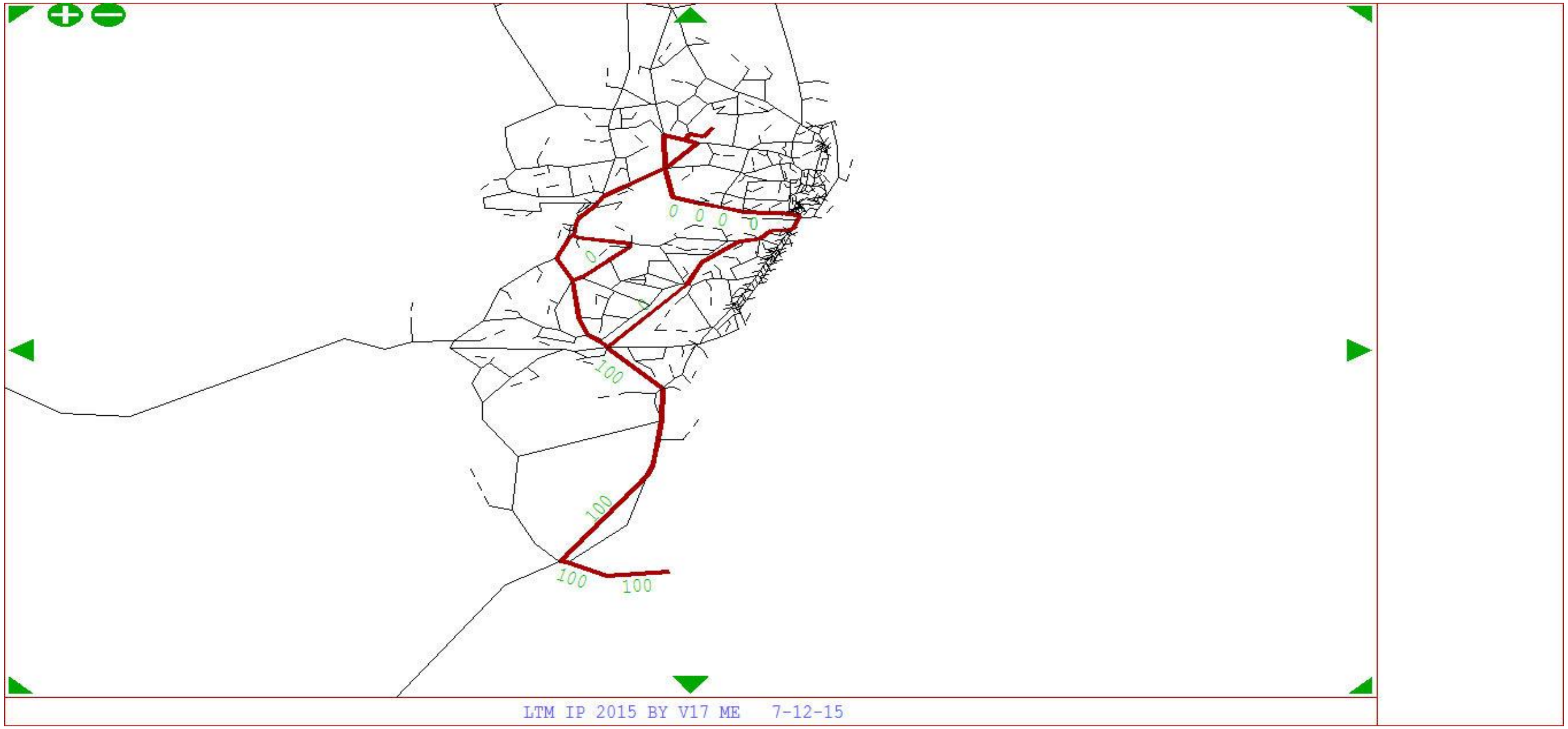
From Zone 149 To Zone 114 - User Class 1



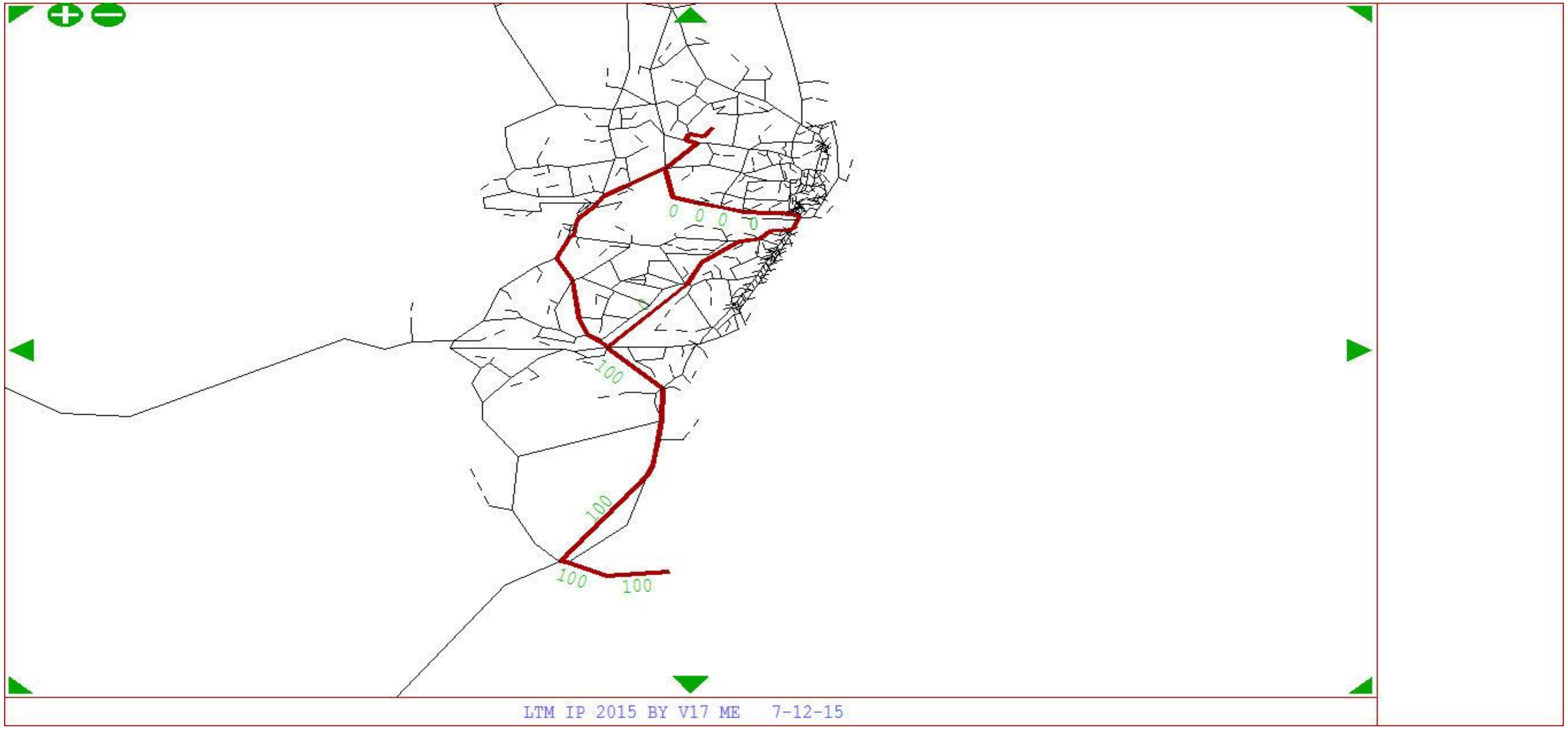
From Zone 149 To Zone 114 - User Class 2



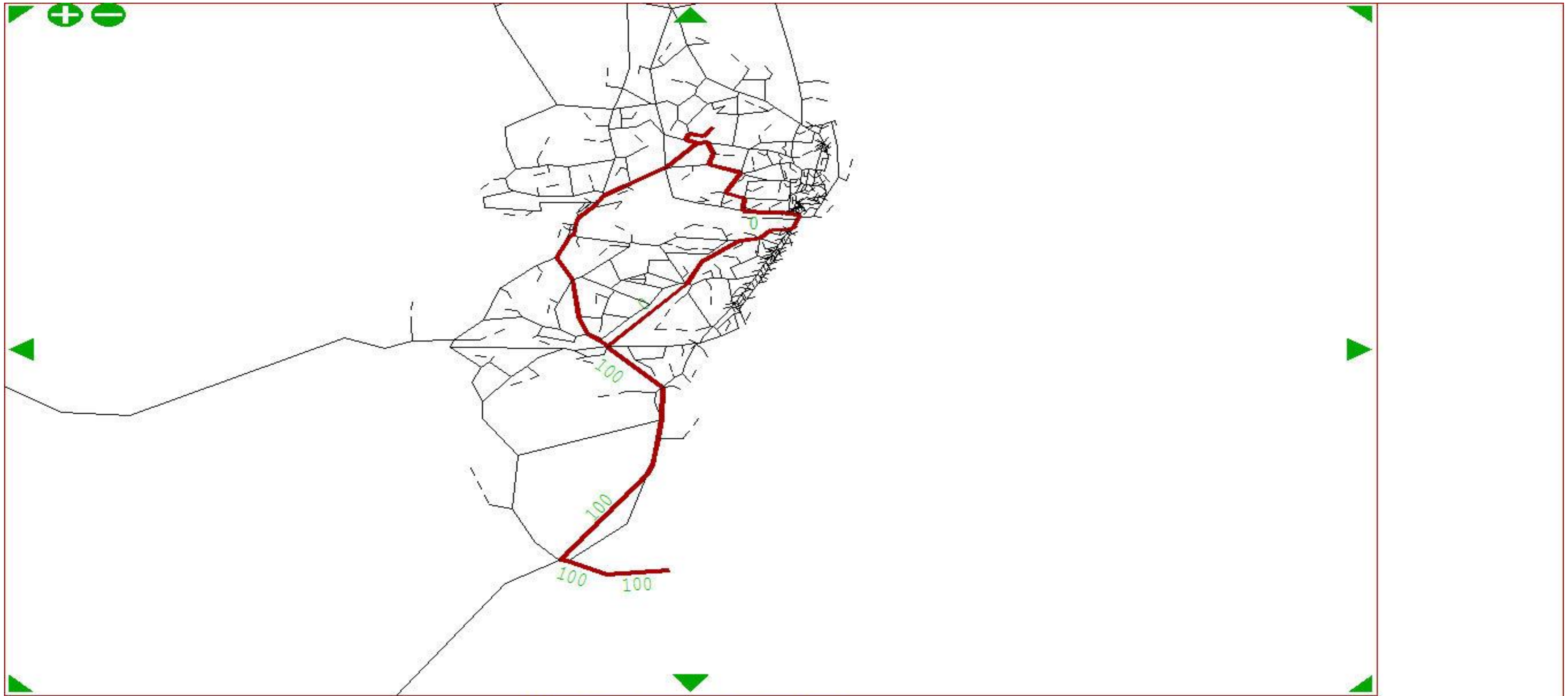
From Zone 149 To Zone 114 - User Class 3



From Zone 149 To Zone 114 - User Class 4



From Zone 149 To Zone 114 - User Class 5



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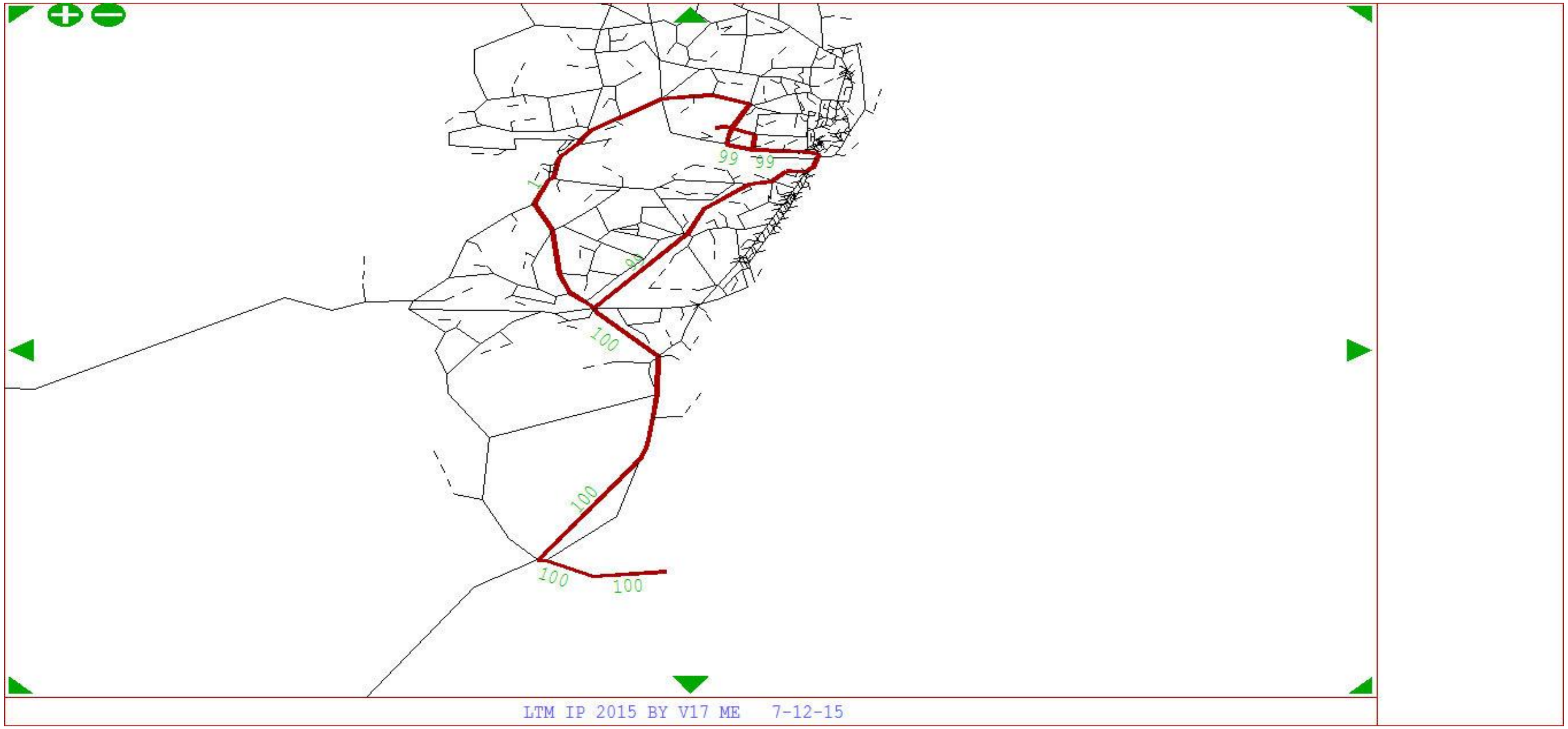
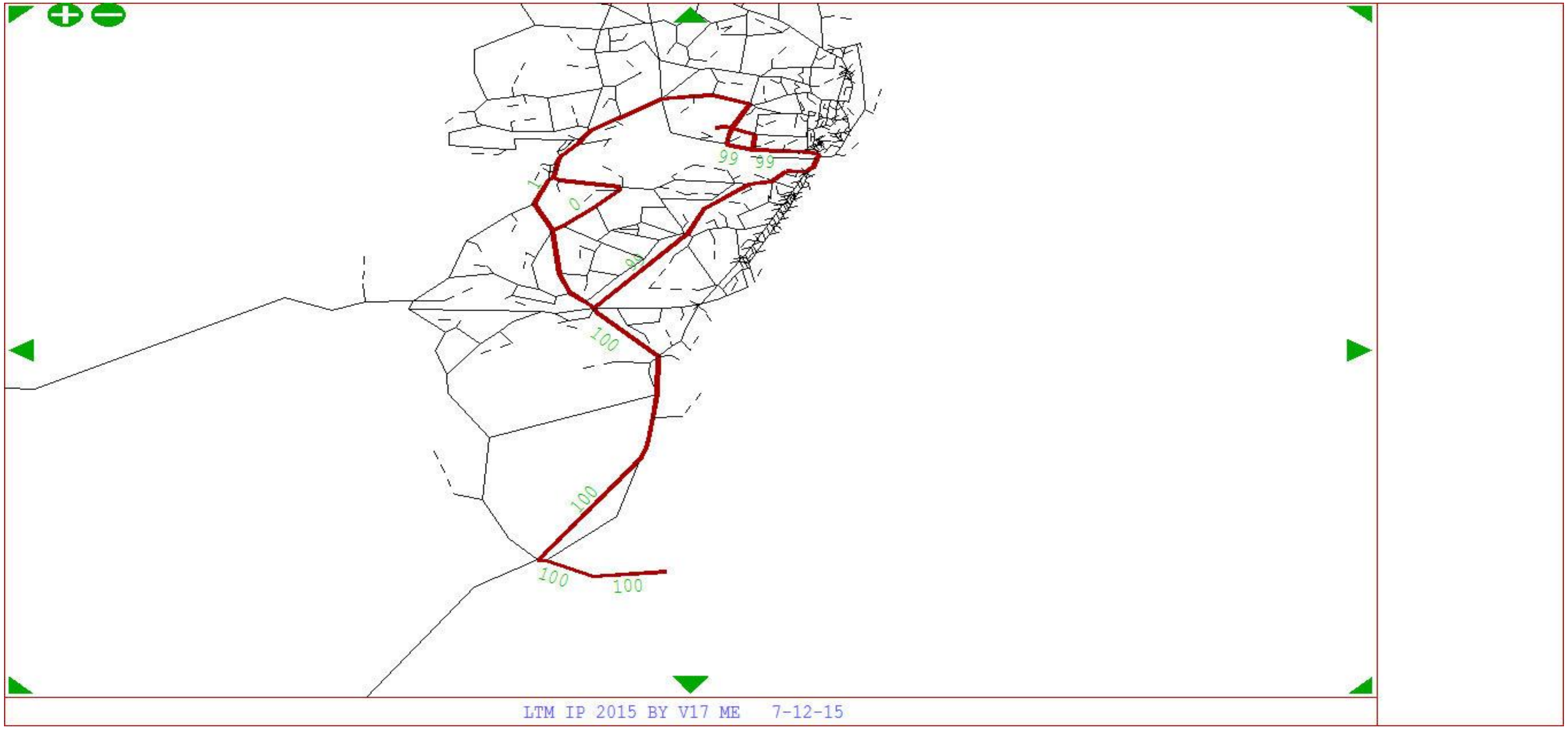
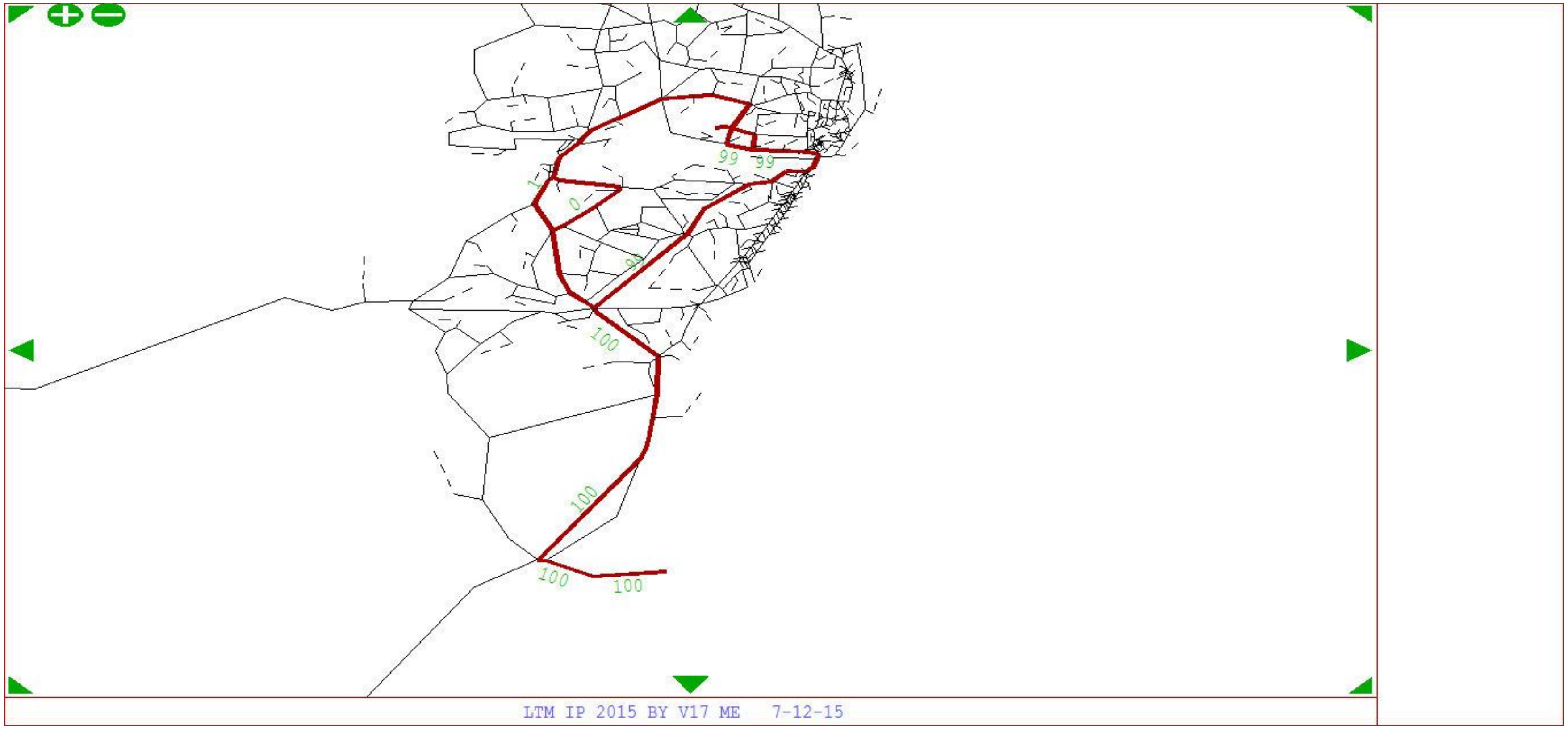
From Zone 149 To Zone 120 - User Class 1



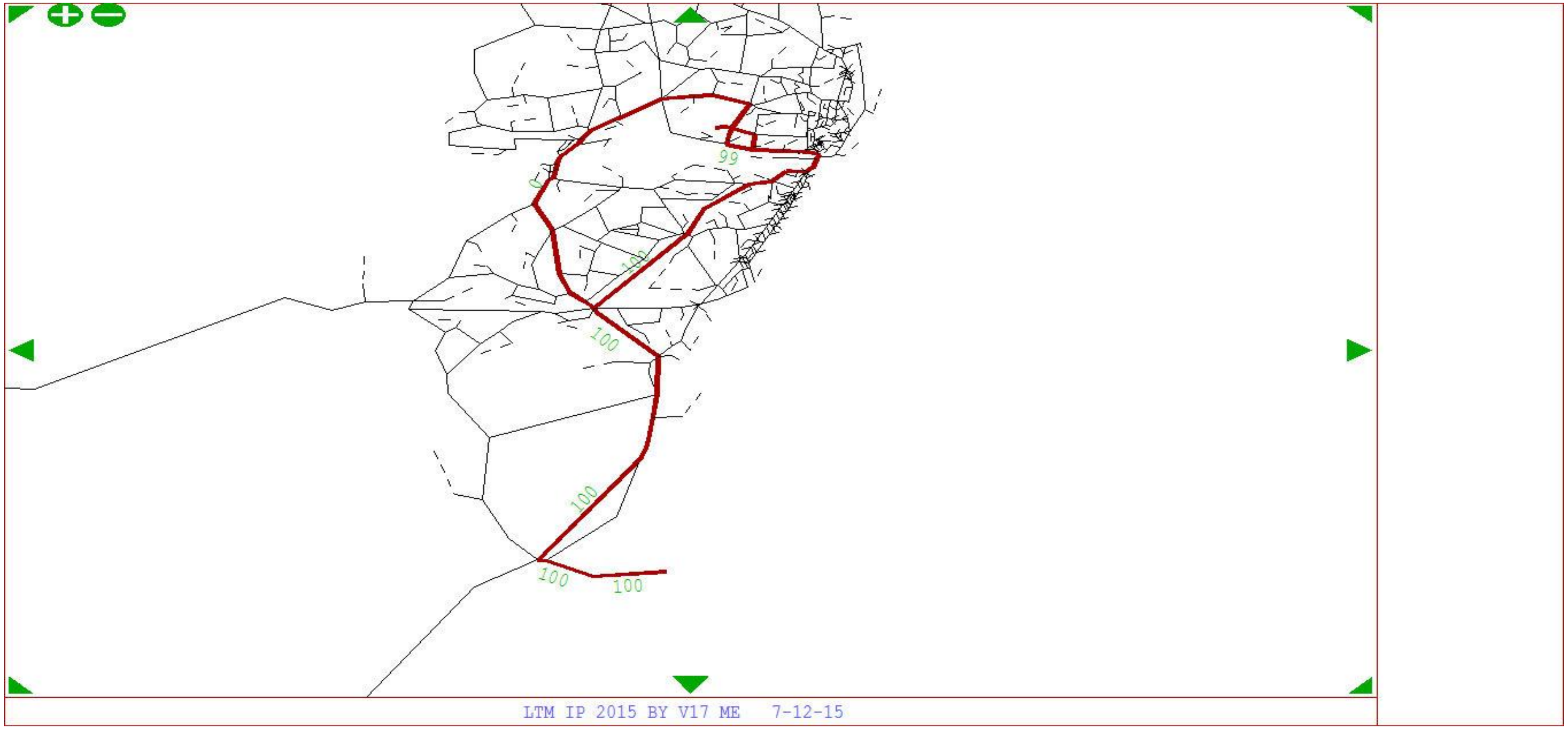
From Zone 149 To Zone 120 - User Class 2



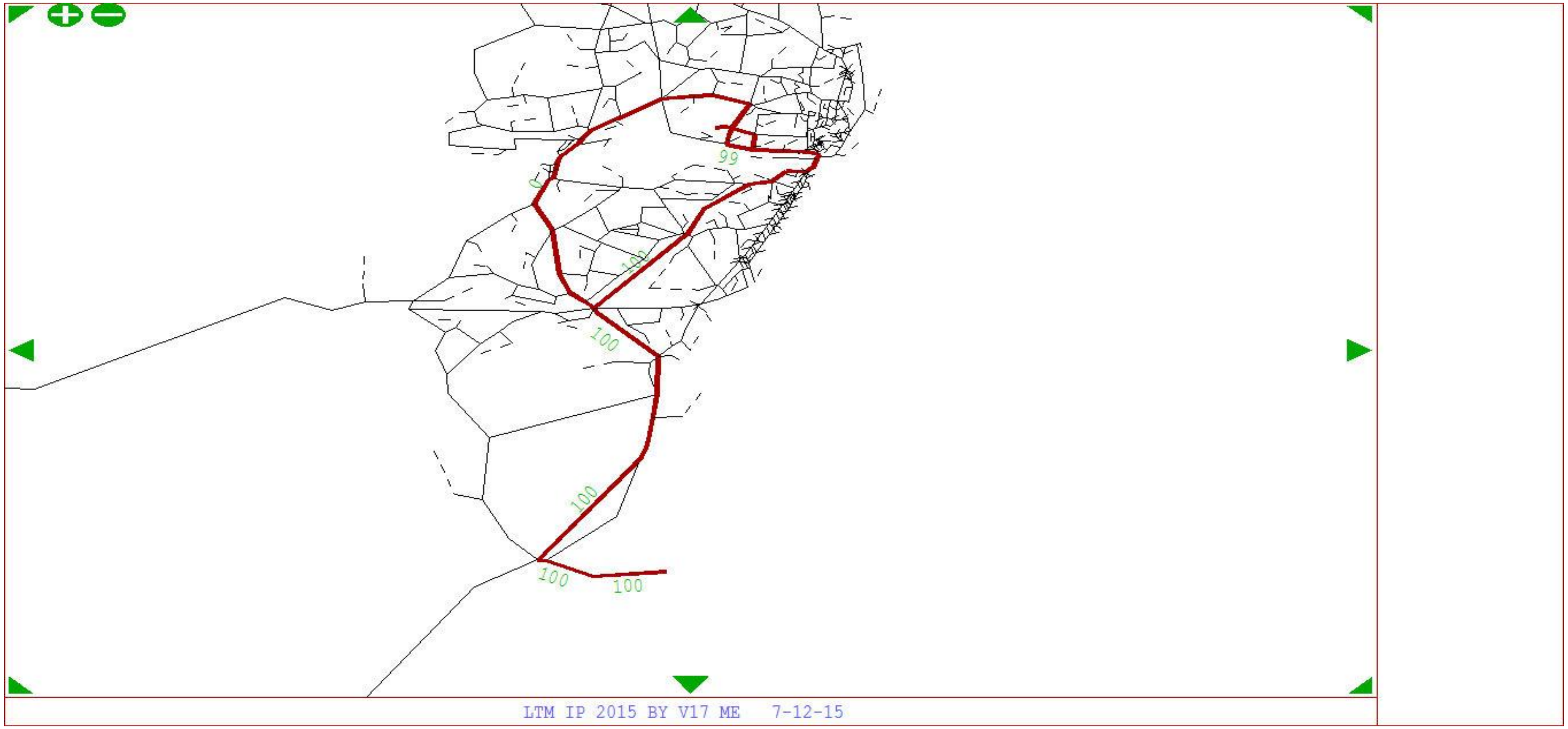
From Zone 149 To Zone 120 - User Class 3



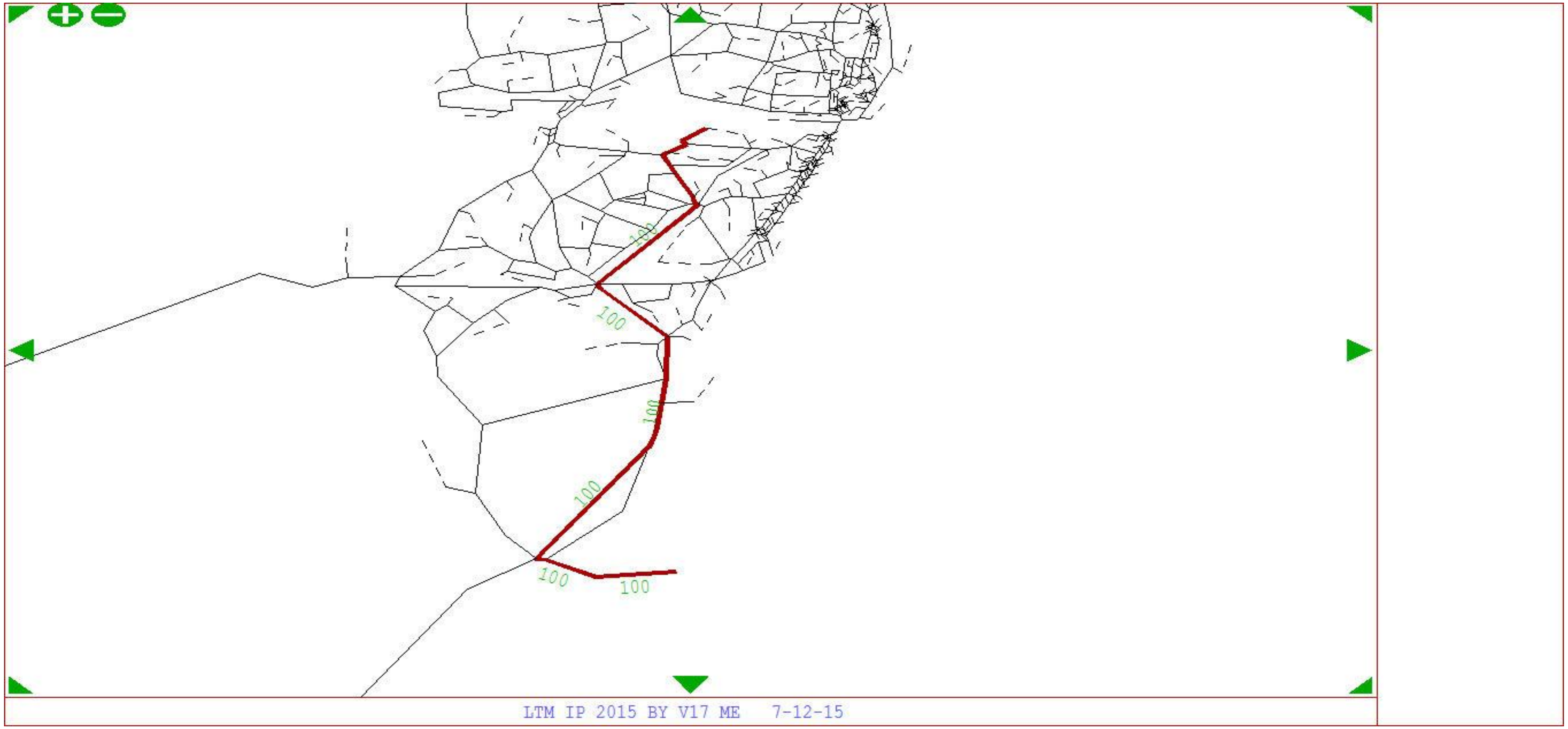
From Zone 149 To Zone 120 - User Class 4



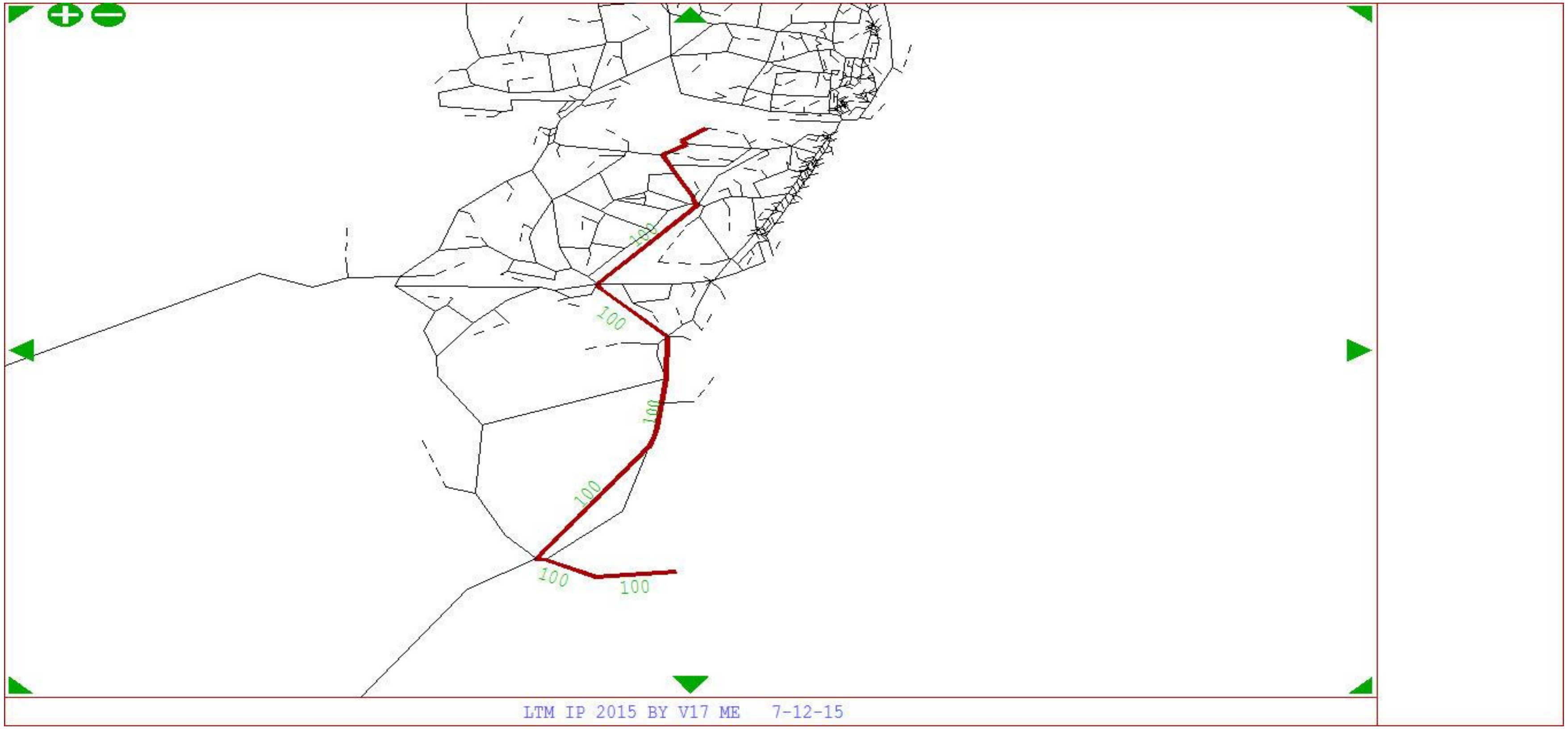
From Zone 149 To Zone 120 - User Class 5



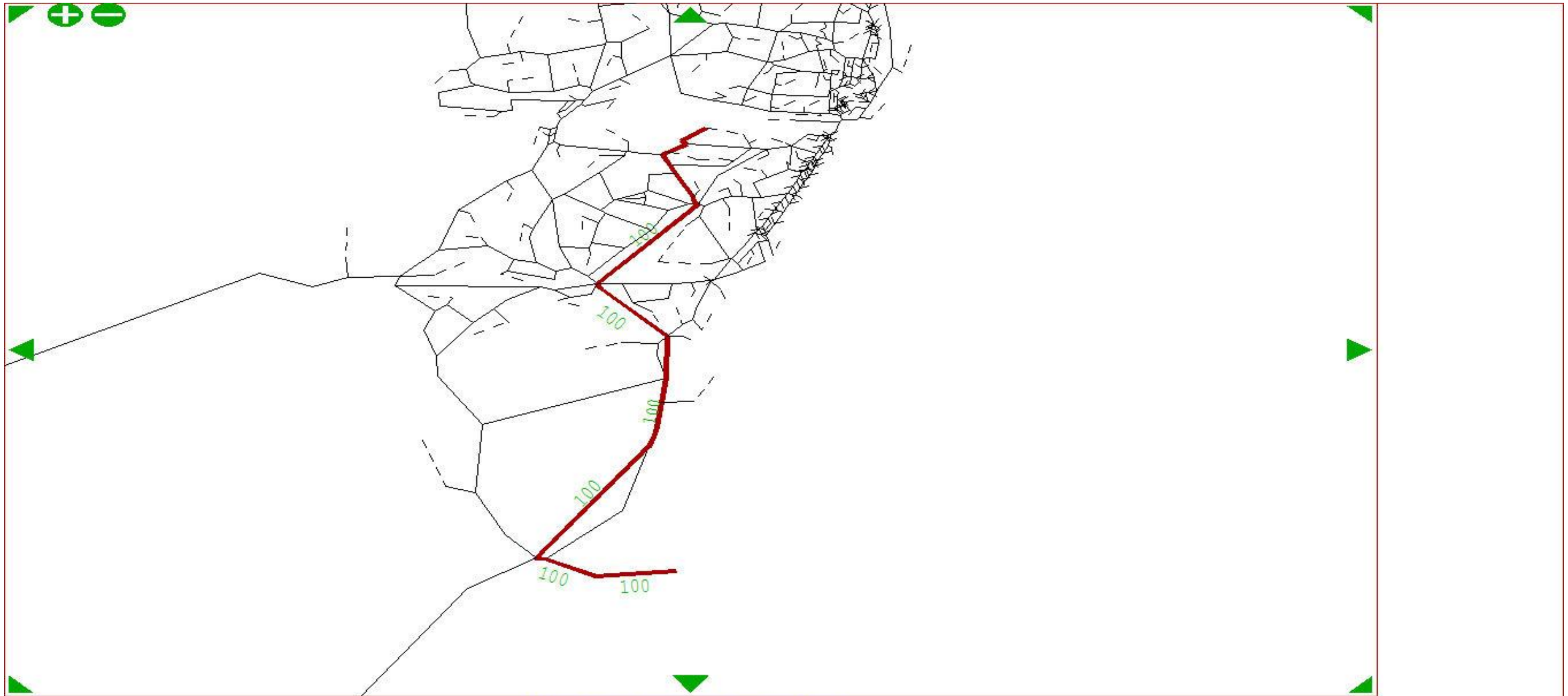
From Zone 149 To Zone 122 - User Class 1



From Zone 149 To Zone 122 - User Class 2



From Zone 149 To Zone 122 - User Class 3



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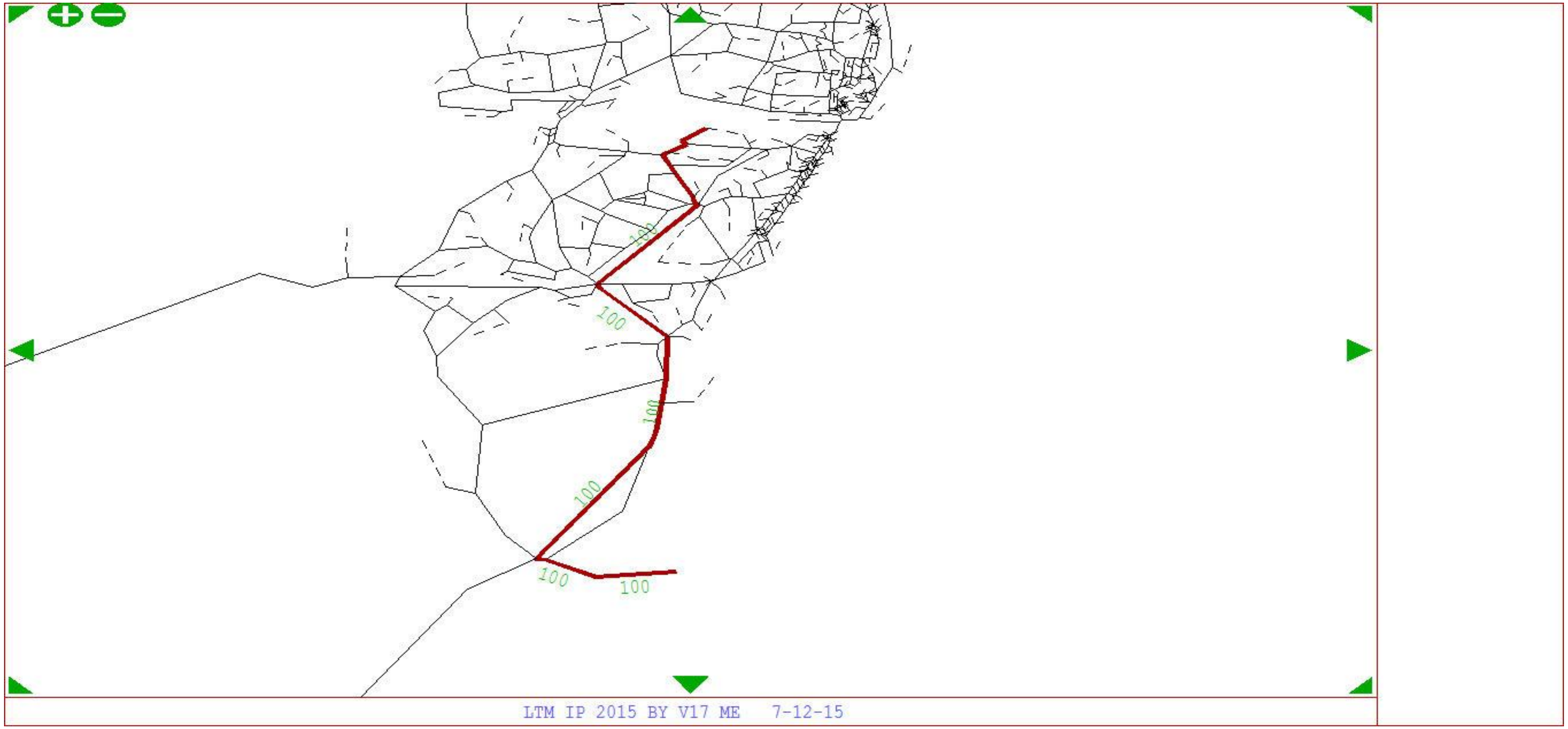
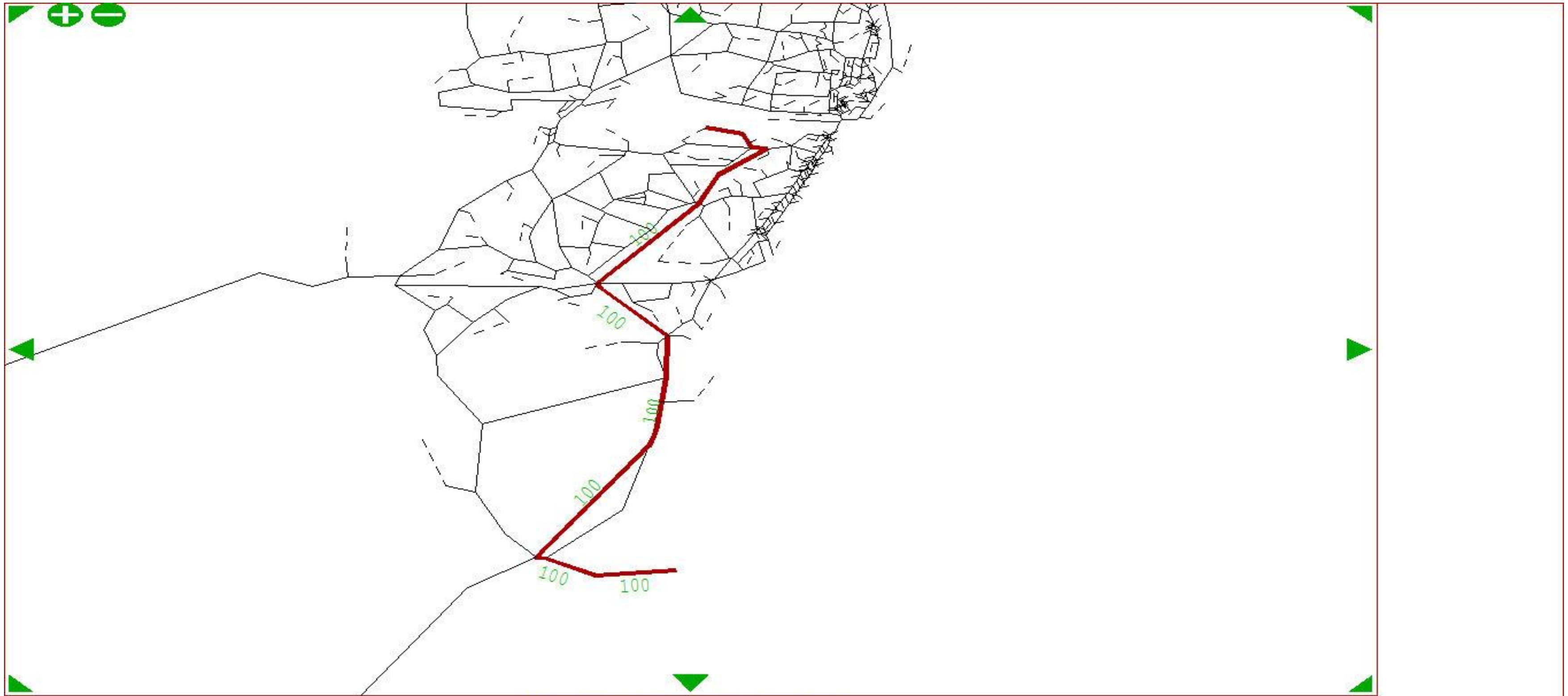
From Zone 149 To Zone 122 - User Class 4

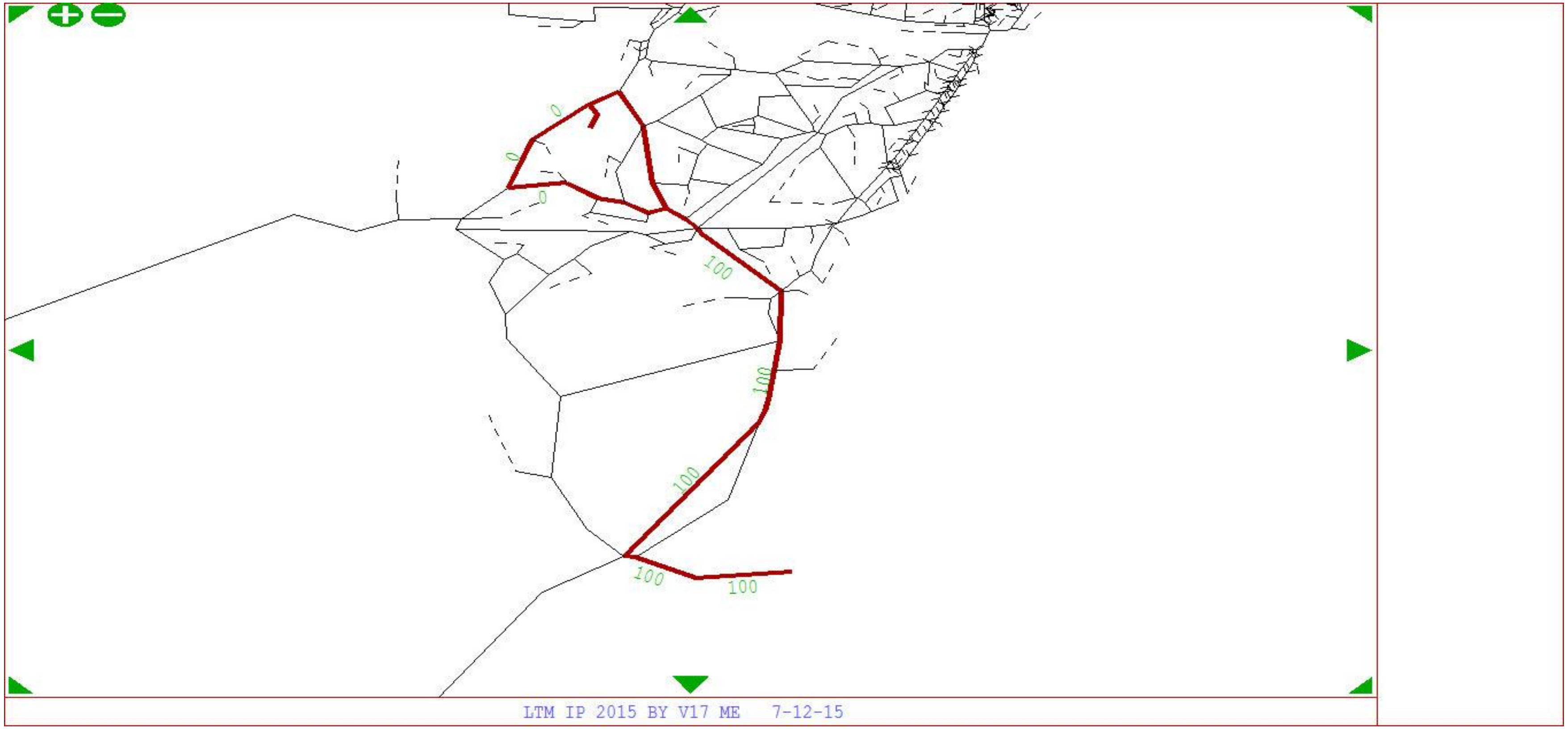


From Zone 149 To Zone 122 - User Class 5

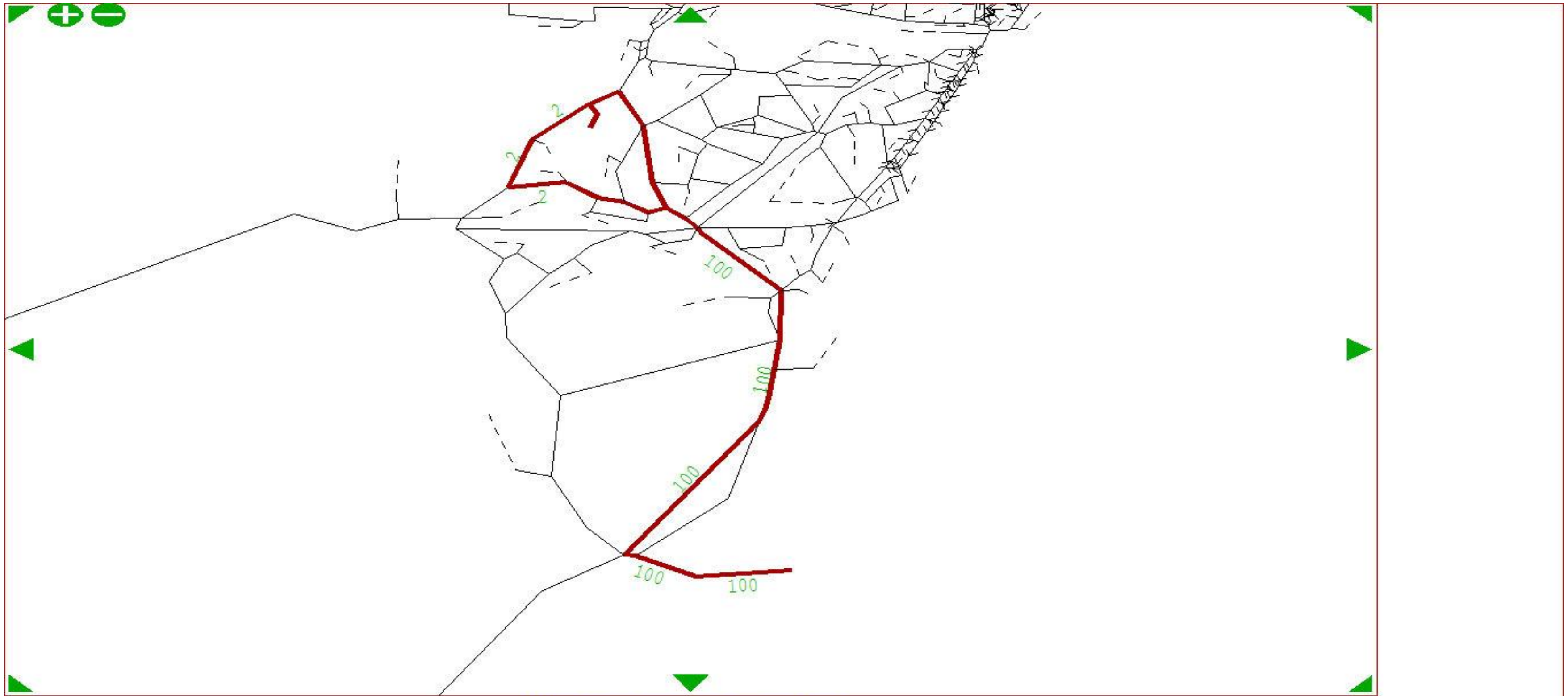


LTM IP 2015 BY V17 ME 7-12-15

From Zone 149 To Zone 128 - User Class 1

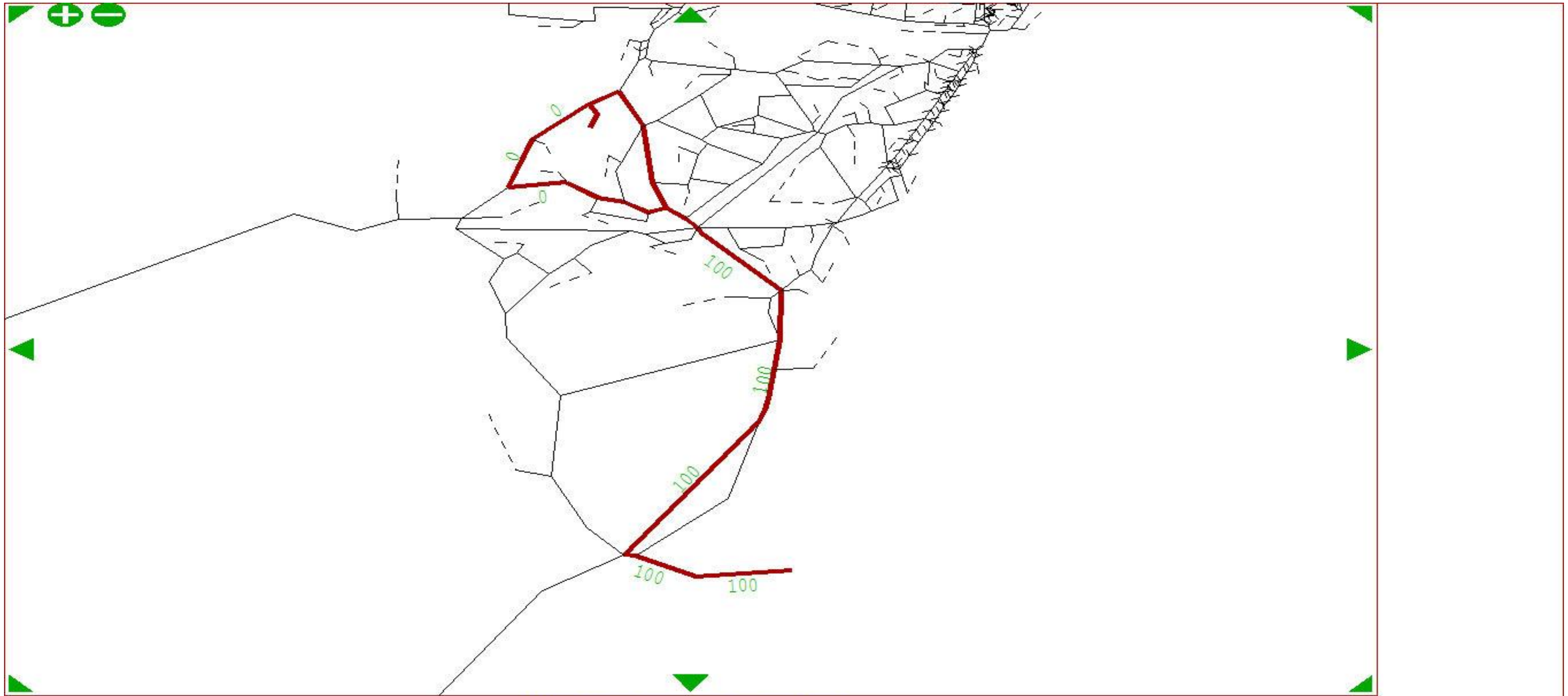


From Zone 149 To Zone 128 - User Class 2



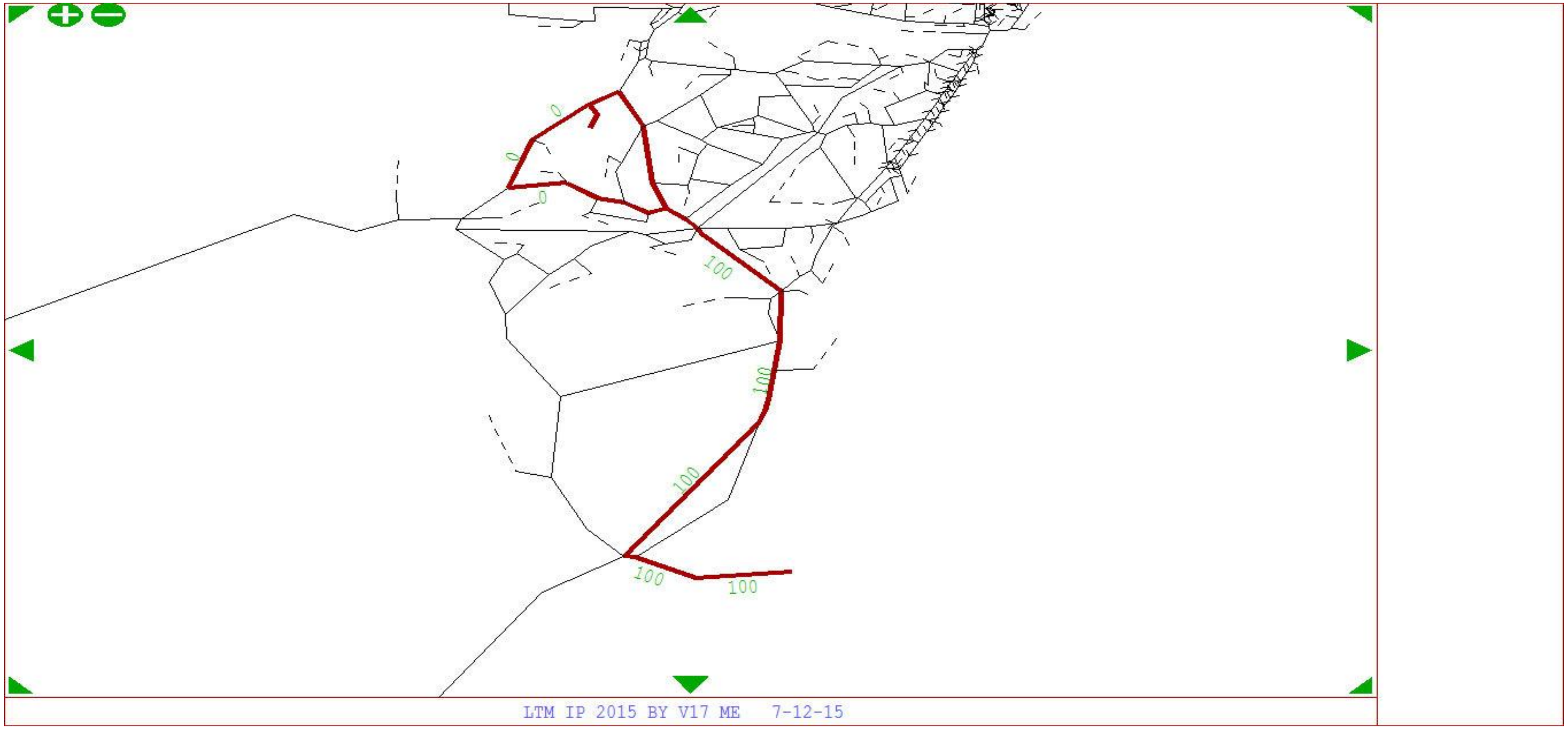
LTM IP 2015 BY V17 ME 7-12-15

From Zone 149 To Zone 128 - User Class 3

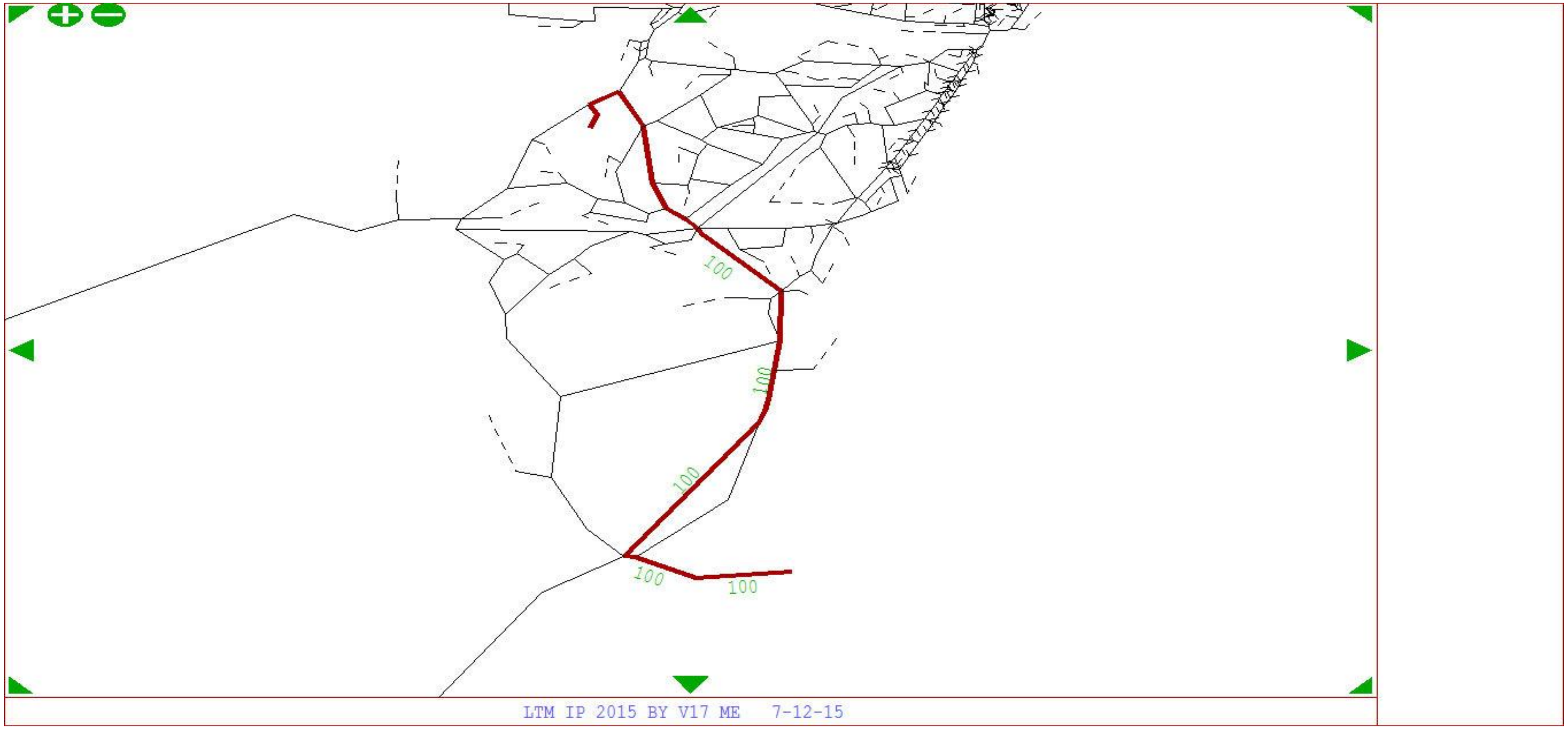


LTM IP 2015 BY V17 ME 7-12-15

From Zone 149 To Zone 128 - User Class 4

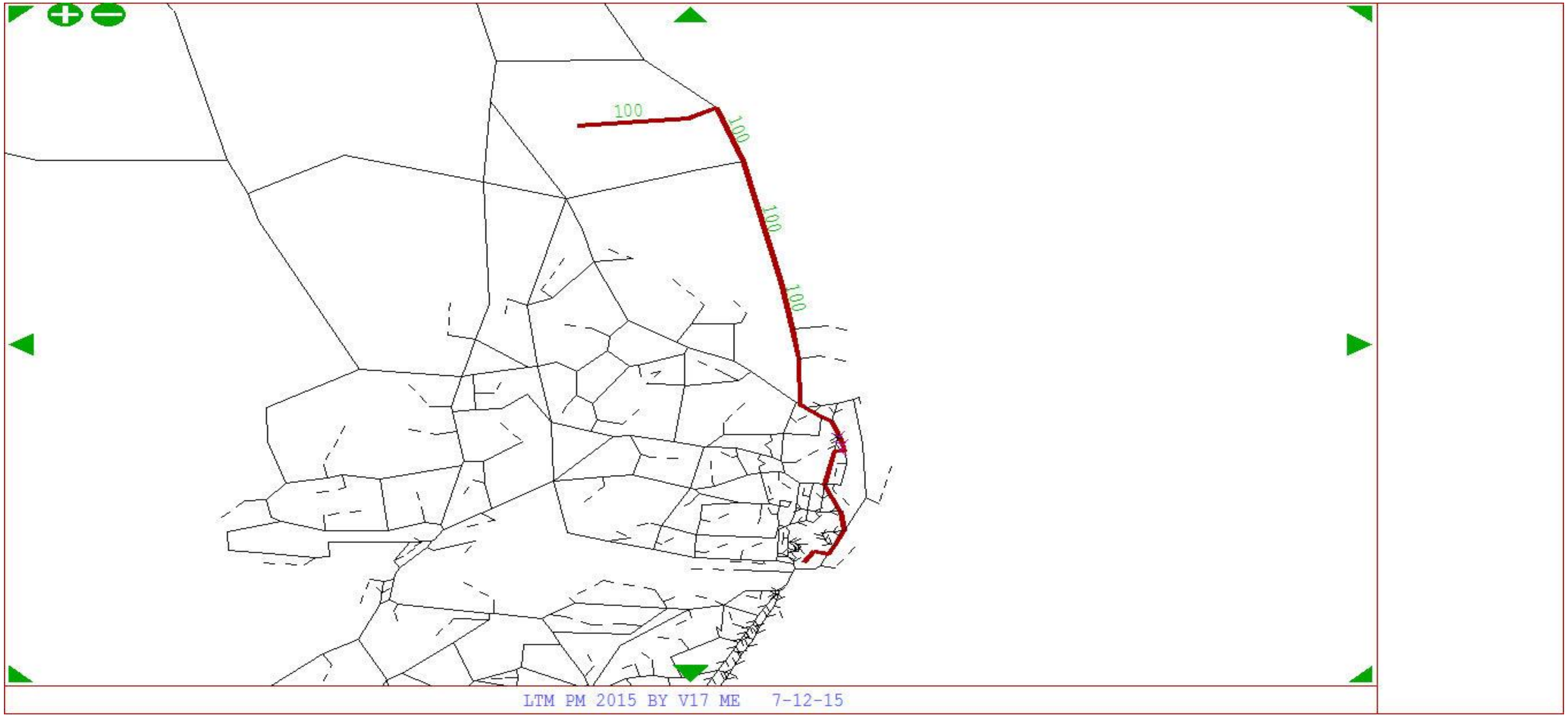


From Zone 149 To Zone 128 - User Class 5

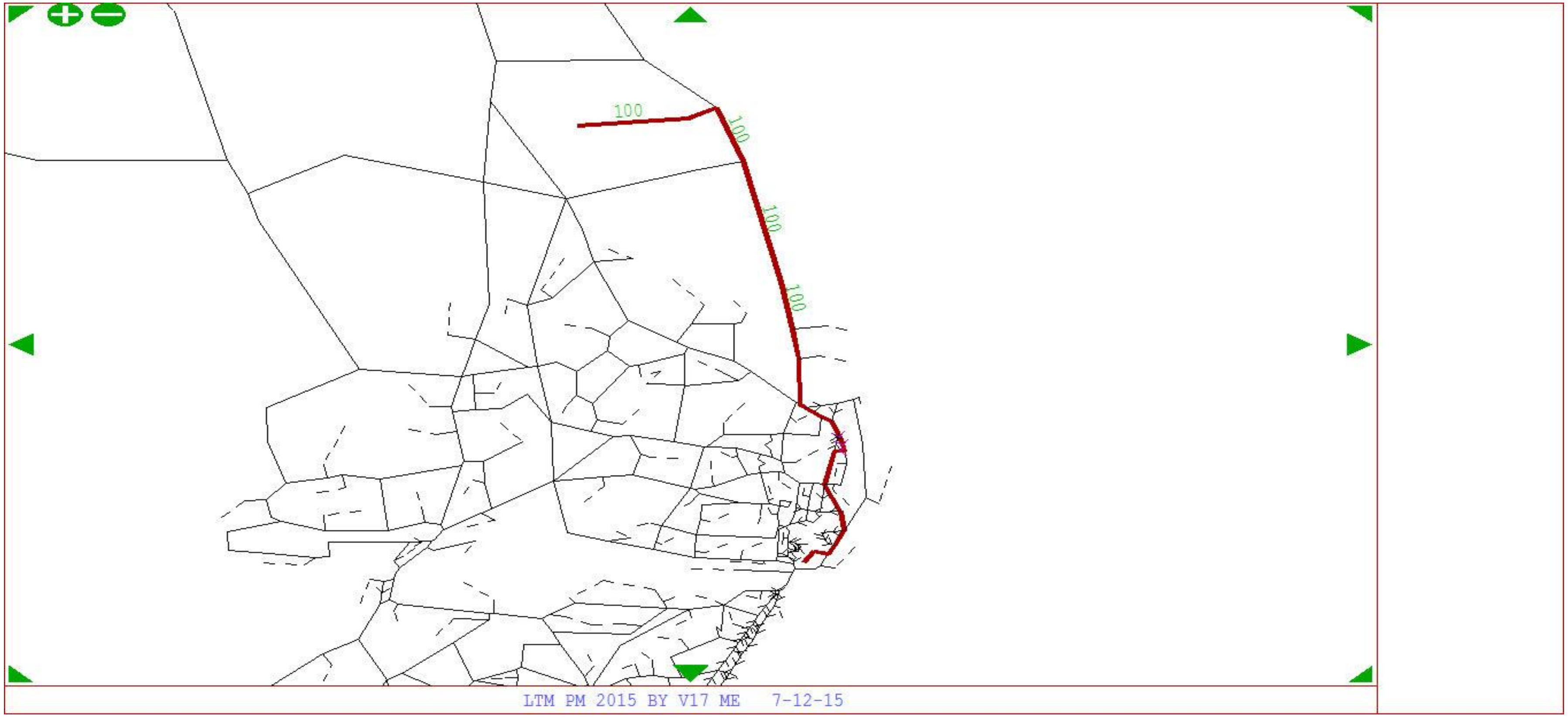


Lowestoft: OD Tree Plots - PM Peak

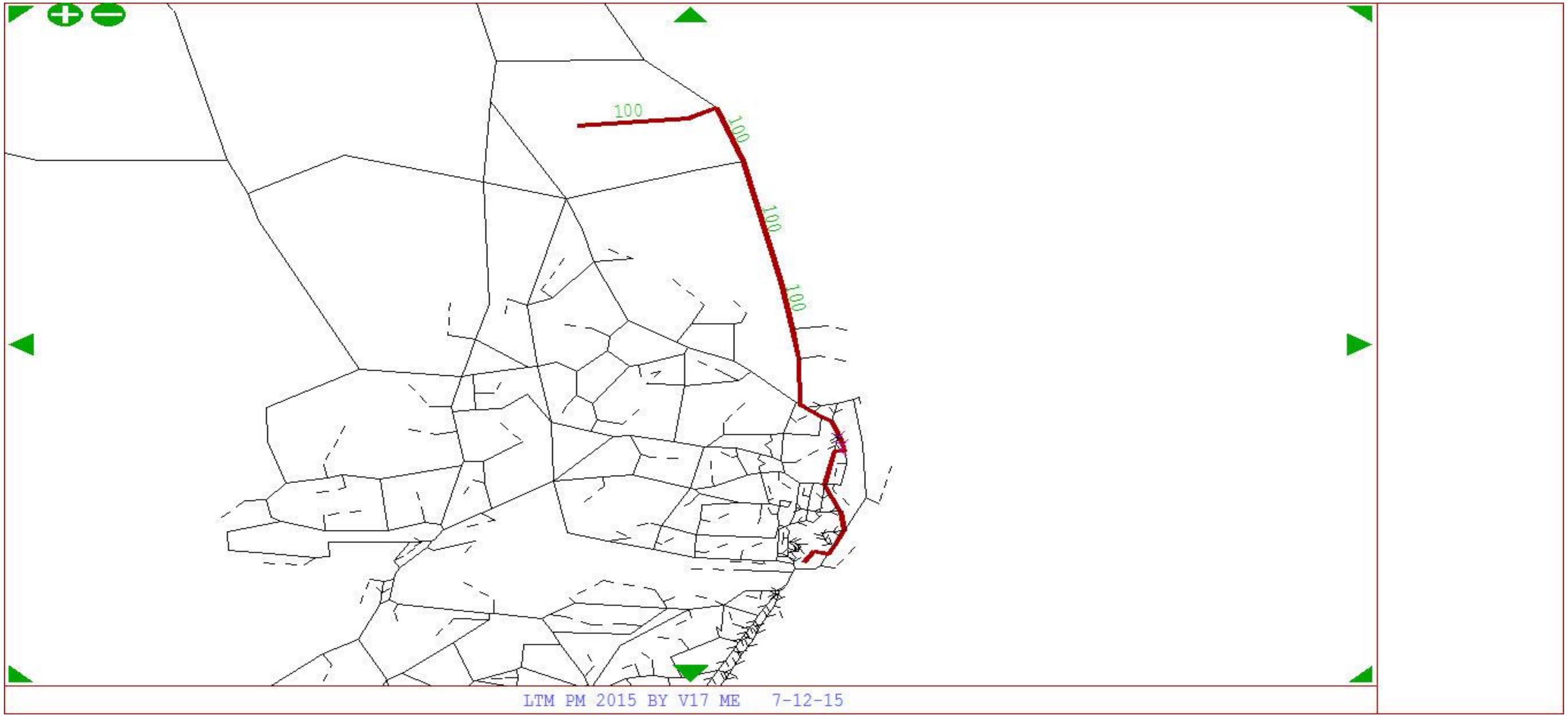
From Zone 102 To Zone 119 - User Class 1



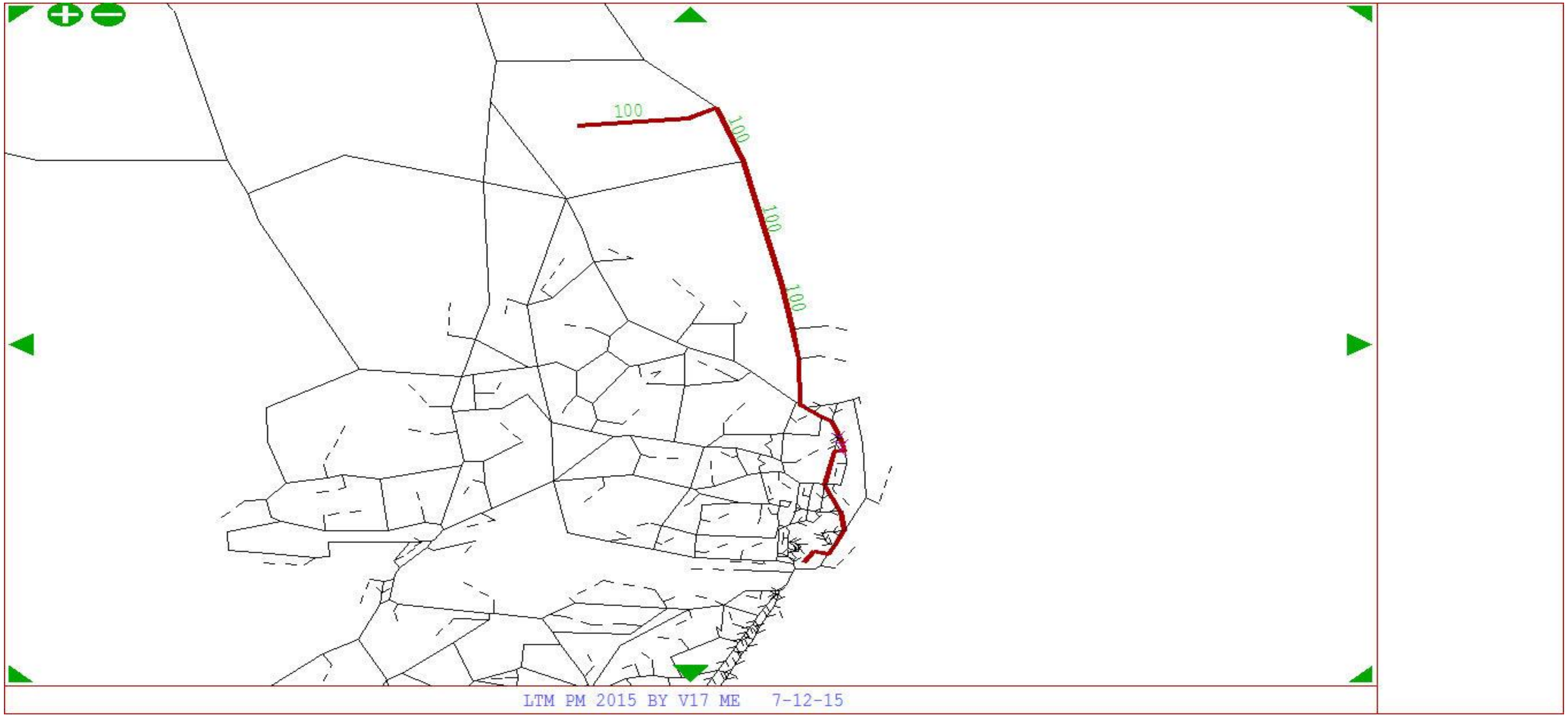
From Zone 102 To Zone 119 - User Class 2



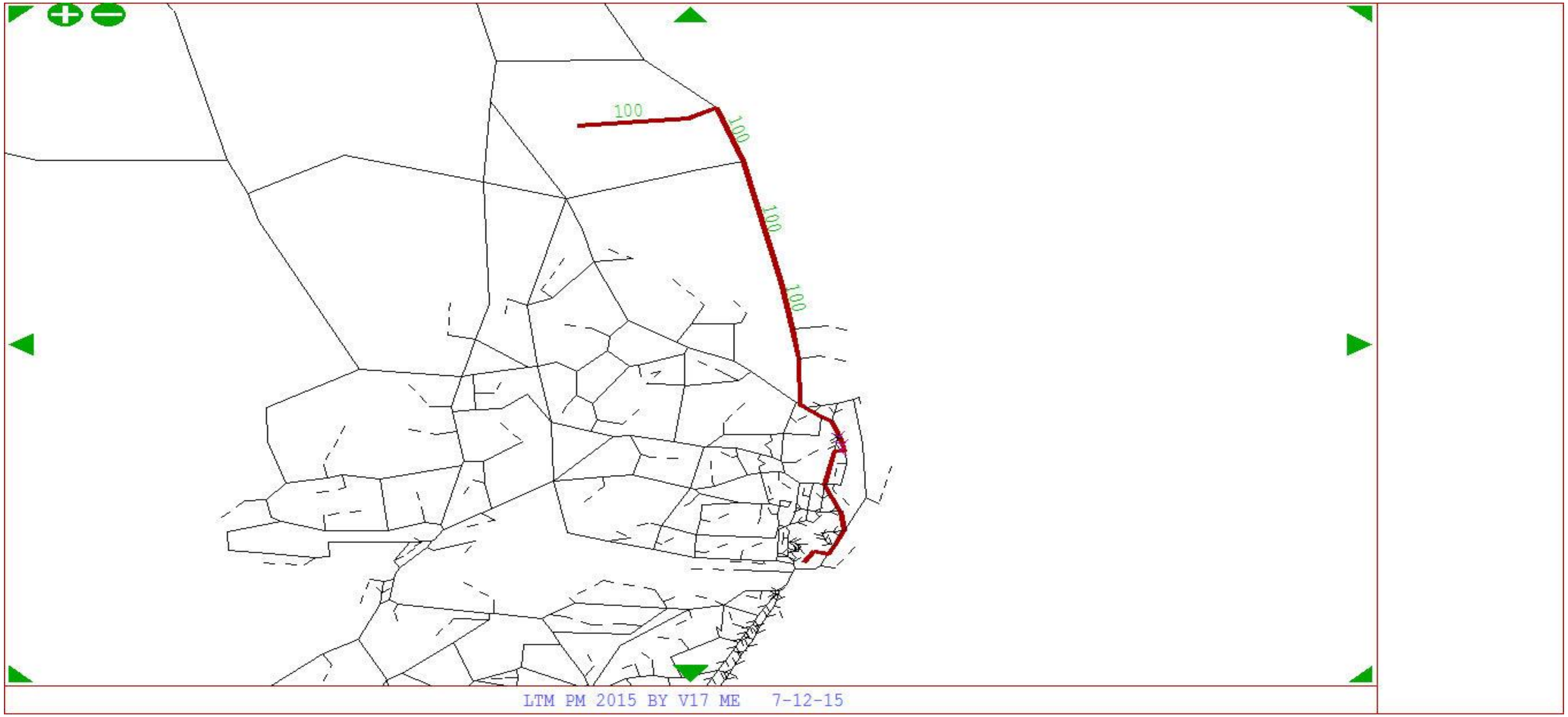
From Zone 102 To Zone 119 - User Class 3



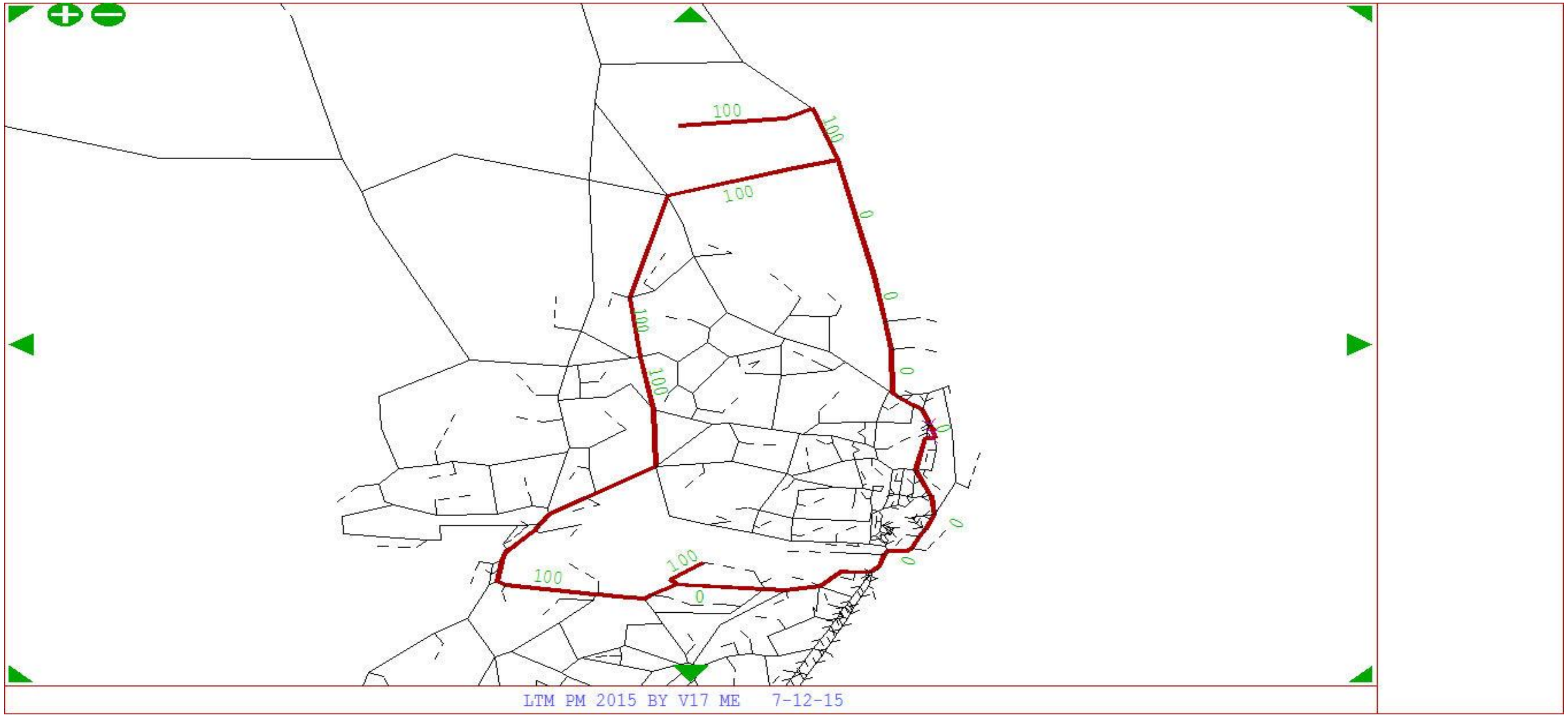
From Zone 102 To Zone 119 - User Class 4



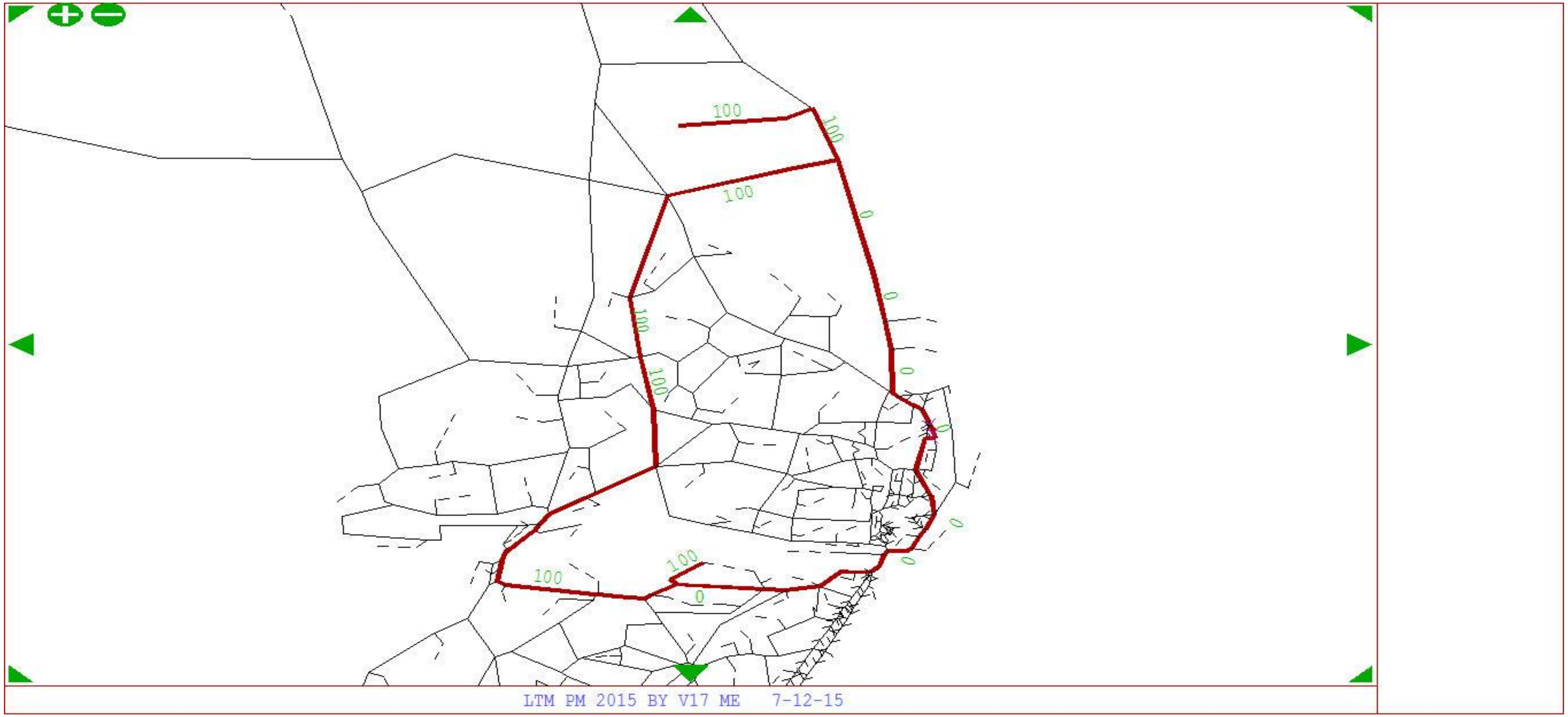
From Zone 102 To Zone 119 - User Class 5



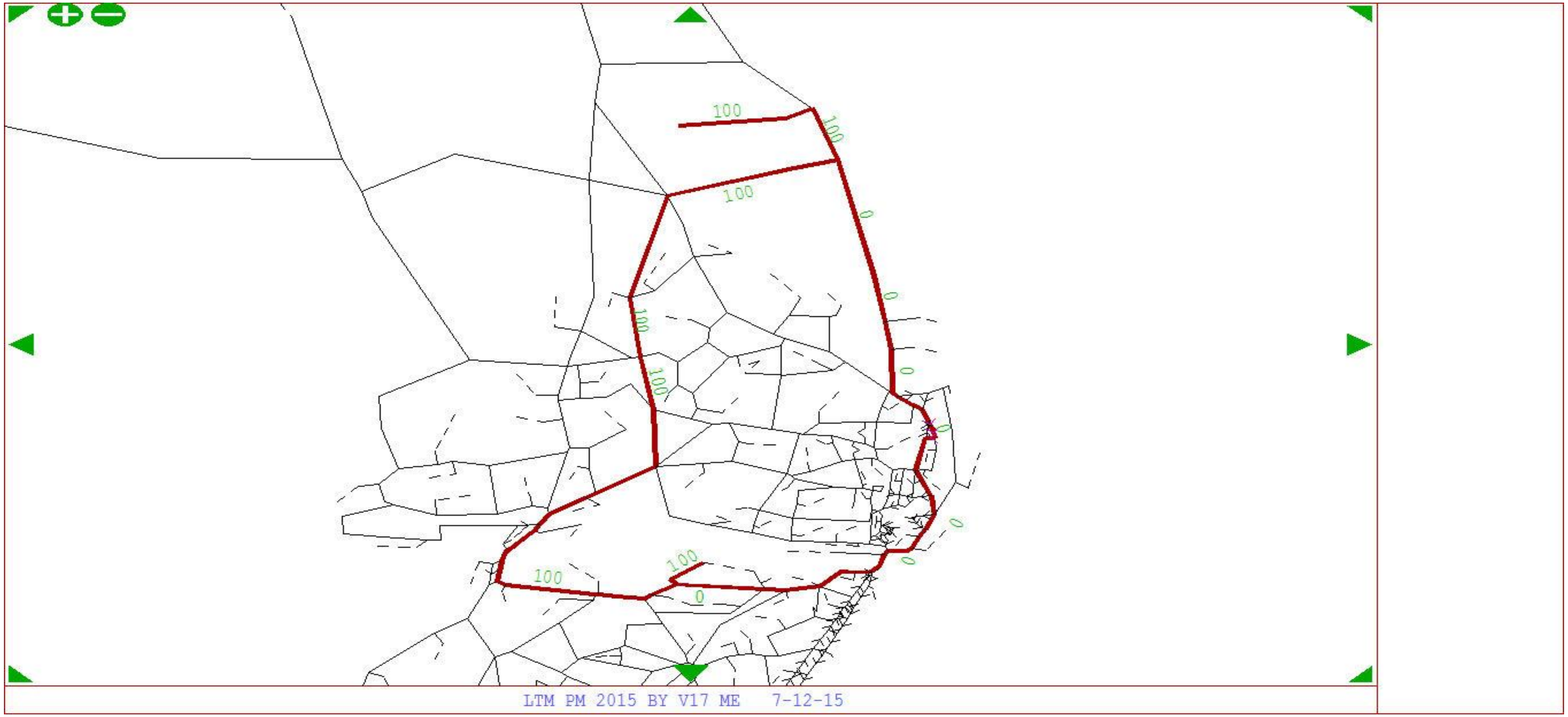
From Zone 102 To Zone 122 - User Class 1



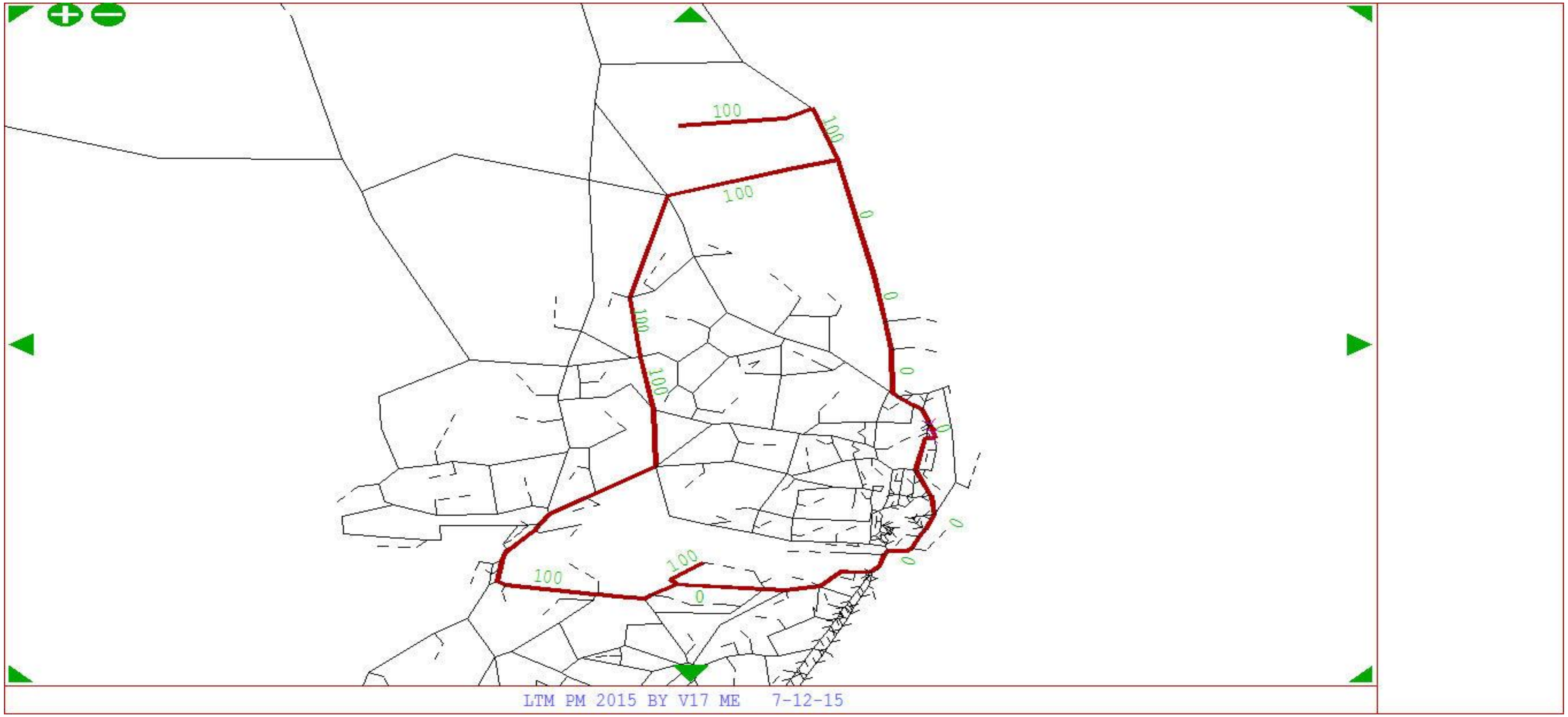
From Zone 102 To Zone 122 - User Class 2



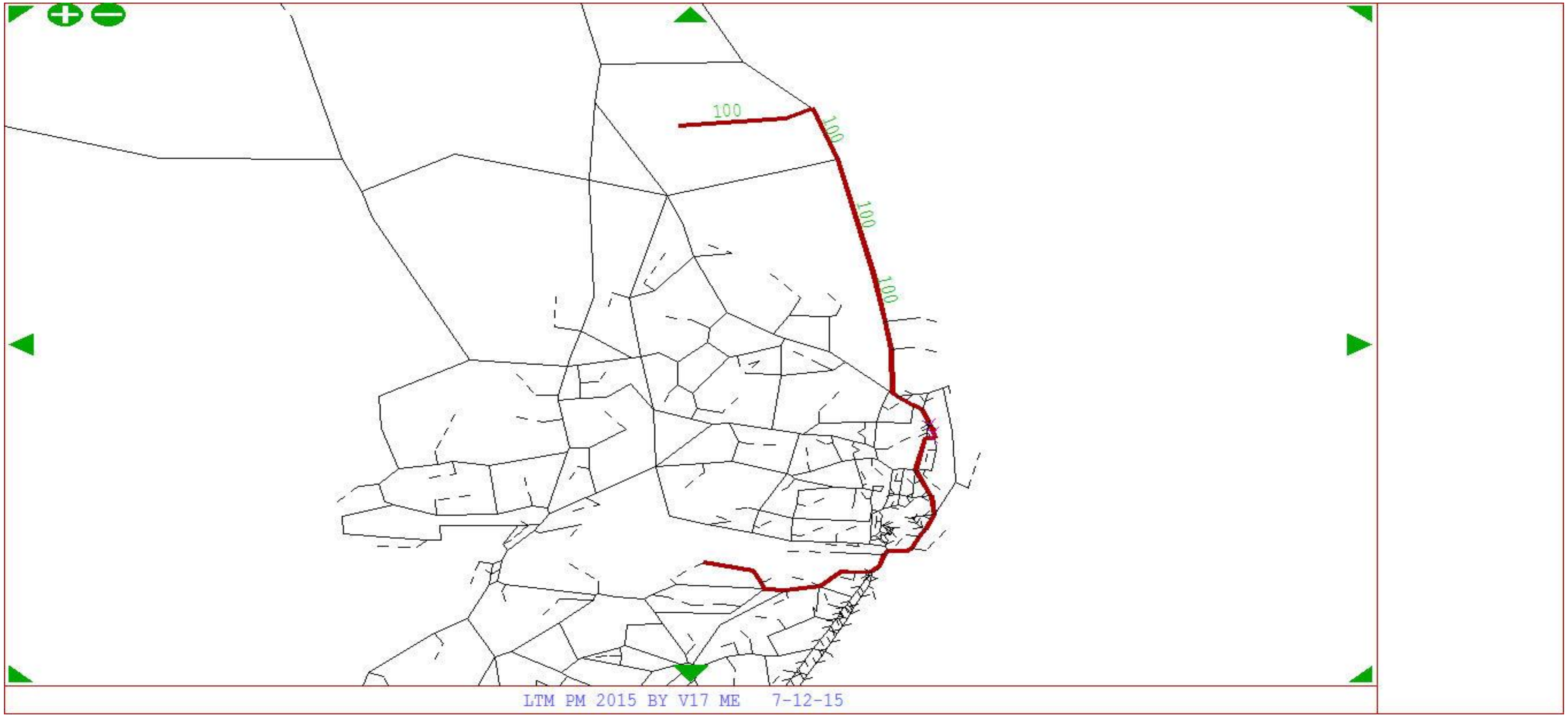
From Zone 102 To Zone 122 - User Class 3



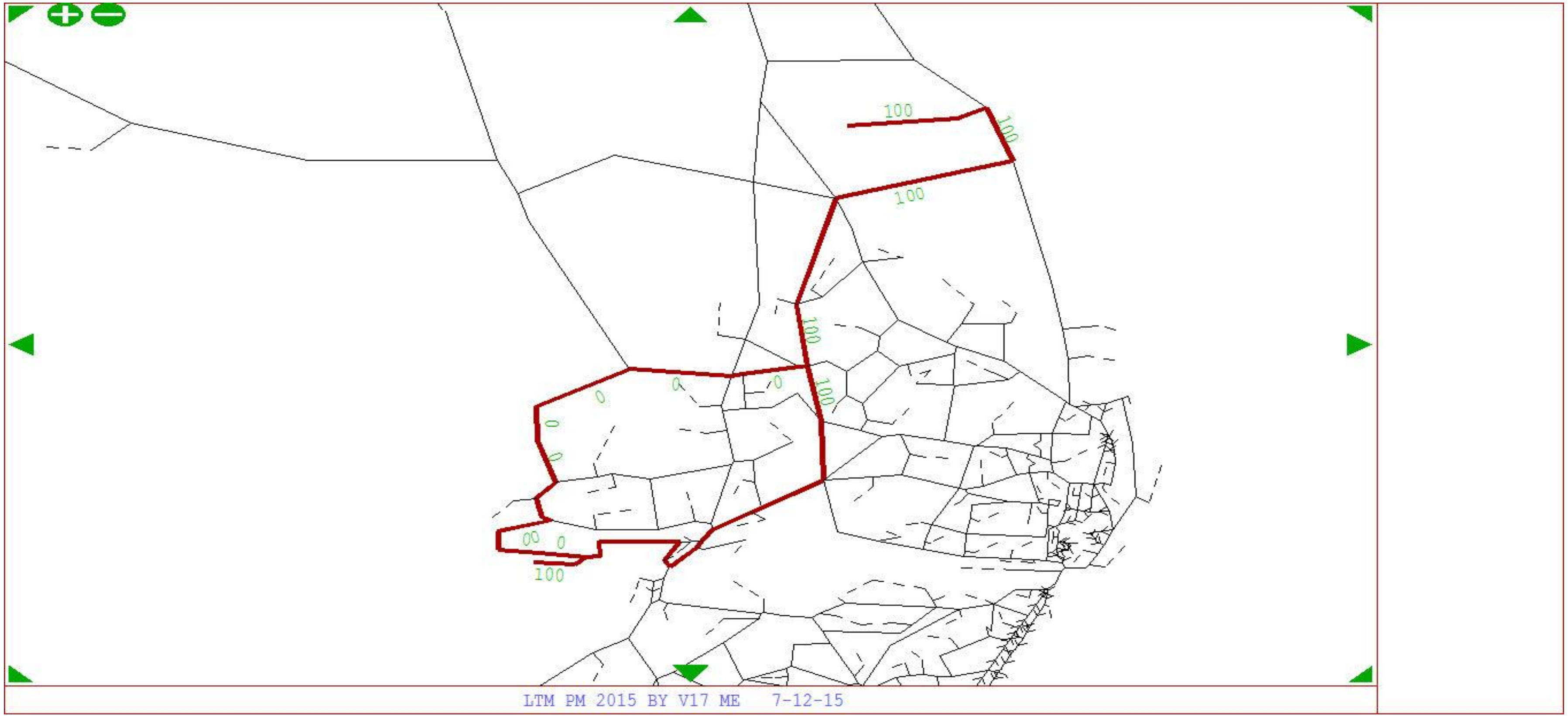
From Zone 102 To Zone 122 - User Class 4



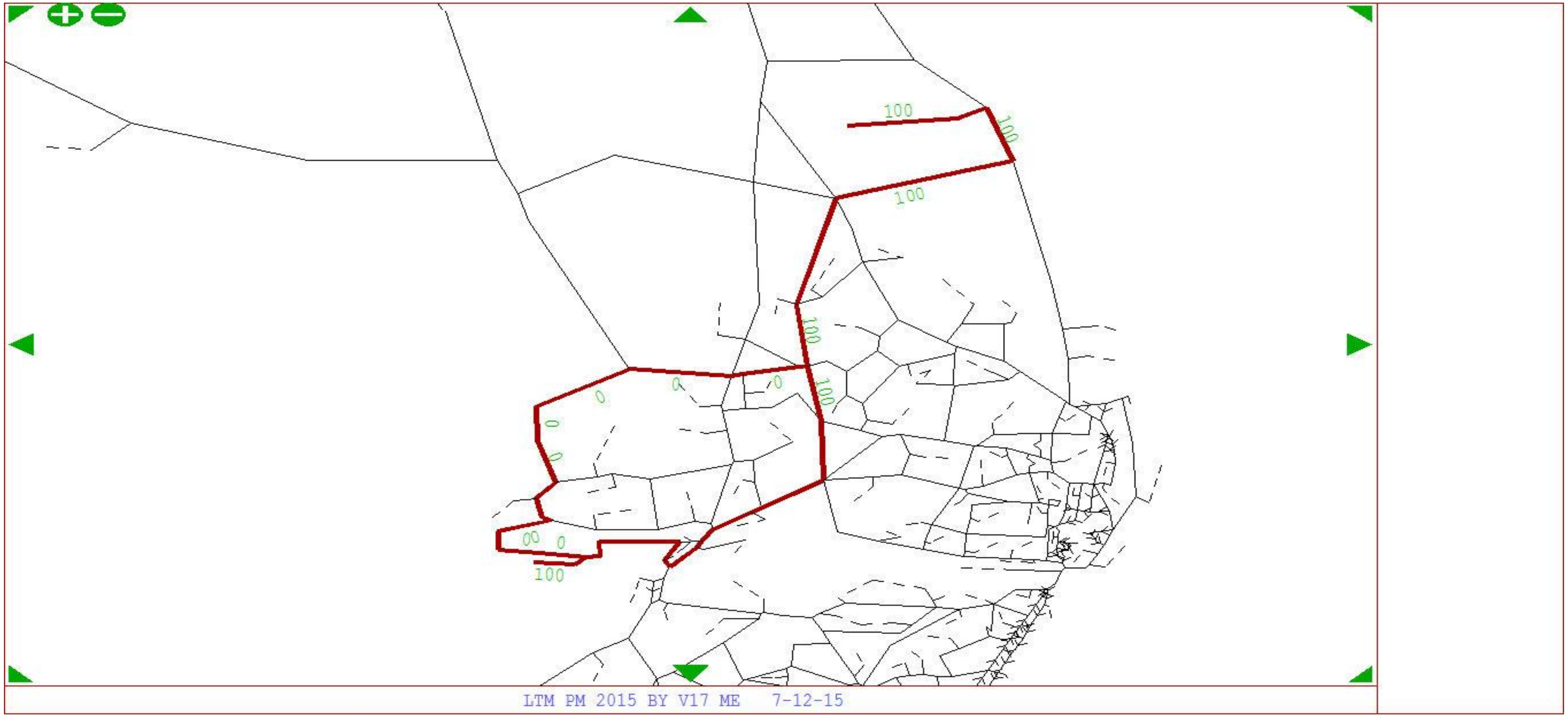
From Zone 102 To Zone 122 - User Class 5



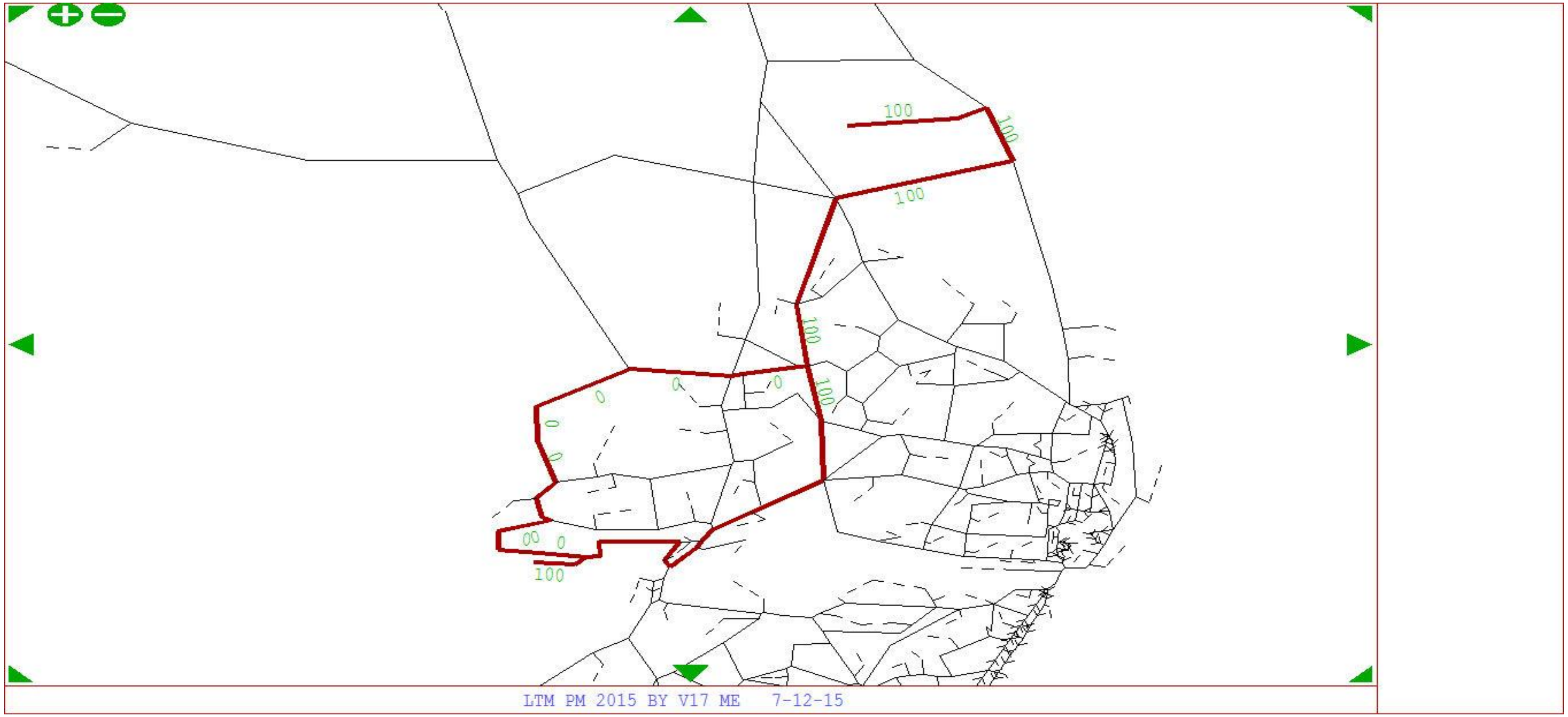
From Zone 102 To Zone 130 - User Class 1



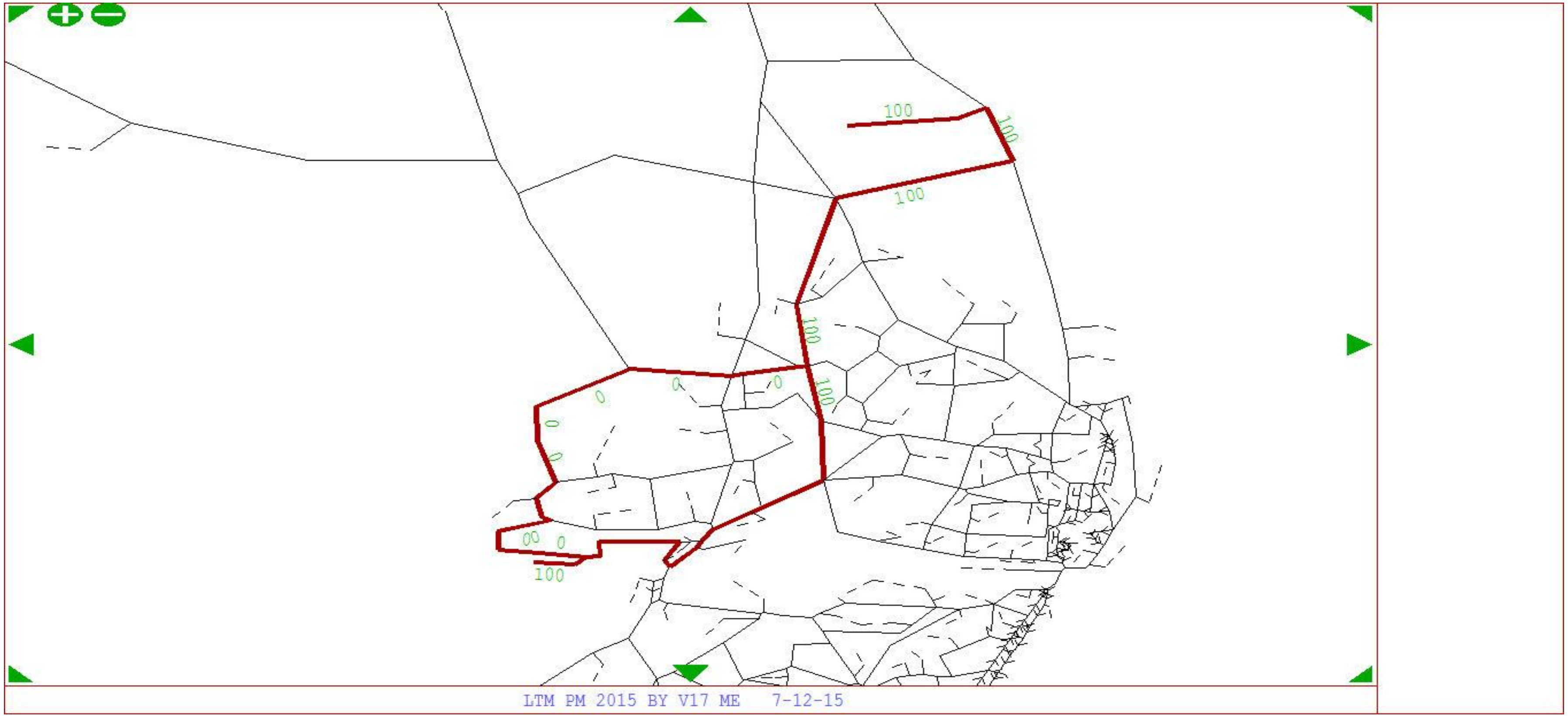
From Zone 102 To Zone 130 - User Class 2



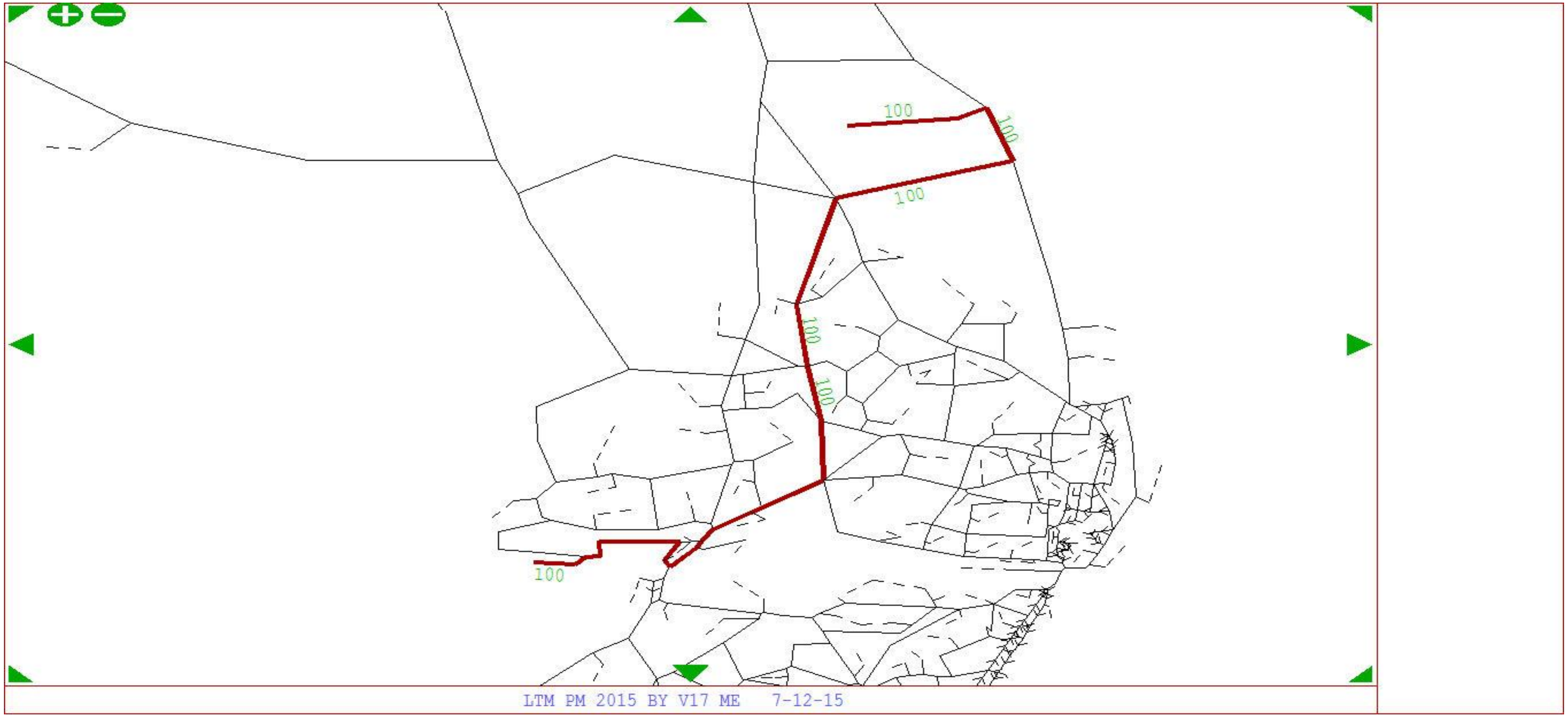
From Zone 102 To Zone 130 - User Class 3



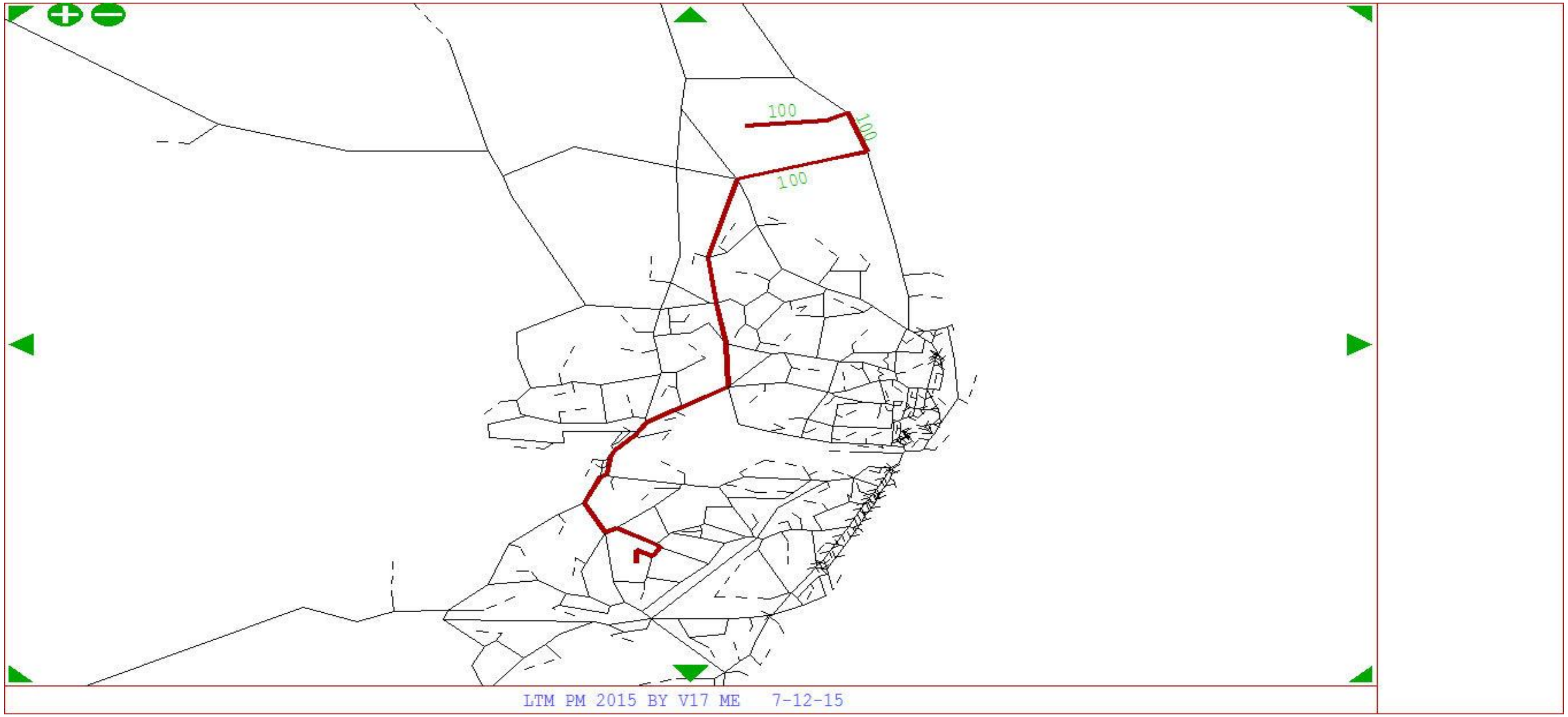
From Zone 102 To Zone 130 - User Class 4



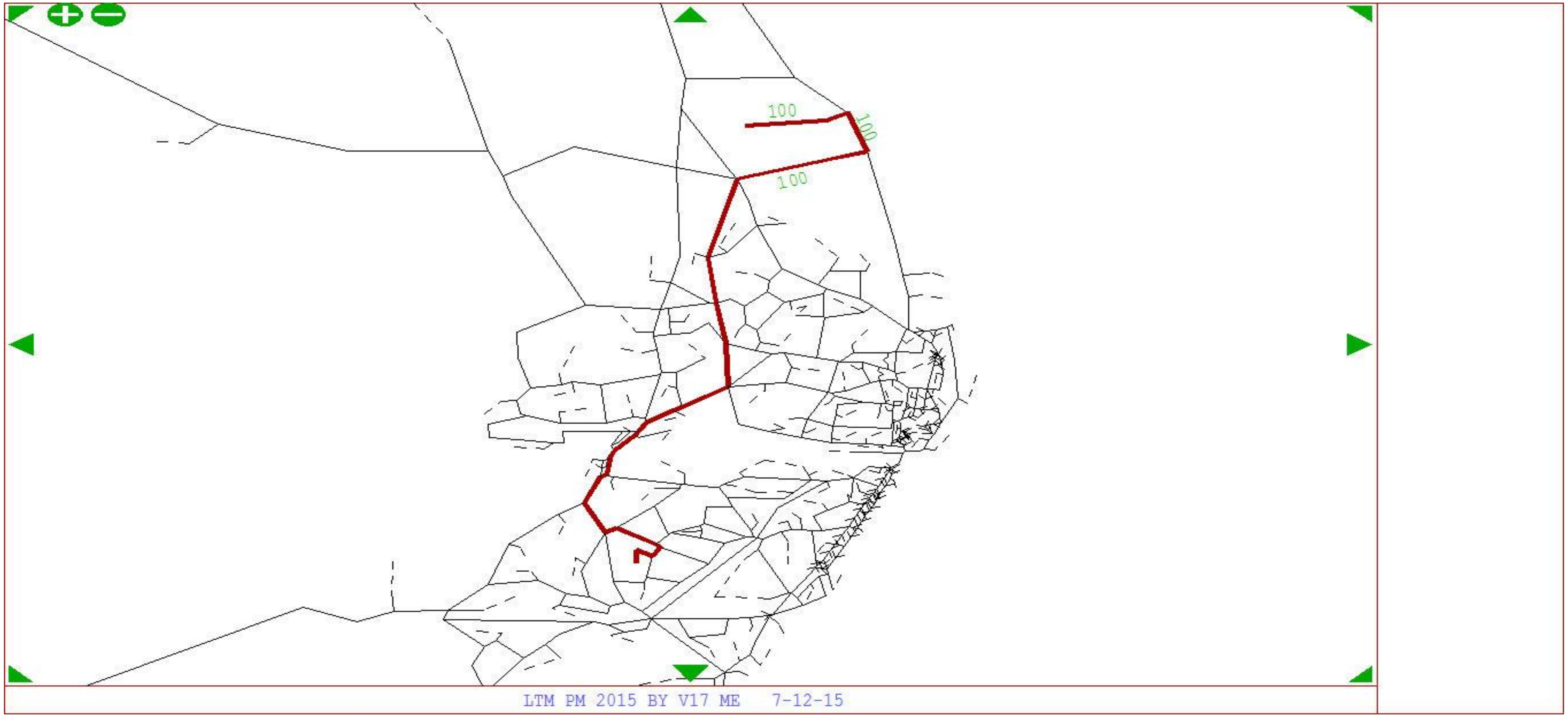
From Zone 102 To Zone 130 - User Class 5



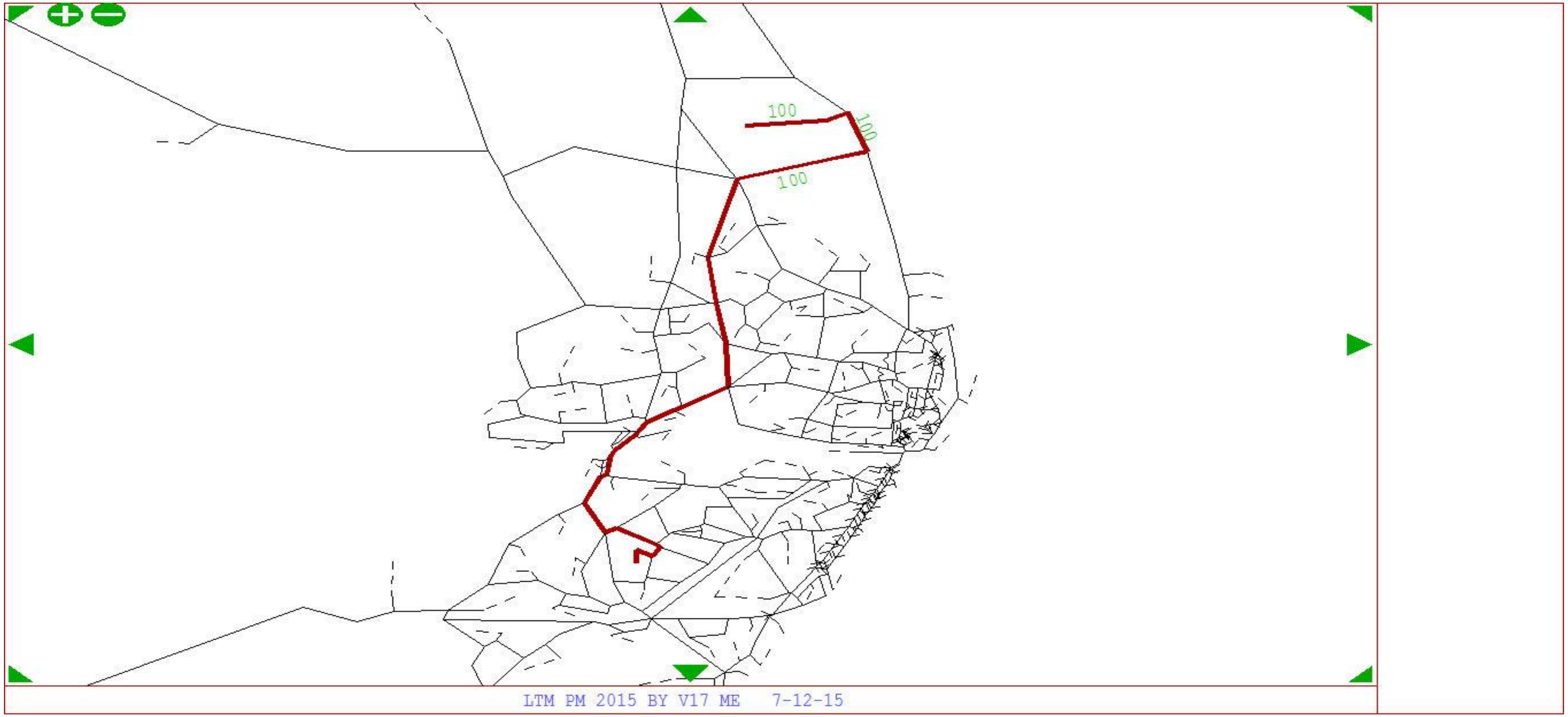
From Zone 102 To Zone 131 - User Class 1



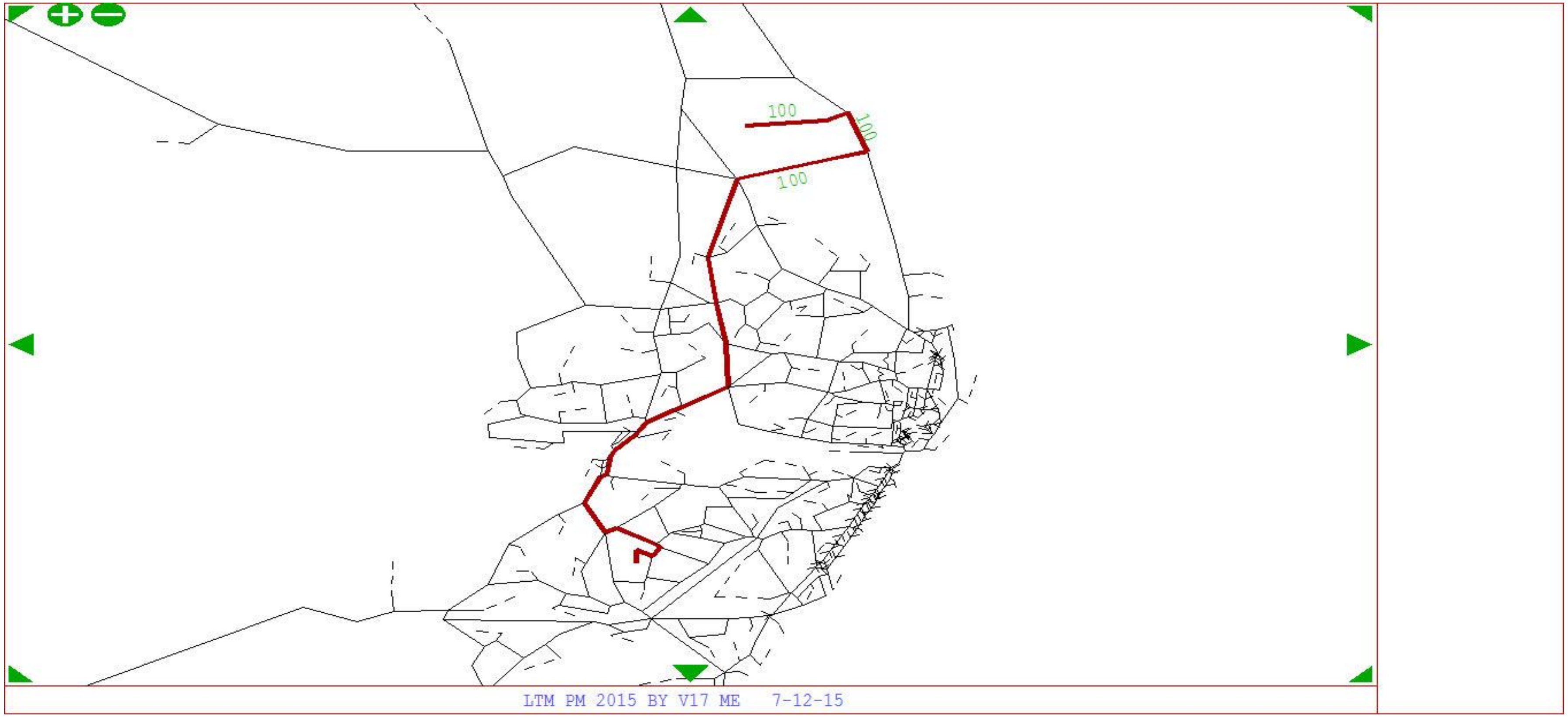
From Zone 102 To Zone 131 - User Class 2



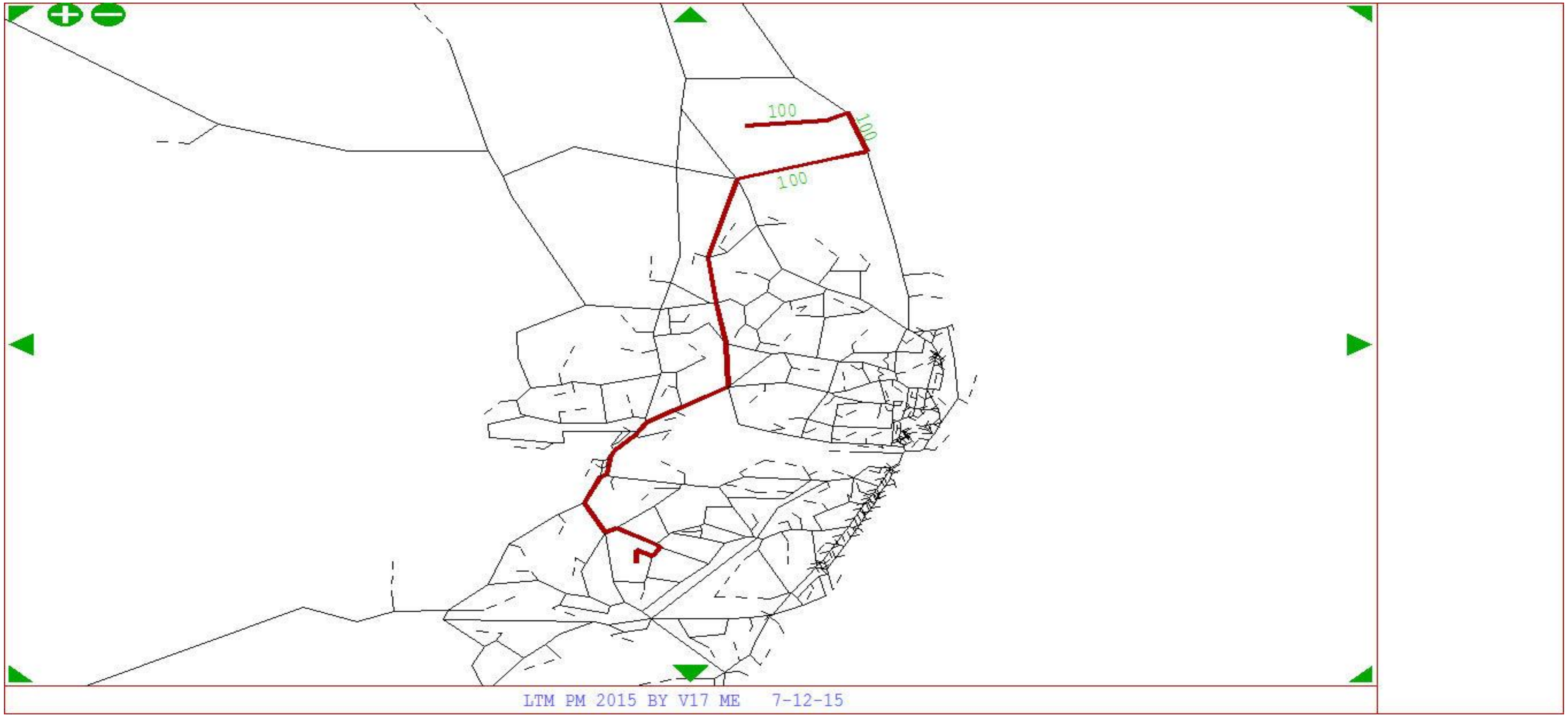
From Zone 102 To Zone 131 - User Class 3



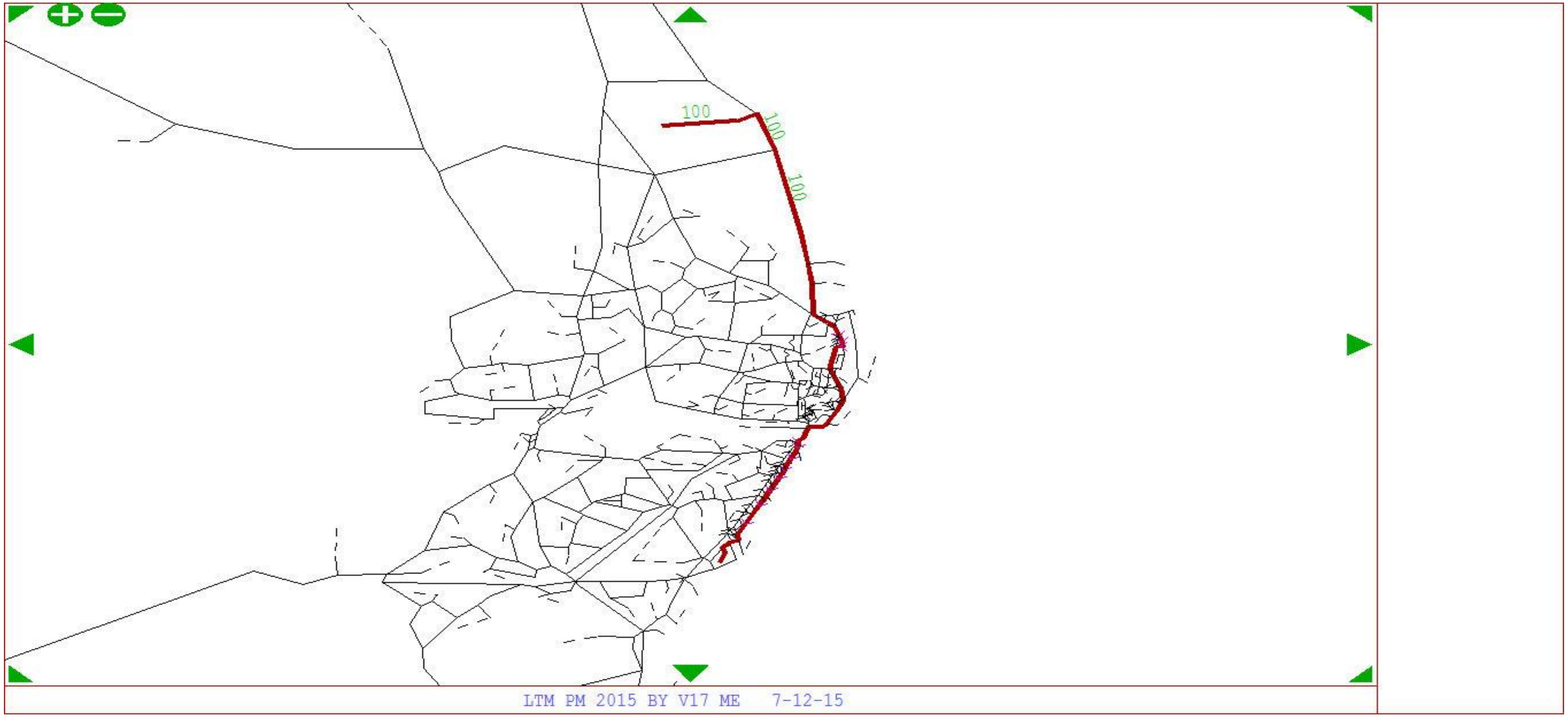
From Zone 102 To Zone 131 - User Class 4



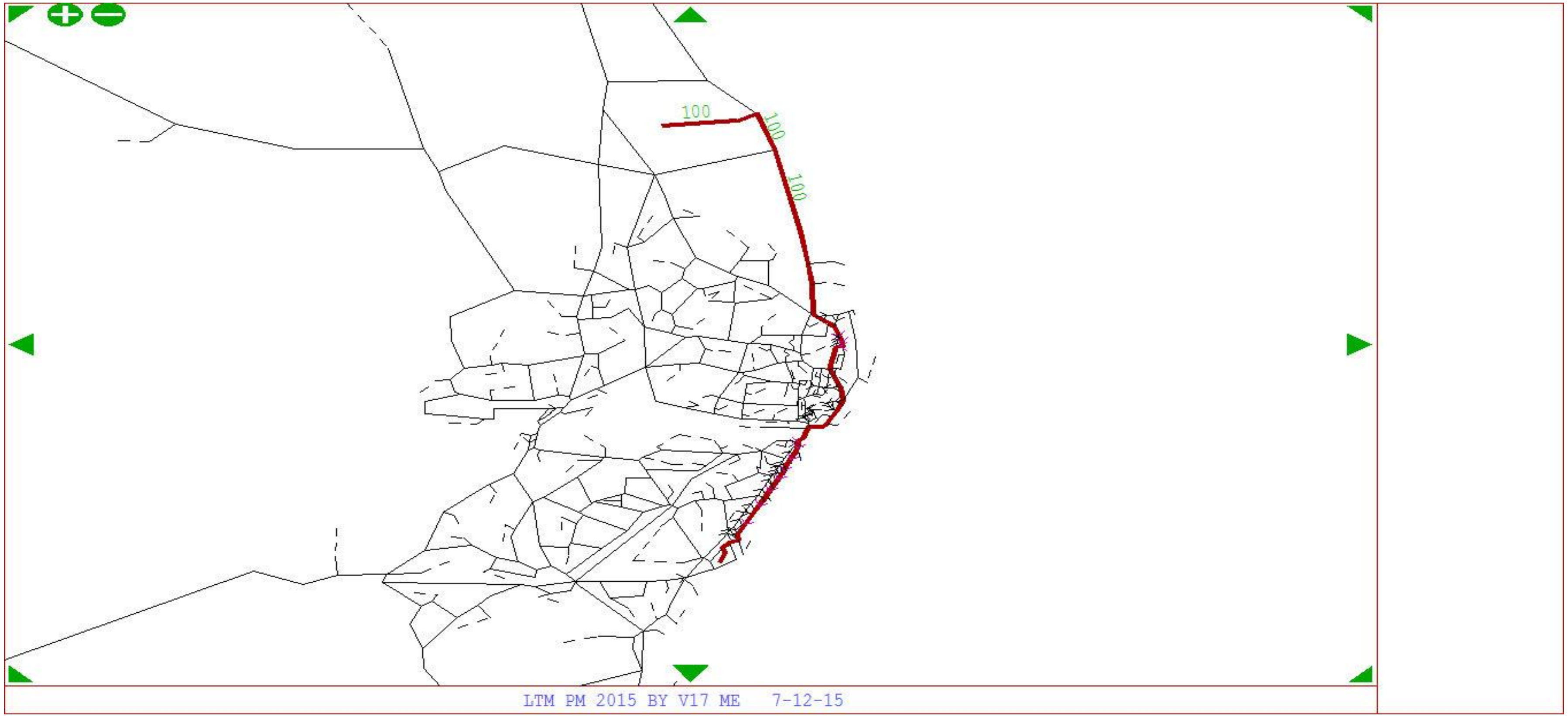
From Zone 102 To Zone 131 - User Class 5



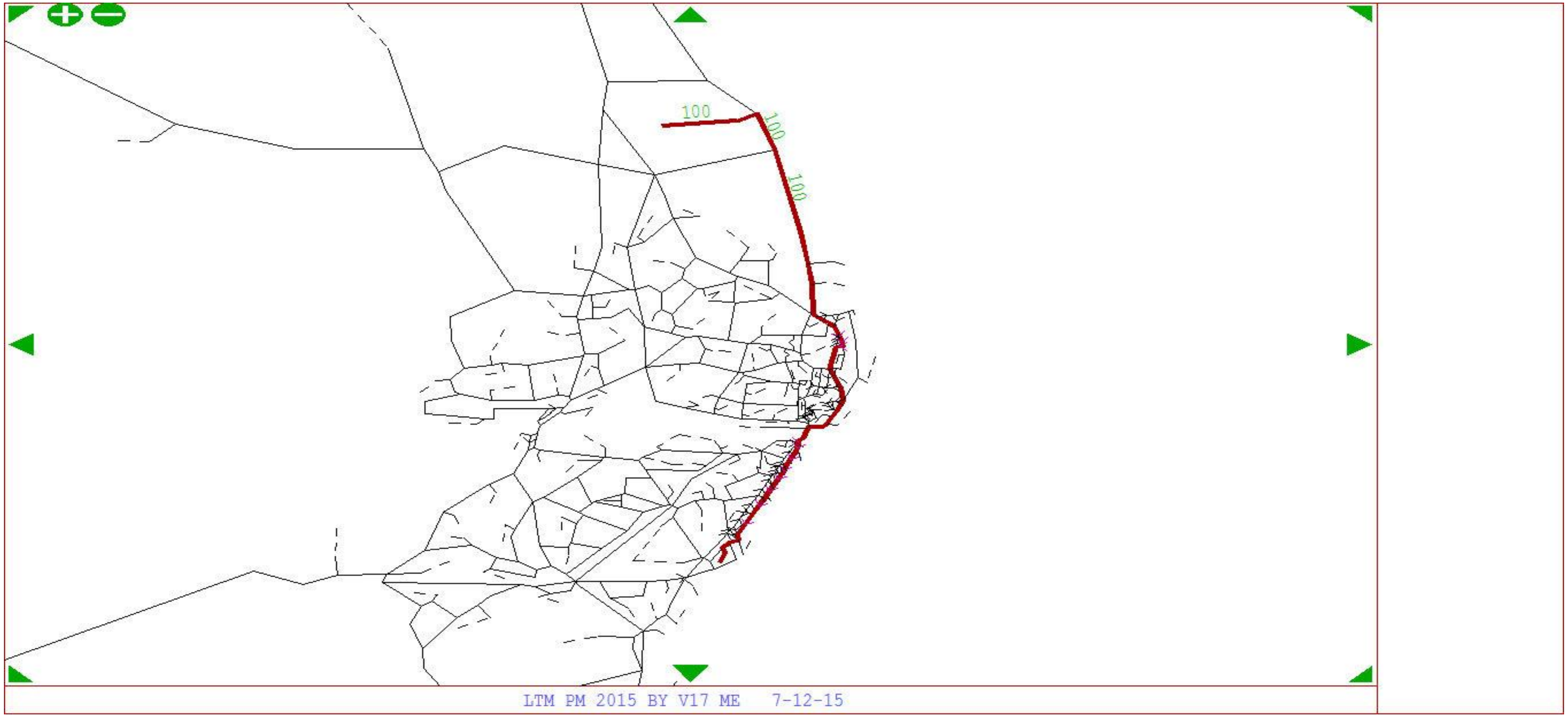
From Zone 102 To Zone 136 - User Class 1



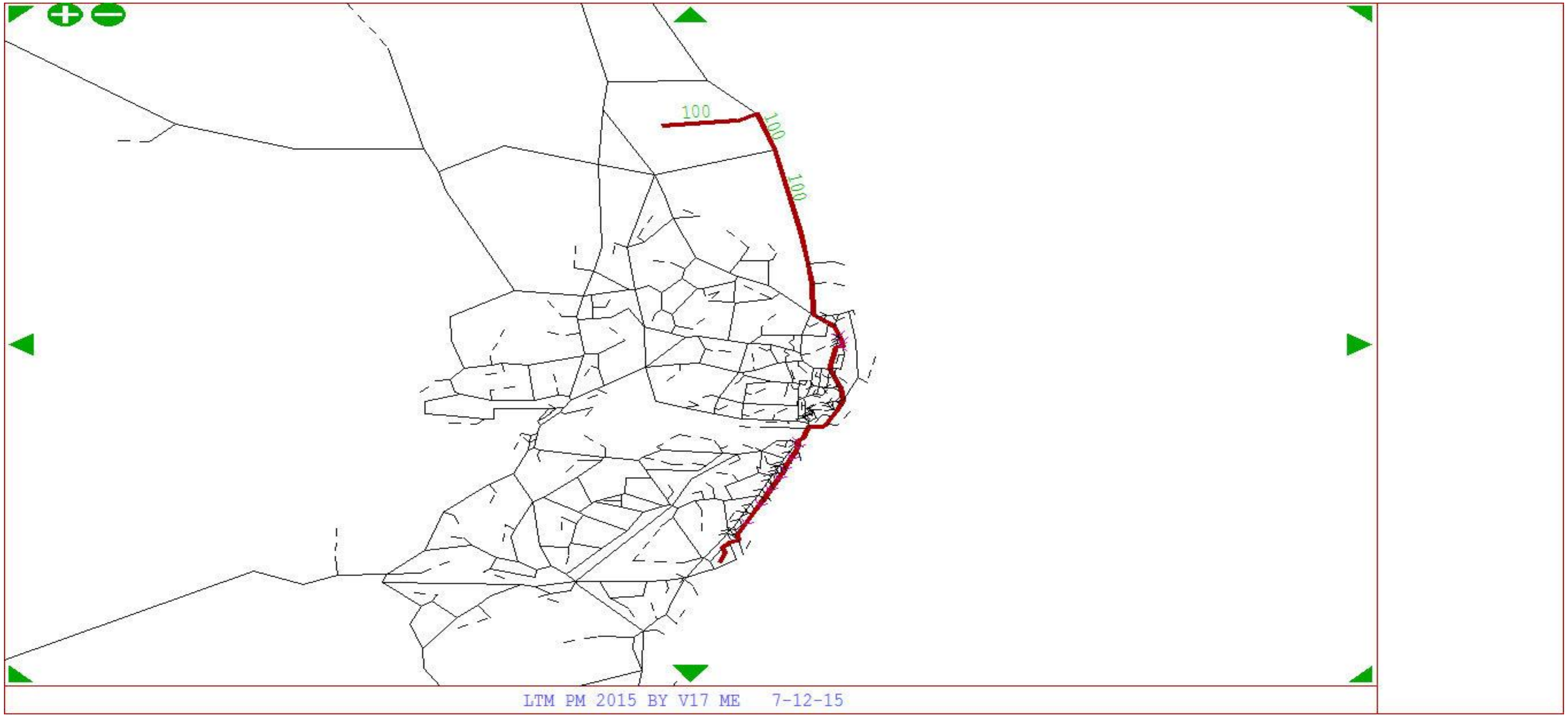
From Zone 102 To Zone 136 - User Class 2



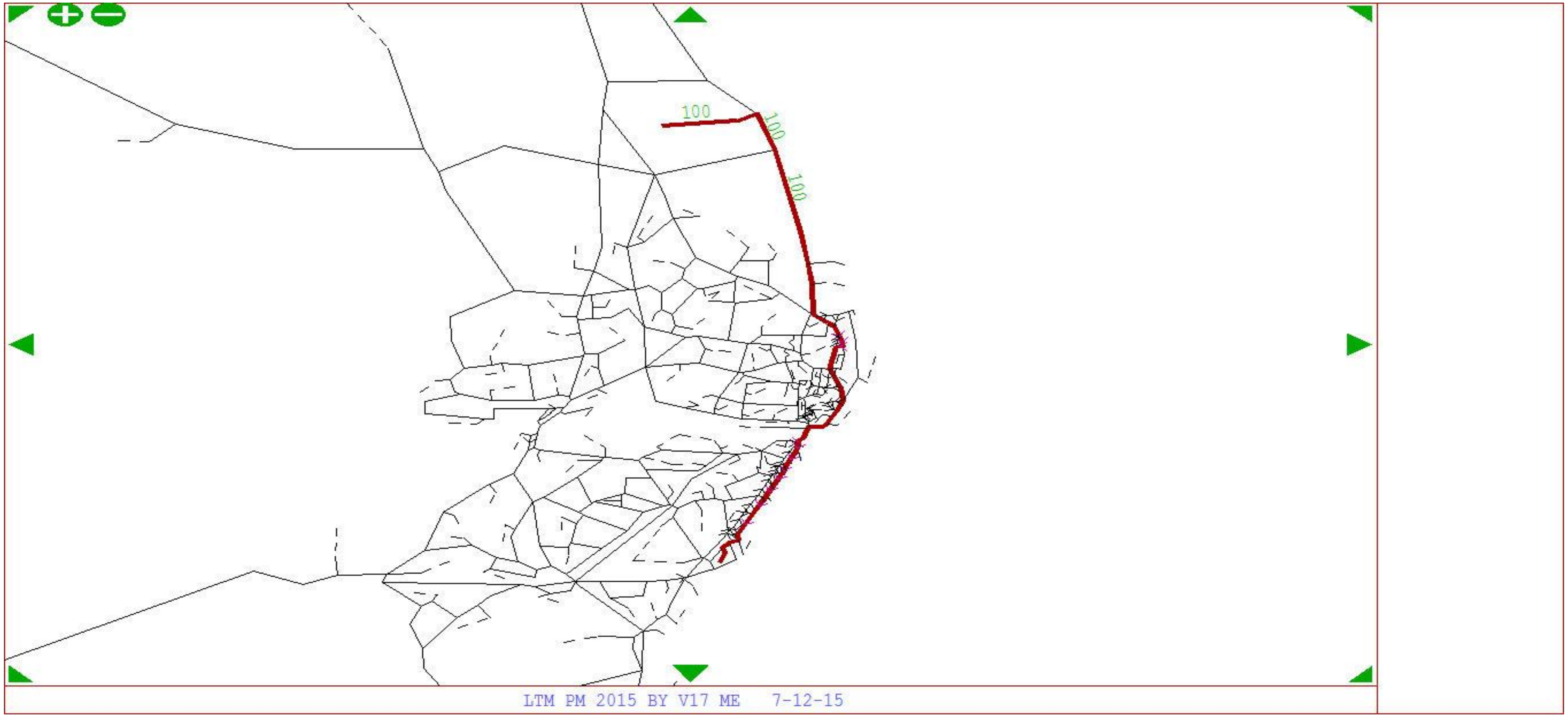
From Zone 102 To Zone 136 - User Class 3



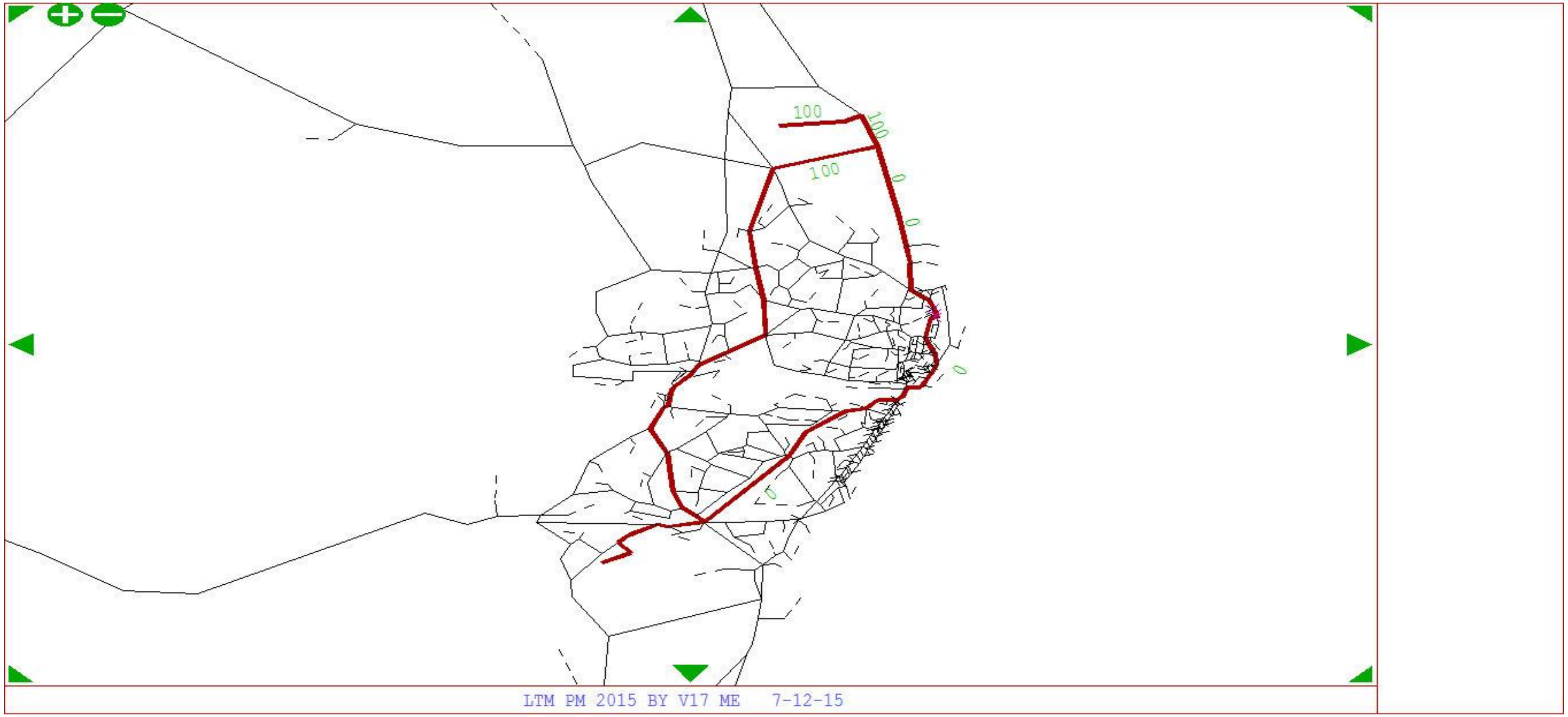
From Zone 102 To Zone 136 - User Class 4



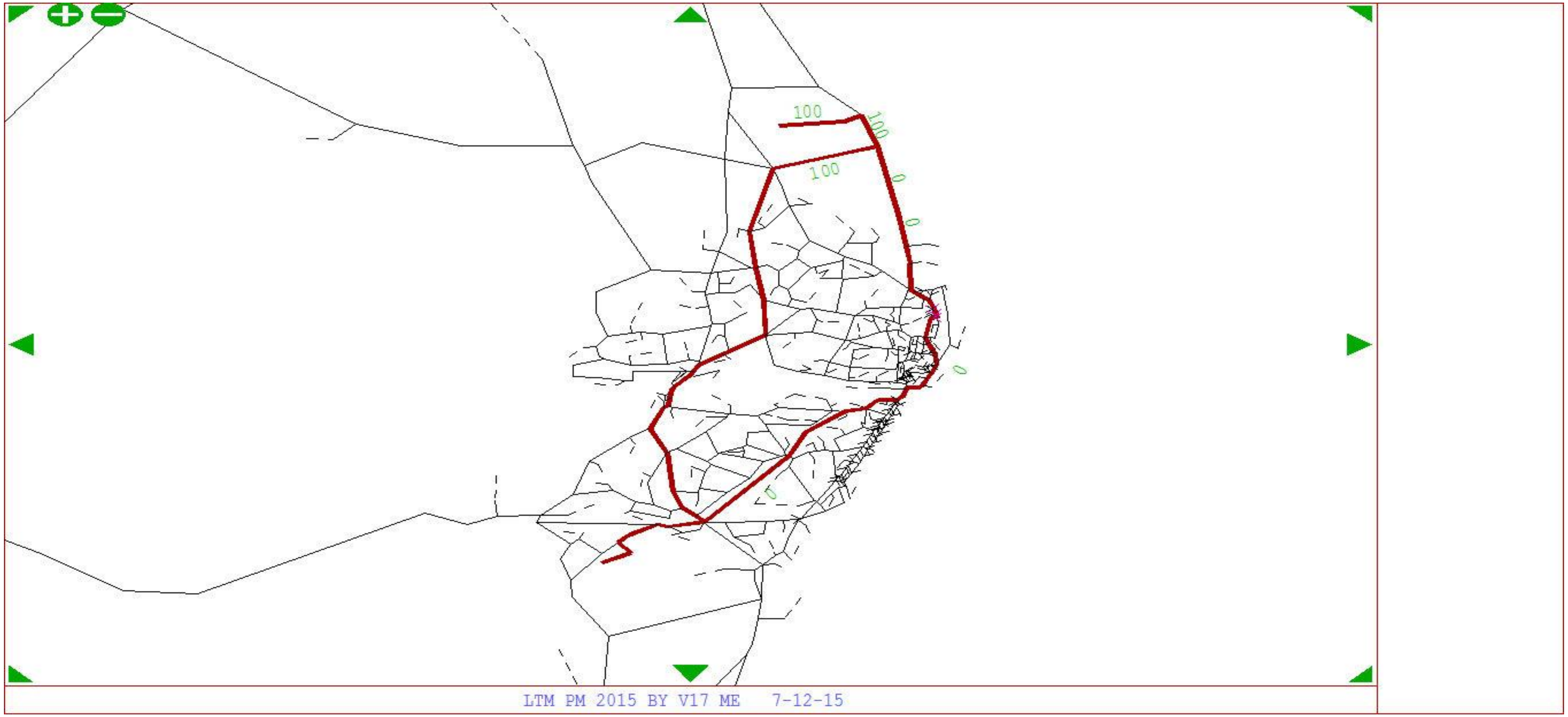
From Zone 102 To Zone 136 - User Class 5



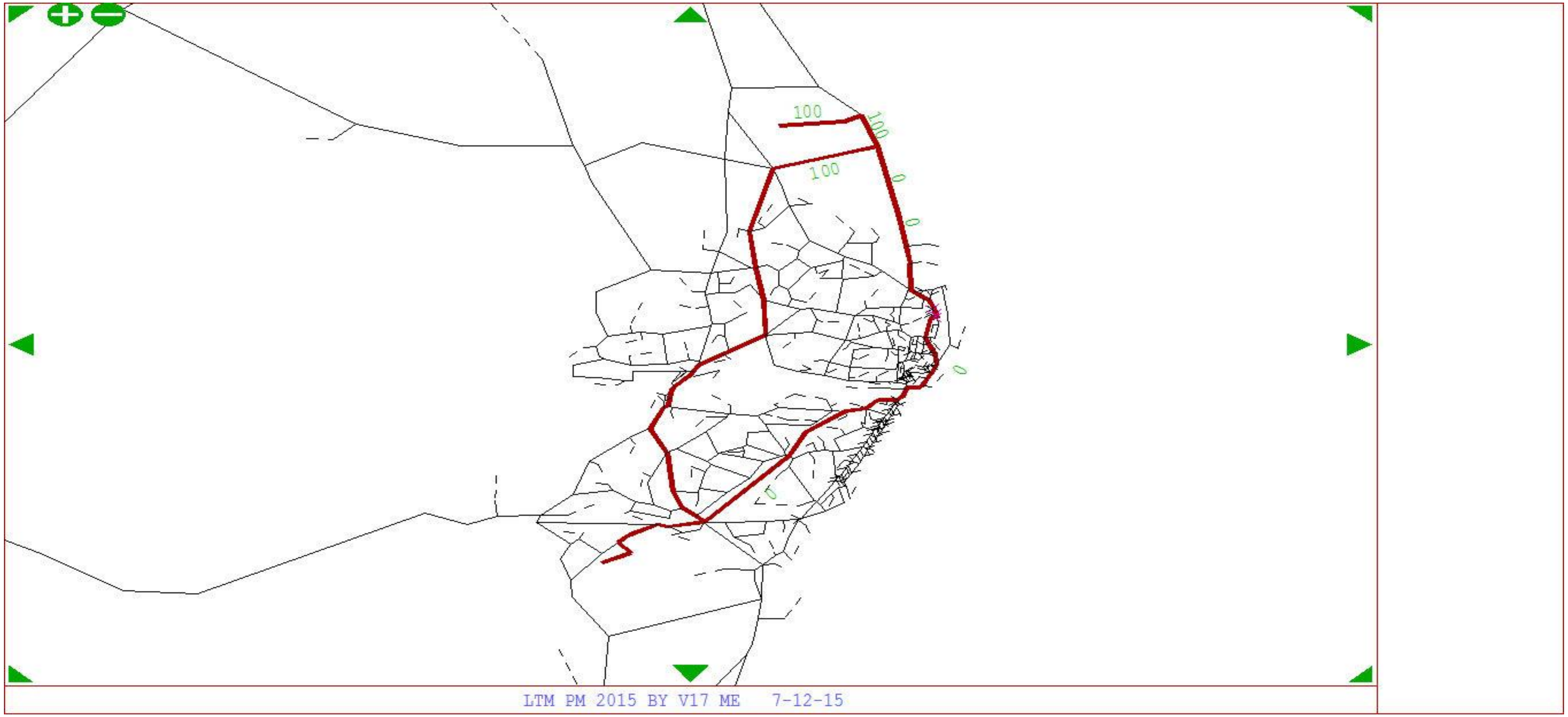
From Zone 102 To Zone 143 - User Class 1



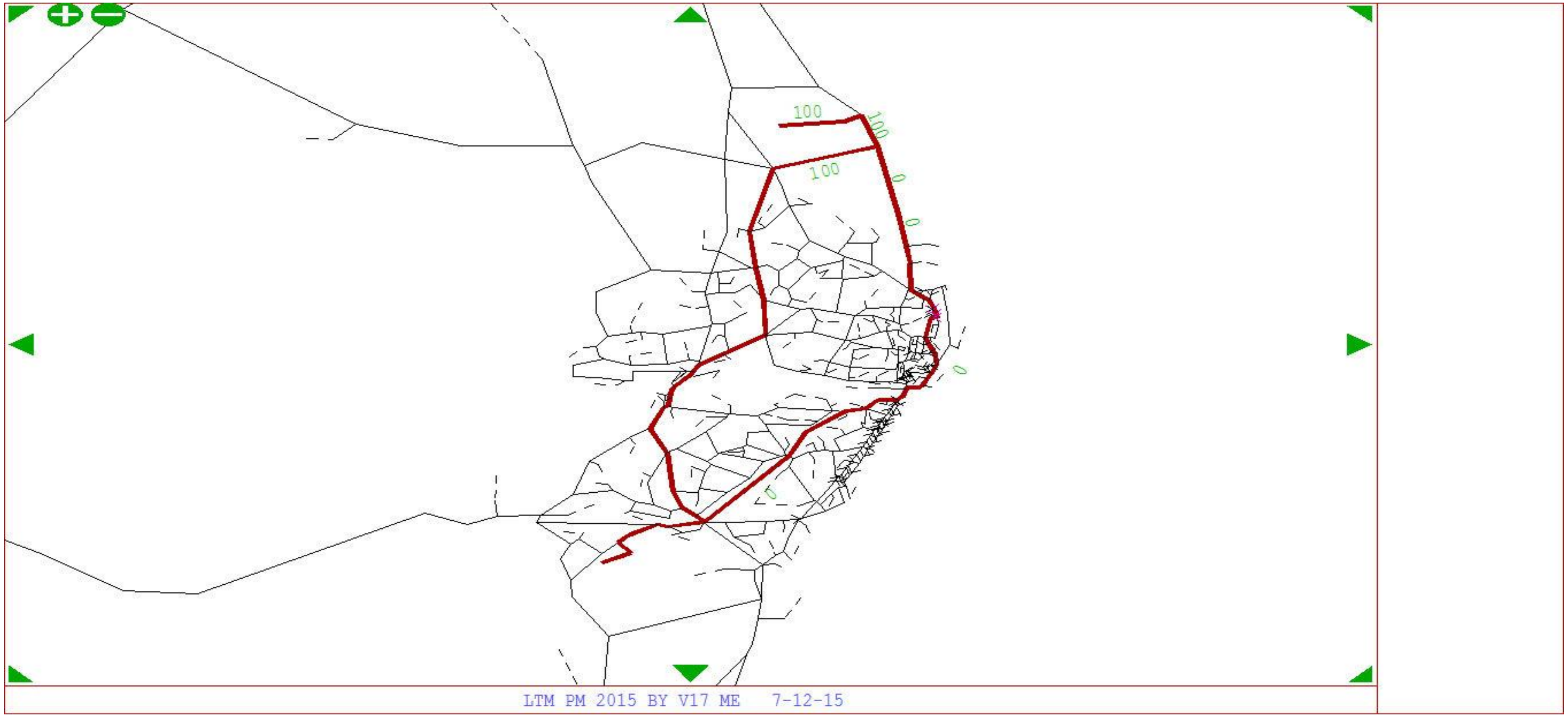
From Zone 102 To Zone 143 - User Class 2



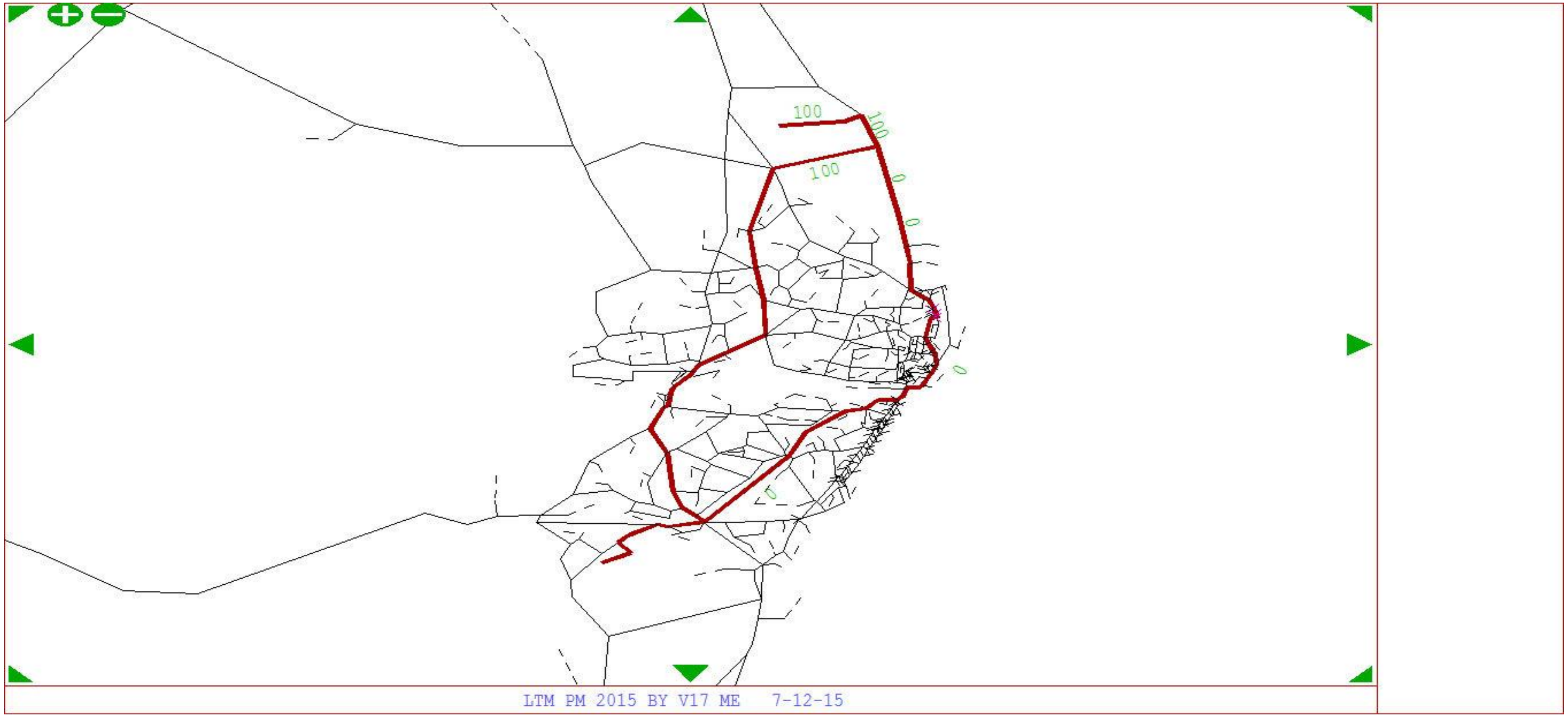
From Zone 102 To Zone 143 - User Class 3



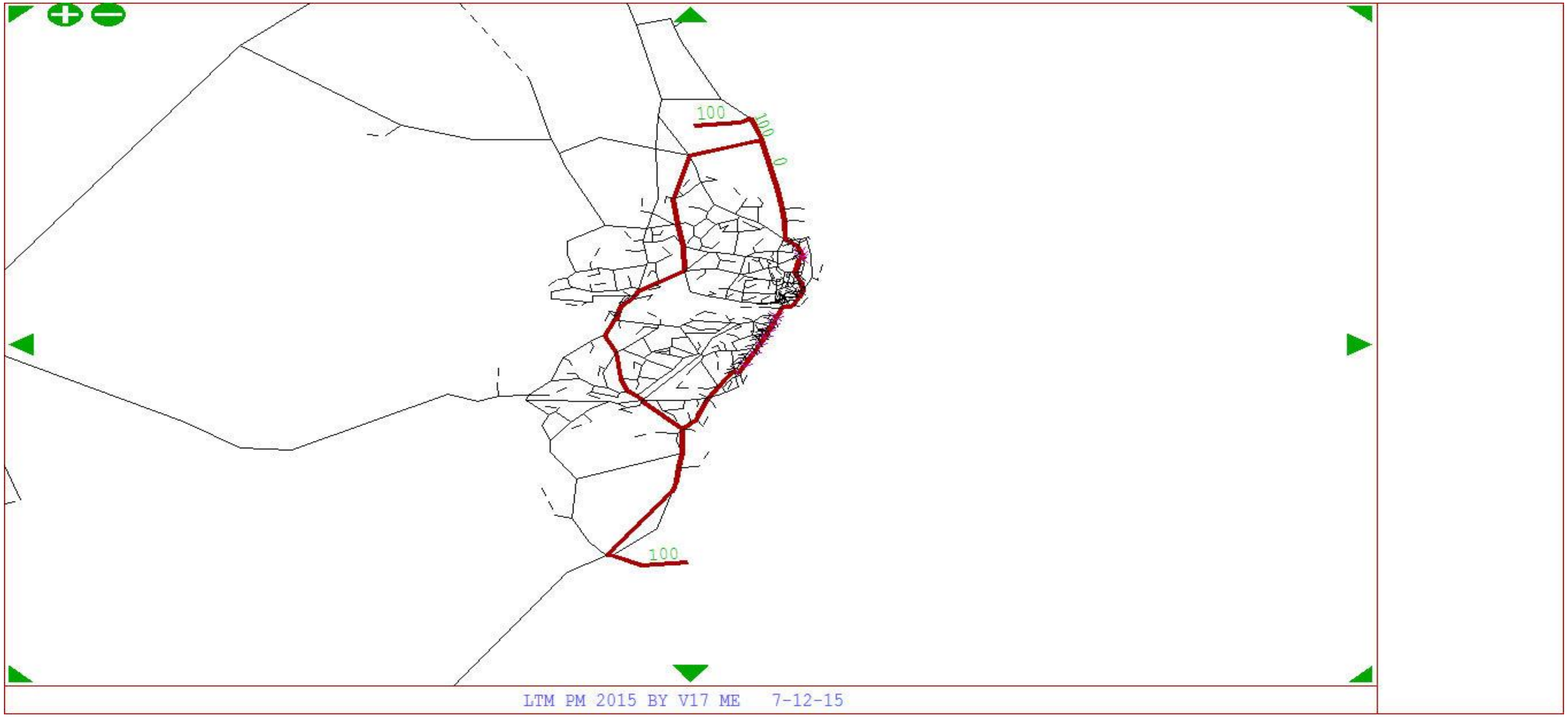
From Zone 102 To Zone 143 - User Class 4



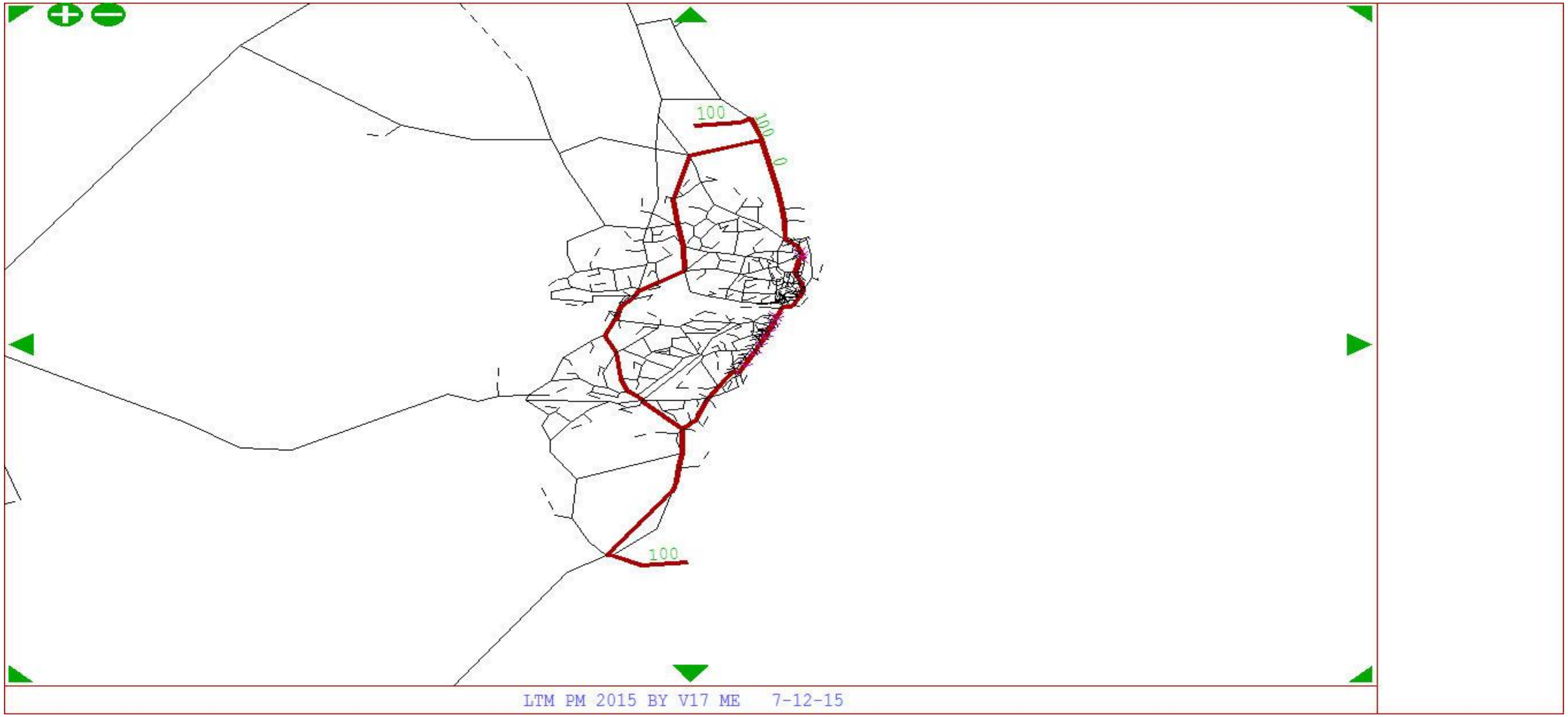
From Zone 102 To Zone 143 - User Class 5



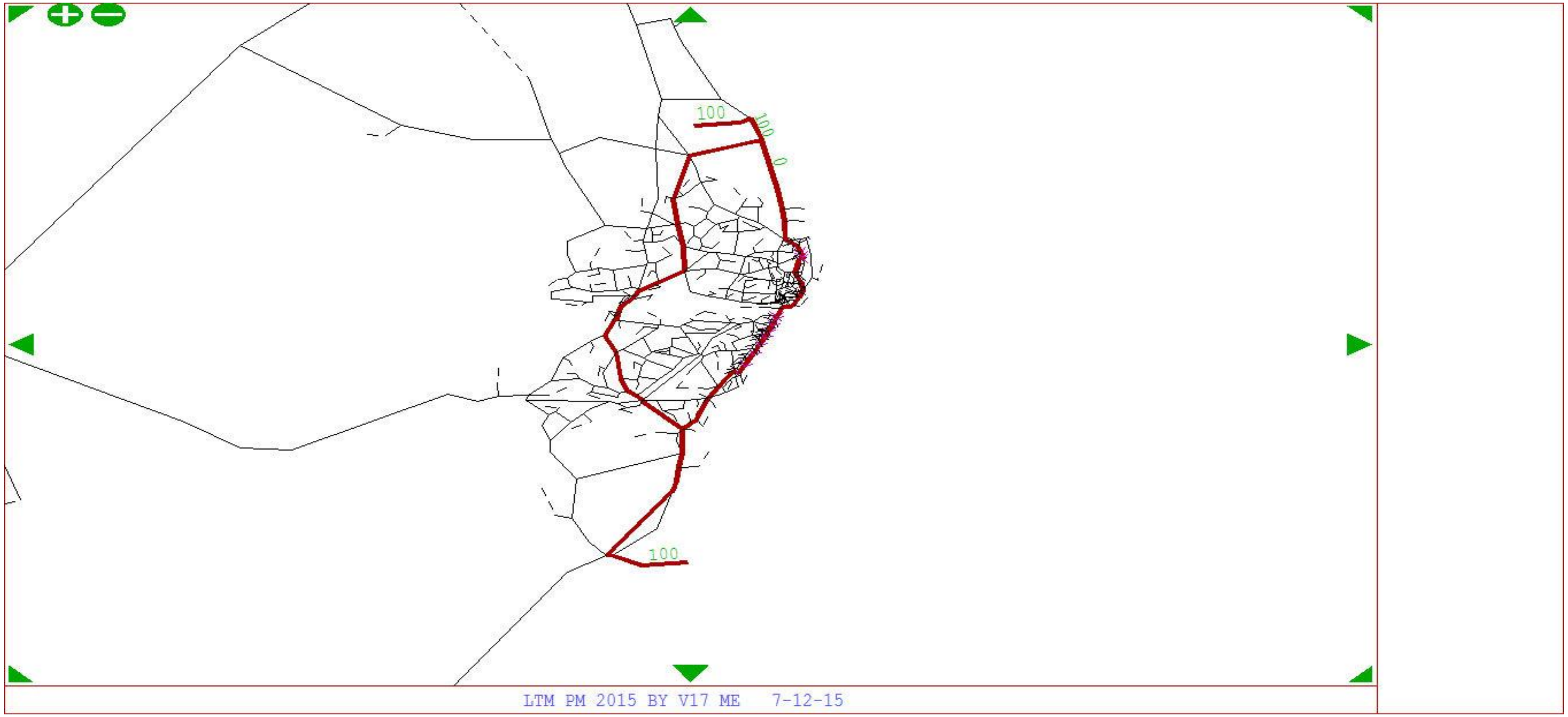
From Zone 102 To Zone 149 - User Class 1



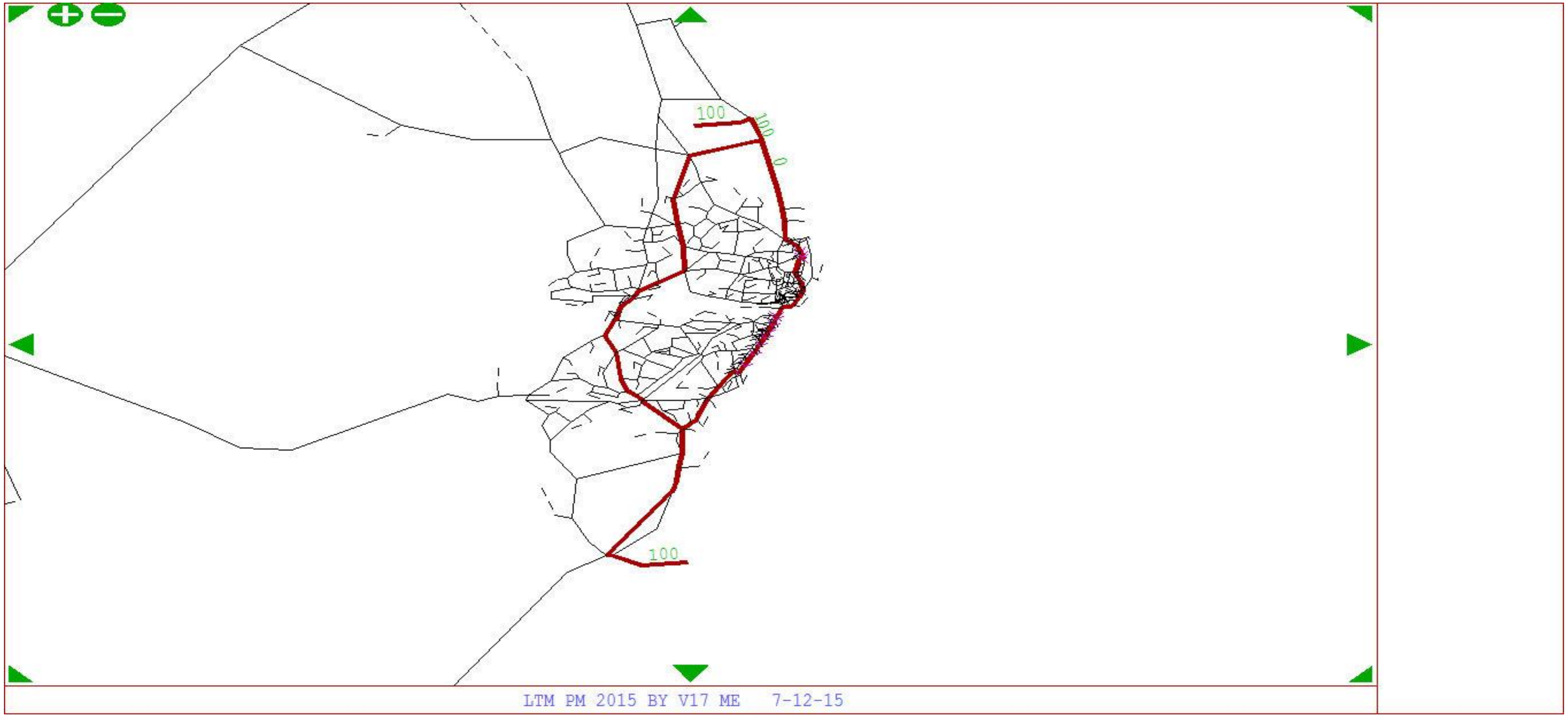
From Zone 102 To Zone 149 - User Class 2



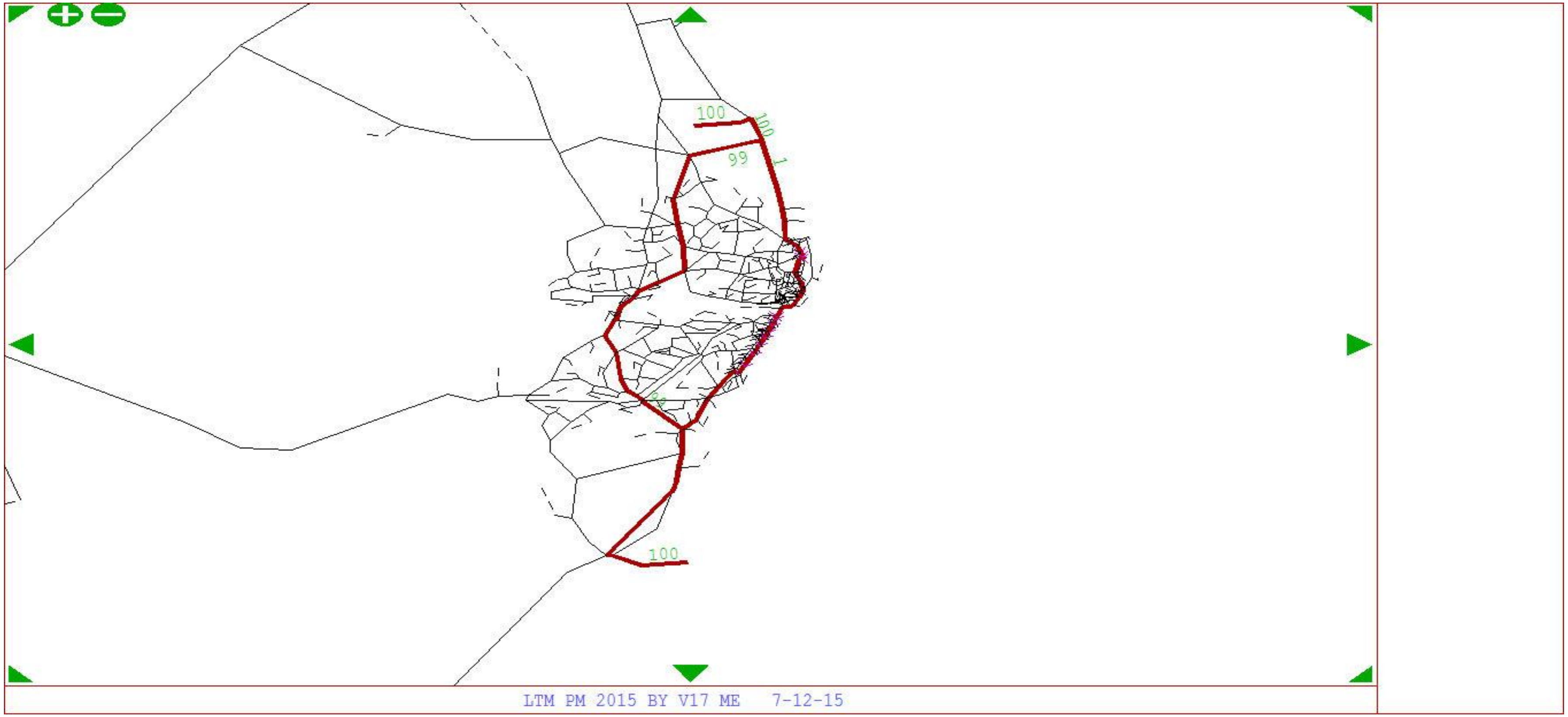
From Zone 102 To Zone 149 - User Class 3



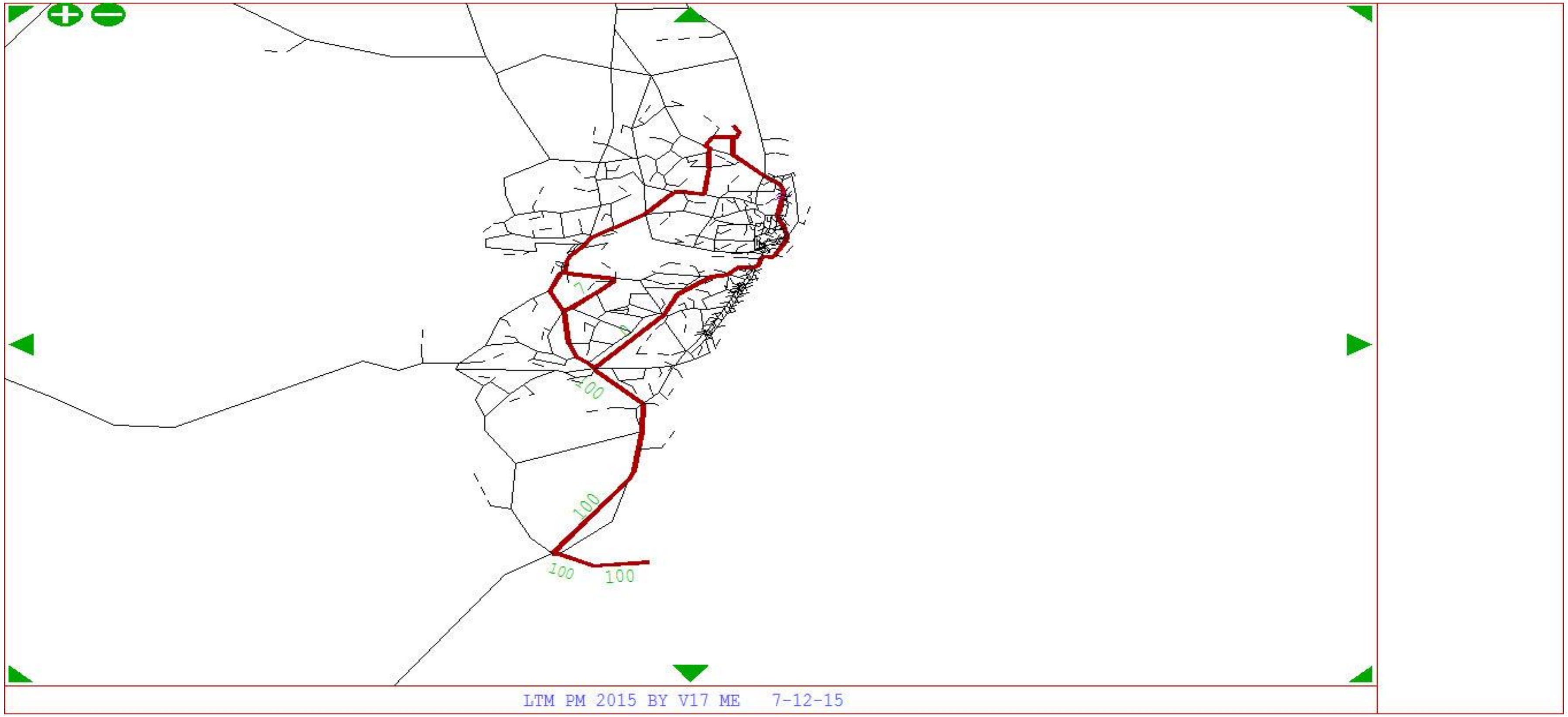
From Zone 102 To Zone 149 - User Class 4



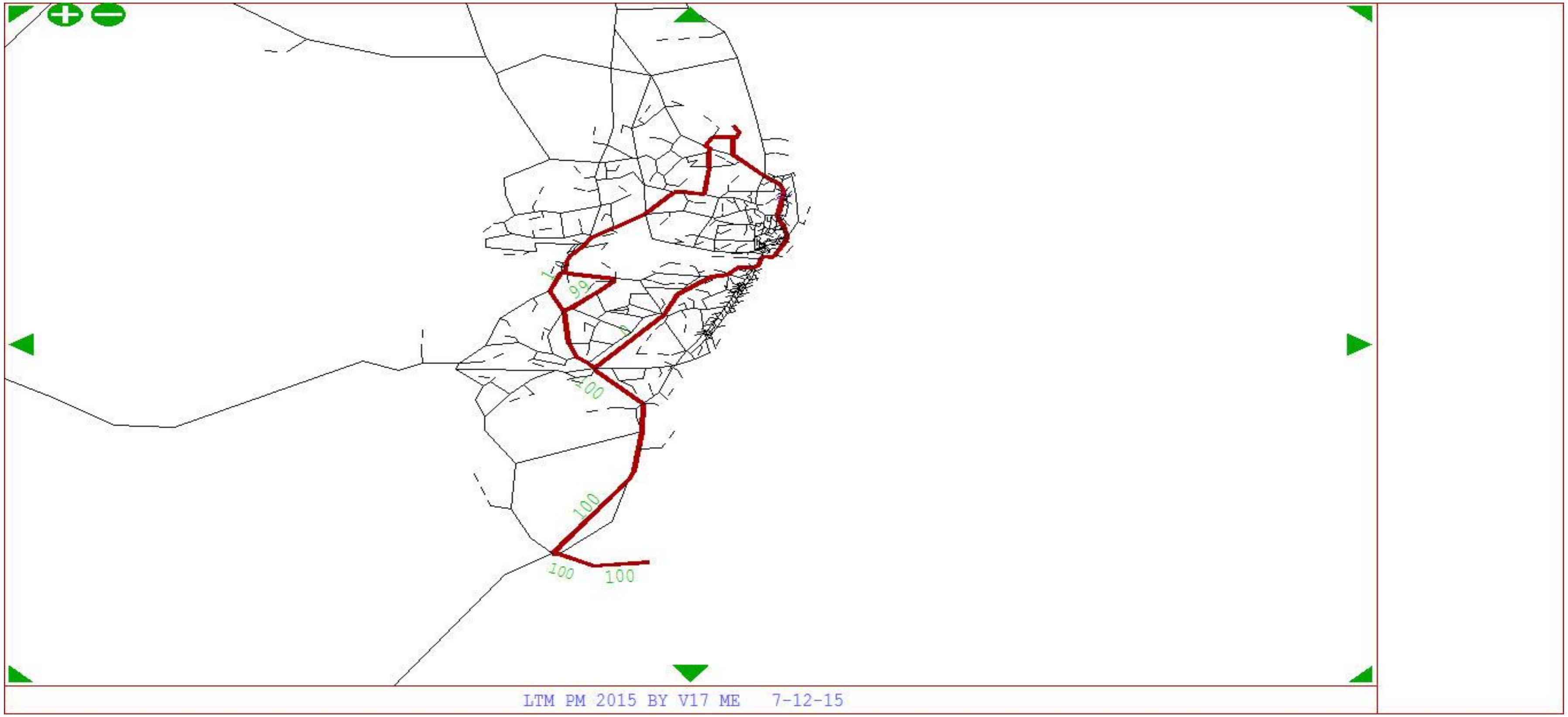
From Zone 102 To Zone 149 - User Class 5



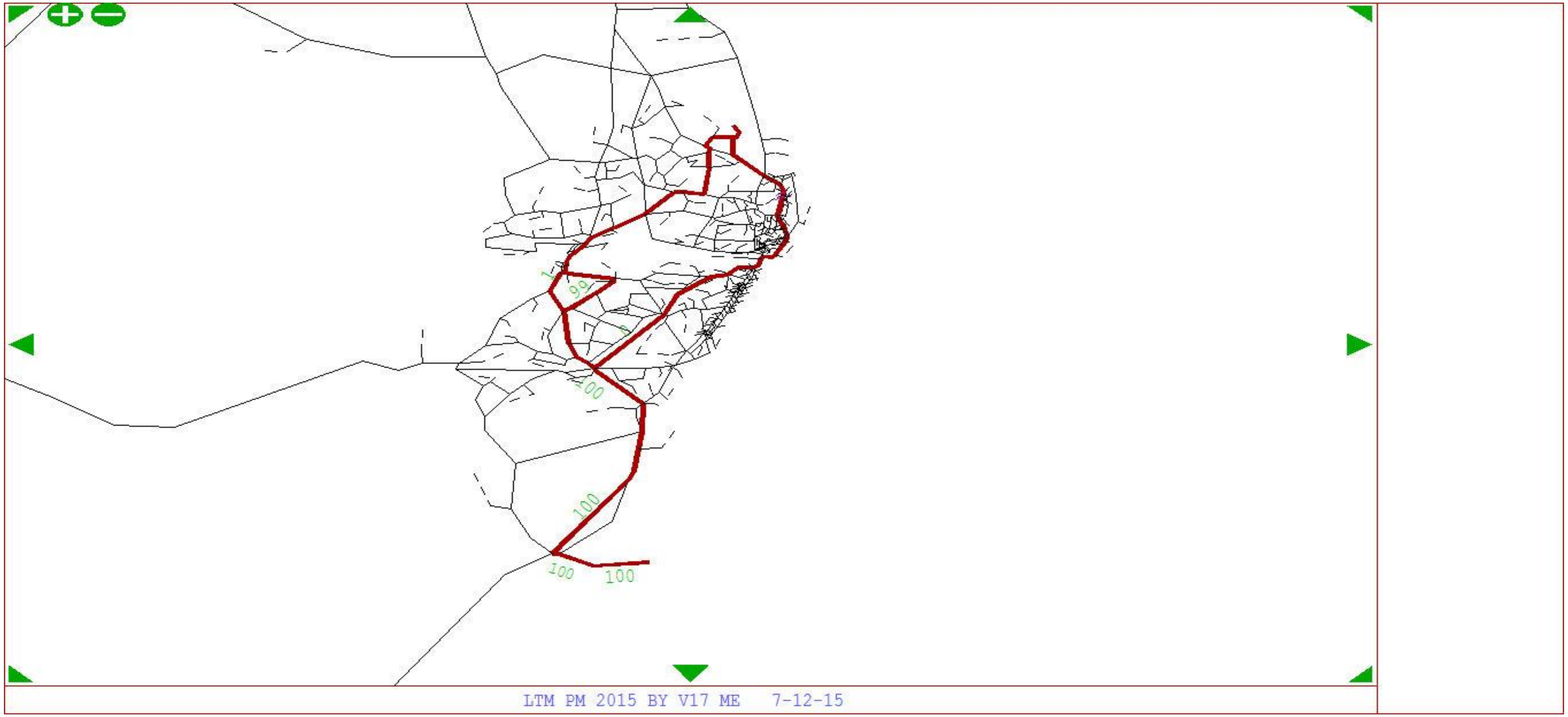
From Zone 149 To Zone 101 - User Class 1



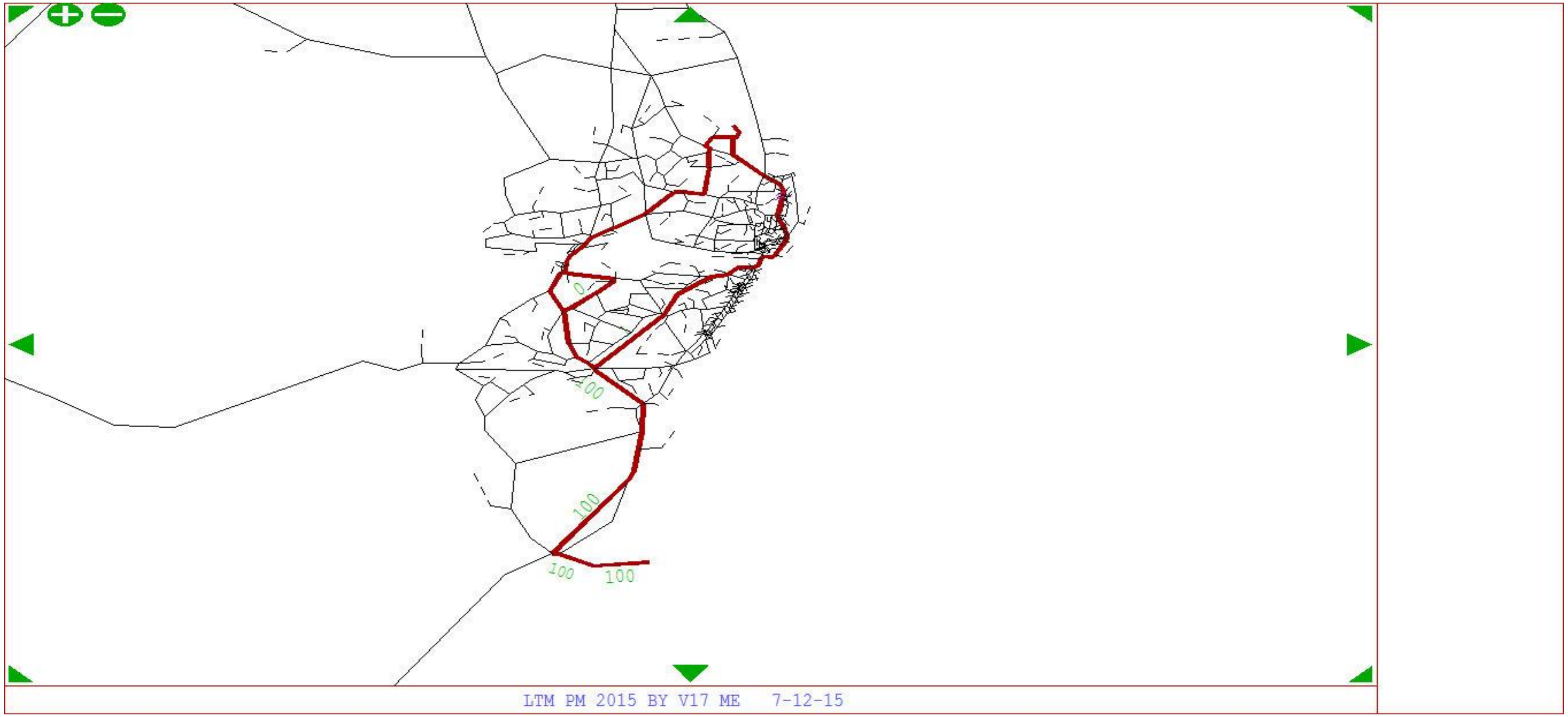
From Zone 149 To Zone 101 - User Class 2



From Zone 149 To Zone 101 - User Class 3



From Zone 149 To Zone 101 - User Class 4



From Zone 149 To Zone 101 - User Class 5

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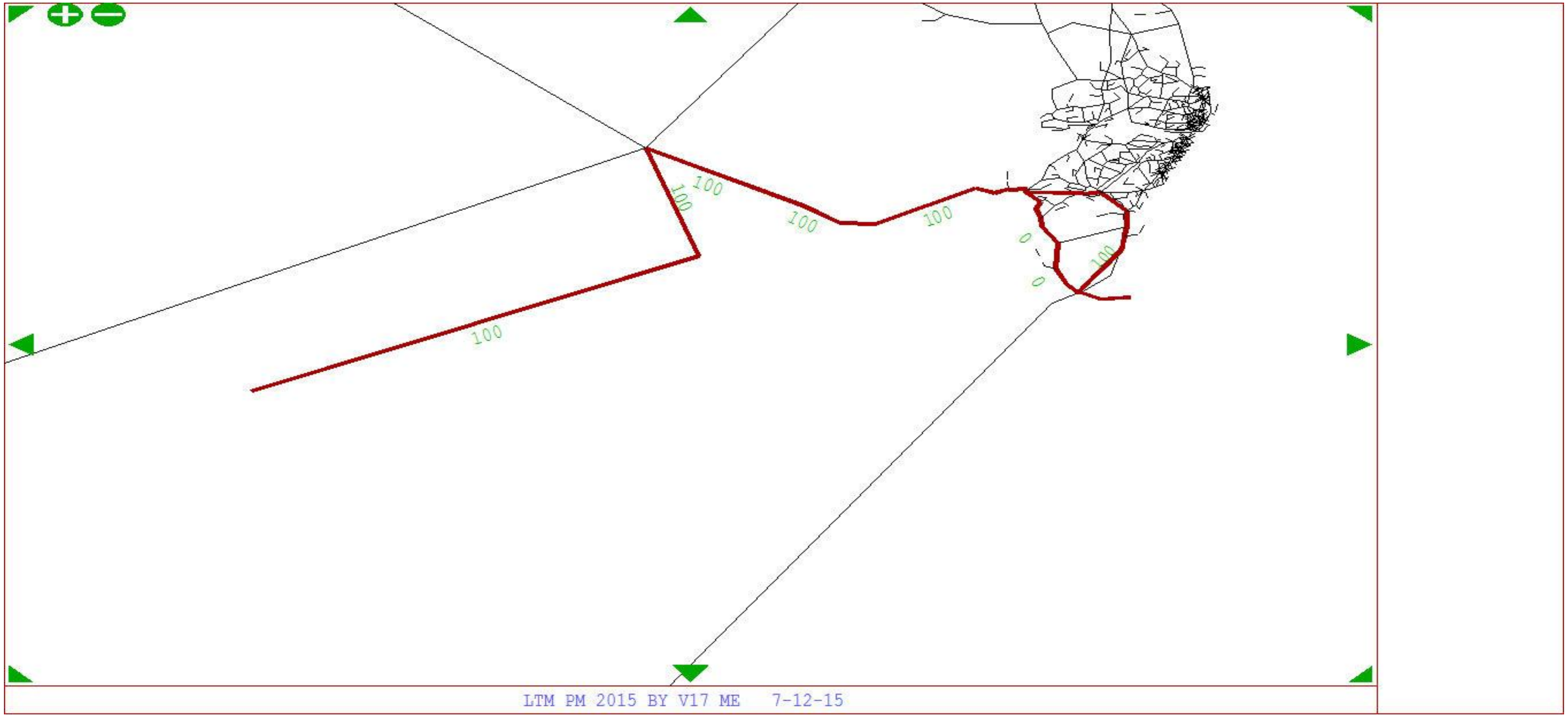
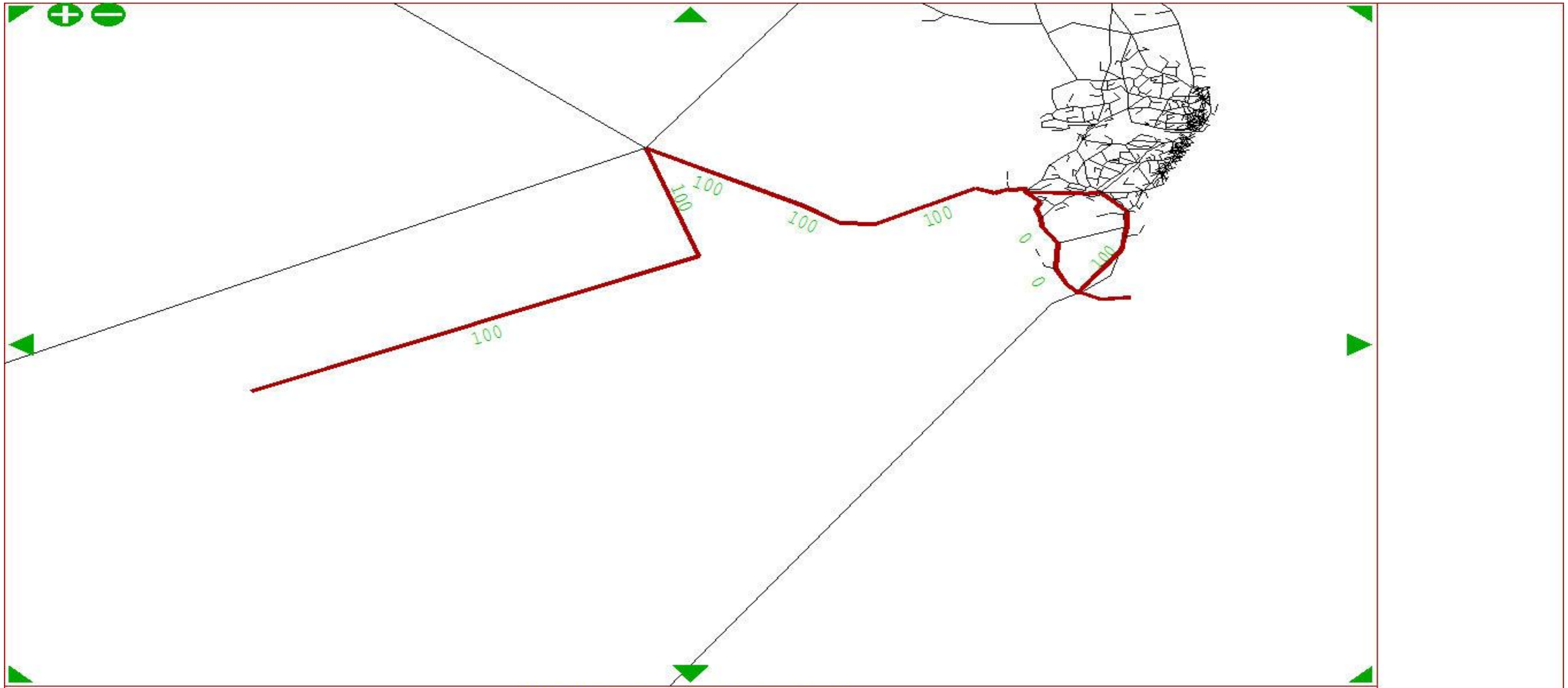
From Zone 149 To Zone 104 - User Class 1



From Zone 149 To Zone 104 - User Class 2



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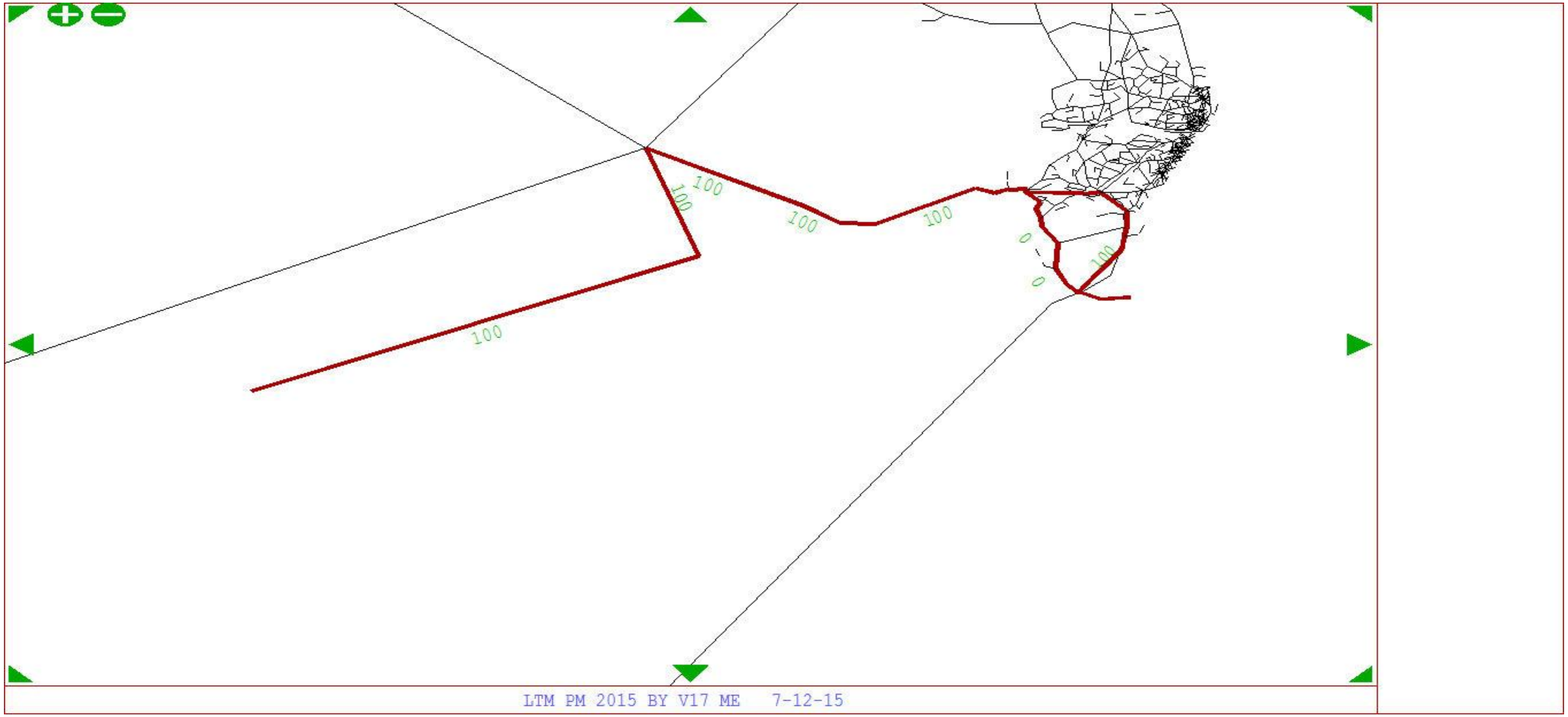
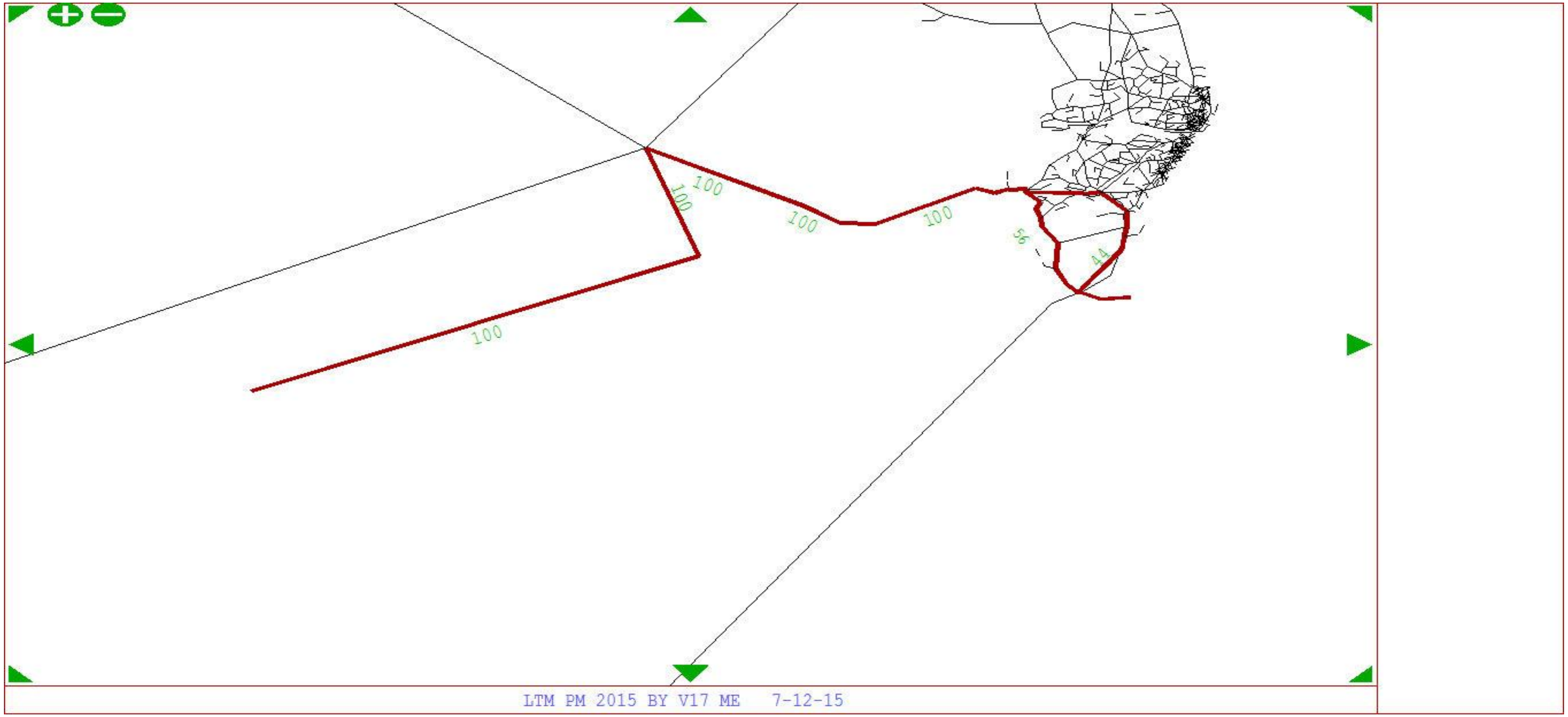
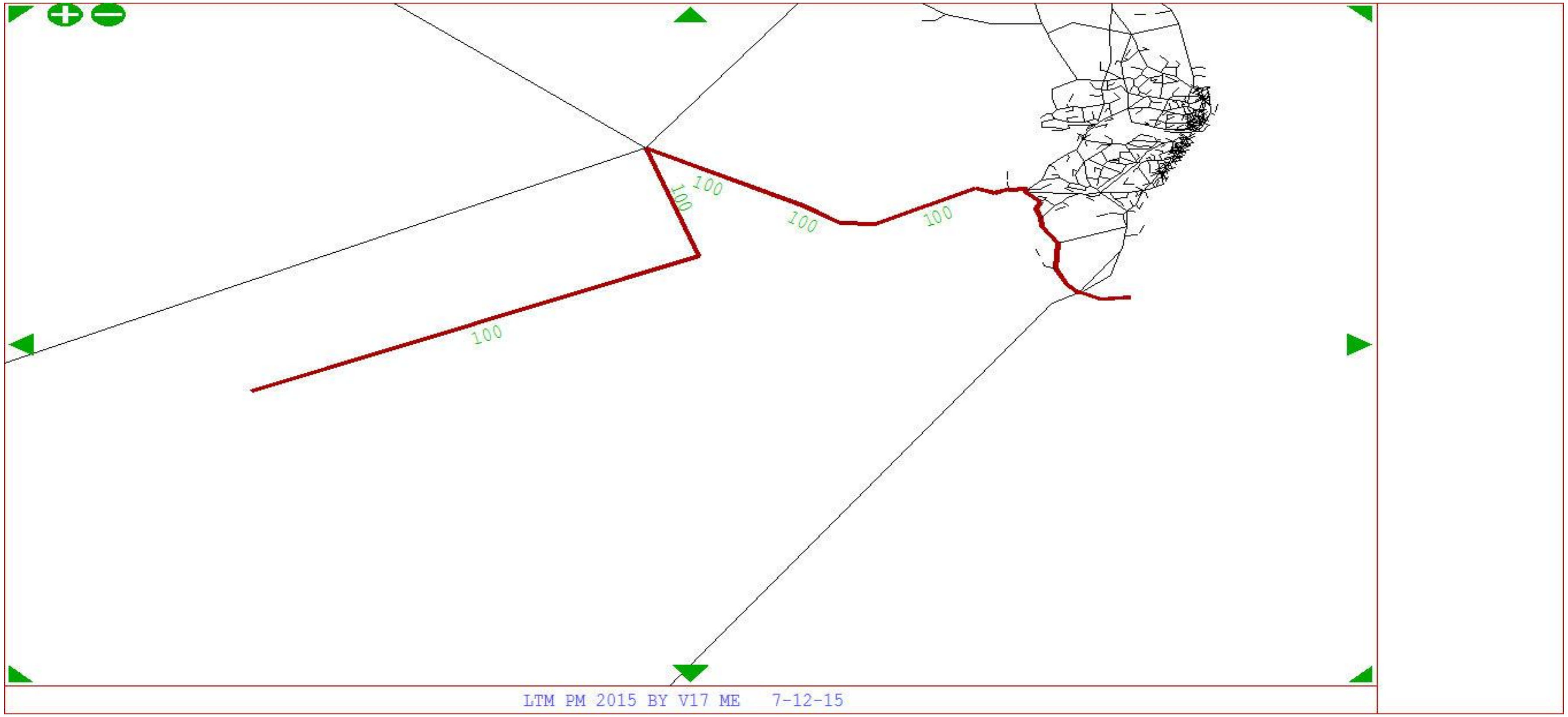
From Zone 149 To Zone 104 - User Class 3



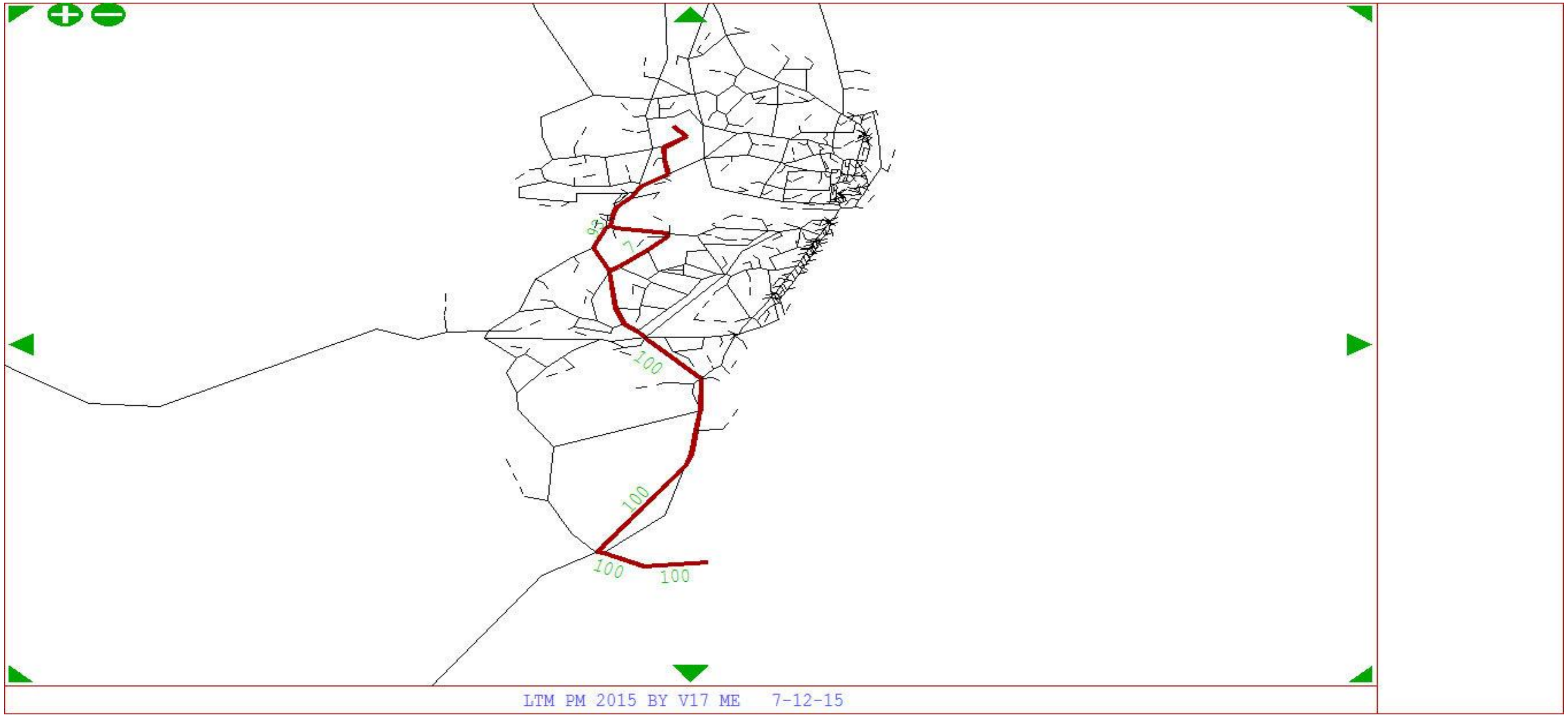
From Zone 149 To Zone 104 - User Class 4



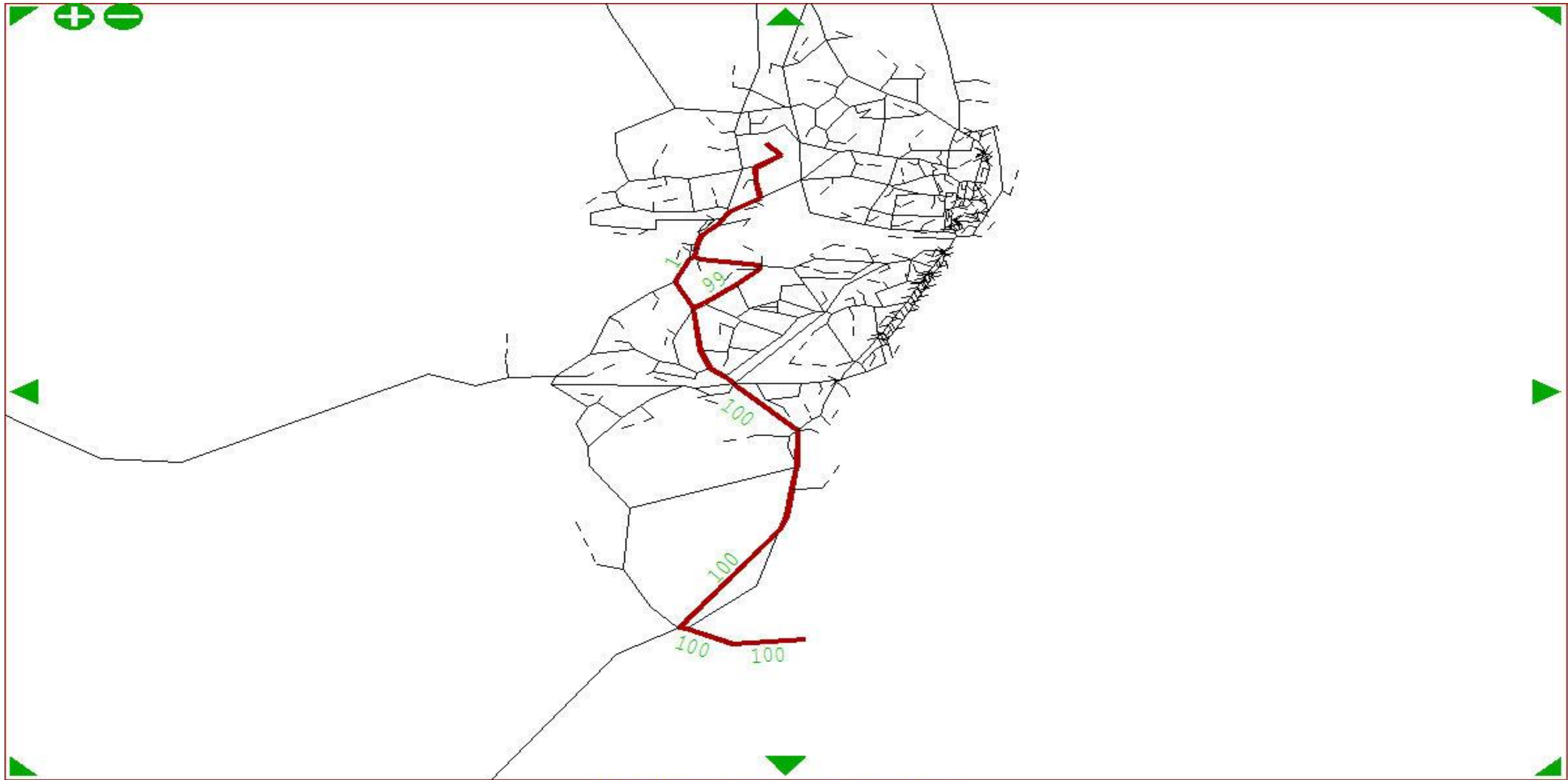
From Zone 149 To Zone 104 - User Class 5



From Zone 149 To Zone 113 - User Class 1

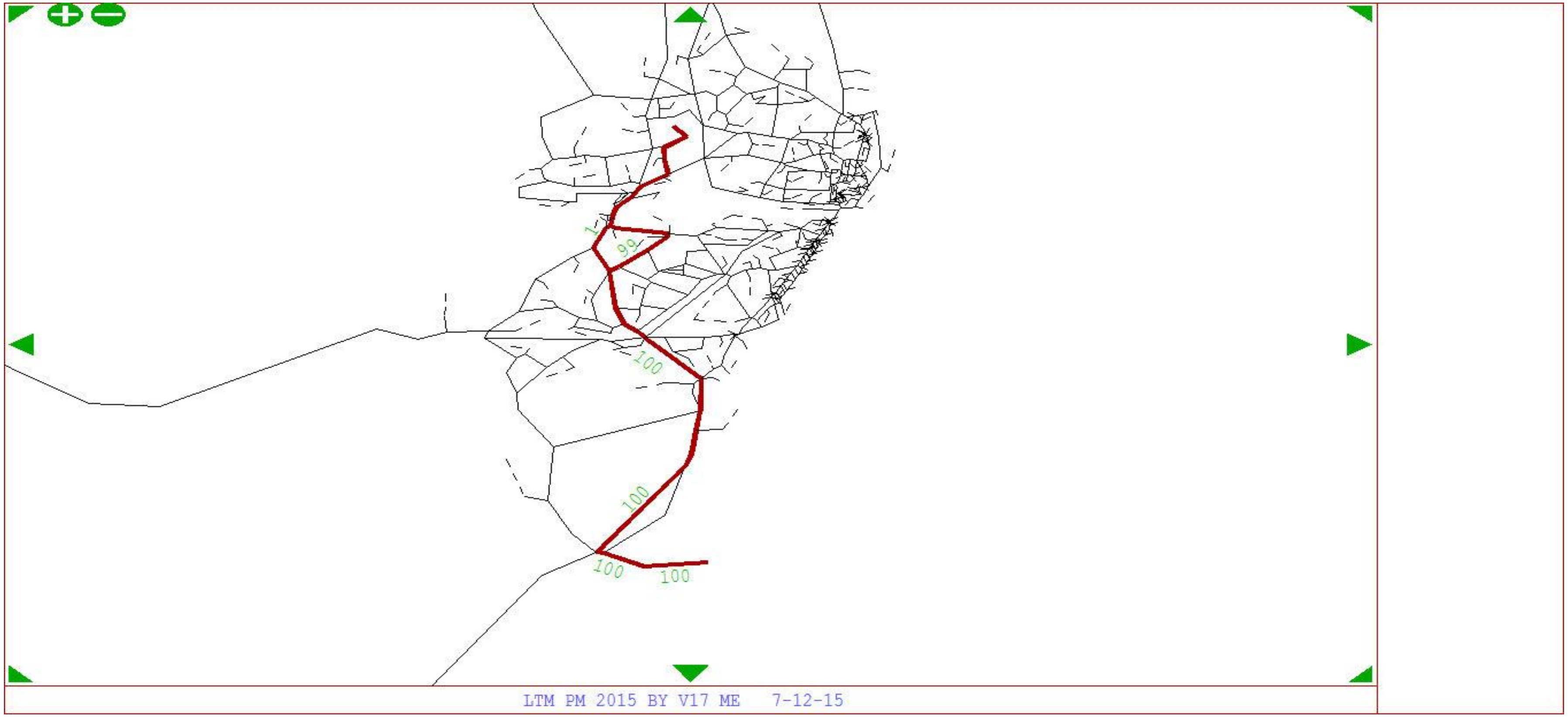


From Zone 149 To Zone 113 - User Class 2

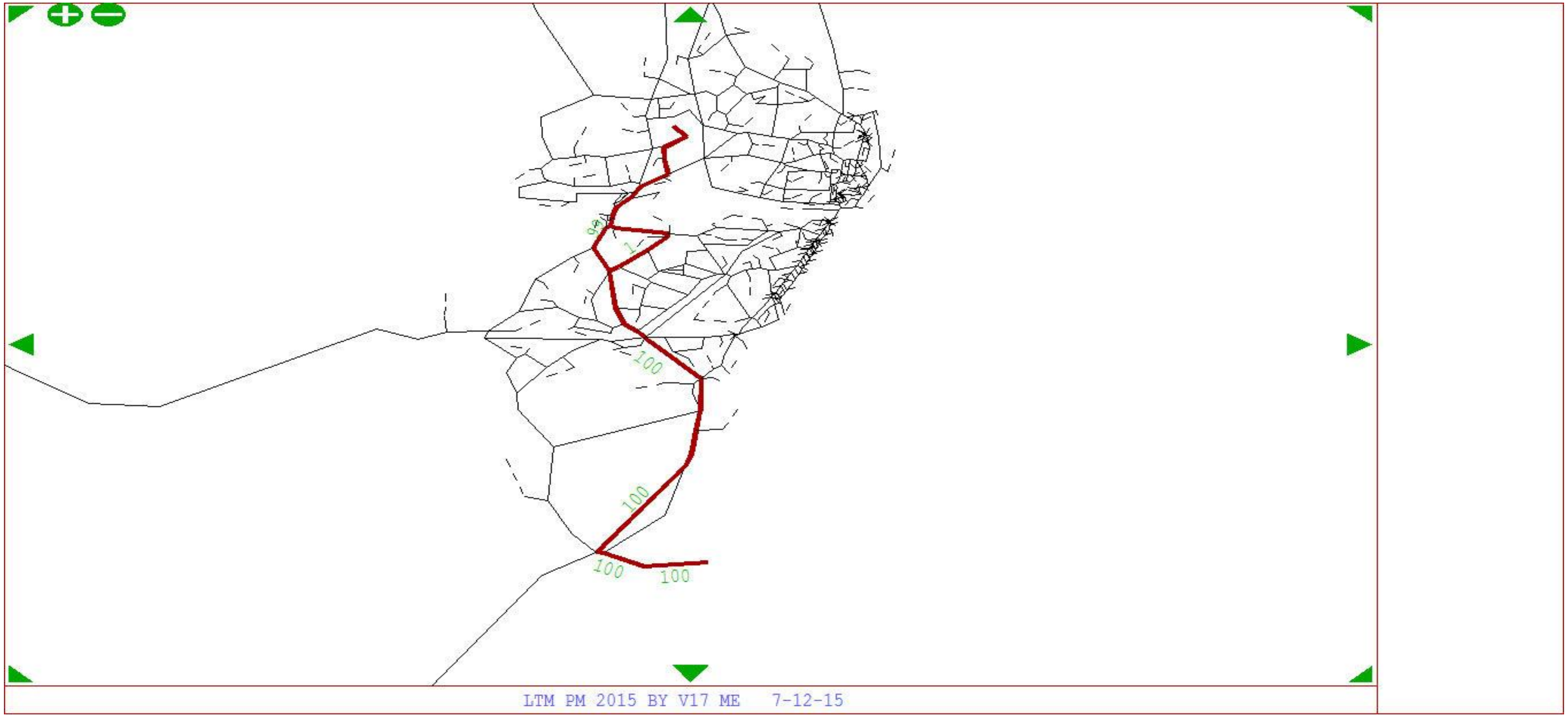


LTM PM 2015 BY V17 ME 7-12-15

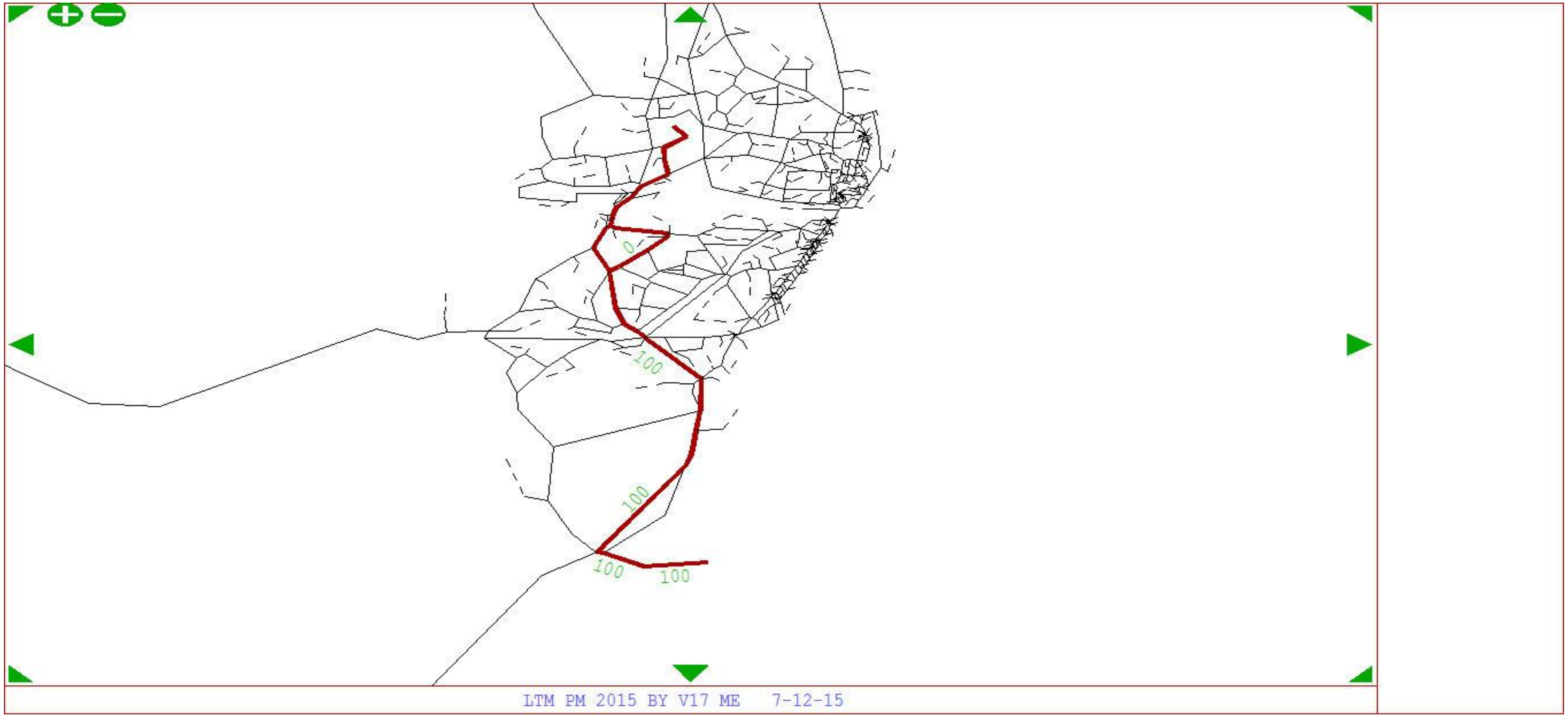
From Zone 149 To Zone 113 - User Class 3



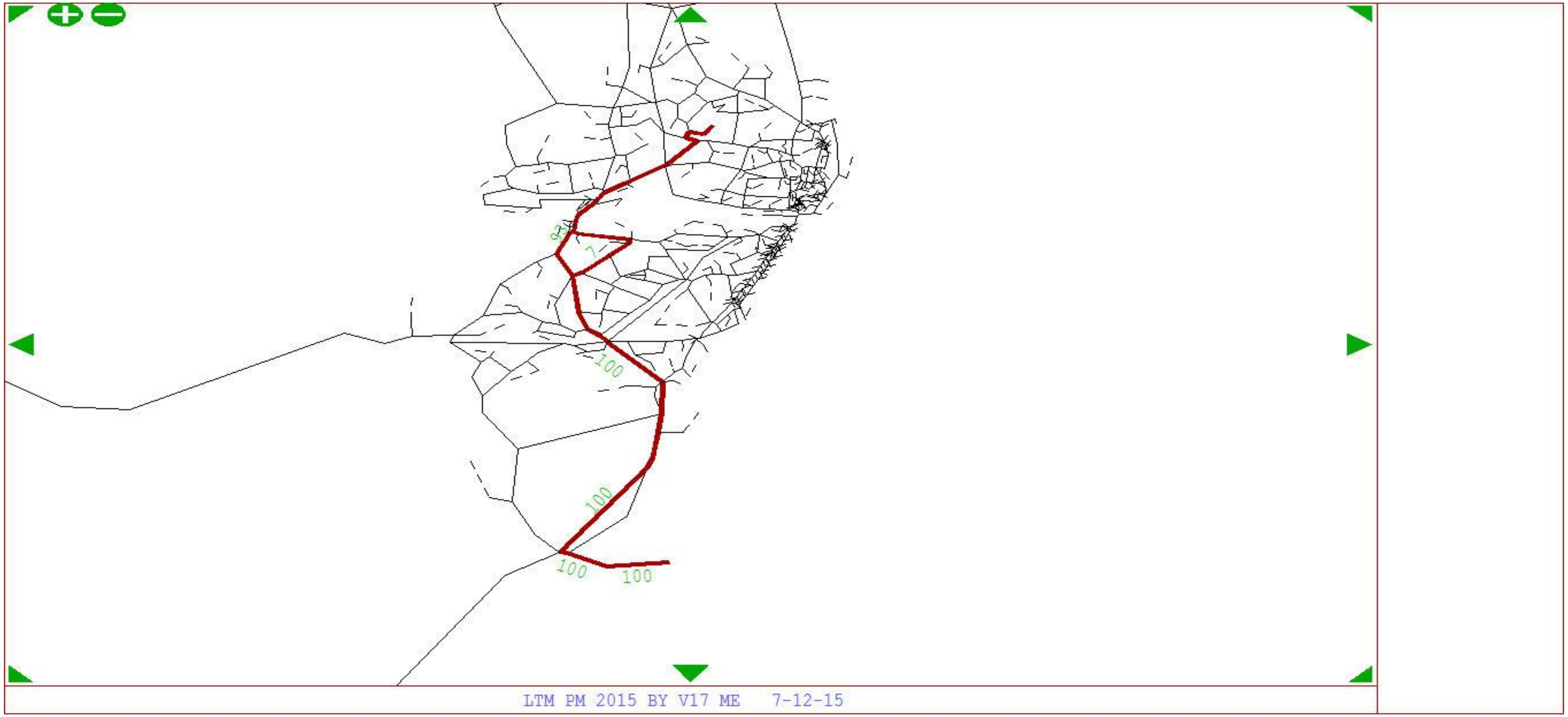
From Zone 149 To Zone 113 - User Class 4



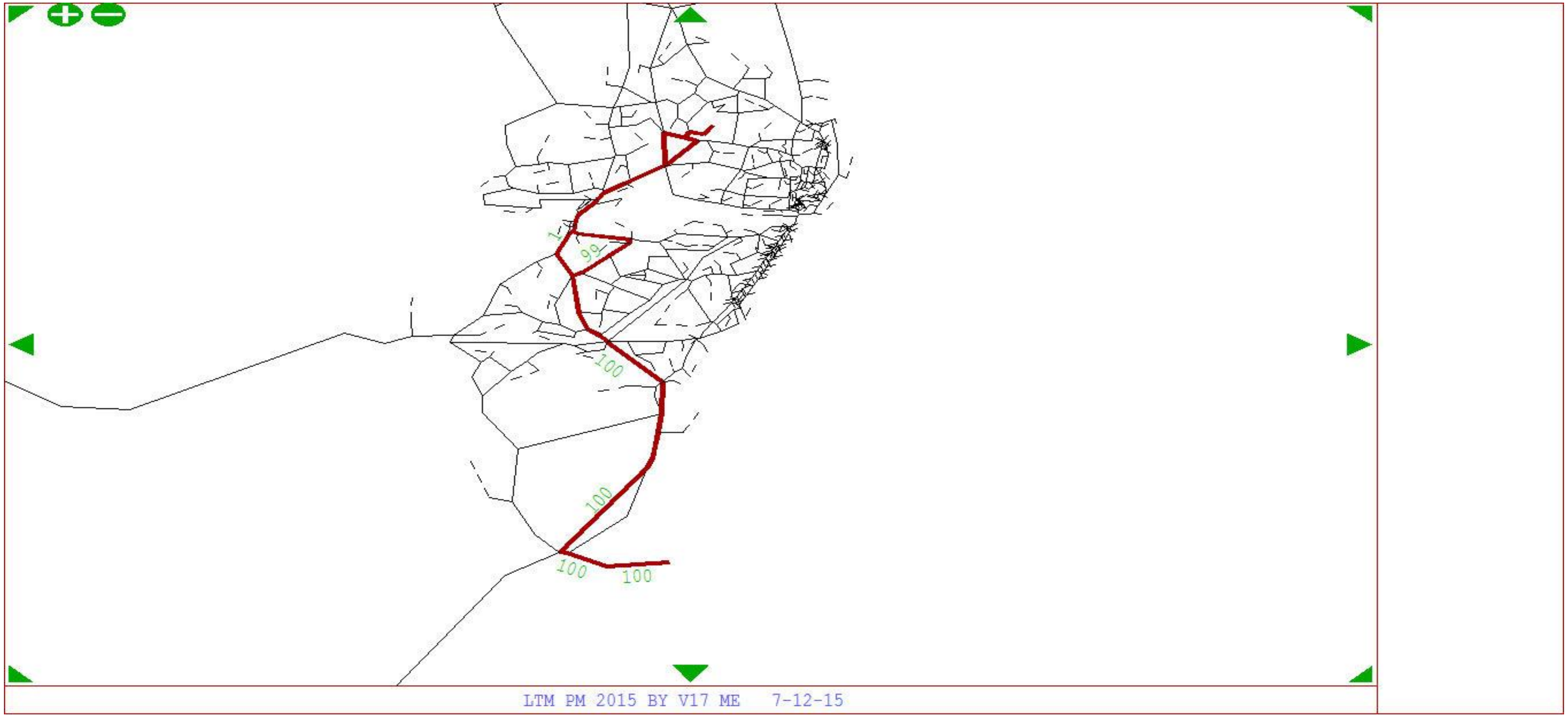
From Zone 149 To Zone 113 - User Class 5



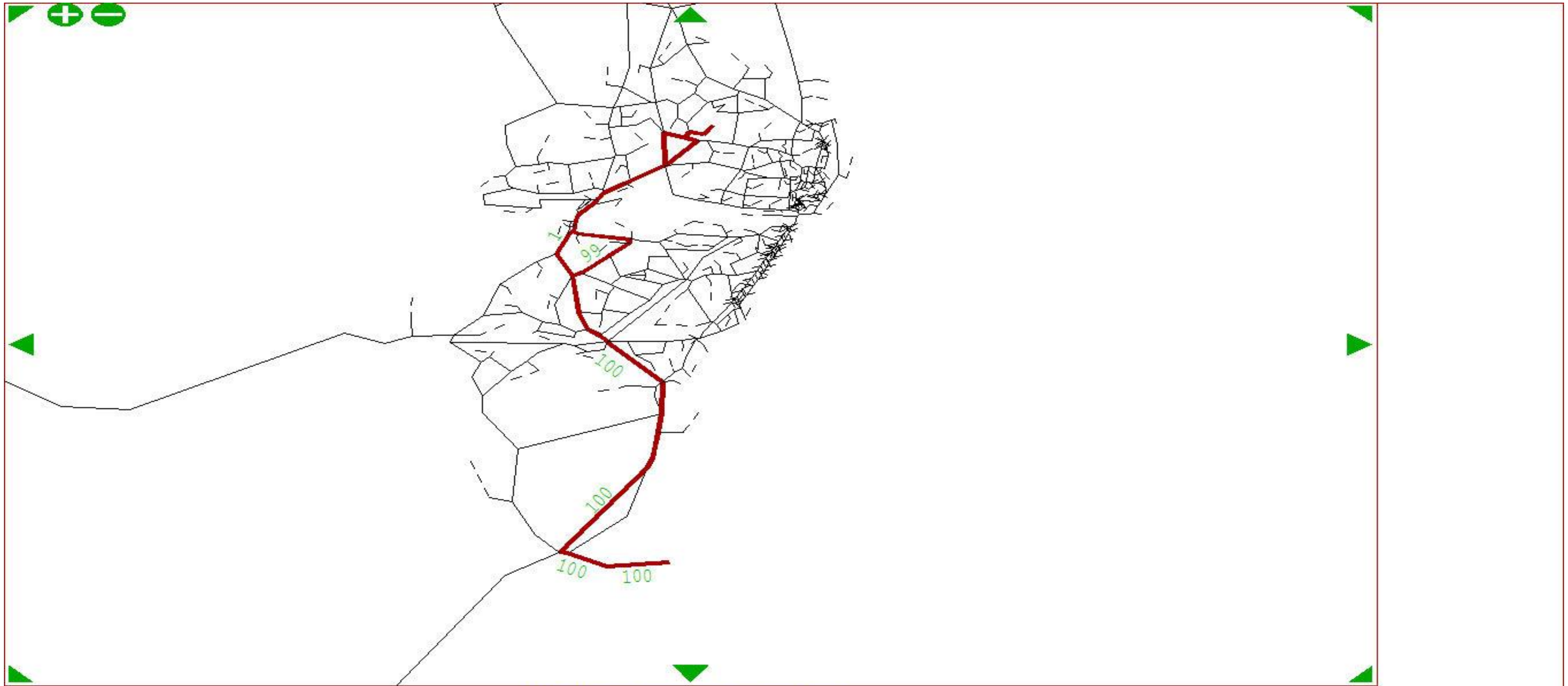
From Zone 149 To Zone 114 - User Class 1



From Zone 149 To Zone 114 - User Class 2



From Zone 149 To Zone 114 - User Class 3



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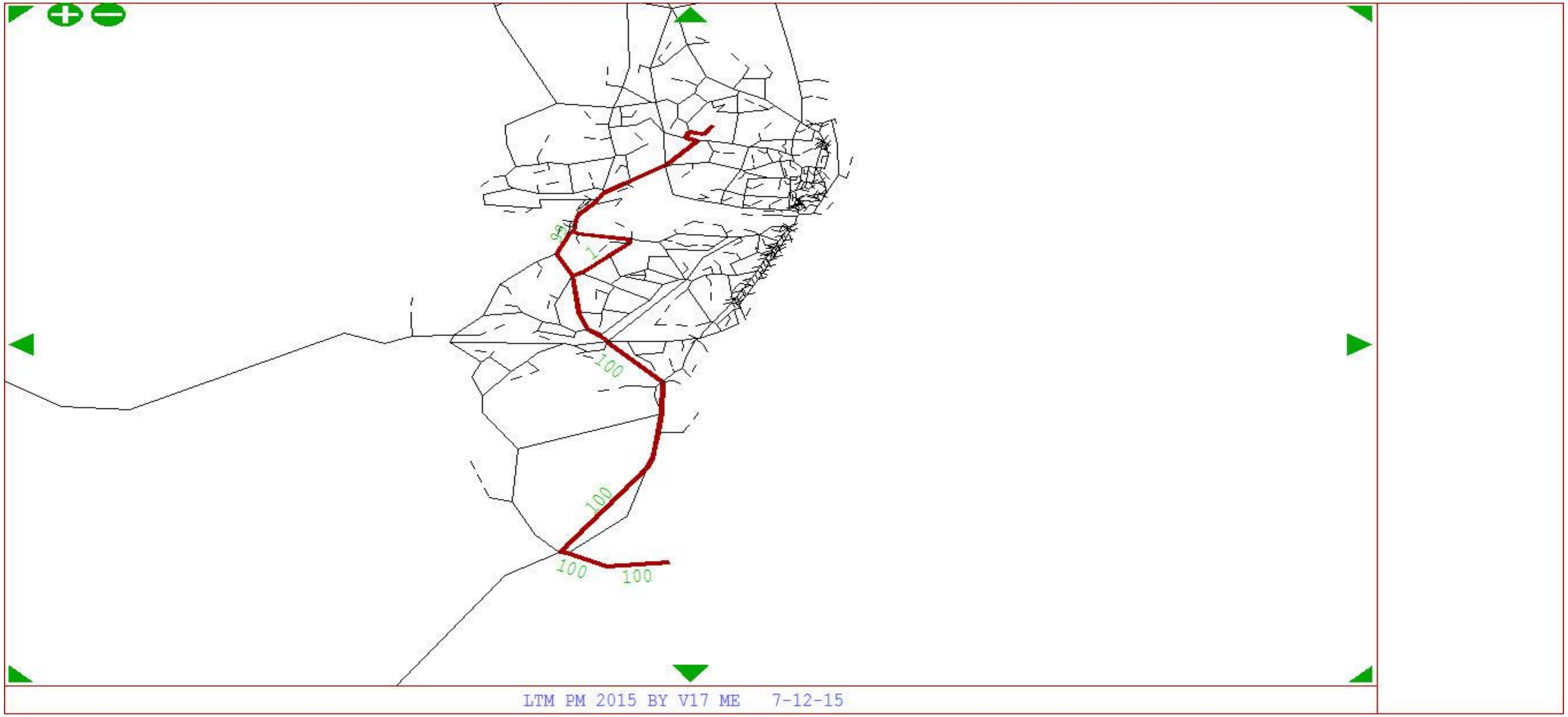
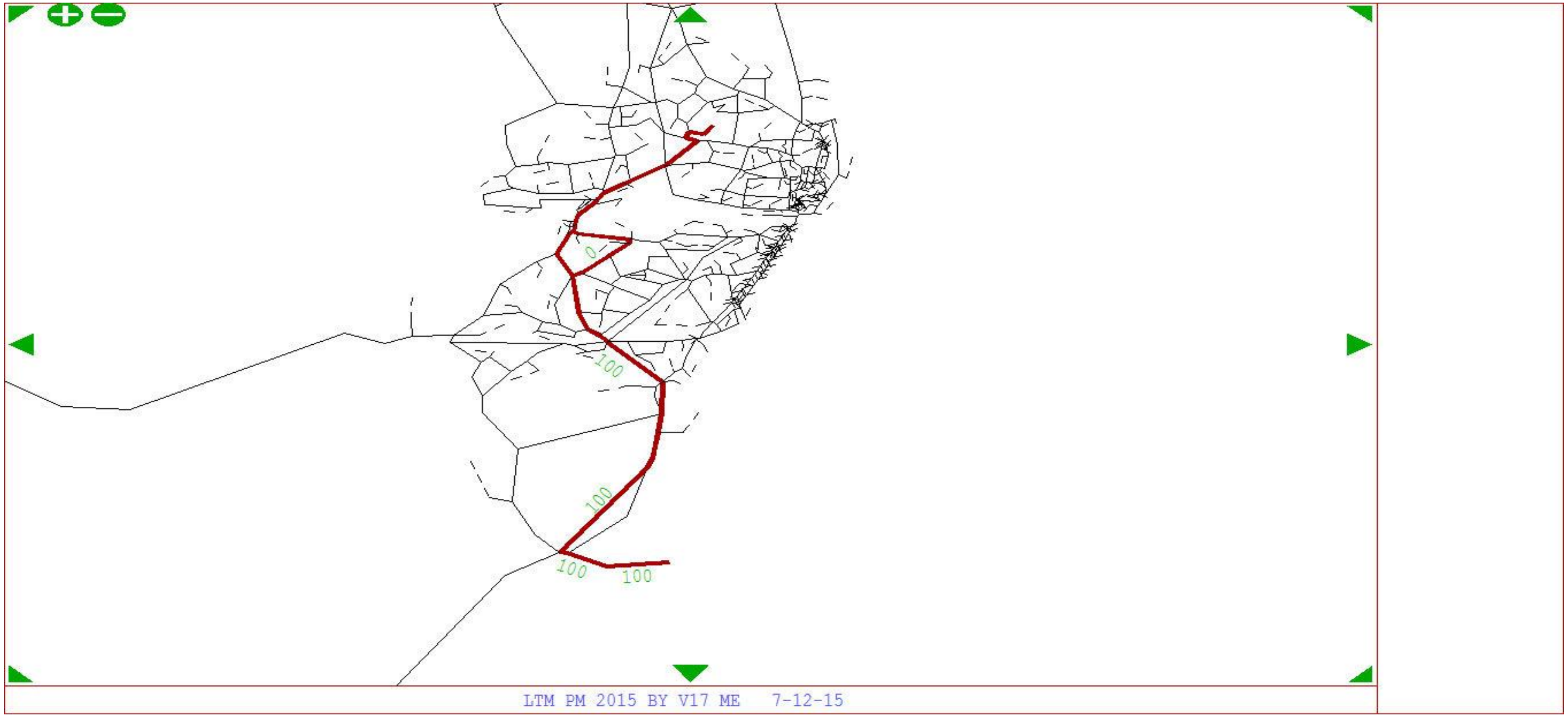
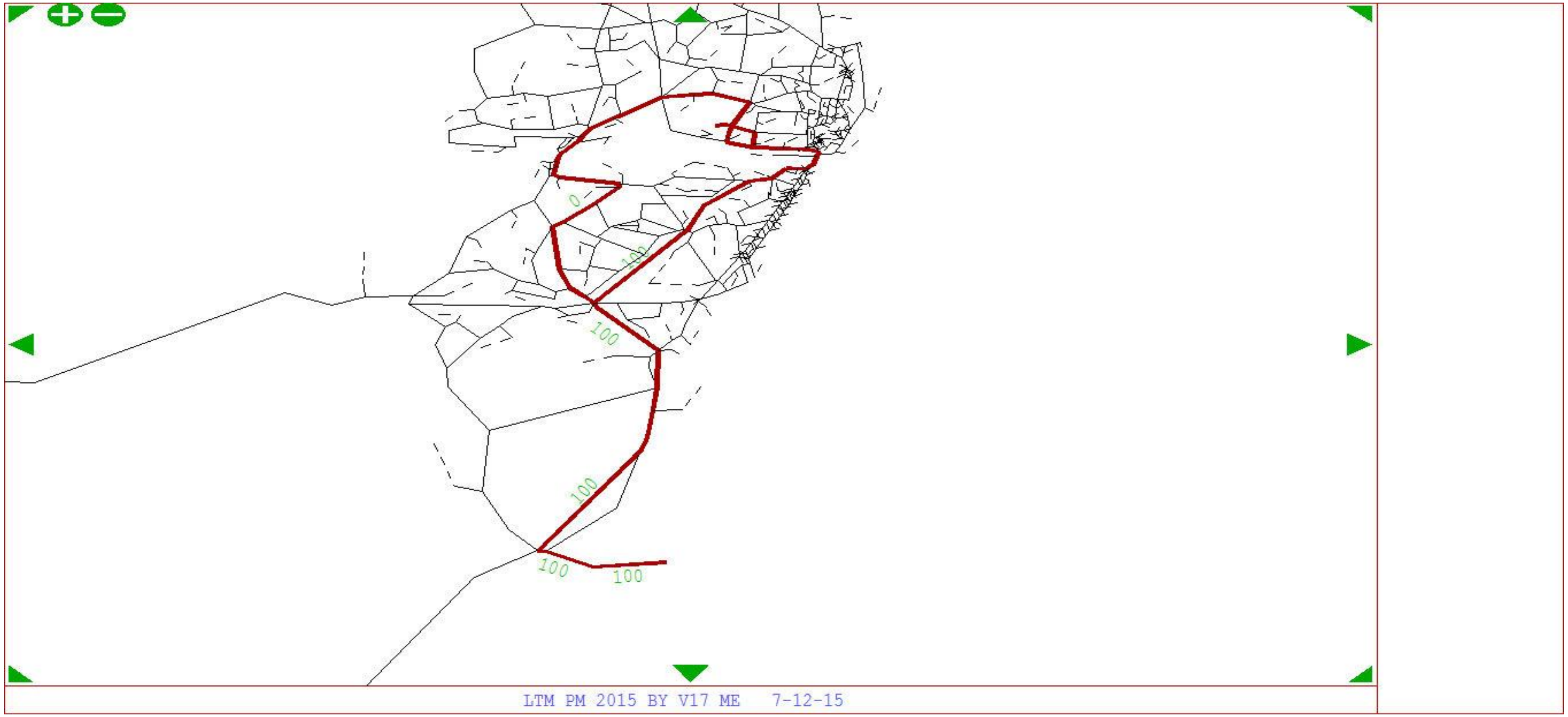
From Zone 149 To Zone 114 - User Class 4



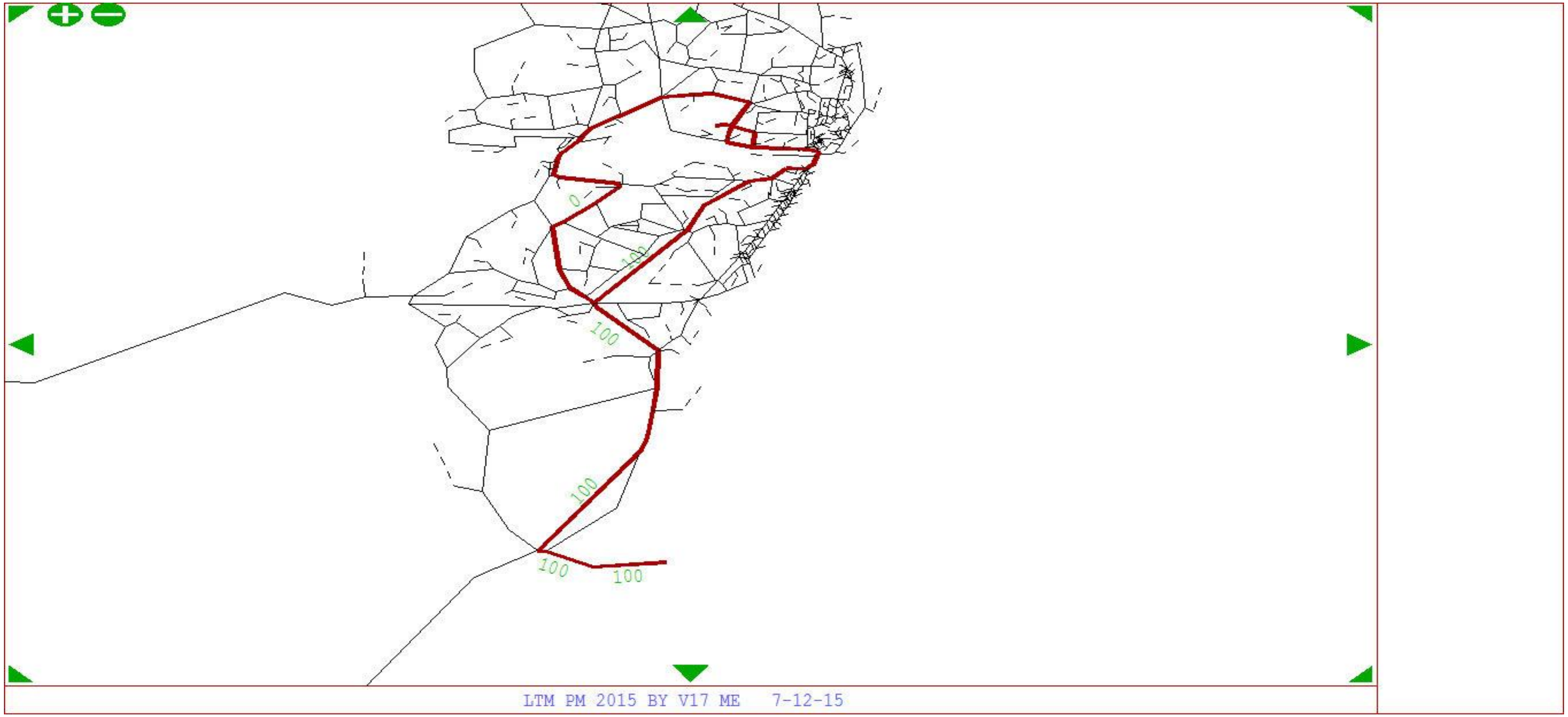
From Zone 149 To Zone 114 - User Class 5



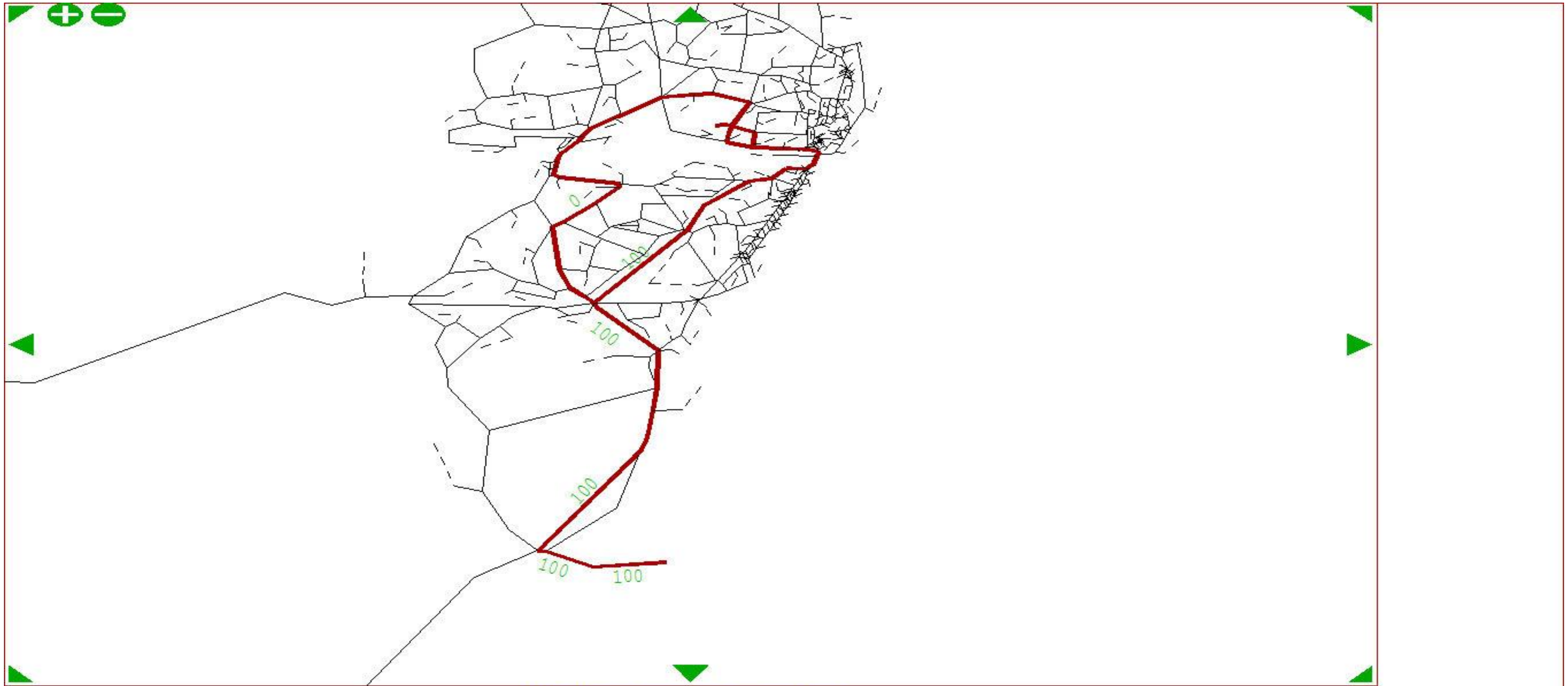
From Zone 149 To Zone 120 - User Class 1



From Zone 149 To Zone 120 - User Class 2



From Zone 149 To Zone 120 - User Class 3



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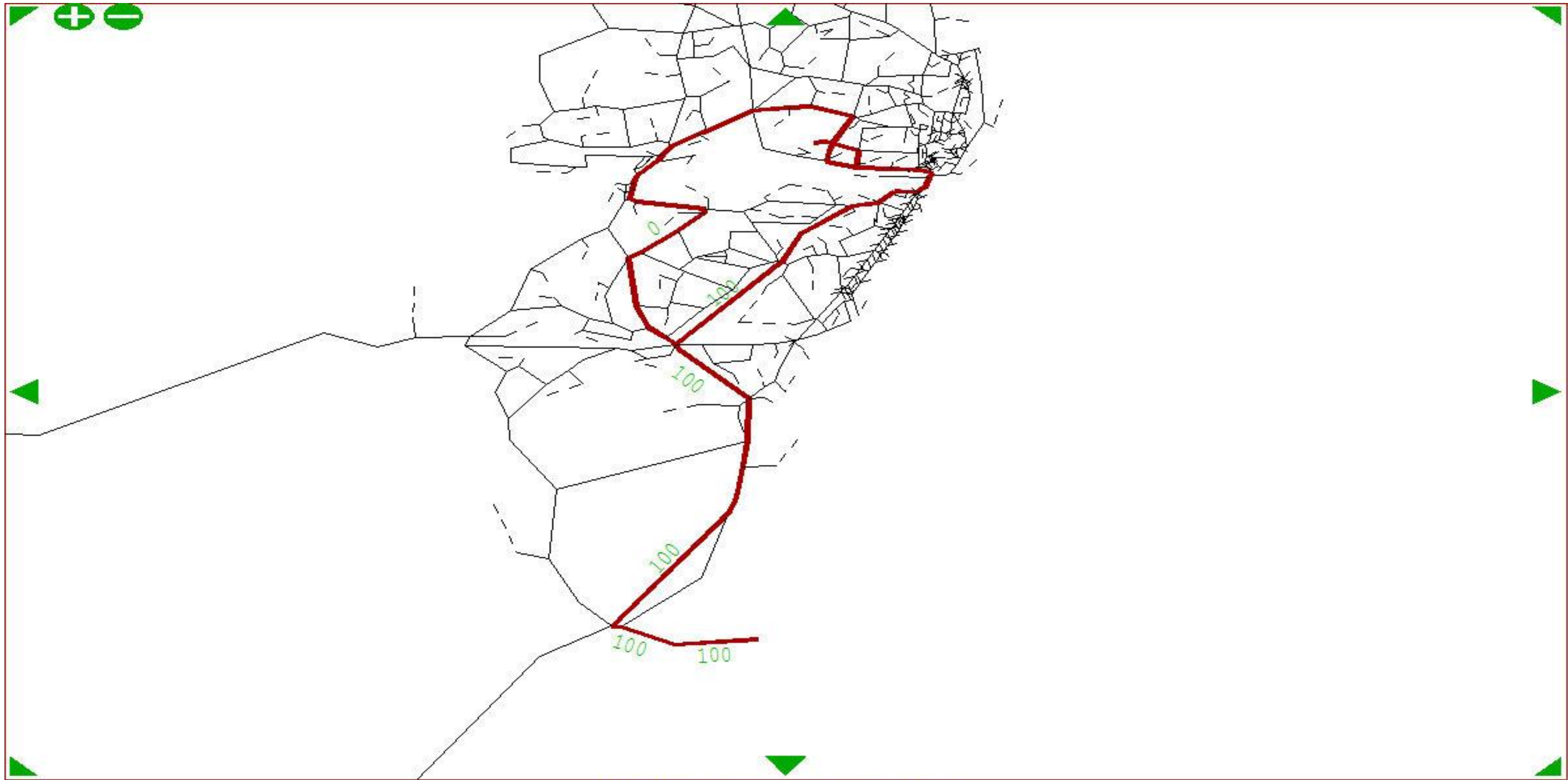
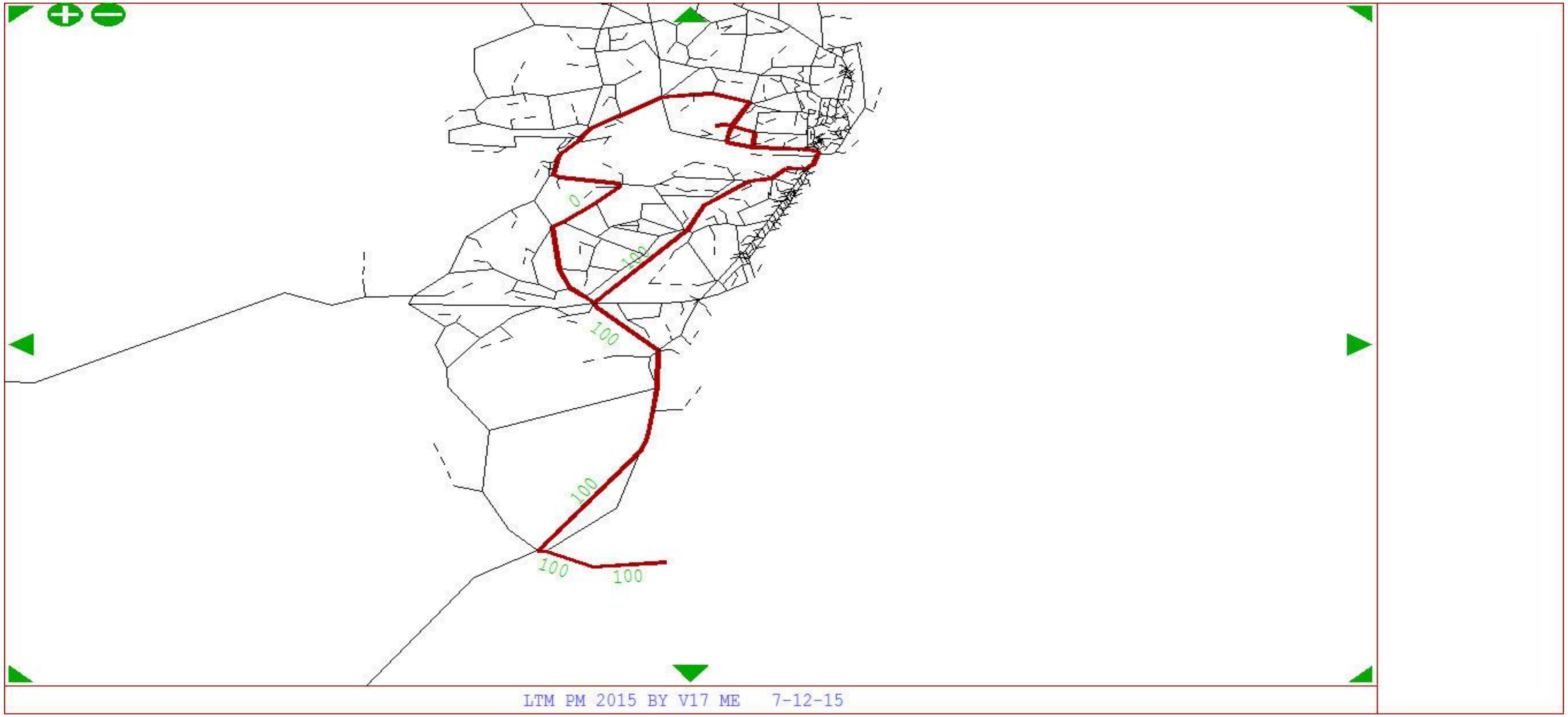
From Zone 149 To Zone 120 - User Class 4

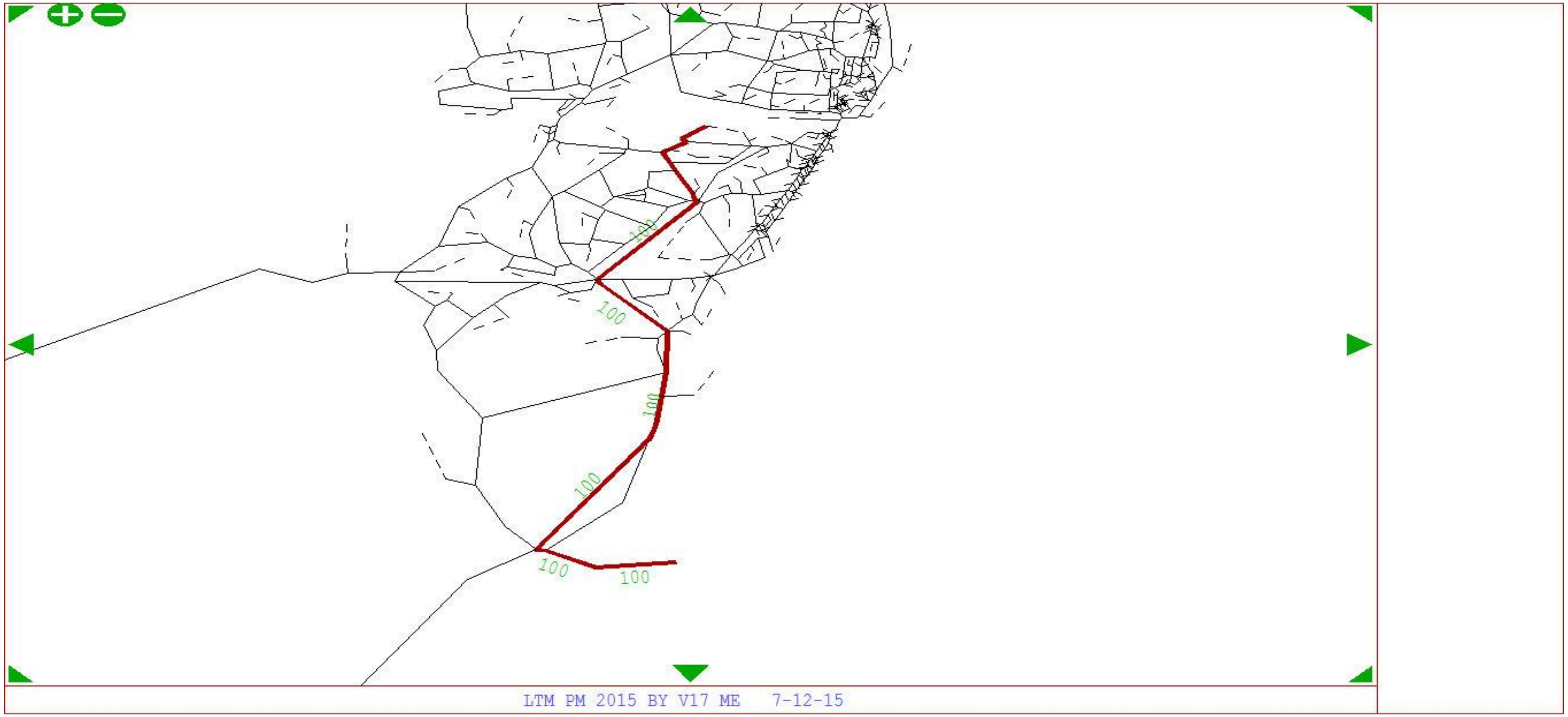


LTM PM 2015 BY V17 ME 7-12-15

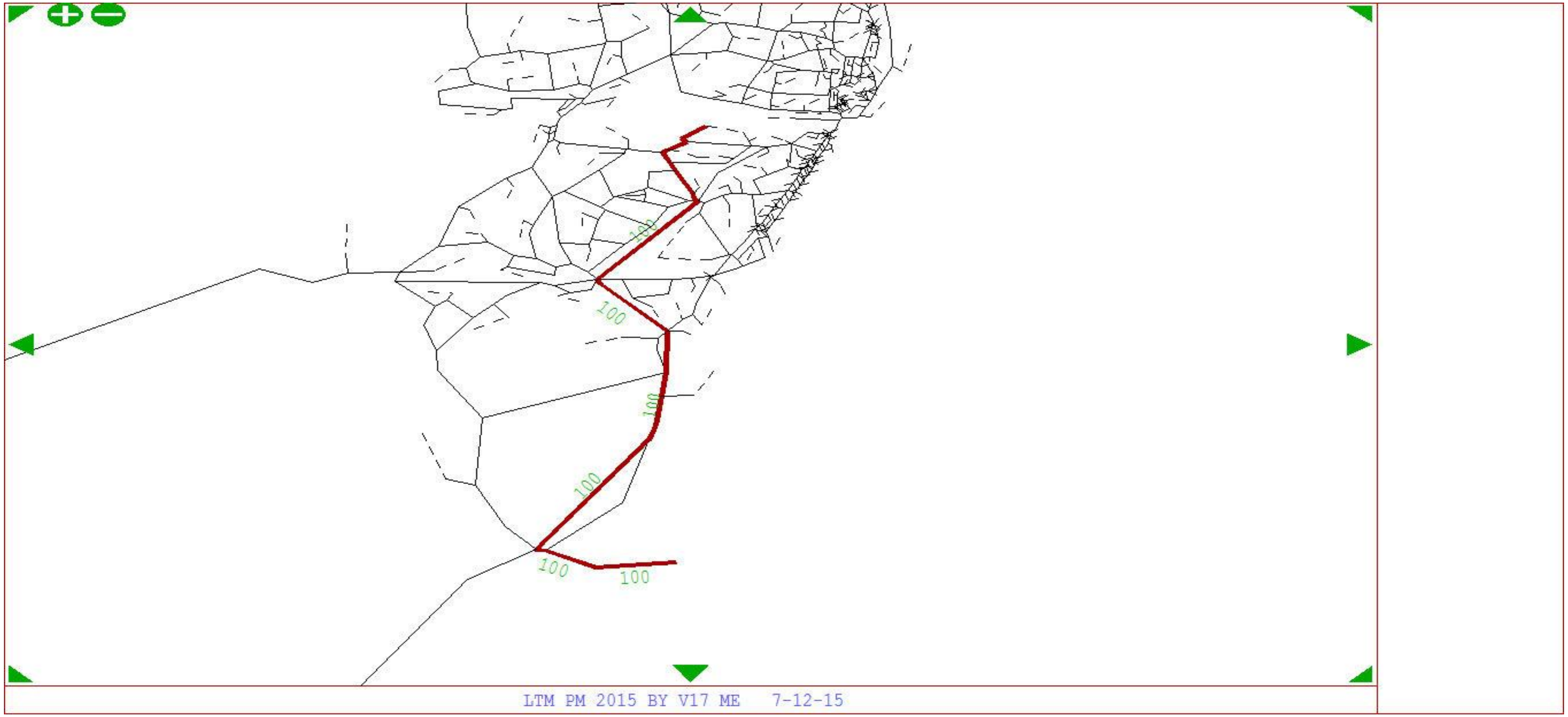
From Zone 149 To Zone 120 - User Class 5



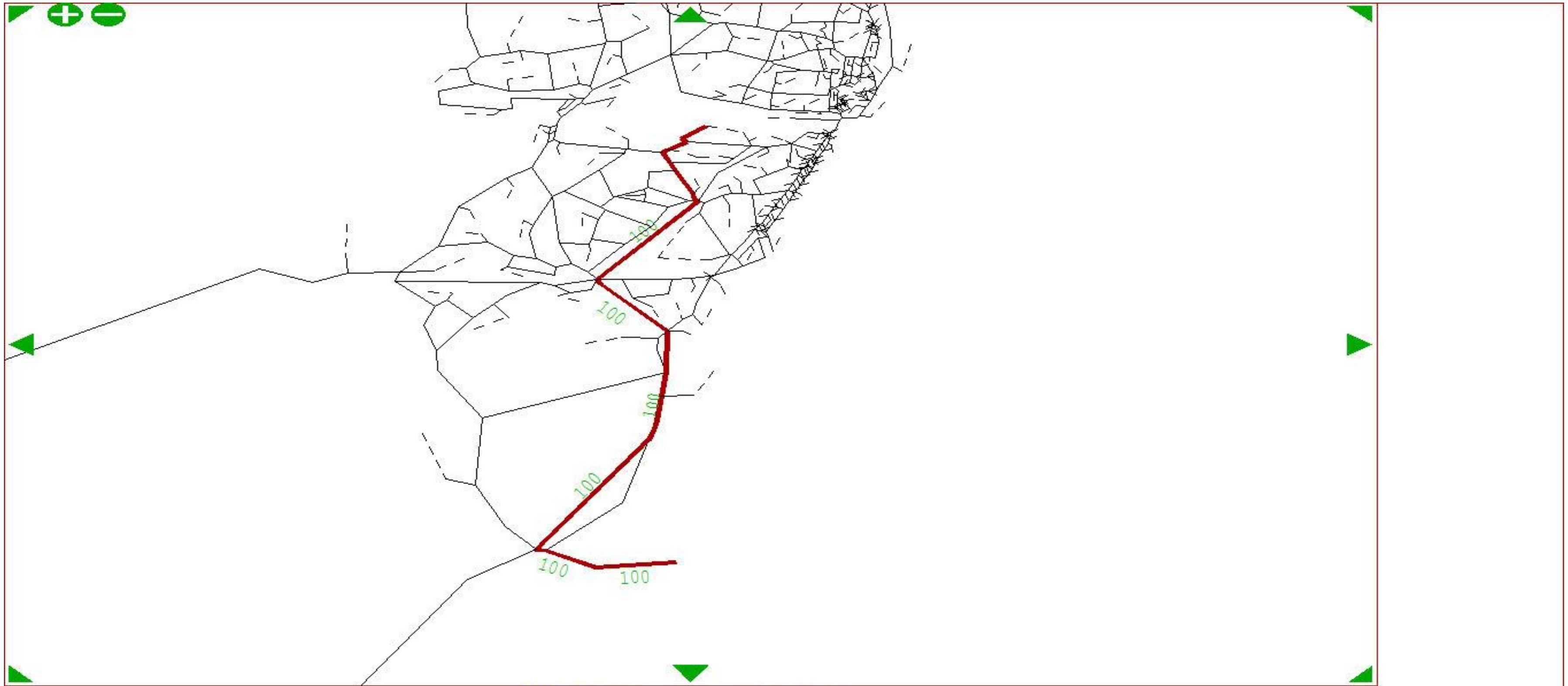
From Zone 149 To Zone 122 - User Class 1



From Zone 149 To Zone 122 - User Class 2



From Zone 149 To Zone 122 - User Class 3



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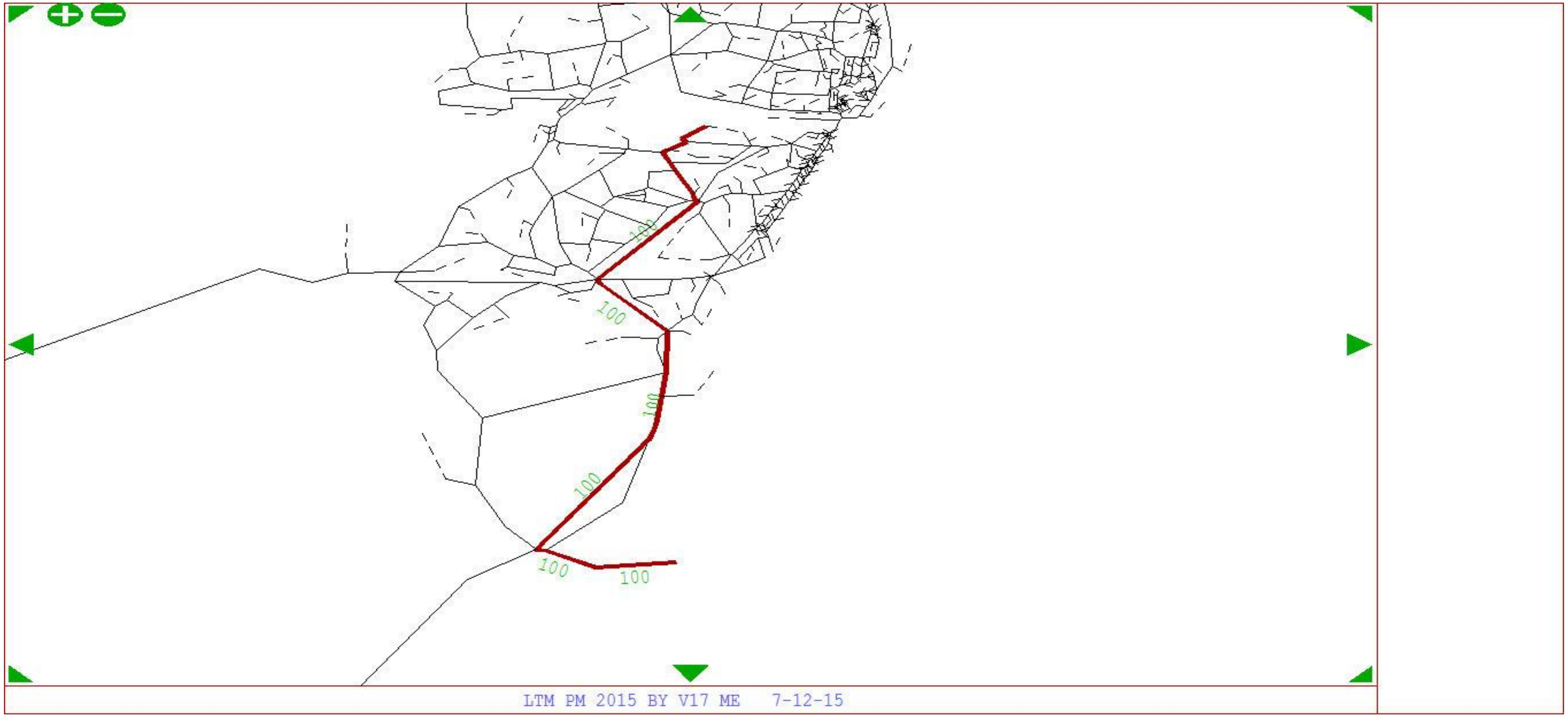
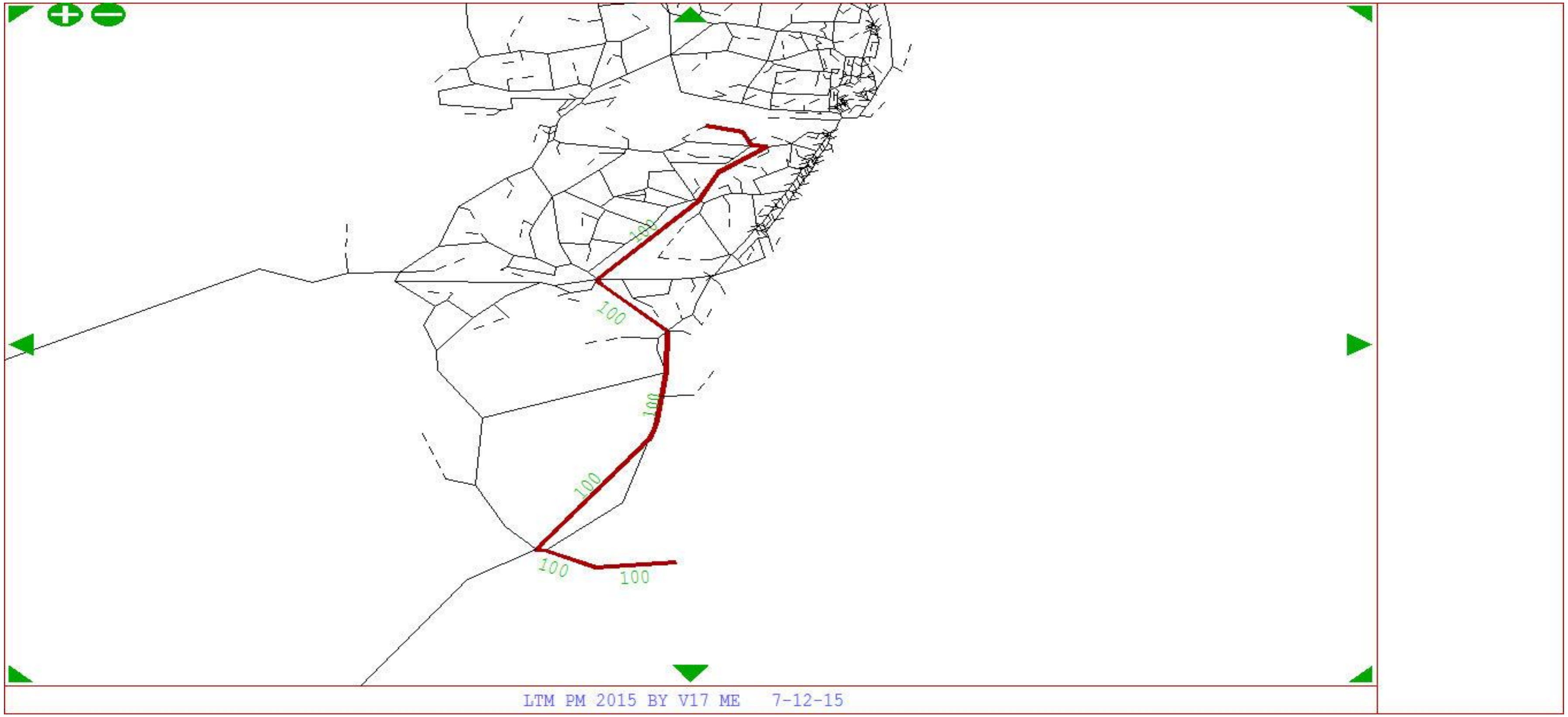
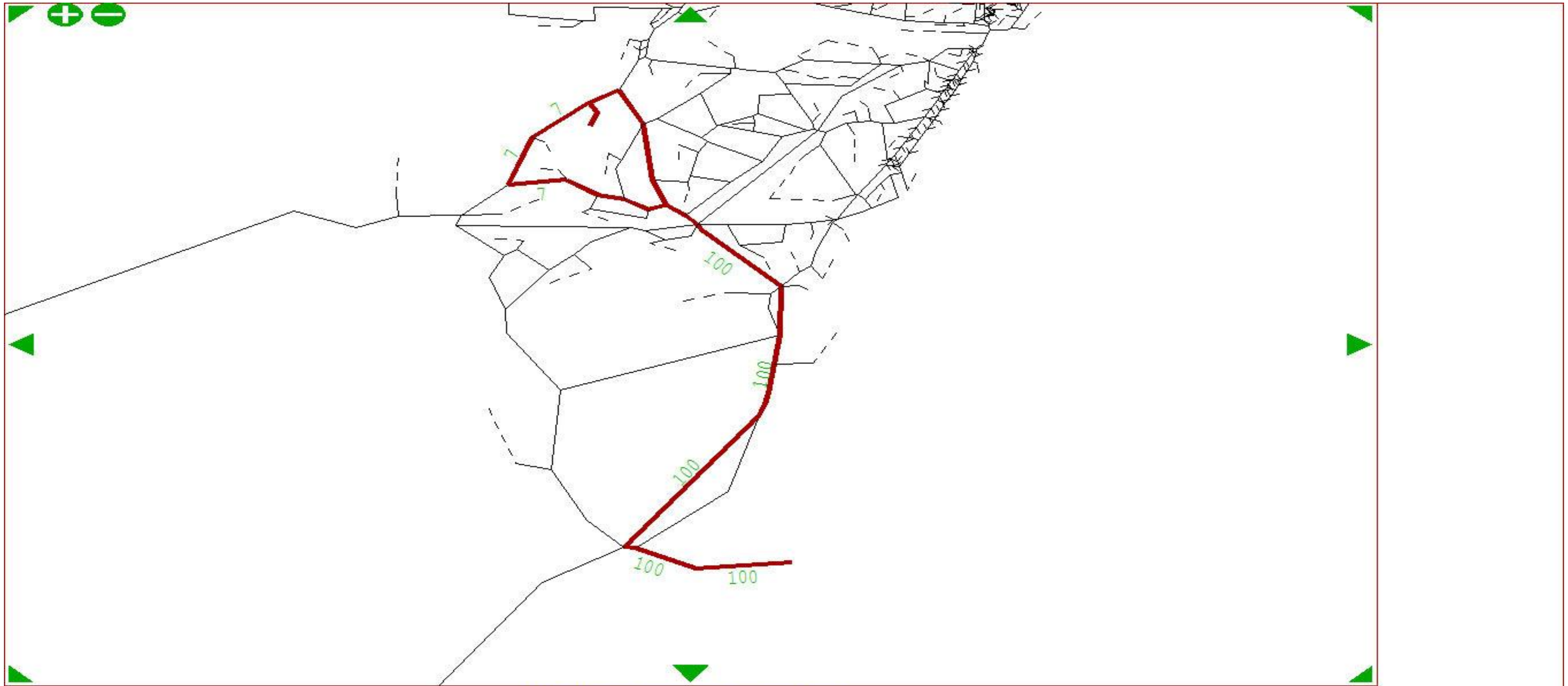
From Zone 149 To Zone 122 - User Class 4



From Zone 149 To Zone 122 - User Class 5



From Zone 149 To Zone 128 - User Class 1



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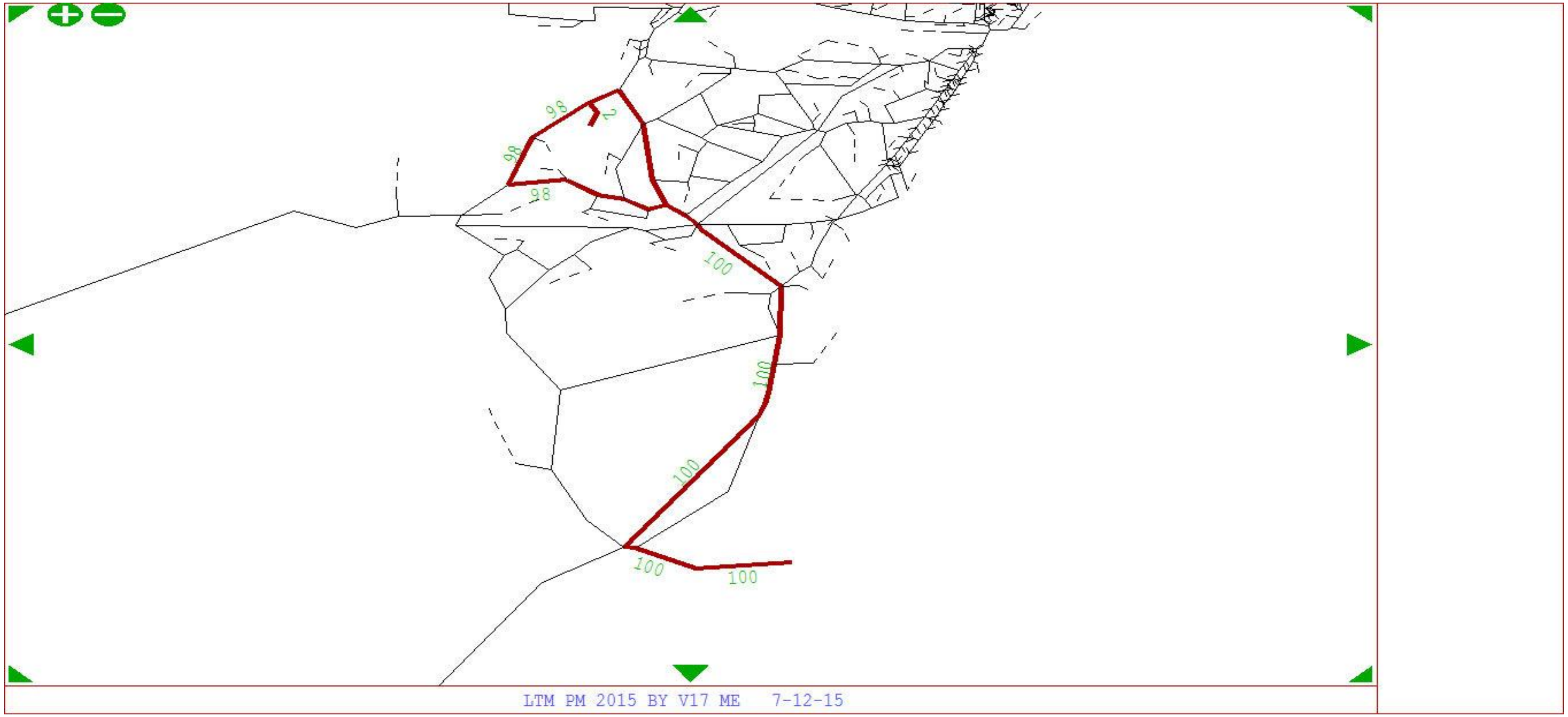
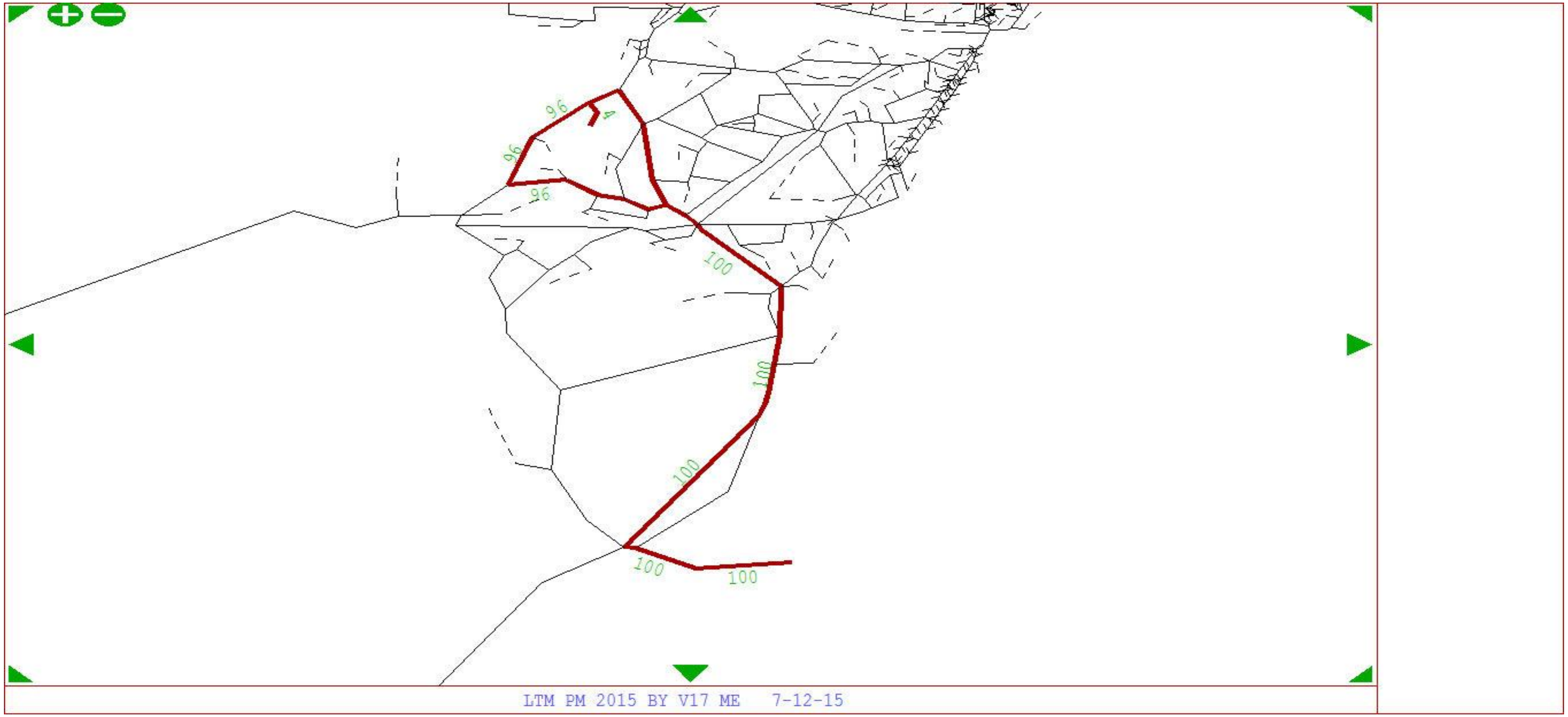
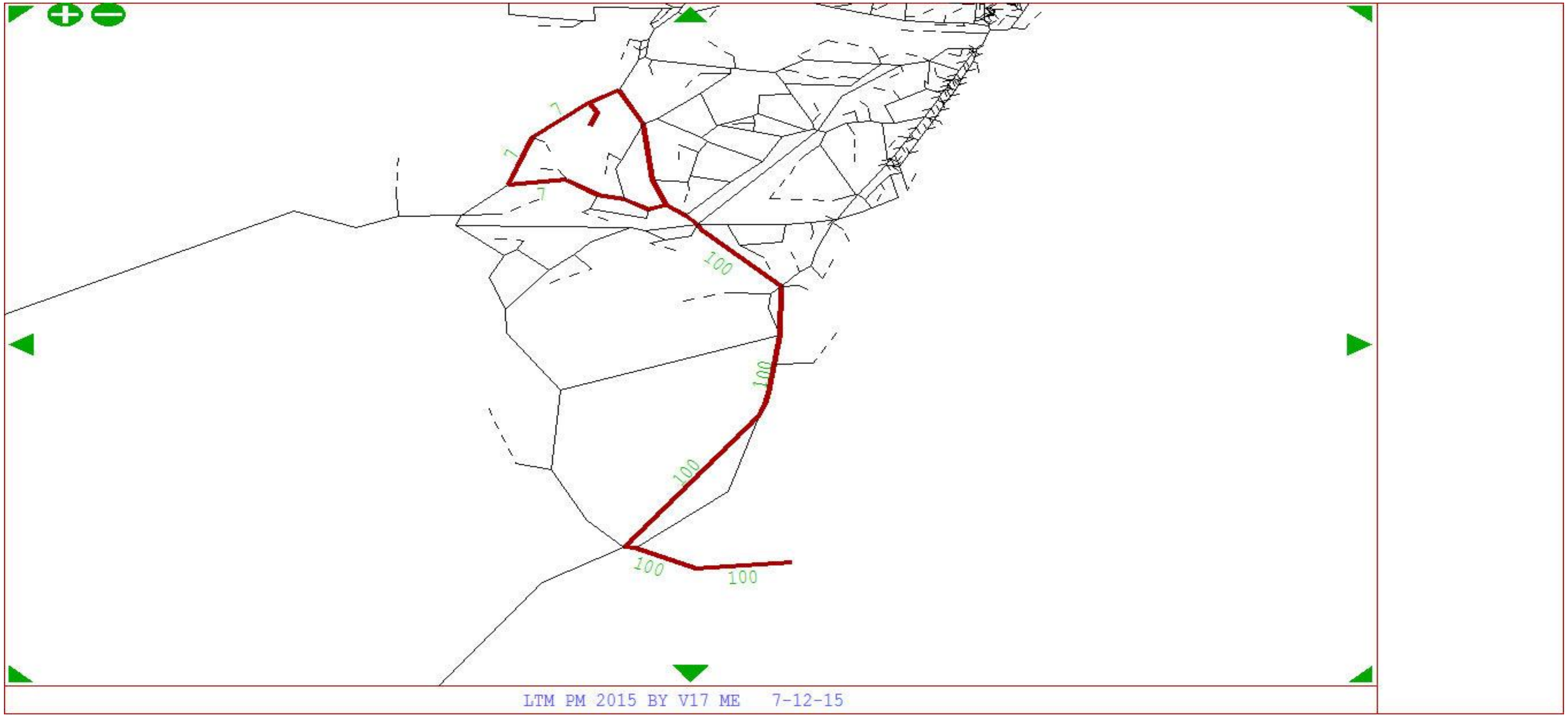
From Zone 149 To Zone 128 - User Class 2



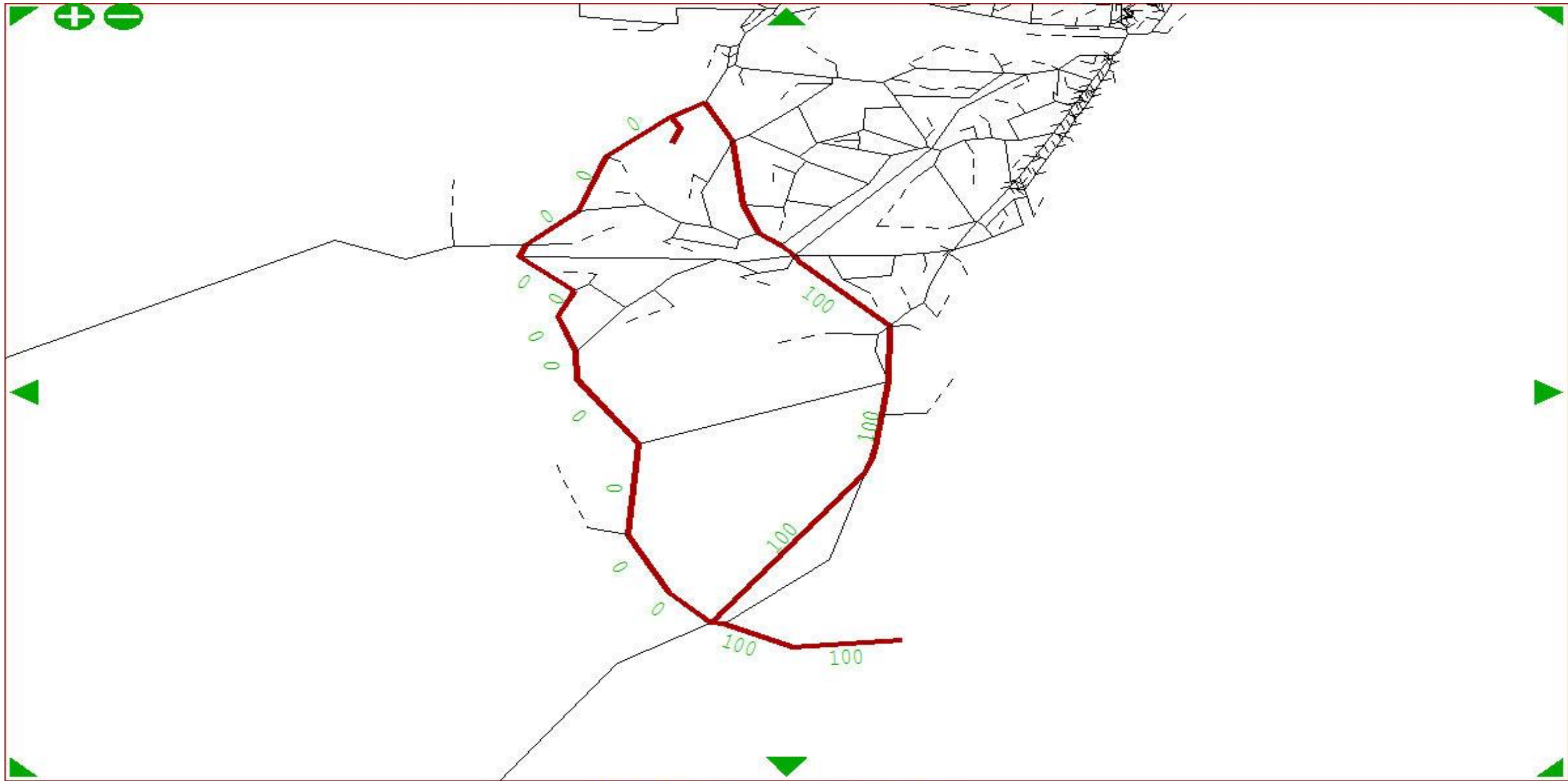
From Zone 149 To Zone 128 - User Class 3



From Zone 149 To Zone 128 - User Class 4



From Zone 149 To Zone 128 - User Class 5



LTM PM 2015 BY V17 ME 7-12-15

Appendix D

POST ME SCREENLINE PERFORMANCE

Lowestoft Screenlines

Index

Screenlines	
Calibration	16
Validation	4

Flow < 5%	Calibration		Validation	
All	14	88%	1	25%
Car	14	88%	2	50%
LGV	13	81%	0	0%
HGV	12	75%	1	25%

GEH < 4	Calibration		Validation	
All	16	100%	4	100%
Car	16	100%	3	75%
LGV	15	94%	2	50%
HGV	16	100%	4	100%

											AM Peak															
											All				Car				LGV				HGV			
ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	AM Peak	Interpeak	PM Peak	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
1	Screenline 1 - NB	55	Calibration	B1385 Corton Road	NB	9460	9480				96	97	1%	0.089	81	82	-17%	0.111	14	14	-1%	0.033	1	1	0%	0.000
		57	Calibration	A12 Yarmouth Road	NB	10257	6250				567	566	0%	0.047	456	456	-24%	0.012	85	84	-1%	0.082	27	26	-2%	0.122
		59	Calibration	B1375 Parkhill	NB	10001	8070				461	434	-6%	1.284	384	378	-22%	0.307	64	43	-33%	2.871	13	13	-1%	0.046
		61	Calibration	B1074 Bluderston Road	NB	10025	20026				179	180	0%	0.047	108	108	-66%	0.048	64	64	0%	0.031	8	8	-2%	0.044
				TOTAL		Calibration		Yes	Yes	Yes	1304	1277	-2%	0.746	1028	1024	0%	0.133	227	205	10%	1.472	49	48	2%	0.132
2	Screenline 1 - SB	56	Calibration	B1385 Corton Road	SB	9480	9460				102	101	-1%	0.062	81	80	-27%	0.056	20	20	1%	0.056	1	1	-27%	0.344
		58	Calibration	A12 Yarmouth Road	SB	6250	10257				567	647	14%	3.252	411	490	-19%	3.728	132	133	1%	0.120	24	24	-2%	0.076
		60	Calibration	B1375 Parkhill	SB	8070	10001				251	269	7%	1.106	178	196	-31%	1.304	65	65	1%	0.041	8	8	-4%	0.117
		62	Calibration	B1074 Bluderston Road	SB	20026	10025				113	122	8%	0.854	14	23	-665%	2.224	94	94	0%	0.000	5	5	-5%	0.110
				TOTAL		Calibration		Yes	Yes	Yes	1032	1139	10%	3.235	683	789	16%	3.906	310	312	-1%	0.111	39	38	3%	0.214
3	Screenline 2 - NB	49	Calibration	B1375 Gorleston Road	NB	8030	8040				584	582	0%	0.065	455	453	-29%	0.101	109	109	0%	0.000	19	20	3%	0.129
		51	Calibration	A1117 Millennium Way	NB	7070	7080				376	378	1%	0.124	296	298	-26%	0.093	60	60	1%	0.052	20	20	2%	0.090
				TOTAL		Calibration		Yes	Yes	Yes	959	960	0%	0.027	752	751	0%	0.020	169	169	0%	0.031	39	40	-2%	0.155
4	Screenline 2 - SB	50	Calibration	B1375 Gorleston Road	SB	8040	8030				484	482	0%	0.078	377	375	-29%	0.125	91	91	0%	0.030	16	16	3%	0.108
		52	Calibration	A1117 Millennium Way	SB	7080	7070				450	455	1%	0.254	375	379	-19%	0.206	59	60	2%	0.156	16	16	1%	0.050
				TOTAL		Calibration		Yes	Yes	Yes	933	937	0%	0.121	752	754	0%	0.057	150	151	-1%	0.121	31	32	-2%	0.112
5	Screenline 3 - NB	41	Calibration	Peto Way	NB	10190	7060				396	386	-2%	0.483	272	261	-49%	0.694	116	116	0%	0.000	7	9	25%	0.624
		43	Calibration	A1117 Normanston Drive	NEB	7050	7060				687	699	2%	0.471	334	343	-103%	0.467	327	329	1%	0.110	25	27	7%	0.352
				TOTAL		Calibration		Yes	Yes	Yes	1082	1085	0%	0.086	607	604	0%	0.111	443	445	0%	0.095	32	36	-11%	0.612
6	Screenline 3 - SB	42	Calibration	Peto Way	SB	7060	10190				317	286	-10%	1.792	150	150	-111%	0.018	153	125	-18%	2.375	14	11	-21%	0.819
		44	Calibration	A1117 Normanston Drive	SWB	7060	7050				506	509	1%	0.115	263	265	-92%	0.148	221	221	0%	0.013	23	23	2%	0.084
				TOTAL		Calibration		Yes	Yes	Yes	824	795	-3%	1.002	413	415	1%	0.107	374	346	8%	1.486	36	34	7%	0.419
7	Screenline 4 - NB	29	Calibration	Katwijk Way	NB	6040	10136				411	364	-11%	2.388	261	231	-69%	1.902	122	107	-12%	1.387	28	26	-8%	0.448
		31	Calibration	A12 Battery Green Road	NB	6160	6150				675	677	0%	0.077	289	290	-133%	0.042	357	357	0%	0.000	29	30	4%	0.237
				TOTAL		Calibration		Yes	Yes	Yes	1086	1041	-4%	1.380	550	521	-5%	1.258	479	464	3%	0.683	57	56	2%	0.139
8	Screenline 4 - SB	30	Calibration	Katwijk Way	SB	10136	6040				134	123	-8%	0.970	87	87	-54%	0.054	34	34	0%	0.029	13	2	-85%	4.093
		32	Calibration	A12 Battery Green Road	SB	6150	6160				571	570	0%	0.031	337	337	-69%	0.000	205	204	0%	0.035	29	29	-1%	0.046
				TOTAL		Calibration		Yes	Yes	Yes	705	693	-2%	0.444	424	424	0%	0.024	239	238	0%	0.043	43	31	27%	1.910
9	Screenline 5 - EB	22	Calibration	Kirkley Run	SEB	5270	10103				94	94	0%	0.017	67	67	-40%	0.041	23	23	-1%	0.035	4	4	0%	0.000
		23	Calibration	A146 Waveney Drive	EB	10088	4010				347	344	-1%	0.138	212	211	-64%	0.038	122	120	-1%	0.142	13	13	-3%	0.122
				TOTAL		Calibration		Yes	Yes	Yes	440	438	-1%	0.114	278	278	0%	0.013	145	143	1%	0.144	17	17	3%	0.107
10	Screenline 5 - WB	21	Calibration	Kirkley Run	NWB	10103	5270				162	159	-2%	0.263	110	110	-47%	0.032	48	45	-7%	0.464	4	4	4%	0.084
		24	Calibration	A146 Waveney Drive	WB	4010	10088				151	139	-8%	0.978	68	67	-123%	0.149	72	72	0%	0.013	10	0	-100%	4.570
				TOTAL		Calibration		Yes	Yes	Yes	313	298	-5%	0.864	179	177	-1%	0.117	120	117	3%	0.301	14	4	72%	3.400
11	Screenline 6 - EB	37	Calibration	Denmark Road	EB	7200	10139				215	214	0%	0.038	138	138	-55%	0.000	68	68	0%	0.027	8	8	-4%	0.117
		45	Calibration	A1144 Normanston Drive	EB	9240	9130				408	413	1%	0.272	225	229	-79%	0.249	167	169	1%	0.135	15	15	0%	0.000
		47	Calibration	Oulton Road	EB	9270	10010				476	377	-21%	4.789	263	263	-81%	0.007	201	103	-49%	7.919	12	11	-10%	0.359
		54	Calibration	A12 Yarmouth Road	SEB	10248	10242				651	595	-9%	2.248	401	401	-62%	0.017	223	167	-25%	4.040	27	27	0%	0.000
				TOTAL		Calibration		Yes	Yes	Yes	1749	1599	-9%	3.668	1027	1031	0%	0.124	659	507	23%	6.313	63	61	2%	0.198
12	Screenline 6 - WB	38	Calibration	Denmark Road	WB	10139	7200				304	342	13%	2.133	202	227	-38%	1.715	90	103	14%	1.300	12	12	4%	0.130
		46	Calibration	A1144 Normanston Drive	WB	9130	9240				190	190	0%	0.018	124	124	-53%	0.022	54	54	0%	0.034	12	12	2%	0.073
		48	Calibration	Oulton Road	WB	10010	9270				246	246	0%	0.028	149	149	-65%	0.009	90	90	0%	0.023	8	7	-7%	0.206
		53	Calibration	A12 Yarmouth Road	NWB	10242	10248				460	460	0%	0.005	298	298	-54%	0.013	139	139	0%	0.000	23	23	1%	0.070
				TOTAL		Calibration		Yes	Yes	Yes	1200	1238	3%	1.096	773	798	3%	0.893	373	386	-3%	0.654	54	54	-1%	0.064
	Screenline 7 - EB	5	Calibration	Gisleham Road	NB	9600	5010				21	5	-76%	4.360	6	3	-307%	1.308	14	1	-93%	4.663	1	1	-21%	0.250
		7	Calibration	A146 Beccles Road	EB	4514	4513				639	639	0%	0.000	267	267	-139%	0.000	312	312	0%	0.000	60	60	0%	0.000
				TOTAL		Calibration		Yes	Yes	Yes	660	644	-2%	0.611	273	270	-1%	0.166	326	313	4%	0.705	61	61	0%	0.034
	Screenline 7 - WB	6	Calibration	Gisleham Road	SB	5010	9600				17	18	3%	0.127	7	6	-159%	0.467	9	9	-4%	0.110	1	3	221%	1.474
		8	Calibration	A146 Beccles Road	WB	4513	4514				670	670	0%	0.000	185	185	-262%	0.000	440	440	0%	0.000	45	45	0%	0.000
				TOTAL		Calibration		Yes	Yes	Yes	687	688	0%	0.020	192	191	-1%	0.087	449	449	0%	0.016	46	48	-4%	0.302

Model Last Updated23/11/2011 15:51:12

Lowestoft Screenlines

Index

Screenlines	
Calibration	16
Validation	4

Flow < 5%	Calibration		Validation	
All	14	88%	1	25%
Car	14	88%	2	50%
LGV	13	81%	0	0%
HGV	12	75%	1	25%

GEH < 4	Calibration		Validation	
All	16	100%	4	100%
Car	16	100%	3	75%
LGV	15	94%	2	50%
HGV	16	100%	4	100%

											AM Peak															
											All				Car				LGV				HGV			
ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	AM	Interp	PM	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
15	Screenline 8 - NB	13	Calibration	London Road South	NEB	9606	1040				452	453	0%	0.035	247	247	-83%	0.008	188	188	0%	0.036	18	18	2%	0.089
		15	Calibration	A12 Tom Crisp Way	NEB	3000	10015				823	819	0%	0.143	623	619	-33%	0.147	172	172	0%	0.000	28	28	-2%	0.084
		17	Calibration	A1117 Elm Tree Road	NB	3030	3040				310	309	0%	0.043	167	166	-86%	0.039	125	125	0%	0.011	18	18	-2%	0.088
				TOTAL		Calibration		Yes	Yes	Yes	1585	1581	0%	0.103	1036	1032	0%	0.133	484	485	0%	0.028	64	64	1%	0.055
16	Screenline 8 - SB	14	Calibration	London Road South	SWB	1040	9606				356	357	0%	0.033	183	183	-95%	0.009	156	156	0%	0.040	18	18	1%	0.059
		16	Calibration	A12 Tom Crisp Way	SWB	10015	3000				381	381	0%	0.011	247	247	-54%	0.021	111	111	0%	0.021	23	23	-1%	0.069
		18	Calibration	A1117 Elm Tree Road	SB	3040	3030				359	359	0%	0.013	209	209	-72%	0.000	134	134	0%	0.022	16	16	0%	0.000
				TOTAL		Calibration		Yes	Yes	Yes	1096	1097	0%	0.033	639	639	0%	0.008	400	401	0%	0.049	57	57	0%	0.011
19	Screenline 9 - NB	81	Validation	Saltwater Way	NB	2050	2060				944	973	3%	0.937	656	545	-61%	4.520	242	383	58%	7.974	46	45	-3%	0.178
		79	Validation	A12 Pier Terrace	NB	1260	10023				1531	1395	-9%	3.556	656	839	-105%	6.688	810	500	-38%	12.103	65	56	-14%	1.173
				TOTAL		Validation		Yes	Yes	Yes	2475	2368	-4%	2.174	1312	1384	5%	1.964	1052	883	16%	5.426	111	101	9%	1.003
20	Screenline 9 - SB	82	Validation	Saltwater Way	SB	2060	2050				904	902	0%	0.067	506	518	-76%	0.532	367	344	-6%	1.230	31	40	30%	1.539
		80	Validation	A12 Pier Terrace	SB	10023	1260				898	768	-14%	4.504	530	473	-80%	2.555	322	256	-20%	3.869	46	39	-15%	1.077
				TOTAL		Validation		Yes	Yes	Yes	1802	1670	-7%	3.168	1036	991	-4%	1.420	689	600	13%	3.503	77	79	-3%	0.242
21	Screenline 10 - NB	9	Validation	A1145 Castleton	EB	5110	5060				441	385	-13%	2.745	260	223	-84%	2.360	155	128	-17%	2.243	26	34	29%	1.374
		11	Validation	A12 London Road	NB	5390	1000				719	742	3%	0.856	371	471	-67%	4.874	307	247	-20%	3.629	40	24	-41%	2.895
		19	Validation	A146 Beccles Road	NEB	10111	10109				479	391	-18%	4.225	256	162	-124%	6.510	198	204	3%	0.459	26	25	-2%	0.100
				TOTAL		Validation		Yes	Yes	Yes	1639	1518	-7%	3.040	887	856	-3%	1.043	660	579	12%	3.239	92	83	10%	1.001
22	Screenline 10 - SB	10	Validation	A1145 Castleton	WB	5060	5110				343	337	-2%	0.337	173	122	-128%	4.233	140	187	33%	3.648	29	28	-5%	0.270
		12	Validation	A12 London Road	SB	1000	5390				595	654	10%	2.379	324	403	-59%	4.159	229	229	0%	0.028	41	22	-47%	3.450
		20	Validation	A146 Beccles Road	SWB	10109	10111				435	302	-31%	6.928	288	94	-119%	14.024	127	190	50%	5.026	21	18	-12%	0.570
				TOTAL		Validation		Yes	Yes	Yes	1373	1293	-6%	2.186	785	619	-21%	6.262	497	606	-22%	4.663	91	68	26%	2.618

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Lowestoft Screenlines

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Screenlines	
Calibration	16
Validation	4

Flow < 5%	Calibration		Validation	
All	16	100%	1	25%
Car	12	75%	1	25%
LGV	14	88%	2	50%
HGV	12	75%	0	0%

GEH < 4	Calibration		Validation	
All	16	100%	3	75%
Car	16	100%	3	75%
LGV	16	100%	4	100%
HGV	16	100%	4	100%

											Interpeak															
											All				Car				LGV				HGV			
ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	AM Peak	Interpeak	PM Peak	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
1	Screenline 1 - NB	55	Calibration	B1385 Corton Road	NB	9460	9480				88	87	-1%	0.074	73	73	-20%	0.019	13	12	-4%	0.161	2	2	2%	0.030
		57	Calibration	A12 Yarmouth Road	NB	10257	6250				495	489	-1%	0.276	389	389	-27%	0.018	80	74	-7%	0.639	26	26	-1%	0.031
		59	Calibration	B1375 Parkhill	NB	10001	8070				263	234	-11%	1.869	210	181	-39%	2.101	42	42	0%	0.001	11	11	-1%	0.023
		61	Calibration	B1074 Bluderston Road	NB	10025	20026				116	116	0%	0.031	73	73	-59%	0.015	39	39	1%	0.037	4	4	-10%	0.213
				TOTAL		Calibration		Yes	Yes	Yes	963	926	-4%	1.192	746	716	-4%	1.111	173	167	3%	0.456	44	43	1%	0.096
2	Screenline 1 - SB	56	Calibration	B1385 Corton Road	SB	9480	9460				99	99	0%	0.038	80	80	-23%	0.012	17	17	2%	0.086	2	2	7%	0.090
		58	Calibration	A12 Yarmouth Road	SB	6250	10257				542	502	-7%	1.750	370	331	-57%	2.077	144	143	-1%	0.079	28	28	-1%	0.030
		60	Calibration	B1375 Parkhill	SB	8070	10001				193	186	-4%	0.532	140	133	-43%	0.604	46	46	0%	0.008	7	7	-3%	0.079
		62	Calibration	B1074 Bluderston Road	SB	20026	10025				101	107	6%	0.570	11	18	-727%	1.711	82	82	0%	0.016	8	7	-8%	0.224
				TOTAL		Calibration		Yes	Yes	Yes	935	894	-4%	1.360	601	562	-7%	1.637	289	288	0%	0.046	45	44	2%	0.128
3	Screenline 2 - NB	49	Calibration	B1375 Gorleston Road	NB	8030	8040				445	415	-7%	1.457	336	306	-41%	1.648	92	92	0%	0.011	18	17	-3%	0.142
		51	Calibration	A1117 Millennium Way	NB	7070	7080				438	472	8%	1.575	348	378	-17%	1.564	75	81	8%	0.656	15	13	-13%	0.528
				TOTAL		Calibration		Yes	Yes	Yes	884	887	0%	0.114	684	684	0%	0.010	167	173	-3%	0.436	33	30	8%	0.459
4	Screenline 2 - SB	50	Calibration	B1375 Gorleston Road	SB	8040	8030				473	462	-2%	0.489	367	357	-31%	0.523	89	89	0%	0.029	16	16	-2%	0.090
		52	Calibration	A1117 Millennium Way	SB	7080	7070				392	445	14%	2.597	326	356	-11%	1.615	51	74	46%	2.942	15	15	0%	0.017
				TOTAL		Calibration		Yes	Yes	Yes	864	907	5%	1.430	693	713	3%	0.750	140	163	-16%	1.865	31	31	1%	0.053
5	Screenline 3 - NB	41	Calibration	Peto Way	NB	10190	7060				445	449	1%	0.178	303	306	-46%	0.182	133	133	0%	0.031	10	10	2%	0.074
		43	Calibration	A1117 Normanston Drive	NEB	7050	7060				641	678	6%	1.458	323	358	-88%	1.908	297	299	1%	0.089	20	21	3%	0.154
				TOTAL		Calibration		Yes	Yes	Yes	1086	1127	4%	1.238	626	664	6%	1.511	430	432	0%	0.091	30	31	-3%	0.169
6	Screenline 3 - SB	42	Calibration	Peto Way	SB	7060	10190				550	553	1%	0.146	300	305	-81%	0.274	237	236	0%	0.065	12	12	-3%	0.099
		44	Calibration	A1117 Normanston Drive	SWB	7060	7050				650	645	-1%	0.199	356	363	-81%	0.346	270	258	-4%	0.724	24	24	1%	0.027
				TOTAL		Calibration		Yes	Yes	Yes	1200	1198	0%	0.047	657	668	2%	0.441	507	494	3%	0.570	36	36	1%	0.035
7	Screenline 4 - NB	29	Calibration	Katwijk Way	NB	6040	10136				323	297	-8%	1.465	193	181	-74%	0.849	106	101	-5%	0.525	24	15	-37%	2.005
		31	Calibration	A12 Battery Green Road	NB	6160	6150				465	467	0%	0.092	202	204	-129%	0.118	238	238	0%	0.019	25	25	0%	0.002
				TOTAL		Calibration		Yes	Yes	Yes	788	764	-3%	0.854	395	385	-3%	0.503	344	339	1%	0.273	49	40	18%	1.324
8	Screenline 4 - SB	30	Calibration	Katwijk Way	SB	10136	6040				204	198	-3%	0.454	138	147	-42%	0.732	49	49	0%	0.012	17	2	-88%	4.920
		32	Calibration	A12 Battery Green Road	SB	6150	6160				610	583	-4%	1.098	355	318	-82%	2.024	229	239	5%	0.682	26	26	0%	0.019
				TOTAL		Calibration		Yes	Yes	Yes	814	781	-4%	1.177	493	465	-6%	1.297	277	288	-4%	0.625	43	28	35%	2.573
9	Screenline 5 - EB	22	Calibration	Kirkley Run	SEB	5270	10103				109	106	-3%	0.329	75	73	-49%	0.211	31	30	-3%	0.186	4	3	-16%	0.320
		23	Calibration	A146 Waveney Drive	EB	10088	4010				258	262	2%	0.264	151	156	-67%	0.367	97	97	0%	0.001	9	9	-3%	0.095
				TOTAL		Calibration		Yes	Yes	Yes	367	368	0%	0.044	226	229	1%	0.182	128	127	1%	0.092	13	12	7%	0.246
10	Screenline 5 - WB	21	Calibration	Kirkley Run	NWB	10103	5270				132	136	3%	0.315	90	93	-44%	0.281	38	39	1%	0.087	4	4	12%	0.216
		24	Calibration	A146 Waveney Drive	WB	4010	10088				266	264	-1%	0.111	134	135	-98%	0.124	122	119	-3%	0.296	10	10	0%	0.000
				TOTAL		Calibration		Yes	Yes	Yes	398	400	0%	0.092	224	228	2%	0.275	161	158	2%	0.215	14	14	-3%	0.113
11	Screenline 6 - EB	37	Calibration	Denmark Road	EB	7200	10139				237	244	3%	0.456	153	158	-52%	0.420	78	79	2%	0.165	7	7	6%	0.142
		45	Calibration	A1144 Normanston Drive	EB	9240	9130				281	298	6%	0.975	160	176	-66%	1.260	110	110	0%	0.005	12	12	2%	0.064
		47	Calibration	Oulton Road	EB	9270	10010				325	266	-18%	3.421	182	171	-85%	0.812	134	86	-36%	4.563	9	9	-2%	0.053
		54	Calibration	A12 Yarmouth Road	SEB	10248	10242				510	481	-6%	1.309	299	270	-80%	1.717	185	185	0%	0.035	26	26	1%	0.062
				TOTAL		Calibration		Yes	Yes	Yes	1353	1289	-5%	1.768	793	775	-2%	0.650	507	460	9%	2.129	53	54	-1%	0.102
12	Screenline 6 - WB	38	Calibration	Denmark Road	WB	10139	7200				338	345	2%	0.367	228	232	-47%	0.253	99	102	3%	0.278	11	11	1%	0.047
		46	Calibration	A1144 Normanston Drive	WB	9130	9240				275	275	0%	0.004	180	177	-54%	0.252	83	87	4%	0.390	11	11	-3%	0.087
		48	Calibration	Oulton Road	WB	10010	9270				270	253	-6%	1.058	164	161	-67%	0.210	99	84	-15%	1.557	8	8	6%	0.164
		53	Calibration	A12 Yarmouth Road	NWB	10242	10248				508	508	0%	0.002	318	318	-60%	0.017	168	168	0%	0.004	22	22	-1%	0.039
				TOTAL		Calibration		Yes	Yes	Yes	1391	1381	-1%	0.278	890	888	0%	0.064	450	441	2%	0.406	52	52	0%	0.019
	Screenline 7 - EB	5	Calibration	Gisleham Road	NB	9600	5010				20	10	-49%	2.521	7	6	-186%	0.536	11	3	-74%	3.118	1	1	2%	0.021
		7	Calibration	A146 Beccles Road	EB	4514	4513				589	617	5%	1.147	227	254	-148%	1.752	316	316	0%	0.028	47	47	1%	0.073
				TOTAL		Calibration		Yes	Yes	Yes	609	627	3%	0.742	234	260	11%	1.640	327	319	2%	0.437	47	48	-1%	0.075
	Screenline 7 - WB	6	Calibration	Gisleham Road	SB	5010	9600				22	24	7%	0.318	10	10	-127%	0.063	12	12	3%	0.109	1	2	92%	0.777
		8	Calibration	A146 Beccles Road	WB	4513	4514				588	588	0%	0.014	161	162	-264%	0.066	378	378	0%	0.009	48	48	-1%	0.048
				TOTAL		Calibration		Yes	Yes	Yes	610	612	0%	0.075	171	172	1%	0.079	390	390	0%	0.011	49	50	-1%	0.089
15	Screenline 8 - NB	13	Calibration	London Road South	NEB	9606	1040				385	367	-5%	0.937	207	198	-90%	0.662	158	151	-5%	0.589	19	18	-7%	0.330
		15	Calibration	A12 Tom Crisp Way	NEB	3000	10015				490	535	9%	2.010	353	391	-28%	1.957	114	121	6%	0.609	22	23	5%	0.241
		17	Calibration	A1117 Elm Tree Road	NB	3030	3040				382	389	2%	0.338	211	218	-78%	0.490	153	153	0%	0.038	18	18	0%	0.016

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Lowestoft Screenlines

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Screenlines	
Calibration	16
Validation	4

Flow < 5%	Calibration		Validation	
All	16	100%	1	25%
Car	12	75%	1	25%
LGV	14	88%	2	50%
HGV	12	75%	0	0%

GEH < 4	Calibration		Validation	
All	16	100%	3	75%
Car	16	100%	3	75%
LGV	16	100%	4	100%
HGV	16	100%	4	100%

											Interpeak															
											All				Car				LGV				HGV			
ID	Name	Link ID	Status	Site Location	Direction	A Node	B Node	AM	Interp	PM	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
				TOTAL		Calibration		Yes	Yes	Yes	1257	1291	3%	0.951	772	807	5%	1.263	426	425	0%	0.057	59	59	1%	0.046
16	Screenline 8 - SB	14	Calibration	London Road South	SWB	1040	9606				408	411	1%	0.147	203	205	-100%	0.167	184	185	0%	0.050	21	21	0%	0.017
		16	Calibration	A12 Tom Crisp Way	SWB	10015	3000				492	499	2%	0.332	326	325	-51%	0.076	141	150	6%	0.706	24	24	1%	0.045
		18	Calibration	A1117 Elm Tree Road	SB	3040	3030				405	395	-2%	0.481	235	235	-72%	0.028	153	143	-6%	0.792	17	17	3%	0.108
				TOTAL		Calibration		Yes	Yes	Yes	1304	1305	0%	0.021	764	765	0%	0.021	478	478	0%	0.020	61	62	-1%	0.075
19	Screenline 9 - NB	81	Validation	Saltwater Way	NB	2050	2060				983	957	-3%	0.845	718	526	-64%	7.686	228	391	72%	9.284	38	40	5%	0.329
		79	Validation	A12 Pier Terrace	NB	1260	10023				1041	955	-8%	2.722	453	570	-104%	5.177	532	346	-35%	8.883	56	39	-30%	2.459
				TOTAL		Validation		Yes	Yes	Yes	2024	1912	-6%	2.532	1171	1096	-6%	2.216	760	737	3%	0.835	94	79	16%	1.601
20	Screenline 9 - SB	82	Validation	Saltwater Way	SB	2060	2050				931	974	5%	1.410	575	577	-61%	0.079	329	357	9%	1.525	27	40	50%	2.318
		80	Validation	A12 Pier Terrace	SB	10023	1260				1051	1090	4%	1.182	612	687	-60%	2.932	394	352	-11%	2.178	45	51	13%	0.867
				TOTAL		Validation		Yes	Yes	Yes	1982	2064	4%	1.827	1187	1264	6%	2.188	723	709	2%	0.517	72	91	-27%	2.150
21	Screenline 10 - NB	9	Validation	A1145 Castleton	EB	5110	5060				306	369	20%	3.412	161	189	-73%	2.131	123	152	24%	2.514	23	28	22%	0.999
		11	Validation	A12 London Road	NB	5390	1000				642	615	-4%	1.096	313	355	-92%	2.322	292	237	-19%	3.355	38	23	-40%	2.775
		19	Validation	A146 Beccles Road	NEB	10111	10109				417	301	-28%	6.104	224	131	-127%	6.982	172	153	-11%	1.519	20	17	-16%	0.745
				TOTAL		Validation		Yes	Yes	Yes	1365	1285	-6%	2.209	697	675	-3%	0.856	586	542	8%	1.872	82	68	17%	1.566
22	Screenline 10 - SB	10	Validation	A1145 Castleton	WB	5060	5110				322	297	-8%	1.430	158	102	-139%	4.941	137	168	22%	2.469	26	27	3%	0.138
		12	Validation	A12 London Road	SB	1000	5390				664	615	-7%	1.926	375	363	-80%	0.610	249	235	-6%	0.922	40	17	-57%	4.252
		20	Validation	A146 Beccles Road	SWB	10109	10111				399	316	-21%	4.391	258	116	-110%	10.393	124	179	44%	4.425	16	21	28%	1.065
				TOTAL		Validation		Yes	Yes	Yes	1385	1228	-11%	4.340	791	581	-27%	8.026	511	582	-14%	3.023	82	65	21%	2.017

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Screenlines	
Calibration	16
Validation	4

Flow < 5%	Calibration		Validation	
All	14	88%	2	50%
Car	15	94%	1	25%
LGV	7	44%	3	75%
HGV	7	44%	0	0%

GEH < 4	Calibration		Validation	
All	16	100%	2	50%
Car	16	100%	2	50%
LGV	15	94%	4	100%
HGV	16	100%	4	100%

											PM Peak															
											All				Car				LGV				HGV			
ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	AM Peak	Interpeak	PM Peak	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
1	Screenline 1 - NB	55	Calibration	B1385 Corton Road	NB	9460	9480				104	104	0%	0.025	88	89	-17%	0.066	14	14	-1%	0.033	1	1	-20%	0.236
		57	Calibration	A12 Yarmouth Road	NB	10257	6250				656	687	5%	1.180	561	574	-15%	0.564	76	100	32%	2.558	20	13	-35%	1.692
		59	Calibration	B1375 Parkhill	NB	10001	8070				315	304	-3%	0.597	257	247	-26%	0.614	51	51	0%	0.035	7	6	-8%	0.200
		61	Calibration	B1074 Bluderston Road	NB	10025	20026				219	229	5%	0.677	144	154	-45%	0.809	70	70	0%	0.015	5	5	8%	0.171
		TOTAL				Calibration		Yes	Yes	Yes	1294	1324	2%	0.842	1050	1064	1%	0.436	212	235	-11%	1.573	32	25	22%	1.352
2	Screenline 1 - SB	56	Calibration	B1385 Corton Road	SB	9480	9460				93	93	0%	0.013	77	77	-21%	0.014	16	16	2%	0.094	0	0	-100%	0.866
		58	Calibration	A12 Yarmouth Road	SB	6250	10257				730	672	-8%	2.180	530	479	-47%	2.271	182	176	-4%	0.480	17	17	-2%	0.069
		60	Calibration	B1375 Parkhill	SB	8070	10001				485	430	-11%	2.571	375	375	-29%	0.013	101	46	-54%	6.415	9	9	3%	0.084
		62	Calibration	B1074 Bluderston Road	SB	20026	10025				143	173	21%	2.428	21	51	-446%	5.101	115	115	0%	0.035	7	7	6%	0.144
		TOTAL				Calibration		Yes	Yes	Yes	1450	1368	-6%	2.187	1003	982	-2%	0.655	414	353	15%	3.136	33	33	0%	0.006
3	Screenline 2 - NB	49	Calibration	B1375 Gorleston Road	NB	8030	8040				543	523	-4%	0.860	429	410	-31%	0.941	105	105	0%	0.042	8	8	-2%	0.050
		51	Calibration	A1117 Millennium Way	NB	7070	7080				545	569	4%	1.012	443	468	-17%	1.154	89	89	0%	0.000	13	12	-6%	0.213
		TOTAL				Calibration		Yes	Yes	Yes	1088	1092	0%	0.122	873	878	1%	0.180	194	194	0%	0.031	21	20	4%	0.197
4	Screenline 2 - SB	50	Calibration	B1375 Gorleston Road	SB	8040	8030				702	655	-7%	1.804	570	561	-25%	0.384	119	81	-32%	3.800	13	13	1%	0.040
		52	Calibration	A1117 Millennium Way	SB	7080	7070				510	601	18%	3.850	448	473	-8%	1.189	55	120	117%	6.901	7	8	8%	0.225
		TOTAL				Calibration		Yes	Yes	Yes	1212	1256	4%	1.245	1018	1034	2%	0.511	174	201	-15%	1.943	20	21	-4%	0.169
5	Screenline 3 - NB	41	Calibration	Peto Way	NB	10190	7060				423	401	-5%	1.078	295	294	-44%	0.044	120	100	-17%	1.896	8	7	-15%	0.453
		43	Calibration	A1117 Normanston Drive	NEB	7050	7060				608	598	-2%	0.399	297	297	-105%	0.023	298	289	-3%	0.537	12	12	-2%	0.057
		TOTAL				Calibration		Yes	Yes	Yes	1031	999	-3%	0.994	592	591	0%	0.047	418	389	7%	1.447	20	19	7%	0.326
6	Screenline 3 - SB	42	Calibration	Peto Way	SB	7060	10190				609	588	-3%	0.848	335	320	-86%	0.802	264	258	-2%	0.394	10	10	1%	0.040
		44	Calibration	A1117 Normanston Drive	SWB	7060	7050				648	641	-1%	0.291	371	361	-78%	0.502	266	272	2%	0.366	12	8	-32%	1.208
		TOTAL				Calibration		Yes	Yes	Yes	1257	1229	-2%	0.798	705	681	-3%	0.915	530	530	0%	0.016	22	18	17%	0.825
7	Screenline 4 - NB	29	Calibration	Katwijk Way	NB	6040	10136				307	282	-8%	1.476	186	180	-69%	0.407	101	93	-7%	0.762	21	9	-58%	3.167
		31	Calibration	A12 Battery Green Road	NB	6160	6150				457	467	2%	0.479	241	246	-88%	0.348	206	211	2%	0.326	10	10	1%	0.045
		TOTAL				Calibration		Yes	Yes	Yes	764	749	-2%	0.547	426	426	0%	0.003	307	304	1%	0.159	31	19	39%	2.433
8	Screenline 4 - SB	30	Calibration	Katwijk Way	SB	10136	6040				225	221	-2%	0.268	165	212	-8%	3.410	46	8	-83%	7.292	14	1	-93%	4.747
		32	Calibration	A12 Battery Green Road	SB	6150	6160				911	881	-3%	1.006	581	550	-62%	1.293	309	308	0%	0.036	22	23	6%	0.264
		TOTAL				Calibration		Yes	Yes	Yes	1136	1102	-3%	1.020	746	762	2%	0.586	354	316	11%	2.100	36	24	33%	2.150
9	Screenline 5 - EB	22	Calibration	Kirkley Run	SEB	5270	10103				183	178	-3%	0.372	132	131	-39%	0.065	49	45	-9%	0.619	2	2	0%	0.000
		23	Calibration	A146 Waveney Drive	EB	10088	4010				221	221	0%	0.000	140	142	-56%	0.159	75	79	5%	0.430	6	0	-100%	3.367
		TOTAL				Calibration		Yes	Yes	Yes	404	399	-1%	0.250	272	273	0%	0.069	124	124	0%	0.042	8	2	74%	2.578
10	Screenline 5 - WB	21	Calibration	Kirkley Run	NWB	10103	5270				219	190	-13%	2.028	155	153	-43%	0.141	62	35	-44%	3.877	2	2	-11%	0.171
		24	Calibration	A146 Waveney Drive	WB	4010	10088				431	433	1%	0.112	233	235	-84%	0.160	189	189	0%	0.032	10	9	-6%	0.182
		TOTAL				Calibration		Yes	Yes	Yes	650	623	-4%	1.057	387	388	0%	0.035	251	224	11%	1.724	12	11	7%	0.239
11	Screenline 6 - EB	37	Calibration	Denmark Road	EB	7200	10139				261	252	-3%	0.554	182	180	-45%	0.112	77	69	-10%	0.879	3	3	4%	0.073
		45	Calibration	A1144 Normanston Drive	EB	9240	9130				238	222	-7%	1.055	142	161	-54%	1.565	90	56	-38%	3.979	6	5	-20%	0.527
		47	Calibration	Oulton Road	EB	9270	10010				371	286	-23%	4.664	205	184	-91%	1.532	160	96	-40%	5.618	6	6	7%	0.156
		54	Calibration	A12 Yarmouth Road	SEB	10248	10242				601	572	-5%	1.197	380	358	-64%	1.132	206	199	-4%	0.518	15	15	1%	0.032
		TOTAL				Calibration		Yes	Yes	Yes	1470	1332	-9%	3.697	908	883	-3%	0.848	532	420	21%	5.150	30	29	2%	0.115
12	Screenline 6 - WB	38	Calibration	Denmark Road	WB	10139	7200				406	406	0%	0.012	290	304	-35%	0.805	107	95	-12%	1.230	8	7	-15%	0.453
		46	Calibration	A1144 Normanston Drive	WB	9130	9240				323	292	-9%	1.740	211	200	-58%	0.785	102	86	-16%	1.675	9	6	-33%	1.095
		48	Calibration	Oulton Road	WB	10010	9270				353	355	1%	0.100	220	221	-60%	0.076	126	127	1%	0.089	7	7	-3%	0.094
		53	Calibration	A12 Yarmouth Road	NWB	10242	10248				702	702	0%	0.009	472	471	-49%	0.029	215	215	0%	0.026	15	16	8%	0.319
		TOTAL				Calibration		Yes	Yes	Yes	1783	1755	-2%	0.669	1193	1196	0%	0.090	551	523	5%	1.208	39	36	8%	0.530
	Screenline 7 - EB	5	Calibration	Gisleham Road	NB	9600	5010				42	27	-36%	2.594	16	12	-192%	1.019	26	15	-42%	2.417	1	0	-100%	1.033
		7	Calibration	A146 Beccles Road	EB	4514	4513				896	924	3%	0.928	383	405	-128%	1.134	489	494	1%	0.248	25	25	0%	0.000
		TOTAL				Calibration		Yes	Yes	Yes	938	951	1%	0.414	398	417	5%	0.926	514	509	1%	0.240	26	25	2%	0.106
	Screenline 7 - WB	6	Calibration	Gisleham Road	SB	5010	9600				26	20	-24%	1.342	12	12	-117%	0.115	13	7	-47%	1.933	1	1	7%	0.068
		8	Calibration	A146 Beccles Road	WB	4513	4514				664	653	-2%	0.429	193	182	-250%	0.803	448	448	0%	0.024	24	23	-2%	0.104
		TOTAL				Calibration		Yes	Yes	Yes	690	673	-3%	0.669	205	194	-6%	0.807	461	455	1%	0.263	24	24	2%	0.088
15	Screenline 8 - NB	13	Calibration	London Road South	NEB	9606	1040				520	504	-3%	0.718	287	275	-86%	0.686	218	213	-2%	0.315	16	16	-1%	0.031
		15	Calibration	A12 Tom Crisp Way	NEB	3000	10015				502	559	11%	2.475	383	431	-19%	2.371	111	120	9%	0.885	8	8	-4%	0.117
		17	Calibration	A1117 Elm Tree Road	NB	3030	3040				421	417	-1%	0.177	254	246	-69%	0.490	159	164	3%	0.364	8	7	-7%	0.186

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Lowestoft Screenlines

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Screenlines	
Calibration	16
Validation	4

Flow < 5%	Calibration		Validation	
All	14	88%	2	50%
Car	15	94%	1	25%
LGV	7	44%	3	75%
HGV	7	44%	0	0%

GEH < 4	Calibration		Validation	
All	16	100%	2	50%
Car	16	100%	2	50%
LGV	15	94%	4	100%
HGV	16	100%	4	100%

ID	Name	Link ID	Status	Site Location	Direction	A Node	B Node	AM	Interp	PM
		TOTAL				Calibration		Yes	Yes	Yes
16	Screenline 8 - SB	14	Calibration	London Road South	SWB	1040	9606			
		16	Calibration	A12 Tom Crisp Way	SWB	10015	3000			
		18	Calibration	A1117 Elm Tree Road	SB	3040	3030			
		TOTAL				Calibration		Yes	Yes	Yes
19	Screenline 9 - NB	81	Validation	Saltwater Way	NB	2050	2060			
		79	Validation	A12 Pier Terrace	NB	1260	10023			
		TOTAL				Validation		Yes	Yes	Yes
20	Screenline 9 - SB	82	Validation	Saltwater Way	SB	2060	2050			
		80	Validation	A12 Pier Terrace	SB	10023	1260			
		TOTAL				Validation		Yes	Yes	Yes
21	Screenline 10 - NB	9	Validation	A1145 Castleton	EB	5110	5060			
		11	Validation	A12 London Road	NB	5390	1000			
		19	Validation	A146 Beccles Road	NEB	10111	10109			
		TOTAL				Validation		Yes	Yes	Yes
22	Screenline 10 - SB	10	Validation	A1145 Castleton	WB	5060	5110			
		12	Validation	A12 London Road	SB	1000	5390			
		20	Validation	A146 Beccles Road	SWB	10109	10111			
		TOTAL				Validation		Yes	Yes	Yes

PM Peak	All				Car				LGV				HGV			
ID / Link ID	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
TOTAL	1443	1480	3%	0.971	923	952	3%	0.933	488	497	-2%	0.428	32	31	3%	0.171
16 / 14	499	483	-3%	0.728	270	258	-89%	0.708	221	216	-2%	0.347	9	9	6%	0.169
16 / 16	708	768	9%	2.227	520	540	-32%	0.891	174	211	21%	2.667	14	17	21%	0.762
16 / 18	417	448	7%	1.485	256	278	-54%	1.323	152	161	6%	0.750	9	9	-1%	0.042
16 TOTAL	1624	1699	5%	1.846	1045	1076	3%	0.940	547	588	-8%	1.732	32	35	-11%	0.585
19 / 81	1114	1209	9%	2.787	852	747	-43%	3.705	228	440	93%	11.588	34	22	-35%	2.274
19 / 79	1104	976	-12%	3.969	582	653	-78%	2.877	499	308	-38%	9.493	24	15	-37%	2.003
19 TOTAL	2218	2185	-1%	0.703	1433	1400	-2%	0.885	727	748	-3%	0.779	58	37	36%	3.030
20 / 82	1133	1017	-10%	3.538	749	666	-62%	3.135	370	331	-11%	2.095	13	20	50%	1.626
20 / 80	1591	1583	-1%	0.201	1014	991	-59%	0.730	539	557	3%	0.772	38	35	-8%	0.493
20 TOTAL	2724	2600	-5%	2.403	1764	1657	-6%	2.576	909	888	2%	0.705	51	55	-7%	0.502
21 / 9	460	519	13%	2.690	275	279	-66%	0.240	172	229	33%	3.997	12	11	-9%	0.331
21 / 11	759	617	-19%	5.403	375	351	-109%	1.282	357	256	-28%	5.784	26	10	-62%	3.771
21 / 19	535	434	-19%	4.599	312	193	-110%	7.489	213	228	7%	1.044	11	13	21%	0.653
21 TOTAL	1753	1570	-10%	4.501	962	823	-14%	4.667	742	713	4%	1.081	49	34	30%	2.311
22 / 10	448	497	11%	2.278	255	196	-99%	3.921	180	283	57%	6.751	12	18	45%	1.443
22 / 12	775	794	2%	0.683	460	512	-57%	2.365	294	272	-8%	1.316	21	10	-52%	2.764
22 / 20	491	186	-62%	16.562	332	67	-128%	18.774	148	112	-24%	3.168	10	7	-32%	1.107
22 TOTAL	1713	1477	-14%	5.909	1047	775	-26%	9.011	623	667	-7%	1.752	43	35	20%	1.354

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Appendix E

INDIVIDUAL LINK COUNT PERFORMANCE

Lowestoft Link Flows

Index

ID	Calibration / Validation	Area	ID	Site Location	Dir	Date	Data Type	Duplicate?	Ref	A-Node	B-Node	Factor	AM Peak	Interpeak	PM Peak	Check
5	Calibration		3	Gisleham Road	NB	Jul-15	ATC	No	9600-501	9600	5010		Yes	Yes	Yes	OK
6	Calibration		3	Gisleham Road	SB	Jul-15	ATC	No	5010-960	5010	9600		Yes	Yes	Yes	OK
7	Calibration		4	A146 Beccles Road	EB	Jul-15	ATC	No	4514-451	4514	4513		Yes	Yes	Yes	OK
8	Calibration		4	A146 Beccles Road	WB	Jul-15	ATC	No	4513-451	4513	4514		Yes	Yes	Yes	OK
9	Validation		5	A1145 Castleton Avenue	EB	Jul-15	ATC	No	5110-506	5110	5060		Yes	Yes	Yes	OK
10	Validation		5	A1145 Castleton Avenue	WB	Jul-15	ATC	No	5060-511	5060	5110		Yes	Yes	Yes	OK
11	Validation		6	A12 London Road	NB	Jul-15	ATC	No	5390-100	5390	1000		Yes	Yes	Yes	OK
12	Validation		6	A12 London Road	SB	Jul-15	ATC	No	1000-539	1000	5390		Yes	Yes	Yes	OK
13	Calibration		7	London Road South	NEB	Jul-15	ATC	No	9606-104	9606	1040		Yes	Yes	Yes	OK
14	Calibration		7	London Road South	SWB	Jul-15	ATC	No	1040-960	1040	9606		Yes	Yes	Yes	OK
15	Calibration		8	A12 Tom Crisp Way	NEB	Jul-15	ATC	No	000-1001	3000	10015		Yes	Yes	Yes	OK
16	Calibration		8	A12 Tom Crisp Way	SWB	Jul-15	ATC	No	0015-300	10015	3000		Yes	Yes	Yes	OK
17	Calibration		9	A1117 Elm Tree Road	NB	Jul-15	ATC	No	3030-304	3030	3040		Yes	Yes	Yes	OK
18	Calibration		9	A1117 Elm Tree Road	SB	Jul-15	ATC	No	3040-303	3040	3030		Yes	Yes	Yes	OK
19	Validation		10	A146 Beccles Road	NEB	Jul-15	ATC	No	0111-101	10111	10109		Yes	Yes	Yes	OK
20	Validation		10	A146 Beccles Road	SWB	Jul-15	ATC	No	0109-101	10109	10111		Yes	Yes	Yes	OK
21	Calibration		11	Kirkley Run	NWB	Jul-15	ATC	No	0103-527	10103	5270		Yes	Yes	Yes	OK
22	Calibration		11	Kirkley Run	SEB	Jul-15	ATC	No	270-1010	5270	10103		Yes	Yes	Yes	OK
23	Calibration		12	A146 Waveney Drive	EB	Jul-15	ATC	No	0088-401	10088	4010		Yes	Yes	Yes	OK
24	Calibration		12	A146 Waveney Drive	WB	Jul-15	ATC	No	010-1008	4010	10088		Yes	Yes	Yes	OK
29	Calibration		15	Katwijk Way	NB	Jul-15	ATC	No	040-1013	6040	10136		Yes	Yes	Yes	OK
30	Calibration		15	Katwijk Way	SB	Jul-15	ATC	No	0136-604	10136	6040		Yes	Yes	Yes	OK
31	Calibration		16	A12 Battery Green Road	NB	Jul-15	ATC	No	6160-615	6160	6150		Yes	Yes	Yes	OK
32	Calibration		16	A12 Battery Green Road	SB	Jul-15	ATC	No	6150-616	6150	6160		Yes	Yes	Yes	OK
33	Validation		17	A12 Old Nelson Street	NB	Jul-15	ATC	No	6140-613	6140	6130		Yes	Yes	Yes	OK
34	Validation		17	A12 Old Nelson Street	SB	Jul-15	ATC	No	6130-614	6130	6140		Yes	Yes	Yes	OK
35	Validation		18	St Peter's Street	EB	Jul-15	ATC	No	6070-607	6070	6075		Yes	Yes	Yes	OK
36	Validation		18	St Peter's Street	WB	Jul-15	ATC	No	6075-607	6075	6070		Yes	Yes	Yes	OK
37	Calibration		19	Denmark Road	EB	Jul-15	ATC	No	200-1013	7200	10139		Yes	Yes	Yes	OK
38	Calibration		19	Denmark Road	WB	Jul-15	ATC	No	0139-720	10139	7200		Yes	Yes	Yes	OK
39	Validation		20	Rotterdam Road	NEB	Jul-15	ATC	No	7210-913	7210	9130		Yes	Yes	Yes	OK
40	Validation		20	Rotterdam Road	SWB	Jul-15	ATC	No	9130-721	9130	7210		Yes	Yes	Yes	OK
41	Calibration		21	Peto Way	NB	Jul-15	ATC	No	0190-706	10190	7060		Yes	Yes	Yes	OK
42	Calibration		21	Peto Way	SB	Jul-15	ATC	No	060-1019	7060	10190		Yes	Yes	Yes	OK
43	Calibration		22	A1117 Normanston Drive	NEB	Jul-15	ATC	No	7050-706	7050	7060		Yes	Yes	Yes	OK
44	Calibration		22	A1117 Normanston Drive	SWB	Jul-15	ATC	No	7060-705	7060	7050		Yes	Yes	Yes	OK
45	Calibration		23	A1144 Normanston Drive	EB	Jul-15	ATC	No	9240-913	9240	9130		Yes	Yes	Yes	OK
46	Calibration		23	A1144 Normanston Drive	WB	Jul-15	ATC	No	9130-924	9130	9240		Yes	Yes	Yes	OK
47	Calibration		24	Oulton Road	EB	Jul-15	ATC	No	270-1001	9270	10010		Yes	Yes	Yes	OK
48	Calibration		24	Oulton Road	WB	Jul-15	ATC	No	0010-927	10010	9270		Yes	Yes	Yes	OK
49	Calibration		25	B1375 Gorleston Road	NB	Jul-15	ATC	No	8030-804	8030	8040		Yes	Yes	Yes	OK
50	Calibration		25	B1375 Gorleston Road	SB	Jul-15	ATC	No	8040-803	8040	8030		Yes	Yes	Yes	OK
51	Calibration		26	A1117 Millennium Way	NB	Jul-15	ATC	No	7070-708	7070	7080		Yes	Yes	Yes	OK
52	Calibration		26	A1117 Millennium Way	SB	Jul-15	ATC	No	7080-707	7080	7070		Yes	Yes	Yes	OK
53	Calibration		27	A12 Yarmouth Road	NWB	Jul-15	ATC	No	0242-102	10242	10248		Yes	Yes	Yes	OK
54	Calibration		27	A12 Yarmouth Road	SEB	Jul-15	ATC	No	0248-102	10248	10242		Yes	Yes	Yes	OK
55	Calibration		28	B1385 Corton Road	NB	Jul-15	ATC	No	9460-948	9460	9480		Yes	Yes	Yes	OK
56	Calibration		28	B1385 Corton Road	SB	Jul-15	ATC	No	9480-946	9480	9460		Yes	Yes	Yes	OK
57	Calibration		29	A12 Yarmouth Road	NB	Jul-15	ATC	No	0257-625	10257	6250		Yes	Yes	Yes	OK
58	Calibration		29	A12 Yarmouth Road	SB	Jul-15	ATC	No	250-1025	6250	10257		Yes	Yes	Yes	OK
59	Calibration		30	B1375 Parkhill	NB	Jul-15	ATC	No	0001-807	10001	8070		Yes	Yes	Yes	OK
60	Calibration		30	B1375 Parkhill	SB	Jul-15	ATC	No	070-1000	8070	10001		Yes	Yes	Yes	OK
61	Calibration		31	B1074 Bluderston Road	NB	Jul-15	ATC	No	0025-200	10025	20026		Yes	Yes	Yes	OK
62	Calibration		31	B1074 Bluderston Road	SB	Jul-15	ATC	No	0026-100	20026	10025		Yes	Yes	Yes	OK
63	Calibration		32	Fixton Road	NB	Jul-15	ATC	No	440-1002	9440	10024		Yes	Yes	Yes	OK
64	Calibration		32	Fixton Road	SB	Jul-15	ATC	No	0024-944	10024	9440		Yes	Yes	Yes	OK
65	Validation		33	Coast Road	NB	Jul-15	ATC	No	510-1002	9510	10027		Yes	Yes	Yes	OK
66	Validation		33	Coast Road	SB	Jul-15	ATC	No	0027-951	10027	9510		Yes	Yes	Yes	OK
67	Validation		06/605	Katwijk Way	NB	Jul-13	TRADS	No	7280-606	7280	6060		Yes	Yes	Yes	OK
75	Calibration		3	A12YarmouthRd	NB	Jul-15	ANPR	No	6280-452	6280	4520		Yes	Yes	Yes	OK
76	Calibration		3	A12YarmouthRd	SB	Jul-15	ANPR	No	4520-628	4520	6280		Yes	Yes	Yes	OK
79	Validation		5	A12 Pier Terrace	NB	Jul-15	ANPR	No	260-1002	1260	10023		Yes	Yes	Yes	OK
80	Validation		5	A12 Pier Terrace	SB	Jul-15	ANPR	No	0023-126	10023	1260		Yes	Yes	Yes	OK
81	Validation		6	Saltwater Way	NB	Jul-15	ANPR	No	2050-206	2050	2060		Yes	Yes	Yes	OK
82	Validation		6	Saltwater Way	SB	Jul-15	ANPR	No	2060-205	2060	2050		Yes	Yes	Yes	OK
99	Validation		15	North Quay Retail Park	Entry	Jul-15	ANPR	No	9220-923	9220	9230		Yes	Yes	Yes	OK
100	Validation		15	North Quay Retail Park	Exit	Jul-15	ANPR	No	9230-922	9230	9220		Yes	Yes	Yes	OK
101	Validation		16	Links Road Car Park	EB	Jul-15	ANPR	No	9602-960	9602	9603		Yes	Yes	Yes	OK
102	Validation		16	Links Road Car Park	WB	Jul-15	ANPR	No	9603-960	9603	9602		Yes	Yes	Yes	OK
103	Validation		17	Swimming Pool Road Car Park	EB	Jul-15	ANPR	No	090-1025	9090	10251		Yes	Yes	Yes	OK
104	Validation		17	Swimming Pool Road Car Park	WB	Jul-15	ANPR	No	0251-909	10251	9090		Yes	Yes	Yes	OK
106	Validation		18	Battery Green Road Car Park	Exit	Jul-15	ANPR	No	0127-101	10127	10126		Yes	Yes	Yes	OK
107	Validation		19	Gordon Road Car Park Entry	Entry	Jul-15	ANPR	No	6140-905	6140	9050		Yes	Yes	Yes	OK
109	Validation		20	Surrey Street Car Park Entry	Entry	Jul-15	ANPR	No	0130-101	10130	10131		Yes	Yes	Yes	OK
112	Validation		21	Clapham Road Car Park Exit	Exit	Jul-15	ANPR	No	0132-101	10132	10133		Yes	Yes	Yes	OK
113	Validation		22	Clapham Road South	Entry	Jul-15	ANPR	No	0137-101	10137	10138		Yes	Yes	Yes	OK
114	Validation		22	Clapham Road South	Exit	Jul-15	ANPR	No	0138-101	10138	10137		Yes	Yes	Yes	OK
115	Validation		23	St Johns Road Car Park	Entry	Jul-15	ANPR	No	0083-100	10083	10084		Yes	Yes	Yes	OK
116	Validation		23	St Johns Road Car Park	Exit	Jul-15	ANPR	No	0084-100	10084	10083		Yes	Yes	Yes	OK
117	Validation		24a	Kirkley Rise Car Park	Entry	Jul-15	ANPR	No	000-1025	4000	10256		Yes	Yes	Yes	OK
118	Validation		24a	Kirkley Rise Car Park	Exit	Jul-15	ANPR	No	0256-400	10256	4000		Yes	Yes	Yes	OK
119	Validation		24b	Kirkley Rise Car Park	Entry	Jul-15	ANPR	No	300-1007	5300	10078		Yes	Yes	Yes	OK
120	Validation		24b	Kirkley Rise Car Park	Exit	Jul-15	ANPR	No	0078-530	10078	5300		Yes	Yes	Yes	OK
121	Validation		25	Kirkley Cliff Road Car Park	Entry	Jul-15	ANPR	No	120-1007	1120	10075		Yes	Yes	Yes	OK
122	Validation		25	Kirkley Cliff Road Car Park	Exit	Jul-15	ANPR	No	0075-112	10075	1120		Yes	Yes	Yes	OK
125	Validation		27	Marine Parade	Entry	Jul-15	ANPR	No	0081-100	10081	10082		Yes	Yes	Yes	OK
126	Validation		27	Marine Parade	Exit	Jul-15	ANPR	No	0082-100	10082	10081		Yes	Yes	Yes	OK
127	Validation		28	Asda Car Park	Entry	Jul-15	ANPR	No	000-1008	4000	10085		Yes	Yes	Yes	OK
128	Validation		28	Asda Car Park	Exit	Jul-15	ANPR	No	0085-400	10085	4000		Yes	Yes	Yes	OK

ID	AM Peak															
	ALL VEHICLES					CAR					LGV			HGV		
	Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	Observed	Modelled	GEH
5	21	5	4.360	Yes	Yes	6	3	1.308	Yes	Yes	14	1	4.663	1	1	0.250
6	17	18	0.127	Yes	Yes	7	6	0.467	Yes	Yes	9	9	0.110	1	3	1.474
7	639	639	0.000	Yes	Yes	267	267	0.000	Yes	Yes	312	312	0.000	60	60	0.000
8	670	670	0.000	Yes	Yes	185	185	0.000	Yes	Yes	440	440	0.000	45	45	0.000
9	441	385	2.745	Yes	Yes	260	223	2.360	Yes	Yes	155	128	2.243	26	34	1.374
10	343	337	0.337	Yes	Yes	173	122	4.233	Yes	Yes	140	187	3.648	29	28	0.270
11	719	742	0.856	Yes	Yes	371	471	4.874	Yes	Yes	307	247	3.629	40	24	2.895
12	595	654	2.379	Yes	Yes	324	403	4.159	Yes	Yes	229	229	0.028	41	22	3.450
13	452	453	0.035	Yes	Yes	247	247	0.008	Yes	Yes	188	188	0.036	18	18	0.089
14	356	357	0.033	Yes	Yes	183	183	0.009	Yes	Yes	156	156	0.040	18	18	0.059
15	823	819	0.143	Yes	Yes	623	619	0.147	Yes	Yes	172	172	0.000	28	28	0.084
16	381	381	0.011	Yes	Yes	247	247	0.021	Yes	Yes	111	111	0.021	23	23	0.069
17	310	309	0.043	Yes	Yes	167	166	0.039	Yes	Yes	125	125	0.011	18	18	0.088
18	359	359	0.013	Yes	Yes	209	209	0.000	Yes	Yes	134	134	0.022	16	16	0.000
19	479	391	4.225	Yes	Yes	256	162	6.510	No	Yes	198	204	0.459	26	25	0.100
20	435	302	6.928	No	No	288	94	14.024	No	No	127	190	5.026	21	18	0.570
21	162	159	0.263	Yes	Yes	110	110	0.032	Yes	Yes	48	45	0.464	4	4	0.084
22	94	94	0.017	Yes	Yes	67	67	0.041	Yes	Yes	23	23	0.035	4	4	0.000
23	347	344	0.138	Yes	Yes	212	211	0.038	Yes	Yes	122	120	0.142	13	13	0.122
24	151	139	0.978	Yes	Yes	68	67	0.149	Yes	Yes	72	72	0.013	10	0	4.570
29	411	364	2.388	Yes	Yes	261	231	1.902	Yes	Yes	122	107	1.387	28	26	0.448
30	134	123	0.970	Yes	Yes	87	87	0.054	Yes	Yes	34	34	0.029	13	2	4.093
31	675	677	0.077	Yes	Yes	289	290	0.042	Yes	Yes	357	357	0.000	29	30	0.237
32	571	570	0.031	Yes	Yes	337	337	0.000	Yes	Yes	205	204	0.035	29	29	0.046
33	414	543	5.915	No	No	307	220	5.347	No	Yes	79	299	16.009	28	24	0.771
34	489	672	7.599	No	No	339	441	5.146	No	No	124	206	6.402	26	25	0.156
35	656	311	15.704	No	No	277	245	2.003	Yes	Yes	345	60	20.045	34	6	6.206
36	301	196	6.661	No	No	197	138	4.559	Yes	Yes	82	48	4.253	22	10	2.932
37	215	214	0.038	Yes	Yes	138	138	0.000	Yes	Yes	68	68	0.027	8	8	0.117
38	304	342	2.133	Yes	Yes	202	227	1.715	Yes	Yes	90	103	1.300	12	12	0.130
39	136	117	1.708	Yes	Yes	76	90	1.588	Yes	Yes	57	23	5.404	3	4	0.288
40	99	122	2.199	Yes	Yes	63	90	3.046	Yes	Yes	34	30	0.726	1	2	0.423
41	396	386	0.483	Yes	Yes	272	261	0.694	Yes	Yes	116	116	0.000	7	9	0.624
42	317	286	1.792	Yes	Yes	150	150	0.018	Yes	Yes	153	125	2.375	14	11	0.819
43	687	699	0.471	Yes	Yes	334	343	0.467	Yes	Yes	327	329	0.110	25	27	0.352
44	506	509	0.115	Yes	Yes	263	265	0.148	Yes	Yes	221	221	0.013	23	23	0.084
45	408	413	0.272	Yes	Yes	225	229	0.249	Yes	Yes	167	169	0.135	15	15	0.000
46	190	190	0.018	Yes	Yes	124	124	0.022	Yes	Yes	54	54	0.034	12	12	0.073
47	476	377	4.789	Yes	Yes	263	263	0.007	Yes	Yes	201	103	7.919	12	11	0.359
48	246	246	0.028	Yes	Yes	149	149	0.009	Yes	Yes	90	90	0.023	8	7	0.206
49	584	582	0.065	Yes	Yes	455	453	0.101	Yes	Yes	109	109	0.000	19	20	0.129
50	484	482	0.078	Yes	Yes	377	375	0.125	Yes	Yes	91	91	0.030	16	16	0.108
51	376	378	0.124	Yes	Yes	296	298	0.093	Yes	Yes	60	60	0.052	20	20	0.090
52	450	455	0.254	Yes	Yes	375	379	0.206	Yes	Yes	59	60	0.156	16	16	0.050
53	460	460	0.005	Yes	Yes	298	298	0.013	Yes	Yes	139	139	0.000	23	23	0.070
54	651	595	2.248	Yes	Yes	401	401	0.017	Yes	Yes	223	167	4.040	27	27	0.000
55	96	97	0.089	Yes	Yes	81	82	0.111	Yes	Yes	14	14	0.033	1	1	0.000
56	102	101	0.062	Yes	Yes	81	80	0.056	Yes	Yes	20	20	0.056	1	1	0.344
57	567	566	0.047	Yes	Yes	456	456	0.012	Yes	Yes	85	84	0.082	27	26	0.122
58	567	647	3.252	Yes	Yes	411	490	3.728	Yes	Yes	132	133	0.120	24	24	0.076
59	461	434	1.284	Yes	Yes	384	378	0.307	Yes	Yes	64	43	2.871	13	13	0.046
60	251	269	1.106	Yes	Yes	178	196	1.304	Yes	Yes	65	65	0.041	8	8	0.117
61	179	180	0.047	Yes	Yes	108	108	0.048	Yes	Yes	64	64	0.031	8	8	0.044
62	113	122	0.854	Yes	Yes	14	23	2.224	Yes	Yes	94	94	0.000	5	5	0.110
63	51	52	0.093	Yes	Yes	9	9	0.112	Yes	Yes	39	39	0.027	4	4	0.084
64	84	85	0.109	Yes	Yes	8	9	0.284	Yes	Yes	73	73	0.039	3	3	0.095
65	61	83	2.609	Yes	Yes	8	77	10.584	No	Yes	51	6	8.443	2	0	1.871
66	50	38	1.809	Yes	Yes	11	26	3.383	Yes	Yes	37	12	4.975	2	0	2.062
67	414	99	19.668	No	No	381	85	19.392	No	No	18	12	1.549	15	2	4.459
75	932	933	0.033	Yes	Yes	746	747	0.037	Yes	Yes	142	142	0.000	44	44	0.000
76	1353	1353	0.000	Yes	Yes	1178	1178	0.000	Yes	Yes	135	135	0.000	40	40	0.000
79	1531	1395	3.556	Yes	Yes	656	839	6.688	No	No	810	500	12.103	65	56	1.173
80	898	768	4.504	Yes	Yes	530	473	2.555	Yes	Yes	322	256	3.869	46	39	1.077
81	944	973	0.937	Yes	Yes	656	545	4.520	Yes	No	242	383	7.974	46	45	0.178
82	904	902	0.067	Yes	Yes	506	518	0.532	Yes	Yes	367	344	1.230	31	40	1.539
99	158	170	0.937	Yes	Yes	143	105	3.413	Yes	Yes	15	65	7.906	0	0	0.000
100	86	154	6.208	No	Yes	71	112	4.286	Yes	Yes	14	41	5.149	1	1	0.000
101	3	0	2.449	Yes	Yes	3	0	2.449	Yes	Yes	0	0	0.000	0	0	0.000
102	4	0	2.828	Yes	Yes	4	0	2.828	Yes	Yes	0	0	0.000	0	0	0.000
103	0	0	0.000	Yes	Yes	0	0	0.000	Yes	Yes	0	0	0.000	0	0	0.000
104	0	0	0.000	Yes	Yes	0	0	0.000	Yes	Yes	0	0	0.000	0	0	0.000
106	2	0	2.000	Yes	Yes	2	0	2.000	Yes	Yes	0	0	0.000	0	0	0.000
107	32	17	3.030	Yes	Yes	32	17	3.030	Yes	Yes	0	0	0.000	0	0	0.000
109	22	33	2.098	Yes	Yes	22	33	2.098	Yes	Yes	0	0	0.000	0	0	0.000
112	3	0	2.449	Yes	Yes	3	0	2.449	Yes	Yes	0	0	0.000	0	0	0.000
113	27	46	3.145	Yes	Yes	27	18	1.897	Yes	Yes	0	23	6.782	0	5	3.162
114	10	15	1.414	Yes	Yes	9	10	0.324	Yes	Yes	1	4	1.897	0	1	1.414
115	3	8	2.132	Yes	Yes	0	8	4.000	Yes	Yes	2	0	2.000	1	0	1.414
116	5	3	1.000	Yes	Yes	2	2	0.000	Yes	Yes	2	1	0.816	1	0	1.414
117	27	23	0.800	Yes	Yes	25	23	0.408	Yes	Yes	2	0	2.000	0	0	0.000
118	11	10	0.309	Yes	Yes	9	10	0.324	Yes	Yes	2	0	2.000	0	0	0.000
119	5	7	0.816	Yes	Yes	5	7	0.816	Yes	Yes	0	0	0.000	0	0	0.000
120	3	2	0.632	Yes	Yes	3	2	0.632	Yes	Yes	0	0	0.000	0	0	0.000
121	1	0	1.414	Yes	Yes	1	0	1.414	Yes	Yes	0	0	0.000	0	0	0.000
122	0	2	2.000	Yes	Yes	0	1	1.414	Yes	Yes	0	1	1.414	0	0	0.000
125	6	0	3.464	Yes	Yes	5	0	3.162	Yes	Yes	1	0	1.414	0	0	0.000
126	3	0	2.449	Yes	Yes	3	0	2.449	Yes	Yes	0	0	0.000	0	0	0.000
127	229	266	2.352	Yes	Yes	215	216	0.068	Yes	Yes	14	50	6.364	0	0	0.000
128	168	169	0.077	Yes	Yes	155	142	1.067	Yes	Yes	13	27	3.130	0	0	0.000

Model Last Updated23/11/2011 15:51:12

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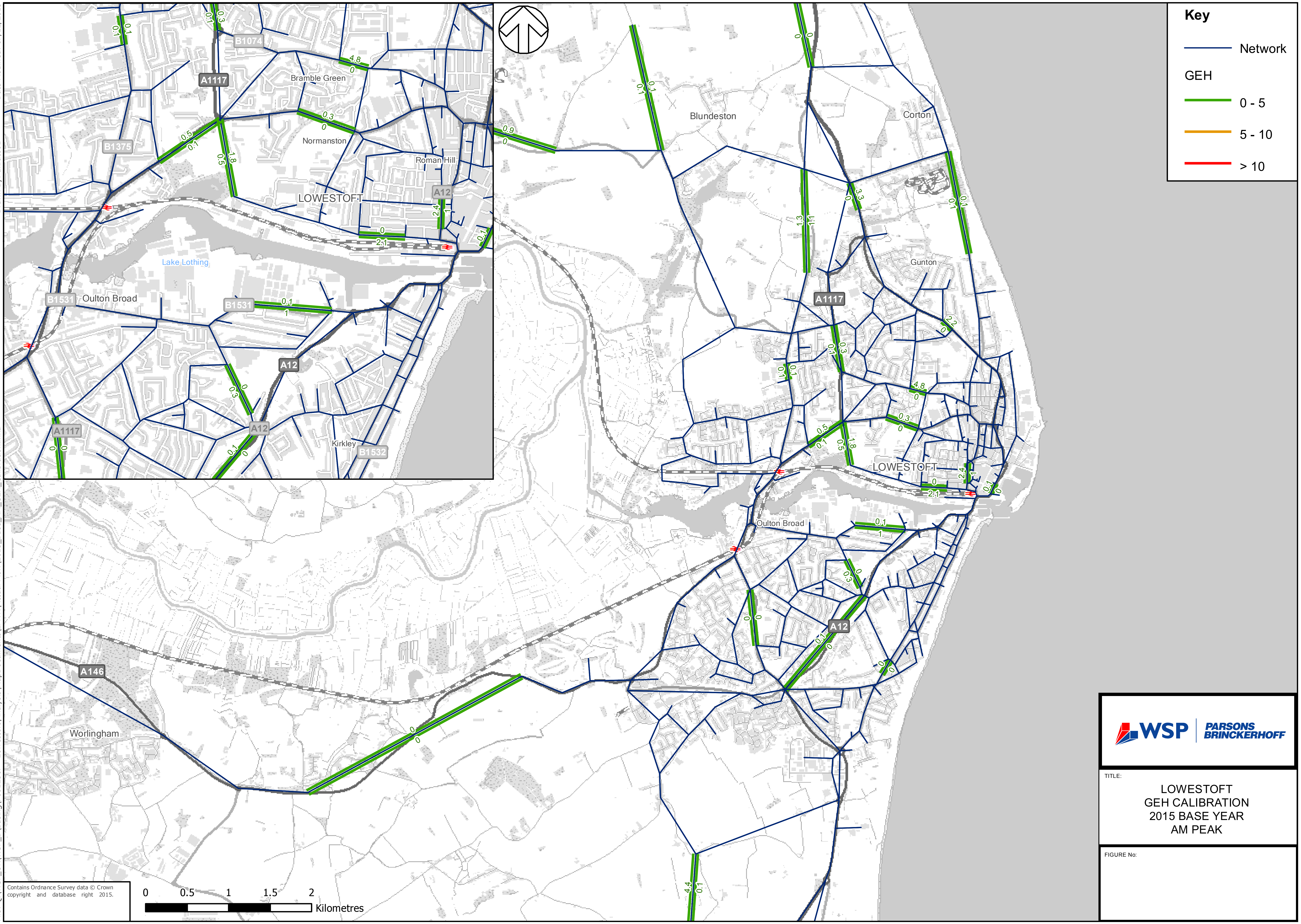
Date Modified: 07/12/2015



WSP | PARSONS BRINCKERHOFF

TITLE:

LOWESTOFT
GEH CALIBRATION
2015 BASE YEAR
AM PEAK

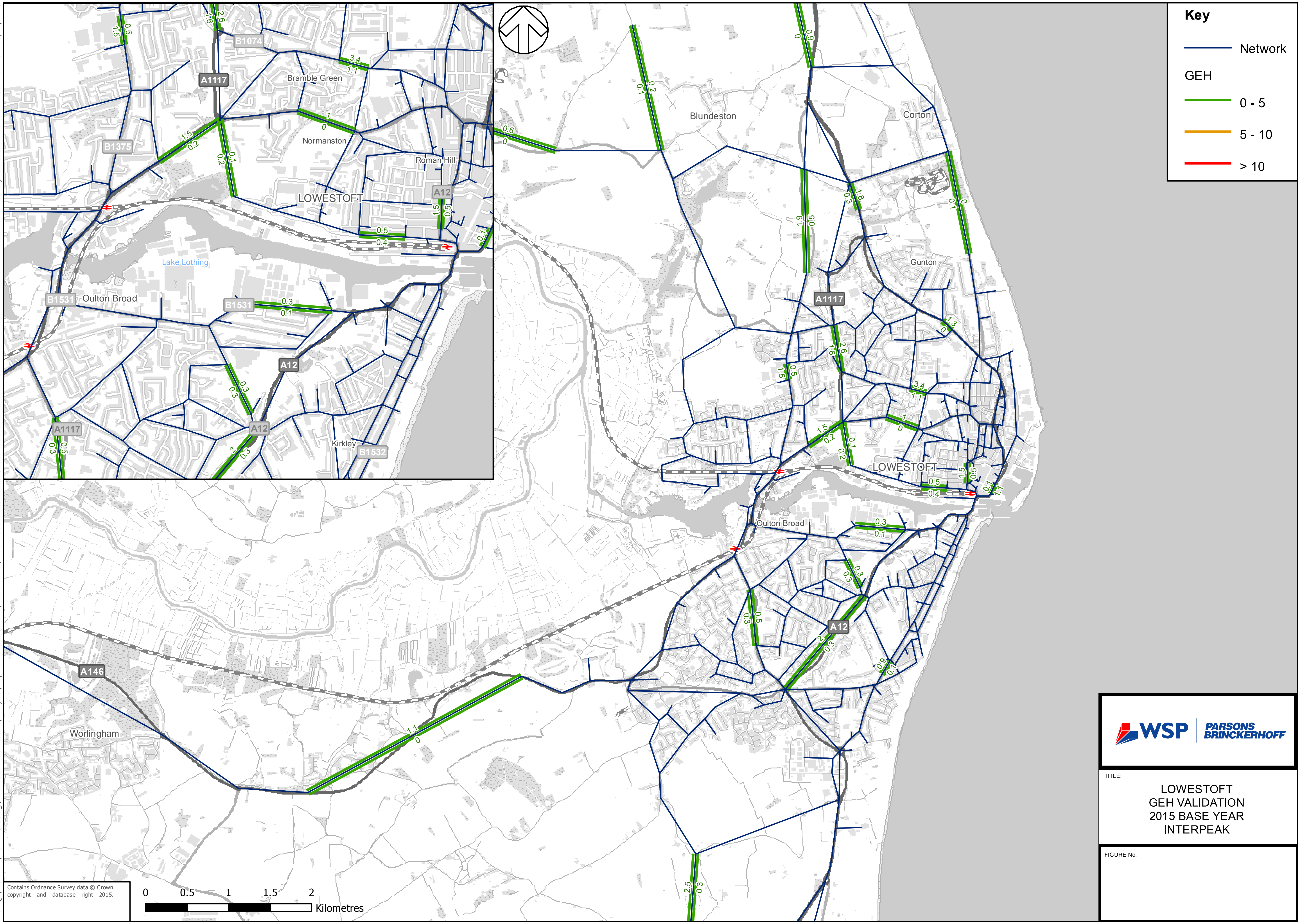
FIGURE No:

Lowestoft Link Flows

Index

ID	Calibration / Validation	Area	ID	Site Location	Dir	Date	Data Type	Duplicate?	Ref	A-Node	B-Node	Factor	AM Peak	Interpeak	PM Peak	Check
5	Calibration		3	Gisleham Road	NB	Jul-15	ATC	No	9600-501	9600	5010		Yes	Yes	Yes	OK
6	Calibration		3	Gisleham Road	SB	Jul-15	ATC	No	5010-960	5010	9600		Yes	Yes	Yes	OK
7	Calibration		4	A146 Beccles Road	EB	Jul-15	ATC	No	4514-451	4514	4513		Yes	Yes	Yes	OK
8	Calibration		4	A146 Beccles Road	WB	Jul-15	ATC	No	4513-451	4513	4514		Yes	Yes	Yes	OK
9	Validation		5	A1145 Castleton Avenue	EB	Jul-15	ATC	No	5110-506	5110	5060		Yes	Yes	Yes	OK
10	Validation		5	A1145 Castleton Avenue	WB	Jul-15	ATC	No	5060-511	5060	5110		Yes	Yes	Yes	OK
11	Validation		6	A12 London Road	NB	Jul-15	ATC	No	5390-100	5390	1000		Yes	Yes	Yes	OK
12	Validation		6	A12 London Road	SB	Jul-15	ATC	No	1000-539	1000	5390		Yes	Yes	Yes	OK
13	Calibration		7	London Road South	NEB	Jul-15	ATC	No	9606-104	9606	1040		Yes	Yes	Yes	OK
14	Calibration		7	London Road South	SWB	Jul-15	ATC	No	1040-960	1040	9606		Yes	Yes	Yes	OK
15	Calibration		8	A12 Tom Crisp Way	NEB	Jul-15	ATC	No	000-1001	3000	10015		Yes	Yes	Yes	OK
16	Calibration		8	A12 Tom Crisp Way	SWB	Jul-15	ATC	No	0015-300	10015	3000		Yes	Yes	Yes	OK
17	Calibration		9	A1117 Elm Tree Road	NB	Jul-15	ATC	No	3030-304	3030	3040		Yes	Yes	Yes	OK
18	Calibration		9	A1117 Elm Tree Road	SB	Jul-15	ATC	No	3040-303	3040	3030		Yes	Yes	Yes	OK
19	Validation		10	A146 Beccles Road	NEB	Jul-15	ATC	No	0111-101	10111	10109		Yes	Yes	Yes	OK
20	Validation		10	A146 Beccles Road	SWB	Jul-15	ATC	No	0109-101	10109	10111		Yes	Yes	Yes	OK
21	Calibration		11	Kirkley Run	NWB	Jul-15	ATC	No	0103-527	10103	5270		Yes	Yes	Yes	OK
22	Calibration		11	Kirkley Run	SEB	Jul-15	ATC	No	270-1010	5270	10103		Yes	Yes	Yes	OK
23	Calibration		12	A146 Waveney Drive	EB	Jul-15	ATC	No	0088-401	10088	4010		Yes	Yes	Yes	OK
24	Calibration		12	A146 Waveney Drive	WB	Jul-15	ATC	No	010-1008	4010	10088		Yes	Yes	Yes	OK
29	Calibration		15	Katwijk Way	NB	Jul-15	ATC	No	040-1013	6040	10136		Yes	Yes	Yes	OK
30	Calibration		15	Katwijk Way	SB	Jul-15	ATC	No	0136-604	10136	6040		Yes	Yes	Yes	OK
31	Calibration		16	A12 Battery Green Road	NB	Jul-15	ATC	No	6160-615	6160	6150		Yes	Yes	Yes	OK
32	Calibration		16	A12 Battery Green Road	SB	Jul-15	ATC	No	6150-616	6150	6160		Yes	Yes	Yes	OK
33	Validation		17	A12 Old Nelson Street	NB	Jul-15	ATC	No	6140-613	6140	6130		Yes	Yes	Yes	OK
34	Validation		17	A12 Old Nelson Street	SB	Jul-15	ATC	No	6130-614	6130	6140		Yes	Yes	Yes	OK
35	Validation		18	St Peter's Street	EB	Jul-15	ATC	No	6070-607	6070	6075		Yes	Yes	Yes	OK
36	Validation		18	St Peter's Street	WB	Jul-15	ATC	No	6075-607	6075	6070		Yes	Yes	Yes	OK
37	Calibration		19	Denmark Road	EB	Jul-15	ATC	No	200-1013	7200	10139		Yes	Yes	Yes	OK
38	Calibration		19	Denmark Road	WB	Jul-15	ATC	No	0139-720	10139	7200		Yes	Yes	Yes	OK
39	Validation		20	Rotterdam Road	NEB	Jul-15	ATC	No	7210-913	7210	9130		Yes	Yes	Yes	OK
40	Validation		20	Rotterdam Road	SWB	Jul-15	ATC	No	9130-721	9130	7210		Yes	Yes	Yes	OK
41	Calibration		21	Peto Way	NB	Jul-15	ATC	No	0190-706	10190	7060		Yes	Yes	Yes	OK
42	Calibration		21	Peto Way	SB	Jul-15	ATC	No	060-1019	7060	10190		Yes	Yes	Yes	OK
43	Calibration		22	A1117 Normanston Drive	NEB	Jul-15	ATC	No	7050-706	7050	7060		Yes	Yes	Yes	OK
44	Calibration		22	A1117 Normanston Drive	SWB	Jul-15	ATC	No	7060-705	7060	7050		Yes	Yes	Yes	OK
45	Calibration		23	A1144 Normanston Drive	EB	Jul-15	ATC	No	9240-913	9240	9130		Yes	Yes	Yes	OK
46	Calibration		23	A1144 Normanston Drive	WB	Jul-15	ATC	No	9130-924	9130	9240		Yes	Yes	Yes	OK
47	Calibration		24	Oulton Road	EB	Jul-15	ATC	No	270-1001	9270	10010		Yes	Yes	Yes	OK
48	Calibration		24	Oulton Road	WB	Jul-15	ATC	No	0010-927	10010	9270		Yes	Yes	Yes	OK
49	Calibration		25	B1375 Gorleston Road	NB	Jul-15	ATC	No	8030-804	8030	8040		Yes	Yes	Yes	OK
50	Calibration		25	B1375 Gorleston Road	SB	Jul-15	ATC	No	8040-803	8040	8030		Yes	Yes	Yes	OK
51	Calibration		26	A1117 Millennium Way	NB	Jul-15	ATC	No	7070-708	7070	7080		Yes	Yes	Yes	OK
52	Calibration		26	A1117 Millennium Way	SB	Jul-15	ATC	No	7080-707	7080	7070		Yes	Yes	Yes	OK
53	Calibration		27	A12 Yarmouth Road	NWB	Jul-15	ATC	No	0242-102	10242	10248		Yes	Yes	Yes	OK
54	Calibration		27	A12 Yarmouth Road	SEB	Jul-15	ATC	No	0248-102	10248	10242		Yes	Yes	Yes	OK
55	Calibration		28	B1385 Corton Road	NB	Jul-15	ATC	No	9460-948	9460	9480		Yes	Yes	Yes	OK
56	Calibration		28	B1385 Corton Road	SB	Jul-15	ATC	No	9480-946	9480	9460		Yes	Yes	Yes	OK
57	Calibration		29	A12 Yarmouth Road	NB	Jul-15	ATC	No	0257-625	10257	6250		Yes	Yes	Yes	OK
58	Calibration		29	A12 Yarmouth Road	SB	Jul-15	ATC	No	250-1025	6250	10257		Yes	Yes	Yes	OK
59	Calibration		30	B1375 Parkhill	NB	Jul-15	ATC	No	0001-807	10001	8070		Yes	Yes	Yes	OK
60	Calibration		30	B1375 Parkhill	SB	Jul-15	ATC	No	070-1000	8070	10001		Yes	Yes	Yes	OK
61	Calibration		31	B1074 Bluderston Road	NB	Jul-15	ATC	No	0025-200	10025	20026		Yes	Yes	Yes	OK
62	Calibration		31	B1074 Bluderston Road	SB	Jul-15	ATC	No	0026-100	20026	10025		Yes	Yes	Yes	OK
63	Calibration		32	Fixton Road	NB	Jul-15	ATC	No	440-1002	9440	10024		Yes	Yes	Yes	OK
64	Calibration		32	Fixton Road	SB	Jul-15	ATC	No	0024-944	10024	9440		Yes	Yes	Yes	OK
65	Validation		33	Coast Road	NB	Jul-15	ATC	No	510-1002	9510	10027		Yes	Yes	Yes	OK
66	Validation		33	Coast Road	SB	Jul-15	ATC	No	0027-951	10027	9510		Yes	Yes	Yes	OK
67	Validation	06/605		Katwijk Way	NB	Jul-13	TRADS	No	7280-606	7280	6060		Yes	Yes	Yes	OK
75	Calibration		3	A12YarmouthRd	NB	Jul-15	ANPR	No	6280-452	6280	4520		Yes	Yes	Yes	OK
76	Calibration		3	A12YarmouthRd	SB	Jul-15	ANPR	No	4520-628	4520	6280		Yes	Yes	Yes	OK
79	Validation		5	A12 Pier Terrace	NB	Jul-15	ANPR	No	260-1002	1260	10023		Yes	Yes	Yes	OK
80	Validation		5	A12 Pier Terrace	SB	Jul-15	ANPR	No	0023-126	10023	1260		Yes	Yes	Yes	OK
81	Validation		6	Saltwater Way	NB	Jul-15	ANPR	No	2050-206	2050	2060		Yes	Yes	Yes	OK
82	Validation		6	Saltwater Way	SB	Jul-15	ANPR	No	2060-205	2060	2050		Yes	Yes	Yes	OK
99	Validation		15	North Quay Retail Park	Entry	Jul-15	ANPR	No	9220-923	9220	9230		Yes	Yes	Yes	OK
100	Validation		15	North Quay Retail Park	Exit	Jul-15	ANPR	No	9230-922	9230	9220		Yes	Yes	Yes	OK
101	Validation		16	Links Road Car Park	EB	Jul-15	ANPR	No	9602-960	9602	9603		Yes	Yes	Yes	OK
102	Validation		16	Links Road Car Park	WB	Jul-15	ANPR	No	9603-960	9603	9602		Yes	Yes	Yes	OK
103	Validation		17	Swimming Pool Road Car Park	EB	Jul-15	ANPR	No	090-1025	9090	10251		Yes	Yes	Yes	OK
104	Validation		17	Swimming Pool Road Car Park	WB	Jul-15	ANPR	No	0251-909	10251	9090		Yes	Yes	Yes	OK
106	Validation		18	Battery Green Road Car Park	Exit	Jul-15	ANPR	No	0127-101	10127	10126		Yes	Yes	Yes	OK
107	Validation		19	Gordon Road Car Park Entry	Entry	Jul-15	ANPR	No	6140-905	6140	9050		Yes	Yes	Yes	OK
109	Validation		20	Surrey Street Car Park Entry	Entry	Jul-15	ANPR	No	0130-101	10130	10131		Yes	Yes	Yes	OK
112	Validation		21	Clapham Road Car Park Exit	Exit	Jul-15	ANPR	No	0132-101	10132	10133		Yes	Yes	Yes	OK
113	Validation		22	Clapham Road South	Entry	Jul-15	ANPR	No	0137-101	10137	10138		Yes	Yes	Yes	OK
114	Validation		22	Clapham Road South	Exit	Jul-15	ANPR	No	0138-101	10138	10137		Yes	Yes	Yes	OK
115	Validation		23	St Johns Road Car Park	Entry	Jul-15	ANPR	No	0083-100	10083	10084		Yes	Yes	Yes	OK
116	Validation		23	St Johns Road Car Park	Exit	Jul-15	ANPR	No	0084-100	10084	10083		Yes	Yes	Yes	OK
117	Validation		24a	Kirkley Rise Car Park	Entry	Jul-15	ANPR	No	000-1025	4000	10256		Yes	Yes	Yes	OK
118	Validation		24a	Kirkley Rise Car Park	Exit	Jul-15	ANPR	No	0256-400	10256	4000		Yes	Yes	Yes	OK
119	Validation		24b	Kirkley Rise Car Park	Entry	Jul-15	ANPR	No	300-1007	5300	10078		Yes	Yes	Yes	OK
120	Validation		24b	Kirkley Rise Car Park	Exit	Jul-15	ANPR	No	0078-530	10078	5300		Yes	Yes	Yes	OK
121	Validation		25	Kirkley Cliff Road Car Park	Entry	Jul-15	ANPR	No	120-1007	1120	10075		Yes	Yes	Yes	OK
122	Validation		25	Kirkley Cliff Road Car Park	Exit	Jul-15	ANPR	No	0075-112	10075	1120		Yes	Yes	Yes	OK
125	Validation		27	Marine Parade	Entry	Jul-15	ANPR	No	0081-100	10081	10082		Yes	Yes	Yes	OK
126	Validation		27	Marine Parade	Exit	Jul-15	ANPR	No	0082-100	10082	10081		Yes	Yes	Yes	OK
127	Validation		28	Asda Car Park	Entry	Jul-15	ANPR	No	000-1008	4000	10085		Yes	Yes	Yes	OK
128	Validation		28	Asda Car Park	Exit	Jul-15	ANPR	No	0085-400	10085	4000		Yes	Yes	Yes	OK

ID	Interpeak															
	ALL VEHICLES					CAR					LGV			HGV		
	Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	Observed	Modelled	GEH
5	20	10	2.521	Yes	Yes	7	6	0.536	Yes	Yes	11	3	3.118	1	1	0.021
6	22	24	0.318	Yes	Yes	10	10	0.063	Yes	Yes	12	12	0.109	1	2	0.777
7	589	617	1.147	Yes	Yes	227	254	1.752	Yes	Yes	316	316	0.028	47	47	0.073
8	588	588	0.014	Yes	Yes	161	162	0.066	Yes	Yes	378	378	0.009	48	48	0.048
9	306	369	3.412	Yes	Yes	161	189	2.131	Yes	Yes	123	152	2.514	23	28	0.999
10	322	297	1.430	Yes	Yes	158	102	4.941	Yes	Yes	137	168	2.469	26	27	0.138
11	642	615	1.096	Yes	Yes	313	355	2.322	Yes	Yes	292	237	3.355	38	23	2.775
12	664	615	1.926	Yes	Yes	375	363	0.610	Yes	Yes	249	235	0.922	40	17	4.252
13	385	367	0.937	Yes	Yes	207	198	0.662	Yes	Yes	158	151	0.589	19	18	0.330
14	408	411	0.147	Yes	Yes	203	205	0.167	Yes	Yes	184	185	0.050	21	21	0.017
15	490	535	2.010	Yes	Yes	353	391	1.957	Yes	Yes	114	121	0.609	22	23	0.241
16	492	499	0.332	Yes	Yes	326	325	0.076	Yes	Yes	141	150	0.706	24	24	0.045
17	382	389	0.338	Yes	Yes	211	218	0.490	Yes	Yes	153	153	0.038	18	18	0.016
18	405	395	0.481	Yes	Yes	235	235	0.028	Yes	Yes	153	143	0.792	17	17	0.108
19	417	301	6.104	No	No	224	131	6.982	No	Yes	172	153	1.519	20	17	0.745
20	399	316	4.391	Yes	Yes	258	116	10.393	No	No	124	179	4.425	16	21	1.065
21	132	136	0.315	Yes	Yes	90	93	0.281	Yes	Yes	38	39	0.087	4	4	0.216
22	109	106	0.329	Yes	Yes	75	73	0.211	Yes	Yes	31	30	0.186	4	3	0.320
23	258	262	0.264	Yes	Yes	151	156	0.367	Yes	Yes	97	97	0.001	9	9	0.095
24	266	264	0.111	Yes	Yes	134	135	0.124	Yes	Yes	122	119	0.296	10	10	0.000
29	323	297	1.465	Yes	Yes	193	181	0.849	Yes	Yes	106	101	0.525	24	15	2.005
30	204	198	0.454	Yes	Yes	138	147	0.732	Yes	Yes	49	49	0.012	17	2	4.920
31	465	467	0.092	Yes	Yes	202	204	0.118	Yes	Yes	238	238	0.019	25	25	0.002
32	610	583	1.098	Yes	Yes	355	318	2.024	Yes	Yes	229	239	0.682	26	26	0.019
33	440	436	0.185	Yes	Yes	325	215	6.668	No	No	88	201	9.396	27	20	1.506
34	474	597	5.335	No	No	336	354	0.969	Yes	Yes	115	223	8.336	23	20	0.624
35	646	364	12.533	No	No	274	269	0.311	Yes	Yes	344	90	17.243	27	5	5.571
36	446	206	13.274	No	No	299	154	9.645	No	No	121	46	8.242	25	6	4.828
37	237	244	0.456	Yes	Yes	153	158	0.420	Yes	Yes	78	79	0.165	7	7	0.142
38	338	345	0.367	Yes	Yes	228	232	0.253	Yes	Yes	99	102	0.278	11	11	0.047
39	146	110	3.165	Yes	Yes	87	76	1.234	Yes	Yes	54	32	3.392	4	2	1.328
40	140	124	1.398	Yes	Yes	88	84	0.405	Yes	Yes	50	36	2.069	3	4	0.661
41	445	449	0.178	Yes	Yes	303	306	0.182	Yes	Yes	133	133	0.031	10	10	0.074
42	550	553	0.146	Yes	Yes	300	305	0.274	Yes	Yes	237	236	0.065	12	12	0.099
43	641	678	1.458	Yes	Yes	323	358	1.908	Yes	Yes	297	299	0.089	20	21	0.154
44	650	645	0.199	Yes	Yes	356	363	0.346	Yes	Yes	270	258	0.724	24	24	0.027
45	281	298	0.975	Yes	Yes	160	176	1.260	Yes	Yes	110	110	0.005	12	12	0.064
46	275	275	0.004	Yes	Yes	180	177	0.252	Yes	Yes	83	87	0.390	11	11	0.087
47	325	266	3.421	Yes	Yes	182	171	0.812	Yes	Yes	134	86	4.563	9	9	0.053
48	270	253	1.058	Yes	Yes	164	161	0.210	Yes	Yes	99	84	1.557	8	8	0.164
49	445	415	1.457	Yes	Yes	336	306	1.648	Yes	Yes	92	92	0.011	18	17	0.142
50	473	462	0.489	Yes	Yes	367	357	0.523	Yes	Yes	89	89	0.029	16	16	0.090
51	438	472	1.575	Yes	Yes	348	378	1.564	Yes	Yes	75	81	0.656	15	13	0.528
52	392	445	2.597	Yes	Yes	326	356	1.615	Yes	Yes	51	74	2.942	15	15	0.017
53	508	508	0.002	Yes	Yes	318	318	0.017	Yes	Yes	168	168	0.004	22	22	0.039
54	510	481	1.309	Yes	Yes	299	270	1.717	Yes	Yes	185	185	0.035	26	26	0.062
55	88	87	0.074	Yes	Yes	73	73	0.019	Yes	Yes	13	12	0.161	2	2	0.030
56	99	99	0.038	Yes	Yes	80	80	0.012	Yes	Yes	17	17	0.086	2	2	0.090
57	495	489	0.276	Yes	Yes	389	389	0.018	Yes	Yes	80	74	0.639	26	26	0.031
58	542	502	1.750	Yes	Yes	370	331	2.077	Yes	Yes	144	143	0.079	28	28	0.030
59	263	234	1.869	Yes	Yes	210	181	2.101	Yes	Yes	42	42	0.001	11	11	0.023
60	193	186	0.532	Yes	Yes	140	133	0.604	Yes	Yes	46	46	0.008	7	7	0.079
61	116	116	0.031	Yes	Yes	73	73	0.015	Yes	Yes	39	39	0.037	4	4	0.213
62	101	107	0.570	Yes	Yes	11	18	1.711	Yes	Yes	82	82	0.016	8	7	0.224
63	49	50	0.131	Yes	Yes	7	7	0.105	Yes	Yes	40	40	0.063	3	3	0.150
64	71	73	0.209	Yes	Yes	4	4	0.060	Yes	Yes	63	63	0.023	4	6	0.819
65	63	68	0.681	Yes	Yes	7	49	7.867	No	Yes	53	18	5.853	2	1	1.071
66	60	86	3.059	Yes	Yes	14	60	7.464	No	Yes	43	25	3.081	2	1	1.109
67	411	207	11.581	No	No	383	166	13.081	No	No	17	36	3.729	11	5	2.121
75	860	861	0.045	Yes	Yes	704	704	0.013	Yes	Yes	119	120	0.076	37	37	0.027
76	864	838	0.891	Yes	Yes	711	685	0.984	Yes	Yes	118	118	0.031	35	35	0.056
79	1041	955	2.722	Yes	Yes	453	570	5.177	No	No	532	346	8.883	56	39	2.459
80	1051	1090	1.182	Yes	Yes	612	687	2.932	Yes	Yes	394	352	2.178	45	51	0.867
81	983	957	0.845	Yes	Yes	718	526	7.686	No	No	228	391	9.284	38	40	0.329
82	931	974	1.410	Yes	Yes	575	577	0.079	Yes	Yes	329	357	1.525	27	40	2.318
99	405	474	3.308	Yes	Yes	376	296	4.381	Yes	Yes	27	178	14.870	1	0	1.414
100	402	372	1.542	Yes	Yes	373	283	4.987	Yes	Yes	28	88	7.851	1	1	0.174
101	10	0	4.435	Yes	Yes	10	0	4.359	Yes	Yes	0	0	0.816	0	0	0.000
102	10	0	4.397	Yes	Yes	9	0	4.282	Yes	Yes	1	0	1.000	0	0	0.000
103	0	0	0.000	Yes	Yes	0	0	0.000	Yes	Yes	0	0	0.000	0	0	0.000
104	0	0	0.000	Yes	Yes	0	0	0.000	Yes	Yes	0	0	0.000	0	0	0.000
106	37	30	1.182	Yes	Yes	36	29	1.283	Yes	Yes	1	1	0.577	0	0	0.000
107	46	33	2.044	Yes	Yes	45	31	2.247	Yes	Yes	1	2	0.816	0	0	0.000
109	62	49	1.682	Yes	Yes	60	49	1.533	Yes	Yes	1	0	1.528	0	0	0.000
112	66	55	1.435	Yes	Yes	65	52	1.700	Yes	Yes	1	3	1.270	0	0	0.000
113	105	126	1.970	Yes	Yes	102	106	0.359	Yes	Yes	3	17	4.644	0	3	2.449
114	109	124	1.406	Yes	Yes	106	113	0.637	Yes	Yes	3	9	2.711	0	2	2.000
115	6	9	1.163	Yes	Yes	4	9	2.119	Yes	Yes	2	0	1.732	1	0	1.155
116	6	2	1.807	Yes	Yes	4	2	0.990	Yes	Yes	1	0	1.633	1	0	1.000
117	10	2	3.311	Yes	Yes	9	2	3.081	Yes	Yes	1	0	1.155	0	0	0.577
118	11	1	4.161	Yes	Yes	11	1	3.962	Yes	Yes	1	0	1.155	0	0	0.577
119	4	7	1.279	Yes	Yes	4	7	1.443	Yes	Yes	0	0	0.816	0	0	0.000
120	3	0	2.517	Yes	Yes	3	0	2.380	Yes	Yes	0	0	0.816	0	0	0.000
121	2	2	0.246	Yes	Yes	2	1	0.447	Yes	Yes	0	1	1.091	0	0	0.000
122	2	2	0.246	Yes	Yes	2	1	0.447	Yes	Yes	0	1	1.091	0	0	0.000
125	41	42	0.155	Yes	Yes	38	39	0.188	Yes	Yes	3	3	0.198	1	0	1.000
126	39	26	2.201	Yes	Yes	36	26	1.713	Yes	Yes	3	0	2.236	1	0	1.000
127	354	362	0.441	Yes	Yes	336	347	0.577	Yes	Yes	16	14	0.558	1	1	0.160
128	356	351	0.275	Yes	Yes	340	318	1.195	Yes	Yes	15	32	3.426	1	1	0.160



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Date Modified: 08/12/2015

Drawn By: ukrdt001

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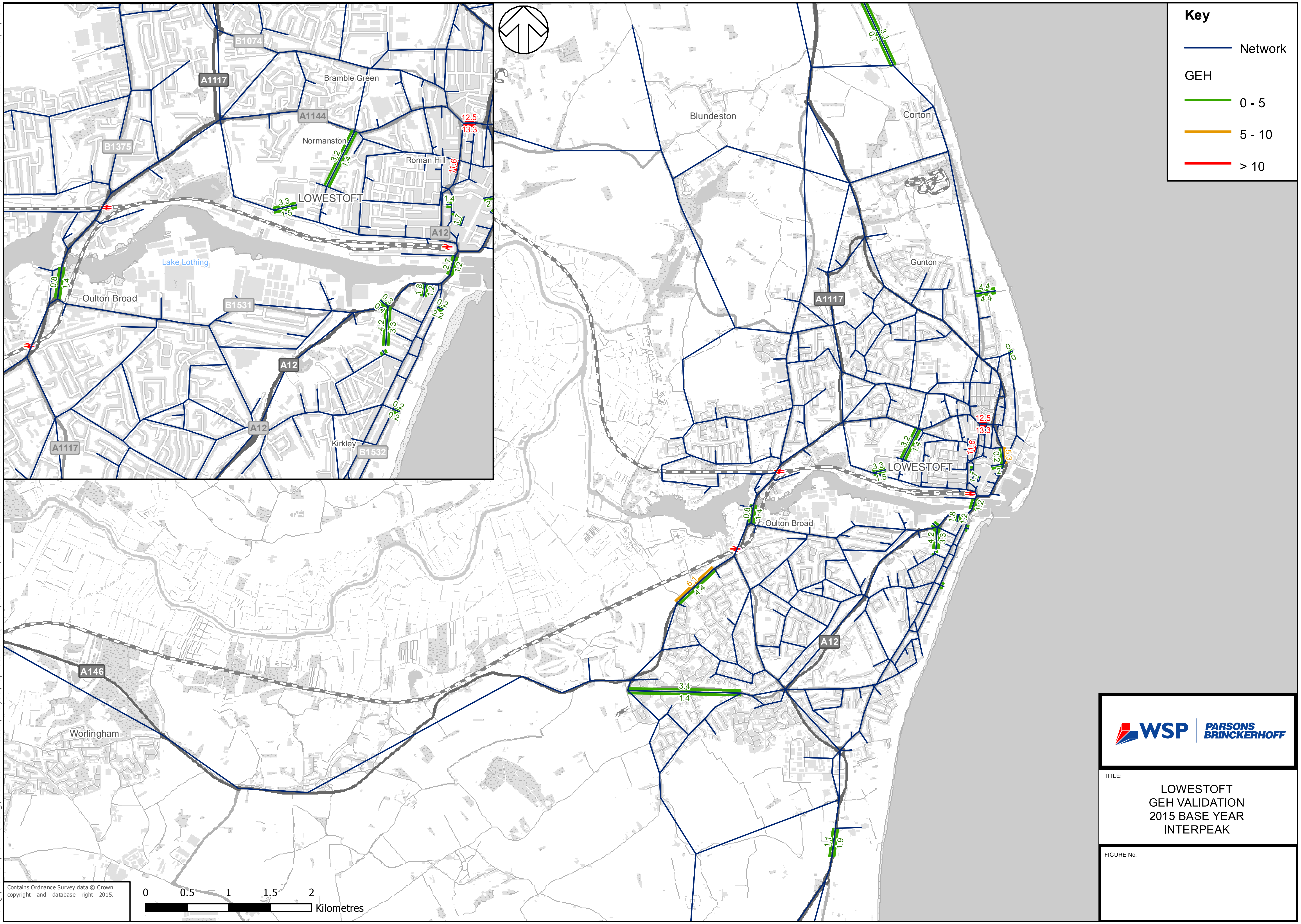

Lowestoft Link Flows

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ID	Calibration / Validation	Area	ID	Site Location	Dir	Date	Data Type	Duplicate?	Ref	A-Node	B-Node	Factor	AM Peak	Interpeak	PM Peak	Check
5	Calibration		3	Gisleham Road	NB	Jul-15	ATC	No	9600-501	9600	5010		Yes	Yes	Yes	OK
6	Calibration		3	Gisleham Road	SB	Jul-15	ATC	No	5010-960	5010	9600		Yes	Yes	Yes	OK
7	Calibration		4	A146 Beccles Road	EB	Jul-15	ATC	No	4514-451	4514	4513		Yes	Yes	Yes	OK
8	Calibration		4	A146 Beccles Road	WB	Jul-15	ATC	No	4513-451	4513	4514		Yes	Yes	Yes	OK
9	Validation		5	A1145 Castleton Avenue	EB	Jul-15	ATC	No	5110-506	5110	5060		Yes	Yes	Yes	OK
10	Validation		5	A1145 Castleton Avenue	WB	Jul-15	ATC	No	5060-511	5060	5110		Yes	Yes	Yes	OK
11	Validation		6	A12 London Road	NB	Jul-15	ATC	No	5390-100	5390	1000		Yes	Yes	Yes	OK
12	Validation		6	A12 London Road	SB	Jul-15	ATC	No	1000-539	1000	5390		Yes	Yes	Yes	OK
13	Calibration		7	London Road South	NEB	Jul-15	ATC	No	9606-104	9606	1040		Yes	Yes	Yes	OK
14	Calibration		7	London Road South	SWB	Jul-15	ATC	No	1040-960	1040	9606		Yes	Yes	Yes	OK
15	Calibration		8	A12 Tom Crisp Way	NEB	Jul-15	ATC	No	000-1001	3000	10015		Yes	Yes	Yes	OK
16	Calibration		8	A12 Tom Crisp Way	SWB	Jul-15	ATC	No	0015-300	10015	3000		Yes	Yes	Yes	OK
17	Calibration		9	A1117 Elm Tree Road	NB	Jul-15	ATC	No	3030-304	3030	3040		Yes	Yes	Yes	OK
18	Calibration		9	A1117 Elm Tree Road	SB	Jul-15	ATC	No	3040-303	3040	3030		Yes	Yes	Yes	OK
19	Validation		10	A146 Beccles Road	NEB	Jul-15	ATC	No	0111-101	10111	10109		Yes	Yes	Yes	OK
20	Validation		10	A146 Beccles Road	SWB	Jul-15	ATC	No	0109-101	10109	10111		Yes	Yes	Yes	OK
21	Calibration		11	Kirkley Run	NWB	Jul-15	ATC	No	0103-527	10103	5270		Yes	Yes	Yes	OK
22	Calibration		11	Kirkley Run	SEB	Jul-15	ATC	No	270-1010	5270	10103		Yes	Yes	Yes	OK
23	Calibration		12	A146 Waveney Drive	EB	Jul-15	ATC	No	0088-401	10088	4010		Yes	Yes	Yes	OK
24	Calibration		12	A146 Waveney Drive	WB	Jul-15	ATC	No	010-1008	4010	10088		Yes	Yes	Yes	OK
29	Calibration		15	Katwijk Way	NB	Jul-15	ATC	No	040-1013	6040	10136		Yes	Yes	Yes	OK
30	Calibration		15	Katwijk Way	SB	Jul-15	ATC	No	0136-604	10136	6040		Yes	Yes	Yes	OK
31	Calibration		16	A12 Battery Green Road	NB	Jul-15	ATC	No	6160-615	6160	6150		Yes	Yes	Yes	OK
32	Calibration		16	A12 Battery Green Road	SB	Jul-15	ATC	No	6150-616	6150	6160		Yes	Yes	Yes	OK
33	Validation		17	A12 Old Nelson Street	NB	Jul-15	ATC	No	6140-613	6140	6130		Yes	Yes	Yes	OK
34	Validation		17	A12 Old Nelson Street	SB	Jul-15	ATC	No	6130-614	6130	6140		Yes	Yes	Yes	OK
35	Validation		18	St Peter's Street	EB	Jul-15	ATC	No	6070-607	6070	6075		Yes	Yes	Yes	OK
36	Validation		18	St Peter's Street	WB	Jul-15	ATC	No	6075-607	6075	6070		Yes	Yes	Yes	OK
37	Calibration		19	Denmark Road	EB	Jul-15	ATC	No	200-1013	7200	10139		Yes	Yes	Yes	OK
38	Calibration		19	Denmark Road	WB	Jul-15	ATC	No	0139-720	10139	7200		Yes	Yes	Yes	OK
39	Validation		20	Rotterdam Road	NEB	Jul-15	ATC	No	7210-913	7210	9130		Yes	Yes	Yes	OK
40	Validation		20	Rotterdam Road	SWB	Jul-15	ATC	No	9130-721	9130	7210		Yes	Yes	Yes	OK
41	Calibration		21	Peto Way	NB	Jul-15	ATC	No	0190-706	10190	7060		Yes	Yes	Yes	OK
42	Calibration		21	Peto Way	SB	Jul-15	ATC	No	060-1019	7060	10190		Yes	Yes	Yes	OK
43	Calibration		22	A1117 Normanston Drive	NEB	Jul-15	ATC	No	7050-706	7050	7060		Yes	Yes	Yes	OK
44	Calibration		22	A1117 Normanston Drive	SWB	Jul-15	ATC	No	7060-705	7060	7050		Yes	Yes	Yes	OK
45	Calibration		23	A1144 Normanston Drive	EB	Jul-15	ATC	No	9240-913	9240	9130		Yes	Yes	Yes	OK
46	Calibration		23	A1144 Normanston Drive	WB	Jul-15	ATC	No	9130-924	9130	9240		Yes	Yes	Yes	OK
47	Calibration		24	Oulton Road	EB	Jul-15	ATC	No	270-1001	9270	10010		Yes	Yes	Yes	OK
48	Calibration		24	Oulton Road	WB	Jul-15	ATC	No	0010-927	10010	9270		Yes	Yes	Yes	OK
49	Calibration		25	B1375 Gorleston Road	NB	Jul-15	ATC	No	8030-804	8030	8040		Yes	Yes	Yes	OK
50	Calibration		25	B1375 Gorleston Road	SB	Jul-15	ATC	No	8040-803	8040	8030		Yes	Yes	Yes	OK
51	Calibration		26	A1117 Millennium Way	NB	Jul-15	ATC	No	7070-708	7070	7080		Yes	Yes	Yes	OK
52	Calibration		26	A1117 Millennium Way	SB	Jul-15	ATC	No	7080-707	7080	7070		Yes	Yes	Yes	OK
53	Calibration		27	A12 Yarmouth Road	NWB	Jul-15	ATC	No	0242-102	10242	10248		Yes	Yes	Yes	OK
54	Calibration		27	A12 Yarmouth Road	SEB	Jul-15	ATC	No	0248-102	10248	10242		Yes	Yes	Yes	OK
55	Calibration		28	B1385 Corton Road	NB	Jul-15	ATC	No	9460-948	9460	9480		Yes	Yes	Yes	OK
56	Calibration		28	B1385 Corton Road	SB	Jul-15	ATC	No	9480-946	9480	9460		Yes	Yes	Yes	OK
57	Calibration		29	A12 Yarmouth Road	NB	Jul-15	ATC	No	0257-625	10257	6250		Yes	Yes	Yes	OK
58	Calibration		29	A12 Yarmouth Road	SB	Jul-15	ATC	No	250-1025	6250	10257		Yes	Yes	Yes	OK
59	Calibration		30	B1375 Parkhill	NB	Jul-15	ATC	No	0001-807	10001	8070		Yes	Yes	Yes	OK
60	Calibration		30	B1375 Parkhill	SB	Jul-15	ATC	No	070-1000	8070	10001		Yes	Yes	Yes	OK
61	Calibration		31	B1074 Bluderston Road	NB	Jul-15	ATC	No	0025-200	10025	20026		Yes	Yes	Yes	OK
62	Calibration		31	B1074 Bluderston Road	SB	Jul-15	ATC	No	0026-100	20026	10025		Yes	Yes	Yes	OK
63	Calibration		32	Fixton Road	NB	Jul-15	ATC	No	440-1002	9440	10024		Yes	Yes	Yes	OK
64	Calibration		32	Fixton Road	SB	Jul-15	ATC	No	0024-944	10024	9440		Yes	Yes	Yes	OK
65	Validation		33	Coast Road	NB	Jul-15	ATC	No	510-1002	9510	10027		Yes	Yes	Yes	OK
66	Validation		33	Coast Road	SB	Jul-15	ATC	No	0027-951	10027	9510		Yes	Yes	Yes	OK
67	Validation		06/605	Katwijk Way	NB	Jul-13	TRADS	No	7280-606	7280	6060		Yes	Yes	Yes	OK
75	Calibration		3	A12YarmouthRd	NB	Jul-15	ANPR	No	6280-452	6280	4520		Yes	Yes	Yes	OK
76	Calibration		3	A12YarmouthRd	SB	Jul-15	ANPR	No	4520-628	4520	6280		Yes	Yes	Yes	OK
79	Validation		5	A12 Pier Terrace	NB	Jul-15	ANPR	No	260-1002	1260	10023		Yes	Yes	Yes	OK
80	Validation		5	A12 Pier Terrace	SB	Jul-15	ANPR	No	0023-126	10023	1260		Yes	Yes	Yes	OK
81	Validation		6	Saltwater Way	NB	Jul-15	ANPR	No	2050-206	2050	2060		Yes	Yes	Yes	OK
82	Validation		6	Saltwater Way	SB	Jul-15	ANPR	No	2060-205	2060	2050		Yes	Yes	Yes	OK
99	Validation		15	North Quay Retail Park	Entry	Jul-15	ANPR	No	9220-923	9220	9230		Yes	Yes	Yes	OK
100	Validation		15	North Quay Retail Park	Exit	Jul-15	ANPR	No	9230-922	9230	9220		Yes	Yes	Yes	OK
101	Validation		16	Links Road Car Park	EB	Jul-15	ANPR	No	9602-960	9602	9603		Yes	Yes	Yes	OK
102	Validation		16	Links Road Car Park	WB	Jul-15	ANPR	No	9603-960	9603	9602		Yes	Yes	Yes	OK
103	Validation		17	Swimming Pool Road Car Park	EB	Jul-15	ANPR	No	090-1025	9090	10251		Yes	Yes	Yes	OK
104	Validation		17	Swimming Pool Road Car Park	WB	Jul-15	ANPR	No	0251-909	10251	9090		Yes	Yes	Yes	OK
106	Validation		18	Battery Green Road Car Park	Exit	Jul-15	ANPR	No	0127-101	10127	10126		Yes	Yes	Yes	OK
107	Validation		19	Gordon Road Car Park Entry	Entry	Jul-15	ANPR	No	6140-905	6140	9050		Yes	Yes	Yes	OK
109	Validation		20	Surrey Street Car Park Entry	Entry	Jul-15	ANPR	No	0130-101	10130	10131		Yes	Yes	Yes	OK
112	Validation		21	Clapham Road Car Park Exit	Exit	Jul-15	ANPR	No	0132-101	10132	10133		Yes	Yes	Yes	OK
113	Validation		22	Clapham Road South	Entry	Jul-15	ANPR	No	0137-101	10137	10138		Yes	Yes	Yes	OK
114	Validation		22	Clapham Road South	Exit	Jul-15	ANPR	No	0138-101	10138	10137		Yes	Yes	Yes	OK
115	Validation		23	St Johns Road Car Park	Entry	Jul-15	ANPR	No	0083-100	10083	10084		Yes	Yes	Yes	OK
116	Validation		23	St Johns Road Car Park	Exit	Jul-15	ANPR	No	0084-100	10084	10083		Yes	Yes	Yes	OK
117	Validation		24a	Kirkley Rise Car Park	Entry	Jul-15	ANPR	No	000-1025	4000	10256		Yes	Yes	Yes	OK
118	Validation		24a	Kirkley Rise Car Park	Exit	Jul-15	ANPR	No	0256-400	10256	4000		Yes	Yes	Yes	OK
119	Validation		24b	Kirkley Rise Car Park	Entry	Jul-15	ANPR	No	300-1007	5300	10078		Yes	Yes	Yes	OK
120	Validation		24b	Kirkley Rise Car Park	Exit	Jul-15	ANPR	No	0078-530	10078	5300		Yes	Yes	Yes	OK
121	Validation		25	Kirkley Cliff Road Car Park	Entry	Jul-15	ANPR	No	120-1007	1120	10075		Yes	Yes	Yes	OK
122	Validation		25	Kirkley Cliff Road Car Park	Exit	Jul-15	ANPR	No	0075-112	10075	1120		Yes	Yes	Yes	OK
125	Validation		27	Marine Parade	Entry	Jul-15	ANPR	No	0081-100	10081	10082		Yes	Yes	Yes	OK
126	Validation		27	Marine Parade	Exit	Jul-15	ANPR	No	0082-100	10082	10081		Yes	Yes	Yes	OK
127	Validation		28	Asda Car Park	Entry	Jul-15	ANPR	No	000-1008	4000	10085		Yes	Yes	Yes	OK
128	Validation		28	Asda Car Park	Exit	Jul-15	ANPR	No	0085-400	10085	4000		Yes	Yes	Yes	OK

	PM Peak															
	ALL VEHICLES					CAR					LGV			HGV		
ID	Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	Observed	Modelled	GEH
5	42	27	2.594	Yes	Yes	16	12	1.019	Yes	Yes	26	15	2.417	1	0	1.033
6	26	20	1.342	Yes	Yes	12	12	0.115	Yes	Yes	13	7	1.933	1	1	0.068
7	896	924	0.928	Yes	Yes	383	405	1.134	Yes	Yes	489	494	0.248	25	25	0.000
8	664	653	0.429	Yes	Yes	193	182	0.803	Yes	Yes	448	448	0.024	24	23	0.104
9	460	519	2.690	Yes	Yes	275	279	0.240	Yes	Yes	172	229	3.997	12	11	0.331
10	448	497	2.278	Yes	Yes	255	196	3.921	Yes	Yes	180	283	6.751	12	18	1.443
11	759	617	5.403	No	No	375	351	1.282	Yes	Yes	357	256	5.784	26	10	3.771
12	775	794	0.683	Yes	Yes	460	512	2.365	Yes	Yes	294	272	1.316	21	10	2.764
13	520	504	0.718	Yes	Yes	287	275	0.686	Yes	Yes	218	213	0.315	16	16	0.031
14	499	483	0.728	Yes	Yes	270	258	0.708	Yes	Yes	221	216	0.347	9	9	0.169
15	502	559	2.475	Yes	Yes	383	431	2.371	Yes	Yes	111	120	0.885	8	8	0.117
16	708	768	2.227	Yes	Yes	520	540	0.891	Yes	Yes	174	211	2.667	14	17	0.762
17	421	417	0.177	Yes	Yes	254	246	0.490	Yes	Yes	159	164	0.364	8	7	0.186
18	417	448	1.485	Yes	Yes	256	278	1.323	Yes	Yes	152	161	0.750	9	9	0.042
19	535	434	4.599	Yes	No	312	193	7.489	No	No	213	228	1.044	11	13	0.653
20	491	186	16.562	No	No	332	67	18.774	No	No	148	112	3.168	10	7	1.107
21	219	190	2.028	Yes	Yes	155	153	0.141	Yes	Yes	62	35	3.877	2	2	0.171
22	183	178	0.372	Yes	Yes	132	131	0.065	Yes	Yes	49	45	0.619	2	2	0.000
23	221	221	0.000	Yes	Yes	140	142	0.159	Yes	Yes	75	79	0.430	6	0	3.367
24	431	433	0.112	Yes	Yes	233	235	0.160	Yes	Yes	189	189	0.032	10	9	0.182
29	307	282	1.476	Yes	Yes	186	180	0.407	Yes	Yes	101	93	0.762	21	9	3.167
30	225	221	0.268	Yes	Yes	165	212	3.410	Yes	Yes	46	8	7.292	14	1	4.747
31	457	467	0.479	Yes	Yes	241	246	0.348	Yes	Yes	206	211	0.326	10	10	0.045
32	911	881	1.006	Yes	Yes	581	550	1.293	Yes	Yes	309	308	0.036	22	23	0.264
33	630	498	5.558	No	No	502	275	11.533	No	No	104	211	8.538	24	12	2.779
34	577	788	8.082	No	No	449	553	4.635	Yes	No	114	221	8.245	13	14	0.169
35	624	391	10.348	No	No	289	348	3.328	Yes	Yes	324	41	20.960	11	2	3.594
36	510	294	10.757	No	No	365	225	8.138	No	No	127	62	6.644	18	7	3.193
37	261	252	0.554	Yes	Yes	182	180	0.112	Yes	Yes	77	69	0.879	3	3	0.073
38	406	406	0.012	Yes	Yes	290	304	0.805	Yes	Yes	107	95	1.230	8	7	0.453
39	151	124	2.262	Yes	Yes	97	95	0.217	Yes	Yes	52	28	3.744	2	1	0.640
40	146	120	2.275	Yes	Yes	101	82	1.937	Yes	Yes	45	36	1.396	1	2	0.938
41	423	401	1.078	Yes	Yes	295	294	0.044	Yes	Yes	120	100	1.896	8	7	0.453
42	609	588	0.848	Yes	Yes	335	320	0.802	Yes	Yes	264	258	0.394	10	10	0.040
43	608	598	0.399	Yes	Yes	297	297	0.023	Yes	Yes	298	289	0.537	12	12	0.057
44	648	641	0.291	Yes	Yes	371	361	0.502	Yes	Yes	266	272	0.366	12	8	1.208
45	238	222	1.055	Yes	Yes	142	161	1.565	Yes	Yes	90	56	3.979	6	5	0.527
46	323	292	1.740	Yes	Yes	211	200	0.785	Yes	Yes	102	86	1.675	9	6	1.095
47	371	286	4.664	Yes	Yes	205	184	1.532	Yes	Yes	160	96	5.618	6	6	0.156
48	353	355	0.100	Yes	Yes	220	221	0.076	Yes	Yes	126	127	0.089	7	7	0.094
49	543	523	0.860	Yes	Yes	429	410	0.941	Yes	Yes	105	105	0.042	8	8	0.050
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53	702	702	0.009	Yes	Yes	472	471	0.029	Yes	Yes	215	215	0.026	15	16	0.319
54	601	572	1.197	Yes	Yes	380	358	1.132	Yes	Yes	206	199	0.518	15	15	0.032
55	104	104	0.025	Yes	Yes	88	89	0.066	Yes	Yes	14	14	0.033	1	1	0.236
56	93	93	0.013	Yes	Yes	77	77	0.014	Yes	Yes	16	16	0.094	0	0	0.866
57	656	687	1.180	Yes	Yes	561	574	0.564	Yes	Yes	76	100	2.558	20	13	1.692
58	730	672	2.180	Yes	Yes	530	479	2.271	Yes	Yes	182	176	0.480	17	17	0.069
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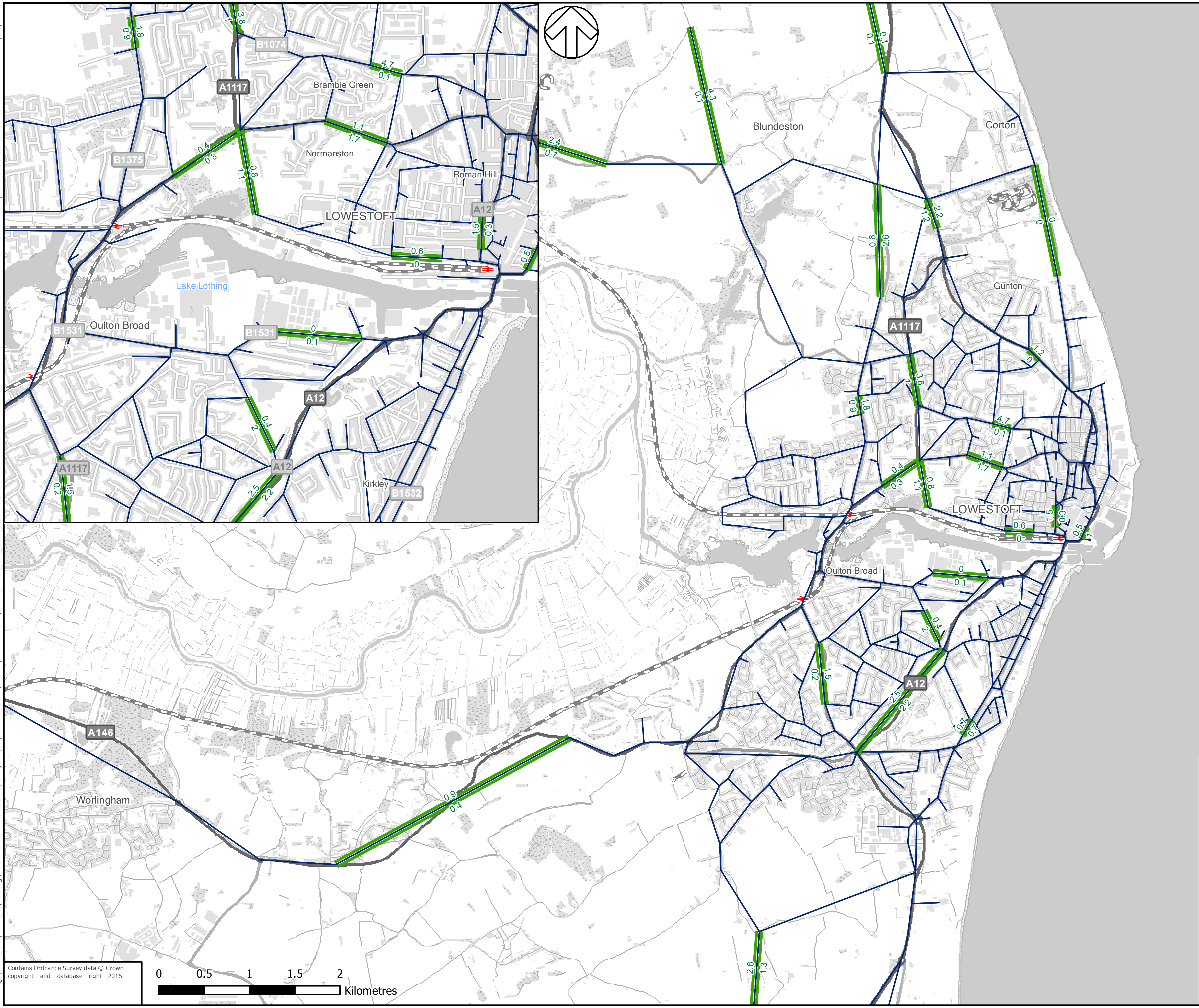
61	219	229	0.677	Yes	Yes	144	154	0.809	Yes	Yes	70	70	0.015	5	5	0.171
62	143	173	2.428	Yes	Yes	21	51	5.101	No	Yes	115	115	0.035	7	7	0.144
63	56	57	0.133	Yes	Yes	8	9	0.343	Yes	Yes	47	47	0.024	1	1	0.160
64	76	118	4.264	Yes	Yes	7	49	7.851	No	Yes	67	67	0.041	2	2	0.000
65	51	23	4.653	Yes	Yes	5	15	3.113	Yes	Yes	44	8	7.060	2	0	2.121
66	69	196	11.087	No	No	14	107	12.001	No	Yes	54	89	4.189	1	0	1.500
67	439	254	9.938	No	No	423	196	12.903	No	No	10	52	7.543	6	6	0.000
75	1579	1575	0.101	Yes	Yes	1388	1389	0.027	Yes	Yes	173	167	0.460	18	19	0.232
76	1019	1023	0.125	Yes	Yes	909	887	0.734	Yes	Yes	91	110	1.895	19	26	1.476
79	1104	976	3.969	Yes	Yes	582	653	2.877	Yes	Yes	499	308	9.493	24	15	2.003
80	1591	1583	0.201	Yes	Yes	1014	991	0.730	Yes	Yes	539	557	0.772	38	35	0.493
81	1114	1209	2.787	Yes	Yes	852	747	3.705	Yes	Yes	228	440	11.588	34	22	2.274
82	1133	1017	3.538	Yes	Yes	749	666	3.135	Yes	Yes	370	331	2.095	13	20	1.626
99	298	428	6.823	No	No	274	277	0.181	Yes	Yes	24	151	13.577	0	0	0.000
100	333	245	5.176	No	Yes	309	189	7.605	No	No	24	56	5.060	0	0	0.000
101	9	0	4.243	Yes	Yes	9	0	4.243	Yes	Yes	0	0	0.000	0	0	0.000
102	8	2	2.683	Yes	Yes	8	2	2.683	Yes	Yes	0	0	0.000	0	0	0.000
103	0	2	2.000	Yes	Yes	0	2	2.000	Yes	Yes	0	0	0.000	0	0	0.000
104	0	0	0.000	Yes	Yes	0	0	0.000	Yes	Yes	0	0	0.000	0	0	0.000
106	16	15	0.254	Yes	Yes	16	15	0.254	Yes	Yes	0	0	0.000	0	0	0.000
107	2	0	2.000	Yes	Yes	1	0	1.414	Yes	Yes	1	0	1.414	0	0	0.000
109	3	0	2.449	Yes	Yes	3	0	2.449	Yes	Yes	0	0	0.000	0	0	0.000
112	15	9	1.732	Yes	Yes	15	9	1.732	Yes	Yes	0	0	0.000	0	0	0.000
113	24	35	2.025	Yes	Yes	22	23	0.211	Yes	Yes	2	11	3.530	0	1	1.414
114	49	76	3.415	Yes	Yes	46	61	2.051	Yes	Yes	3	14	3.773	0	1	1.414
115	8	18	2.774	Yes	Yes	8	17	2.546	Yes	Yes	0	1	1.414	0	0	0.000
116	4	7	1.279	Yes	Yes	4	5	0.471	Yes	Yes	0	1	1.414	0	1	1.414
117	3	2	0.632	Yes	Yes	2	2	0.000	Yes	Yes	1	0	1.414	0	0	0.000
118	11	7	1.333	Yes	Yes	10	7	1.029	Yes	Yes	1	0	1.414	0	0	0.000
119	4	0	2.828	Yes	Yes	4	0	2.828	Yes	Yes	0	0	0.000	0	0	0.000
120	2	1	0.816	Yes	Yes	2	1	0.816	Yes	Yes	0	0	0.000	0	0	0.000
121	1	3	1.414	Yes	Yes	1	2	0.816	Yes	Yes	0	1	1.414	0	0	0.000
122	1	3	1.414	Yes	Yes	1	2	0.816	Yes	Yes	0	1	1.414	0	0	0.000
125	18	15	0.739	Yes	Yes	17	15	0.500	Yes	Yes	1	0	1.414	0	0	0.000
126	28	34	1.078	Yes	Yes	23	19	0.873	Yes	Yes	4	15	3.569	1	0	1.414
127	307	286	1.220	Yes	Yes	288	278	0.594	Yes	Yes	19	8	2.994	0	0	0.000
128	336	365	1.549	Yes	Yes	315	305	0.568	Yes	Yes	21	60	6.128	0	0	0.000



Key

GEH

0 - 5

5 - 10

> 10

Network

WSP | PARSONS BRINCKERHOFF

TITLE:

LOWESTOFT
GEH CALIBRATION
2015 BASE YEAR
PM PEAK HOUR

FIGURE No:

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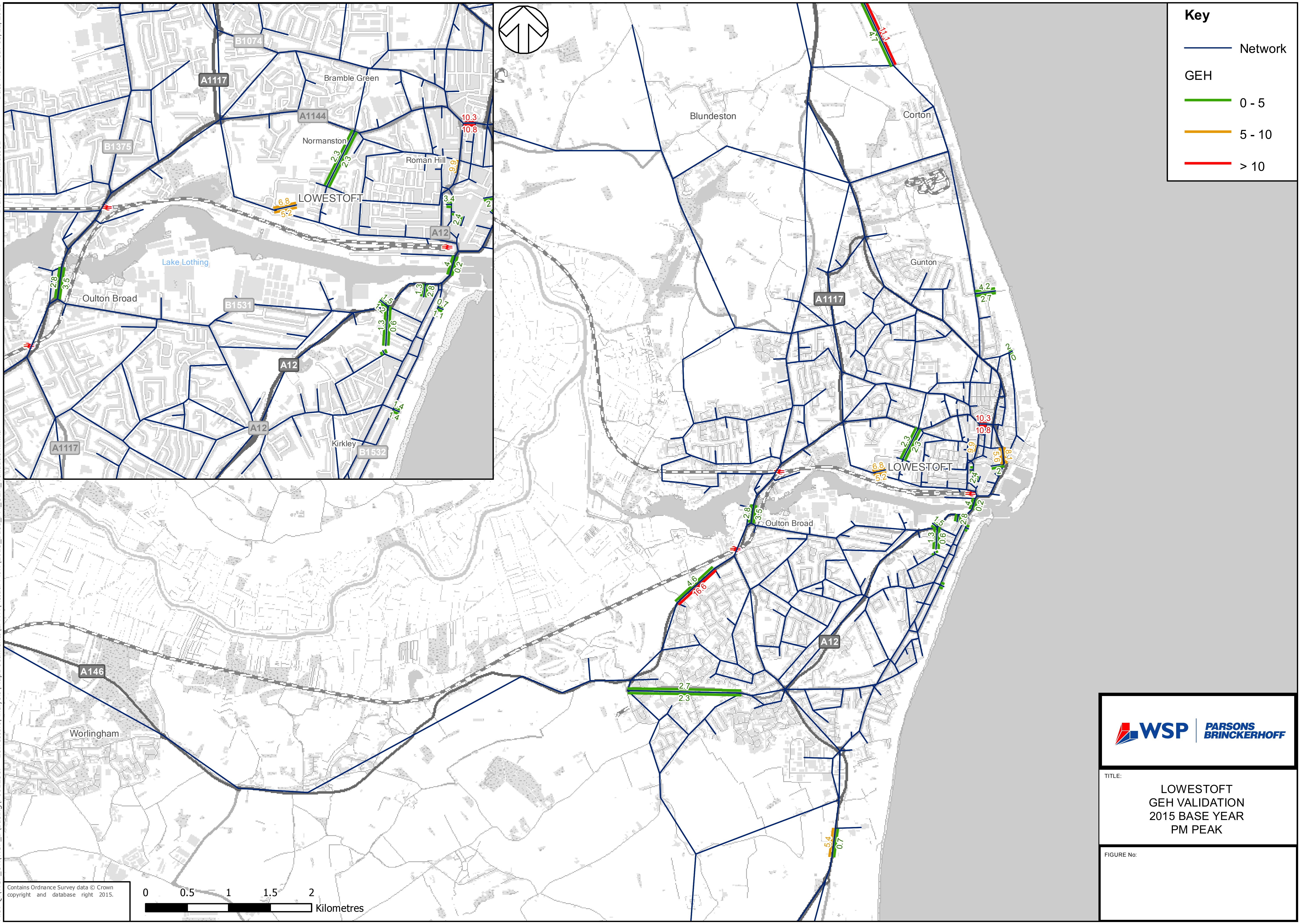
Date Modified: 08/12/2015



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TITLE:

LOWESTOFT
GEH VALIDATION
2015 BASE YEAR
PM PEAK

FIGURE No:

Date Modified: 08/12/2015

Drawn By: ukrdt001

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Appendix F

JOURNEY TIME GRAPHS

Lowestoft Journey Time Graphs - AM Peak

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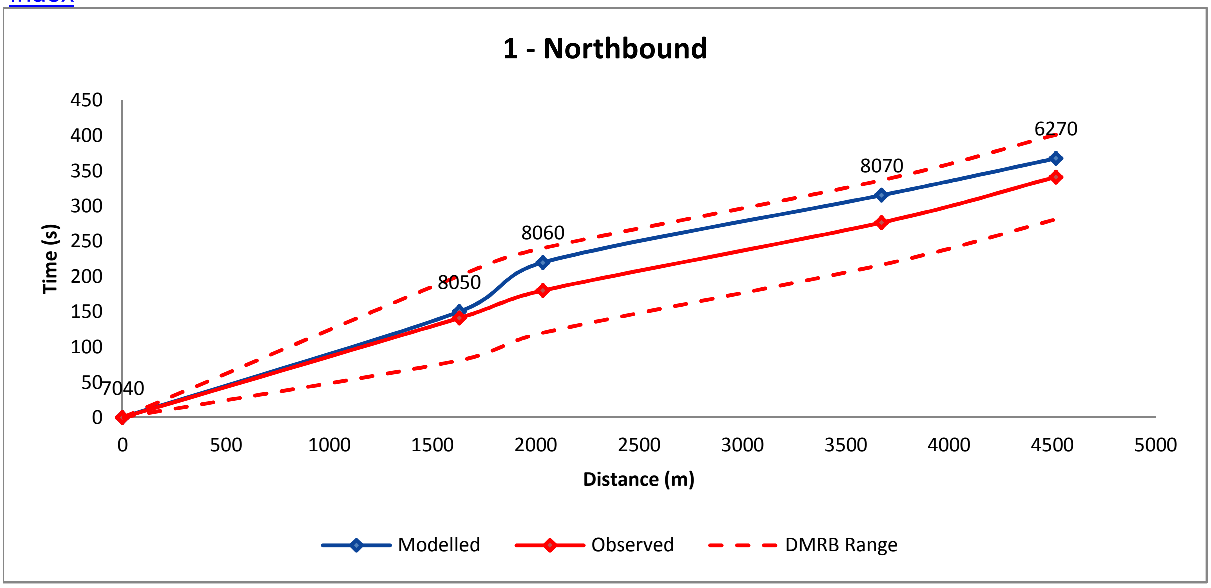

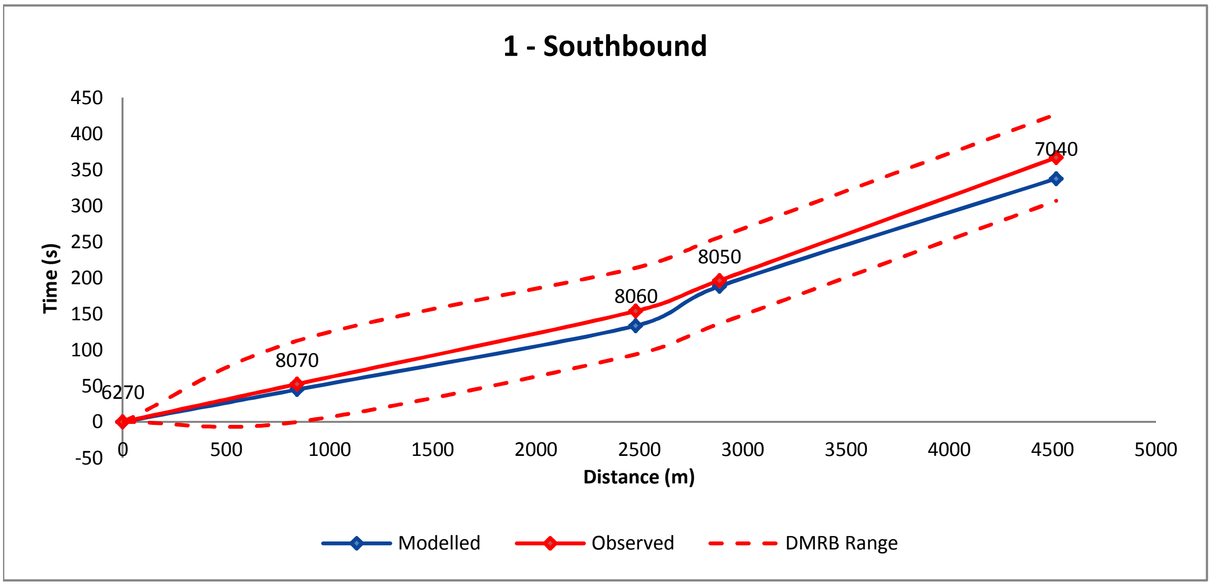

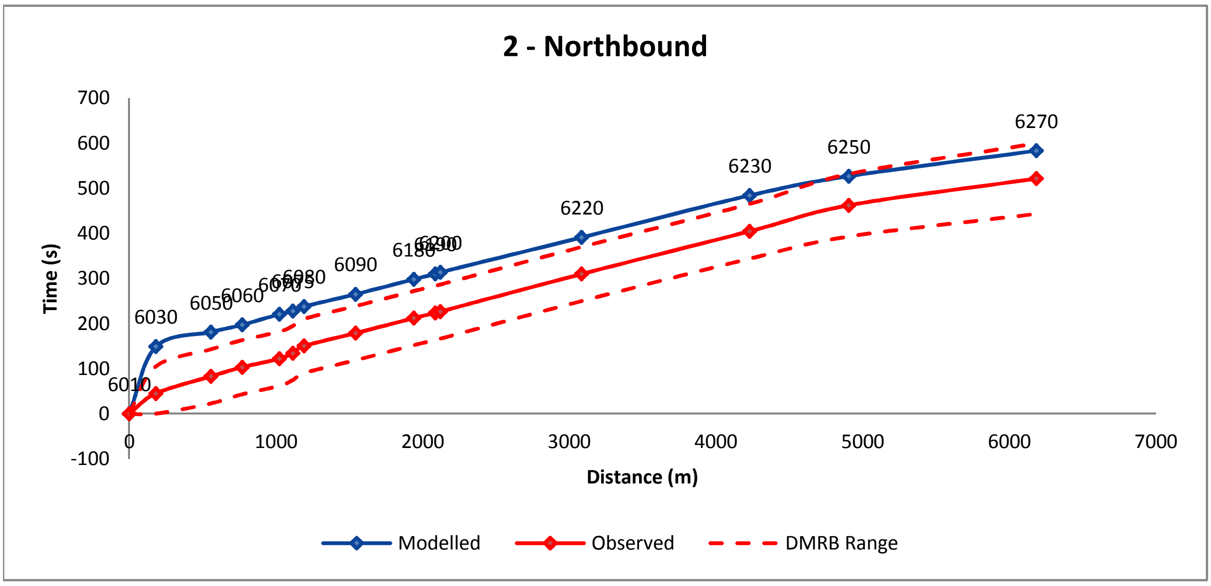

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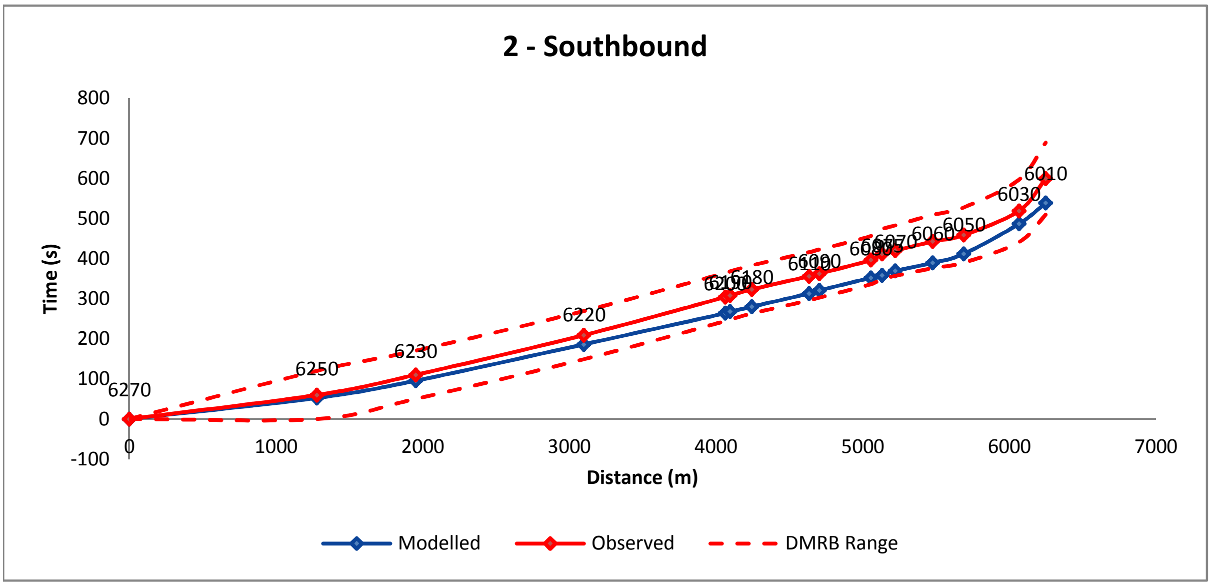
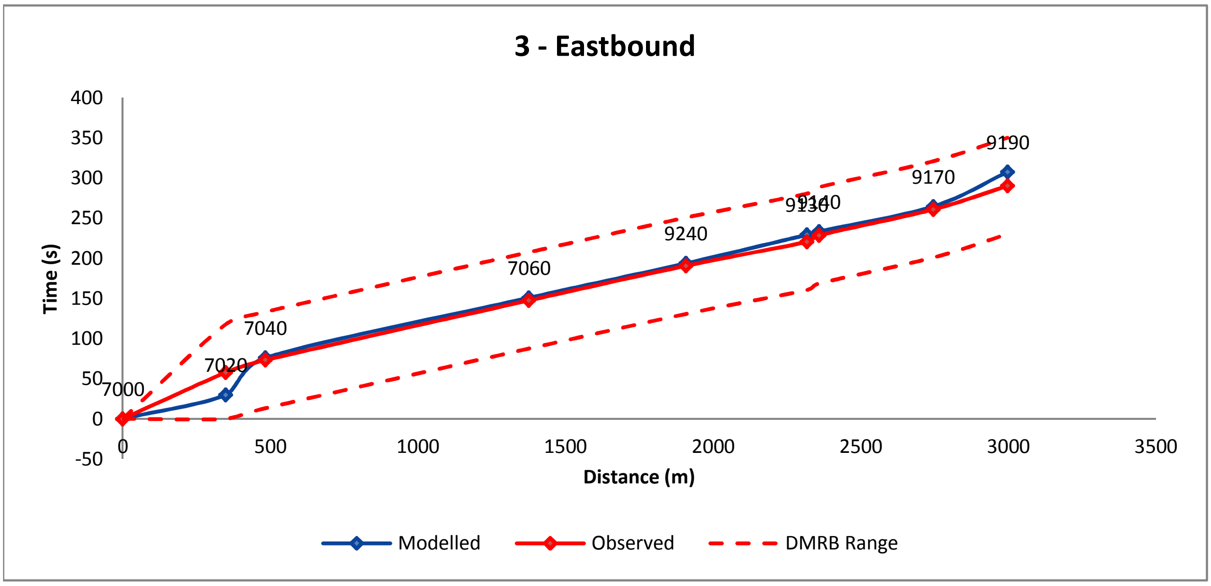
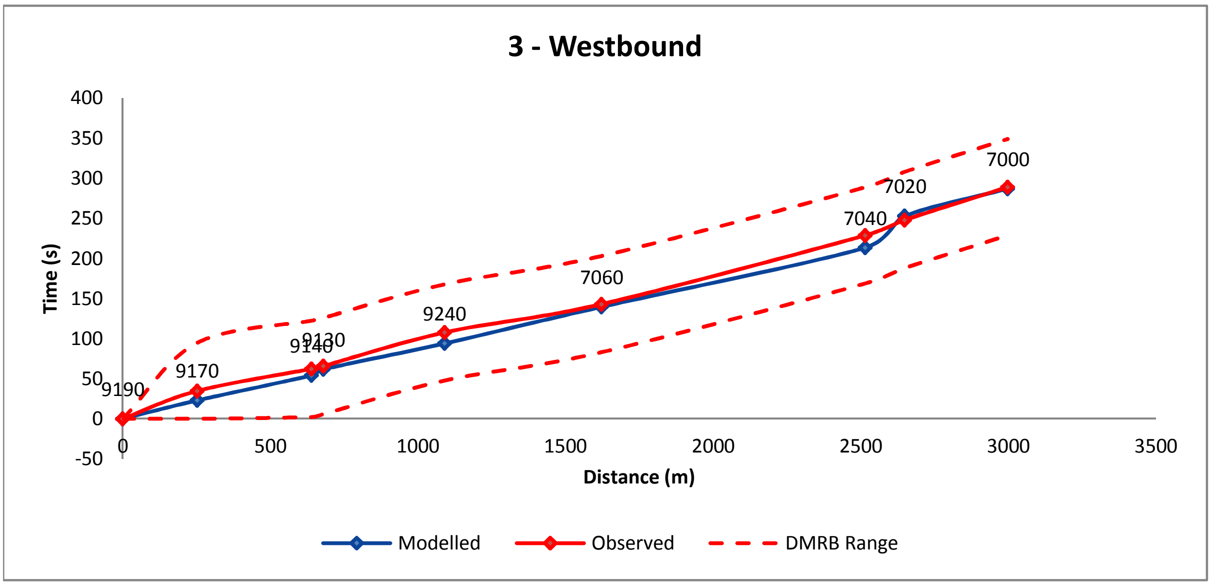
Lowestoft Journey Time Graphs - AM Peak







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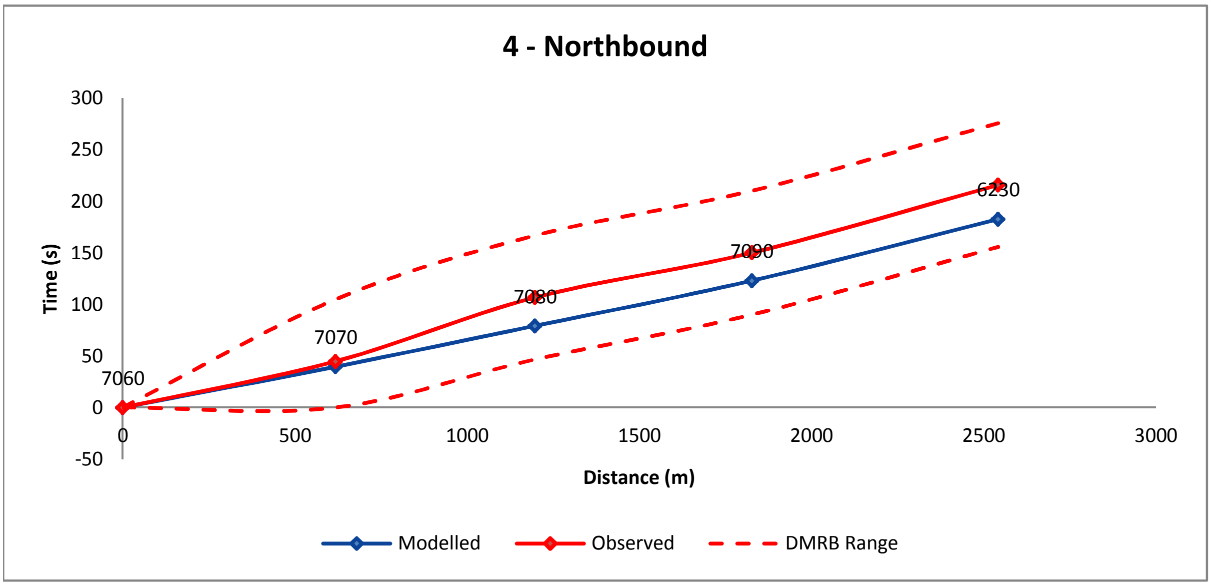
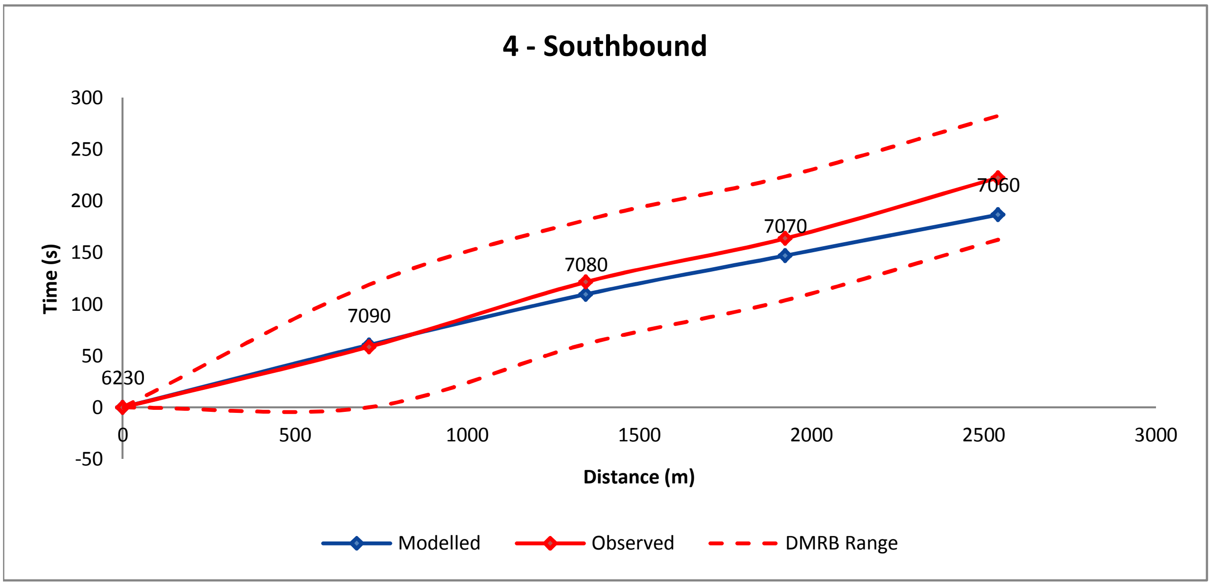
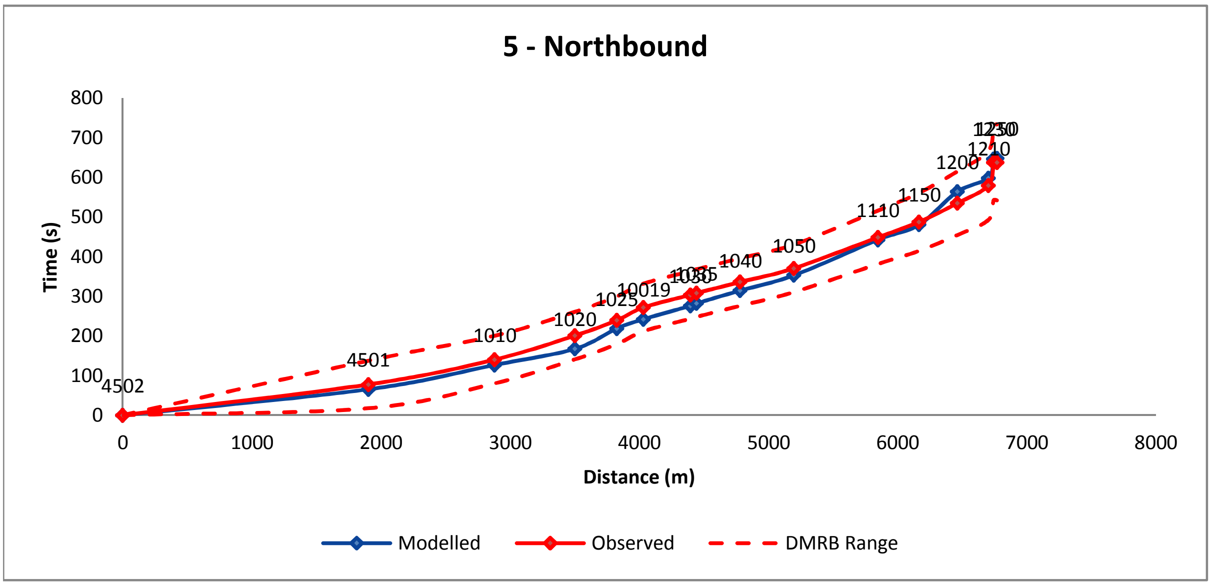
Lowestoft Journey Time Graphs - AM Peak







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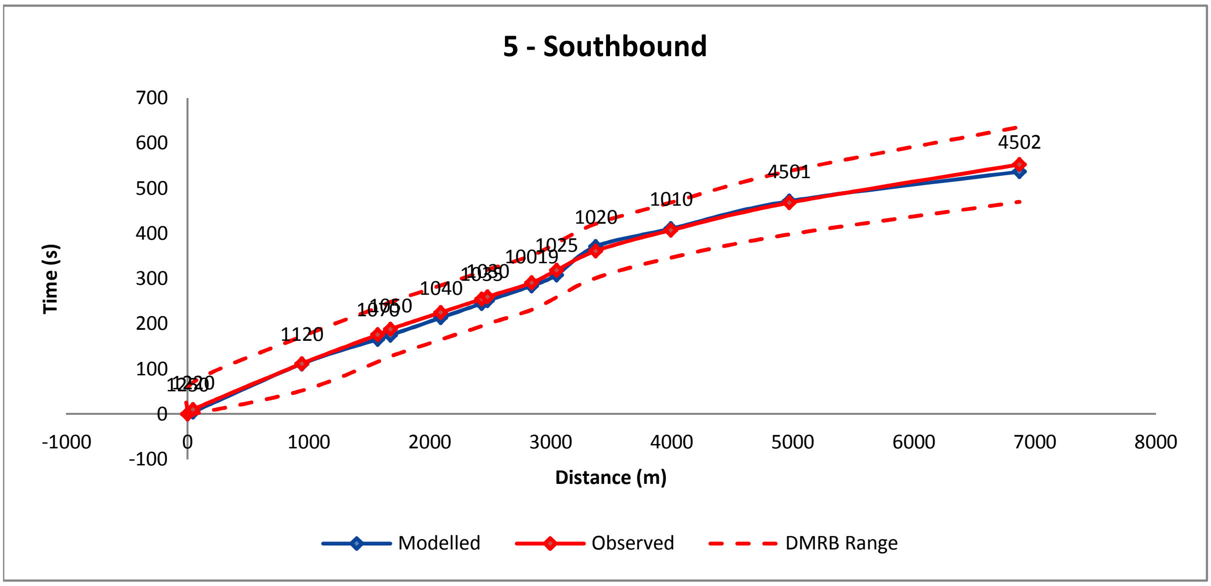
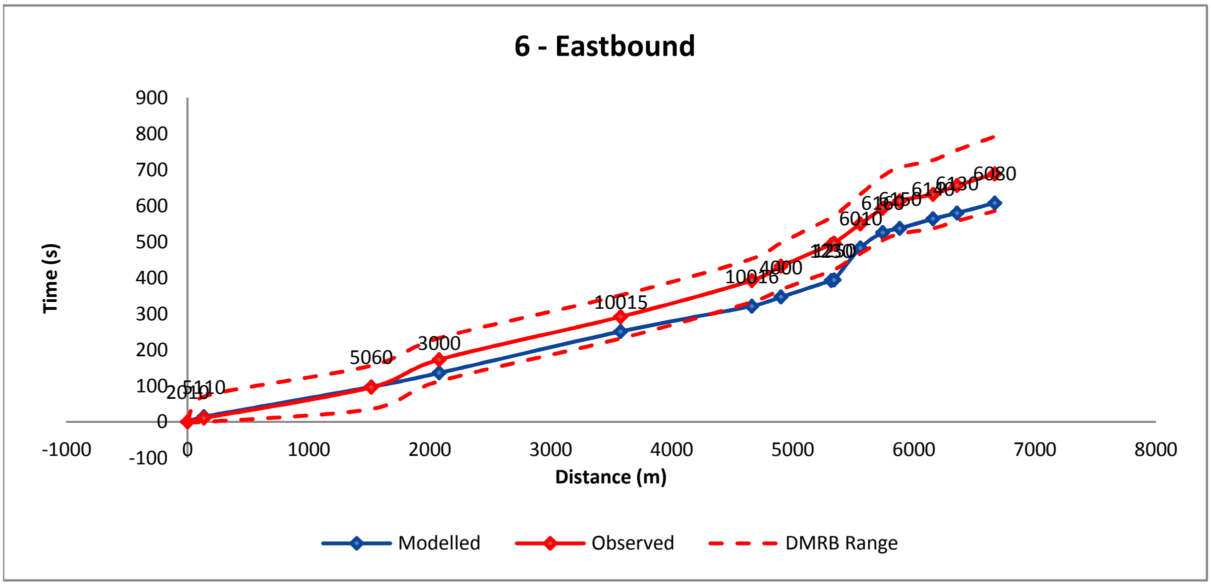
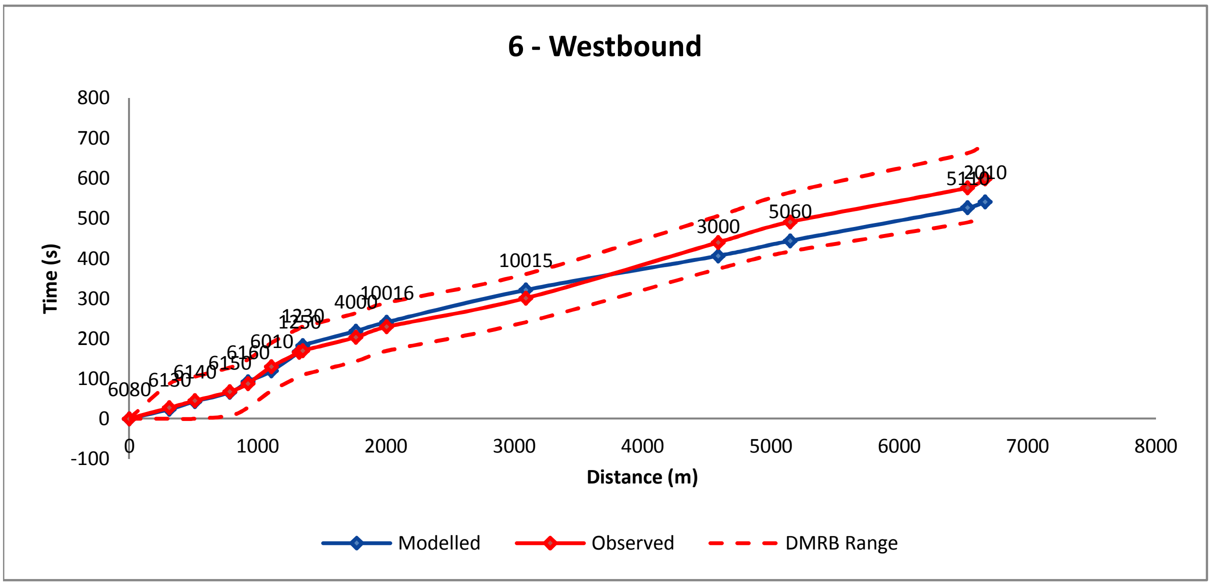
Lowestoft Journey Time Graphs - AM Peak







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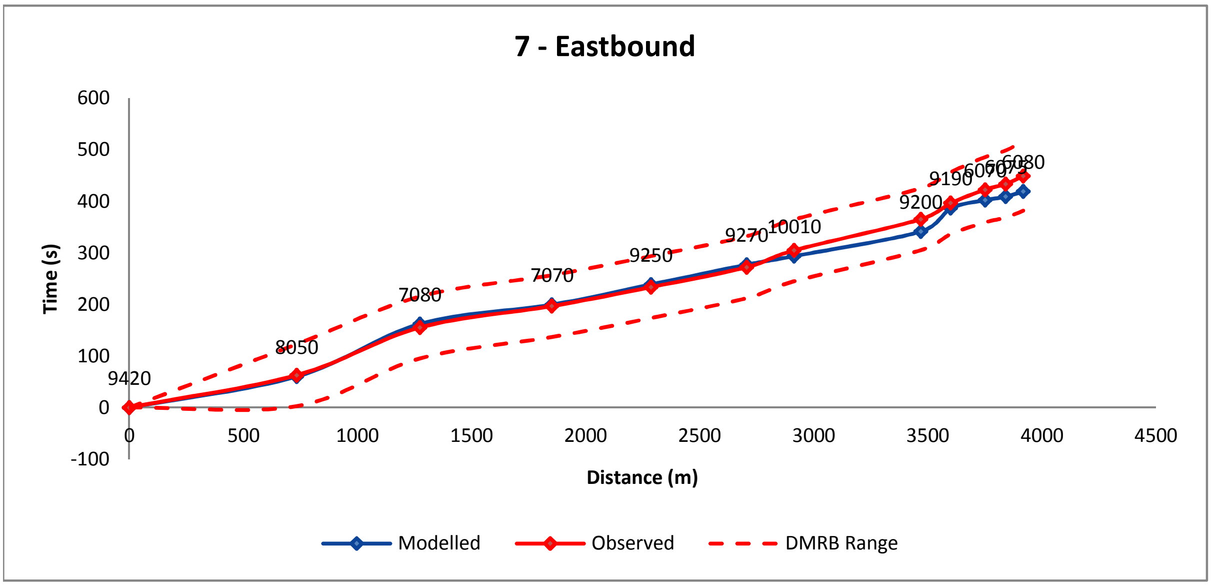

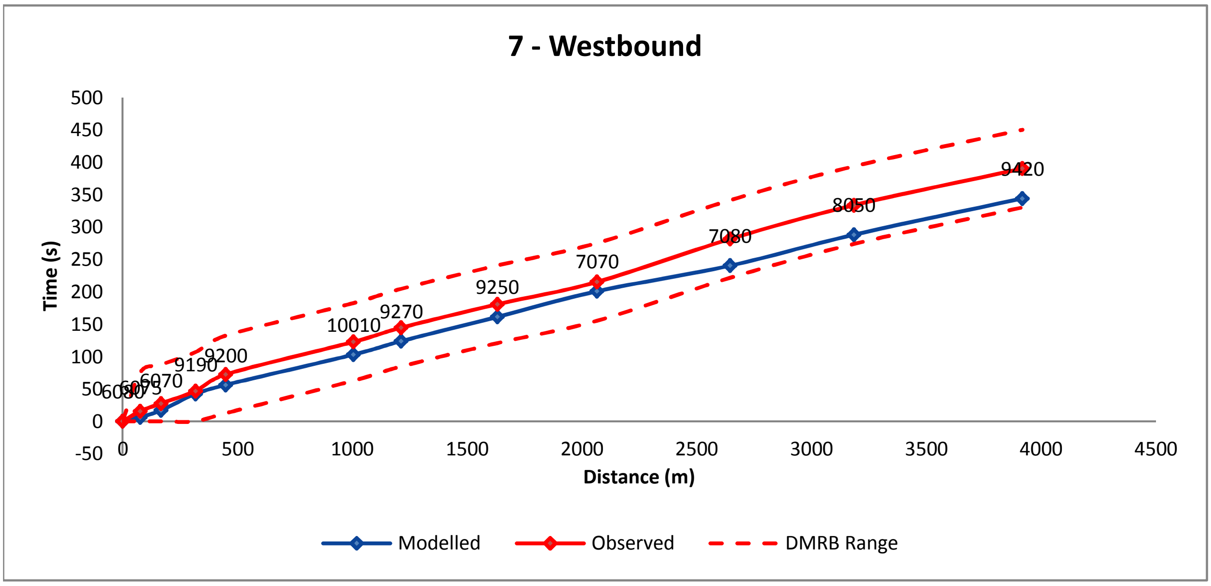

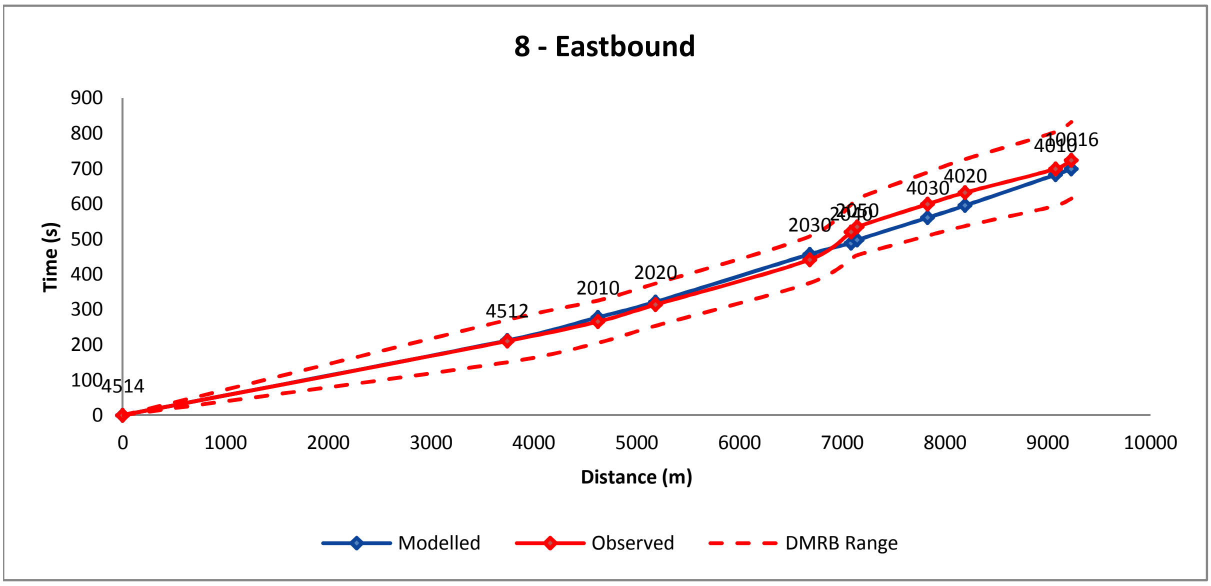

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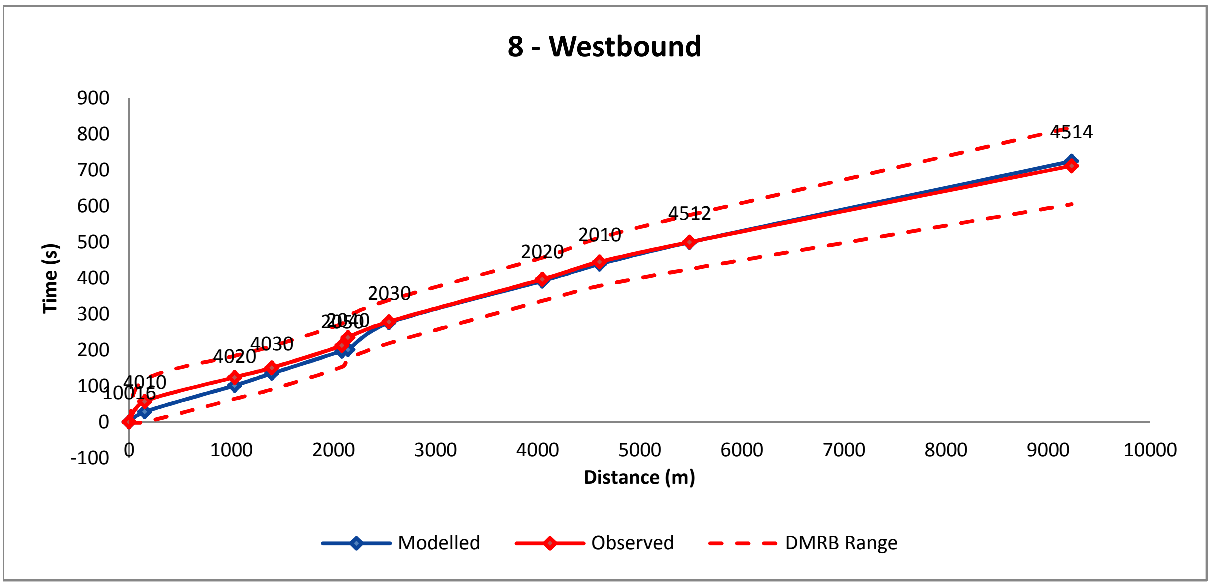

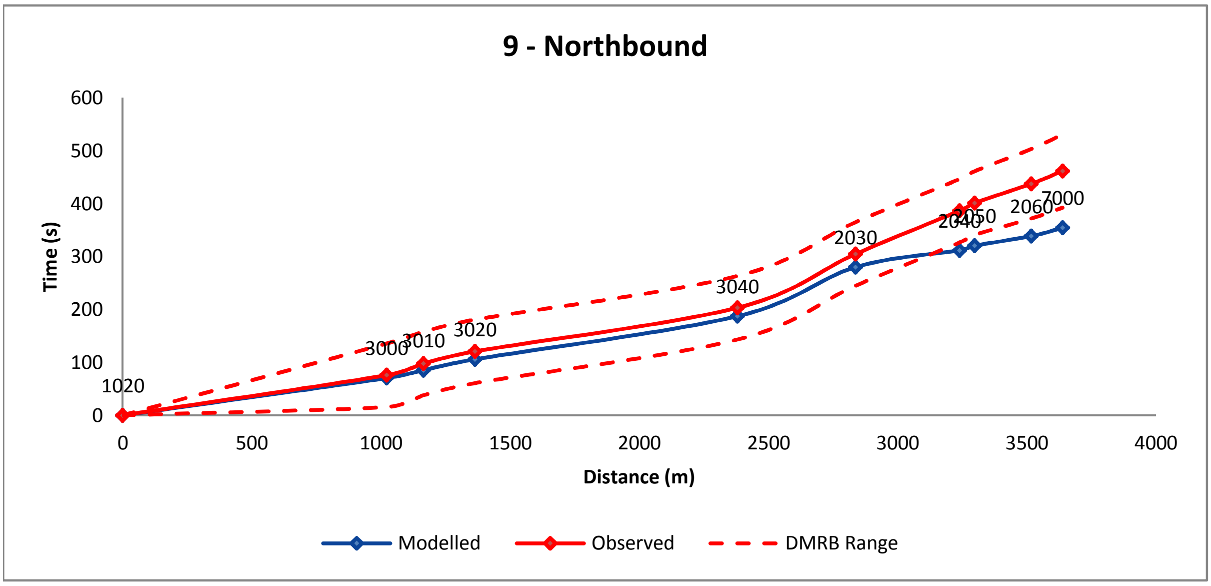

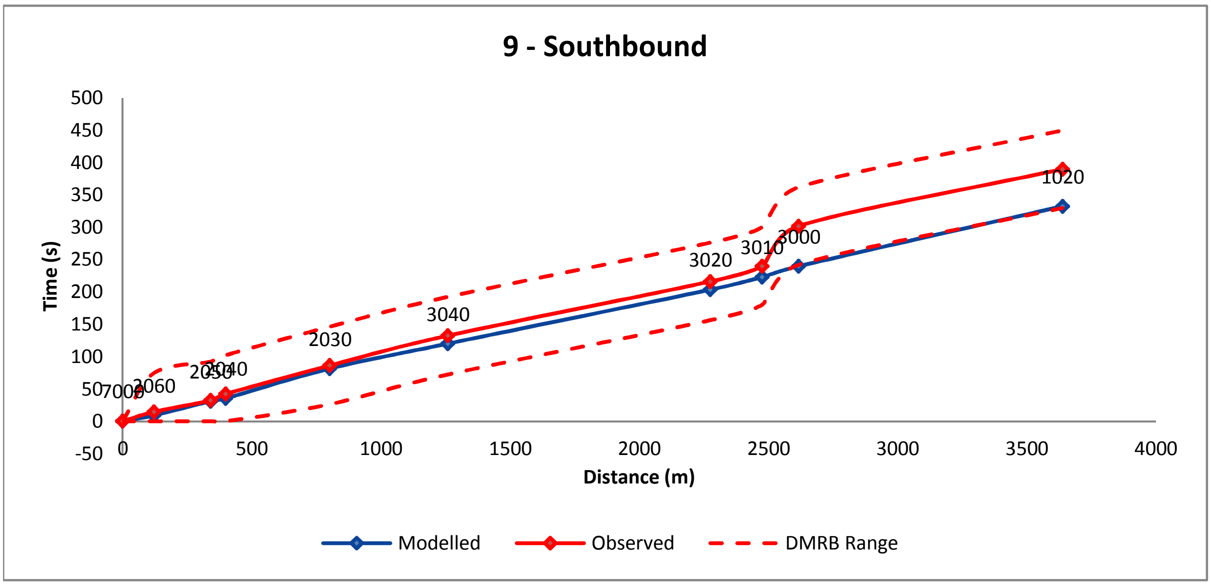

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Lowestoft Journey Time Graphs - Interpeak

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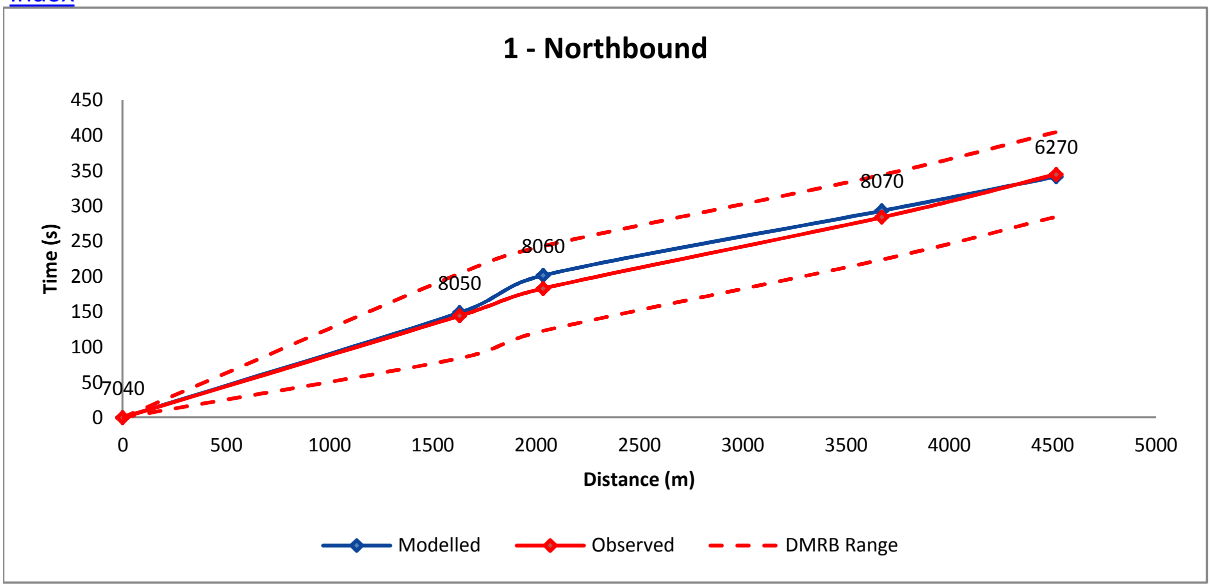

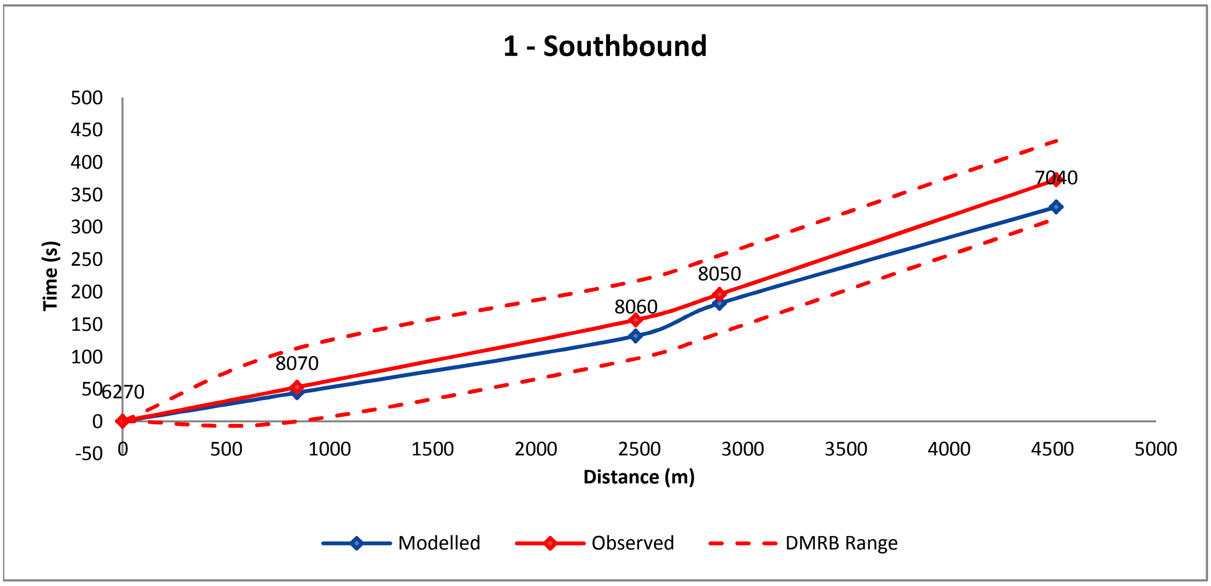

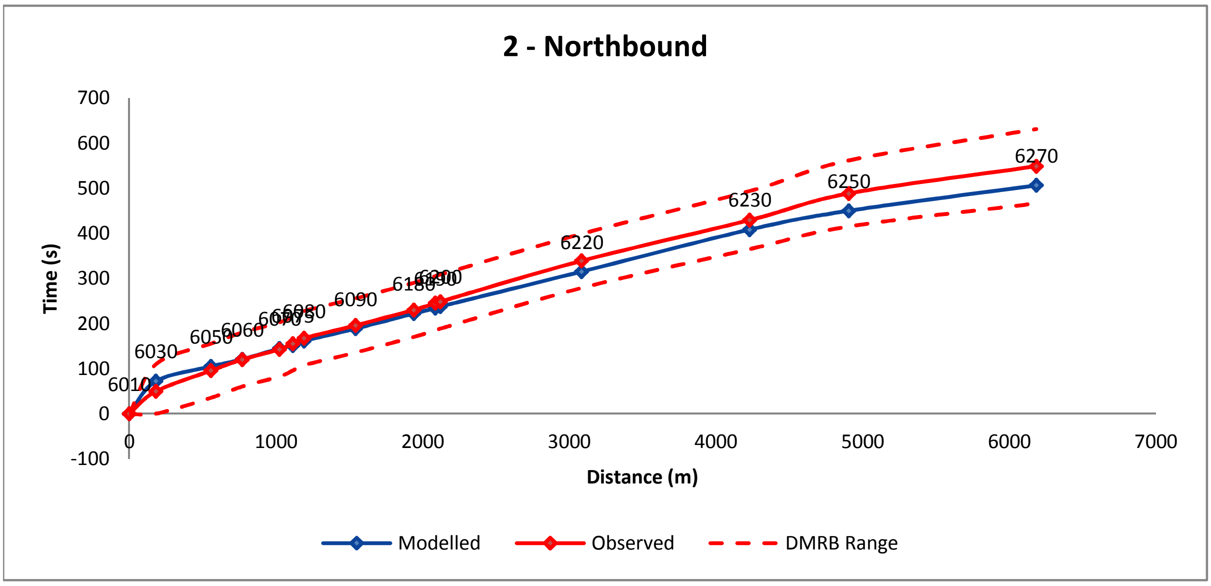

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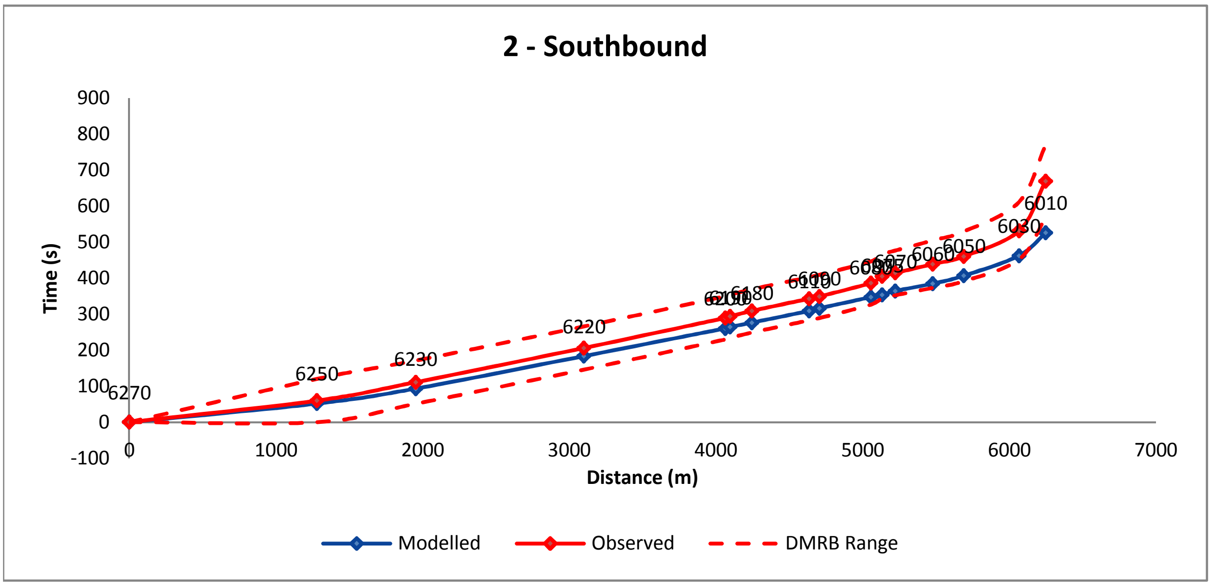
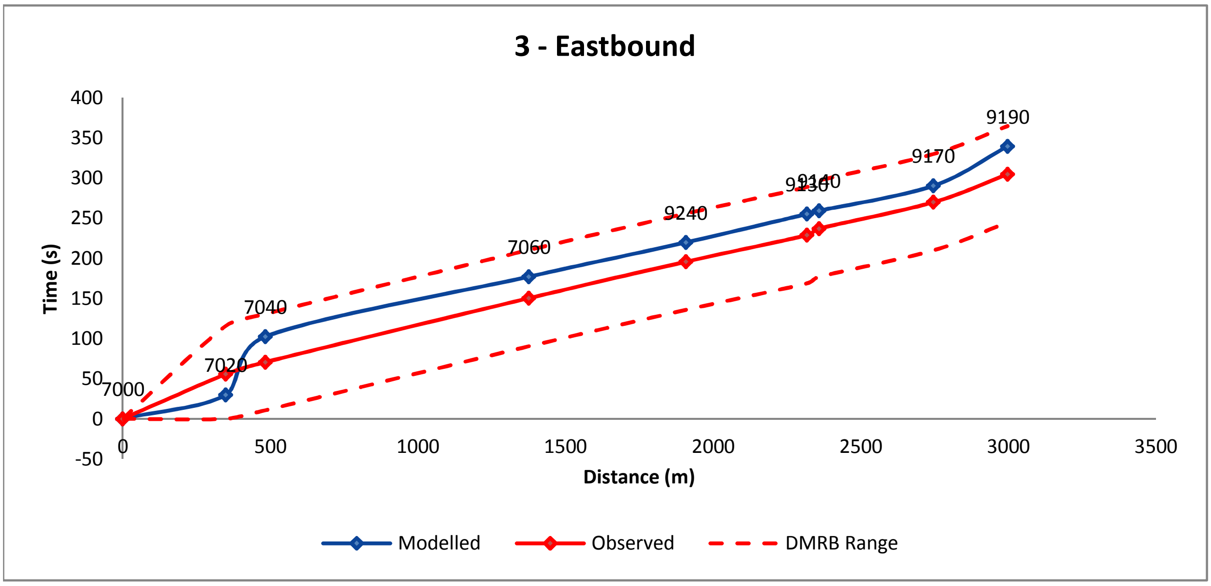
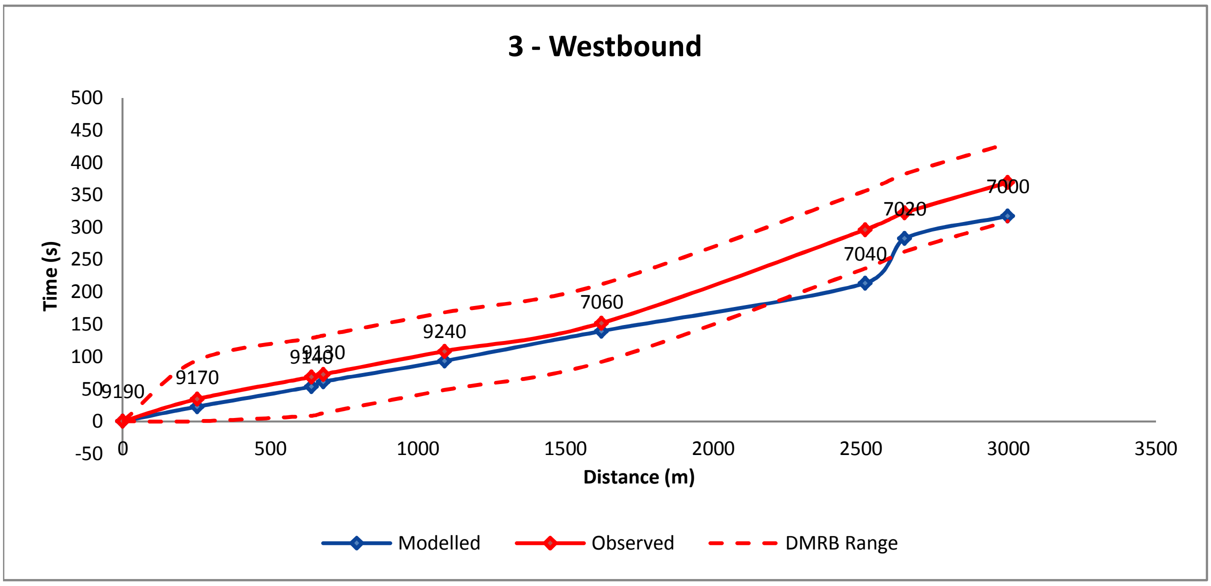
Lowestoft Journey Time Graphs - Interpeak







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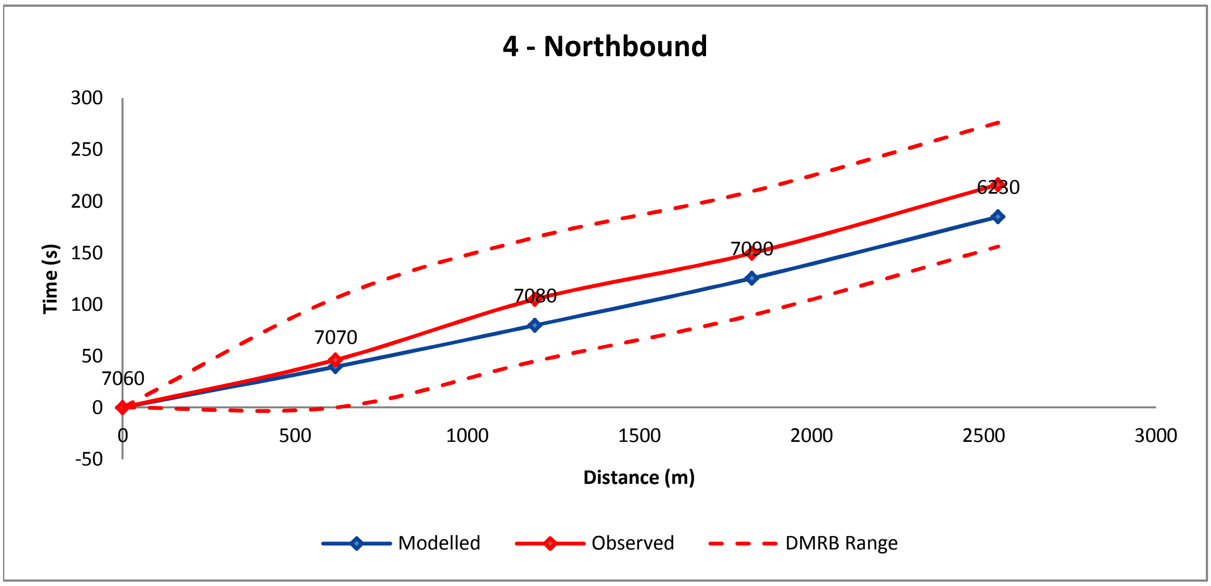

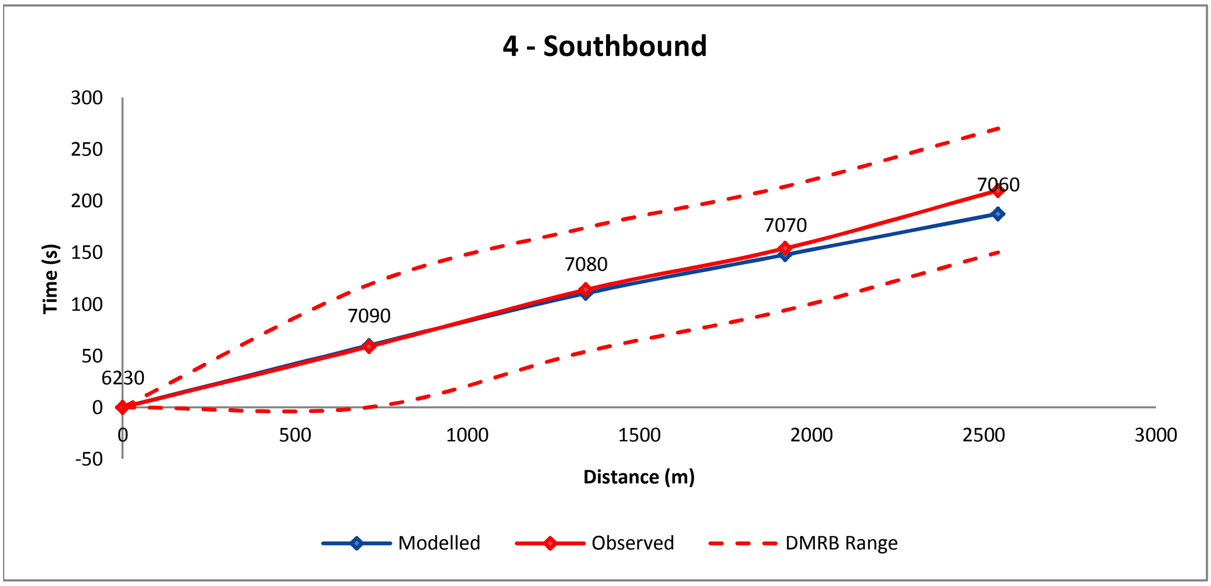

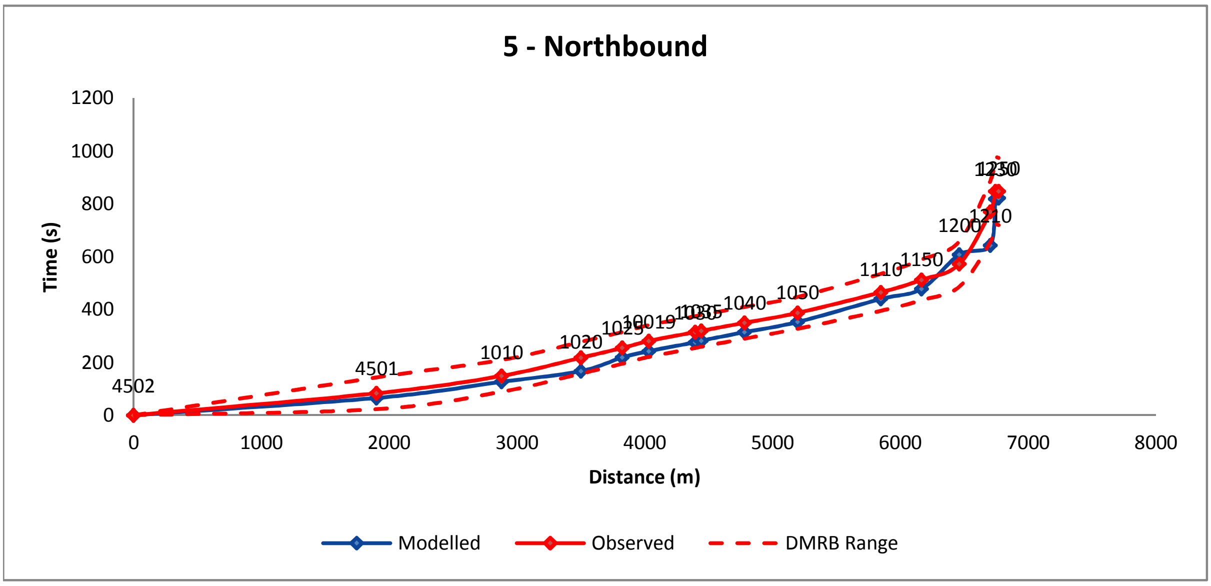

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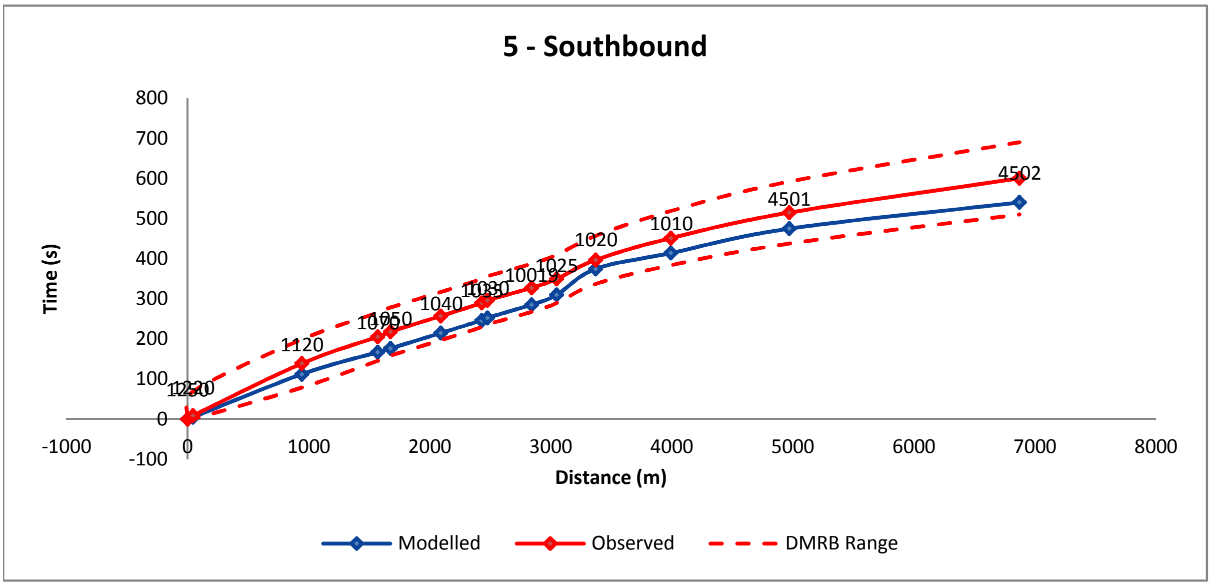

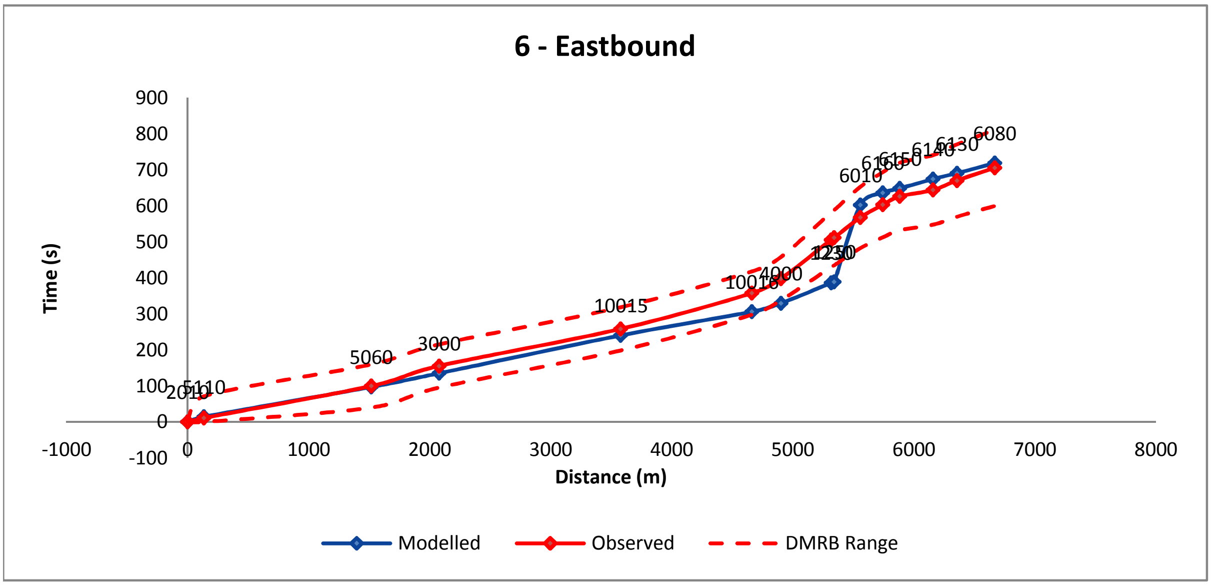

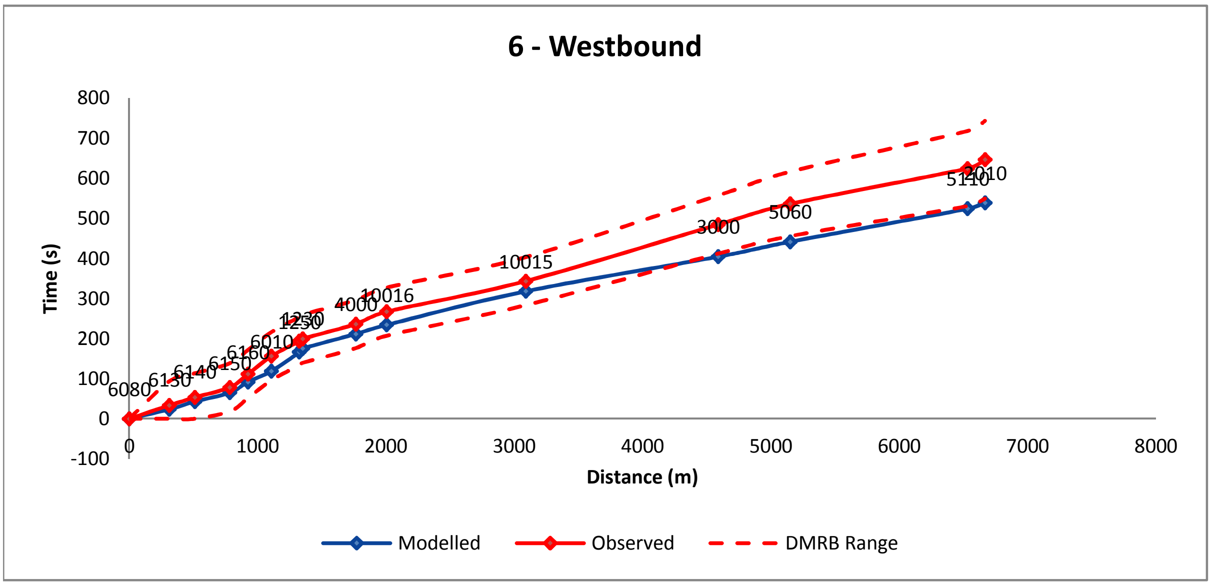

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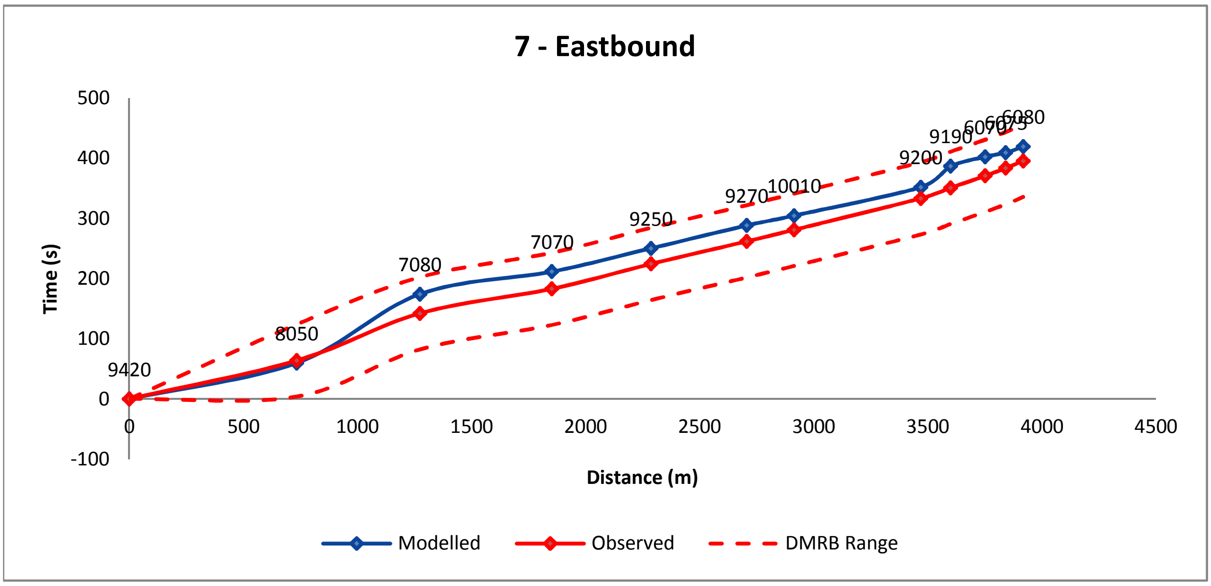
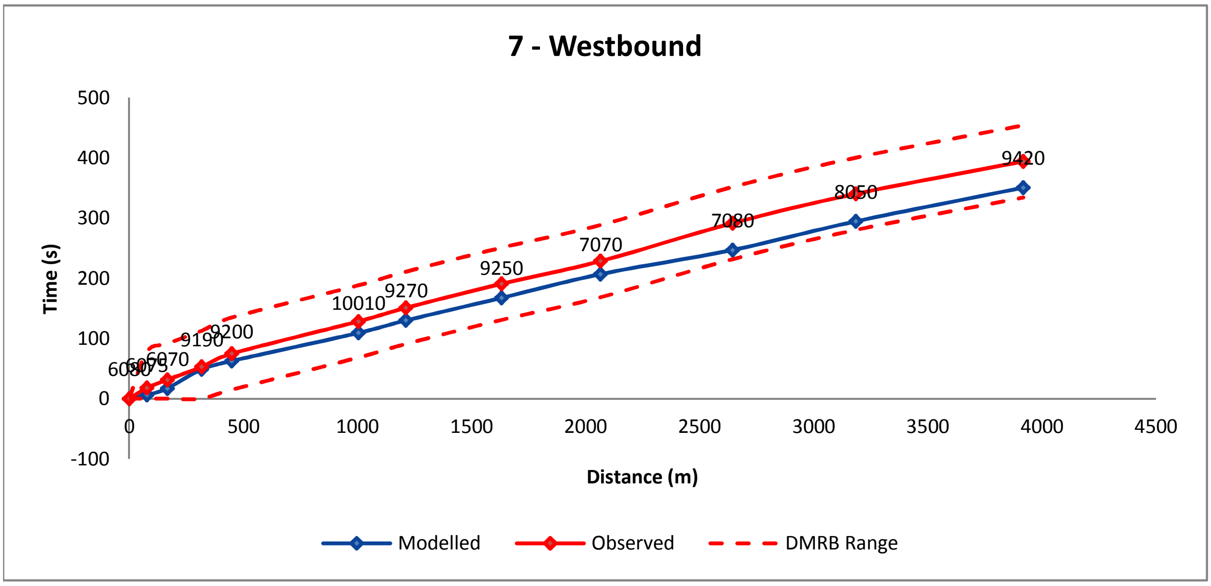
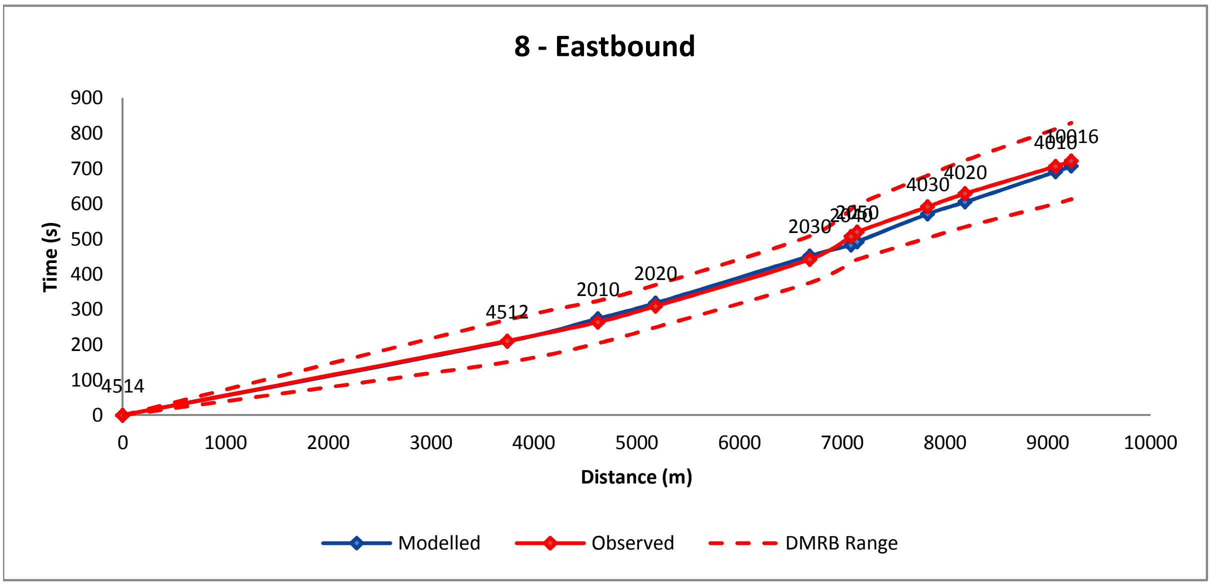
Lowestoft Journey Time Graphs - Interpeak







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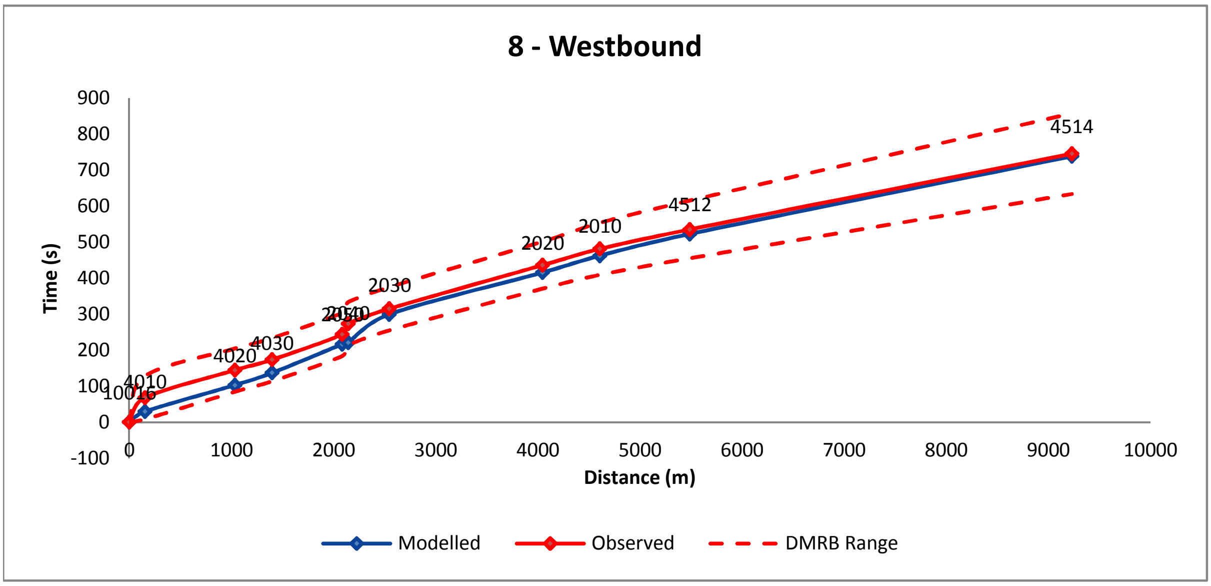
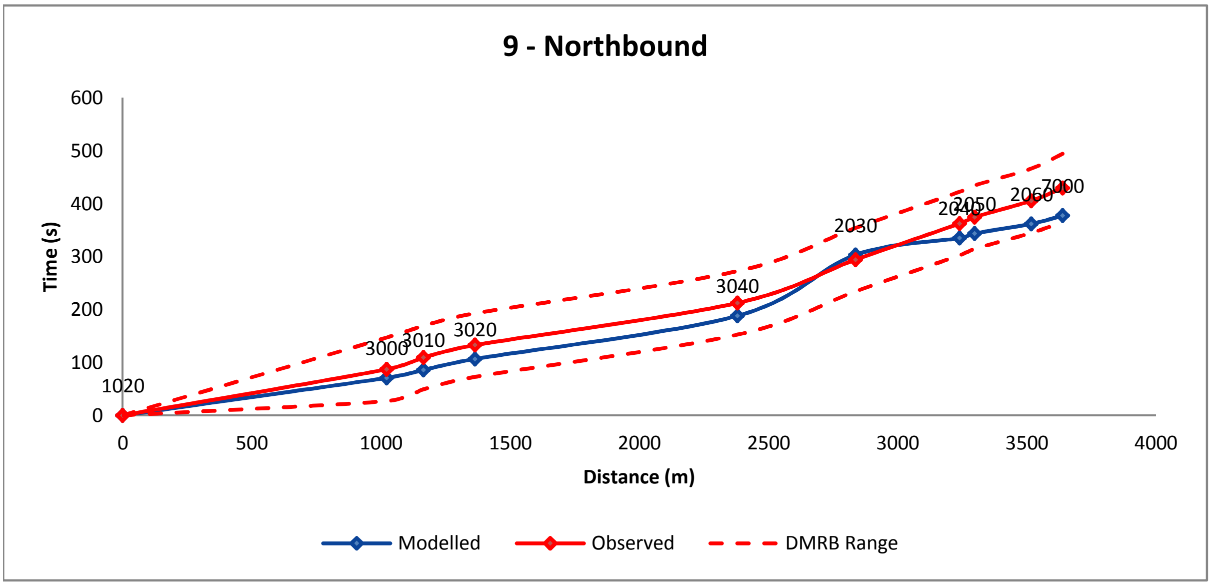
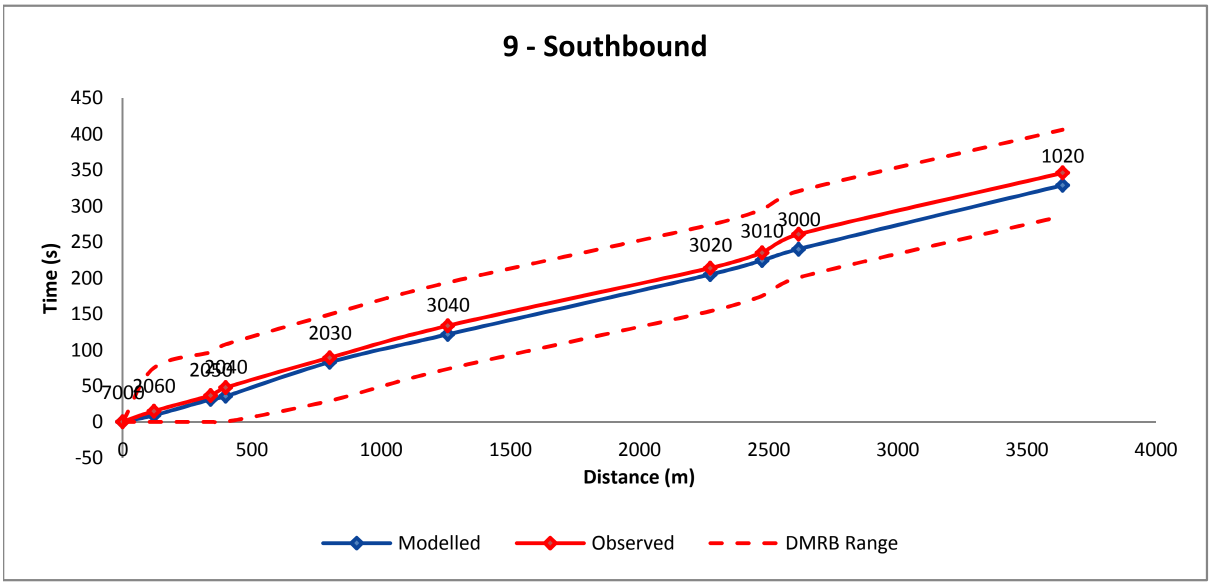
Lowestoft Journey Time Graphs - Interpeak







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Lowestoft Journey Time Graphs - PM Peak

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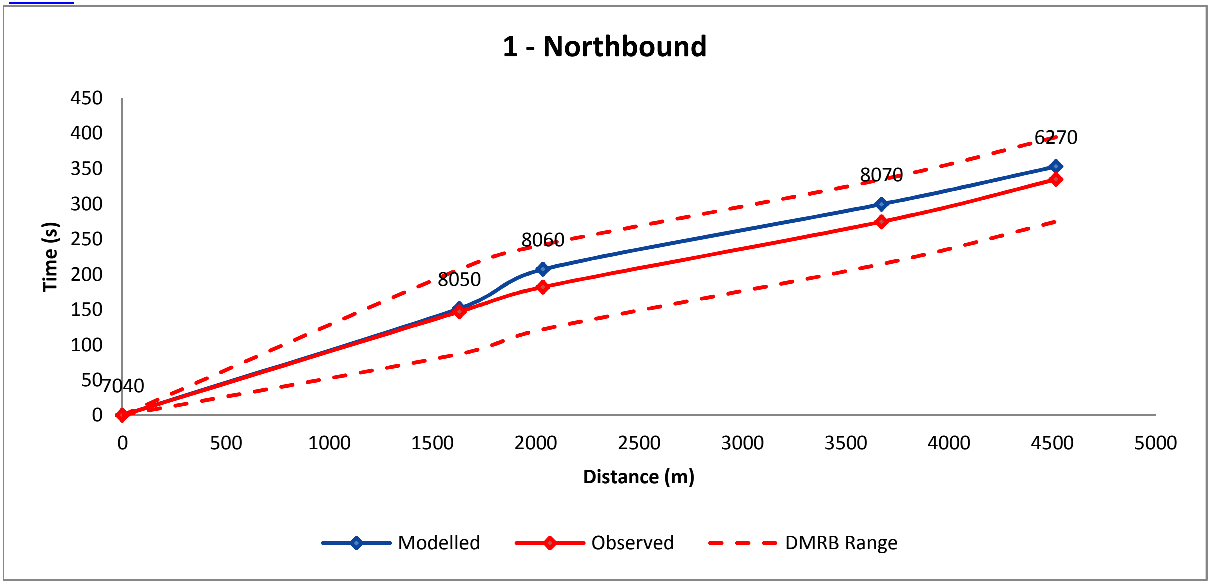

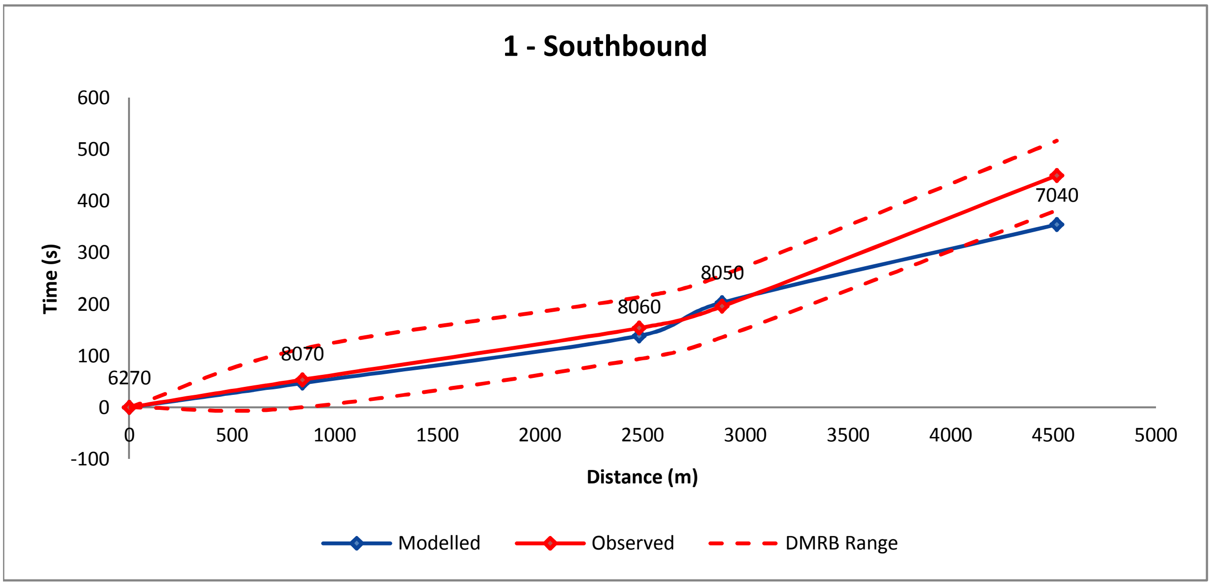

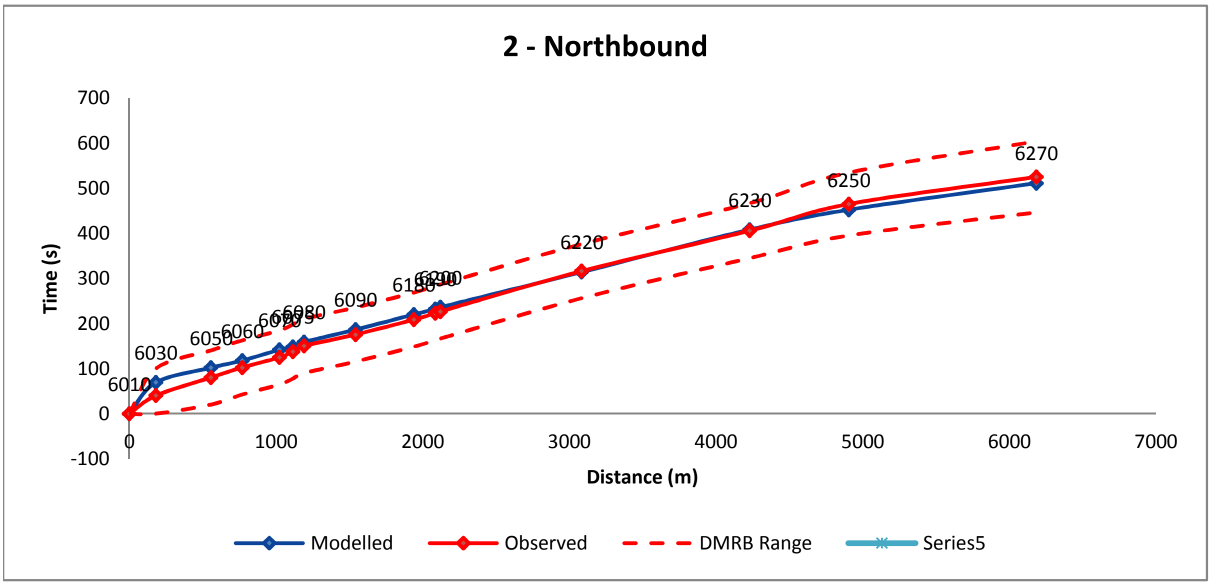

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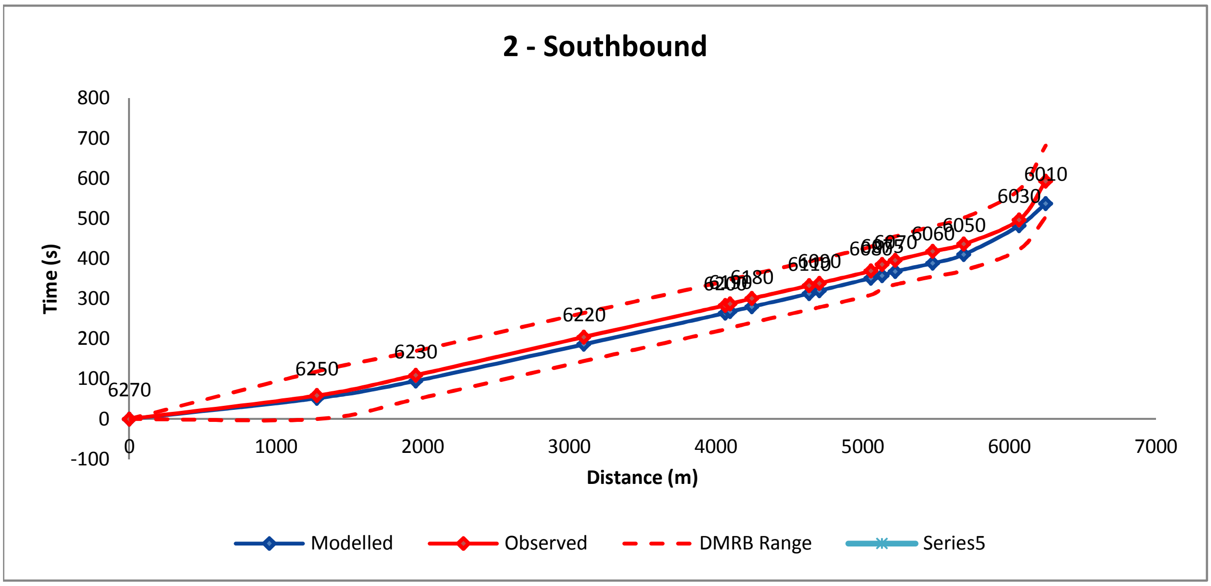
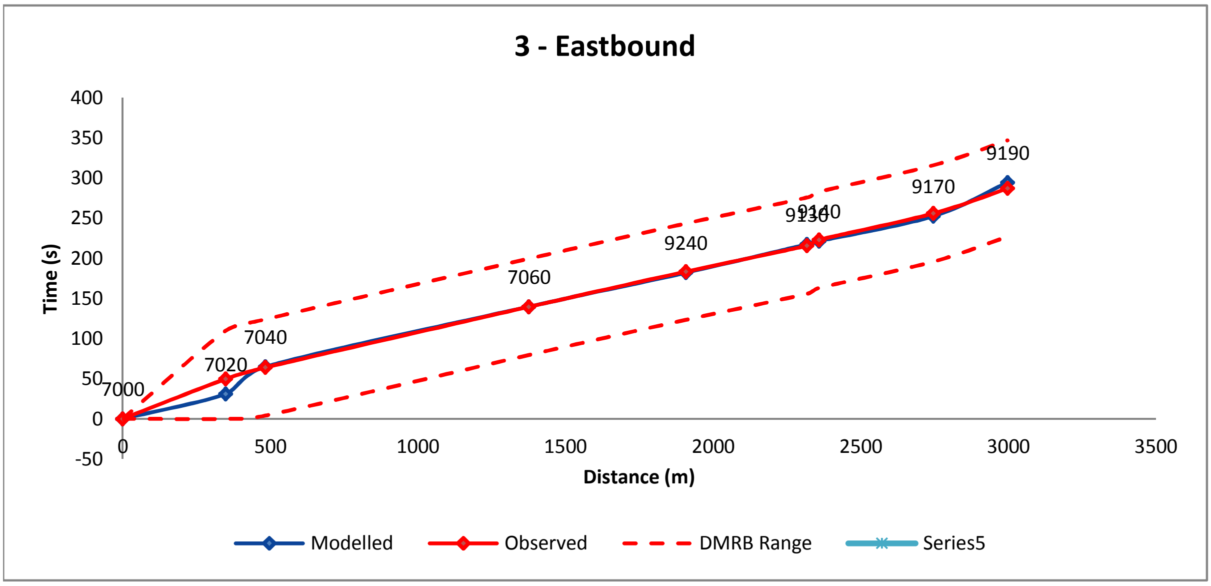
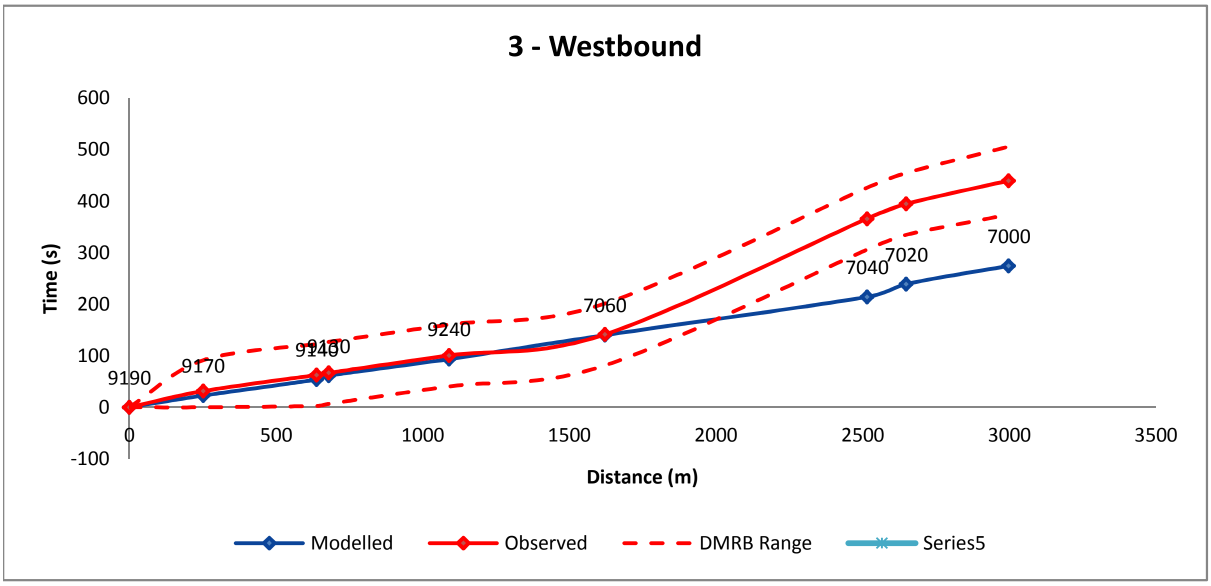
Lowestoft Journey Time Graphs - PM Peak







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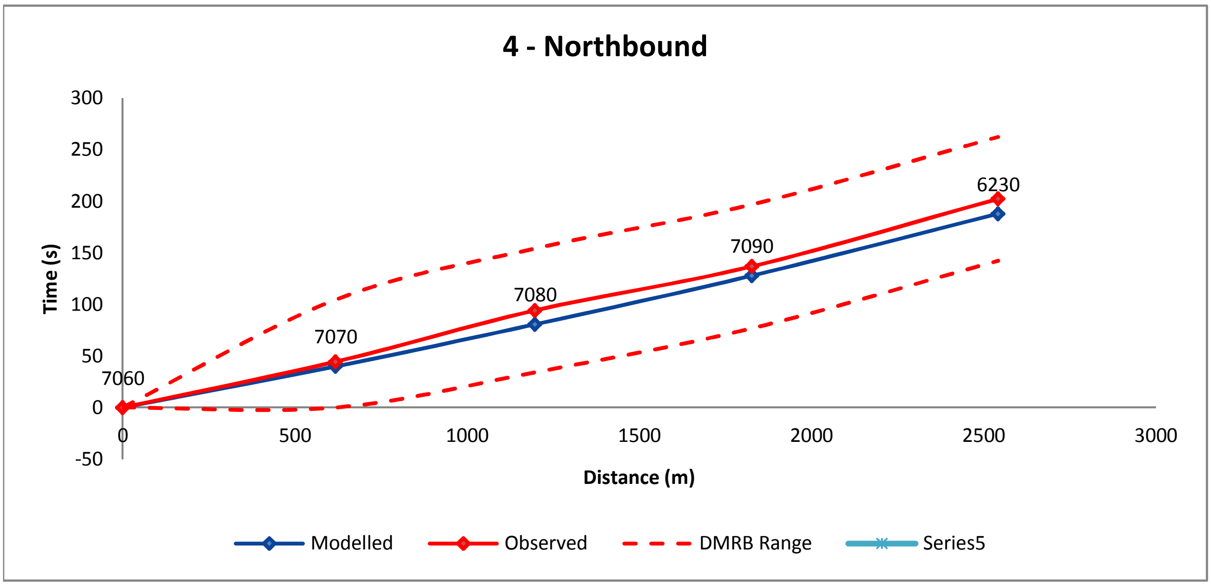
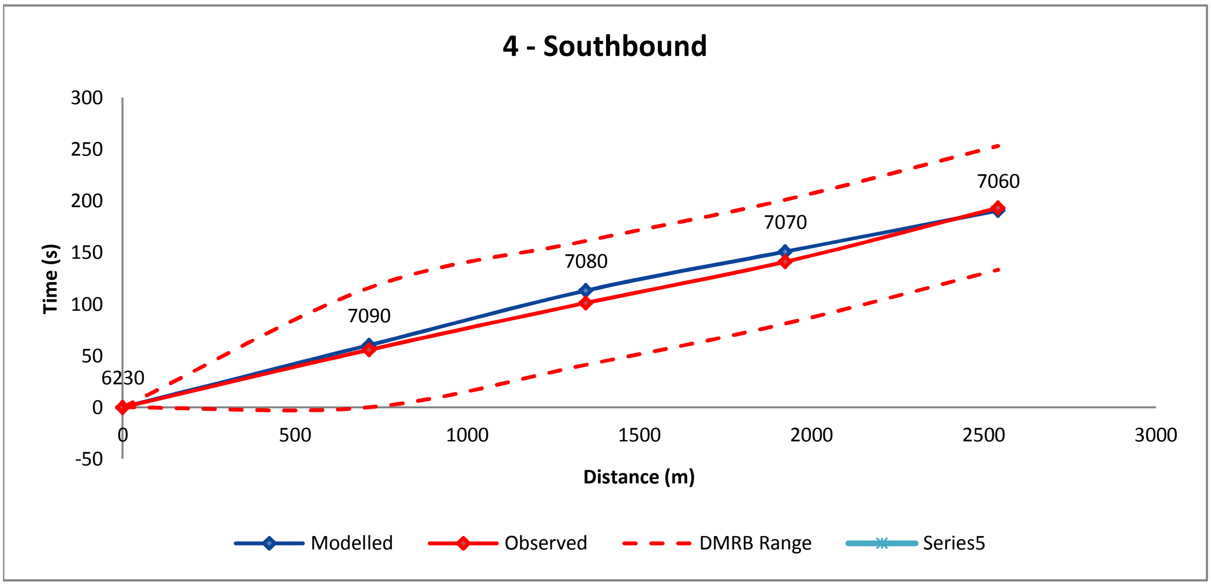
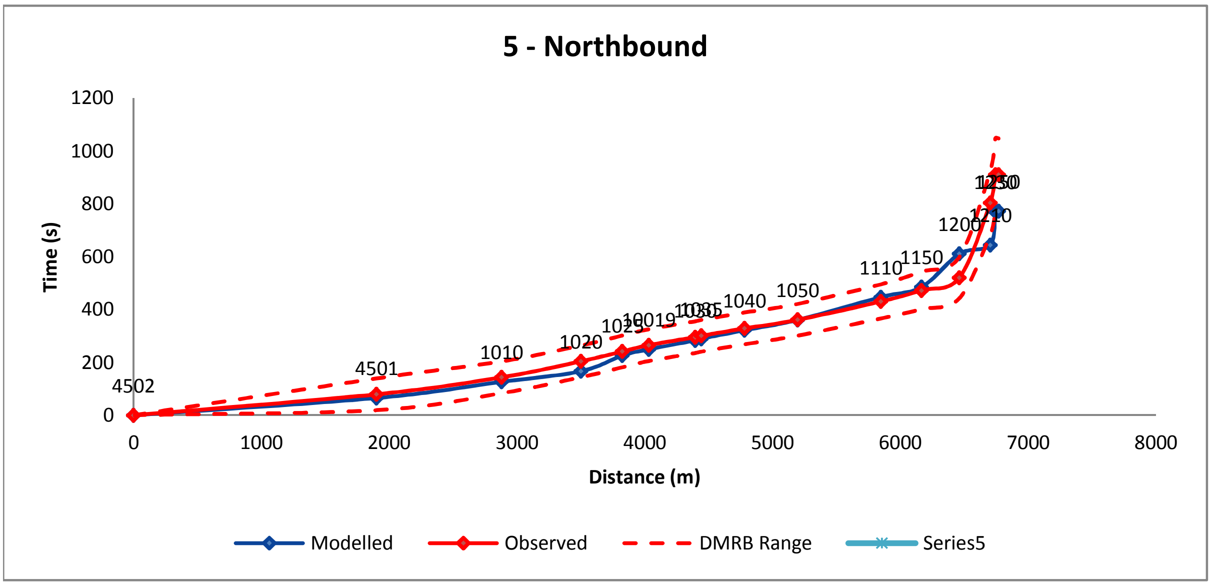
Lowestoft Journey Time Graphs - PM Peak







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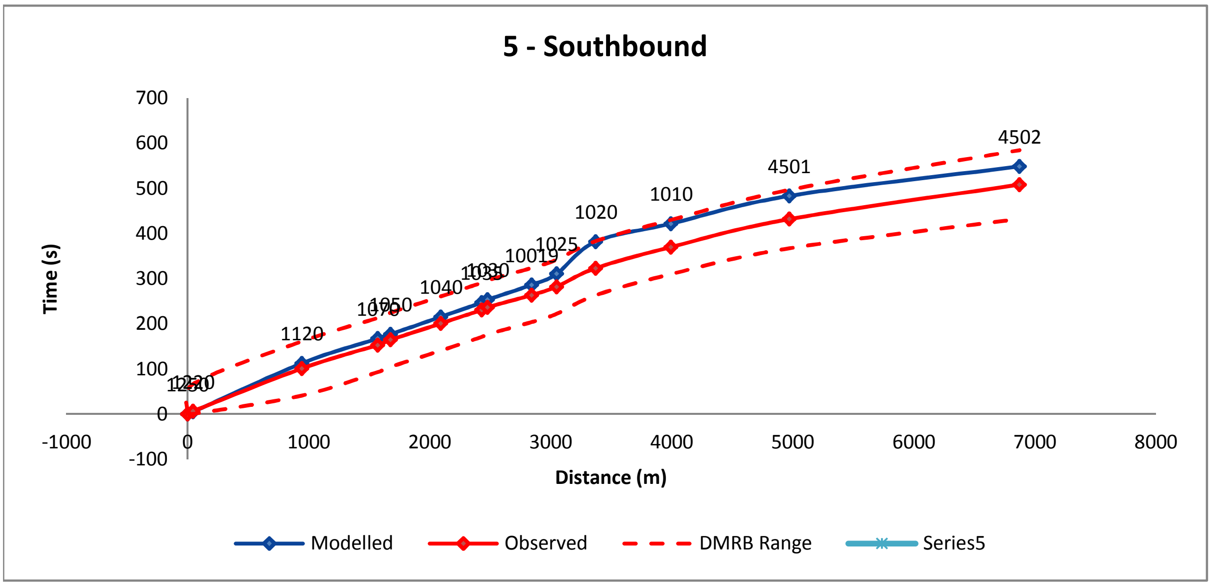
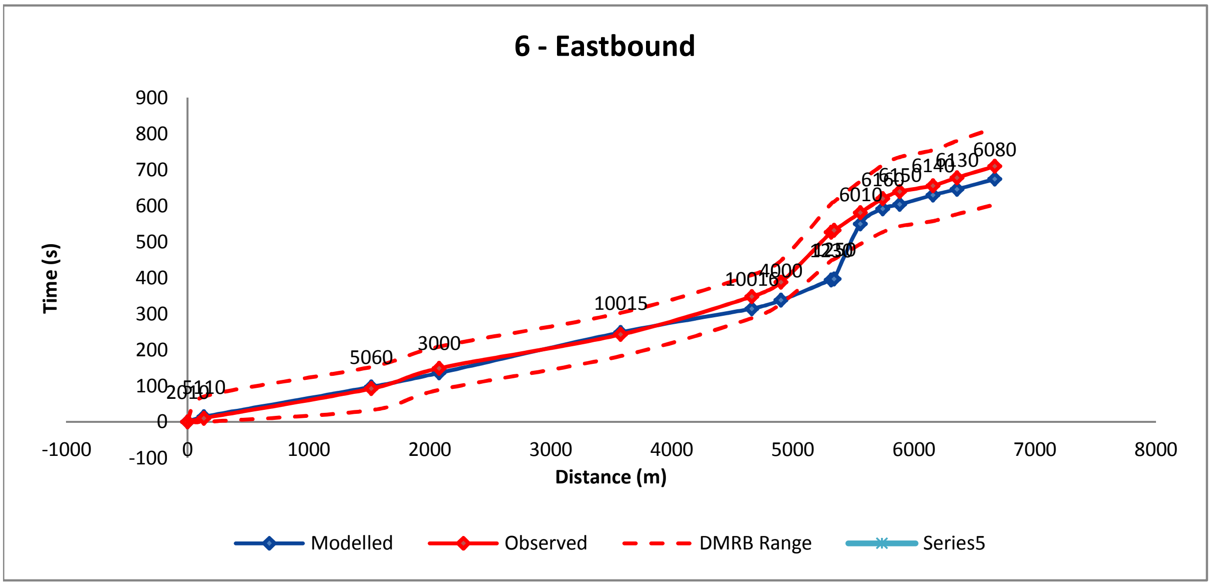
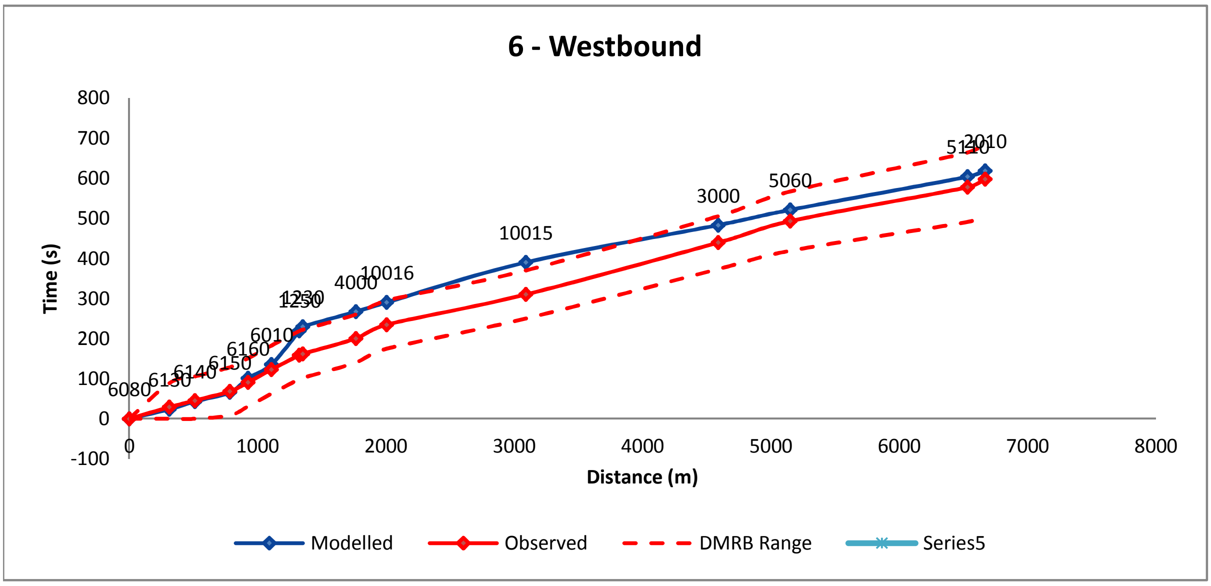
Lowestoft Journey Time Graphs - PM Peak







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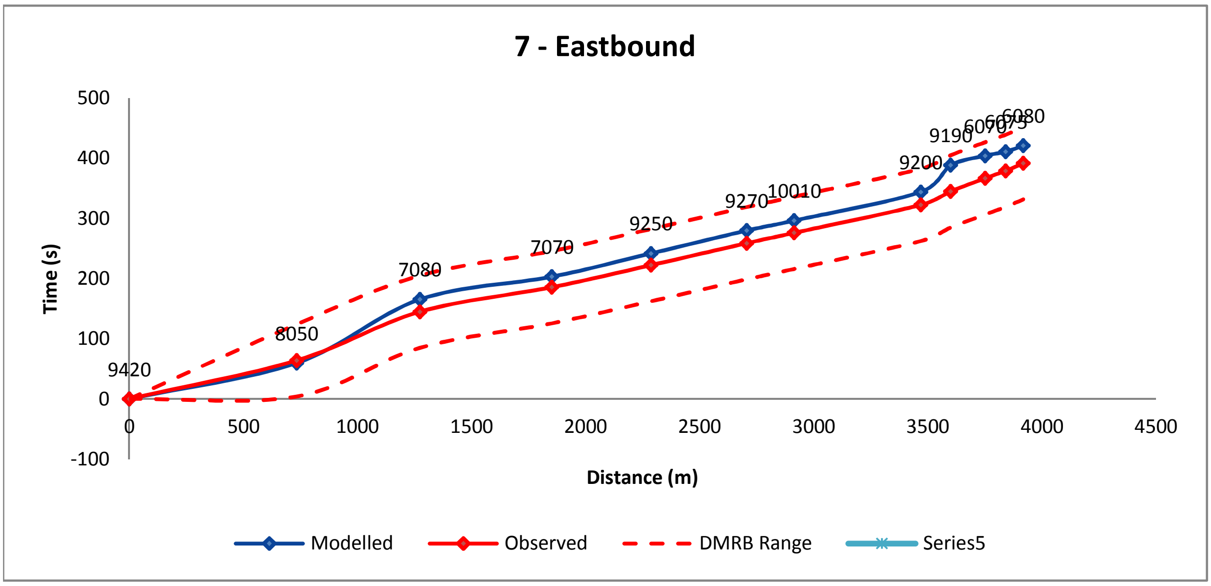
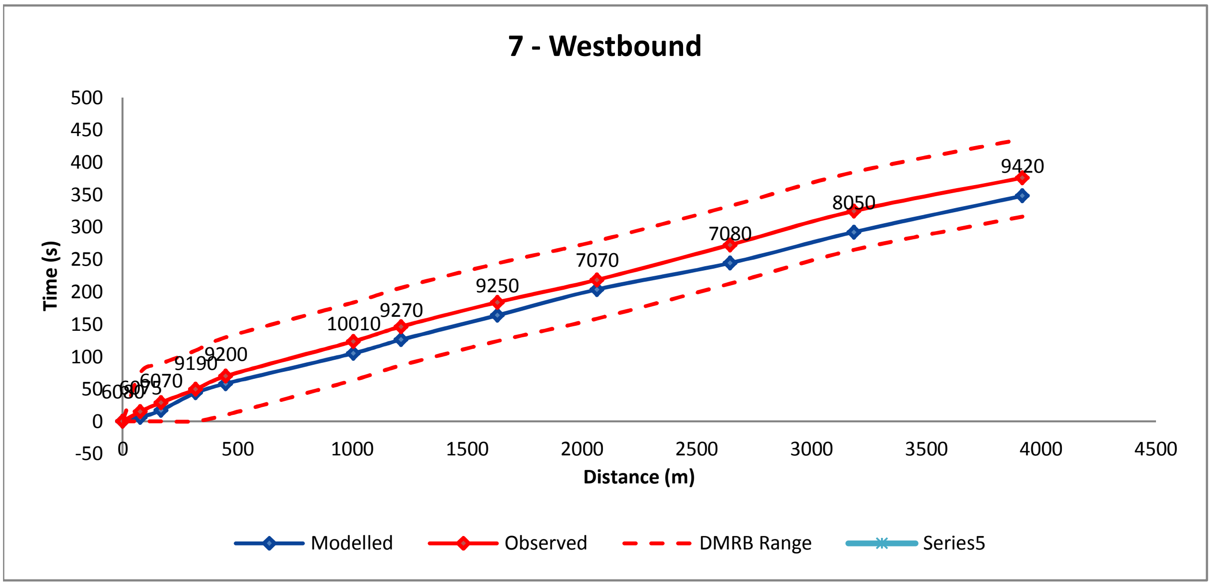
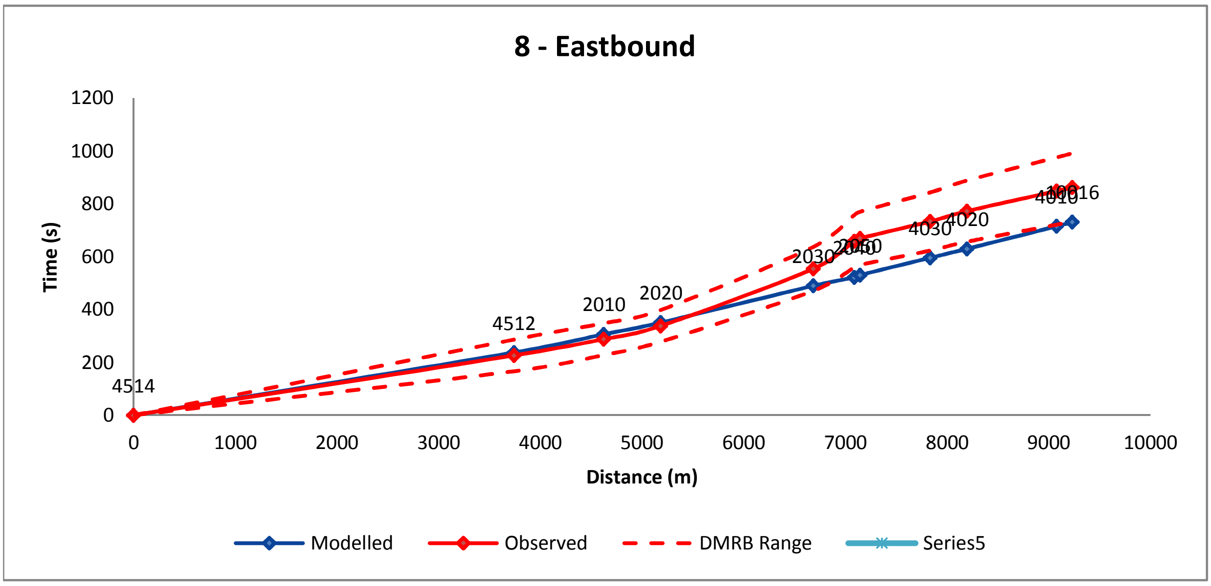
Lowestoft Journey Time Graphs - PM Peak







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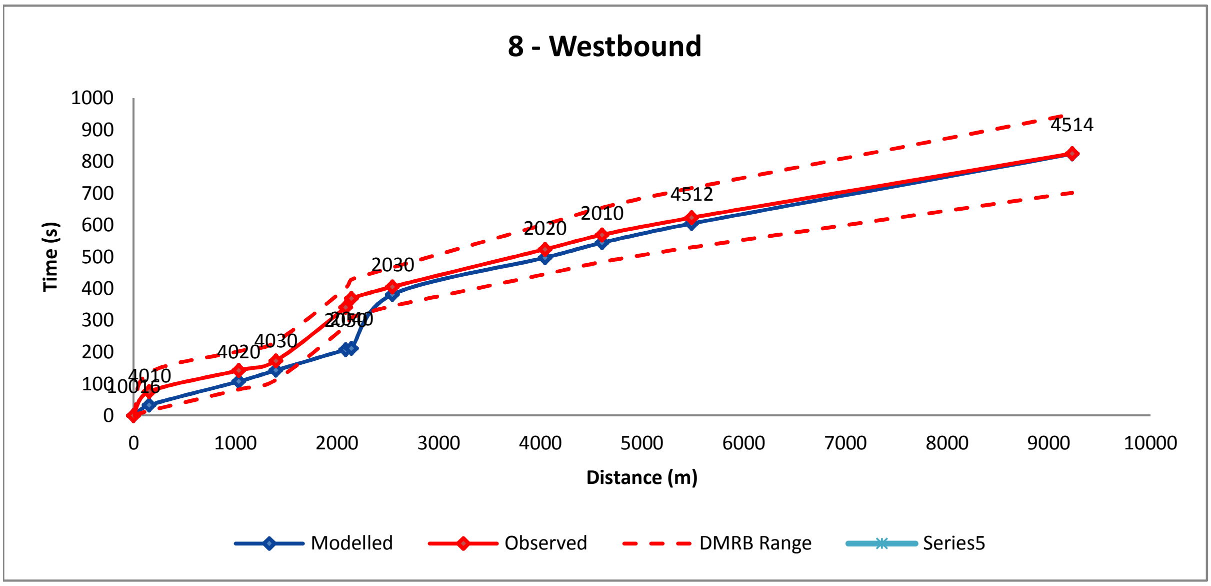
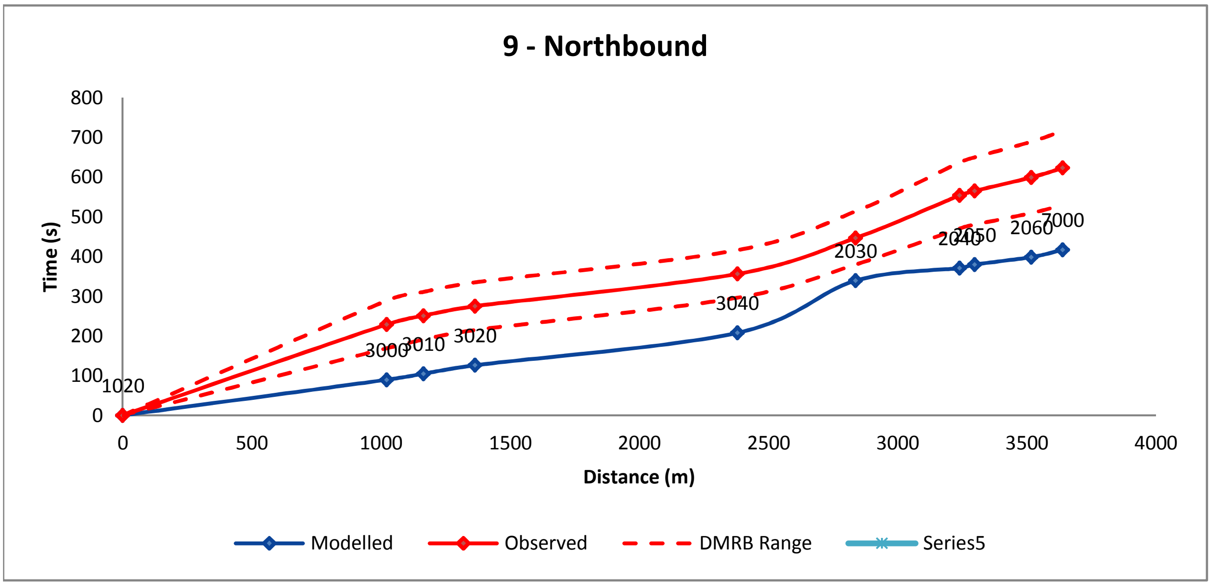
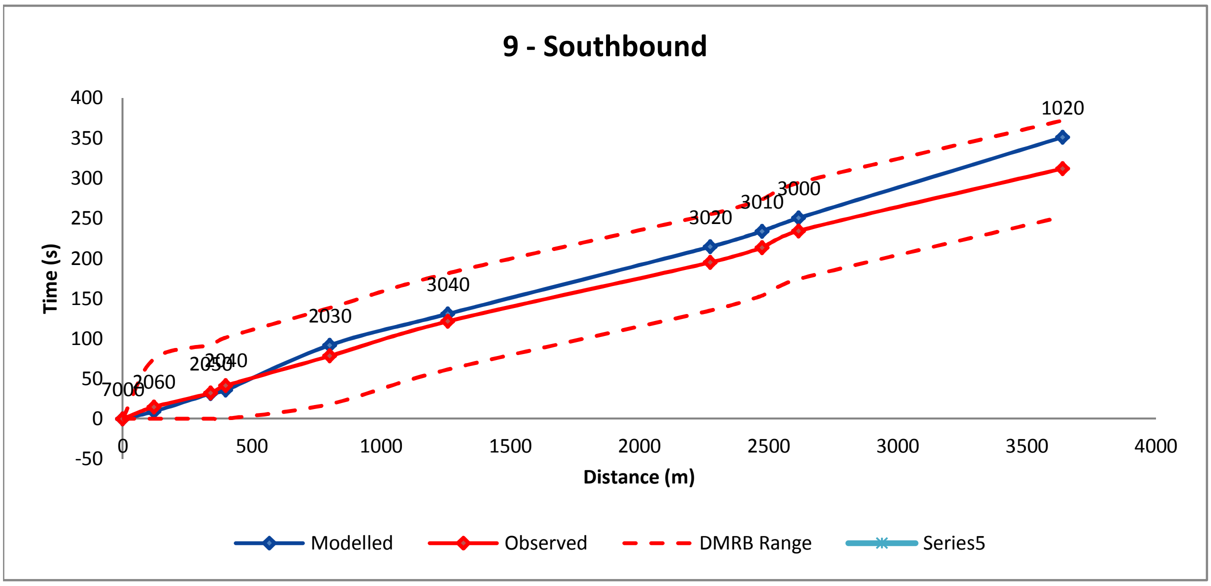
Lowestoft Journey Time Graphs - PM Peak







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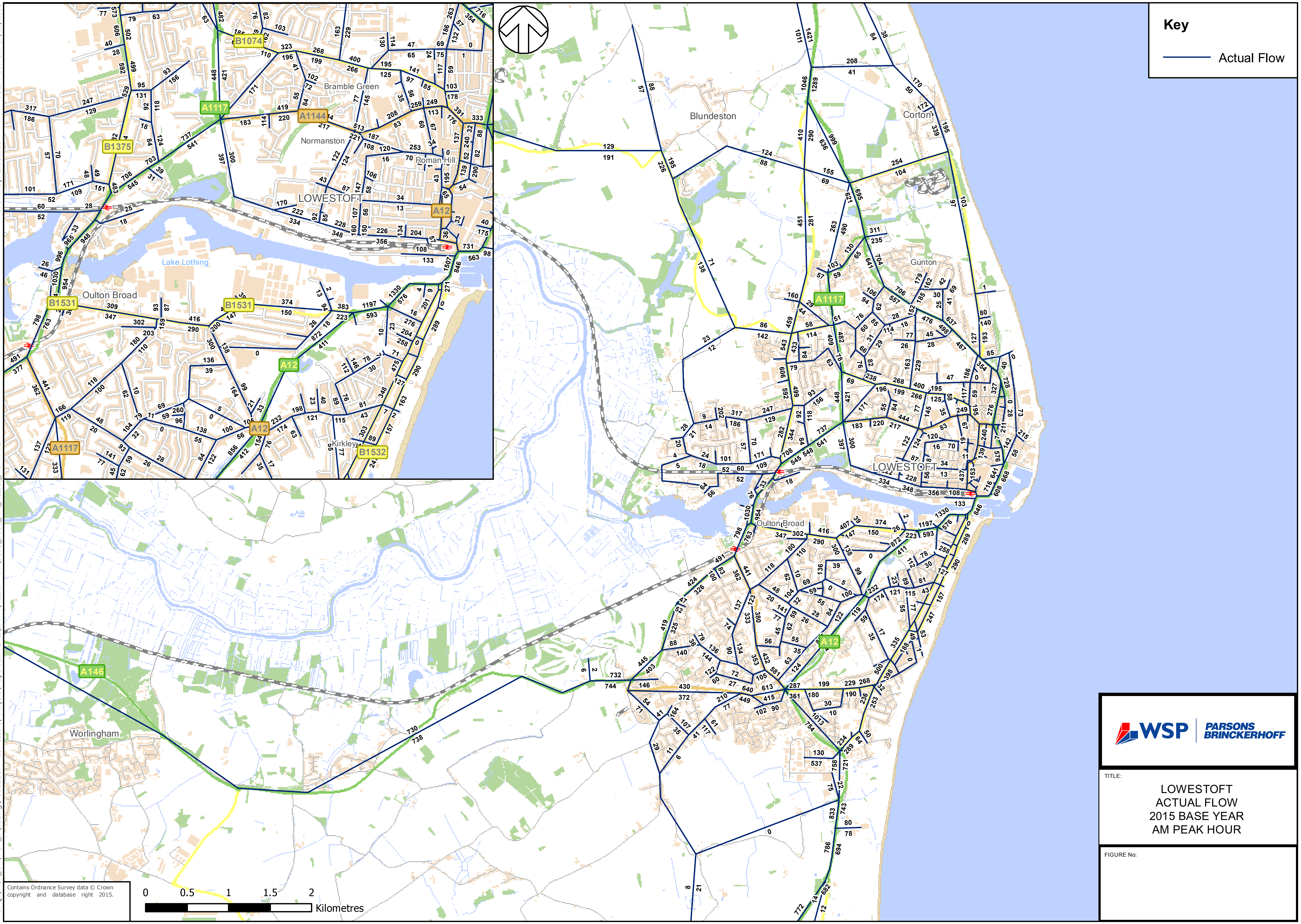
Appendix G

FLOW AND V/C PLOTS



WSP | PARSONS BRINCKERHOFF

TITLE:

LOWESTOFT
ACTUAL FLOW
2015 BASE YEAR
AM PEAK HOUR

FIGURE No:

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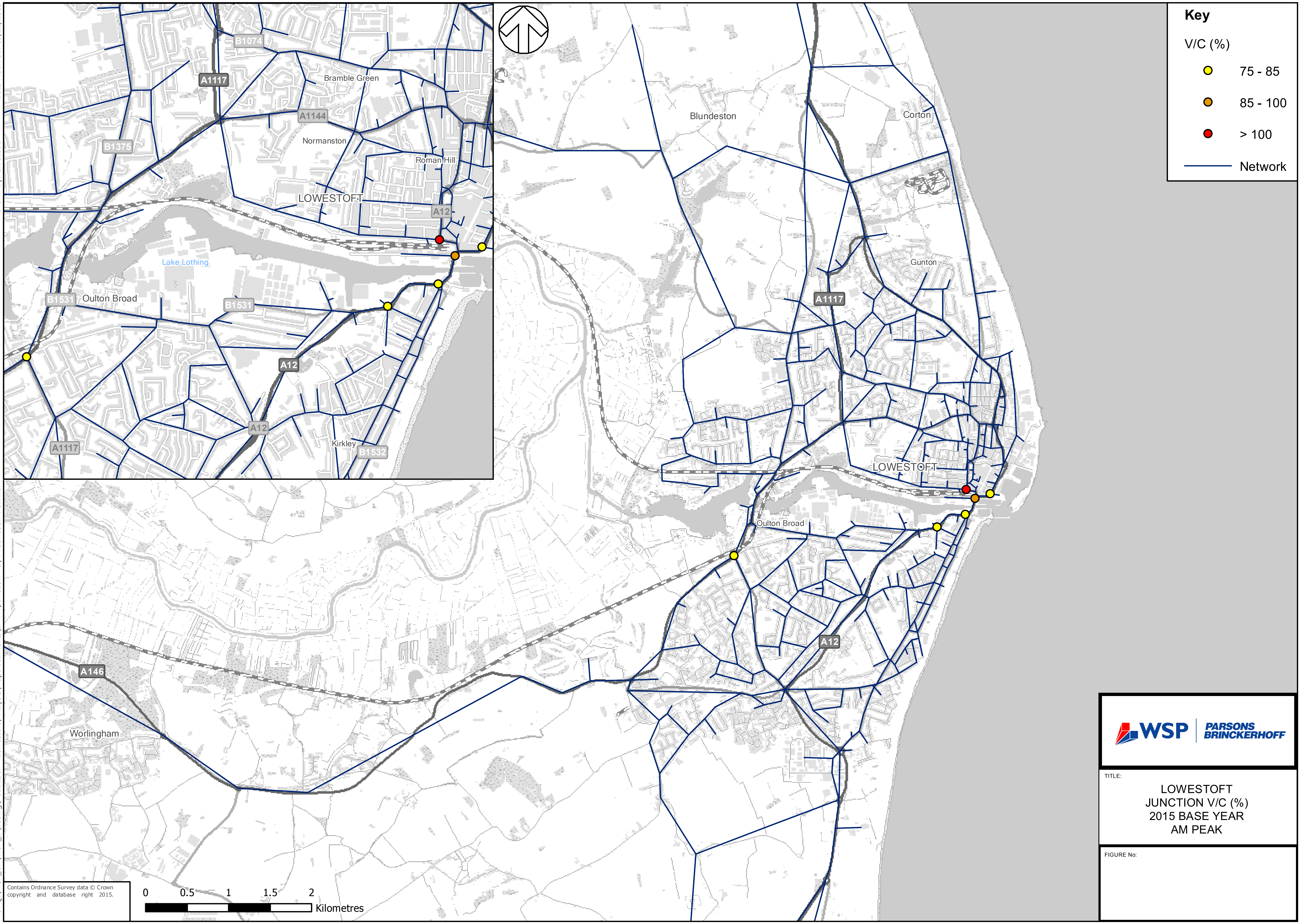
Drawn By: ukrdt001

Date Modified: 07/12/2015



Key

V/C (%)

- 75 - 85
- 85 - 100
- > 100
- Network

WSP | PARSONS BRINCKERHOFF

TITLE:

LOWESTOFT
JUNCTION V/C (%)
2015 BASE YEAR
AM PEAK

FIGURE No:

Date Modified: 09/12/2015

Drawn By: ukrdt001

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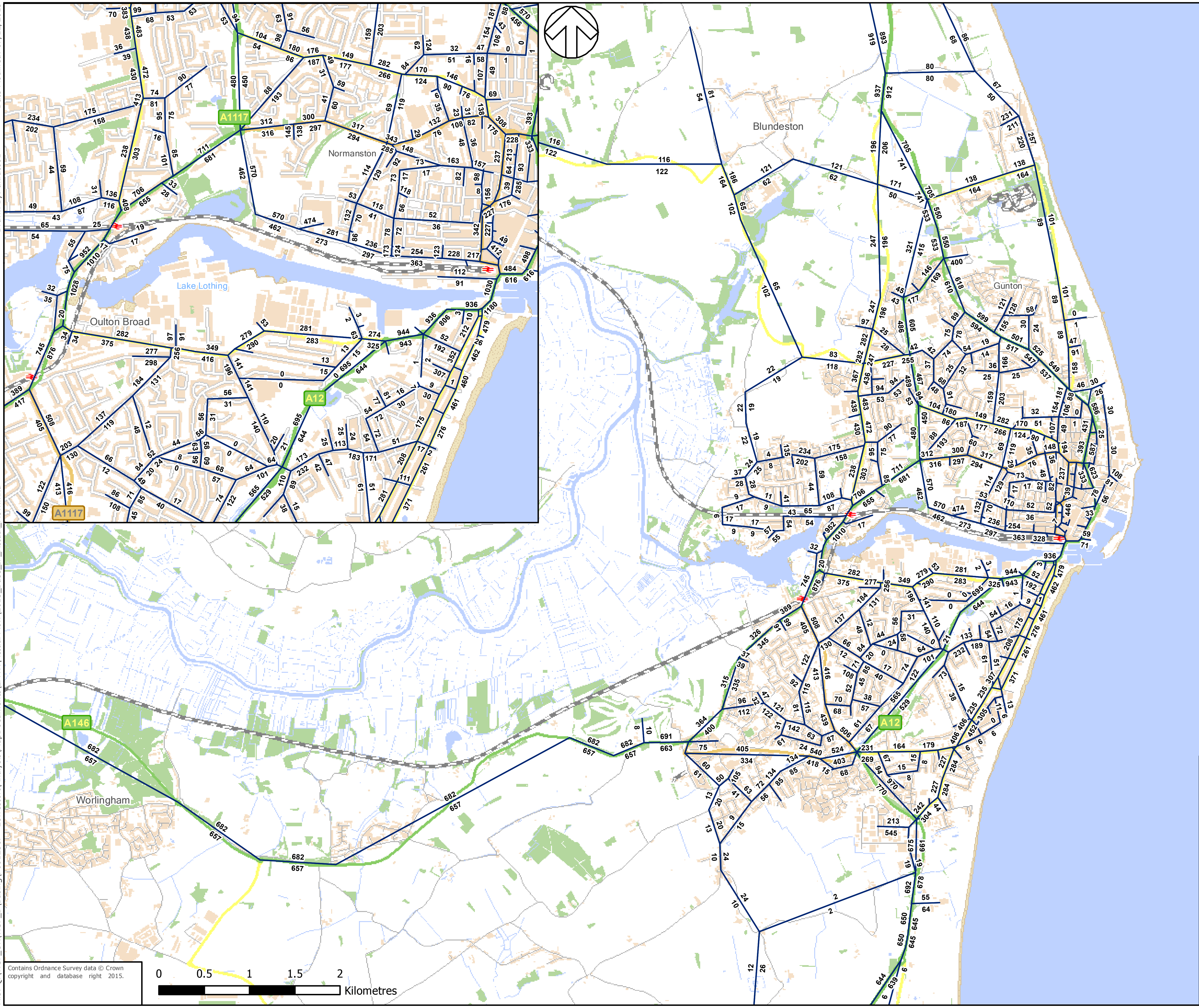

Key

Actual Flow

WSP | PARSONS BRINCKERHOFF

TITLE:

LOWESTOFT
ACTUAL FLOW
2015 BASE YEAR
IP PEAK HOUR

FIGURE No:

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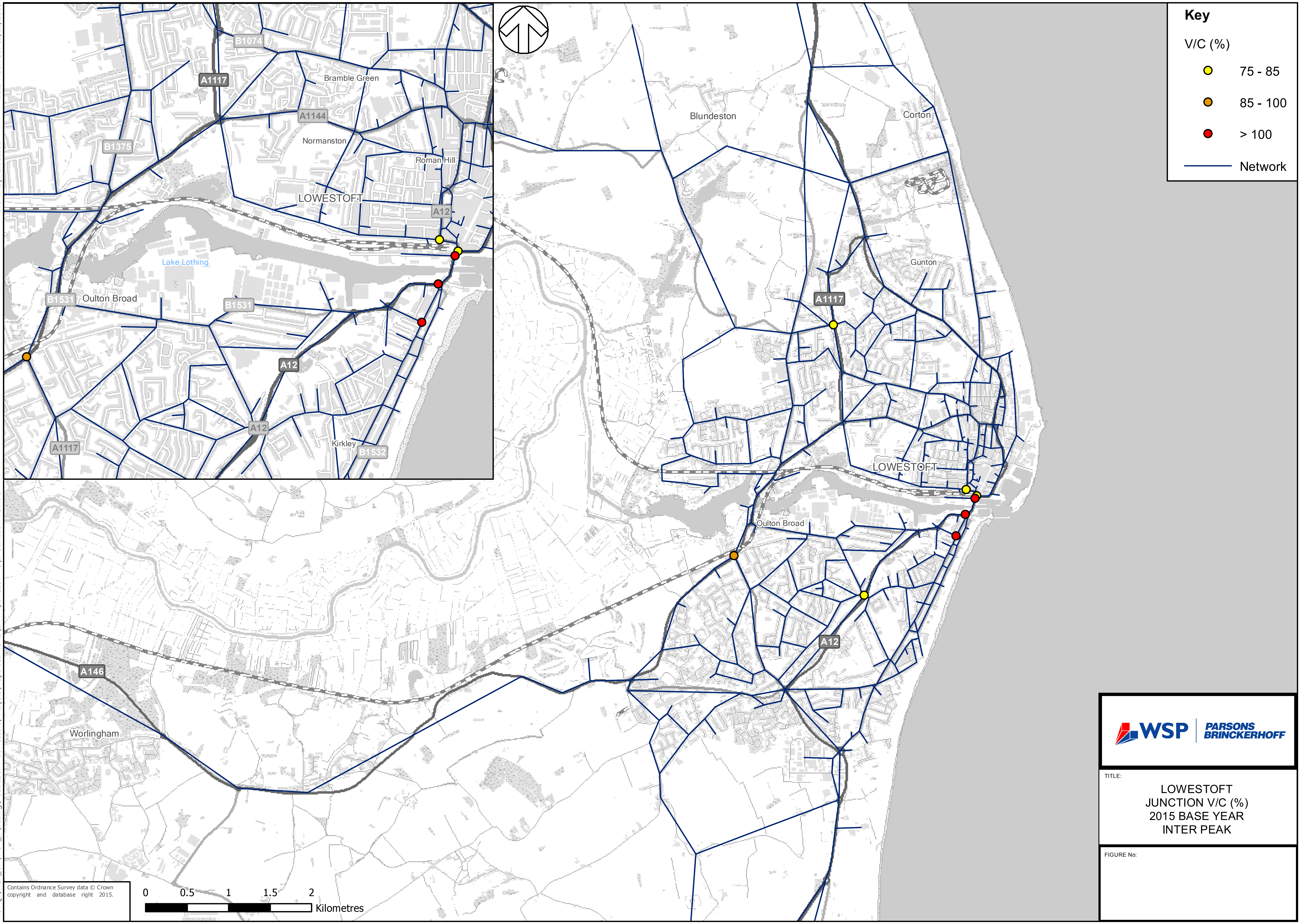
Drawn By: ukrdt001

Date Modified: 07/12/2015



WSP | PARSONS BRINCKERHOFF

TITLE:

LOWESTOFT
JUNCTION V/C (%)
2015 BASE YEAR
INTER PEAK

FIGURE No:

Date Modified: 09/12/2015
Drawn By: ukrdt001
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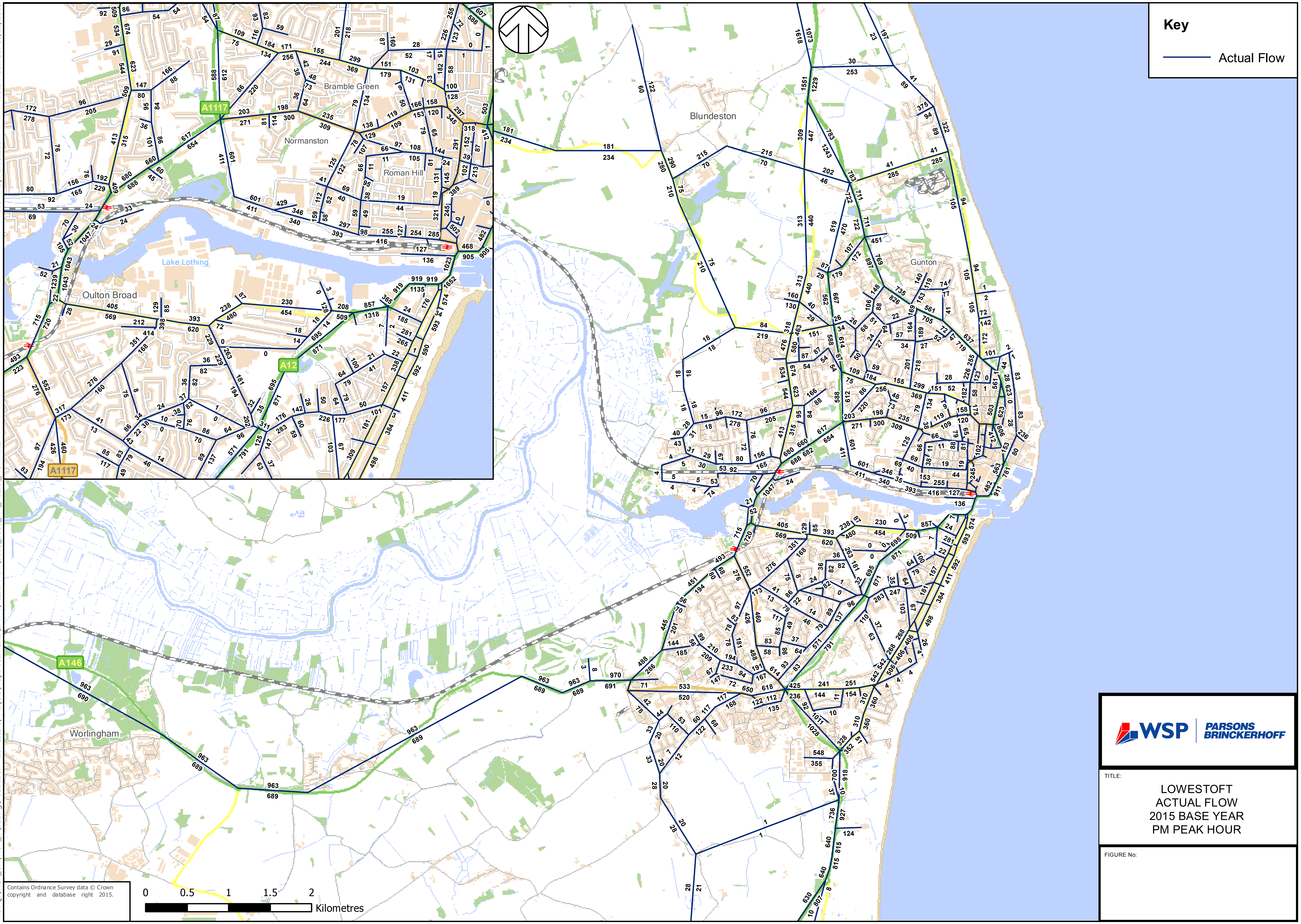

Key

Actual Flow

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WSP | PARSONS BRINCKERHOFF

TITLE:

LOWESTOFT
ACTUAL FLOW
2015 BASE YEAR
PM PEAK HOUR

FIGURE No:

Date Modified: 08/12/2015

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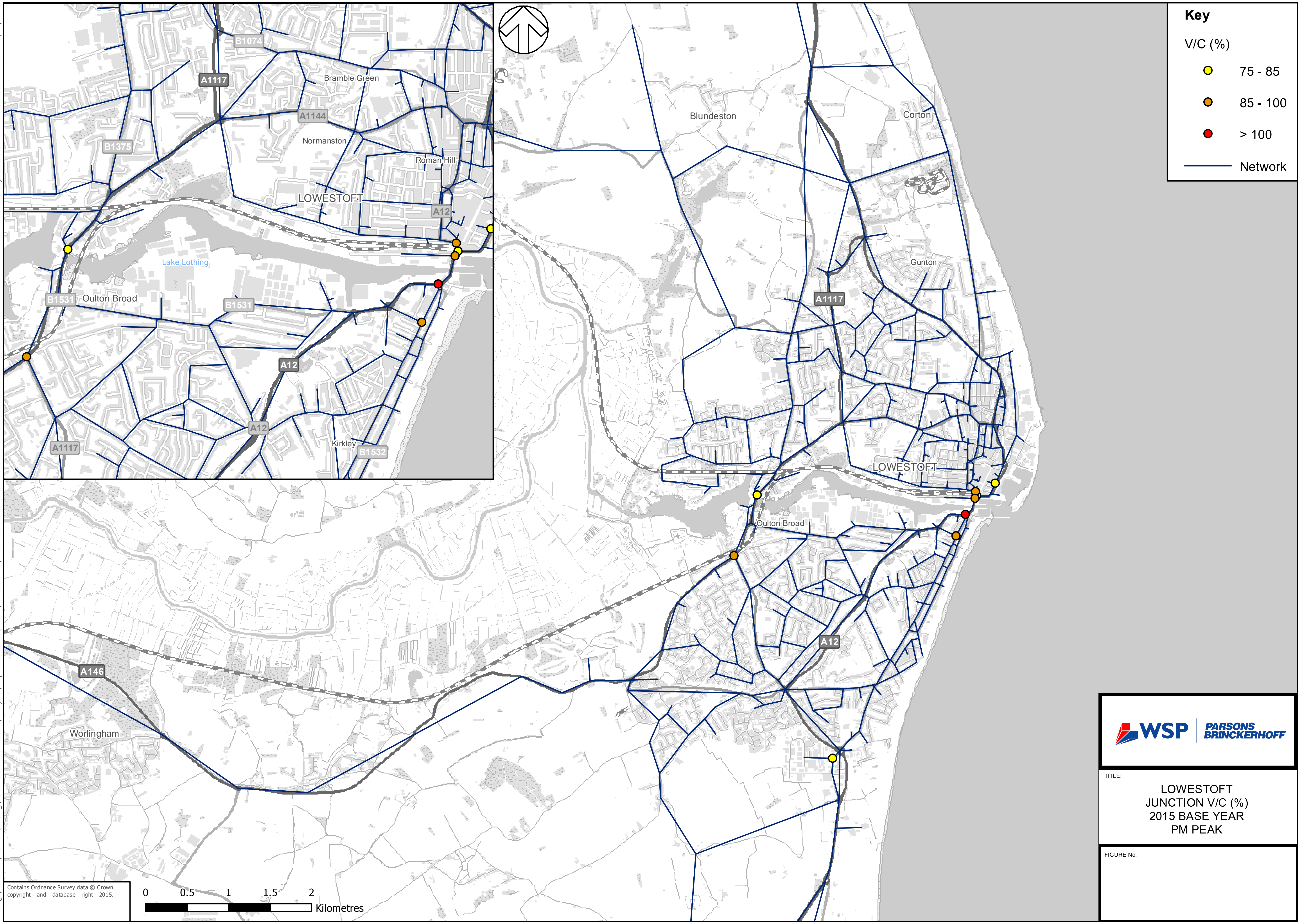

WSP | PARSONS BRINCKERHOFF

TITLE:

LOWESTOFT
JUNCTION V/C (%)
2015 BASE YEAR
PM PEAK

FIGURE No:

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