The Lake Lothing (Lowestoft) Third Crossing Order 201[*]

Lake Lothing THIRD CROSSING

Document 7.2: Transport Assessment

Appendix E (Part 1) Highway LMVR and DMVR

Author: Suffolk County Council

Suffolk County Council

LOWESTOFT DCO MODELLING

Highway Model Local Validation and Forecasting Report

70016133
NOVEMBER 2017

CONFIDENTIAL

Suffolk County **Council**

LOWESTOFT DCO MODELLING

Highway Model Local Validation and Forecasting Report

TYPE OF DOCUMENT (VERSION) CONFIDENTIAL

PROJECT NO. 70016133
OUR REF. NO. 70016133

DATE: NOVEMBER 2017

WSP
WSP House
70 Chancery Lane
London
WC2A 1AF
Phone: +44 20 7314 5000
Fax: +44 20 7314 5111
WSP.com

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft			
Date	1st November 2017			
Prepared by	Krissel Alcaraz Michael Johns Sayijan Verlkumar			
Signature				
Checked by	Michael Johns			
Signature				
Authorised by	Matthew Chilvers			
Signature				
Project number	70016133			
Report number	LW3			
File reference	171101 Lowestoft LMVR - DRAFT_final.docx			

CONTENTS

TABLES

FIGURES

APPENDICES

Appendix A - Screenline performance

Appendix B - Link count performance

Appendix C - Journey time graphs

Appendix D - Route choice validation

Appendix E - Site specific developments

Appendix F - TEMPRO alternative planning assumptions

1 INTRODUCTION

1.1 BACKGROUND

1.1.1. WSP has been commissioned by Suffolk County Council (SCC) to upgrade the existing transport modelling tools available to SCC and develop an integrated county-wide multi-modal model known as the Suffolk County Transport Model (SCTM). WSP is working in partnership with Kier under the Suffolk County Council Professional Services Framework.

1.1.2. The SCTM has been developed to an extent that it is able to serve as a high-level strategic assessment tool for all such applications. However, no strategic model is capable of representing a whole county in fine detail, so the level of detail required for each application should be reviewed prior to testing. It may be necessary to enhance a particular local area for a specific testing purpose.

1.1.3. In particular the model was developed to enable the testing of The Upper Orwell Crossings (TUOC) in Ipswich and the Lake Lothing Third Crossing in Lowestoft. As a result the level of detail of coding in Ipswich and Lowestoft is in significantly greater detail and based upon the modelling used for the business case submissions in December of 2015.

1.1.4. The SCTM highway assignment model therefore incorporates the model networks used within the Ipswich Transport Model (ITM) and Lowestoft Traffic Model (LTM) which were previously used to inform the Outline Business Cases (OBCs) for the Ipswich Wet Dock Crossing and Lake Lothing Third Crossing.

1.1.5. Details upon the full county model development, methodologies and performance are set out within the D3 SCTM LMVR (November 2017) and should be read in conjunction with this report.

1.2 MODEL PURPOSE

1.2.1. The SCTM is a substantial improvement to previous transport modelling tools within Suffolk and allows for a greater range of behavioural responses to be tested. The SCTM provides a robust evidence base for a range of possible applications.

1.2.2. In this application and local validation, the model is being used solely to test the impact of the Lowestoft third crossing and support the scheme through the DCO process and subsequent final business case application to the Department for Transport (DfT).

1.3 PURPOSE OF THIS REPORT

1.3.1. The SCTM model is currently validated at a county level, and to support the Lake Lothing Third Crossing through the DCO process a local model validation of Lowestoft is required. The local validation process ensures that more detailed local congestion is better represented in the model and that local validation issues are not lost in the scale of the countywide model.

1.3.2. The aim of this local validation report is therefore to demonstrate the SCTM highway model is fit for purpose particularly in Lowestoft and is developed following the principles set out within WebTAG guidance to ensure the model can provide an improved appraisal of the proposed scheme stand up to scrutiny as part of the DCO process.

1.3.3. In addition this report sets out the forecast model development methodologies to demonstrate the suitability of the model results for inclusion within the transport assessment and business case appraisal.

1.4 PREVIOUS MODELS

1.4.1. The Lowestoft Traffic Model (LTM) was a highway assignment model using SATURN validated to a 2015 base with Variable Demand Modelling (VDM) carried out using DIADEM. This was updated as part of the Lake Lothing Third Crossing Transport Business Case, with demand matrices developed based on ANPR data and traffic survey data collected in 2015.

1.4.2. The networks and zone system for LTM were incorporated into the SCTM and used to form the basis of the simulation network for Lowestoft.

1.5 PLANNED BASE YEAR MODELLING

1.5.1. The SCTM has a base year of 2016 based on an average Monday to Thursday for neutral months.

1.5.2. The main matrix demand for the 2016 base year uses Mobile Network Data (MND) from Telefonica, which is considered to be accurate at MSOA level. A detailed review of the mobile network data is set out in the WSP document entitled 'Mobile Network Data Verification Report' dated October 2017.

1.5.3. The following three time periods have been modelled:

- AM peak hour (0800-0900)
- Inter peak average hour (1000-1600)
- PM peak hour (1700-1800)

1.6 REPORT STRUCTURE

1.6.1. 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 – Lake Lothing Third Crossing
- Section 3 – Local Model Detail
- Section 4 – Calibration and Validation Data
- Section 5 – Network Development
- Section 6 – Trip Matrix Development
- Section 7 – Assignment Calibration and Validation
- Section 8 – Forecasting Methodology
- Section 9 – Summary

2 LAKE LOTHING THIRD CROSSING

2.1 SCENARIOS TO BE FORECAST AND INTERVENTIONS TO BE TESTED

2.1.1. The base year validation update to the SCTM has been carried out in order to be able to test the latest central design for the Lake Lothing Third Crossing.

2.1.2. The town centre in Lowestoft currently has two river crossings shown in Figure 1 below.

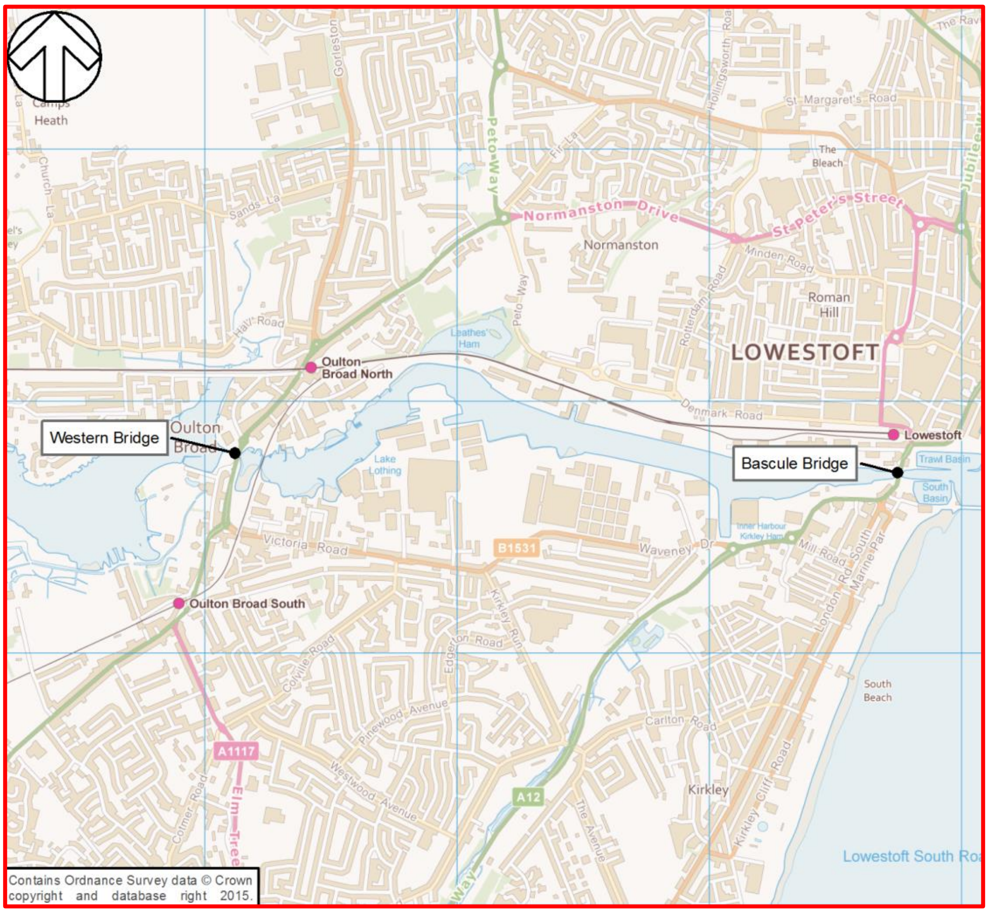


Figure 1 - *Bridge locations*

2.1.3. The scheme which will be tested involves a third central bridge crossing between Peto Way / Denmark Road to the north and Waveney Drive to the south. The latest central crossing design, Option C18, is shown in Figure 2.

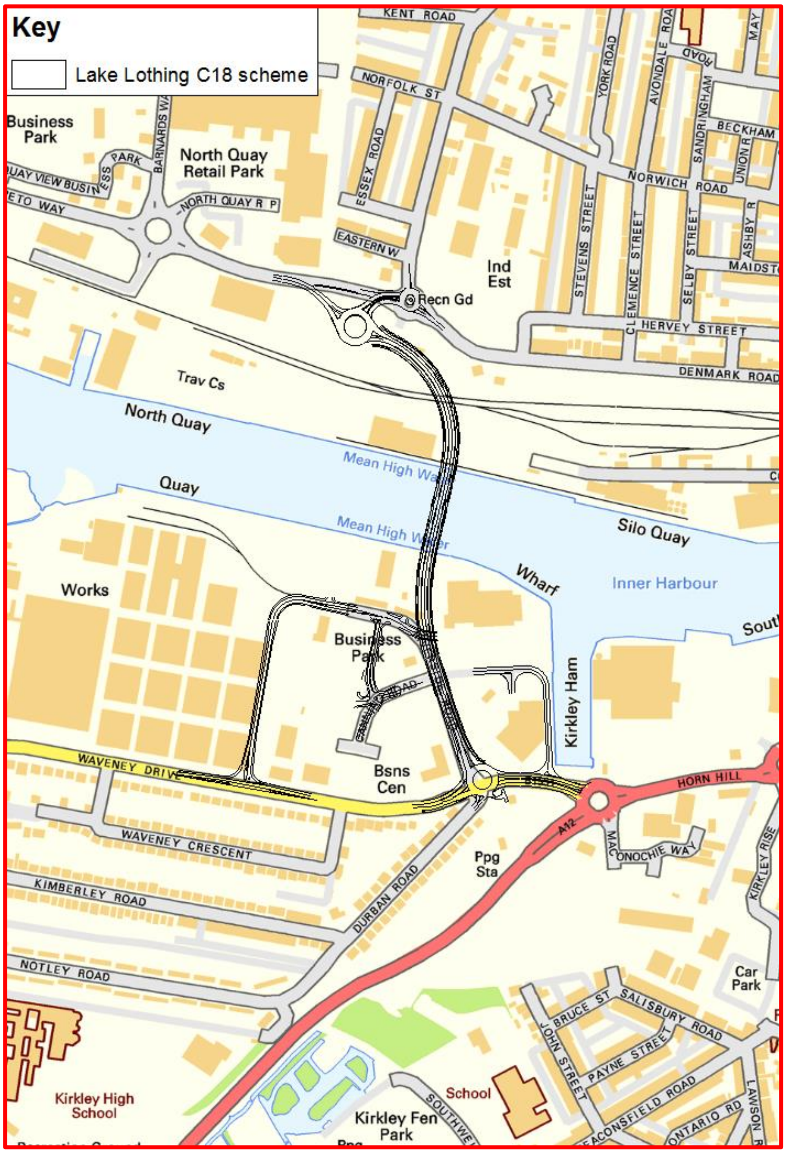


Figure 2 - ***Lake Lothing Third Crossing – Option C18***

2.2 SCENARIOS TO BE TESTED

2.2.1. The following forecast years have been used to test the Lake Lothing Third Crossing:

- 2022; scheme opening year;
- 2037; scheme opening year + 15 years

2.2.2. The forecast year models have been developed on an uncertainty based approach for Waveney District which the scheme is located within. Forecasts have been developed for a core scenario only based on residential developments which are considered to be “Near Certain” or “More Than Likely”.

2.2.3. Information relating to the development forecast model is reported in section 8 of this report.

3 LOCAL MODEL DETAIL

3.1 AREA OF INFLUENCE

3.1.1. The area of influence for the Lake Lothing Third Crossing scheme has been determined by comparing previous 2036 SCTM forecasts with and without the scheme to determine the extent of the significant flow changes which occur. Figure 3 shows the extent of the area of influence for the Lake Lothing Third Crossing.

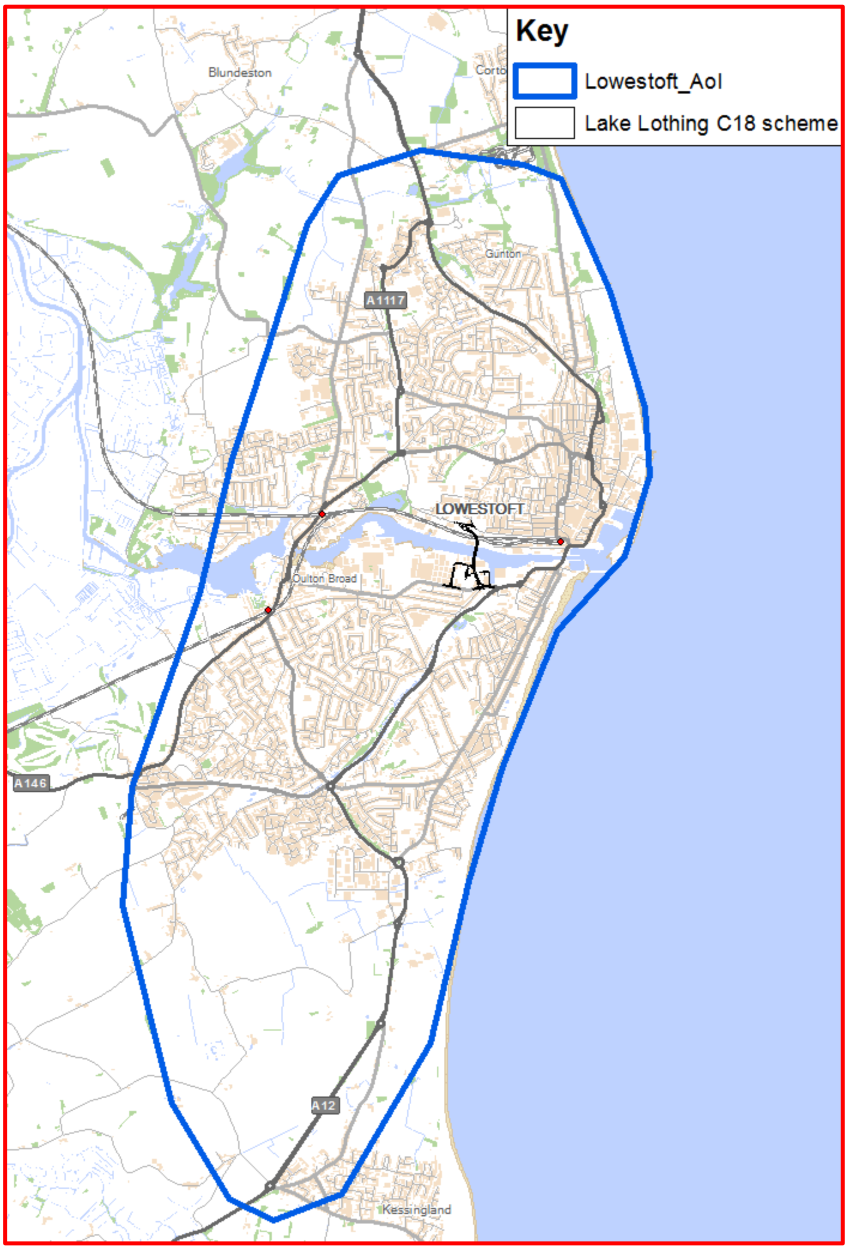


Figure 3 - ***Modelled Area***

3.2 ZONING SYSTEM

3.2.1. The zoning system within the SCTM was based initially on 2011 Census boundaries:

- Lower Super Output Area (LSOA) level across Suffolk
- Combinations of MSOAs within districts adjacent to Suffolk
- District level in other adjacent counties within the East of England (Norfolk, Cambridgeshire, Essex, Hertfordshire, Bedfordshire)
- County and regional level in remainder of UK outside of the East of England

3.2.2. Some zones when the further disaggregated where LSOA areas remained too large. The final model zone system contains 893 zones.

3.2.3. Figure 4 shows the detail of the model zones adjacent to the scheme and existing swing bridges in north and south Lowestoft.

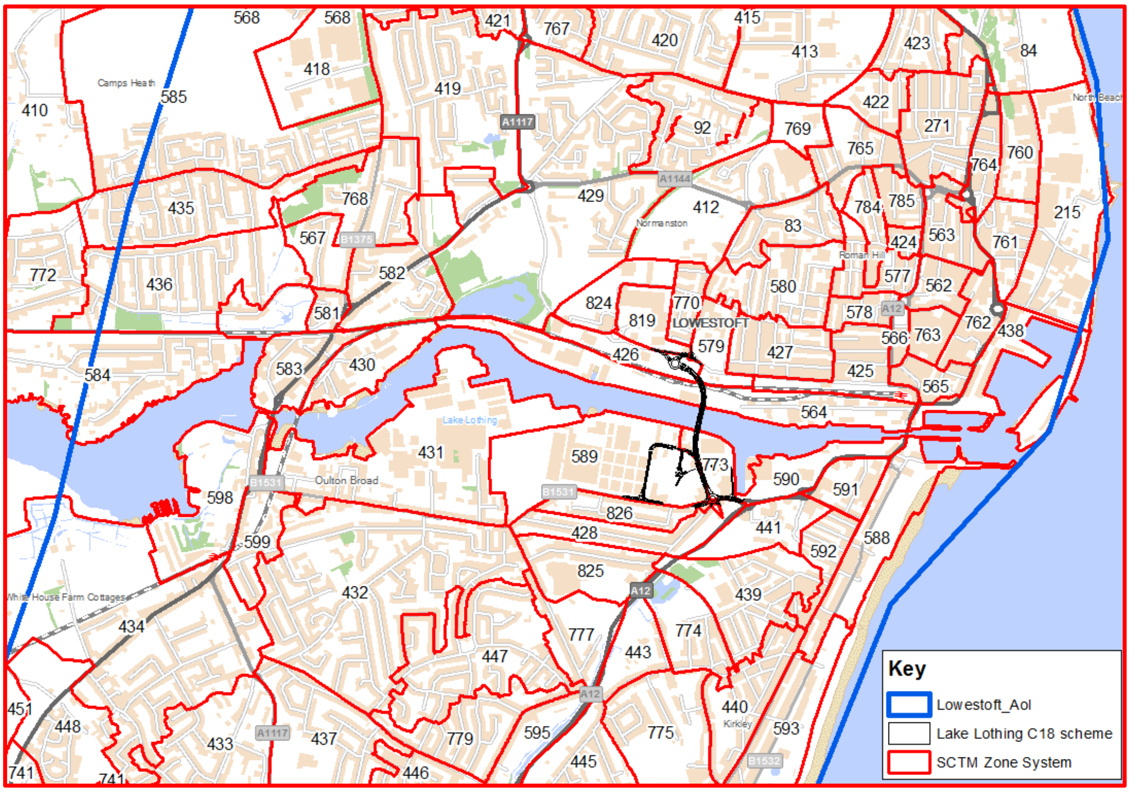


Figure 4 - *Zoning in vicinity of Lake Lothing Third Crossing*

3.2.4. Figure 5 shows the detail of the model zones within the area of influence for the scheme.

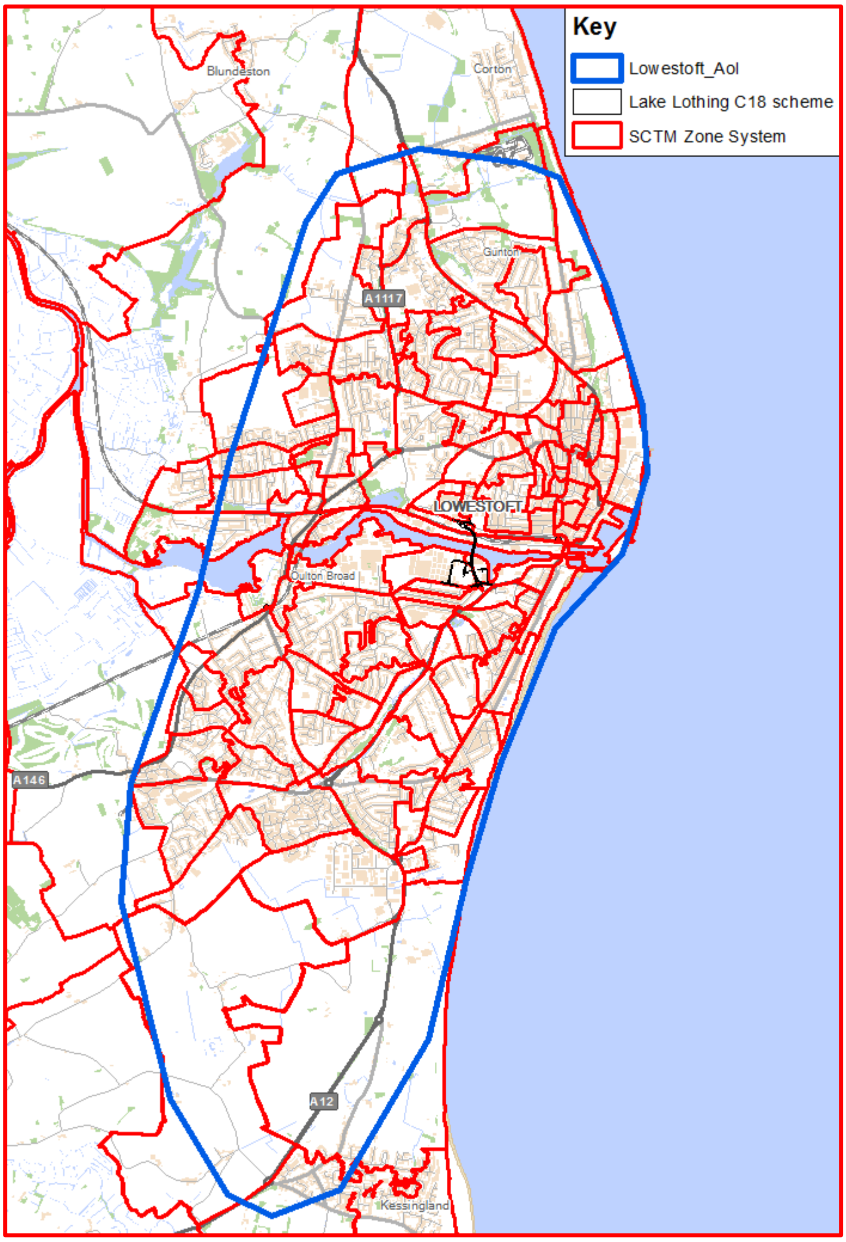


Figure 5 - ***Zoning within Area of Influence***

3.2.5. Figure 6 highlights the internal zones within Lowestoft and the surrounding area within Suffolk, as well as highlighting the external zones adjacent to Lowestoft covering Great Yarmouth and other locations in Norfolk.

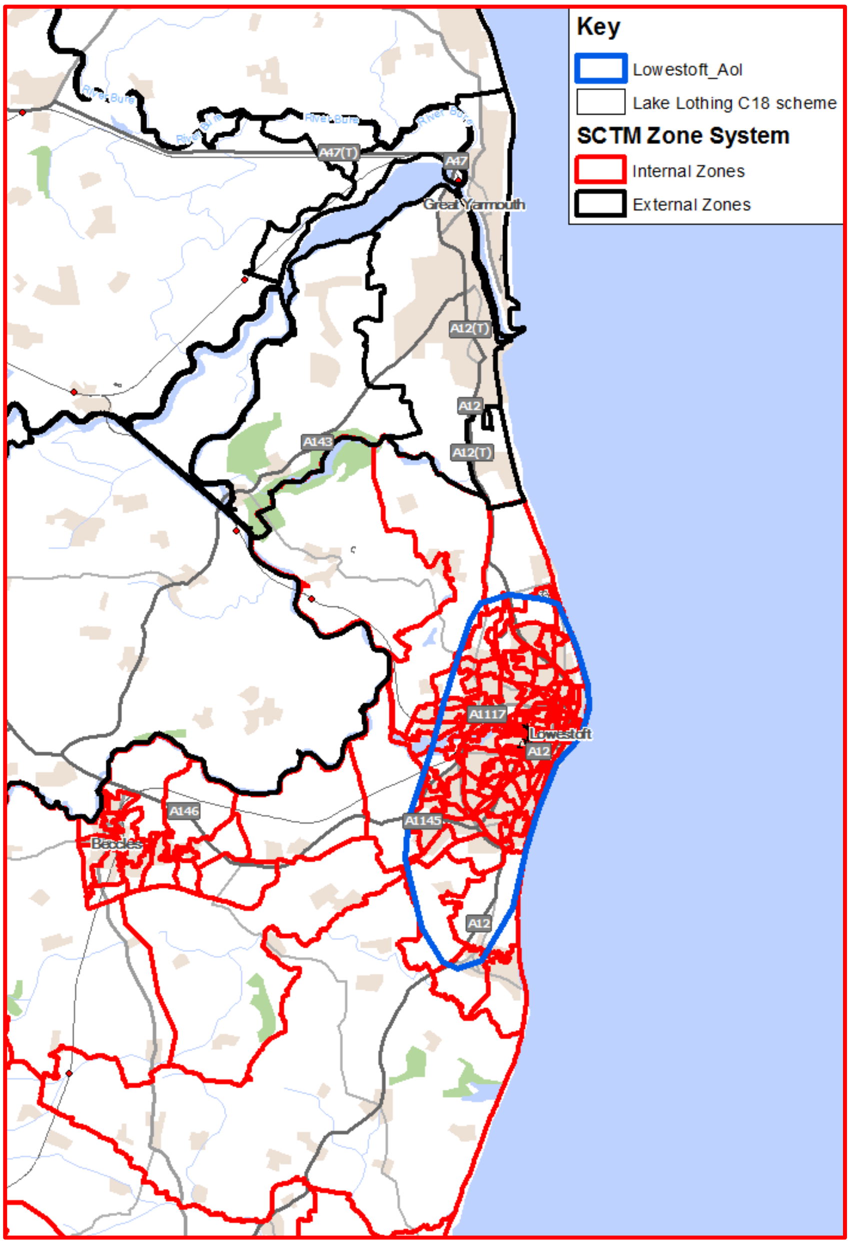


Figure 6 - *Zoning in external area*

3.2.6. The level of detail shown for the zoning within Lowestoft and the surrounding area is considered to be sufficiently detailed to capture the key local land uses and provide a suitable basis for base year model validation and calibration.

3.3 NETWORK STRUCTURE

3.3.1. The key strategic roads within Lowestoft are included within the SCTM. The network structure in close proximity to the bridge crossings is shown in Figure 7.

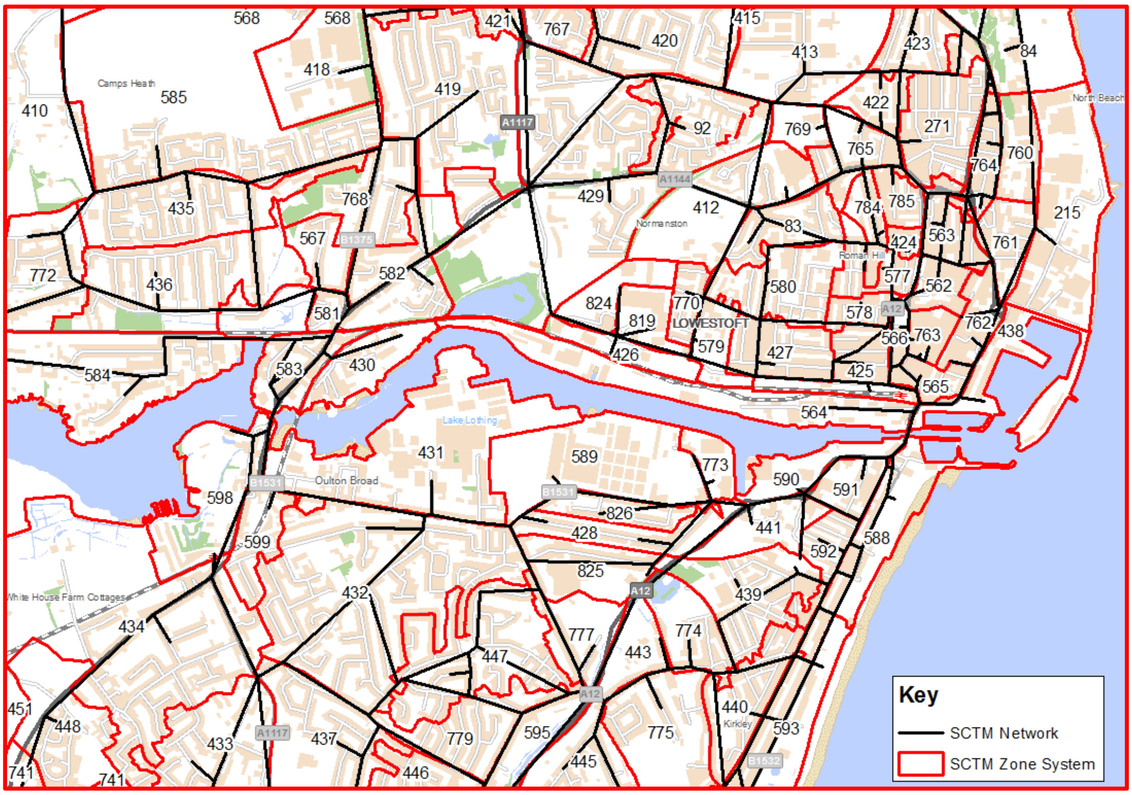


Figure 7 - ***Local network structure***

3.3.2. Figure 8 presents the network structure for Lowestoft and the surrounding area.

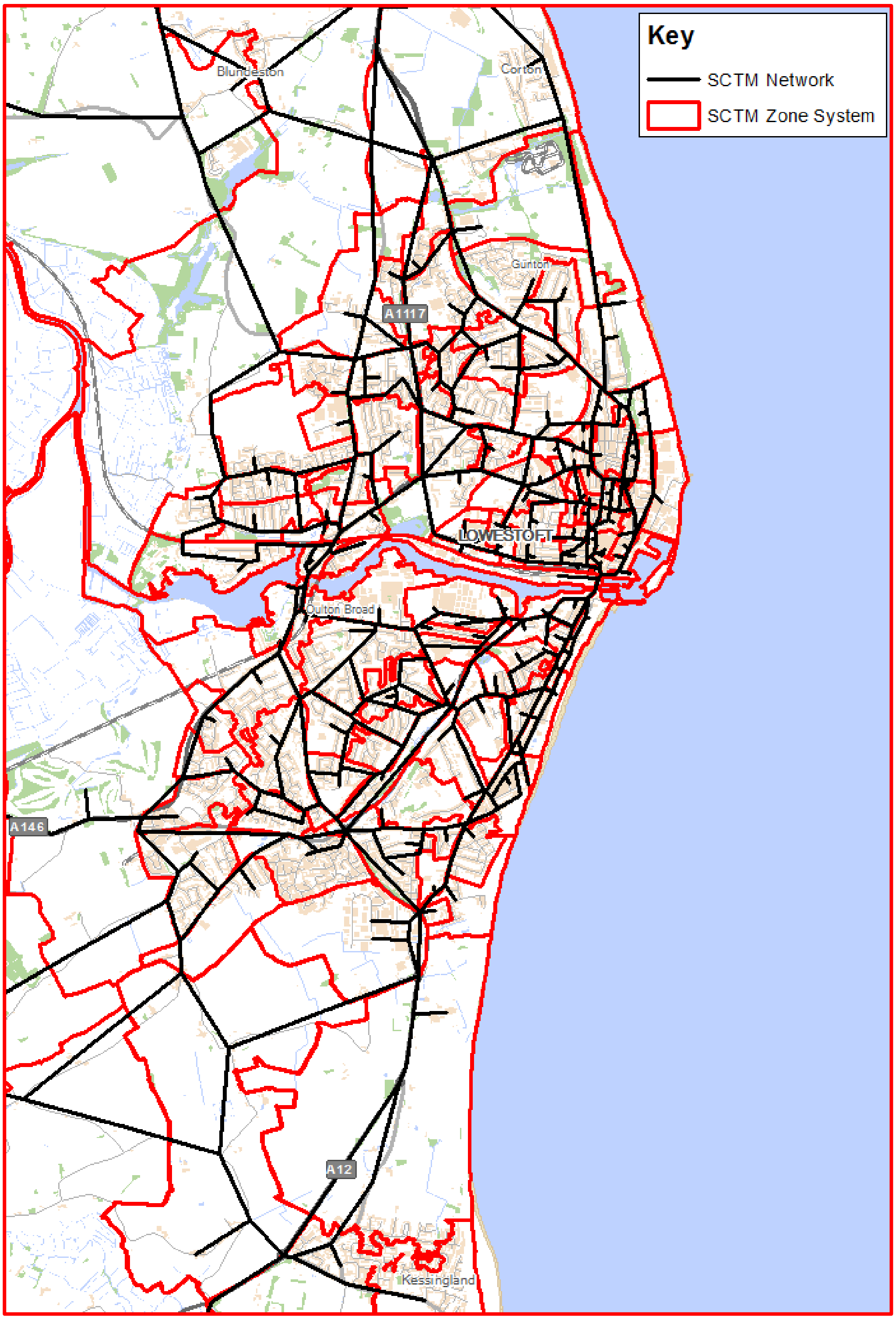


Figure 8 - ***Wider network structure***

3.3.3. It is considered the SCTM network is sufficiently detailed in Lowestoft for the purposes of base year validation and calibration, and provides a sufficient basis from which to build forecasts to appraise the Lake Lothing Third Crossing scheme.

3.4 CENTROID CONNECTORS

3.4.1. Centroid connectors connect the zoning system to the model network, allowing trips to load onto the network for assignment. It is critical that centroid connectors represent realistic loading points, particularly in the fully modelled area. Centroid connectors 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.

3.4.2. 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.

3.4.3. 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 in the majority of cases, 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.

3.4.4. In the internal simulation network covered by Suffolk, 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.

3.4.5. 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.

3.5 USER CLASSES

3.5.1. The following user classes are modelled within the SCTM:

- UC1: Car – Home Based Work (Inbound)
- UC2: Car – Home Based Work (Outbound)
- UC3: Car – Home Based Employers Business (Inbound)
- UC4: Car – Home Based Employers Business (Outbound)
- UC5: Car – Non Home Based Employers Business
- UC6: Car – Home Based Other (Inbound)
- UC7: Car – Home Based Other (Outbound)
- UC8: Car – Non Home Based Other
- UC9: LGV
- UC10: HGV

3.5.2. These car user classes are consistent with those presented in the D3 SCTM LMVR (November 2017). This detail in terms of model user classes is used to aid the conversion of highway assignment matrices in Origin-Destination format into Production-Attraction matrices in the SCTM Variable Demand Model (VDM). The SCTM VDM needs to be able to distinguish which part of a trip is home-based, inbound; meaning an individual is heading towards their place of residence, and outbound; an individual is leaving their home at the start of the trip. This directionality of trips is available in the Mobile Network Data (MND) which was used to build the matrices and therefore this information was utilised rather than the SCTM Demand Model having to infer directionality of home-based trips artificially from user classes which combine the inbound and outbound direction of home-based trips.

3.6 ASSIGNMENT METHODOLOGY

3.6.1. 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:

3.6.2. "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."

3.6.3. 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.

3.7 RELATIONSHIP WITH DEMAND MODELS AND PUBLIC TRANSPORT ASSIGNMENT MODELS

3.7.1. The SCTM Public Transport assignment model utilises the same MND provided by Telefonica as the basis for the matrices. As discussed in D3 SCTM LMVR (November 2017), movements designated as “Road” in the MND are separated into Cars / LGVs and Bus movements, with the latter matrix then used in the public transport model.

3.7.2. The SCTM VDM utilises time and distance skim matrices from the SCTM Highway Model, as well as skims from the public transport model in order to determine costs and the propensity for modal shift between different motorised modes. The SCTM Demand Model will be capable to taking into account trips which involve car usage at the start of a journey to then access the rail network and therefore create a composite cost for full park and ride trips, and therefore the potential for transport users to switch between modes taking into account congestion will occur on the highway network in the future.

3.7.3. The Suffolk VDM is described in greater detail in the D5 SCTM Demand Model Validation Report (DMVR; November 2017).

4 CALIBRATION AND VALIDATION DATA

4.1 INTRODUCTION

4.1.1. This section of the report details the sources of the traffic data in Lowestoft which was used for traffic flow and journey time calibration and validation. It also provides details of the screenlines which have been used to assess the ability of the SCTM highway model within Lowestoft to match to observed data across several sites representing key strategic movements within the county.

4.2 LOWESTOFT TRAFFIC SURVEY DATA

4.2.1. The main source of traffic data available in Lowestoft was collected in July 2015 and was used to support the Lake Lothing Third Crossing OBC.

4.2.2. WSP subsequently commissioned a range of surveys which are detailed in the D2 SCTM Data Collection Report (November 2017) these were used to calibrate and validate the SCTM at a county-wide level which include survey locations in Waveney District. The Data Collection Report also details the 2015 which has been utilised within the modelling outlined in this report.

4.2.3. Additional traffic survey data was collected in 2016 at the locations listed in Table 1 below, these counts were fully classified turning counts carried out on a single day.

Table 1 – 2016 MCC Locations

Count Number	Location
1	London Road / Arbor Lane / A12 / Tower Road
2	Tom Crisp Way / Stradbroke 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 / Unnamed Road

4.2.4. The base year of the SCTM is 2016; therefore traffic surveys conducted in 2015 were adjusted using a combination of NTEM 7.2 factors for observed car values and the National Transport Model (NTM) for observed LGV and HGV values. These factors are summarised in Table 2.

Table 2 - Factors applied to 2015 counts

Peak	Car	LGV	HGV
AM Peak	0.986	1.028	1.028
Inter Peak	0.999	1.028	1.028
PM Peak	0.989	1.007	1.007

4.2.5. It is considered that the combination of traffic data sources provide a sufficient level of coverage to enable calibration and validation of the SCTM in the Lowestoft area. The sources of the various traffic data surveys is summarised in Table 3.

Table 3 - Lowestoft traffic survey data

Data Source	Time Period	Number Of Surveys
TRADS	April 2016	2
LTM ATCs	July 2015	30
SCC ATCs	April / May / June 2016	12
LTM MCTCs	July 2015	9
SCTM MCTCs	July 2016	6
Total	Combined	59

4.3 LOWESTOFT SCREENLINES

4.3.1. Figure 9 details the traffic counts and screenlines which have been used for validation and calibration within Lowestoft. In total there are 4 calibration screenlines and 3 validation screenlines which have been used specifically within Lowestoft.

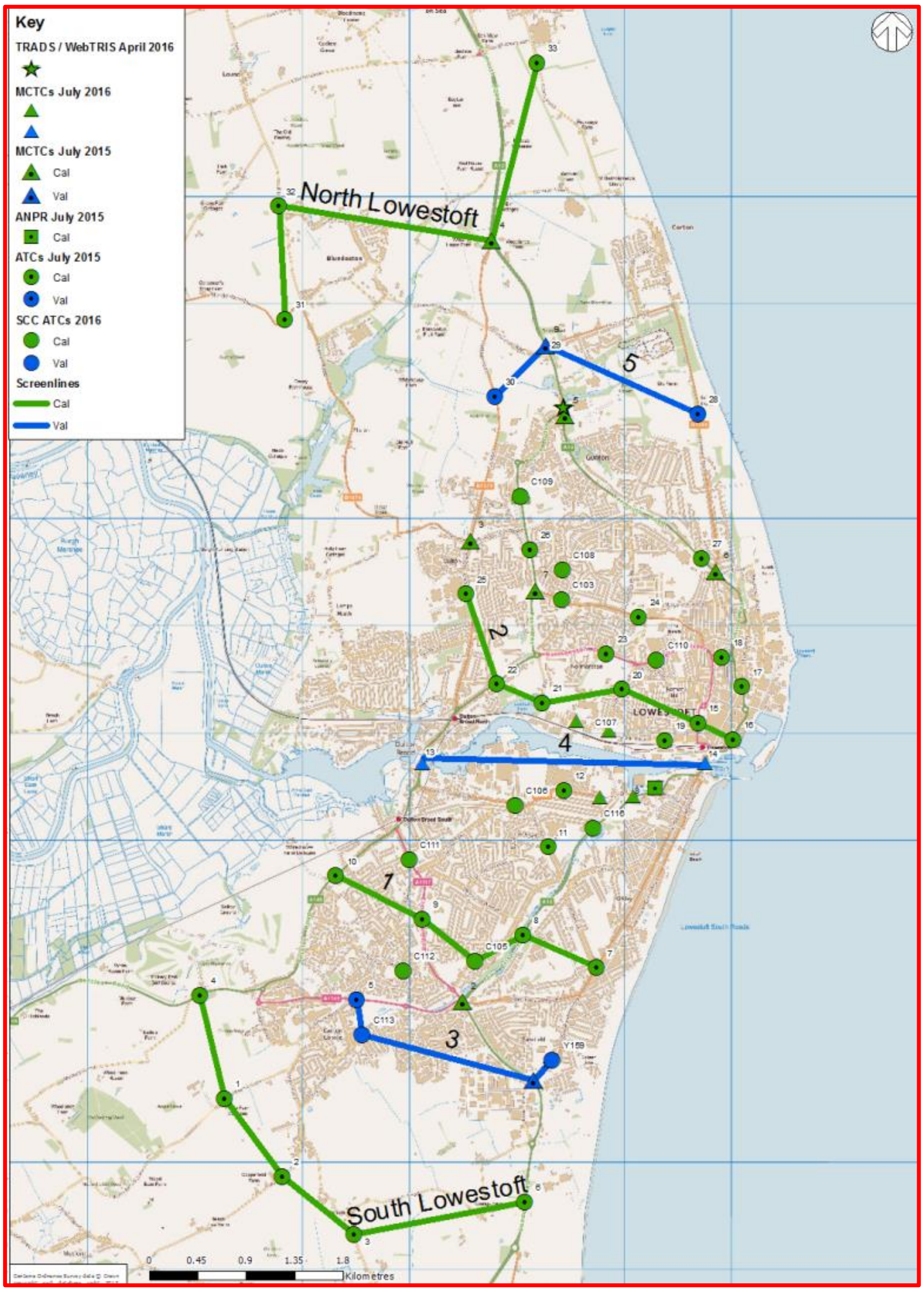


Figure 9 - ***Lowestoft Screenlines and Count Data***

4.4 JOURNEY TIME SURVEYS FOR CALIBRATION AND VALIDATION

4.4.1. The SCTM was validated and calibrated using a range of journey time routes covering key strategic routes across the county. The journey time routes are presented in the D3 SCTM LMVR (February 2017) and utilised 2015/2016 Trafficmaster GPS data. This included four journey time routes in Lowestoft, namely routes 14, 15, 60 and 64.

4.4.2. Additional journey time routes have been derived for Lowestoft to improve the local validation. All existing and new journey time routes were updated using 2015/2016 Trafficmaster GPS data.

4.4.3. Table 4 describes the journey time routes which were used for calibrating and validating the SCTM within Lowestoft. Following the guidance in WebTAG unit M1.2 it has been ensured the journey time routes were kept between 3km and 15km.

Table 4 - *Lowestoft Journey time routes*

ID	Description	Length
14	A12 Wangford to Pakefield	14.3km
15	A134 Long Melford to Stanningfield	4.5km
60	A1145 through Lowestoft	9km
64	A145 Beccles to Lowestoft	7.5km
101	B1375 Gorleston Road	4.5km
102	A12 Yarmouth Road / Katwijk Way	8.5km
103	A1117 Normanston Drive / A1144 St Peter's Street	3.3km
104	A12 London Road / B1532 London Road South	3.3km
105	B1074 / A1117 Millennium Way / Oulton Road	3.9km
106	A146 Beccles Road / A146 Waveney Drive	4.8km

4.4.4. The 2015/2016 Trafficmaster GPS data was filtered to only include data from the following neutral months:

- September 2016
- October 2016
- November 2016
- March 2017
- April 2017
- May 2017

4.4.5. The data was processed to provide an average weekday (Monday to Thursday) travel time by direction for each peak hour modelled within the SCTM. Suffolk school holidays and bank holidays were excluded from the data used to derive the average travel times.

4.4.6. The journey time routes used for model calibration and validation are shown in Figure 10.

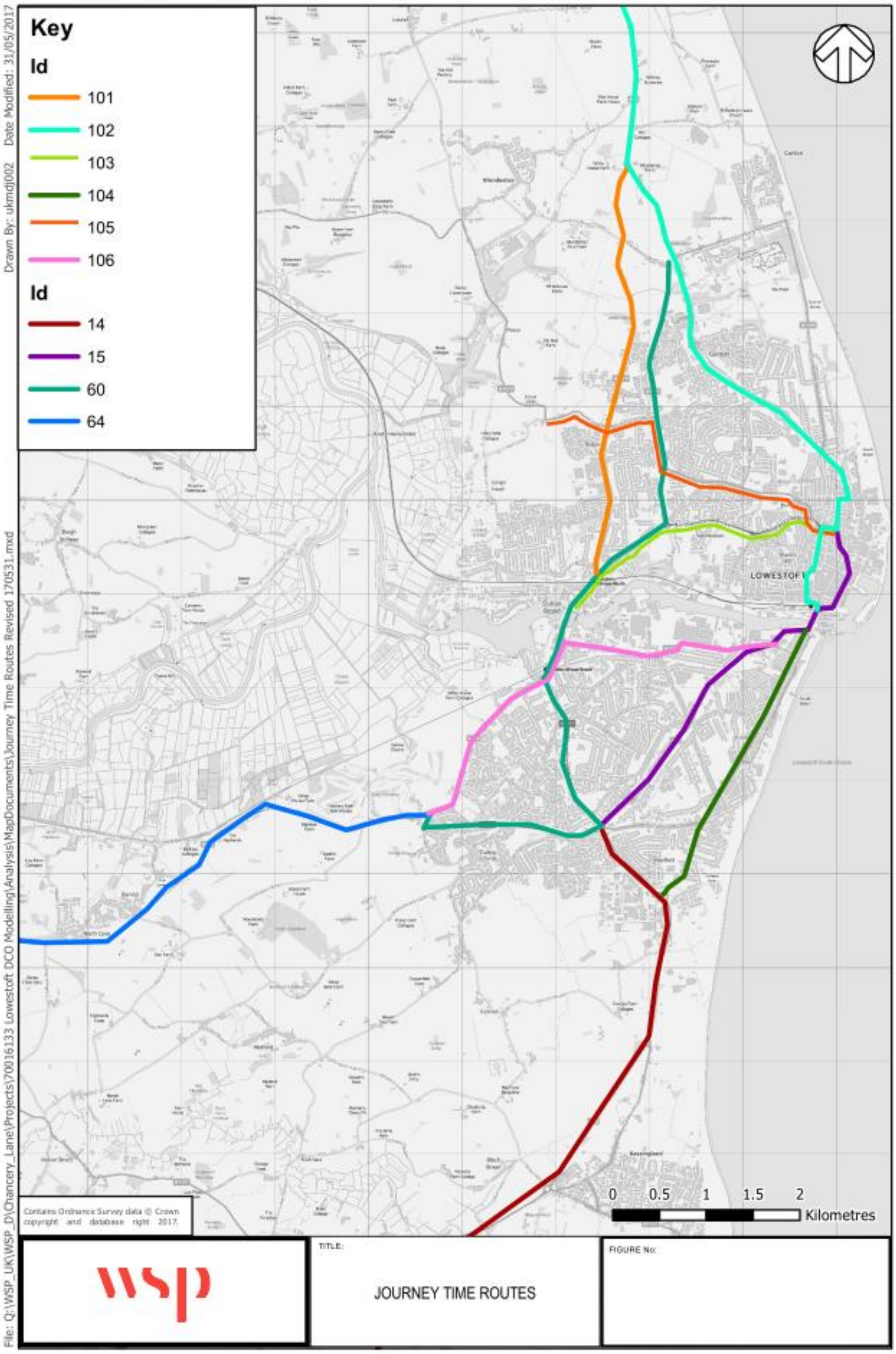


Figure 10 - ***Journey Time Routes***

5 NETWORK DEVELOPMENT

5.1 INTRODUCTION

5.1.1. While the SCTM provides a sound basis for countywide scheme appraisal, the suitability of the model within the vicinity of any scheme intervention needs to be reviewed. With regard to the Lake Lothing Third Crossing it was considered additional local coding was required to achieve better calibration and validation results in Lowestoft.

5.1.2. As part of the local validation the model was calibrated to better reflect the 2016 base year conditions, including updating the speed flow curves assigned to links, zone connectors, lane capacities and free flow speeds.

5.2 FLOW / DELAY RELATIONSHIPS

5.2.1. Table 5 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). No swing bridge delay was coded for the western Mutford Bridge as observations showed the bridge rarely opens to maritime traffic.

Table 5 - 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	3,300	300

5.2.2. There are two level crossings in the immediate vicinity of the western Mutford Bridge on Bridge Road and Victoria Road. These were represented in the model as a signalised node with a single stage using the timings detailed in Table 6 and Table 7.

Table 6 - Bridge Road level crossing timings input into the model

Peak Hour	Green Time (Seconds)	Red Time (Seconds)
AM peak	950	250
Inter peak	1017	183
PM peak	980	220

Table 7 - Victoria Road level crossing timings input into the model

Peak Hour	Green Time (Seconds)	Red Time (Seconds)
AM peak	1693	107
Inter peak	1693	107
PM peak	1593	207

5.2.3. The delays generated by the swing bridges and level crossings were compared to journey time route graphs combined with a comparison of modelled to observed flow to ensure an appropriate level of delay was applied.

5.3 TIDAL FLOW LANE

5.3.1. Between the A12 Belvedere Road / London Road S and A12 Station Square / Commercial Road the direction of travel for the central lane changes by time of day. In the AM peak this was coded with the central lane allowing northbound movements. In the inter peak and PM the central lane was coded to allow southbound movements.

5.4 DETAILED SATURATION FLOWS CALCULATIONS

5.4.1. The SCTM uses default measurements for junction saturation flows based upon typical junction layouts and these are set out within D3 SCTM LMVR (November 2017). In addition a number of junctions within the Lowestoft model area have individually calculated saturation flows from the coding of the original Lowestoft Transport model.

5.4.2. As part of this model update additional measurements were carried out using to derive saturation flows for the following local key junctions in Lowestoft:

- Normanston Drive / Peto Way
- Normanston Drive / Bridge Road / B1375
- Bridge Road / A146
- A12 / A146
- A12 / Mill Road
- A12 / A1145

5.5 SUMMARY

5.5.1. The inclusion of delays associated with swing bridges and level crossings, directionality of the tidal flow lane and specifically measured saturation flows at key junctions ensures the SCTM better replicates the local highway network within Lowestoft for the purposes of calibration and validation in the local area.

5.5.2. The Changes made as part of this local model validation have been incorporated into the wider county mode validation that are set out within D3 SCTM LMVR (November 2017).

6 TRIP MATRIX DEVELOPMENT

6.1 INTRODUCTION

6.1.1. The main source of the demand from which matrices have been derived within the SCTM is from Mobile Network Data (MND) provided by Telefonica. This data has been combined with a synthetic matrix derived from 2011 Census Journey to Work data and the National Travel Survey (NTS) which infills the MND for short distance trips (0-2km) which are not present in the MND.

6.1.2. The D3 SCTM LMVR (November 2017) provides details of the verification which has been undertaken for the MND and the methodology which has been undertaken to derive the matrices.

6.2 TRIP MATRIX ESTIMATION

6.2.1. Matrix estimation was carried on the prior matrix during the calibration and validation process. Table 8 compares the prior matrix totals to the post matrix-estimation totals.

Table 8 - Prior and Post ME Matrix Totals

User Class	AM Peak Hour (0800-0900)		Inter Peak Avg Hour (1000-1600)		PM Peak Hour (1700-1800)	
	Prior	Post ME	Prior	Post ME	Prior	Post ME
UC1 – Car HBW IB	3,046	3,719	7,557	7,899	61,232	53,969
UC2 – Car HBW OB	64,460	56,289	6,322	6,562	1,315	1,485
UC3 – Car HEB IB	302	316	956	1,036	4,041	4,031
UC4 – Car HEB OB	4,433	4,207	853	892	958	967
UC5 – Car NHEB	7,588	8,186	6,209	6,846	7,165	7,662
UC6 – Car HBO IB	4,928	5,510	26,251	28,444	40,921	37,366
UC7 – Car HBO OB	37,957	34,885	26,809	28,389	16,164	16,567
UC8 – Car NHBO	6,298	6,037	13,800	15,004	12,191	11,579
UC9 – LGV	14,806	12,629	11,563	10,611	11,689	10,292
UC10 – HGV	4,458	8,810	4,631	9,070	4,988	6,085
Total	**148,275**	**140,587**	**104,951**	**114,752**	**160,665**	**150,004**

7 ASSIGNMENT CALIBRATION AND VALIDATION

7.1 INTRODUCTION

7.1.1. This section preens the local model validation statistics for the Lowestoft study area. In general, the criteria detailed in this section of the report have been drawn from DfT TAG Unit M3.1, section 3.2 (January 2014). All the models reported on in this report are results from assignments in SATURN version 11.3.12w.

7.2 CONVERGENCE

7.2.1. An element of calibrating the model is ensuring that a satisfactory convergence is achieved. Model convergence is needed to ensure results remain stable between successive iterations of the model assignments. 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.

7.2.2. 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.

7.2.3. The convergence criteria used to assess when a model is considered to have converged is shown in Table 9.

Table 9 - 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%

7.2.4. TAG Unit M3.1 (January 2014) 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

7.2.5. Table 10, Table 11 and Table 12 show the convergence results against WebTAG criteria for each peak hour modelled.

Table 10 - AM peak convergence results

Iteration	Delta	%Flow	%Gap
18	0.0179	98	0.014
19	0.0161	98.4	0.012
20	0.0147	98.7	0.011
21	0.0139	99	0.0093

Table 11 - Inter peak convergence results

Iteration	Delta	%Flow	%Gap
16	0.0062	98.4	0.023
17	0.0063	98.8	0.01
18	0.0064	98.7	0.0065
19	0.0044	98.4	0.0056

Table 12 - PM peak convergence results

Iteration	Delta	%Flow	%Gap
20	0.0182	98.1	0.034
21	0.0206	98.5	0.035
22	0.0263	98.2	0.034
23	0.0196	98.5	0.03

7.2.6. The model convergence results show the SCTM successfully converges to the WebTAG requirements in all three peaks.

7.3 SCREENLINE VALIDATION CRITERIA

7.3.1. 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 13.

Table 13 - ***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

7.3.2. Screenlines are presented for each time period, for all vehicle user classes, namely Cars, LGVs and HGVs. The main body of this report provides screenline analysis in terms of the total overall flow including all vehicle types. Breakdown of screenline performance by vehicle type is detailed in Appendix D for the final model assignment.

7.4 SCREENLINE VALIDATION PERFORMANCE

7.4.1. This section presents screenline calibration and validation by route and direction for each time period and an overall summary of model performance.

AM PEAK SCREENLINE PERFORMANCE

7.4.2. Table 14 shows the performance in terms of percentage difference between modelled and observed flow for calibration and validation screenlines in the AM peak.

Table 14 - AM peak screenline performance

ID	Description	Dir	Type	Obs	Mod	Diff
1	South Lowestoft	Inbound	Calibration	1421	1452	2%
2	South Lowestoft	Outbound	Calibration	1330	1364	3%
3	Lowestoft Screenline 1 - NB	Northbound	Calibration	2207	2207	0%
4	Lowestoft Screenline 1 - SB	Southbound	Calibration	1685	1693	0%
5	Lowestoft Screenline 2 - NB	Northbound	Calibration	2866	2872	0%
6	Lowestoft Screenline 2 - SB	Southbound	Calibration	2095	2114	1%
7	North Lowestoft	Inbound	Calibration	1194	1191	0%
8	North Lowestoft	Outbound	Calibration	1454	1452	0%
9	Lowestoft Screenline 3 - EB	Eastbound	Validation	1747	1626	-7%
10	Lowestoft Screenline 3 - WB	Westbound	Validation	1741	1541	-11%
11	Lowestoft Screenline 4 - NB	Northbound	Validation	2419	2308	-5%
12	Lowestoft Screenline 4 - SB	Southbound	Validation	1732	1883	9%
13	Lowestoft Screenline 5 - NB	Northbound	Validation	1359	1344	-1%
14	Lowestoft Screenline 5 - SB	Southbound	Validation	1024	1052	3%

7.4.3. Table 14 shows all but 3 of the screenlines pass WebTAG guidance criteria. Of those that fail, validation screenline 3 eastbound shows a modelled flow difference of -7%, Validation screenline 3 westbound shows a modelled flow difference of -11% and Validation screenline 4 southbound shows a modelled flow difference of 9%.

INTER PEAK SCREENLINE PERFORMANCE

7.4.4. Table 15 shows the performance of the calibration and validation screenlines in the inter-peak.

Table 15 - Inter peak screenline performance

ID	Description	Dir	Type	Obs	Mod	Diff
1	South Lowestoft	Inbound	Calibration	1326	1339	1%
2	South Lowestoft	Outbound	Calibration	1347	1361	1%
3	Lowestoft Screenline 1 - NB	Northbound	Calibration	1826	1828	0%
4	Lowestoft Screenline 1 - SB	Southbound	Calibration	1873	1876	0%
5	Lowestoft Screenline 2 - NB	Northbound	Calibration	2473	2481	0%
6	Lowestoft Screenline 2 - SB	Southbound	Calibration	2635	2628	0%
7	North Lowestoft	Inbound	Calibration	1052	1030	-2%
8	North Lowestoft	Outbound	Calibration	1027	1009	-2%
9	Lowestoft Screenline 3 - EB	Eastbound	Validation	1665	1587	-5%
10	Lowestoft Screenline 3 - WB	Westbound	Validation	1662	1595	-4%
11	Lowestoft Screenline 4 - NB	Northbound	Validation	1857	2036	10%
12	Lowestoft Screenline 4 - SB	Southbound	Validation	2013	2188	9%
13	Lowestoft Screenline 5 - NB	Northbound	Validation	940	936	-1%
14	Lowestoft Screenline 5 - SB	Southbound	Validation	905	936	3%

7.4.5. Table 15 shows for nearly all screenlines, modelled flows are within 5% of observed flows. The exception to this is Validation Screenline 4 northbound with modelled flow 10% higher compared to observed flow and Validation Screenline 4 southbound with a modelled flow 9% higher than observed.

PM PEAK SCREENLINE PERFORMANCE

7.4.6. Table 16 details the performance of the screenlines in the PM peak.

Table 16 - ***PM peak screenline performance***

ID	Description	Dir	Type	Obs	Mod	Diff
1	South Lowestoft	Inbound	Calibration	1792	1801	1%
2	South Lowestoft	Outbound	Calibration	1517	1536	1%
3	Lowestoft Screenline 1 - NB	Northbound	Calibration	2145	2145	0%
4	Lowestoft Screenline 1 - SB	Southbound	Calibration	2284	2292	0%
5	Lowestoft Screenline 2 - NB	Northbound	Calibration	2471	2473	0%
6	Lowestoft Screenline 2 - SB	Southbound	Calibration	3219	3228	0%
7	North Lowestoft	Inbound	Calibration	1851	1829	-1%
8	North Lowestoft	Outbound	Calibration	1211	1207	0%
9	Lowestoft Screenline 3 - EB	Eastbound	Validation	2021	1899	-6%
10	Lowestoft Screenline 4 - WB	Westbound	Validation	1725	1784	3%
11	Lowestoft Screenline 4 - NB	Northbound	Validation	2041	2113	4%
12	Lowestoft Screenline 4 - SB	Southbound	Validation	2528	3001	19%
13	Lowestoft Screenline 5 - NB	Northbound	Validation	1129	1116	-1%
14	Lowestoft Screenline 5 - SB	Southbound	Validation	1598	1699	6%

7.4.7. Table 16shows for the majority of screenlines there minimal differences between the observed and modelled flow. Validation Screenline 3 east bound has a modelled flow 6% less than observed while Validation Screenline 4 southbound is 19% higher compared to the modelled flow.

SCREENLINE SUMMARY PERFORMANCE

7.4.8. Table 17 shows the overall screenline performance by modelled time period.

Table 17 - Overall Screenline Performance

Time Period	Total Screenlines	Modelled Flow On Screenlines Within 5% of Observed	Modelled (s)
AM Peak	14	11	79%
Inter Peak	14	12	86%
PM Peak	14	11	79%

7.4.9. Table 17 shows in the inter peak and PM peak, nearly all screenlines (86%) have modelled flow within 5% of the observed flow. In the AM peak, there are three screenlines which show a difference of greater than 5%, meaning 79% of screenlines pass the threshold.

7.4.10. Appendix A provides further detail of the performance of the individual counts which comprise the Lowestoft screenlines.

7.5 ASSIGNMENT VALIDATION CRITERIA

7.5.1. This section presentation the link flow and turning movement validation statistics for the Lowestoft study area and is in line with TAG Unit M3.1 (January 2014).

7.5.2. Measures used for link validation are:

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

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

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

7.5.4. The link flow and turning movement validation criteria are shown in Table 18.

Table 18 - 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

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

7.6 LOWESTOFT ASSIGNMENT VALIDATION PERFORMANCE

7.6.1. The calibration and validation performance for Lowestoft is presented in this section. The performance of the full county model is provided in section 7.5.

7.6.2. The calibration and validation results for all user classes in the AM peak are shown in Table 19.

Table 19 - AM Peak – All User Classes – Flow Test Calibration and Validation - Lowestoft

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
< 700 vph	±100 vph	> 85 % of links	149	138	93%	11	10	91%
700 - 2,700 vph	±15%	> 85 % of links	9	9	100%	7	7	100%
> 2,700 vph	±400 vph	> 85 % of links	0	0	0%	0	0	0%

7.6.3. Table 19 shows that the model exceeds WebTAG guidance with a minimum of 91% of counts achieving criteria in all categories. Table 20 shows the breakdown of calibration and validation count performance by GEH band for the AM peak.

Table 20 - AM Peak – All User Classes – GEH Test Calibration and Validation - Lowestoft

GEH Range	Calibration		Validation		Combined	
GEH < 2	120	76%	11	61%	131	74%
GEH < 4	136	86%	15	83%	151	86%
GEH < 6	147	93%	17	94%	164	93%
GEH < 8	150	95%	17	94%	167	95%
GEH < 10	156	99%	17	94%	173	98%
GEH <5	142	90%	16	89%	158	90%

7.6.4. Table 20 shows that calibration, validation and combined count performance exceeds the WebTAG guidance with a minimum of 89% of counts achieving criteria in all categories This rises to 93% for a GEH below 6, and 95% for a GEH below 8, this implies there are a number of counts falling marginally outside the WebTAG requirement of a GEH below 5.

7.6.5. The calibration and validation results for all user classes in the Inter peak are shown in Table 21.

Table 21 - Inter Peak – All User Classes – Flow Test Calibration and Validation - Lowestoft

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
< 700 vph	±100 vph	> 85 % of links	154	146	95%	12	12	100%
700 - 2,700 vph	±15%	> 85 % of links	4	4	100%	6	5	83%
> 2,700 vph	±400 vph	> 85 % of links	0	0	0%	0	0	0%

7.6.6. Table 21 shows that the model exceeds WebTAG guidance for calibration with a minimum of 95% of links meeting criteria but is marginally lower for validation with a minimum of 83% achieving criteria in all categories.

7.6.7. Table 22 details the performance of the calibration and validation counts in the inter peak by GEH band.

Table 22 - Inter Peak – All User Classes – GEH Test Calibration and Validation - Lowestoft

GEH Range	Calibration		Validation		Combined	
GEH < 2	120	76%	5	28%	125	71%
GEH < 4	136	86%	15	83%	151	86%
GEH < 6	147	93%	15	83%	162	92%
GEH < 8	151	96%	18	100%	169	96%
GEH < 10	154	97%	18	100%	172	98%
GEH <5	142	90%	15	83%	157	89%

7.6.8. Table 22 shows that calibration and combined count performance exceeds the WebTAG guidance with a minimum of 89% of counts achieving criteria but is marginally lower for validation with 83% achieving criteria. This rises to 100% for a GEH below 8, which demonstrates there are a number of validation counts falling close to the WebTAG guidance for a GEH below 5.

7.6.9. The calibration and validation results for all user classes in the PM peak are shown in Table 23.

Table 23 - PM Peak – All User Classes – Flow Test Calibration and Validation - Lowestoft

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
< 700 vph	±100 vph	> 85 % of links	140	130	93%	10	7	70%
700 - 2,700 vph	±15%	> 85 % of links	18	15	83%	8	6	75%
> 2,700 vph	±400 vph	> 85 % of links	0	0	0%	0	0	0%

7.6.10. Table 23 shows that the model is close to WebTAG guidance for calibration with a minimum of 83% of links meeting criteria but is lower for validation with a minimum of 70% achieving criteria in all categories. The validation would need 2 additional inks with flow under 700 and 1 link over 700 to pass criteria in order to fully meet the guidance.

7.6.11. Table 24 shows the GEH performance by band for the calibration and validation counts in the PM peak.

Table 24 - PM Peak – All User Classes – GEH Test Calibration and Validation - GEH

GEH Range	Calibration		Validation		Combined	
GEH < 2	113	72%	8	44%	121	69%
GEH < 4	138	87%	11	61%	149	85%
GEH < 6	145	92%	16	89%	161	91%
GEH < 8	151	96%	17	94%	168	95%
GEH < 10	155	98%	18	100%	173	98%
GEH <5	141	89%	14	78%	155	88%

7.6.12. Table 24 shows that calibration and combined count performance exceeds the WebTAG guidance with a minimum of 88% of counts achieving criteria but is lower for validation with 78% achieving criteria. This rises to 89% for a GEH below 6, which demonstrates there are a number of validation counts falling marginally outside the WebTAG guidance of a GEH below 5.

7.6.13. Appendix B contains details of the performance for each individual link count used in validation or calibration in terms of GEH and flow by peak hour modelled. Overall it is consider the mode provides a good calibration and validation across all time periods within the Lowestoft model area.

7.7 COUNTYWIDE ASSIGNMENT VALIDATION PERFORMANCE

7.7.1. The calibration and validation results for all user classes in the AM peak are shown in Table 25.

Table 25 - AM Peak – All User Classes – Flow Test Calibration and Validation – Overall County Level

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
< 700 vph	±100 vph	> 85 % of links	1022	884	86%	200	140	70%
700 - 2,700 vph	±15%	> 85 % of links	195	173	89%	54	38	70%
> 2,700 vph	±400 vph	> 85 % of links	7	7	100%	0	0	0%

7.7.2. Table 25 shows that the model meets WebTAG guidance for calibration with a minimum of 86% of links meeting criteria but is lower for validation with a minimum of 70% meeting criteria. Given the analysis provided in section 7.4, it has been demonstrated the majority of links which fail criteria are located outside of the area of interest and are not significant on the assessment of this scheme.

7.7.3. Table 26 shows the breakdown of calibration and validation count performance by GEH band for the AM peak.

Table 26 - AM Peak – All User Classes – GEH Test Calibration and Validation – Overall County Level

GEH Range	Calibration		Validation		Combined	
GEH < 2	780	64%	11	4%	791	54%
GEH < 4	943	77%	138	54%	1081	73%
GEH < 6	1059	87%	186	73%	1245	84%
GEH < 8	1113	91%	209	82%	1322	89%
GEH < 10	1157	95%	223	88%	1380	93%
GEH <5	1011	83%	166	65%	1177	80%

7.7.4. Table 26 shows that calibration and combined count performance are close to WebTAG guidance with a minimum of 80% of counts achieving criteria but is lower for validation with 65% achieving criteria. Combined 84% have a GEH less than 6 showing a number of counts marginally miss the criteria.

7.7.5. The calibration and validation results for all user classes in the Inter peak are shown in Table 27.

Table 27 - Inter Peak – All User Classes – Flow Test Calibration and Validation – Overall County Level

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
< 700 vph	±100 vph	> 85 % of links	1085	1007	93%	228	177	78%
700 - 2,700 vph	±15%	> 85 % of links	139	129	93%	26	21	81%
> 2,700 vph	±400 vph	> 85 % of links	0	0	0%	0	0	0%

7.7.6. Table 27 shows that the model meets WebTAG guidance for calibration with a minimum of 93% of links meeting criteria but is lower for validation with a minimum of 78% achieving criteria. Given the analysis provided in section 7.4, it has been demonstrated the majority of links which fail criteria are located outside of the area of interest and are not significant on the assessment of this scheme.

7.7.7. Table 28 details the performance of the calibration and validation counts in the inter peak by GEH band.

Table 28 – Inter Peak – All User Classes – GEH Test Calibration and Validation – Overall County Level

GEH Range	Calibration		Validation		Combined	
GEH < 2	846	69%	5	2%	851	58%
GEH < 4	999	82%	164	65%	1163	79%
GEH < 6	1099	90%	196	77%	1295	88%
GEH < 8	1159	95%	220	87%	1379	93%
GEH < 10	1195	98%	234	92%	1429	97%
GEH <5	1053	86%	181	71%	1234	83%

7.7.8. Table 28 shows that calibration meets WebTAG guidance with 86% of counts achieving criteria but is lower for combined at 83% and validation 71% achieving criteria. Combined 88% have a GEH less than 6 showing a number of counts marginally miss the criteria and validation has 87% with a GEH of less than 8.

7.7.9. The calibration and validation results for all user classes in the PM peak are shown in Table 29.

Table 29 - PM Peak – All User Classes – Flow Test Calibration and Validation – Overall County Level

Criteria and Measure		Acceptability Guideline	Calibration			Validation		
			Total Counts	Meet Criteria	%	Total Counts	Meet Criteria	%
< 700 vph	±100 vph	> 85 % of links	985	859	87%	190	125	66%
700 - 2,700 vph	±15%	> 85 % of links	230	200	87%	64	45	70%
> 2,700 vph	±400 vph	> 85 % of links	9	9	100%	0	0	0%

7.7.10. Table 29 shows that the model meets WebTAG guidance for calibration with 87% of links meeting criteria. It is lower for validation with 66% achieving criteria. Given the analysis provided in section 7.4, it has been demonstrated the majority of links which fail criteria are located outside of the area of interest and are not significant on the assessment of this scheme.

7.7.11. Table 30 details the performance of the calibration and validation counts in the PM peak by GEH band.

Table 30 - PM Peak – All User Classes – GEH Test Calibration and Validation – Overall County Level

GEH Range	Calibration		Validation		Combined	
GEH < 2	773	63%	8	3%	781	53%
GEH < 4	949	78%	142	56%	1091	74%
GEH < 6	1051	86%	187	74%	1238	84%
GEH < 8	1109	91%	216	85%	1325	90%
GEH < 10	1152	94%	225	89%	1377	93%
GEH <5	1007	82%	162	64%	1169	79%

7.7.12. Table 30 shows that calibration is close to WebTAG guidance with 82% of counts achieving criteria but is lower for combined at 79% and validation 64% achieving criteria. Combined 84% have a GEH less than 6 showing a number of counts marginally miss the criteria and validation has 85% with a GEH of less than 8.

7.8 MANUAL CLASSIFIED TURNING COUNTS

7.8.1. Further validation of the Lowestoft modelled area was carried out by comparing the GEH for all turns at the junctions for which Manual Classified Turning Counts were commissioned for the 2015 LTM. WebTAG guidance indicates that GEH and flow should match minimum requirements at a link based level, rather than at the level of individual turns, therefore the analysis in this section is a general indicator only of how well the SCTM matches to turning movements at the surveyed junctions.

7.8.2. Table 31 provides a summary of the GEH performance of the turns at the manual classified turning count locations in the AM peak.

Table 31 - *: AM peak manual classified turning count performance*

ID	Description	GEH < 5	GEH < 7.5	GEH < 10
1	London Road/Arbor Lane/A12/Tower Road	92%	100%	100%
2	Tom Crisp Way/Stadbroke Road/Elm Tree Road	97%	97%	100%
3	Somerleyton Road/Oulton Street/Hall Lane/Gorleston Road	88%	94%	100%
4	Yarmouth Road/Gorleston Road	100%	100%	100%
5	Yarmouth Road/Leisure Way/Foxburrow Hill/Bentley Drive	63%	100%	100%
6	Yarmouth Road/Corton Road	89%	100%	100%
7	Millennium Way/Oulton Road/Peto Way	75%	88%	94%
8	Horn Hill/Maconochie Way/A12/Waveney Drive	100%	100%	100%
9	A12/Corton Long Lane/A12/Unnamed Road	92%	100%	100%

7.8.3. Table 31 shows the majority of junctions achieve 100% of turns with a GEH below 10 and 78% have a GEH below 5.

7.8.4. Table 32 provides a summary of the GEH performance of the turns at the manual classified turning count locations in the inter peak.

Table 32 - *Inter peak manual classified turning count performance*

ID	Description	GEH < 5	GEH < 7.5	GEH < 10
1	London Road/Arbor Lane/A12/Tower Road	96%	100%	100%
2	Tom Crisp Way/Stadbroke Road/Elm Tree Road	97%	100%	100%
3	Somerleyton Road/Oulton Street/Hall Lane/Gorleston Road	100%	100%	100%
4	Yarmouth Road/Gorleston Road	100%	100%	100%
5	Yarmouth Road/Leisure Way/Foxburrow Hill/Bentley Drive	81%	100%	100%
6	Yarmouth Road/Corton Road	100%	100%	100%
7	Millennium Way/Oulton Road/Peto Way	81%	94%	100%
8	Horn Hill/Maconochie Way/A12/Waveney Drive	100%	100%	100%
9	A12/Corton Long Lane/A12/Unnamed Road	100%	100%	100%

7.8.5. Table 32 shows all junctions achieve 100% of turns with a GEH below 10 and 81% have a GEH below 5.

7.8.6. Table 33 provides a summary of the GEH performance of the turns at the manual classified turning count locations in the PM peak.

Table 33 - PM peak manual classified turning count performance

ID	Description	GEH < 5	GEH < 7.5	GEH < 10
1	London Road/Arbor Lane/A12/Tower Road	92%	100%	100%
2	Tom Crisp Way/Stadbroke Road/Elm Tree Road	86%	94%	100%
3	Somerleyton Road/Oulton Street/Hall Lane/Gorleston Road	81%	100%	100%
4	Yarmouth Road/Gorleston Road	100%	100%	100%
5	Yarmouth Road/Leisure Way/Foxburrow Hill/Bentley Drive	81%	94%	100%
6	Yarmouth Road/Corton Road	100%	100%	100%
7	Millennium Way/Oulton Road/Peto Way	69%	81%	94%
8	Horn Hill/Maconochie Way/A12/Waveney Drive	94%	100%	100%
9	A12/Corton Long Lane/A12/Unnamed Road	100%	100%	100%

7.8.7. Table 33 shows the majority of junctions achieve 100% of turns with a GEH below 10 and 69% have a GEH below 5.

7.9 JOURNEY TIME VALIDATION CRITERIA

7.9.1. The criteria for journey time validation is stipulated within WebTAG and presented in Table 34.

Table 34 - Journey time acceptability

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

7.9.2. The model does not feature different speed/flow relationships or link speeds for different vehicle types with the comparisons being presented for all vehicles combined. Comparisons are presented separately for all modelled time periods.

7.10 JOURNEY TIME VALIDATION PERFORMANCE

7.10.1. This section presents journey time validation by route and direction for each time period and an overall summary of model performance.

AM PEAK JOURNEY TIME PERFORMANCE

7.10.2. Table 35 provides a summary of the performance by each journey time route and direction in the AM peak.

Table 35 - *AM peak journey time route performance*

ID	Name	Observed (s)	Modelled (s)	Diff	%	Pass?
1	14 - Northbound	766	760	-6	-1%	Yes
2	14 - Southbound	782	751	-31	-4%	Yes
3	15 - Northbound	544	538	-6	-1%	Yes
4	15 - Southbound	479	479	0	0%	Yes
5	60 - Northbound	1025	894	-131	-13%	Yes
6	60 - Southbound	956	889	-67	-7%	Yes
7	64 - Eastbound	316	306	-10	-3%	Yes
8	64 - Westbound	311	317	6	2%	Yes
9	101 - Northbound	356	412	56	16%	Yes
10	101 - Southbound	412	361	-51	-12%	Yes
11	102 - Northbound	701	662	-39	-6%	Yes
12	102 - Southbound	753	668	-85	-11%	Yes
13	103 - Eastbound	383	375	-8	-2%	Yes
14	103 - Westbound	372	428	56	15%	Yes
15	104 - Northbound	543	518	-25	-5%	Yes
16	104 - Southbound	390	401	11	3%	Yes
17	105 - Eastbound	505	462	-43	-8%	Yes
18	105 - Westbound	447	365	-82	-18%	No
19	106 - Eastbound	620	480	-140	-23%	No
20	106 - Westbound	515	502	-13	-3%	Yes

7.10.3. Table 35 shows all but 2 routes pass WebTAG guidance criteria. Of the two routes that fail, Route 105 Westbound falls marginally outside of the minimum criteria of 15% with a modelled journey time 18% slower than the observed and Route 106 Eastbound has a modelled journey time 23% faster than the observed.

INTER PEAK JOURNEY TIME PERFORMANCE

7.10.4. Table 36 provides a summary of the performance by each journey time route and direction in the Inter peak.

Table 36 - Inter peak journey time route comparison

ID	Name	Observed (s)	Modelled (s)	Diff	%	Pass?
1	14 - Northbound	814	753	-61	-7%	Yes
2	14 - Southbound	787	746	-41	-5%	Yes
3	15 - Northbound	560	622	62	11%	Yes
4	15 - Southbound	514	438	-76	-15%	Yes
5	60 - Northbound	873	958	85	10%	Yes
6	60 - Southbound	887	954	67	8%	Yes
7	64 - Eastbound	311	299	-12	-4%	Yes
8	64 - Westbound	311	302	-9	-3%	Yes
9	101 - Northbound	344	368	24	7%	Yes
10	101 - Southbound	387	358	-29	-7%	Yes
11	102 - Northbound	723	632	-91	-13%	Yes
12	102 - Southbound	868	690	-178	-20%	No
13	103 - Eastbound	359	388	29	8%	Yes
14	103 - Westbound	401	474	73	18%	No
15	104 - Northbound	641	516	-125	-20%	No
16	104 - Southbound	401	395	-6	-1%	Yes
17	105 - Eastbound	464	446	-18	-4%	Yes
18	105 - Westbound	423	426	3	1%	Yes
19	106 - Eastbound	532	481	-51	-10%	Yes
20	106 - Westbound	483	515	32	7%	Yes

7.10.5. Table 36 shows all but 3 routes pass WebTAG guidance criteria. Of the 3 routes that fail, Route 102 Southbound has a modelled journey time 20% faster than the observed, Route 103 Westbound has a modelled journey time 18% slower than the observed and Route 104 northbound is 20% faster than the observed journey time.

PM PEAK JOURNEY TIME PERFORMANCE

7.10.6. Table 37 provides a summary of the performance by each journey time route and direction in the PM peak

Table 37 - ***PM peak journey time route comparison***

ID	Name	Observed (s)	Modelled (s)	Diff	%	Pass?
1	14 - Northbound	882	775	-107	-12%	Yes
2	14 - Southbound	743	746	3	0%	Yes
3	15 - Northbound	584	521	-63	-11%	Yes
4	15 - Southbound	499	541	42	8%	Yes
5	60 - Northbound	958	958	0	0%	Yes
6	60 - Southbound	941	1005	64	7%	Yes
7	64 - Eastbound	323	344	21	7%	Yes
8	64 - Westbound	312	314	2	1%	Yes
9	101 - Northbound	341	376	35	10%	Yes
10	101 - Southbound	467	432	-35	-8%	Yes
11	102 - Northbound	683	630	-53	-8%	Yes
12	102 - Southbound	760	708	-52	-7%	Yes
13	103 - Eastbound	352	369	17	5%	Yes
14	103 - Westbound	468	488	20	4%	Yes
15	104 - Northbound	655	546	-109	-17%	No
16	104 - Southbound	359	399	40	11%	Yes
17	105 - Eastbound	462	444	-18	-4%	Yes
18	105 - Westbound	412	440	28	7%	Yes
19	106 - Eastbound	677	483	-194	-29%	No
20	106 - Westbound	570	548	-22	-4%	Yes

7.10.7. Table 37 shows all but 2 routes pass WebTAG guidance criteria. Of the 3 routes that fail, Route 104 northbound is modelled 17% faster than the observed journey time and Route 106 eastbound is modelled 29% faster than the observed journey time.

7.11 JOURNEY TIME PERFORMANCE SUMMARY

7.11.1. The overall performance of journey time routes by peak hour modelled is presented in Table 38.

Table 38 - Overall journey time route performance

ID	Total Observed Journey Time Routes	Modelled Journey Time Routes Within 15% of Observed	Modelled (s)
AM Peak	20	18	90%
Inter Peak	20	17	85%
PM Peak	20	18	90%

7.11.2. Table 38 demonstrates that across all three time periods the minimum criteria of 85% of modelled routes return travel times within 15% of the observed journey time has been achieved. The modelled is therefore considered to have excellent journey time validation.

7.11.3. Appendix C contains graphs for each journey time route by direction and for each time period modelled.

7.12 ROUTE VALIDATION

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

7.12.2. 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 determines as follows:

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

7.12.3. Based on the 116 SCTM zones which are within the area of influence for the Lake Lothing Third Crossing, this equates to 36 routes. The origin / destination zone pairs and descriptions used for the route validation are described in Table 39.

Table 39 – Origin-destination route checks

ID	Origin Zone	Origin Description	Destination Zone	Destination Description
1	408	Stirrups Lane	465	A12 Near the Hollies Camping 7 Leisure Resort
2	465	A12 Near the Hollies Camping 7 Leisure Resort	408	Stirrups Lane
3	84	395 Whapload Road	593	43 Kirkley Cliff Road
4	593	43 Kirkley Cliff Road	84	395 Whapload Road
5	767	5 Lulworth Park	434	17 Smith's Walk
6	434	17 Smith's Walk	767	5 Lulworth Park
7	84	395 Whapload Road	782	40-50 Rectory Road
8	782	40-50 Rectory Road	84	395 Whapload Road
9	586	2 The Lease	781	Hadenham Road (Near Adventure Island Park Play)
10	781	Hadenham Road (Near Adventure Island Park Play)	586	2 The Lease

11	408	Stirrups Lane	582	270 Normanston Drive
12	582	270 Normanston Drive	408	Stirrups Lane
13	427	Harvey Street (Denmark Road)	781	Hadenham Road (Screwfix)
14	781	Hadenham Road (Screwfix)	427	Harvey Street (Denmark Road)
15	639	1 Spinney Gardens	463	Coopers Lane
16	463	Coopers Lane	639	1 Spinney Gardens
17	409	5 Lowry Way	584	51-55 Borrow Road
18	584	51-55 Borrow Road	409	5 Lowry Way
19	586	2 The Leas	762	10 Gordon Road
20	762	10 Gordon Road	586	2 The Leas
21	432	5 Highland Way	761	6 Spurgeon Score
22	761	6 Spurgeon Score	432	5 Highland Way
23	416	39 Blyford Road	588	46 Marine Parade
24	588	46 Marine Parade	416	39 Blyford Road
25	593	43 Kirkley Cliff Road	598	2 John Lang Court
26	598	2 John Lang Court	593	43 Kirkley Cliff Road
27	773	Riverside Road	782	48-50 Rectory Road
28	782	48-50 Rectory Road	773	Riverside Road
29	409	5 Lowry Way	589	138 Waveney Drive
30	589	138 Waveney Drive	409	5 Lowry Way
31	587	Woodland Path	779	15 Briarwood Road
32	779	15 Briarwood Road	587	Woodland Path
33	766	15 Leonard Drive	427	Maidstone Road (North Sea Charters)
34	427	Maidstone Road (North Sea Charters)	766	15 Leonard Drive
35	819	20 North Quay Retail Park	588	46 Marine Parade
36	588	46 Marine Parade	819	20 North Quay Retail Park

7.12.4. Appendix D contains “forests” which plot the lowest cost routes in the SATURN for each of the origin-destination pairs. These plots have been produced for the car user class with the highest proportion of traffic for the peak hour modelled and for HGVs. Checks of these routes show they are appropriate and provide further evidence the SATURN model provides sensible and predictable routes for vehicles on key routes within the area of influence of the Lake Lothing Third Crossing.

8 FORECASTING METHODOLOGY

8.1.1. In order to assess the scheme, it was necessary to build demand trip matrices in relation to the forecast years 2022 (scheme opening year) and 2037 (scheme opening year + 15 years).

8.1.2. The methodology in deriving the aforementioned trip matrices is set out in the following 8 distinct steps:

- **Step 1** - Establishing site specific developments within Waveney, whereby the term development refers to either residential or commercial site use. Categorising these developments in relation to 'Uncertainty' definitions as defined from Table A in TAG Unit M4 – Forecasting & Uncertainty;
- **Step 2** - Of these development sites, determine a quantum to be applied in the trip generation process. For example, defining the number of dwellings for residential units;
- **Step 3** - Allocate these site specific developments a corresponding SATURN zone;
- **Step 4** - Calculation of trip rates to convert the number of dwellings in to peak hour trips in relation to the forecast years via TEMPRO;
- **Step 5** - Proportioning out these development trips across the 8 car based user classes.
- **Step 6** - Determining growth factors for the surrounding districts via the application of alternative planning assumptions in TEMPRO (dataset version 7.2) to remove the number of household units used in the site specific development trip generation process;
- **Step 7** - Applying NRTF (National Road Traffic Forecast) factors to account for UC9 (LGV) and UC10 (HGV) growth in a respective forecast year model; and
- **Step 8** - Applying a combination of the above components and matrix furnessing to produce a set of forecast year matrices for the respective model years and peak periods.

8.2 STEP 1 – SITE SPECIFIC DEVELOPMENTS (CORE SCENARIO)

8.2.1. Appendix E outlines each of the individual site specific developments that were utilised in the trip generation process and how these site specific developments align with TAG Unit M4 definitions of 'Uncertainty'. For the forecast matrix development, only developments defined as 'Near Certain' or 'More than likely' have been taken in to account and are combined to reflect what is henceforth known as the 'Core' scenario.

8.3 STEP 2 – PHASED DEVELOPMENT PROJECTIONS

8.3.1. Of the policies defined in the 'Core' scenario, there was an associated value outlining the sum total of dwellings related to the site. However, not all these dwellings are in operation in the year construction begins and in some cases can cross over between the forecast years being modelled. As such, a phased approach for the sum total of dwellings is applied using housing projections defined via these policies. For example, developments such as the Kirkley Waterfront and Woods Meadow developments adopt this phased approach and can be seen via the columns labelled as "Dwelling Projections" for 2022 and 2037 in Appendix E.

8.4 STEP 3 – HIGHWAY ASSIGNMENT MODEL ZONES

8.4.1. All of the developments specified in the 'Core' scenario were allocated a specific zone in relation to the highway assignment model in SATURN. Some developments have been split across multiple zones to account for the size and manner in which they connect with the network; Kirkley Waterfront and Woods Meadow are examples of such developments.

8.5 STEP 4 – TRIP RATES

8.5.1. Trip rates were derived using a combination of TEMPRO growth rates in Waveney and local count data. Changes in origin and destination growth rates were used as a proxy to derive the equivalent data covering the AM, IP and PM peak periods. Following this, local ATC data was used to represent peak hour equivalents for the AM and PM peak and average hour for the IP. A summary of these trip rates in relation to the Waveney site specific developments is presented in Table 40.

Table 40 – Forecast Model Trip Rates for Site Specific Developments (Waveney)

Forecast Year	AM Origin	AM Destination	IP Origin	IP Destination	PM Origin	PM Destination
2022	0.182	0.255	0.242	0.240	0.258	0.202
2037	0.147	0.213	0.210	0.209	0.221	0.172

8.6 STEP 5 – DISTRIBUTION OF TRIPS AMONGST USER CLASSES

8.6.1. As the trips generated are not assigned to a specific user class in line with the base year model, all the development trips are then distributed via user class proportions for the 3 peaks in relation to the 8 car specific user classes. These are based on the user class proportions in the equivalent time periods modelled in the 2016 base year.

8.7 STEP 6 – BACKGROUND GROWTH IN SURROUNDING DISTRICTS

8.7.1. Upon determining the quantum of development trips in the Waveney district, it was necessary to derive growth factors in the surrounding districts to account for background growth and thereby constraining the total trip matrix to TEMPRO origin and destination growth factors. An illustration of the different planning assumptions applied to the Waveney district is presented in Appendix F, which outlines the different growth factors with and without alternative planning assumptions applied.

8.8 STEP 7 – LGV & HGV GROWTH FACTORS

8.8.1. NRTF factors were applied to UC9 (LGV) and UC10 (HGV) to account for background growth respective to these user classes.

8.9 STEP 8 – MATRIX FURNESSING

8.9.1. The above calculations and factors were then applied to generate forecast matrices for 2022 and 2037 by using the matrix furnessing capability within SATURN. The 2016 base year matrix was used as the pivot for the furnessing process, the final forecast model trip matrix totals are presented via Table 41 in PCU's (Passenger Car Units).

Table 41 – Forecast Trip Matrix Totals (PCU Units)

User Class	2016	2022	2037
AM			
UC1: Car – Home Based Work (Inbound)	3,719	3,960	4,385
UC2: Car – Home Based Work (Outbound)	56,288	59,778	65,970
UC3: Car – Home Based Employers Business (Inbound)	316	335	369
UC4: Car – Home Based Employers Business (Outbound)	4,207	4,469	4,931
UC5: Car – Non Home Based Employers Business	8,186	8,708	9,628
UC6: Car – Home Based Other (Inbound)	5,510	5,858	6,472
UC7: Car – Home Based Other (Outbound)	34,885	37,043	40,864
UC8: Car – Non Home Based Other	6,037	6,416	7,084
UC9: LGV	12,629	14,866	20,084
UC10: HGV	8,810	9,466	11,171
Total	**140,587**	**150,897**	**170,959**
% Change relative to 2016	**-**	**7%**	**22%**
IP			
UC1: Car – Home Based Work (Inbound)	7,899	8,553	9,847
UC2: Car – Home Based Work (Outbound)	6,562	7,103	8,174
UC3: Car – Home Based Employers Business (Inbound)	1,036	1,121	1,290
UC4: Car – Home Based Employers Business (Outbound)	892	966	1,111
UC5: Car – Non Home Based Employers Business	6,846	7,416	8,541
UC6: Car – Home Based Other (Inbound)	28,444	30,796	35,441
UC7: Car – Home Based Other (Outbound)	28,389	30,734	35,368
UC8: Car – Non Home Based Other	15,004	16,249	18,713
UC9: LGV	10,611	12,491	16,875
UC10: HGV	9,070	9,745	11,500
Total	**114,752**	**125,173**	**146,859**
% Change relative to 2016	**-**	**9%**	**28%**
PM			
UC1: Car – Home Based Work (Inbound)	53,969	57,262	63,401
UC2: Car – Home Based Work (Outbound)	1,485	1,579	1,752
UC3: Car – Home Based Employers Business (Inbound)	4,031	4,280	4,741
UC4: Car – Home Based Employers Business (Outbound)	967	1,027	1,137
UC5: Car – Non Home Based Employers Business	7,662	8,141	9,030
UC6: Car – Home Based Other (Inbound)	37,366	39,635	43,859
UC7: Car – Home Based Other (Outbound)	16,567	17,591	19,496
UC8: Car – Non Home Based Other	11,579	12,294	13,624
UC9: LGV	10,292	12,116	16,369
UC10: HGV	6,085	6,538	7,715
Total	**150,004**	**160,463**	**181,124**
% Change relative to 2016	**-**	**7%**	**21%**

9 SUMMARY

9.1.1. This Local Model Validation Report (LMVR) details the fitness for purpose of the SCTM in Lowestoft. This highway model will be used in conjunction with a public transport and demand model which have been developed in VISUM.

9.1.2. The SCTM highway model represents a base year of 2016, and incorporated the networks previously developed in the Ipswich Transport Model (ITM) and Lowestoft Transport Model (LTM) which were used in 2015 for the Outline Business Cases for the Upper Orwell Crossing in Ipswich and Third Crossing in Lowestoft.

9.1.3. The SCTM highway model can be used as a stand-alone highway model from which to build forecast highway assessments, but also in conjunction with the public transport model and demand model to test the impacts of multi-modal changes and interventions. The SCTM will be used during the DCO process for the Upper Orwell Crossing in Ipswich and Lowestoft Third Crossing.

9.1.4. The validation and calibration has referenced the latest guidelines stipulated in WebTAG as the basis for determining the fitness for purpose of the SCTM highway model.

9.1.5. An extensive data collection exercise was carried out in Lowestoft in 2015 to inform the OBC. This has been supplemented by additional count data collected in 2016 and 2017. The range of traffic data available within Lowestoft is considered appropriate and sufficient to create a strategic highway assignment. Further data collection will have to be considered going forward for any local testing of schemes and developments which need to be carried out.

9.1.6. The trip matrices used for both the highway model and public transport model have been derived predominantly from Mobile Network Data (MND) supplied by Telefonica, supplemented with a synthetic matrix based upon a gravity model. Extensive verification of the MND has been carried out.

9.1.7. Screenlines have been presented in this report, covering key movements in Lowestoft. The final matrix assignment is shown to match well across the array of screenlines, achieving a flow difference within 5% in the majority of cases.

9.1.8. The model is shown to converge satisfactorily across all three peaks. In terms of combined calibration and validation counts, the model is shown to achieve 85% of counts with a GEH of below 5 across all three peaks.

9.1.9. A comprehensive coverage of journey time routes have been included in the SCTM highway model, taking into account directionality of routes there are 125 routes which have been used to analyse journey time route performance across the key strategic routes within the county. In terms of the WebTAG requirement of observed modelled journey times being within 15% of the modelled journey times, this has been achieved for 90% of routes in the AM peak, 85% in the inter peak and 90% in the PM peak. This is significantly above the 85% threshold stipulated in WebTAG. Routes which do not meet the requirement within WebTAG are detailed in Section 11 of this report and highlight issues where the SCTM highway model has not been able to emulate significant increases in the observed delay present in the AM and PM peak.

9.1.10. The SCTM highway model has been validated to link based traffic data, however when compared to the commissioned Manual Classified Turning Count data, the model is shown to match well at these key junctions in terms of GEH when comparing modelled and observed turn flows in the majority of cases.

9.1.11. The forecast matrices have been built in accordance with TAG Unit M4 definitions of modelling assumptions to be considered in a 'Core' scenario for 2022 and 2037. These trip matrices have been built with the latest TEMPRO data set available as of November 2017 with site specific development taken in to account within the district of Waveney.

9.1.12. It is considered the SCTM highway model has shown to provide a sufficient match to observed traffic count and journey time data within Lowestoft. The SCTM highway model provides a robust basis from which to create forecast assignments for future scheme and development testing.

Appendix A

SCREENLINE PERFORMANCE

Screenline			AM Peak															
			All				Car				LGV				HGV			
ID	Name	Type	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
1	Screenline 18 South - Inbound	Calibration	1421	1452	2%	0.824	1191	1191	0%	0.007	194	195	0%	0.065	36	66	83%	4.203
2	Screenline 18 South - Outbound	Calibration	1330	1364	3%	0.941	1115	1117	0%	0.080	182	182	0%	0.058	34	65	92%	4.421
3	Lowestoft Screenline 1 - NB	Calibration	2207	2207	0%	0.015	1846	1845	0%	0.009	301	301	0%	0.027	60	60	0%	0.019
4	Lowestoft Screenline 1 - SB	Calibration	1685	1693	0%	0.190	1408	1413	0%	0.134	230	230	0%	0.010	47	50	6%	0.422
5	Lowestoft Screenline 2 - NB	Calibration	2866	2872	0%	0.114	2402	2408	0%	0.128	391	391	0%	0.019	73	73	0%	0.023
6	Lowestoft Screenline 2 - SB	Calibration	2095	2114	1%	0.413	1755	1768	1%	0.291	286	286	0%	0.012	53	60	13%	0.921
7	Screenline 18 North - Inbound	Calibration	1194	1191	0%	0.094	978	979	0%	0.035	179	175	-2%	0.305	37	37	-1%	0.045
8	Screenline 18 North - Outbound	Calibration	1454	1452	0%	0.050	1251	1253	0%	0.075	165	160	-3%	0.404	38	39	2%	0.099
9	Lowestoft Screenline 4 - EB	Validation	1747	1626	-7%	2.947	1376	1276	-7%	2.745	297	277	-7%	1.185	74	73	-1%	0.118
10	Lowestoft Screenline 4 - WB	Validation	1741	1541	-11%	4.927	1394	1201	-14%	5.355	266	273	3%	0.430	80	67	-17%	1.605
11	Lowestoft Screenline 5 - NB	Validation	2419	2308	-5%	2.288	2038	1963	-4%	1.679	280	283	1%	0.152	101	62	-38%	4.284
12	Lowestoft Screenline 5 - SB	Validation	1732	1883	9%	3.551	1400	1562	12%	4.201	247	270	9%	1.426	85	51	-40%	4.070
13	Lowestoft Screenline 6 - NB	Validation	1359	1344	-1%	0.408	1155	1164	1%	0.265	164	146	-11%	1.460	40	35	-15%	0.962
14	Lowestoft Screenline 6 - SB	Validation	1024	1052	3%	0.846	844	861	2%	0.588	151	155	3%	0.388	30	35	18%	0.923

ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	ID Rep	AM Peak	PM Peak	Off Peak	AM Peak															
												All				Car				LGV				HGV			
												Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
1	Screenline 18 South - Inbound	548	Calibration	Mutfordw	EB	4567	5070					19	48	156%	5.075	16	42	164%	4.820	3	7	158%	1.886	0	0	-100%	0.978
		550	Calibration	Rushmere Road	EB	4566	5000					34	0	-100%	8.271	29	0	-100%	7.572	5	0	-100%	3.056	1	0	-100%	1.320
		552	Calibration	Gisleham	NB	9600	5010					20	19	-8%	0.352	17	17	0%	0.003	3	1	-49%	0.952	1	0	-32%	0.255
		554	Calibration	A146 Beccles Road	EB	4512	2000					634	751	18%	4.449	531	610	15%	3.293	87	105	22%	1.921	16	36	121%	3.849
		558	Calibration	A12 London Road	NB	5390	1000					713	634	-11%	3.061	598	522	-13%	3.191	97	81	-16%	1.682	18	30	66%	2.439
		TOTAL				Calibration			Yes	Yes	Yes	1421	1452	2%	0.824	1191	1191	0%	0.007	194	195	0%	0.065	36	66	83%	4.203
2	Screenline 18 South - Outbound	549	Calibration	Mutfordw	WB	5070	4567					14	22	56%	1.832	12	19	65%	1.923	2	2	20%	0.267	0	0	-60%	0.430
		551	Calibration	Rushmere Road	WB	5000	4566					44	0	-100%	9.366	37	0	-100%	8.574	6	0	-100%	3.460	1	0	-100%	1.495
		553	Calibration	Gisleham	SB	5010	9600					17	22	26%	1.032	15	20	40%	1.395	2	1	-62%	1.147	0	1	48%	0.285
		555	Calibration	A146 Beccles Road	WB	2000	4512					665	812	22%	5.418	557	668	20%	4.467	91	107	18%	1.645	17	37	120%	3.905
		559	Calibration	A12 London Road	SB	1000	5390					590	509	-14%	3.461	494	410	-17%	3.974	81	72	-11%	0.975	15	27	79%	2.593
		TOTAL				Calibration			Yes	Yes	Yes	1330	1364	3%	0.941	1115	1117	0%	0.080	182	182	0%	0.058	34	65	92%	4.421
3	Lowestoft Screenline 1 - NB	560	Calibration	London	NEB	9606	1040					449	420	-6%	1.357	376	369	-2%	0.359	61	48	-22%	1.862	11	4	-67%	2.762
		562	Calibration	A12 Tom Crisp Way	NEB	3000	6314					817	909	11%	3.143	685	761	11%	2.860	111	114	2%	0.244	21	34	62%	2.461
		564	Calibration	A1117	NB	3030	3040					307	454	48%	7.528	258	380	47%	6.851	42	68	61%	3.458	8	7	-13%	0.364
		566	Calibration	A146 Beccles Road	NEB	6406	6404					475	370	-22%	5.127	398	294	-26%	5.609	65	63	-4%	0.294	12	13	11%	0.362
		1618	Calibration	Long Road	NB	3010	5180					159	53	-67%	10.337	129	41	-68%	9.577	22	9	-58%	3.220	8	3	-67%	2.316
		TOTAL				Calibration			Yes	Yes	Yes	2207	2207	0%	0.015	1846	1845	0%	0.009	301	301	0%	0.027	60	60	0%	0.019
4	Lowestoft Screenline 1 - SB	561	Calibration	London	SWB	1040	9606					354	459	30%	5.214	296	381	29%	4.609	48	75	55%	3.363	9	3	-68%	2.508
		563	Calibration	A12 Tom Crisp Way	SWB	6314	3000					378	400	6%	1.122	317	330	4%	0.761	52	58	12%	0.865	10	12	21%	0.623
		565	Calibration	A1117	SB	3040	3030					356	438	23%	4.134	298	347	16%	2.695	49	68	39%	2.490	9	24	165%	3.686
		567	Calibration	A146 Beccles Road	SWB	6404	6406					432	309	-29%	6.399	362	274	-24%	4.946	59	24	-59%	5.419	11	11	0%	0.015
		1617	Calibration	Long Road	SB	5180	3010					165	87	-48%	7.005	135	81	-40%	5.178	22	5	-76%	4.552	8	0	-94%	3.756
		TOTAL				Calibration			Yes	Yes	Yes	1685	1693	0%	0.190	1408	1413	0%	0.134	230	230	0%	0.010	47	50	6%	0.422
5	Lowestoft Screenline 2 - NB	574	Calibration	Katwijk	NB	6040	6431					408	302	-26%	5.600	342	256	-25%	4.980	56	34	-39%	3.249	10	13	22%	0.676
		576	Calibration	A12 Battery Green Road	NB	6160	6150					670	587	-12%	3.298	561	511	-9%	2.193	91	62	-32%	3.322	17	14	-16%	0.702
		584	Calibration	Rotterdam	NEB	7210	9130					135	117	-13%	1.625	113	90	-20%	2.300	18	24	30%	1.205	3	3	-17%	0.338
		586	Calibration	Peto Way	NB	10190	7060					393	326	-17%	3.530	329	258	-22%	4.135	54	62	15%	1.076	10	6	-42%	1.503
		588	Calibration	A1117 Normanston Drive	NEB	7050	7060					681	945	39%	9.254	571	783	37%	8.161	93	135	45%	3.896	17	27	58%	2.116
		594	Calibration	B1375 Gorleston Road	NB	8030	8040					579	595	3%	0.640	485	510	5%	1.111	79	74	-6%	0.545	15	10	-31%	1.273
		TOTAL				Calibration			Yes	Yes	Yes	2866	2872	0%	0.114	2402	2408	0%	0.128	391	391	0%	0.019	73	73	0%	0.023
		575	Calibration	Katwijk	SB	6431	6040					133	266	100%	9.445	111	223	101%	8.657	18	35	93%	3.285	3	8	133%	1.892

ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	ID Rep	AM Peak	PM Peak	Off Peak	AM Peak															
												All				Car				LGV				HGV			
												Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
6	Lowestoft Screenline 2 - SB	577	Calibration	A12 Battery Green Road	SB	6150	6160					566	338	-40%	10.767	475	284	-40%	9.767	77	48	-37%	3.636	14	5	-68%	3.165
		585	Calibration	Rotterdam	SWB	9130	7210					98	86	-13%	1.318	82	66	-19%	1.851	13	14	7%	0.241	2	5	97%	1.259
		587	Calibration	Peto Way	SB	7060	10190					315	393	25%	4.152	264	341	29%	4.440	43	41	-5%	0.303	8	11	36%	0.928
		589	Calibration	A1117 Normanston Drive	SWB	7060	7050					503	542	8%	1.723	421	438	4%	0.820	69	83	21%	1.633	13	21	64%	1.988
		595	Calibration	B1375 Gorleston Road	SB	8040	8030					480	490	2%	0.433	402	415	3%	0.605	66	64	-2%	0.182	12	11	-10%	0.358
		TOTAL				Calibration			Yes	Yes	Yes	2095	2114	1%	0.413	1755	1768	1%	0.291	286	286	0%	0.012	53	60	13%	0.921
7	Screenline 18 North - Inbound	606	Calibration	B1074	NB	6324	9440					178	230	29%	3.651	149	192	29%	3.288	24	34	42%	1.872	5	4	-21%	0.470
		609	Calibration	Fixton Road	SB	5656	4563					83	23	-72%	8.259	70	21	-69%	7.176	11	2	-85%	3.779	2	0	-100%	2.061
		611	Calibration	Coast	SB	6326	9510					50	0	-100%	9.939	42	0	-100%	9.098	7	0	-100%	3.672	1	0	-100%	1.590
		1464	Calibration	JTC 4_A-In	0	6280	6270					883	938	6%	1.810	717	765	7%	1.776	137	139	2%	0.189	29	33	14%	0.724
		TOTAL				Calibration			Yes	Yes	Yes	1194	1191	0%	0.094	978	979	0%	0.035	179	175	-2%	0.305	37	37	-1%	0.045
8	Screenline 18 North - Outbound	607	Calibration	B1074	SB	9440	6324					112	142	27%	2.635	94	117	25%	2.242	15	19	24%	0.873	3	6	107%	1.460
		608	Calibration	Fixton Road	NB	4563	5656					51	23	-55%	4.617	43	16	-62%	4.839	7	7	-7%	0.175	1	0	-100%	1.611
		610	Calibration	Coast	NB	9510	6326					61	51	-16%	1.313	51	51	-1%	0.070	8	0	-94%	3.725	2	0	-100%	1.754
		1465	Calibration	JTC 4_A-Out	0	6270	6280					1230	1236	1%	0.180	1063	1069	1%	0.197	135	134	0%	0.046	32	33	1%	0.069
		TOTAL				Calibration			Yes	Yes	Yes	1454	1452	0%	0.050	1251	1253	0%	0.075	165	160	-3%	0.404	38	39	2%	0.099
9	Lowestoft Screenline 4 - EB	556	Validation	A1145	EB	5110	5060					437	439	0%	0.060	367	367	0%	0.013	60	50	-17%	1.359	11	22	99%	2.711
		1633	Validation	Lowestoft Road Carlton Colville	EB	6335	9604					233	151	-35%	5.948	190	140	-26%	3.873	32	11	-66%	4.520	12	0	-100%	4.874
		1724	Validation	London	NB	6345	1025					346	299	-14%	2.636	282	263	-7%	1.119	47	33	-30%	2.254	18	3	-83%	4.568
		1443	Validation	JTC 1_E-Out	0	1020	10258					729	737	1%	0.279	537	505	-6%	1.399	158	183	16%	1.916	33	48	43%	2.268
		TOTAL				Validation			Yes	Yes	Yes	1747	1626	-7%	2.947	1376	1276	-7%	2.745	297	277	-7%	1.185	74	73	-1%	0.118
10	Lowestoft Screenline 4 - WB	557	Validation	A1145	WB	5060	5110					341	399	17%	3.029	285	297	4%	0.670	46	77	66%	3.908	9	25	185%	3.931
		1634	Validation	Lowestoft Road Carlton Colville	WB	9604	6335					231	55	-76%	14.762	188	48	-74%	12.865	31	6	-80%	5.766	12	0	-99%	4.768
		1723	Validation	London	SB	1025	6345					381	352	-8%	1.533	310	280	-10%	1.740	52	68	32%	2.156	19	3	-83%	4.805
		1442	Validation	JTC 1_E-In	0	10258	1020					788	736	-7%	1.879	610	576	-6%	1.416	137	121	-11%	1.349	41	38	-5%	0.323
		TOTAL				Validation			Yes	Yes	Yes	1741	1541	-11%	4.927	1394	1201	-14%	5.355	266	273	3%	0.430	80	67	-17%	1.605
11	Lowestoft Screenline 5 -	1769	Validation	0	NB	2070	7000					1007	1069	6%	1.934	833	895	7%	2.098	118	149	26%	2.663	56	26	-54%	4.707
		1787	Validation	0	NB	1260	6322					1412	1238	-12%	4.767	1205	1068	-11%	4.056	162	134	-17%	2.320	45	36	-19%	1.347
		TOTAL				Validation			Yes	Yes	Yes	2419	2308	-5%	2.288	2038	1963	-4%	1.679	280	283	1%	0.152	101	62	-38%	4.284
12	Lowestoft Screenline 5 -	1770	Validation	0	SB	7000	2070					921	1038	13%	3.728	742	869	17%	4.476	130	135	4%	0.440	49	34	-31%	2.402
		1788	Validation	0	SB	6322	1260					811	845	4%	1.192	658	693	5%	1.332	117	135	15%	1.592	36	18	-51%	3.505
		TOTAL				Validation			Yes	Yes	Yes	1732	1883	9%	3.551	1400	1562	12%	4.201	247	270	9%	1.426	85	51	-40%	4.070
13	Lowestoft Screenline 6 - NB	600	Validation	B1385	NB	9460	9480					95	98	2%	0.229	80	87	9%	0.808	13	10	-23%	0.871	2	0	-90%	1.886
		604	Validation	B1375 Parkhill	NB	6300	8070					458	454	-1%	0.183	384	396	3%	0.617	62	50	-19%	1.596	12	8	-35%	1.319
		1501	Validation	JTC 9_A-	0	6250	6260					806	793	-2%	0.473	691	681	-2%	0.402	88	85	-4%	0.345	26	27	1%	0.075
		TOTAL				Validation			Yes	Yes	Yes	1359	1344	-1%	0.408	1155	1164	1%	0.265	164	146	-11%	1.460	40	35	-15%	0.962
14	Lowestoft Screenline 6 - SB	601	Validation	B1385	SB	9480	9460					101	72	-29%	3.152	85	59	-31%	3.075	14	11	-18%	0.708	3	2	-29%	0.511
		605	Validation	B1375 Parkhill	SB	8070	6300					249	276	11%	1.657	209	228	9%	1.319	34	41	19%	1.074	6	7	13%	0.306
		1500	Validation	JTC 9_A-	0	6260	6250					674	704	4%	1.130	550	574	4%	0.998	103	104	1%	0.073	21	27	25%	1.074

ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	ID Rep	AM Peak	PM Peak	Off Peak
		TOTAL				Validation			Yes	Yes	Yes

AM Peak															
All				Car				LGV				HGV			
Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
1024	1052	3%	0.846	844	861	2%	0.588	151	155	3%	0.388	30	35	18%	0.923

Screenline			Interpeak															
			All				Car				LGV				HGV			
ID	Name	Type	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
1	Screenline 18 South - Inbound	Calibration	1326	1339	1%	0.369	1116	1115	0%	0.024	174	175	0%	0.048	36	49	38%	2.096
2	Screenline 18 South - Outbound	Calibration	1347	1361	1%	0.369	1134	1135	0%	0.032	177	176	-1%	0.100	36	50	38%	2.110
3	Lowestoft Screenline 1 - NB	Calibration	1826	1828	0%	0.046	1528	1530	0%	0.049	243	243	0%	0.005	54	55	0%	0.020
4	Lowestoft Screenline 1 - SB	Calibration	1873	1876	0%	0.058	1567	1570	0%	0.063	250	250	0%	0.004	56	56	0%	0.012
5	Lowestoft Screenline 2 - NB	Calibration	2473	2481	0%	0.164	2082	2089	0%	0.173	325	325	0%	0.009	66	67	1%	0.054
6	Lowestoft Screenline 2 - SB	Calibration	2635	2628	0%	0.135	2218	2213	0%	0.110	346	344	-1%	0.112	71	71	1%	0.042
7	Screenline 18 North - Inbound	Calibration	1052	1030	-2%	0.689	871	851	-2%	0.704	148	147	-1%	0.149	32	32	1%	0.042
8	Screenline 18 North - Outbound	Calibration	1027	1009	-2%	0.557	855	838	-2%	0.560	143	141	-1%	0.123	30	30	0%	0.004
9	Lowestoft Screenline 4 - EB	Validation	1665	1587	-5%	1.939	1336	1281	-4%	1.498	252	249	-1%	0.177	77	56	-27%	2.597
10	Lowestoft Screenline 4 - WB	Validation	1662	1595	-4%	1.662	1326	1282	-3%	1.220	252	247	-2%	0.316	84	66	-21%	2.078
11	Lowestoft Screenline 5 - NB	Validation	1857	2036	10%	4.047	1592	1724	8%	3.231	197	259	31%	4.085	68	53	-22%	1.898
12	Lowestoft Screenline 5 - SB	Validation	2013	2188	9%	3.810	1728	1831	6%	2.447	208	294	42%	5.461	77	62	-20%	1.809
13	Lowestoft Screenline 6 - NB	Validation	940	936	-1%	0.157	789	781	-1%	0.306	127	129	2%	0.193	25	26	6%	0.312
14	Lowestoft Screenline 6 - SB	Validation	905	936	3%	1.020	754	776	3%	0.795	123	132	8%	0.846	28	28	-2%	0.112

											Interpeak																
											All				Car				LGV				HGV			
ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	ID Rep	Interpeak	Off Peak	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
1	Screenline 18 South - Inbound	548	Calibration	Mutfordw	EB	4567	5070				20	42	105%	3.830	17	38	121%	3.947	3	4	41%	0.612	1	0	-85%	0.823
		550	Calibration	Rushmere Road	EB	4566	5000				50	0	-100%	10.037	42	0	-100%	9.209	7	0	-100%	3.638	1	0	-100%	1.643
		552	Calibration	Gisleham	NB	9600	5010				20	59	200%	6.298	17	58	248%	6.756	3	1	-61%	1.174	1	0	-7%	0.054
		554	Calibration	A146 Beccles Road	EB	4512	2000				591	695	18%	4.123	497	573	15%	3.291	78	96	24%	1.963	16	26	64%	2.215
		558	Calibration	A12 London Road	NB	5390	1000				645	543	-16%	4.171	543	446	-18%	4.337	85	74	-12%	1.184	17	23	31%	1.201
		TOTAL				Calibration			Yes	Yes	1326	1339	1%	0.369	1116	1115	0%	0.024	174	175	0%	0.048	36	49	38%	2.096
2	Screenline 18 South - Outbound	549	Calibration	Mutfordw	WB	5070	4567				18	49	180%	5.459	15	45	208%	5.597	2	3	49%	0.664	0	0	-73%	0.630
		551	Calibration	Rushmere Road	WB	5000	4566				52	0	-100%	10.183	44	0	-100%	9.343	7	0	-100%	3.691	1	0	-100%	1.667
		553	Calibration	Gisleham	SB	5010	9600				23	33	44%	1.909	19	32	67%	2.542	3	0	-85%	1.933	1	0	-44%	0.386
		555	Calibration	A146 Beccles Road	WB	2000	4512				590	706	20%	4.573	496	585	18%	3.825	77	97	25%	2.056	16	24	52%	1.850
		559	Calibration	A12 London Road	SB	1000	5390				666	573	-14%	3.715	561	473	-16%	3.861	87	75	-14%	1.364	18	25	42%	1.630
		TOTAL				Calibration			Yes	Yes	1347	1361	1%	0.369	1134	1135	0%	0.032	177	176	-1%	0.100	36	50	38%	2.110
3	Lowestoft Screenline 1 - NB	560	Calibration	London	NEB	9606	1040				386	341	-12%	2.361	325	291	-10%	1.945	51	45	-11%	0.793	10	5	-52%	1.951
		562	Calibration	A12 Tom Crisp Way	NEB	3000	6314				491	552	12%	2.651	413	446	8%	1.583	65	83	29%	2.173	13	22	69%	2.152
		564	Calibration	A1117	NB	3030	3040				384	474	24%	4.377	323	389	20%	3.505	50	70	38%	2.472	10	16	52%	1.491
		566	Calibration	A146 Beccles Road	NEB	6406	6404				418	409	-2%	0.434	352	355	1%	0.184	55	42	-23%	1.832	11	12	4%	0.139
		1618	Calibration	Long Road	NB	3010	5180				147	52	-65%	9.572	115	49	-58%	7.341	23	3	-87%	5.509	9	0	-99%	4.268
		TOTAL				Calibration			Yes	Yes	1826	1828	0%	0.046	1528	1530	0%	0.049	243	243	0%	0.005	54	55	0%	0.020
4	Lowestoft Screenline 1 - SB	561	Calibration	London	SWB	1040	9606				409	449	10%	1.933	345	385	12%	2.115	54	57	7%	0.472	11	7	-35%	1.281
		563	Calibration	A12 Tom Crisp Way	SWB	6314	3000				493	539	9%	2.001	415	433	4%	0.859	65	77	19%	1.480	13	29	116%	3.348
		565	Calibration	A1117	SB	3040	3030				406	446	10%	1.924	342	351	3%	0.483	53	79	48%	3.167	11	16	45%	1.351
		567	Calibration	A146 Beccles Road	SWB	6404	6406				400	361	-10%	2.037	337	322	-4%	0.804	53	33	-37%	2.940	11	5	-55%	2.105
		1617	Calibration	Long Road	SB	5180	3010				164	81	-50%	7.481	129	79	-39%	4.911	25	3	-89%	6.039	11	0	-98%	4.489
		TOTAL				Calibration			Yes	Yes	1873	1876	0%	0.058	1567	1570	0%	0.063	250	250	0%	0.004	56	56	0%	0.012
5	Lowestoft Screenline 2 - NB	574	Calibration	Katwijk	NB	6040	6431				324	193	-41%	8.169	273	167	-39%	7.155	43	22	-49%	3.675	9	4	-51%	1.731
		576	Calibration	A12 Battery Green Road	NB	6160	6150				467	388	-17%	3.788	393	315	-20%	4.114	61	61	0%	0.006	13	12	-8%	0.275
		584	Calibration	Rotterdam	NEB	7210	9130				146	125	-15%	1.836	123	97	-21%	2.514	19	22	13%	0.562	4	6	62%	1.077
		586	Calibration	Peto Way	NB	10190	7060				447	528	18%	3.689	376	475	26%	4.809	59	43	-26%	2.150	12	10	-20%	0.737
		588	Calibration	A1117 Normanston Drive	NEB	7050	7060				643	795	24%	5.684	541	662	22%	4.922	84	111	32%	2.721	17	22	28%	1.077
		594	Calibration	B1375 Gorleston Road	NB	8030	8040				447	452	1%	0.250	376	374	-1%	0.114	59	65	11%	0.826	12	13	8%	0.285
		TOTAL				Calibration			Yes	Yes	2473	2481	0%	0.164	2082	2089	0%	0.173	325	325	0%	0.009	66	67	1%	0.054
		575	Calibration	Katwijk	SB	6431	6040				205	325	59%	7.380	173	263	53%	6.150	27	52	93%	3.975	5	10	80%	1.587

											Interpeak															
											All				Car				LGV				HGV			
ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	ID Rep	Interpeak	Off Peak	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
6	Lowestoft Screenline 2 - SB	577	Calibration	A12 Battery Green Road	SB	6150	6160				612	527	-14%	3.548	515	443	-14%	3.286	80	67	-17%	1.556	16	17	4%	0.149
		585	Calibration	Rotterdam	SWB	9130	7210				141	113	-20%	2.443	118	88	-25%	2.945	18	20	10%	0.409	4	4	17%	0.314
		587	Calibration	Peto Way	SB	7060	10190				551	412	-25%	6.334	464	370	-20%	4.592	72	32	-55%	5.528	15	10	-35%	1.498
		589	Calibration	A1117 Normanston Drive	SWB	7060	7050				652	775	19%	4.593	549	649	18%	4.089	86	106	24%	2.113	17	19	11%	0.444
		595	Calibration	B1375 Gorleston Road	SB	8040	8030				474	476	0%	0.065	399	399	0%	0.023	62	66	6%	0.479	13	11	-16%	0.576
		TOTAL				Calibration			Yes	Yes	2635	2628	0%	0.135	2218	2213	0%	0.110	346	344	-1%	0.112	71	71	1%	0.042
7	Screenline 18 North - Inbound	606	Calibration	B1074	NB	6324	9440				117	186	60%	5.649	98	155	58%	5.025	15	26	73%	2.432	3	5	60%	0.934
		609	Calibration	Fixton Road	SB	5656	4563				71	18	-75%	8.086	60	16	-73%	7.130	9	1	-88%	3.625	2	0	-84%	1.518
		611	Calibration	Coast	SB	6326	9510				60	0	-99%	10.855	51	0	-99%	9.942	8	0	-100%	3.973	2	0	-100%	1.794
		1464	Calibration	JTC 4_A-In	0	6280	6270				804	825	3%	0.765	662	679	3%	0.657	116	119	3%	0.301	25	27	6%	0.305
		TOTAL				Calibration			Yes	Yes	1052	1030	-2%	0.689	871	851	-2%	0.704	148	147	-1%	0.149	32	32	1%	0.042
8	Screenline 18 North - Outbound	607	Calibration	B1074	SB	9440	6324				102	160	58%	5.124	85	133	55%	4.517	13	23	73%	2.288	3	4	62%	0.888
		608	Calibration	Fixton Road	NB	4563	5656				49	16	-67%	5.769	41	13	-68%	5.399	6	3	-53%	1.588	1	0	-100%	1.624
		610	Calibration	Coast	NB	9510	6326				63	1	-98%	10.897	53	1	-99%	10.116	8	0	-98%	3.942	2	0	-74%	1.217
		1465	Calibration	JTC 4_A-Out	0	6270	6280				814	832	2%	0.633	675	692	3%	0.650	115	115	0%	0.029	24	25	4%	0.177
		TOTAL				Calibration			Yes	Yes	1027	1009	-2%	0.557	855	838	-2%	0.560	143	141	-1%	0.123	30	30	0%	0.004
9	Lowestoft Screenline 4 - EB	556	Validation	A1145	EB	5110	5060				307	343	12%	2.003	259	270	4%	0.681	40	58	44%	2.534	8	16	88%	2.111
		1633	Validation	Lowestoft Road Carlton Colville	EB	6335	9604				205	114	-45%	7.240	160	105	-35%	4.839	31	8	-74%	5.204	13	1	-95%	4.733
		1724	Validation	London	NB	6345	1025				351	287	-18%	3.573	275	242	-12%	2.066	54	42	-23%	1.773	23	4	-81%	5.027
		1443	Validation	JTC 1_E-Out	0	1020	10258				801	842	5%	1.429	642	665	4%	0.926	127	141	12%	1.284	33	36	7%	0.415
		TOTAL				Validation			Yes	Yes	1665	1587	-5%	1.939	1336	1281	-4%	1.498	252	249	-1%	0.177	77	56	-27%	2.597
10	Lowestoft Screenline 4 - WB	557	Validation	A1145	WB	5060	5110				323	368	14%	2.414	272	283	4%	0.680	42	64	50%	2.924	9	21	141%	3.185
		1634	Validation	Lowestoft Road Carlton Colville	WB	9604	6335				197	102	-48%	7.736	154	95	-38%	5.303	30	6	-80%	5.689	13	1	-89%	4.240
		1723	Validation	London	SB	1025	6345				372	322	-13%	2.688	291	269	-7%	1.271	57	46	-19%	1.526	24	6	-74%	4.597
		1442	Validation	JTC 1_E-In	0	10258	1020				770	803	4%	1.169	609	634	4%	1.006	122	131	7%	0.790	39	38	-3%	0.193
		TOTAL				Validation			Yes	Yes	1662	1595	-4%	1.662	1326	1282	-3%	1.220	252	247	-2%	0.316	84	66	-21%	2.078
11	Lowestoft Screenline 5 -	1769	Validation	0	NB	2070	7000				947	1187	25%	7.352	811	1000	23%	6.293	100	155	55%	4.891	37	32	-12%	0.755
		1787	Validation	0	NB	1260	6322				911	849	-7%	2.077	782	724	-7%	2.105	98	104	7%	0.647	31	21	-33%	2.023
		TOTAL				Validation			Yes	Yes	1857	2036	10%	4.047	1592	1724	8%	3.231	197	259	31%	4.085	68	53	-22%	1.898
12	Lowestoft Screenline 5 -	1770	Validation	0	SB	7000	2070				964	1063	10%	3.120	824	892	8%	2.321	99	145	46%	4.119	40	26	-35%	2.458
		1788	Validation	0	SB	6322	1260				1049	1125	7%	2.284	904	939	4%	1.160	109	150	38%	3.612	37	36	-3%	0.158
		TOTAL				Validation			Yes	Yes	2013	2188	9%	3.810	1728	1831	6%	2.447	208	294	42%	5.461	77	62	-20%	1.809
13	Lowestoft Screenline 6 - NB	600	Validation	B1385	NB	9460	9480				88	66	-25%	2.544	74	55	-26%	2.419	12	10	-13%	0.465	2	1	-58%	1.052
		604	Validation	B1375 Parkhill	NB	6300	8070				264	278	5%	0.833	223	229	3%	0.415	35	40	14%	0.803	7	10	37%	0.898
		1501	Validation	JTC 9_A-	0	6250	6260				588	592	1%	0.155	493	497	1%	0.207	80	79	-1%	0.133	15	16	2%	0.087
		TOTAL				Validation			Yes	Yes	940	936	-1%	0.157	789	781	-1%	0.306	127	129	2%	0.193	25	26	6%	0.312
14	Lowestoft Screenline 6 - SB	601	Validation	B1385	SB	9480	9460				99	69	-30%	3.283	83	59	-29%	2.837	13	9	-30%	1.186	3	0	-82%	1.742
		605	Validation	B1375 Parkhill	SB	8070	6300				194	250	29%	3.757	163	205	25%	3.059	25	38	51%	2.283	5	7	30%	0.646
		1500	Validation	JTC 9_A-	0	6260	6250				612	617	1%	0.204	507	512	1%	0.197	84	85	1%	0.064	20	20	0%	0.001

ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	ID Rep	Interpeak	Off Peak
		TOTAL				Validation			Yes	Yes

Interpeak															
All				Car				LGV				HGV			
Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
905	936	3%	1.020	754	776	3%	0.795	123	132	8%	0.846	28	28	-2%	0.112

Screenline			PM Peak															
			All				Car				LGV				HGV			
ID	Name	Type	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
1	Screenline 18 South - Inbound	Calibration	1792	1801	1%	0.225	1592	1593	0%	0.033	189	188	-1%	0.088	11	20	90%	2.416
2	Screenline 18 South - Outbound	Calibration	1517	1536	1%	0.482	1348	1354	0%	0.162	160	161	0%	0.044	9	21	138%	3.172
3	Lowestoft Screenline 1 - NB	Calibration	2145	2145	0%	0.007	1902	1902	0%	0.010	227	227	0%	0.025	16	17	2%	0.067
4	Lowestoft Screenline 1 - SB	Calibration	2284	2292	0%	0.163	2025	2032	0%	0.146	242	243	0%	0.059	17	18	2%	0.066
5	Lowestoft Screenline 2 - NB	Calibration	2471	2473	0%	0.036	2195	2197	0%	0.039	261	261	0%	0.015	15	15	1%	0.044
6	Lowestoft Screenline 2 - SB	Calibration	3219	3228	0%	0.157	2860	2869	0%	0.174	340	341	0%	0.033	19	18	-5%	0.242
7	Screenline 18 North - Inbound	Calibration	1851	1829	-1%	0.512	1631	1608	-1%	0.576	209	209	0%	0.015	10	12	14%	0.437
8	Screenline 18 North - Outbound	Calibration	1211	1207	0%	0.112	1080	1077	0%	0.095	122	121	-1%	0.084	9	9	2%	0.052
9	Lowestoft Screenline 4 - EB	Validation	2021	1899	-6%	2.763	1761	1652	-6%	2.641	234	232	-1%	0.128	27	15	-42%	2.467
10	Lowestoft Screenline 4 - WB	Validation	1725	1784	3%	1.404	1505	1579	5%	1.886	195	183	-6%	0.858	26	22	-13%	0.704
11	Lowestoft Screenline 5 - NB	Validation	2041	2113	4%	1.570	1775	1887	6%	2.621	237	208	-12%	1.929	29	17	-41%	2.463
12	Lowestoft Screenline 5 - SB	Validation	2528	3001	19%	8.992	2279	2706	19%	8.558	222	280	26%	3.673	27	14	-47%	2.793
13	Lowestoft Screenline 6 - NB	Validation	1129	1116	-1%	0.389	1021	996	-2%	0.784	101	113	12%	1.182	8	7	-4%	0.123
14	Lowestoft Screenline 6 - SB	Validation	1598	1699	6%	2.492	1412	1506	7%	2.464	178	183	3%	0.363	8	11	26%	0.713

ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	ID Rep	AM Peak	PM Peak	Off Peak	PM Peak															
												All				Car				LGV				HGV			
												Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
1	Screenline 18 South - Inbound	548	Calibration	Mutfordw	EB	4567	5070					29	47	60%	2.838	26	44	69%	3.011	3	3	-4%	0.078	0	0	-90%	0.500
		550	Calibration	Rushmere Road	EB	4566	5000					77	0	-100%	12.431	69	0	-100%	11.718	8	0	-100%	4.043	0	0	-99%	0.939
		552	Calibration	Gisleham	NB	9600	5010					42	56	32%	1.938	37	55	46%	2.548	4	1	-79%	2.134	0	0	-96%	0.666
		554	Calibration	A146 Beccles Road	EB	4512	2000					890	1058	19%	5.395	791	938	19%	5.015	94	108	15%	1.396	5	12	132%	2.346
		558	Calibration	A12 London Road	NB	5390	1000					754	641	-15%	4.263	669	557	-17%	4.542	80	76	-4%	0.389	4	8	76%	1.359
		TOTAL				Calibration			Yes	Yes	Yes	1792	1801	1%	0.225	1592	1593	0%	0.033	189	188	-1%	0.088	11	20	90%	2.416
2	Screenline 18 South - Outbound	549	Calibration	Mutfordw	WB	5070	4567					21	52	146%	5.082	19	45	143%	4.712	2	6	184%	1.983	0	0	-100%	0.497
		551	Calibration	Rushmere Road	WB	5000	4566					41	0	-100%	9.011	36	0	-100%	8.493	4	0	-100%	2.930	0	0	-100%	0.690
		553	Calibration	Gisleham	SB	5010	9600					26	29	12%	0.583	23	27	17%	0.794	3	1	-56%	1.103	0	1	413%	0.926
		555	Calibration	A146 Beccles Road	WB	2000	4512					659	833	26%	6.368	586	739	26%	5.943	70	84	21%	1.631	4	11	174%	2.500
		559	Calibration	A12 London Road	SB	1000	5390					770	621	-19%	5.623	684	542	-21%	5.720	81	69	-15%	1.381	5	10	118%	1.983
		TOTAL				Calibration			Yes	Yes	Yes	1517	1536	1%	0.482	1348	1354	0%	0.162	160	161	0%	0.044	9	21	138%	3.172
3	Lowestoft Screenline 1 - NB	560	Calibration	London	NEB	9606	1040					517	580	12%	2.718	459	520	13%	2.769	55	59	8%	0.545	3	1	-57%	1.178
		562	Calibration	A12 Tom Crisp Way	NEB	3000	6314					499	550	10%	2.225	443	481	9%	1.787	53	63	19%	1.315	3	5	87%	1.237
		564	Calibration	A1117	NB	3030	3040					418	495	19%	3.635	371	434	17%	3.138	44	58	32%	1.986	2	3	20%	0.304
		566	Calibration	A146 Beccles Road	NEB	6406	6404					532	446	-16%	3.874	472	401	-15%	3.414	56	38	-32%	2.619	3	7	118%	1.656
		1618	Calibration	Long Road	NB	3010	5180					180	74	-59%	9.428	156	65	-58%	8.636	19	9	-55%	2.866	5	0	-98%	3.024
		TOTAL				Calibration			Yes	Yes	Yes	2145	2145	0%	0.007	1902	1902	0%	0.010	227	227	0%	0.025	16	17	2%	0.067
4	Lowestoft Screenline 1 - SB	561	Calibration	London	SWB	1040	9606					496	587	18%	3.919	440	528	20%	3.961	52	56	7%	0.504	3	3	12%	0.192
		563	Calibration	A12 Tom Crisp Way	SWB	6314	3000					703	825	17%	4.440	624	751	20%	4.834	74	67	-9%	0.836	4	7	73%	1.265
		565	Calibration	A1117	SB	3040	3030					414	469	13%	2.597	368	395	7%	1.382	44	70	60%	3.482	2	4	54%	0.744
		567	Calibration	A146 Beccles Road	SWB	6404	6406					487	336	-31%	7.456	433	291	-33%	7.460	52	43	-17%	1.285	3	2	-19%	0.329
		1617	Calibration	Long Road	SB	5180	3010					184	75	-59%	9.615	160	67	-58%	8.673	20	7	-67%	3.651	5	1	-78%	2.226
		TOTAL				Calibration			Yes	Yes	Yes	2284	2292	0%	0.163	2025	2032	0%	0.146	242	243	0%	0.059	17	18	2%	0.066
5	Lowestoft Screenline 2 - NB	574	Calibration	Katwijk	NB	6040	6431					305	183	-40%	7.830	271	170	-37%	6.841	32	12	-62%	4.250	2	1	-40%	0.596
		576	Calibration	A12 Battery Green Road	NB	6160	6150					454	376	-17%	3.806	403	328	-19%	3.909	48	45	-6%	0.398	3	3	-2%	0.031
		584	Calibration	Rotterdam	NEB	7210	9130					149	118	-21%	2.764	133	107	-19%	2.361	16	11	-34%	1.463	1	0	-89%	1.121
		586	Calibration	Peto Way	NB	10190	7060					420	587	40%	7.457	373	529	42%	7.341	44	58	30%	1.841	2	1	-70%	1.351
		588	Calibration	A1117 Normanston Drive	NEB	7050	7060					604	697	15%	3.665	536	623	16%	3.589	64	68	7%	0.519	4	6	81%	1.287
		594	Calibration	B1375 Gorleston Road	NB	8030	8040					539	512	-5%	1.190	479	441	-8%	1.787	57	68	18%	1.329	3	4	18%	0.300
		TOTAL				Calibration			Yes	Yes	Yes	2471	2473	0%	0.036	2195	2197	0%	0.039	261	261	0%	0.015	15	15	1%	0.044
		575	Calibration	Katwijk	SB	6431	6040					223	407	82%	10.331	199	367	85%	10.033	24	39	66%	2.787	1	0	-75%	1.083

ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	ID Rep	AM Peak	PM Peak	Off Peak	PM Peak															
												All				Car				LGV				HGV			
												Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
6	Lowestoft Screenline 2 - SB	577	Calibration	A12 Battery Green Road	SB	6150	6160					905	791	-13%	3.919	804	722	-10%	2.977	96	66	-31%	3.265	5	3	-47%	1.243
		585	Calibration	Rotterdam	SWB	9130	7210					145	124	-15%	1.872	129	110	-15%	1.727	15	13	-17%	0.685	1	1	-29%	0.286
		587	Calibration	Peto Way	SB	7060	10190					605	398	-34%	9.242	537	362	-33%	8.256	64	31	-52%	4.852	4	5	43%	0.732
		589	Calibration	A1117 Normanston Drive	SWB	7060	7050					644	843	31%	7.309	572	749	31%	6.865	68	91	34%	2.586	4	4	-4%	0.081
		595	Calibration	B1375 Gorleston Road	SB	8040	8030					697	666	-4%	1.191	619	560	-10%	2.457	74	101	37%	2.913	4	5	32%	0.609
		TOTAL				Calibration			Yes	Yes	Yes	3219	3228	0%	0.157	2860	2869	0%	0.174	340	341	0%	0.033	19	18	-5%	0.242
7	Screenline 18 North - Inbound	606	Calibration	B1074	NB	6324	9440					217	215	-1%	0.144	193	179	-7%	1.012	23	34	49%	2.100	1	2	36%	0.377
		609	Calibration	Fixton Road	SB	5656	4563					75	45	-40%	3.916	67	40	-41%	3.734	8	5	-33%	1.037	0	0	-100%	0.942
		611	Calibration	Coast	SB	6326	9510					68	1	-99%	11.508	61	1	-99%	10.831	7	0	-100%	3.785	0	0	-100%	0.894
		1464	Calibration	JTC 4_A-In	0	6280	6270					1489	1568	5%	2.001	1310	1388	6%	2.124	171	169	-1%	0.122	8	10	23%	0.608
		TOTAL				Calibration			Yes	Yes	Yes	1851	1829	-1%	0.512	1631	1608	-1%	0.576	209	209	0%	0.015	10	12	14%	0.437
8	Screenline 18 North - Outbound	607	Calibration	B1074	SB	9440	6324					142	181	28%	3.098	126	158	26%	2.736	15	21	40%	1.420	1	2	84%	0.644
		608	Calibration	Fixton Road	NB	4563	5656					56	18	-68%	6.267	49	16	-69%	5.948	6	2	-63%	1.856	0	0	-100%	0.808
		610	Calibration	Coast	NB	9510	6326					51	27	-48%	3.922	46	27	-41%	3.144	5	0	-98%	3.204	0	0	-100%	0.774
		1465	Calibration	JTC 4_A-Out	0	6270	6280					962	981	2%	0.616	859	877	2%	0.579	96	98	2%	0.211	7	7	1%	0.030
		TOTAL				Calibration			Yes	Yes	Yes	1211	1207	0%	0.112	1080	1077	0%	0.095	122	121	-1%	0.084	9	9	2%	0.052
9	Lowestoft Screenline 4 - EB	556	Validation	A1145	EB	5110	5060					456	495	8%	1.754	405	422	4%	0.823	48	65	35%	2.265	3	7	166%	2.007
		1633	Validation	Lowestoft Road Carlton Colville	EB	6335	9604					219	101	-54%	9.286	190	94	-50%	8.014	23	7	-70%	4.221	6	0	-96%	3.210
		1724	Validation	London	NB	6345	1025					566	446	-21%	5.325	490	398	-19%	4.350	61	46	-25%	2.039	15	2	-88%	4.552
		1443	Validation	JTC 1_E-Out	0	1020	10258					780	857	10%	2.681	675	737	9%	2.308	102	114	12%	1.184	3	6	101%	1.434
		TOTAL				Validation			Yes	Yes	Yes	2021	1899	-6%	2.763	1761	1652	-6%	2.641	234	232	-1%	0.128	27	15	-42%	2.467
10	Lowestoft Screenline 4 - WB	557	Validation	A1145	WB	5060	5110					444	525	18%	3.662	395	469	19%	3.581	47	48	1%	0.075	3	8	217%	2.427
		1634	Validation	Lowestoft Road Carlton Colville	WB	9604	6335					207	149	-28%	4.278	179	140	-22%	3.084	22	9	-57%	3.182	5	0	-100%	3.313
		1723	Validation	London	SB	1025	6345					355	360	2%	0.288	307	324	6%	0.954	38	34	-11%	0.706	9	2	-77%	3.026
		1442	Validation	JTC 1_E-In	0	10258	1020					720	749	4%	1.101	624	646	3%	0.857	87	92	5%	0.483	8	12	45%	1.163
		TOTAL				Validation			Yes	Yes	Yes	1725	1784	3%	1.404	1505	1579	5%	1.886	195	183	-6%	0.858	26	22	-13%	0.704
11	Lowestoft Screenline 5 -	1769	Validation	0	NB	2070	7000					1055	1243	18%	5.536	892	1104	24%	6.698	144	128	-11%	1.394	19	11	-40%	1.968
		1787	Validation	0	NB	1260	6322					986	870	-12%	3.811	883	784	-11%	3.443	93	80	-13%	1.345	10	6	-42%	1.482
		TOTAL				Validation			Yes	Yes	Yes	2041	2113	4%	1.570	1775	1887	6%	2.621	237	208	-12%	1.929	29	17	-41%	2.463
12	Lowestoft Screenline 5 -	1770	Validation	0	SB	7000	2070					1092	1248	14%	4.547	975	1100	13%	3.868	105	141	35%	3.281	12	6	-46%	1.810
		1788	Validation	0	SB	6322	1260					1436	1753	22%	7.945	1304	1607	23%	7.934	117	139	19%	1.926	15	8	-48%	2.128
		TOTAL				Validation			Yes	Yes	Yes	2528	3001	19%	8.992	2279	2706	19%	8.558	222	280	26%	3.673	27	14	-47%	2.793
13	Lowestoft Screenline 6 - NB	600	Validation	B1385	NB	9460	9480					103	85	-18%	1.880	92	76	-17%	1.664	11	9	-22%	0.763	1	0	-100%	1.100
		604	Validation	B1375 Parkhill	NB	6300	8070					312	310	-1%	0.148	277	261	-6%	0.989	33	45	38%	1.981	2	3	66%	0.774
		1501	Validation	JTC 9_A-	0	6250	6260					713	721	1%	0.291	652	658	1%	0.257	57	59	4%	0.286	5	4	-19%	0.437
		TOTAL				Validation			Yes	Yes	Yes	1129	1116	-1%	0.389	1021	996	-2%	0.784	101	113	12%	1.182	8	7	-4%	0.123
14	Lowestoft Screenline 6 - SB	601	Validation	B1385	SB	9480	9460					92	84	-8%	0.828	82	76	-7%	0.685	10	9	-12%	0.385	1	0	-98%	1.004
		605	Validation	B1375 Parkhill	SB	8070	6300					482	587	22%	4.558	428	518	21%	4.140	51	65	27%	1.785	3	5	63%	0.923
		1500	Validation	JTC 9_A-	0	6260	6250					1024	1028	0%	0.112	902	912	1%	0.338	117	110	-6%	0.706	5	6	19%	0.404

												PM Peak															
												All				Car				LGV				HGV			
ID	Name	Link ID	Status	Site Location	Direction	A-Node	B-Node	ID Rep	AM Peak	PM Peak	Off Peak	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
		TOTAL				Validation			Yes	Yes	Yes	1598	1699	6%	2.492	1412	1506	7%	2.464	178	183	3%	0.363	8	11	26%	0.713

Appendix B

LINK COUNT PERFORMANCE

Add Single Count | Add Multiple Counts | Export Link Flows | Import Link Flows

																	AM Peak															
																	ALL VEHICLES					CAR					LGV			HGV		
ID	Calibration / Validation	Area	Ref	Site Location	Dir	Date	Data Type	Duplicate?	Ref	A-Node	B-Node	Factor	AM Peak	PM Peak	Off Peak	Check	Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	GEH Pass?	Flow Pass?	Observed	Modelled	GEH	Observed	Modelled	GEH
544	Calibration	Lowestoft	0	ite 6339/1 on link A12 southbound between B1375	SB	Jan-16	TRADS	No	10257-623	10257	6230		Yes	Yes	Yes	OK	586	626	1.632	Yes	Yes	523.25	514	0.397	Yes	Yes	31.5	94	7.847	30.91667	18	2.594
545	Calibration	Lowestoft	0	ite 6339/2 on link A12 northbound between A1117	NB	Jan-16	TRADS	No	6230-10257	6230	10257		Yes	Yes	Yes	OK	574	594	0.843	Yes	Yes	522.75	504	0.848	Yes	Yes	25.16667	70	6.496	25.66667	20	1.090
548	Calibration	Lowestoft	1	Mutfordwood Lane	EB	Jan-15	ATC	No	4567-5070	4567	5070		Yes	Yes	Yes	OK	19	48	5.075	No	Yes	15.7372	42	4.820	Yes	Yes	2.563042	7	1.886	0.478363	0	0.978
549	Calibration	Lowestoft	1	Mutfordwood Lane	WB	Jan-15	ATC	No	5070-4567	5070	4567		Yes	Yes	Yes	OK	14	22	1.832	Yes	Yes	11.579	19	1.923	Yes	Yes	1.885816	2	0.267	0.351966	0	0.430
550	Calibration	Lowestoft	2	Rushmere Road	EB	Jan-15	ATC	No	4566-5000	4566	5000		Yes	Yes	Yes	OK	34	0	8.271	No	Yes	28.66389	0	7.572	No	Yes	4.668349	0	3.056	0.871295	0	1.320
551	Calibration	Lowestoft	2	Rushmere Road	WB	Jan-15	ATC	No	5000-4566	5000	4566		Yes	Yes	Yes	OK	44	0	9.366	No	Yes	36.75853	0	8.574	No	Yes	5.986683	0	3.460	1.117348	0	1.495
552	Calibration	Lowestoft	3	Gisleham Road	NB	Jan-15	ATC	No	9600-5010	9600	5010		Yes	Yes	Yes	OK	20	19	0.352	Yes	Yes	17.1318	17	0.003	Yes	Yes	2.790174	1	0.952	0.520755	0	0.255
553	Calibration	Lowestoft	3	Gisleham Road	SB	Jan-15	ATC	No	5010-9600	5010	9600		Yes	Yes	Yes	OK	17	22	1.032	Yes	Yes	14.52599	20	1.395	Yes	Yes	2.365778	1	1.147	0.441546	1	0.285
554	Calibration	Lowestoft	4	A146 Beccles Road	EB	Jan-15	ATC	No	4512-2000	4512	2000		Yes	Yes	Yes	OK	634	751	4.449	Yes	No	531.4185	610	3.293	Yes	Yes	86.54956	105	1.921	16.15351	36	3.849
555	Calibration	Lowestoft	4	A146 Beccles Road	WB	Jan-15	ATC	No	2000-4512	2000	4512		Yes	Yes	Yes	OK	665	812	5.418	No	No	557.1994	668	4.467	Yes	No	90.74836	107	1.645	16.93717	37	3.905
556	Validation	Lowestoft	5	A1145 Castleton Avenue	EB	Jan-15	ATC	No	5110-5060	5110	5060		Yes	Yes	Yes	OK	437	439	0.060	Yes	Yes	366.5688	367	0.013	Yes	Yes	59.70129	50	1.359	11.14258	22	2.711
557	Validation	Lowestoft	5	A1145 Castleton Avenue	WB	Jan-15	ATC	No	5060-5110	5060	5110		Yes	Yes	Yes	OK	341	399	3.029	Yes	Yes	285.4376	297	0.670	Yes	Yes	46.48784	77	3.908	8.676438	25	3.931
558	Calibration	Lowestoft	6	A12 London Road	NB	Jan-15	ATC	No	5390-1000	5390	1000		Yes	Yes	Yes	OK	713	634	3.061	Yes	Yes	597.831	522	3.191	Yes	Yes	97.36584	81	1.682	18.17225	30	2.439
559	Calibration	Lowestoft	6	A12 London Road	SB	Jan-15	ATC	No	1000-5390	1000	5390		Yes	Yes	Yes	OK	590	509	3.461	Yes	Yes	494.4699	410	3.974	Yes	Yes	80.53192	72	0.975	15.03038	27	2.593
560	Calibration	Lowestoft	7	London Road South	NEB	Jan-15	ATC	No	9606-1040	9606	1040		Yes	Yes	Yes	OK	449	420	1.357	Yes	Yes	376.1096	369	0.359	Yes	Yes	61.25515	48	1.862	11.43259	4	2.762
561	Calibration	Lowestoft	7	London Road South	SWB	Jan-15	ATC	No	1040-9606	1040	9606		Yes	Yes	Yes	OK	354	459	5.214	No	No	296.376	381	4.609	Yes	Yes	48.26933	75	3.363	9.008932	3	2.508
562	Calibration	Lowestoft	8	A12 Tom Crisp Way	NEB	Jan-15	ATC	No	3000-6314	3000	6314		Yes	Yes	Yes	OK	817	909	3.143	Yes	Yes	684.5328	761	2.860	Yes	Yes	111.4865	114	0.244	20.80772	34	2.461
563	Calibration	Lowestoft	8	A12 Tom Crisp Way	SWB	Jan-15	ATC	No	6314-3000	6314	3000		Yes	Yes	Yes	OK	378	400	1.122	Yes	Yes	316.6708	330	0.761	Yes	Yes	51.57457	58	0.865	9.625818	12	0.623
564	Calibration	Lowestoft	9	A1117 Elm Tree Road	NB	Jan-15	ATC	No	3030-3040	3030	3040		Yes	Yes	Yes	OK	307	454	7.528	No	No	257.6008	380	6.851	No	No	41.95419	68	3.458	7.830282	7	0.364
565	Calibration	Lowestoft	9	A1117 Elm Tree Road	SB	Jan-15	ATC	No	3040-3030	3040	3030		Yes	Yes	Yes	OK	356	438	4.134	Yes	Yes	298.3512	347	2.695	Yes	Yes	48.59101	68	2.490	9.06897	24	3.686
566	Calibration	Lowestoft	10	A146 Beccles Road	NEB	Jan-15	ATC	No	6406-6404	6406	6404		Yes	Yes	Yes	OK	475	370	5.127	No	No	398.4599	294	5.609	No	No	64.89504	63	0.294	12.11197	13	0.362
567	Calibration	Lowestoft	10	A146 Beccles Road	SWB	Jan-15	ATC	No	6404-6406	6404	6406		Yes	Yes	Yes	OK	432	309	6.399	No	No	361.7638	274	4.946	Yes	Yes	58.91871	24	5.419	10.99652	11	0.015
568	Calibration	Lowestoft	11	Kirkley Run	NWB	Jan-15	ATC	No	6398-5270	6398	5270		Yes	Yes	Yes	OK	161	162	0.086	Yes	Yes	135.003	136	0.118	Yes	Yes	21.98729	22	0.019	4.103683	4	0.097
569	Calibration	Lowestoft	11	Kirkley Run	SEB	Jan-15	ATC	No	5270-6398	5270	6398		Yes	Yes	Yes	OK	93	91	0.216	Yes	Yes	78.03563	77	0.138	Yes	Yes	12.70929	13	0.039	2.372047	1	0.733
570	Calibration	Lowestoft	12	A146 Waveney Drive	EB	Jan-15	ATC	No	4613-4010	4613	4010		Yes	Yes	Yes	OK	344	425	4.126	Yes	Yes	288.2098	384	5.208	No	Yes	46.93933	31	2.481	8.760703	10	0.319
571	Calibration	Lowestoft	12	A146 Waveney Drive	WB	Jan-15	ATC	No	4010-4613	4010	4613		Yes	Yes	Yes	OK	150	144	0.432	Yes	Yes	125.393	122	0.265	Yes	Yes	20.42214	22	0.332	3.811566	0	2.761
574	Calibration	Lowestoft	15	Katwijk Way	NB	Jan-15	ATC	No	6040-6431	6040	6431		Yes	Yes	Yes	OK	408	302	5.600	No	No	341.8044	256	4.980	Yes	Yes	55.66803	34	3.249	10.38982	13	0.676
575	Calibration	Lowestoft	15	Katwijk Way	SB	Jan-15	ATC	No	6431-6040	6431	6040		Yes	Yes	Yes	OK	133	266	9.445	No	No	111.4399	223	8.657	No	No	18.14967	35	3.285	3.387434	8	1.892
576	Calibration	Lowestoft	16	A12 Battery Green Road	NB	Jan-15	ATC	No	6160-6150	6160	6150		Yes	Yes	Yes	OK	670	587	3.298	Yes	Yes	561.3576	511	2.193	Yes	Yes	91.42559	62	3.322	17.06357	14	0.702
577	Calibration	Lowestoft	16	A12 Battery Green Road	SB	Jan-15	ATC	No	6150-6160	6150	6160		Yes	Yes	Yes	OK	566	338	10.767	No	No	474.659	284	9.767	No	No	77.30542	48	3.636	14.42819	5	3.165
578	Calibration	Lowestoft	17	A12 Old Nelson Street	NB	Jan-15	ATC	No	6140-6130	6140	6130		Yes	Yes	Yes	OK	410	412	0.083	Yes	Yes	344.0023	346	0.125	Yes	Yes	56.02599	55	0.104	10.45663	11	0.042
579	Calibration	Lowestoft	17	A12 Old Nelson Street	SB	Jan-15	ATC	No	6130-6140	6130	6140		Yes	Yes	Yes	OK	485	472	0.625	Yes	Yes	406.613	399	0.398	Yes	Yes	66.22309	64	0.232	12.3598	9	1.180
580	Calibration	Lowestoft	18	St Peter's Street	EB	Jan-15	ATC	No	6070-6075	6070	6075		Yes	Yes	Yes	OK	651	613	1.512	Yes	Yes	545.8683	545	0.058	Yes	Yes	88.90292	66	2.659	16.59274	3	4.222
581	Calibration	Lowestoft	18	St Peter's Street	WB	Jan-15	ATC	No	6075-6070	6075	6070		Yes	Yes	Yes	OK	299	286	0.737	Yes	Yes	250.3239	243	0.461	Yes	Yes	40.76904	41	0.005	7.609087	2	2.427
582	Calibration	Lowestoft	19	Denmark Road	EB	Jan-15	ATC	No	7200-1013	7200	10139		Yes	Yes	Yes	OK	213	208	0.368	Yes	Yes	178.4332	173	0.374	Yes	Yes	29.06055	29	0.030	5.423827	5	0.095
583	Calibration	Lowestoft	19	Denmark Road	WB	Jan-15	ATC	No	10139-7200	10139	7200		Yes	Yes	Yes	OK	301	299	0.134	Yes	Yes	252.5416	250	0.166	Yes	Yes	41.13023	41	0.006	7.676499	8	0.094
584	Calibration	Lowestoft	20	Rotterdam Road	NEB	Jan-15	ATC	No	7210-9130	7210	9130		Yes	Yes	Yes	OK	135	117	1.625	Yes	Yes	113.288	90	2.300	Yes	Yes	18.45066	24	1.205	3.443611	3	0.338
585	Calibration	Lowestoft	20	Rotterdam Road	SWB	Jan-15	ATC	No	9130-7210	9130	7210		Yes	Yes	Yes	OK	98	86	1.318	Yes	Yes	82.24004	66	1.851	Yes	Yes	13.39404	14	0.241	2.499848	5	1.259
586	Calibration	Lowestoft	21	Peto Way	NB	Jan-15	ATC	No	10190-706	10190	7060		Yes	Yes	Yes	OK	393	326	3.530	Yes	Yes	328.9602	258	4.135	Yes	Yes	53.57615	62	1.076	9.999391	6	1.503
587	Calibration	Lowestoft	21	Peto Way	SB	Jan-15	ATC	No	7060-1019	7060	10190		Yes	Yes	Yes	OK	315	393	4.152	Yes	Yes	263.7226	341	4.440	Yes	Yes	42.95122	41	0.303	8.016366	11	0.928
588	Calibration	Lowestoft	22	A1117 Normanston Drive	NEB	Jan-15	ATC	No	7050-7060	7050	7060		Yes	Yes	Yes	OK	681	945	9.254	No	No	571.0046	783	8.161	No	No	92.99676	135	3.896	17.35681	27	2.116
589	Calibration	Lowestoft	22	A1117 Normanston Drive	SWB	Jan-15	ATC	No	7060-7050	7060	7050		Yes	Yes	Yes	OK	503	542	1.723	Yes	Yes	421.1429	438	0.820	Yes	Yes	68.58951	83	1.633	12.80147	21	1.988
590	Calibration	Lowestoft	23	A1144 Normanston Drive	EB	Jan-15	ATC	No	9240-9130	9240	9130		Yes	Yes	Yes	OK	404	414	0.495	Yes	Yes	338.8936	349	0.540	Yes	Yes	55.19397	55	0.018	10.30134	10	0.041
591	Calibration	Lowestoft	23	A1144 Normanston Drive	WB	Jan-15	ATC	No	9130-9240	9130	9240		Yes	Yes	Yes	OK	188	186	0.163	Yes	Yes	157.8039	157	0.050	Yes	Yes	25.70075	26	0.002	4.796758	3	0.799
592	Calibration	Lowestoft	24	Oulton Road	EB	Jan-15	ATC	No	9270-6309	9270	6309		Yes	Yes	Yes	OK	472	470	0.086	Yes	Yes	395.7686	394	0.080	Yes	Yes	64.45692	64	0.058	12.03017	12	0.055
593	Calibration	Lowestoft	24	Oulton Road	WB	Jan-15	ATC	No	6309-9270	6309	9270		Yes	Yes	Yes	OK	245	242	0.183	Yes	Yes	204.9533	203	0.145	Yes	Yes	33.37975	33	0.111	6.229958	6	0.059
594	Calibration	Lowestoft	25	B1375 Gorleston Road	NB	Jan-15	ATC	No	8030-8040	8030	8040		Yes	Yes	Yes	OK	579	595	0.640	Yes	Yes	485.3218	510	1.111	Yes	Yes	79.04202	74	0.545	14.75231	10	1.273
595	Calibration	Lowestoft	25	B1375 Gorleston Road	SB	Jan-15	ATC	No	8040-8030	8040	8030		Yes	Yes	Yes	OK	480	490	0.433	Yes	Yes	402.2766	415	0.605	Yes	Yes	65.51684	64	0.182	12.22799	11	0.358
596	Calibration	Lowestoft	26	A1117 Millennium Way	NB	Jan-15	ATC	No	7070-7080	7070	7080		Yes	Yes	Yes	OK	373	371	0.095	Yes	Yes	312.3643	311	0.067	Yes	Yes	50.87326	50	0.090	9.494927	9	0.001
597	Calibration	Lowestoft	26	A1117 Millennium Way	SB	Jan-15	ATC	No	7080-7070	7080	7070		Yes	Yes	Yes	OK	446	442	0.206	Yes	Yes	373.9057	366	0.410	Yes	Yes	60.89622	63	0.251	11.3656	13	0.450
598	Calibration	Lowestoft	27	A12 Yarmouth Road	NWB	Jan-15	ATC	No	0242-1024	10242	10248		Yes	Yes	Yes	OK	456	447	0.440	Yes	Yes	382.4624	373	0.506	Yes	Yes	62.2898	61	0.195	11.6257	14	0.563
599	Calibration	Lowestoft	27	A12 Yarmouth Road	SEB	Jan-15	ATC	No	0248-1024	10248	10242		Yes	Yes	Yes	OK	646	631	0.616	Yes	Yes	541.4906	532	0.417	Yes	Yes	88.18995	88	0.012	16.45967	11	1.575
600	Validation	Lowestoft	28	B1385 Corton Road	NB	Jan-15	ATC	No	9460-9480	9460	9480		Yes	Yes	Yes	OK	95	98	0.229	Yes	Yes	79.94148	87	0.808	Yes	Yes	13.01968	10	0.871	2.429978	0	1.886
601	Validation	Lowestoft	28	B1385 Corton Road	SB	Jan-15	ATC	No	9480-9460	9480	9460		Yes	Yes	Yes	OK	101	72	3.152	Yes	Yes	84.5155	59	3.075	Yes	Yes	13.76463	11	0.708	2.569015	2	0.511
604	Validation	Lowestoft	30	B1375 Parkhill	NB	Jan-15	ATC	No	6300-8070	6300	8070		Yes	Yes	Yes	OK	458	454	0.183	Yes	Yes	383.525	396	0.617	Yes	Yes	62.46287	50	1.596	11.658	8	1.319
605	Validation	Lowestoft	30	B1375 Parkhill	SB	Jan-15	ATC	No	8070-6300	8070	6300		Yes	Yes	Yes	OK	249	276	1.657	Yes	Yes	208.8805	228	1.319	Yes	Yes	34.01935	41	1.074	6.349332	7	0.306
606	Calibration	Lowestoft	31	B1074 Bluderston Road	NB	Jan-15	ATC	No	6324-9440	6324	9440		Yes	Yes	Yes	OK	178	230	3.651	Yes	Yes	149.1756	192	3.288	Yes	Yes	24.2955	34	1.872	4.534485	4	0.470
607	Calibration	Lowestoft	31	B1074 Bluderston Road	SB	Jan-15	ATC	No	9440-6324	9440	6324		Yes	Yes	Yes	OK	112	142	2.635	Yes	Yes	93.76751	117	2.242	Yes	Yes	15.27146	19	0.873	2.850248	6	1.460
608	Calibration	Lowestoft	32	Fixton Road	NB	Jan-15	ATC	No	4563-5656	4563	5656		Yes	Yes	Yes	OK	51	23	4.617	Yes	Yes	42.6909	16	4.839	Yes	Yes	6.95286	7	0.175	1.297674	0	1.611
609	Calibration	Lowestoft	32	Fixton Road	SB	Jan-15	ATC	No	5656-4563	5656	4563		Yes	Yes	Yes	OK	83	23	8.259	No	Yes	69.85783	21	7.176	No	Yes	11.37741	2	3.779	2.123466	0	2.061
610	Calibration	Lowestoft	33	Coast Road	NB	Jan-15	ATC	No	9510-6326	9510	6326		Yes	Yes	Yes	OK	61	51	1.313	Yes	Yes	51.04199	51	0.070	Yes	Yes	8.245234	0	3.725	1.538881	0	1.754
611	Calibration	Lowestoft	33	Coast Road	SB	Jan-15	ATC	No	6326-9510	6326	9510		Yes	Yes	Yes	OK	50	0	9.939	No	Yes	41.92361	0	9.098	No	Yes	6.772266	0	3.672	1.263968	0	1.590
620	Calibration	Lowestoft	29	Asda Car Park	Entry	Jan-15	ANPR	No	4000-6381	4000	6381		Yes	Yes	Yes	OK	227	226	0.069	Yes	Yes	190.4458	190	0.060	Yes	Yes	31.01698	31	0.014	5.788973	6	0.057
621	Calibration	Lowestoft	29	Asda Car Park	Exit	Jan-15	ANPR	No	6381-4000	6381	4000		Yes	Yes	Yes	OK	167	168	0.095	Yes	Yes	139.7157	140	0.031	Yes	Yes	22.75481	23	0.032	4.246932	5	0.329
1434	Calibration	Lowestoft	1	JTC 1_A-In	0	Jan-15	MCC	No	6345-1020	6345	1020		Yes	Yes	Yes	OK	391	391	0.030	Yes	Yes	318.5103	317	0.058	Yes	Yes	69.94813	70	0.017	3.037974	3	0.173
1435	Calibration	Lowestoft	1	JTC 1_A-Out	0	Jan-15	MCC	No	1020-6345	1020	6345		Yes	Yes	Yes	OK	367	339	1.504	Yes	Yes	316.5381	302	0.842	Yes	Yes	47.31786	34	2.112	3.037974	3	0.011
1436	Calibration	Lowestoft	1	JTC 1_B-In	0	Jan-15	MCC	No	5370-1020	5370	1020		Yes	Yes	Yes	OK	65	64	0.074	Yes	Yes	53.2494	53	0.036	Yes	Yes	11.31514	11	0.100	0	0	0.093
1437	Calibration	Lowestoft	1	JTC 1_B-Out	0	Jan-15	MCC	No	1020-5370	1020	5370		Yes	Yes	Yes	OK	66	65	0.091	Yes	Yes	51.2772	51	0.039	Yes	Yes	14.40109	14	0.122	0	0	0.000
1438	Calibration	Lowestoft	1	JTC 1_C-In	0	Jan-15	MCC	No	1010-1020	1010	1020		Yes	Yes	Yes	OK	574	583	0.386	Yes	Yes	475.3002	475	0.031	Yes	Yes	81.26327	81	0.080	17.21518	28	2.248
1439	Calibration	Lowestoft	1	JTC 1_C-Out	0	Jan-15	MCC	No	1020-1010	1020	1010		Yes	Yes	Yes	OK	512	492	0.910	Yes	Yes	366.8292	377	0.517	Yes	Yes	120.3519	93	2.650	25.31645	22	0.615
1440	Calibration	Lowestoft	1	JTC 1_D-In	0	Jan-15	MCC	No	5340-1020	5340	1020		Yes	Yes	Yes	OK	328	329	0.072	Yes	Yes	186.3729	186	0.028	Yes	Yes	121.3806	121	0.054	20.25316	23	0.493
1441	Calibration	Lowestoft	1	JTC 1_D-Out	0	Jan-15	MCC	No	1020-5340	1020	5340		Yes	Yes	Yes	OK	471	471	0.028	Yes	Yes	371.7597	372	0.011	Yes	Yes	80.23463	80	0.069	19.2405	19	0.049
1442	Validation	Lowestoft	1	JTC 1_E-In	0	Jan-15	MCC	No	10258-102	10258	1020		Yes	Yes	Yes	OK	788	736	1.879	Yes	Yes	610.3959	576	1.416	Yes	Yes	136.8103	121	1.349	40.50632	38	0.323
1443	Validation	Lowestoft	1	JTC 1_E-Out	0	Jan-15	MCC	No	1020-1025	1020	10258		Yes	Yes	Yes	OK	729	737	0.279	Yes	Yes	537.4245	505	1.399	Yes	Yes	158.412	183	1.916	33.41771	48	2.268
1446	Calibration	Lowestoft	2	JTC 2_B-In	0	Jan-15	MCC	No	6341-3000	6341	3000		Yes	Yes	Yes	OK	298	298	0.016	Yes	Yes	267.2331	267	0.025	Yes	Yes	27.77352	28	0.033	3.037974	3	0.024
1447	Calibration	Lowestoft	2	JTC 2_B-Out	0	Jan-15	MCC	No	3000-6341	3000	6341		Yes	Yes	Yes	OK	335	335	0.021	Yes	Yes	294.8439	295	0.019	Yes	Yes	37.03137	37	0.013	3.037974	3	0.008
1450	Calibration	Lowestoft	2	JTC 2_D-In	0	Jan-15	MCC	No	6340-3000	6340	3000		Yes	Yes	Yes	OK	408	409	0.042	Yes	Yes	384.579	385	0.016	Yes	Yes	21.60163	22	0.079	2.025316	2	0.114
1451	Calibration	Lowestoft	2	JTC 2_D-Out	0	Jan-15	MCC	No	3000-6340	3000	6340		Yes	Yes	Yes	OK	130	122	0.736	Yes	Yes	109.4571	109	0.043	Yes	Yes	18.51568	11	2.090	2.025316	2	0.105
1452	Calibration	Lowestoft	2	JTC 2_E-In	0	Jan-15	MCC	No	6337-3000	6337	3000		Yes	Yes	Yes	OK	575	576	0.050	Yes	Yes	493.05	494	0.051	Yes	Yes	59.66164	60	0.022	22.27847	22	0.021
1453	Calibration	Lowestoft	2	JTC 2_E-Out	0	Jan-15	MCC	No	3000-6337	3000	6337		Yes	Yes	Yes	OK	411	415	0.163	Yes	Yes	303.7188	307	0.200	Yes	Yes	83.32057	83	0.035	24.30379	24	0.027
1454	Calibration	Lowestoft	2	JTC 2_F-In	0	Jan-15	MCC	No	3010-3000	3010	3000		Yes	Yes	Yes	OK	705	723	0.654	Yes	Yes	579.8268	585	0.204	Yes	Yes	113.1514	113	0.031	12.15189	25	2.987
1455	Calibration	Lowestoft	2	JTC 2_F-Out	0	Jan-15	MCC	No	3000-3010	3000	3010		Yes	Yes	Yes	OK	639	626	0.490	Yes	Yes	519.6747	518	0.056	Yes	Yes	108.0081	98	0.990	11.13924	10	0.311
1456	Calibration	Lowestoft	3	JTC 3_A-In	0	Jan-15	MCC	No	6306-8050	6306	8050		Yes	Yes	Yes	OK	283	286	0.167	Yes	Yes	233.7057	236	0.135	Yes	Yes	43.20326	42	0.208	6.075947	8	0.790
1457	Calibration	Lowestoft	3	JTC 3_A-Out	0	Jan-15	MCC	No	8050-6306	8050	6306		Yes	Yes	Yes	OK	493	481	0.552	Yes	Yes	422.0508	423	0.062	Yes	Yes	63.77624	51	1.756	7.088605	7	0.068
1458	Calibration	Lowestoft	3	JTC 3_B-In	0	Jan-15	MCC	No	10222-805	10222	8050		Yes	Yes	Yes	OK	224	221	0.175	Yes	Yes	203.1366	207	0.248	Yes	Yes	17.48703	13	1.081	3.037974	1	1.329
1459	Calibration	Lowestoft	3	JTC 3_B-Out	0	Jan-15	MCC	No	050-1022	8050	10222		Yes	Yes	Yes	OK	317	260	3.404	Yes	Yes	292.8717	237	3.425	Yes	Yes	20.57298	21	0.085	4.050632	2	1.461
1460	Calibration	Lowestoft	3	JTC 3_C-In	0	Jan-15	MCC	No	10216-805	10216	8050		Yes	Yes	Yes	OK	604	600	0.169	Yes	Yes	519.6747	519	0.012	Yes	Yes	73.03408	70	0.398	11.13924	11	0.156
1461	Calibration	Lowestoft	3	JTC 3_C-Out	0	Jan-15	MCC	No	050-1021	8050	10216		Yes	Yes	Yes	OK	439	440	0.076	Yes	Yes	364.857	372	0.351	Yes	Yes	62.74759	59	0.440	11.13924	9	0.531
1462	Calibration	Lowestoft	3	JTC 3_D-In	0	Jan-15	MCC	No	9420-8050	9420	8050		Yes	Yes	Yes	OK	251	190	4.058	Yes	Yes	219.9003	167	3.778	Yes	Yes	28.80217	21	1.572	2.025316	2	0.100
1463	Calibration	Lowestoft	3	JTC 3_D-Out	0	Jan-15	MCC	No	8050-9420	8050	9420		Yes	Yes	Yes	OK	112	116	0.396	Yes	Yes	96.6378	97	0.055	Yes	Yes	15.42974	15	0.123	0	4	2.888
1464	Calibration	Lowestoft	4	JTC 4_A-In	0	Jan-15	MCC	No	6280-6270	6280	6270		Yes	Yes	Yes	OK	883	938	1.810	Yes	Yes	716.8947	765	1.776	Yes	Yes	136.8103	139	0.189	29.36708	33	0.724
1465	Calibration	Lowestoft	4	JTC 4_A-Out	0	Jan-15	MCC	No	6270-6280	6270	6280		Yes	Yes	Yes	OK	1230	1236	0.180	Yes	Yes	1063.016	1069	0.197	Yes	Yes	134.753	134	0.046	32.40505	33	0.069
1466	Calibration	Lowestoft	4	JTC 4_B-In	0	Jan-15	MCC	No	6260-6270	6260	6270		Yes	Yes	Yes	OK	795	793	0.083	Yes	Yes	684.3534	681	0.139	Yes	Yes	84.34922	85	0.098	26.32911	27	0.075
1467	Calibration	Lowestoft	4	JTC 4_B-Out	0	Jan-15	MCC	No	6270-6260	6270	6260		Yes	Yes	Yes	OK	668	704	1.360	Yes	Yes	545.3133	574	1.209	Yes	Yes	100.8076	104	0.277	22.27847	27	0.858
1468	Calibration	Lowestoft	4	JTC 4_C-In	0	Jan-15	MCC	No	8070-6270	8070	6270		Yes	Yes	Yes	OK	444	444	0.008	Yes	Yes	388.5234	389	0.011	Yes	Yes	49.37515	49	0.058	6.075947	6	0.004
1469	Calibration	Lowestoft	4	JTC 4_C-Out	0	Jan-15	MCC	No	6270-8070	6270	8070		Yes	Yes	Yes	OK	224	234	0.672	Yes	Yes	181.4424	191	0.725	Yes	Yes	34.97407	35	0.075	7.088605	7	0.068
1472	Calibration	Lowestoft	5	JTC 5_B-In	0	Jan-15	MCC	No	9470-6230	9470	6230		Yes	Yes	Yes	OK	206	205	0.066	Yes	Yes	184.4007	183	0.106	Yes	Yes	21.60163	22	0.102	0	0	0.000
1473	Calibration	Lowestoft	5	JTC 5_B-Out	0	Jan-15	MCC	No	6230-9470	6230	9470		Yes	Yes	Yes	OK	293	292	0.064	Yes	Yes	272.1636	270	0.112	Yes	Yes	19.54433	20	0.096	1.012658	1	0.294
1474	Calibration	Lowestoft	5	JTC 5_C-In	0	Jan-15	MCC	No	10234-623	10234	6230		Yes	Yes	Yes	OK	678	655	0.897	Yes	Yes	575.8824	560	0.666	Yes	Yes	82.29192	75	0.838	20.25316	20	0.033
1475	Calibration	Lowestoft	5	JTC 5_C-Out	0	Jan-15	MCC	No	230-1023	6230	10234		Yes	Yes	Yes	OK	697	695	0.083	Yes	Yes	584.7573	575	0.411	Yes	Yes	100.8076	102	0.123	11.13924	18	1.700

Add Single Count | Add Multiple Counts | Export Link Flows | Import Link Flows

ID	Calibration / Validation	Area	Ref	Site Location	Dir	Date	Data Type	Duplicate?	Ref	A-Node	B-Node	Factor	AM Peak	PM Peak	Off Peak	Check
1476	Calibration	Lowestoft	5	JTC 5_D-In	0	Jan-15	MCC	No	10220-6230	10220	6230		Yes	Yes	Yes	OK
1477	Calibration	Lowestoft	5	JTC 5_D-Out	0	Jan-15	MCC	No	6230-10220	6230	10220		Yes	Yes	Yes	OK
1478	Calibration	Lowestoft	6	JTC 6_A-In	0	Jan-15	MCC	No	9991-6200	9991	6200		Yes	Yes	Yes	OK
1479	Calibration	Lowestoft	6	JTC 6_A-Out	0	Jan-15	MCC	No	6200-9991	6200	9991		Yes	Yes	Yes	OK
1480	Calibration	Lowestoft	6	JTC 6_B-In	0	Jan-15	MCC	No	6190-6200	6190	6200		Yes	Yes	Yes	OK
1481	Calibration	Lowestoft	6	JTC 6_B-Out	0	Jan-15	MCC	No	6200-6190	6200	6190		Yes	Yes	Yes	OK
1482	Calibration	Lowestoft	6	JTC 6_C-In	0	Jan-15	MCC	No	6210-6200	6210	6200		Yes	Yes	Yes	OK
1483	Calibration	Lowestoft	6	JTC 6_C-Out	0	Jan-15	MCC	No	6200-6210	6200	6210		Yes	Yes	Yes	OK
1488	Calibration	Lowestoft	7	JTC 7_C-In	0	Jan-15	MCC	No	7060-7070	7060	7070		Yes	Yes	Yes	OK
1489	Calibration	Lowestoft	7	JTC 7_C-Out	0	Jan-15	MCC	No	7070-7060	7070	7060		Yes	Yes	Yes	OK
1490	Calibration	Lowestoft	7	JTC 7_D-In	0	Jan-15	MCC	No	6305-7070	6305	7070		Yes	Yes	Yes	OK
1491	Calibration	Lowestoft	7	JTC 7_D-Out	0	Jan-15	MCC	No	7070-6305	7070	6305		Yes	Yes	Yes	OK
1500	Validation	Lowestoft	9	JTC 9_A-In	0	Jan-15	MCC	No	6260-6250	6260	6250		Yes	Yes	Yes	OK
1501	Validation	Lowestoft	9	JTC 9_A-Out	0	Jan-15	MCC	No	6250-6260	6250	6260		Yes	Yes	Yes	OK
1502	Calibration	Lowestoft	9	JTC 9_B-In	0	Jan-15	MCC	No	9990-6250	9990	6250		Yes	Yes	Yes	OK
1503	Calibration	Lowestoft	9	JTC 9_B-Out	0	Jan-15	MCC	No	6250-9990	6250	9990		Yes	Yes	Yes	OK
1504	Calibration	Lowestoft	9	JTC 9_C-In	0	Jan-15	MCC	No	10257-6250	10257	6250		Yes	Yes	Yes	OK
1505	Calibration	Lowestoft	9	JTC 9_C-Out	0	Jan-15	MCC	No	6250-10257	6250	10257		Yes	Yes	Yes	OK
1506	Calibration	Lowestoft	9	JTC 9_D-In	0	Jan-15	MCC	No	7090-6250	7090	6250		Yes	Yes	Yes	OK
1507	Calibration	Lowestoft	9	JTC 9_D-Out	0	Jan-15	MCC	No	6250-7090	6250	7090		Yes	Yes	Yes	OK
1615	Calibration	Lowestoft	C103	Oulton Road	EB	Jan-16	ATC	No	7070-9310	7070	9310		Yes	Yes	Yes	OK
1616	Calibration	Lowestoft	C103	Oulton Road	WB	Jan-16	ATC	No	9310-7070	9310	7070		Yes	Yes	Yes	OK
1617	Calibration	Lowestoft	C105	Long Road	SB	Jan-16	ATC	No	5180-3010	5180	3010		Yes	Yes	Yes	OK
1618	Calibration	Lowestoft	C105	Long Road	NB	Jan-16	ATC	No	3010-5180	3010	5180		Yes	Yes	Yes	OK
1619	Calibration	Lowestoft	C106	Victoria Road	EB	Jan-16	ATC	No	9617-4020	9617	4020		Yes	Yes	Yes	OK
1620	Calibration	Lowestoft	C106	Victoria Road	WB	Jan-16	ATC	No	4020-9617	4020	9617		Yes	Yes	Yes	OK
1623	Calibration	Lowestoft	C108	Crestview Drive	SB	Jan-16	ATC	No	10228-9300	10228	9300		Yes	Yes	Yes	OK
1624	Calibration	Lowestoft	C108	Crestview Drive	NB	Jan-16	ATC	No	9300-10228	9300	10228		Yes	Yes	Yes	OK
1625	Calibration	Lowestoft	C109	Millenium Way	SB	Jan-16	ATC	No	7090-7080	7090	7080		Yes	Yes	Yes	OK
1626	Calibration	Lowestoft	C109	Millenium Way	NB	Jan-16	ATC	No	7080-7090	7080	7090		Yes	Yes	Yes	OK
1627	Calibration	Lowestoft	C110	St.Peters Street	EB	Jan-16	ATC	No	10171-9170	10171	9170		Yes	Yes	Yes	OK
1628	Calibration	Lowestoft	C110	St.Peters Street	WB	Jan-16	ATC	No	9170-10171	9170	10171		Yes	Yes	Yes	OK
1629	Calibration	Lowestoft	C111	Cotmer Road Oulton Broad	SB	Jan-16	ATC	No	2030-3040	2030	3040		Yes	Yes	Yes	OK
1630	Calibration	Lowestoft	C111	Cotmer Road Oulton Broad	NB	Jan-16	ATC	No	3040-2030	3040	2030		Yes	Yes	Yes	OK
1631	Calibration	Lowestoft	C112	Ashburnham Way Carlton Colville	EB	Jan-16	ATC	No	5105-6355	5105	6355		Yes	Yes	Yes	OK
1632	Calibration	Lowestoft	C112	Ashburnham Way Carlton Colville	WB	Jan-16	ATC	No	6355-5105	6355	5105		Yes	Yes	Yes	OK
1633	Validation	Lowestoft	C113	Lowestoft Road Carlton Colville	EB	Jan-16	ATC	No	6335-9604	6335	9604		Yes	Yes	Yes	OK
1634	Validation	Lowestoft	C113	Lowestoft Road Carlton Colville	WB	Jan-16	ATC	No	9604-6335	9604	6335		Yes	Yes	Yes	OK
1635	Calibration	Lowestoft	C116	Tom Crisp Way	SB	Jan-16	ATC	No	6315-6413	6315	6413		Yes	Yes	Yes	OK
1636	Calibration	Lowestoft	C116	Tom Crisp Way	NB	Jan-16	ATC	No	6413-6315	6413	6315		Yes	Yes	Yes	OK
1679	Calibration	Lowestoft	M043	Kessingland Bypass	SB	Jan-16	ATC	No	4501-4502	4501	4502		Yes	Yes	Yes	OK
1680	Calibration	Lowestoft	M043	Kessingland Bypass	NB	Jan-16	ATC	No	4502-4501	4502	4501		Yes	Yes	Yes	OK
1723	Validation	Lowestoft	Y159	London Road Pakefield	SB	Jan-16	ATC	No	1025-6345	1025	6345		Yes	Yes	Yes	OK
1724	Validation	Lowestoft	Y159	London Road Pakefield	NB	Jan-16	ATC	No	6345-1025	6345	1025		Yes	Yes	Yes	OK
1757	Calibration	Lowestoft	9	JTC 9_E-In	EB	Jan-15	MCC	No	8070-6250	8070	6250		Yes	Yes	Yes	OK
1758	Calibration	Lowestoft	9	JTC 9_E-Out	WB	Jan-15	MCC	No	6250-8070	6250	8070		Yes	Yes	Yes	OK
1769	Validation	Lowestoft	1	0	NB	Jan-16	MCC	No	2070-7000	2070	7000		Yes	Yes	Yes	OK
1770	Validation	Lowestoft	1	0	SB	Jan-16	MCC	No	7000-2070	7000	2070		Yes	Yes	Yes	OK
1771	Calibration	Lowestoft	3	0	NB	Jan-16	MCC	No	9220-4612	9220	4612		Yes	Yes	Yes	OK
1772	Calibration	Lowestoft	3	0	SB	Jan-16	MCC	No	4612-9220	4612	9220		Yes	Yes	Yes	OK
1773	Calibration	Lowestoft	3	0	NE	Jan-16	MCC	No	9220-9230	9220	9230		Yes	Yes	Yes	OK
1774	Calibration	Lowestoft	3	0	SW	Jan-16	MCC	No	9230-9220	9230	9220		Yes	Yes	Yes	OK
1777	Calibration	Lowestoft	3	0	SB	Jan-16	MCC	No	9220-4603	9220	4603		Yes	Yes	Yes	OK
1778	Calibration	Lowestoft	3	0	NB	Jan-16	MCC	No	4603-9220	4603	9220		Yes	Yes	Yes	OK
1779	Calibration	Lowestoft	3	0	WB	Jan-16	MCC	No	9220-10190	9220	10190		Yes	Yes	Yes	OK
1780	Calibration	Lowestoft	3	0	EB	Jan-16	MCC	No	10190-9220	10190	9220		Yes	Yes	Yes	OK
1781	Calibration	Lowestoft	4	0	NB	Jan-16	MCC	No	9120-10185	9120	10185		Yes	Yes	Yes	OK
1782	Calibration	Lowestoft	4	0	SB	Jan-16	MCC	No	10185-9120	10185	9120		Yes	Yes	Yes	OK
1783	Calibration	Lowestoft	4	0	EB	Jan-16	MCC	No	9120-7200	9120	7200		Yes	Yes	Yes	OK
1784	Calibration	Lowestoft	4	0	WB	Jan-16	MCC	No	7200-9120	7200	9120		Yes	Yes	Yes	OK
1787	Validation	Lowestoft	5	0	NB	Jan-16	MCC	No	1260-6322	1260	6322		Yes	Yes	Yes	OK
1788	Validation	Lowestoft	5	0	SB	Jan-16	MCC	No	6322-1260	6322	1260		Yes	Yes	Yes	OK
1791	Calibration	Lowestoft	6	0	EB	Jan-16	MCC	No	6315-4000	6315	4000		Yes	Yes	Yes	OK
1792	Calibration	Lowestoft	6	0	WB	Jan-16	MCC	No	4000-6315	4000	6315		Yes	Yes	Yes	OK
1793	Calibration	Lowestoft	6	0	SE	Jan-16	MCC	No	6315-6382	6315	6382		Yes	Yes	Yes	OK
1794	Calibration	Lowestoft	6	0	NW	Jan-16	MCC	No	6382-6315	6382	6315		Yes	Yes	Yes	OK
1797	Calibration	Lowestoft	6	0	WB	Jan-16	MCC	No	6315-4010	6315	4010		Yes	Yes	Yes	OK
1798	Calibration	Lowestoft	6	0	EB	Jan-16	MCC	No	4010-6315	4010	6315		Yes	Yes	Yes	OK
1801	Calibration	Lowestoft	7	0	SB	Jan-16	MCC	No	4613-4614	4613	4614		Yes	Yes	Yes	OK
1802	Calibration	Lowestoft	7	0	NB	Jan-16	MCC	No	4614-4613	4614	4613		Yes	Yes	Yes	OK
1803	Calibration	Lowestoft	7	0	WB	Jan-16	MCC	No	4613-6384	4613	6384		Yes	Yes	Yes	OK
1804	Calibration	Lowestoft	7	0	EB	Jan-16	MCC	No	6384-4613	6384	4613		Yes	Yes	Yes	OK
2331	Calibration	Lowestoft		Vaveney Drive / Riverside Road / Durban Road - Riversi	pproac	Jul-17	MCC	No	10259-4010	10259	4010		Yes	Yes	Yes	OK
2332	Calibration	Lowestoft		Vaveney Drive / Riverside Road / Durban Road - Riversi	Exit	Jul-17	MCC	No	4010-10259	4010	10259		Yes	Yes	Yes	OK
2335	Calibration	Lowestoft		Vaveney Drive / Riverside Road / Durban Road - Durbar	pproac	Jul-17	MCC	No	6402-4010	6402	4010		Yes	Yes	Yes	OK
2336	Calibration	Lowestoft		Vaveney Drive / Riverside Road / Durban Road - Durbar	Exit	Jul-17	MCC	No	4010-6402	4010	6402		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
1476	224	222	0.143	Yes	Yes	202.1505	199	0.201	Yes	Yes	20.57298	21	0.189	1.012658	1	0.152
1477	129	128	0.120	Yes	Yes	108.471	108	0.072	Yes	Yes	19.54433	20	0.091	1.012658	0	1.423
1478	145	146	0.098	Yes	Yes	125.2347	126	0.026	Yes	Yes	19.54433	20	0.183	0	0	0.361
1479	145	146	0.093	Yes	Yes	130.1652	131	0.099	Yes	Yes	14.40109	14	0.088	0	0	0.791
1480	652	605	1.859	Yes	Yes	557.1465	517	1.749	Yes	Yes	77.14868	75	0.226	17.21518	13	1.052
1481	768	716	1.911	Yes	Yes	652.7982	601	2.071	Yes	Yes	105.9509	106	0.028	9.113921	9	0.030
1482	662	646	0.612	Yes	Yes	560.1048	544	0.706	Yes	Yes	92.57841	93	0.095	9.113921	9	0.008
1483	546	536	0.435	Yes	Yes	459.5226	453	0.285	Yes	Yes	68.91949	69	0.046	17.21518	13	1.139
1488	346	373	1.416	Yes	Yes	300.7605	321	1.126	Yes	Yes	36.00272	43	1.101	9.113921	9	0.028
1489	410	394	0.804	Yes	Yes	357.9543	337	1.097	Yes	Yes	41.14596	44	0.392	11.13924	13	0.518
1490	140	137	0.234	Yes	Yes	125.2347	124	0.122	Yes	Yes	13.37244	13	0.103	1.012658	0	1.423
1491	184	173	0.846	Yes	Yes	170.5953	160	0.850	Yes	Yes	13.37244	13	0.103	0	0	0.000
1500	674	704	1.130	Yes	Yes	550.2438	574	0.998	Yes	Yes	102.8649	104	0.073	21.26582	27	1.074
1501	806	793	0.473	Yes	Yes	691.2561	681	0.402	Yes	Yes	88.46382	85	0.345	26.32911	27	0.075
1502	180	142	2.980	Yes	Yes	164.6787	135	2.417	Yes	Yes	14.40109	7	2.202	1.012658	0	1.423
1503	198	160	2.835	Yes	Yes	178.4841	150	2.187	Yes	Yes	16.45838	8	2.473	3.037974	2	0.821
1504	594	594	0.006	Yes	Yes	503.8971	504	0.016	Yes	Yes	69.94813	70	0.003	20.25316	20	0.040
1505	621	626	0.213	Yes	Yes	514.7442	514	0.024	Yes	Yes	93.60706	94	0.006	12.15189	18	1.524
1506	335	336	0.028	Yes	Yes	305.691	303	0.142	Yes	Yes	23.65893	25	0.266	6.075947	8	0.639
1507	196	232	2.397	Yes	Yes	164.6787	195	2.247	Yes	Yes	24.68758	29	0.908	7.088605	7	0.084
1615	314	287	1.566	Yes	Yes	255.2598	254	0.051	Yes	Yes	42.5274	32	1.695	15.96283	0	5.650
1616	311	273	2.217	Yes	Yes	252.819	252	0.034	Yes	Yes	42.12076	20	3.906	15.81019	0	5.469
1617	165	87	7.005	No	Yes	134.647	81	5.178	No	Yes	22.43278	5	4.552	8.420232	0	3.756
1618	159	53	10.337	No	No	129.1553	41	9.577	No	Yes	21.51785	9	3.220	8.076809	3	2.316
1619	436	415	1.058	Yes	Yes	355.1263	349	0.336	Yes	Yes	59.16561	59	0.059	22.20804	7	3.930
1620	299	291	0.461	Yes	Yes	243.4629	246	0.165	Yes	Yes	40.56199	41	0.061	15.2251	4	3.486
1623	180	173	0.513	Yes	Yes	146.2405	149	0.258	Yes	Yes	24.3643	15	1.990	9.145237	8	0.365
1624	154	143	0.934	Yes	Yes	125.2909	125	0.012	Yes	Yes	20.87401	13	1.968	7.83514	5	1.266
1625	508	487	0.951	Yes	Yes	413.2971	412	0.060	Yes	Yes	68.85711	63	0.754	25.84579	12	3.190
1626	461	440	0.981	Yes	Yes	374.8556	374	0.033	Yes	Yes	62.45259	57	0.761	23.44182	9	3.541
1627	397	384	0.651	Yes	Yes	323.1935	320	0.162	Yes	Yes	53.84545	54	0.010	20.2111	10	2.575
1628	222	213	0.637	Yes	Yes	180.8175	181	0.013	Yes	Yes	30.12499	30	0.030	11.30753	2	3.480
1629	487	488	0.053	Yes	Yes	396.0086	397	0.043	Yes	Yes	65.97677	66	0.034	24.76464	25	0.007
1630	435	394	2.011	Yes	Yes	353.7026	328	1.398	Yes	Yes	58.9284	59	0.015	22.11901	7	3.924
1631	283	238	2.797	Yes	Yes	230.6491	200	2.067	Yes	Yes	38.42715	38	0.067	14.42378	0	5.371
1632	259	205	3.535	Yes	Yes	210.513	181	2.112	Yes	Yes	35.0724	24	2.043	13.16456	0	5.131
1633	233	151	5.948	No	Yes	189.9702	140	3.873	Yes	Yes	31.64987	11	4.520	11.8799	0	4.874
1634	231	55	14.762	No	No	188.3431	48	12.865	No	No	31.37878	6	5.766	11.77815	0	4.768
1635	421	409	0.571	Yes	Yes	342.5159	331	0.652	Yes	Yes	57.06465	57	0.048	21.41944	21	0.008
1636	978	964	0.466	Yes	Yes	796.0851	814	0.615	Yes	Yes	132.6313	116	1.469	49.78367	34	2.404
1679	492	491	0.009	Yes	Yes	397.7261	398	0.004	Yes	Yes	67.47557	67	0.064	26.29832	27	0.079
1680	558	562	0.160	Yes	Yes	451.5385	454	0.134	Yes	Yes	76.60502	77	0.083	29.85649	30	0.038
1723	381	352	1.533	Yes	Yes	310.1762	280	1.740	Yes	Yes	51.67672	68	2.156	19.39706	3	4.805
1724	346	299	2.636	Yes	Yes	281.9044	263	1.119	Yes	Yes	46.96651	33	2.254	17.62907	3	4.568
1757	107	107	0.012	Yes	Yes	89.7351	89	0.030	Yes	Yes	17.48703	17	0.115	0	1	1.127
1758	70	73	0.350	Yes	Yes	65.0826	65	0.004	Yes	Yes	5.143245	7	0.628	0	1	1.717
1769	1007	1069	1.934	Yes	Yes	833	895	2.098	Yes	Yes	118	149	2.663	56	26	4.707
1770	921	1038	3.728	Yes	Yes	742	869	4.476	Yes	No	130	135	0.440	49	34	2.402
1771	123	123	0.029	Yes	Yes	100	100	0.036	Yes	Yes	23	23	0.008	0	0	0.000
1772	80	82	0.175	Yes	Yes	25	25	0.002	Yes	Yes	53	53	0.000	2	4	0.949
1773	185	187	0.154	Yes	Yes	174	175	0.058	Yes	Yes	9	9	0.007	2	3	0.824
1774	100	100	0.002	Yes	Yes	92	92	0.002	Yes	Yes	8	8	0.000	0	0	0.000
1777	71	72	0.107	Yes	Yes	55	55	0.032	Yes	Yes	15	15	0.008	1	2	0.596
1778	52	52	0.062	Yes	Yes	36	36	0.003	Yes	Yes	15	15	0.000	1	1	0.423
1779	345	326	1.057	Yes	Yes	259	258	0.055	Yes	Yes	74	62	1.487	12	6	2.087
1780	396	393	0.162	Yes	Yes	344	341	0.166	Yes	Yes	41	41	0.002	11	11	0.039
1781	133	131	0.159	Yes	Yes	103	101	0.180	Yes	Yes	23	23	0.002	7	7	0.002
1782	149	132	1.405	Yes	Yes	108	108	0.001	Yes	Yes	27	21	1.238	14	3	3.600
1783	242	233	0.593	Yes	Yes	184	181	0.224	Yes	Yes	44	43	0.199	14	9	1.407
1784	316	313	0.178	Yes	Yes	271	269	0.139	Yes	Yes	36	36	0.068	9	8	0.444
1787	1412	1238	4.767	Yes	Yes	1205	1068	4.056	Yes	Yes	162	134	2.320	45	36	1.347
1788	811	845	1.192	Yes	Yes	658	693	1.332	Yes	Yes	117	135	1.592	36	18	3.505
1791	1164	1185	0.598	Yes	Yes	1014	1005	0.291	Yes	Yes	109	138	2.597	41	42	0.142
1792	540	530	0.419	Yes	Yes	417	437	0.962	Yes	Yes	91	74	1.847	32	19	2.523
1793	24	27	0.594	Yes	Yes	23	23	0.038	Yes	Yes	1	4	1.884	0	0	0.646
1794	8	24	3.931	Yes	Yes	6	22	4.197	Yes	Yes	2	2	0.000	0	0	0.295
1797	348	338	0.519	Yes	Yes	310	307	0.155	Yes	Yes	31	31	0.020	7	0	3.742
1798	449	441	0.365	Yes	Yes	398	393	0.234	Yes	Yes	38	38	0.011	13	10	0.874
1801	10	14	1.076	Yes	Yes	8	13	1.656	Yes	Yes	0	0	0.469	2	0	1.752
1802	29	29	0.089	Yes	Yes	24	24	0.014	Yes	Yes	2	2	0.000	3	3	0.244
1803	149	140	0.717	Yes	Yes	118	118	0.002	Yes	Yes	26	22	0.740	5	0	3.162
1804	425	406	0.934	Yes	Yes	388	369	0.991	Yes	Yes	30	30	0.013	7	7	0.117
2331	42	43	0.096	Yes	Yes	31	31	0.052	Yes	Yes	12	12	0.100	0	0	0.000
2332	248	249	0.046	Yes	Yes	234	234	0.019	Yes	Yes	15	15	0.112	0	0	0.000
2335	54	52	0.341	Yes	Yes	48	48	0.076	Yes	Yes	7	3	1.464	0	0	0.780
2336	24	23	0.091	Yes	Yes	20	20	0.079	Yes	Yes	3	3	0.113	1	0	1.405

Add Single Count | Add Multiple Counts | Export Link Flows | Import Link Flows

ID	Calibration / Validation	Area	Ref	Site Location	Dir	Date	Data Type	Duplicate?	Ref	A-Node	B-Node	Factor	Interpeak	Off Peak	Check
544	Calibration	Lowestoft	0	ite 6339/1 on link A12 southbound between B1375	SB	Jan-16	TRADS	No	10257-6230	10257	6230		Yes	Yes	OK
545	Calibration	Lowestoft	0	ite 6339/2 on link A12 northbound between A1117	NB	Jan-16	TRADS	No	6230-10257	6230	10257		Yes	Yes	OK
548	Calibration	Lowestoft	1	Mutfordwood Lane	EB	Jan-15	ATC	No	4567-5070	4567	5070		Yes	Yes	OK
549	Calibration	Lowestoft	1	Mutfordwood Lane	WB	Jan-15	ATC	No	5070-4567	5070	4567		Yes	Yes	OK
550	Calibration	Lowestoft	2	Rushmere Road	EB	Jan-15	ATC	No	4566-5000	4566	5000		Yes	Yes	OK
551	Calibration	Lowestoft	2	Rushmere Road	WB	Jan-15	ATC	No	5000-4566	5000	4566		Yes	Yes	OK
552	Calibration	Lowestoft	3	Gisleham Road	NB	Jan-15	ATC	No	9600-5010	9600	5010		Yes	Yes	OK
553	Calibration	Lowestoft	3	Gisleham Road	SB	Jan-15	ATC	No	5010-9600	5010	9600		Yes	Yes	OK
554	Calibration	Lowestoft	4	A146 Beccles Road	EB	Jan-15	ATC	No	4512-2000	4512	2000		Yes	Yes	OK
555	Calibration	Lowestoft	4	A146 Beccles Road	WB	Jan-15	ATC	No	2000-4512	2000	4512		Yes	Yes	OK
556	Validation	Lowestoft	5	A1145 Castleton Avenue	EB	Jan-15	ATC	No	5110-5060	5110	5060		Yes	Yes	OK
557	Validation	Lowestoft	5	A1145 Castleton Avenue	WB	Jan-15	ATC	No	5060-5110	5060	5110		Yes	Yes	OK
558	Calibration	Lowestoft	6	A12 London Road	NB	Jan-15	ATC	No	5390-1000	5390	1000		Yes	Yes	OK
559	Calibration	Lowestoft	6	A12 London Road	SB	Jan-15	ATC	No	1000-5390	1000	5390		Yes	Yes	OK
560	Calibration	Lowestoft	7	London Road South	NEB	Jan-15	ATC	No	9606-1040	9606	1040		Yes	Yes	OK
561	Calibration	Lowestoft	7	London Road South	SWB	Jan-15	ATC	No	1040-9606	1040	9606		Yes	Yes	OK
562	Calibration	Lowestoft	8	A12 Tom Crisp Way	NEB	Jan-15	ATC	No	3000-6314	3000	6314		Yes	Yes	OK
563	Calibration	Lowestoft	8	A12 Tom Crisp Way	SWB	Jan-15	ATC	No	6314-3000	6314	3000		Yes	Yes	OK
564	Calibration	Lowestoft	9	A1117 Elm Tree Road	NB	Jan-15	ATC	No	3030-3040	3030	3040		Yes	Yes	OK
565	Calibration	Lowestoft	9	A1117 Elm Tree Road	SB	Jan-15	ATC	No	3040-3030	3040	3030		Yes	Yes	OK
566	Calibration	Lowestoft	10	A146 Beccles Road	NEB	Jan-15	ATC	No	6406-6404	6406	6404		Yes	Yes	OK
567	Calibration	Lowestoft	10	A146 Beccles Road	SWB	Jan-15	ATC	No	6404-6406	6404	6406		Yes	Yes	OK
568	Calibration	Lowestoft	11	Kirkley Run	NWB	Jan-15	ATC	No	6398-5270	6398	5270		Yes	Yes	OK
569	Calibration	Lowestoft	11	Kirkley Run	SEB	Jan-15	ATC	No	5270-6398	5270	6398		Yes	Yes	OK
570	Calibration	Lowestoft	12	A146 Waveney Drive	EB	Jan-15	ATC	No	4613-4010	4613	4010		Yes	Yes	OK
571	Calibration	Lowestoft	12	A146 Waveney Drive	WB	Jan-15	ATC	No	4010-4613	4010	4613		Yes	Yes	OK
574	Calibration	Lowestoft	15	Katwijk Way	NB	Jan-15	ATC	No	6040-6431	6040	6431		Yes	Yes	OK
575	Calibration	Lowestoft	15	Katwijk Way	SB	Jan-15	ATC	No	6431-6040	6431	6040		Yes	Yes	OK
576	Calibration	Lowestoft	16	A12 Battery Green Road	NB	Jan-15	ATC	No	6160-6150	6160	6150		Yes	Yes	OK
577	Calibration	Lowestoft	16	A12 Battery Green Road	SB	Jan-15	ATC	No	6150-6160	6150	6160		Yes	Yes	OK
578	Calibration	Lowestoft	17	A12 Old Nelson Street	NB	Jan-15	ATC	No	6140-6130	6140	6130		Yes	Yes	OK
579	Calibration	Lowestoft	17	A12 Old Nelson Street	SB	Jan-15	ATC	No	6130-6140	6130	6140		Yes	Yes	OK
580	Calibration	Lowestoft	18	St Peter's Street	EB	Jan-15	ATC	No	6070-6075	6070	6075		Yes	Yes	OK
581	Calibration	Lowestoft	18	St Peter's Street	WB	Jan-15	ATC	No	6075-6070	6075	6070		Yes	Yes	OK
582	Calibration	Lowestoft	19	Denmark Road	EB	Jan-15	ATC	No	7200-10139	7200	10139		Yes	Yes	OK
583	Calibration	Lowestoft	19	Denmark Road	WB	Jan-15	ATC	No	10139-7200	10139	7200		Yes	Yes	OK
584	Calibration	Lowestoft	20	Rotterdam Road	NEB	Jan-15	ATC	No	7210-9130	7210	9130		Yes	Yes	OK
585	Calibration	Lowestoft	20	Rotterdam Road	SWB	Jan-15	ATC	No	9130-7210	9130	7210		Yes	Yes	OK
586	Calibration	Lowestoft	21	Peto Way	NB	Jan-15	ATC	No	10190-7060	10190	7060		Yes	Yes	OK
587	Calibration	Lowestoft	21	Peto Way	SB	Jan-15	ATC	No	7060-10190	7060	10190		Yes	Yes	OK
588	Calibration	Lowestoft	22	A1117 Normanston Drive	NEB	Jan-15	ATC	No	7050-7060	7050	7060		Yes	Yes	OK
589	Calibration	Lowestoft	22	A1117 Normanston Drive	SWB	Jan-15	ATC	No	7060-7050	7060	7050		Yes	Yes	OK
590	Calibration	Lowestoft	23	A1144 Normanston Drive	EB	Jan-15	ATC	No	9240-9130	9240	9130		Yes	Yes	OK
591	Calibration	Lowestoft	23	A1144 Normanston Drive	WB	Jan-15	ATC	No	9130-9240	9130	9240		Yes	Yes	OK
592	Calibration	Lowestoft	24	Oulton Road	EB	Jan-15	ATC	No	9270-6309	9270	6309		Yes	Yes	OK
593	Calibration	Lowestoft	24	Oulton Road	WB	Jan-15	ATC	No	6309-9270	6309	9270		Yes	Yes	OK
594	Calibration	Lowestoft	25	B1375 Gorleston Road	NB	Jan-15	ATC	No	8030-8040	8030	8040		Yes	Yes	OK
595	Calibration	Lowestoft	25	B1375 Gorleston Road	SB	Jan-15	ATC	No	8040-8030	8040	8030		Yes	Yes	OK
596	Calibration	Lowestoft	26	A1117 Millennium Way	NB	Jan-15	ATC	No	7070-7080	7070	7080		Yes	Yes	OK
597	Calibration	Lowestoft	26	A1117 Millennium Way	SB	Jan-15	ATC	No	7080-7070	7080	7070		Yes	Yes	OK
598	Calibration	Lowestoft	27	A12 Yarmouth Road	NWB	Jan-15	ATC	No	0242-1024	10242	10248		Yes	Yes	OK
599	Calibration	Lowestoft	27	A12 Yarmouth Road	SEB	Jan-15	ATC	No	0248-1024	10248	10242		Yes	Yes	OK
600	Validation	Lowestoft	28	B1385 Corton Road	NB	Jan-15	ATC	No	9460-9480	9460	9480		Yes	Yes	OK
601	Validation	Lowestoft	28	B1385 Corton Road	SB	Jan-15	ATC	No	9480-9460	9480	9460		Yes	Yes	OK
604	Validation	Lowestoft	30	B1375 Parkhill	NB	Jan-15	ATC	No	6300-8070	6300	8070		Yes	Yes	OK
605	Validation	Lowestoft	30	B1375 Parkhill	SB	Jan-15	ATC	No	8070-6300	8070	6300		Yes	Yes	OK
606	Calibration	Lowestoft	31	B1074 Bluderston Road	NB	Jan-15	ATC	No	6324-9440	6324	9440		Yes	Yes	OK
607	Calibration	Lowestoft	31	B1074 Bluderston Road	SB	Jan-15	ATC	No	9440-6324	9440	6324		Yes	Yes	OK
608	Calibration	Lowestoft	32	Fixton Road	NB	Jan-15	ATC	No	4563-5656	4563	5656		Yes	Yes	OK
609	Calibration	Lowestoft	32	Fixton Road	SB	Jan-15	ATC	No	5656-4563	5656	4563		Yes	Yes	OK
610	Calibration	Lowestoft	33	Coast Road	NB	Jan-15	ATC	No	9510-6326	9510	6326		Yes	Yes	OK
611	Calibration	Lowestoft	33	Coast Road	SB	Jan-15	ATC	No	6326-9510	6326	9510		Yes	Yes	OK
620	Calibration	Lowestoft	29	Asda Car Park	Entry	Jan-15	ANPR	No	4000-6381	4000	6381		Yes	Yes	OK
621	Calibration	Lowestoft	29	Asda Car Park	Exit	Jan-15	ANPR	No	6381-4000	6381	4000		Yes	Yes	OK
1434	Calibration	Lowestoft	1	JTC 1_A-In	0	Jan-15	MCC	No	6345-1020	6345	1020		Yes	Yes	OK
1435	Calibration	Lowestoft	1	JTC 1_A-Out	0	Jan-15	MCC	No	1020-6345	1020	6345		Yes	Yes	OK
1436	Calibration	Lowestoft	1	JTC 1_B-In	0	Jan-15	MCC	No	5370-1020	5370	1020		Yes	Yes	OK
1437	Calibration	Lowestoft	1	JTC 1_B-Out	0	Jan-15	MCC	No	1020-5370	1020	5370		Yes	Yes	OK
1438	Calibration	Lowestoft	1	JTC 1_C-In	0	Jan-15	MCC	No	1010-1020	1010	1020		Yes	Yes	OK
1439	Calibration	Lowestoft	1	JTC 1_C-Out	0	Jan-15	MCC	No	1020-1010	1020	1010		Yes	Yes	OK
1440	Calibration	Lowestoft	1	JTC 1_D-In	0	Jan-15	MCC	No	5340-1020	5340	1020		Yes	Yes	OK
1441	Calibration	Lowestoft	1	JTC 1_D-Out	0	Jan-15	MCC	No	1020-5340	1020	5340		Yes	Yes	OK
1442	Validation	Lowestoft	1	JTC 1_E-In	0	Jan-15	MCC	No	10258-1020	10258	1020		Yes	Yes	OK
1443	Validation	Lowestoft	1	JTC 1_E-Out	0	Jan-15	MCC	No	1020-10258	1020	10258		Yes	Yes	OK
1446	Calibration	Lowestoft	2	JTC 2_B-In	0	Jan-15	MCC	No	6341-3000	6341	3000		Yes	Yes	OK
1447	Calibration	Lowestoft	2	JTC 2_B-Out	0	Jan-15	MCC	No	3000-6341	3000	6341		Yes	Yes	OK
1450	Calibration	Lowestoft	2	JTC 2_D-In	0	Jan-15	MCC	No	6340-3000	6340	3000		Yes	Yes	OK
1451	Calibration	Lowestoft	2	JTC 2_D-Out	0	Jan-15	MCC	No	3000-6340	3000	6340		Yes	Yes	OK
1452	Calibration	Lowestoft	2	JTC 2_E-In	0	Jan-15	MCC	No	6337-3000	6337	3000		Yes	Yes	OK
1453	Calibration	Lowestoft	2	JTC 2_E-Out	0	Jan-15	MCC	No	3000-6337	3000	6337		Yes	Yes	OK
1454	Calibration	Lowestoft	2	JTC 2_F-In	0	Jan-15	MCC	No	3010-3000	3010	3000		Yes	Yes	OK
1455	Calibration	Lowestoft	2	JTC 2_F-Out	0	Jan-15	MCC	No	3000-3010	3000	3010		Yes	Yes	OK
1456	Calibration	Lowestoft	3	JTC 3_A-In	0	Jan-15	MCC	No	6306-8050	6306	8050		Yes	Yes	OK
1457	Calibration	Lowestoft	3	JTC 3_A-Out	0	Jan-15	MCC	No	8050-6306	8050	6306		Yes	Yes	OK
1458	Calibration	Lowestoft	3	JTC 3_B-In	0	Jan-15	MCC	No	10222-8050	10222	8050		Yes	Yes	OK
1459	Calibration	Lowestoft	3	JTC 3_B-Out	0	Jan-15	MCC	No	8050-10222	8050	10222		Yes	Yes	OK
1460	Calibration	Lowestoft	3	JTC 3_C-In	0	Jan-15	MCC	No	10216-8050	10216	8050		Yes	Yes	OK
1461	Calibration	Lowestoft	3	JTC 3_C-Out	0	Jan-15	MCC	No	8050-10216	8050	10216		Yes	Yes	OK
1462	Calibration	Lowestoft	3	JTC 3_D-In	0	Jan-15	MCC	No	9420-8050	9420	8050		Yes	Yes	OK
1463	Calibration	Lowestoft	3	JTC 3_D-Out	0	Jan-15	MCC	No	8050-9420	8050	9420		Yes	Yes	OK
1464	Calibration	Lowestoft	4	JTC 4_A-In	0	Jan-15	MCC	No	6280-6270	6280	6270		Yes	Yes	OK
1465	Calibration	Lowestoft	4	JTC 4_A-Out	0	Jan-15	MCC	No	6270-6280	6270	6280		Yes	Yes	OK
1466	Calibration	Lowestoft	4	JTC 4_B-In	0	Jan-15	MCC	No	6260-6270	6260	6270		Yes	Yes	OK
1467	Calibration	Lowestoft	4	JTC 4_B-Out	0	Jan-15	MCC	No	6270-6260	6270	6260		Yes	Yes	OK
1468	Calibration	Lowestoft	4	JTC 4_C-In	0	Jan-15	MCC	No	8070-6270	8070	6270		Yes	Yes	OK
1469	Calibration	Lowestoft	4	JTC 4_C-Out	0	Jan-15	MCC	No	6270-8070	6270	8070		Yes	Yes	OK
1472	Calibration	Lowestoft	5	JTC 5_B-In	0	Jan-15	MCC	No	9470-6230	9470	6230		Yes	Yes	OK
1473	Calibration	Lowestoft	5	JTC 5_B-Out	0	Jan-15	MCC	No	6230-9470	6230	9470		Yes	Yes	OK
1474	Calibration	Lowestoft	5	JTC 5_C-In	0	Jan-15	MCC	No	10234-6230	10234	6230		Yes	Yes	OK
1475	Calibration	Lowestoft	5	JTC 5_C-Out	0	Jan-15	MCC	No	6230-10234	6230	10234		Yes	Yes	OK

ID	Interpeak ALL VEHICLES Observed	Modelled	GEH	GEH Pass?	Flow Pass?	CAR Observed	Modelled	GEH	GEH Pass?	Flow Pass?	LGV Observed	Modelled	GEH	HGV Observed	Modelled	GEH
544	467	533	2.962	Yes	Yes	416.5972	445	1.380	Yes	Yes	25.4375	71	6.543	25.07639	17	1.694
545	447	493	2.117	Yes	Yes	399.6806	412	0.596	Yes	Yes	24.08333	69	6.582	22.90278	12	2.640
548	20	42	3.830	Yes	Yes	17.06219	38	3.947	Yes	Yes	2.662609	4	0.612	0.543158	0	0.823
549	18	49	5.459	No	Yes	14.7698	45	5.597	No	Yes	2.304875	3	0.664	0.470182	0	0.630
550	50	0	10.037	No	Yes	42.40705	0	9.209	No	Yes	6.617755	0	3.638	1.349985	0	1.643
551	52	0	10.183	No	Yes	43.64809	0	9.343	No	Yes	6.811423	0	3.691	1.389493	0	1.667
552	20	59	6.298	No	Yes	16.65373	58	6.756	No	Yes	2.598868	1	1.174	0.530155	0	0.054
553	23	33	1.909	Yes	Yes	18.97628	32	2.542	Yes	Yes	2.961309	0	1.933	0.604091	0	0.386
554	591	695	4.123	Yes	No	497.3071	573	3.291	Yes	Yes	77.60635	96	1.963	15.83126	26	2.215
555	590	706	4.573	Yes	No	496.3217	585	3.825	Yes	Yes	77.45259	97	2.056	15.7999	24	1.850
556	307	343	2.003	Yes	Yes	258.7	270	0.681	Yes	Yes	40.37096	58	2.534	8.235453	16	2.111
557	323	368	2.414	Yes	Yes	272.0812	283	0.680	Yes	Yes	42.45914	64	2.924	8.661429	21	3.185
558	645	543	4.171	Yes	No	542.6219	446	4.337	Yes	Yes	84.67787	74	1.184	17.27382	23	1.201
559	666	573	3.715	Yes	Yes	560.532	473	3.861	Yes	Yes	87.4728	75	1.364	17.84397	25	1.630
560	386	341	2.361	Yes	Yes	325.3016	291	1.945	Yes	Yes	50.76434	45	0.793	10.35564	5	1.951
561	409	449	1.933	Yes	Yes	344.5975	385	2.115	Yes	Yes	53.77553	57	0.472	10.96991	7	1.281
562	491	552	2.651	Yes	Yes	413.4196	446	1.583	Yes	Yes	64.51545	83	2.173	13.16079	22	2.152
563	493	539	2.001	Yes	Yes	415.2006	433	0.859	Yes	Yes	64.79338	77	1.480	13.21749	29	3.348
564	384	474	4.377	Yes	Yes	322.9321	389	3.505	Yes	Yes	50.39458	70	2.472	10.28022	16	1.491
565	406	446	1.924	Yes	Yes	341.7275	351	0.483	Yes	Yes	53.32767	79	3.167	10.87855	16	1.351
566	418	409	0.434	Yes	Yes	351.8603	355	0.184	Yes	Yes	54.90893	42	1.832	11.20112	12	0.139
567	400	361	2.037	Yes	Yes	337.0042	322	0.804	Yes	Yes	52.59058	33	2.940	10.72819	5	2.105
568	133	133	0.016	Yes	Yes	111.7765	112	0.037	Yes	Yes	17.44307	17	0.066	3.55829	4	0.033
569	110	109	0.085	Yes	Yes	92.40931	92	0.068	Yes	Yes	14.42077	14	0.122	2.941756	3	0.125
570	259	247	0.709	Yes	Yes	217.682	218	0.005	Yes	Yes	33.96997	23	2.159	6.929686	7	0.045
571	267	293	1.560	Yes	Yes	224.4924	259	2.216	Yes	Yes	35.03276	26	1.546	7.146488	7	0.078
574	324	193	8.169	No	No	272.6163	167	7.155	No	No	42.54265	22	3.675	8.678464	4	1.731
575	205	325	7.380	No	No	172.6663	263	6.150	No	Yes	26.94512	52	3.975	5.496656	10	1.587
576	467	388	3.788	Yes	Yes	392.7295	315	4.114	Yes	Yes	61.28669	61	0.006	12.50214	12	0.275
577	612	527	3.548	Yes	Yes	515.0209	443	3.286	Yes	Yes	80.37065	67	1.556	16.39517	17	0.149
578	441	444	0.125	Yes	Yes	371.5082	374	0.113	Yes	Yes	57.97503	58	0.058	11.82659	12	0.001
579	475	479	0.161	Yes	Yes	399.9594	404	0.203	Yes	Yes	62.41494	62	0.068	12.7323	13	0.004
580	648	555	3.758	Yes	Yes	545.231	490	2.445	Yes	Yes	85.08503	54	3.741	17.35687	12	1.406
581	447	444	0.167	Yes	Yes	376.3409	373	0.196	Yes	Yes	58.7292	59	0.009	11.98043	12	0.058
582	238	240	0.133	Yes	Yes	200.1029	202	0.146	Yes	Yes	31.22669	31	0.041	6.370071	7	0.085
583	339	341	0.086	Yes	Yes	285.6561	286	0.048	Yes	Yes	44.57661	45	0.038	9.09338	10	0.169
584	146	125	1.836	Yes	Yes	123.1342	97	2.514	Yes	Yes	19.21549	22	0.562	3.919852	6	1.077
585	141	113	2.443	Yes	Yes	118.2956	88	2.945	Yes	Yes	18.4604	20	0.409	3.765819	4	0.314
586	447	528	3.689	Yes	Yes	376.0379	475	4.809	Yes	Yes	58.68191	43	2.150	11.97079	10	0.737
587	551	412	6.334	No	No	464.1443	370	4.592	Yes	Yes	72.43119	32	5.528	14.77556	10	1.498
588	643	795	5.684	No	No	540.9991	662	4.922	Yes	No	84.42464	111	2.721	17.22216	22	1.077
589	652	775	4.593	Yes	No	549.0225	649	4.089	Yes	No	85.67671	106	2.113	17.47757	19	0.444
590	282	283	0.069	Yes	Yes	237.6625	239	0.096	Yes	Yes	37.08799	37	0.024	7.565743	7	0.064
591	276	271	0.279	Yes	Yes	232.3136	228	0.256	Yes	Yes	36.25327	36	0.071	7.395467	7	0.116
592	326	323	0.140	Yes	Yes	274.3052	272	0.151	Yes	Yes	42.8062	43	0.002	8.732227	9	0.015
593	271	271	0.026	Yes	Yes	228.1318	227	0.079	Yes	Yes	35.60069	37	0.188	7.262344	7	0.135
594	447	452	0.250	Yes	Yes	376.0197	374	0.114	Yes	Yes	58.67997	65	0.826	11.97021	13	0.285
595	474	476	0.065	Yes	Yes	399.1246	399	0.023	Yes	Yes	62.28466	66	0.479	12.70572	11	0.576
596	440	430	0.488	Yes	Yes	370.2452	362	0.408	Yes	Yes	57.77795	55	0.307	11.78638	12	0.018
597	393	389	0.185	Yes	Yes	330.9633	327	0.227	Yes	Yes	51.64787	52	0.046	10.53588	11	0.042
598	510	503	0.283	Yes	Yes	428.9913	424	0.241	Yes	Yes	66.94545	67	0.001	13.6565	12	0.384
599	512	501	0.473	Yes	Yes	430.8368	421	0.481	Yes	Yes	67.23345	67	0.086	13.71525	14	0.002
600	88	66	2.544	Yes	Yes	74.05765	55	2.419	Yes	Yes	11.55693	10	0.465	2.35755	1	1.052
601	99	69	3.283	Yes	Yes	83.29506	59	2.837	Yes	Yes	12.99846	9	1.186	2.651614	0	1.742
604	264	278	0.833	Yes	Yes	222.527	229	0.415	Yes	Yes	34.72605	40	0.803	7.083922	10	0.898
605	194	250	3.757	Yes	Yes	163.2735	205	3.059	Yes	Yes	25.47935	38	2.283	5.197647	7	0.646
606	117	186	5.649	No	Yes	98.25087	155	5.025	No	Yes	15.33236	26	2.432	3.127717	5	0.934
607	102	160	5.124	No	Yes	85.45925	133	4.517	Yes	Yes	13.33619	23	2.288	2.720509	4	0.688
608	49	16	5.769	No	Yes	41.44728	13	5.399	No	Yes	6.46798	3	1.588	1.319432	0	1.624
609	71	18	8.086	No	Yes	60.15168	16	7.130	No	Yes	9.386861	1	3.625	1.914868	0	1.518
610	63	1	10.897	No	Yes	52.76143	1	10.116	No	Yes	8.2373	0	3.942	1.680364	0	1.217
611	60	0	10.855	No	Yes	50.54545	0	9.942	No	Yes	7.891333	0	3.973	1.609788	0	1.794
620	355	354	0.039	Yes	Yes	298.6939	298	0.055	Yes	Yes	46.61213	47	0.027	9.508617	10	0.010
621	357	358	0.015	Yes	Yes	300.8053	300	0.045	Yes	Yes	46.94163	47	0.002	9.575832	11	0.341
1434	355	357	0.128	Yes	Yes	306.5572	305	0.075	Yes	Yes	46.11777	46	0.031	2.194092	6	1.926
1435	330	324	0.338	Yes	Yes	276.2512	276	0.042	Yes	Yes	49.37515	44	0.811	4.219408	4	0.058
1436	84	84	0.018	Yes	Yes	70.9361	71	0.003	Yes	Yes	13.201	13	0.067	0.337553	0	0.163
1437	87	86	0.026	Yes	Yes	73.9334	74	0.004	Yes	Yes	12.34379	12	0.107	0.337553	0	0.156
1438	454	453	0.027	Yes	Yes	370.1666	370	0.008	Yes	Yes	64.97633	64	0.094	18.73417	19	0.074
1439	510	510	0.004	Yes	Yes	417.4573	418	0.008	Yes	Yes	70.46246	70	0.089	21.77215	22	0.140
1440	578	577	0.047	Yes	Yes	451.4267	450	0.050	Yes	Yes	105.7794	106	0.005	20.59071	21	0.007
1441	513	512	0.061	Yes	Yes	398.4744	398	0.034	Yes	Yes	93.43562	93	0.057	21.43459	21	0.033
1442	770	803	1.169	Yes	Yes	608.7849	634	1.006	Yes	Yes	122.0664	131	0.790	38.98733	38	0.193
1443	801	842	1.429	Yes	Yes	641.7552	665	0.926	Yes	Yes	126.5238	141	1.284	33.08016	36	0.415
1446	237	233	0.235	Yes	Yes	209.1449	206	0.204	Yes	Yes	23.48749	23	0.170	4.219408	4	0.079
1447	234	234	0.037	Yes	Yes	205.3151	205	0.051	Yes	Yes	26.91632	27	0.035	2.194092	2	0.011
1450	179	178	0.085	Yes	Yes	161.1881	161	0.035	Yes	Yes	16.45838	16	0.124	1.518987	1	0.162
1451	188	188	0.028	Yes	Yes	170.6796	171	0.014	Yes	Yes	15.42974	15	0.118	1.85654	2	0.081
1452	433	433	0.001	Yes	Yes	351.1837	351	0.024	Yes	Yes	65.6621	66	0.043	16.03375	16	0.019
1453	446	447	0.039	Yes	Yes	354.514	355	0.049	Yes	Yes	69.43381	69	0.039	21.94092	22	0.046
1454	661	660	0.058	Yes	Yes	556.4987	555	0.069	Yes	Yes	88.63526	89	0.010	15.86497	16	0.059
1455	668	662	0.238	Yes	Yes	565.6571	560	0.241	Yes	Yes	87.60661	86	0.127	15.02109	16	0.197
1456	275	267	0.520	Yes	Yes	228.6274	220	0.573	Yes	Yes	41.3174	40	0.180	5.232066	6	0.486
1457	315	309	0.310	Yes	Yes	260.2656	255	0.347	Yes	Yes	44.91767	45	0.008	9.62025	10	0.013
1458	257	256	0.080	Yes	Yes	228.6274	229	0.004	Yes	Yes	25.03046	25	0.107	3.713079	3	0.372
1459	227	218	0.544	Yes	Yes	196.1566	192	0.327	Yes	Yes	26.91632	23	0.701	3.544303	3	0.031
1460	426	420	0.329	Yes	Yes	354.181	348	0.332	Yes	Yes	58.633	59	0.019	13.50211	13	0.192
1461	433	428	0.248	Yes	Yes	367.0027	363	0.226	Yes	Yes	57.09002	56	0.085	9.282698	9	0.062
1462	137	135	0.184	Yes	Yes	112.8983	113	0.006	Yes	Yes	22.45884	20	0.454	1.85654	2	0.084
1463	121	121	0.001	Yes	Yes	100.9091	101	0.034	Yes	Yes	18.51568	19	0.103	1.85654	2	0.088
1464	804	825	0.765	Yes	Yes	662.4033	679	0.657	Yes	Yes	115.723	119	0.301	25.48522	27	0.305
1465	814	832	0.633	Yes	Yes	675.0586	692	0.650	Yes	Yes	114.6944	115	0.029	23.96624	25	0.177
1466	586	592	0.231	Yes	Yes	490.7246	497	0.290	Yes	Yes	79.89174	79	0.094	15.6962	16	0.001
1467	610	617	0.273	Yes	Yes	507.2098	512	0.197	Yes	Yes	82.97769	85	0.214	20.08438	20	0.076
1468	241	240	0.053	Yes	Yes	196.1566	195	0.095	Yes	Yes	36.17416	36	0.034	8.438816	9	0.241
1469	207	208	0.120	Yes	Yes	167.0162	168	0.058	Yes	Yes	34.11686	34	0.013	5.569619	7	0.424
1472	376	378	0.087	Yes	Yes	352.0162	354	0.102	Yes	Yes	22.2874	22	0.080	2.025316	2	0.100
1473	383	382	0.060	Yes	Yes	356.0126	355	0.067	Yes	Yes	24.68758	25	0.014	2.025316	2	0.114
1474	571	585	0.567	Yes	Yes	485.8956	494	0.382	Yes	Yes	75.43426	78	0.327	9.789027	12	0.697
1475	587	592	0.230	Yes	Yes	496.5527	499	0.097	Yes	Yes	74.7485	77	0.297	15.35865	16	0.206

Add Single Count | Add Multiple Counts | Export Link Flows | Import Link Flows

ID	Calibration / Validation	Area	Ref	Site Location	Dir	Date	Data Type	Duplicate?	Ref	A-Node	B-Node	Factor	Interpeak	Off Peak	Check
1476	Calibration	Lowestoft	5	JTC 5_D-In	0	Jan-15	MCC	No	10220-6230	10220	6230		Yes	Yes	OK
1477	Calibration	Lowestoft	5	JTC 5_D-Out	0	Jan-15	MCC	No	6230-10220	6230	10220		Yes	Yes	OK
1478	Calibration	Lowestoft	6	JTC 6_A-In	0	Jan-15	MCC	No	9991-6200	9991	6200		Yes	Yes	OK
1479	Calibration	Lowestoft	6	JTC 6_A-Out	0	Jan-15	MCC	No	6200-9991	6200	9991		Yes	Yes	OK
1480	Calibration	Lowestoft	6	JTC 6_B-In	0	Jan-15	MCC	No	6190-6200	6190	6200		Yes	Yes	OK
1481	Calibration	Lowestoft	6	JTC 6_B-Out	0	Jan-15	MCC	No	6200-6190	6200	6190		Yes	Yes	OK
1482	Calibration	Lowestoft	6	JTC 6_C-In	0	Jan-15	MCC	No	6210-6200	6210	6200		Yes	Yes	OK
1483	Calibration	Lowestoft	6	JTC 6_C-Out	0	Jan-15	MCC	No	6200-6210	6200	6210		Yes	Yes	OK
1488	Calibration	Lowestoft	7	JTC 7_C-In	0	Jan-15	MCC	No	7060-7070	7060	7070		Yes	Yes	OK
1489	Calibration	Lowestoft	7	JTC 7_C-Out	0	Jan-15	MCC	No	7070-7060	7070	7060		Yes	Yes	OK
1490	Calibration	Lowestoft	7	JTC 7_D-In	0	Jan-15	MCC	No	6305-7070	6305	7070		Yes	Yes	OK
1491	Calibration	Lowestoft	7	JTC 7_D-Out	0	Jan-15	MCC	No	7070-6305	7070	6305		Yes	Yes	OK
1500	Validation	Lowestoft	9	JTC 9_A-In	0	Jan-15	MCC	No	6260-6250	6260	6250		Yes	Yes	OK
1501	Validation	Lowestoft	9	JTC 9_A-Out	0	Jan-15	MCC	No	6250-6260	6250	6260		Yes	Yes	OK
1502	Calibration	Lowestoft	9	JTC 9_B-In	0	Jan-15	MCC	No	9990-6250	9990	6250		Yes	Yes	OK
1503	Calibration	Lowestoft	9	JTC 9_B-Out	0	Jan-15	MCC	No	6250-9990	6250	9990		Yes	Yes	OK
1504	Calibration	Lowestoft	9	JTC 9_C-In	0	Jan-15	MCC	No	10257-6250	10257	6250		Yes	Yes	OK
1505	Calibration	Lowestoft	9	JTC 9_C-Out	0	Jan-15	MCC	No	6250-10257	6250	10257		Yes	Yes	OK
1506	Calibration	Lowestoft	9	JTC 9_D-In	0	Jan-15	MCC	No	7090-6250	7090	6250		Yes	Yes	OK
1507	Calibration	Lowestoft	9	JTC 9_D-Out	0	Jan-15	MCC	No	6250-7090	6250	7090		Yes	Yes	OK
1615	Calibration	Lowestoft	C103	Oulton Road	EB	Jan-16	ATC	No	7070-9310	7070	9310		Yes	Yes	OK
1616	Calibration	Lowestoft	C103	Oulton Road	WB	Jan-16	ATC	No	9310-7070	9310	7070		Yes	Yes	OK
1617	Calibration	Lowestoft	C105	Long Road	SB	Jan-16	ATC	No	5180-3010	5180	3010		Yes	Yes	OK
1618	Calibration	Lowestoft	C105	Long Road	NB	Jan-16	ATC	No	3010-5180	3010	5180		Yes	Yes	OK
1619	Calibration	Lowestoft	C106	Victoria Road	EB	Jan-16	ATC	No	9617-4020	9617	4020		Yes	Yes	OK
1620	Calibration	Lowestoft	C106	Victoria Road	WB	Jan-16	ATC	No	4020-9617	4020	9617		Yes	Yes	OK
1623	Calibration	Lowestoft	C108	Crestview Drive	SB	Jan-16	ATC	No	10228-9300	10228	9300		Yes	Yes	OK
1624	Calibration	Lowestoft	C108	Crestview Drive	NB	Jan-16	ATC	No	9300-10228	9300	10228		Yes	Yes	OK
1625	Calibration	Lowestoft	C109	Millenium Way	SB	Jan-16	ATC	No	7090-7080	7090	7080		Yes	Yes	OK
1626	Calibration	Lowestoft	C109	Millenium Way	NB	Jan-16	ATC	No	7080-7090	7080	7090		Yes	Yes	OK
1627	Calibration	Lowestoft	C110	St.Peters Street	EB	Jan-16	ATC	No	10171-9170	10171	9170		Yes	Yes	OK
1628	Calibration	Lowestoft	C110	St.Peters Street	WB	Jan-16	ATC	No	9170-10171	9170	10171		Yes	Yes	OK
1629	Calibration	Lowestoft	C111	Cotmer Road Oulton Broad	SB	Jan-16	ATC	No	2030-3040	2030	3040		Yes	Yes	OK
1630	Calibration	Lowestoft	C111	Cotmer Road Oulton Broad	NB	Jan-16	ATC	No	3040-2030	3040	2030		Yes	Yes	OK
1631	Calibration	Lowestoft	C112	Ashburnham Way Carlton Colville	EB	Jan-16	ATC	No	5105-6355	5105	6355		Yes	Yes	OK
1632	Calibration	Lowestoft	C112	Ashburnham Way Carlton Colville	WB	Jan-16	ATC	No	6355-5105	6355	5105		Yes	Yes	OK
1633	Validation	Lowestoft	C113	Lowestoft Road Carlton Colville	EB	Jan-16	ATC	No	6335-9604	6335	9604		Yes	Yes	OK
1634	Validation	Lowestoft	C113	Lowestoft Road Carlton Colville	WB	Jan-16	ATC	No	9604-6335	9604	6335		Yes	Yes	OK
1635	Calibration	Lowestoft	C116	Tom Crisp Way	SB	Jan-16	ATC	No	6315-6413	6315	6413		Yes	Yes	OK
1636	Calibration	Lowestoft	C116	Tom Crisp Way	NB	Jan-16	ATC	No	6413-6315	6413	6315		Yes	Yes	OK
1679	Calibration	Lowestoft	M043	Kessingland Bypass	SB	Jan-16	ATC	No	4501-4502	4501	4502		Yes	Yes	OK
1680	Calibration	Lowestoft	M043	Kessingland Bypass	NB	Jan-16	ATC	No	4502-4501	4502	4501		Yes	Yes	OK
1723	Validation	Lowestoft	Y159	London Road Pakefield	SB	Jan-16	ATC	No	1025-6345	1025	6345		Yes	Yes	OK
1724	Validation	Lowestoft	Y159	London Road Pakefield	NB	Jan-16	ATC	No	6345-1025	6345	1025		Yes	Yes	OK
1757	Calibration	Lowestoft	9	JTC 9_E-In	EB	Jan-15	MCC	No	8070-6250	8070	6250		Yes	Yes	OK
1758	Calibration	Lowestoft	9	JTC 9_E-Out	WB	Jan-15	MCC	No	6250-8070	6250	8070		Yes	Yes	OK
1769	Validation	Lowestoft	1	0	NB	Jan-16	MCC	No	2070-7000	2070	7000		Yes	Yes	OK
1770	Validation	Lowestoft	1	0	SB	Jan-16	MCC	No	7000-2070	7000	2070		Yes	Yes	OK
1771	Calibration	Lowestoft	3	0	NB	Jan-16	MCC	No	9220-4612	9220	4612		Yes	Yes	OK
1772	Calibration	Lowestoft	3	0	SB	Jan-16	MCC	No	4612-9220	4612	9220		Yes	Yes	OK
1773	Calibration	Lowestoft	3	0	NE	Jan-16	MCC	No	9220-9230	9220	9230		Yes	Yes	OK
1774	Calibration	Lowestoft	3	0	SW	Jan-16	MCC	No	9230-9220	9230	9220		Yes	Yes	OK
1777	Calibration	Lowestoft	3	0	SB	Jan-16	MCC	No	9220-4603	9220	4603		Yes	Yes	OK
1778	Calibration	Lowestoft	3	0	NB	Jan-16	MCC	No	4603-9220	4603	9220		Yes	Yes	OK
1779	Calibration	Lowestoft	3	0	WB	Jan-16	MCC	No	9220-10190	9220	10190		Yes	Yes	OK
1780	Calibration	Lowestoft	3	0	EB	Jan-16	MCC	No	10190-9220	10190	9220		Yes	Yes	OK
1781	Calibration	Lowestoft	4	0	NB	Jan-16	MCC	No	9120-10185	9120	10185		Yes	Yes	OK
1782	Calibration	Lowestoft	4	0	SB	Jan-16	MCC	No	10185-9120	10185	9120		Yes	Yes	OK
1783	Calibration	Lowestoft	4	0	EB	Jan-16	MCC	No	9120-7200	9120	7200		Yes	Yes	OK
1784	Calibration	Lowestoft	4	0	WB	Jan-16	MCC	No	7200-9120	7200	9120		Yes	Yes	OK
1787	Validation	Lowestoft	5	0	NB	Jan-16	MCC	No	1260-6322	1260	6322		Yes	Yes	OK
1788	Validation	Lowestoft	5	0	SB	Jan-16	MCC	No	6322-1260	6322	1260		Yes	Yes	OK
1791	Calibration	Lowestoft	6	0	EB	Jan-16	MCC	No	6315-4000	6315	4000		Yes	Yes	OK
1792	Calibration	Lowestoft	6	0	WB	Jan-16	MCC	No	4000-6315	4000	6315		Yes	Yes	OK
1793	Calibration	Lowestoft	6	0	SE	Jan-16	MCC	No	6315-6382	6315	6382		Yes	Yes	OK
1794	Calibration	Lowestoft	6	0	NW	Jan-16	MCC	No	6382-6315	6382	6315		Yes	Yes	OK
1797	Calibration	Lowestoft	6	0	WB	Jan-16	MCC	No	6315-4010	6315	4010		Yes	Yes	OK
1798	Calibration	Lowestoft	6	0	EB	Jan-16	MCC	No	4010-6315	4010	6315		Yes	Yes	OK
1801	Calibration	Lowestoft	7	0	SB	Jan-16	MCC	No	4613-4614	4613	4614		Yes	Yes	OK
1802	Calibration	Lowestoft	7	0	NB	Jan-16	MCC	No	4614-4613	4614	4613		Yes	Yes	OK
1803	Calibration	Lowestoft	7	0	WB	Jan-16	MCC	No	4613-6384	4613	6384		Yes	Yes	OK
1804	Calibration	Lowestoft	7	0	EB	Jan-16	MCC	No	6384-4613	6384	4613		Yes	Yes	OK
2331	Calibration	Lowestoft	Vaveney Drive / Riverside Road / Durban Road - Rivers		pproac	Jul-17	MCC	No	10259-4010	10259	4010		Yes	Yes	OK
2332	Calibration	Lowestoft	Vaveney Drive / Riverside Road / Durban Road - Rivers		Exit	Jul-17	MCC	No	4010-10259	4010	10259		Yes	Yes	OK
2335	Calibration	Lowestoft	Vaveney Drive / Riverside Road / Durban Road - Durbar		pproac	Jul-17	MCC	No	6402-4010	6402	4010		Yes	Yes	OK
2336	Calibration	Lowestoft	Vaveney Drive / Riverside Road / Durban Road - Durbar		Exit	Jul-17	MCC	No	4010-6402	4010	6402		Yes	Yes	OK

	Interpeak																	
	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
1476	181	180	0.103	Yes	Yes	159.3565	158	0.085	Yes	Yes	20.40154	20	0.103	1.181434	1	0.125
1477	207	209	0.142	Yes	Yes	184.8335	187	0.129	Yes	Yes	19.88721	20	0.050	2.531645	3	0.048
1478	123	123	0.024	Yes	Yes	107.5698	108	0.044	Yes	Yes	14.22965	14	0.058	0.843882	1	0.023
1479	119	123	0.312	Yes	Yes	105.4051	108	0.249	Yes	Yes	12.85811	14	0.182	1.181434	1	0.174
1480	611	591	0.830	Yes	Yes	525.1936	506	0.852	Yes	Yes	75.94859	75	0.130	9.789027	10	0.048
1481	625	600	1.038	Yes	Yes	527.1918	503	1.076	Yes	Yes	82.29192	81	0.106	15.86497	16	0.076
1482	541	544	0.145	Yes	Yes	452.4258	454	0.091	Yes	Yes	73.20552	75	0.181	15.35865	15	0.029
1483	530	535	0.243	Yes	Yes	452.5923	458	0.231	Yes	Yes	68.23372	69	0.062	8.945145	9	0.054
1488	419	419	0.024	Yes	Yes	366.1702	364	0.124	Yes	Yes	43.71758	47	0.429	9.113921	9	0.007
1489	342	344	0.080	Yes	Yes	292.7363	294	0.063	Yes	Yes	40.11731	41	0.065	9.282698	9	0.000
1490	103	103	0.000	Yes	Yes	92.41675	92	0.025	Yes	Yes	10.45793	10	0.143	0	1	1.180
1491	131	131	0.031	Yes	Yes	119.559	120	0.006	Yes	Yes	11.48658	11	0.154	0.337553	0	0.150
1500	612	617	0.204	Yes	Yes	507.2098	512	0.197	Yes	Yes	84.34922	85	0.064	20.42193	20	0.001
1501	588	592	0.155	Yes	Yes	492.5563	497	0.207	Yes	Yes	80.23463	79	0.133	15.35865	16	0.087
1502	151	143	0.686	Yes	Yes	132.8803	133	0.053	Yes	Yes	15.60118	9	2.046	2.362868	1	1.509
1503	141	133	0.736	Yes	Yes	123.0558	121	0.203	Yes	Yes	16.28694	10	1.709	2.025316	2	0.118
1504	489	493	0.146	Yes	Yes	411.9622	412	0.014	Yes	Yes	68.23372	69	0.090	9.113921	12	0.857
1505	534	533	0.012	Yes	Yes	445.7651	445	0.025	Yes	Yes	71.14823	71	0.038	16.70886	17	0.139
1506	226	220	0.423	Yes	Yes	193.1593	189	0.305	Yes	Yes	26.40199	24	0.397	6.582276	6	0.041
1507	217	216	0.107	Yes	Yes	184.8335	184	0.054	Yes	Yes	27.43064	27	0.177	5.06329	5	0.034
1615	235	208	1.820	Yes	Yes	183.6932	184	0.042	Yes	Yes	36.02311	21	2.727	15.117	2	4.445
1616	235	200	2.349	Yes	Yes	183.6606	177	0.476	Yes	Yes	36.01672	20	3.065	15.11432	3	3.996
1617	164	81	7.481	No	Yes	128.6113	79	4.911	Yes	Yes	25.22129	3	6.039	10.58404	0	4.489
1618	147	52	9.572	No	Yes	114.8897	49	7.341	No	Yes	22.53043	3	5.509	9.45483	0	4.268
1619	309	291	1.024	Yes	Yes	241.7737	241	0.052	Yes	Yes	47.41296	42	0.879	19.89672	9	2.925
1620	326	322	0.200	Yes	Yes	254.713	261	0.361	Yes	Yes	49.95043	50	0.054	20.96156	11	2.434
1623	115	108	0.692	Yes	Yes	90.0866	89	0.078	Yes	Yes	17.66641	17	0.223	7.413659	2	2.634
1624	119	114	0.464	Yes	Yes	93.31329	93	0.004	Yes	Yes	18.29918	18	0.068	7.679199	3	2.066
1625	490	431	2.742	Yes	Yes	383.031	371	0.618	Yes	Yes	75.1142	51	3.015	31.52146	9	5.104
1626	466	428	1.776	Yes	Yes	364.2249	360	0.240	Yes	Yes	71.42624	56	1.981	29.97382	13	3.717
1627	306	298	0.413	Yes	Yes	239.0684	240	0.047	Yes	Yes	46.88246	47	0.005	19.67409	12	2.005
1628	274	264	0.626	Yes	Yes	214.2979	211	0.197	Yes	Yes	42.02484	42	0.004	17.6356	10	1.989
1629	552	535	0.748	Yes	Yes	431.8551	431	0.050	Yes	Yes	84.68883	85	0.010	35.53943	19	3.153
1630	423	389	1.684	Yes	Yes	330.9477	304	1.516	Yes	Yes	64.90041	69	0.460	27.23527	17	2.285
1631	236	193	2.946	Yes	Yes	184.3777	184	0.025	Yes	Yes	36.15734	9	5.839	15.17333	0	5.509
1632	254	183	4.847	Yes	Yes	199.077	168	2.269	Yes	Yes	39.03995	14	4.745	16.38301	0	5.724
1633	205	114	7.240	No	Yes	160.4545	105	4.839	Yes	Yes	31.4659	8	5.204	13.20457	1	4.733
1634	197	102	7.736	No	Yes	154.2293	95	5.303	No	Yes	30.2451	6	5.689	12.69227	1	4.240
1635	588	575	0.542	Yes	Yes	459.7871	467	0.358	Yes	Yes	90.16644	80	1.154	37.83809	28	1.770
1636	544	531	0.575	Yes	Yes	425.7276	424	0.106	Yes	Yes	83.48721	84	0.031	35.03517	24	2.110
1679	464	461	0.122	Yes	Yes	361.7409	363	0.079	Yes	Yes	72.6799	73	0.018	29.6209	25	0.819
1680	469	461	0.384	Yes	Yes	365.736	365	0.025	Yes	Yes	73.4826	73	0.046	29.94804	23	1.445
1723	372	322	2.688	Yes	Yes	290.6955	269	1.271	Yes	Yes	57.00677	46	1.526	23.92273	6	4.597
1724	351	287	3.573	Yes	Yes	274.7576	242	2.066	Yes	Yes	53.88127	42	1.773	22.61112	4	5.027
1757	75	75	0.002	Yes	Yes	62.27723	61	0.100	Yes	Yes	11.31514	11	0.201	1.181434	3	1.039
1758	73	73	0.035	Yes	Yes	61.27813	60	0.177	Yes	Yes	10.80081	11	0.063	0.506329	2	1.318
1769	947	1187	7.352	No	No	810.5	1000	6.293	No	No	99.83333	155	4.891	36.5	32	0.755
1770	964	1063	3.120	Yes	Yes	824.3333	892	2.321	Yes	Yes	99.16667	145	4.119	40.16667	26	2.458
1771	73	75	0.331	Yes	Yes	50.83333	51	0.005	Yes	Yes	17	17	0.065	4.666667	7	1.043
1772	79	79	0.042	Yes	Yes	58.33333	58	0.025	Yes	Yes	16.33333	16	0.151	4.333333	6	0.528
1773	356	356	0.007	Yes	Yes	339.5	339	0.025	Yes	Yes	15.16667	15	0.016	1.666667	2	0.200
1774	356	357	0.066	Yes	Yes	338.8333	340	0.056	Yes	Yes	15	15	0.067	2	2	0.311
1777	93	94	0.120	Yes	Yes	77.66667	78	0.013	Yes	Yes	12.66667	13	0.148	2.5	3	0.312
1778	94	94	0.044	Yes	Yes	80.66667	81	0.059	Yes	Yes	11.33333	11	0.157	1.833333	2	0.293
1779	532	528	0.154	Yes	Yes	477.6667	475	0.111	Yes	Yes	44.33333	43	0.152	9.666667	10	0.037
1780	413	412	0.034	Yes	Yes	370	370	0.018	Yes	Yes	33.16667	32	0.132	9.833333	10	0.090
1781	148	146	0.168	Yes	Yes	118.6667	120	0.078	Yes	Yes	18.5	18	0.108	10.66667	8	0.788
1782	158	157	0.085	Yes	Yes	133.1667	133	0.034	Yes	Yes	20.66667	20	0.155	4.333333	4	0.009
1783	234	236	0.144	Yes	Yes	207	209	0.142	Yes	Yes	22	22	0.017	5.166667	5	0.032
1784	337	336	0.073	Yes	Yes	290	289	0.031	Yes	Yes	34.83333	35	0.089	12.33333	11	0.392
1787	911	849	2.077	Yes	Yes	781.8333	724	2.105	Yes	Yes	97.5	104	0.647	31.16667	21	2.023
1788	1049	1125	2.284	Yes	Yes	903.8333	939	1.160	Yes	Yes	108.5	150	3.612	37	36	0.158
1791	749	774	0.919	Yes	Yes	645.6667	652	0.243	Yes	Yes	76.33333	95	2.005	26.5	27	0.123
1792	829	848	0.653	Yes	Yes	716	723	0.249	Yes	Yes	80.33333	92	1.219	32.66667	34	0.158
1793	20	23	0.658	Yes	Yes	17.33333	21	0.779	Yes	Yes	2.5	2	0.333	0.5	1	0.237
1794	23	23	0.005	Yes	Yes	18.33333	18	0.097	Yes	Yes	3.666667	4	0.170	0.833333	1	0.062
1797	359	365	0.318	Yes	Yes	320.1667	325	0.285	Yes	Yes	29.66667	30	0.081	9	9	0.160
1798	333	335	0.142	Yes	Yes	298	301	0.181	Yes	Yes	26.66667	27	0.099	8	7	0.387
1801	14	14	0.027	Yes	Yes	12.5	12	0.126	Yes	Yes	1.166667	1	0.248	0.166667	0	0.125
1802	10	13	0.832	Yes	Yes	8.833333	9	0.052	Yes	Yes	1.166667	2	0.960	0	1	1.650
1803	287	288	0.054	Yes	Yes	254.6667	256	0.070	Yes	Yes	25.33333	25	0.040	7.166667	7	0.002
1804	244	244	0.040	Yes	Yes	218.3333	218	0.046	Yes	Yes	20.16667	20	0.001	5.666667	6	0.021
2331	82	82	0.018	Yes	Yes	73	73	0.011	Yes	Yes	9	9	0.087	0	0	0.000
2332	69	70	0.141	Yes	Yes	60	60	0.033	Yes	Yes	8	8	0.082	1	2	0.955
2335	38	38	0.105	Yes	Yes	36	36	0.097	Yes	Yes	3	2	0.844	0	0	0.295
2336	35	34	0.285	Yes	Yes	32	32	0.089	Yes	Yes	4	2	1.373	0	0	0.437

Add Single Count | Add Multiple Counts | Export Link Flows | Import Link Flows

ID	Calibration / Validation	Area	Ref	Site Location	Dir	Date	Data Type	Duplicate?	Ref	A-Node	B-Node	Factor	AM Peak	PM Peak	Off Peak	Check	PM Peak – ALL VEHICLES Observed	Modelled	GEH	GEH Pass?	Flow Pass?	CAR Observed	Modelled	GEH	GEH Pass?	Flow Pass?	LGV Observed	Modelled	GEH	HGV Observed	Modelled	GEH
544	Calibration	Lowestoft	0	ite 6339/1 on link A12 southbound between B1375	SB	Jan-16	TRADS	No	10257-6230	10257	6230		Yes	Yes	Yes	OK	668	752	3.159	Yes	Yes	627.6667	664	1.424	Yes	Yes	25.45833	82	7.762	14.54167	6	2.855
545	Calibration	Lowestoft	0	ite 6339/2 on link A12 northbound between A1117	NB	Jan-16	TRADS	No	6230-10257	6230	10257		Yes	Yes	Yes	OK	564	627	2.567	Yes	Yes	532.1667	569	1.555	Yes	Yes	16.58333	53	6.199	15.20833	5	3.320
548	Calibration	Lowestoft	1	Mutfordwood Lane	EB	Jan-15	ATC	No	4567-5070	4567	5070		Yes	Yes	Yes	OK	29	47	2.838	Yes	Yes	25.8394	44	3.011	Yes	Yes	3.075929	3	0.078	0.170793	0	0.500
549	Calibration	Lowestoft	1	Mutfordwood Lane	WB	Jan-15	ATC	No	5070-4567	5070	4567		Yes	Yes	Yes	OK	21	52	5.082	No	Yes	18.71781	45	4.712	Yes	Yes	2.228173	6	1.983	0.123721	0	0.497
550	Calibration	Lowestoft	2	Rushmere Road	EB	Jan-15	ATC	No	4566-5000	4566	5000		Yes	Yes	Yes	OK	77	0	12.431	No	Yes	68.6556	0	11.718	No	Yes	8.17278	0	4.043	0.453799	0	0.939
551	Calibration	Lowestoft	2	Rushmere Road	WB	Jan-15	ATC	No	5000-4566	5000	4566		Yes	Yes	Yes	OK	41	0	9.011	No	Yes	36.06487	0	8.493	No	Yes	4.293171	0	2.930	0.238381	0	0.690
552	Calibration	Lowestoft	3	Gisleham Road	NB	Jan-15	ATC	No	9600-5010	9600	5010		Yes	Yes	Yes	OK	42	56	1.938	Yes	Yes	37.29277	55	2.548	Yes	Yes	4.439341	1	2.134	0.246497	0	0.666
553	Calibration	Lowestoft	3	Gisleham Road	SB	Jan-15	ATC	No	5010-9600	5010	9600		Yes	Yes	Yes	OK	26	29	0.583	Yes	Yes	23.3521	27	0.794	Yes	Yes	2.779839	1	1.103	0.154352	1	0.926
554	Calibration	Lowestoft	4	A146 Beccles Road	EB	Jan-15	ATC	No	4512-2000	4512	2000		Yes	Yes	Yes	OK	890	1058	5.395	No	No	790.5596	938	5.015	No	No	94.10842	108	1.396	5.225428	12	2.346
555	Calibration	Lowestoft	4	A146 Beccles Road	WB	Jan-15	ATC	No	2000-4512	2000	4512		Yes	Yes	Yes	OK	659	833	6.368	No	No	585.8611	739	5.943	No	No	69.74106	84	1.631	3.872416	11	2.500
556	Validation	Lowestoft	5	A1145 Castleton Avenue	EB	Jan-15	ATC	No	5110-5060	5110	5060		Yes	Yes	Yes	OK	456	495	1.754	Yes	Yes	405.4265	422	0.823	Yes	Yes	48.26207	65	2.265	2.679782	7	2.007
557	Validation	Lowestoft	5	A1145 Castleton Avenue	WB	Jan-15	ATC	No	5060-5110	5060	5110		Yes	Yes	Yes	OK	444	525	3.662	Yes	Yes	394.8386	469	3.581	Yes	Yes	47.00169	48	0.075	2.609798	8	2.427
558	Calibration	Lowestoft	6	A12 London Road	NB	Jan-15	ATC	No	5390-1000	5390	1000		Yes	Yes	Yes	OK	754	641	4.263	Yes	Yes	669.4295	557	4.542	Yes	No	79.68906	76	0.389	4.424785	8	1.359
559	Calibration	Lowestoft	6	A12 London Road	SB	Jan-15	ATC	No	1000-5390	1000	5390		Yes	Yes	Yes	OK	770	621	5.623	No	No	683.6727	542	5.720	No	No	81.38458	69	1.381	4.518929	10	1.983
560	Calibration	Lowestoft	7	London Road South	NEB	Jan-15	ATC	No	9606-1040	9606	1040		Yes	Yes	Yes	OK	517	580	2.718	Yes	Yes	459.0275	520	2.769	Yes	Yes	54.64275	59	0.545	3.034073	1	1.178
561	Calibration	Lowestoft	7	London Road South	SWB	Jan-15	ATC	No	1040-9606	1040	9606		Yes	Yes	Yes	OK	496	587	3.919	Yes	Yes	440.3885	528	3.961	Yes	Yes	52.42396	56	0.504	2.910873	3	0.192
562	Calibration	Lowestoft	8	A12 Tom Crisp Way	NEB	Jan-15	ATC	No	3000-6314	3000	6314		Yes	Yes	Yes	OK	499	550	2.225	Yes	Yes	442.9251	481	1.787	Yes	Yes	52.72592	63	1.315	2.92764	5	1.237
563	Calibration	Lowestoft	8	A12 Tom Crisp Way	SWB	Jan-15	ATC	No	6314-3000	6314	3000		Yes	Yes	Yes	OK	703	825	4.440	Yes	No	624.2421	751	4.834	Yes	No	74.30994	67	0.836	4.126106	7	1.265
564	Calibration	Lowestoft	9	A1117 Elm Tree Road	NB	Jan-15	ATC	No	3030-3040	3030	3040		Yes	Yes	Yes	OK	418	495	3.635	Yes	Yes	371.1263	434	3.138	Yes	Yes	44.17897	58	1.986	2.453064	3	0.304
565	Calibration	Lowestoft	9	A1117 Elm Tree Road	SB	Jan-15	ATC	No	3040-3030	3040	3030		Yes	Yes	Yes	OK	414	469	2.597	Yes	Yes	368.0381	395	1.382	Yes	Yes	43.81135	70	3.482	2.432653	4	0.744
566	Calibration	Lowestoft	10	A146 Beccles Road	NEB	Jan-15	ATC	No	6406-6404	6406	6404		Yes	Yes	Yes	OK	532	446	3.874	Yes	Yes	472.2623	401	3.414	Yes	Yes	56.21823	38	2.619	3.121552	7	1.656
567	Calibration	Lowestoft	10	A146 Beccles Road	SWB	Jan-15	ATC	No	6404-6406	6404	6406		Yes	Yes	Yes	OK	487	336	7.456	No	No	432.8887	291	7.460	No	No	51.53119	43	1.285	2.861301	2	0.329
568	Calibration	Lowestoft	11	Kirkley Run	NWB	Jan-15	ATC	No	6398-5270	6398	5270		Yes	Yes	Yes	OK	218	218	0.028	Yes	Yes	193.2283	193	0.019	Yes	Yes	23.00195	24	0.177	1.277197	1	0.736
569	Calibration	Lowestoft	11	Kirkley Run	SEB	Jan-15	ATC	No	5270-6398	5270	6398		Yes	Yes	Yes	OK	182	179	0.209	Yes	Yes	161.4647	161	0.063	Yes	Yes	19.2208	17	0.442	1.067247	1	0.110
570	Calibration	Lowestoft	12	A146 Waveney Drive	EB	Jan-15	ATC	No	4613-4010	4613	4010		Yes	Yes	Yes	OK	219	213	0.451	Yes	Yes	194.9929	192	0.212	Yes	Yes	23.21201	18	1.111	1.288861	3	0.976
571	Calibration	Lowestoft	12	A146 Waveney Drive	WB	Jan-15	ATC	No	4010-4613	4010	4613		Yes	Yes	Yes	OK	428	415	0.629	Yes	Yes	379.9862	381	0.054	Yes	Yes	45.23366	34	1.844	2.511627	0	2.077
574	Calibration	Lowestoft	15	Katwijk Way	NB	Jan-15	ATC	No	6040-6431	6040	6431		Yes	Yes	Yes	OK	305	183	7.830	No	No	271.1667	170	6.841	No	No	32.27975	12	4.250	1.792353	1	0.596
575	Calibration	Lowestoft	15	Katwijk Way	SB	Jan-15	ATC	No	6431-6040	6431	6040		Yes	Yes	Yes	OK	223	407	10.331	No	No	198.5222	367	10.033	No	No	23.63214	39	2.787	1.312189	0	1.083
576	Calibration	Lowestoft	16	A12 Battery Green Road	NB	Jan-15	ATC	No	6160-6150	6160	6150		Yes	Yes	Yes	OK	454	376	3.806	Yes	Yes	402.9686	328	3.909	Yes	Yes	47.96949	45	0.398	2.663535	3	0.031
577	Calibration	Lowestoft	16	A12 Battery Green Road	SB	Jan-15	ATC	No	6150-6160	6150	6160		Yes	Yes	Yes	OK	905	791	3.919	Yes	Yes	803.9047	722	2.977	Yes	Yes	95.69702	66	3.265	5.313637	3	1.243
578	Calibration	Lowestoft	17	A12 Old Nelson Street	NB	Jan-15	ATC	No	6140-6130	6140	6130		Yes	Yes	Yes	OK	626	624	0.055	Yes	Yes	555.8622	554	0.091	Yes	Yes	66.16998	67	0.113	3.674129	4	0.083
579	Calibration	Lowestoft	17	A12 Old Nelson Street	SB	Jan-15	ATC	No	6130-6140	6130	6140		Yes	Yes	Yes	OK	573	585	0.512	Yes	Yes	508.9889	520	0.482	Yes	Yes	60.59017	62	0.164	3.364307	3	0.059
580	Calibration	Lowestoft	18	St Peter's Street	EB	Jan-15	ATC	No	6070-6075	6070	6075		Yes	Yes	Yes	OK	620	500	5.068	No	No	550.6786	464	3.858	Yes	Yes	65.55292	33	4.689	3.639867	3	0.086
581	Calibration	Lowestoft	18	St Peter's Street	WB	Jan-15	ATC	No	6075-6070	6075	6070		Yes	Yes	Yes	OK	506	503	0.141	Yes	Yes	449.6528	449	0.054	Yes	Yes	53.52679	54	0.063	2.972108	1	1.876
582	Calibration	Lowestoft	19	Denmark Road	EB	Jan-15	ATC	No	7200-10139	7200	10139		Yes	Yes	Yes	OK	259	257	0.113	Yes	Yes	230.1755	230	0.035	Yes	Yes	27.40015	26	0.206	1.52141	1	0.183
583	Calibration	Lowestoft	19	Denmark Road	WB	Jan-15	ATC	No	10139-7200	10139	7200		Yes	Yes	Yes	OK	403	402	0.039	Yes	Yes	358.0017	357	0.037	Yes	Yes	42.61662	43	0.010	2.366314	2	0.104
584	Calibration	Lowestoft	20	Rotterdam Road	NEB	Jan-15	ATC	No	7210-9130	7210	9130		Yes	Yes	Yes	OK	149	118	2.764	Yes	Yes	132.7893	107	2.361	Yes	Yes	15.80727	11	1.463	0.877709	0	1.121
585	Calibration	Lowestoft	20	Rotterdam Road	SWB	Jan-15	ATC	No	9130-7210	9130	7210		Yes	Yes	Yes	OK	145	124	1.872	Yes	Yes	129.0394	110	1.727	Yes	Yes	15.36089	13	0.685	0.852923	1	0.286
586	Calibration	Lowestoft	21	Peto Way	NB	Jan-15	ATC	No	10190-7060	10190	7060		Yes	Yes	Yes	OK	420	587	7.457	No	No	373.1115	529	7.341	No	No	44.41529	58	1.841	2.466186	1	1.351
587	Calibration	Lowestoft	21	Peto Way	SB	Jan-15	ATC	No	7060-10190	7060	10190		Yes	Yes	Yes	OK	605	398	9.242	No	No	537.1129	362	8.256	No	No	63.93806	31	4.852	3.5502	5	0.732
588	Calibration	Lowestoft	22	A1117 Normanston Drive	NEB	Jan-15	ATC	No	7050-7060	7050	7060		Yes	Yes	Yes	OK	604	697	3.665	Yes	Yes	536.2747	623	3.589	Yes	Yes	63.83828	68	0.519	3.54466	6	1.287
589	Calibration	Lowestoft	22	A1117 Normanston Drive	SWB	Jan-15	ATC	No	7060-7050	7060	7050		Yes	Yes	Yes	OK	644	843	7.309	No	No	572.0969	749	6.865	No	No	68.10257	91	2.586	3.781437	4	0.081
590	Calibration	Lowestoft	23	A1144 Normanston Drive	EB	Jan-15	ATC	No	9240-9130	9240	9130		Yes	Yes	Yes	OK	236	234	0.162	Yes	Yes	209.9924	208	0.141	Yes	Yes	24.99755	24	0.238	1.388004	2	0.545
591	Calibration	Lowestoft	23	A1144 Normanston Drive	WB	Jan-15	ATC	No	9130-9240	9130	9240		Yes	Yes	Yes	OK	320	320	0.018	Yes	Yes	284.5485	284	0.004	Yes	Yes	33.87273	34	0.006	1.880804	2	0.223
592	Calibration	Lowestoft	24	Oulton Road	EB	Jan-15	ATC	No	9270-6309	9270	6309		Yes	Yes	Yes	OK	368	381	0.698	Yes	Yes	326.8999	338	0.628	Yes	Yes	38.91425	41	0.294	2.160738	2	0.130
593	Calibration	Lowestoft	24	Oulton Road	WB	Jan-15	ATC	No	6309-9270	6309	9270		Yes	Yes	Yes	OK	351	346	0.234	Yes	Yes	311.5696	307	0.256	Yes	Yes	37.08932	37	0.002	2.059408	2	0.085
594	Calibration	Lowestoft	25	B1375 Gorleston Road	NB	Jan-15	ATC	No	8030-8040	8030	8040		Yes	Yes	Yes	OK	539	512	1.190	Yes	Yes	478.9743	441	1.787	Yes	Yes	57.01722	68	1.329	3.165916	4	0.300
595	Calibration	Lowestoft	25	B1375 Gorleston Road	SB	Jan-15	ATC	No	8040-8030	8040	8030		Yes	Yes	Yes	OK	697	666	1.191	Yes	Yes	619.3893	560	2.457	Yes	Yes	73.73227	101	2.913	4.09403	5	0.609
596	Calibration	Lowestoft	26	A1117 Millennium Way	NB	Jan-15	ATC	No	7070-7080	7070	7080		Yes	Yes	Yes	OK	541	451	4.049	Yes	Yes	480.9752	393	4.195	Yes	Yes	57.25541	55	0.316	3.179142	3	0.077
597	Calibration	Lowestoft	26	A1117 Millennium Way	SB	Jan-15	ATC	No	7080-7070	7080	7070		Yes	Yes	Yes	OK	507	477	1.328	Yes	Yes	450.2043	425	1.223	Yes	Yes	53.59243	50	0.516	2.975753	3	0.106
598	Calibration	Lowestoft	27	A12 Yarmouth Road	NWB	Jan-15	ATC	No	0242-1024	10242	10248		Yes	Yes	Yes	OK	697	695	0.083	Yes	Yes	619.1688	620	0.014	Yes	Yes	73.70601	74	0.023	4.092572	2	1.357
599	Calibration	Lowestoft	27	A12 Yarmouth Road	SEB	Jan-15	ATC	No	0248-1024	10248	10242		Yes	Yes	Yes	OK	597	616	0.779	Yes	Yes	530.2749	546	0.686	Yes	Yes	63.12406	66	0.320	3.505003	4	0.356
600	Validation	Lowestoft	28	B1385 Corton Road	NB	Jan-15	ATC	No	9460-9480	9460	9480		Yes	Yes	Yes	OK	103	85	1.880	Yes	Yes	91.5408	76	1.664	Yes	Yes	10.89704	9	0.763	0.605065	0	1.100
601	Validation	Lowestoft	28	B1385 Corton Road	SB	Jan-15	ATC	No	9480-9460	9480	9460		Yes	Yes	Yes	OK	92	84	0.828	Yes	Yes	81.94556	76	0.685	Yes	Yes	9.754821	9	0.385	0.541642	0	1.004
604	Validation	Lowestoft	30	B1375 Parkhill	NB	Jan-15	ATC	No	6300-8070	6300	8070		Yes	Yes	Yes	OK	312	310	0.148	Yes	Yes	277.49	261	0.989	Yes	Yes	33.03247	45	1.981	1.834149	3	0.774
605	Validation	Lowestoft	30	B1375 Parkhill	SB	Jan-15	ATC	No	8070-6300	8070	6300		Yes	Yes	Yes	OK	482	587	4.558	Yes	No	427.9257	518	4.140	Yes	Yes	50.94038	65	1.785	2.828496	5	0.923
606	Calibration	Lowestoft	31	B1074 Bluderston Road	NB	Jan-15	ATC	No	6324-9440	6324	9440		Yes	Yes	Yes	OK	217	215	0.144	Yes	Yes	193.118	179	1.012	Yes	Yes	22.98882	34	2.100	1.276468	2	0.377
607	Calibration	Lowestoft	31	B1074 Bluderston Road	SB	Jan-15	ATC	No	9440-6324	9440	6324		Yes	Yes	Yes	OK	142	181	3.098	Yes	Yes	125.7307	158	2.736	Yes	Yes	14.96702	21	1.420	0.831053	2	0.644
608	Calibration	Lowestoft	32	Fixton Road	NB	Jan-15	ATC	No	4563-5656	4563	5656		Yes	Yes	Yes	OK	56	18	6.267	No	Yes	49.40998	16	5.948	No	Yes	5.881776	2	1.856	0.326589	0	0.808
609	Calibration	Lowestoft	32	Fixton Road	SB	Jan-15	ATC	No	5656-4563	5656	4563		Yes	Yes	Yes	OK	75	45	3.916	Yes	Yes	67.0564	40	3.734	Yes	Yes	7.98241	5	1.037	0.443228	0	0.942
610	Calibration	Lowestoft	33	Coast Road	NB	Jan-15	ATC	No	9510-6326	9510	6326		Yes	Yes	Yes	OK	51	27	3.922	Yes	Yes	45.62716	27	3.144	Yes	Yes	5.396004	0	3.204	0.299616	0	0.774
611	Calibration	Lowestoft	33	Coast Road	SB	Jan-15	ATC	No	6326-9510	6326	9510		Yes	Yes	Yes	OK	68	1	11.508	No	Yes	60.83621	1	10.831	No	Yes	7.194673	0	3.785	0.399489	0	0.894
620	Calibration	Lowestoft	29	Asda Car Park	Entry	Jan-15	ANPR	No	4000-6381	4000	6381		Yes	Yes	Yes	OK	305	305	0.019	Yes	Yes	270.8725	271	0.028	Yes	Yes	32.24474	32	0.015	1.790409	2	0.039
621	Calibration	Lowestoft	29	Asda Car Park	Exit	Jan-15	ANPR	No	6381-4000	6381	4000		Yes	Yes	Yes	OK	334	334	0.041	Yes	Yes	296.4599	296	0.032	Yes	Yes	35.29066	35	0.078	1.959536	4	1.043
1434	Calibration	Lowestoft	1	JTC 1_A-In	0	Jan-15	MCC	No	6345-1020	6345	1020		Yes	Yes	Yes	OK	355	356	0.056	Yes	Yes	320.436	321	0.023	Yes	Yes	32.91677	33	0.089	2.025316	2	0.091
1435	Calibration	Lowestoft	1	JTC 1_A-Out	0	Jan-15	MCC	No	1020-6345	1020	6345		Yes	Yes	Yes	OK	526	513	0.551	Yes	Yes	462.852	460	0.149	Yes	Yes	60.69029	51	1.272	2.025316	2	0.105
1436	Calibration	Lowestoft	1	JTC 1_B-In	0	Jan-15	MCC	No	5370-1020	5370	1020		Yes	Yes	Yes	OK	119	119	0.007	Yes	Yes	113.735	114	0.022	Yes	Yes	5.143245	5	0.073	0	0	0.000
1437	Calibration	Lowestoft	1	JTC 1_B-Out	0	Jan-15	MCC	No	1020-5370	1020	5370		Yes	Yes	Yes	OK	133	133	0.001	Yes	Yes	124.614	125	0.023	Yes	Yes	8.229192	8	0.084	0	0	0.000
1438	Calibration	Lowestoft	1	JTC 1_C-In	0	Jan-15	MCC	No	1010-1020	1010	1020		Yes	Yes	Yes	OK	565	606	1.696	Yes	Yes	460.874	501	1.826	Yes	Yes	101.8363	100	0.203	2.025316	5	1.611
1439	Calibration	Lowestoft	1	JTC 1_C-Out	0	Jan-15	MCC	No	1020-1010	1020	1010		Yes	Yes	Yes	OK	605	613	0.317	Yes	Yes	514.28	518	0.156	Yes	Yes	84.34922	85	0.056	6.075947	10	1.334
1440	Calibration	Lowestoft	1	JTC 1_D-In	0	Jan-15	MCC	No	5340-1020	5340	1020		Yes	Yes	Yes	OK	611	612	0.009	Yes	Yes	552.851	553	0.004	Yes	Yes	55.54705	56	0.042	3.037974	3	0.003
1441	Calibration	Lowestoft	1	JTC 1_D-Out	0	Jan-15	MCC	No	1020-5340	1020	5340		Yes	Yes	Yes	OK	327	327	0.011	Yes	Yes	294.722	295	0.007	Yes	Yes	27.77352	28	0.039	4.050632	4	0.071
1442	Validation	Lowestoft	1	JTC 1_E-In	0	Jan-15	MCC	No	10258-1020	10258	1020		Yes	Yes	Yes	OK	720	749	1.101	Yes	Yes	624.059	646	0.857	Yes	Yes	87.43517	92	0.483	8.101263	12	1.163
1443	Validation	Lowestoft	1	JTC 1_E-Out	0	Jan-15	MCC	No	1020-10258	1020	10258		Yes	Yes	Yes	OK	780	857	2.681	Yes	Yes	675.487	737	2.308	Yes	Yes	101.8363	114	1.184	3.037974	6	1.434
1446	Calibration	Lowestoft	2	JTC 2_B-In	0	Jan-15	MCC	No	6341-3000	6341	3000		Yes	Yes	Yes	OK	318	315	0.145	Yes	Yes	287.799	286	0.089	Yes	Yes	25.71623	25	0.186	4.050632	4	0.071
1447	Calibration	Lowestoft	2	JTC 2_B-Out	0	Jan-15	MCC	No	3000-6341	3000	6341		Yes	Yes	Yes	OK	314	313	0.030	Yes	Yes	281.865	281	0.030	Yes	Yes	30.85947	31	0.022	1.012658	1	0.148
1450	Calibration	Lowestoft	2	JTC 2_D-In	0	Jan-15	MCC	No	6340-3000	6340	3000		Yes	Yes	Yes	OK	248	235	0.829	Yes	Yes	223.514	224	0.025	Yes	Yes	24.68758	11	3.167	0	0	0.567
1451	Calibration	Lowestoft	2	JTC 2_D-Out	0	Jan-15	MCC	No	3000-6340	3000	6340		Yes	Yes	Yes	OK	414	414	0.007	Yes	Yes	380.765	381	0.011	Yes	Yes	32.91677	33	0.004	0	0	0.295
1452	Calibration	Lowestoft	2	JTC 2_E-In	0	Jan-15	MCC	No	6337-3000	6337	3000		Yes	Yes	Yes	OK	550	553	0.150	Yes	Yes	472.742	475	0.094	Yes	Yes	69.94813	72	0.193	7.088605	7	0.050
1453	Calibration	Lowestoft	2	JTC 2_E-Out	0	Jan-15	MCC	No	3000-6337	3000	6337		Yes	Yes	Yes	OK	658	657	0.029	Yes	Yes	593.4	593	0.030	Yes	Yes	56.5757	56	0.023	8.101263	8	0.059
1454	Calibration	Lowestoft	2	JTC 2_F-In	0	Jan-15	MCC	No	3010-3000	3010	3000		Yes	Yes	Yes	OK	700	697	0.103	Yes	Yes	608.235	605	0.123	Yes	Yes	86.40652	87	0.018	5.06329	5	0.066
1455	Calibration	Lowestoft	2	JTC 2_F-Out	0	Jan-15	MCC	No	3000-3010	3000	3010		Yes	Yes	Yes	OK	802	800	0.077	Yes	Yes	697.245	696	0.036	Yes	Yes	101.8363	101	0.121	3.037974	3	0.003
1456	Calibration	Lowestoft	3	JTC 3_A-In	0	Jan-15	MCC	No	6306-8050	6306	8050		Yes	Yes	Yes	OK	535	583	2.023	Yes	Yes	462.852	510	2.130	Yes	Yes	68.91949	69	0.040	3.037974	4	0.617
1457	Calibration	Lowestoft	3	JTC 3_A-Out	0	Jan-15	MCC	No	8050-6306	8050	6306		Yes	Yes	Yes	OK	336	334	0.109	Yes	Yes	281.865	280	0.102	Yes	Yes	51.43245	51	0.098	3.037974	3	0.228
1458	Calibration	Lowestoft	3	JTC 3_B-In	0	Jan-15	MCC	No	10222-8050	10222	8050		Yes	Yes	Yes	OK	309	273	2.107	Yes	Yes	277.909	257	1.264	Yes	Yes	28.80217	16	2.807	2.025316	0	2.013
1459	Calibration	Lowestoft	3	JTC 3_B-Out	0	Jan-15	MCC	No	8050-10222	8050	10222		Yes	Yes	Yes	OK	292	259	1.978	Yes	Yes	260.107	241	1.213	Yes	Yes	31.88812	18	2.733	0	0	0.295
1460	Calibration	Lowestoft	3	JTC 3_C-In	0	Jan-15	MCC	No	10216-8050	10216	8050		Yes	Yes	Yes	OK	471	469	0.089	Yes	Yes	403.512	403	0.014	Yes	Yes	63.77624	63	0.133	4.050632	3	0.311
1461	Calibration	Lowestoft	3	JTC 3_C-Out	0	Jan-15	MCC	No	8050-10216	8050	10216		Yes	Yes	Yes	OK	695	692	0.137	Yes	Yes	593.4	590	0.121	Yes	Yes	95.66436	96	0.037	6.075947	5	0.440
1462	Calibration	Lowestoft	3	JTC 3_D-In	0	Jan-15	MCC	No	9420-8050	9420	8050		Yes	Yes	Yes	OK	191	143	3.710	Yes	Yes	158.24	110	4.133	Yes	Yes	31.88812	32	0.013	1.012658	1	0.148
1463	Calibration	Lowestoft	3	JTC 3_D-Out	0	Jan-15	MCC	No	8050-9420	8050	9420		Yes	Yes	Yes	OK	183	183	0.030	Yes	Yes	167.141	169	0.149	Yes	Yes	14.40109	14	0.136	1.012658	0	1.423
1464	Calibration	Lowestoft	4	JTC 4_A-In	0	Jan-15	MCC	No	6280-6270	6280	6270		Yes	Yes	Yes	OK	1489	1568	2.001	Yes	Yes	1310.425	1388	2.124	Yes	Yes	170.7557	169	0.122	8.101263	10	0.608
1465	Calibration	Lowestoft	4	JTC 4_A-Out	0	Jan-15	MCC	No	6270-6280	6270	6280		Yes	Yes	Yes	OK	962	981	0.616	Yes	Yes	859.441	877	0.579	Yes	Yes	95.66436	98	0.211	7.088605	7	0.030
1466	Calibration	Lowestoft	4	JTC 4_B-In	0	Jan-15	MCC	No	6260-6270	6260	6270		Yes	Yes	Yes	OK	709	721	0.474	Yes	Yes	644.828	658	0.529	Yes	Yes	58.633	59	0.015	5.06329	4	0.437
1467	Calibration	Lowestoft	4	JTC 4_B-Out	0	Jan-15	MCC	No	6270-6260	6270	6260		Yes	Yes	Yes	OK	1011	1028	0.520	Yes	Yes	893.067	912	0.635	Yes	Yes	113.1514	110	0.323	5.06329	6	0.404
1468	Calibration	Lowestoft	4	JTC 4_C-In	0	Jan-15	MCC	No	8070-6270	8070	6270		Yes	Yes	Yes	OK	260	260	0.030	Yes	Yes	217.58	218	0.039	Yes	Yes	39.08866	39	0.016	3.037974	3	0.003
1469	Calibration	Lowestoft	4	JTC 4_C-Out	0	Jan-15	MCC	No	6270-8070	6270	8070		Yes	Yes	Yes	OK	484	540	2.457	Yes	Yes	420.325	476	2.644	Yes	Yes	59.66164	59	0.031	4.050632	4	0.069
1472	Calibration	Lowestoft	5	JTC 5_B-In	0	Jan-15	MCC	No	9470-6230	9470	6230		Yes	Yes	Yes	OK	494	495	0.084	Yes	Yes	466.808	468	0.071	Yes	Yes	26.74488	27	0.067	0	0	0.000
1473	Calibration	Lowestoft	5	JTC 5_B-Out	0	Jan-15	MCC	No	6230-9470	6230	9470		Yes	Yes	Yes	OK	439	443	0.186	Yes	Yes	407.468	411	0.193	Yes	Yes	31.88812	32	0.000	0	0	0.000
1474	Calibration	Lowestoft	5	JTC 5_C-In	0	Jan-15	MCC	No	10234-6230	10234	6230		Yes	Yes	Yes	OK	739	750	0.415	Yes	Yes	665.597	676	0.412	Yes	Yes	69.94813	69	0.114	3.037974	5	0.811
1475	Calibration	Lowestoft	5	JTC 5_C-Out	0	Jan-15	MCC	No	6230-10234	6230	10234		Yes	Yes	Yes	OK	826	870	1.519	Yes	Yes	737.794	776	1.375	Yes	Yes	83.32057	89	0.647	5.06329	5	0.173

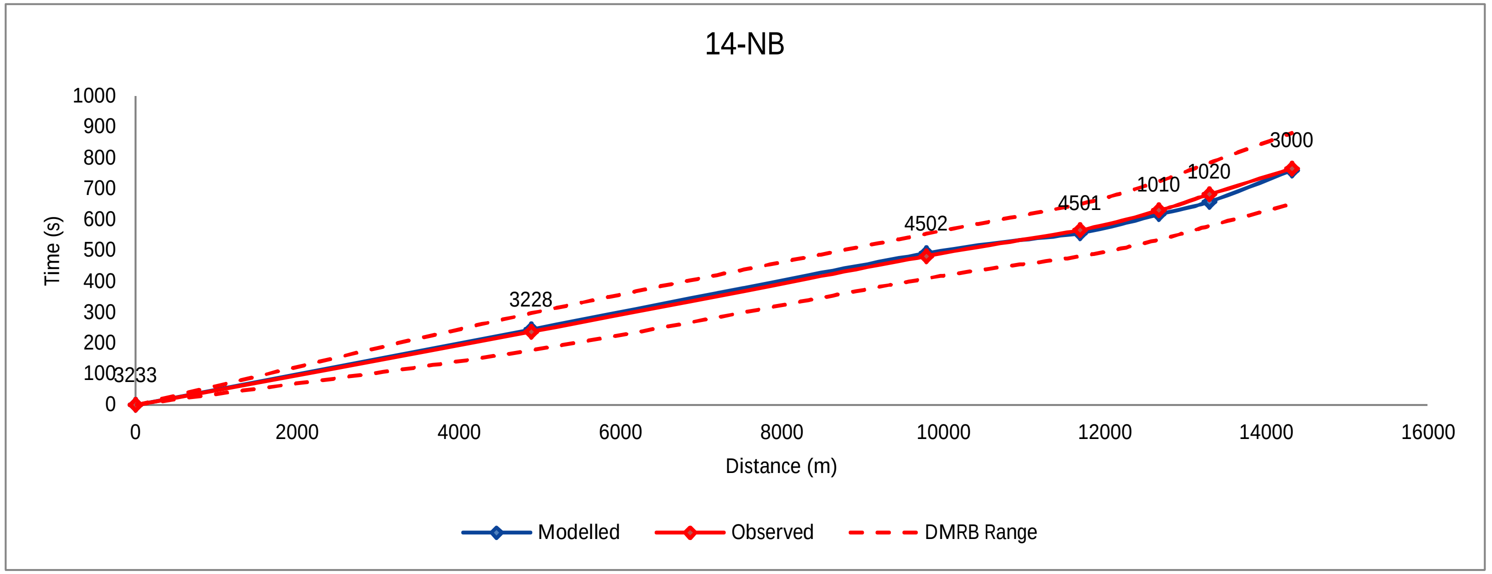
Add Single Count | Add Multiple Counts | Export Link Flows | Import Link Flows

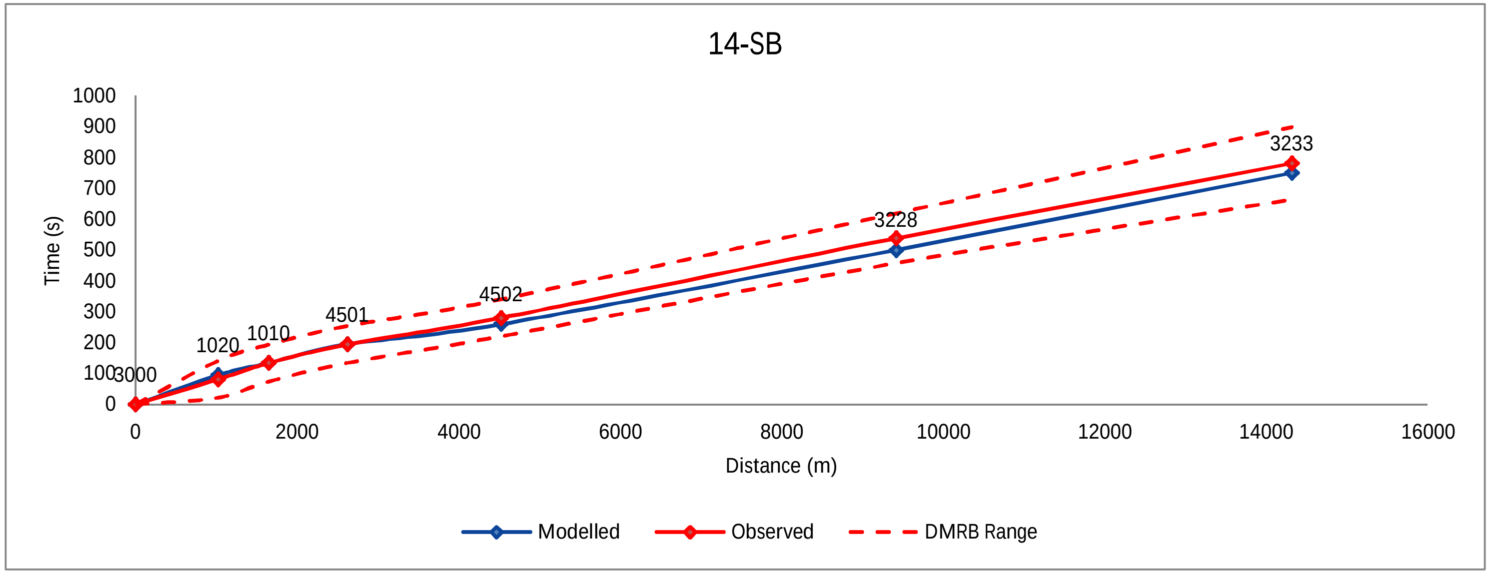
ID	Calibration / Validation	Area	Ref	Site Location	Dir	Date	Data Type	Duplicate?	Ref	A-Node	B-Node	Factor	AM Peak	PM Peak	Off Peak	Check	PM Peak ALL VEHICLES Observed	Modelled	GEH	GEH Pass?	Flow Pass?	CAR Observed	Modelled	GEH	GEH Pass?	Flow Pass?	LGV Observed	Modelled	GEH	HGV Observed	Modelled	GEH
1476	Calibration	Lowestoft	5	JTC 5_D-In	0	Jan-15	MCC	No	10220-6230	10220	6230		Yes	Yes	Yes	OK	184	192	0.559	Yes	Yes	176.042	177	0.076	Yes	Yes	8.229192	15	1.934	0	0	0.447
1477	Calibration	Lowestoft	5	JTC 5_D-Out	0	Jan-15	MCC	No	6230-10220	6230	10220		Yes	Yes	Yes	OK	261	249	0.766	Yes	Yes	236.371	230	0.427	Yes	Yes	24.68758	19	1.233	0	0	0.295
1478	Calibration	Lowestoft	6	JTC 6_A-In	0	Jan-15	MCC	No	9991-6200	9991	6200		Yes	Yes	Yes	OK	96	96	0.041	Yes	Yes	85.054	85	0.012	Yes	Yes	11.31514	11	0.100	0	0	0.295
1479	Calibration	Lowestoft	6	JTC 6_A-Out	0	Jan-15	MCC	No	6200-9991	6200	9991		Yes	Yes	Yes	OK	153	152	0.067	Yes	Yes	139.449	139	0.041	Yes	Yes	13.37244	13	0.094	0	0	0.000
1480	Calibration	Lowestoft	6	JTC 6_B-In	0	Jan-15	MCC	No	6190-6200	6190	6200		Yes	Yes	Yes	OK	869	849	0.673	Yes	Yes	794.167	776	0.654	Yes	Yes	72.00543	72	0.012	3.037974	2	1.008
1481	Calibration	Lowestoft	6	JTC 6_B-Out	0	Jan-15	MCC	No	6200-6190	6200	6190		Yes	Yes	Yes	OK	659	652	0.281	Yes	Yes	573.62	566	0.336	Yes	Yes	80.23463	82	0.187	5.06329	4	0.397
1482	Calibration	Lowestoft	6	JTC 6_C-In	0	Jan-15	MCC	No	6210-6200	6210	6200		Yes	Yes	Yes	OK	597	612	0.615	Yes	Yes	518.236	532	0.620	Yes	Yes	74.06273	76	0.209	5.06329	4	0.418
1483	Calibration	Lowestoft	6	JTC 6_C-Out	0	Jan-15	MCC	No	6200-6210	6200	6210		Yes	Yes	Yes	OK	751	754	0.110	Yes	Yes	684.388	689	0.163	Yes	Yes	63.77624	64	0.030	3.037974	2	1.008
1488	Calibration	Lowestoft	7	JTC 7_C-In	0	Jan-15	MCC	No	7060-7070	7060	7070		Yes	Yes	Yes	OK	488	548	2.604	Yes	Yes	442.083	495	2.464	Yes	Yes	42.17461	49	1.005	4.050632	3	0.464
1489	Calibration	Lowestoft	7	JTC 7_C-Out	0	Jan-15	MCC	No	7070-7060	7070	7060		Yes	Yes	Yes	OK	405	445	1.943	Yes	Yes	364.941	398	1.680	Yes	Yes	38.06001	45	1.138	2.025316	2	0.067
1490	Calibration	Lowestoft	7	JTC 7_D-In	0	Jan-15	MCC	No	6305-7070	6305	7070		Yes	Yes	Yes	OK	117	126	0.798	Yes	Yes	104.834	114	0.920	Yes	Yes	12.34379	11	0.280	0	0	0.493
1491	Calibration	Lowestoft	7	JTC 7_D-Out	0	Jan-15	MCC	No	7070-6305	7070	6305		Yes	Yes	Yes	OK	178	178	0.042	Yes	Yes	156.262	156	0.002	Yes	Yes	21.60163	22	0.087	0	0	0.502
1500	Validation	Lowestoft	9	JTC 9_A-In	0	Jan-15	MCC	No	6260-6250	6260	6250		Yes	Yes	Yes	OK	1024	1028	0.112	Yes	Yes	901.968	912	0.338	Yes	Yes	117.266	110	0.706	5.06329	6	0.404
1501	Validation	Lowestoft	9	JTC 9_A-Out	0	Jan-15	MCC	No	6250-6260	6250	6260		Yes	Yes	Yes	OK	713	721	0.291	Yes	Yes	651.751	658	0.257	Yes	Yes	56.5757	59	0.286	5.06329	4	0.437
1502	Calibration	Lowestoft	9	JTC 9_B-In	0	Jan-15	MCC	No	9990-6250	9990	6250		Yes	Yes	Yes	OK	121	117	0.339	Yes	Yes	110.768	111	0.067	Yes	Yes	10.28649	6	1.558	0	0	0.228
1503	Calibration	Lowestoft	9	JTC 9_B-Out	0	Jan-15	MCC	No	6250-9990	6250	9990		Yes	Yes	Yes	OK	156	152	0.301	Yes	Yes	139.449	141	0.128	Yes	Yes	16.45838	11	1.414	0	0	0.000
1504	Calibration	Lowestoft	9	JTC 9_C-In	0	Jan-15	MCC	No	10257-6250	10257	6250		Yes	Yes	Yes	OK	627	627	0.027	Yes	Yes	568.675	569	0.001	Yes	Yes	55.54705	53	0.318	3.037974	5	0.857
1505	Calibration	Lowestoft	9	JTC 9_C-Out	0	Jan-15	MCC	No	6250-10257	6250	10257		Yes	Yes	Yes	OK	746	752	0.203	Yes	Yes	652.74	664	0.433	Yes	Yes	89.49247	82	0.756	4.050632	6	0.665
1506	Calibration	Lowestoft	9	JTC 9_D-In	0	Jan-15	MCC	No	7090-6250	7090	6250		Yes	Yes	Yes	OK	228	228	0.003	Yes	Yes	205.712	206	0.004	Yes	Yes	21.60163	22	0.053	1.012658	1	0.143
1507	Calibration	Lowestoft	9	JTC 9_D-Out	0	Jan-15	MCC	No	6250-7090	6250	7090		Yes	Yes	Yes	OK	375	364	0.586	Yes	Yes	334.282	326	0.434	Yes	Yes	40.11731	36	0.604	1.012658	1	0.334
1615	Calibration	Lowestoft	C103	Oulton Road	EB	Jan-16	ATC	No	7070-9310	7070	9310		Yes	Yes	Yes	OK	314	287	1.555	Yes	Yes	271.6141	270	0.115	Yes	Yes	33.55525	16	3.560	8.330677	1	3.402
1616	Calibration	Lowestoft	C103	Oulton Road	WB	Jan-16	ATC	No	9310-7070	9310	7070		Yes	Yes	Yes	OK	266	210	3.602	Yes	Yes	230.4604	182	3.341	Yes	Yes	28.47113	28	0.098	7.068453	0	3.756
1617	Calibration	Lowestoft	C105	Long Road	SB	Jan-16	ATC	No	5180-3010	5180	3010		Yes	Yes	Yes	OK	184	75	9.615	No	No	159.6328	67	8.673	No	Yes	19.72107	7	3.651	4.896099	1	2.226
1618	Calibration	Lowestoft	C105	Long Road	NB	Jan-16	ATC	No	3010-5180	3010	5180		Yes	Yes	Yes	OK	180	74	9.428	No	No	156.1673	65	8.636	No	Yes	19.29293	9	2.866	4.789807	0	3.024
1619	Calibration	Lowestoft	C106	Victoria Road	EB	Jan-16	ATC	No	9617-4020	9617	4020		Yes	Yes	Yes	OK	316	308	0.451	Yes	Yes	273.78	272	0.111	Yes	Yes	33.82284	32	0.253	8.397109	4	1.895
1620	Calibration	Lowestoft	C106	Victoria Road	WB	Jan-16	ATC	No	4020-9617	4020	9617		Yes	Yes	Yes	OK	482	474	0.368	Yes	Yes	417.6012	420	0.094	Yes	Yes	51.59054	53	0.169	12.80825	2	4.165
1623	Calibration	Lowestoft	C108	Crestview Drive	SB	Jan-16	ATC	No	10228-9300	10228	9300		Yes	Yes	Yes	OK	106	100	0.616	Yes	Yes	91.62101	89	0.284	Yes	Yes	11.31888	10	0.332	2.810109	0	1.945
1624	Calibration	Lowestoft	C108	Crestview Drive	NB	Jan-16	ATC	No	9300-10228	9300	10228		Yes	Yes	Yes	OK	118	116	0.176	Yes	Yes	101.8011	102	0.053	Yes	Yes	12.57653	12	0.156	3.122343	1	1.279
1625	Calibration	Lowestoft	C109	Millenium Way	SB	Jan-16	ATC	No	7090-7080	7090	7080		Yes	Yes	Yes	OK	583	532	2.153	Yes	Yes	505.3235	477	1.263	Yes	Yes	62.42776	54	1.145	15.49878	1	4.863
1626	Calibration	Lowestoft	C109	Millenium Way	NB	Jan-16	ATC	No	7080-7090	7080	7090		Yes	Yes	Yes	OK	564	537	1.115	Yes	Yes	488.2122	488	0.003	Yes	Yes	60.31383	48	1.679	14.97396	1	4.820
1627	Calibration	Lowestoft	C110	St.Peters Street	EB	Jan-16	ATC	No	10171-9170	10171	9170		Yes	Yes	Yes	OK	276	268	0.463	Yes	Yes	239.1243	238	0.088	Yes	Yes	29.54147	29	0.150	7.334184	2	2.550
1628	Calibration	Lowestoft	C110	St.Peters Street	WB	Jan-16	ATC	No	9170-10171	9170	10171		Yes	Yes	Yes	OK	305	296	0.514	Yes	Yes	264.4663	263	0.119	Yes	Yes	32.67222	33	0.052	8.111448	1	3.438
1629	Calibration	Lowestoft	C111	Cotmer Road Oulton Broad	SB	Jan-16	ATC	No	2030-3040	2030	3040		Yes	Yes	Yes	OK	629	617	0.505	Yes	Yes	545.1775	544	0.057	Yes	Yes	67.35134	68	0.068	16.72114	5	3.602
1630	Calibration	Lowestoft	C111	Cotmer Road Oulton Broad	NB	Jan-16	ATC	No	3040-2030	3040	2030		Yes	Yes	Yes	OK	489	478	0.483	Yes	Yes	423.2328	422	0.054	Yes	Yes	52.28626	52	0.006	12.98097	3	3.330
1631	Calibration	Lowestoft	C112	Ashburnham Way Carlton Colville	EB	Jan-16	ATC	No	5105-6355	5105	6355		Yes	Yes	Yes	OK	257	237	1.292	Yes	Yes	222.8795	223	0.013	Yes	Yes	27.53458	14	3.003	6.835938	0	3.698
1632	Calibration	Lowestoft	C112	Ashburnham Way Carlton Colville	WB	Jan-16	ATC	No	6355-5105	6355	5105		Yes	Yes	Yes	OK	322	260	3.616	Yes	Yes	278.7618	230	3.090	Yes	Yes	34.43829	31	0.680	8.549905	0	4.135
1633	Validation	Lowestoft	C113	Lowestoft Road Carlton Colville	EB	Jan-16	ATC	No	6335-9604	6335	9604		Yes	Yes	Yes	OK	219	101	9.286	No	No	189.74	94	8.014	No	Yes	23.44051	7	4.221	5.819516	0	3.210
1634	Validation	Lowestoft	C113	Lowestoft Road Carlton Colville	WB	Jan-16	ATC	No	9604-6335	9604	6335		Yes	Yes	Yes	OK	207	149	4.278	Yes	Yes	178.9101	140	3.084	Yes	Yes	22.10258	9	3.182	5.487352	0	3.313
1635	Calibration	Lowestoft	C116	Tom Crisp Way	SB	Jan-16	ATC	No	6315-6413	6315	6413		Yes	Yes	Yes	OK	931	882	1.599	Yes	Yes	806.1783	810	0.141	Yes	Yes	99.59542	65	3.832	24.7263	7	4.349
1636	Calibration	Lowestoft	C116	Tom Crisp Way	NB	Jan-16	ATC	No	6413-6315	6413	6315		Yes	Yes	Yes	OK	459	455	0.184	Yes	Yes	397.241	399	0.090	Yes	Yes	49.07523	51	0.202	12.18378	5	2.433
1679	Calibration	Lowestoft	M043	Kessingland Bypass	SB	Jan-16	ATC	No	4501-4502	4501	4502		Yes	Yes	Yes	OK	485	487	0.120	Yes	Yes	419.4613	423	0.180	Yes	Yes	52.76372	54	0.192	12.27493	10	0.741
1680	Calibration	Lowestoft	M043	Kessingland Bypass	NB	Jan-16	ATC	No	4502-4501	4502	4501		Yes	Yes	Yes	OK	613	605	0.303	Yes	Yes	530.4952	530	0.007	Yes	Yes	66.73059	67	0.052	15.52418	8	2.275
1723	Validation	Lowestoft	Y159	London Road Pakefield	SB	Jan-16	ATC	No	1025-6345	1025	6345		Yes	Yes	Yes	OK	355	360	0.288	Yes	Yes	307.3528	324	0.954	Yes	Yes	37.97042	34	0.706	9.426818	2	3.026
1724	Validation	Lowestoft	Y159	London Road Pakefield	NB	Jan-16	ATC	No	6345-1025	6345	1025		Yes	Yes	Yes	OK	566	446	5.325	No	No	489.945	398	4.350	Yes	Yes	60.5279	46	2.039	15.02711	2	4.552
1757	Calibration	Lowestoft	9	JTC 9_E-In	EB	Jan-15	MCC	No	8070-6250	8070	6250		Yes	Yes	Yes	OK	74	73	0.016	Yes	Yes	62.307	62	0.018	Yes	Yes	10.28649	10	0.043	1.012658	1	0.148
1758	Calibration	Lowestoft	9	JTC 9_E-Out	WB	Jan-15	MCC	No	6250-8070	6250	8070		Yes	Yes	Yes	OK	84	84	0.087	Yes	Yes	71.208	71	0.041	Yes	Yes	12.34379	12	0.101	0	2	1.732
1769	Validation	Lowestoft	1	0	NB	Jan-16	MCC	No	2070-7000	2070	7000		Yes	Yes	Yes	OK	1055	1243	5.536	No	No	892	1104	6.698	No	No	144	128	1.394	19	11	1.968
1770	Validation	Lowestoft	1	0	SB	Jan-16	MCC	No	7000-2070	7000	2070		Yes	Yes	Yes	OK	1092	1248	4.547	Yes	Yes	975	1100	3.868	Yes	Yes	105	141	3.281	12	6	1.810
1771	Calibration	Lowestoft	3	0	NB	Jan-16	MCC	No	9220-4612	9220	4612		Yes	Yes	Yes	OK	53	53	0.004	Yes	Yes	41	41	0.014	Yes	Yes	9	9	0.003	3	3	0.028
1772	Calibration	Lowestoft	3	0	SB	Jan-16	MCC	No	4612-9220	4612	9220		Yes	Yes	Yes	OK	123	123	0.016	Yes	Yes	119	119	0.017	Yes	Yes	4	4	0.005	0	0	0.000
1773	Calibration	Lowestoft	3	0	NE	Jan-16	MCC	No	9220-9230	9220	9230		Yes	Yes	Yes	OK	312	311	0.031	Yes	Yes	293	292	0.033	Yes	Yes	19	19	0.002	0	0	0.093
1774	Calibration	Lowestoft	3	0	SW	Jan-16	MCC	No	9230-9220	9230	9220		Yes	Yes	Yes	OK	323	323	0.022	Yes	Yes	303	303	0.028	Yes	Yes	20	20	0.020	0	0	0.000
1777	Calibration	Lowestoft	3	0	SB	Jan-16	MCC	No	9220-4603	9220	4603		Yes	Yes	Yes	OK	104	104	0.018	Yes	Yes	98	98	0.019	Yes	Yes	6	6	0.000	0	0	0.093
1778	Calibration	Lowestoft	3	0	NB	Jan-16	MCC	No	4603-9220	4603	9220		Yes	Yes	Yes	OK	59	59	0.005	Yes	Yes	51	51	0.011	Yes	Yes	8	8	0.014	0	0	0.000
1779	Calibration	Lowestoft	3	0	WB	Jan-16	MCC	No	9220-10190	9220	10190		Yes	Yes	Yes	OK	588	587	0.027	Yes	Yes	530	529	0.042	Yes	Yes	57	58	0.074	1	1	0.265
1780	Calibration	Lowestoft	3	0	EB	Jan-16	MCC	No	10190-9220	10190	9220		Yes	Yes	Yes	OK	403	398	0.265	Yes	Yes	369	362	0.364	Yes	Yes	28	31	0.477	6	5	0.395
1781	Calibration	Lowestoft	4	0	NB	Jan-16	MCC	No	9120-10185	9120	10185		Yes	Yes	Yes	OK	156	145	0.856	Yes	Yes	141	134	0.575	Yes	Yes	11	9	0.586	4	2	1.094
1782	Calibration	Lowestoft	4	0	SB	Jan-16	MCC	No	10185-9120	10185	9120		Yes	Yes	Yes	OK	182	181	0.101	Yes	Yes	154	154	0.011	Yes	Yes	28	26	0.297	0	0	0.295
1783	Calibration	Lowestoft	4	0	EB	Jan-16	MCC	No	9120-7200	9120	7200		Yes	Yes	Yes	OK	293	292	0.057	Yes	Yes	264	264	0.015	Yes	Yes	28	27	0.173	1	1	0.175
1784	Calibration	Lowestoft	4	0	WB	Jan-16	MCC	No	7200-9120	7200	9120		Yes	Yes	Yes	OK	411	409	0.091	Yes	Yes	369	368	0.039	Yes	Yes	39	39	0.011	3	2	0.657
1787	Validation	Lowestoft	5	0	NB	Jan-16	MCC	No	1260-6322	1260	6322		Yes	Yes	Yes	OK	986	870	3.811	Yes	Yes	883	784	3.443	Yes	Yes	93	80	1.345	10	6	1.482
1788	Validation	Lowestoft	5	0	SB	Jan-16	MCC	No	6322-1260	6322	1260		Yes	Yes	Yes	OK	1436	1753	7.945	No	No	1304	1607	7.934	No	No	117	139	1.926	15	8	2.128
1791	Calibration	Lowestoft	6	0	EB	Jan-16	MCC	No	6315-4000	6315	4000		Yes	Yes	Yes	OK	704	709	0.184	Yes	Yes	643	643	0.006	Yes	Yes	54	58	0.596	7	7	0.093
1792	Calibration	Lowestoft	6	0	WB	Jan-16	MCC	No	4000-6315	4000	6315		Yes	Yes	Yes	OK	1197	1200	0.088	Yes	Yes	1105	1105	0.014	Yes	Yes	80	89	0.999	12	6	1.866
1793	Calibration	Lowestoft	6	0	SE	Jan-16	MCC	No	6315-6382	6315	6382		Yes	Yes	Yes	OK	8	12	1.139	Yes	Yes	8	9	0.346	Yes	Yes	0	2	1.833	0	1	1.322
1794	Calibration	Lowestoft	6	0	NW	Jan-16	MCC	No	6382-6315	6382	6315		Yes	Yes	Yes	OK	23	24	0.126	Yes	Yes	20	20	0.009	Yes	Yes	2	3	0.505	1	1	0.135
1797	Calibration	Lowestoft	6	0	WB	Jan-16	MCC	No	6315-4010	6315	4010		Yes	Yes	Yes	OK	458	456	0.070	Yes	Yes	412	417	0.247	Yes	Yes	41	38	0.400	5	1	2.313
1798	Calibration	Lowestoft	6	0	EB	Jan-16	MCC	No	4010-6315	4010	6315		Yes	Yes	Yes	OK	389	381	0.406	Yes	Yes	364	356	0.430	Yes	Yes	21	21	0.002	4	4	0.086
1801	Calibration	Lowestoft	7	0	SB	Jan-16	MCC	No	4613-4614	4613	4614		Yes	Yes	Yes	OK	27	27	0.014	Yes	Yes	21	21	0.044	Yes	Yes	6	6	0.000	0	0	0.502
1802	Calibration	Lowestoft	7	0	NB	Jan-16	MCC	No	4614-4613	4614	4613		Yes	Yes	Yes	OK	23	23	0.050	Yes	Yes	19	19	0.005	Yes	Yes	4	4	0.000	0	0	0.666
1803	Calibration	Lowestoft	7	0	WB	Jan-16	MCC	No	4613-6384	4613	6384		Yes	Yes	Yes	OK	402	398	0.206	Yes	Yes	368	368	0.016	Yes	Yes	29	29	0.068	5	0	2.969
1804	Calibration	Lowestoft	7	0	EB	Jan-16	MCC	No	6384-4613	6384	4613		Yes	Yes	Yes	OK	201	200	0.099	Yes	Yes	180	181	0.077	Yes	Yes	18	16	0.510	3	3	0.207
2331	Calibration	Lowestoft		Vaveney Drive / Riverside Road / Durban Road - Riversi	pproac	Jul-17	MCC	No	10259-4010	10259	4010		Yes	Yes	Yes	OK	170	171	0.084	Yes	Yes	165	165	0.037	Yes	Yes	5	5	0.065	1	1	0.435
2332	Calibration	Lowestoft		Vaveney Drive / Riverside Road / Durban Road - Riversi	Exit	Jul-17	MCC	No	4010-10259	4010	10259		Yes	Yes	Yes	OK	33	33	0.057	Yes	Yes	31	31	0.046	Yes	Yes	2	2	0.048	0	0	0.000
2335	Calibration	Lowestoft		Vaveney Drive / Riverside Road / Durban Road - Durbar	pproac	Jul-17	MCC	No	6402-4010	6402	4010		Yes	Yes	Yes	OK	69	66	0.356	Yes	Yes	66	66	0.052	Yes	Yes	3	0	1.996	0	0	0.295
2336	Calibration	Lowestoft		Vaveney Drive / Riverside Road / Durban Road - Durbar	Exit	Jul-17	MCC	No	4010-6402	4010	6402		Yes	Yes	Yes	OK	84	78	0.642	Yes	Yes	77	72	0.602	Yes	Yes	6	5	0.198	1	1	0.122

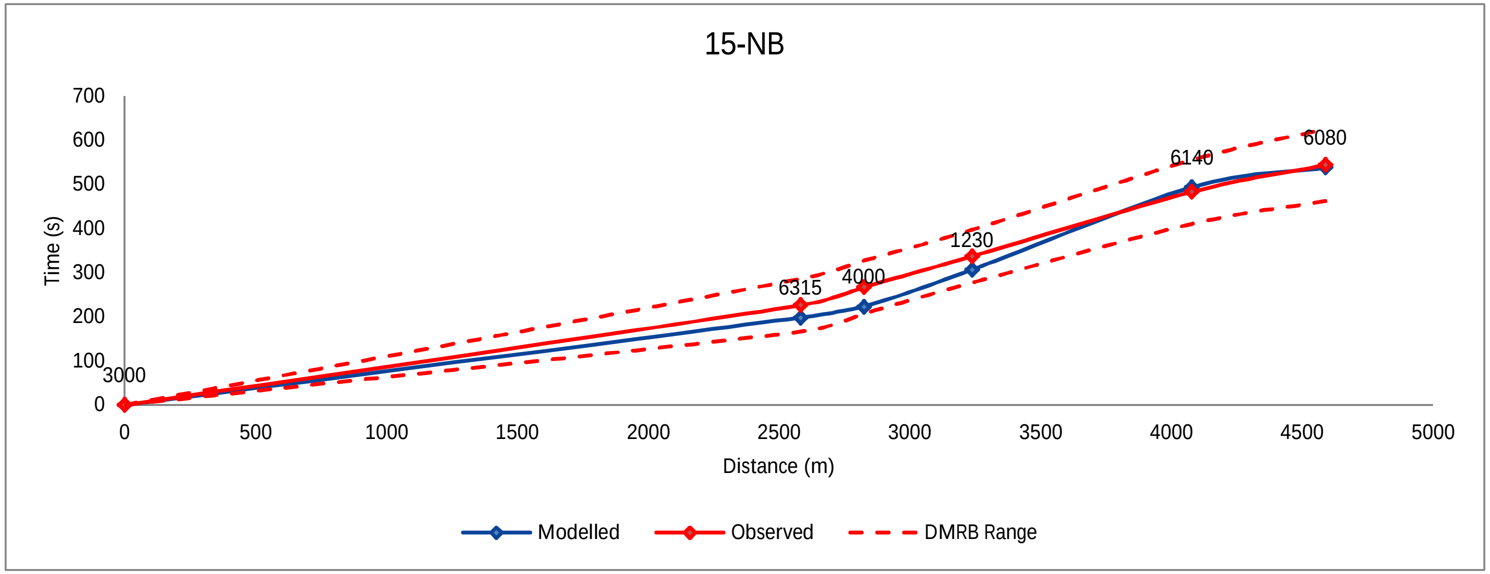
Appendix C

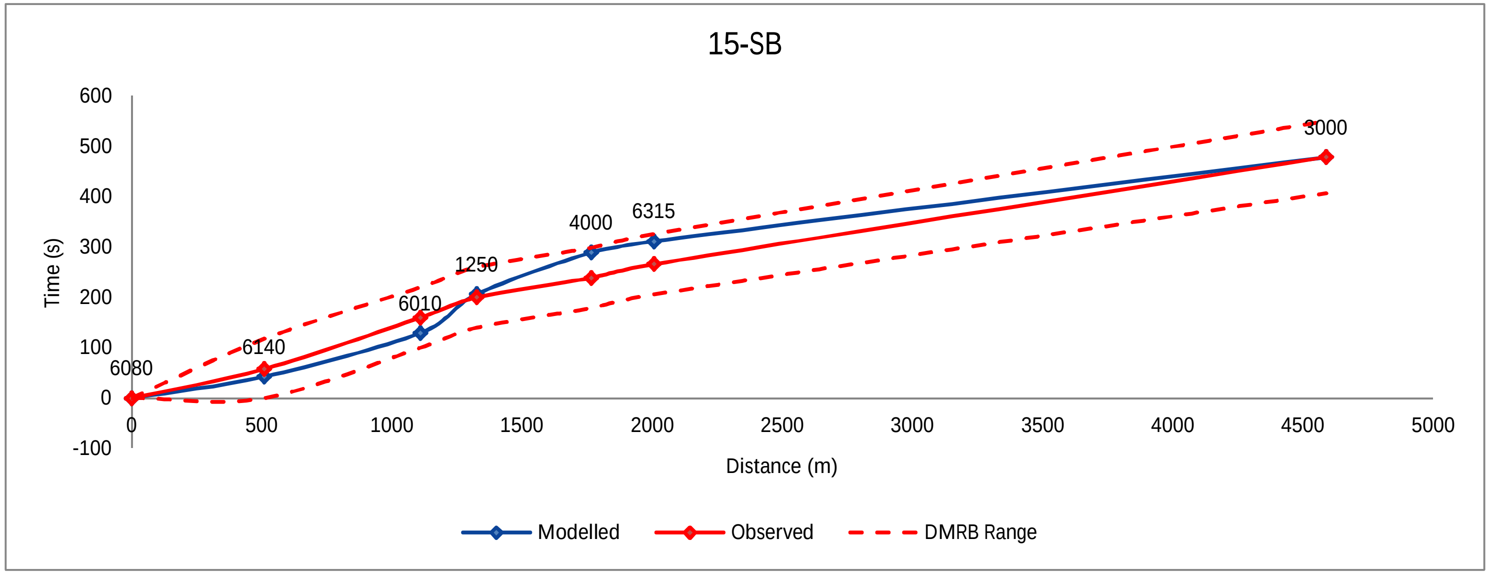
JOURNEY TIME GRAPHS

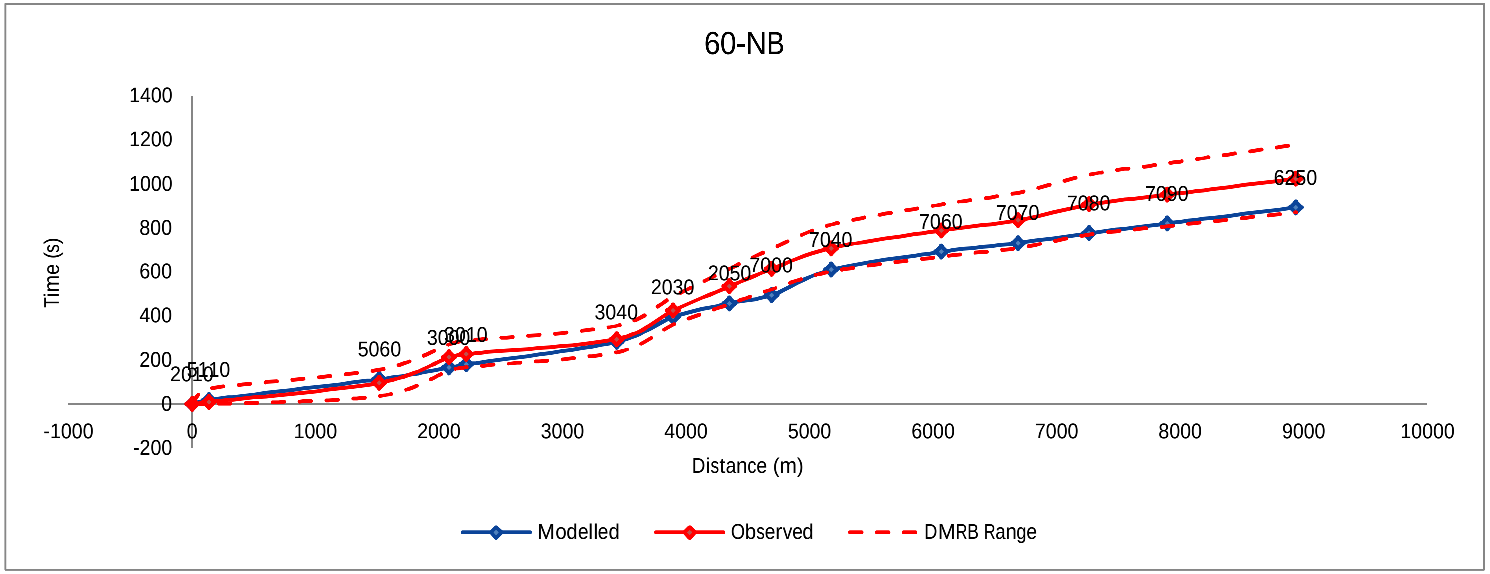
AM Peak

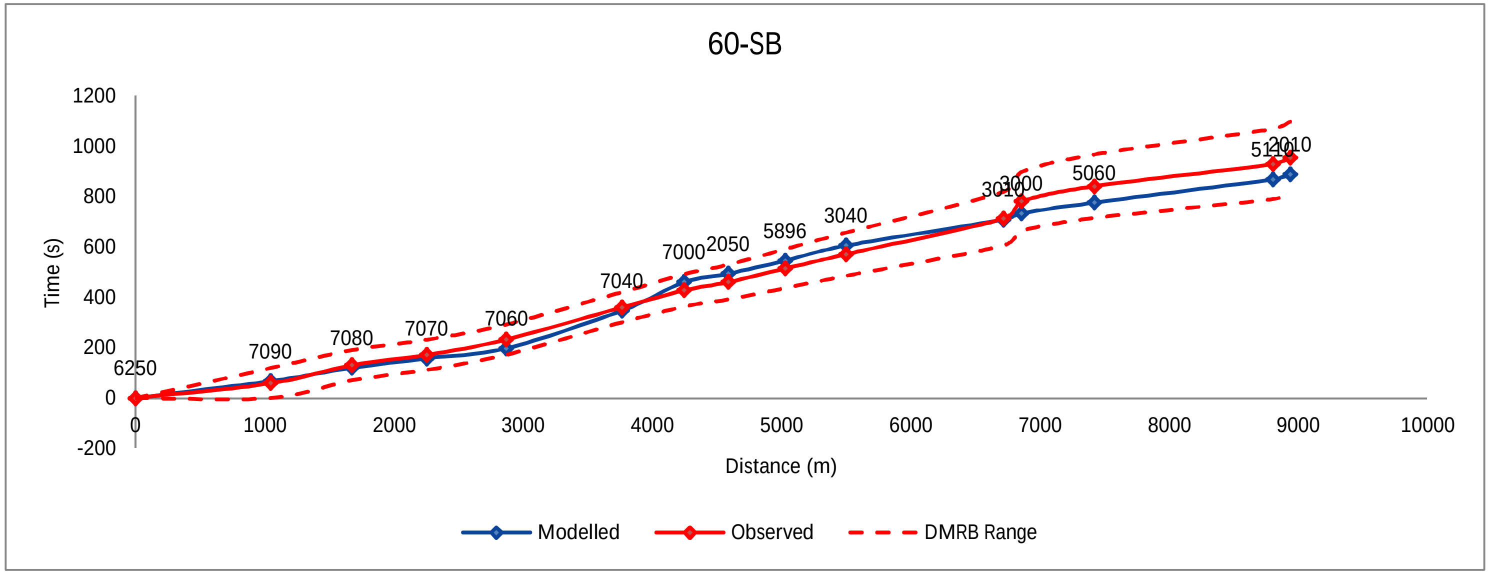

14-NB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
Distance (m)
0
2000
4000
6000
8000
10000
12000
14000
16000
3233
3228
4502
4501
1010
1020
3000
Modelled
Observed
DMRB Range

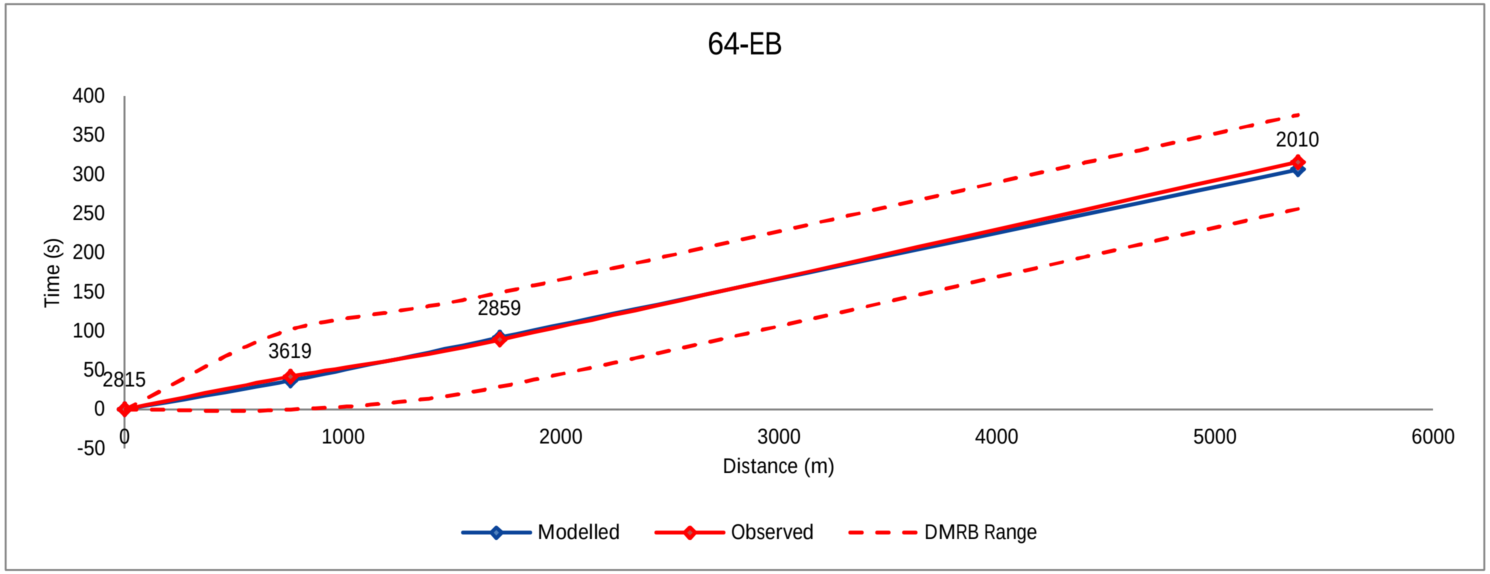

14-SB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
Distance (m)
0
2000
4000
6000
8000
10000
12000
14000
16000
3000
1020
1010
4501
4502
3228
3233
Modelled
Observed
DMRB Range

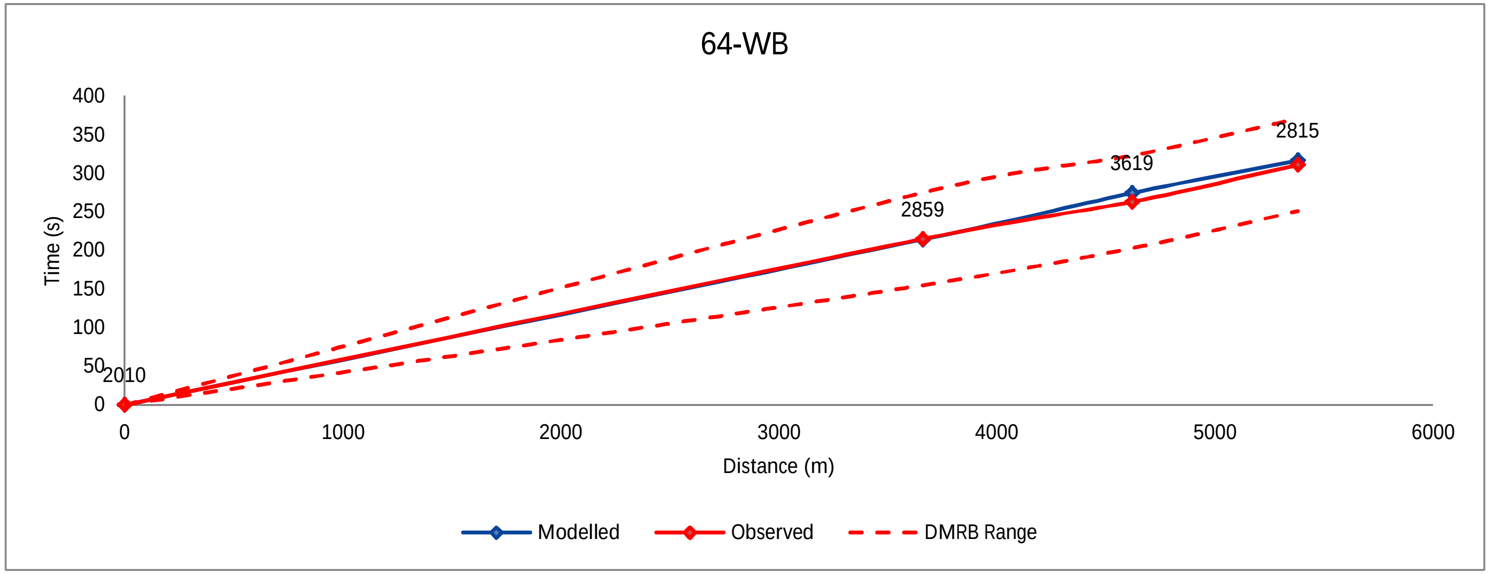

15-NB
Time (s)
700
600
500
400
300
200
100
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
3000
6315
4000
1230
6140
6080
Modelled
Observed
DMRB Range

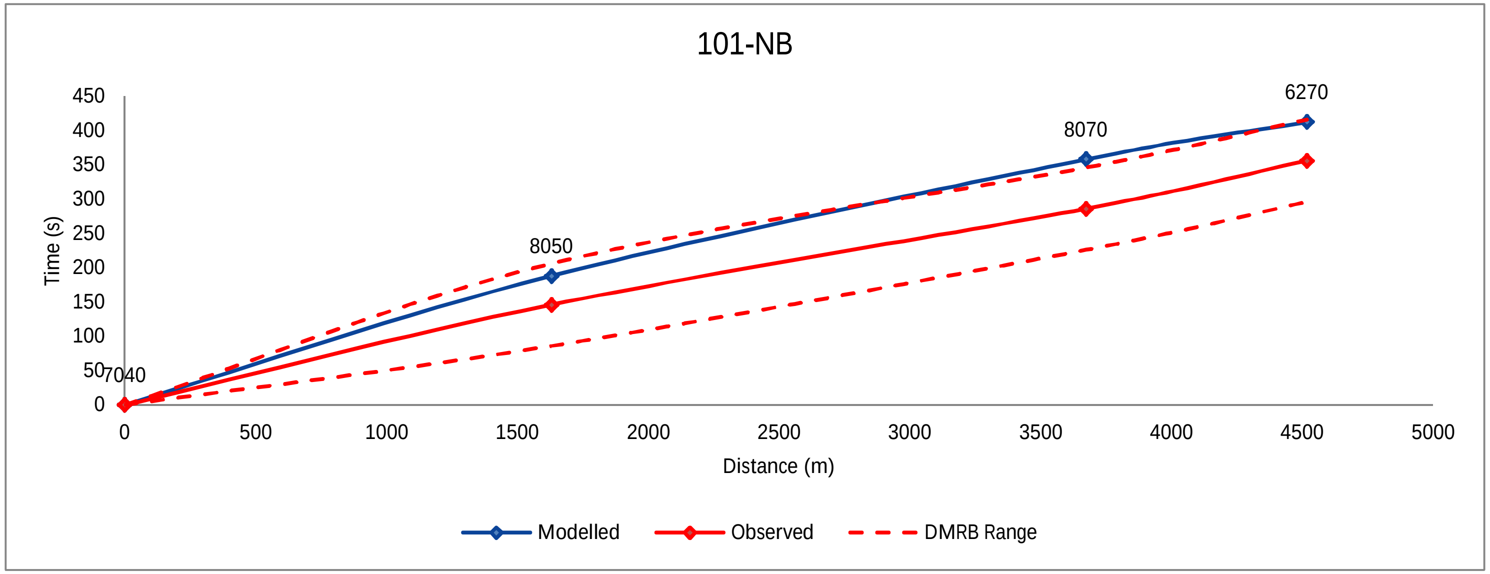

15-SB
Time (s)
600
500
400
300
200
100
0
-100
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
6080
6140
6010
1250
4000
6315
3000
Modelled
Observed
DMRB Range

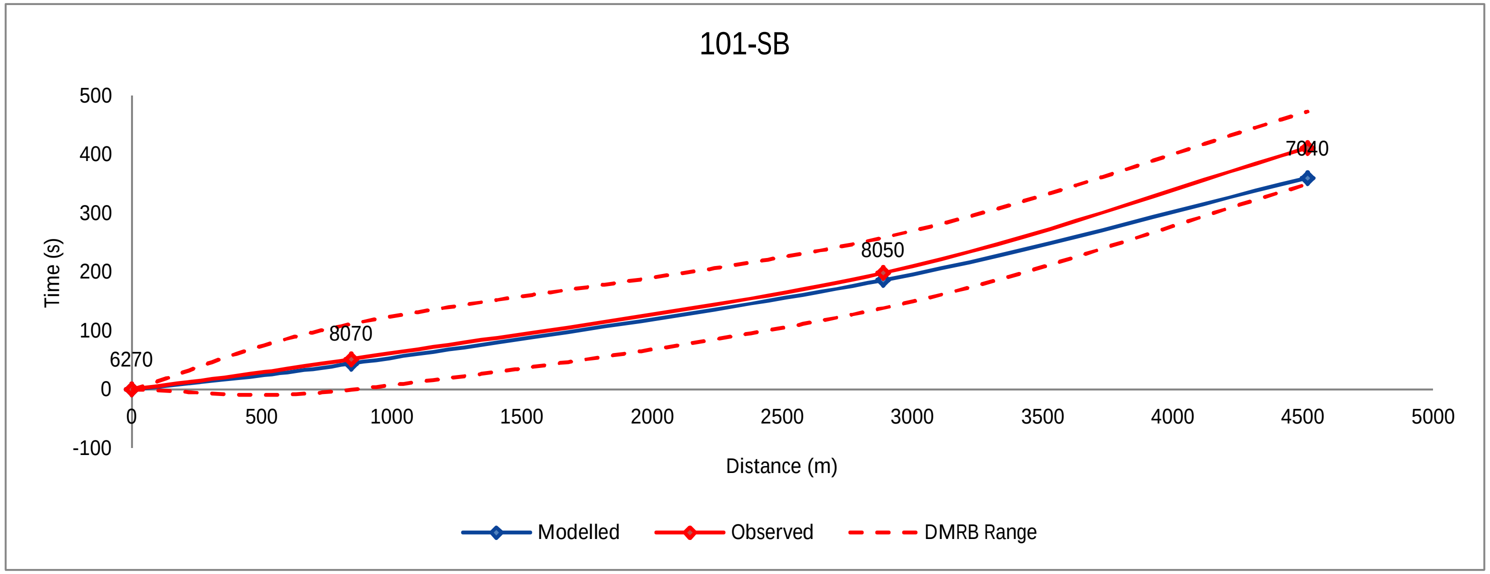

60-NB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range

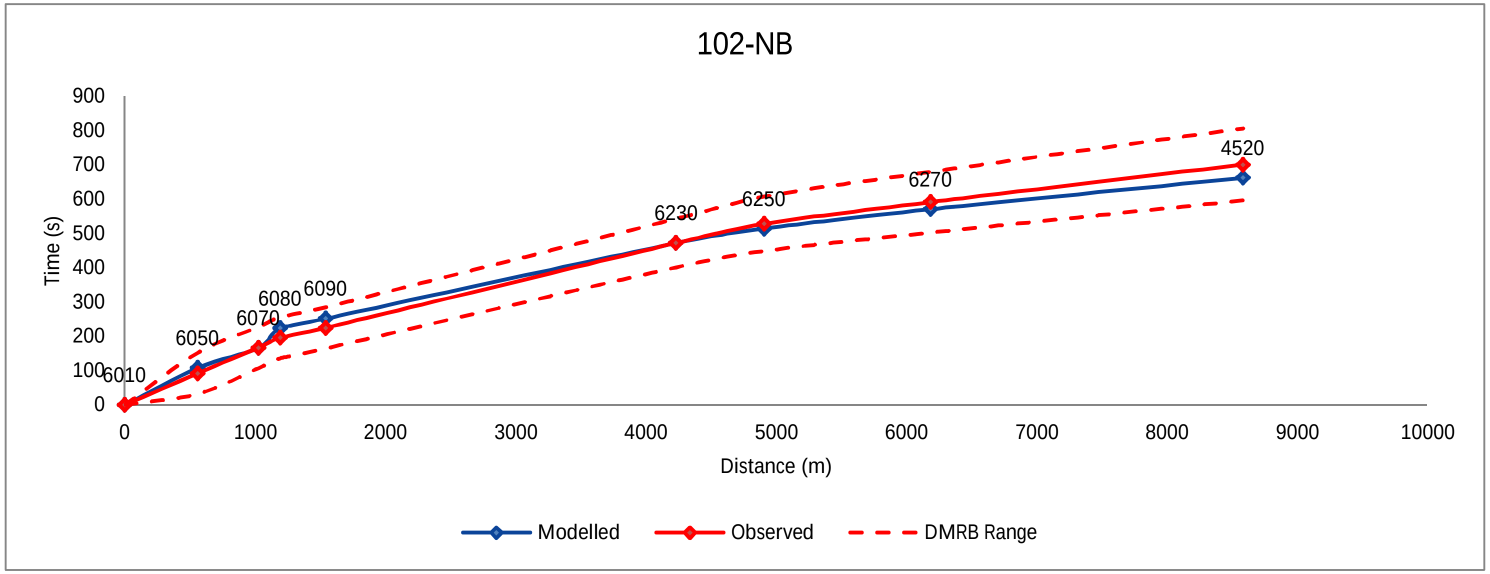

60-SB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range


64-EB
400
350
300
250
200
150
100
50
0
-50
Time (s)
2815
3619
2859
2010
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range

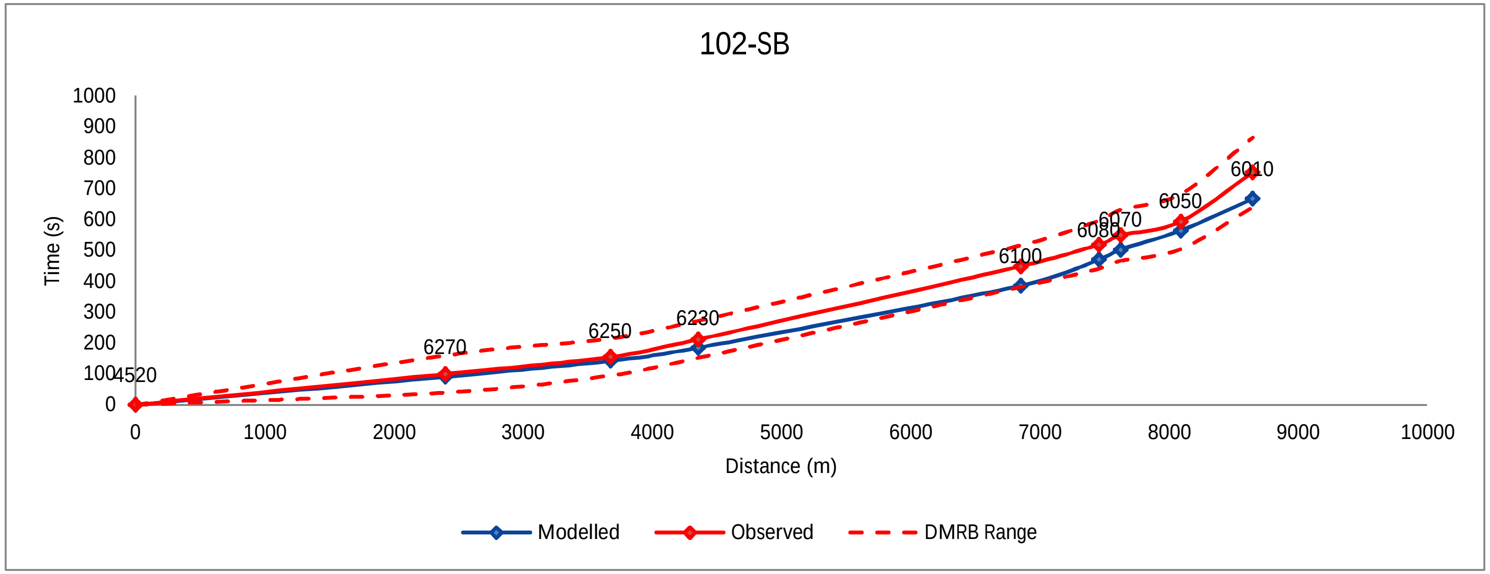

64-WB
400
350
300
250
200
150
100
50
0
Time (s)
2010
2859
3619
2815
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range


101-NB
Time (s)
450
400
350
300
250
200
150
100
50
0
7040
8050
8070
6270
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range

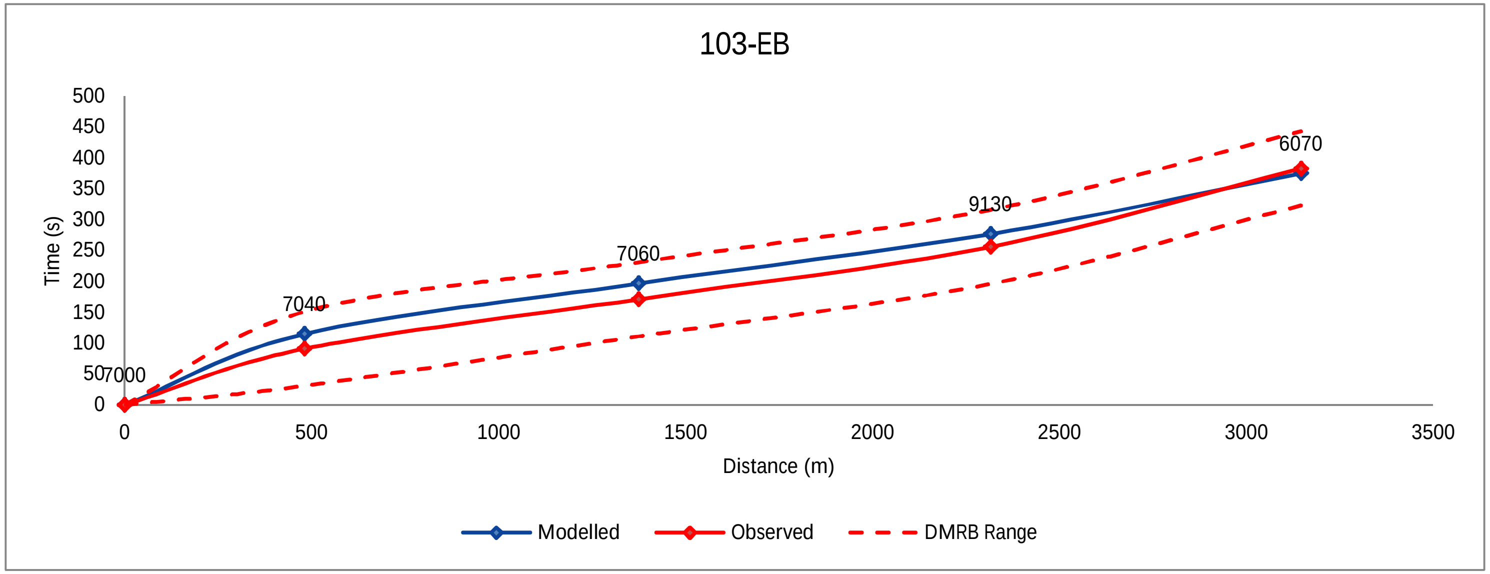

101-SB
Time (s)
500
400
300
200
100
0
-100
6270
8070
8050
7040
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range



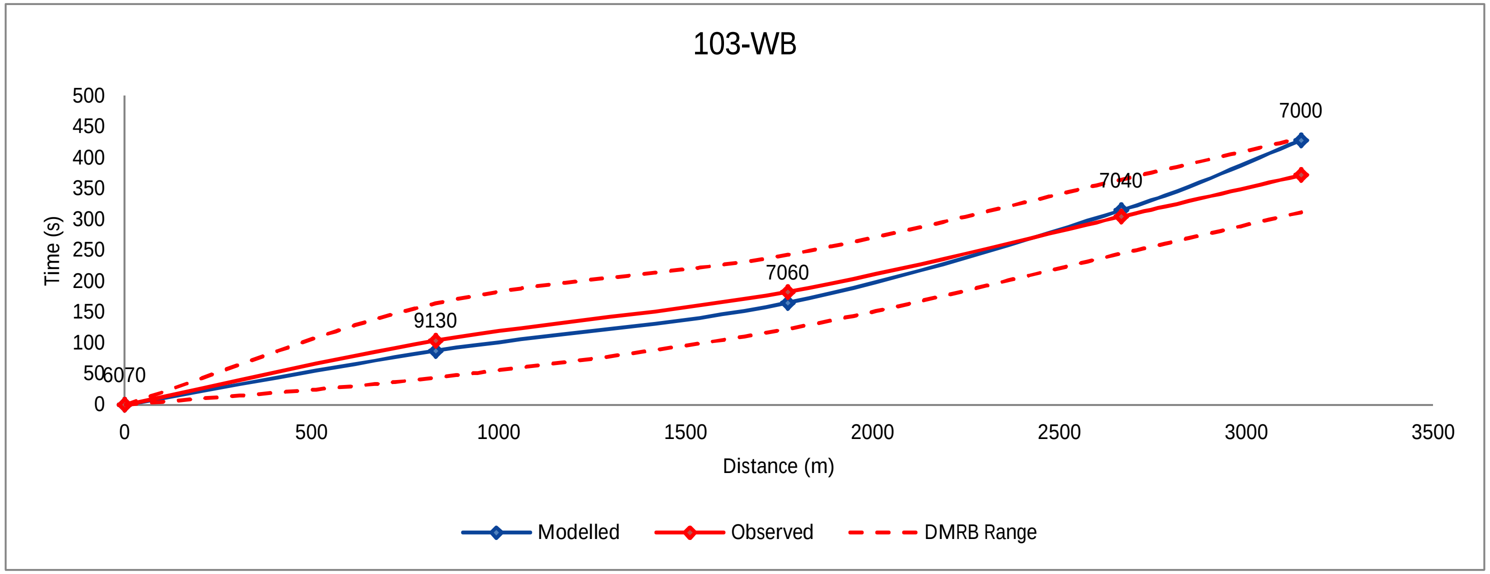
102-NB
Time (s)
Distance (m)
6010
6050
6070
6080
6090
6230
6250
6270
4520
Modelled
Observed
DMRB Range



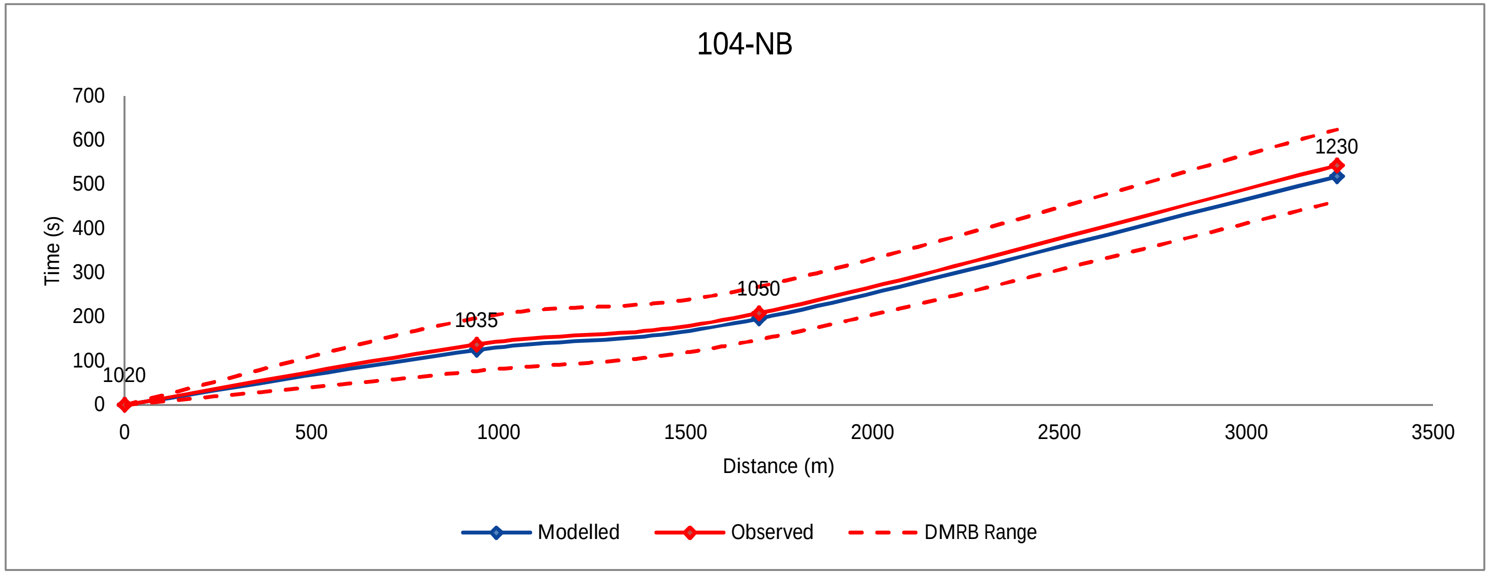
102-SB
Time (s)
Distance (m)
4520
6270
6250
6230
6100
6080
6070
6050
6010
Modelled
Observed
DMRB Range

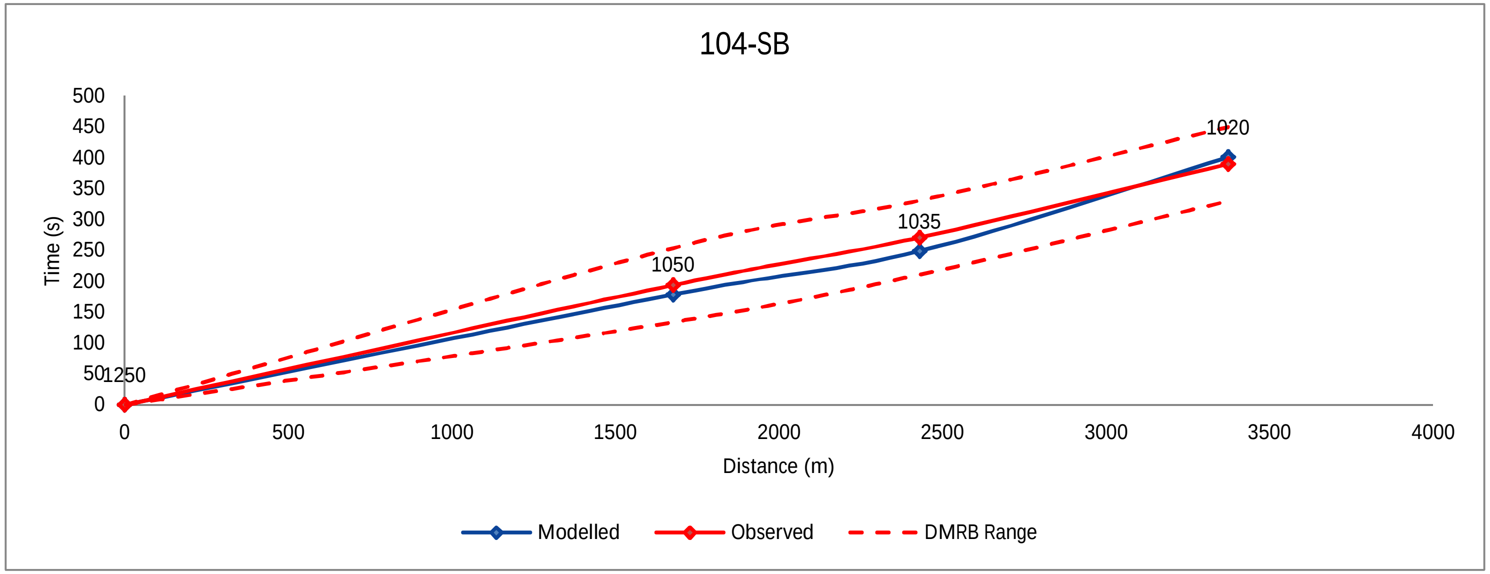


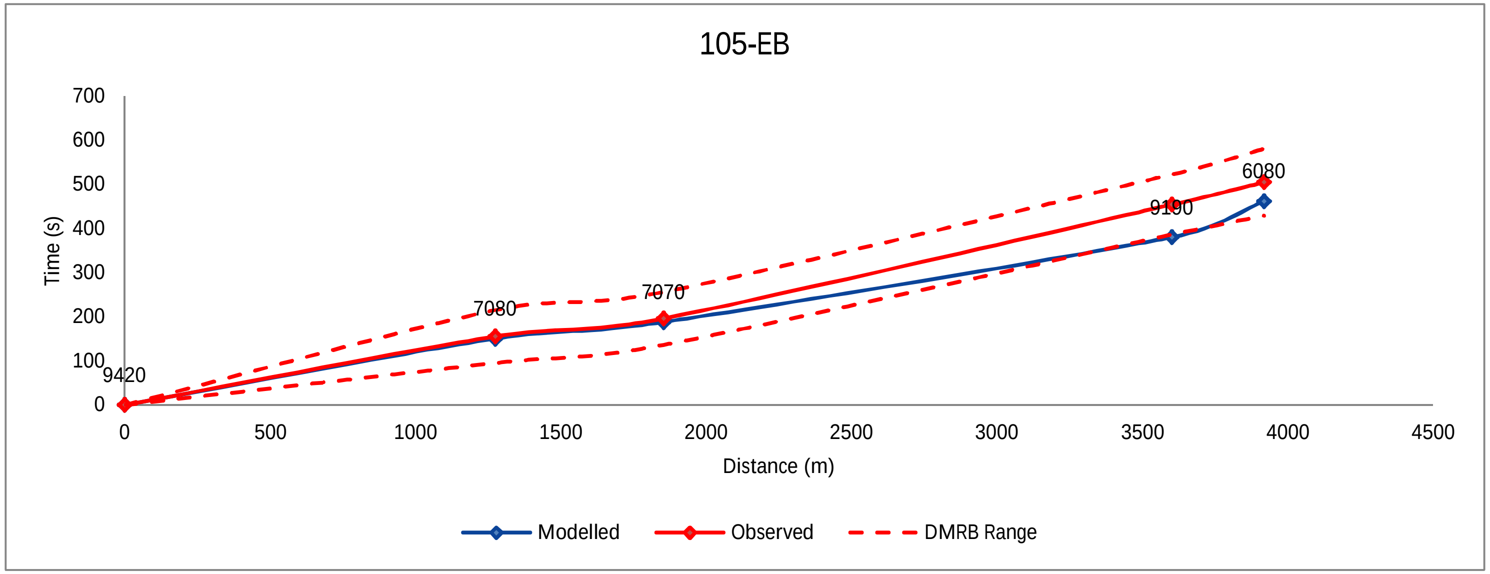
103-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
7000
7040
7060
9130
6070
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range

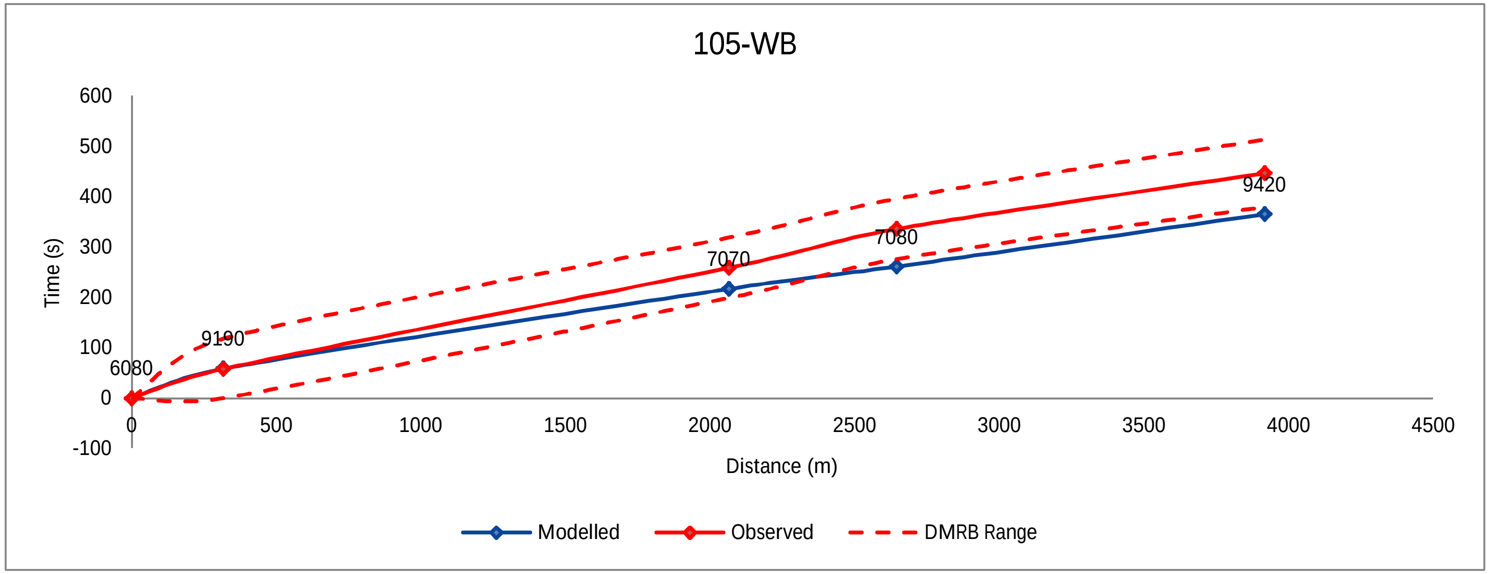


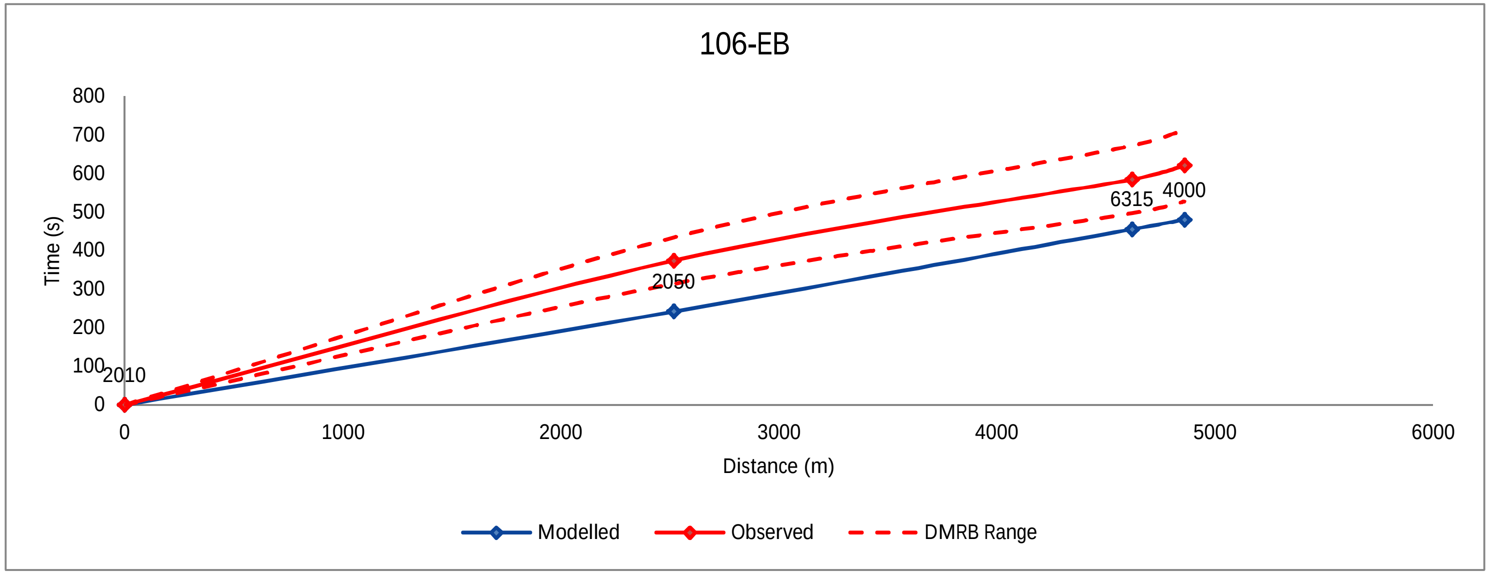
103-WB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
6070
9130
7060
7040
7000
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range

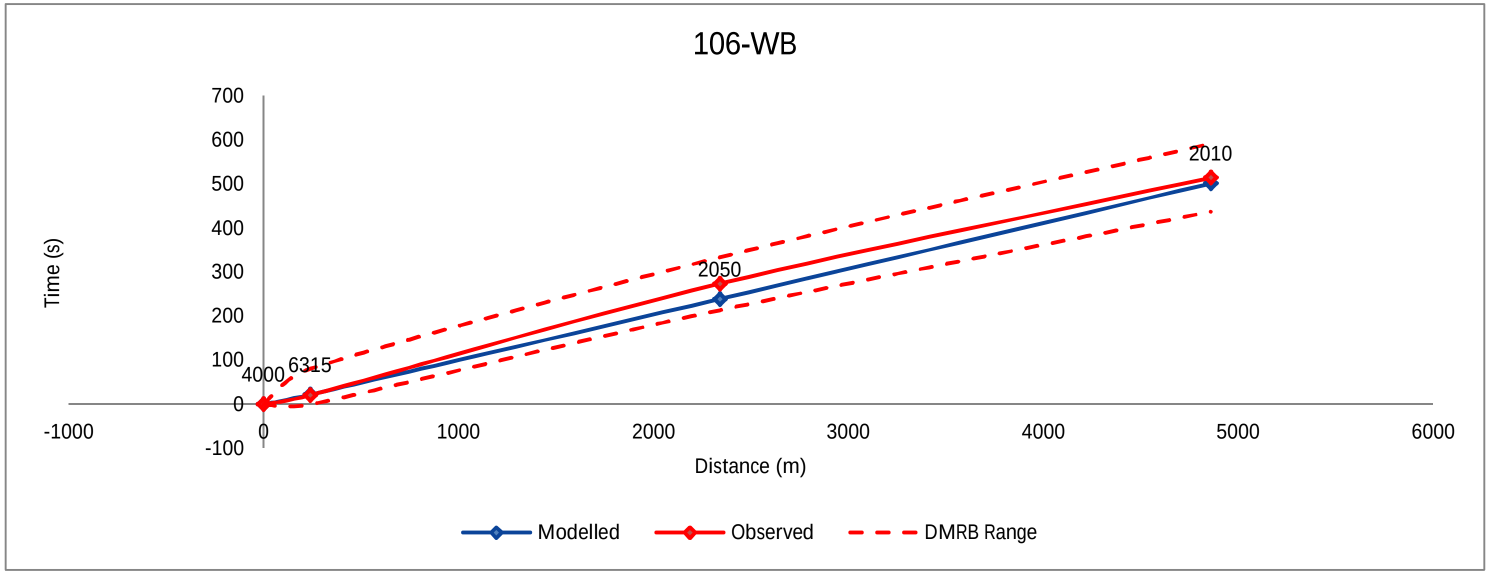

104-NB
Time (s)
700
600
500
400
300
200
100
0
1020
1035
1050
1230
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range


104-SB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
1250
1050
1035
1020
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
Modelled
Observed
DMRB Range

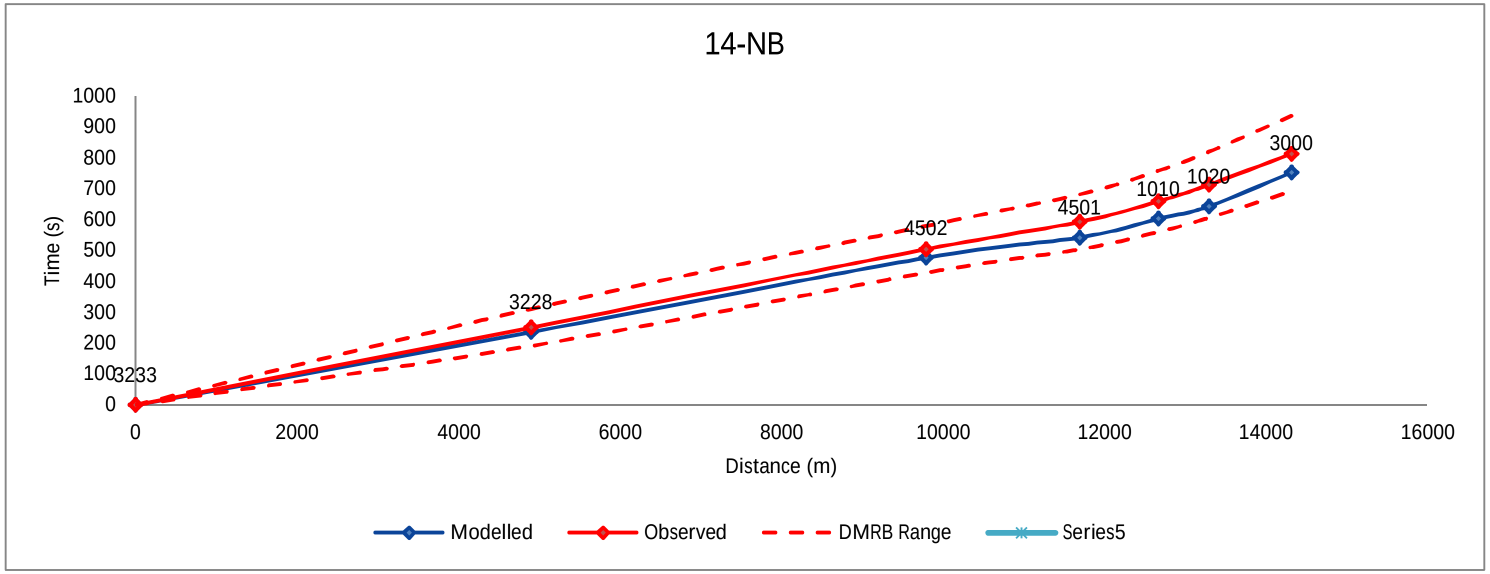

105-EB
Time (s)
700
600
500
400
300
200
100
0
9420
7080
7070
9190
6080
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Distance (m)
Modelled
Observed
DMRB Range

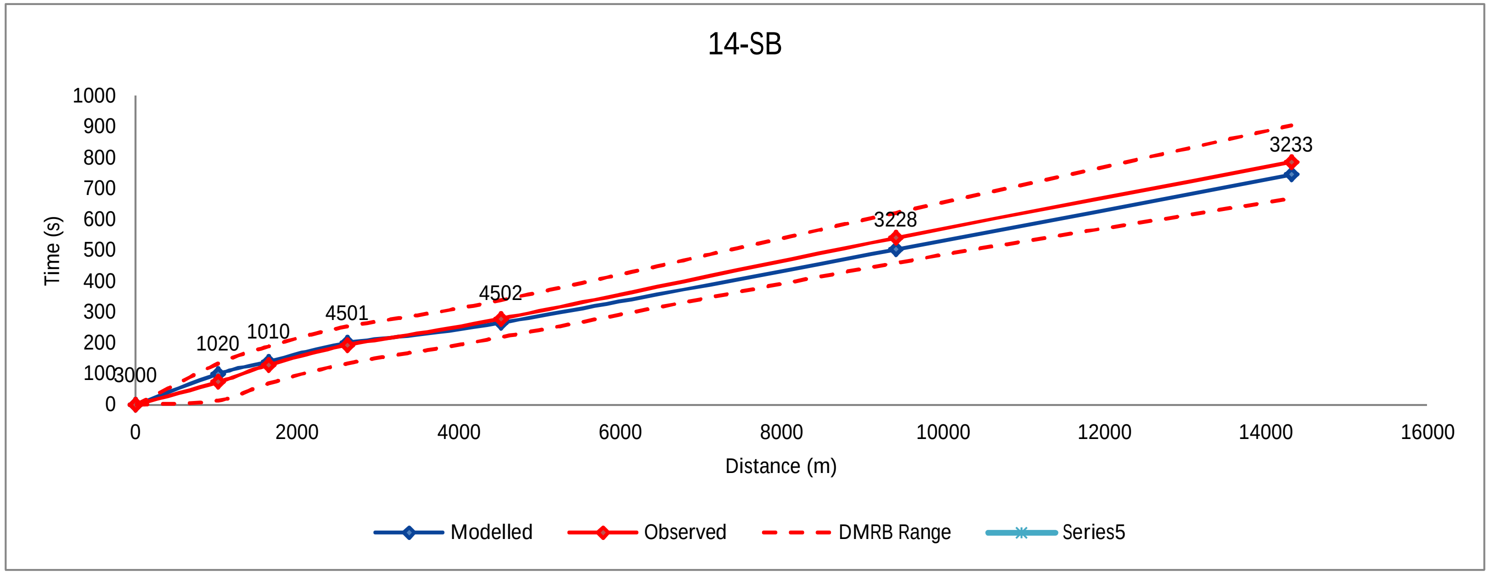

105-WB
Time (s)
600
500
400
300
200
100
0
-100
6080
9190
7070
7080
9420
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Distance (m)
Modelled
Observed
DMRB Range

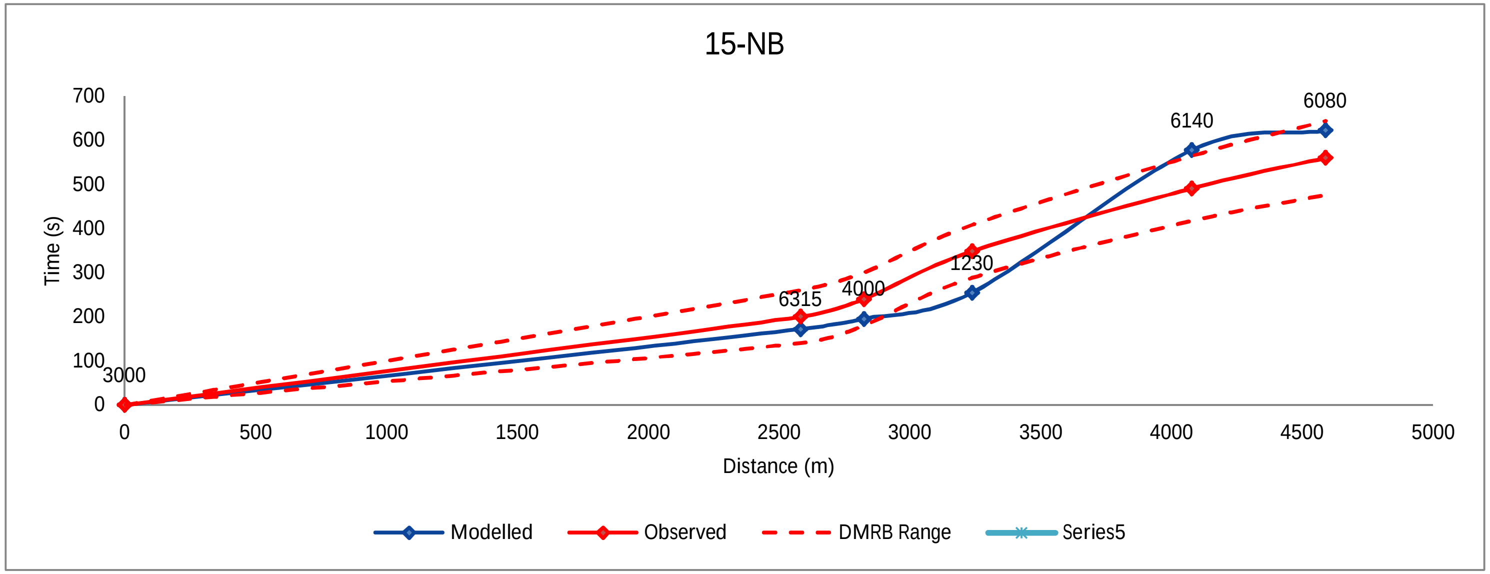

106-EB
Time (s)
800
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
Distance (m)
2010
2050
6315
4000
Modelled
Observed
DMRB Range

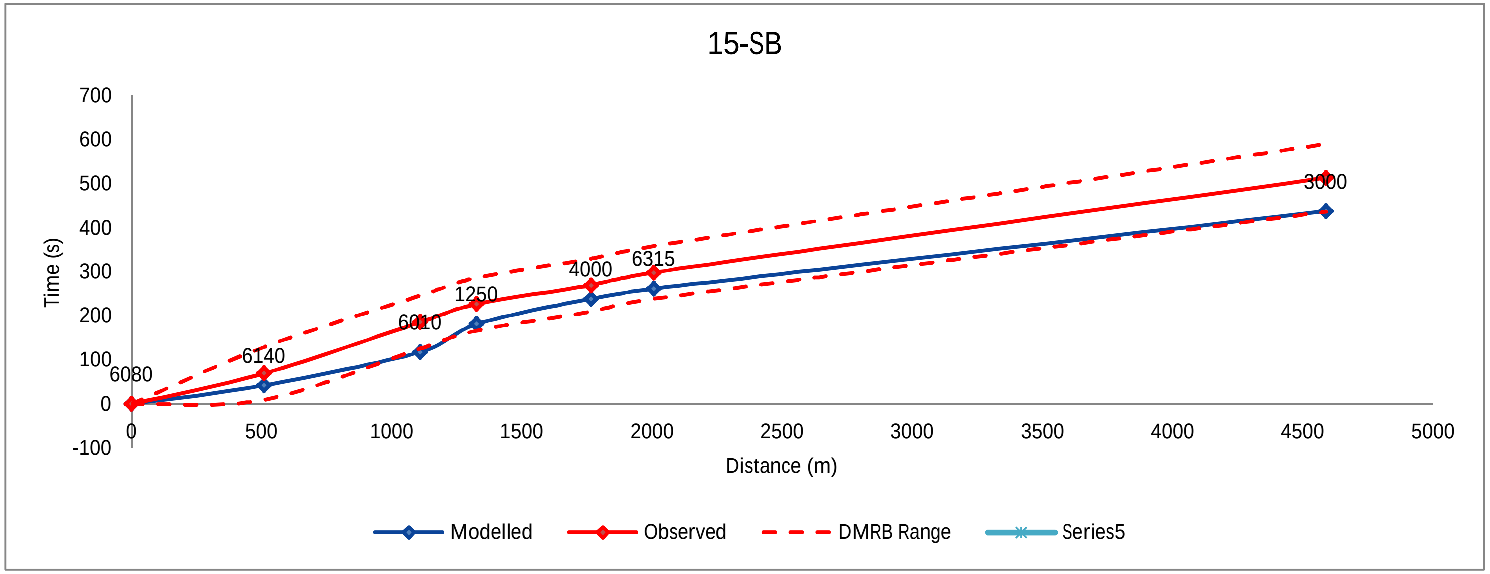

106-WB
Time (s)
700
600
500
400
300
200
100
0
-100
-1000
0
1000
2000
3000
4000
5000
6000
Distance (m)
4000
6315
2050
2010
Modelled
Observed
DMRB Range

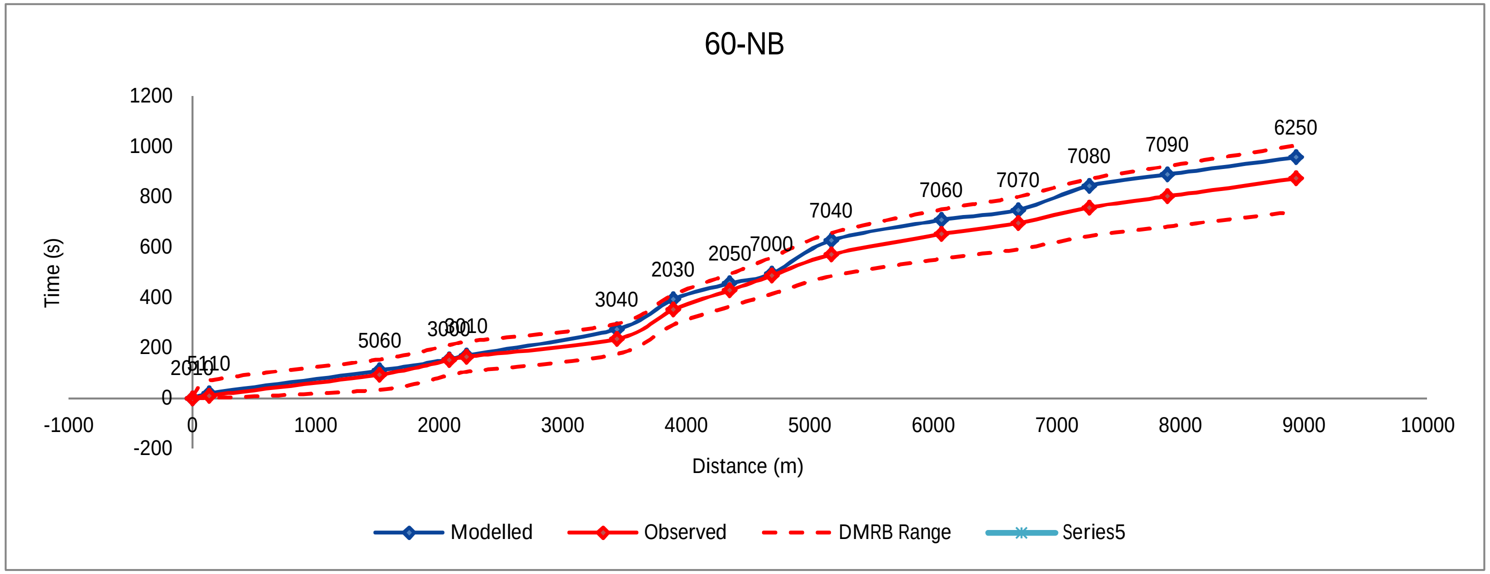
Inter Peak

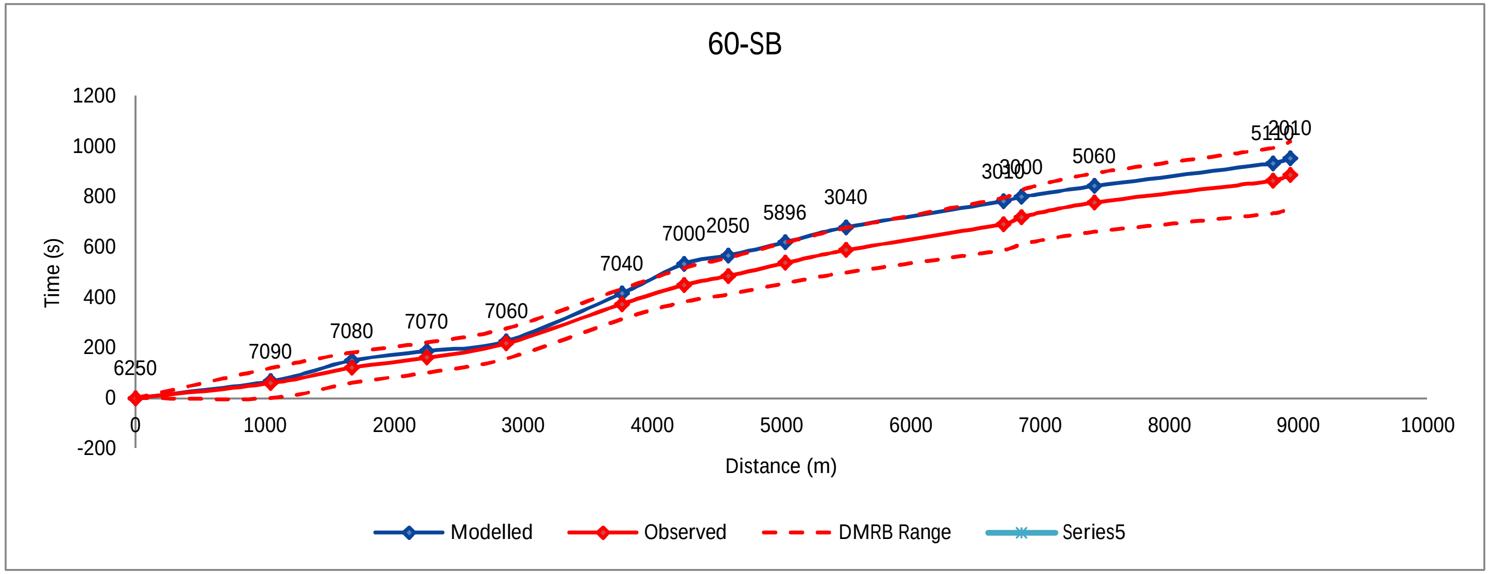

14-NB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3233
3228
4502
4501
1010
1020
3000
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

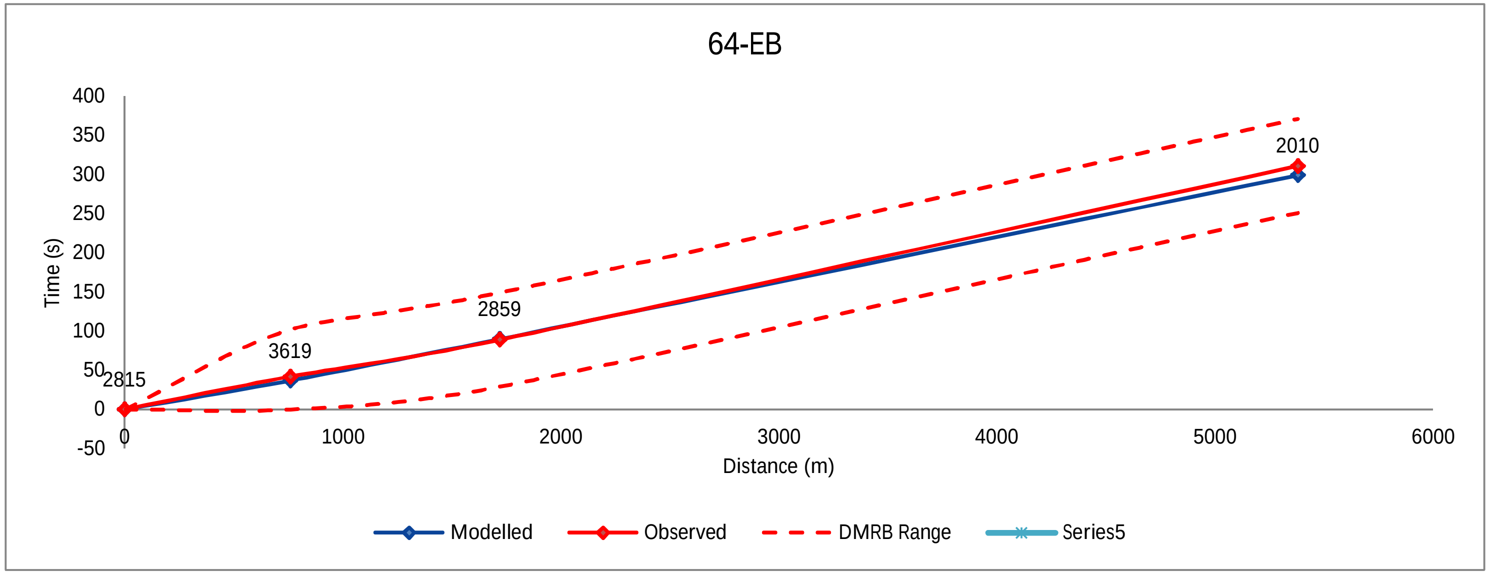

14-SB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3000
1020
1010
4501
4502
3228
3233
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5


15-NB
Time (s)
Distance (m)
3000
6315
4000
1230
6140
6080
Modelled
Observed
DMRB Range
Series5

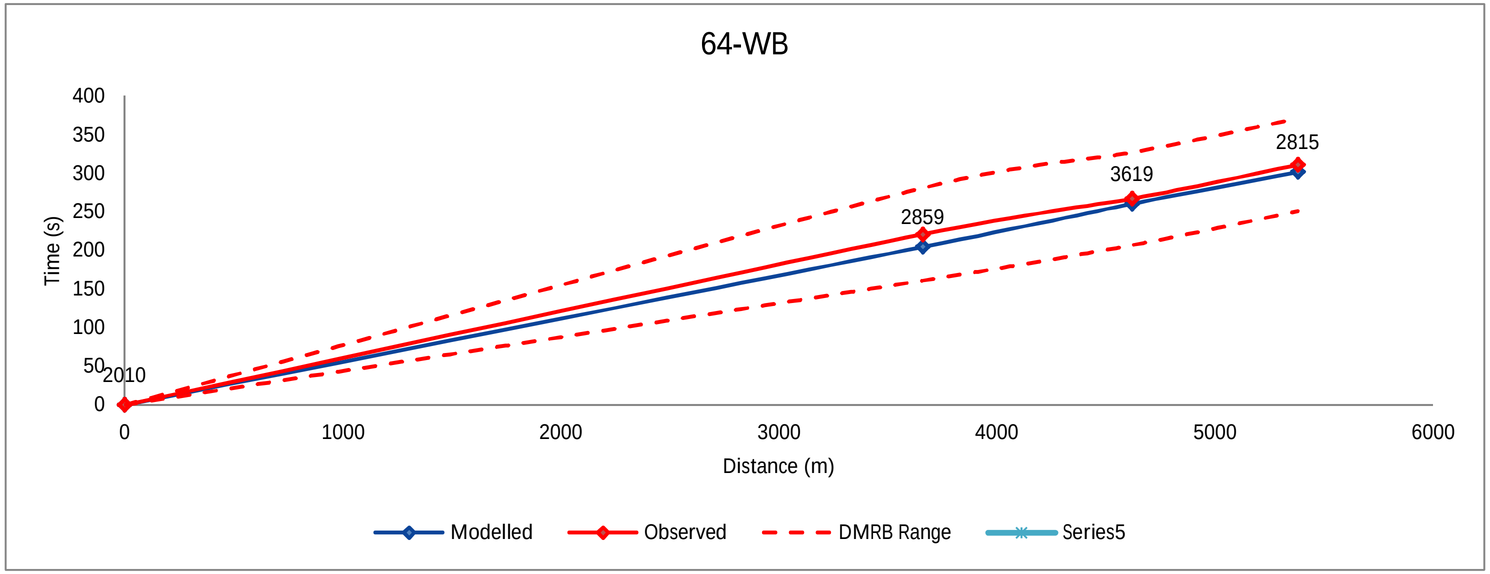

15-SB
Time (s)
Distance (m)
6080
6140
6010
1250
4000
6315
3000
Modelled
Observed
DMRB Range
Series5


60-NB
Time (s)
Distance (m)
6250
7090
7080
7070
7060
7040
7000
2050
2030
3040
3000
3010
5060
5110
2010
Modelled
Observed
DMRB Range
Series5

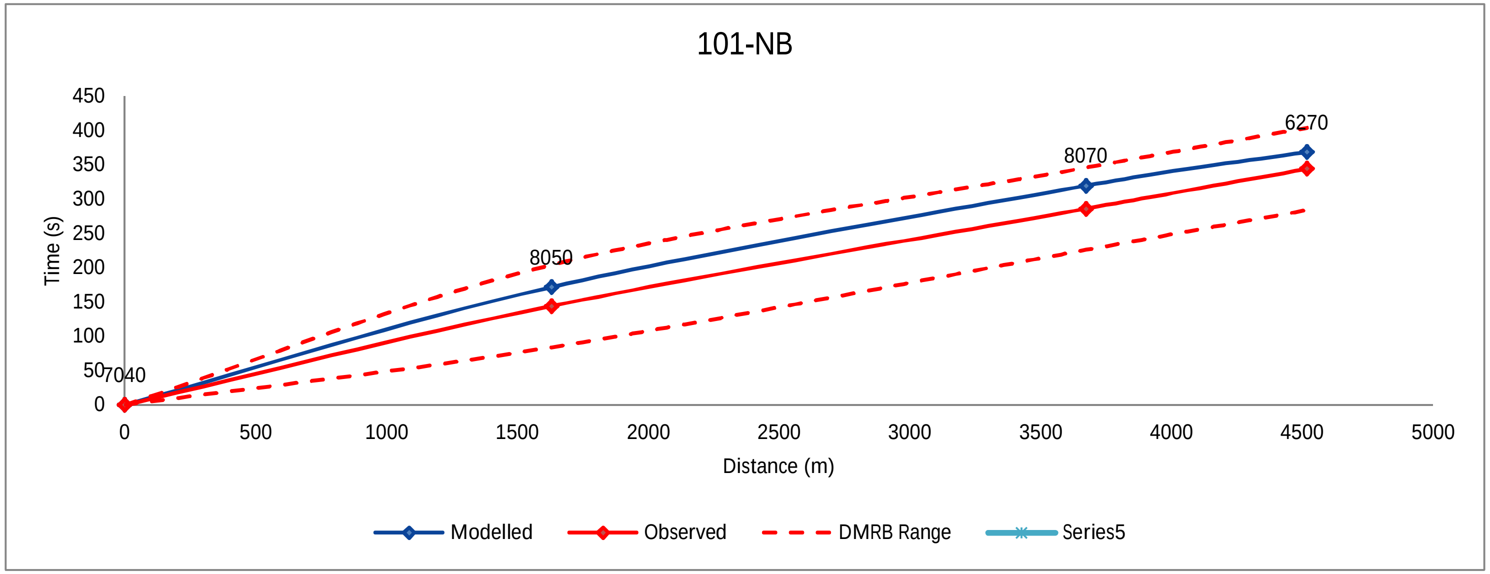

60-SB
Time (s)
Distance (m)
6250
7090
7080
7070
7060
7040
7000
2050
5896
3040
3010
3000
5060
5110
2010
Modelled
Observed
DMRB Range
Series5

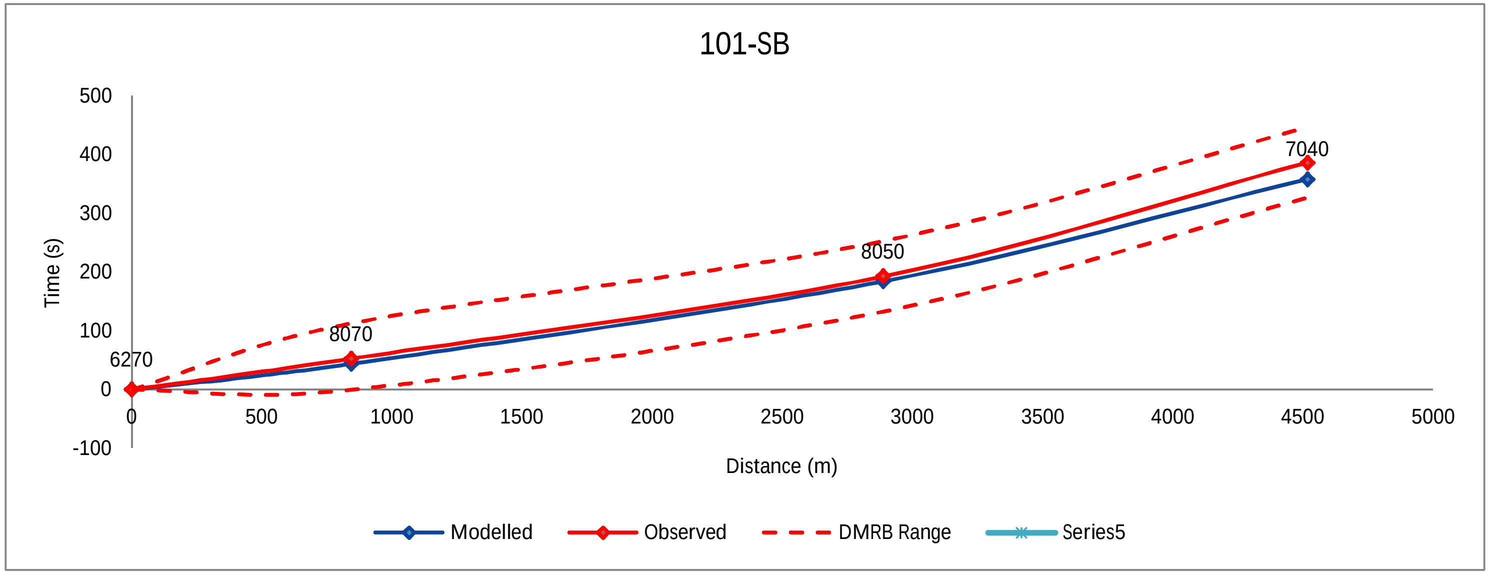


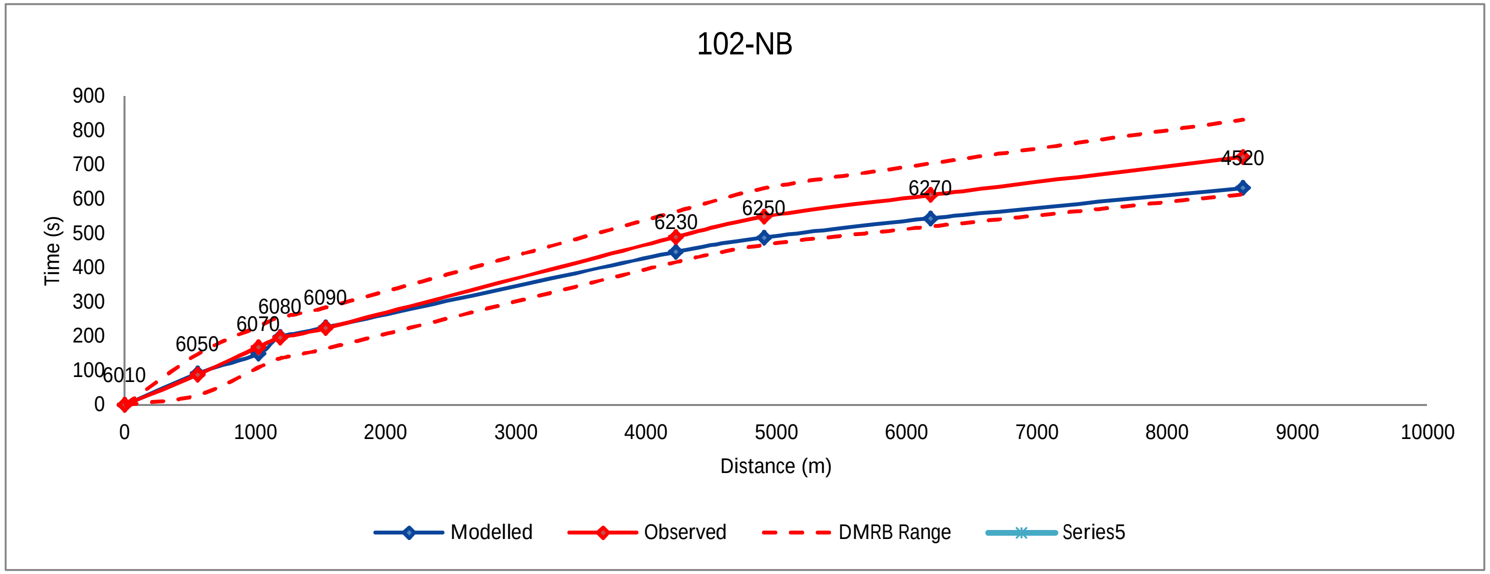
64-EB
400
350
300
250
200
150
100
50
0
-50
Time (s)
2815
3619
2859
2010
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

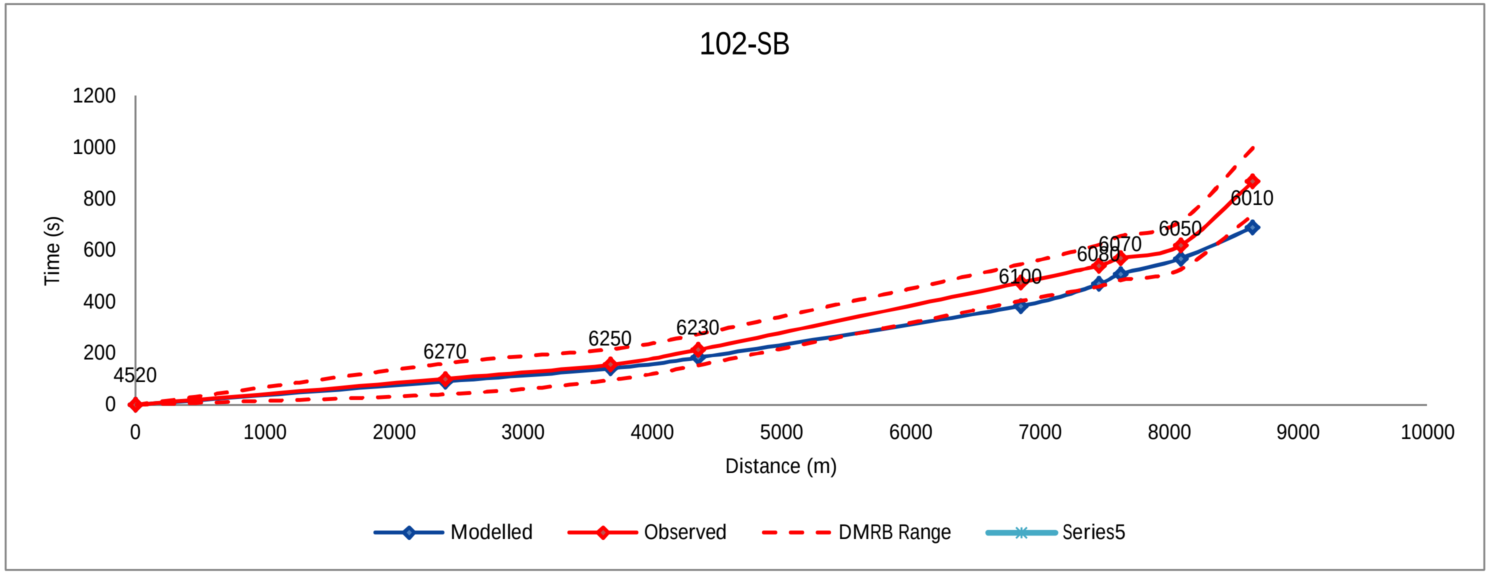


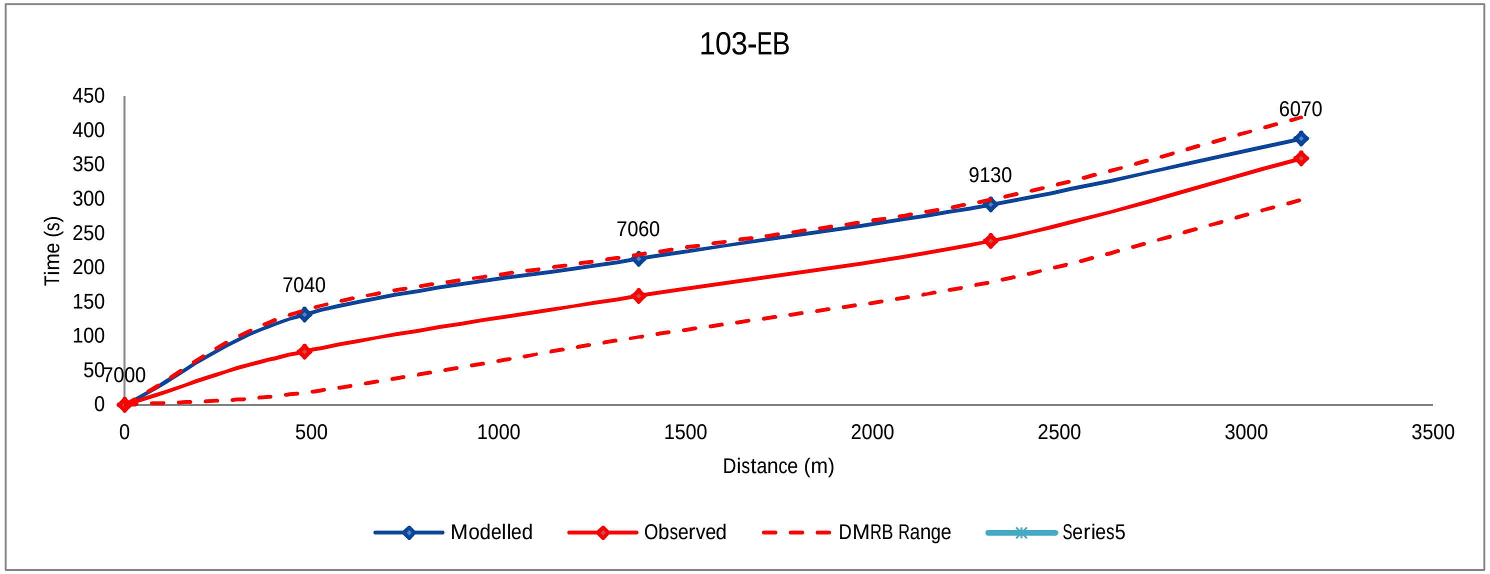
64-WB
400
350
300
250
200
150
100
50
0
Time (s)
2010
2859
3619
2815
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

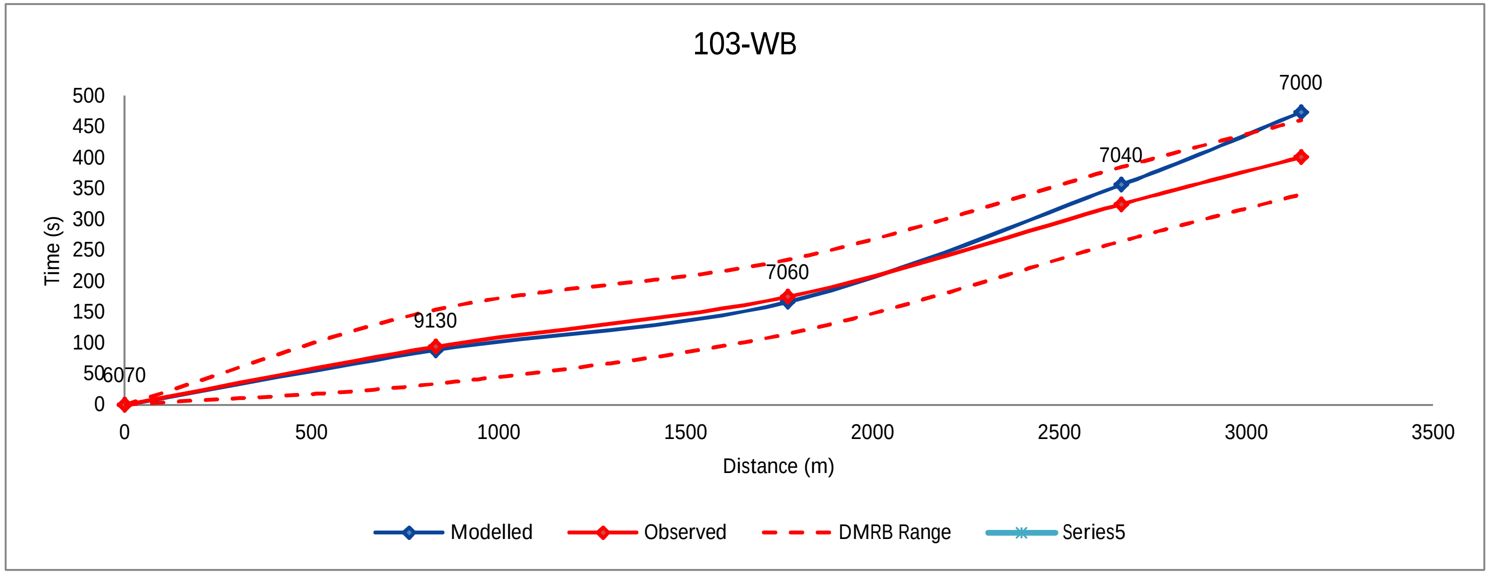

101-NB
Time (s)
450
400
350
300
250
200
150
100
50
0
7040
8050
8070
6270
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

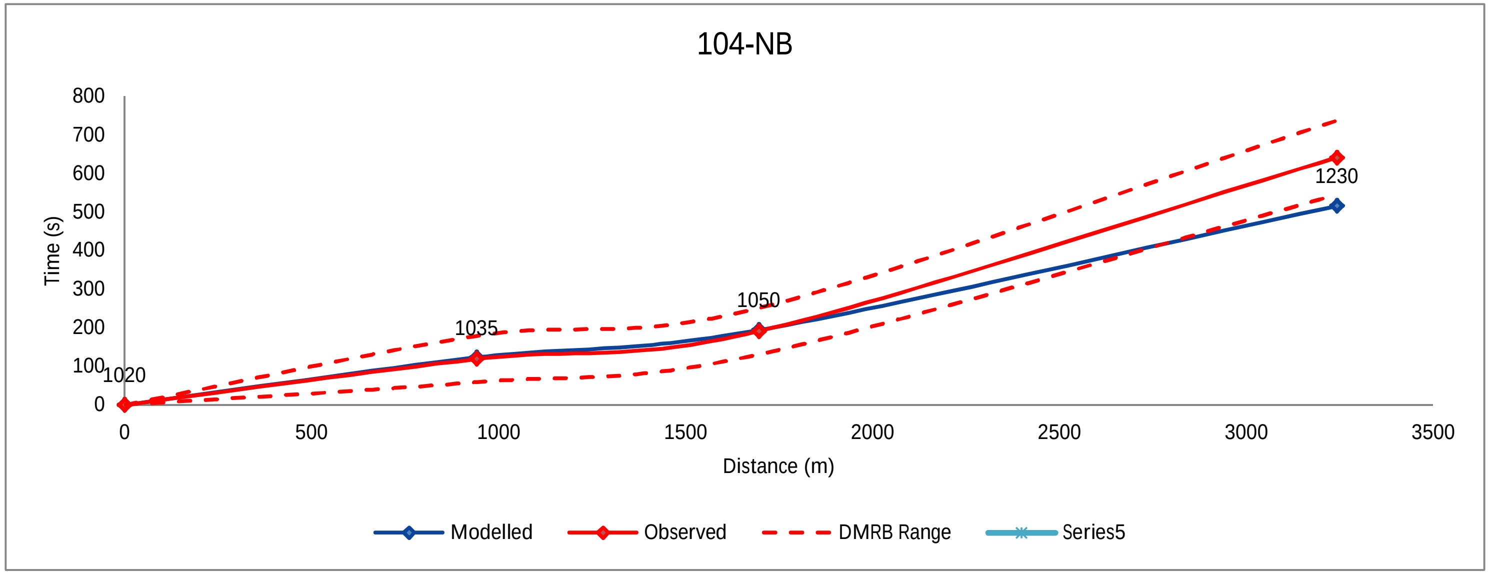

101-SB
Time (s)
500
400
300
200
100
0
-100
6270
8070
8050
7040
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

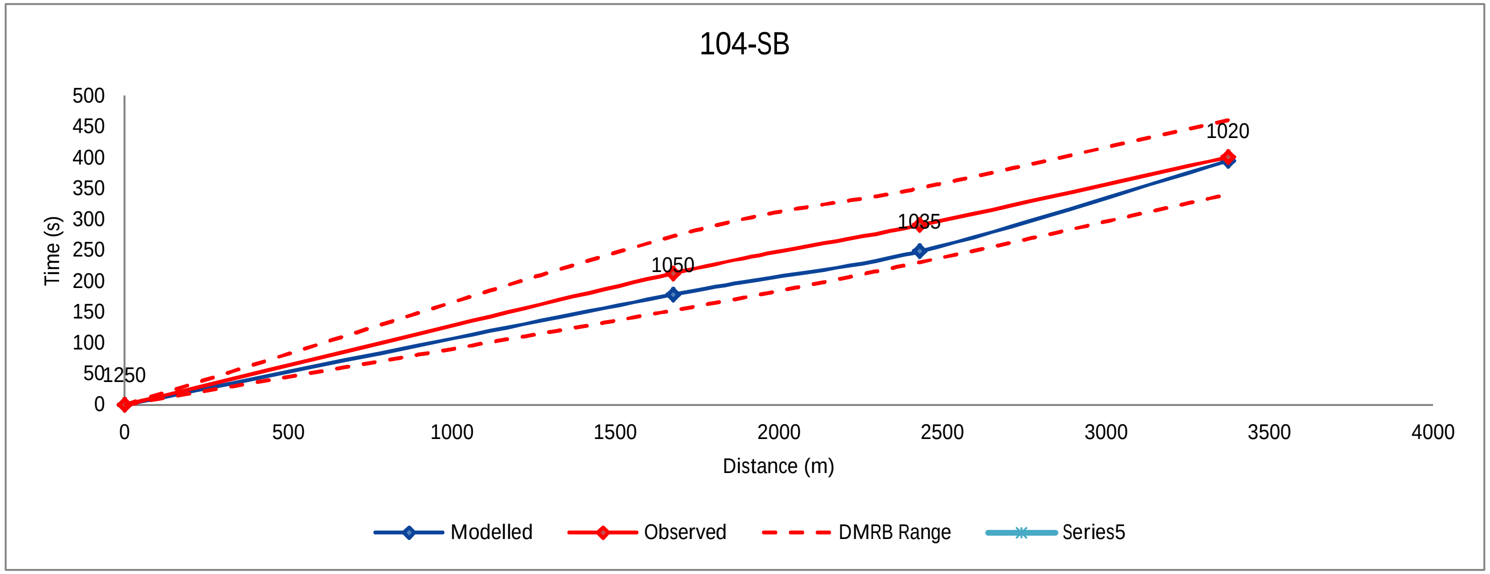

102-NB
Time (s)
900
800
700
600
500
400
300
200
100
0
6010
6050
6070
6080
6090
6230
6250
6270
4520
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5

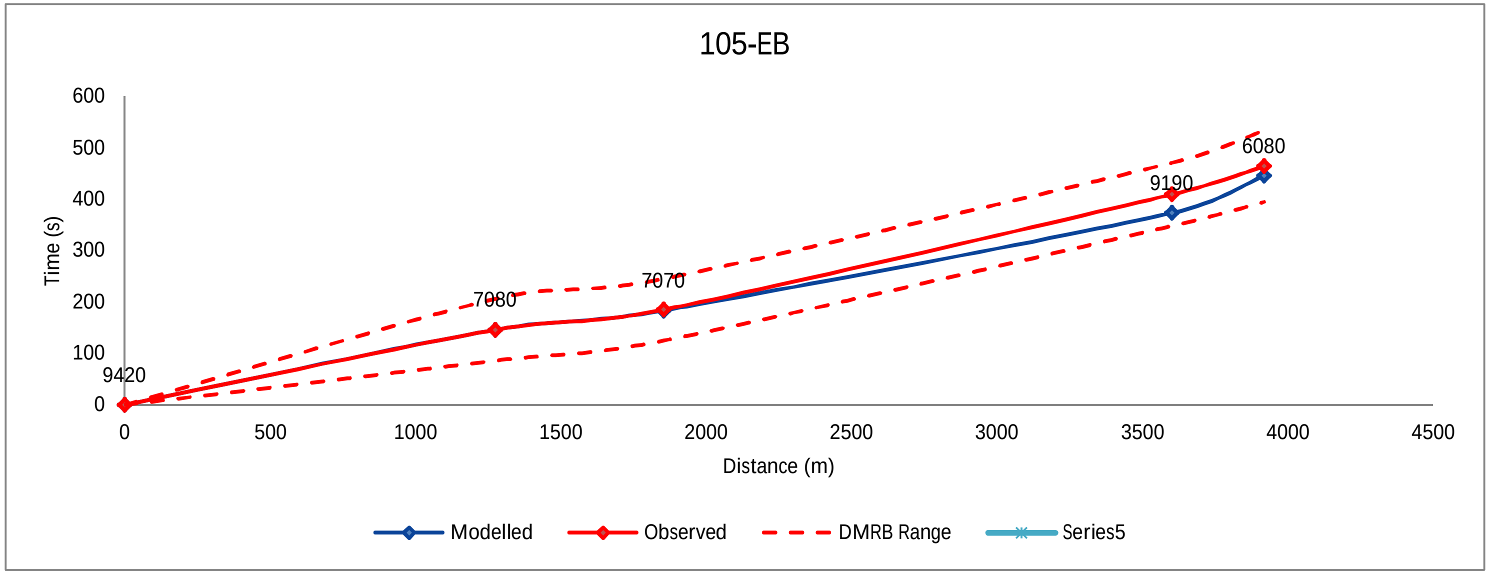

102-SB
Time (s)
1200
1000
800
600
400
200
0
4520
6270
6250
6230
6100
6080
6070
6050
6010
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5


103-EB
Time (s)
450
400
350
300
250
200
150
100
50
0
7000
7040
7060
9130
6070
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5

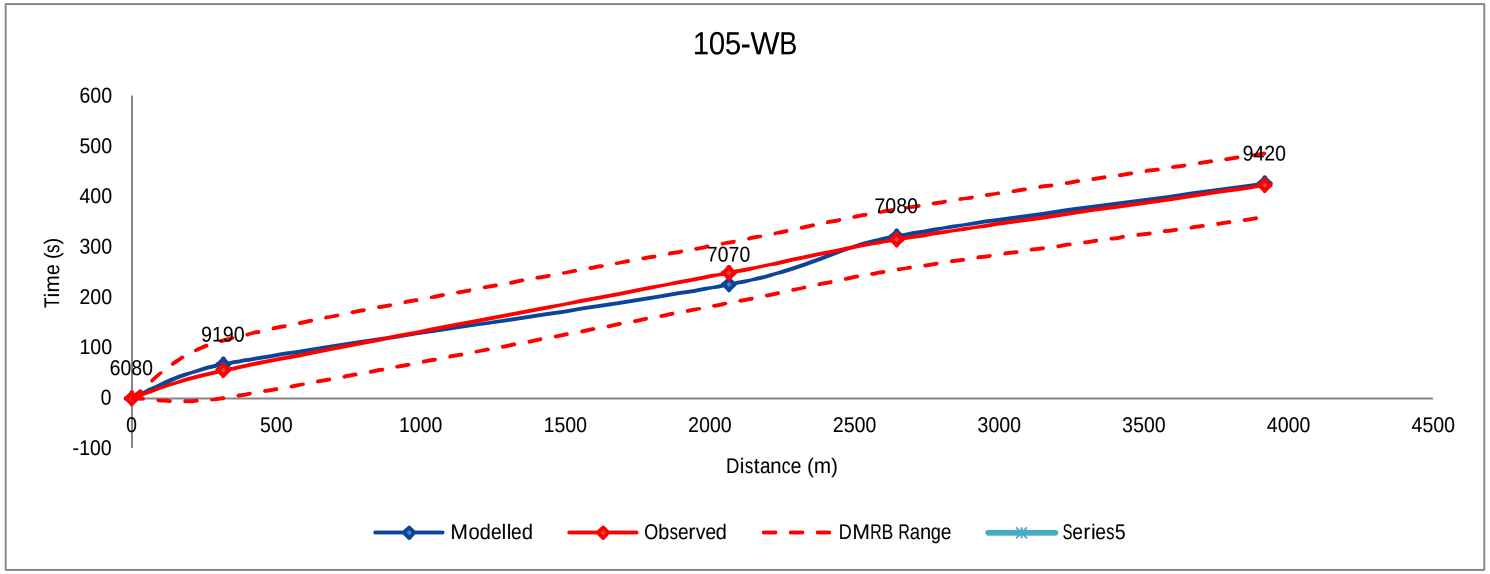

103-WB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
6070
9130
7060
7040
7000
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5


104-NB
Time (s)
800
700
600
500
400
300
200
100
0
1020
1035
1050
1230
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5

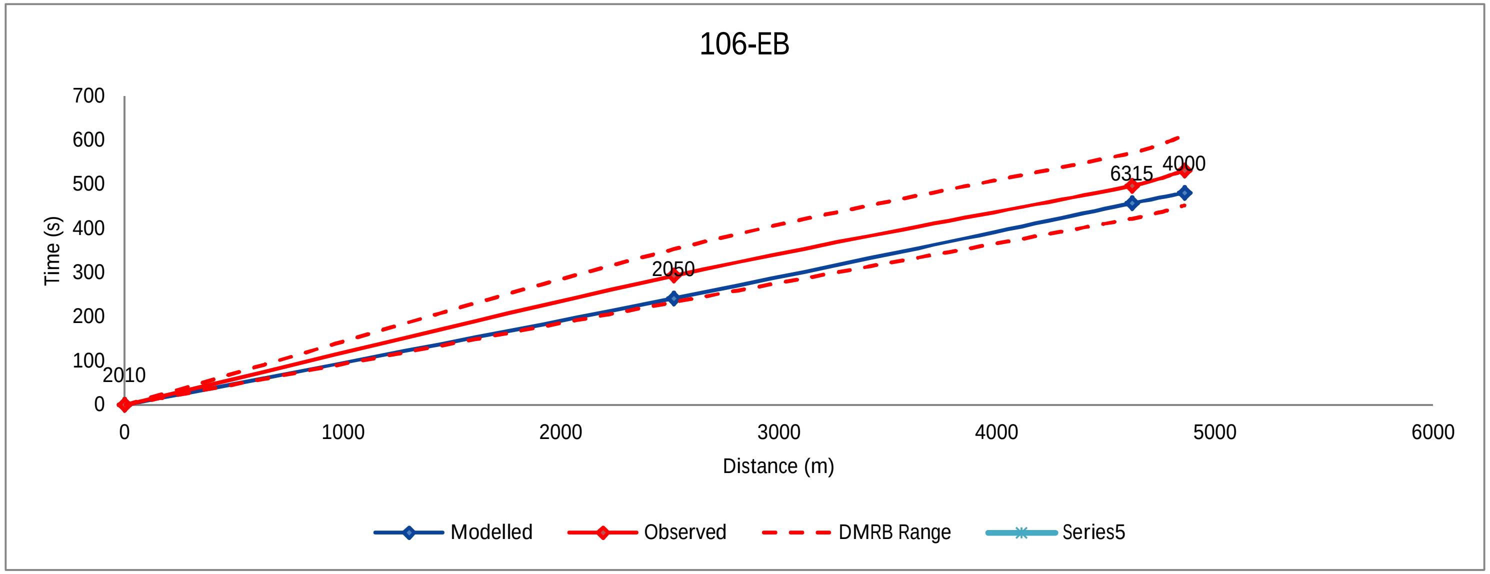

104-SB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
1250
1050
1035
1020
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
Modelled
Observed
DMRB Range
Series5

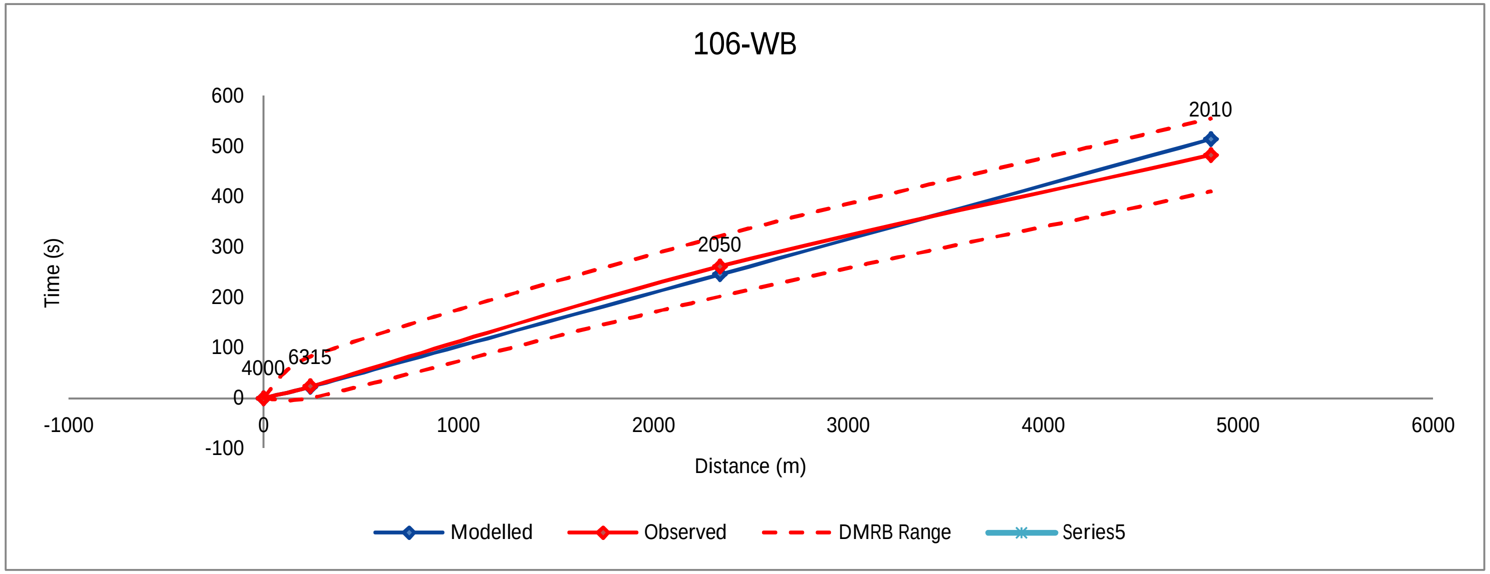


105-EB
Time (s)
600
500
400
300
200
100
0
9420
7080
7070
9190
6080
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Distance (m)
Modelled
Observed
DMRB Range
Series5

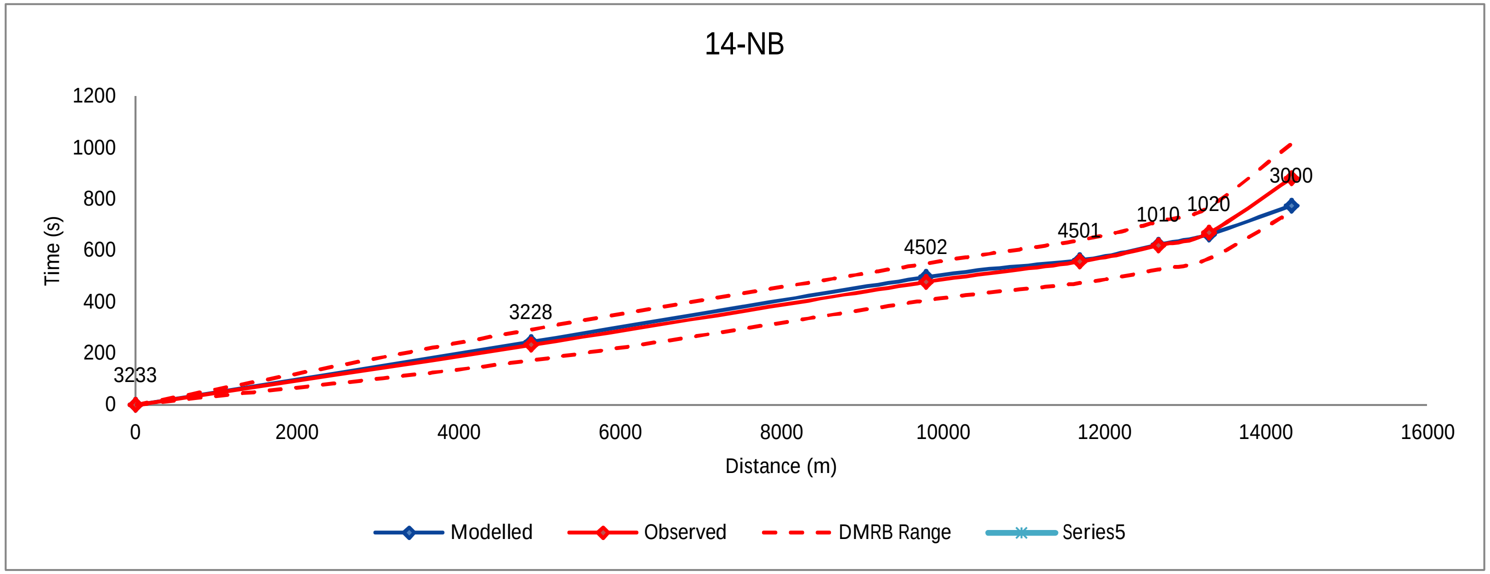


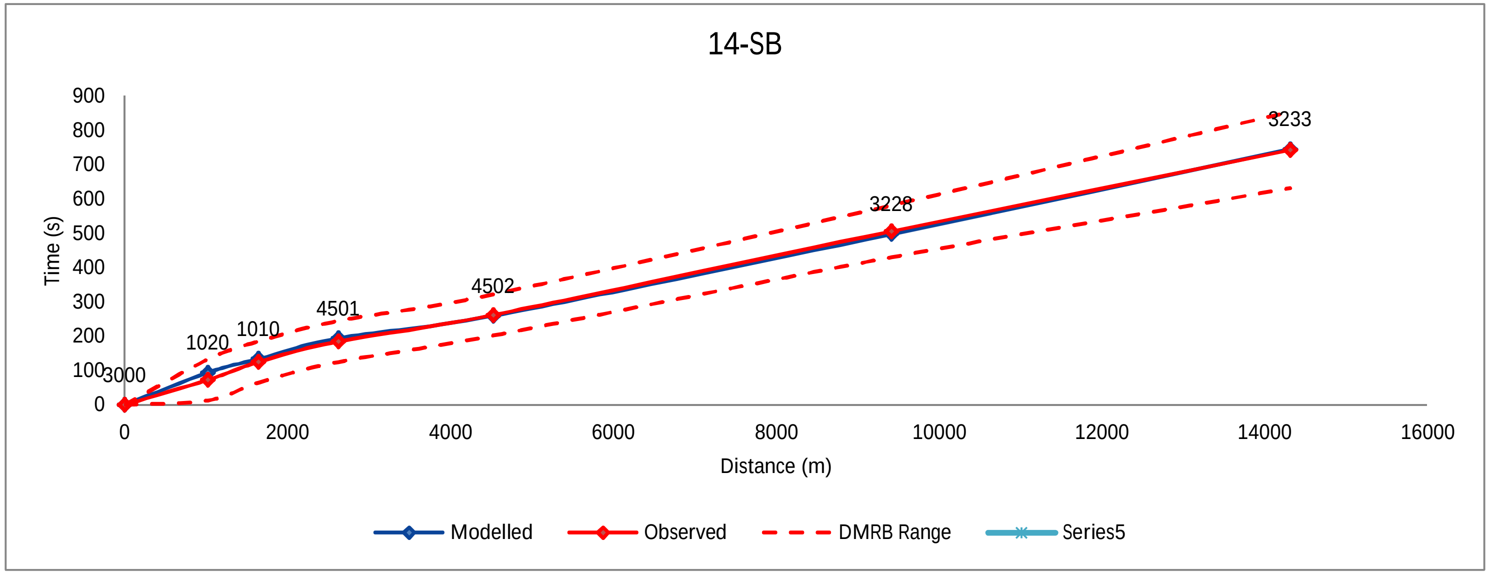
105-WB
Time (s)
600
500
400
300
200
100
0
-100
6080
9190
7070
7080
9420
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Distance (m)
Modelled
Observed
DMRB Range
Series5

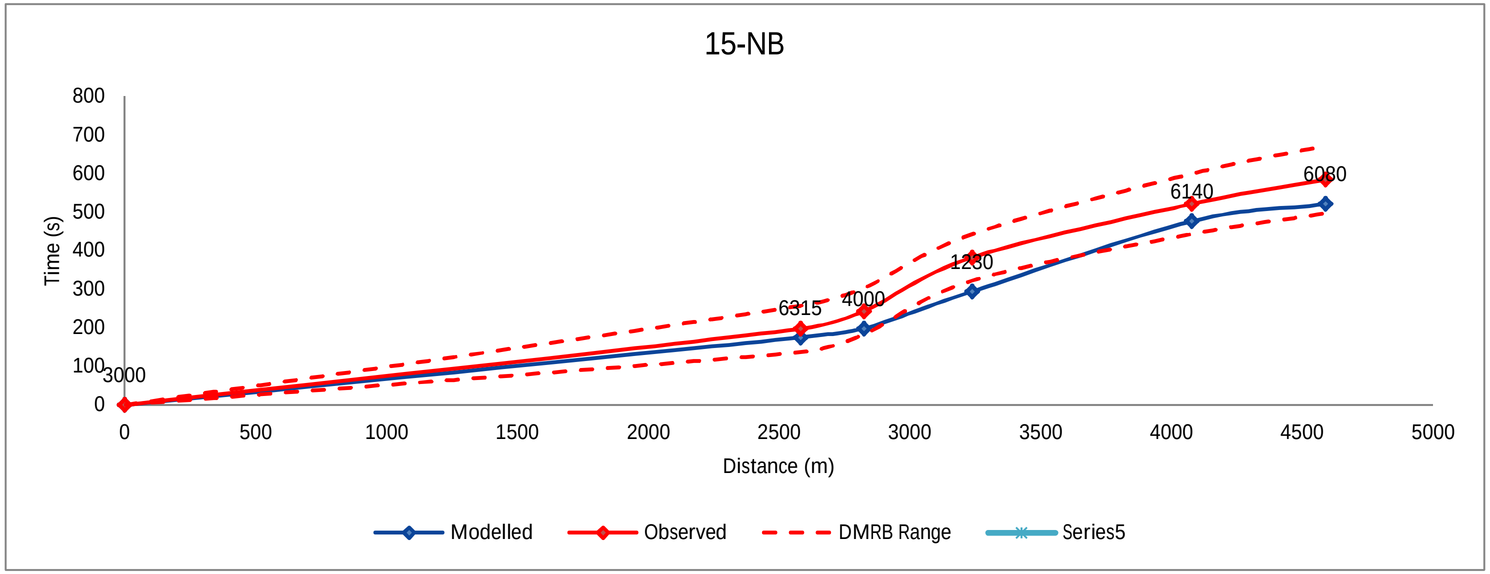

106-EB
Time (s)
700
600
500
400
300
200
100
0
2010
2050
6315
4000
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

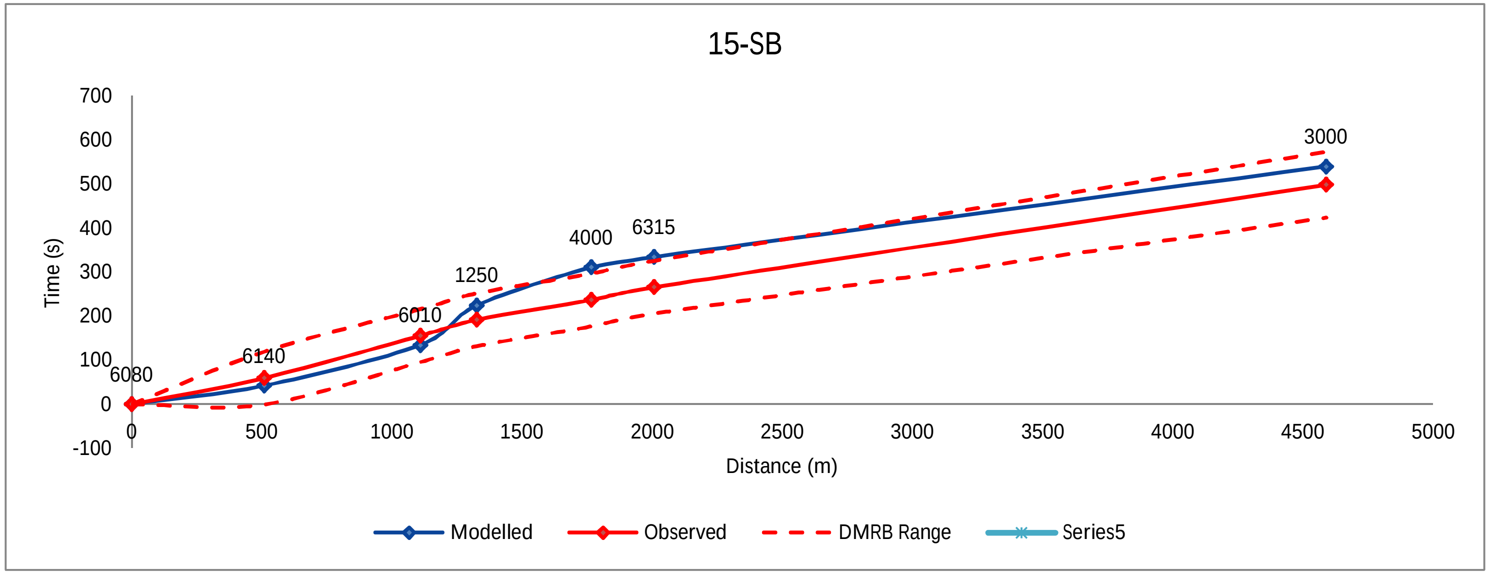

106-WB
Time (s)
600
500
400
300
200
100
0
-100
4000
6315
2050
2010
-1000
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

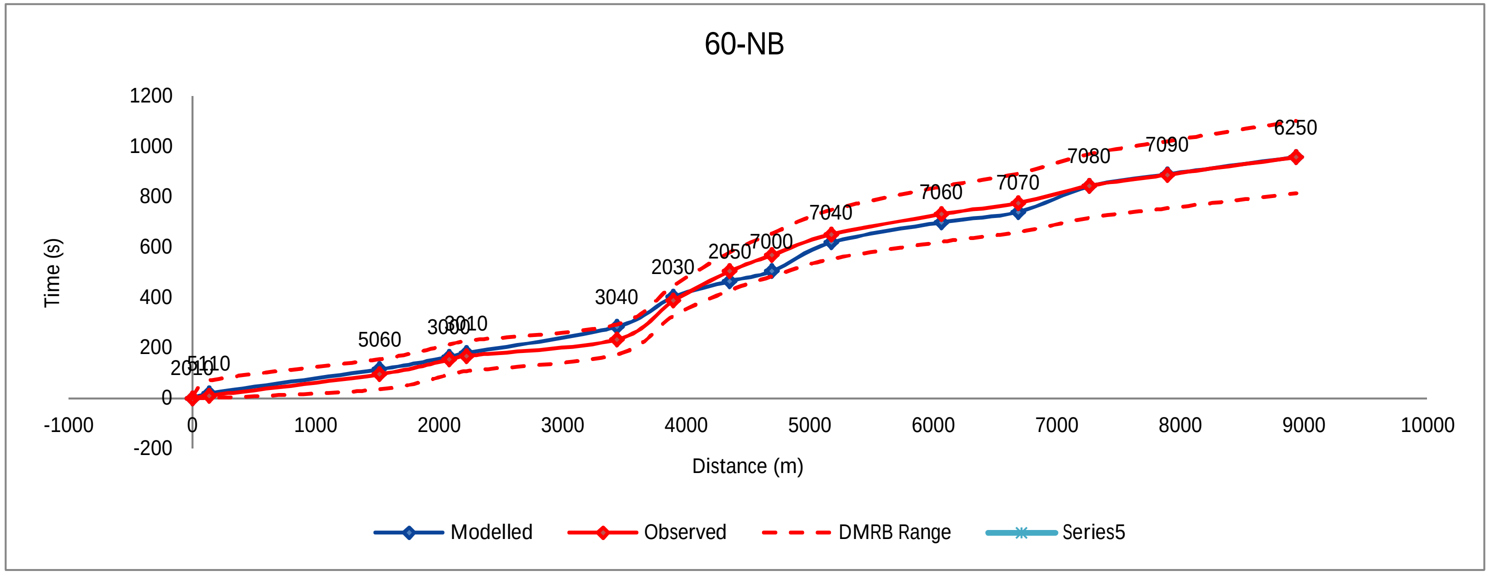
PM Peak

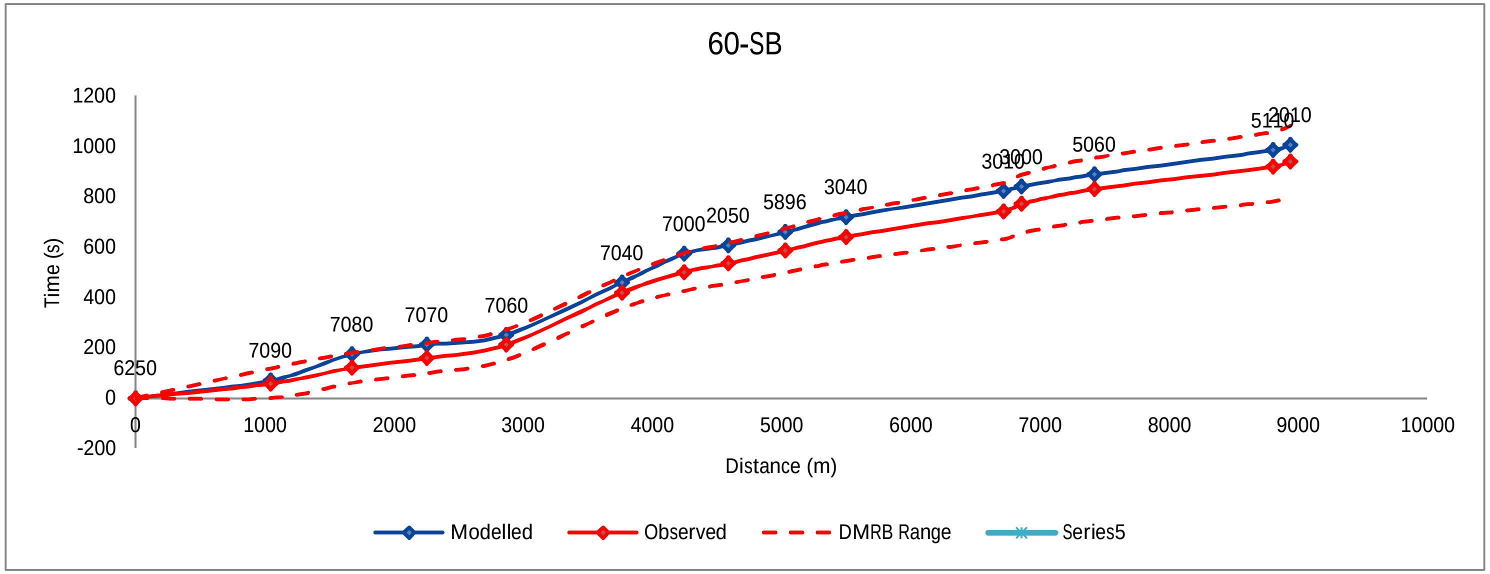

14-NB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3233
3228
4502
4501
1010
1020
3000
Modelled
Observed
DMRB Range
Series5

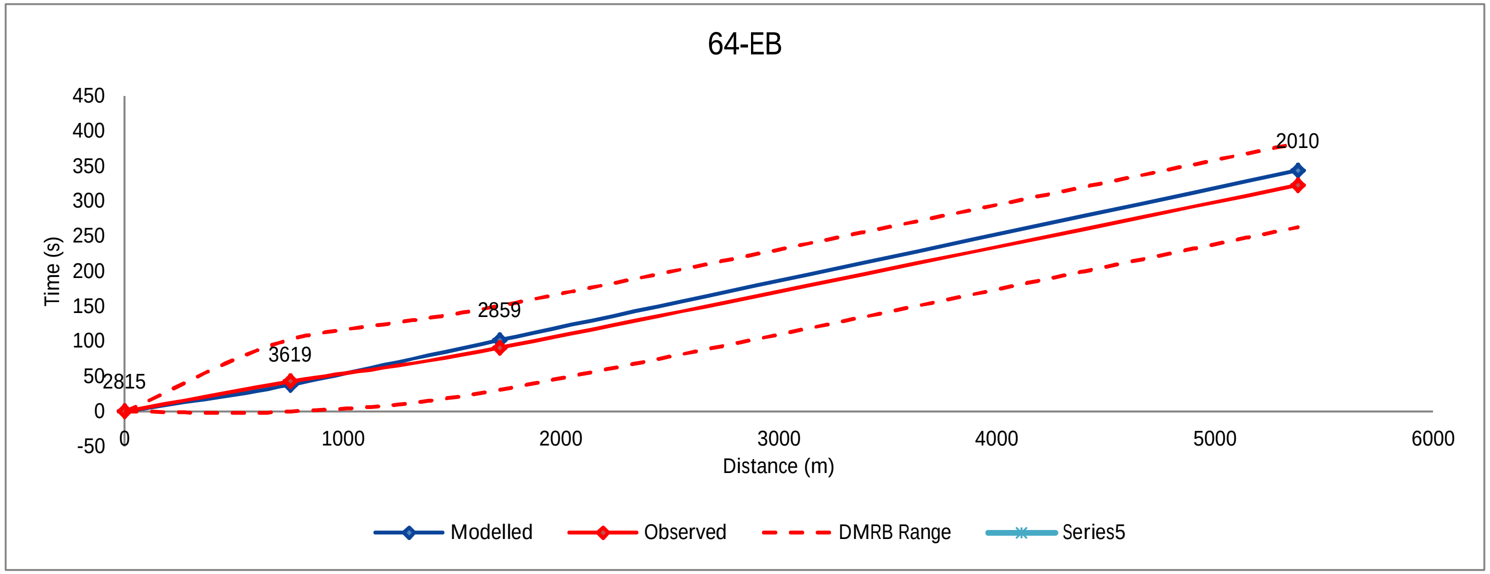

14-SB
Time (s)
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3000
1020
1010
4501
4502
3228
3233
Modelled
Observed
DMRB Range
Series5

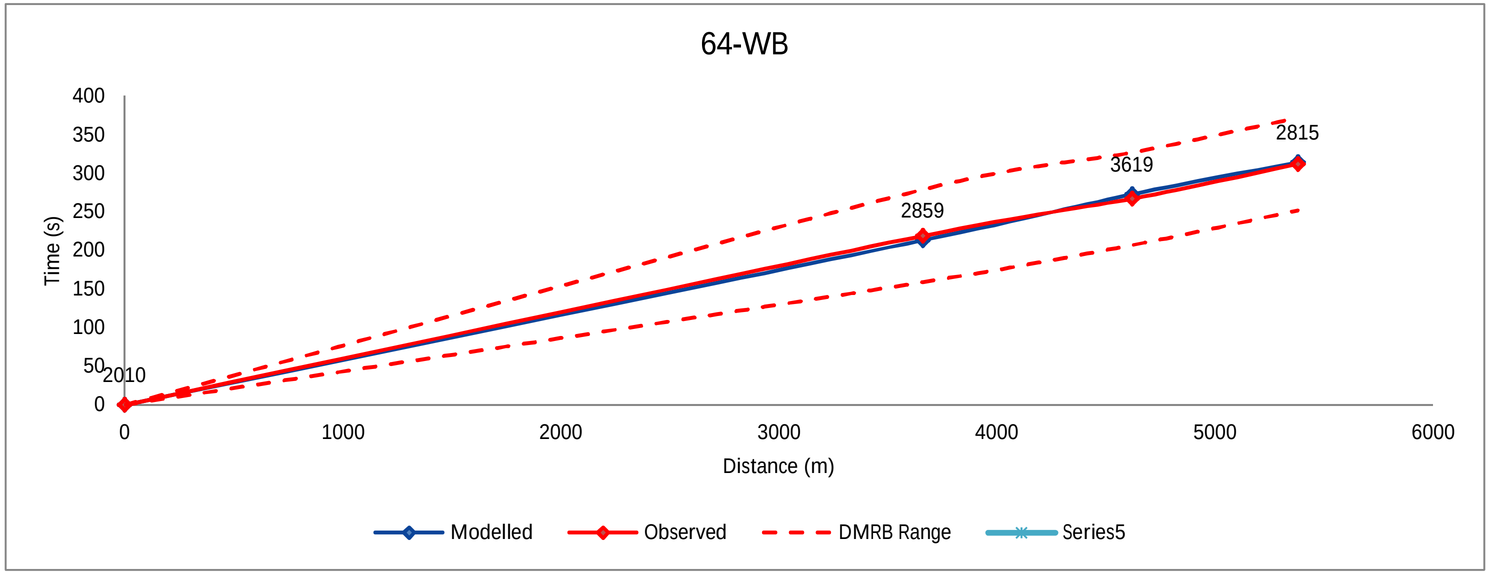

15-NB
Time (s)
800
700
600
500
400
300
200
100
0
3000
6315
4000
1280
6140
6080
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

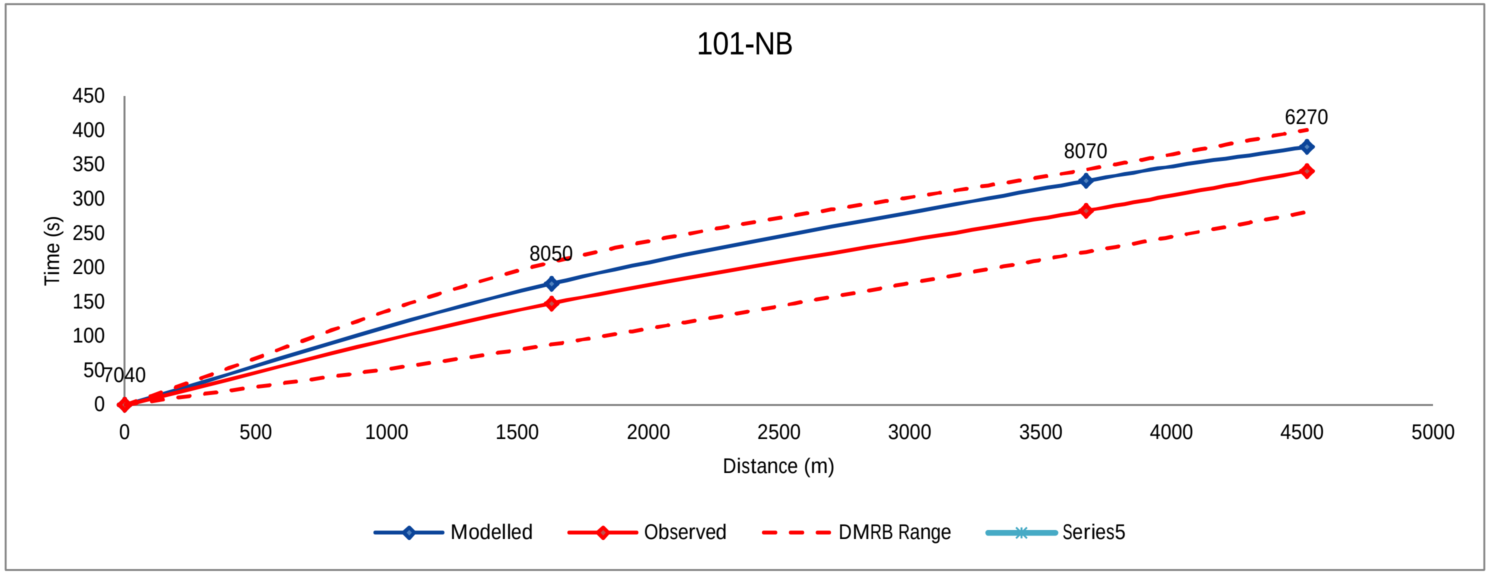

15-SB
Time (s)
700
600
500
400
300
200
100
0
-100
6080
6140
6010
1250
4000
6315
3000
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

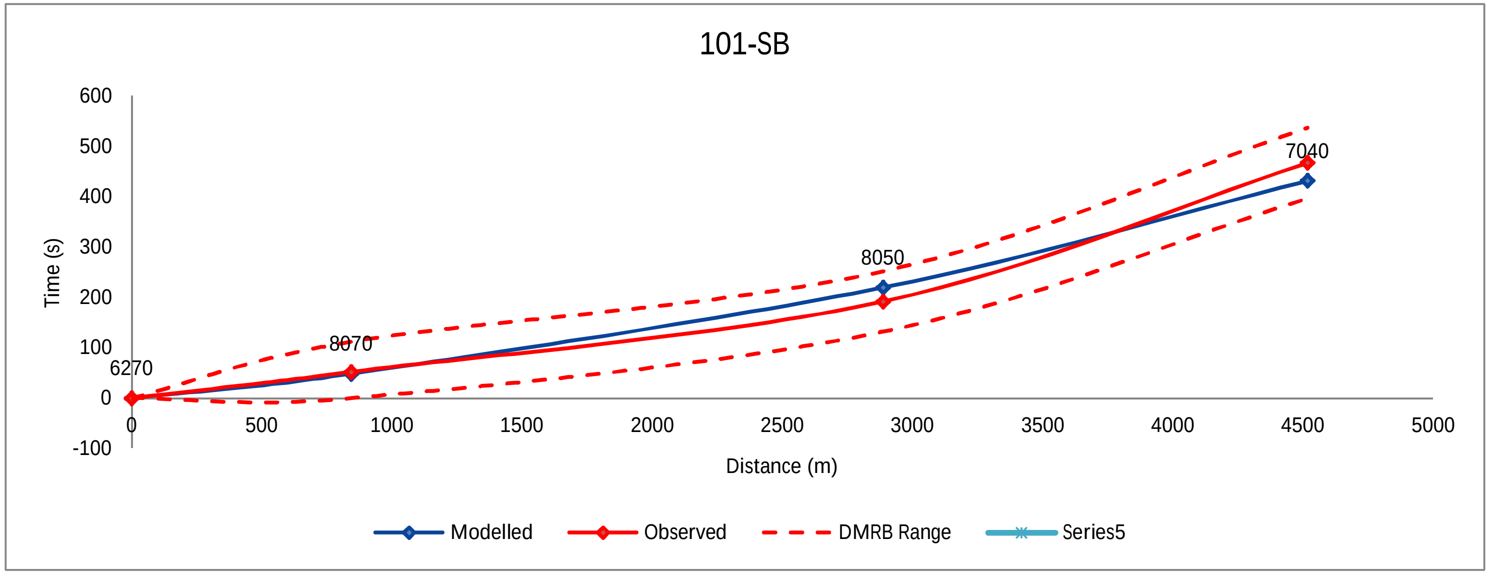

60-NB
Time (s)
1200
1000
800
600
400
200
0
-200
-1000
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
2010
5110
5060
3000
3010
3040
2030
2050
7000
7040
7060
7070
7080
7090
6250
Modelled
Observed
DMRB Range
Series5

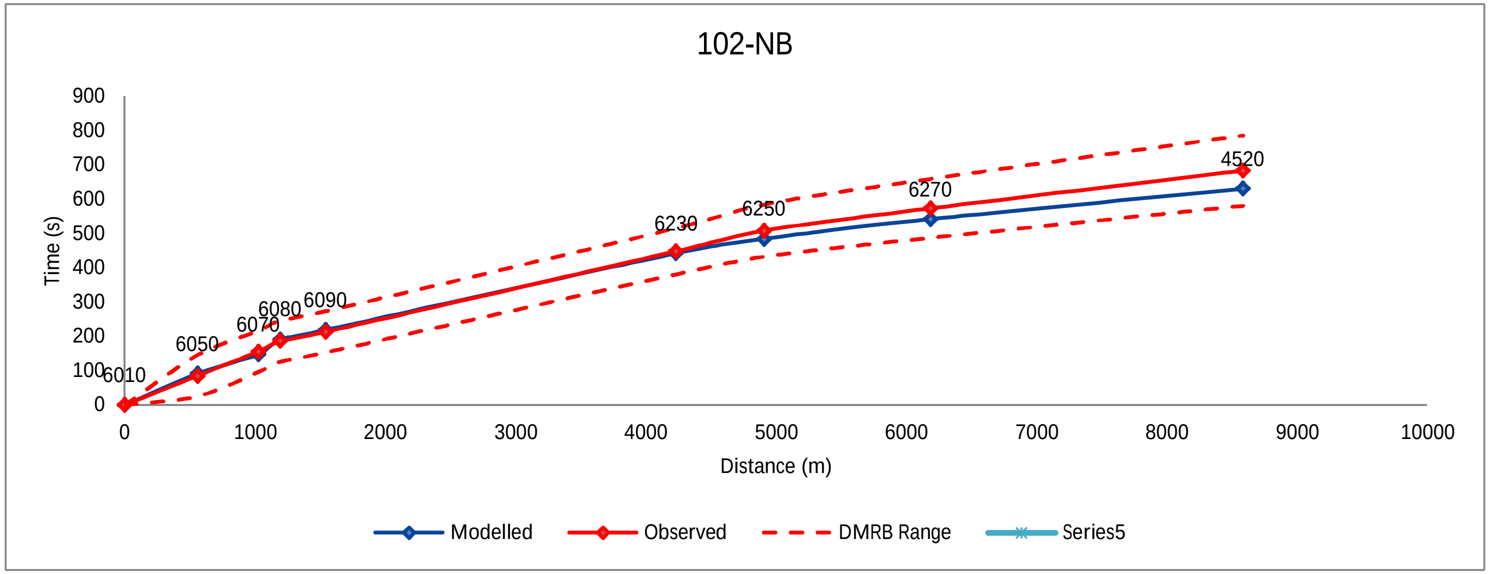

60-SB
Time (s)
1200
1000
800
600
400
200
0
-200
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
6250
7090
7080
7070
7060
7040
7000
2050
5896
3040
3010
3000
5060
5110
2010
Modelled
Observed
DMRB Range
Series5

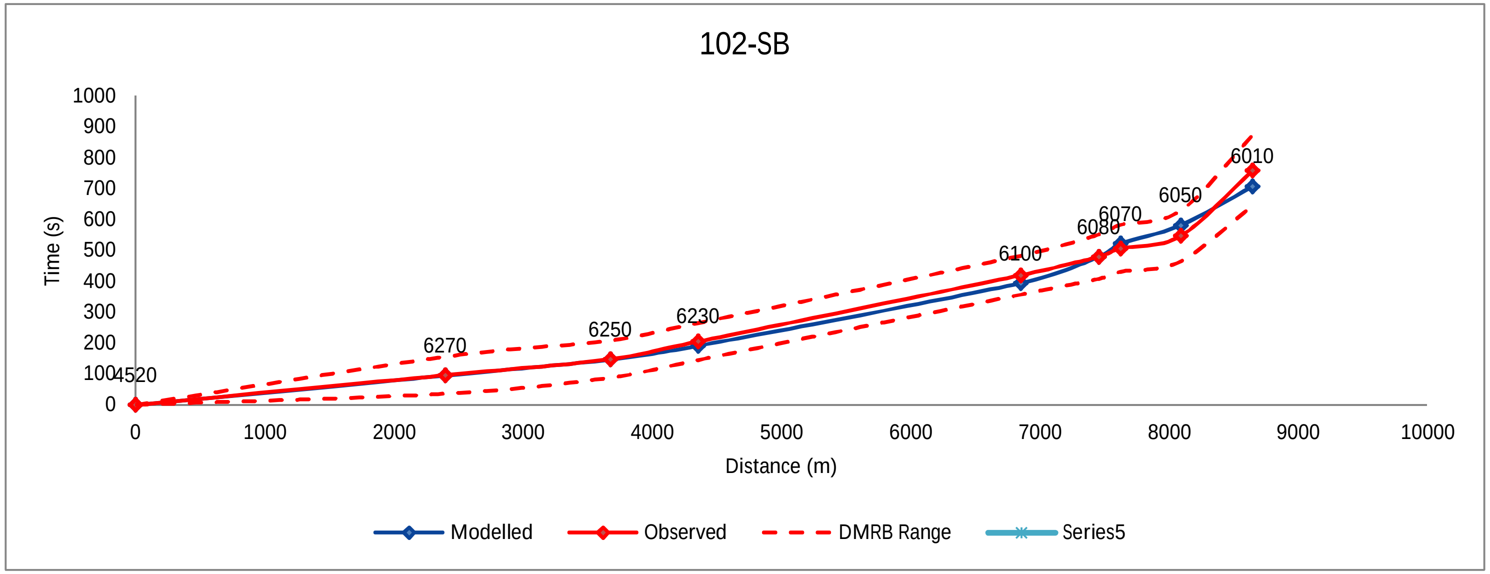

64-EB
Time (s)
Distance (m)
2815
3619
2859
2010
Modelled
Observed
DMRB Range
Series5

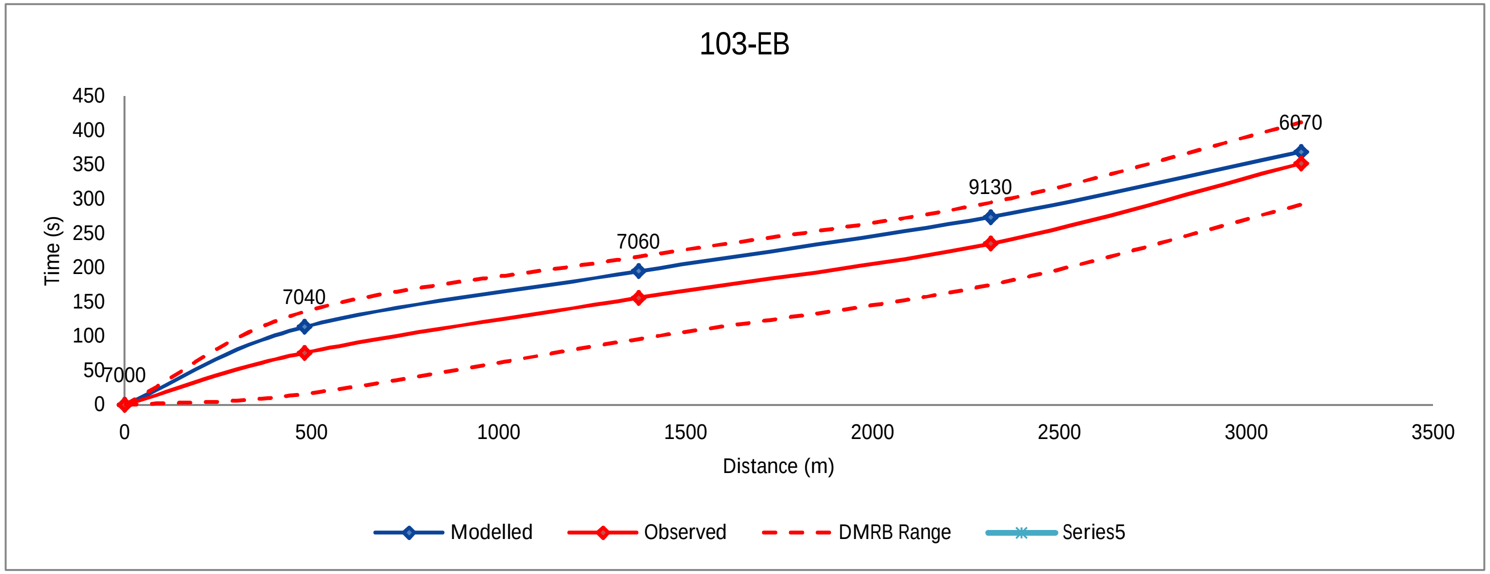

64-WB
Time (s)
Distance (m)
2010
2859
3619
2815
Modelled
Observed
DMRB Range
Series5

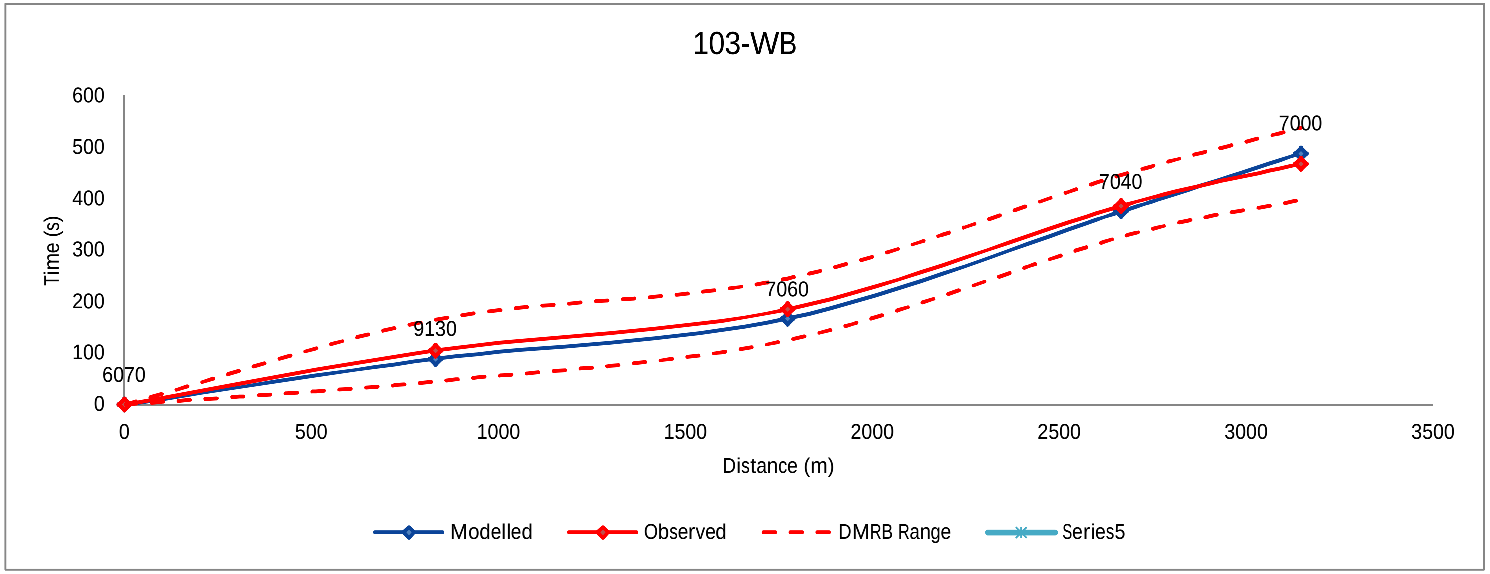

101-NB
Time (s)
450
400
350
300
250
200
150
100
50
0
7040
8050
8070
6270
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

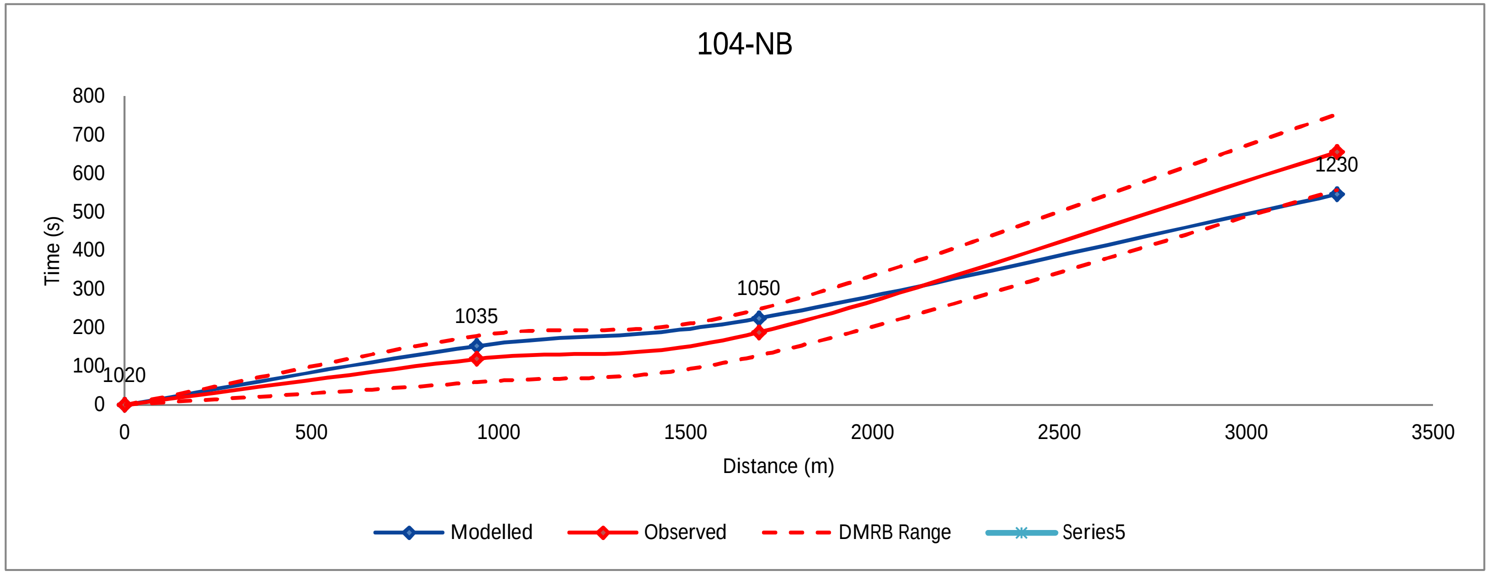

101-SB
Time (s)
600
500
400
300
200
100
0
-100
6270
8070
8050
7040
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

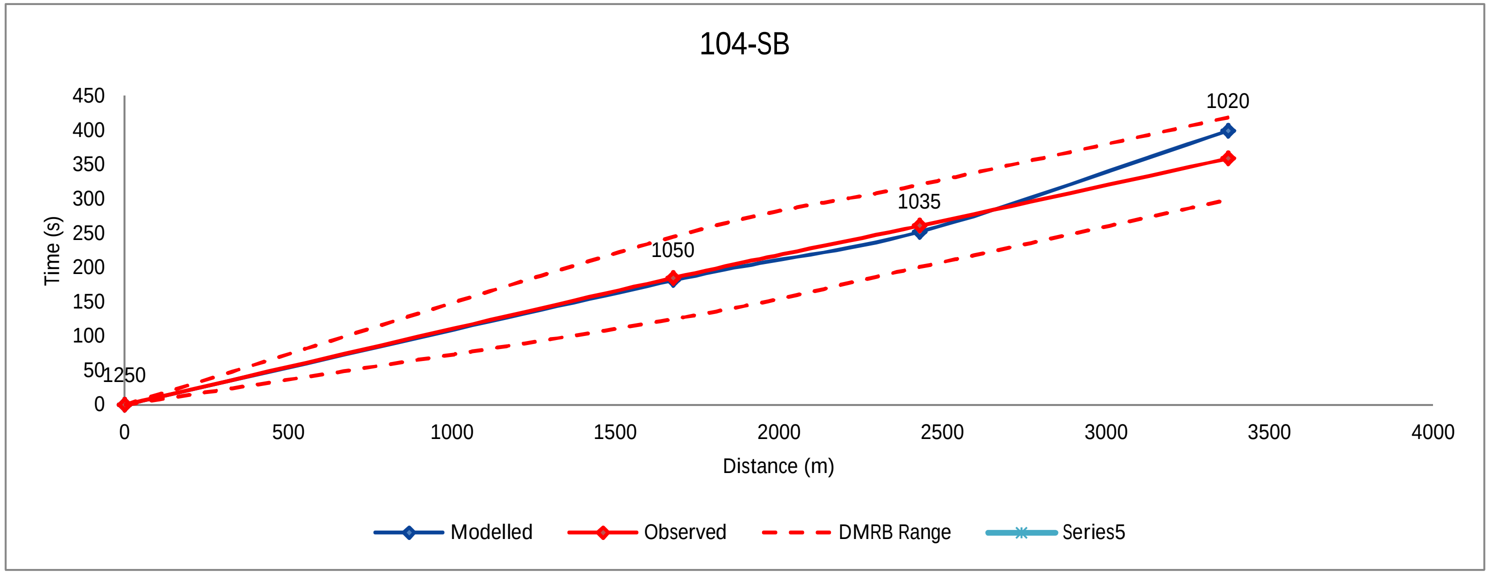

102-NB
Time (s)
Distance (m)
6010
6050
6070
6080
6090
6230
6250
6270
4520
Modelled
Observed
DMRB Range
Series5

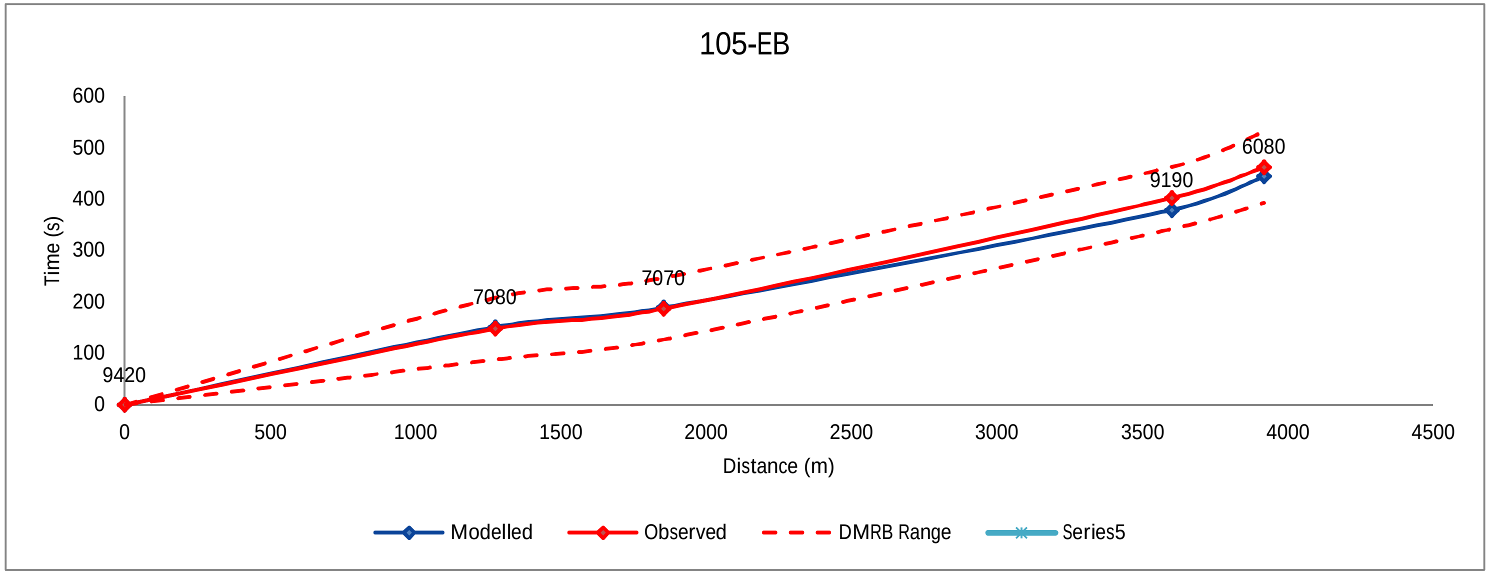

102-SB
Time (s)
Distance (m)
4520
6270
6250
6230
6100
6080
6070
6050
6010
Modelled
Observed
DMRB Range
Series5

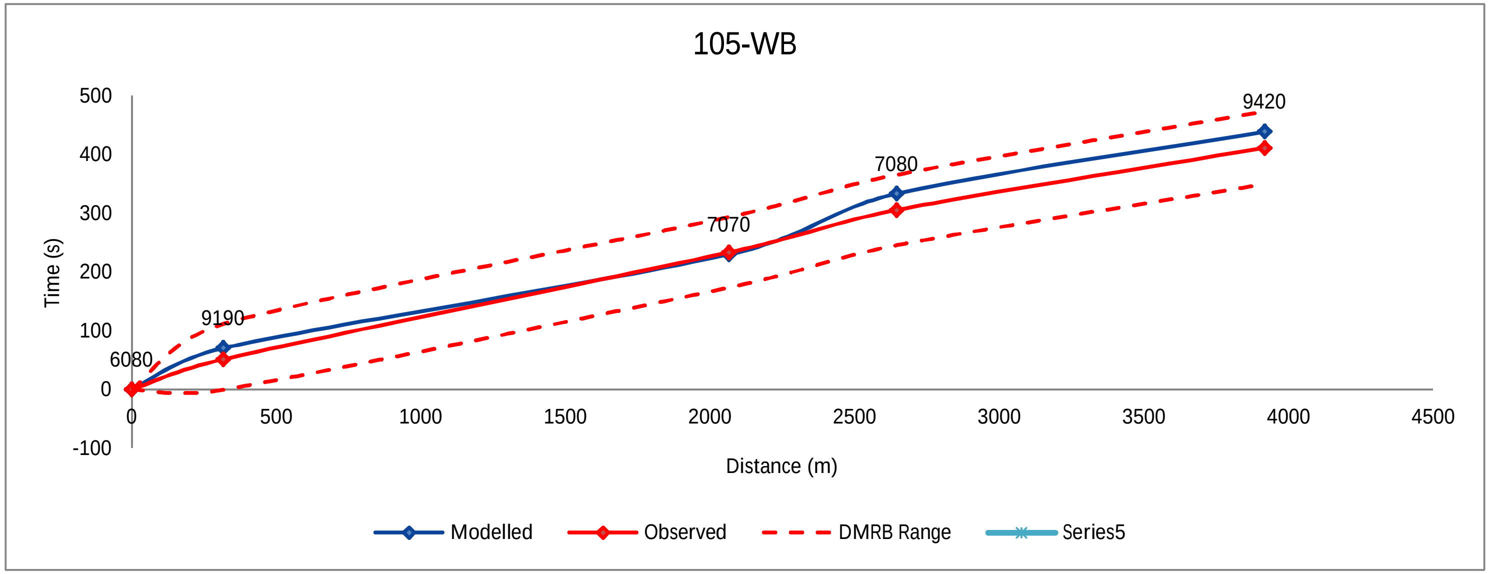

103-EB
Time (s)
450
400
350
300
250
200
150
100
50
0
7000
7040
7060
9130
6070
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5

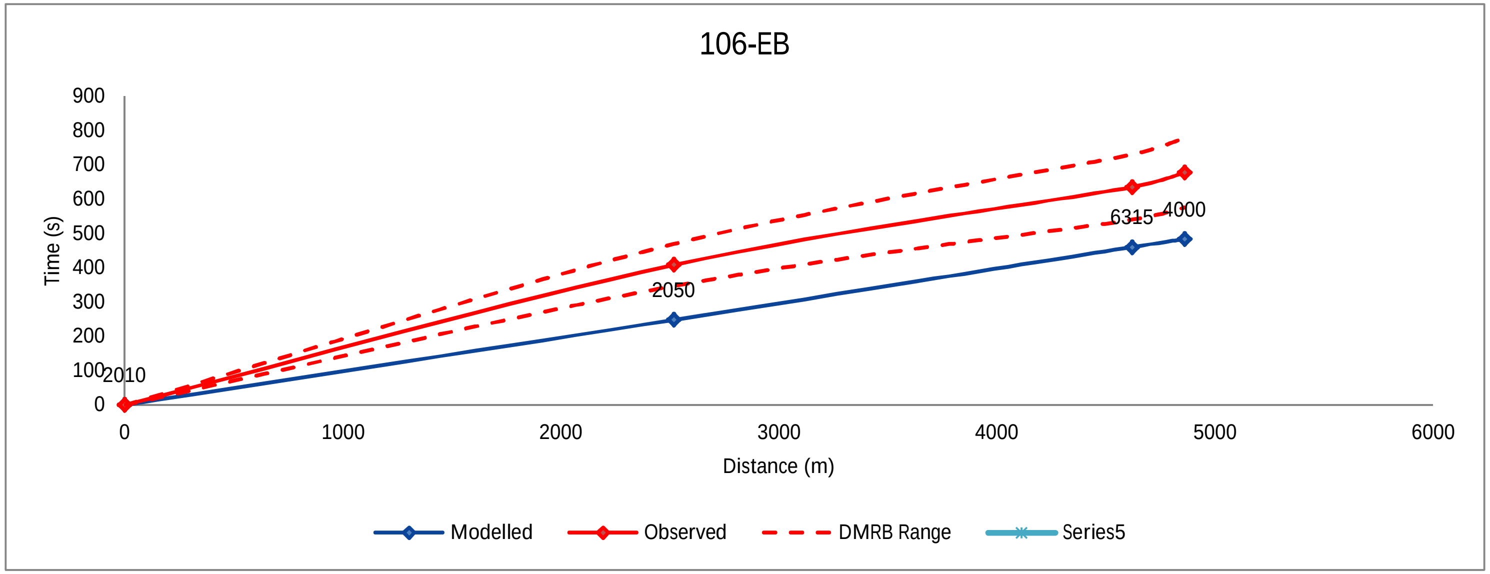

103-WB
Time (s)
600
500
400
300
200
100
0
6070
9130
7060
7040
7000
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5

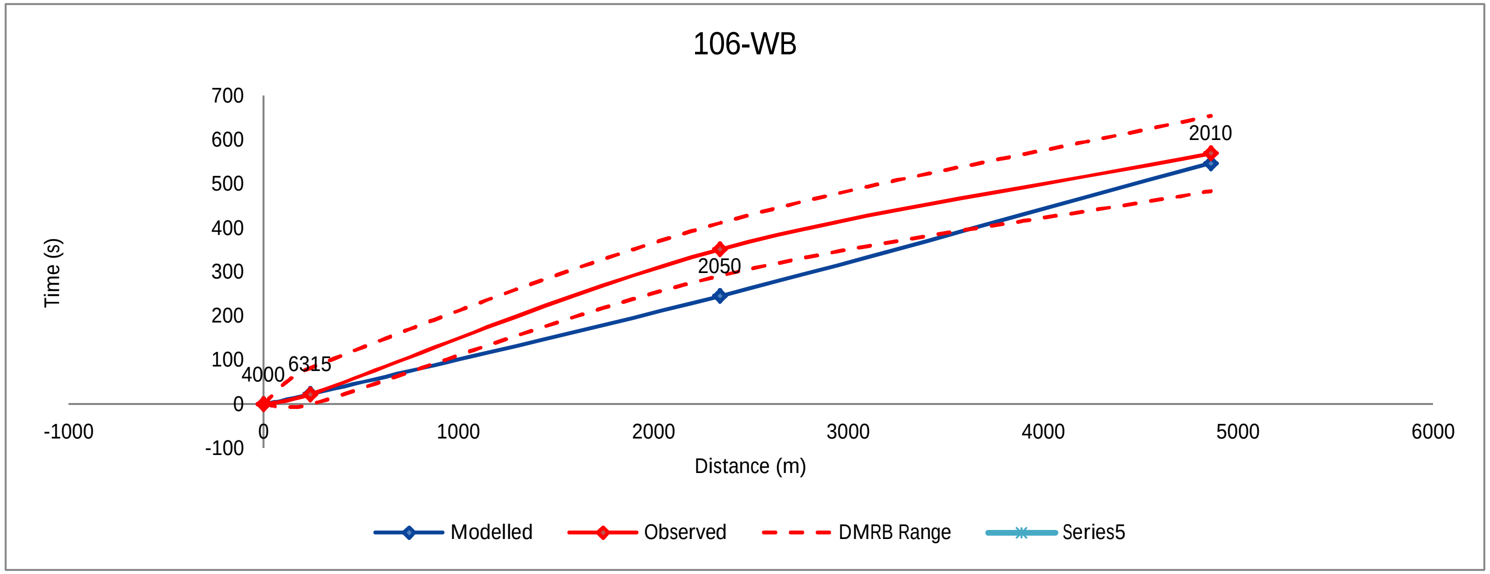

104-NB
Time (s)
800
700
600
500
400
300
200
100
0
1020
1035
1050
1230
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5


104-SB
Time (s)
450
400
350
300
250
200
150
100
50
0
1250
1050
1035
1020
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
Modelled
Observed
DMRB Range
Series5


105-EB
Time (s)
Distance (m)
9420
7080
7070
9190
6080
Modelled
Observed
DMRB Range
Series5


105-WB
Time (s)
Distance (m)
6080
9190
7070
7080
9420
Modelled
Observed
DMRB Range
Series5


106-EB
900
800
700
600
500
400
300
200
100
0
Time (s)
2010
2050
6315
4000
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

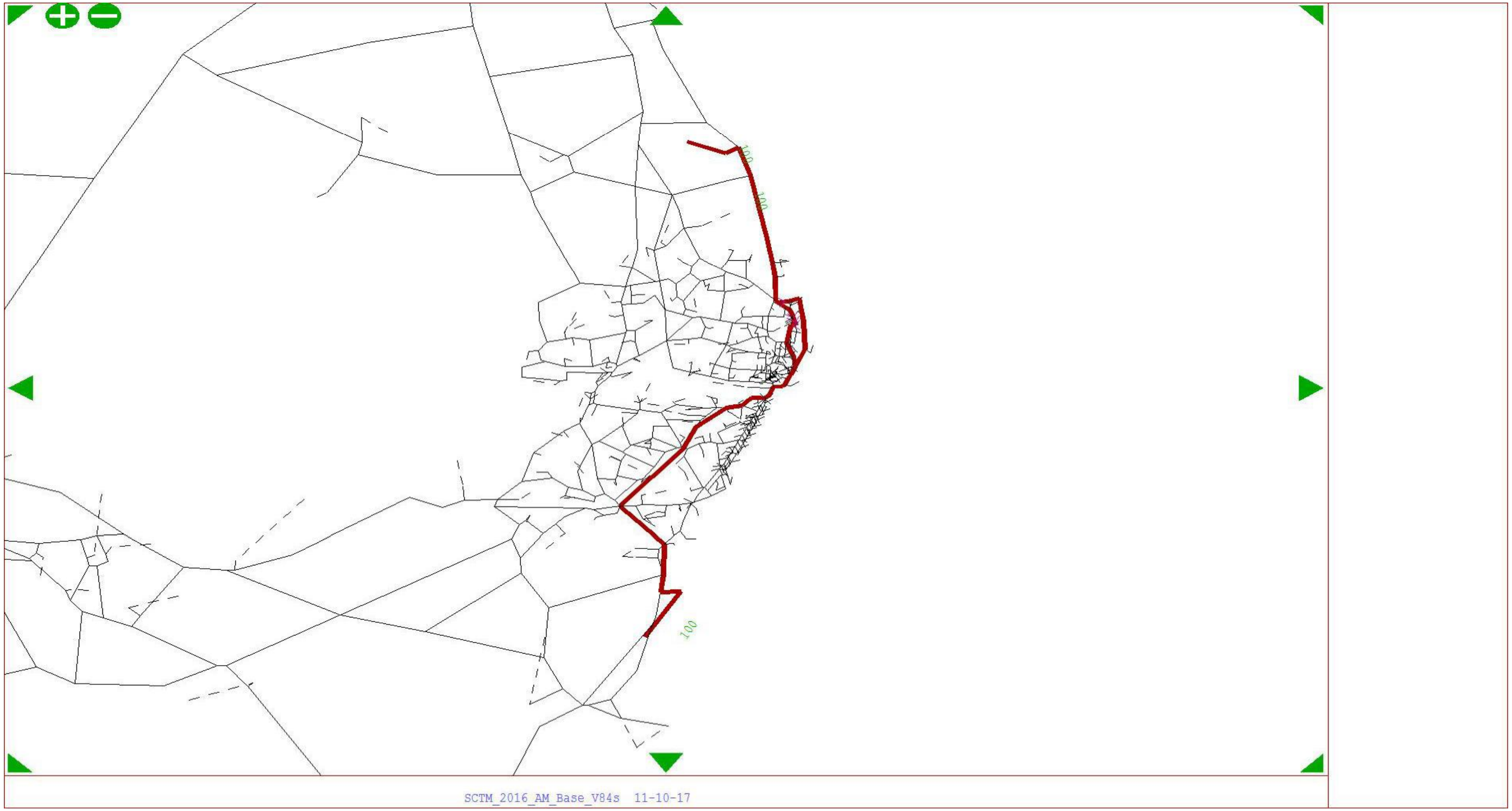

106-WB
700
600
500
400
300
200
100
0
-100
Time (s)
4000
6315
2050
2010
-1000
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

Appendix D

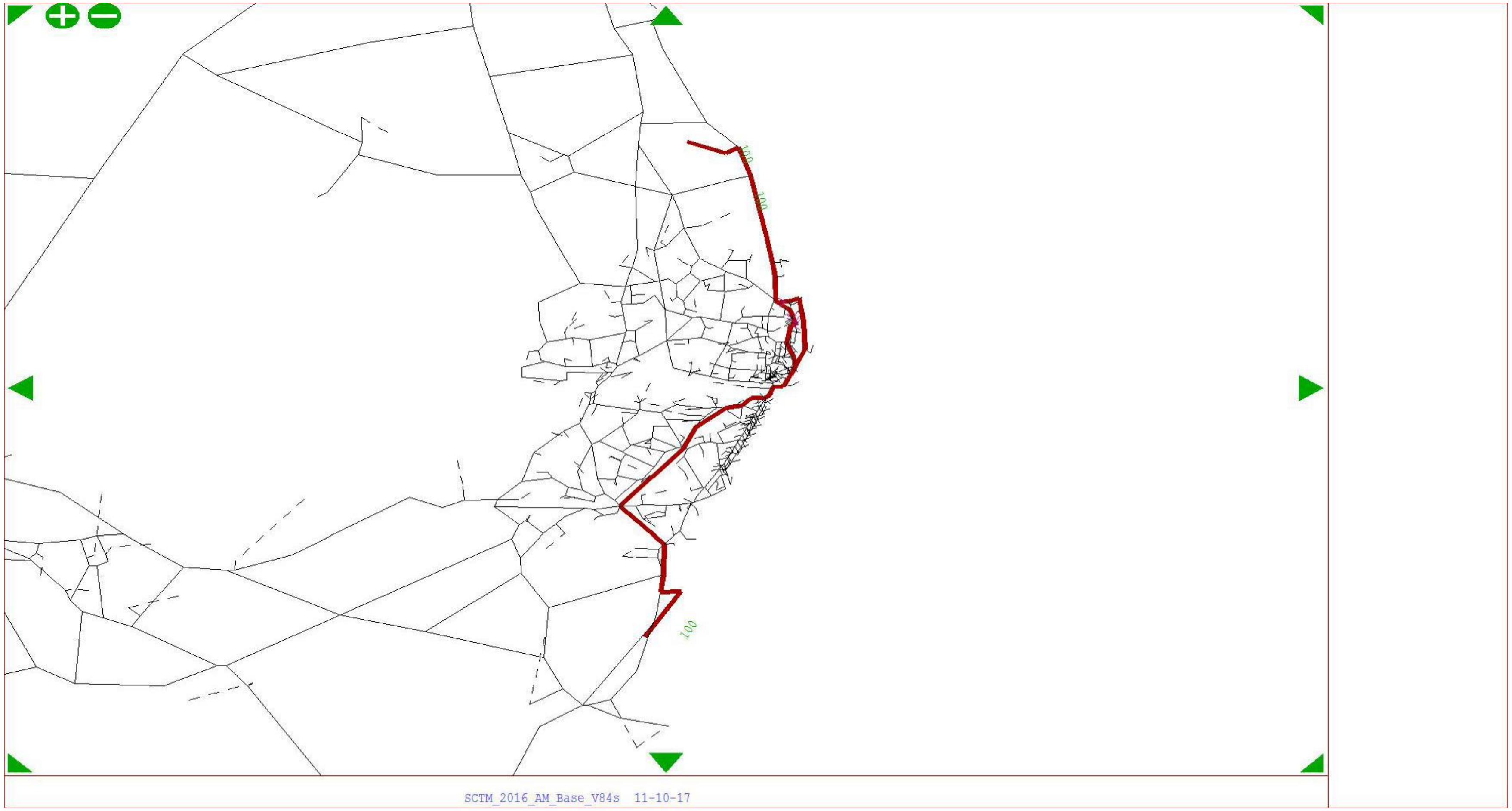
ROUTE CHOICE VALIDATION

AM Peak

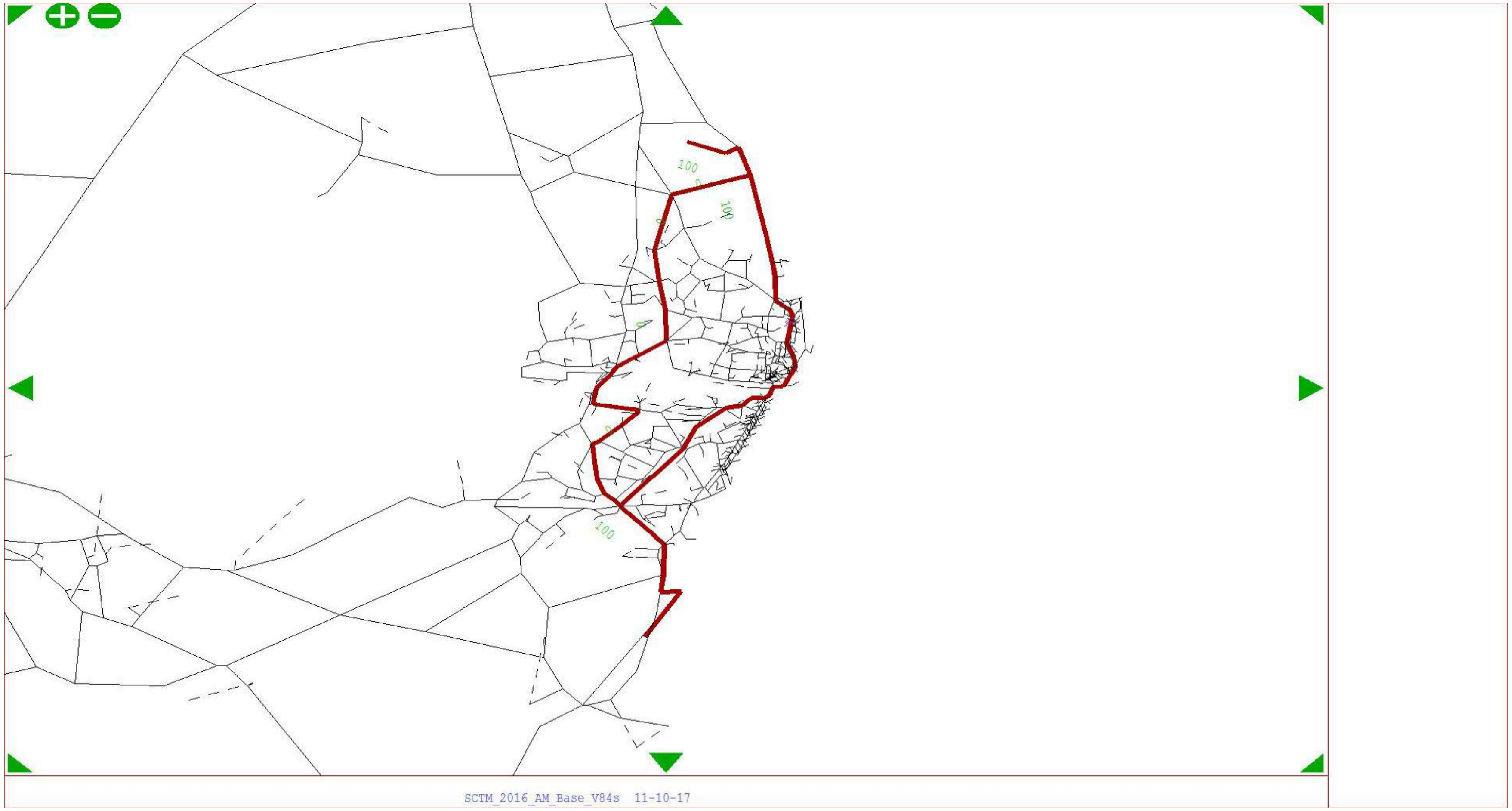
From Zone 408 To Zone 465 - User Class 2



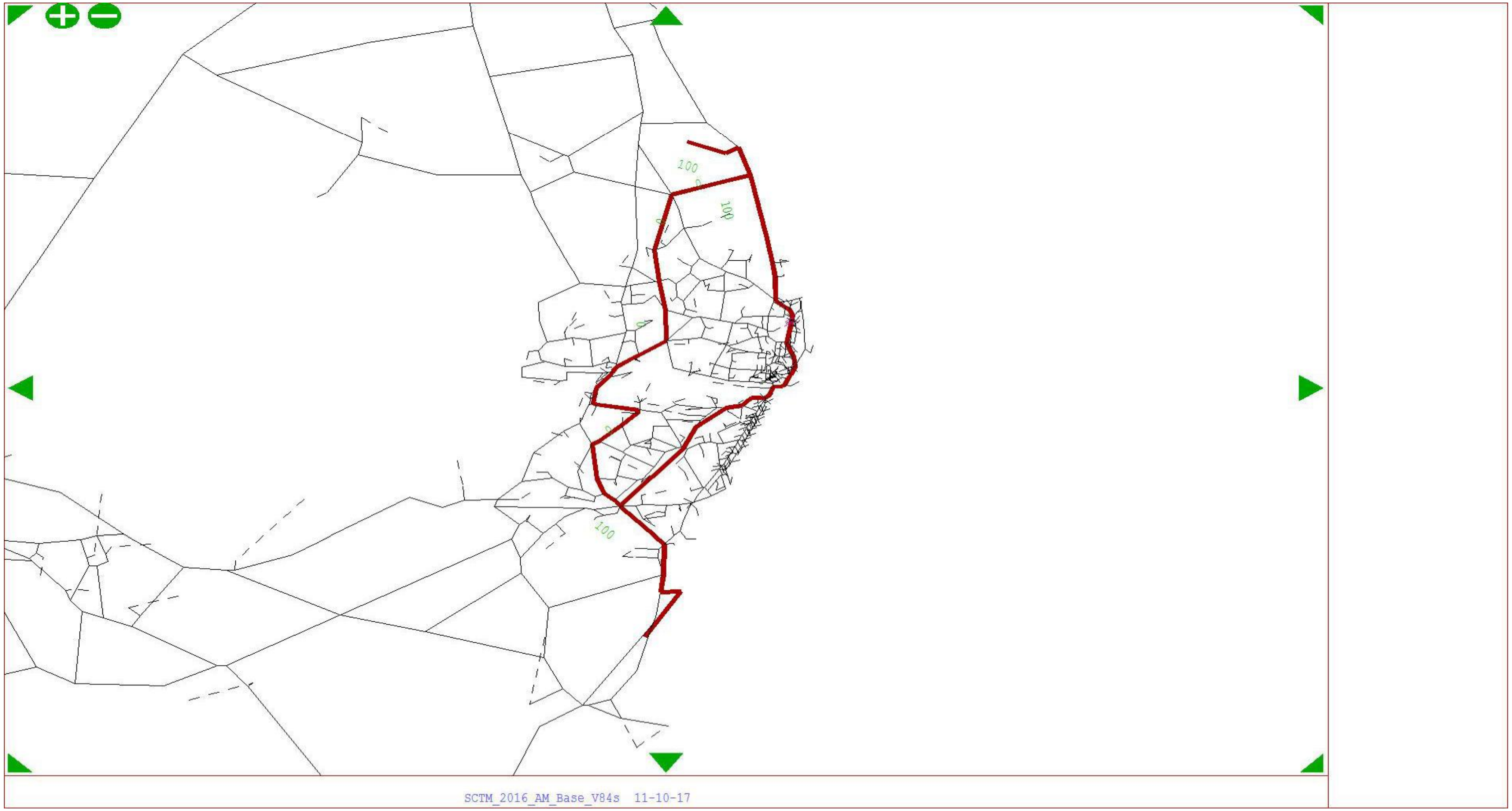
From Zone 408 To Zone 465 - User Class 10



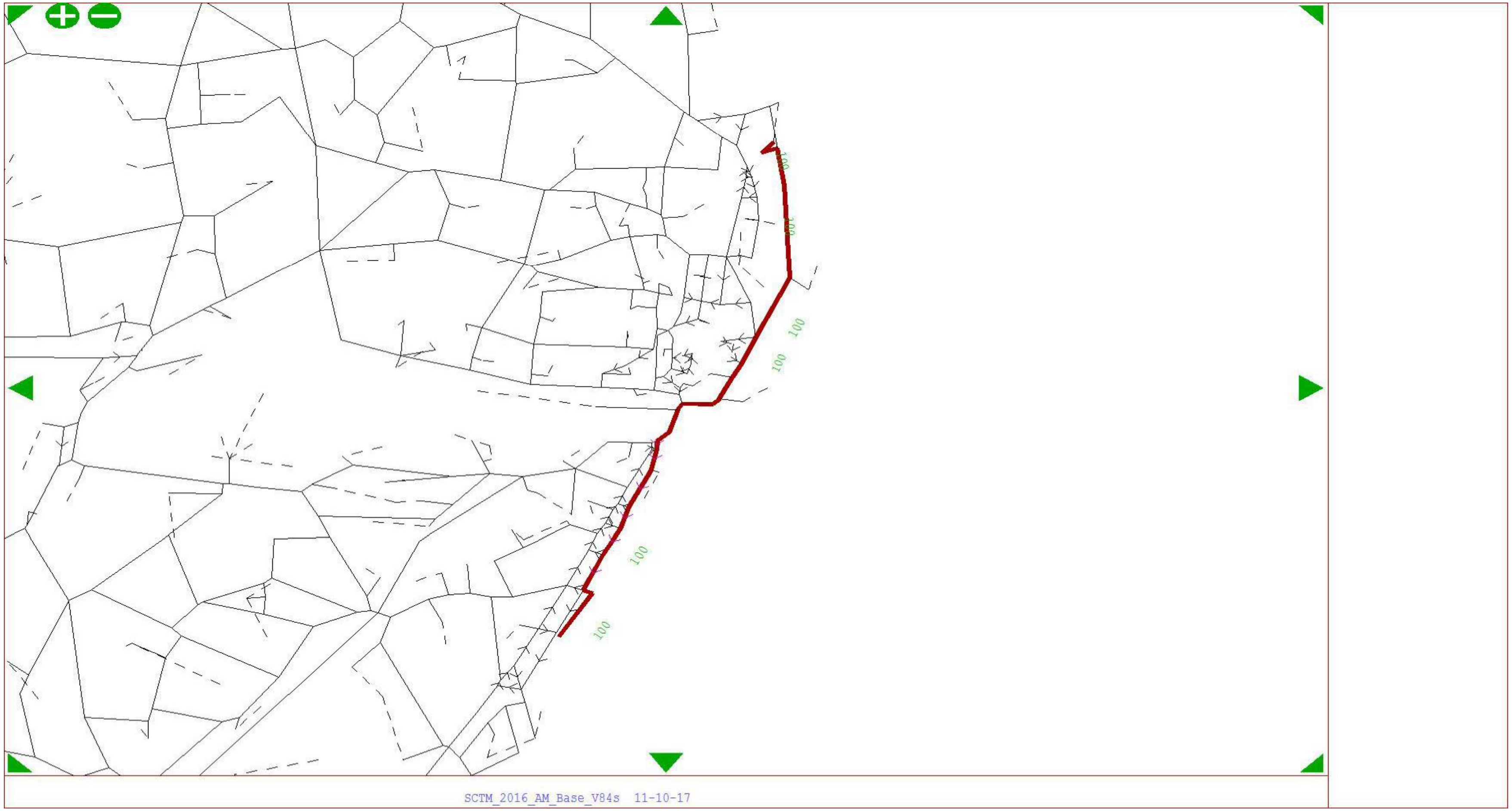
From Zone 465 To Zone 408 - User Class 2



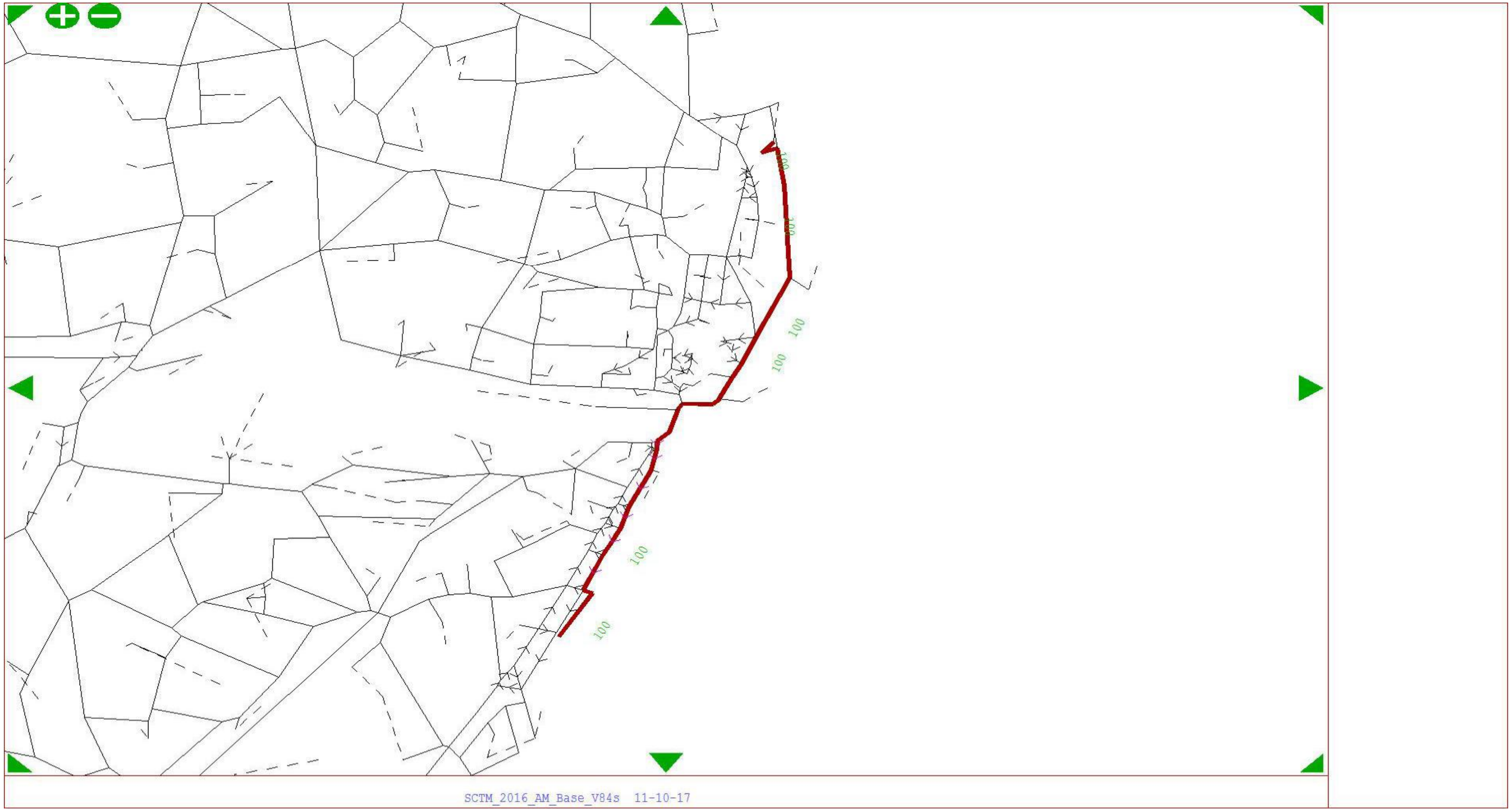
From Zone 465 To Zone 408 - User Class 10



From Zone 84 To Zone 593 - User Class 2



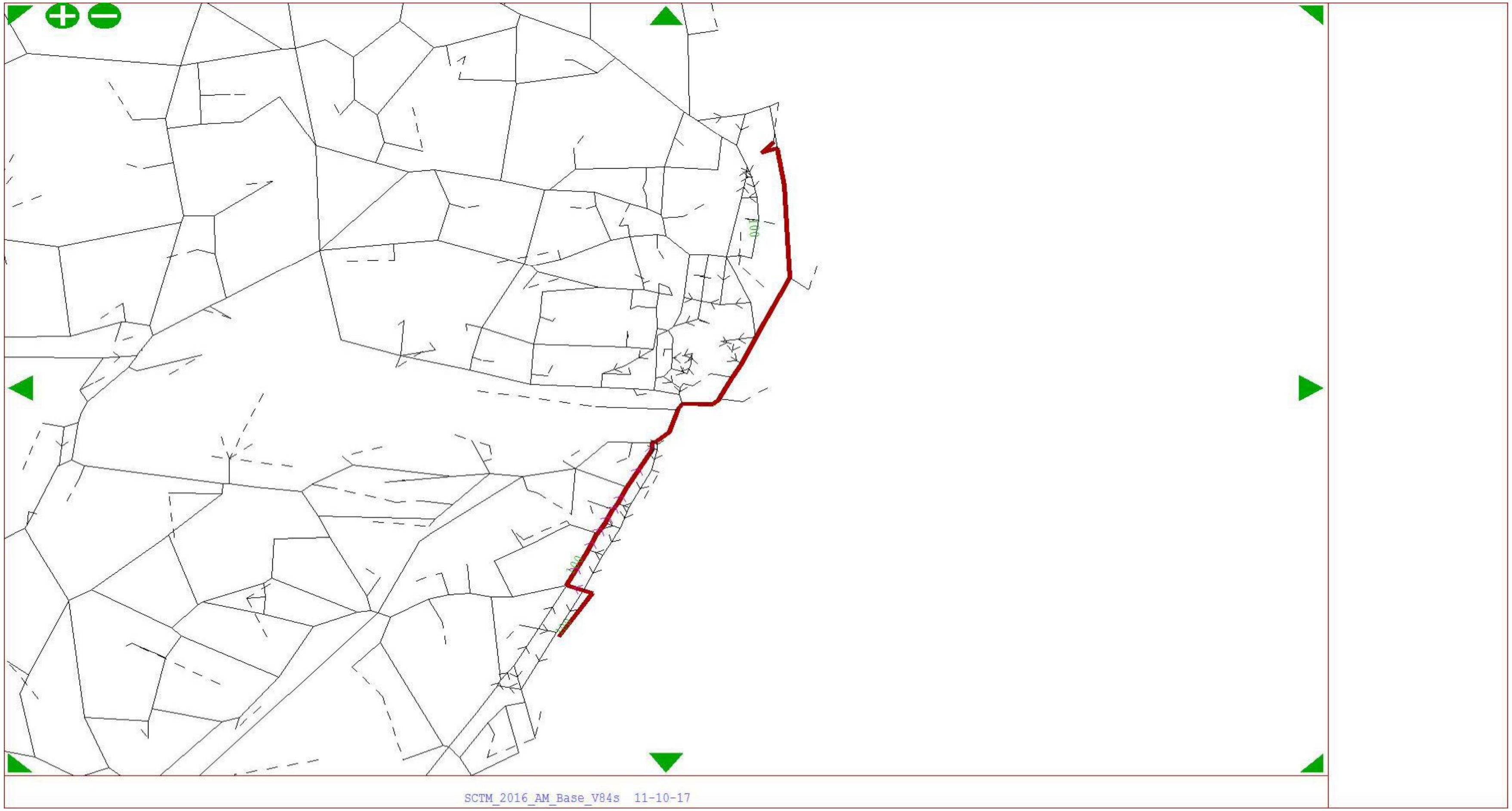
From Zone 84 To Zone 593 - User Class 10



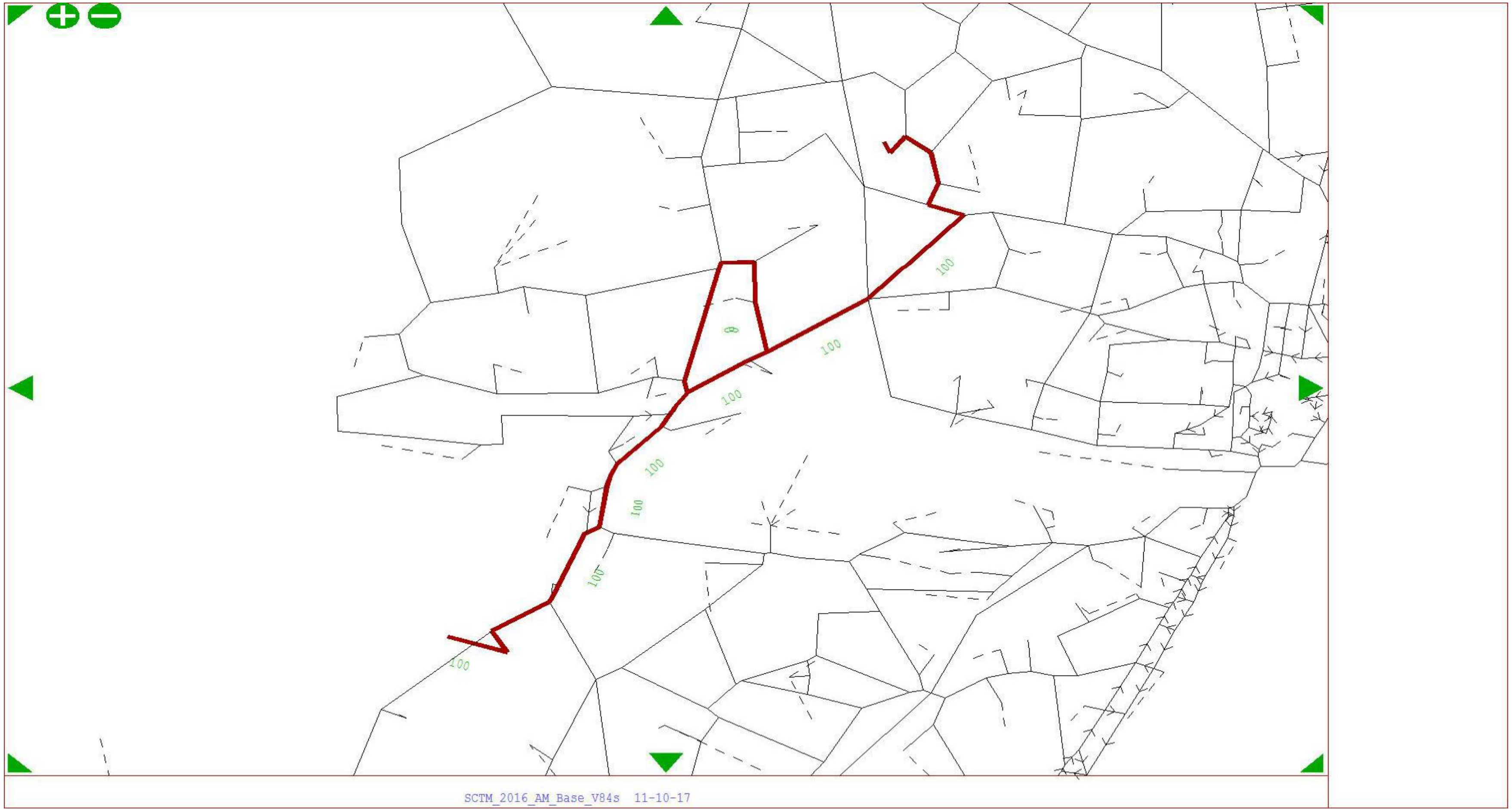
From Zone 593 To Zone 84 - User Class 2

SCTM_2016_AM_Base_V84s 11-10-17

From Zone 593 To Zone 84 - User Class 10

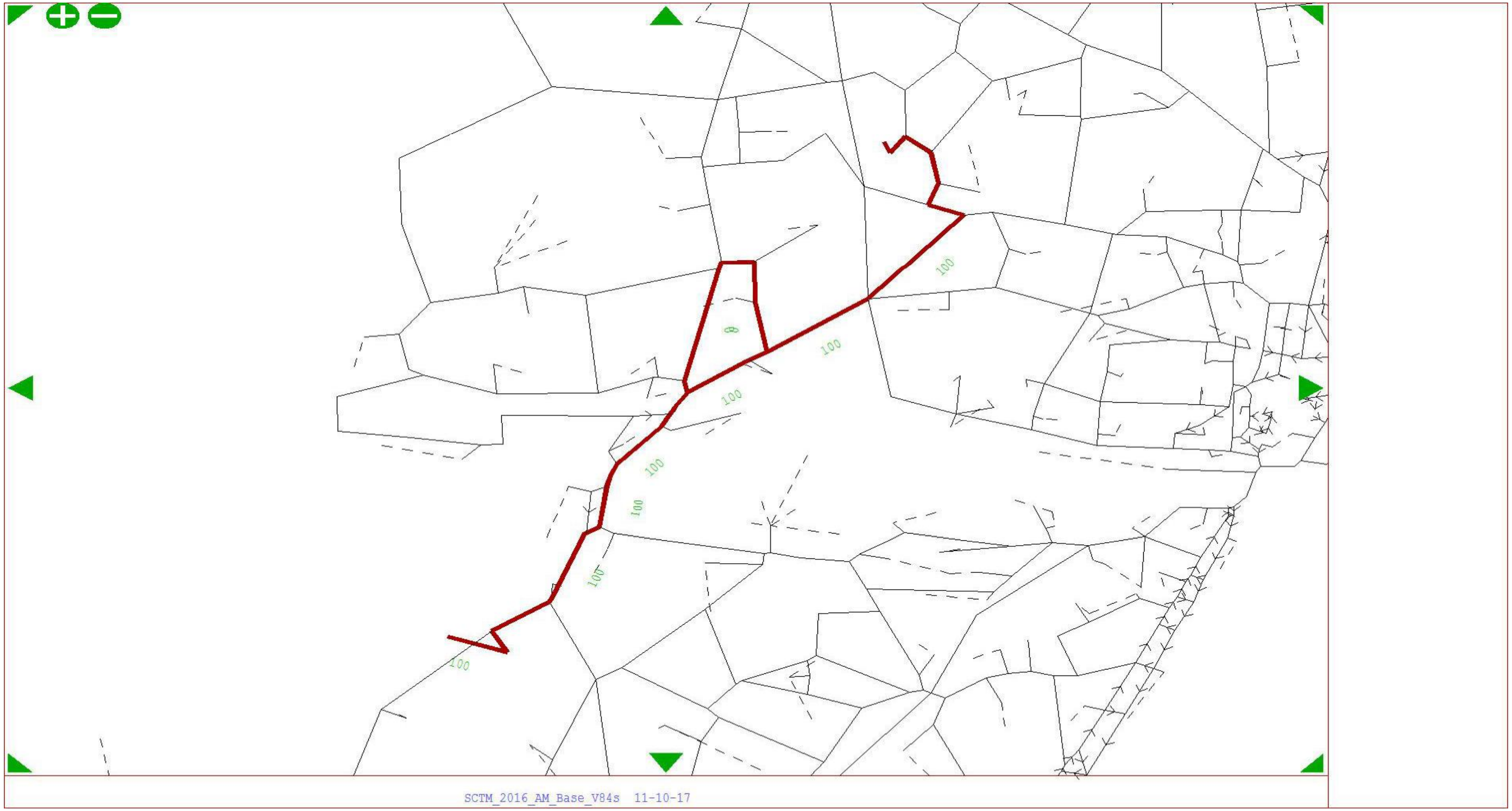


From Zone 767 To Zone 434 - User Class 2



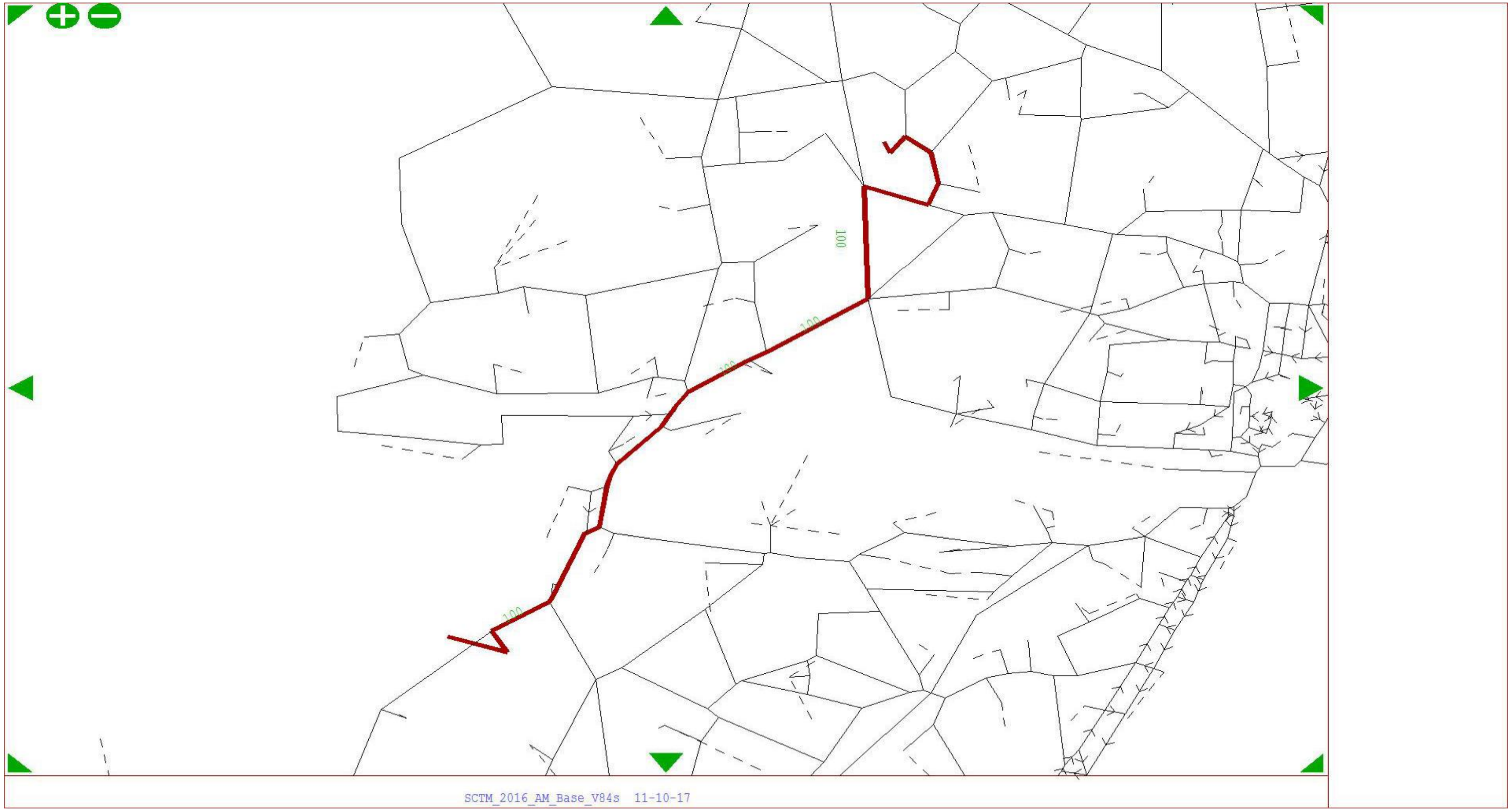
SCTM_2016_AM_Base_V84s 11-10-17

From Zone 767 To Zone 434 - User Class 10

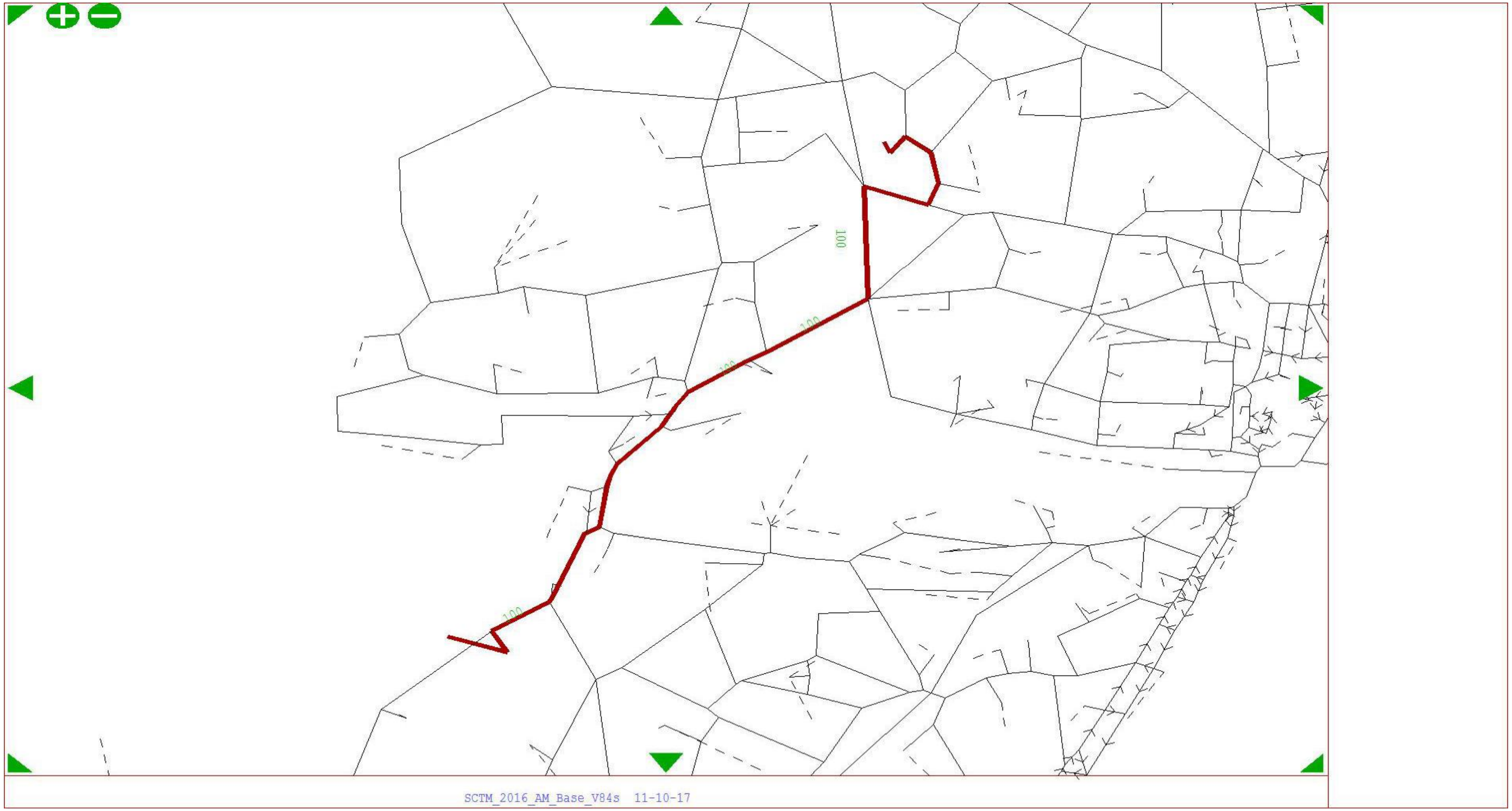


SCTM_2016_AM_Base_V84s 11-10-17

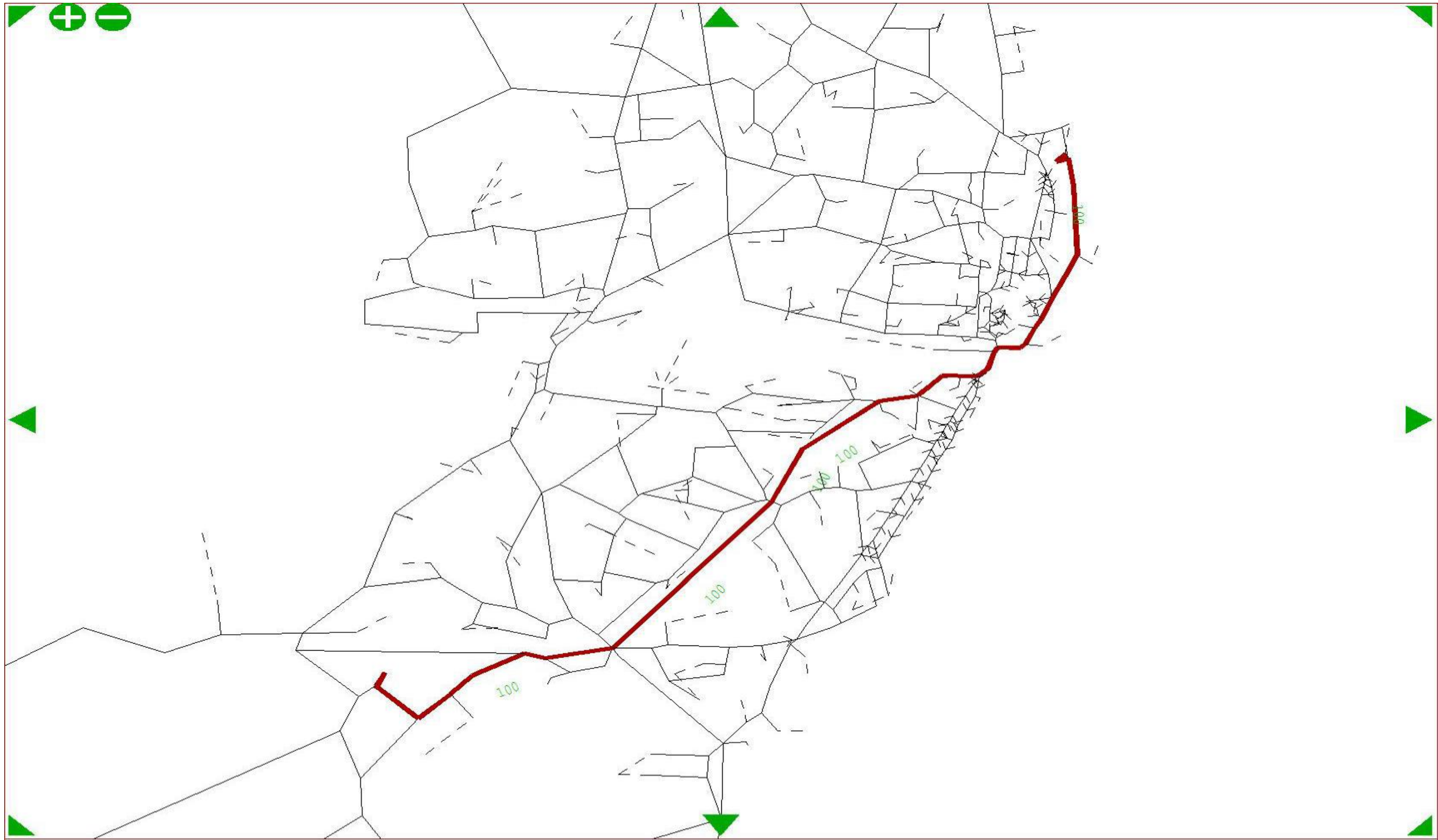
From Zone 434 To Zone 767 - User Class 2



From Zone 434 To Zone 767 - User Class 10

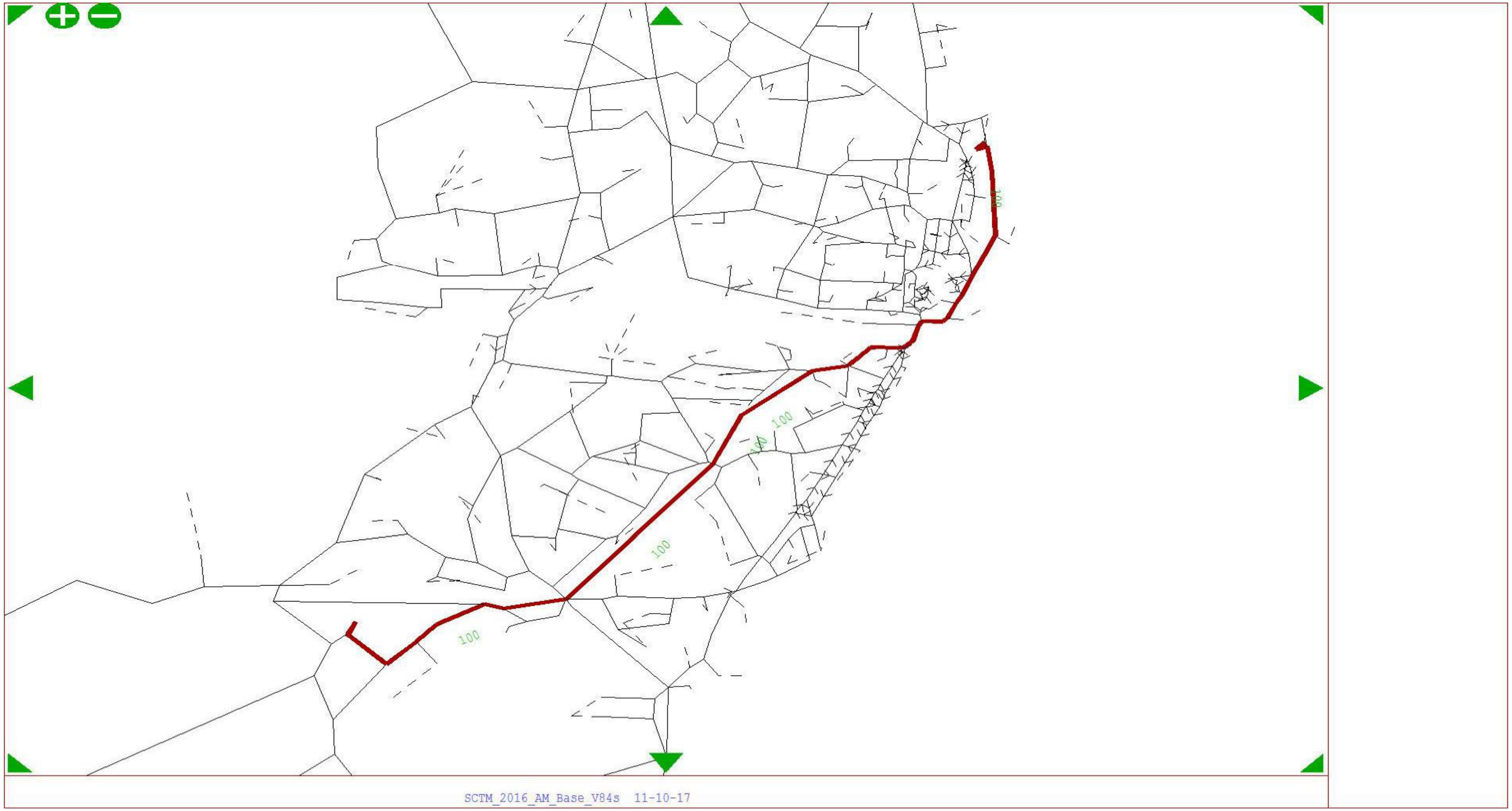


From Zone 84 To Zone 782 - User Class 2

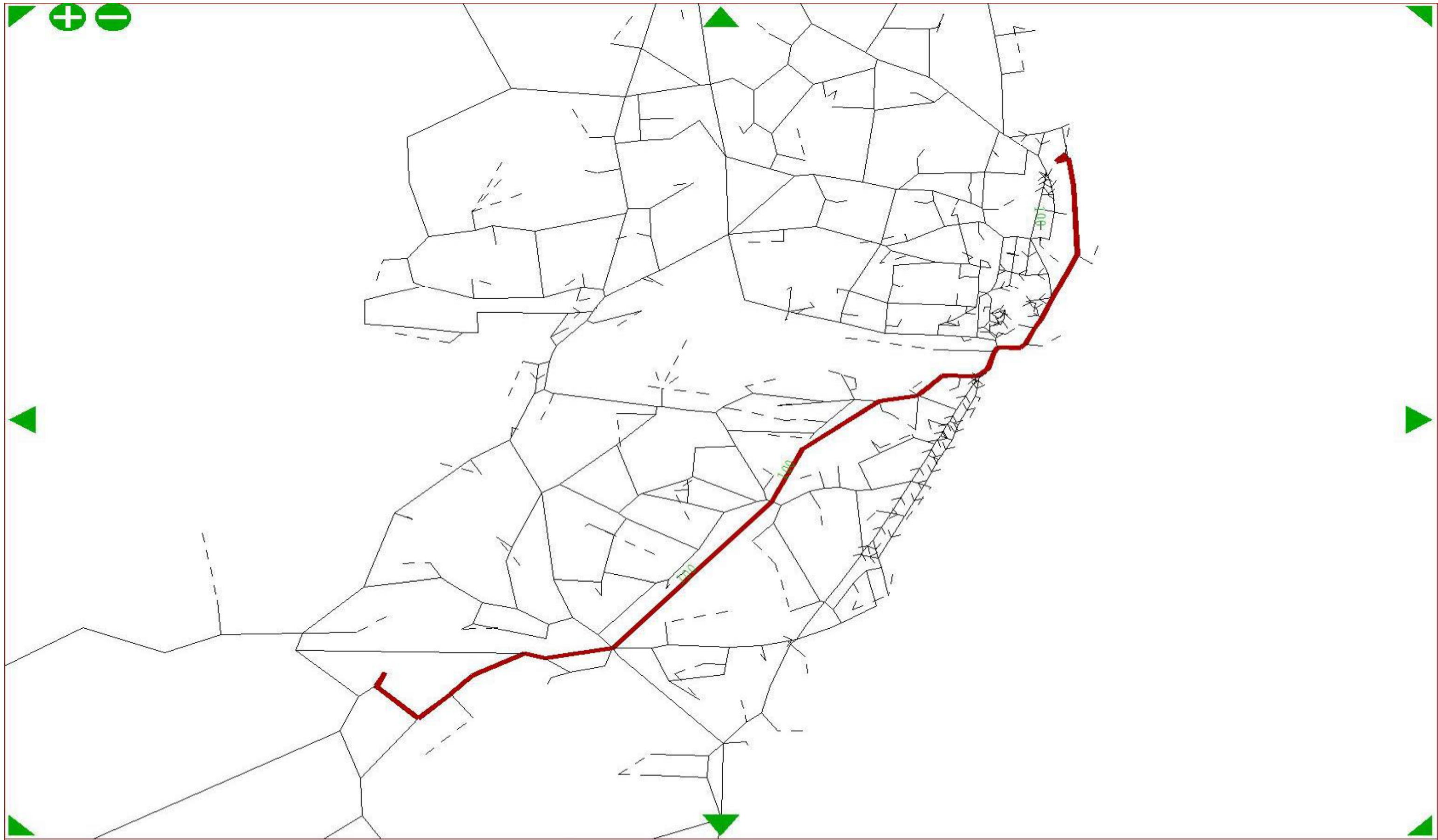


SCTM_2016_AM_Base_V84s 11-10-17

From Zone 84 To Zone 782 - User Class 10

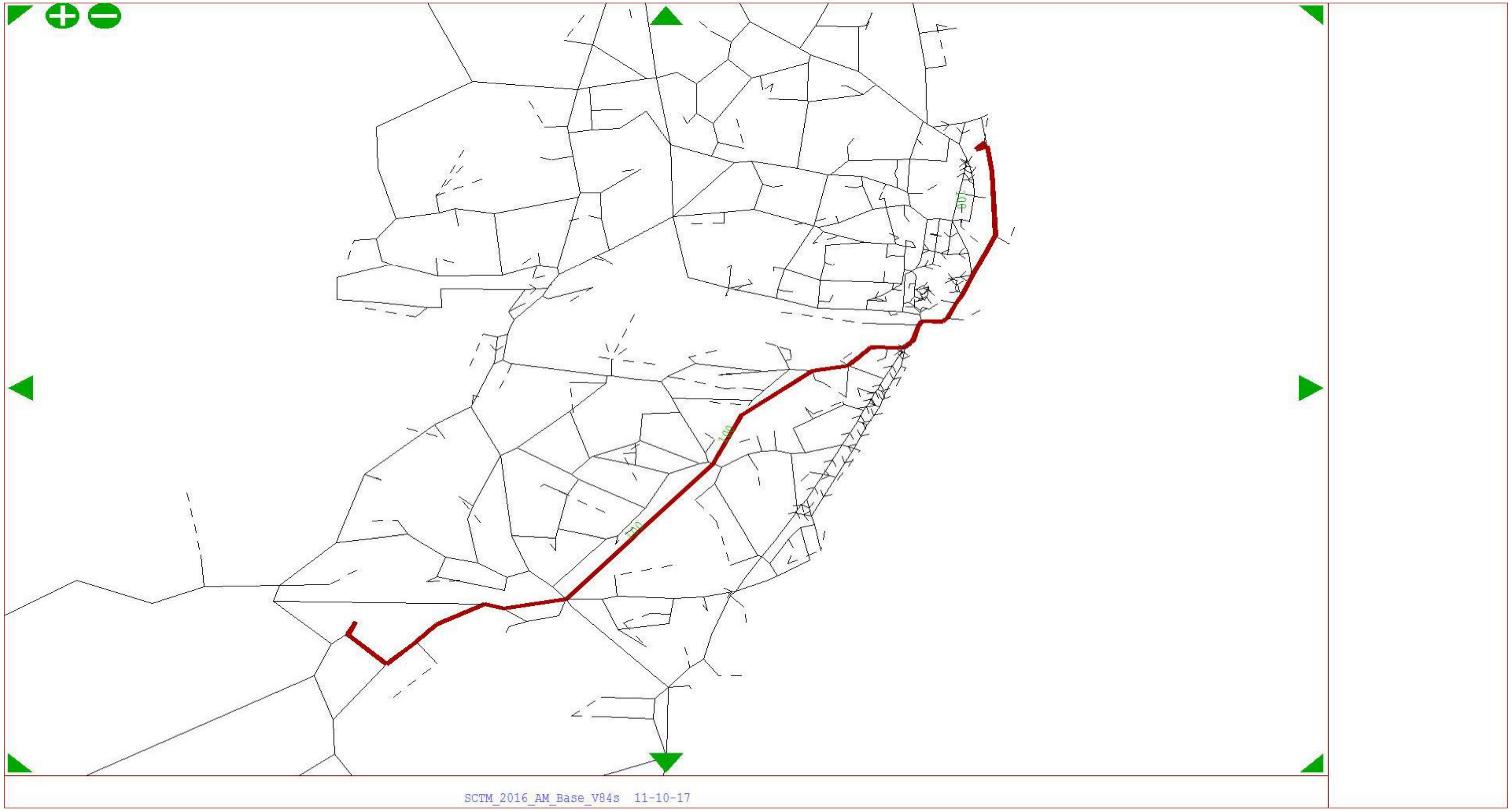


From Zone 782 To Zone 84 - User Class 2



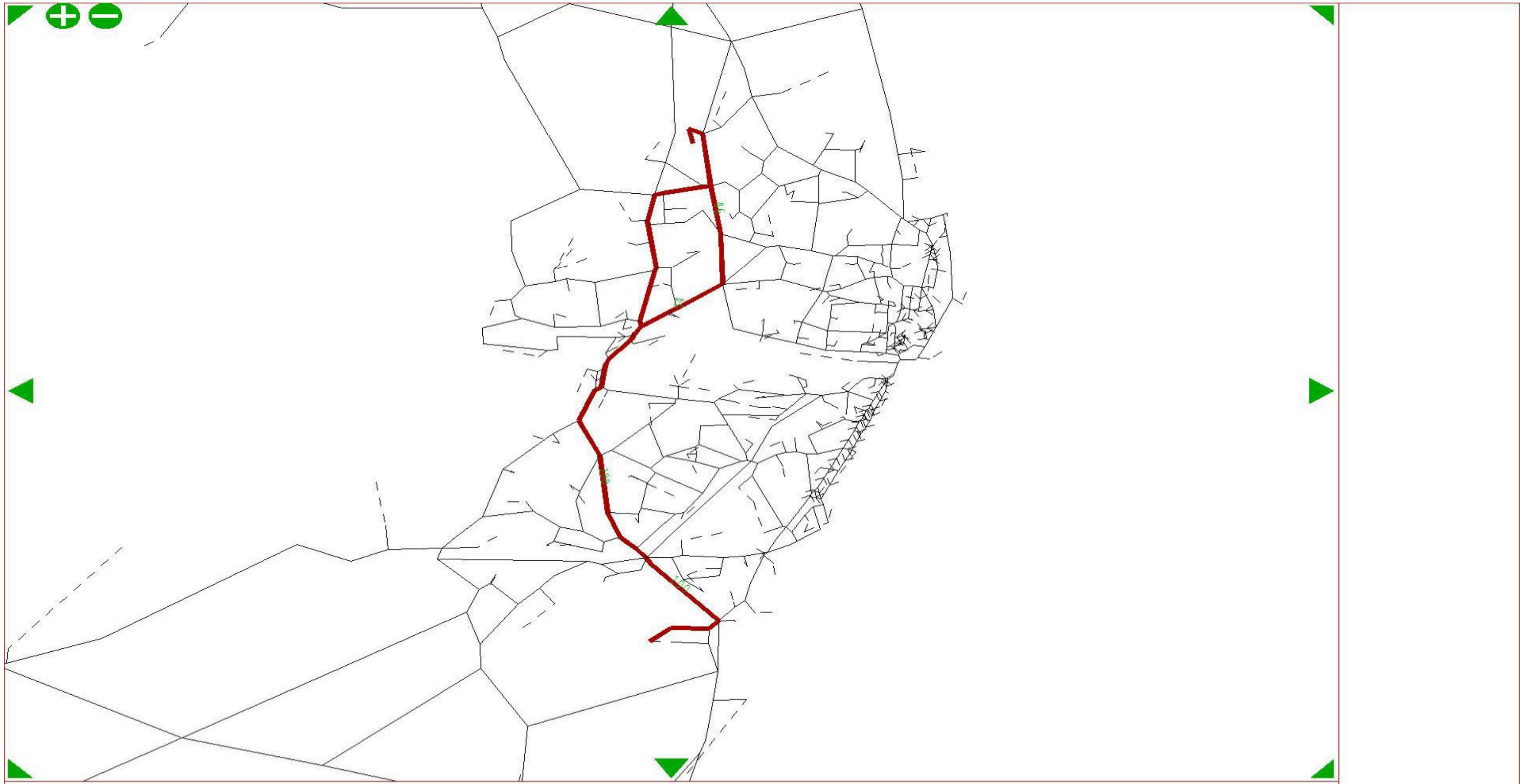
SCTM_2016_AM_Base_V84s 11-10-17

From Zone 782 To Zone 84 - User Class 10



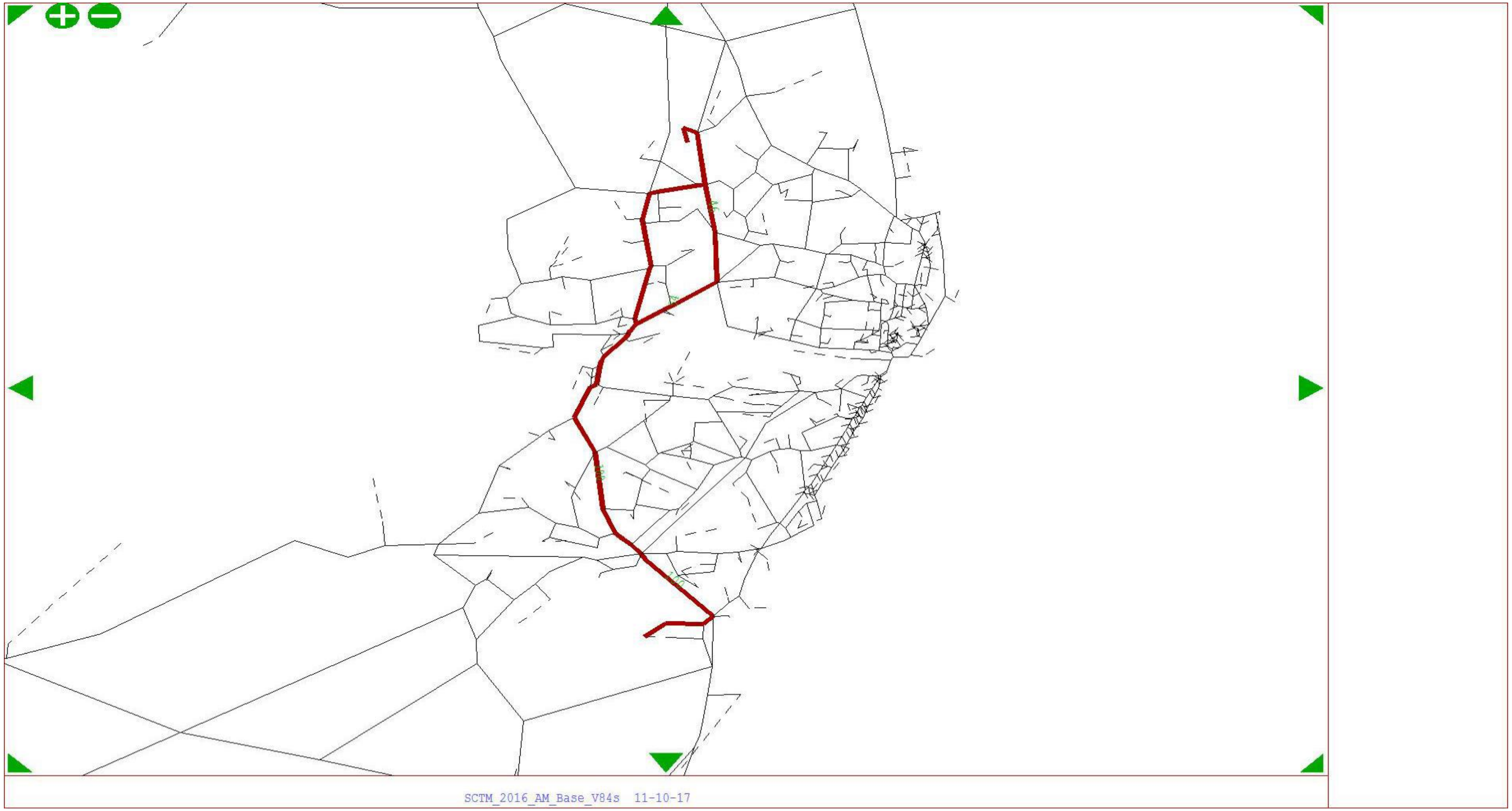
SCTM_2016_AM_Base_V84s 11-10-17

From Zone 586 To Zone 781 - User Class 2

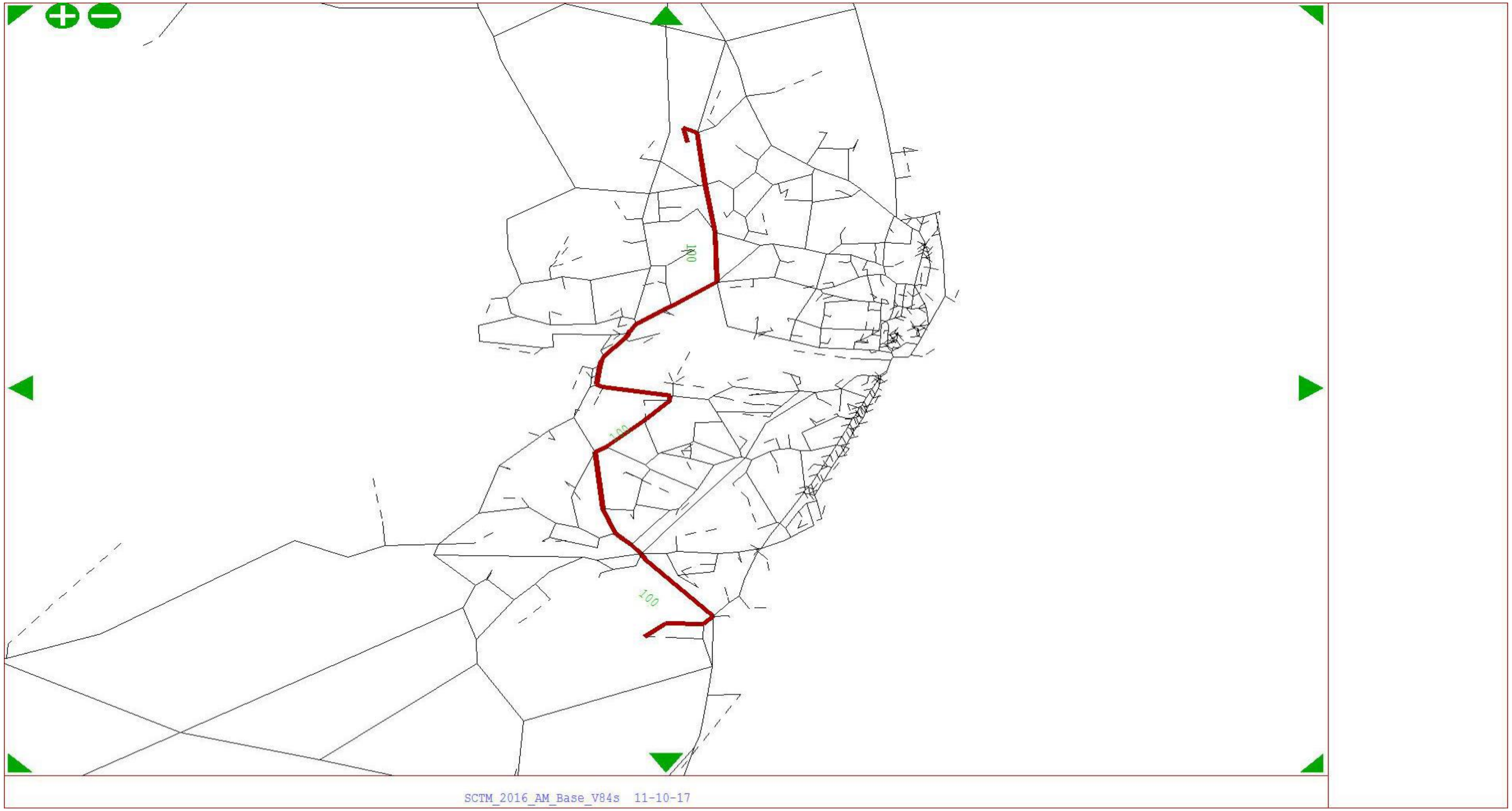


SCTM_2016_AM_Base_V84s 11-10-17

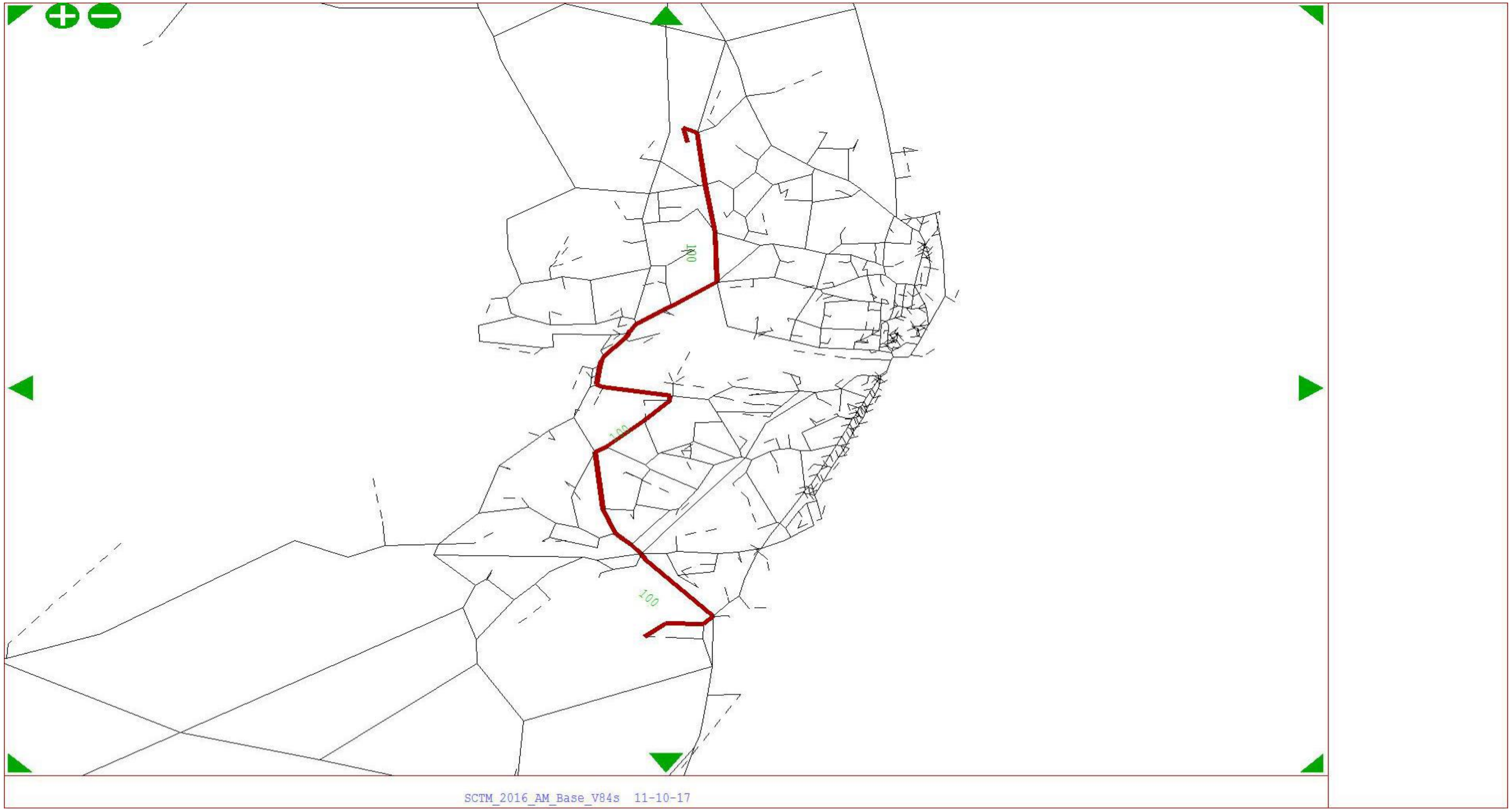
From Zone 586 To Zone 781 - User Class 10



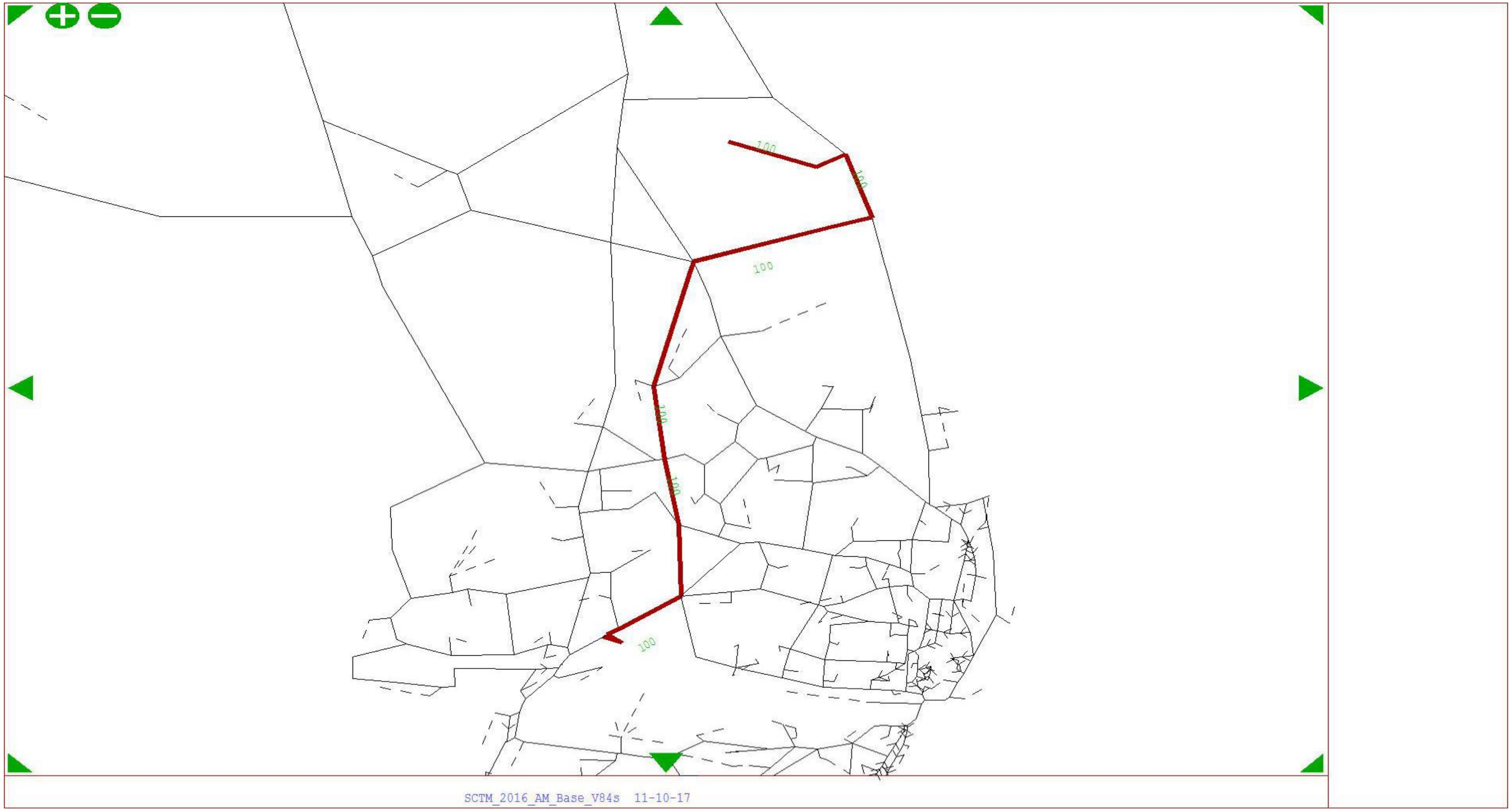
From Zone 781 To Zone 586 - User Class 2



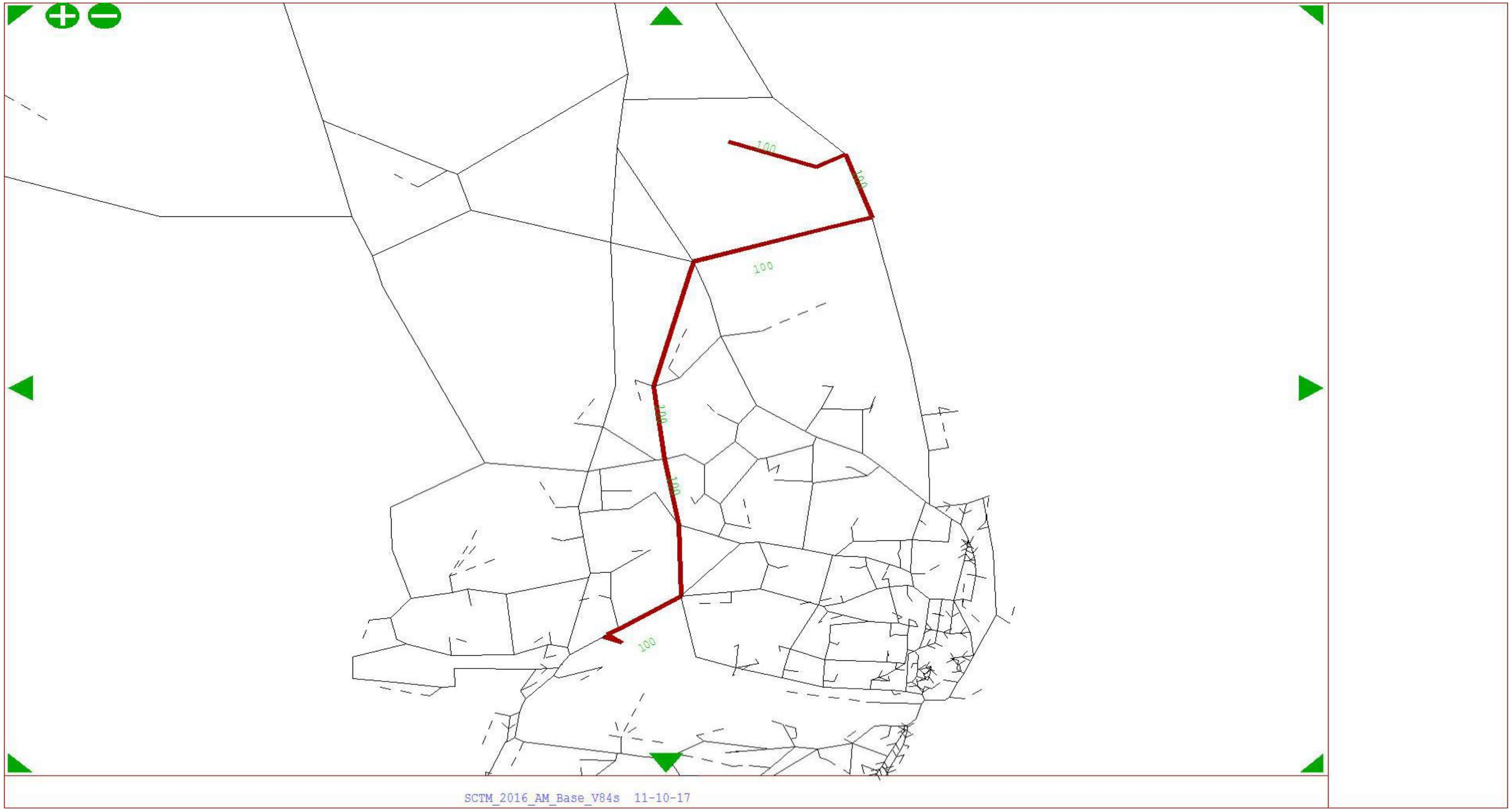
From Zone 781 To Zone 586 - User Class 10



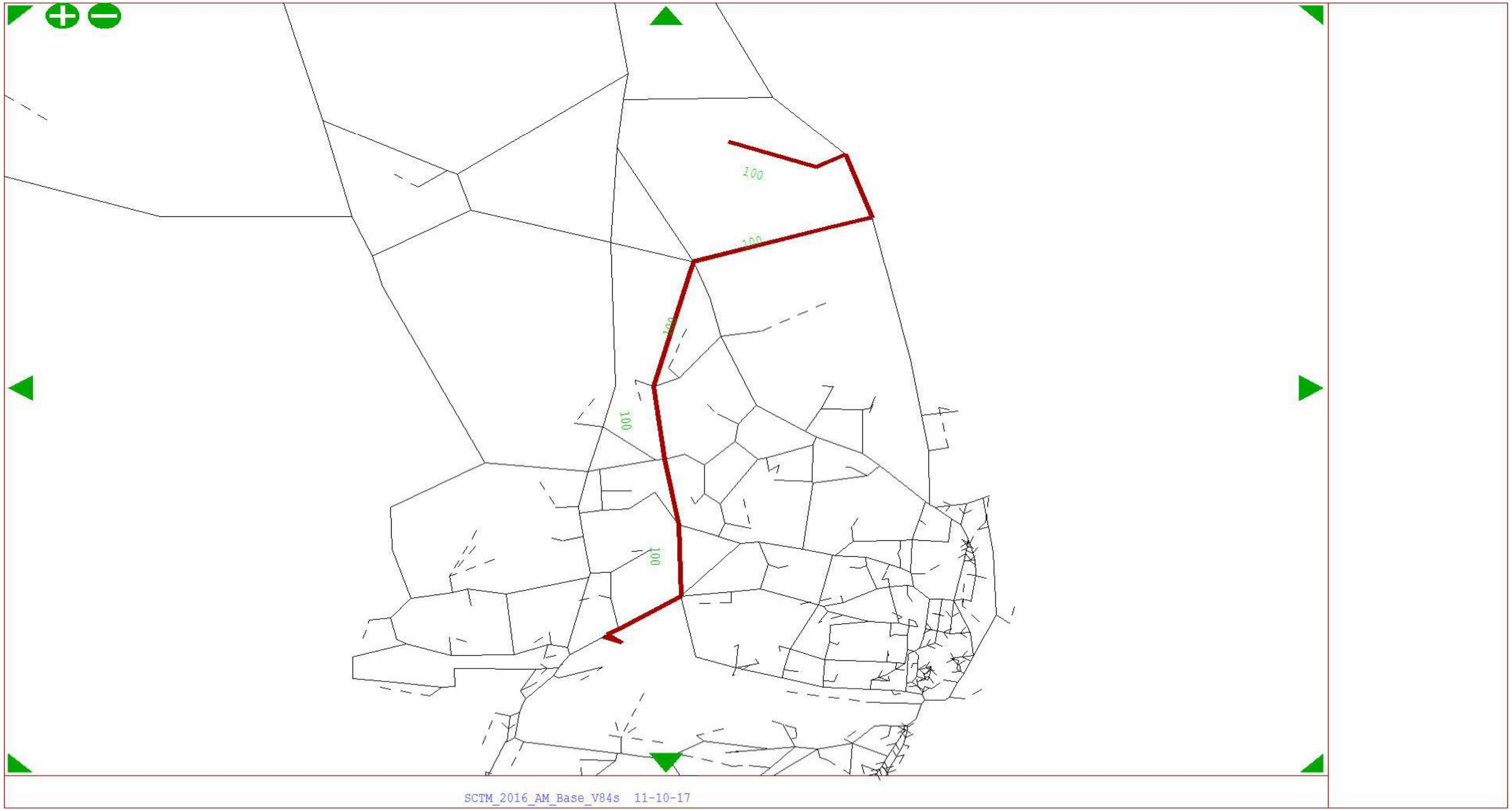
From Zone 408 To Zone 582 - User Class 2



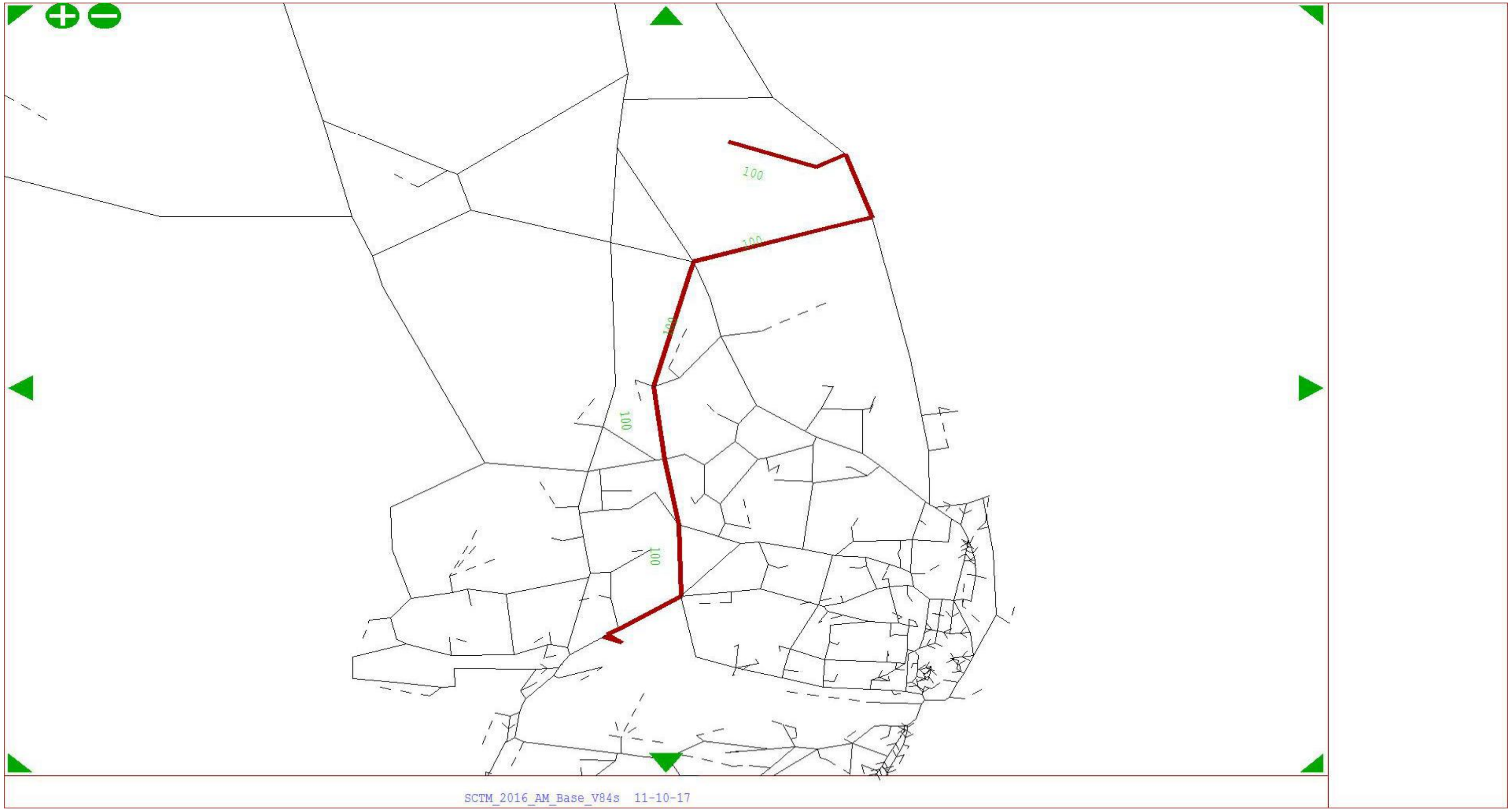
From Zone 408 To Zone 582 - User Class 10



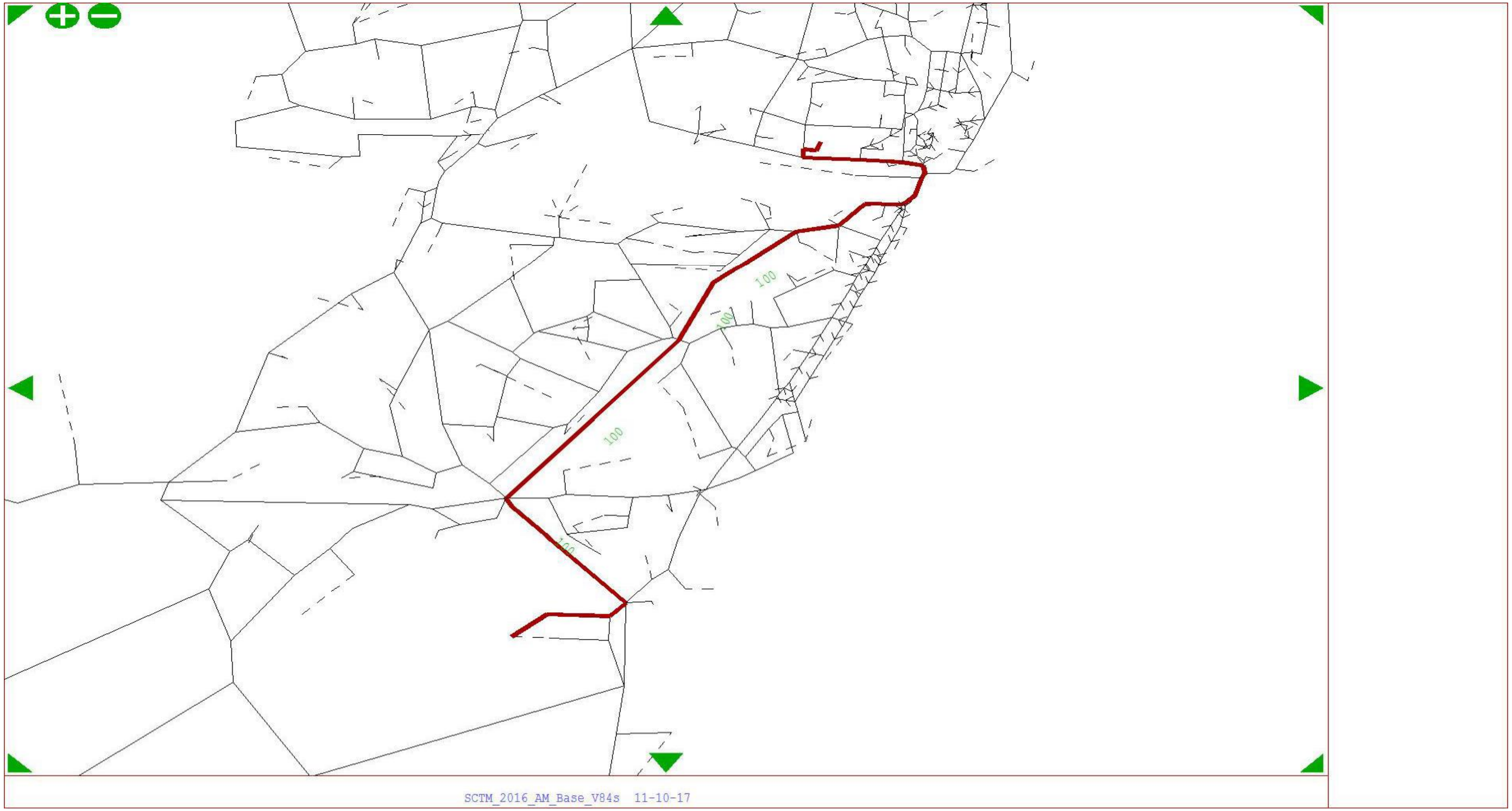
From Zone 582 To Zone 408 - User Class 2



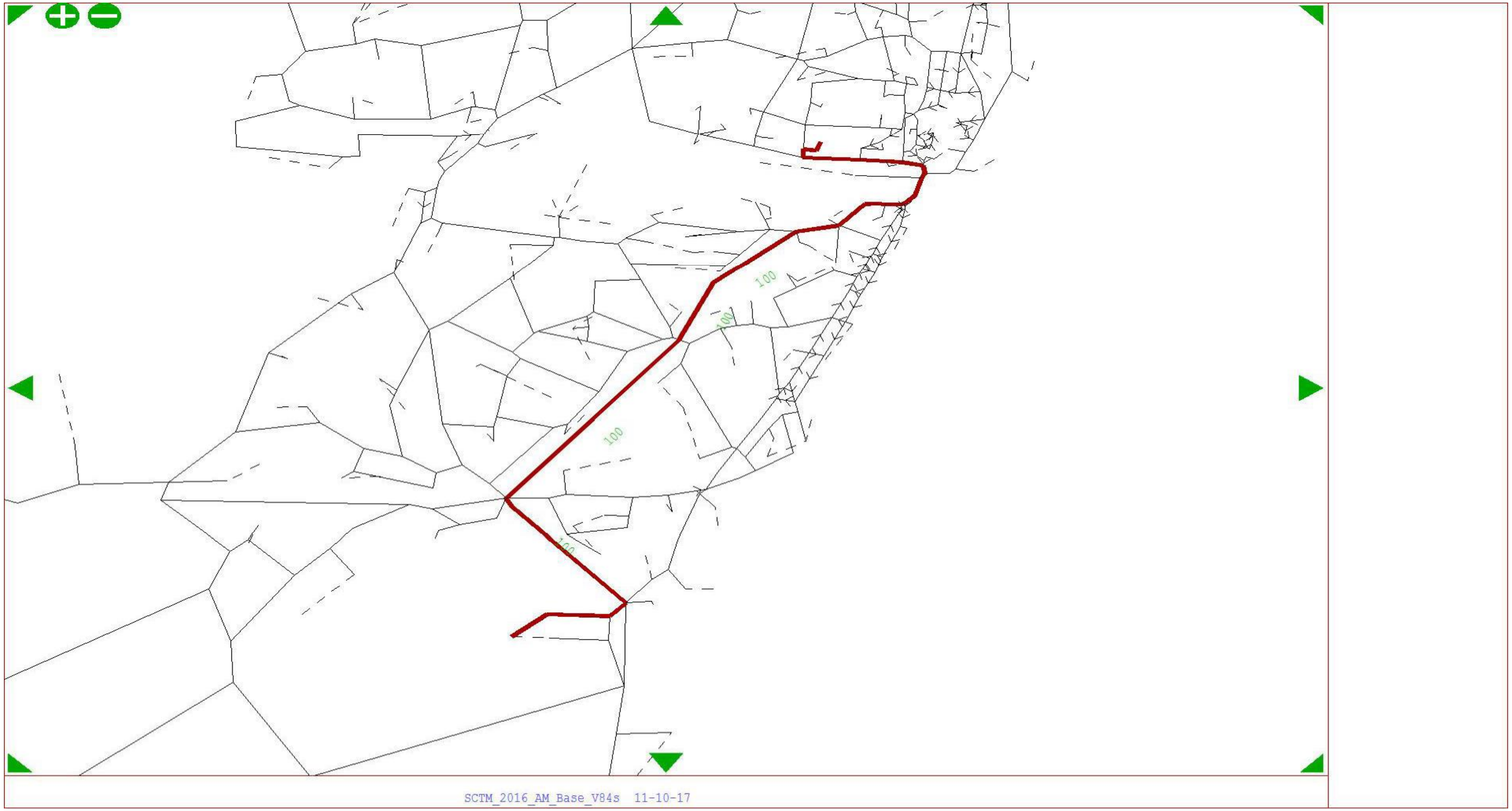
From Zone 582 To Zone 408 - User Class 10



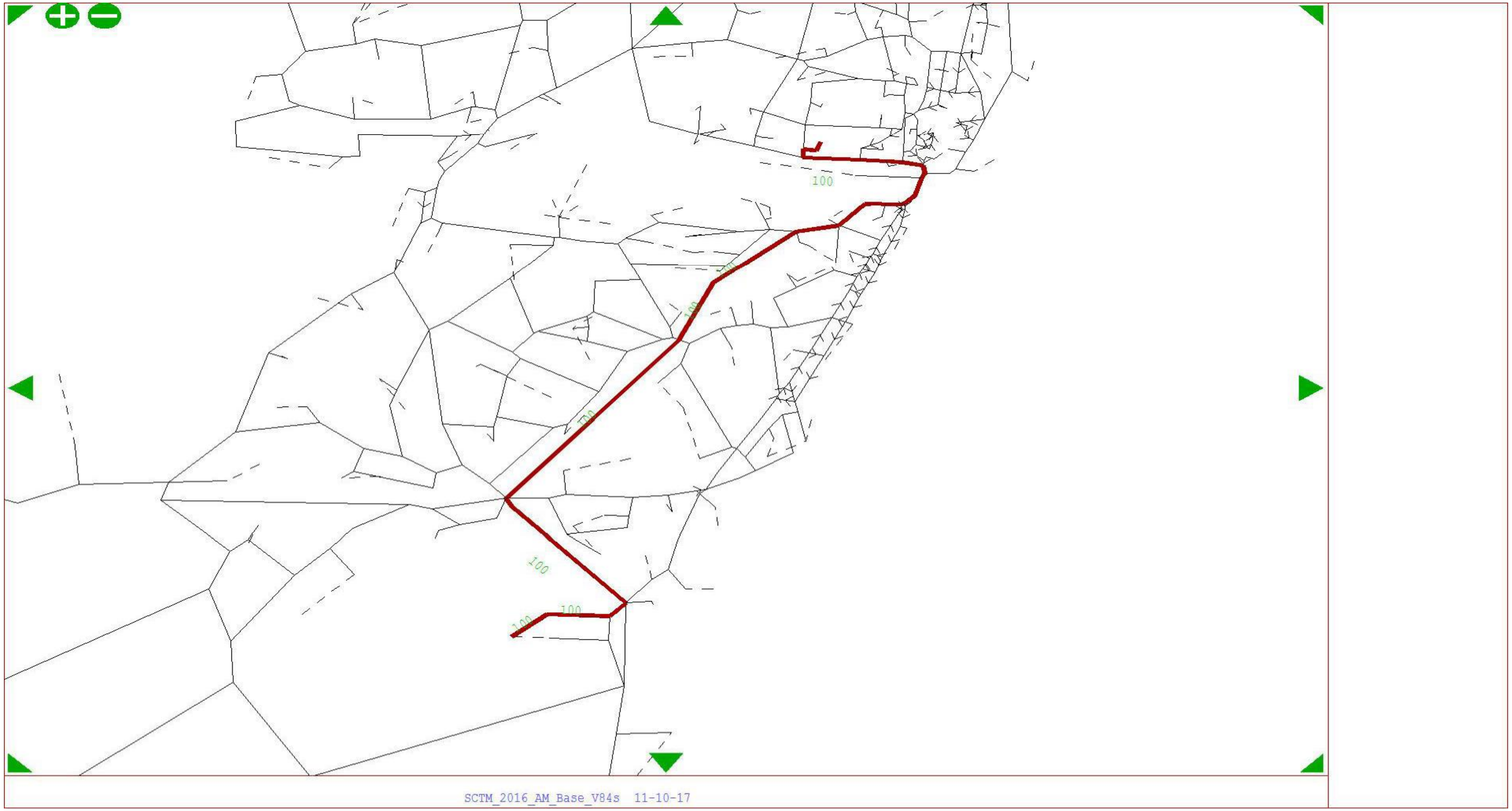
From Zone 427 To Zone 781 - User Class 2



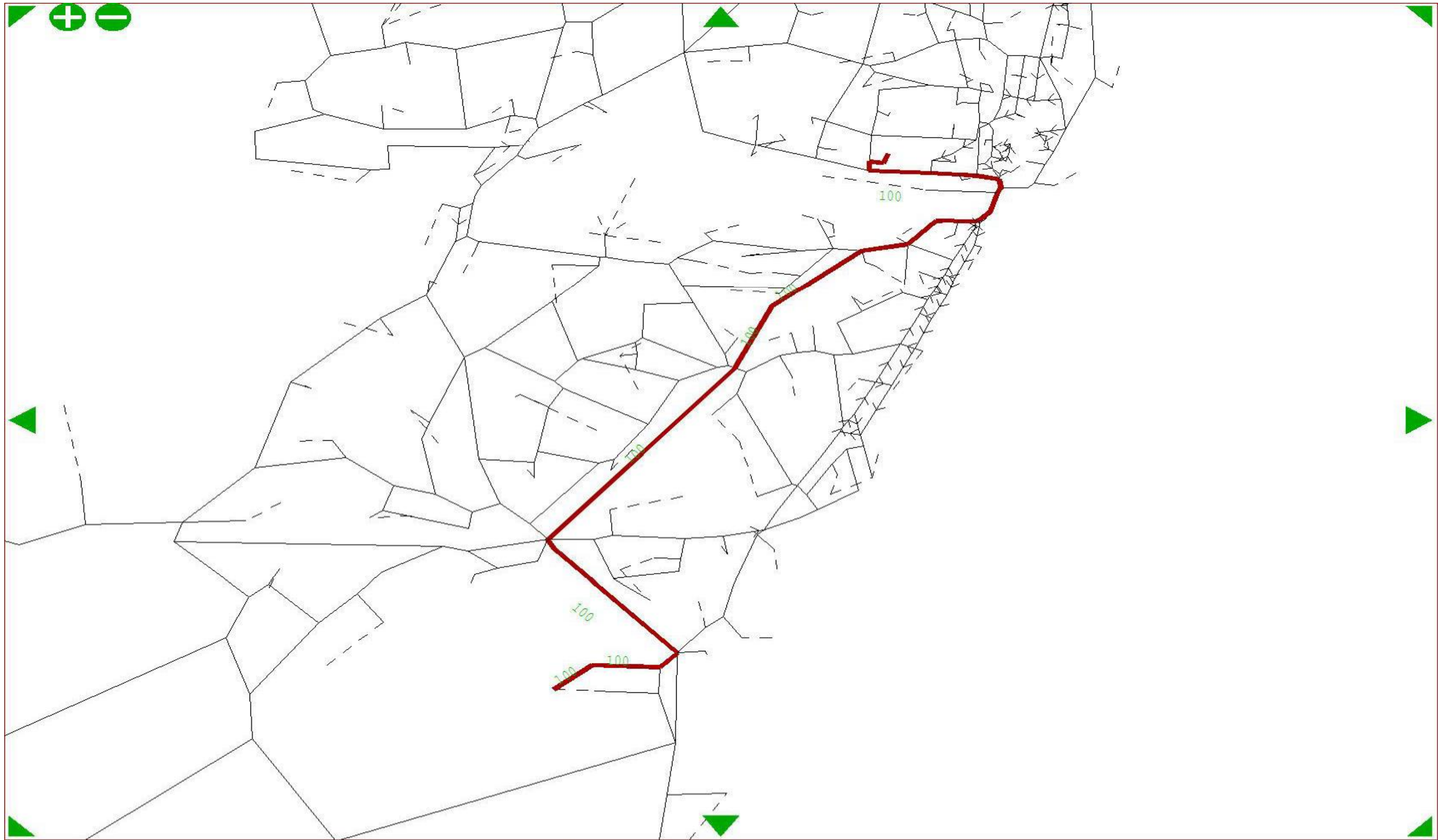
From Zone 427 To Zone 781 - User Class 10



From Zone 781 To Zone 427 - User Class 2

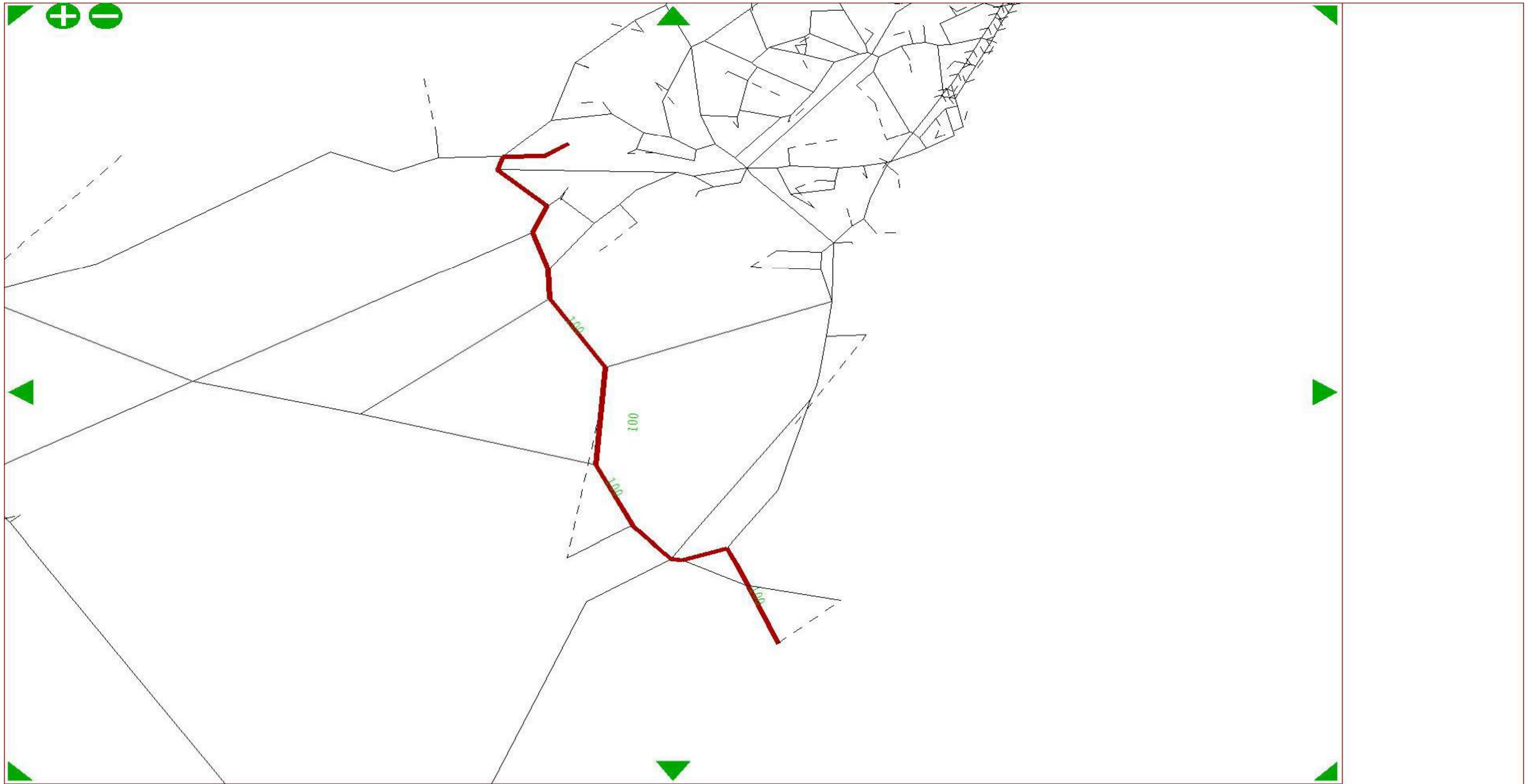


From Zone 781 To Zone 427 - User Class 10



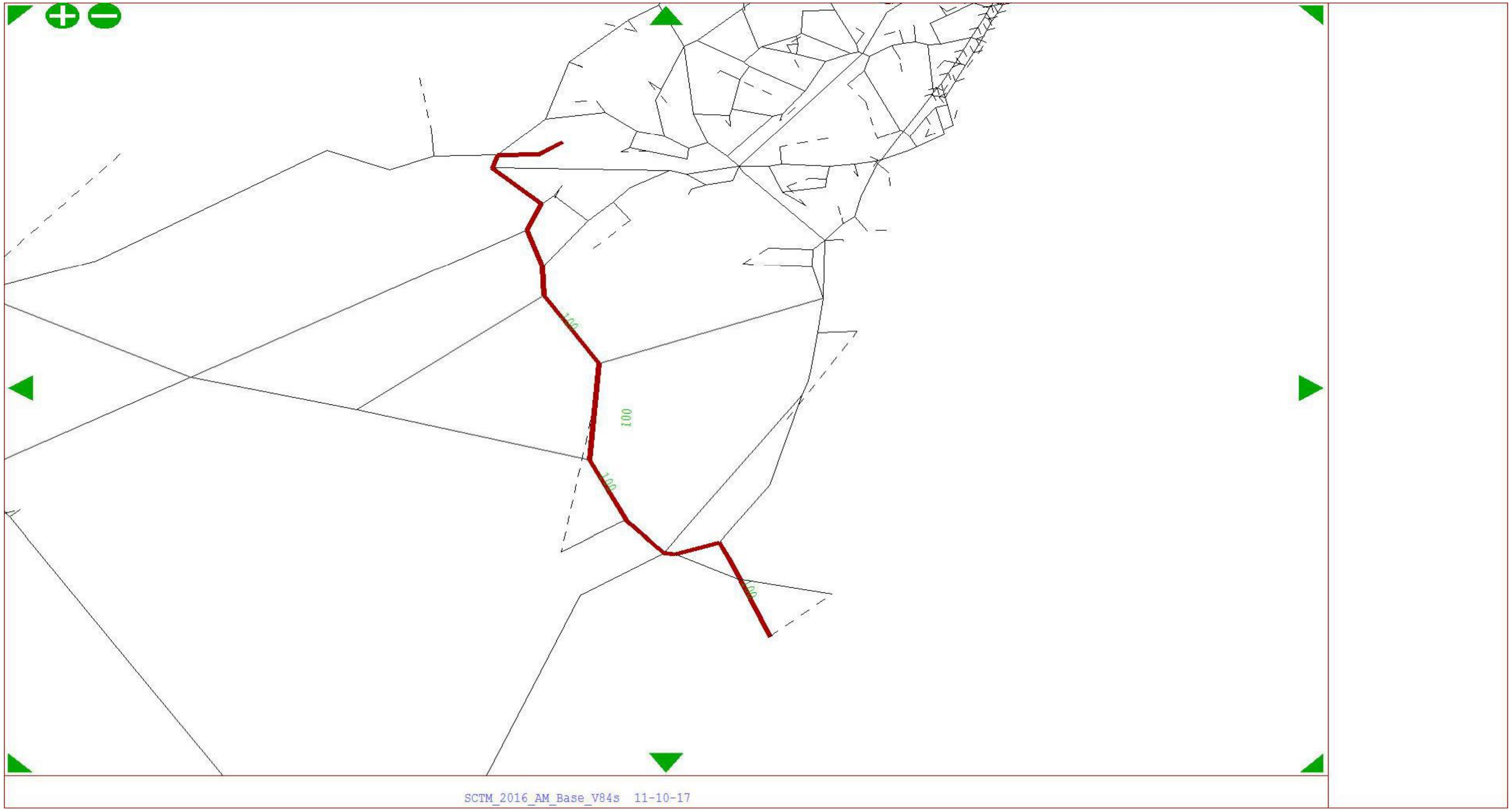
SCTM_2016_AM_Base_V84s 11-10-17

From Zone 639 To Zone 463 - User Class 2



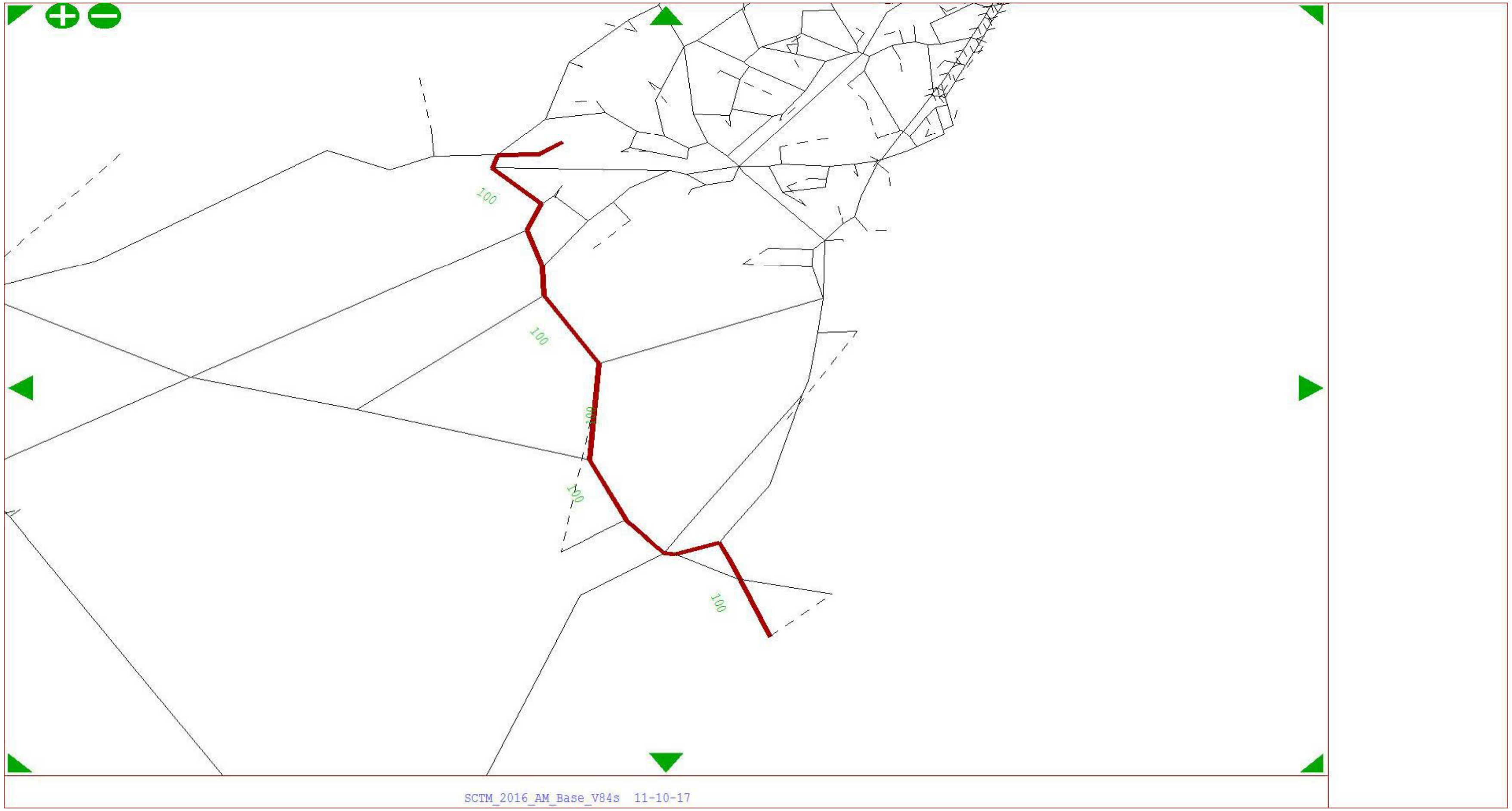
SCTM_2016_AM_Base_V84s 11-10-17

From Zone 639 To Zone 463 - User Class 10



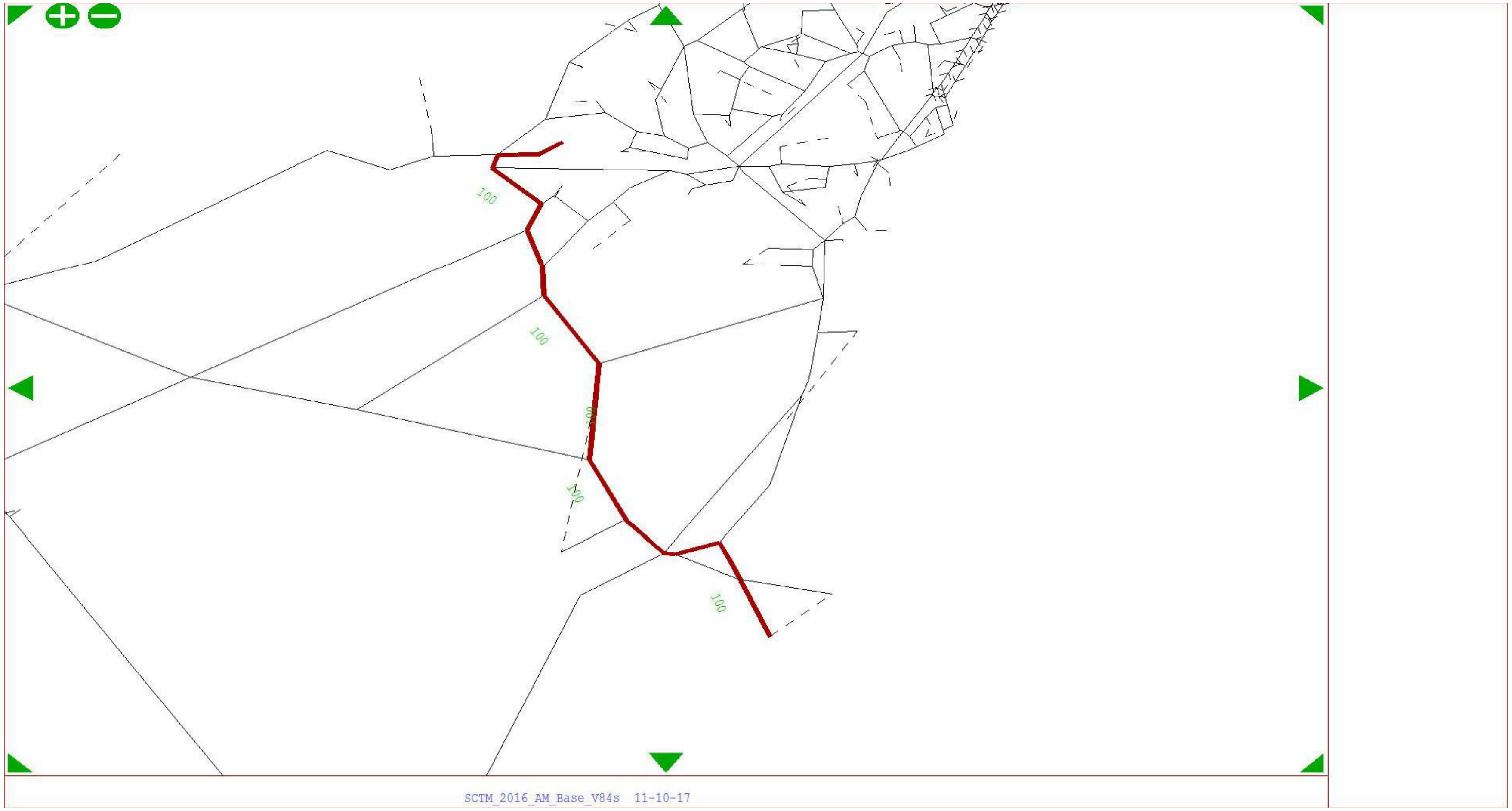
SCTM_2016_AM_Base_V84s 11-10-17

From Zone 463 To Zone 639 - User Class 2

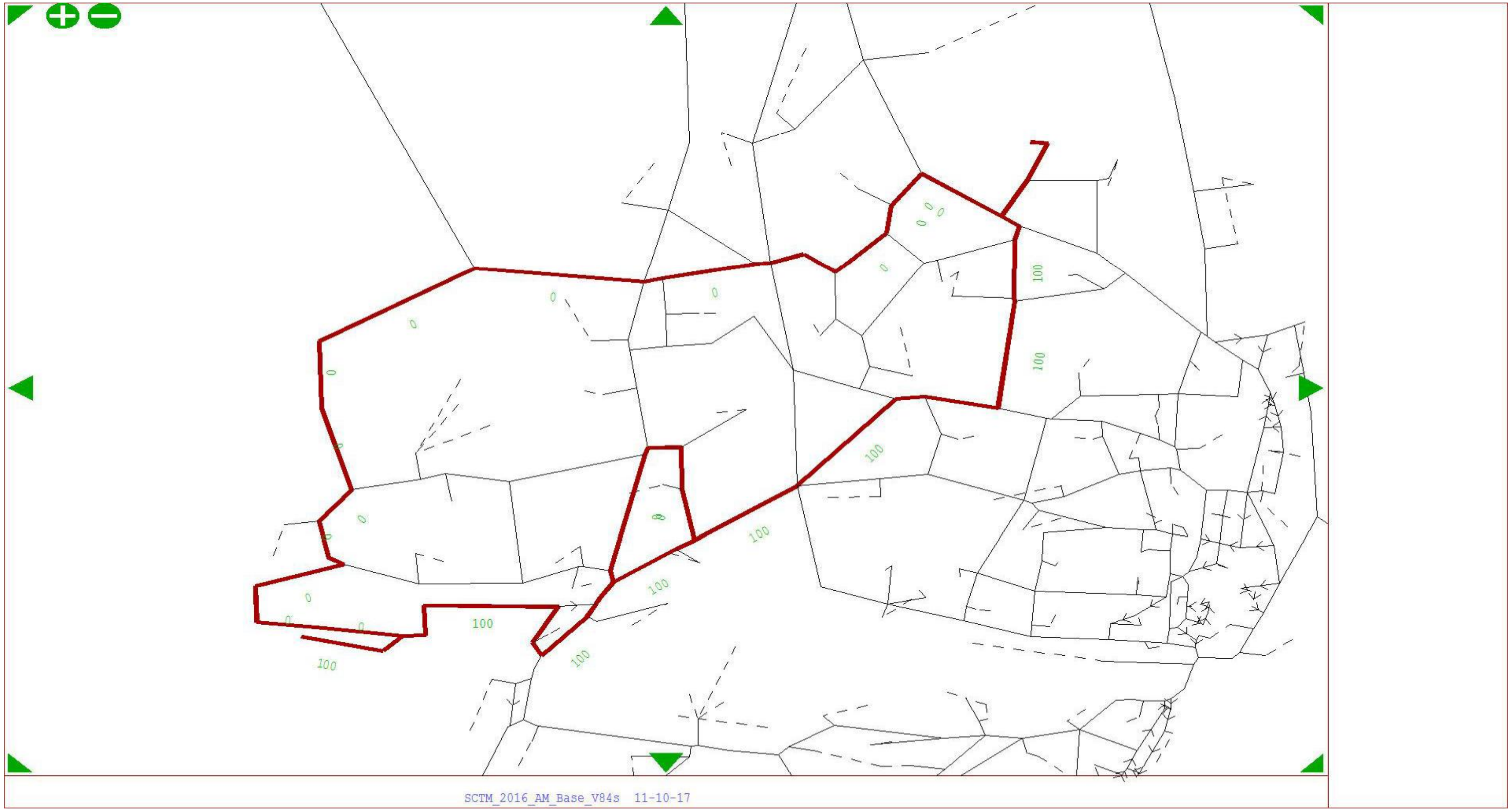


SCTM_2016_AM_Base_V84s 11-10-17

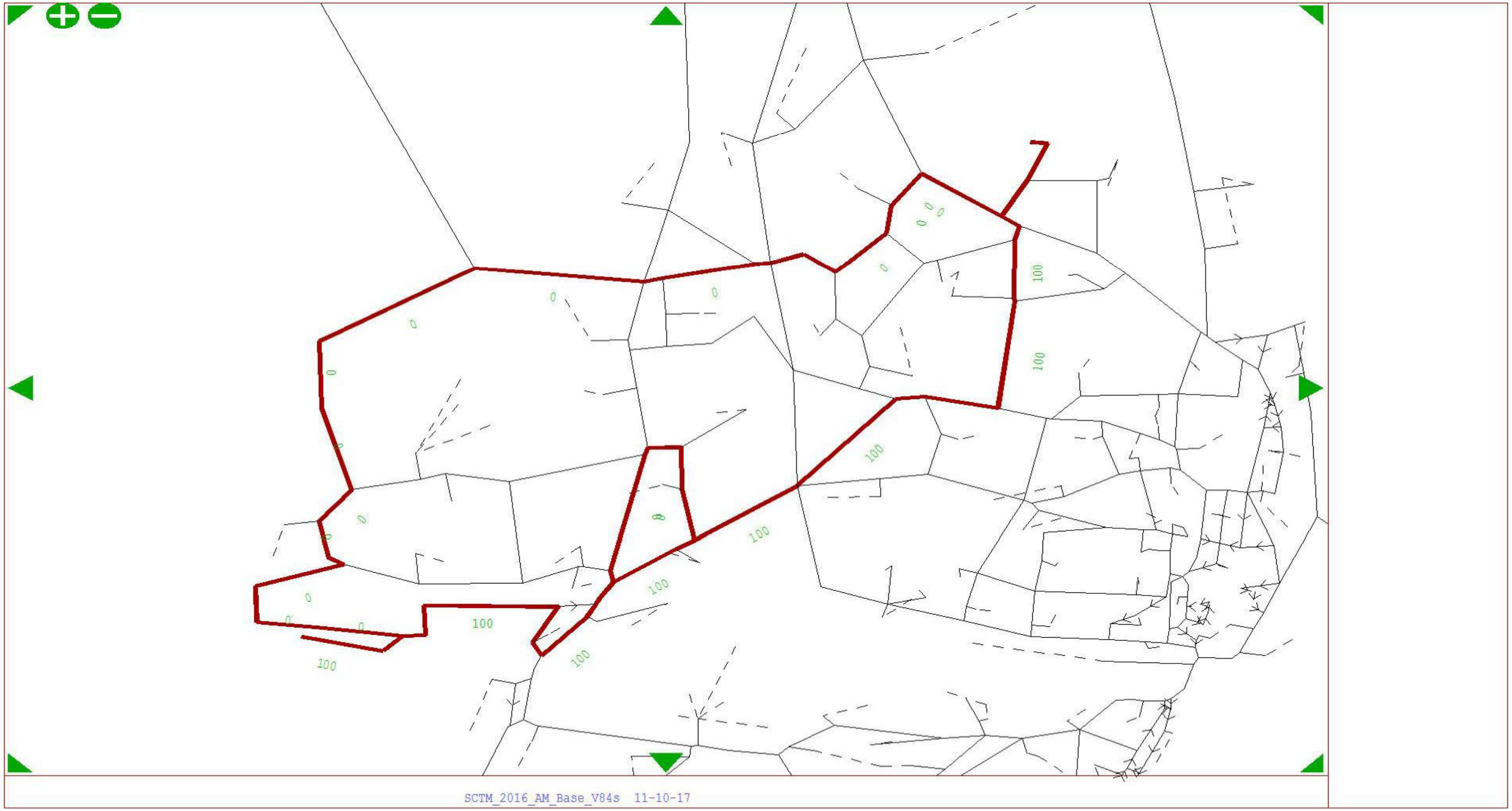
From Zone 463 To Zone 639 - User Class 10



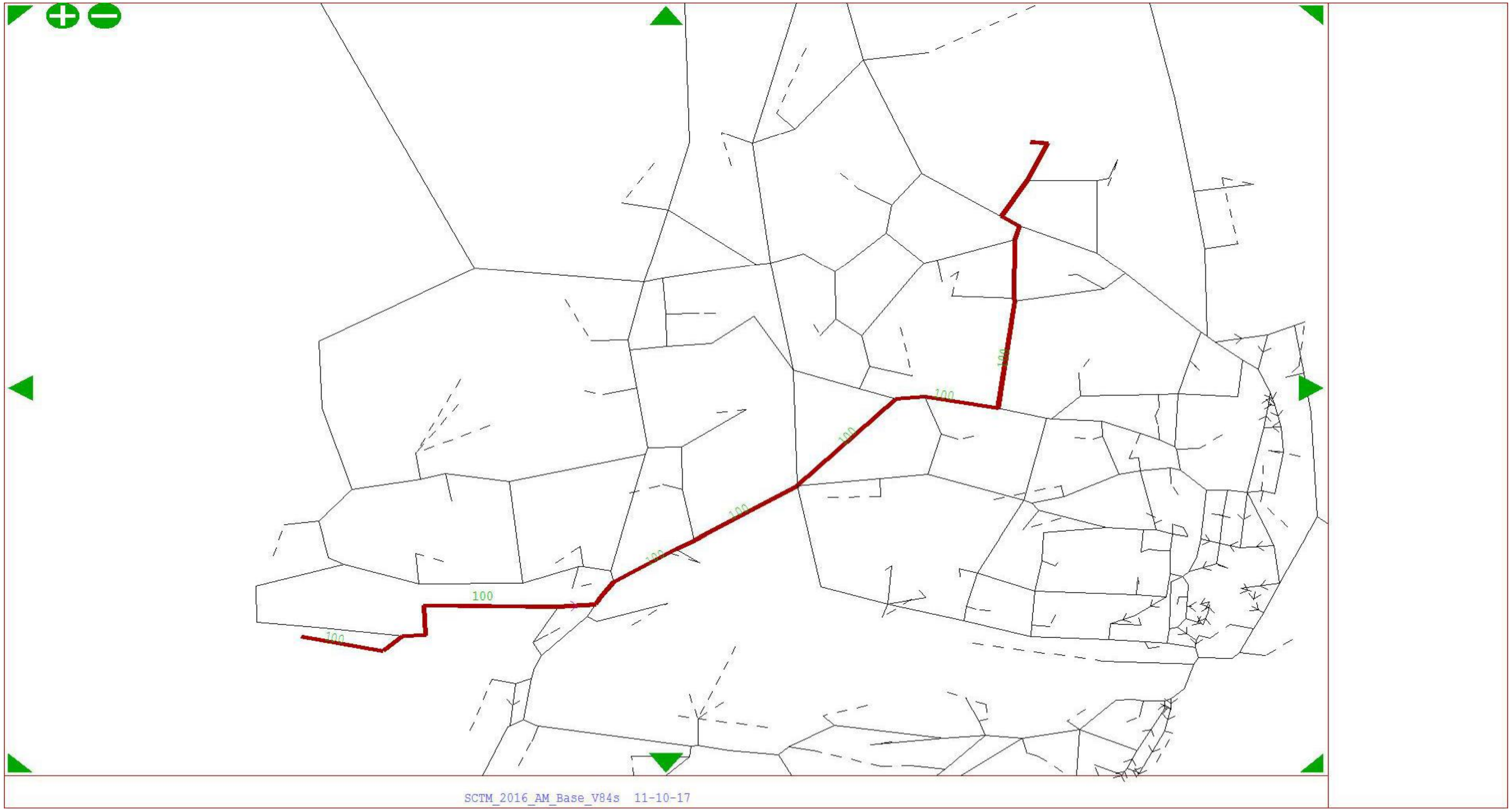
From Zone 409 To Zone 584 - User Class 2



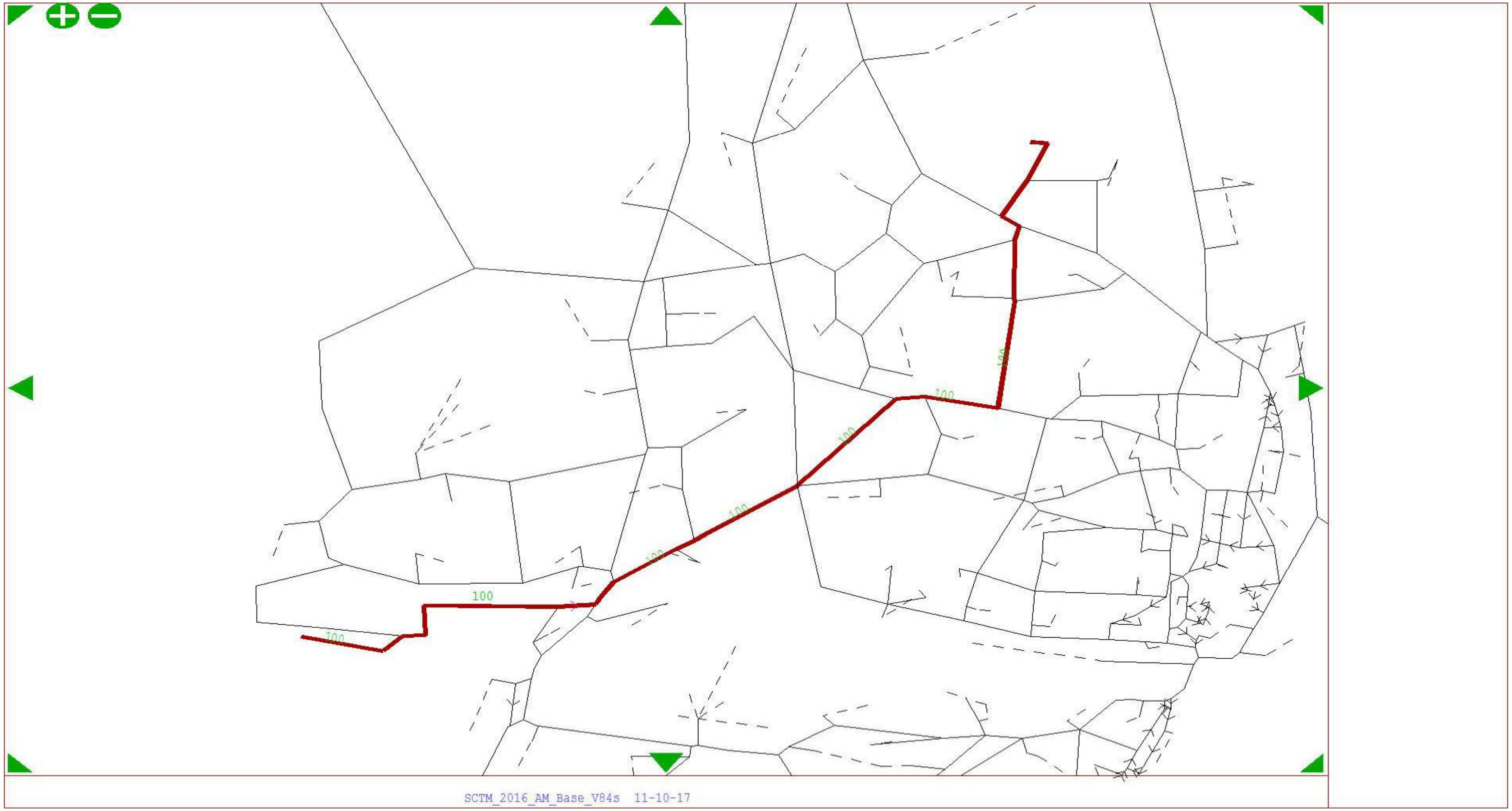
From Zone 409 To Zone 584 - User Class 10



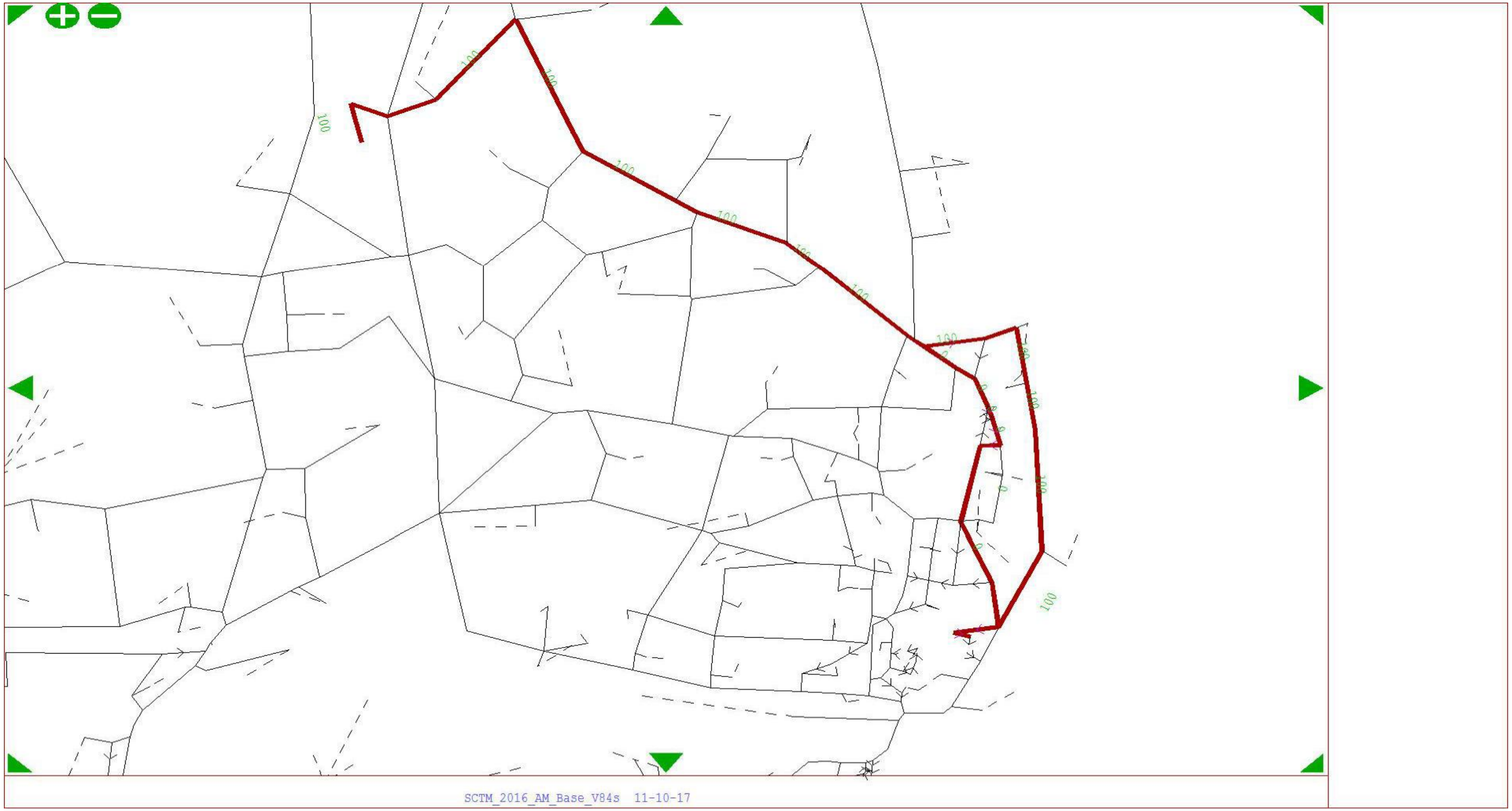
From Zone 584 To Zone 409 - User Class 2



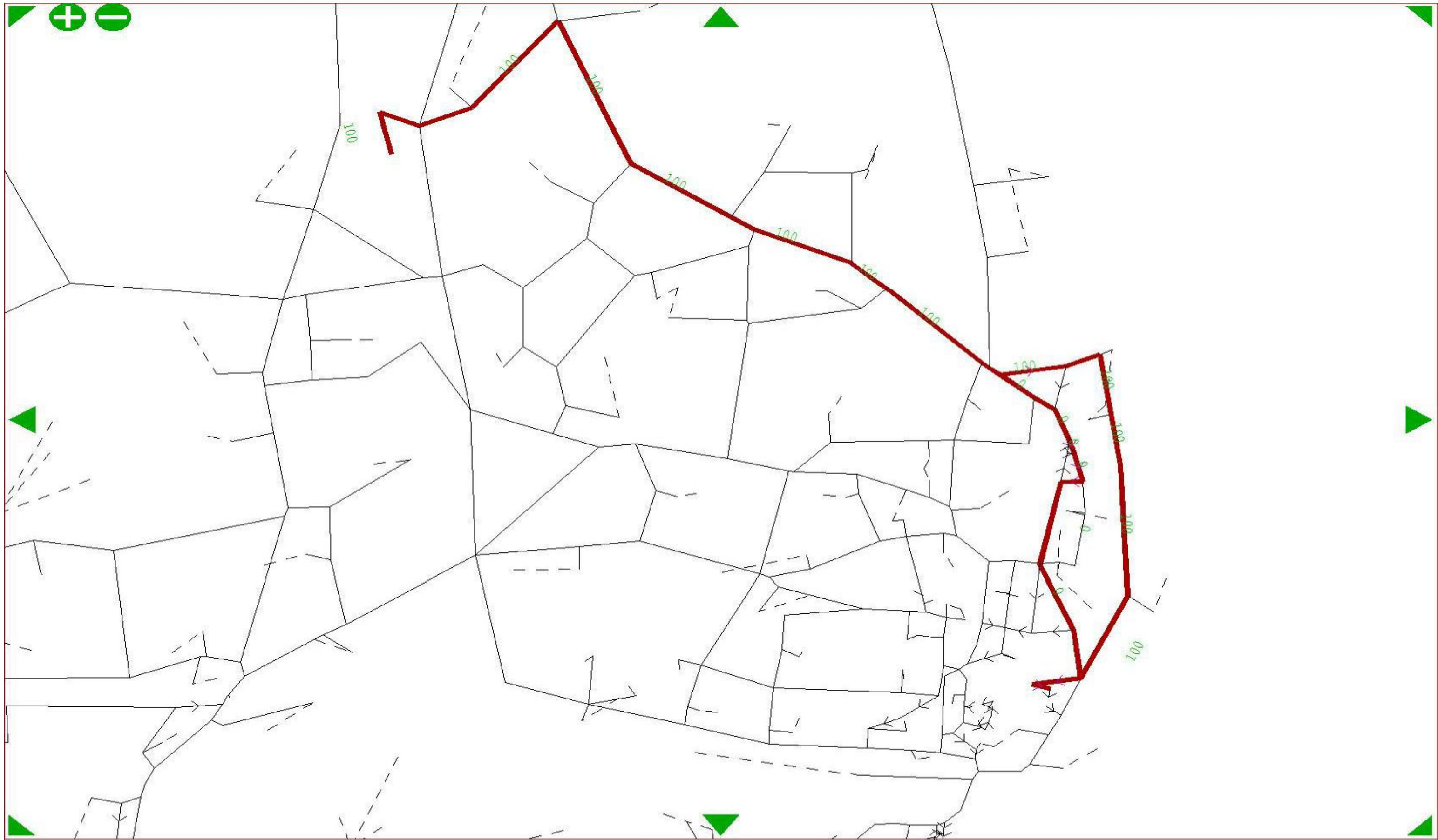
From Zone 584 To Zone 409 - User Class 10



From Zone 586 To Zone 762 - User Class 2

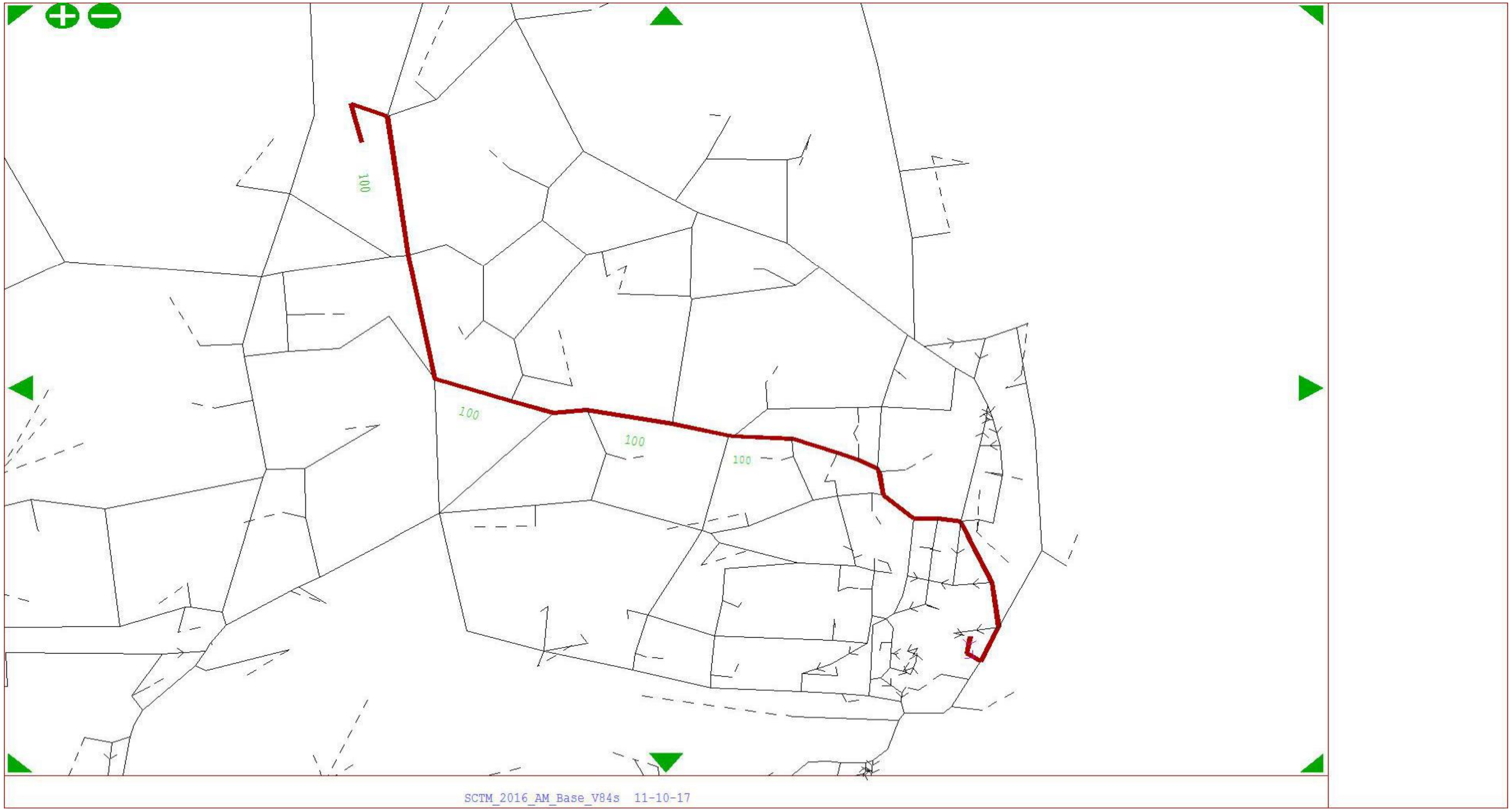


From Zone 586 To Zone 762 - User Class 10

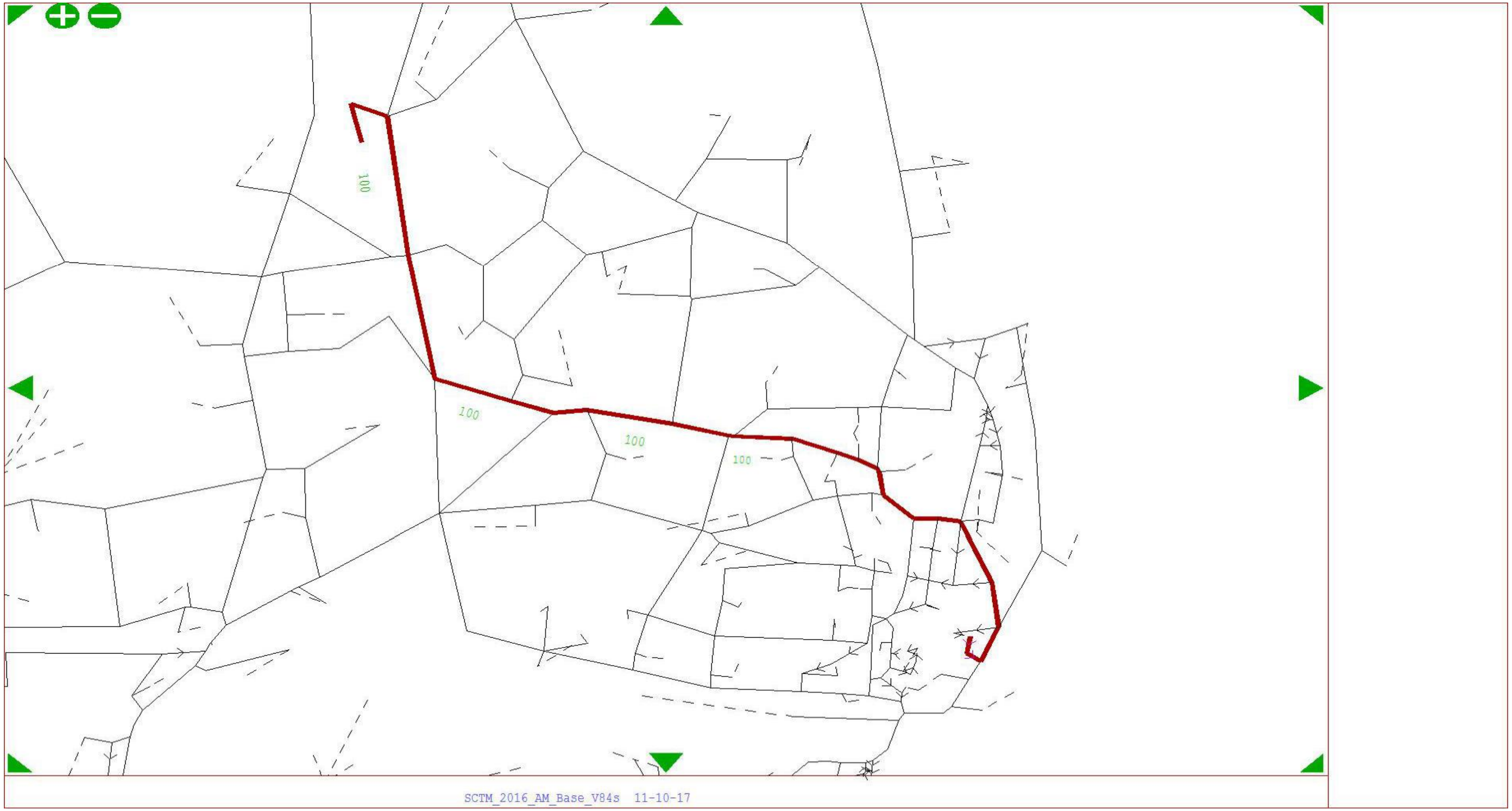


SCTM_2016_AM_Base_V84s 11-10-17

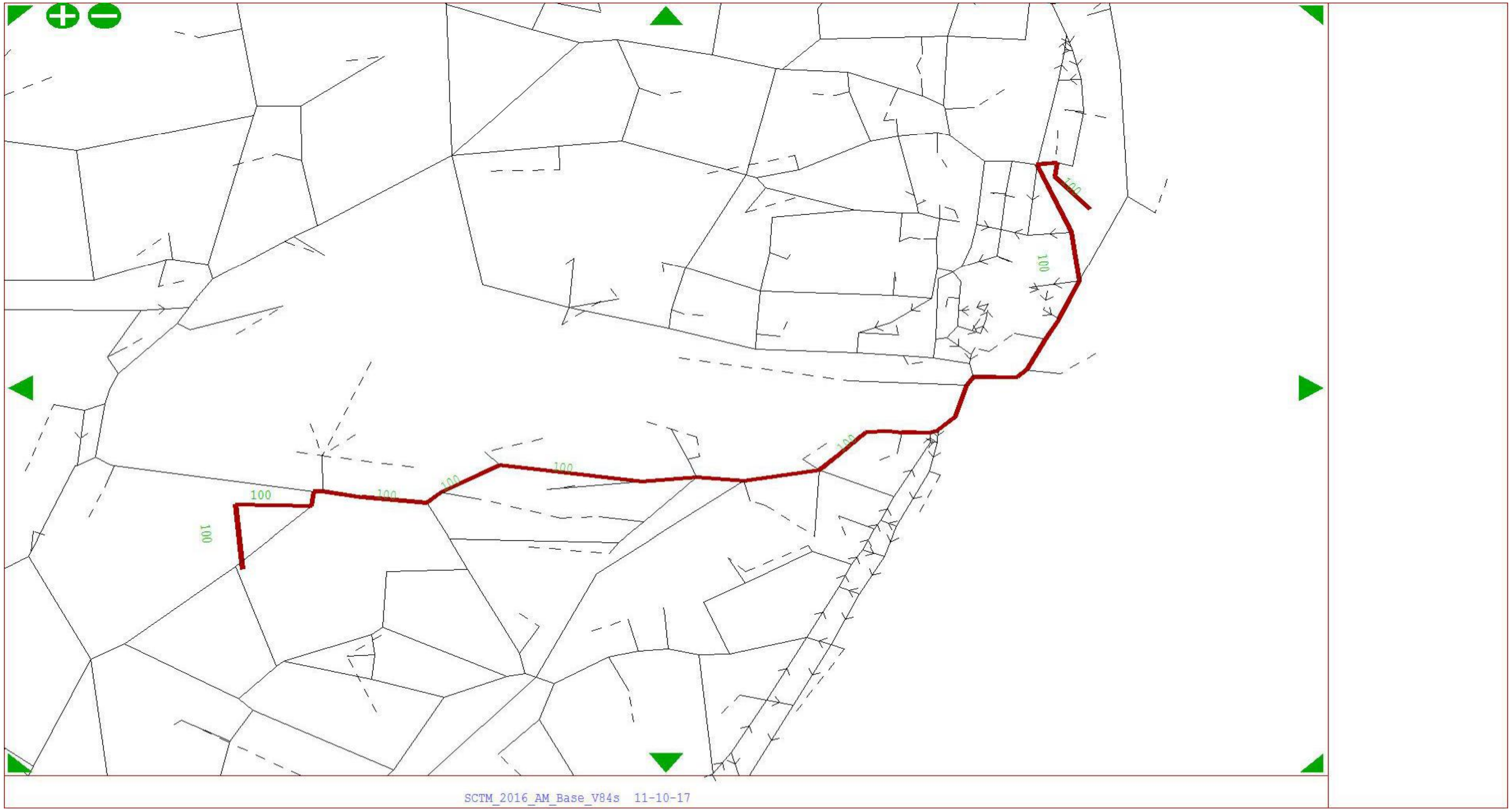
From Zone 762 To Zone 586 - User Class 2



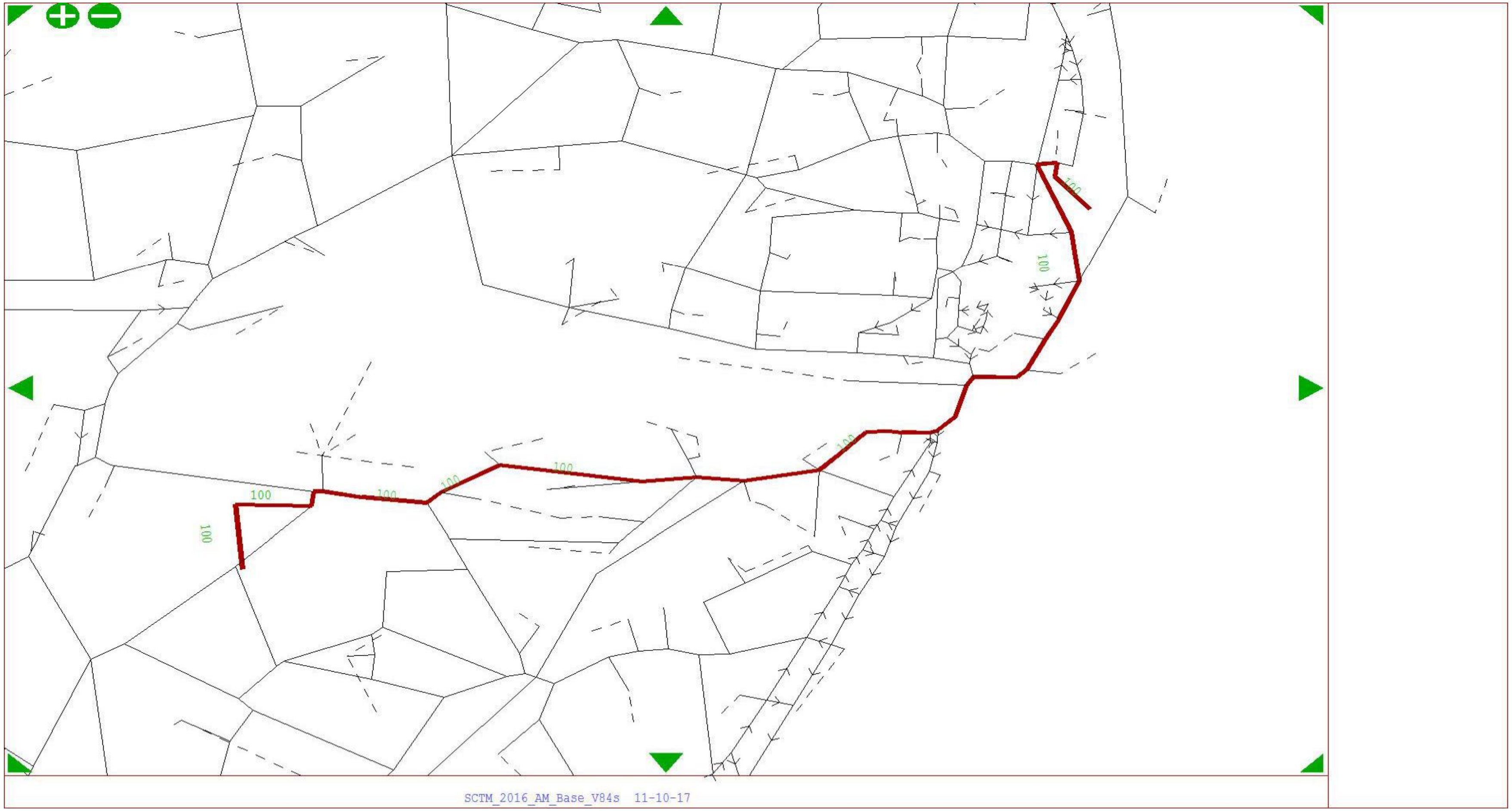
From Zone 762 To Zone 586 - User Class 10



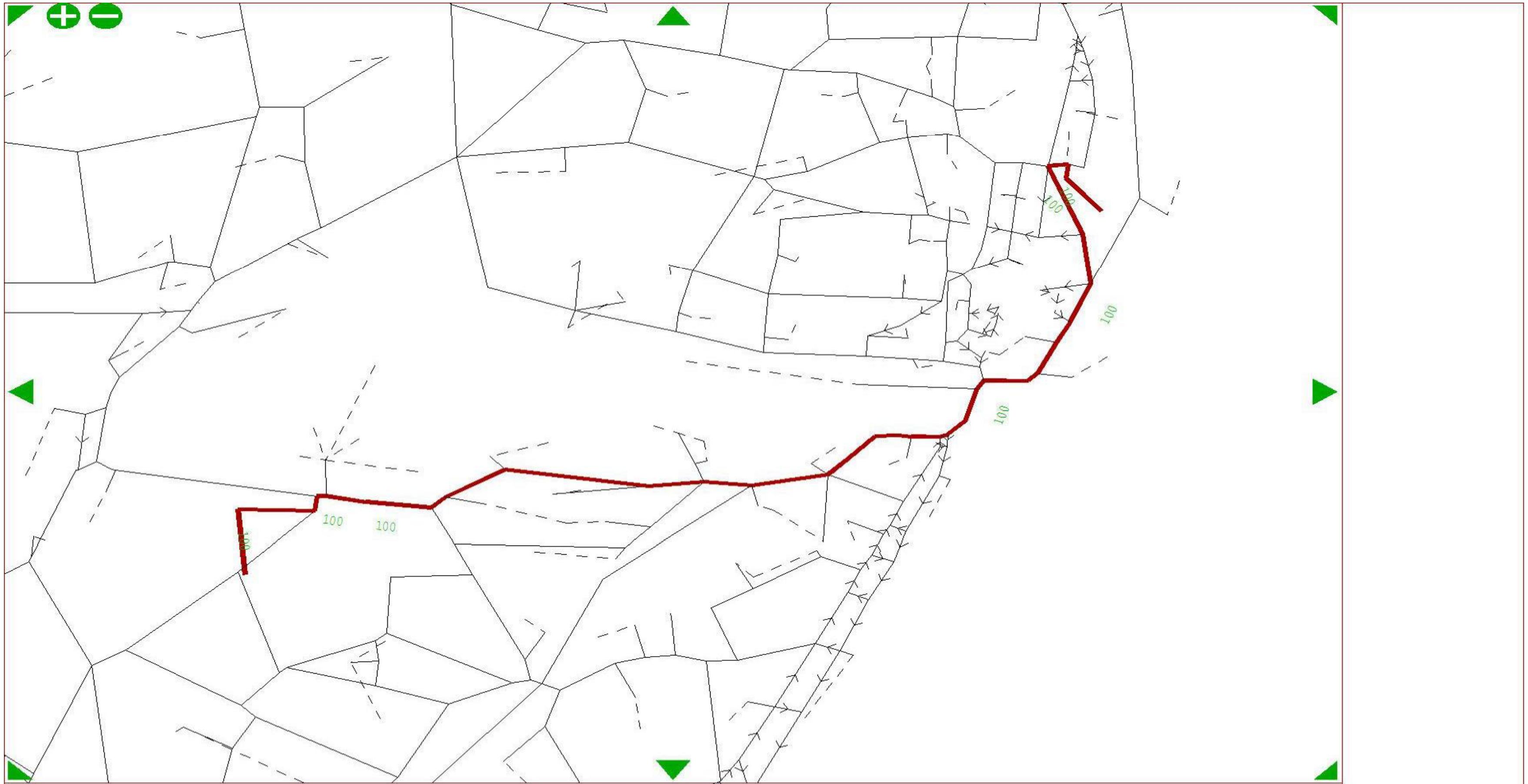
From Zone 432 To Zone 761 - User Class 2



From Zone 432 To Zone 761 - User Class 10

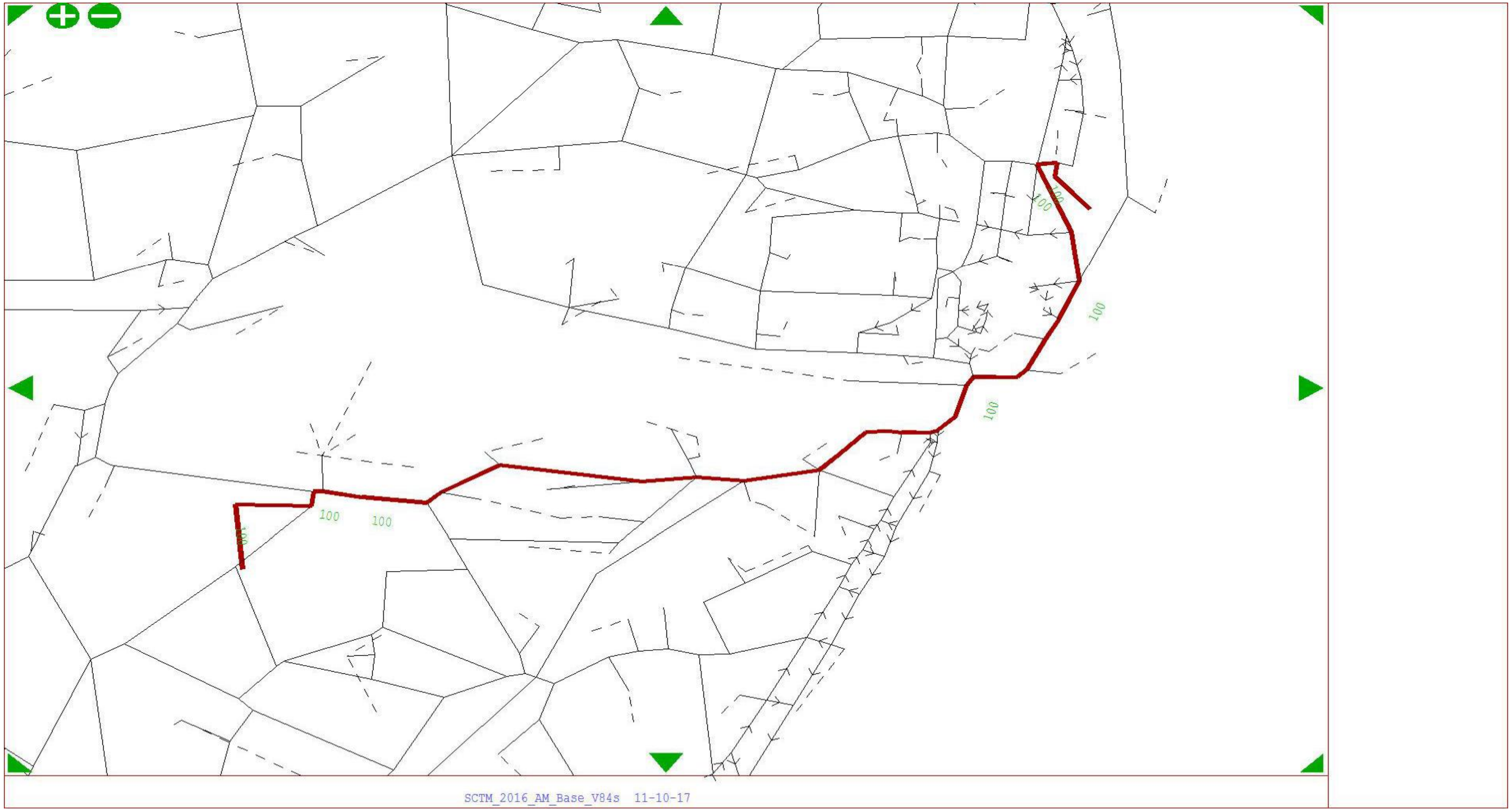


From Zone 761 To Zone 432 - User Class 2

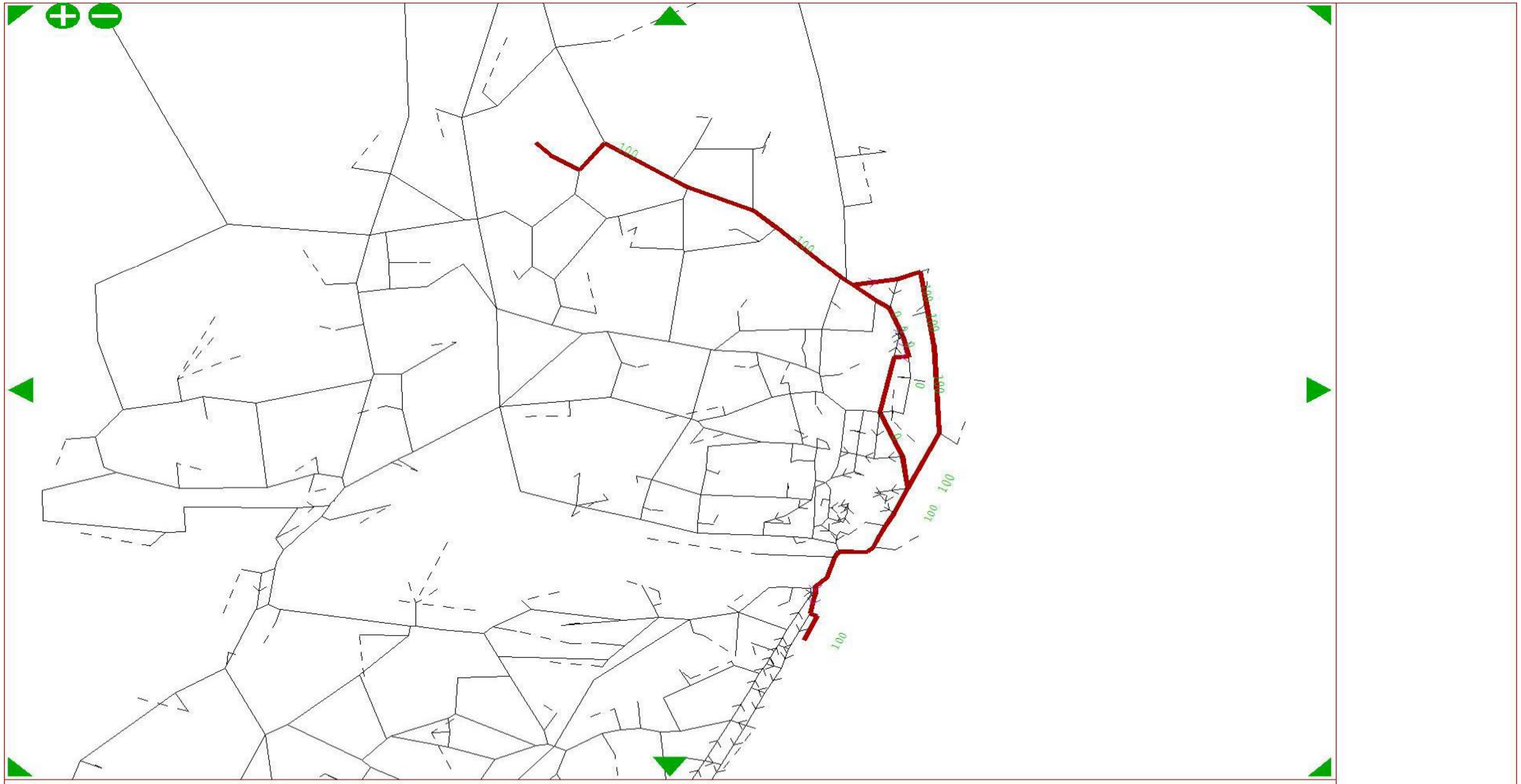


SCTM_2016_AM_Base_V84s 11-10-17

From Zone 761 To Zone 432 - User Class 10

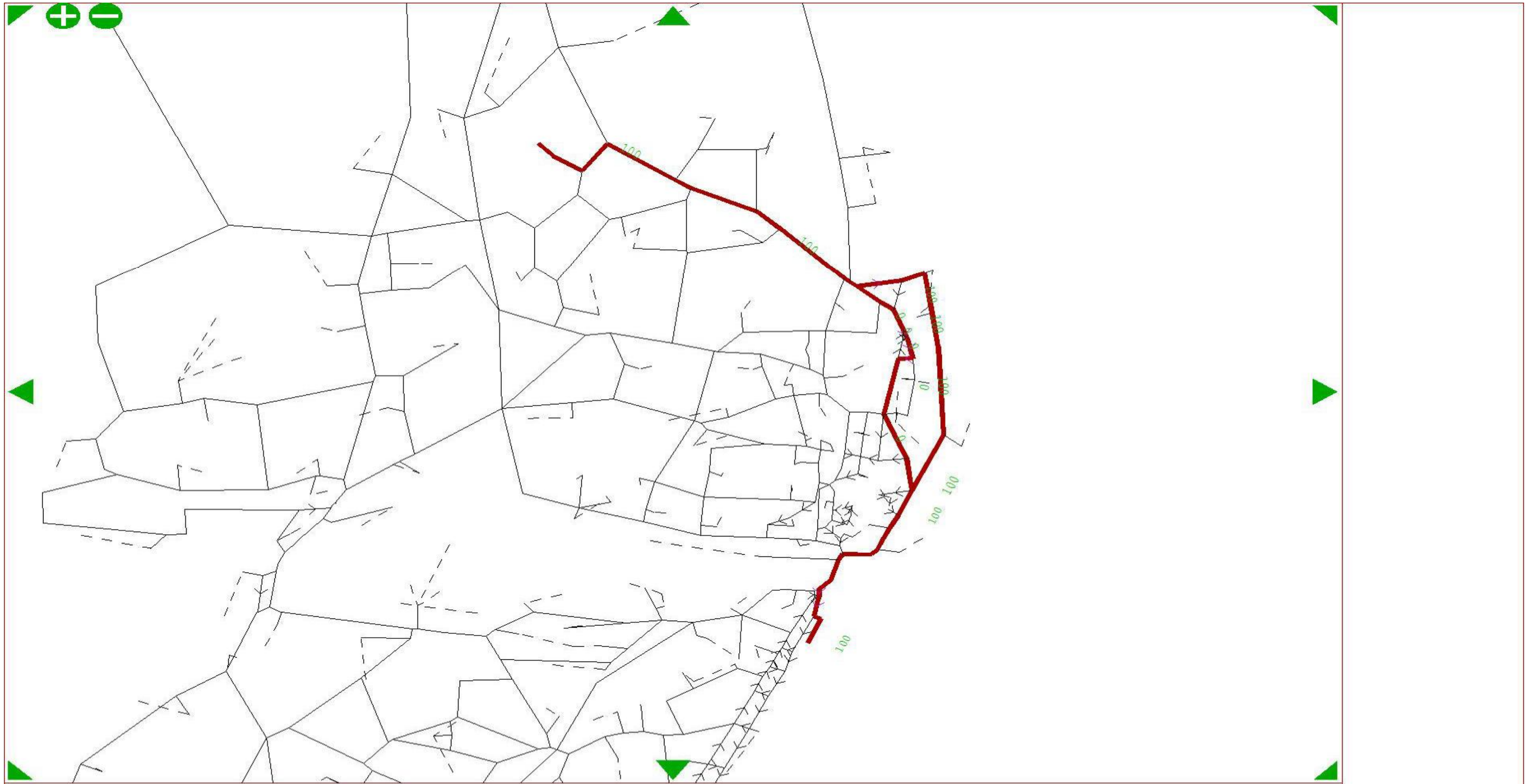


From Zone 416 To Zone 588 - User Class 2



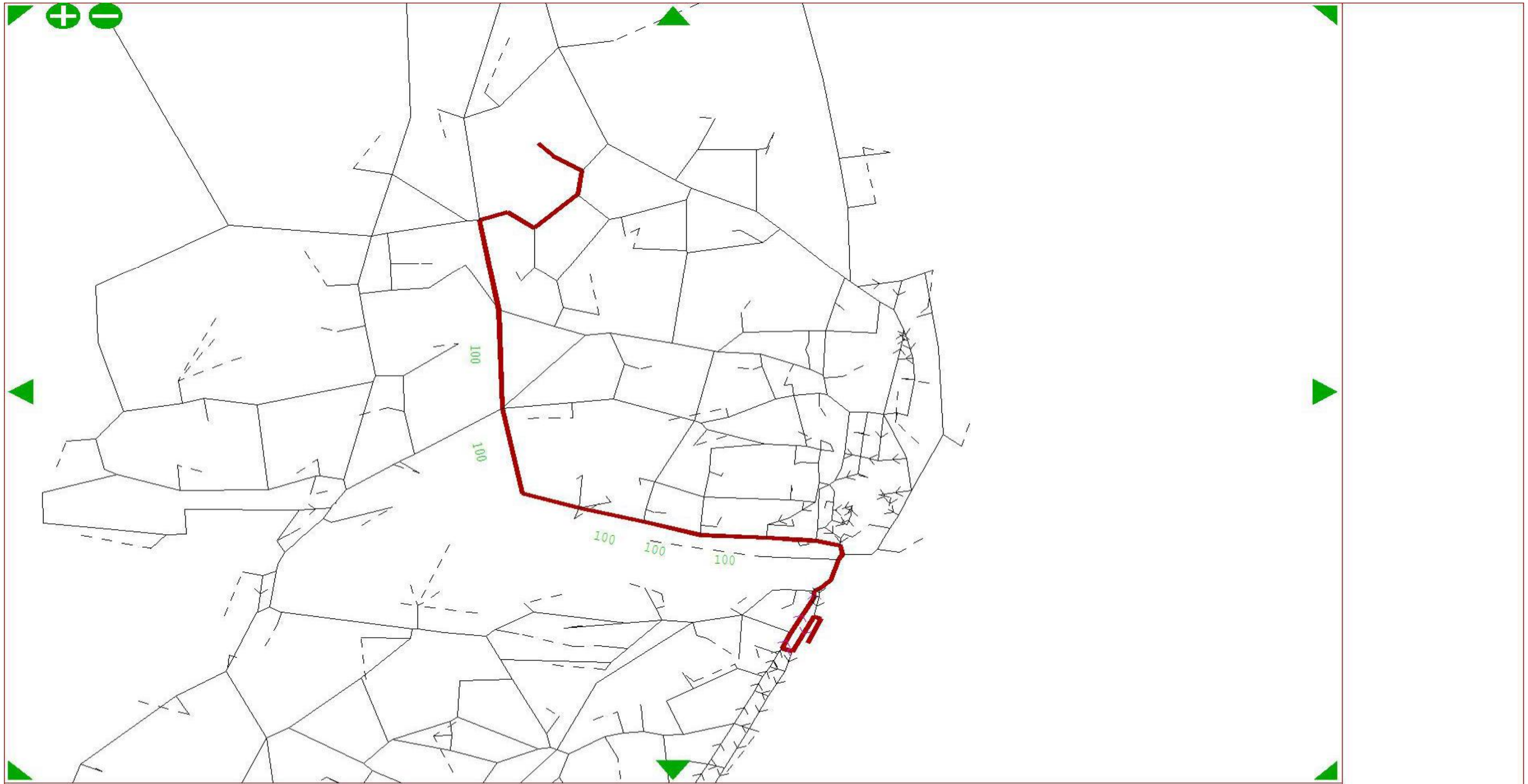
SCTM_2016_AM_Base_V84s 11-10-17

From Zone 416 To Zone 588 - User Class 10



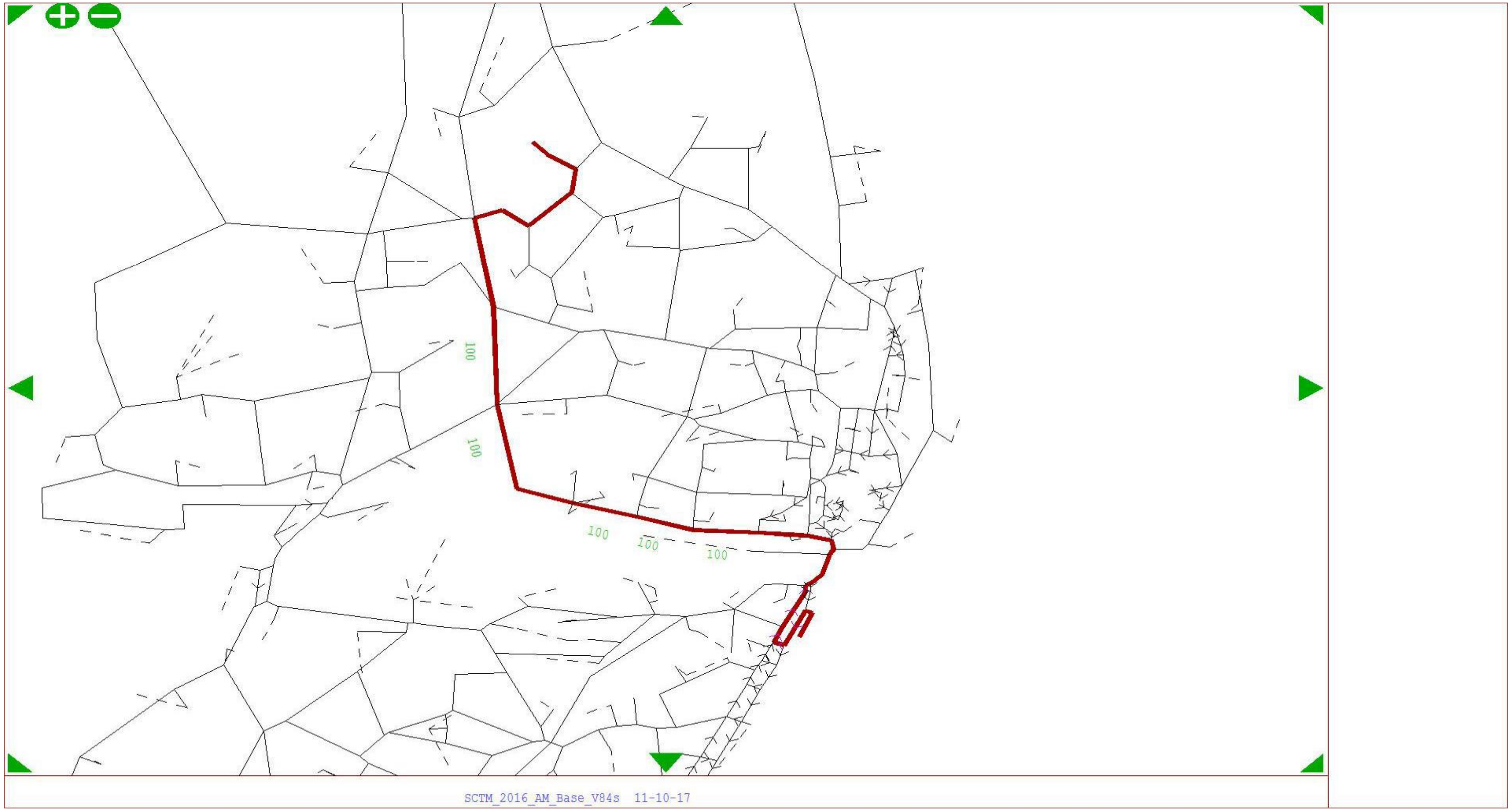
SCTM_2016_AM_Base_V84s 11-10-17

From Zone 588 To Zone 416 - User Class 2

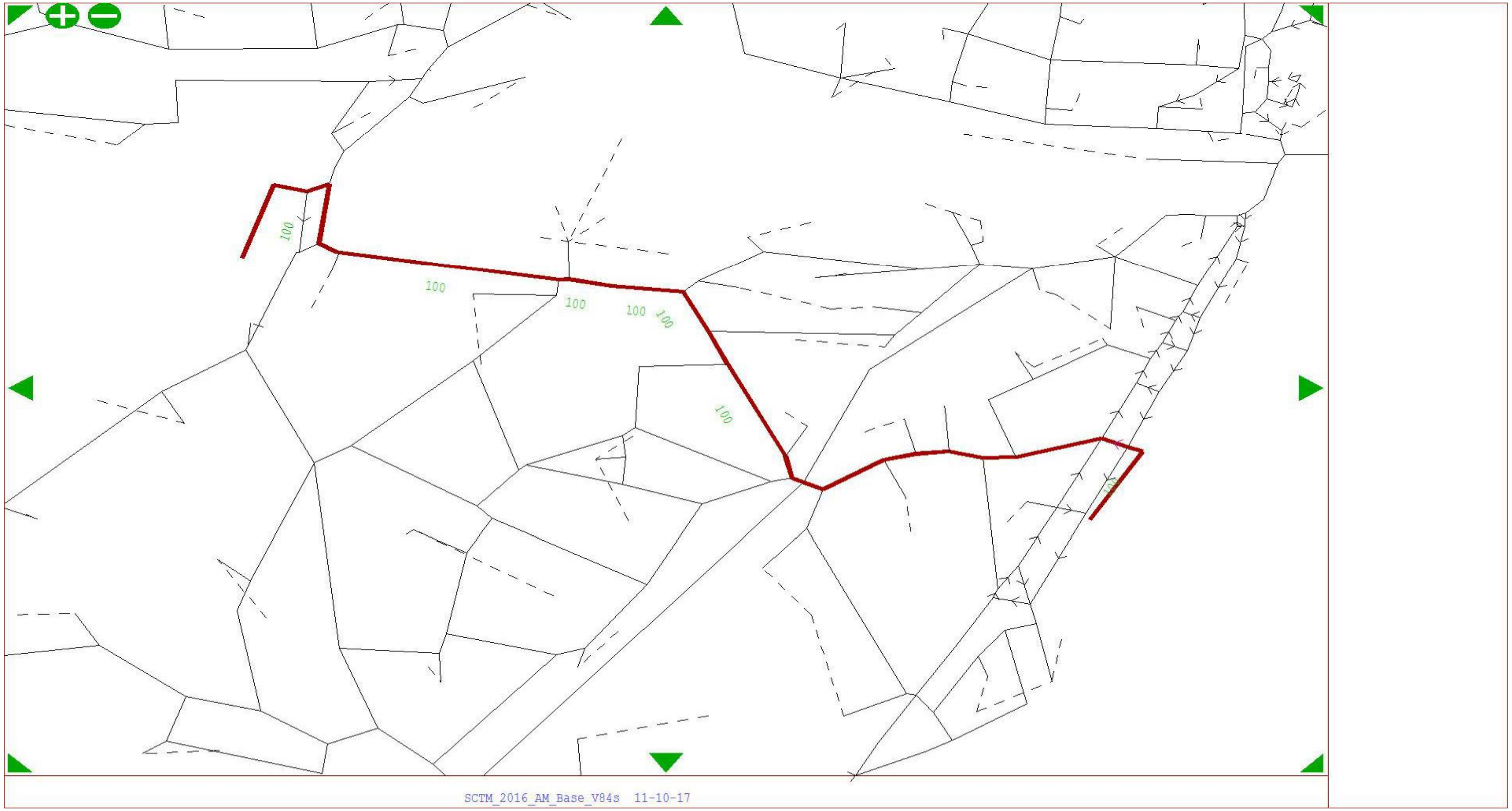


SCTM_2016_AM_Base_V84s 11-10-17

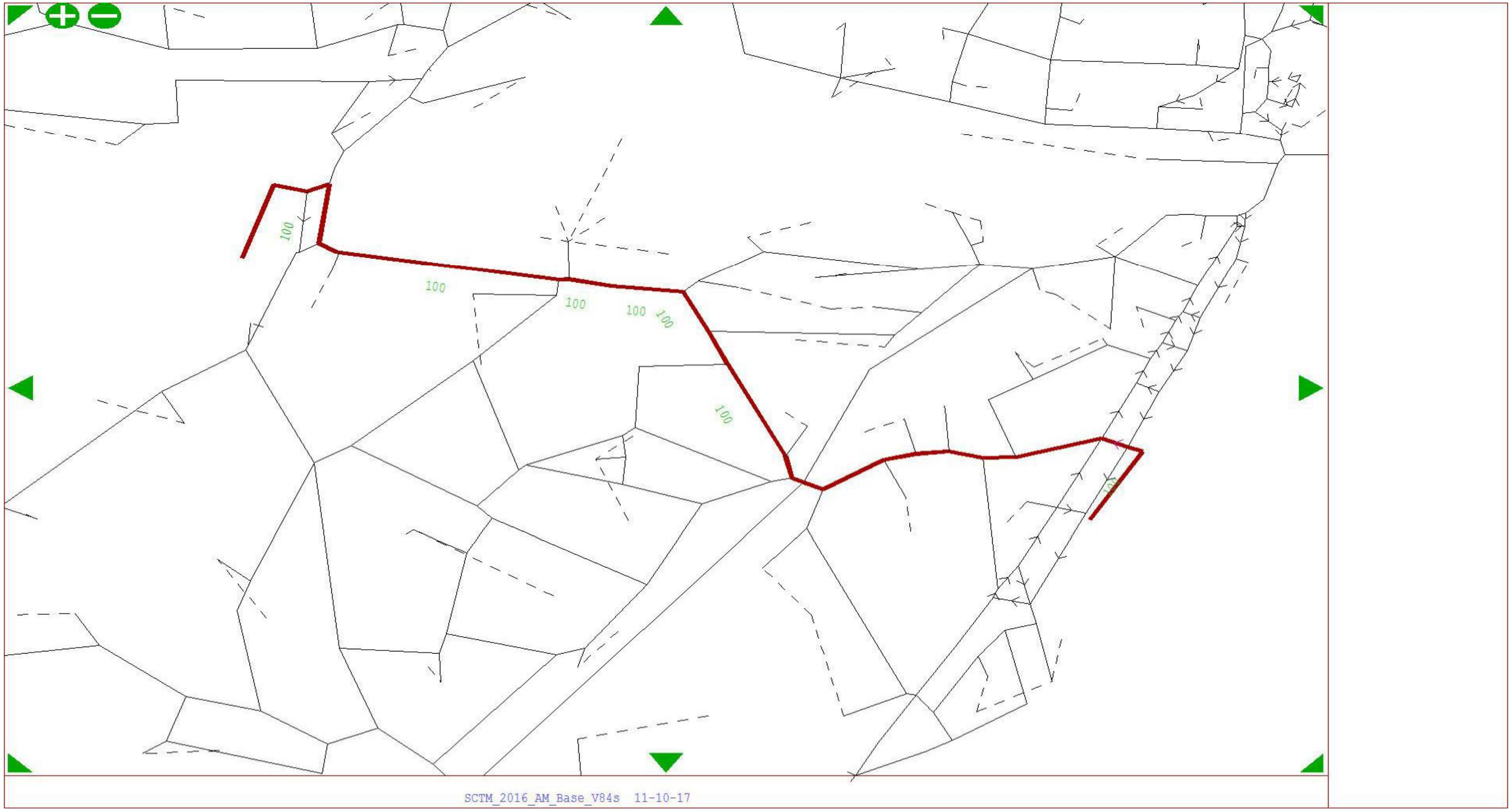
From Zone 588 To Zone 416 - User Class 10



From Zone 593 To Zone 598 - User Class 2

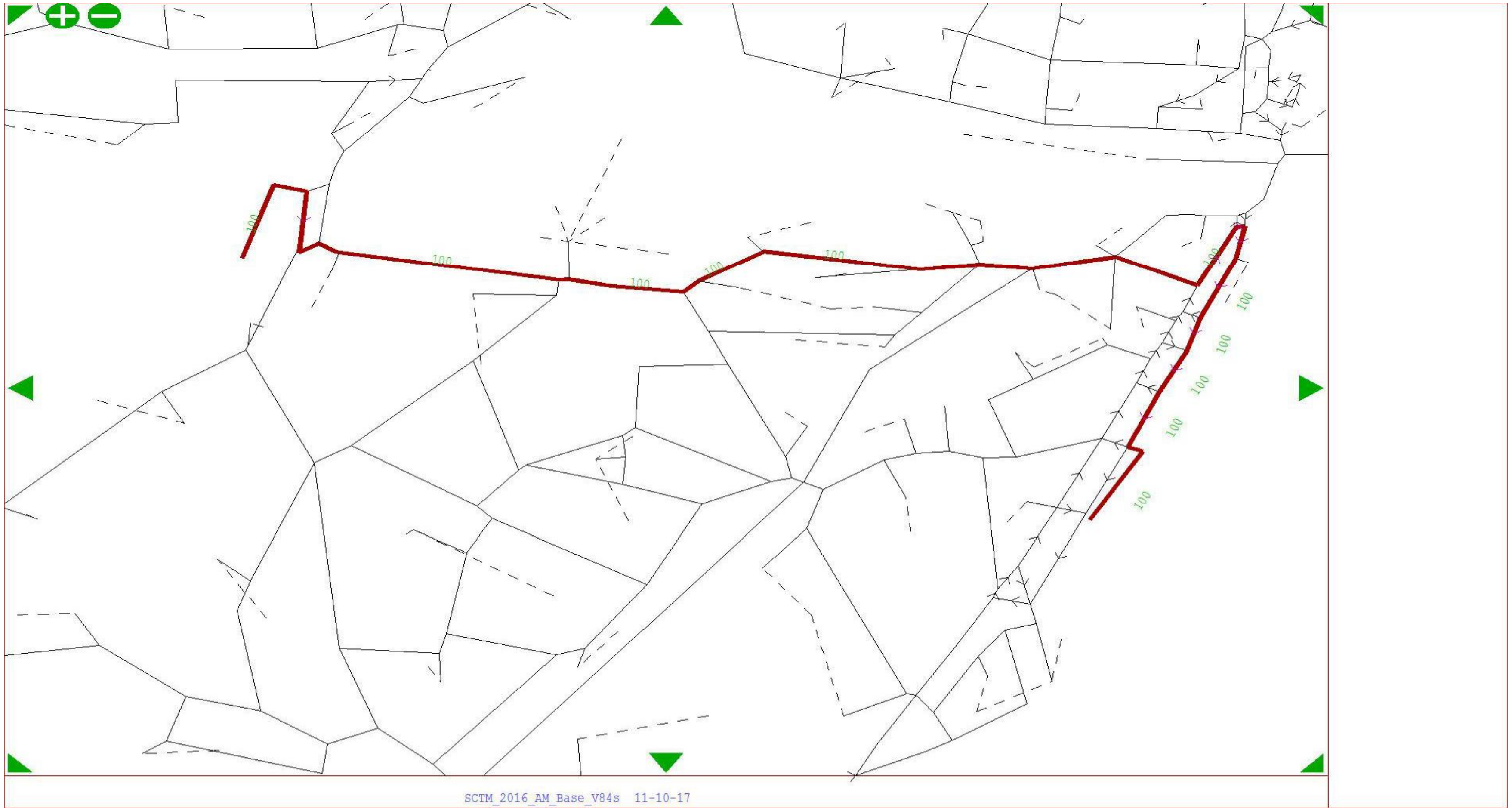


From Zone 593 To Zone 598 - User Class 10

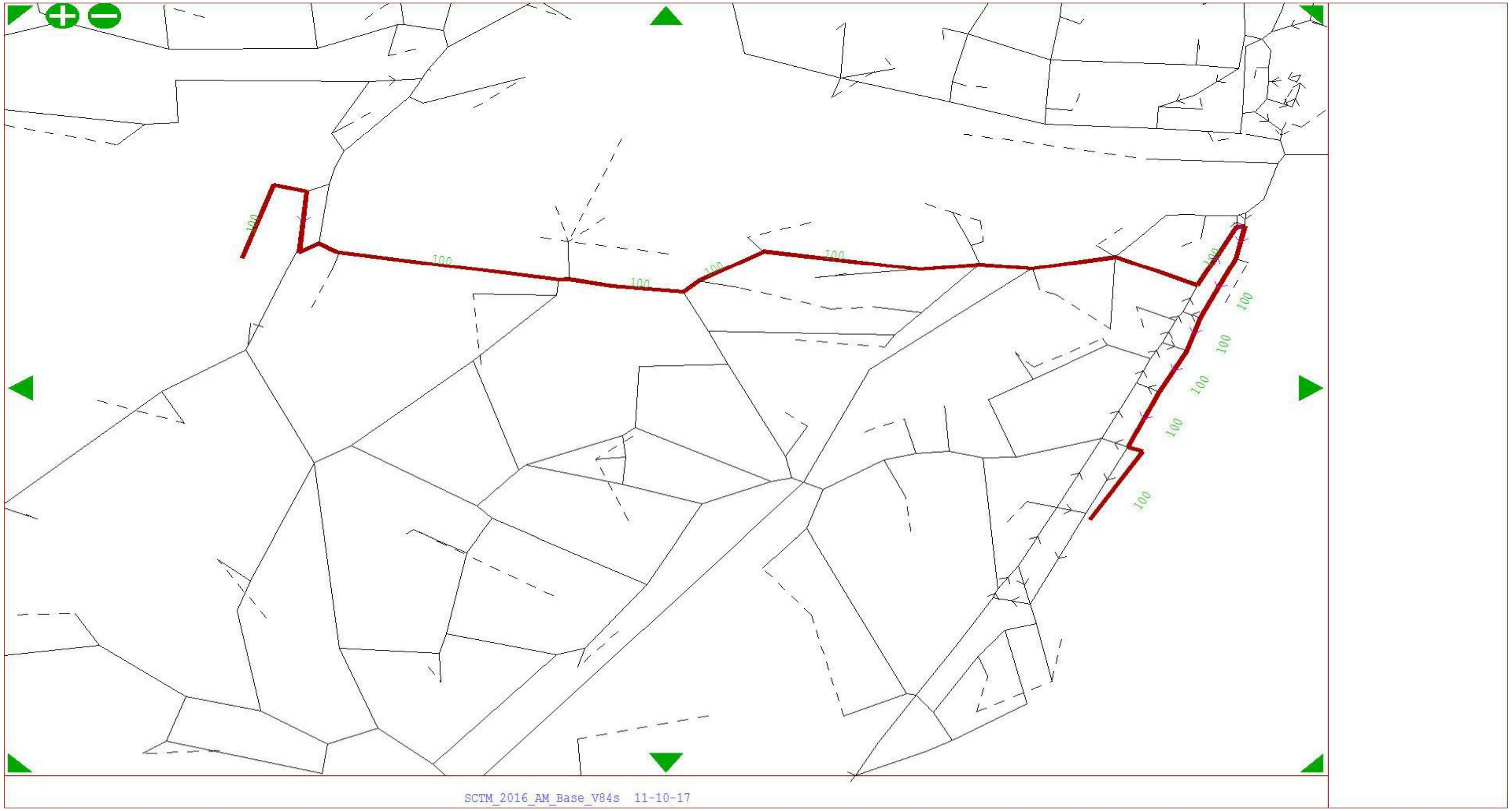


SCTM_2016_AM_Base_V84s 11-10-17

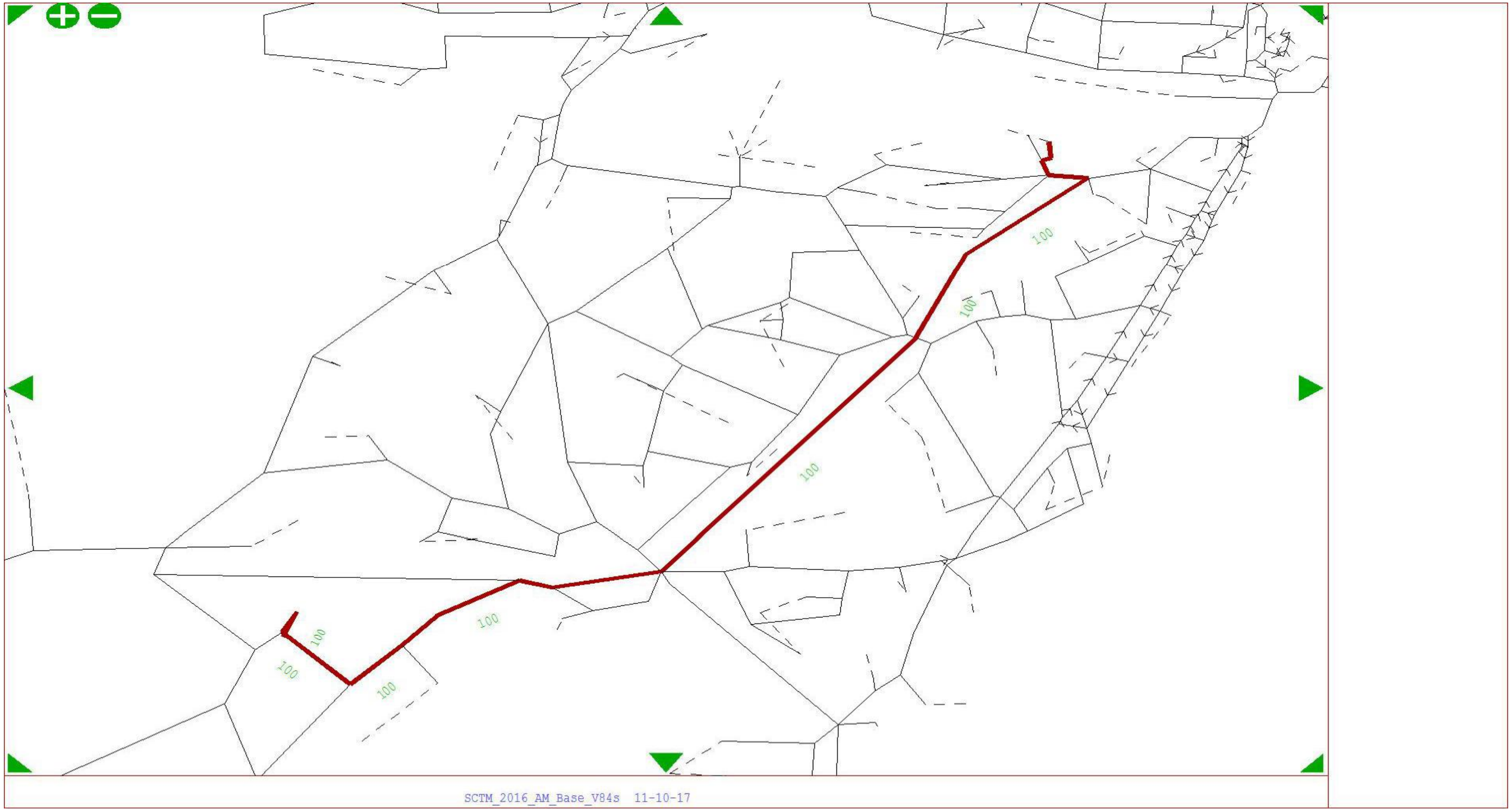
From Zone 598 To Zone 593 - User Class 2



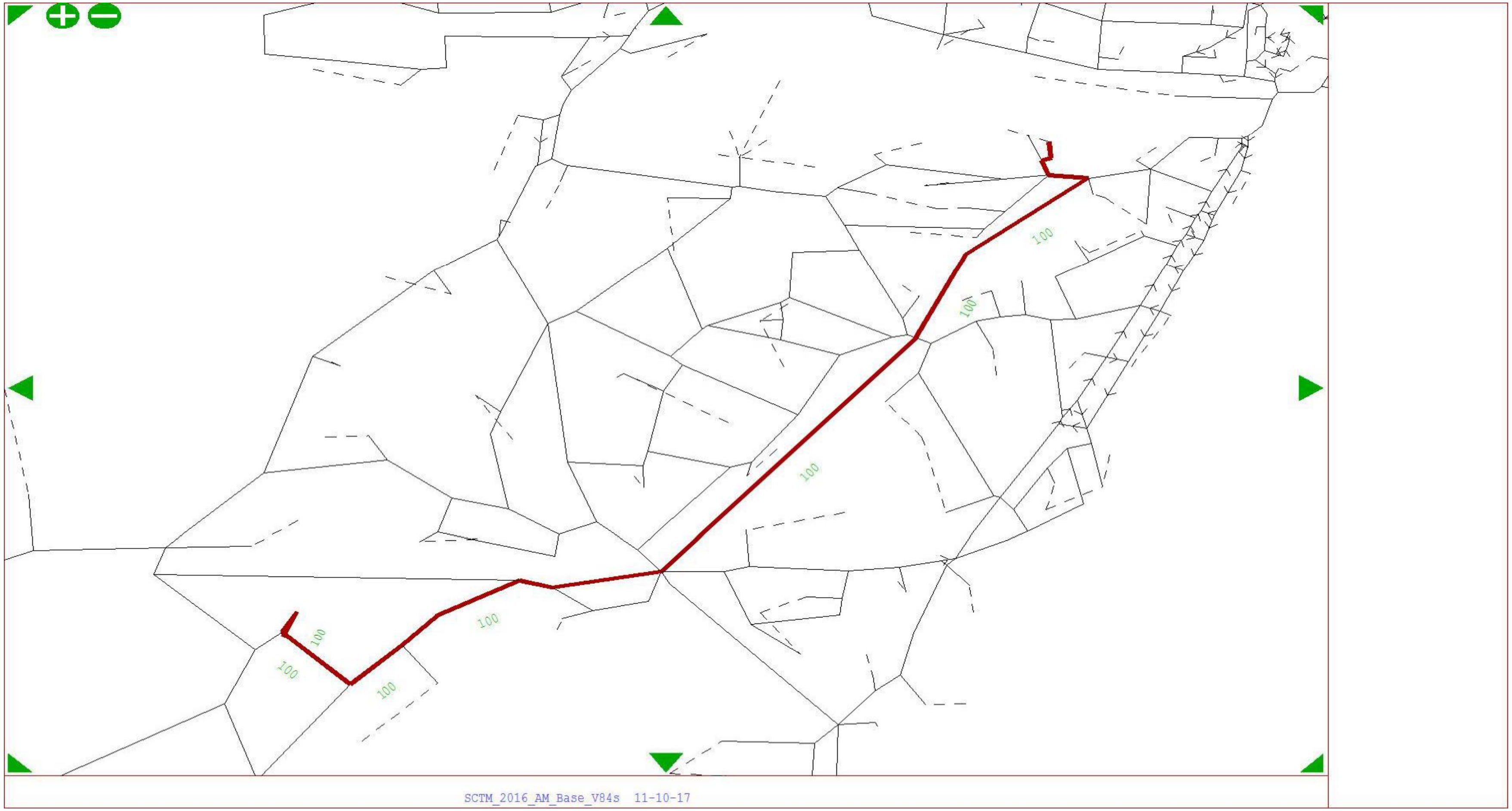
From Zone 598 To Zone 593 - User Class 10



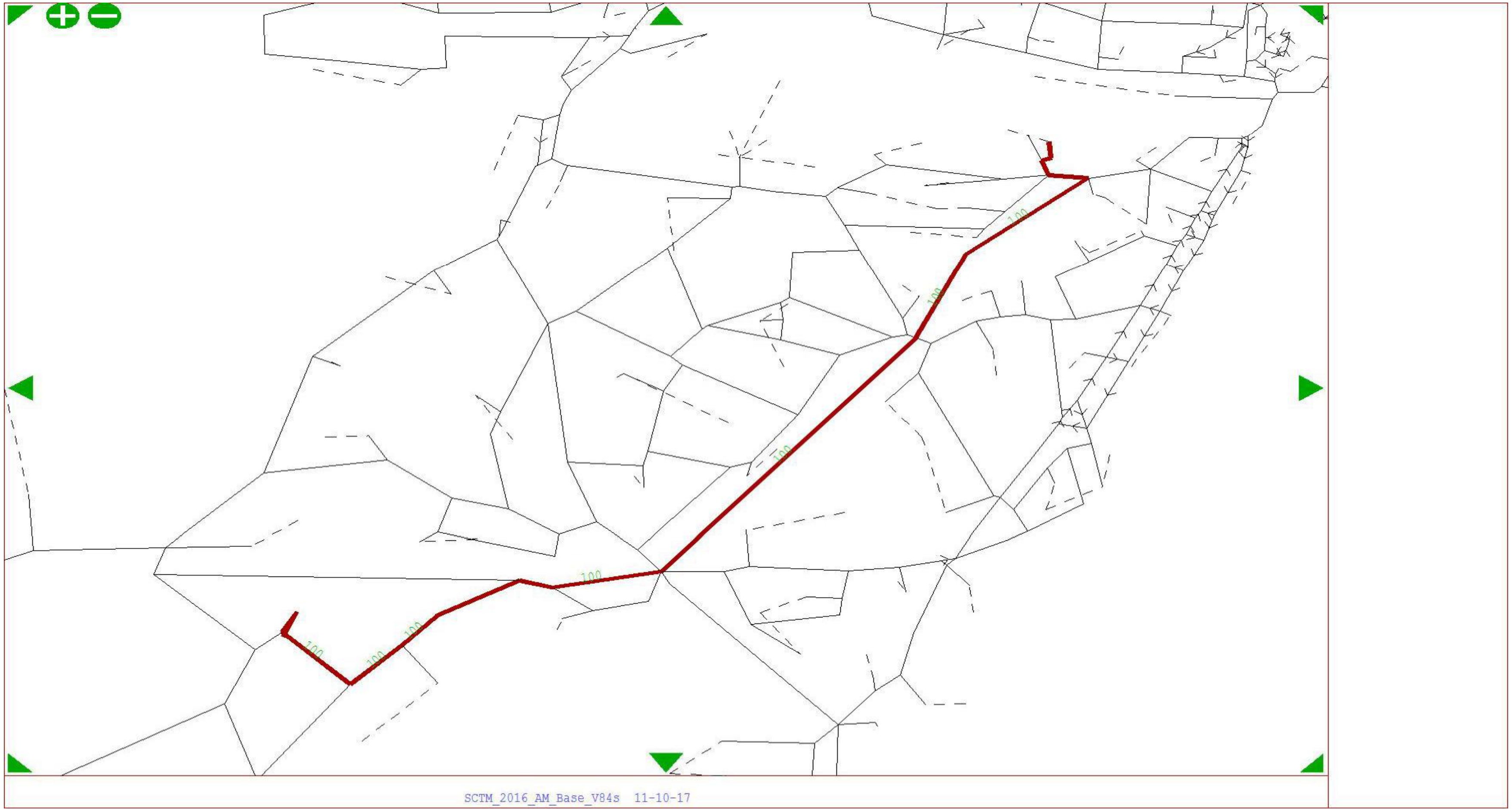
From Zone 773 To Zone 782 - User Class 2



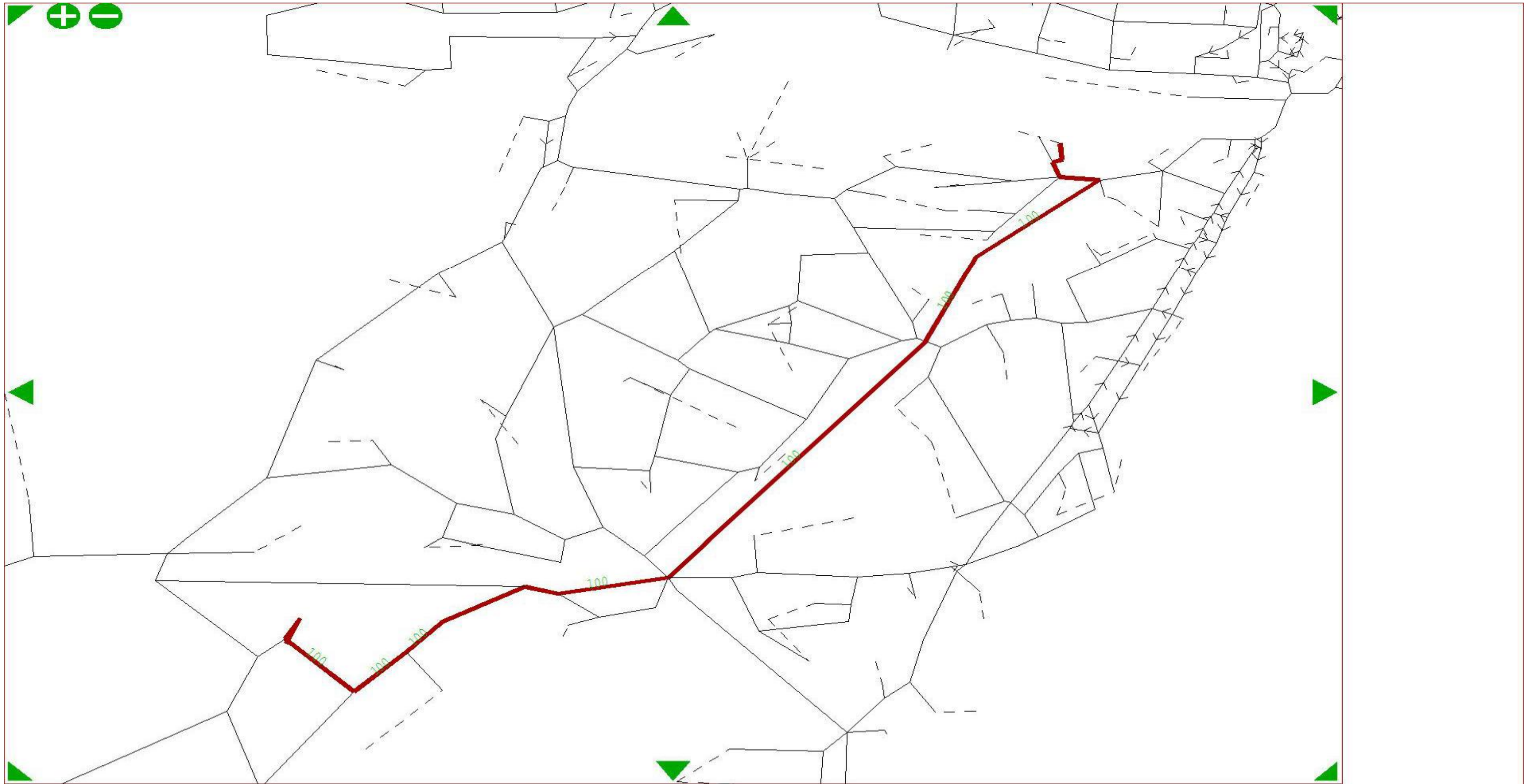
From Zone 773 To Zone 782 - User Class 10



From Zone 782 To Zone 773 - User Class 2

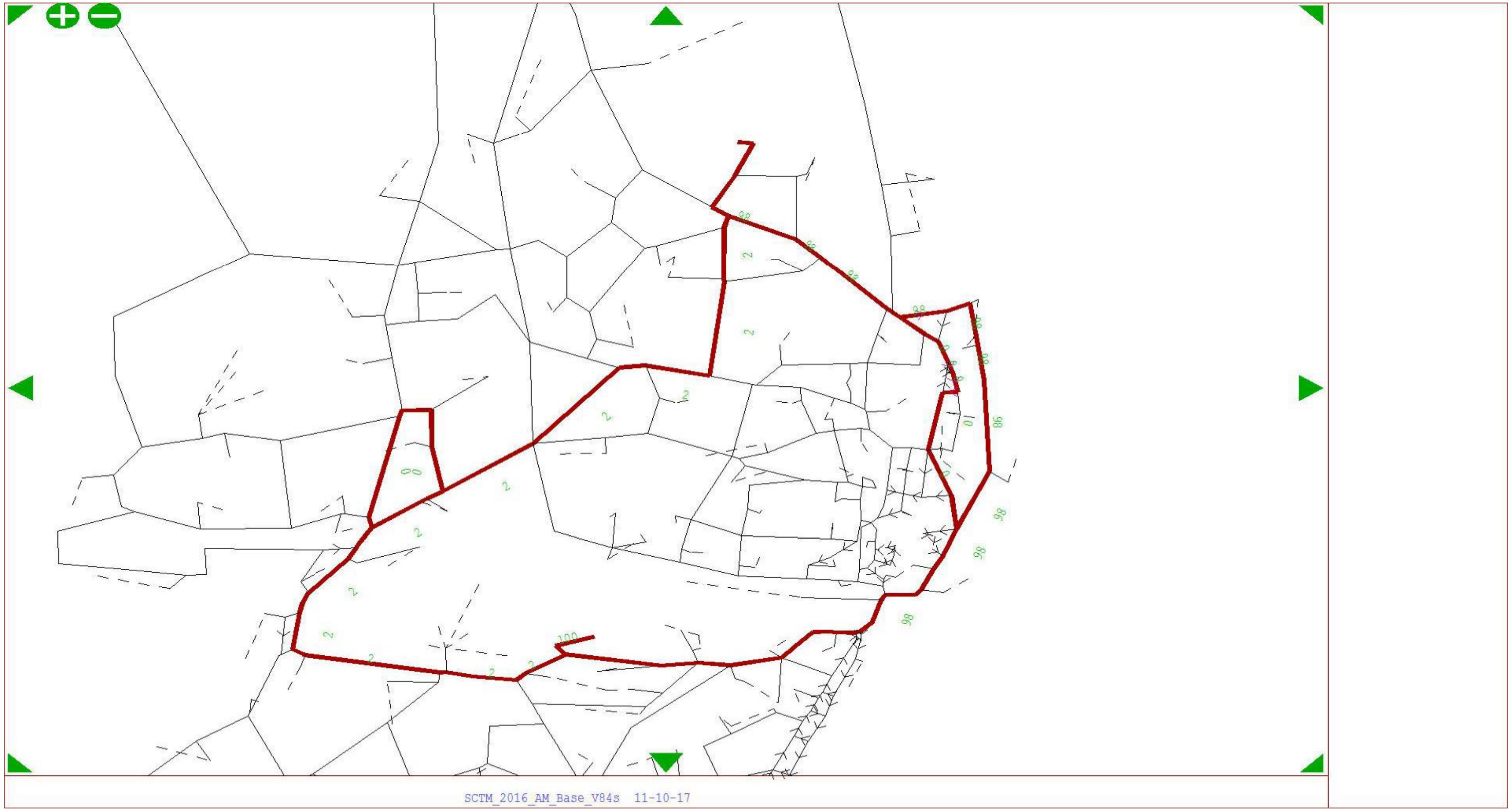


From Zone 782 To Zone 773 - User Class 10



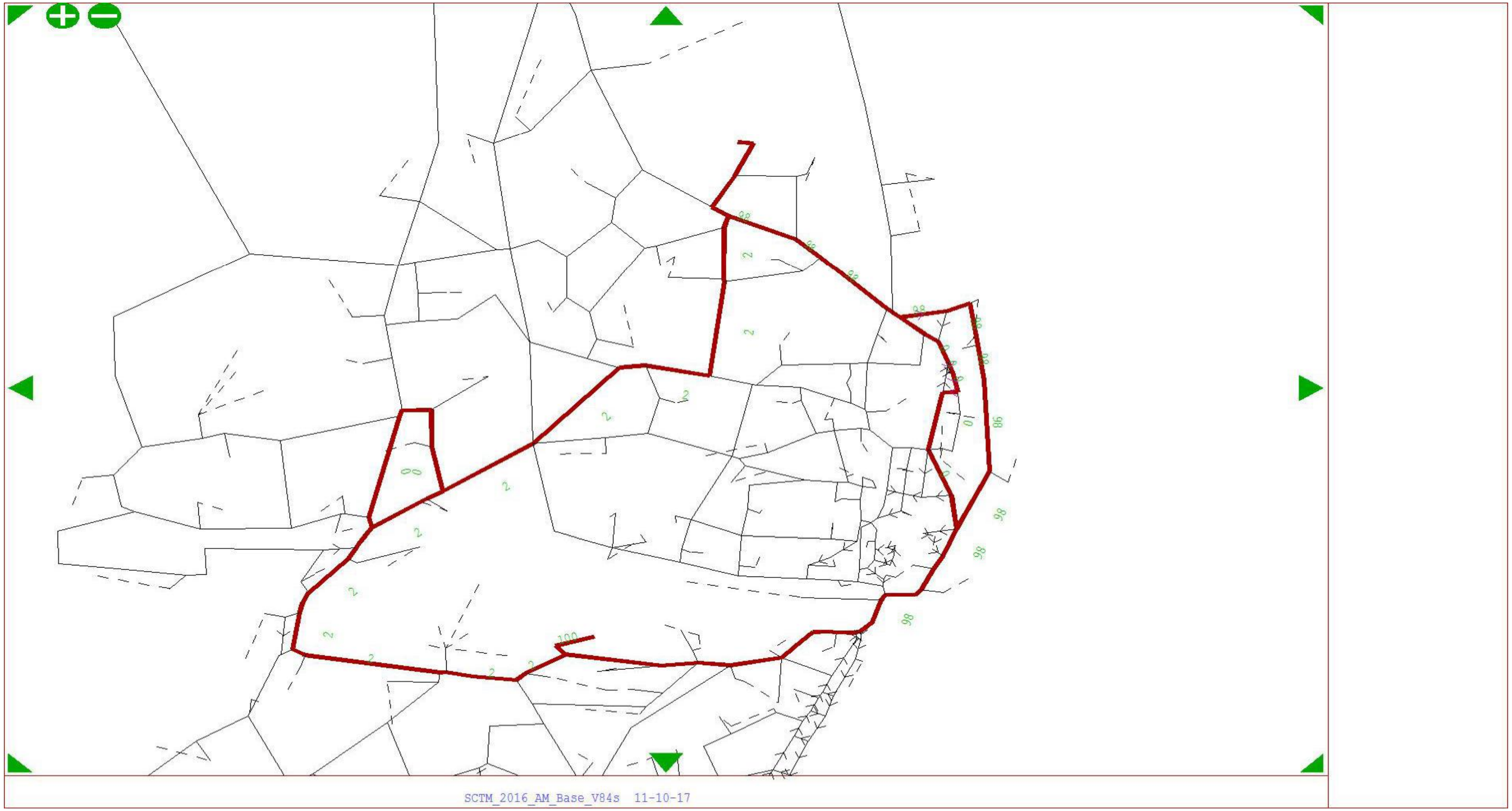
SCTM_2016_AM_Base_V84s 11-10-17

From Zone 409 To Zone 589 - User Class 2



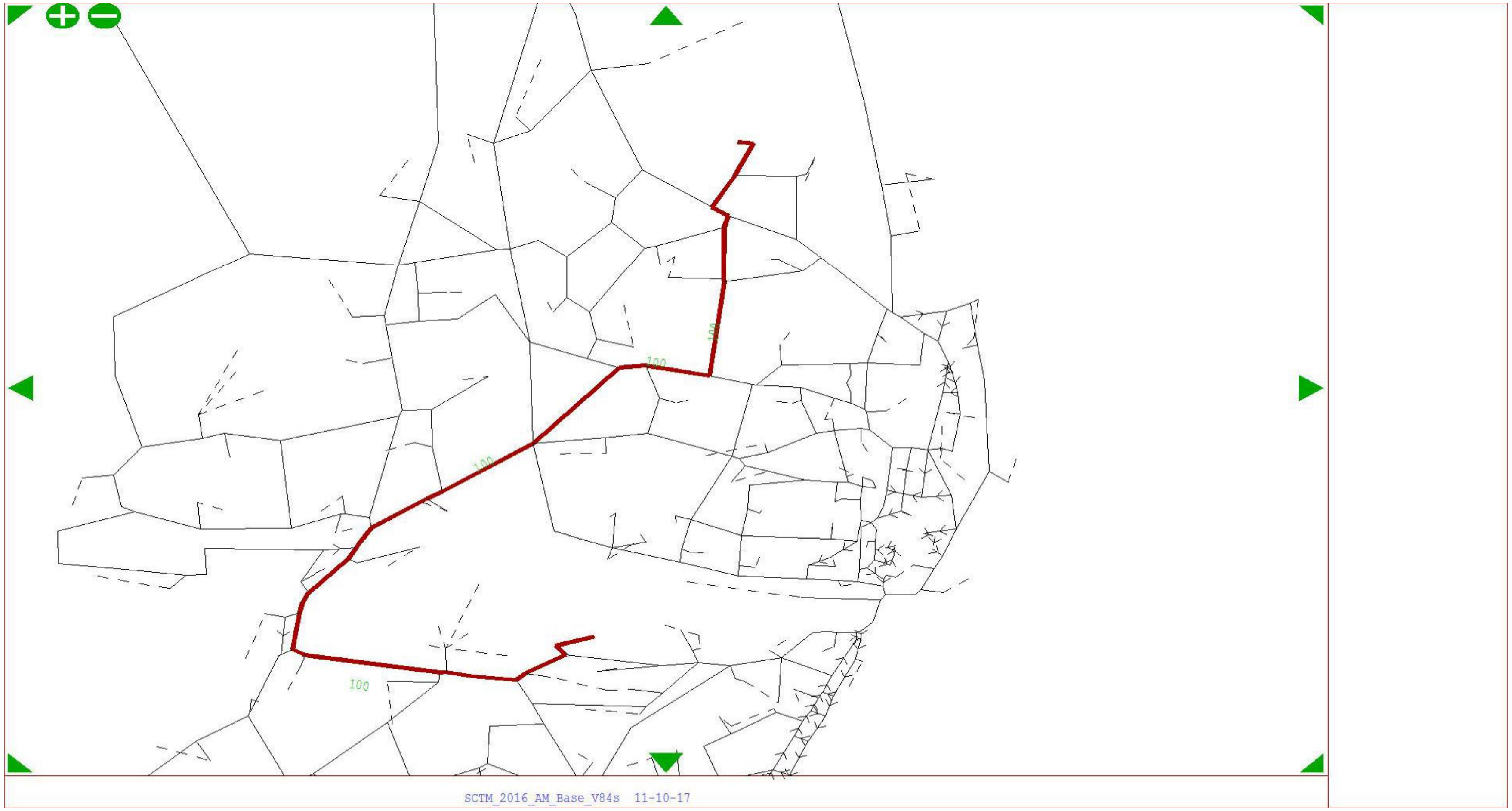
SCTM_2016_AM_Base_V84s 11-10-17

From Zone 409 To Zone 589 - User Class 10

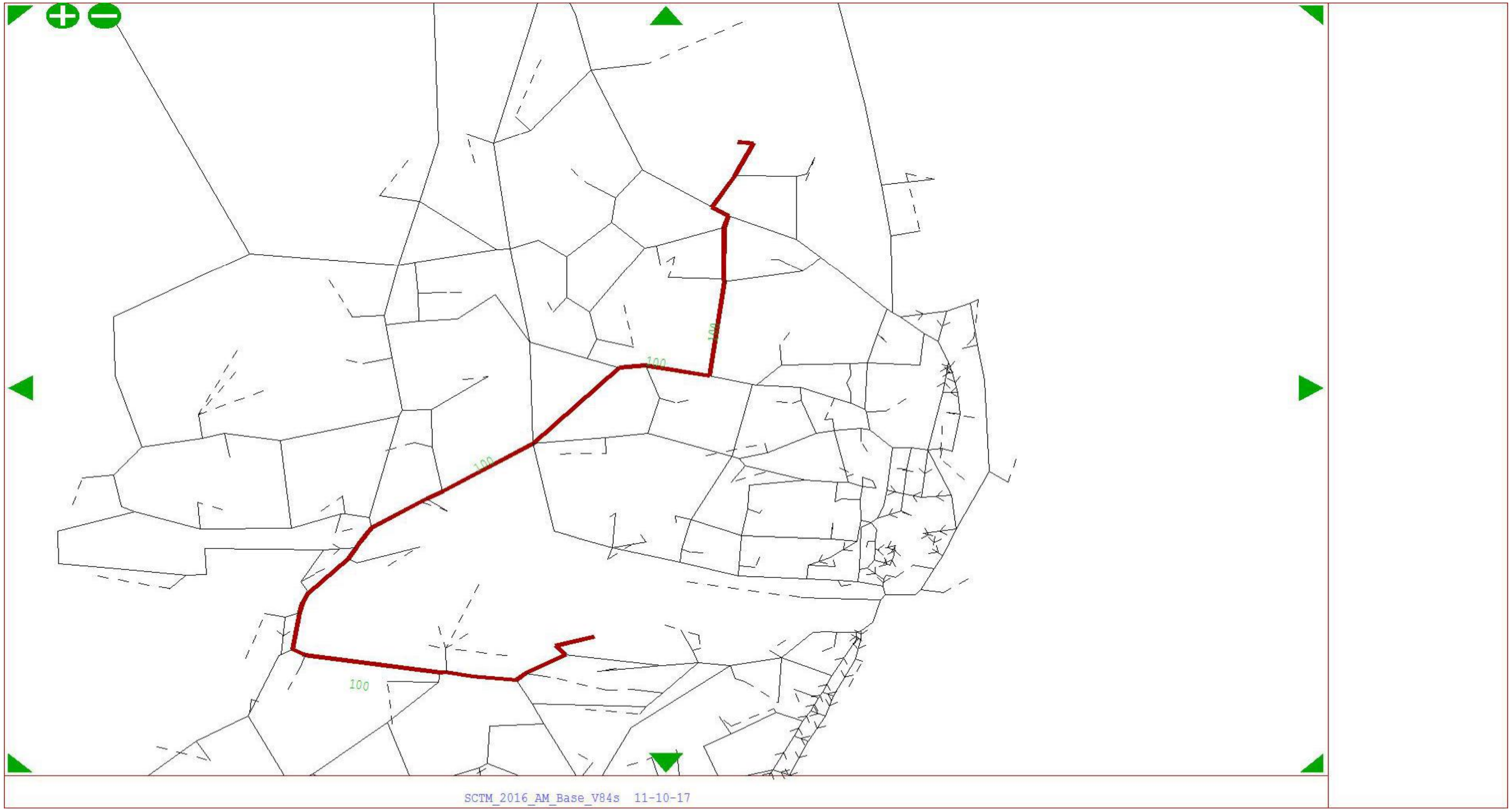


SCTM_2016_AM_Base_V84s 11-10-17

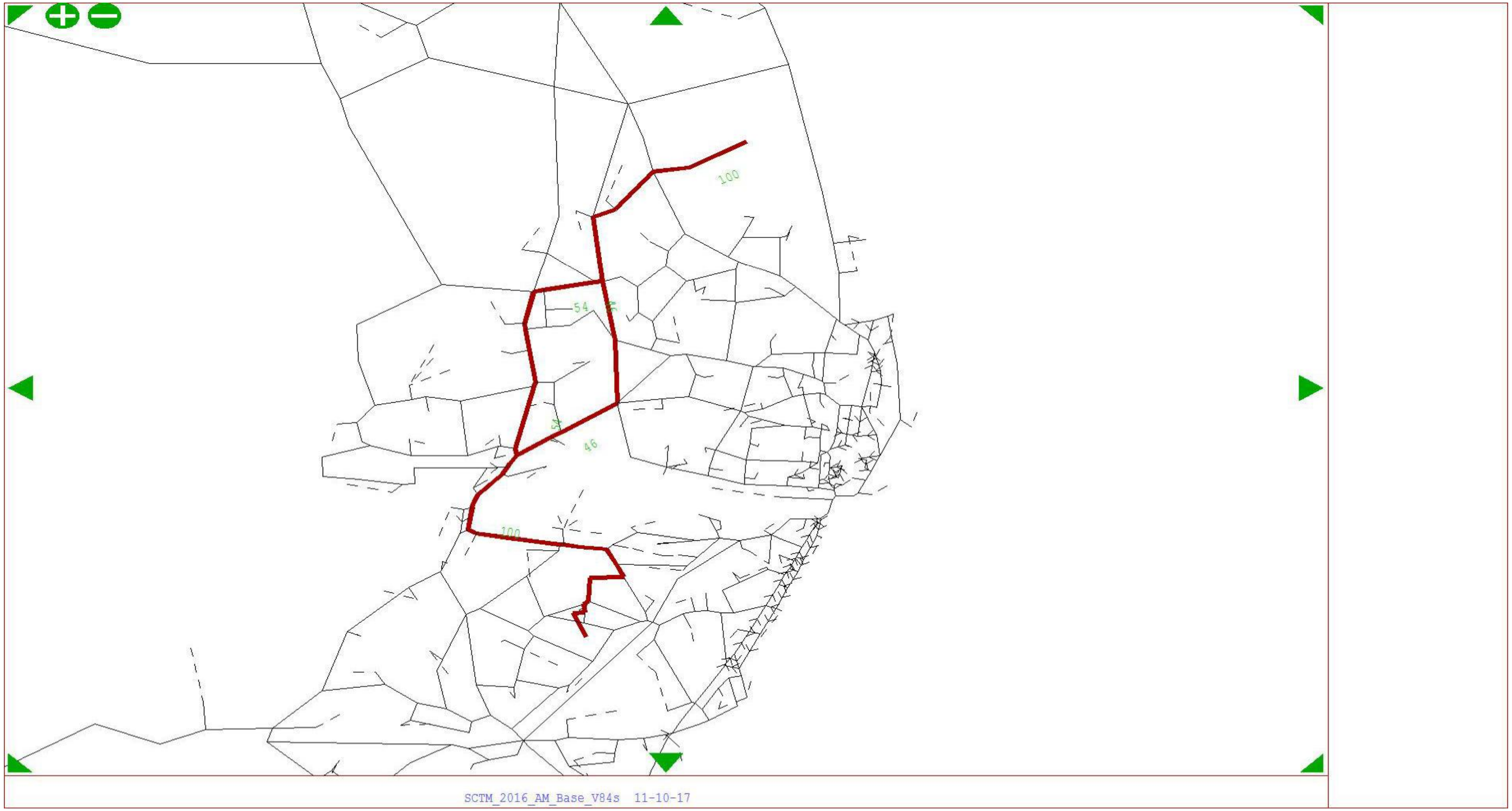
From Zone 589 To Zone 409 - User Class 2



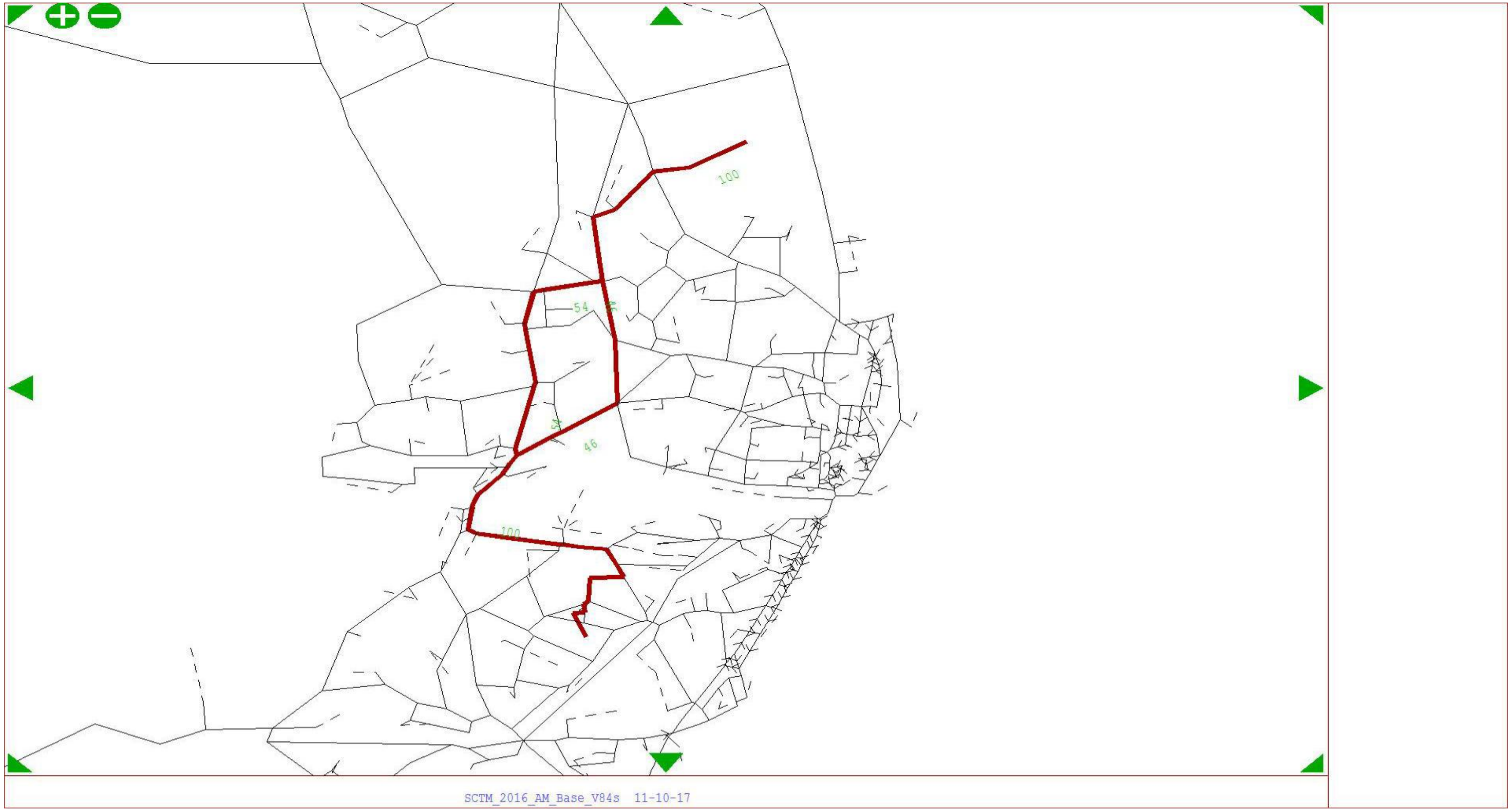
From Zone 589 To Zone 409 - User Class 10



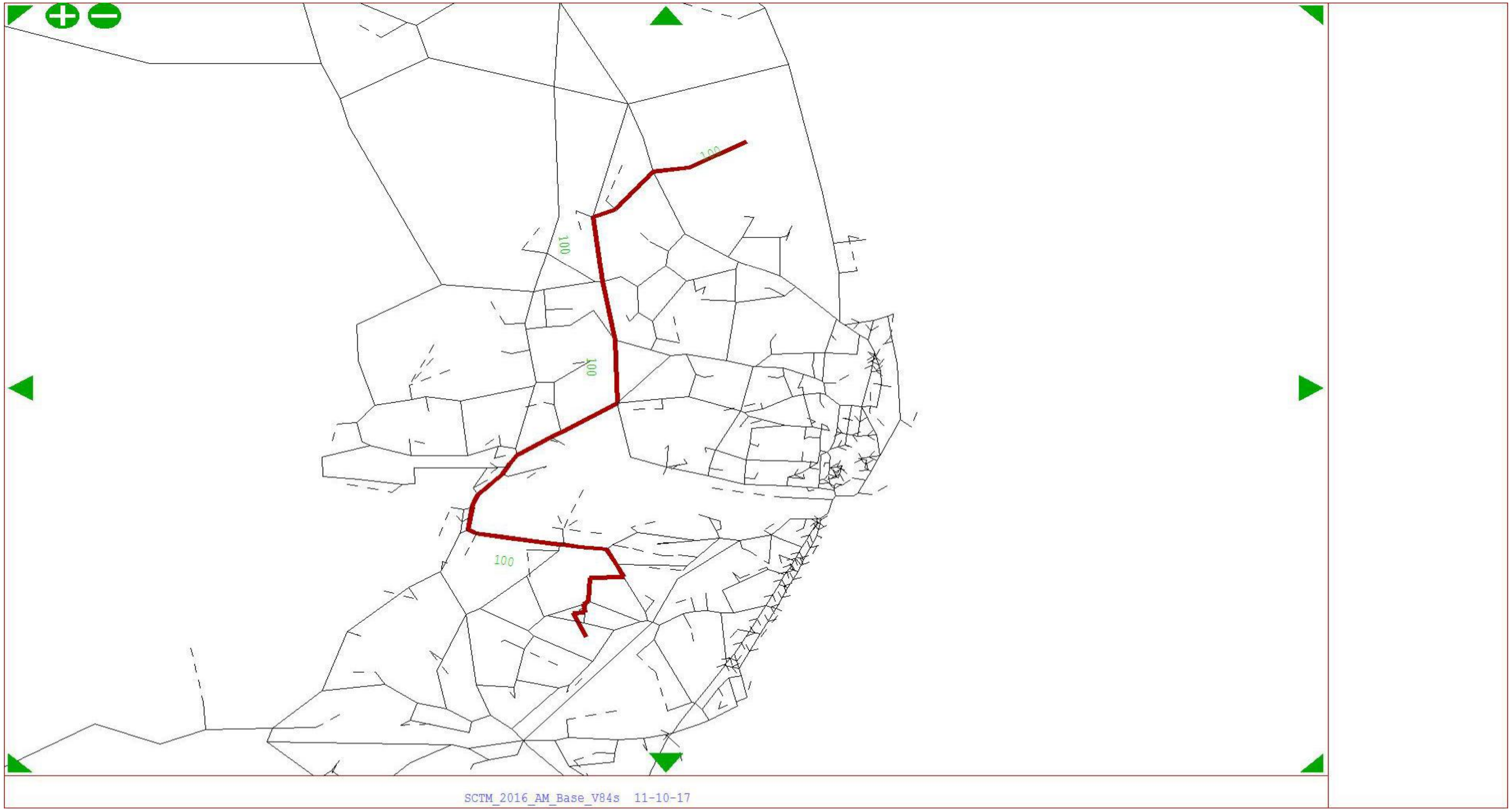
From Zone 587 To Zone 779 - User Class 2



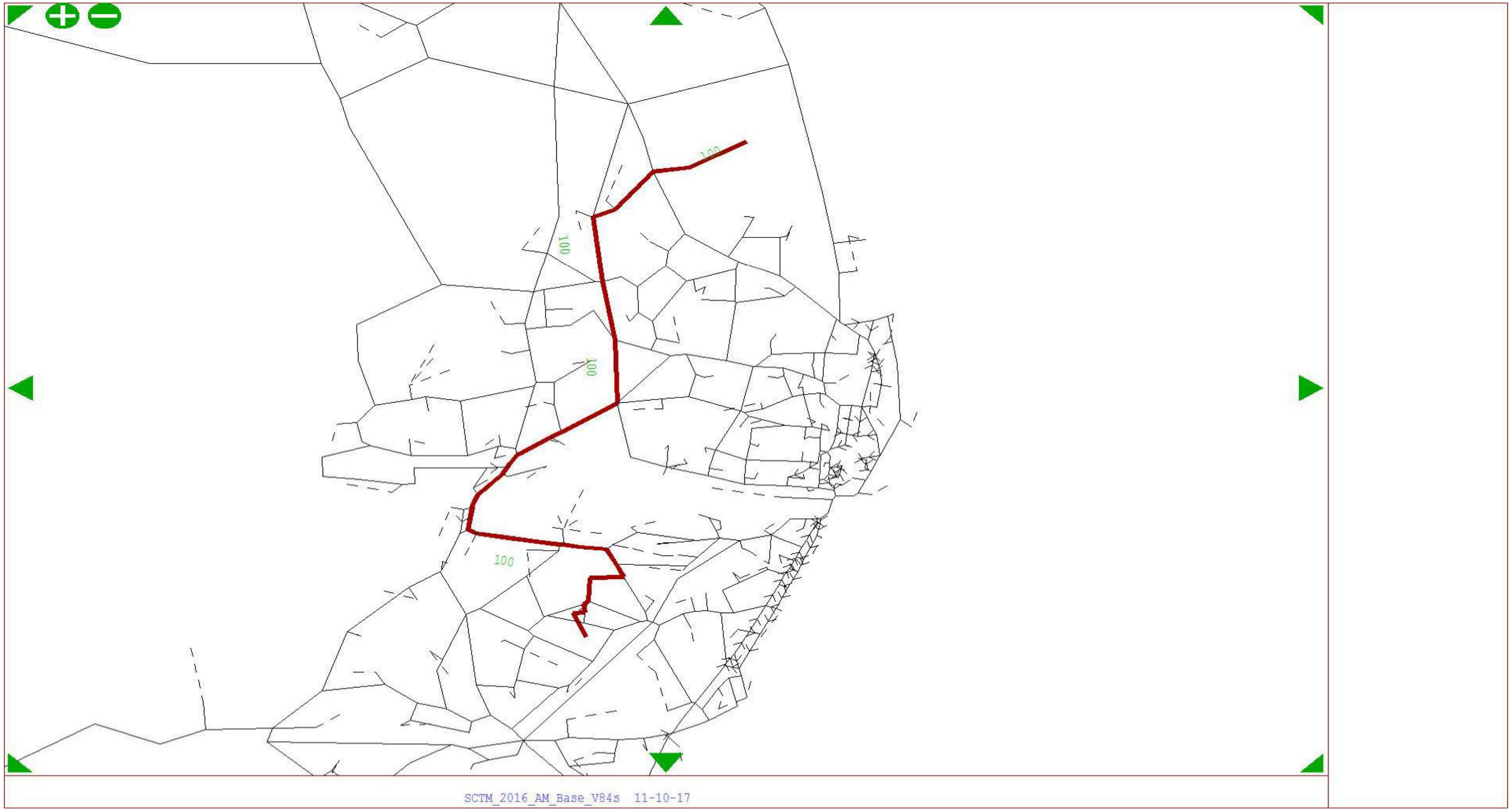
From Zone 587 To Zone 779 - User Class 10



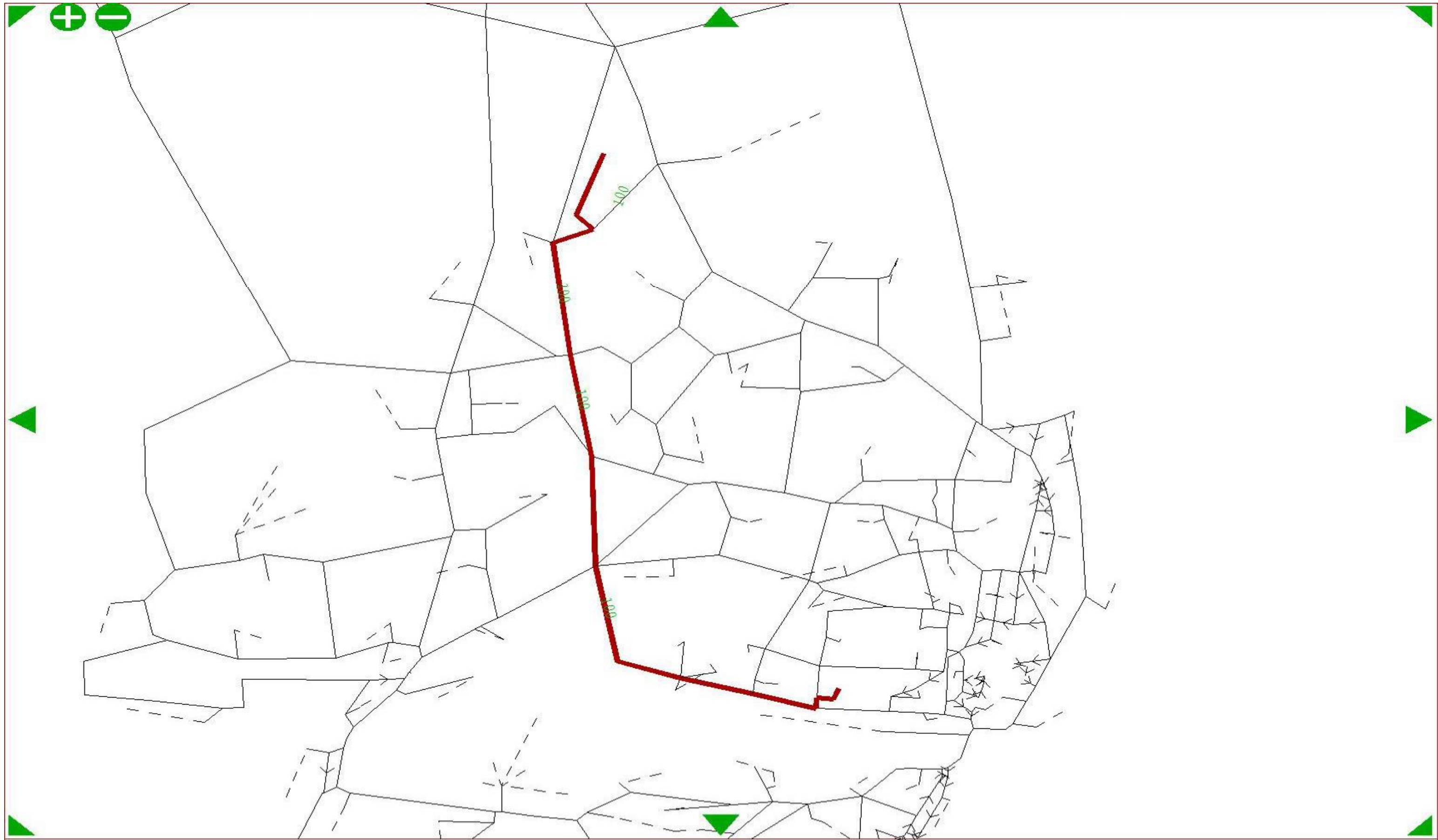
From Zone 779 To Zone 587 - User Class 2



From Zone 779 To Zone 587 - User Class 10

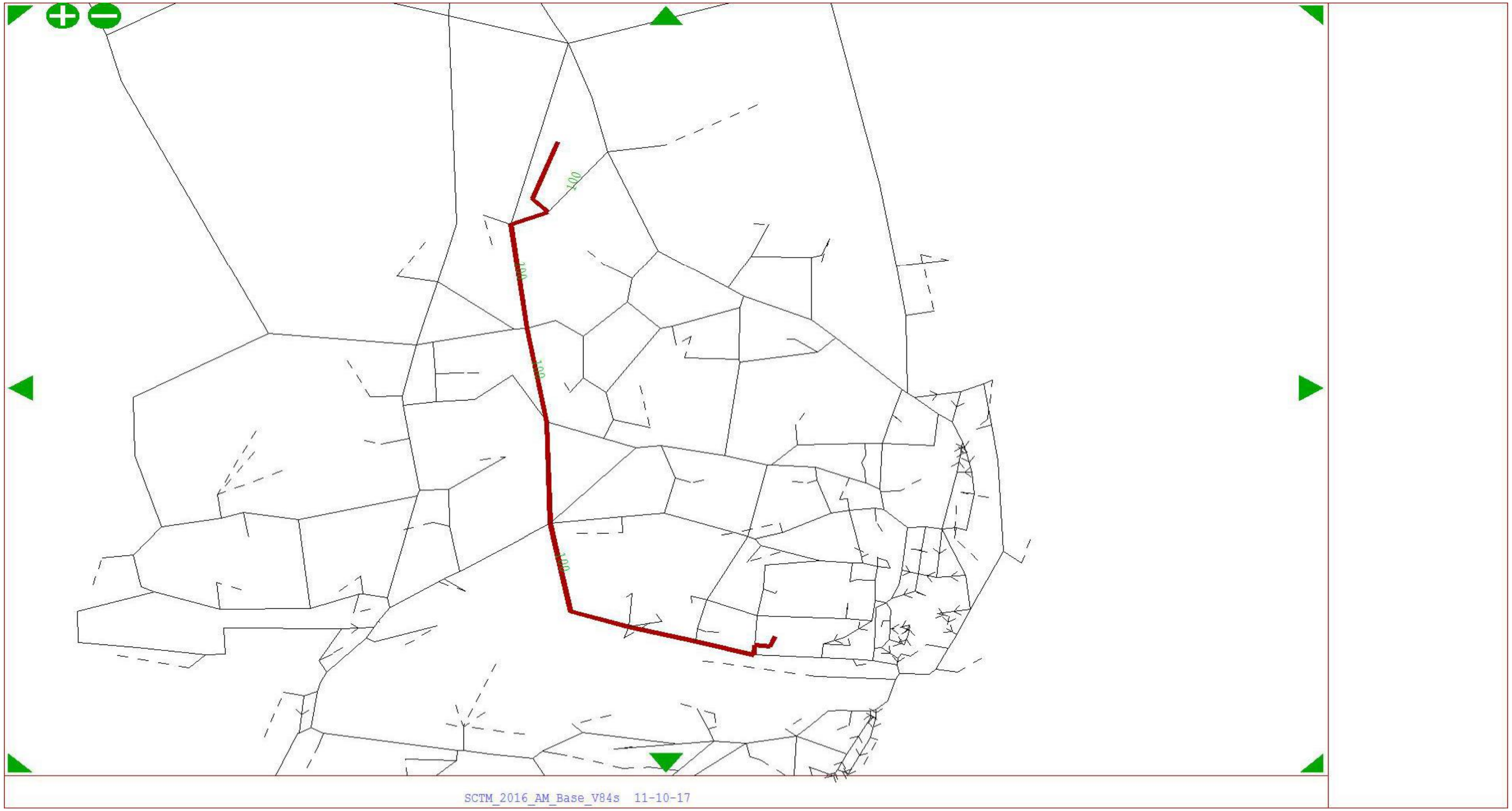


From Zone 766 To Zone 427 - User Class 2

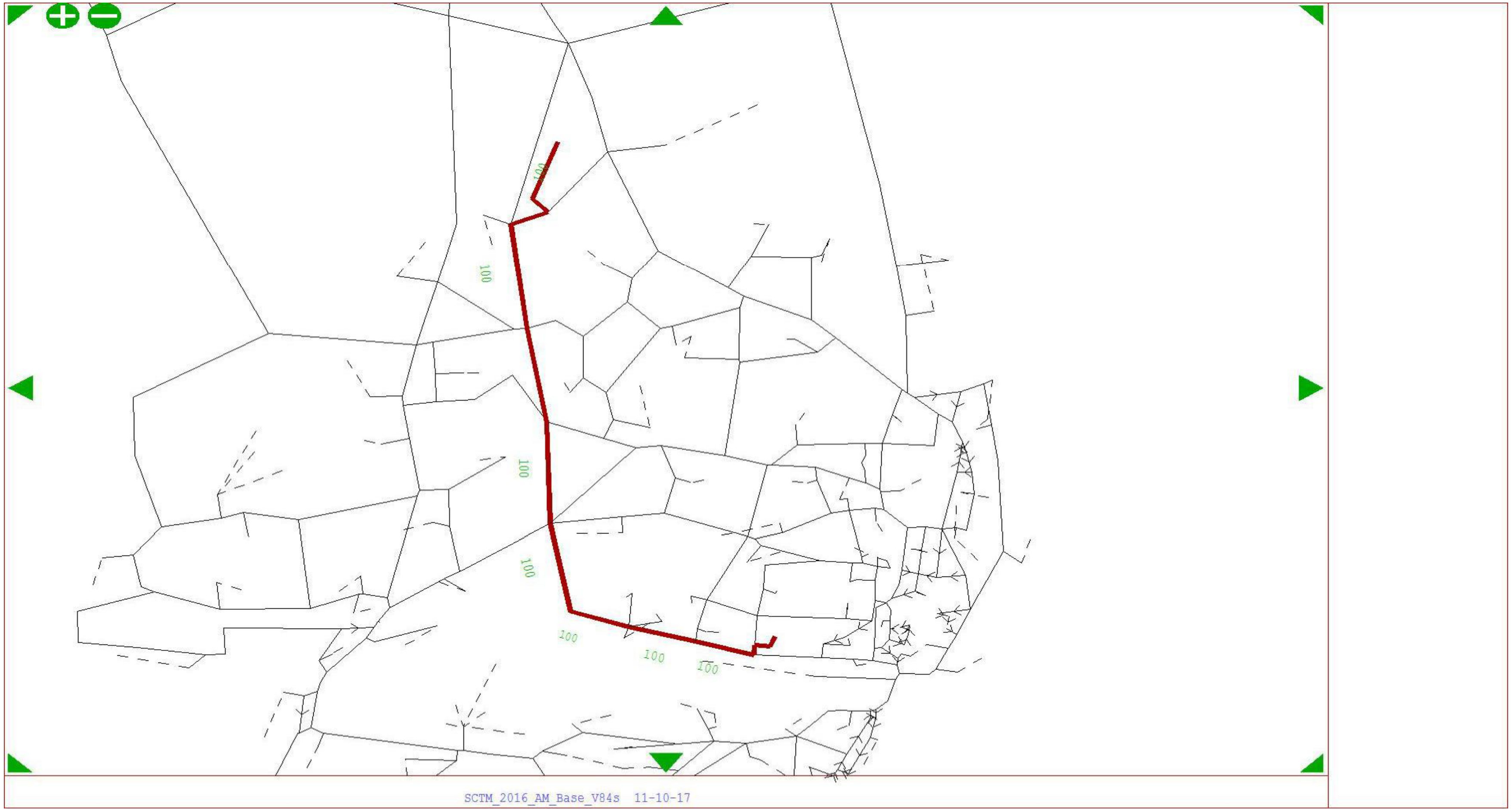


SCTM_2016_AM_Base_V84s 11-10-17

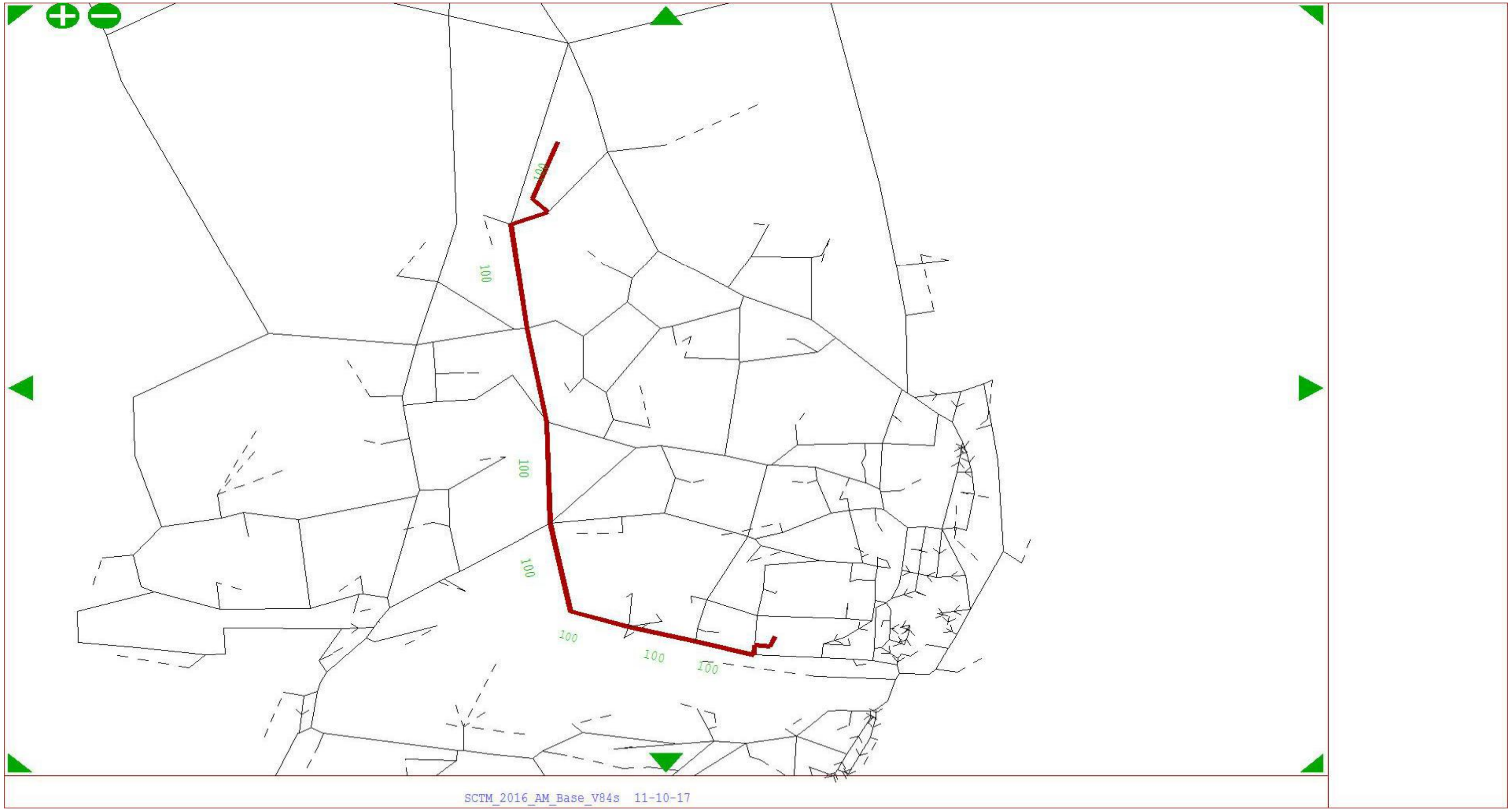
From Zone 766 To Zone 427 - User Class 10



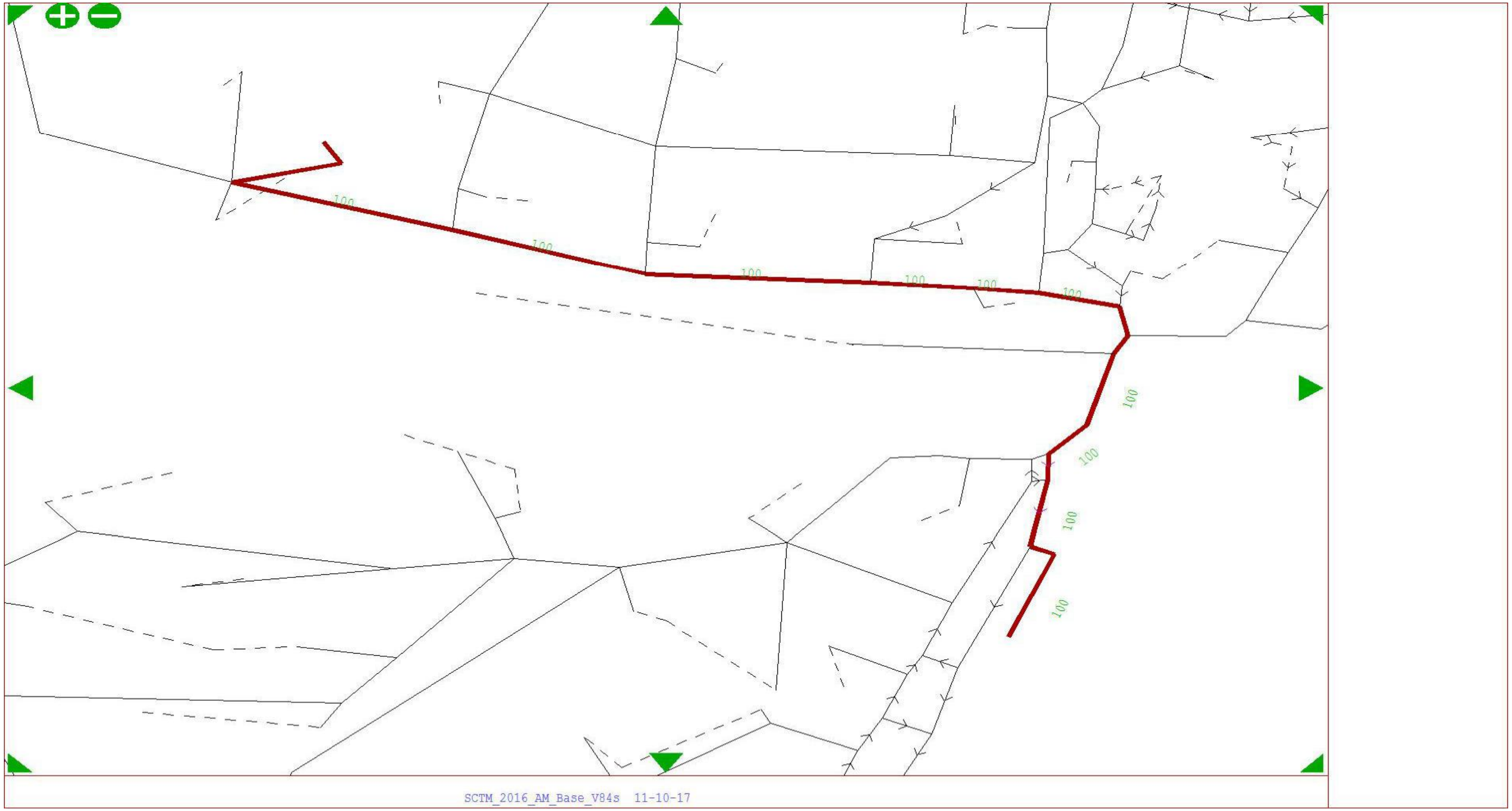
From Zone 427 To Zone 766 - User Class 2



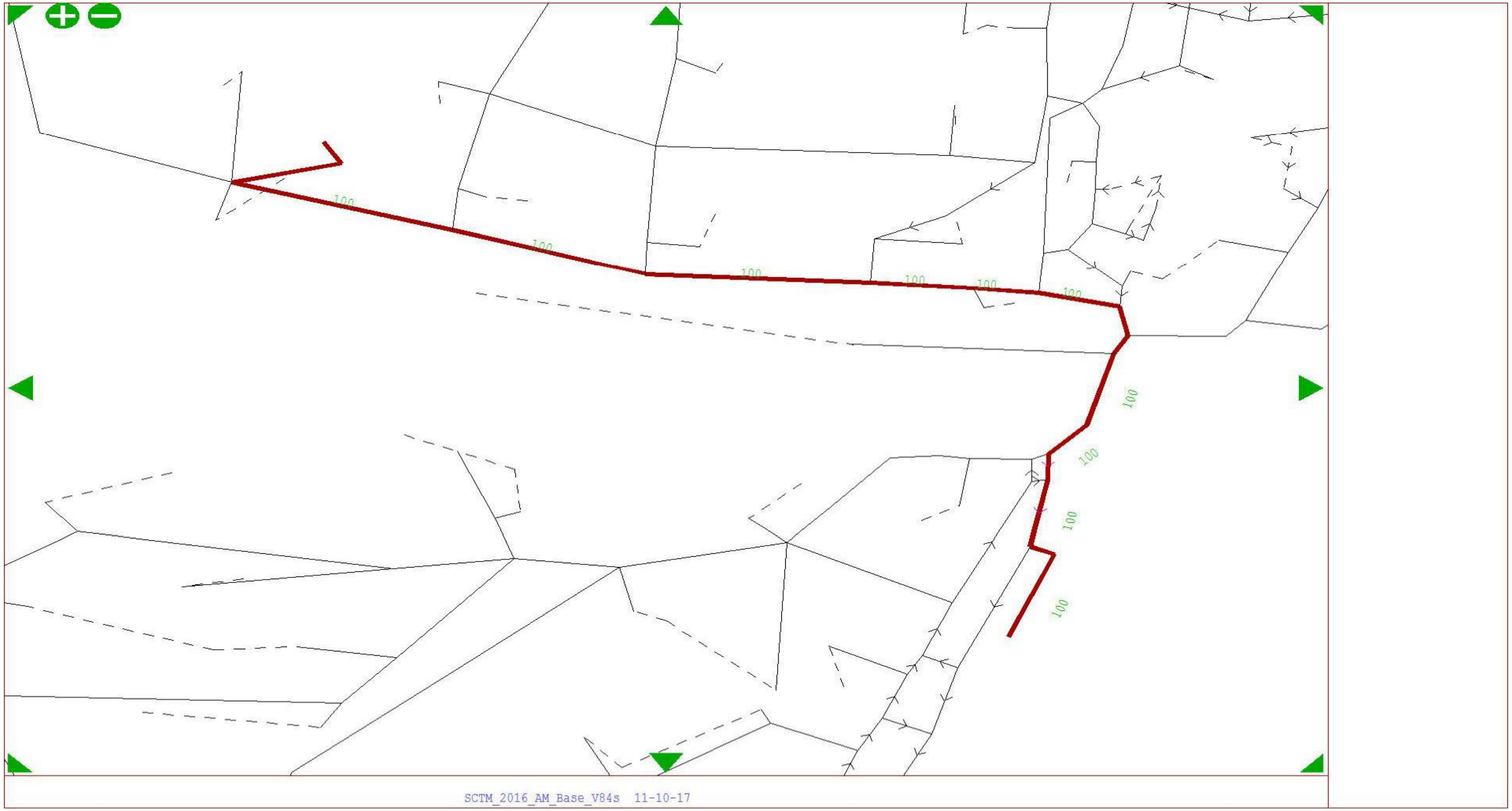
From Zone 427 To Zone 766 - User Class 10



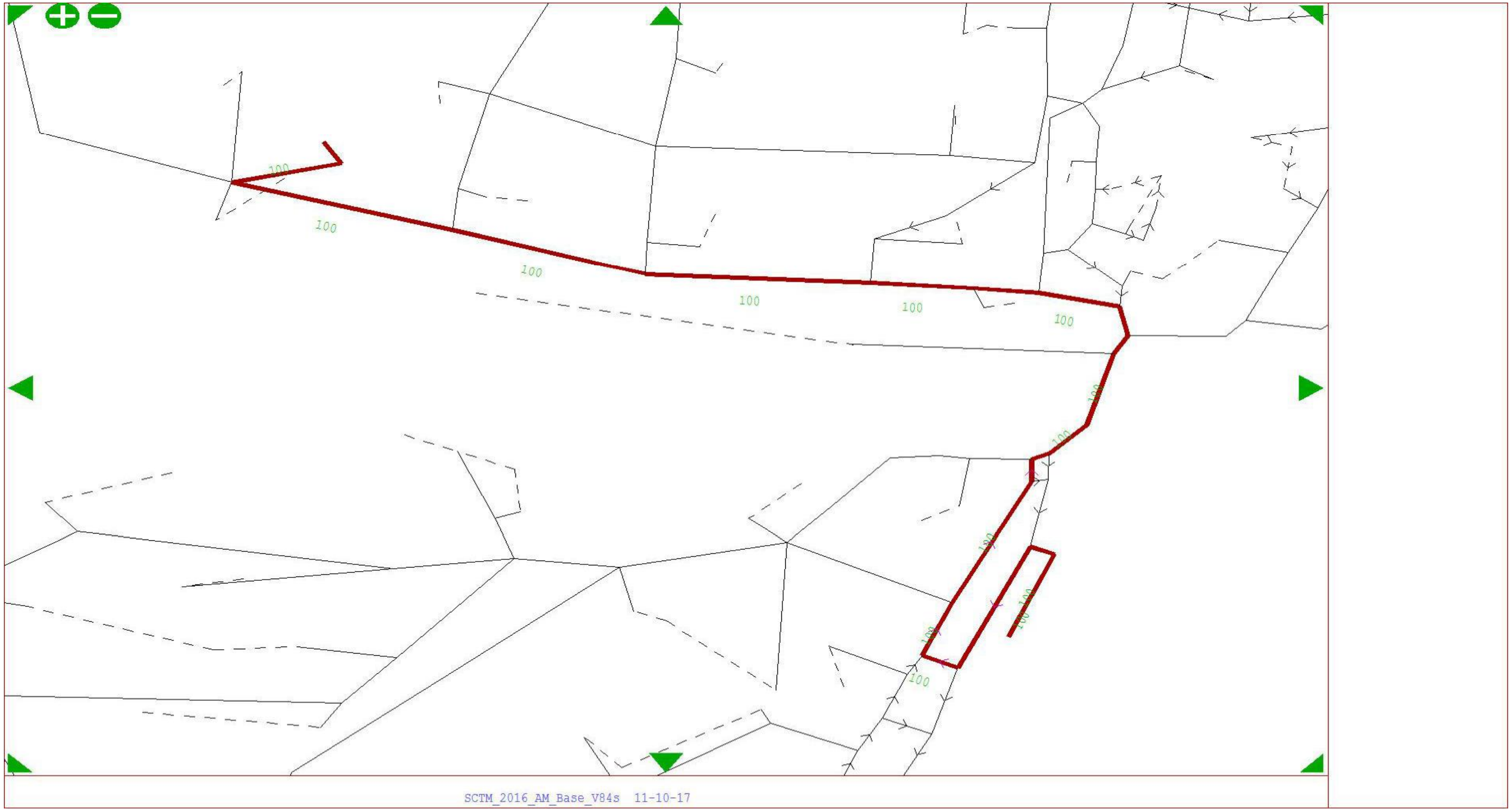
From Zone 819 To Zone 588 - User Class 2



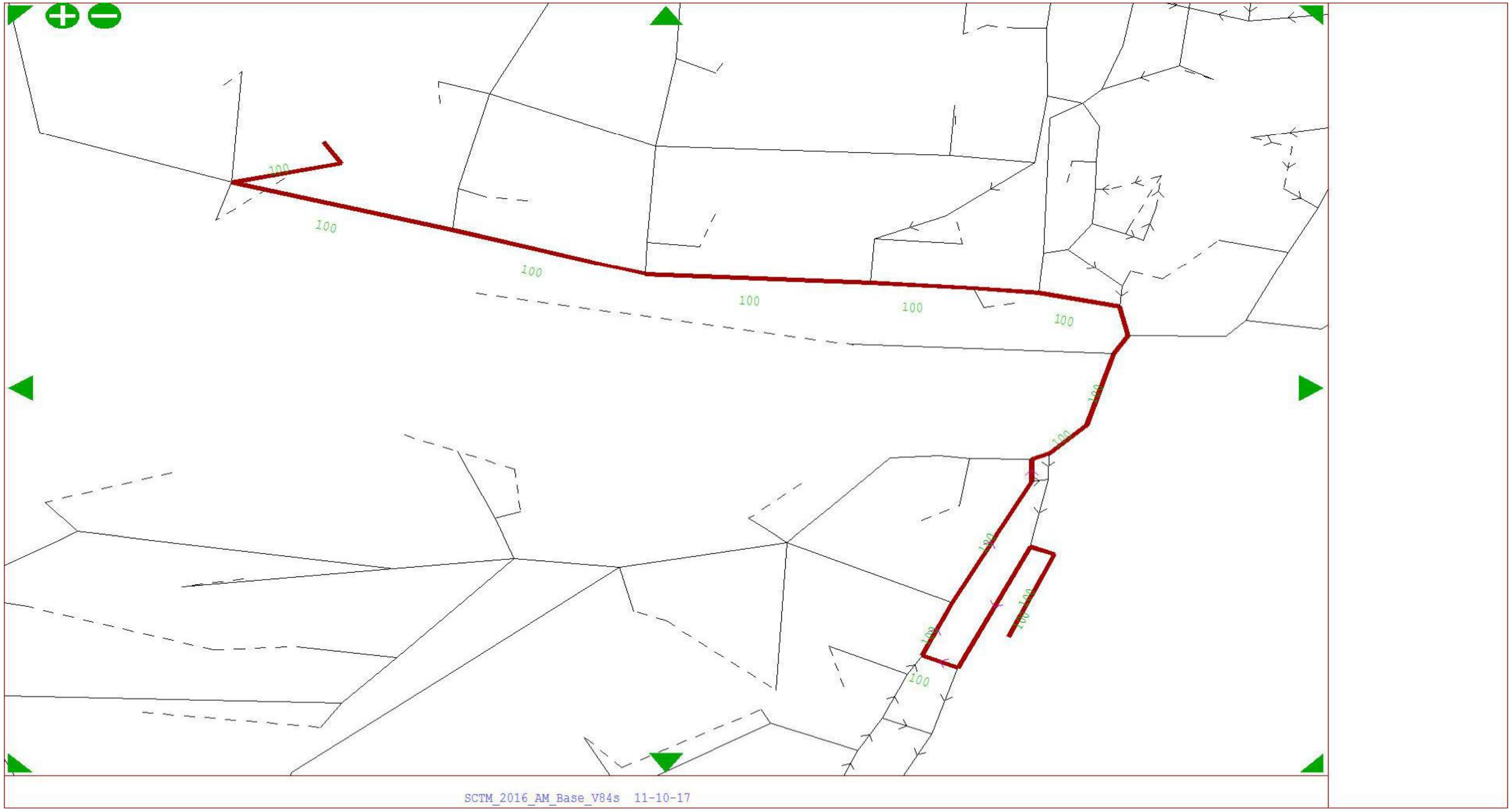
From Zone 819 To Zone 588 - User Class 10



From Zone 588 To Zone 819 - User Class 2



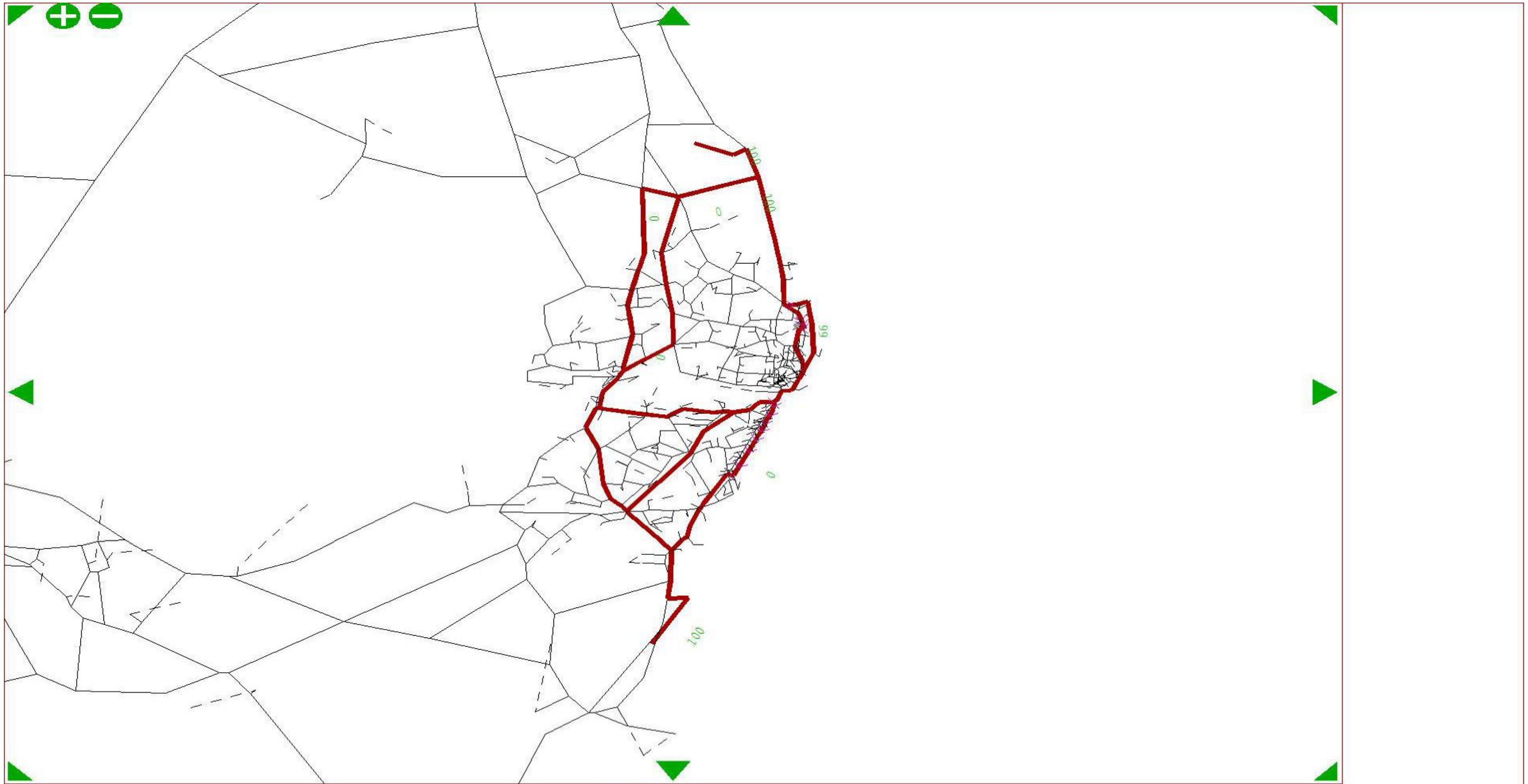
From Zone 588 To Zone 819 - User Class 10



Inter Peak

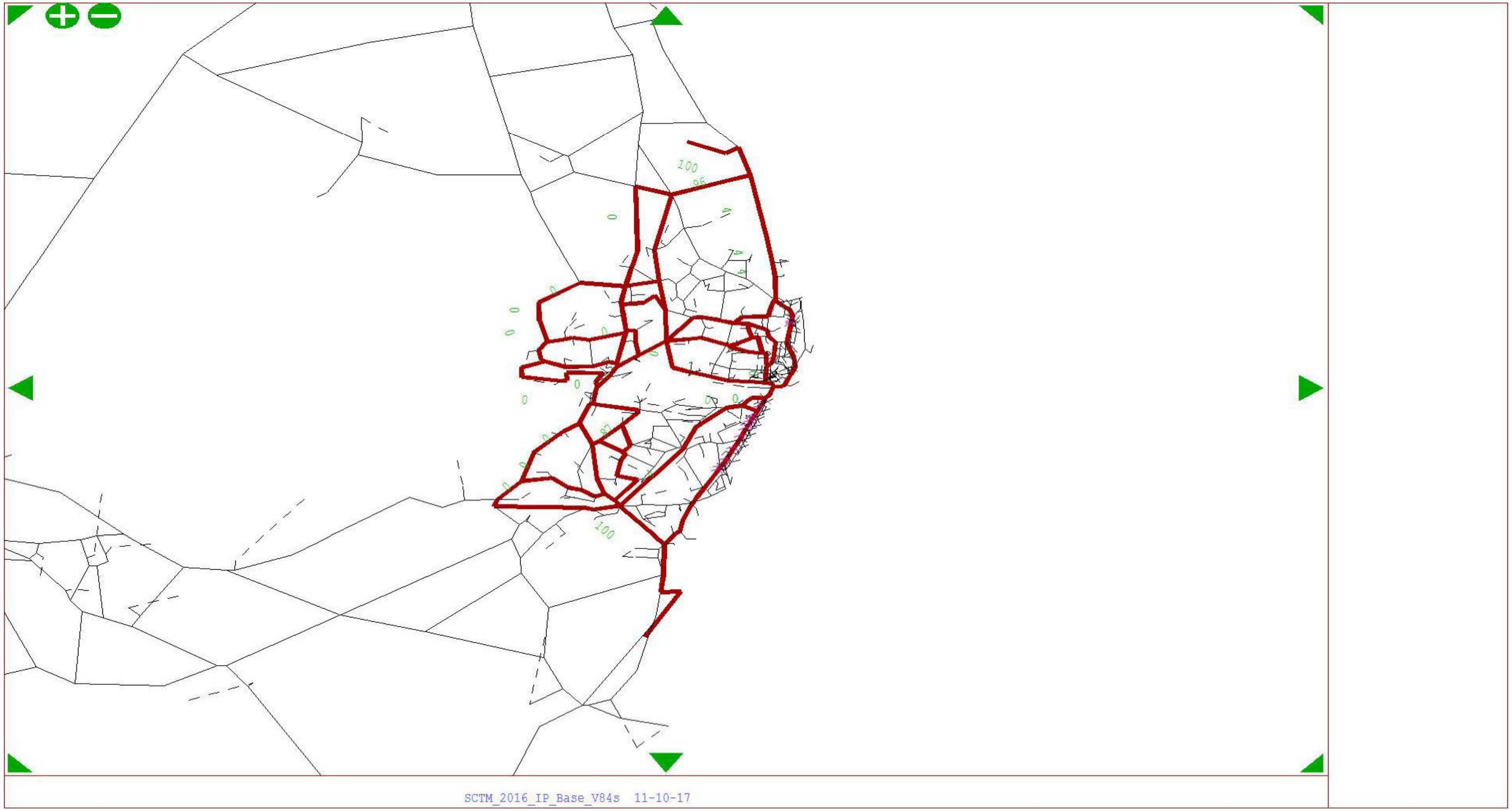
From Zone 408 To Zone 465 - User Class 6

From Zone 408 To Zone 465 - User Class 10



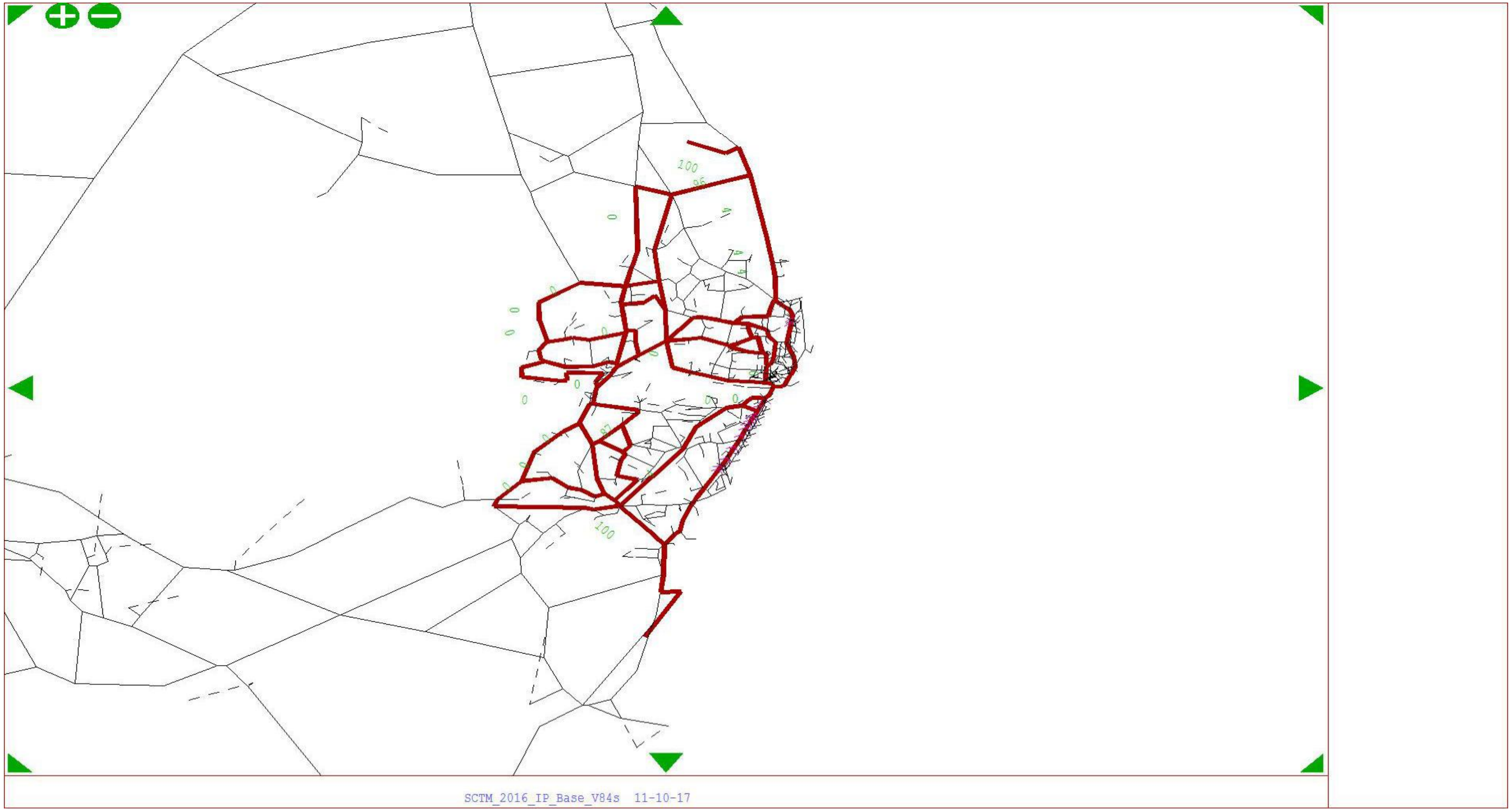
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 465 To Zone 408 - User Class 6

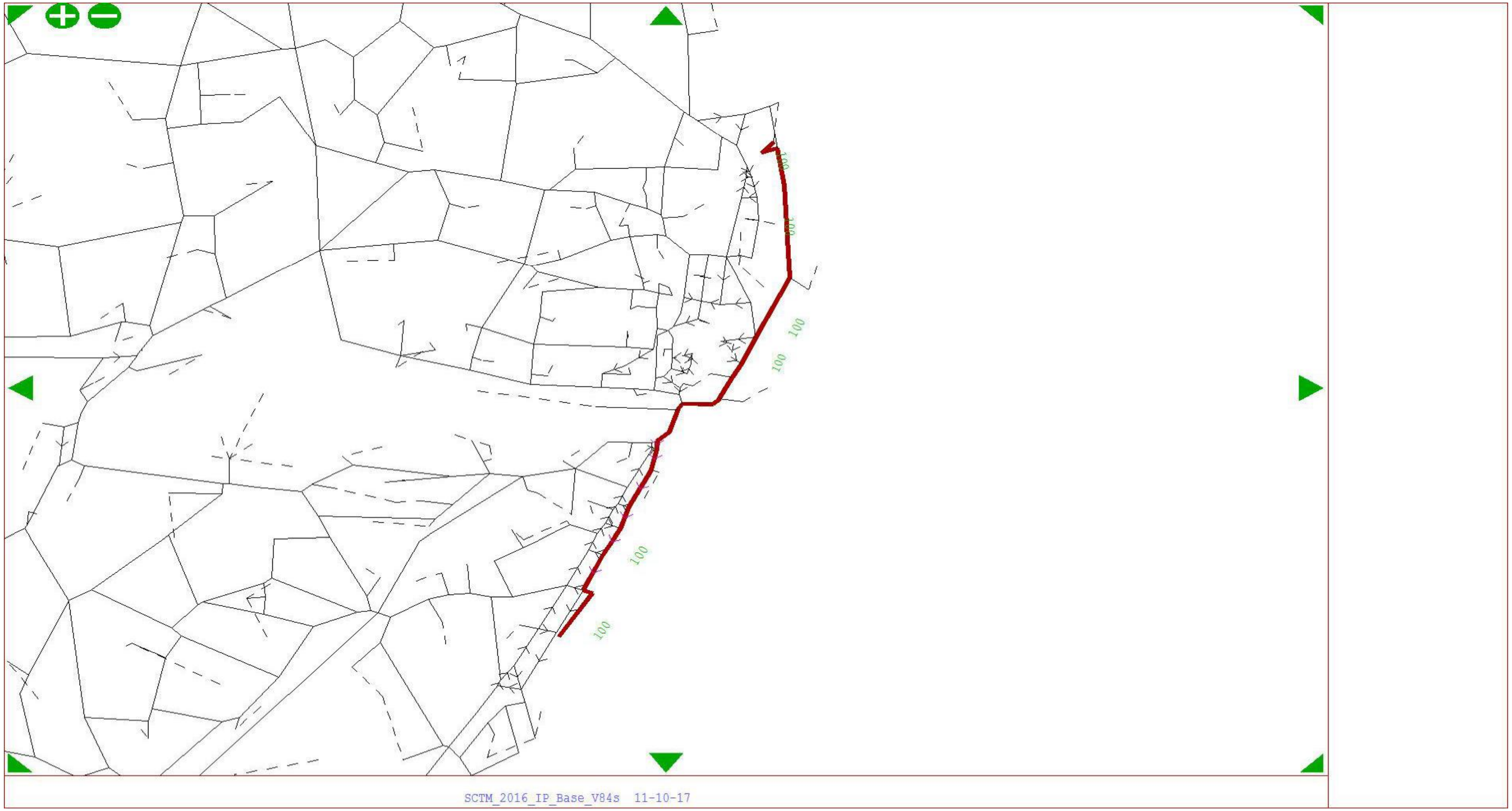


SCTM_2016_IP_Base_V84s 11-10-17

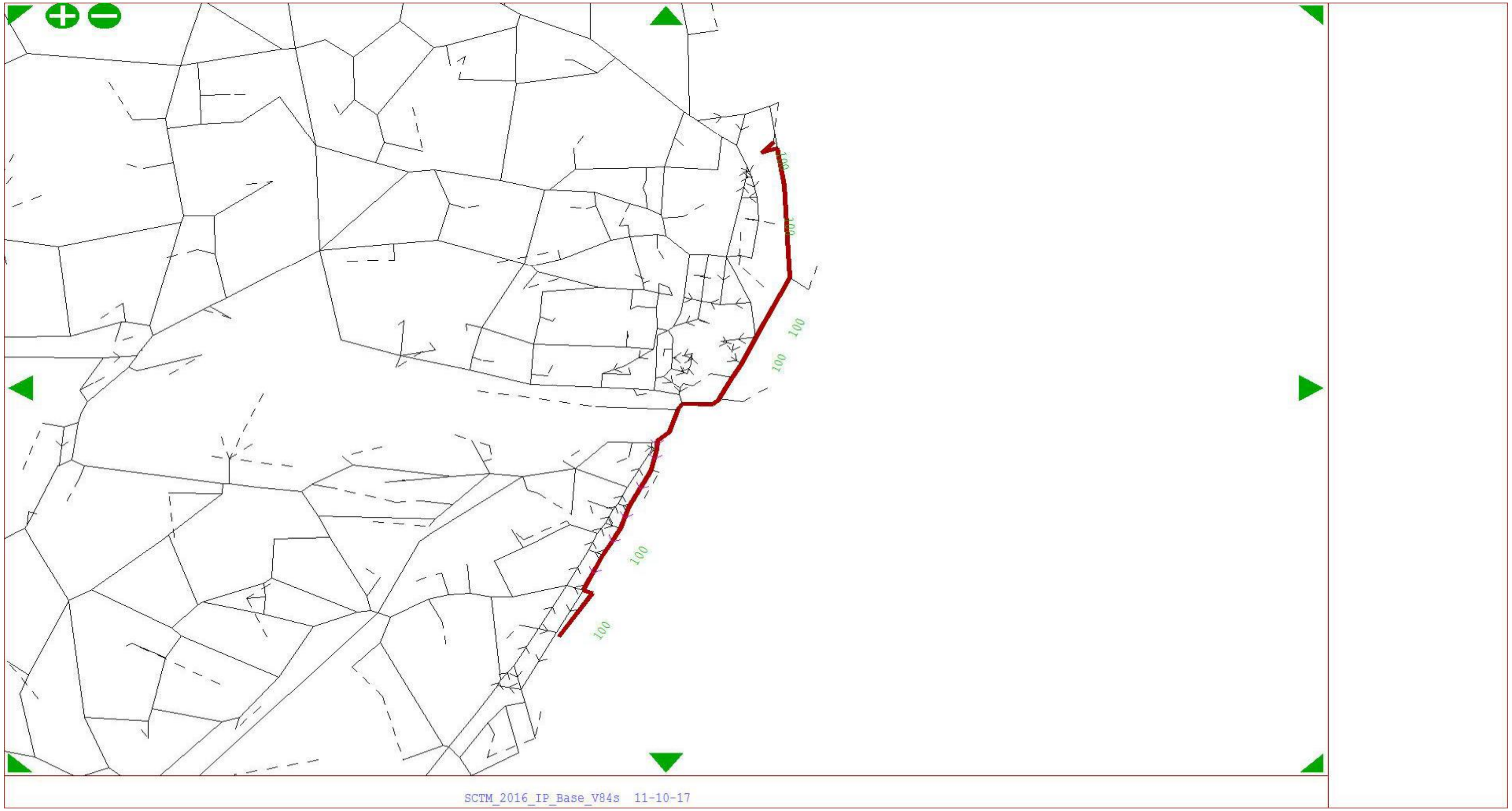
From Zone 465 To Zone 408 - User Class 10



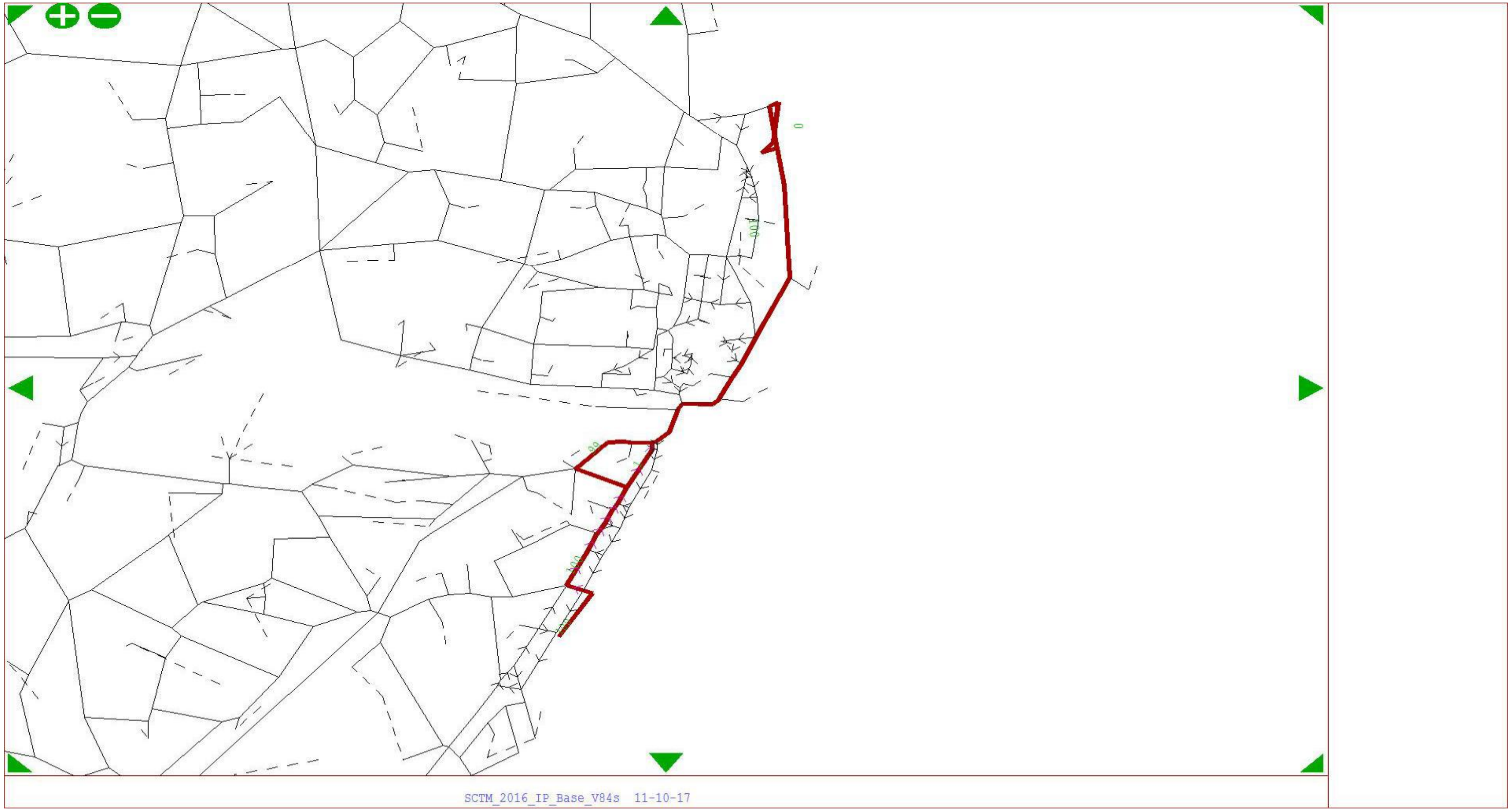
From Zone 84 To Zone 593 - User Class 6



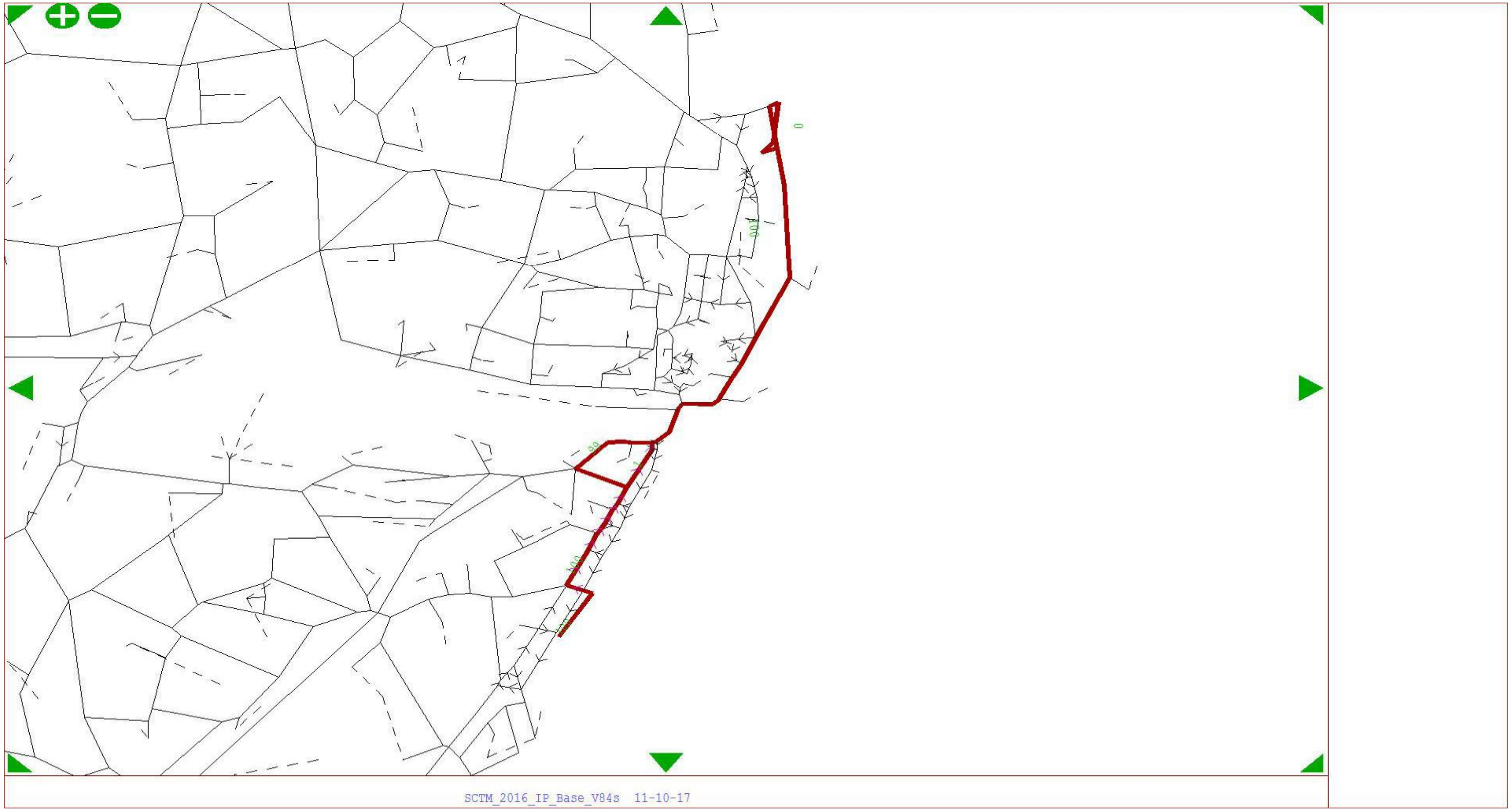
From Zone 84 To Zone 593 - User Class 10



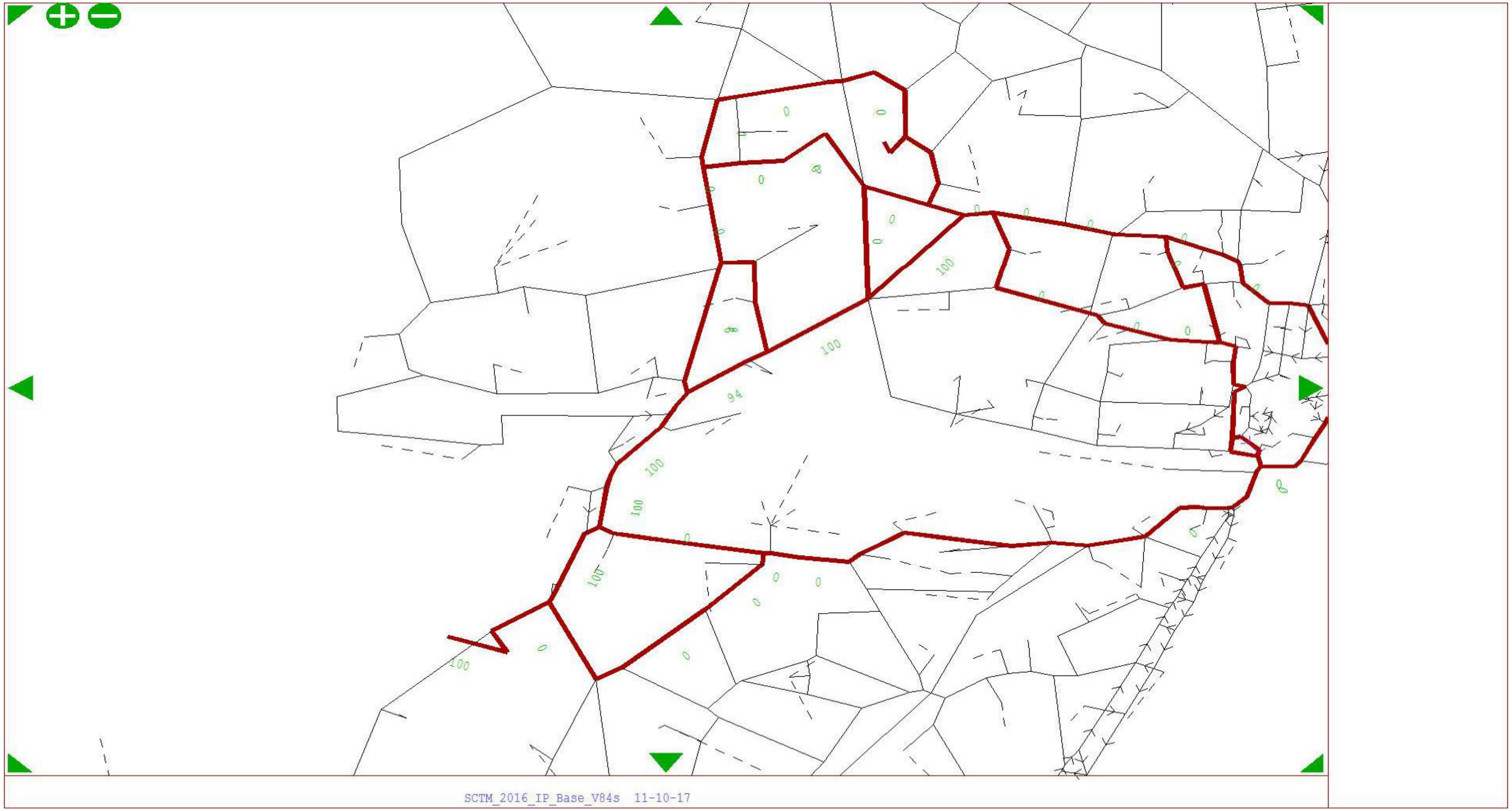
From Zone 593 To Zone 84 - User Class 6



From Zone 593 To Zone 84 - User Class 10

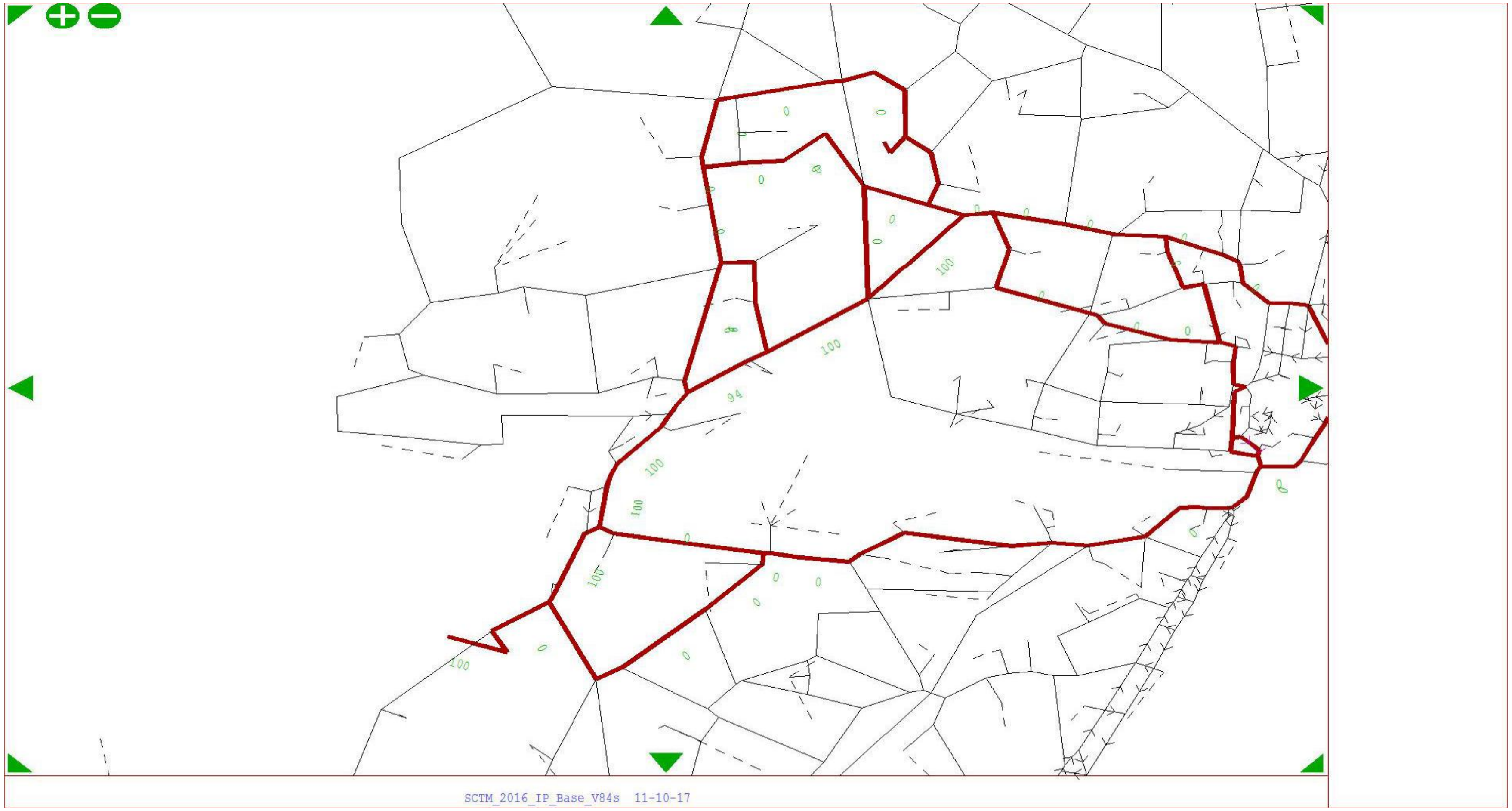


From Zone 767 To Zone 434 - User Class 6



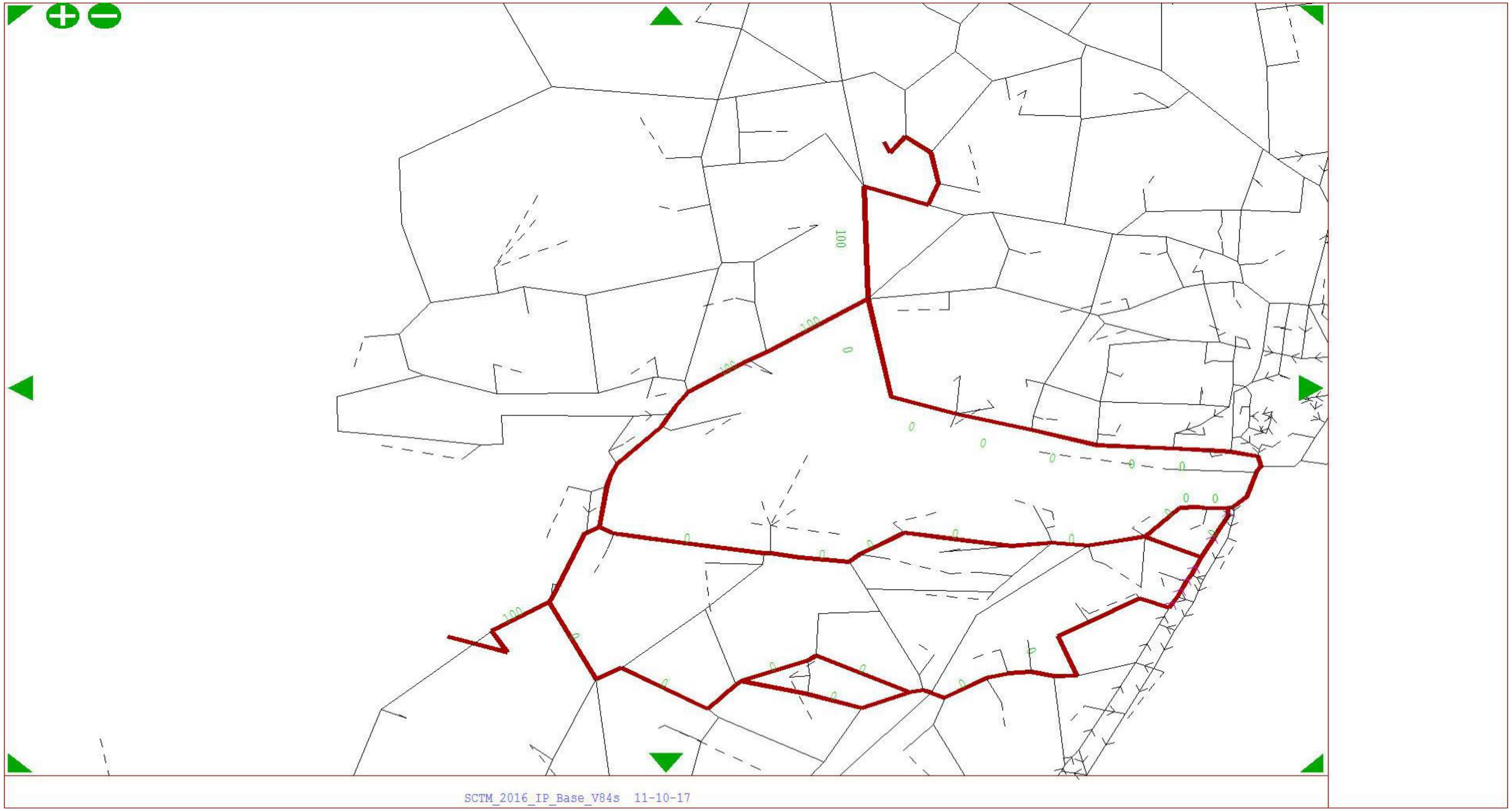
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 767 To Zone 434 - User Class 10

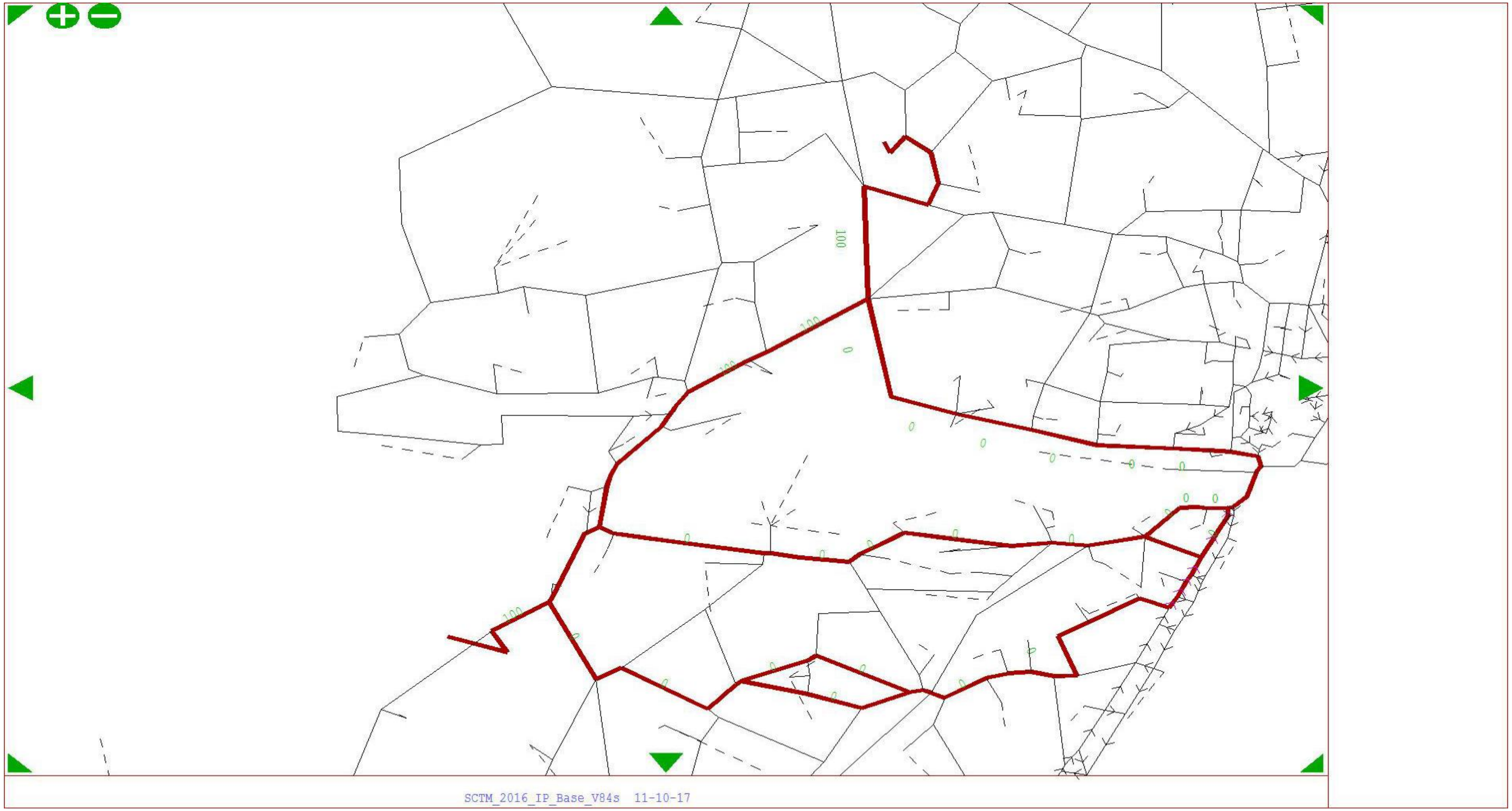


SCTM_2016_IP_Base_V84s 11-10-17

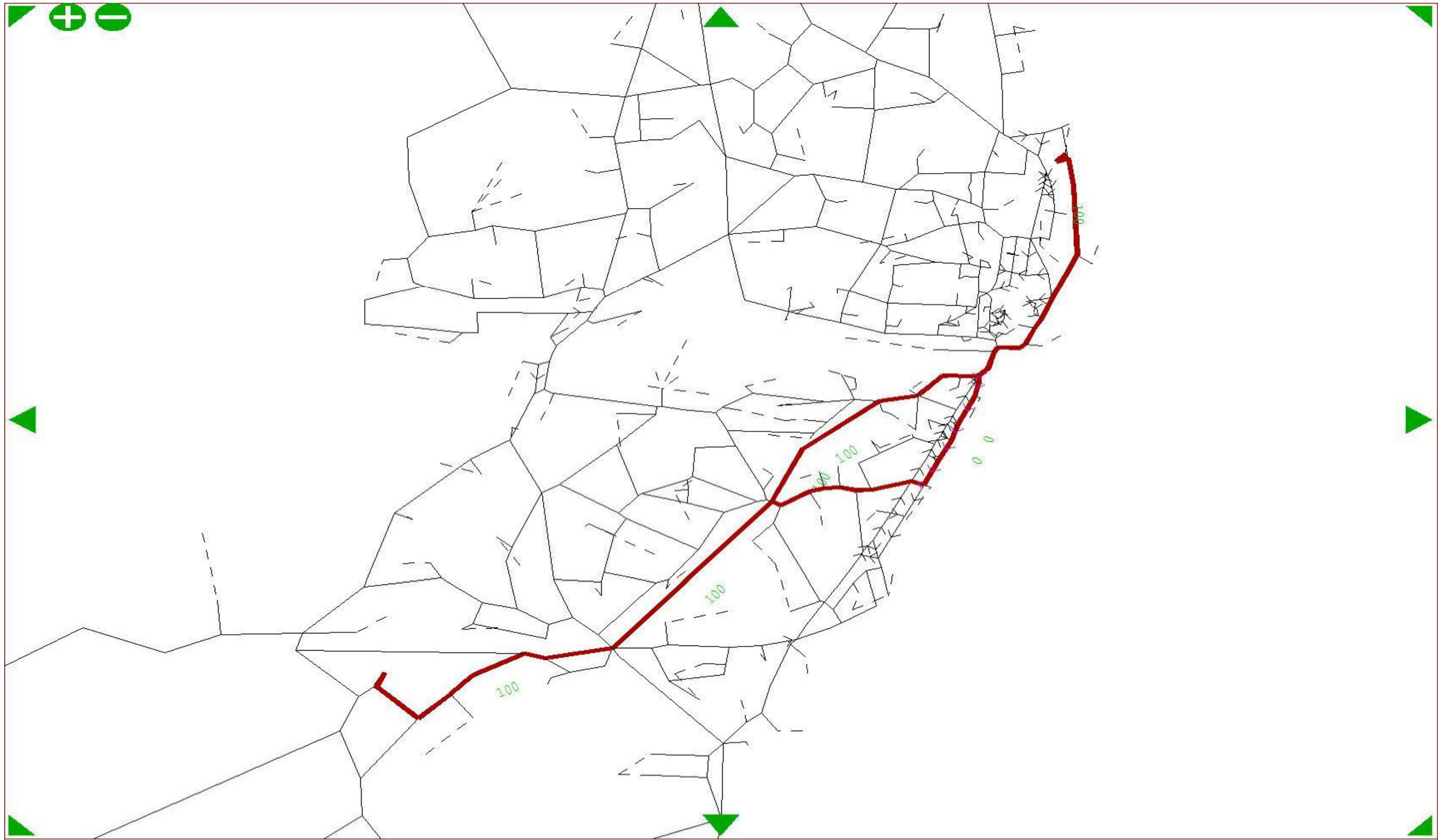
From Zone 434 To Zone 767 - User Class 6



From Zone 434 To Zone 767 - User Class 10

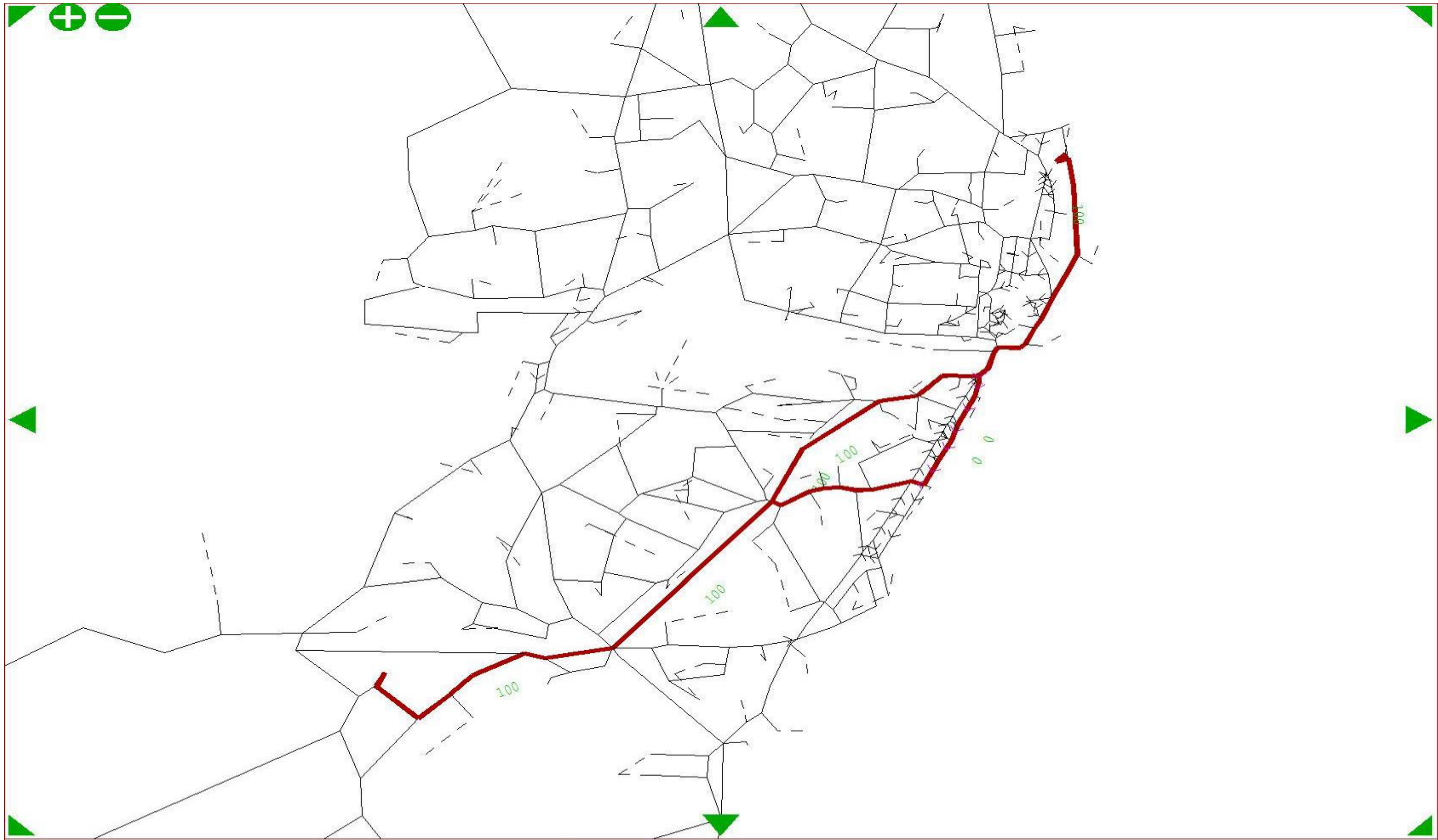


From Zone 84 To Zone 782 - User Class 6



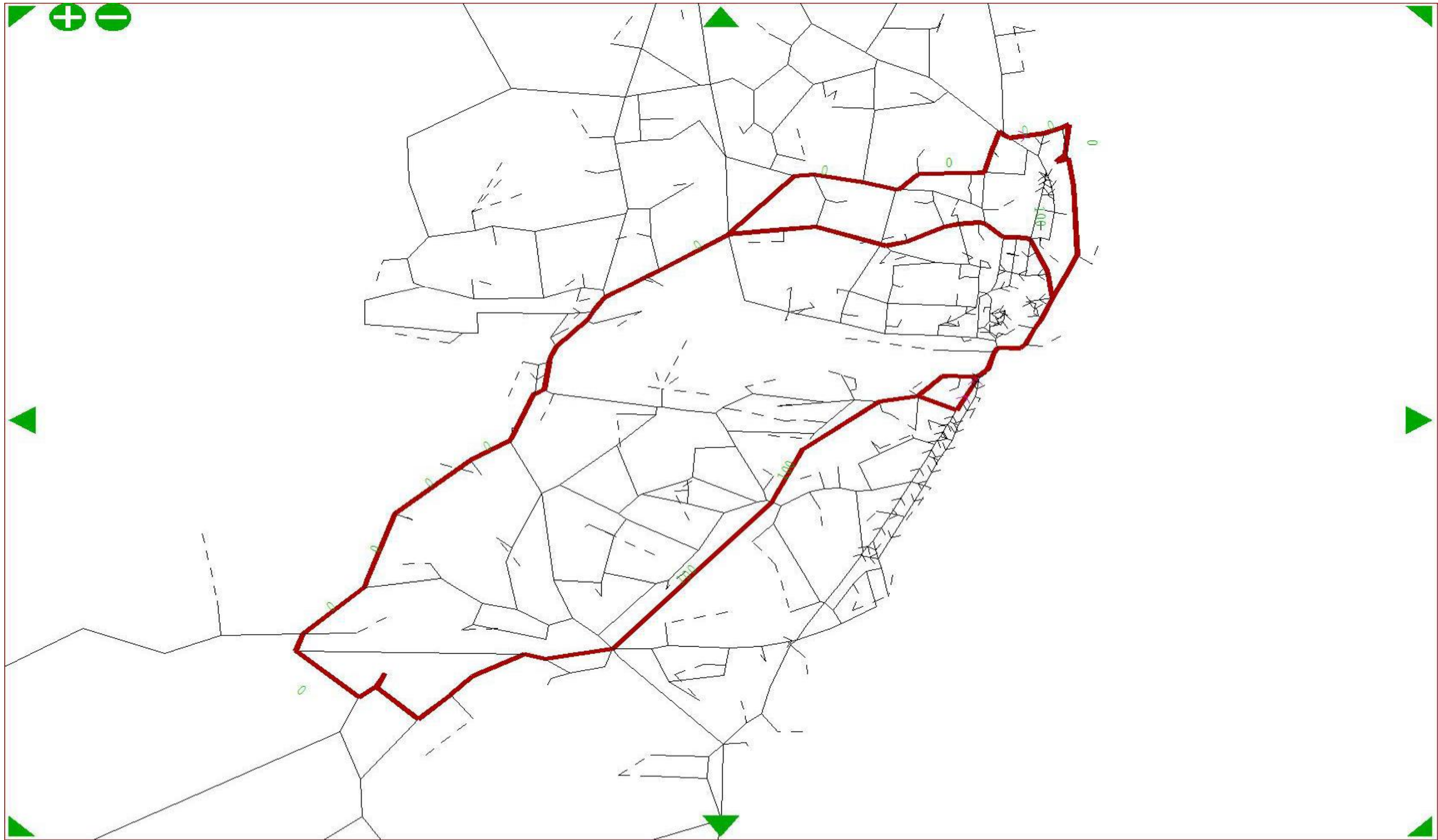
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 84 To Zone 782 - User Class 10



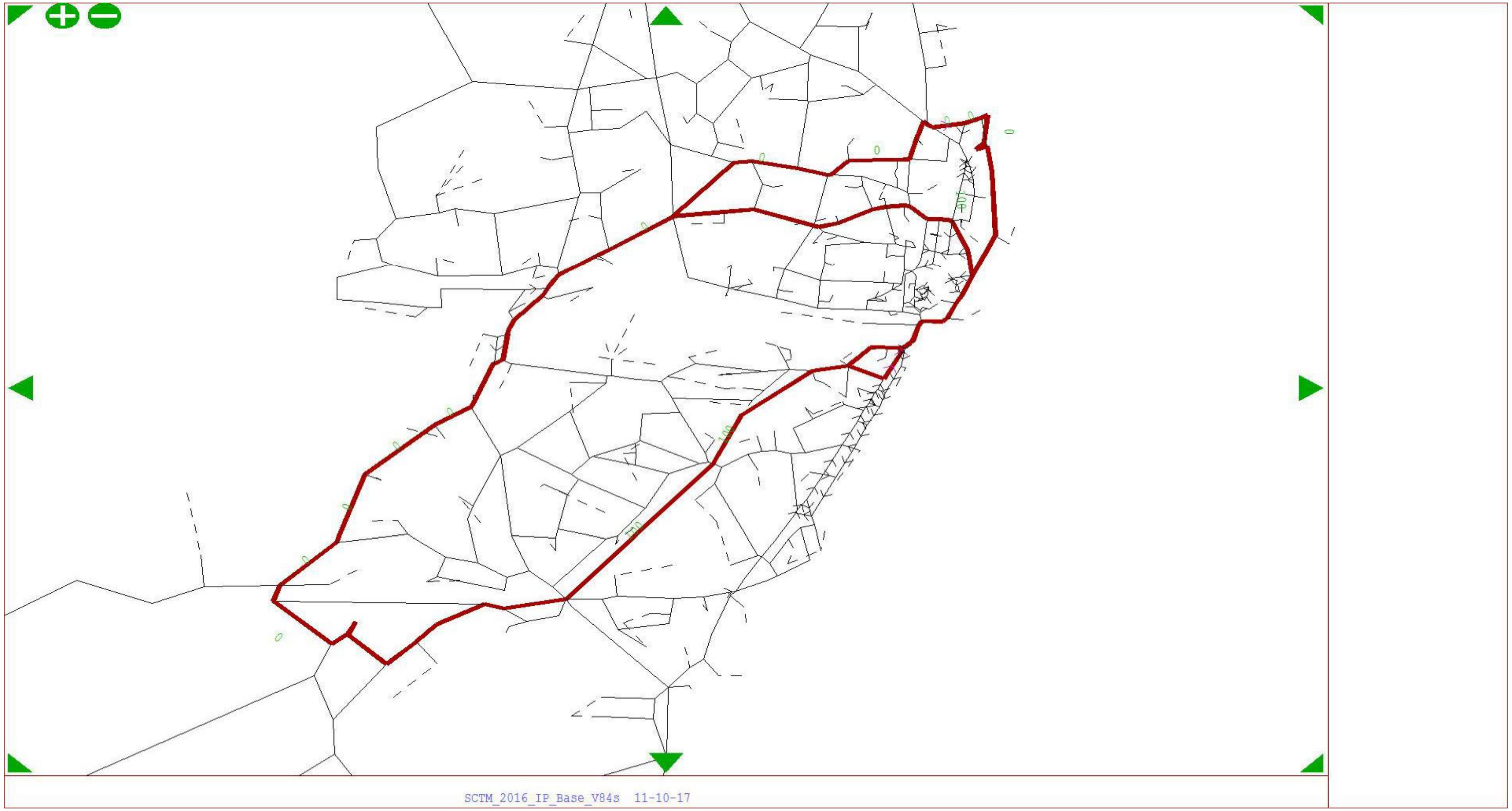
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 782 To Zone 84 - User Class 6



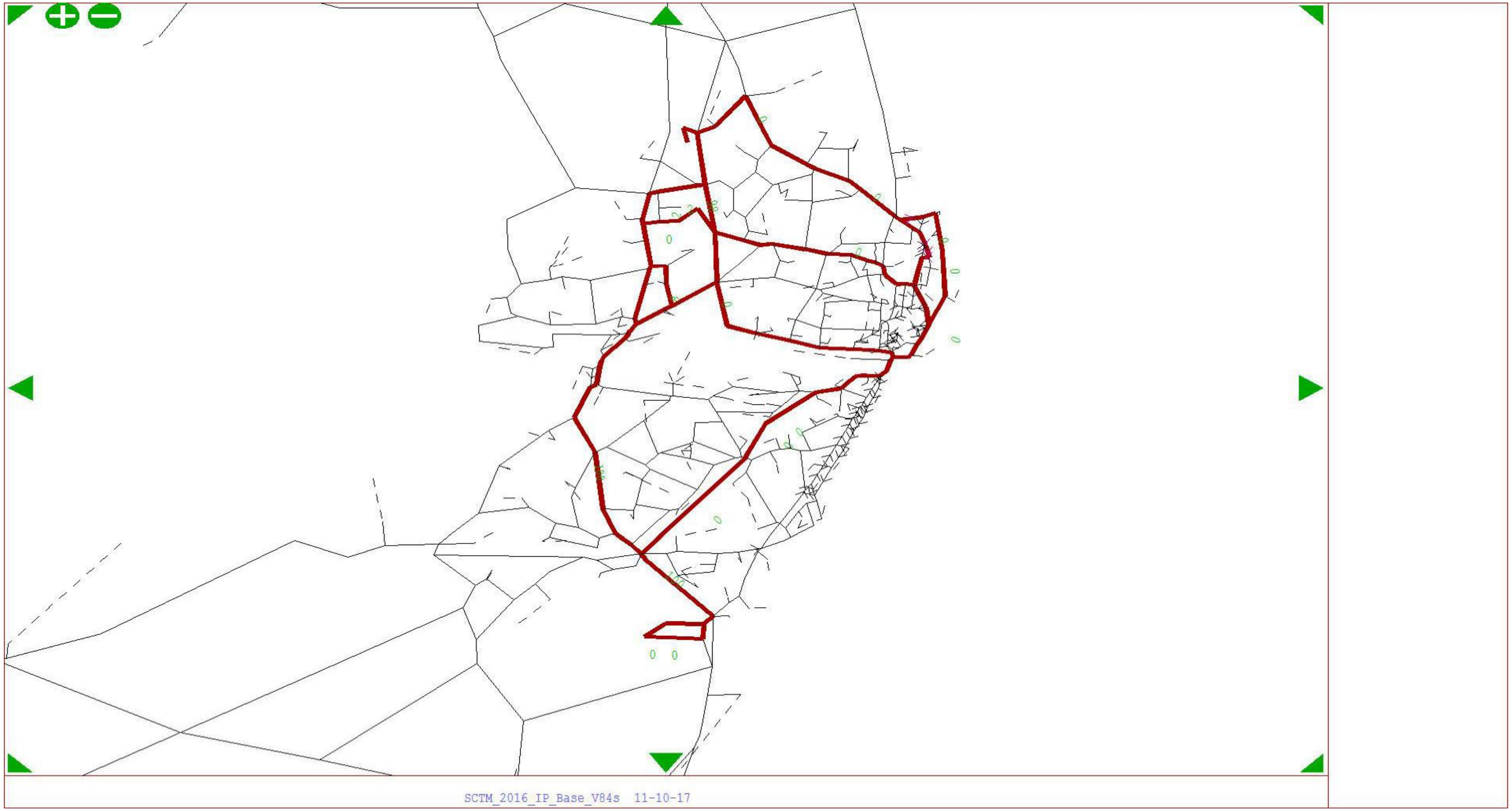
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 782 To Zone 84 - User Class 10

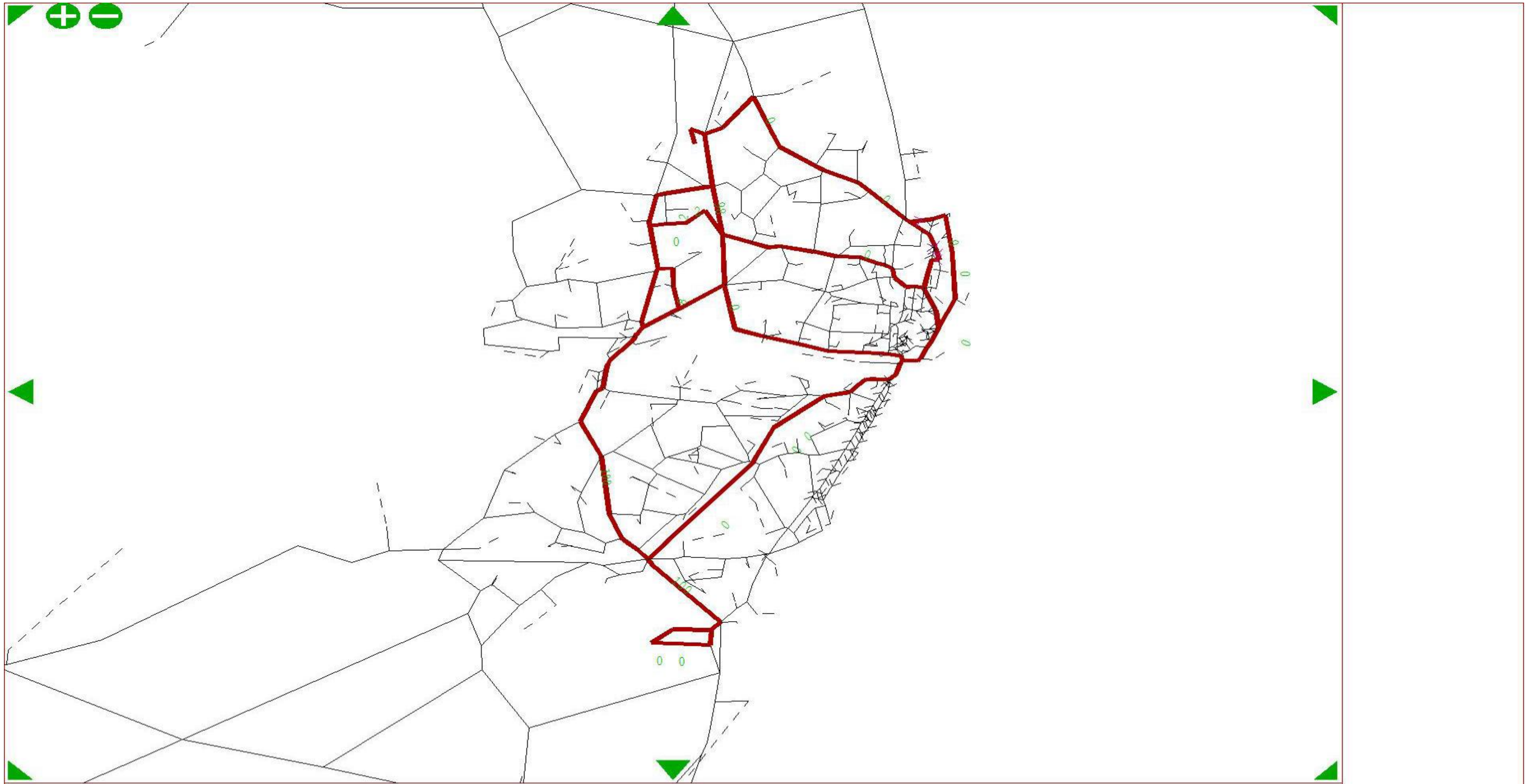


SCTM_2016_IP_Base_V84s 11-10-17

From Zone 586 To Zone 781 - User Class 6

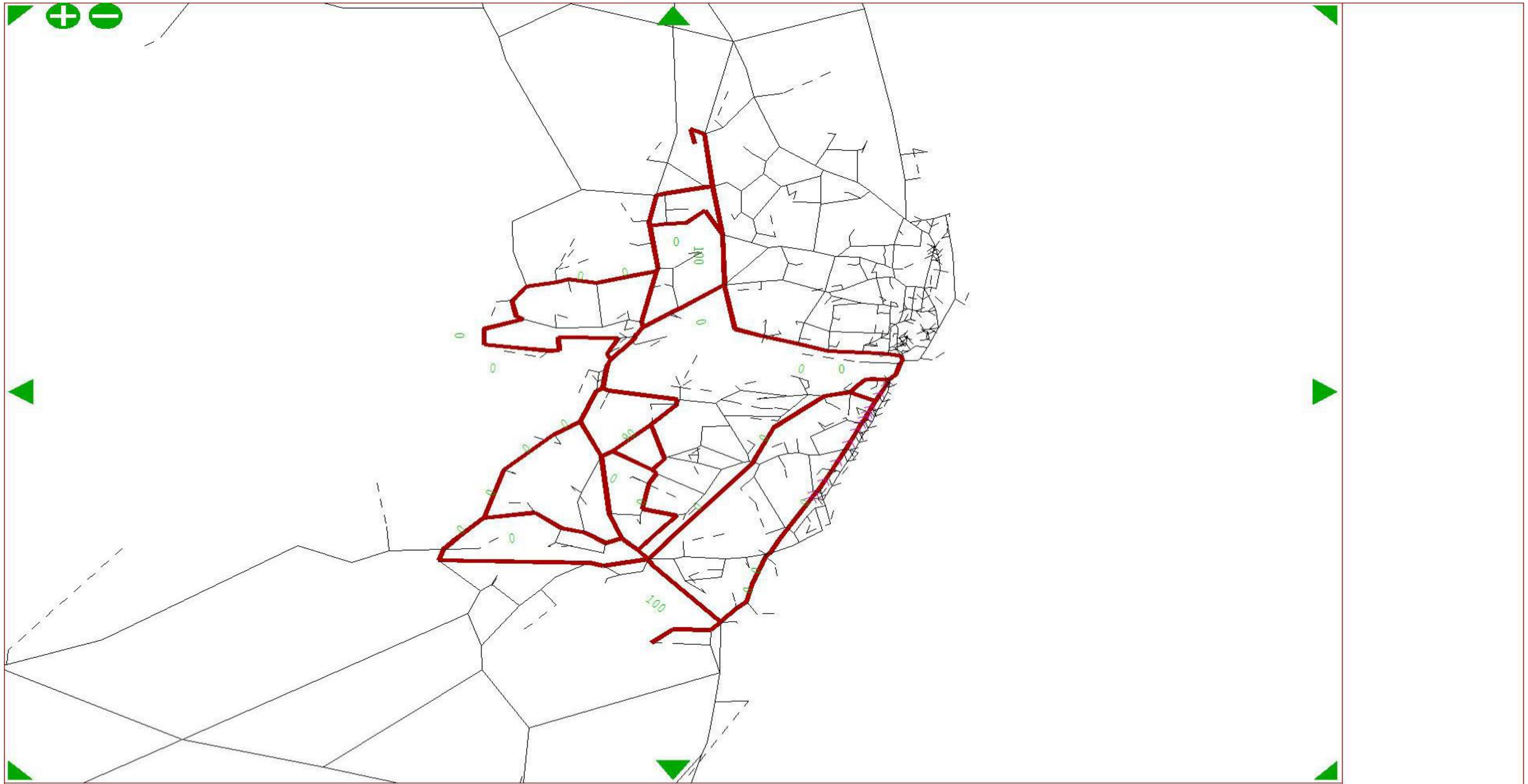


From Zone 586 To Zone 781 - User Class 10



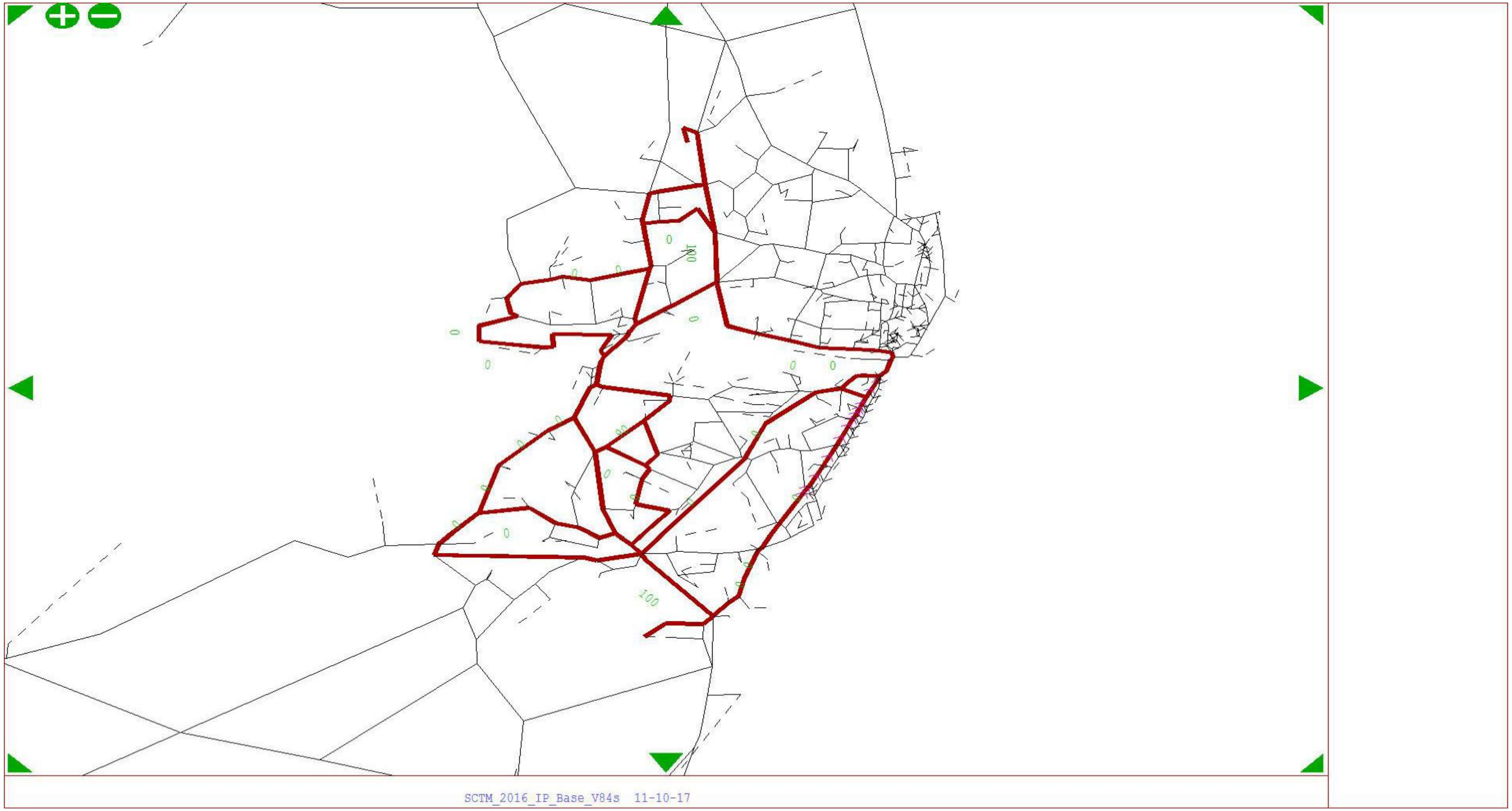
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 781 To Zone 586 - User Class 6



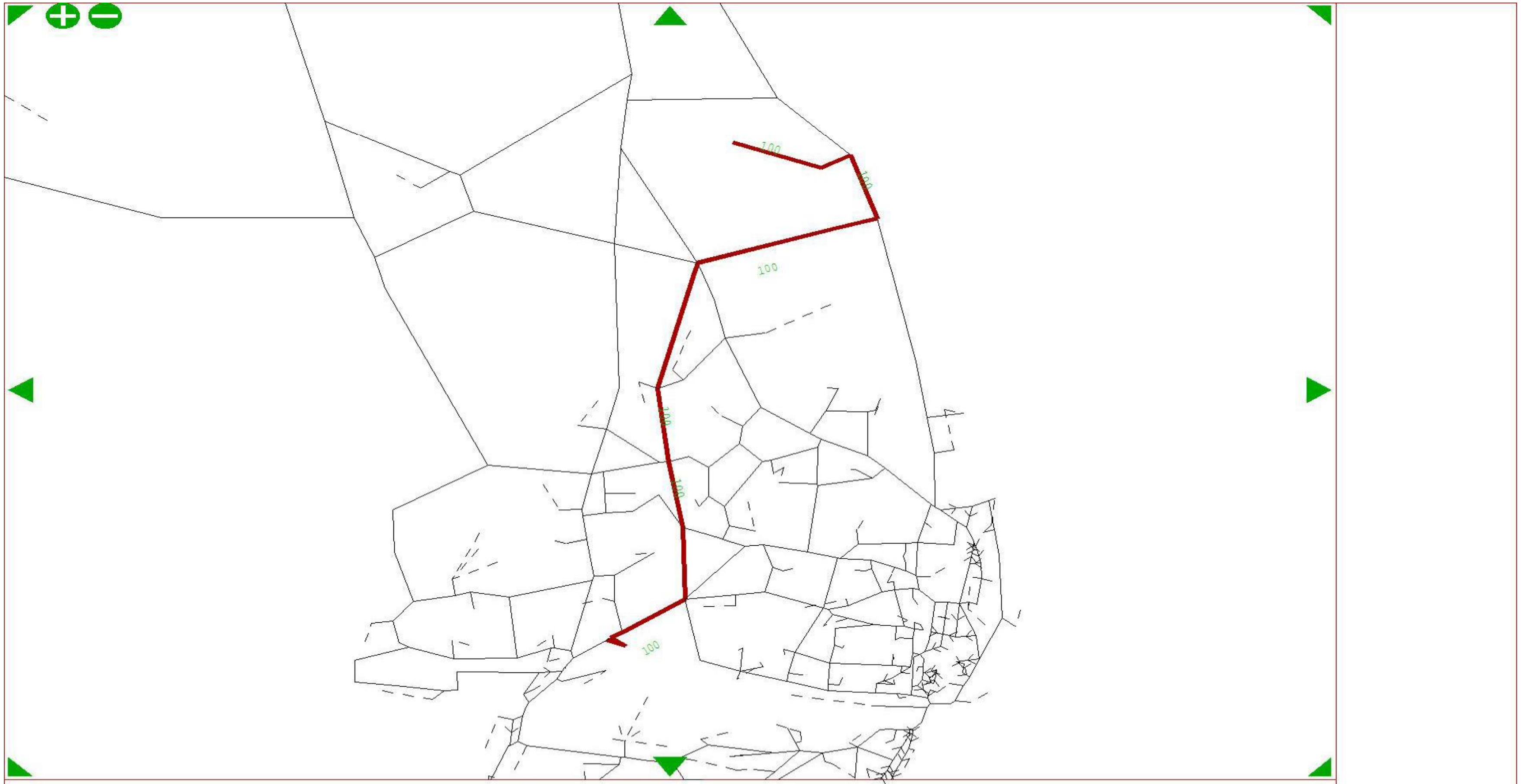
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 781 To Zone 586 - User Class 10



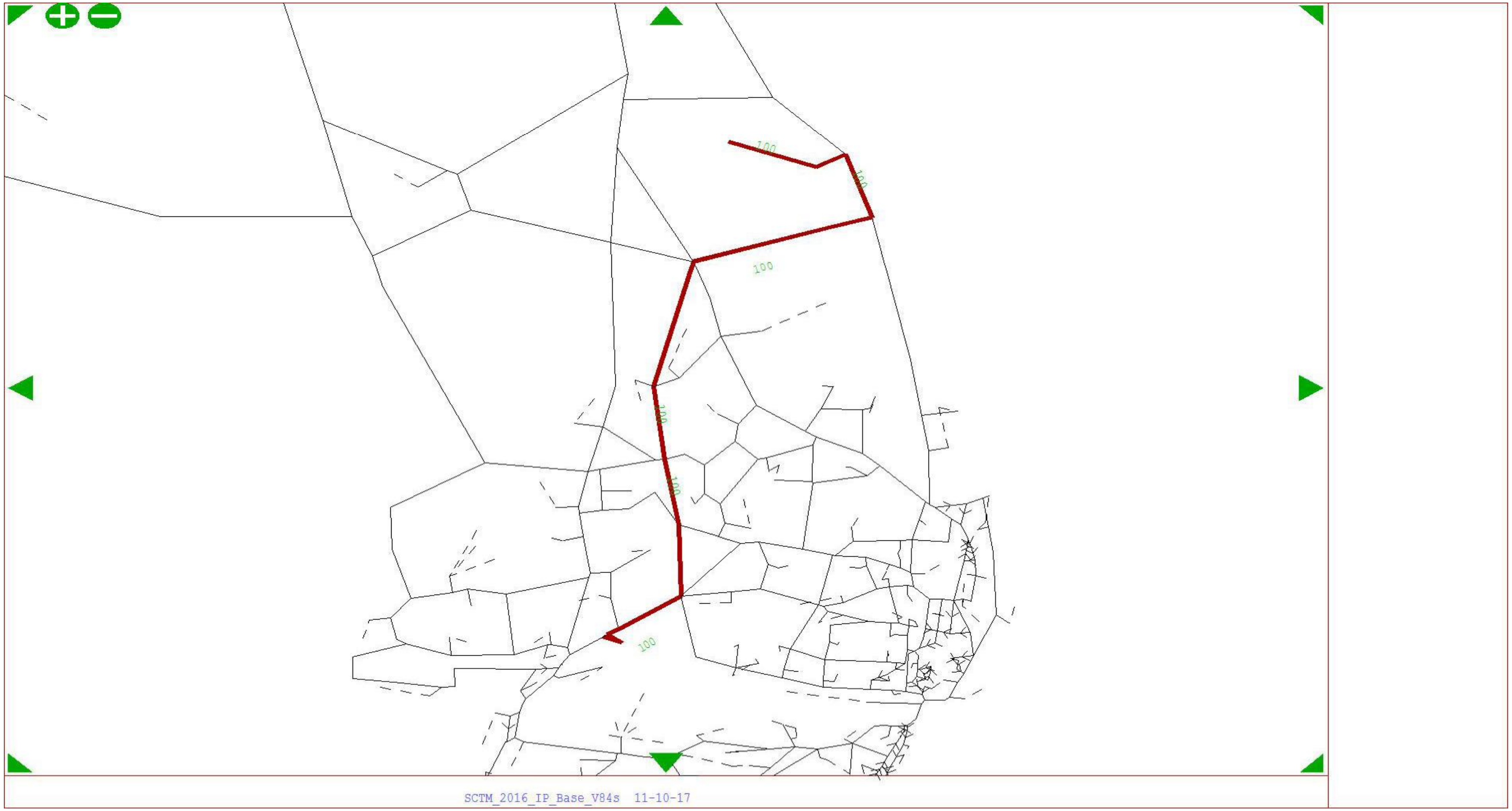
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 408 To Zone 582 - User Class 6

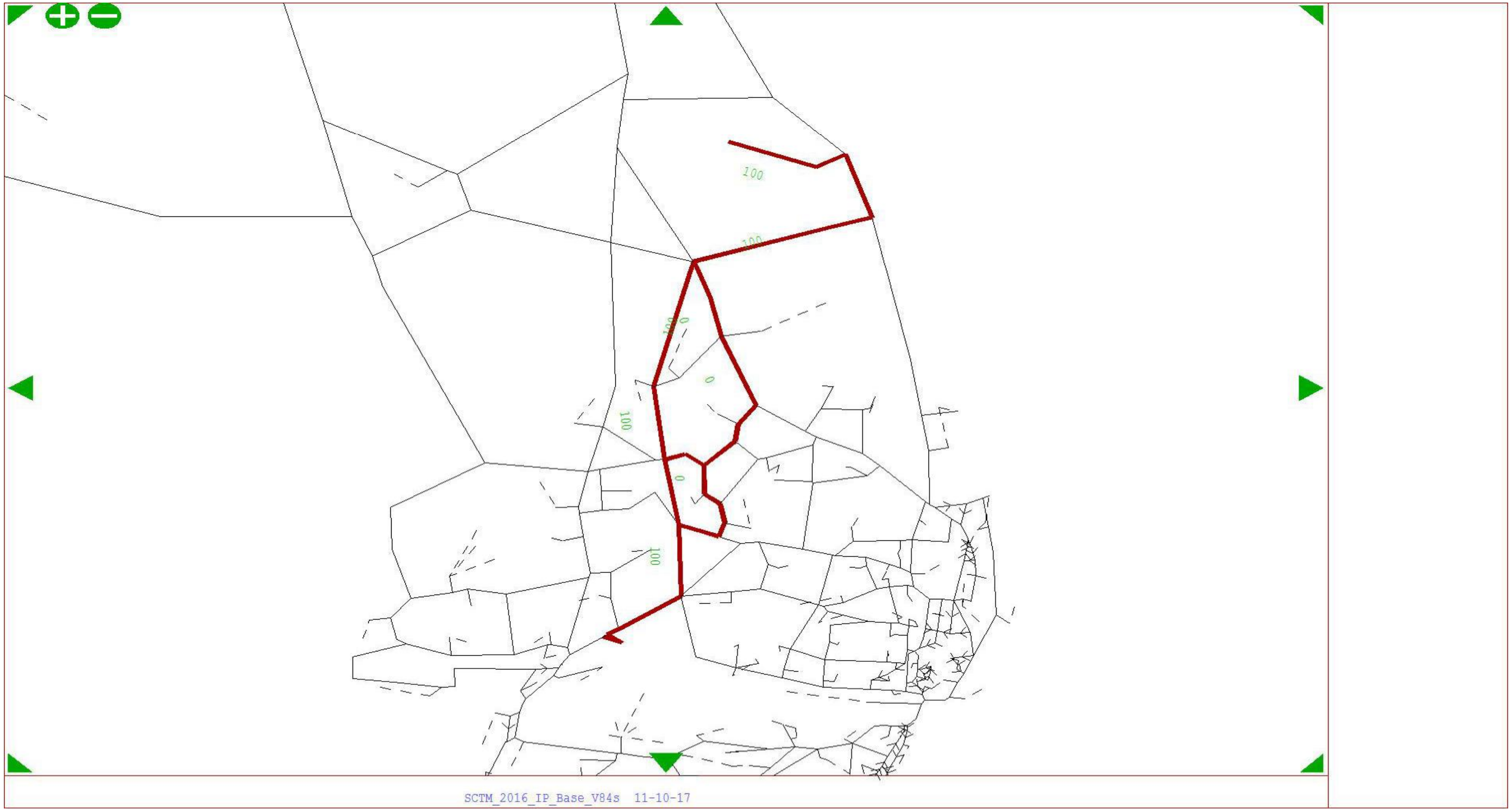


SCTM_2016_IP_Base_V84s 11-10-17

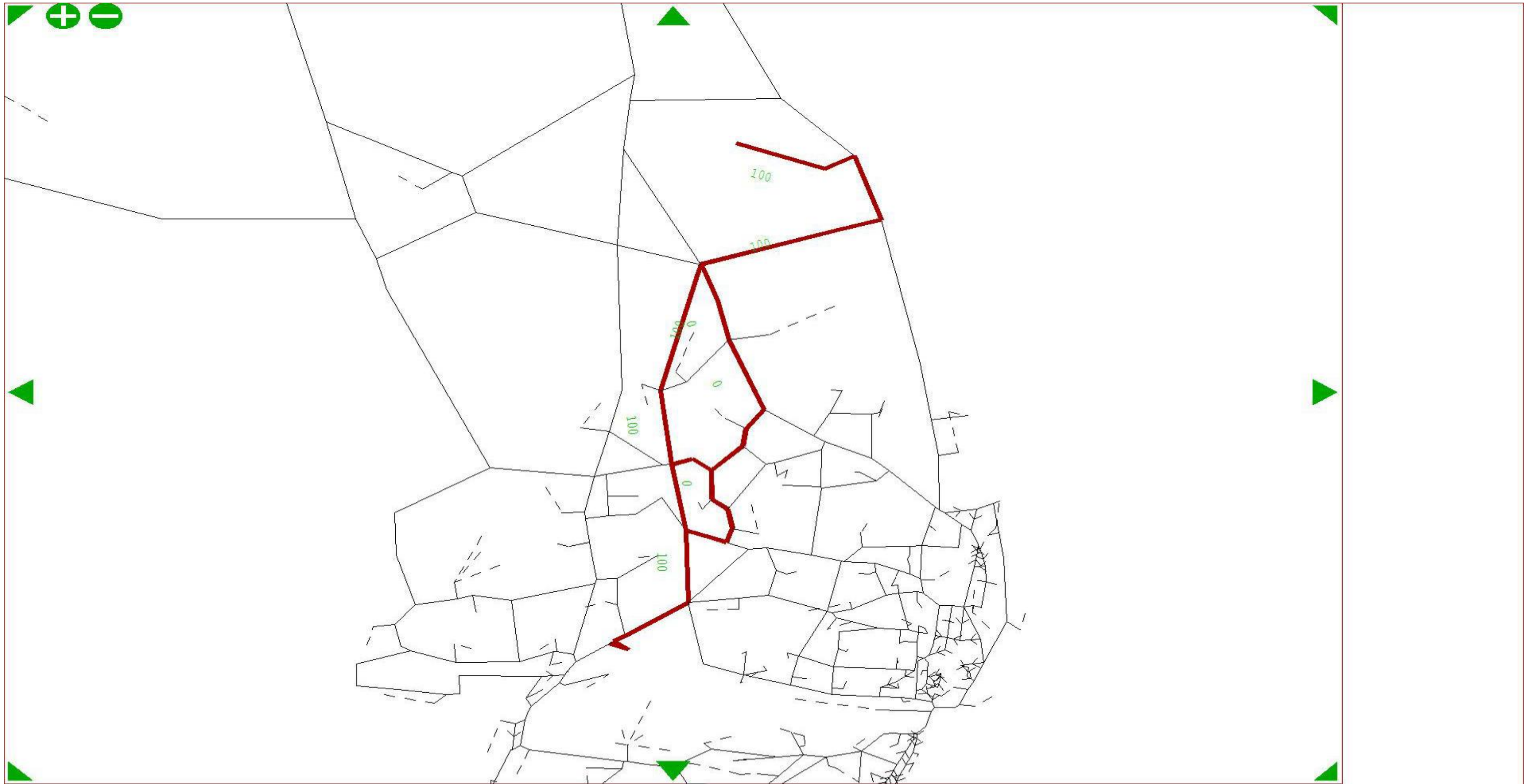
From Zone 408 To Zone 582 - User Class 10



From Zone 582 To Zone 408 - User Class 6



From Zone 582 To Zone 408 - User Class 10

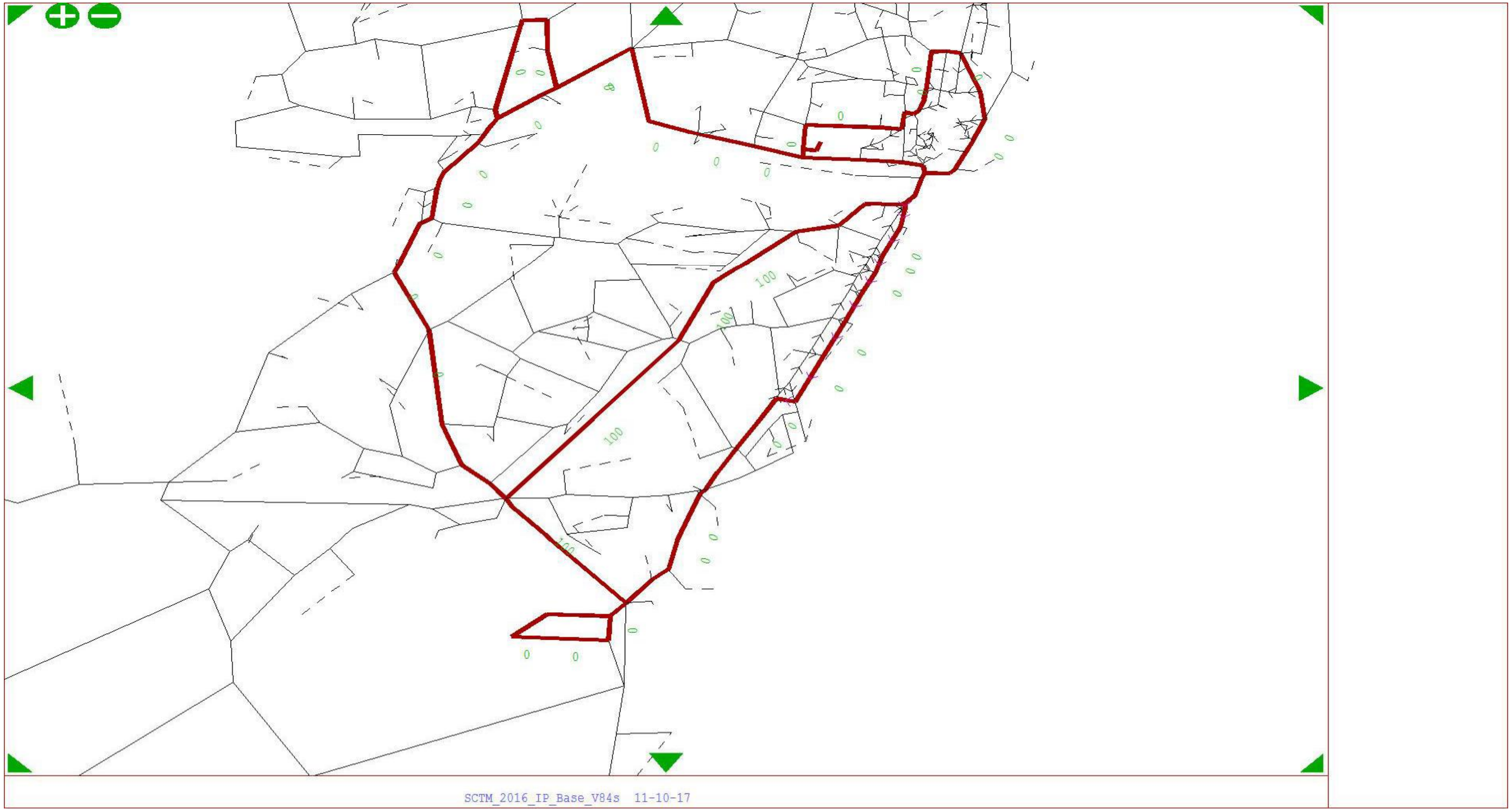


SCTM_2016_IP_Base_V84s 11-10-17

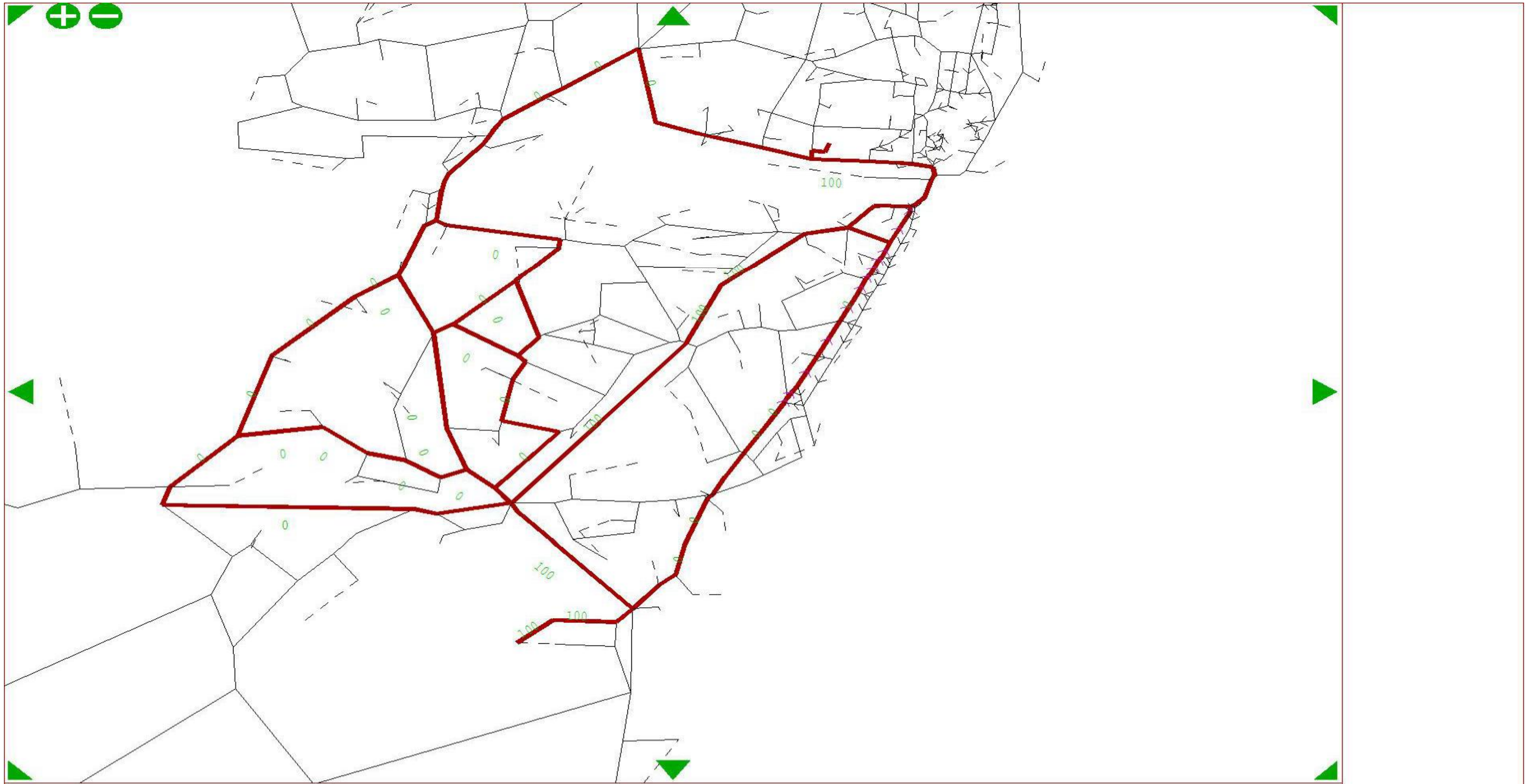
From Zone 427 To Zone 781 - User Class 6

SCTM_2016_IP_Base_V84s 11-10-17

From Zone 427 To Zone 781 - User Class 10

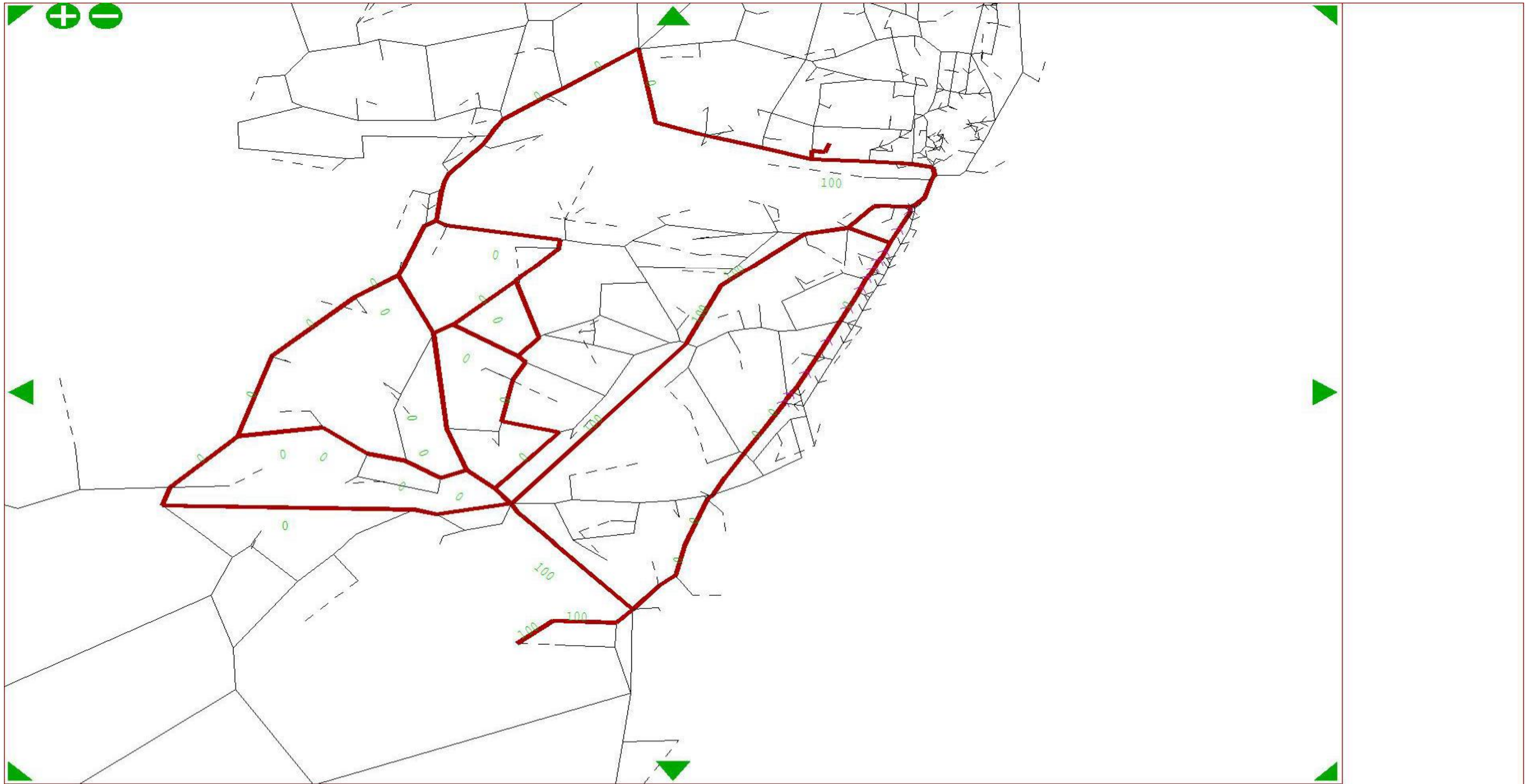


From Zone 781 To Zone 427 - User Class 6



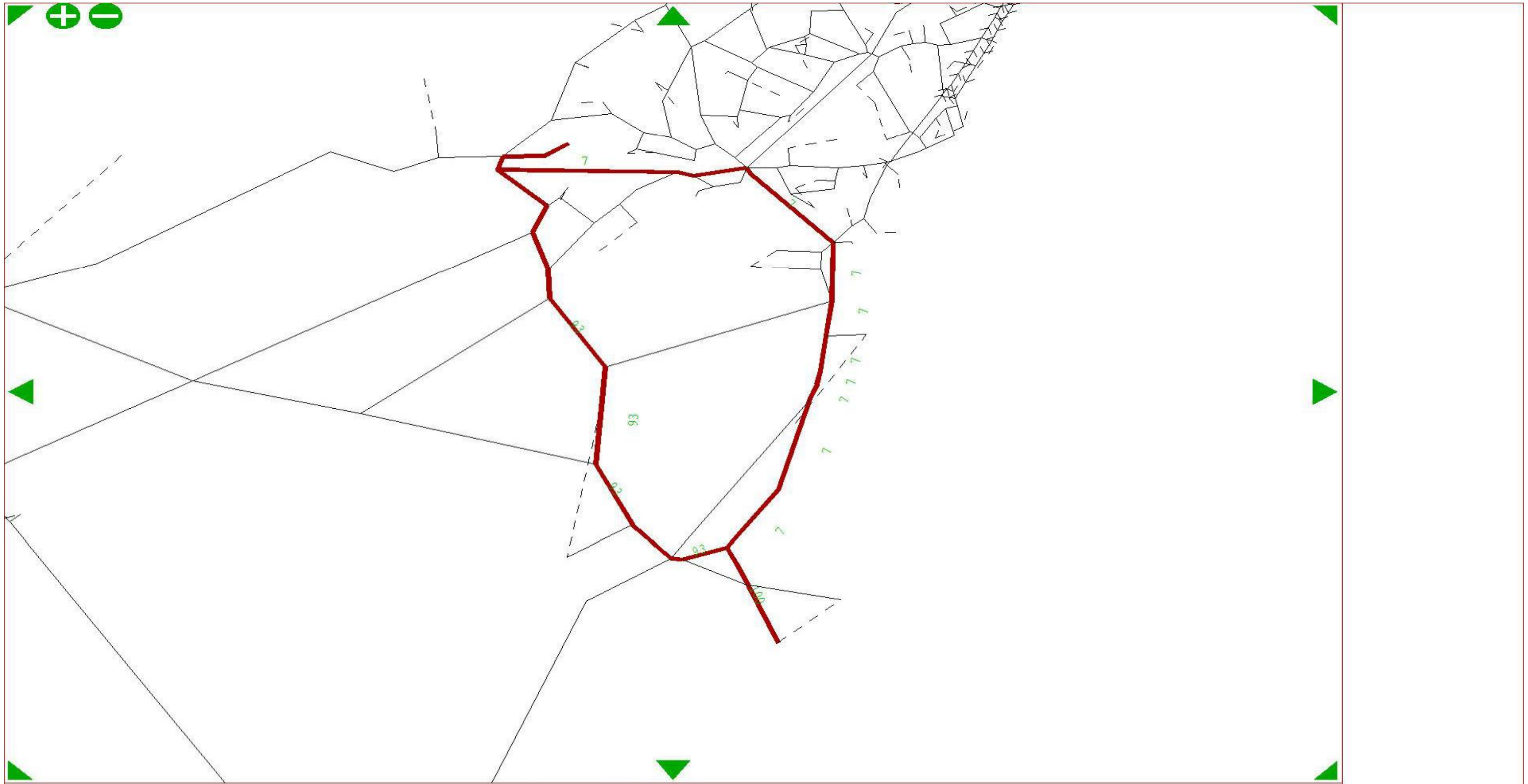
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 781 To Zone 427 - User Class 10



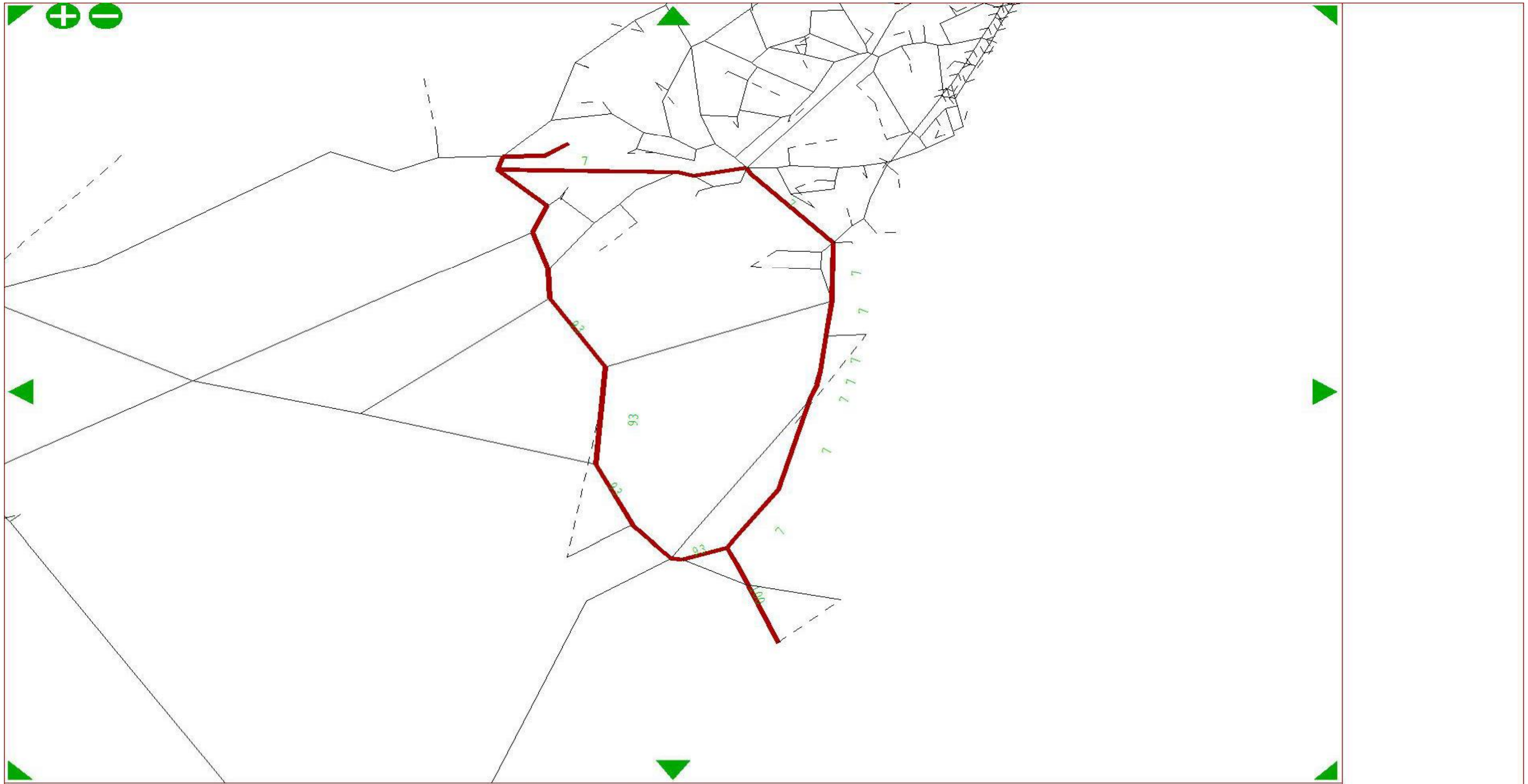
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 639 To Zone 463 - User Class 6



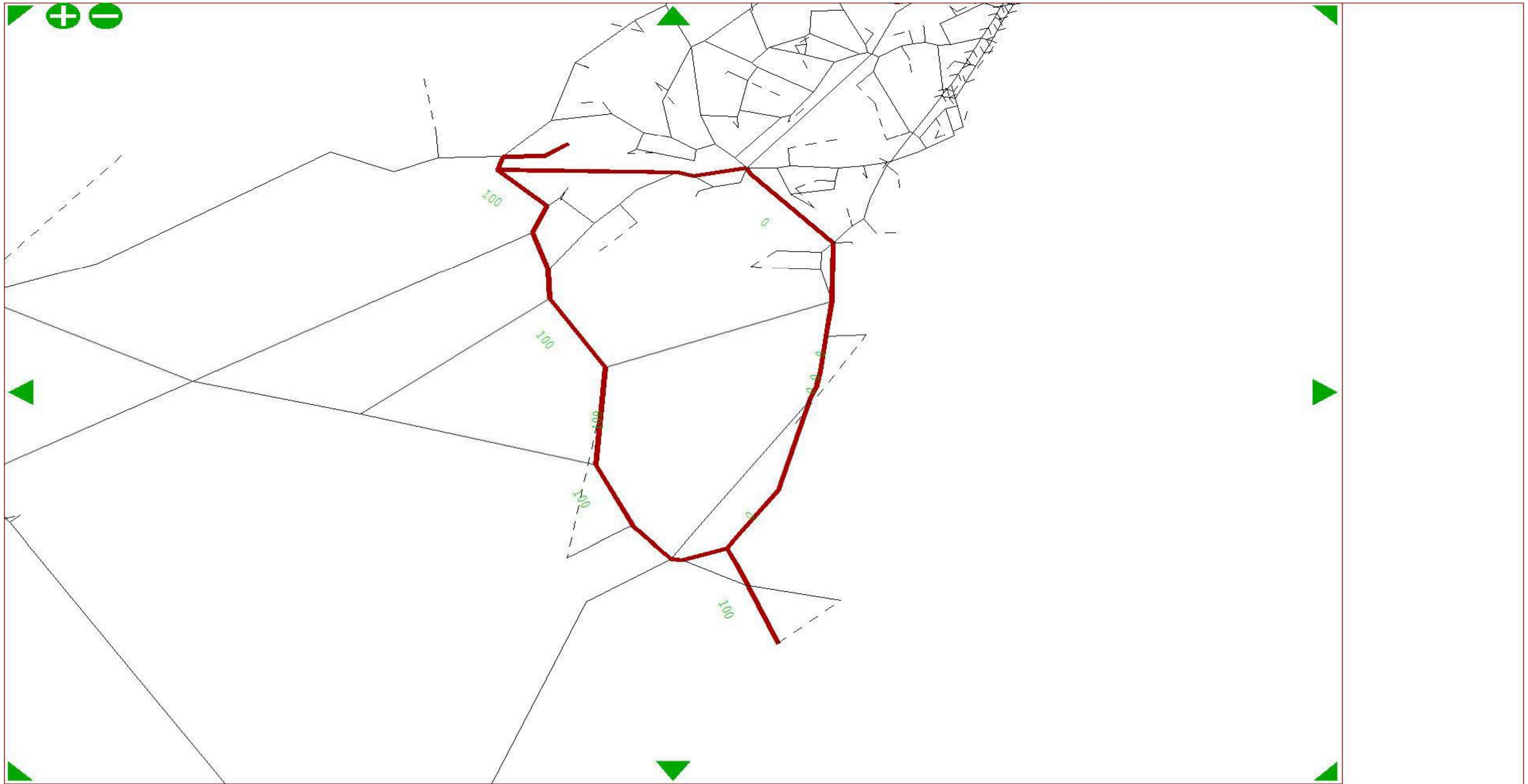
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 639 To Zone 463 - User Class 10



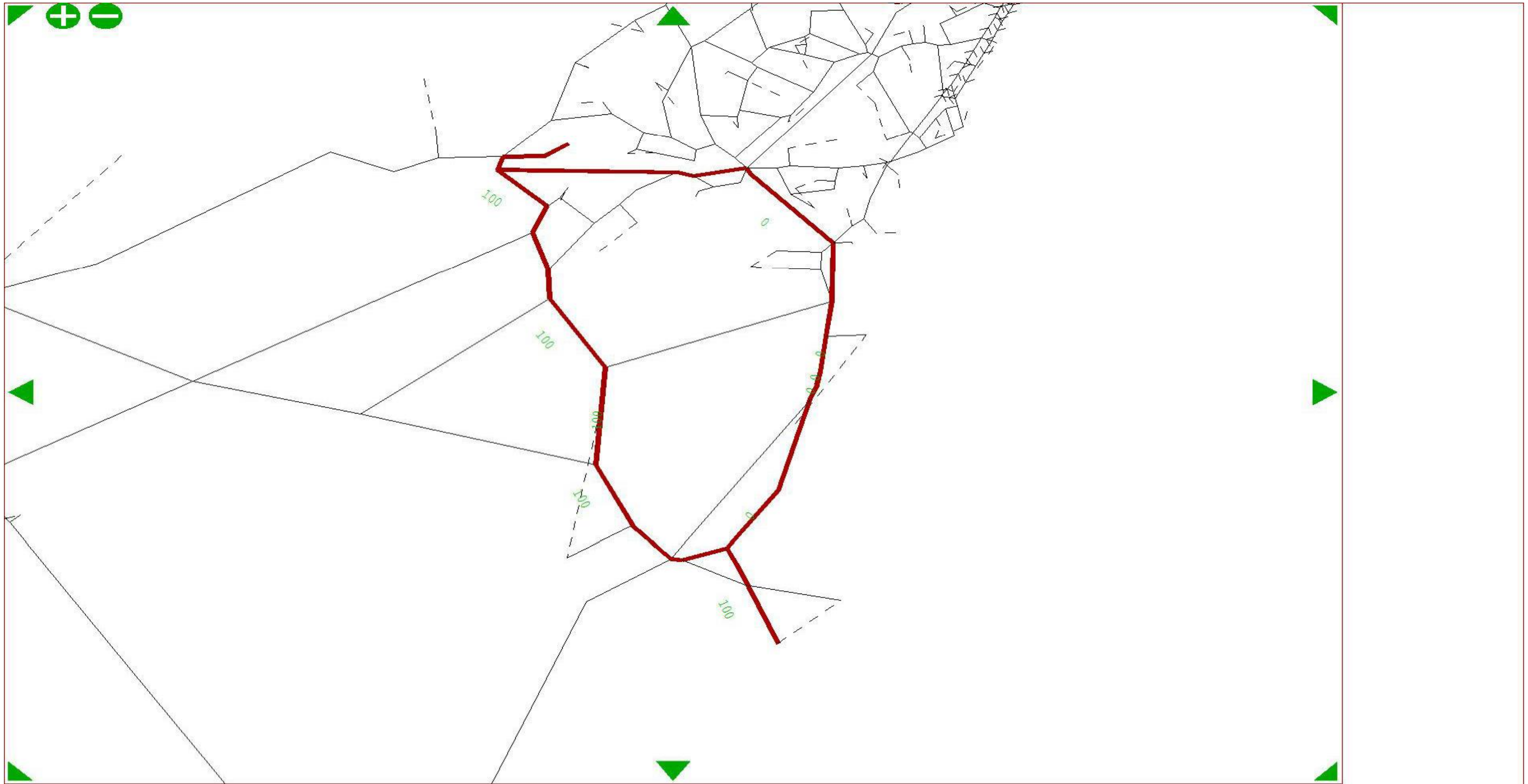
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 463 To Zone 639 - User Class 6



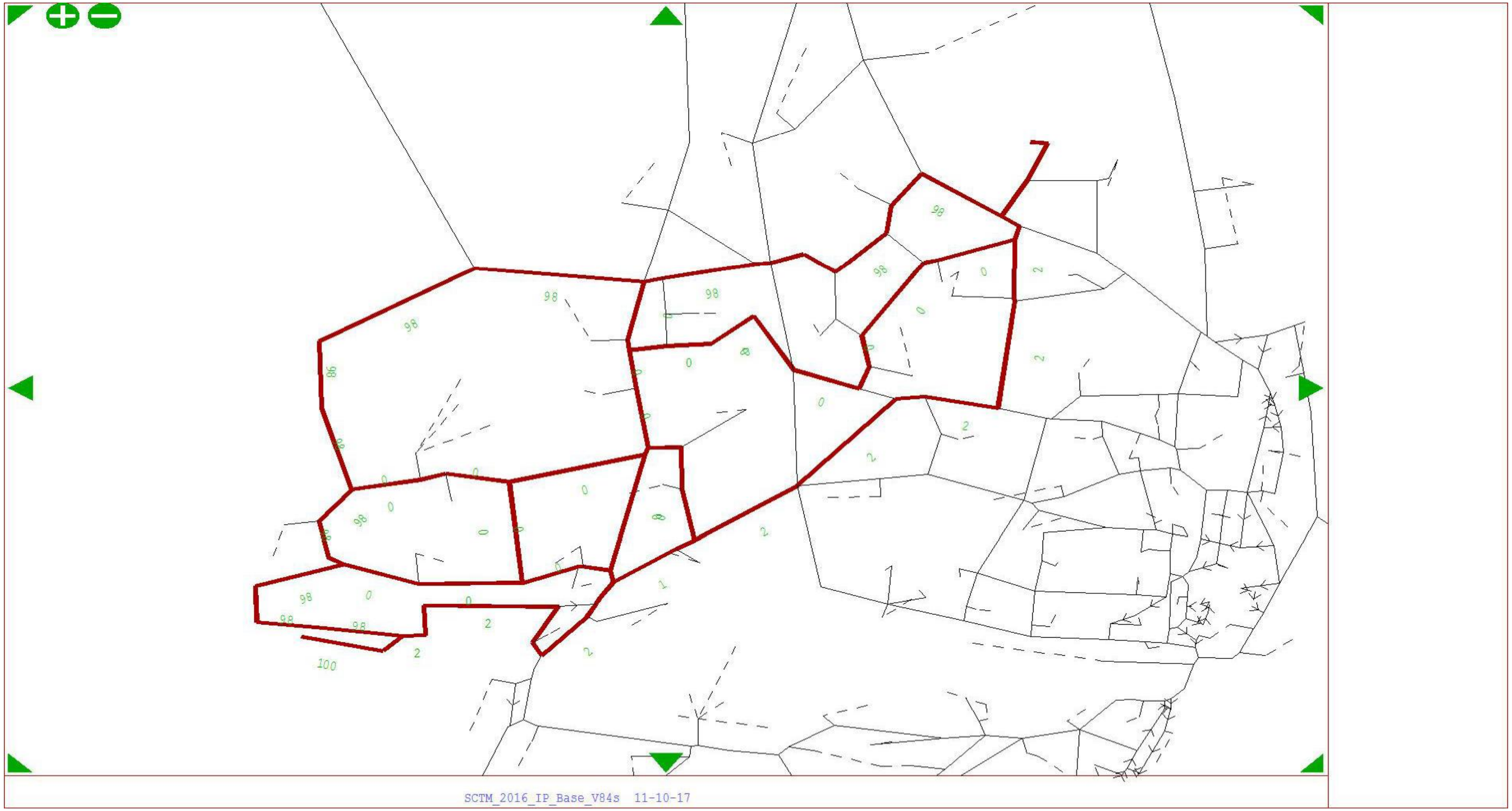
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 463 To Zone 639 - User Class 10



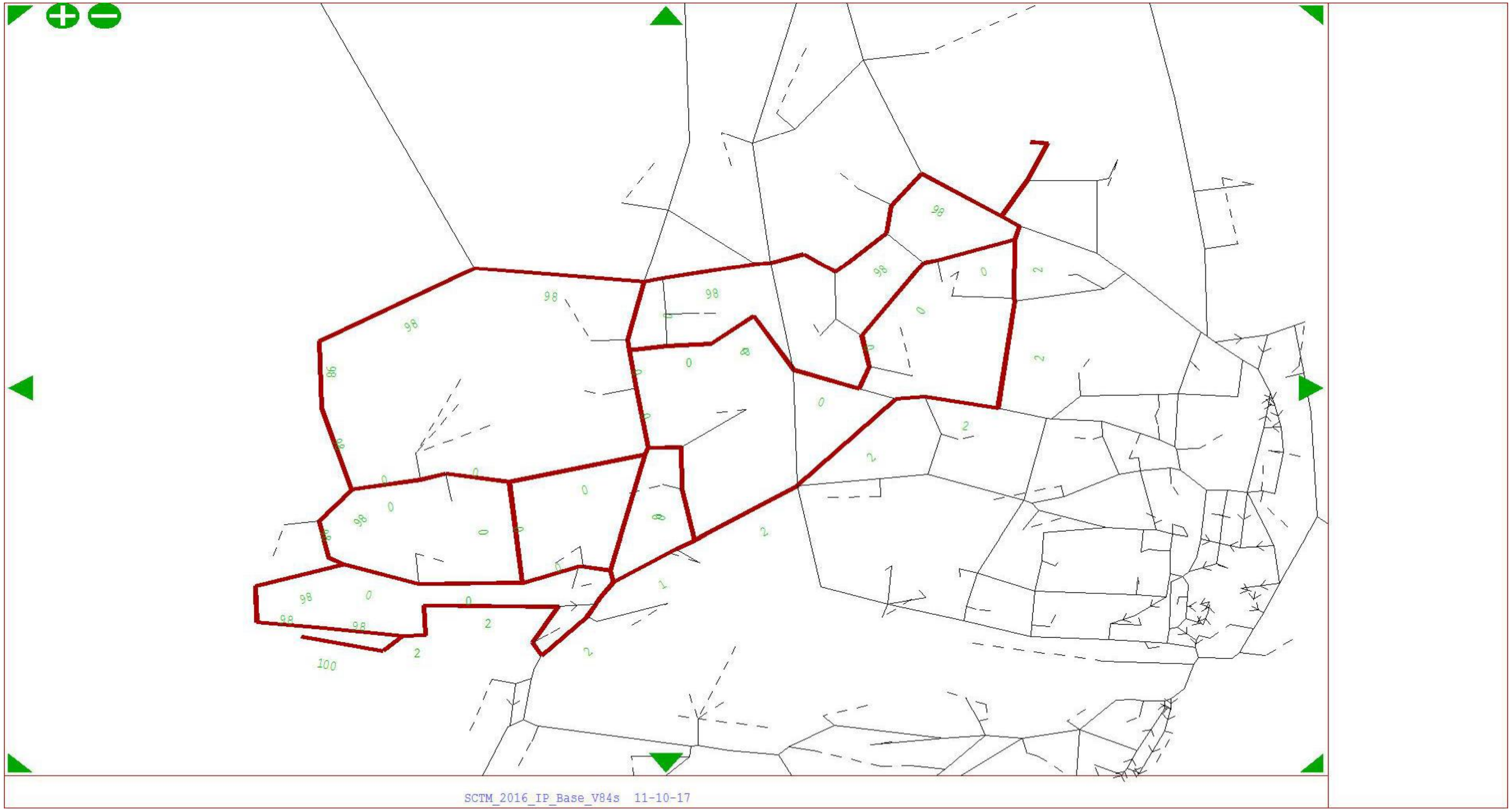
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 409 To Zone 584 - User Class 6



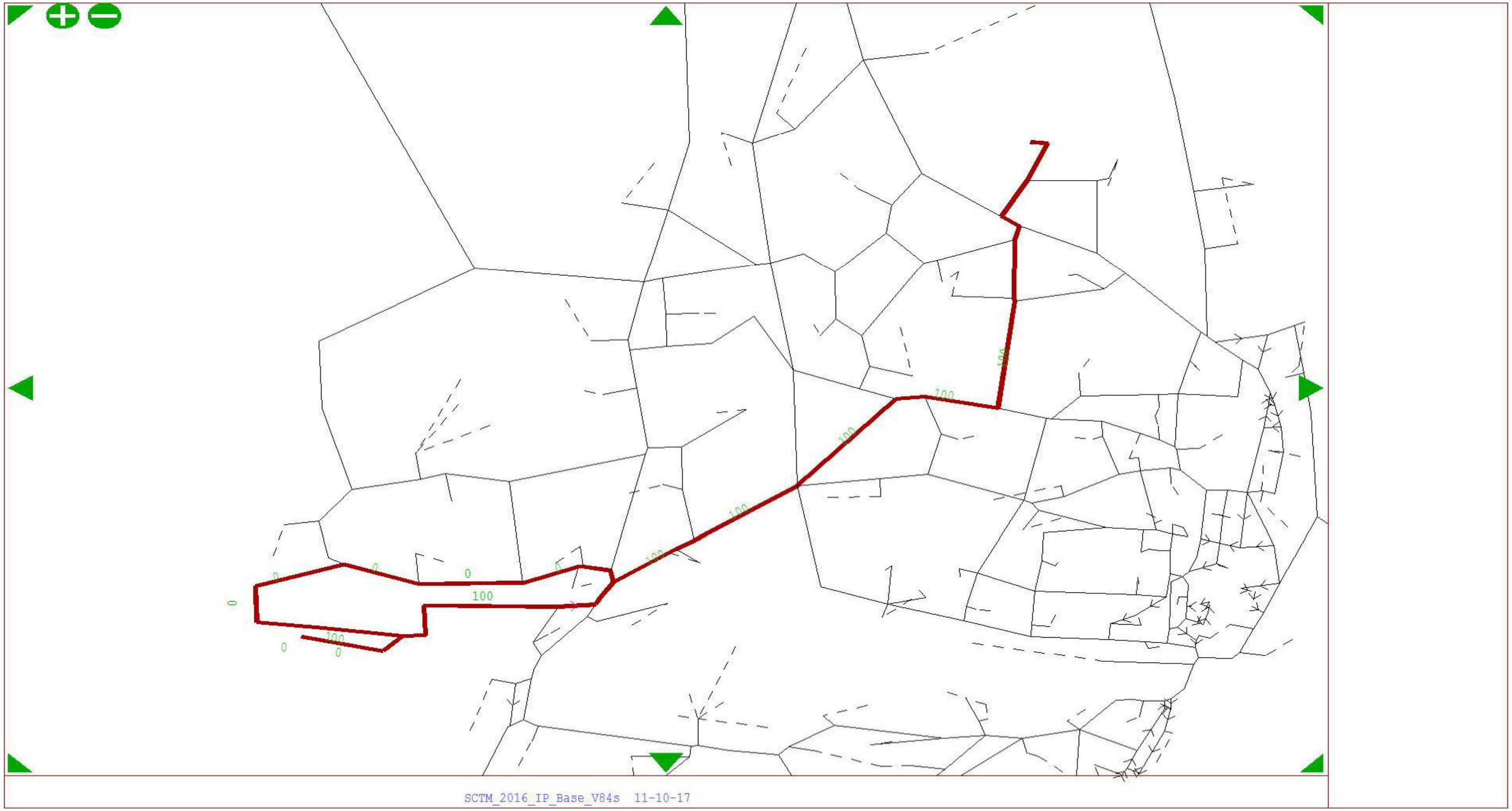
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 409 To Zone 584 - User Class 10

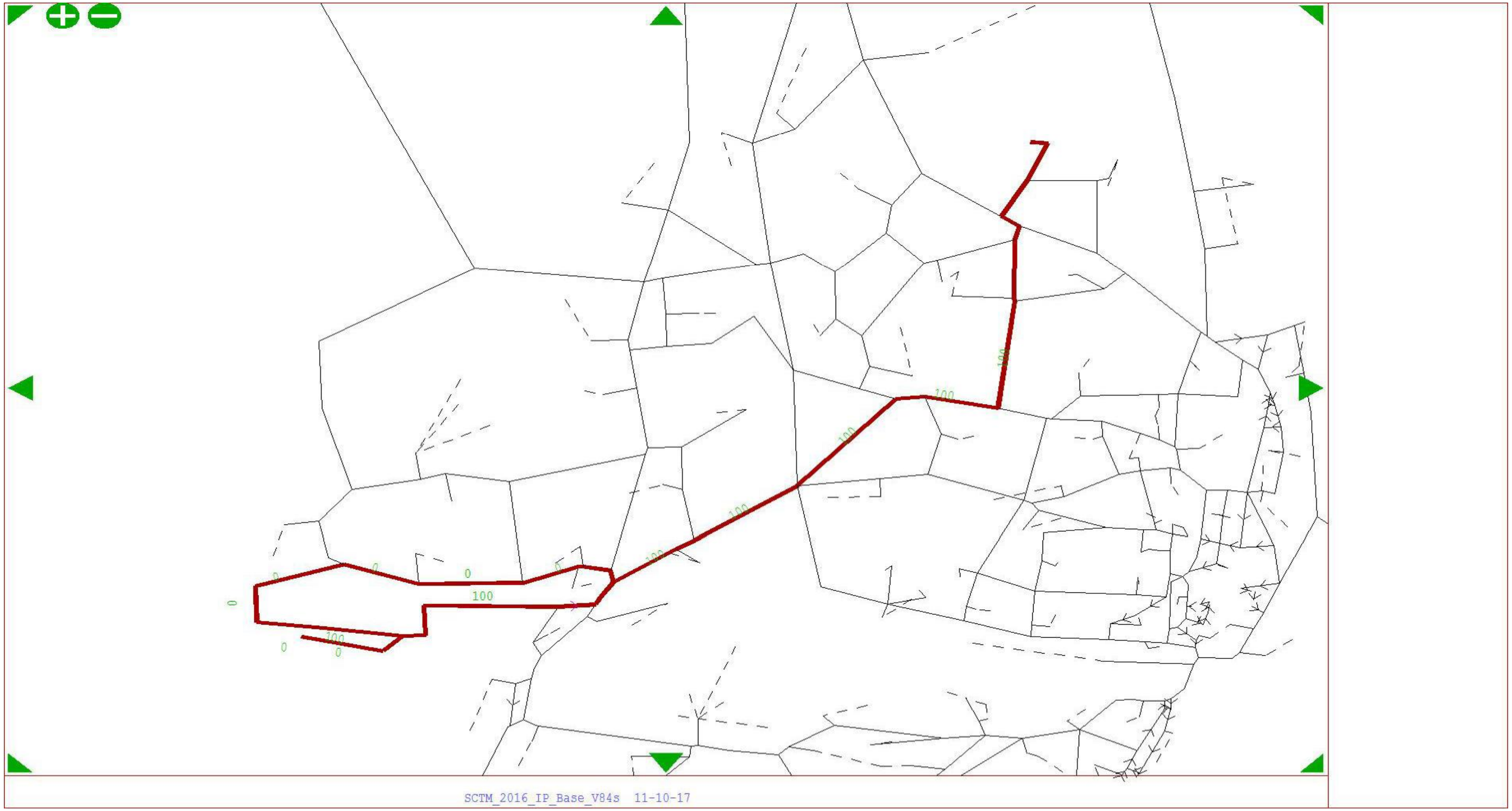


SCTM_2016_IP_Base_V84s 11-10-17

From Zone 584 To Zone 409 - User Class 6

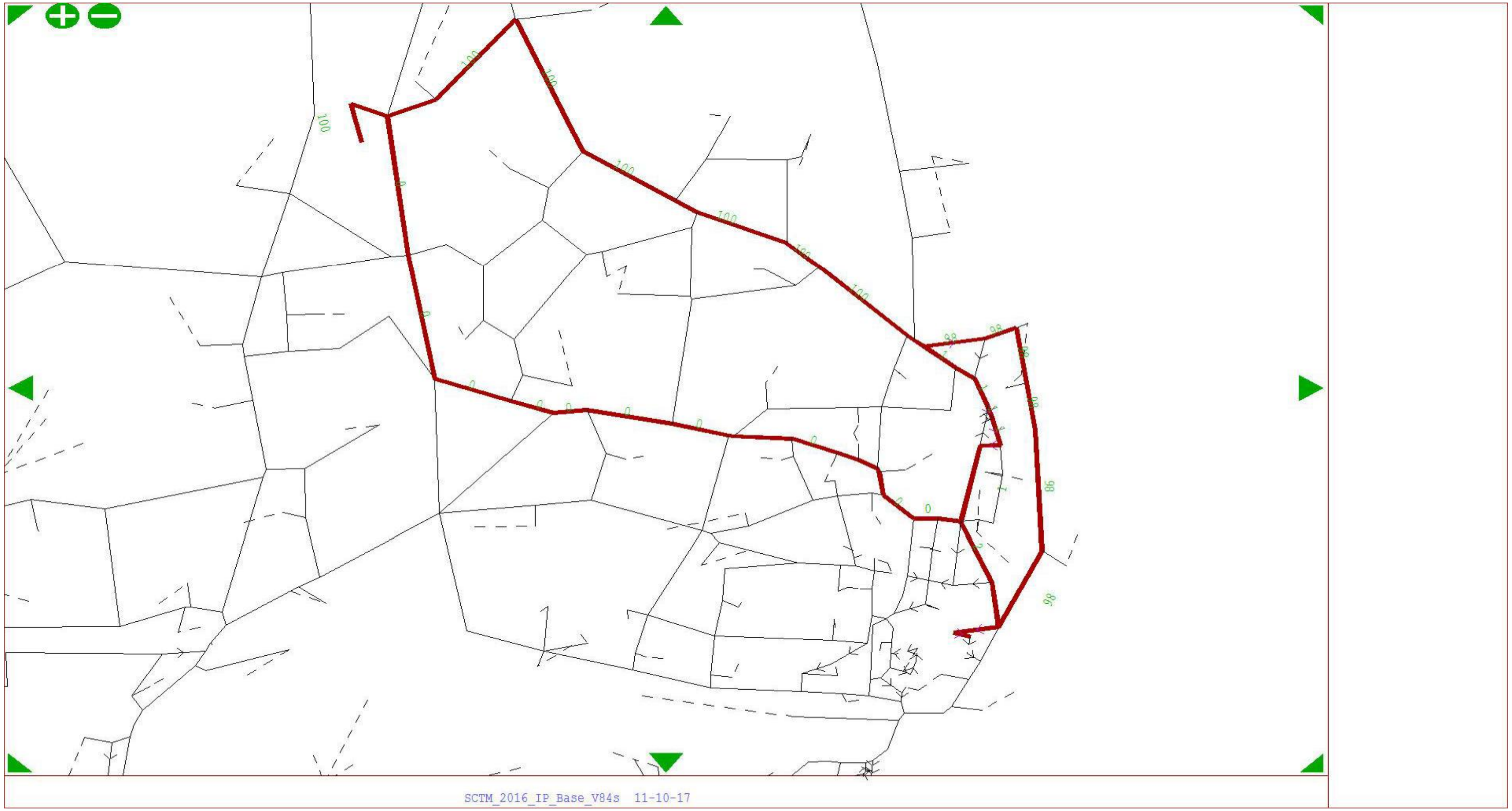


From Zone 584 To Zone 409 - User Class 10

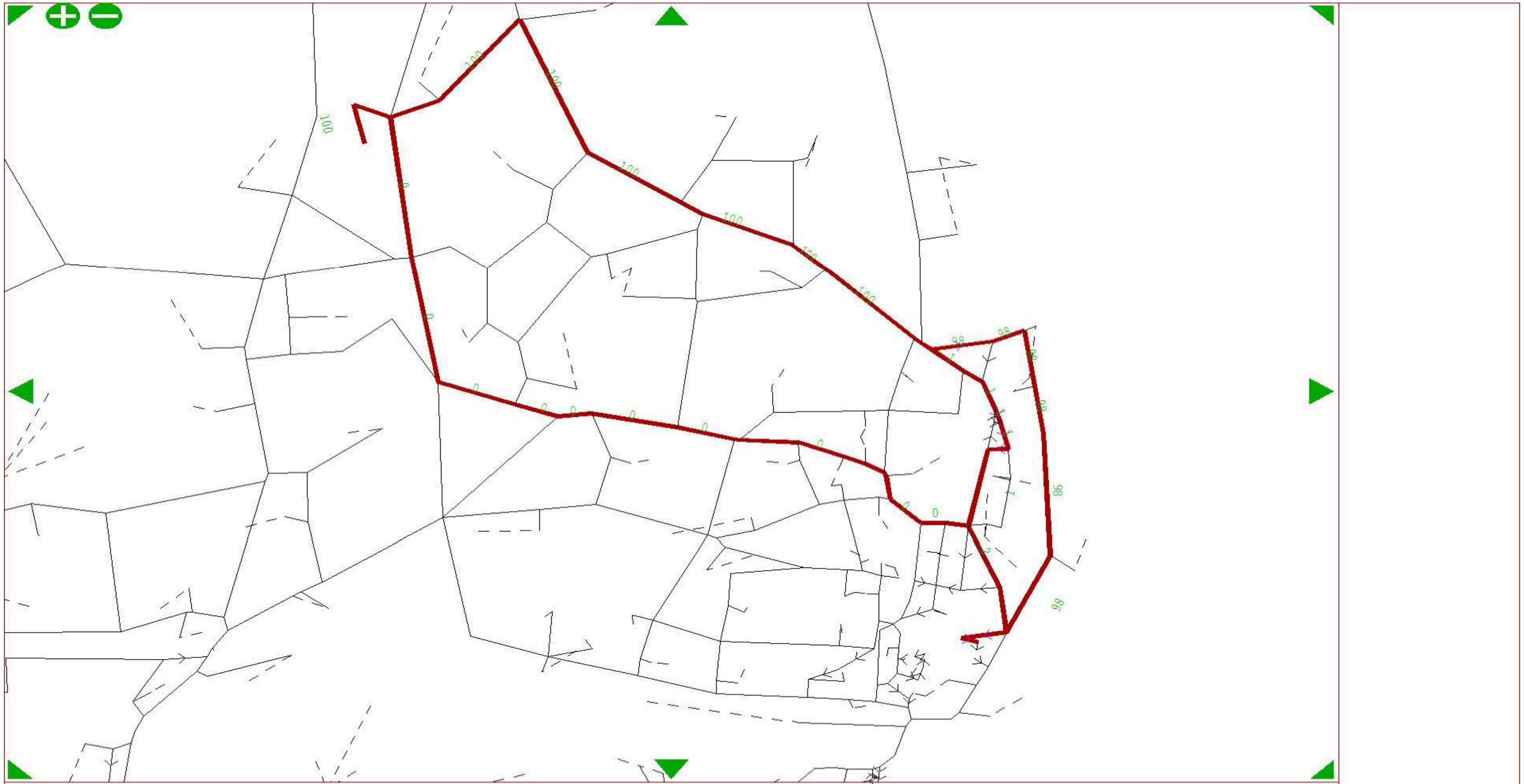


SCTM_2016_IP_Base_V84s 11-10-17

From Zone 586 To Zone 762 - User Class 6

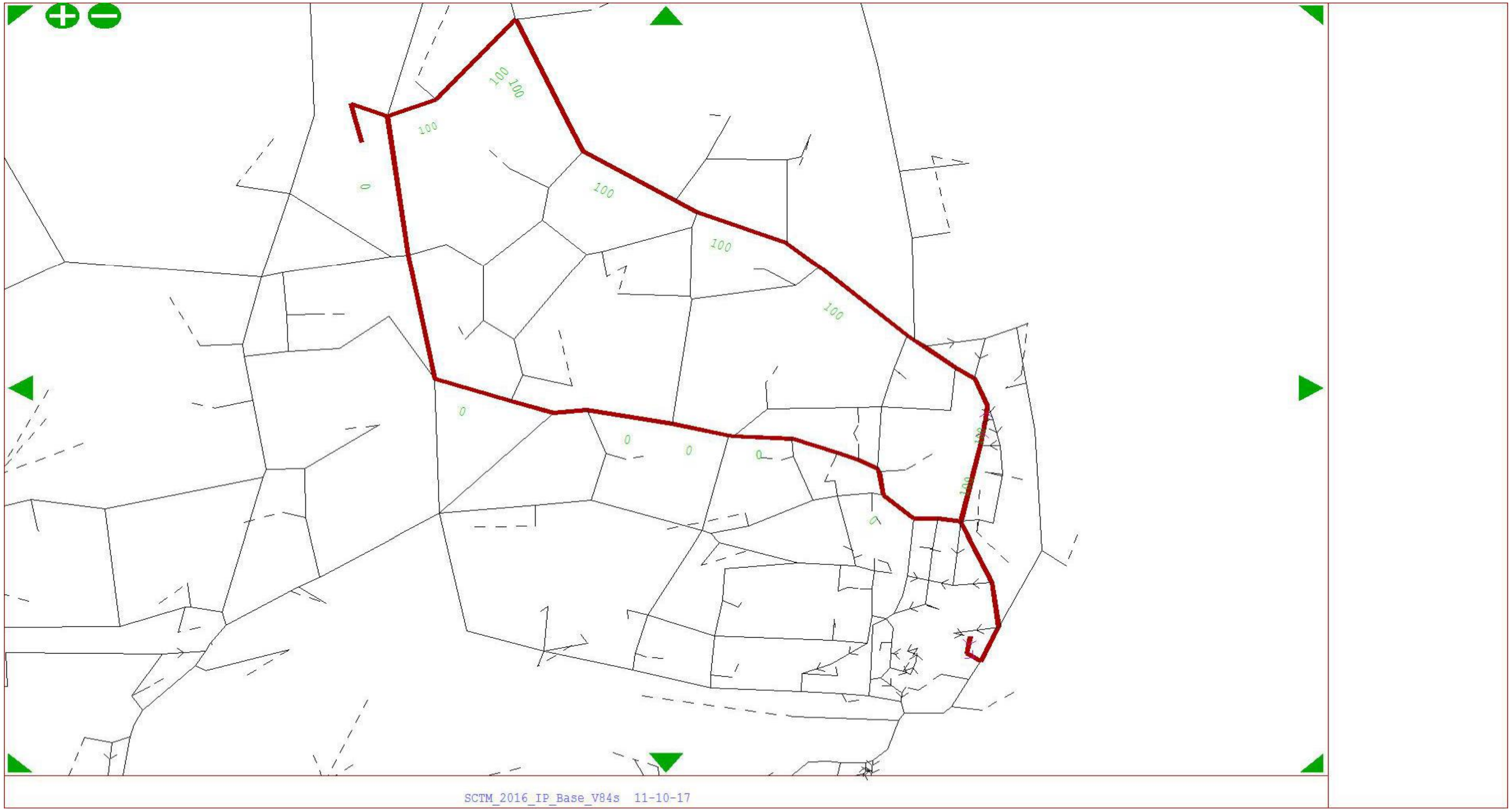


From Zone 586 To Zone 762 - User Class 10

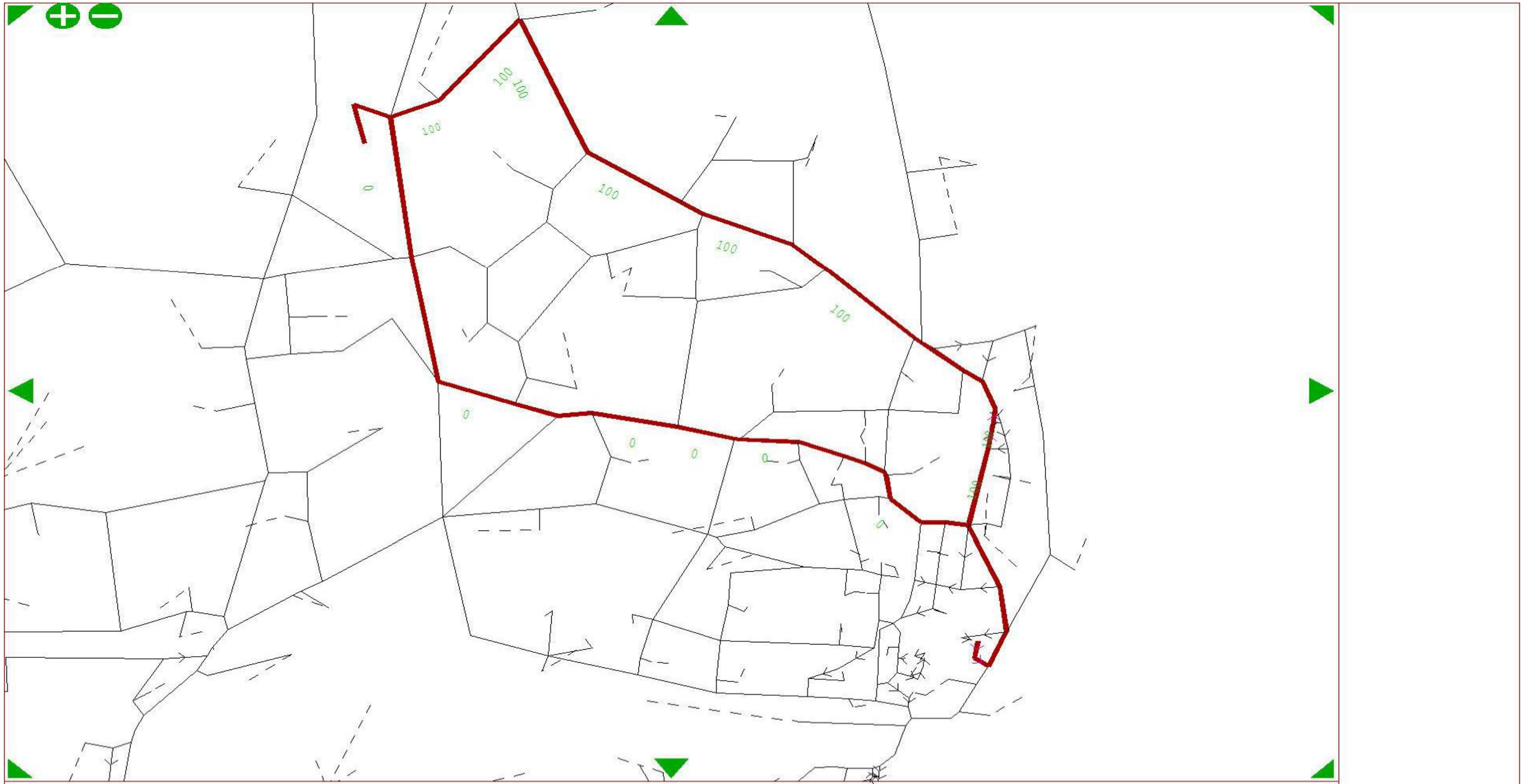


SCTM_2016_IP_Base_V84s 11-10-17

From Zone 762 To Zone 586 - User Class 6

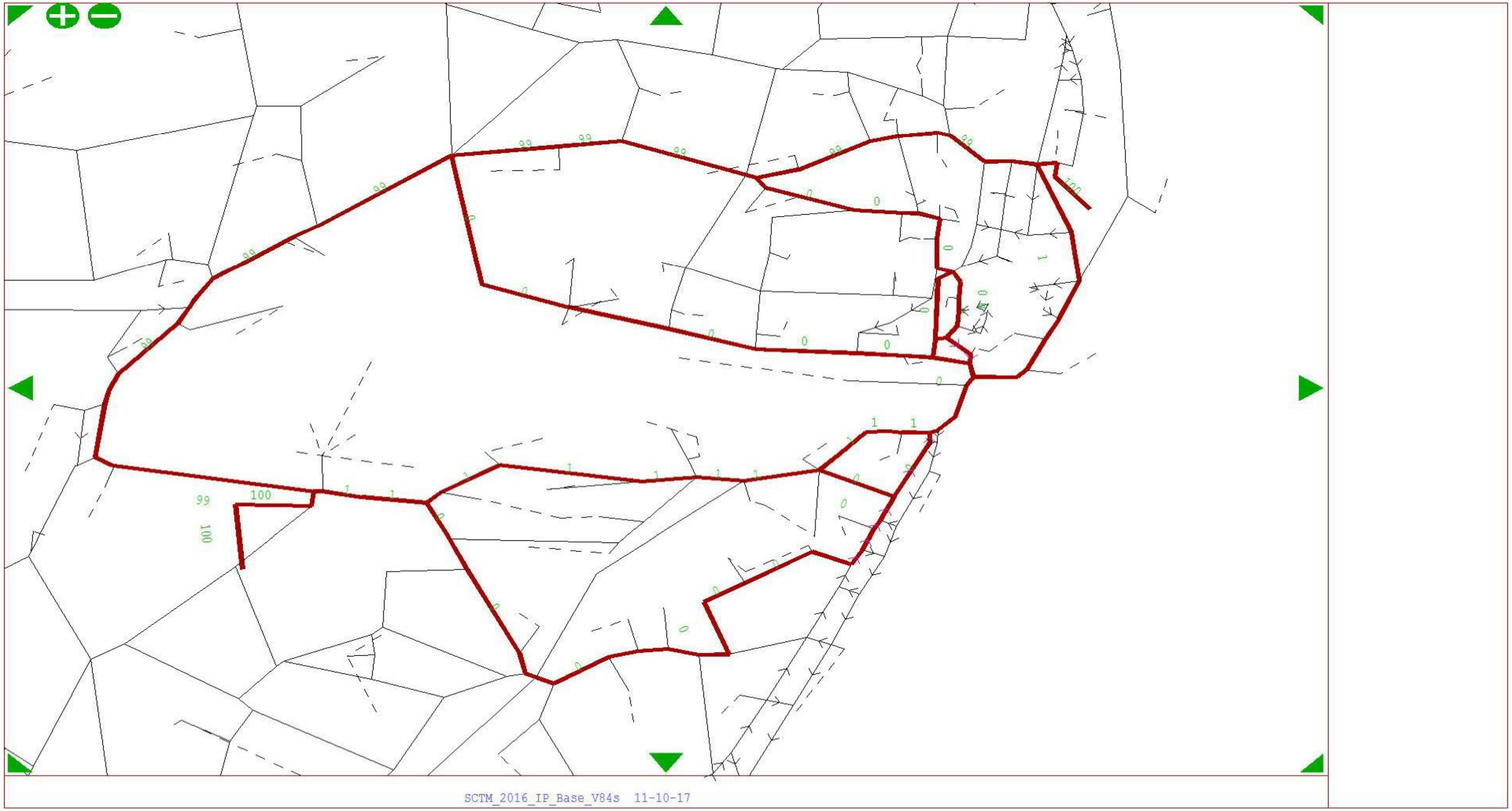


From Zone 762 To Zone 586 - User Class 10



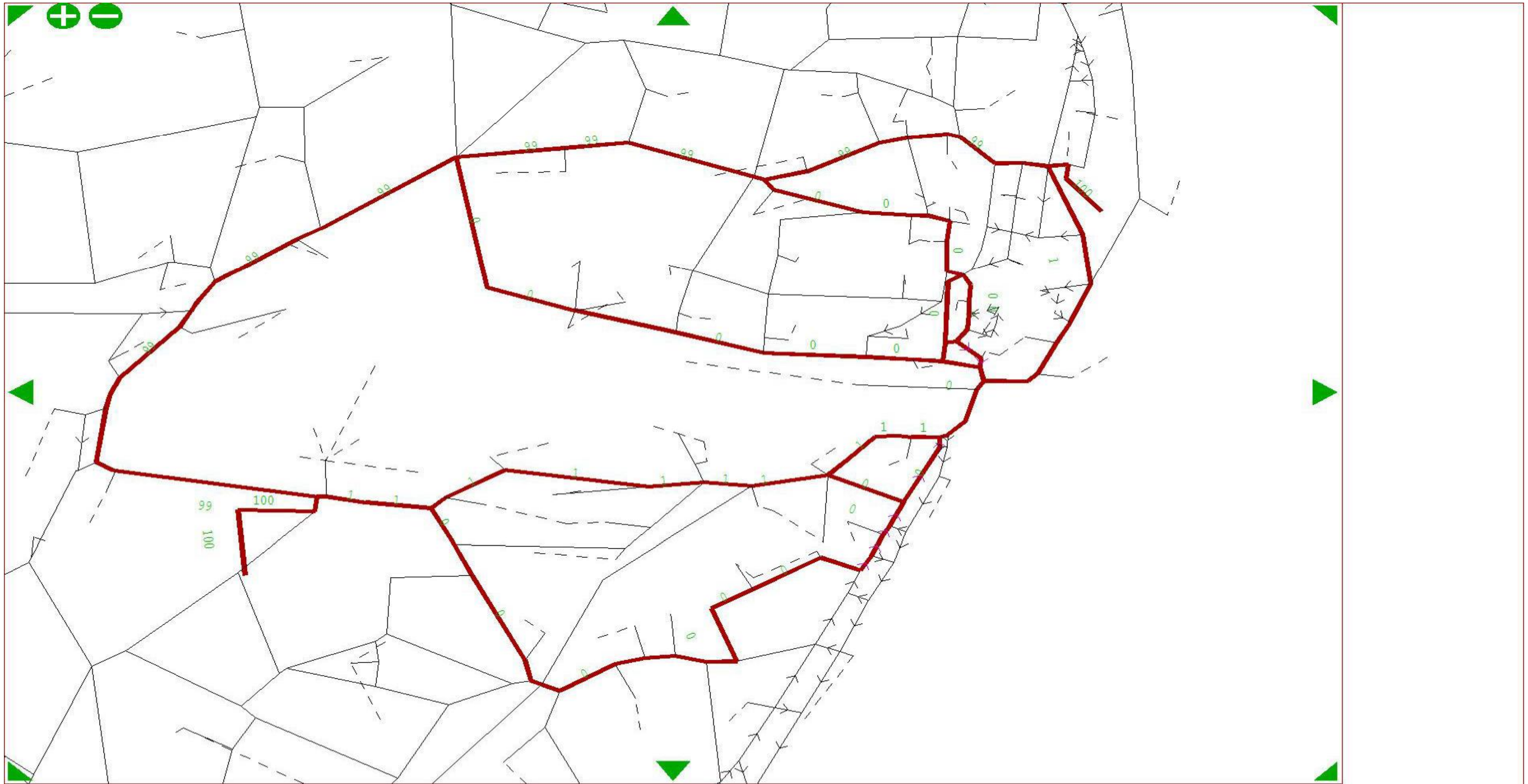
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 432 To Zone 761 - User Class 6



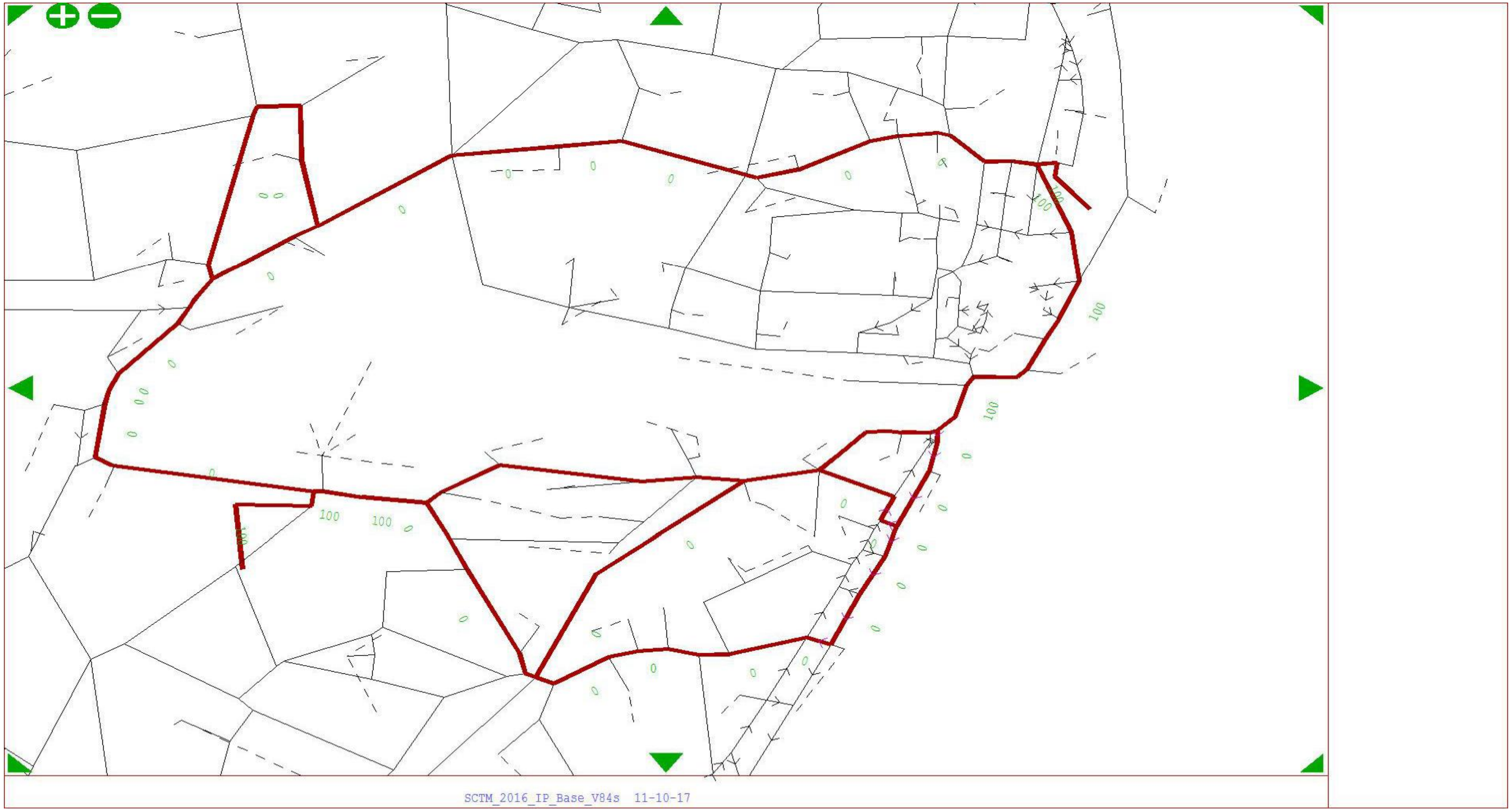
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 432 To Zone 761 - User Class 10

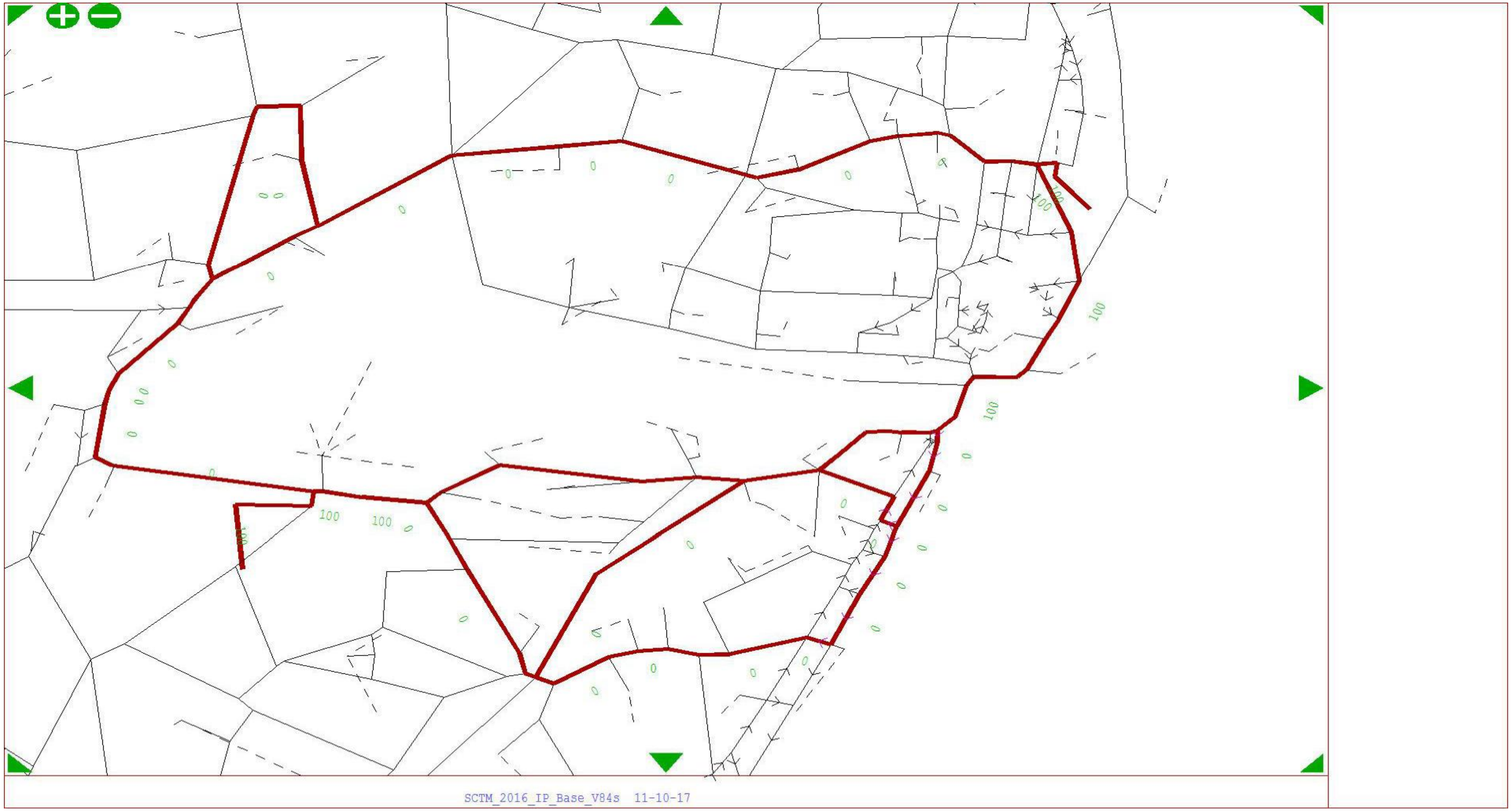


SCTM_2016_IP_Base_V84s 11-10-17

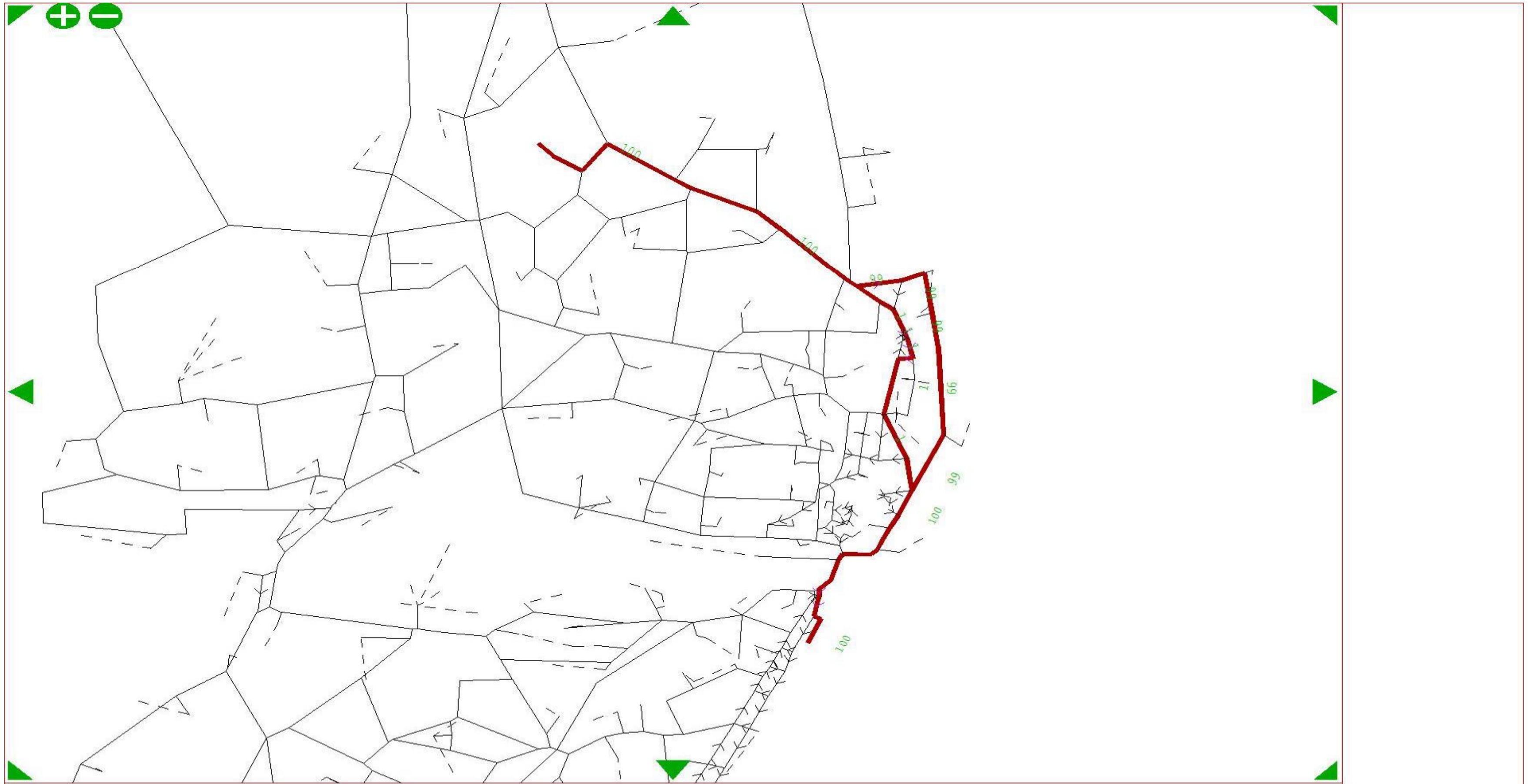
From Zone 761 To Zone 432 - User Class 6



From Zone 761 To Zone 432 - User Class 10

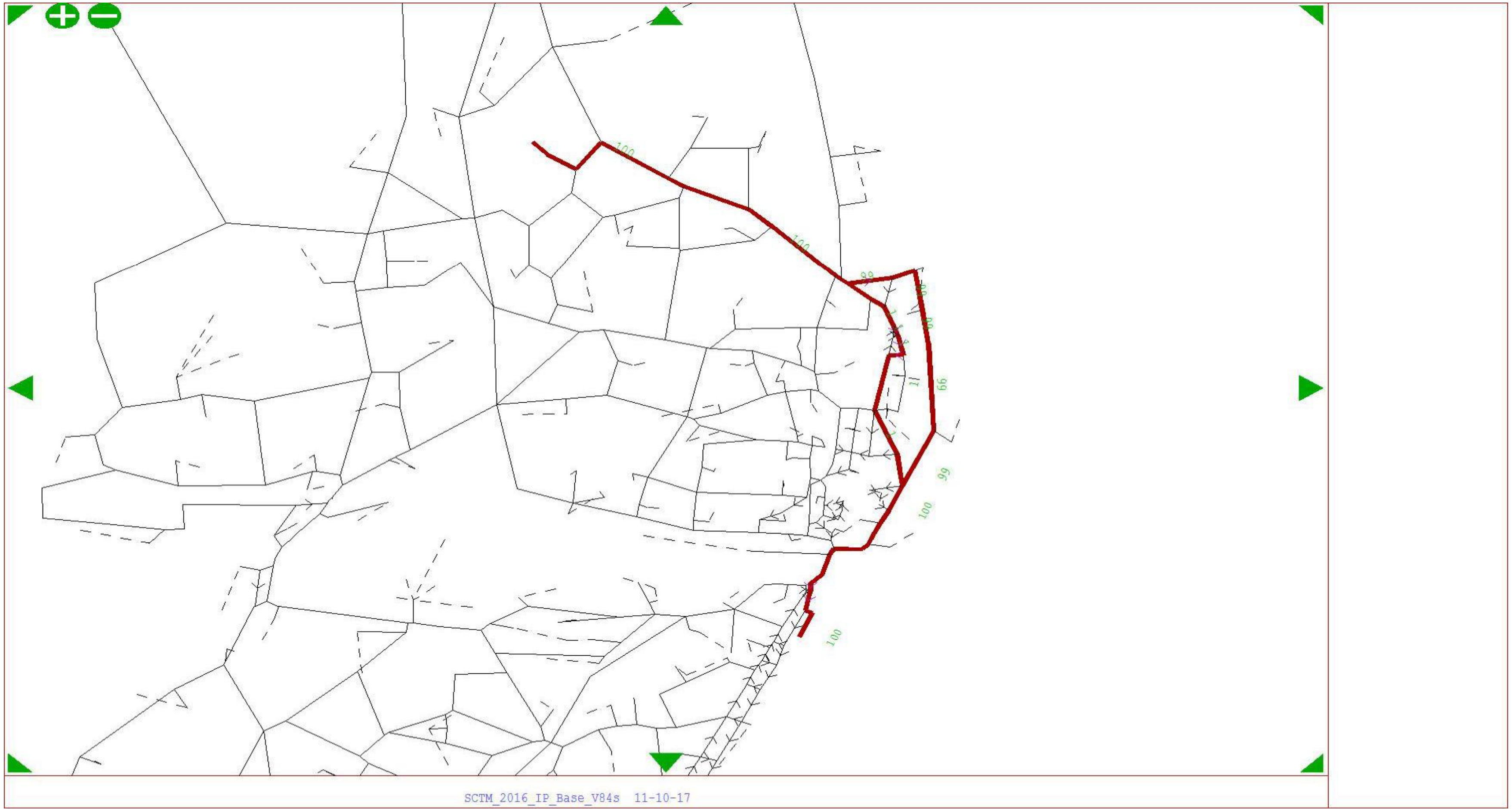


From Zone 416 To Zone 588 - User Class 6

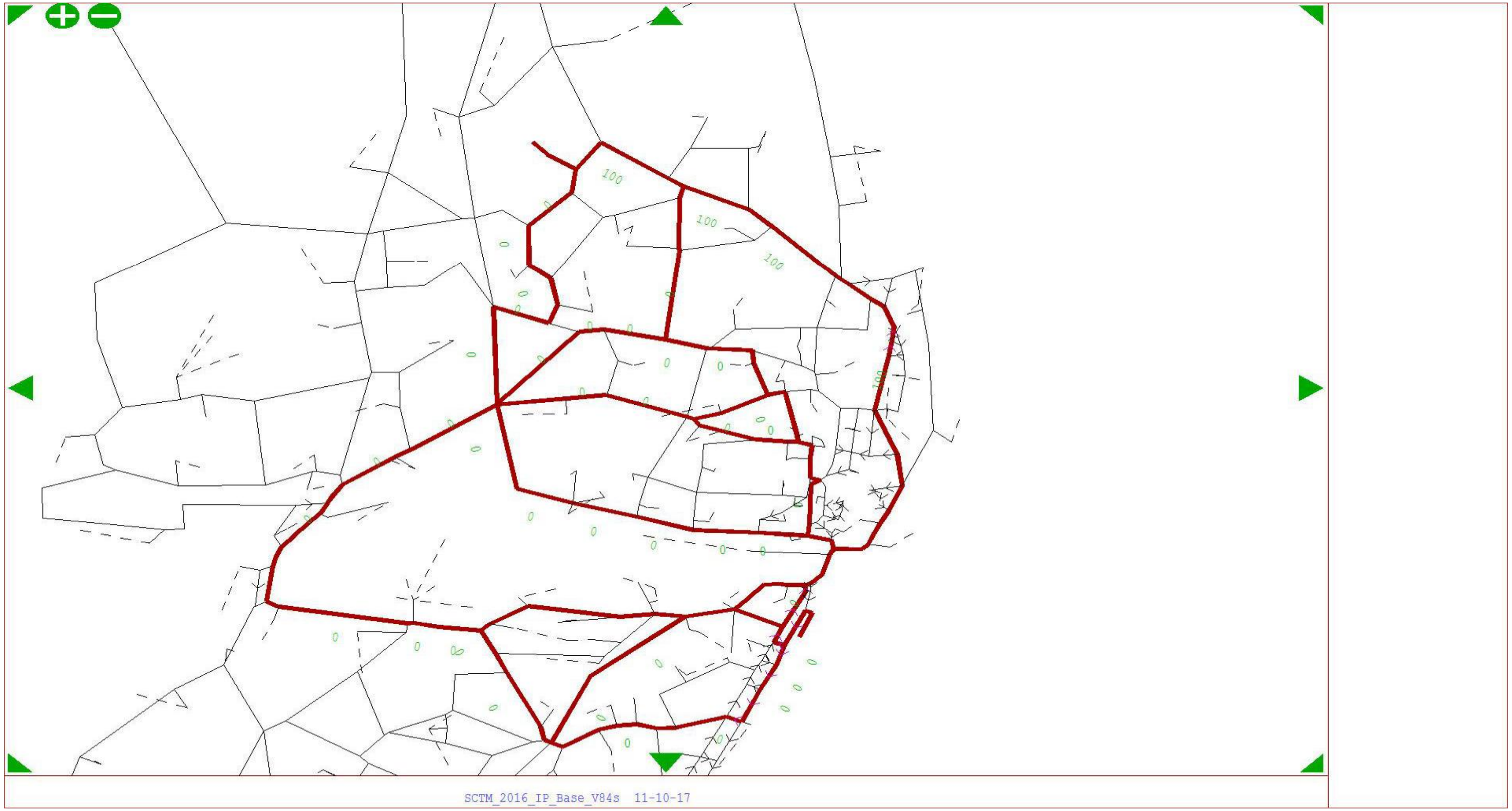


SCTM_2016_IP_Base_V84s 11-10-17

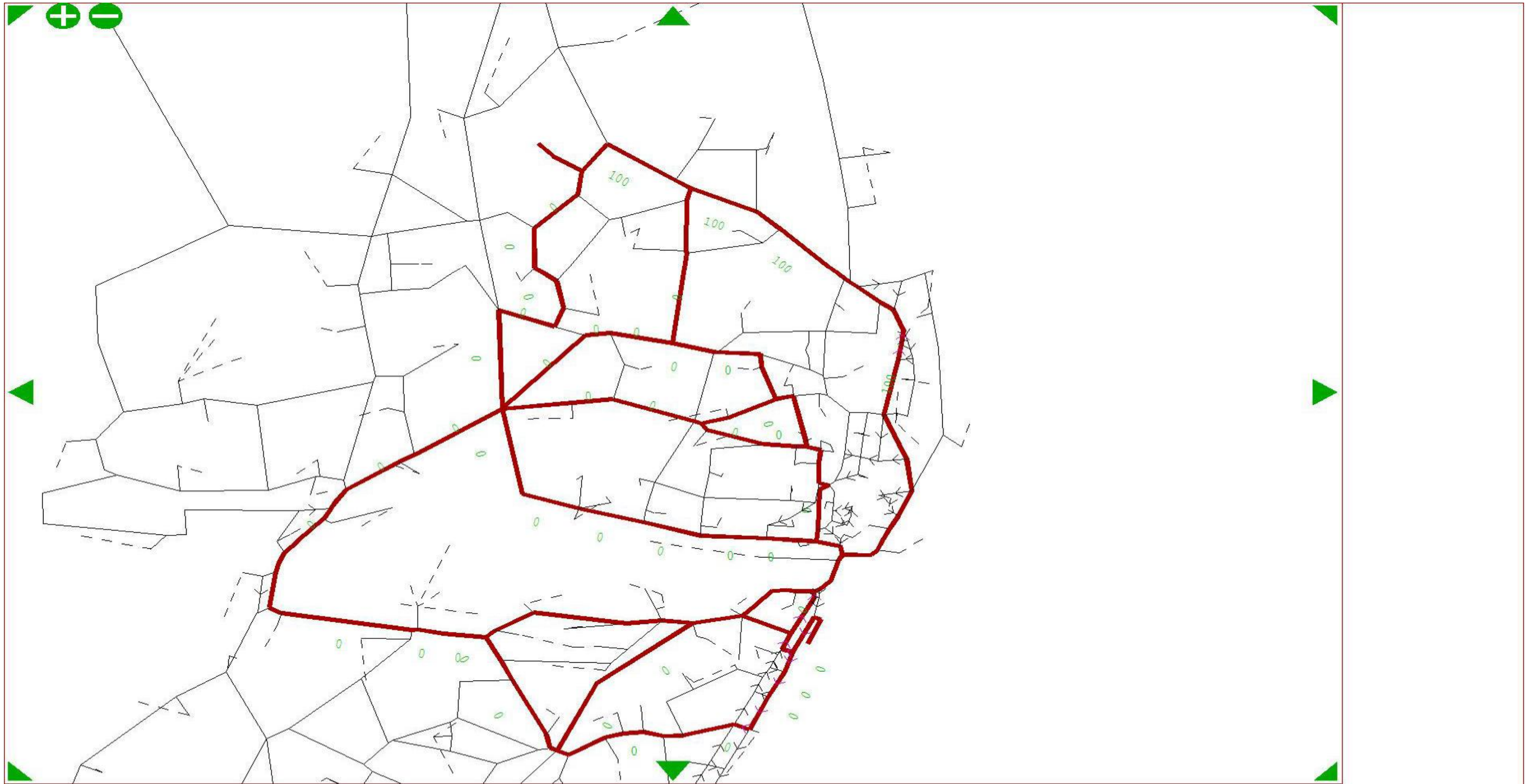
From Zone 416 To Zone 588 - User Class 10



From Zone 588 To Zone 416 - User Class 6

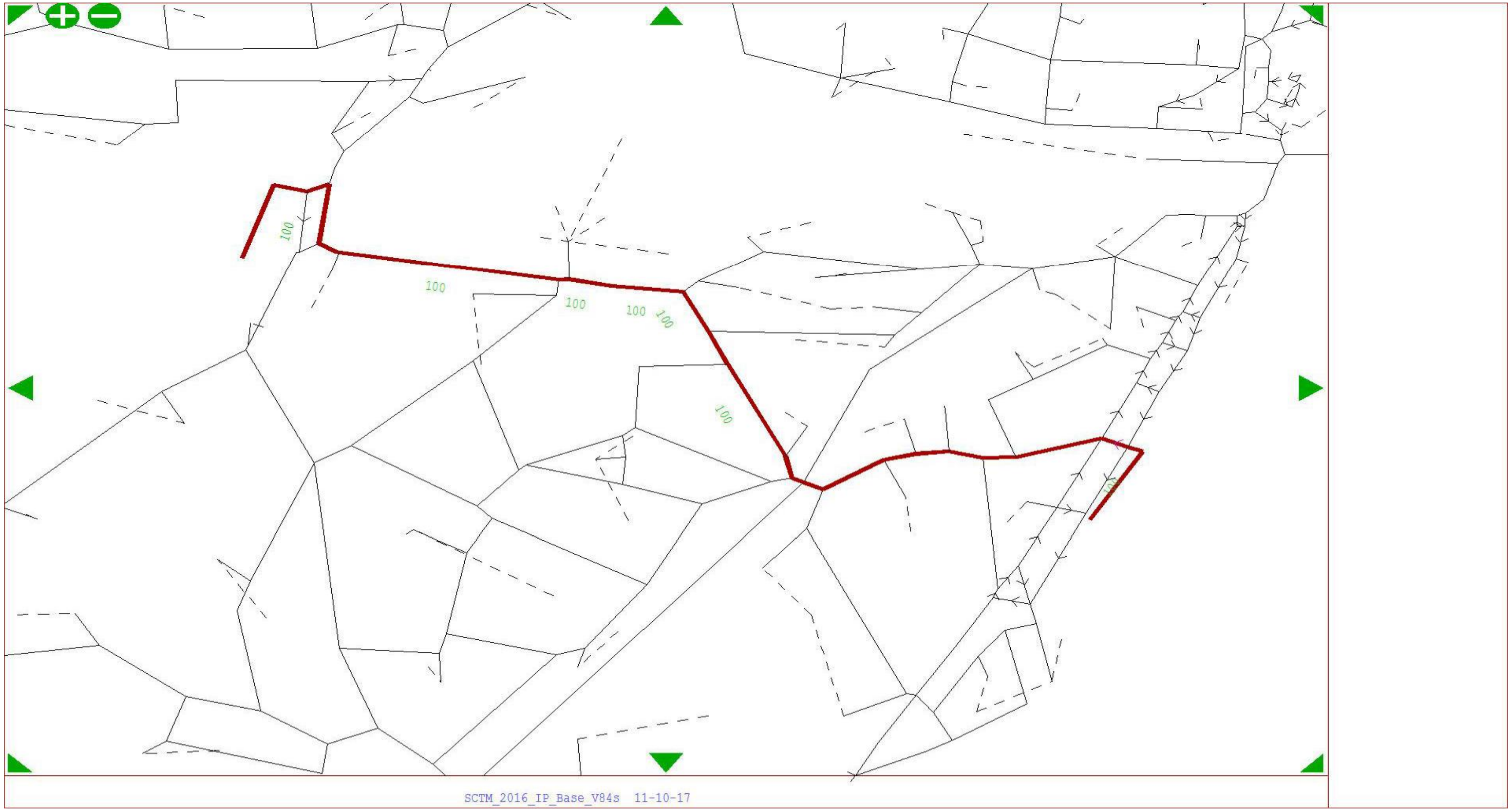


From Zone 588 To Zone 416 - User Class 10

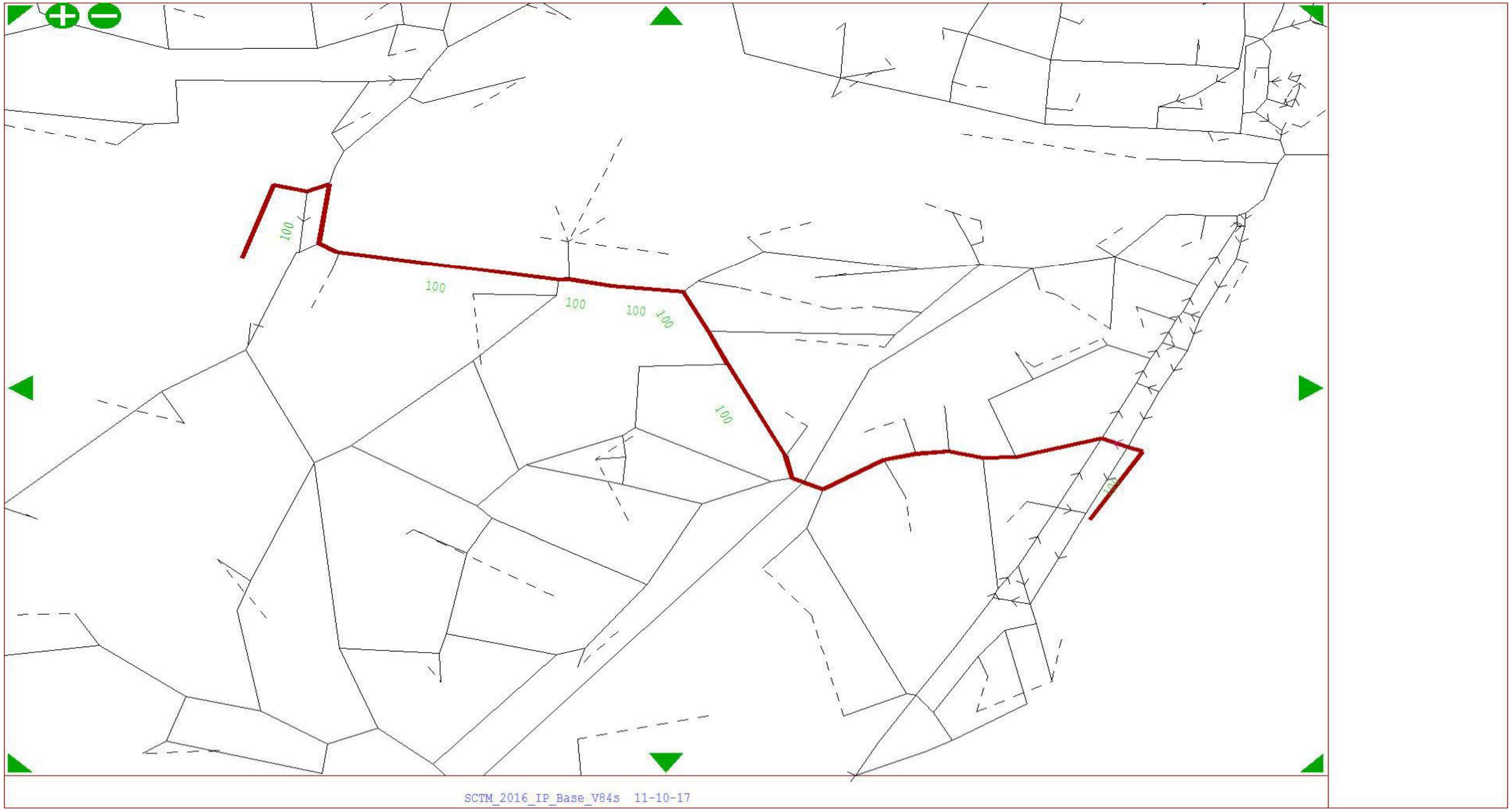


SCTM_2016_IP_Base_V84s 11-10-17

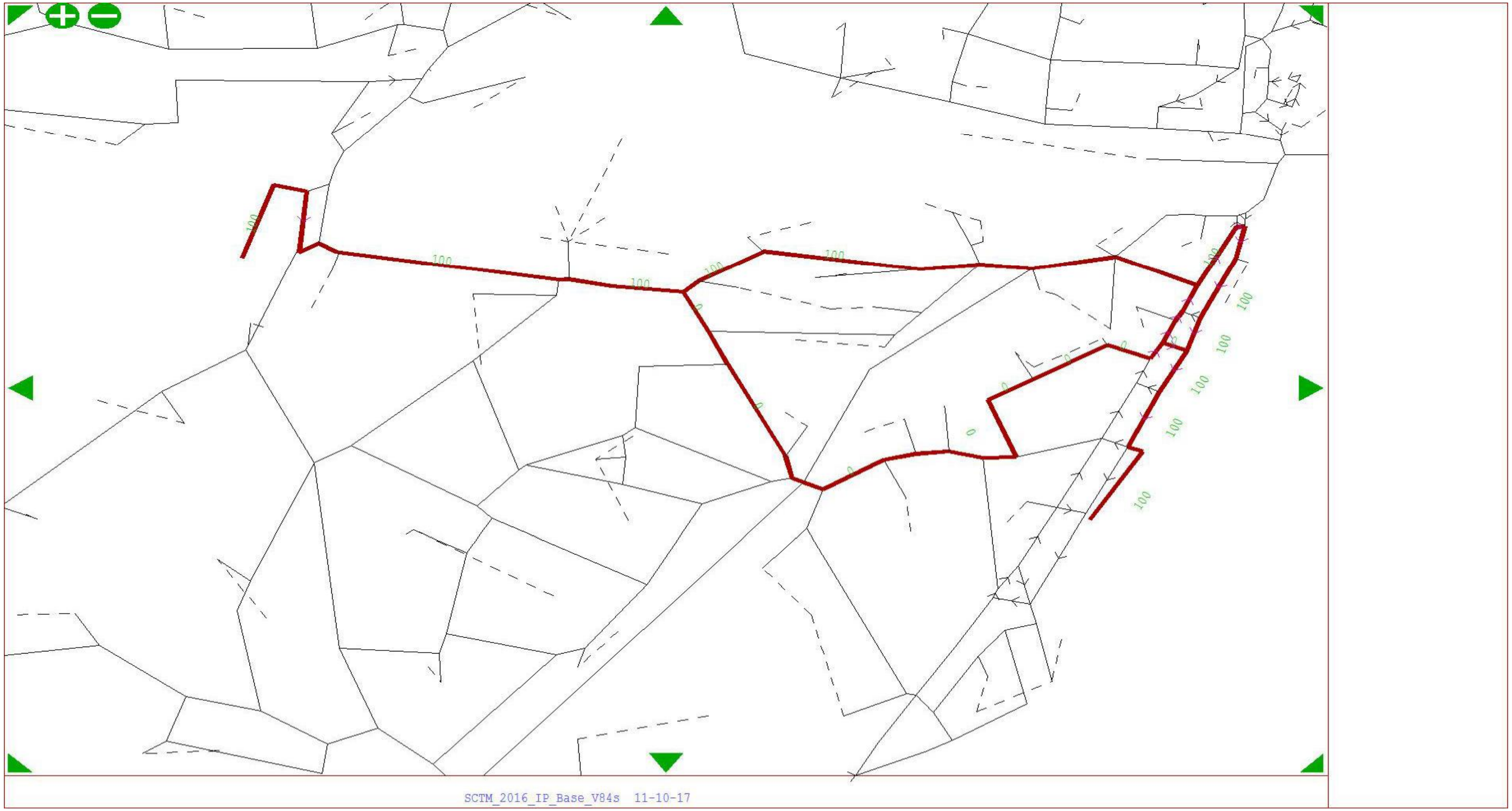
From Zone 593 To Zone 598 - User Class 6



From Zone 593 To Zone 598 - User Class 10

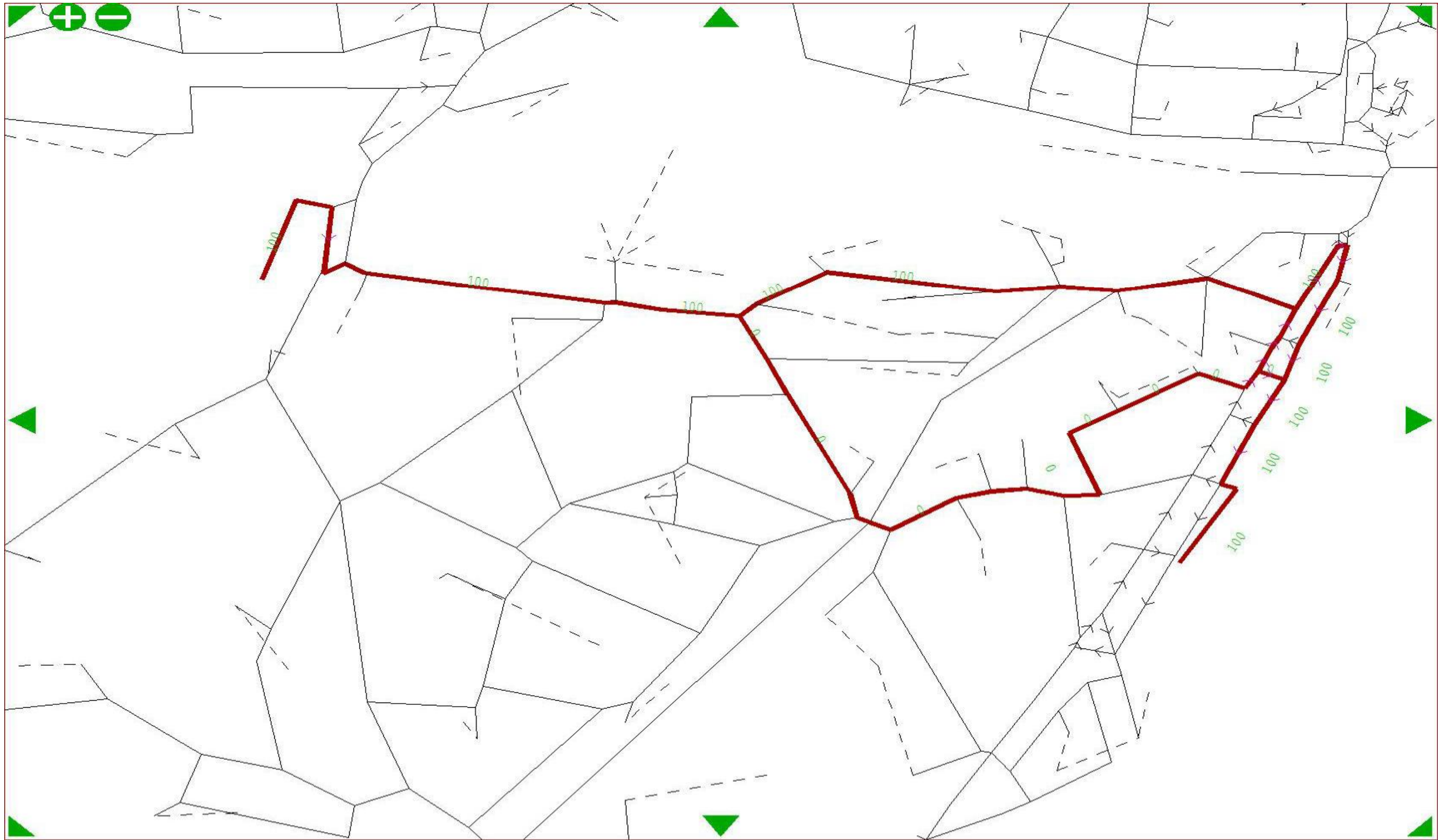


From Zone 598 To Zone 593 - User Class 6



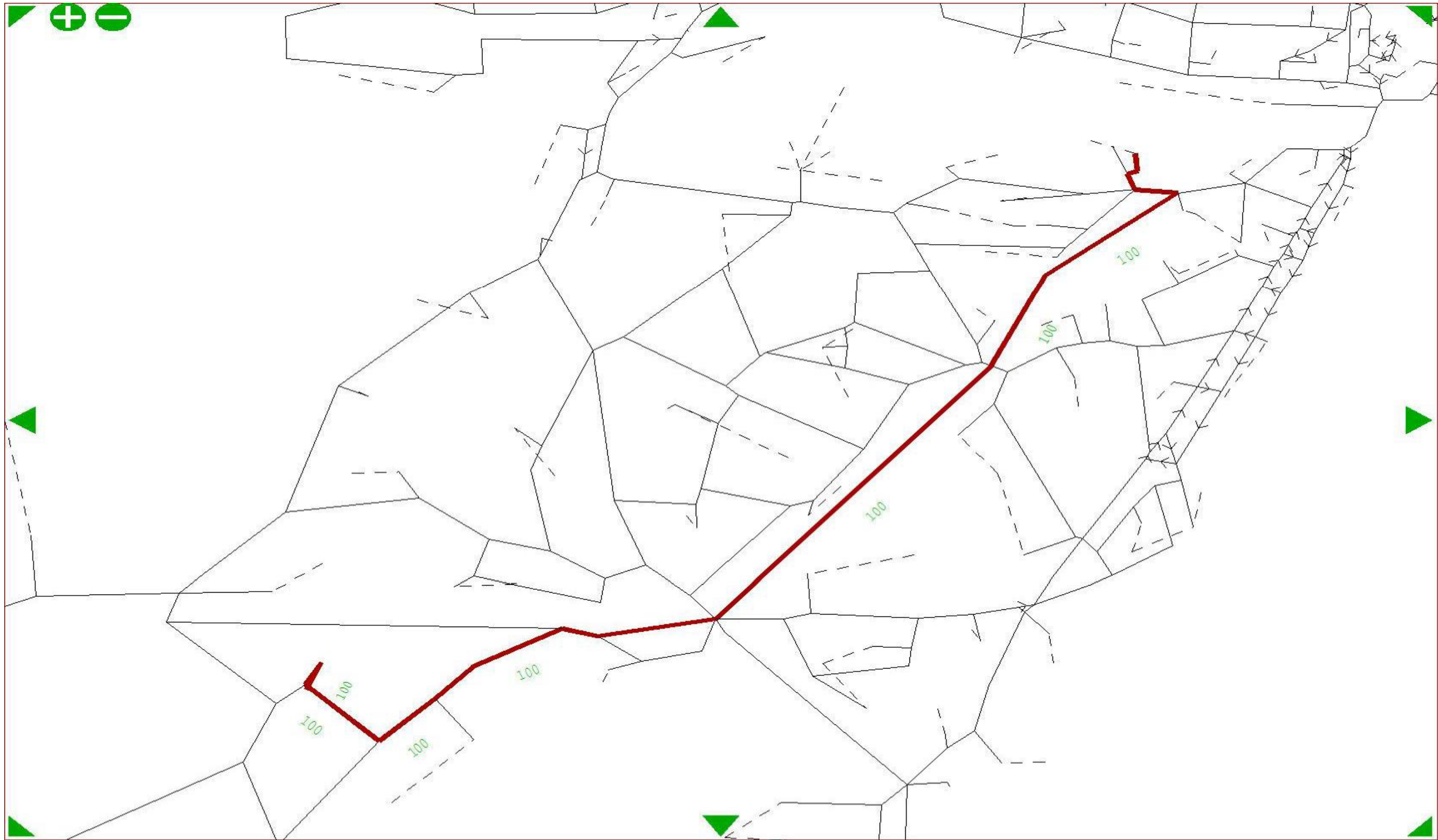
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 598 To Zone 593 - User Class 10



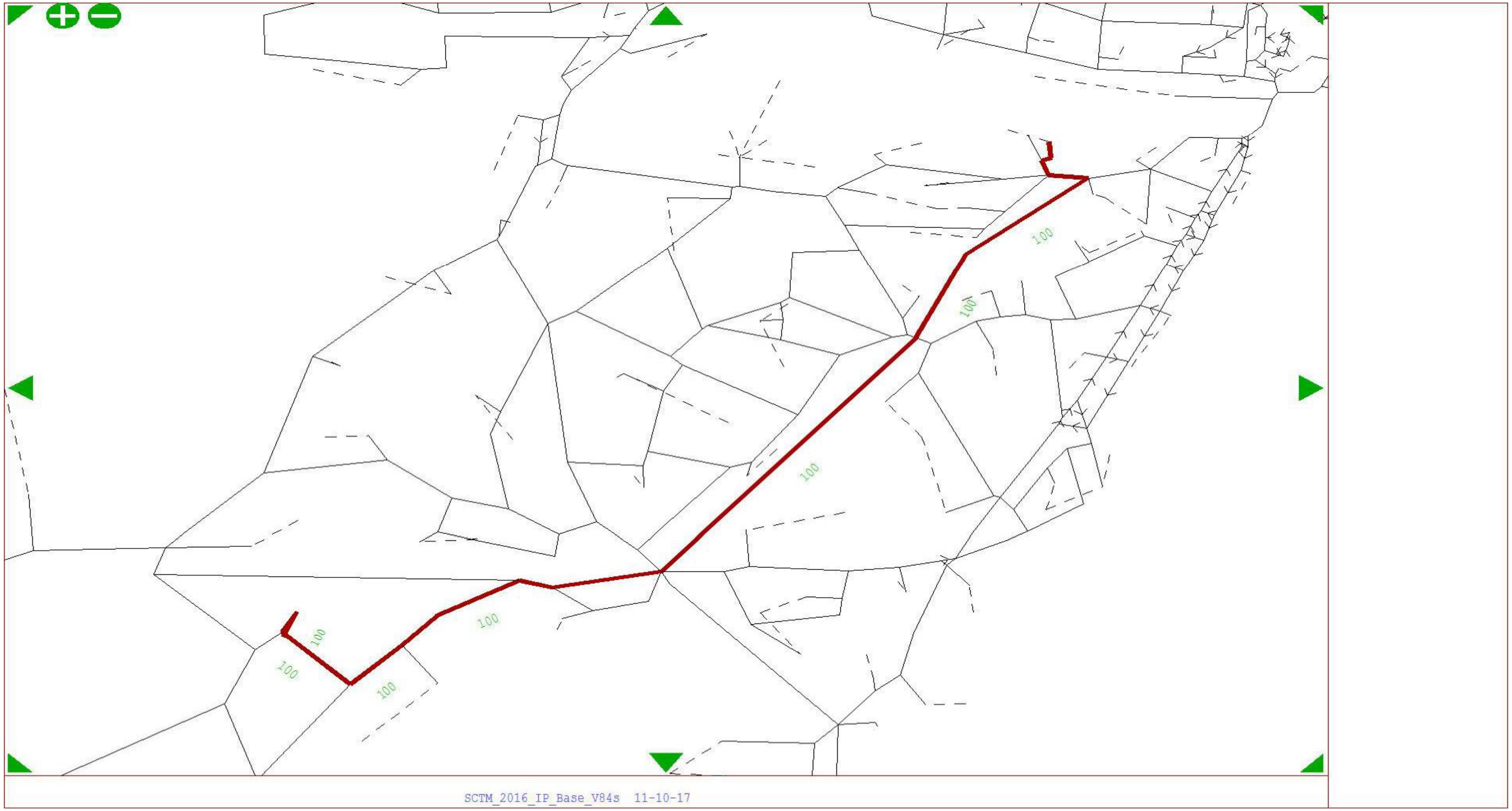
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 773 To Zone 782 - User Class 6

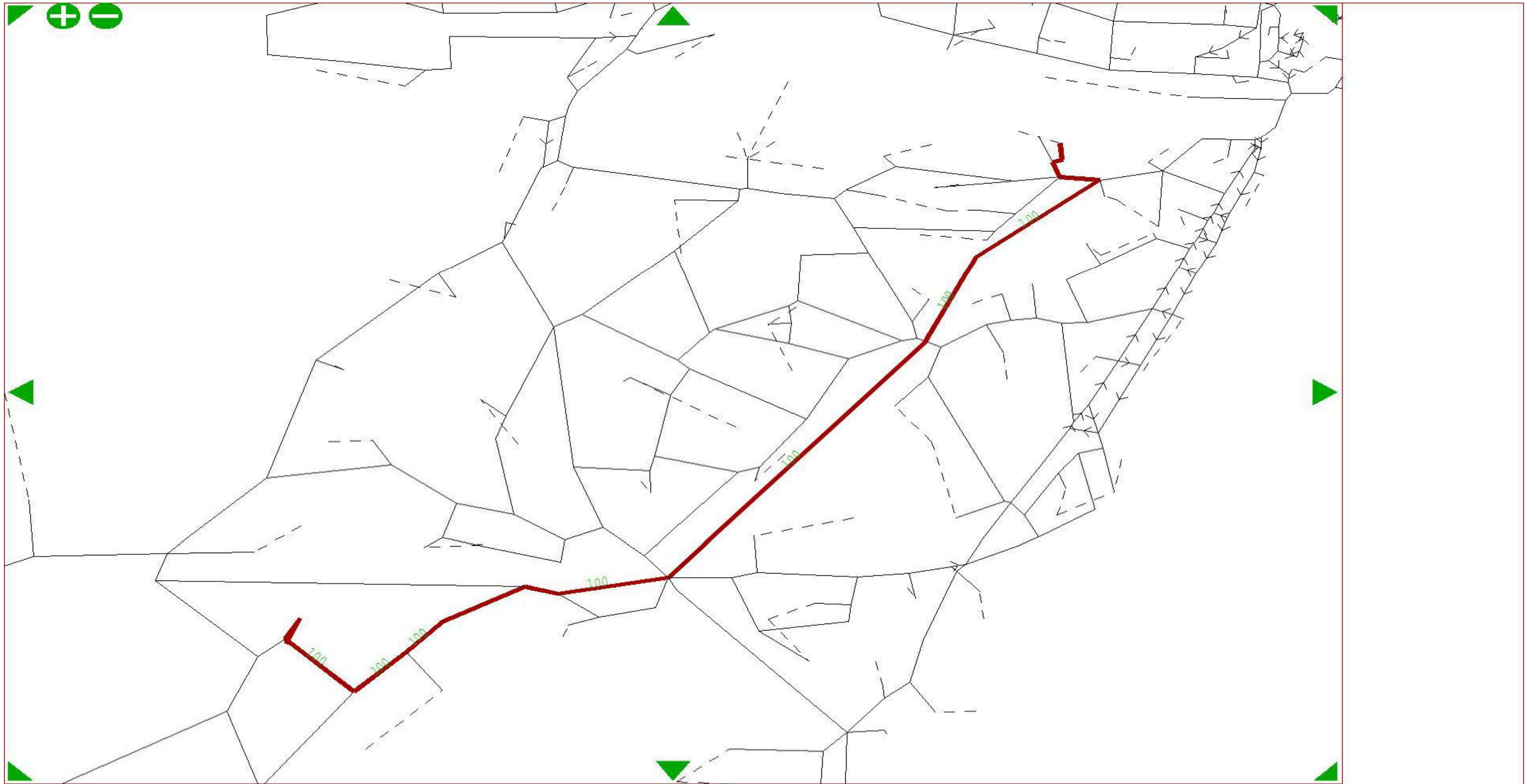


SCTM_2016_IP_Base_V84s 11-10-17

From Zone 773 To Zone 782 - User Class 10

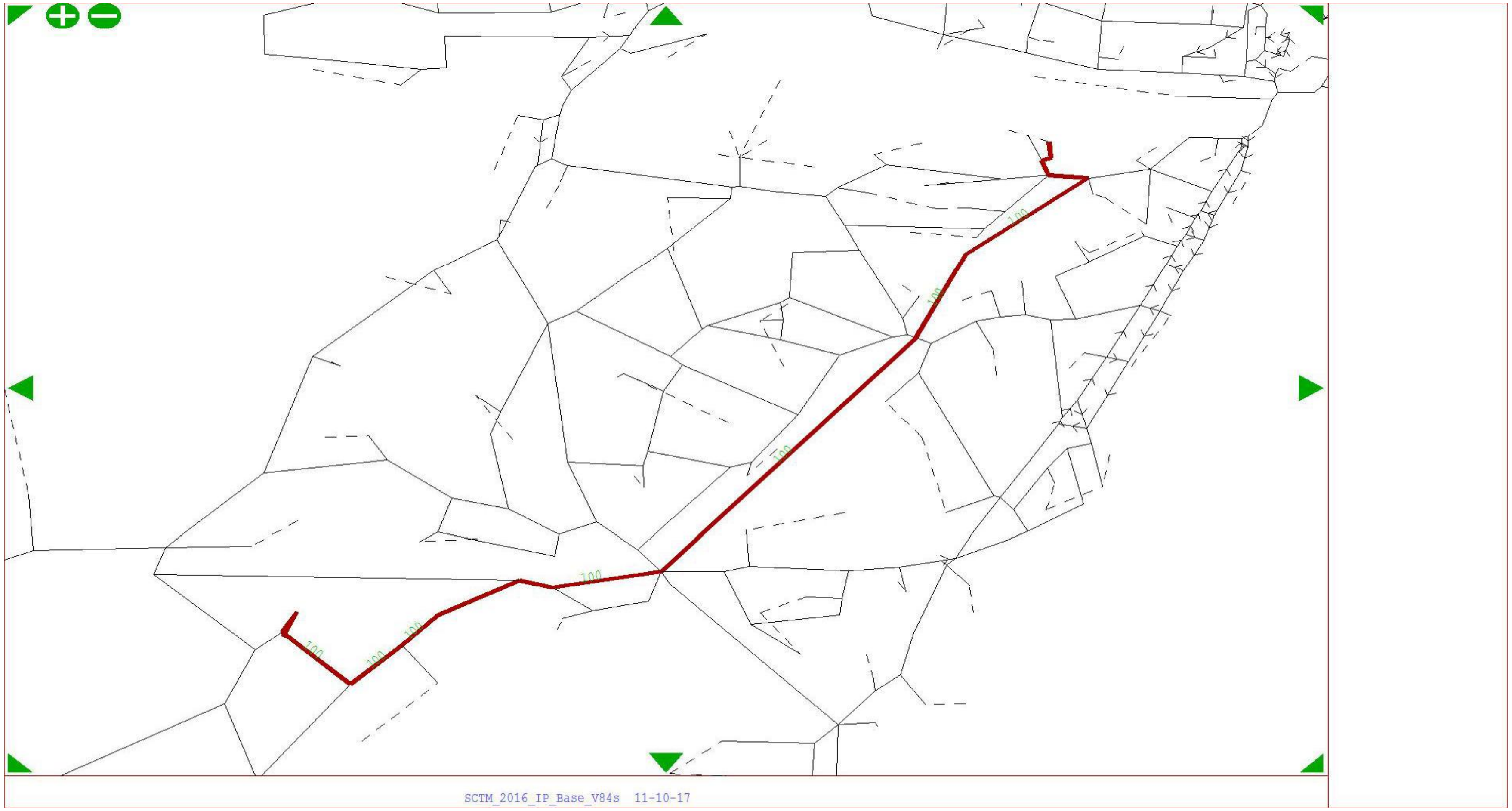


From Zone 782 To Zone 773 - User Class 6

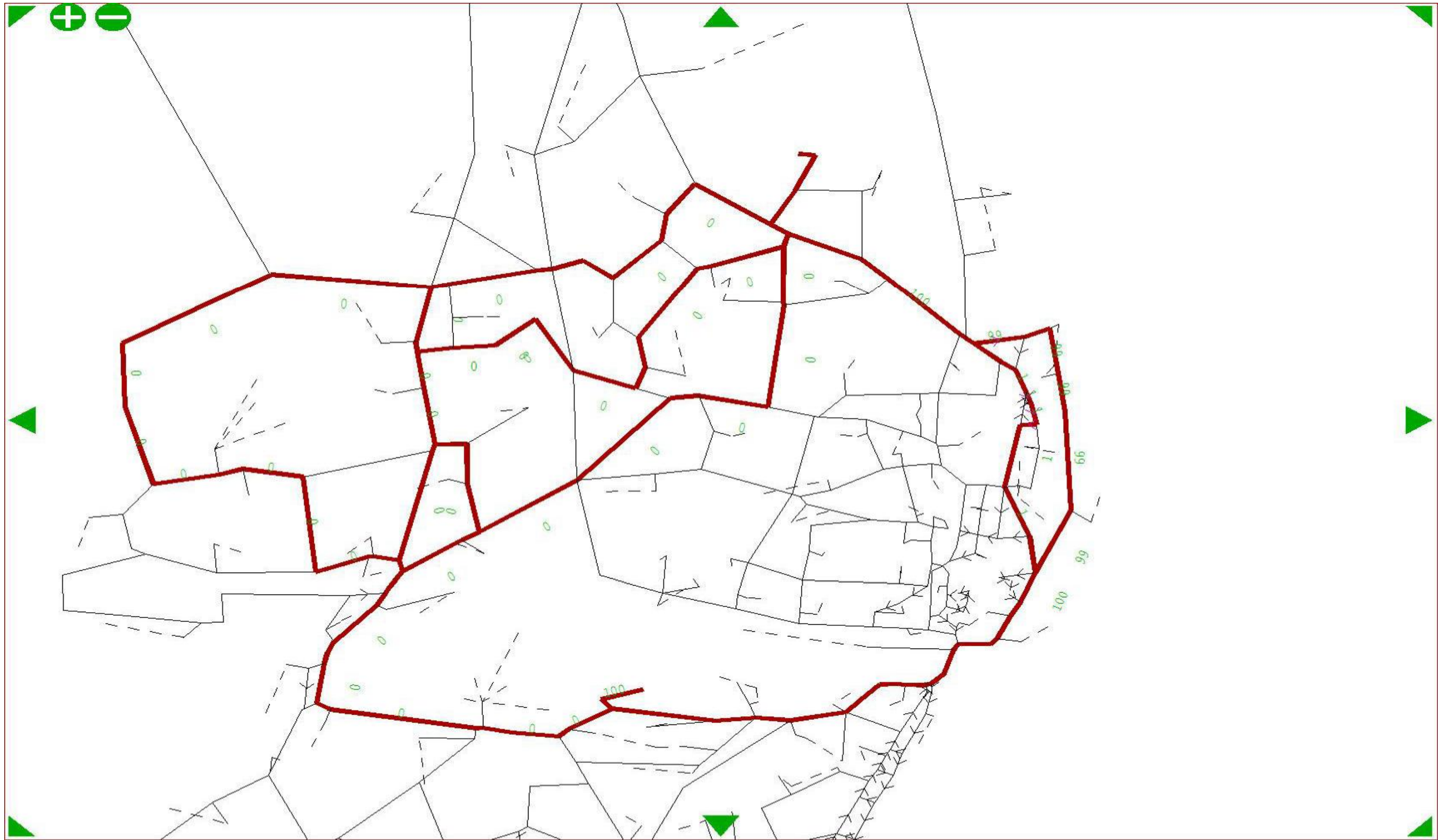


SCTM_2016_IP_Base_V84s 11-10-17

From Zone 782 To Zone 773 - User Class 10

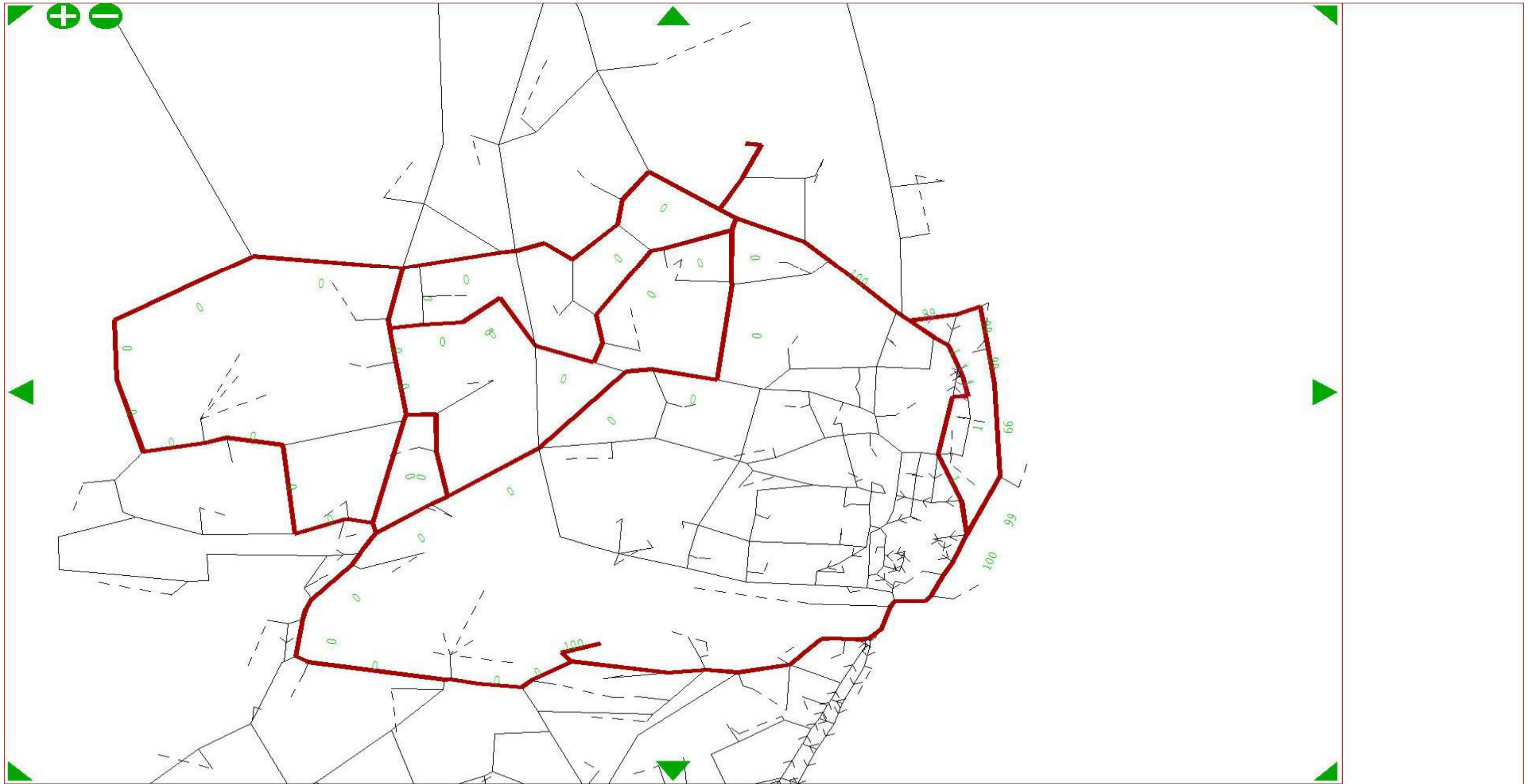


From Zone 409 To Zone 589 - User Class 6



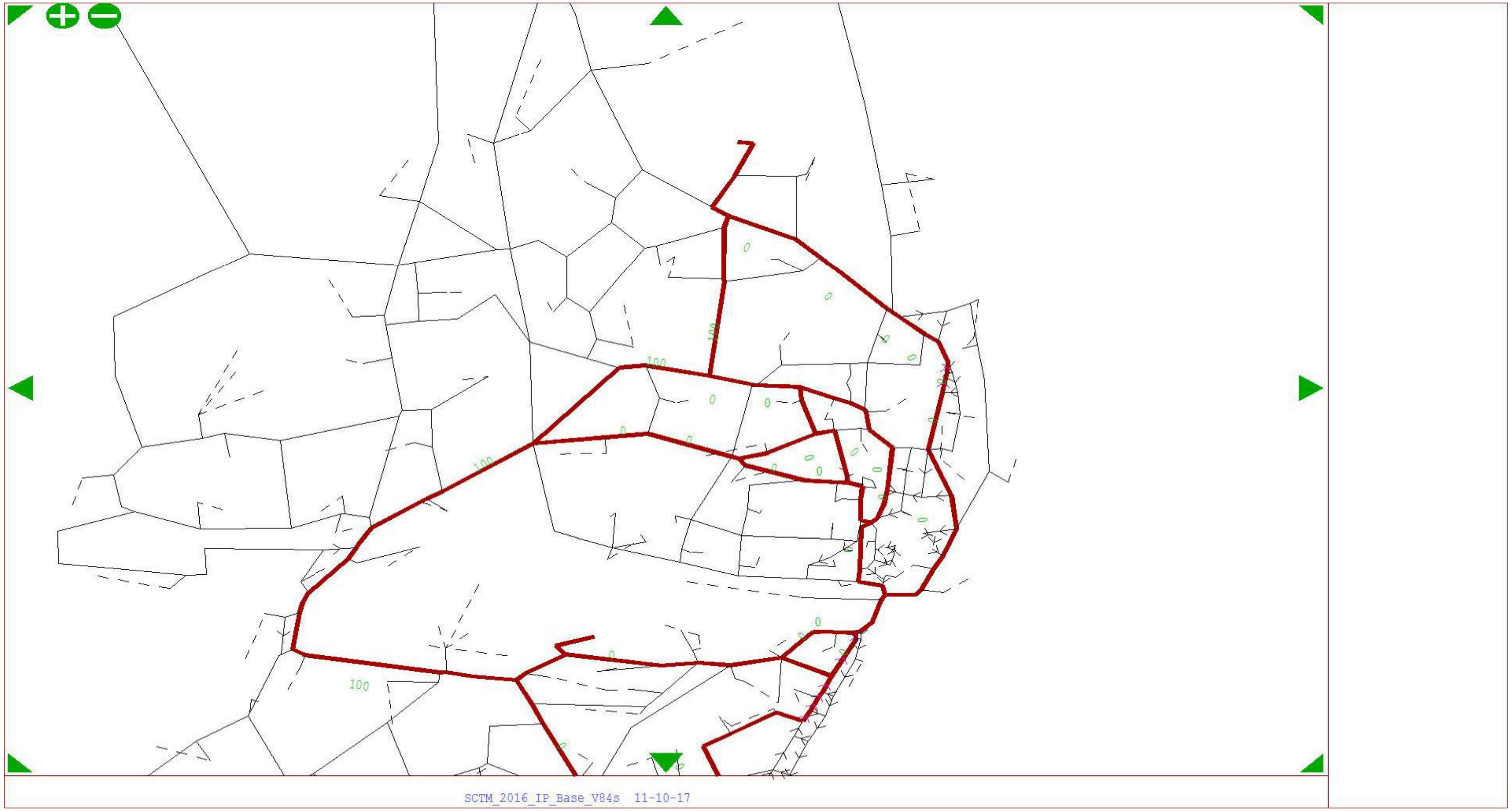
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 409 To Zone 589 - User Class 10

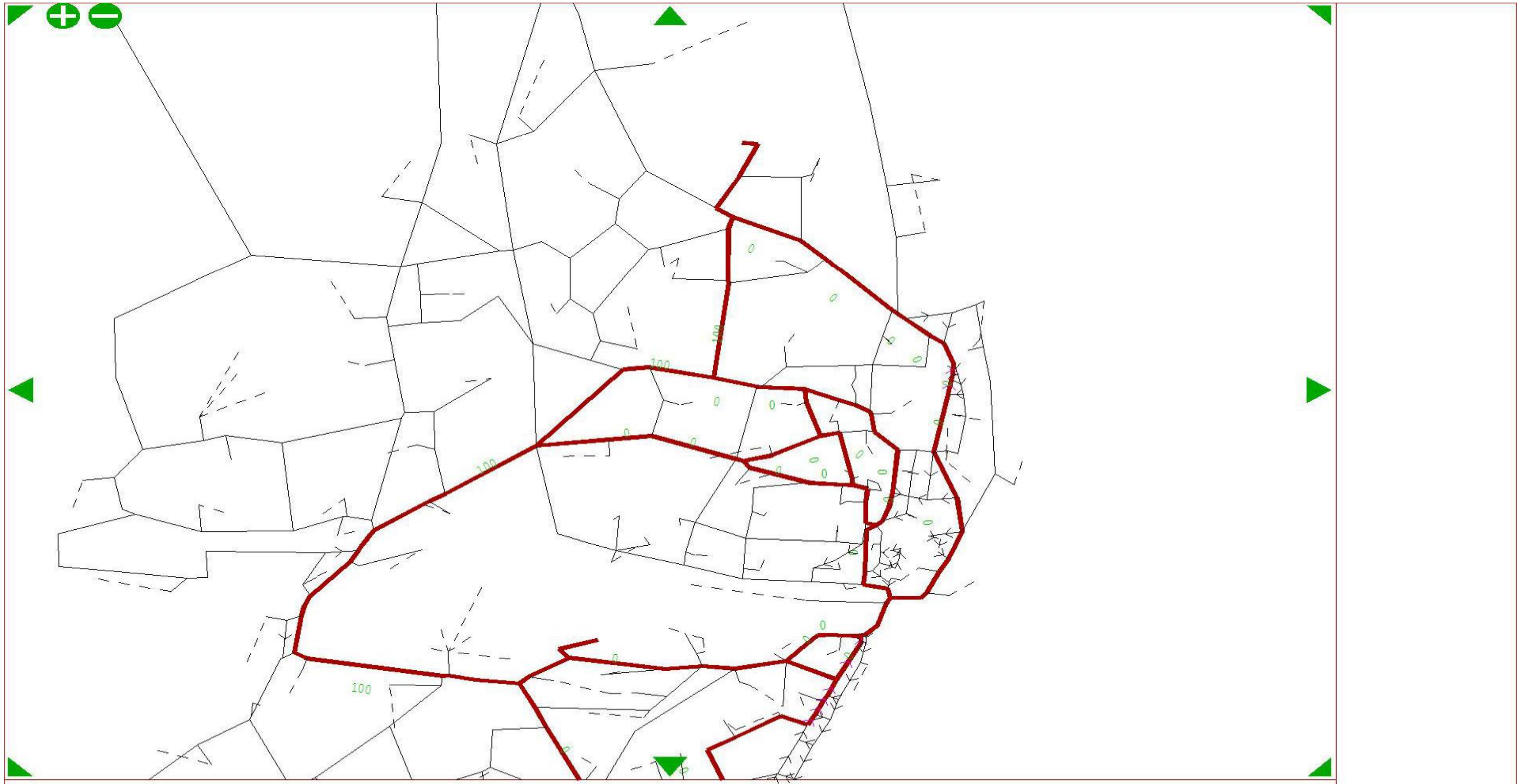


SCTM_2016_IP_Base_V84s 11-10-17

From Zone 589 To Zone 409 - User Class 6

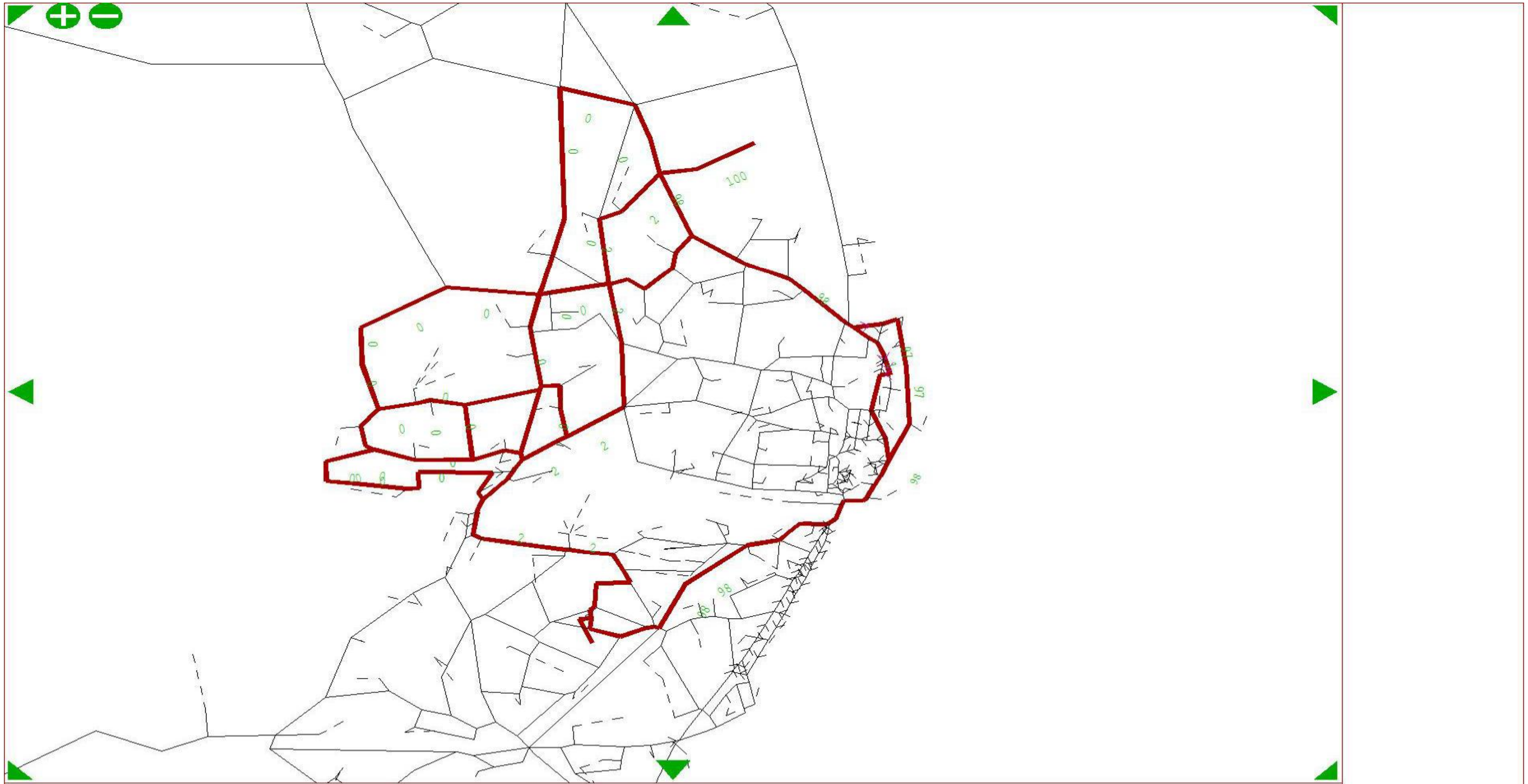


From Zone 589 To Zone 409 - User Class 10



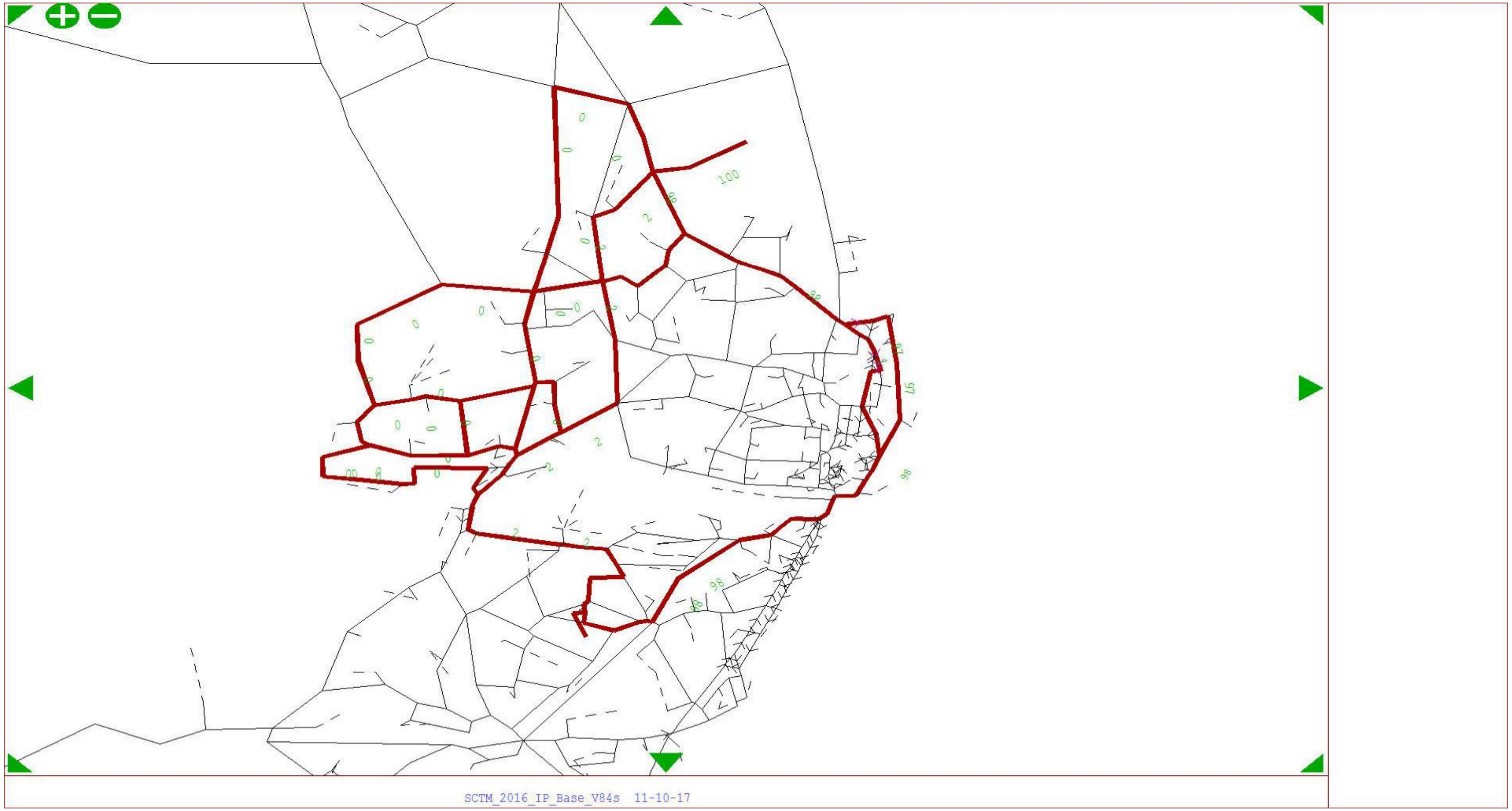
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 587 To Zone 779 - User Class 6

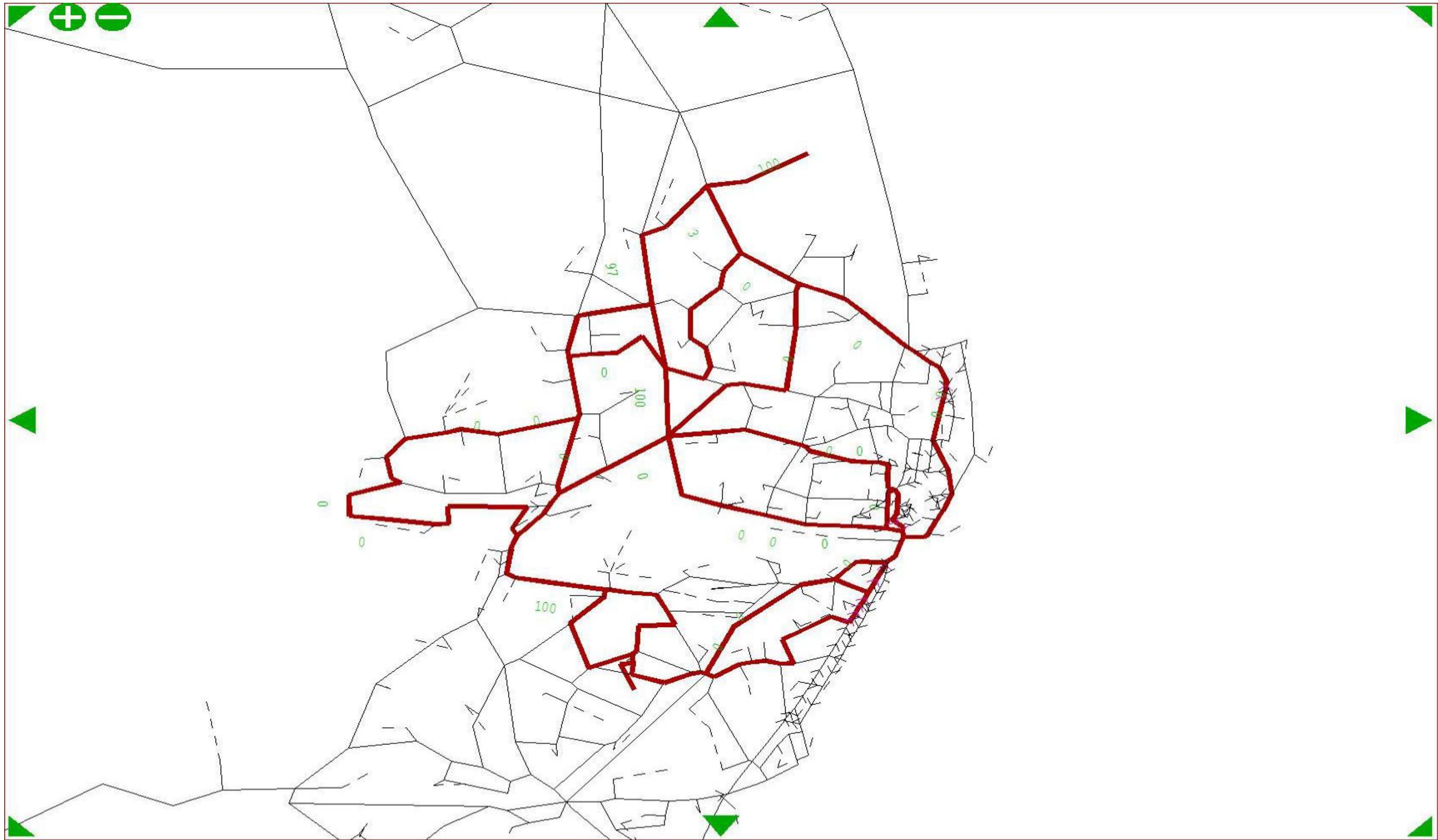


SCTM_2016_IP_Base_V84s 11-10-17

From Zone 587 To Zone 779 - User Class 10

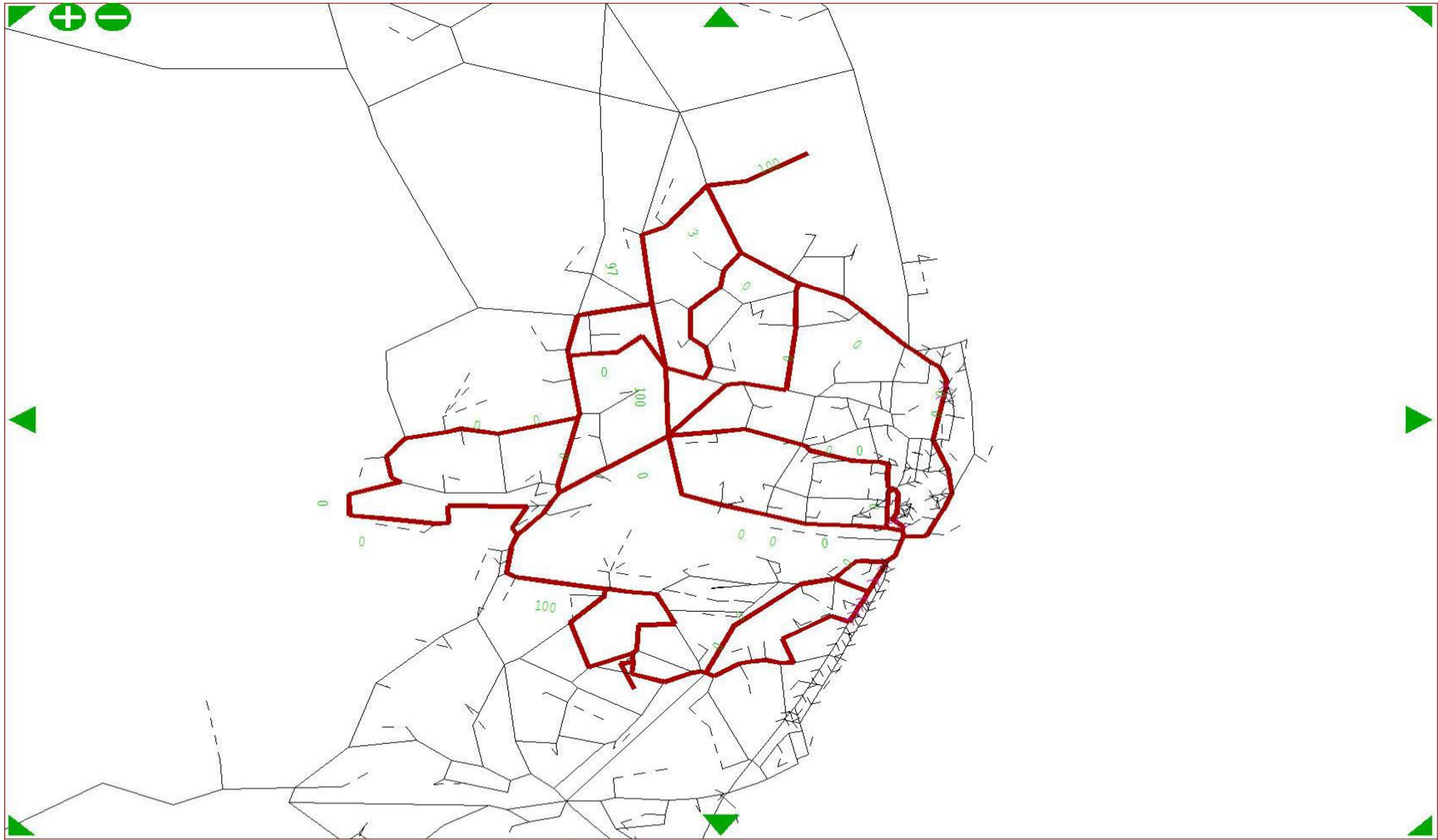


From Zone 779 To Zone 587 - User Class 6



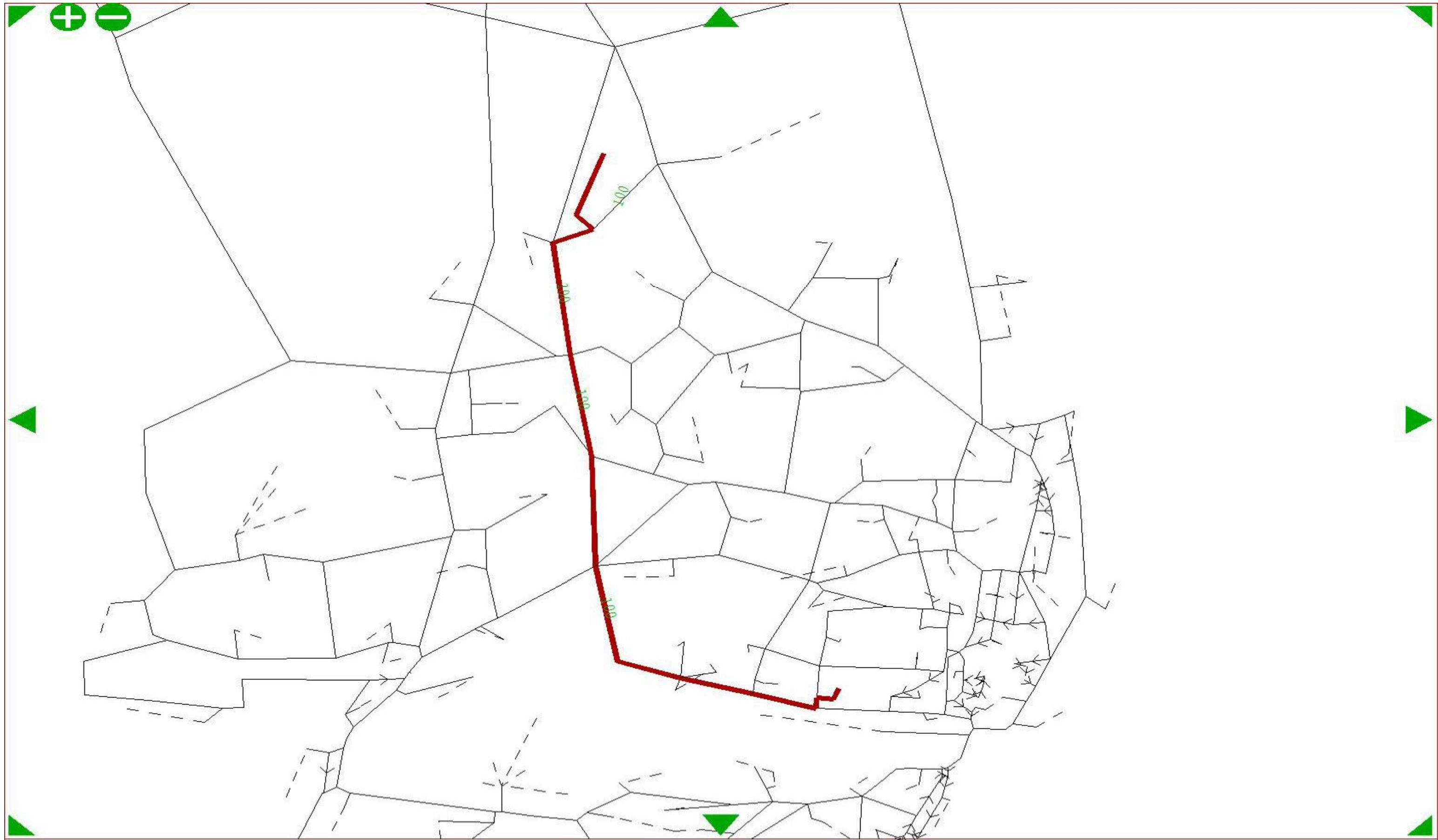
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 779 To Zone 587 - User Class 10



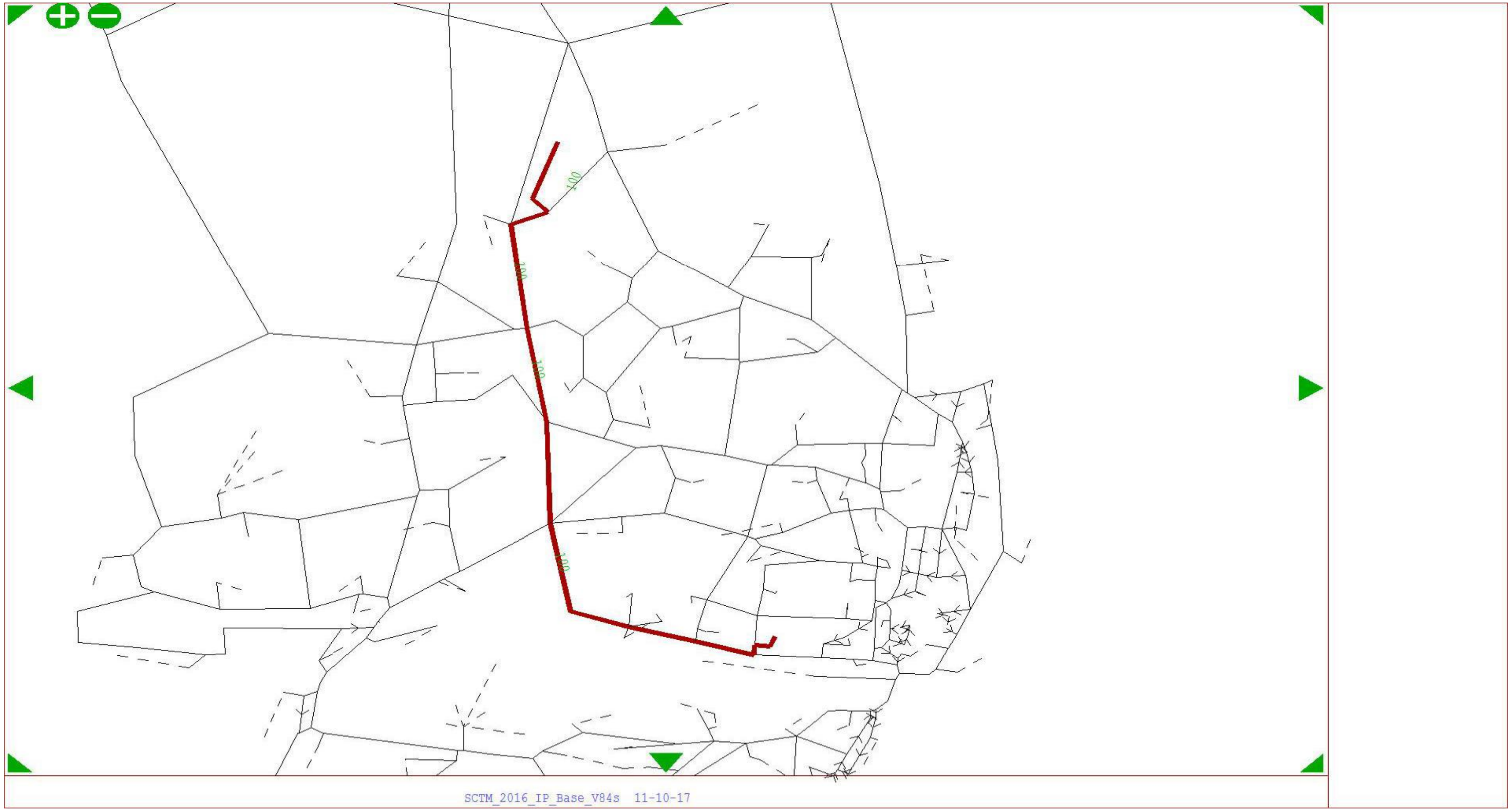
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 766 To Zone 427 - User Class 6

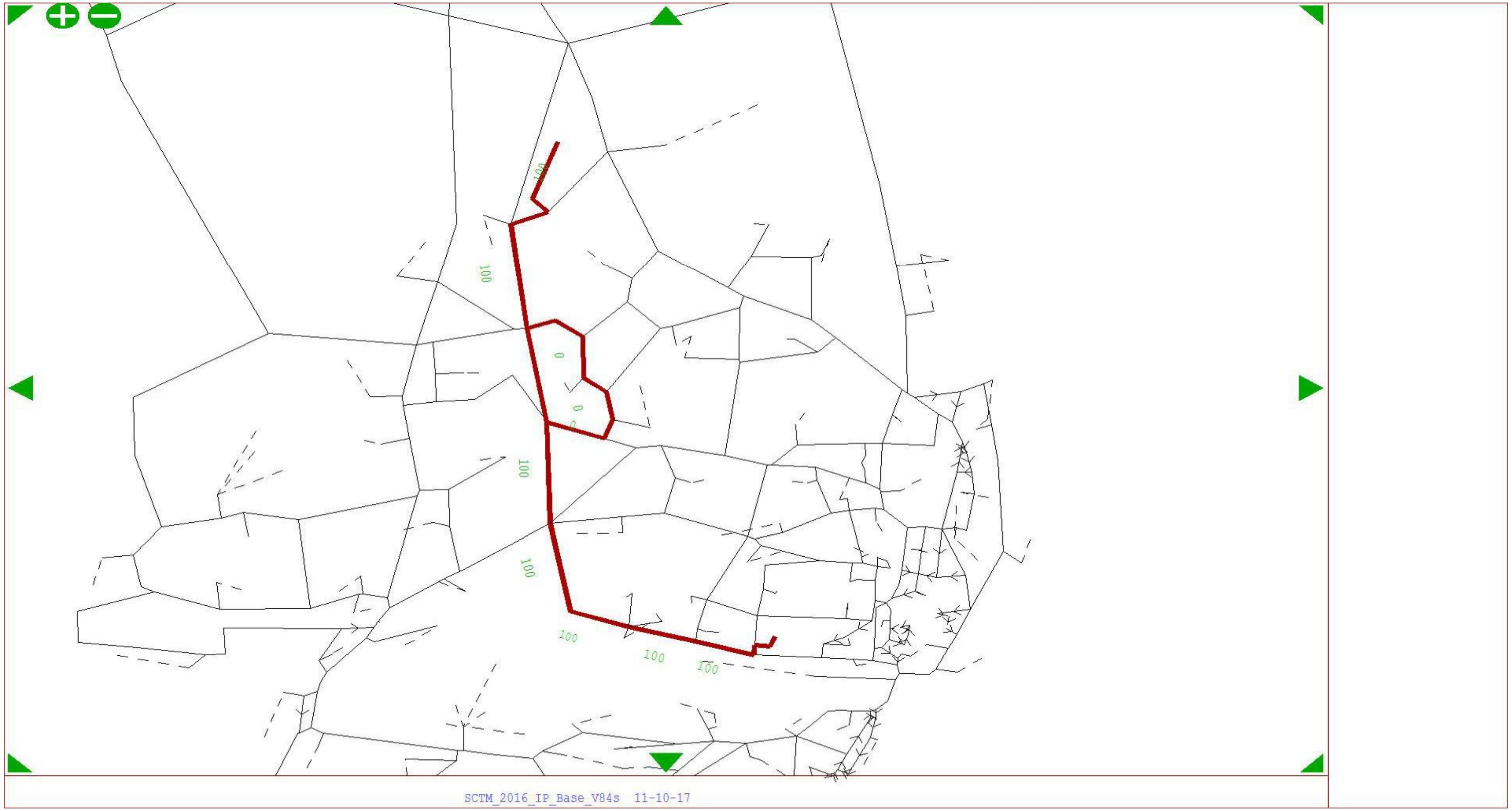


SCTM_2016_IP_Base_V84s 11-10-17

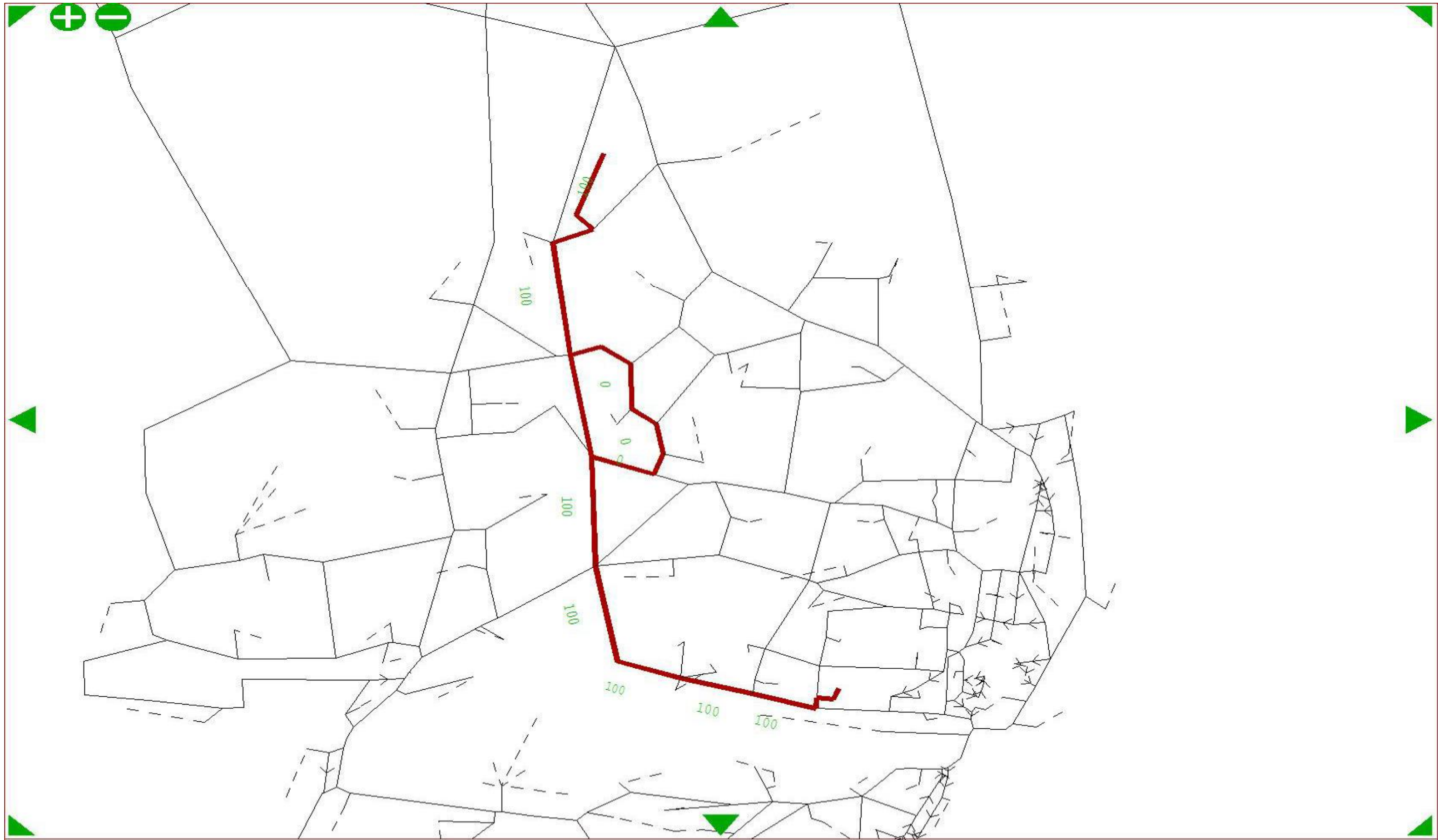
From Zone 766 To Zone 427 - User Class 10



From Zone 427 To Zone 766 - User Class 6

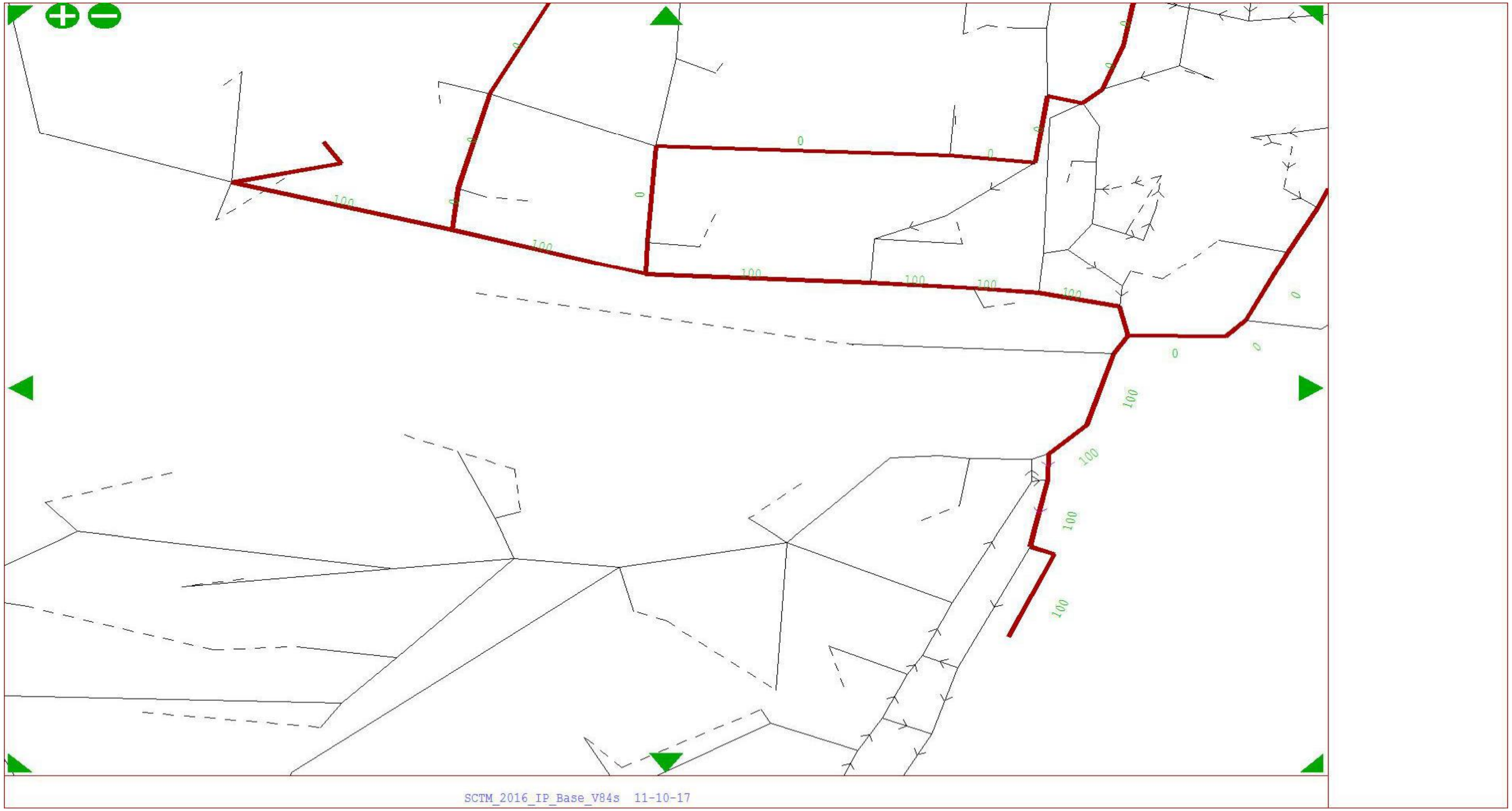


From Zone 427 To Zone 766 - User Class 10



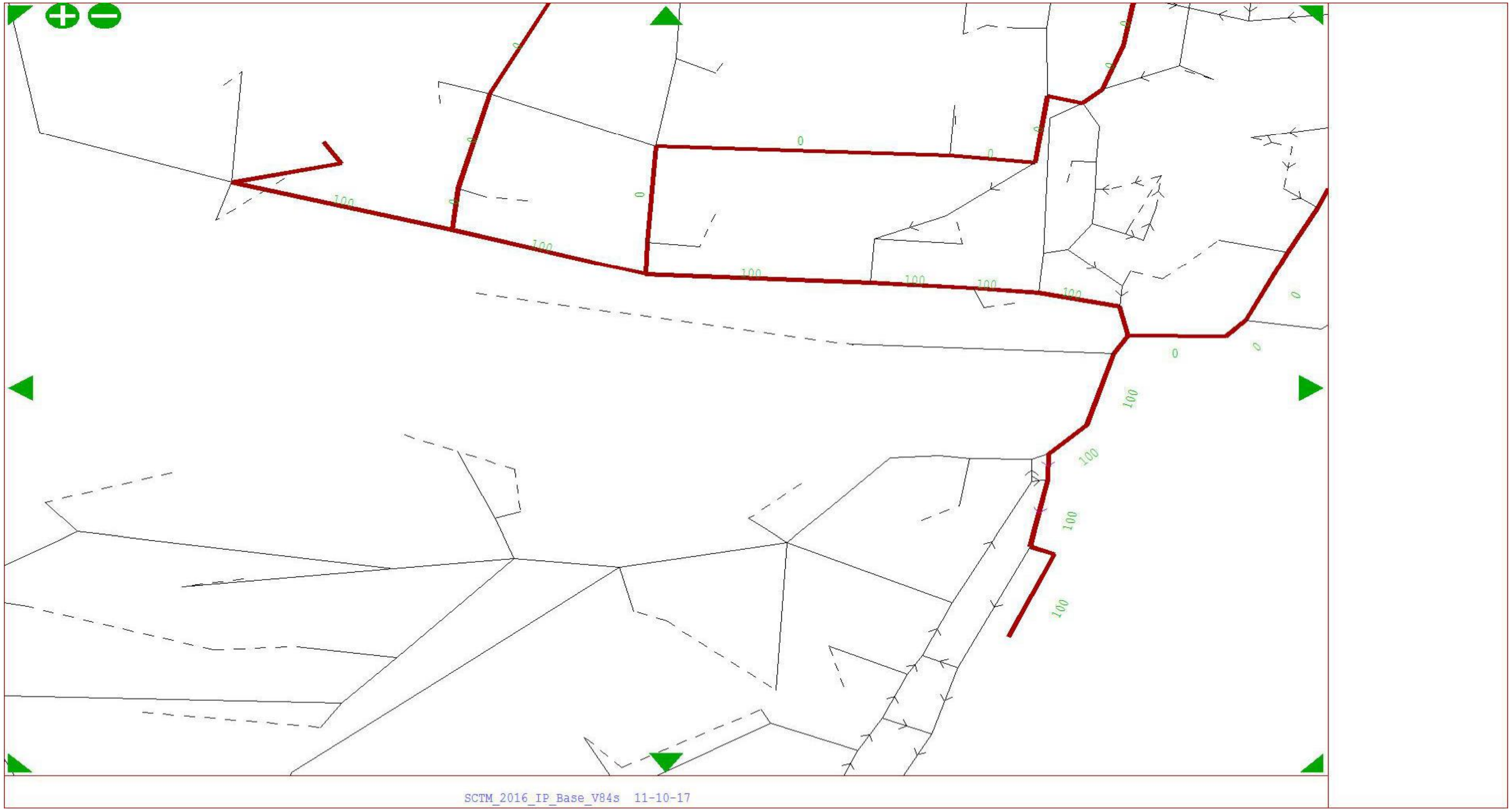
SCTM_2016_IP_Base_V84s 11-10-17

From Zone 819 To Zone 588 - User Class 6

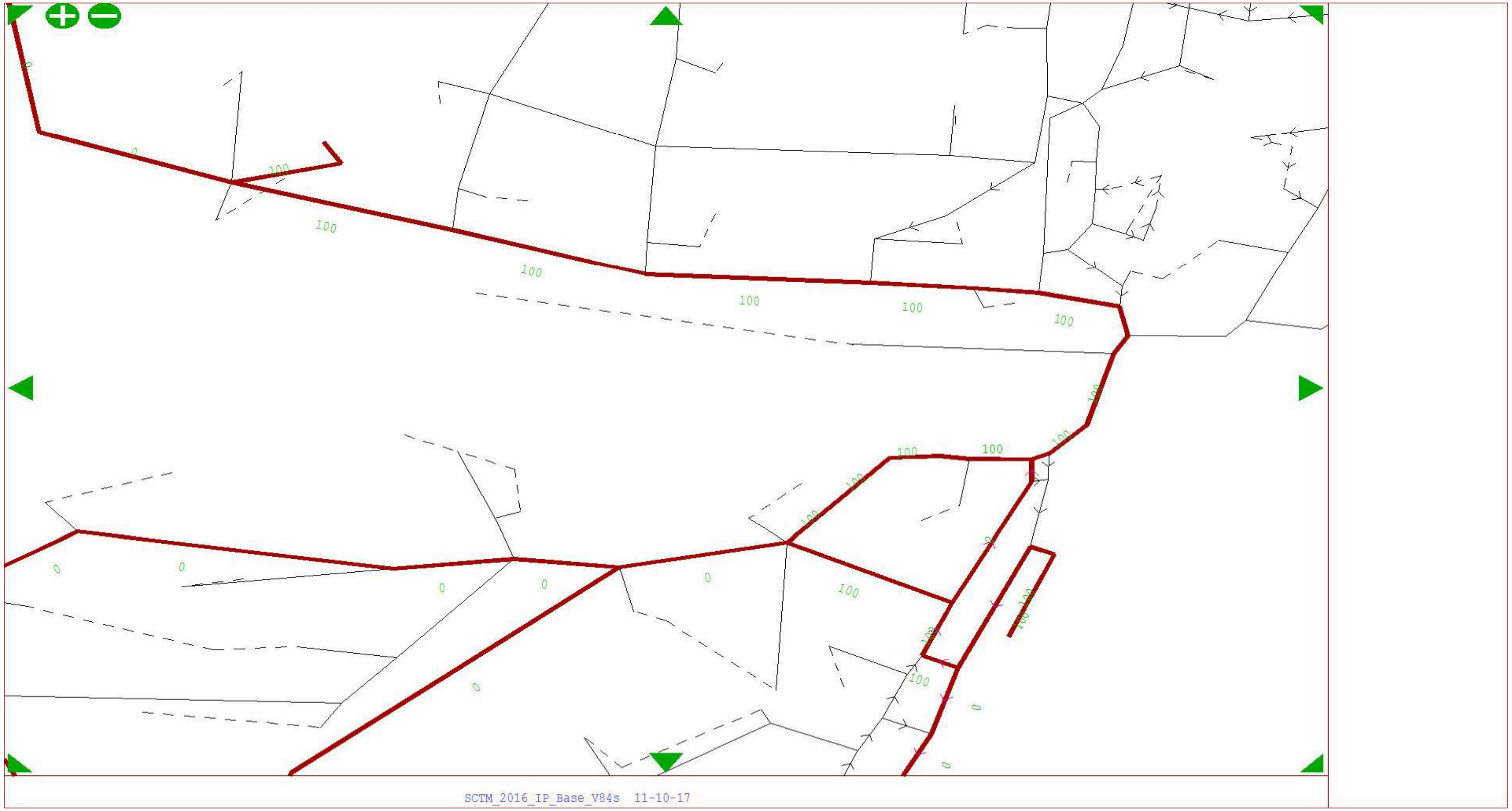


SCTM_2016_IP_Base_V84s 11-10-17

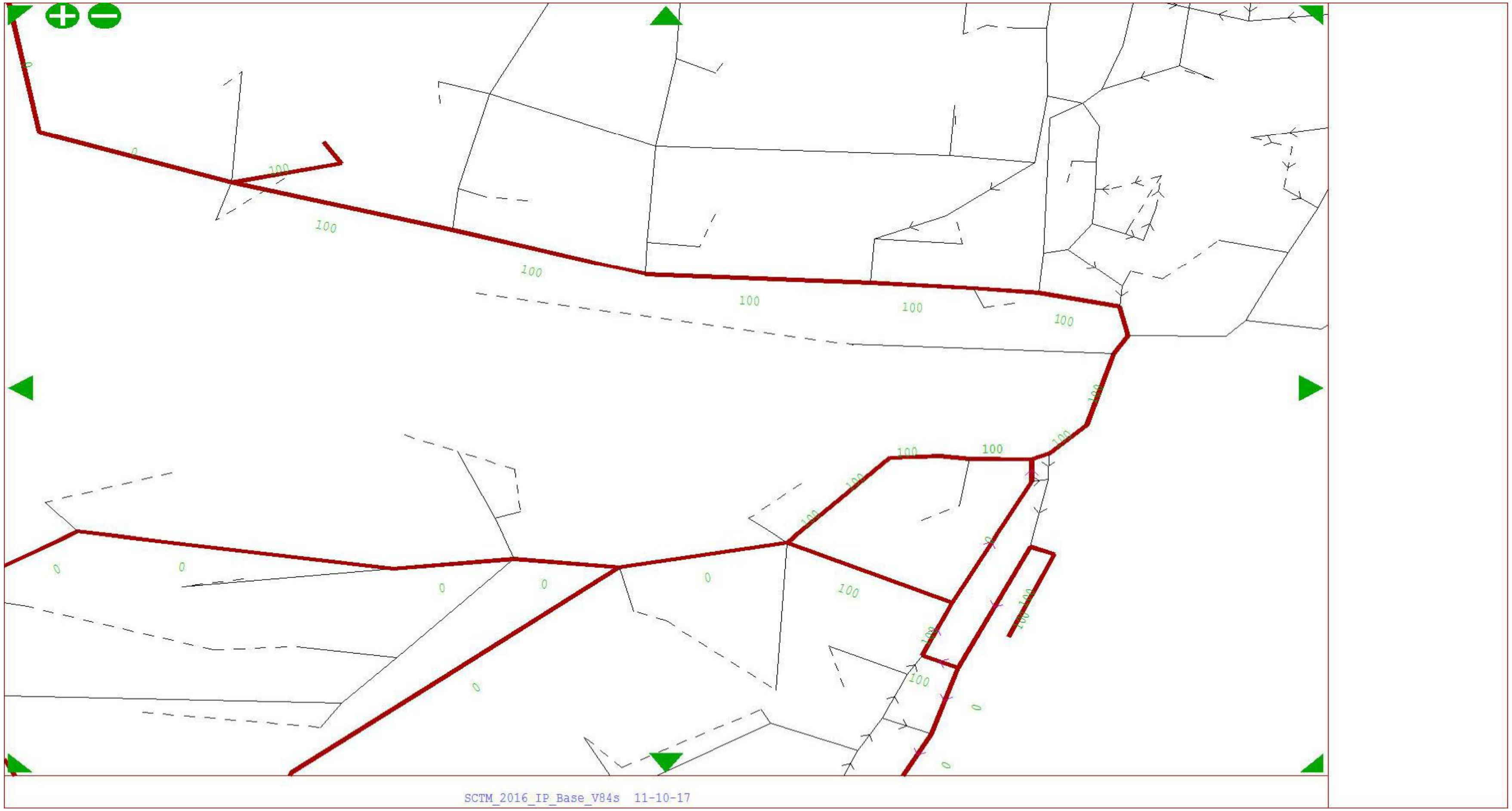
From Zone 819 To Zone 588 - User Class 10



From Zone 588 To Zone 819 - User Class 6



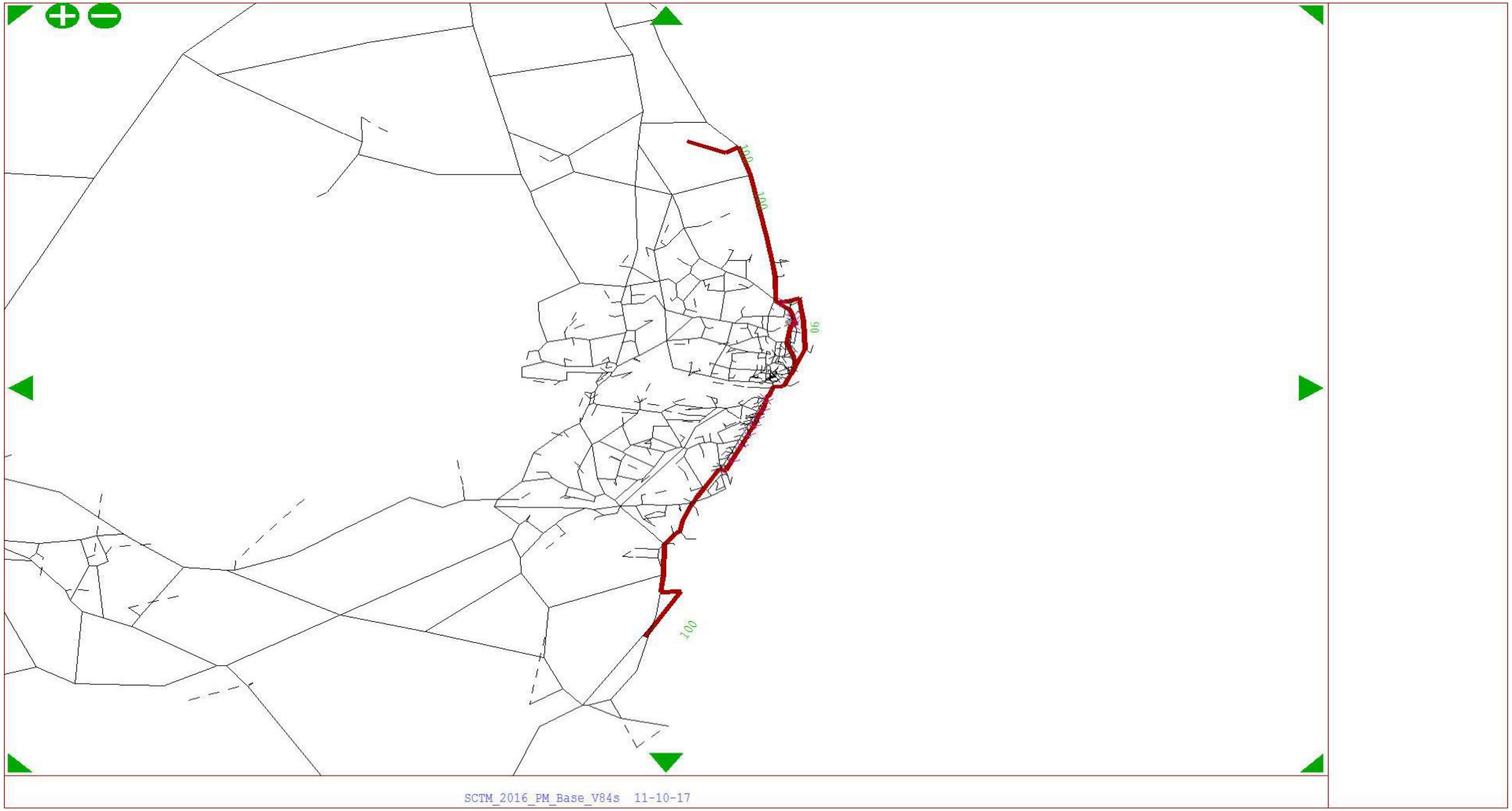
From Zone 588 To Zone 819 - User Class 10



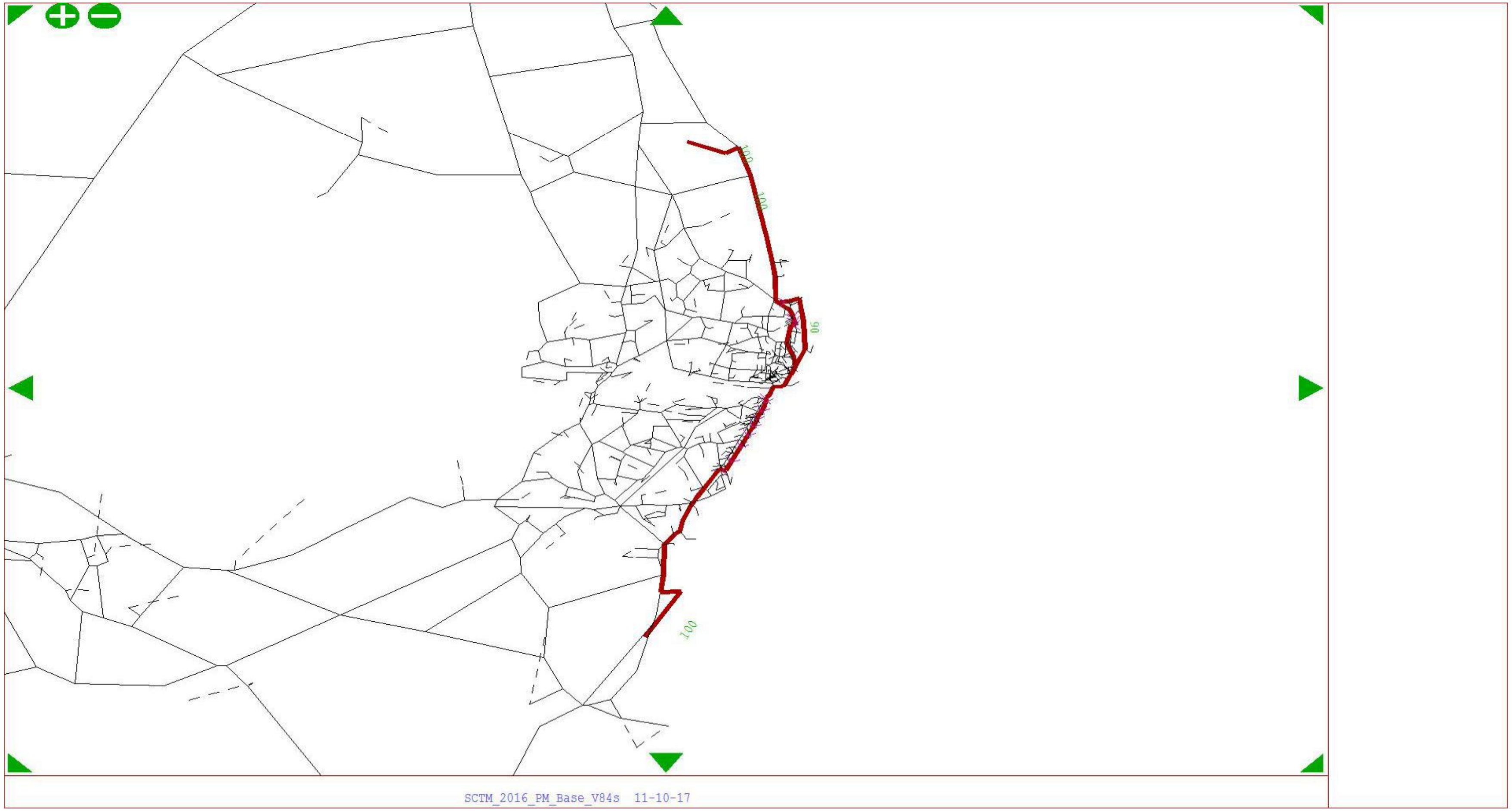
PM Peak

Project Name: OD Tree Plots -

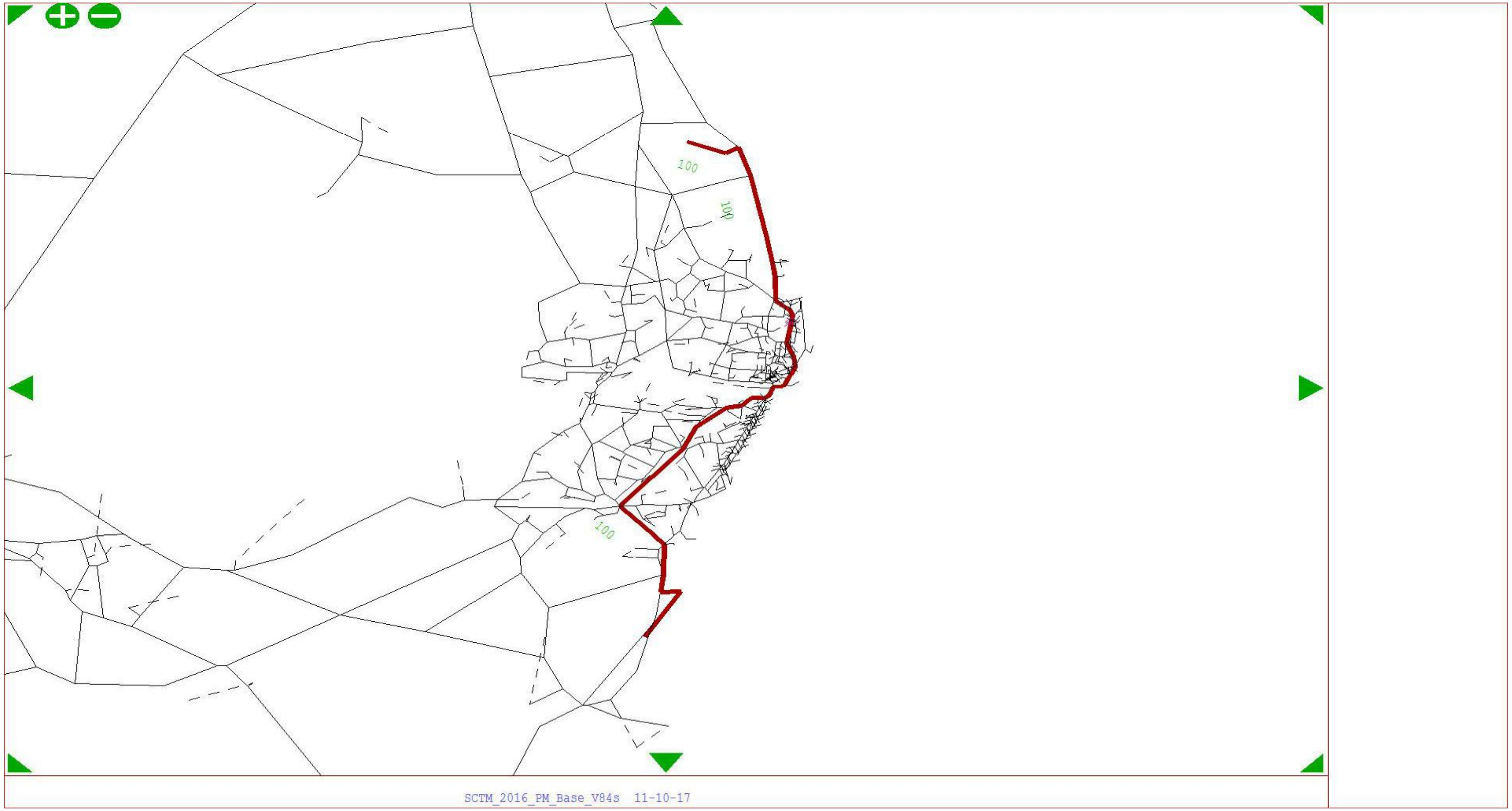
From Zone 408 To Zone 465 - User Class 1



From Zone 408 To Zone 465 - User Class 10

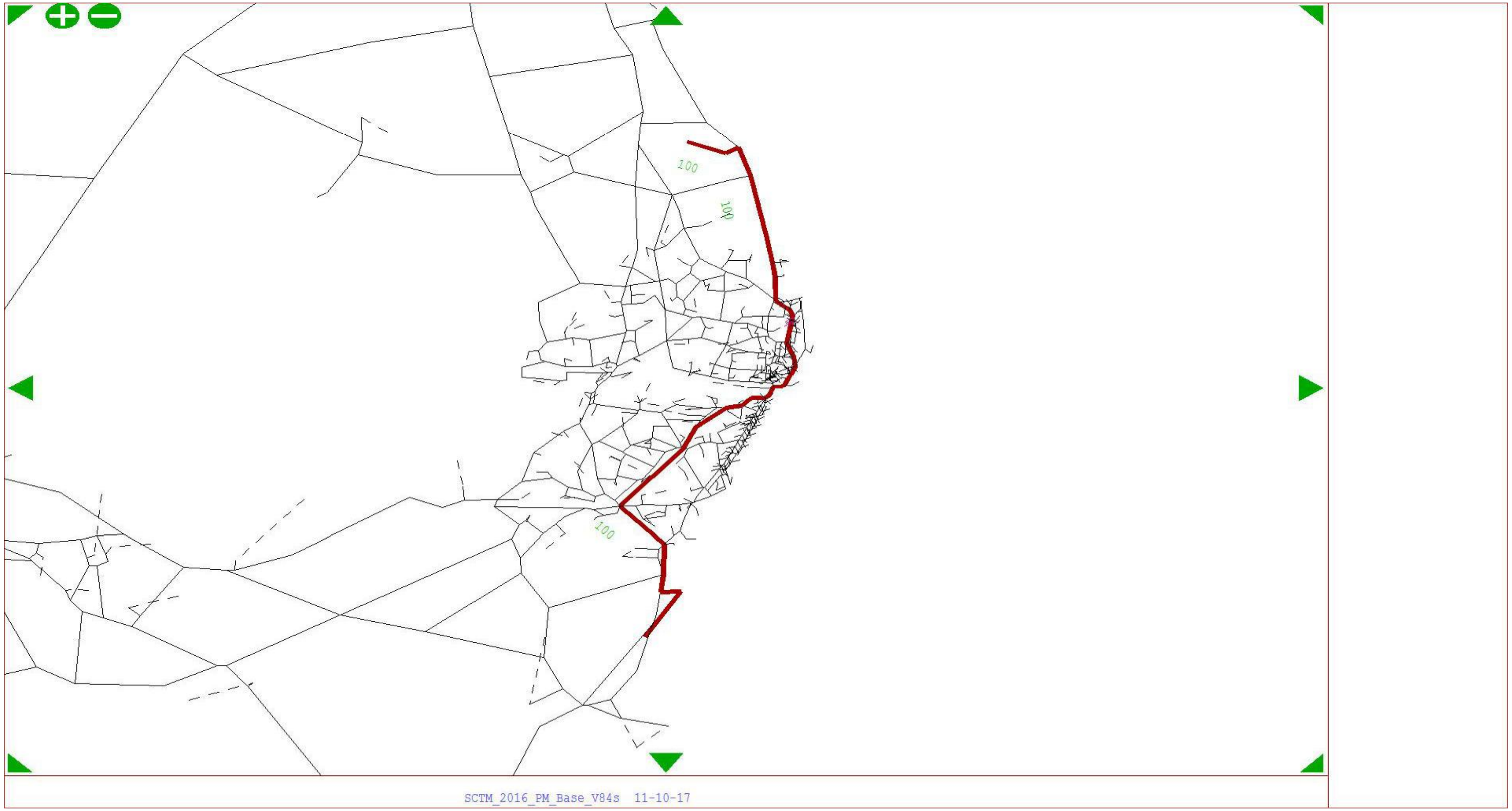


From Zone 465 To Zone 408 - User Class 1

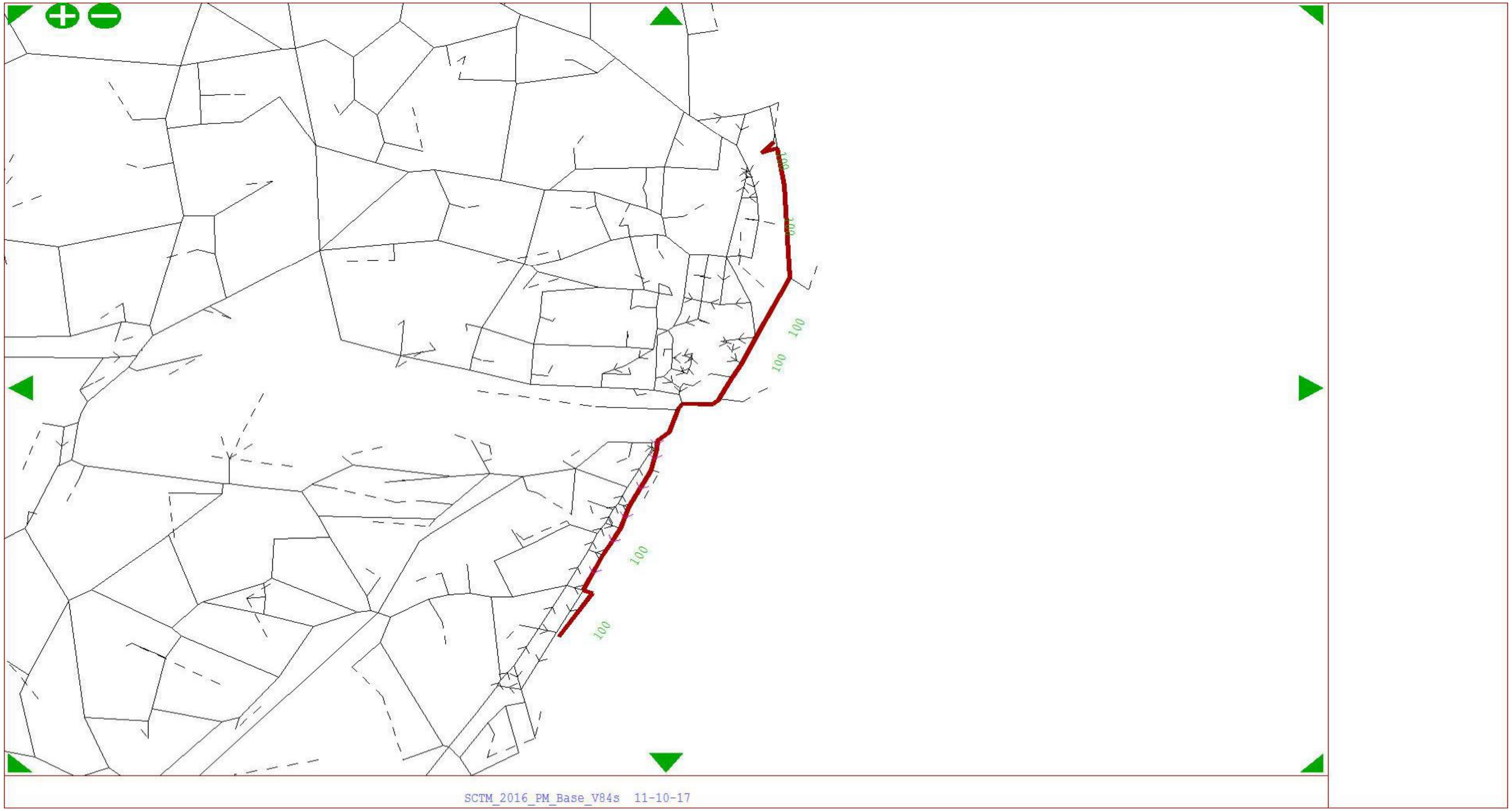


SCTM_2016_PM_Base_V84s 11-10-17

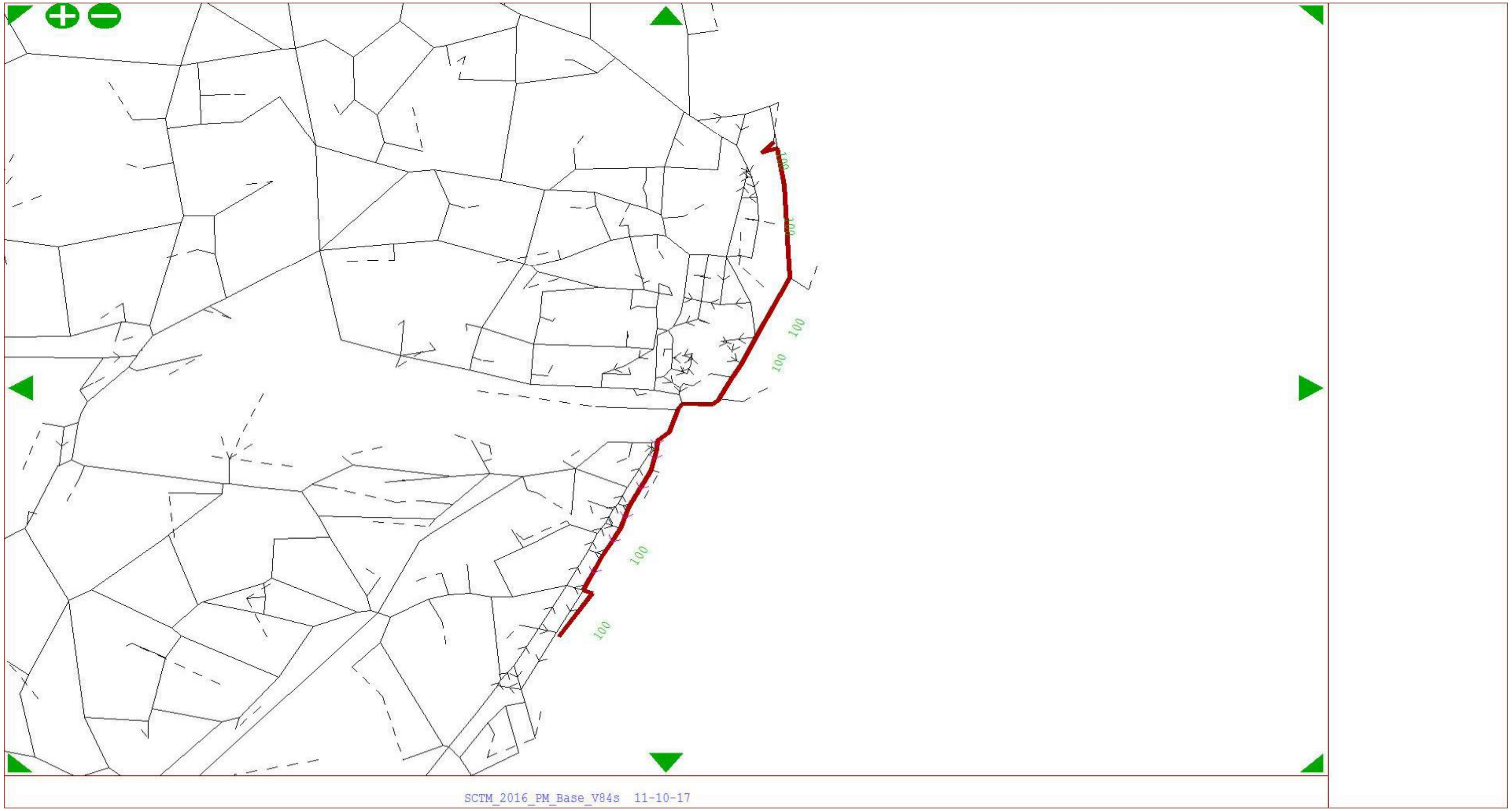
From Zone 465 To Zone 408 - User Class 10



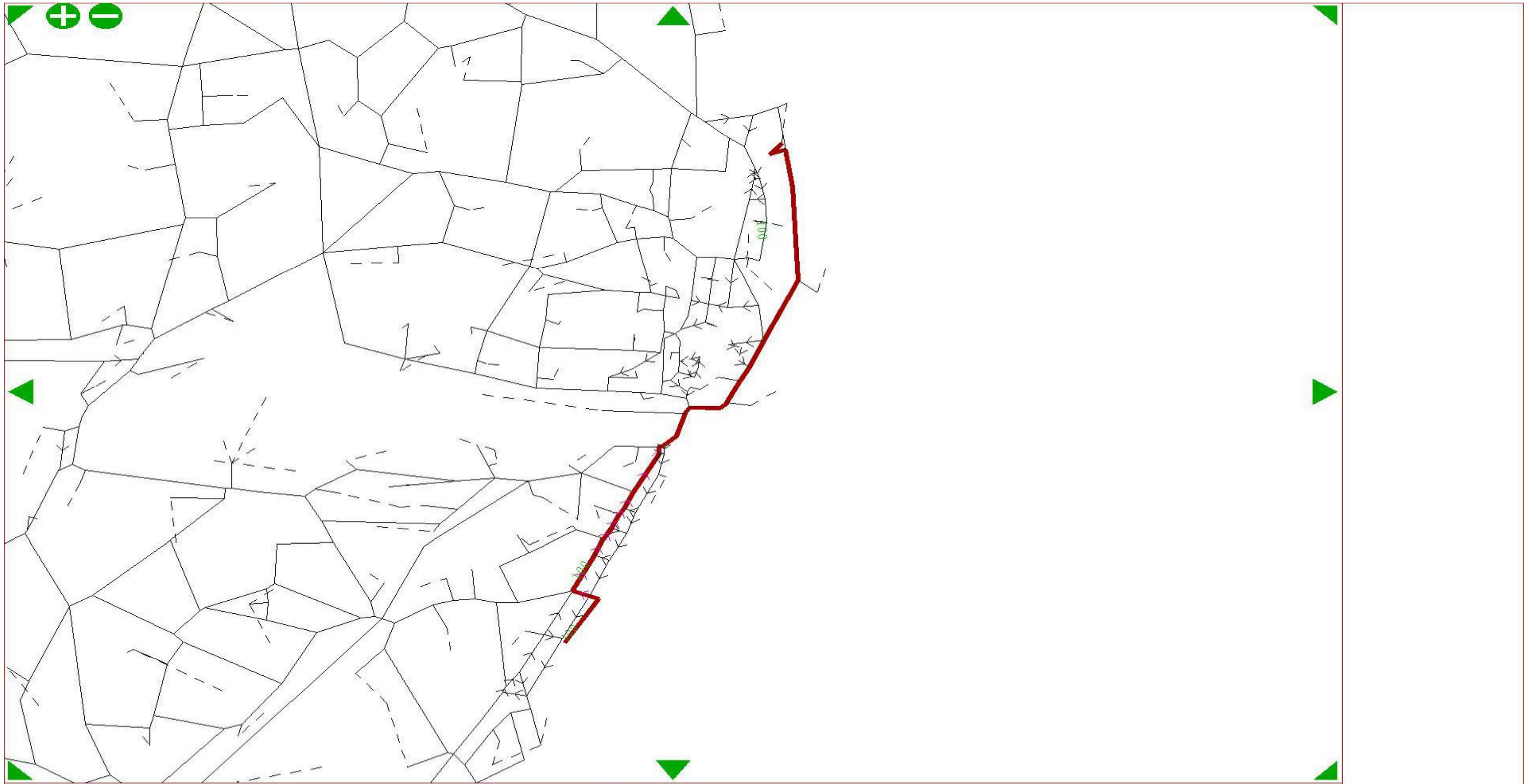
From Zone 84 To Zone 593 - User Class 1



From Zone 84 To Zone 593 - User Class 10



From Zone 593 To Zone 84 - User Class 1

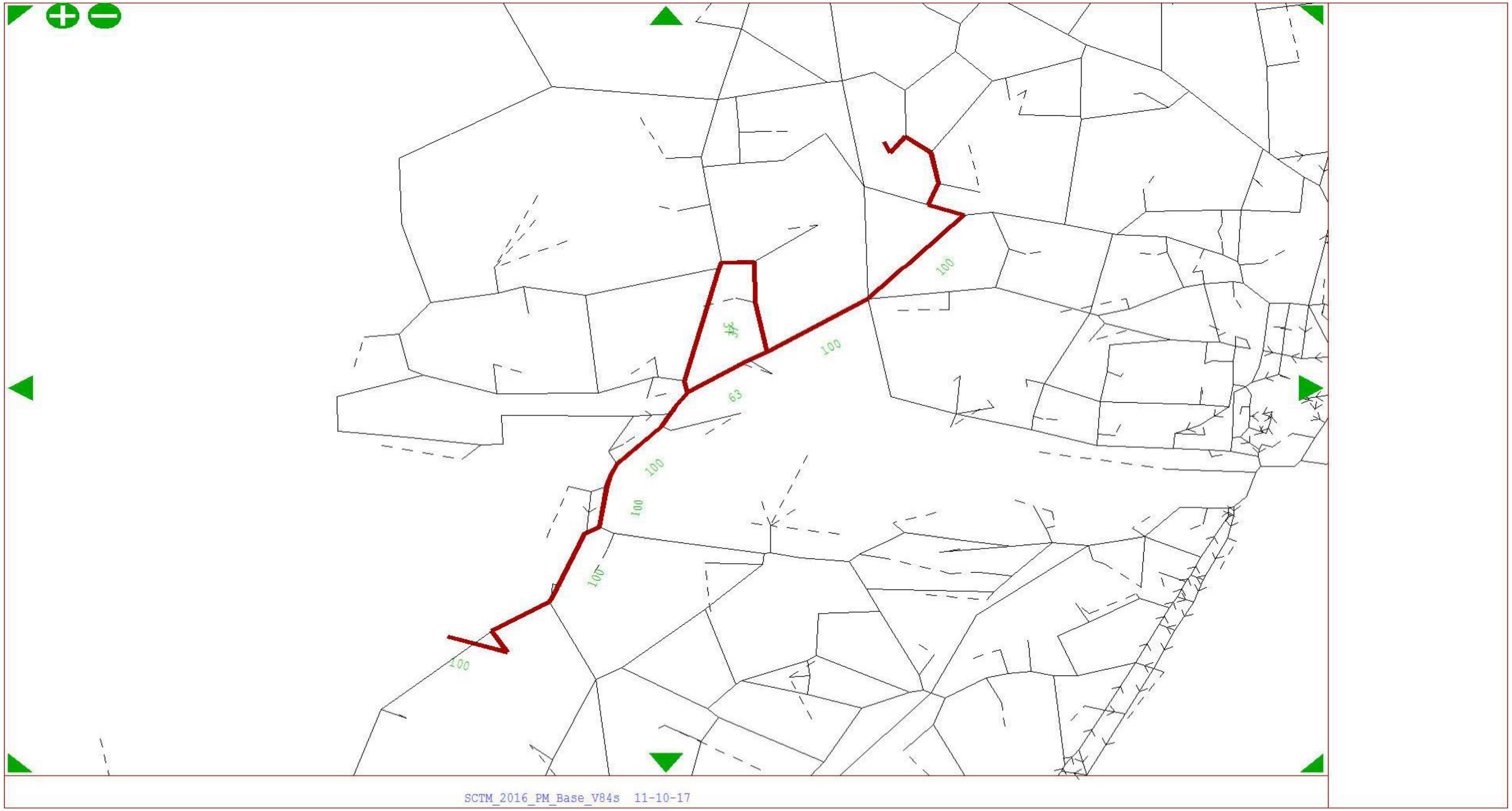


SCTM_2016_PM_Base_V84s 11-10-17

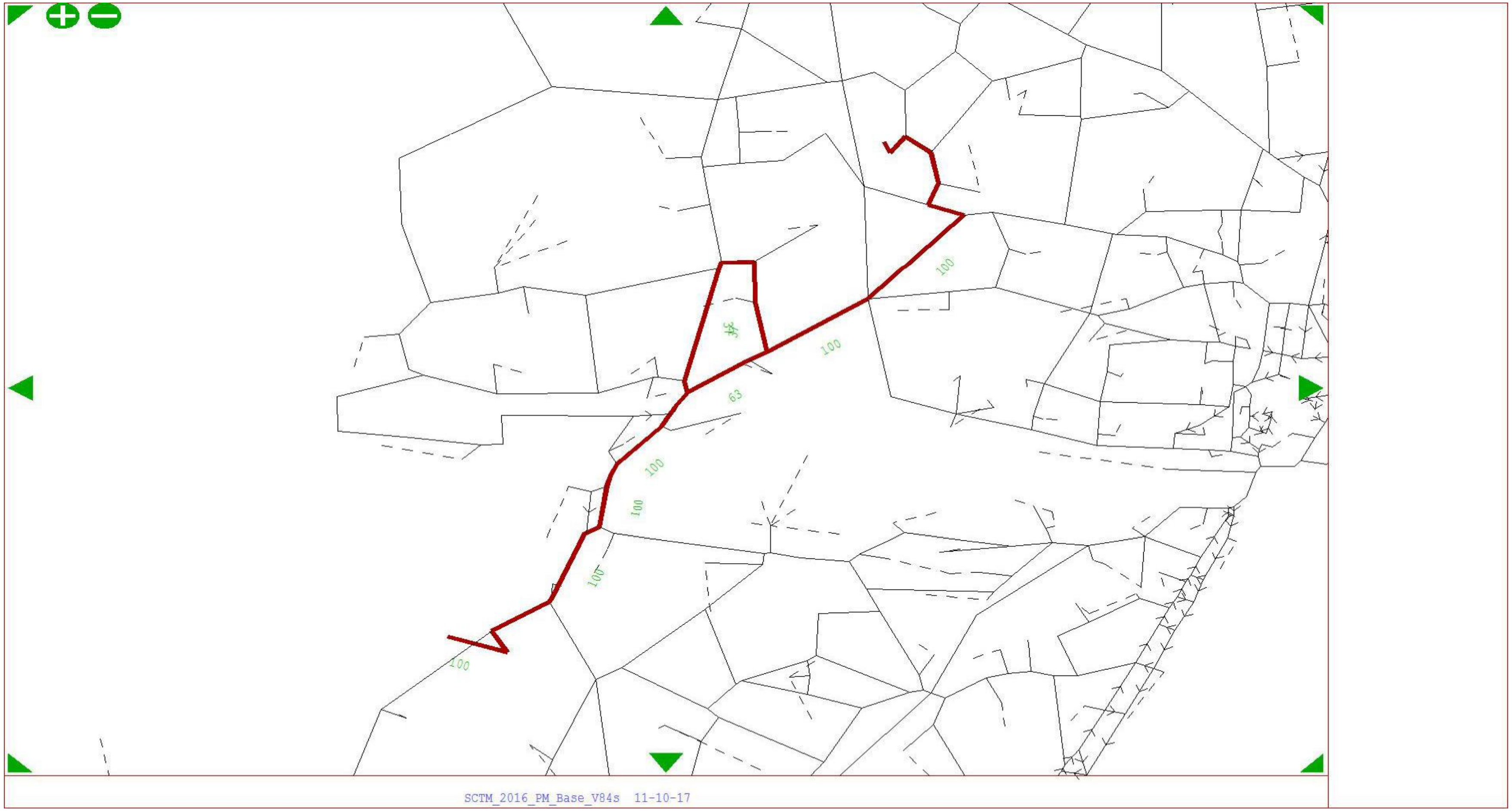
From Zone 593 To Zone 84 - User Class 10

SCTM_2016_PM_Base_V84s 11-10-17

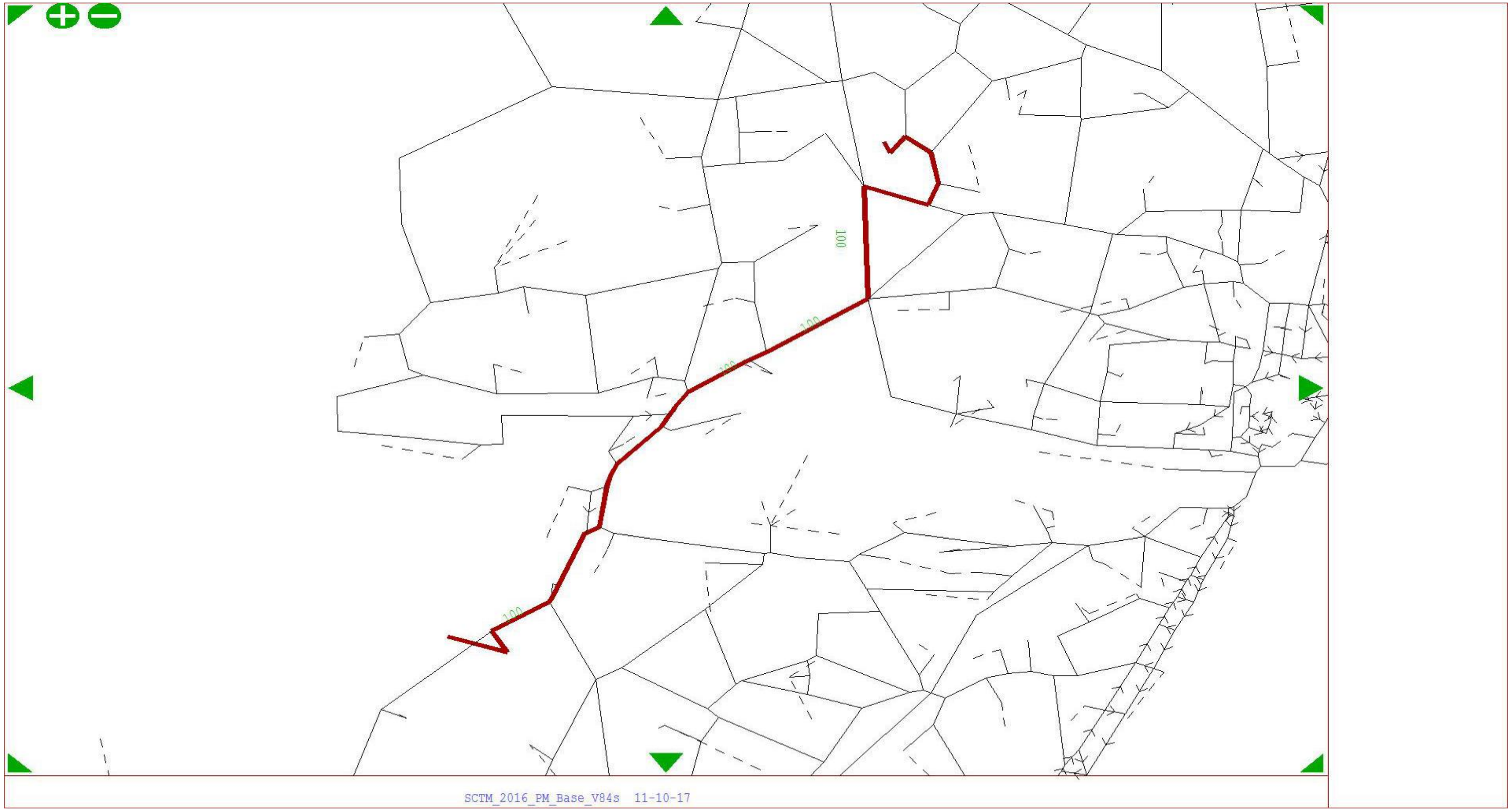
From Zone 767 To Zone 434 - User Class 1



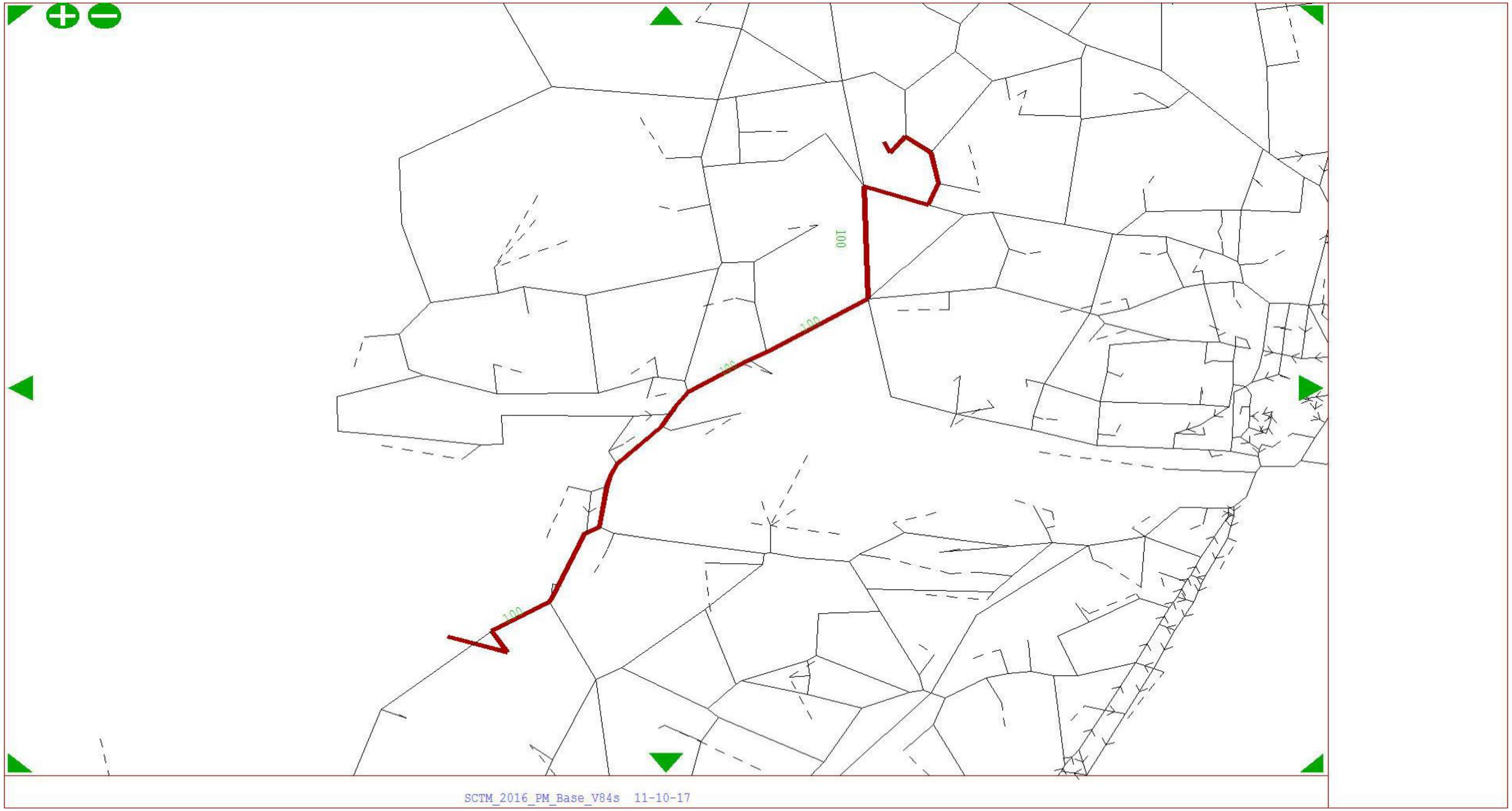
From Zone 767 To Zone 434 - User Class 10



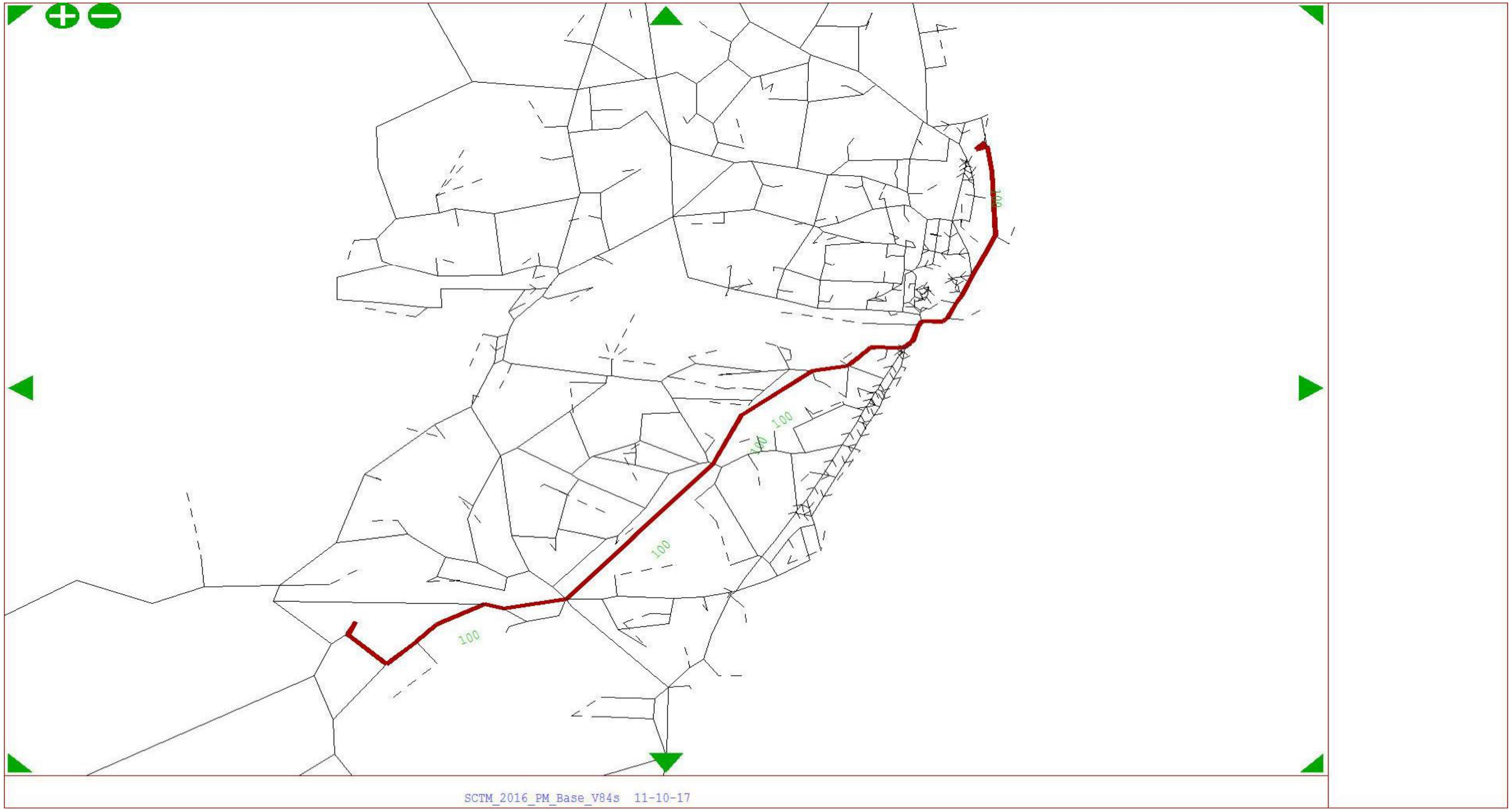
From Zone 434 To Zone 767 - User Class 1



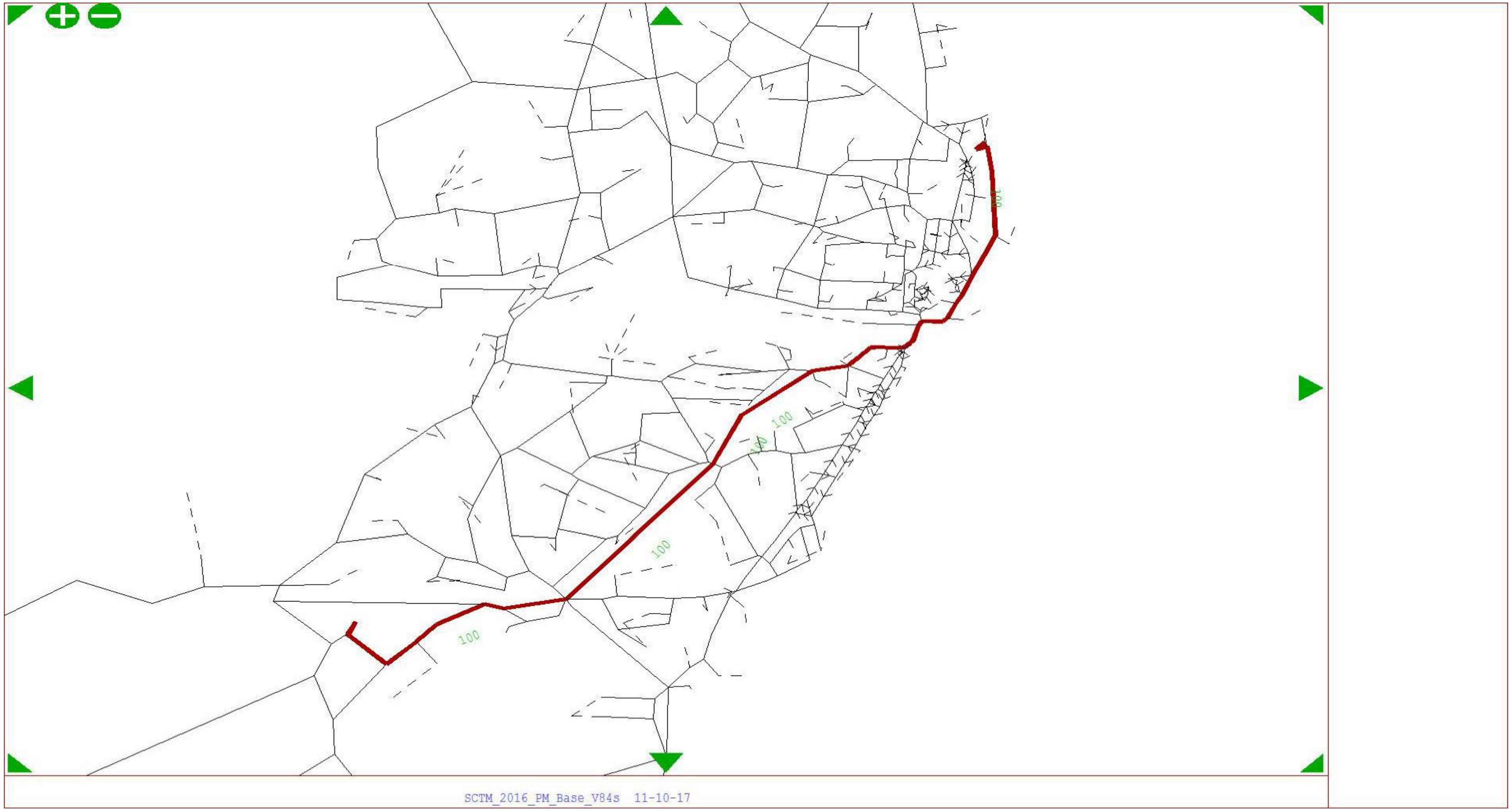
From Zone 434 To Zone 767 - User Class 10



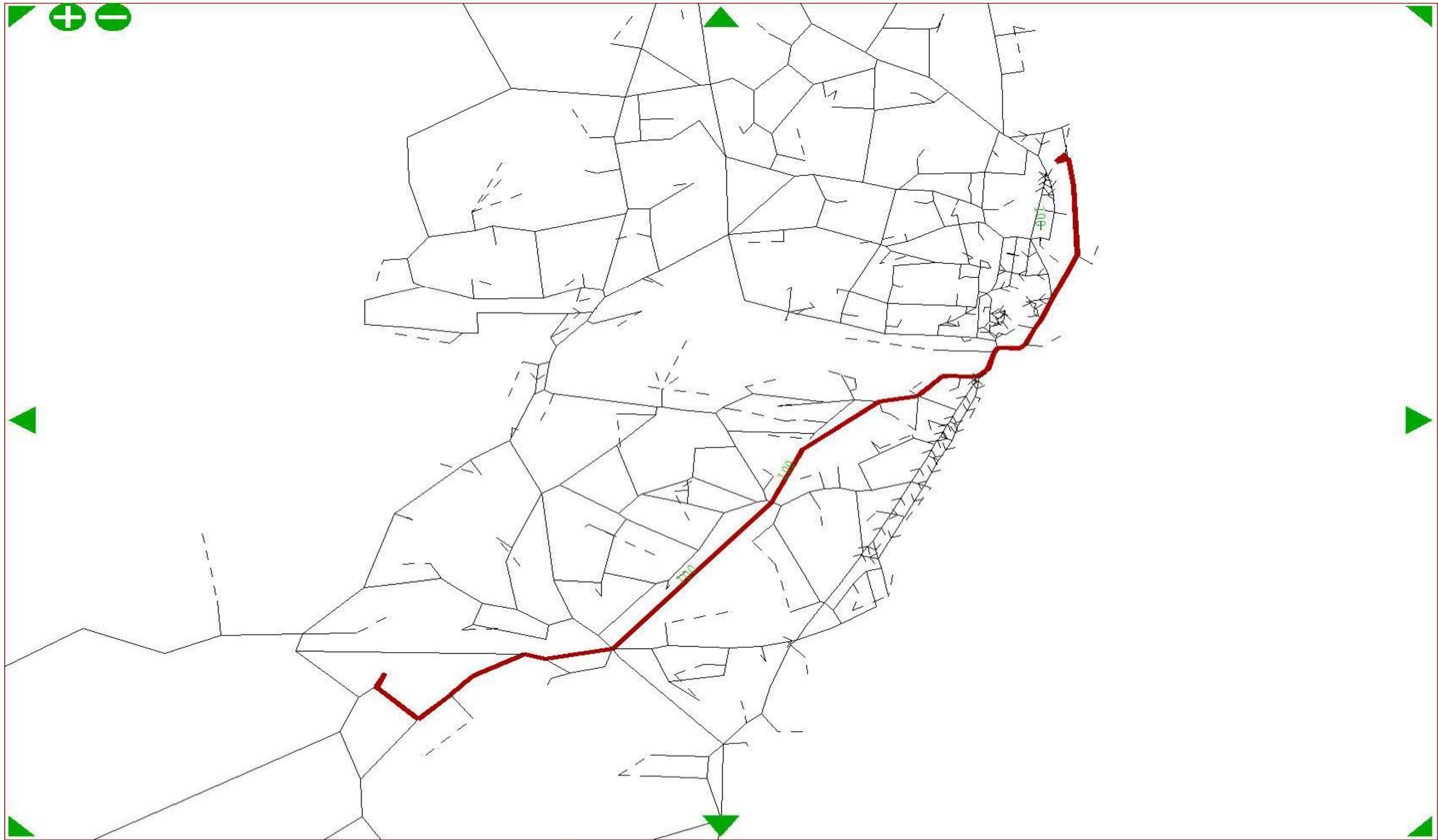
From Zone 84 To Zone 782 - User Class 1



From Zone 84 To Zone 782 - User Class 10

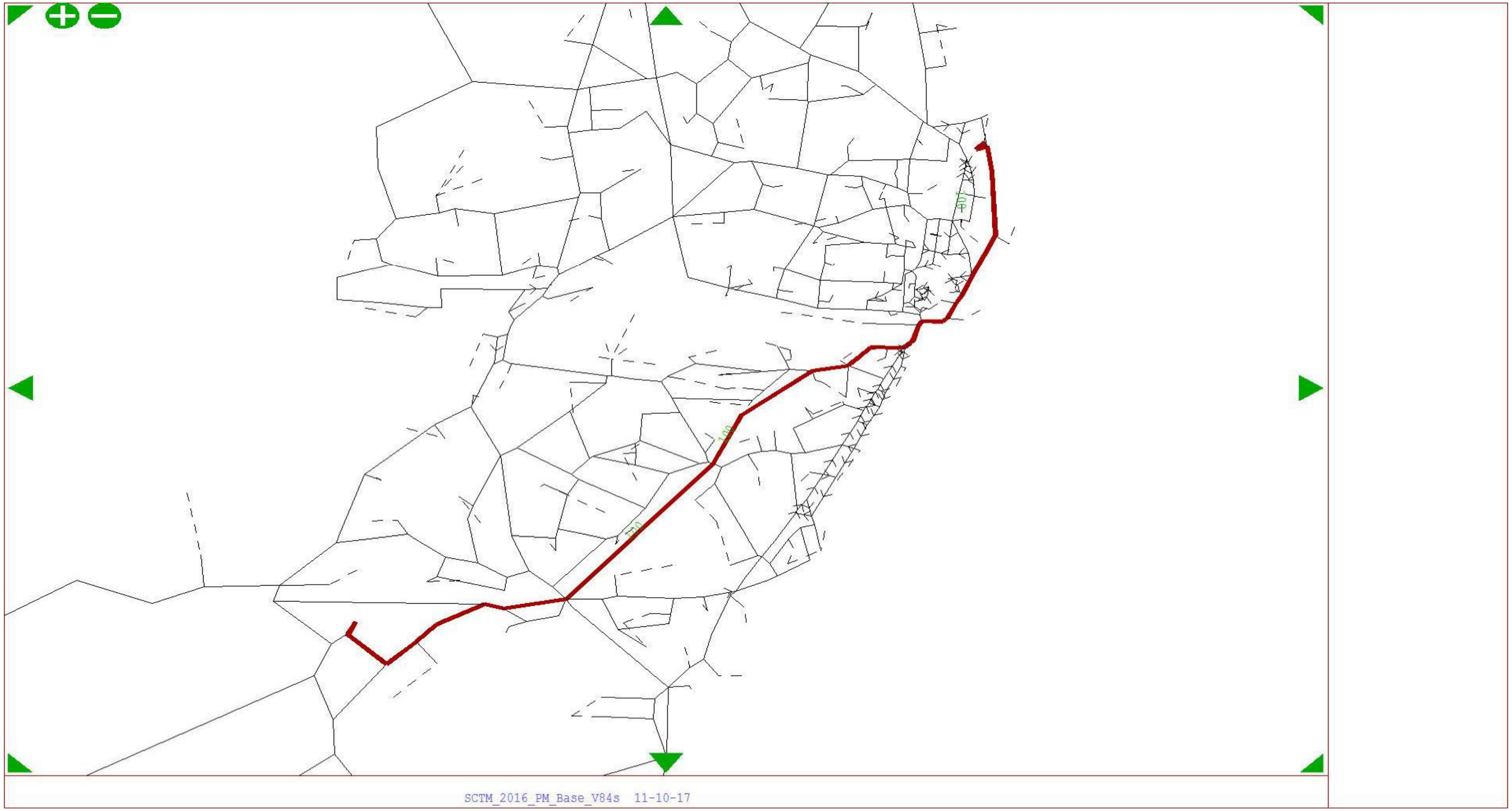


From Zone 782 To Zone 84 - User Class 1



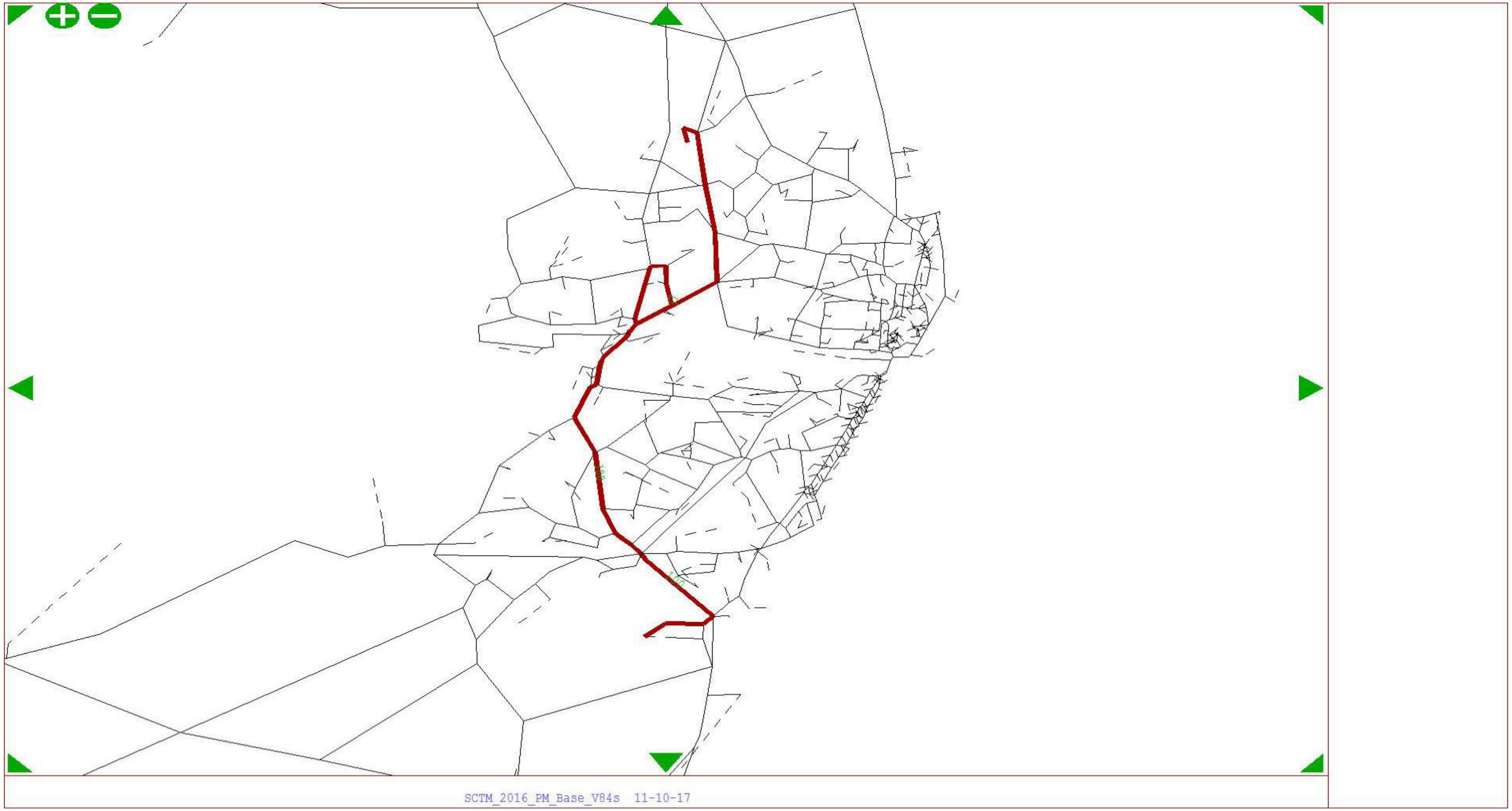
SCTM_2016_PM_Base_V84s 11-10-17

From Zone 782 To Zone 84 - User Class 10

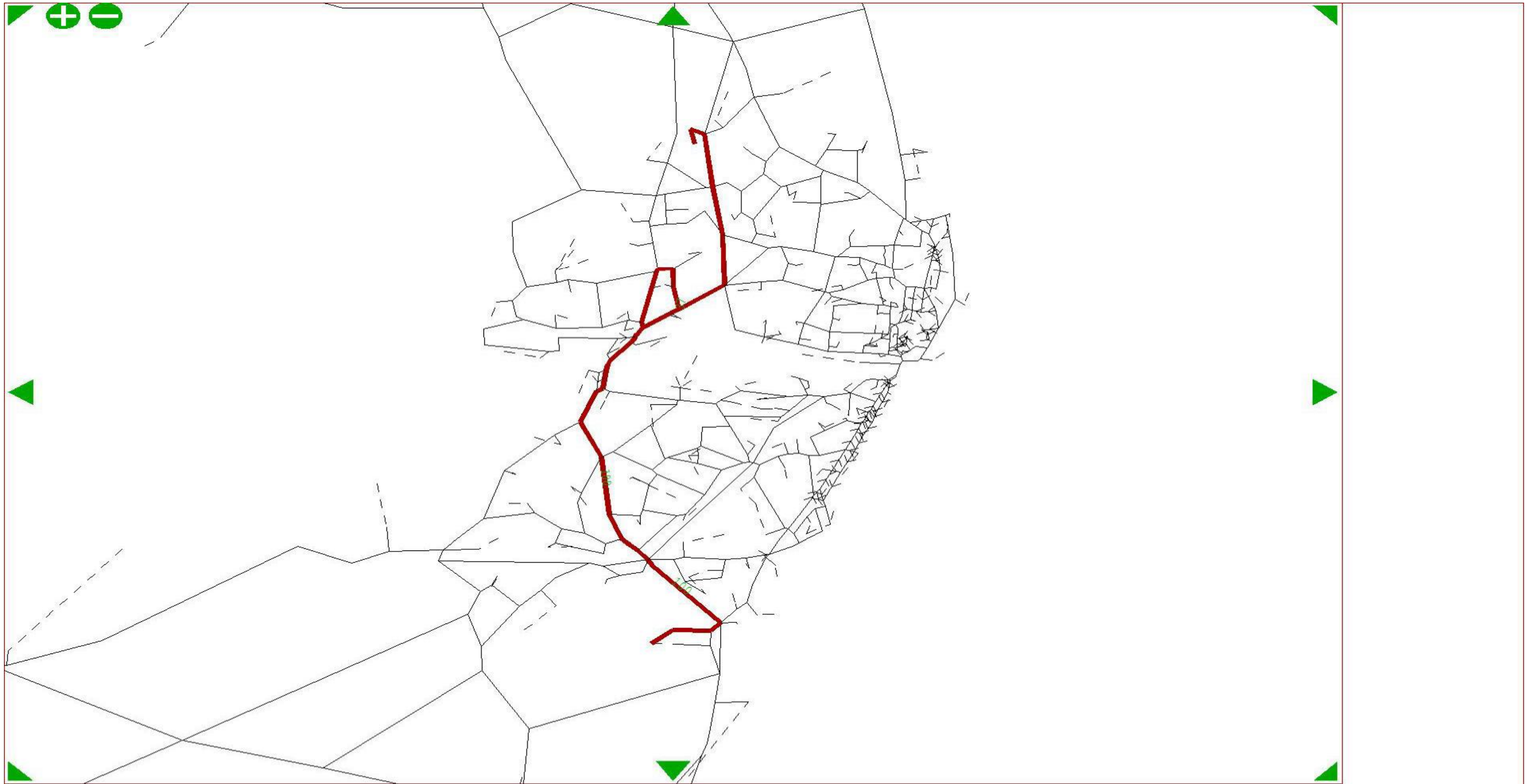


SCTM_2016_PM_Base_V84s 11-10-17

From Zone 586 To Zone 781 - User Class 1



From Zone 586 To Zone 781 - User Class 10

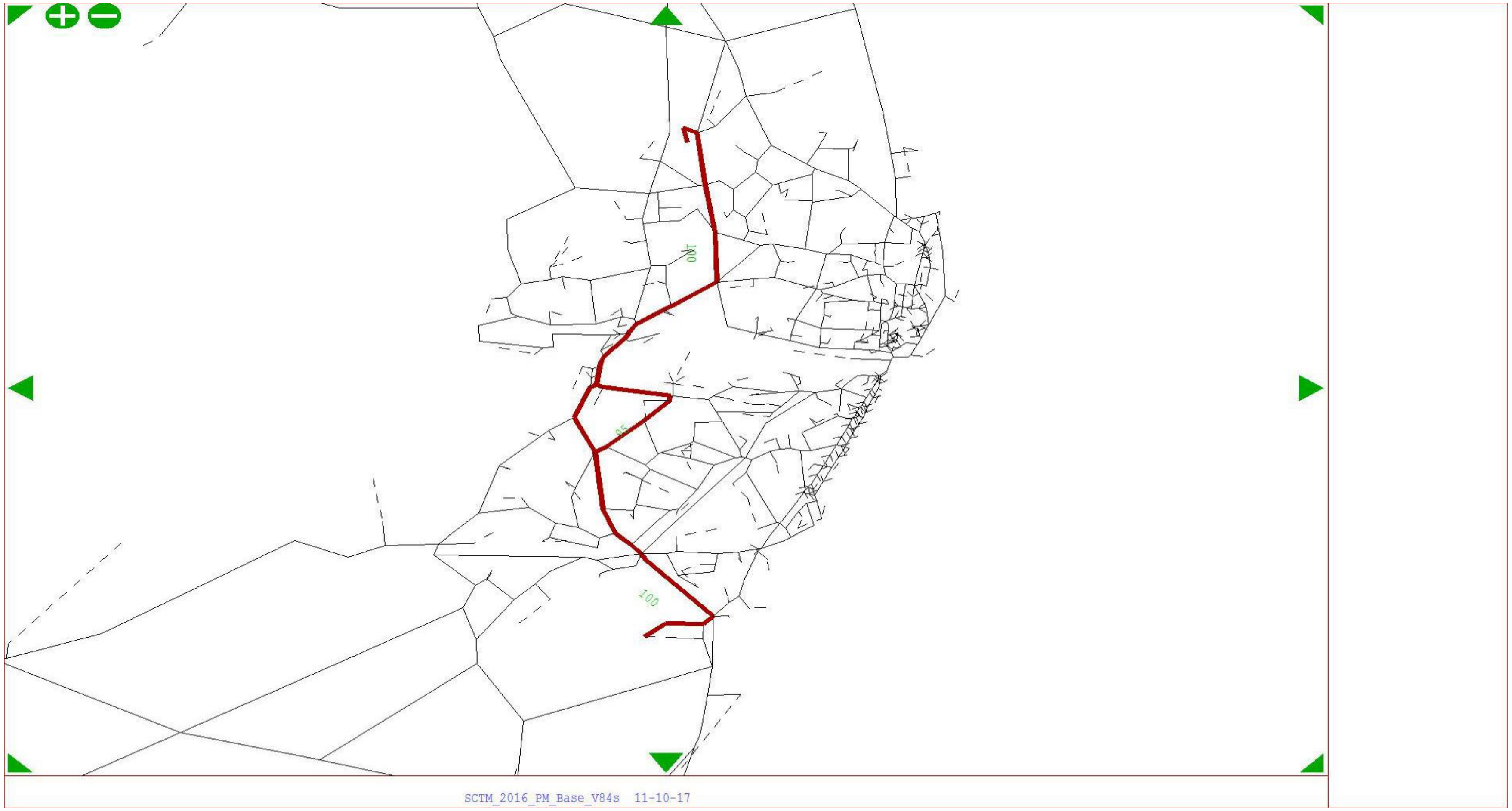


SCTM_2016_PM_Base_V84s 11-10-17

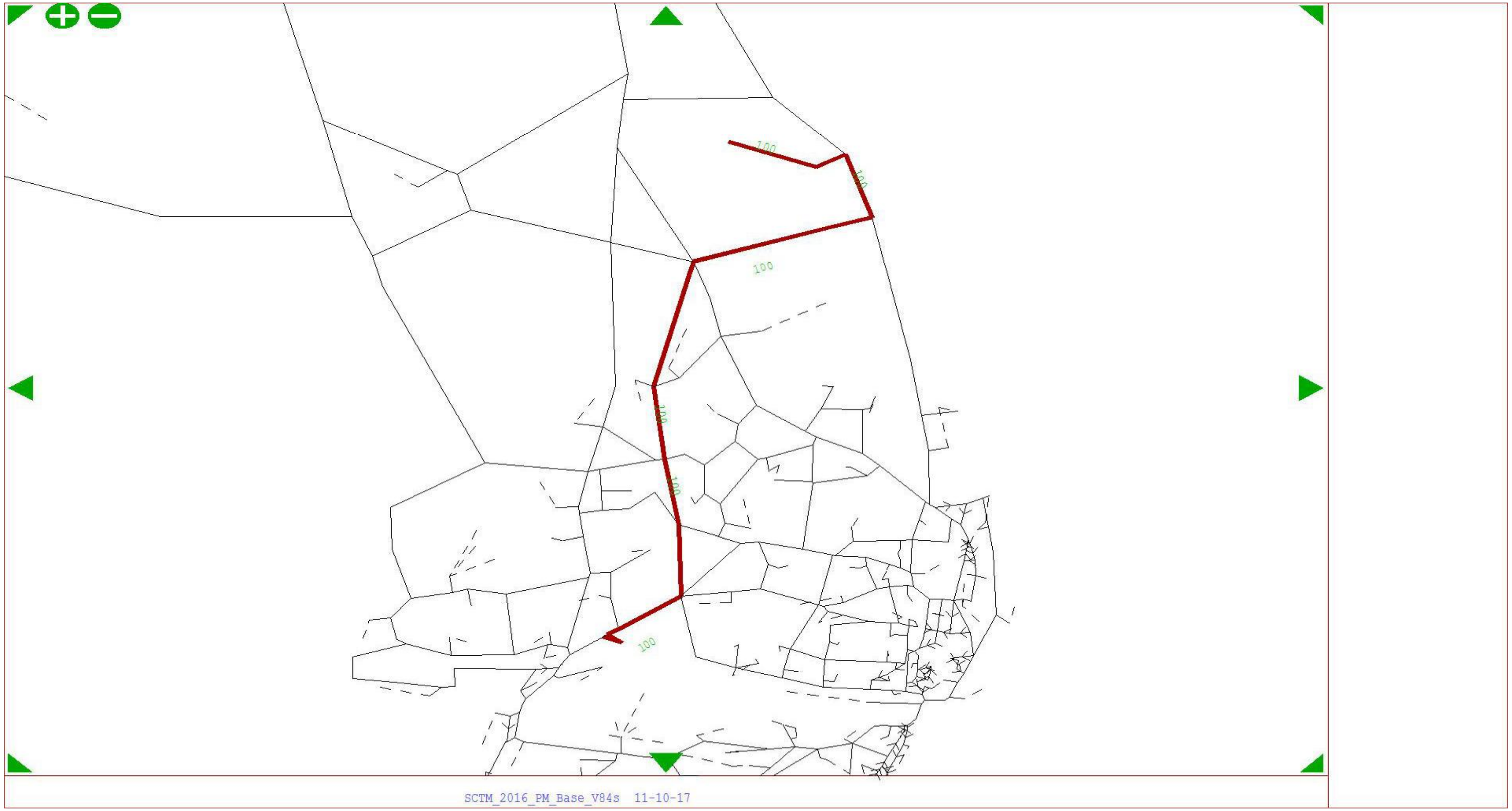
From Zone 781 To Zone 586 - User Class 1

SCTM_2016_PM_Base_V84s 11-10-17

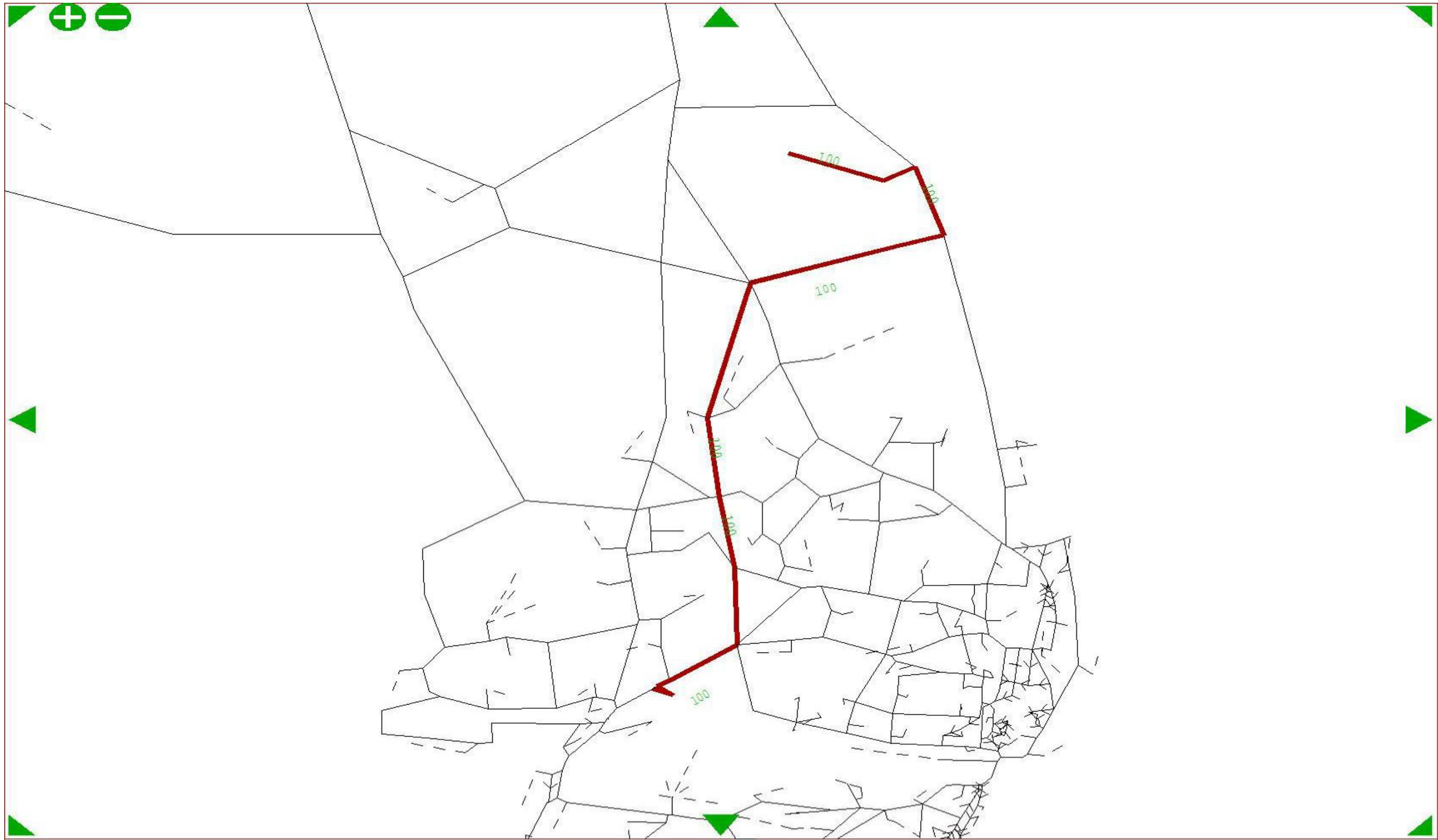
From Zone 781 To Zone 586 - User Class 10



From Zone 408 To Zone 582 - User Class 1

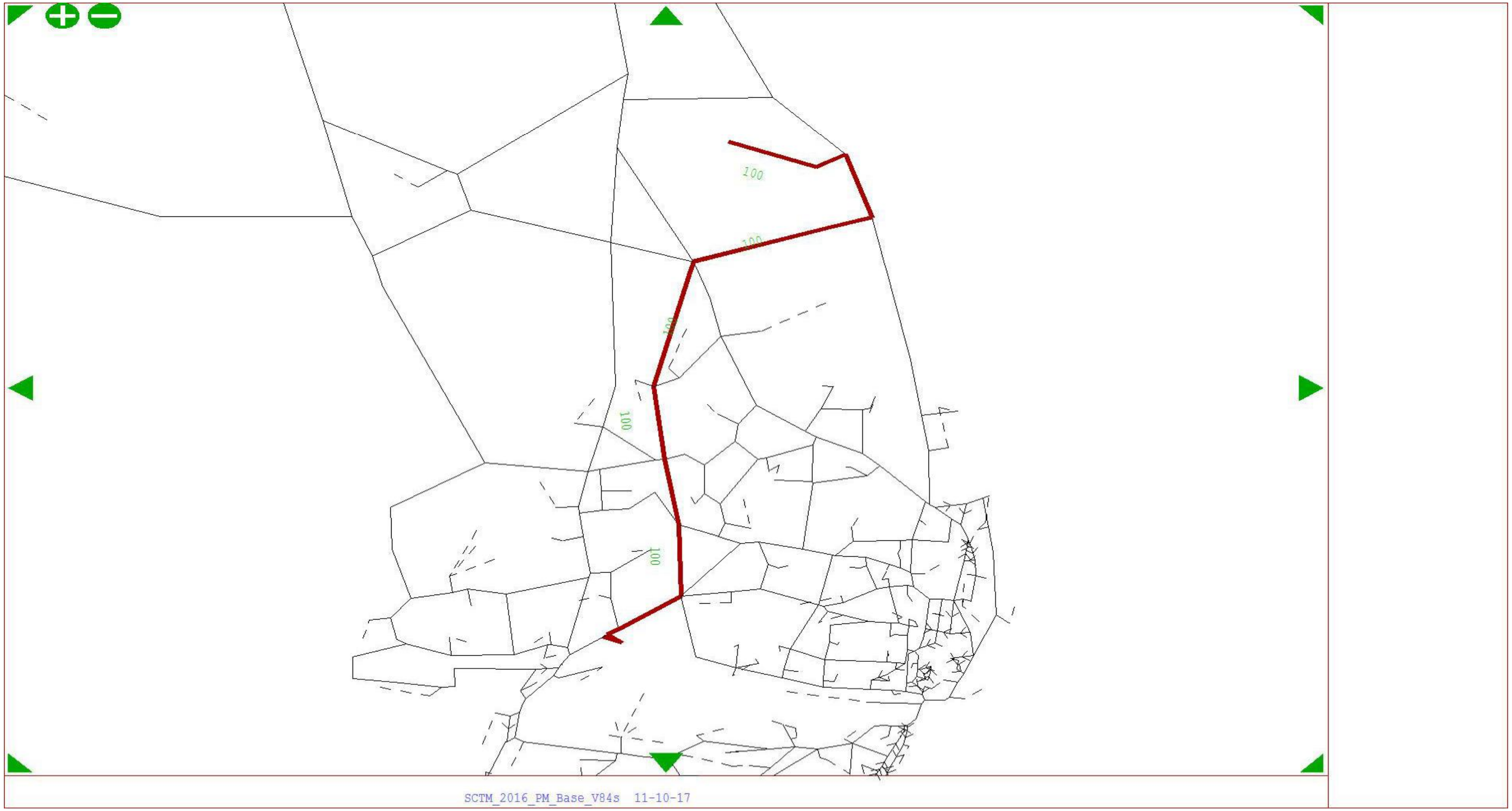


From Zone 408 To Zone 582 - User Class 10

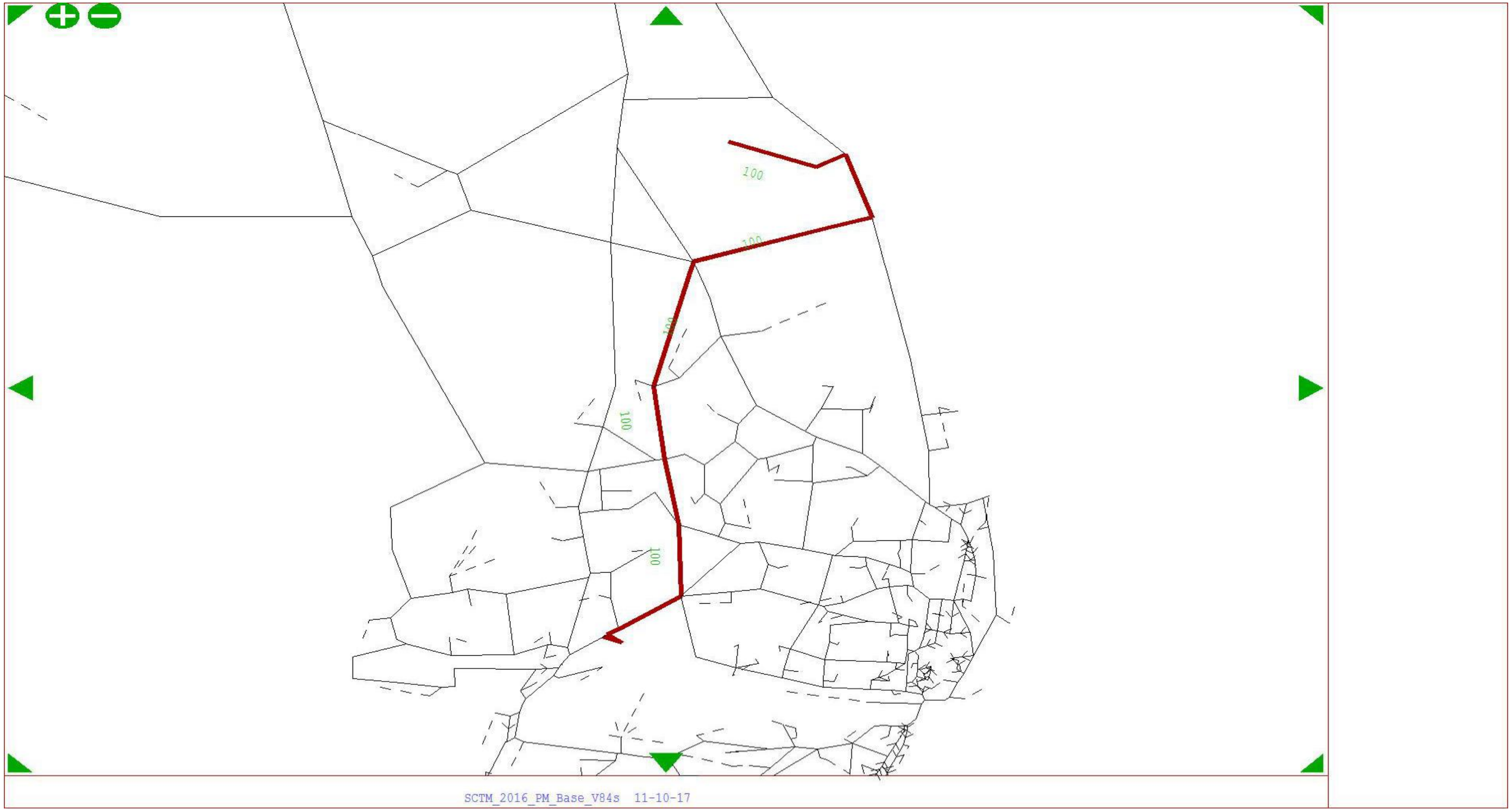


SCTM_2016_PM_Base_V84s 11-10-17

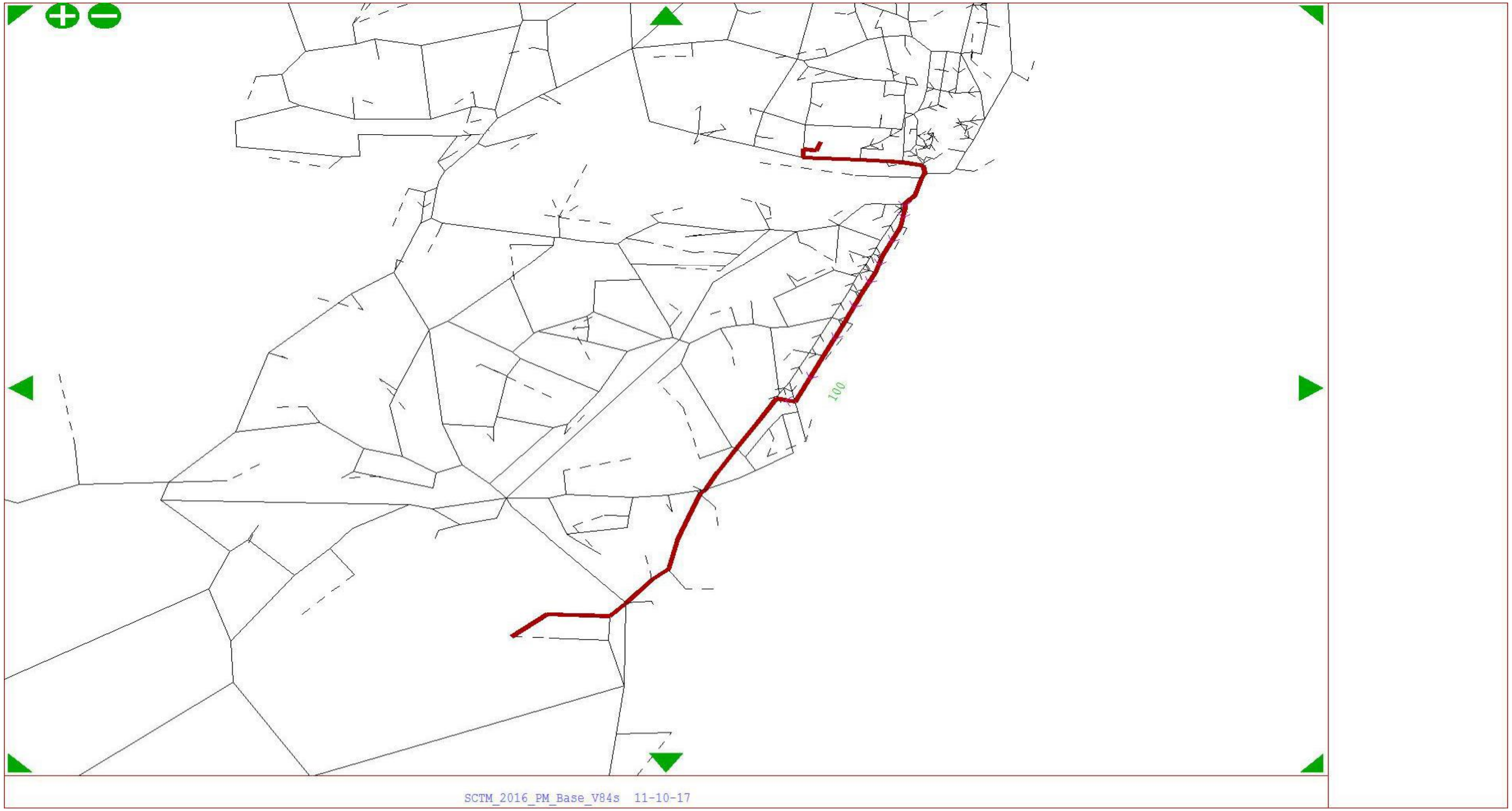
From Zone 582 To Zone 408 - User Class 1



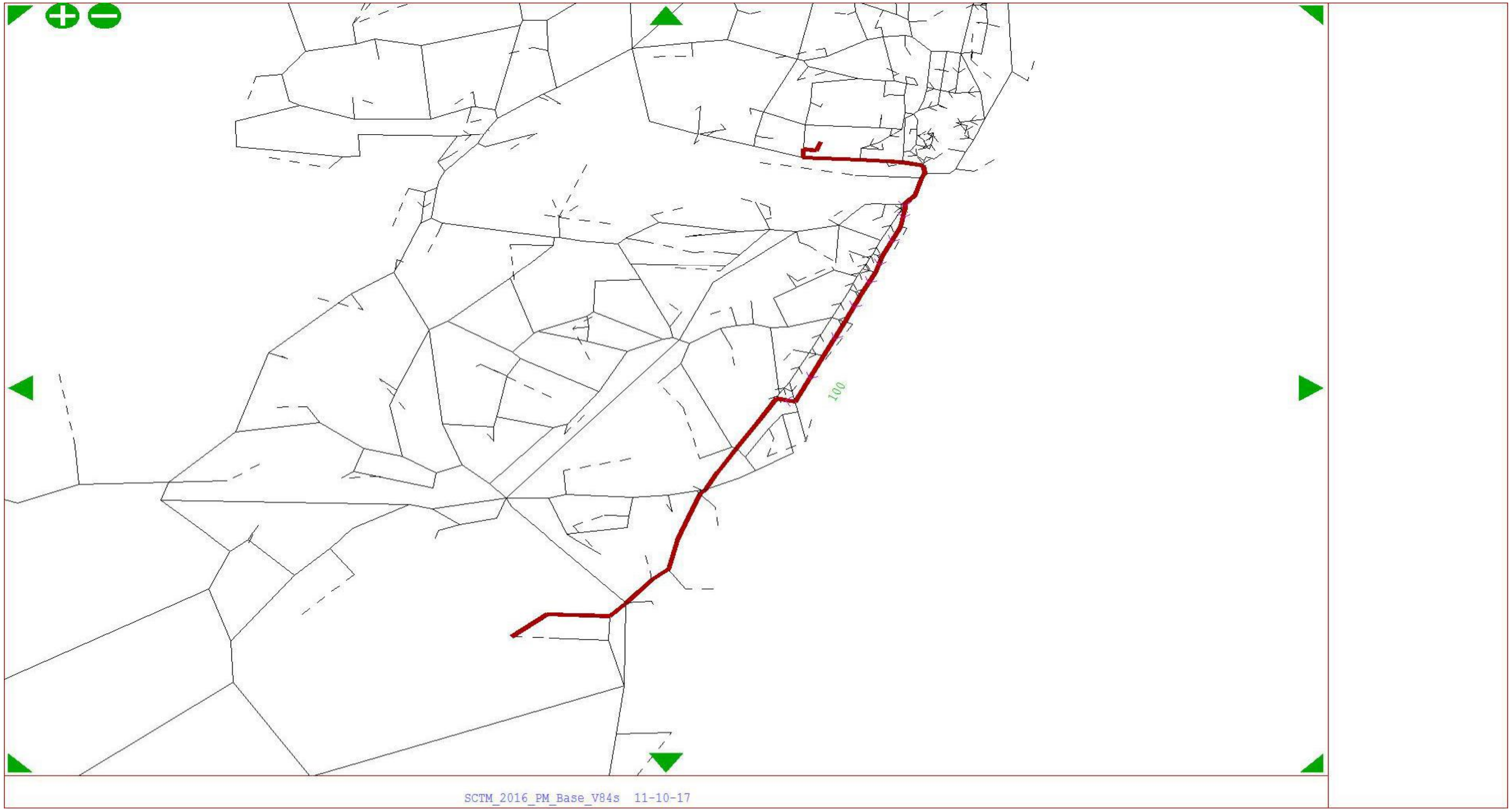
From Zone 582 To Zone 408 - User Class 10



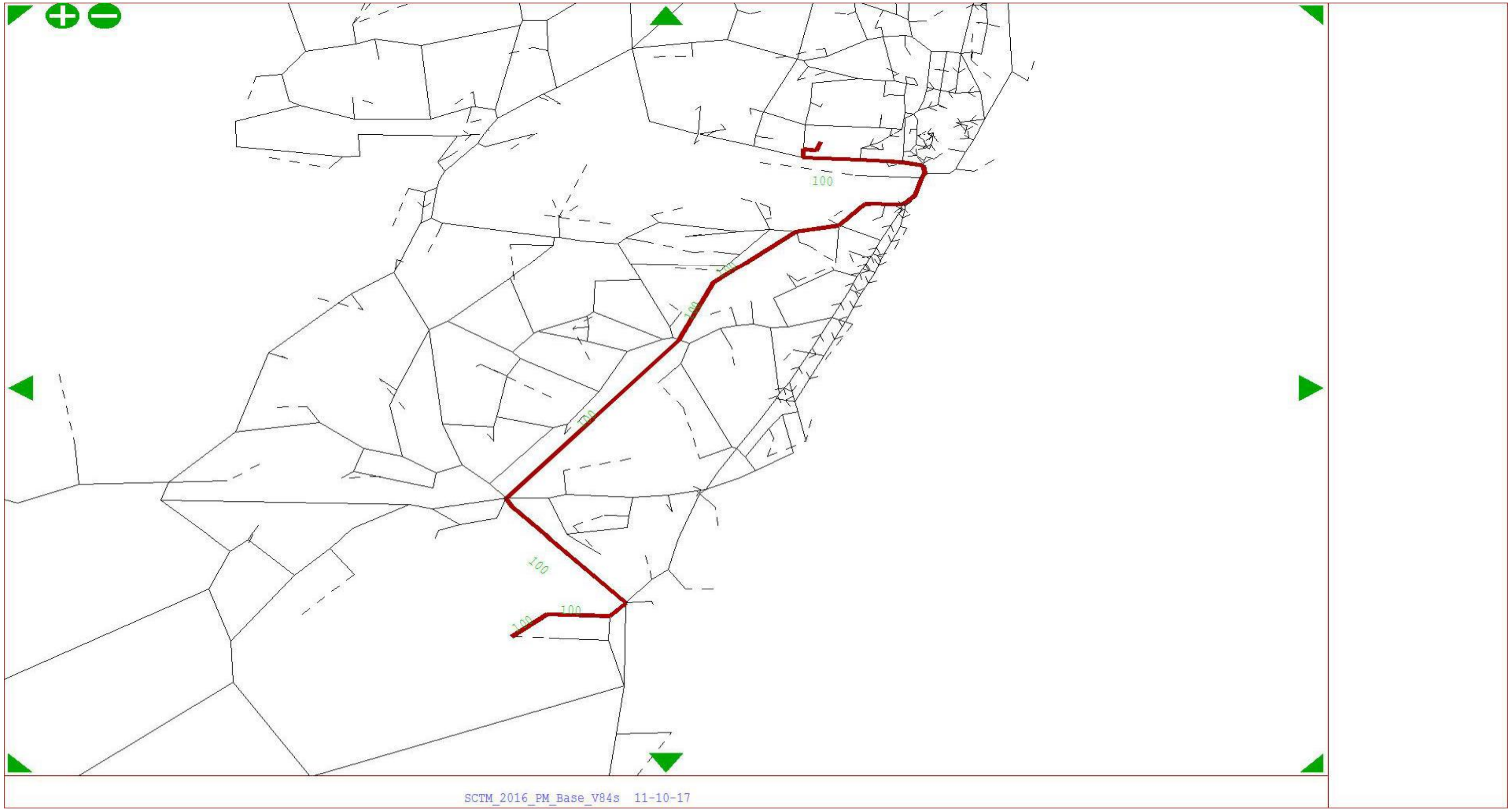
From Zone 427 To Zone 781 - User Class 1



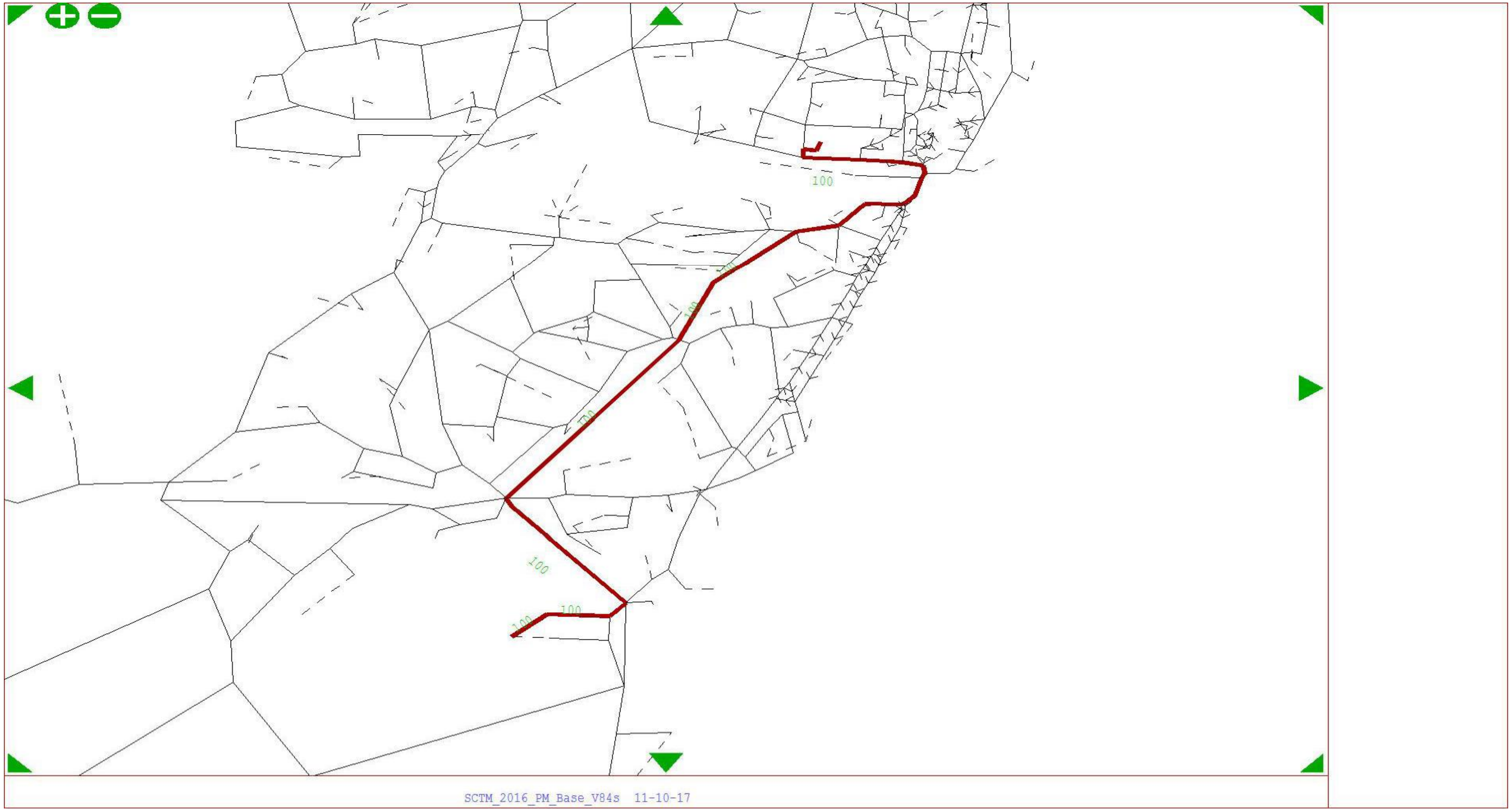
From Zone 427 To Zone 781 - User Class 10



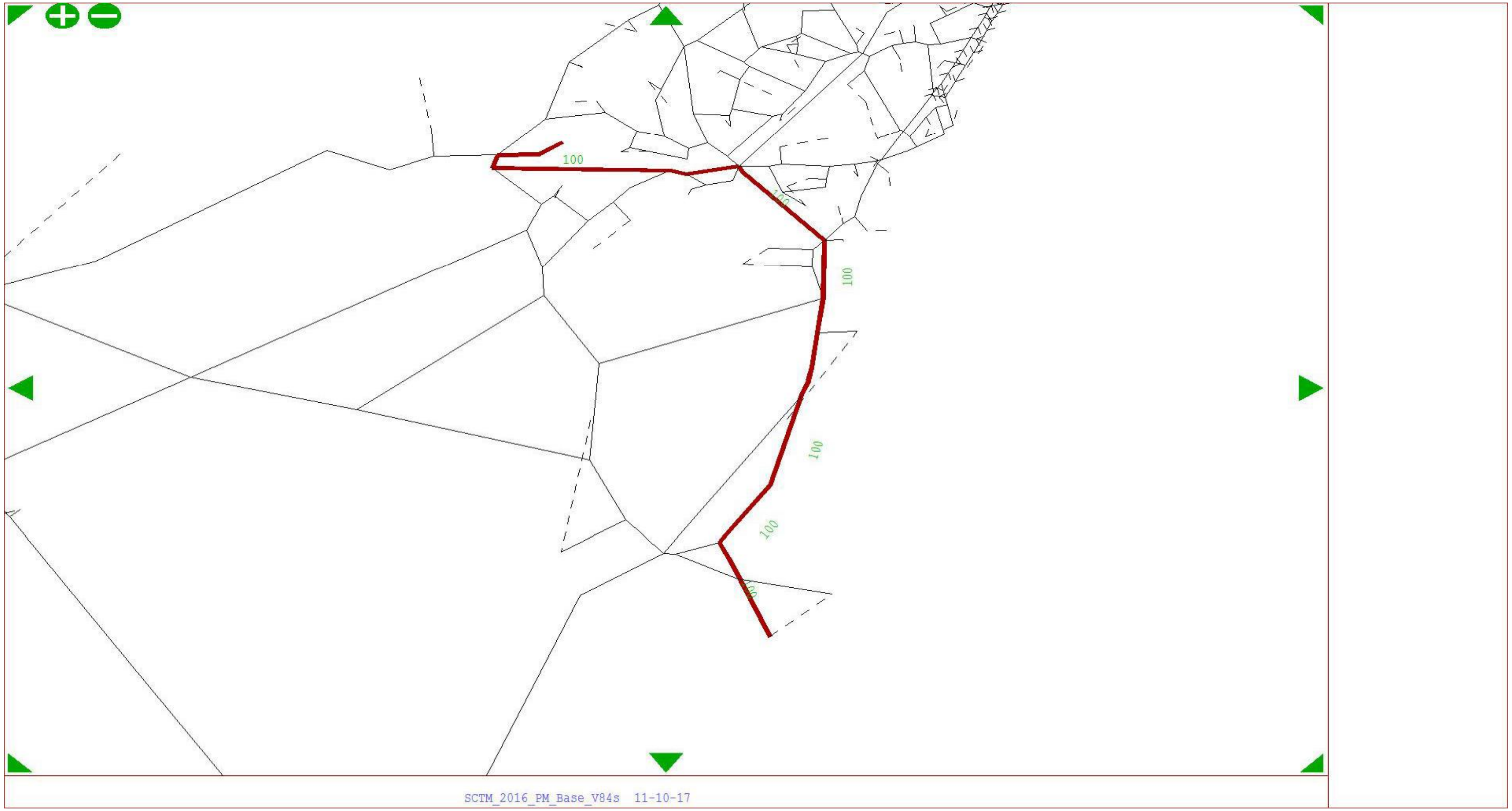
From Zone 781 To Zone 427 - User Class 1



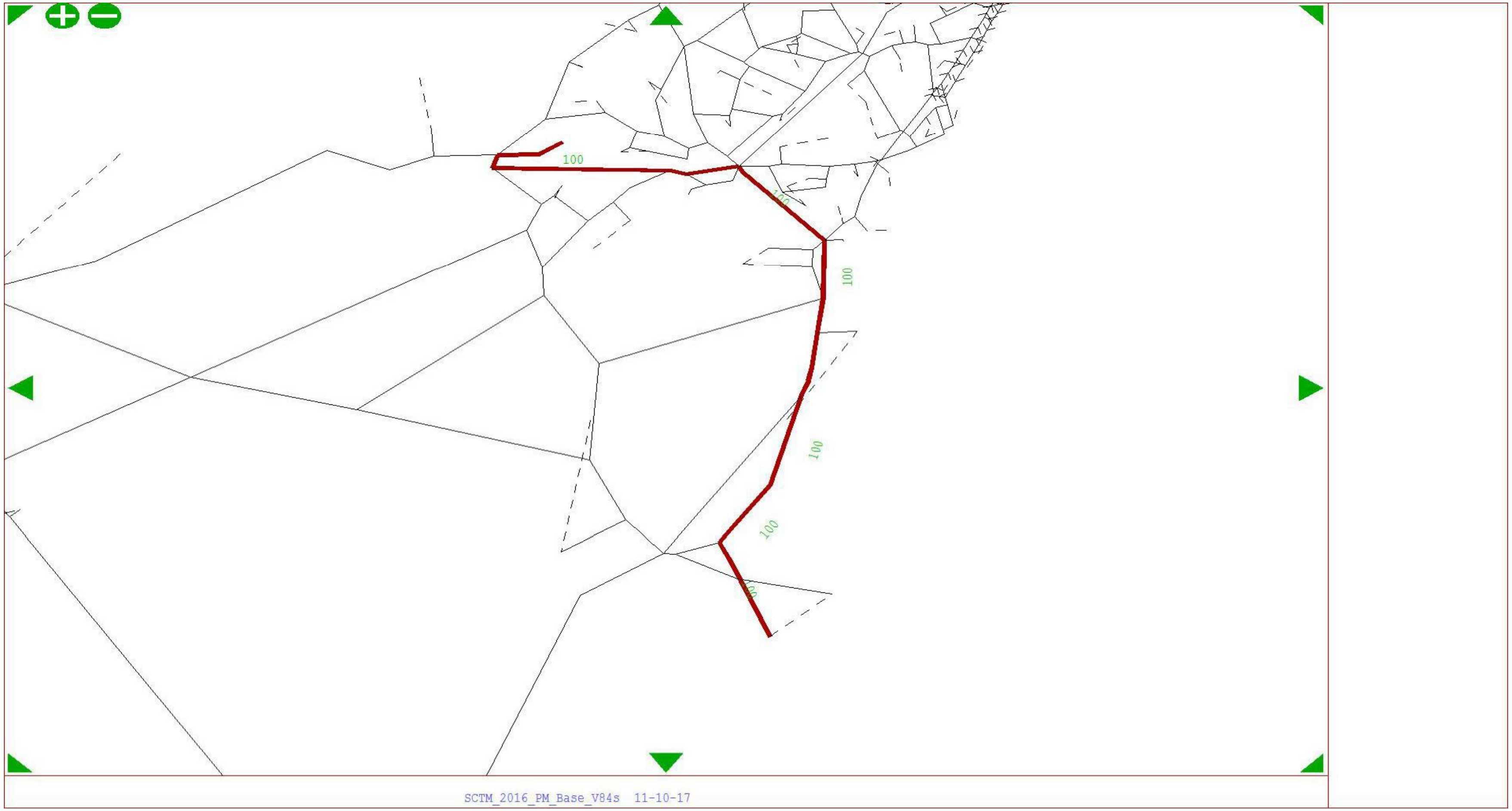
From Zone 781 To Zone 427 - User Class 10



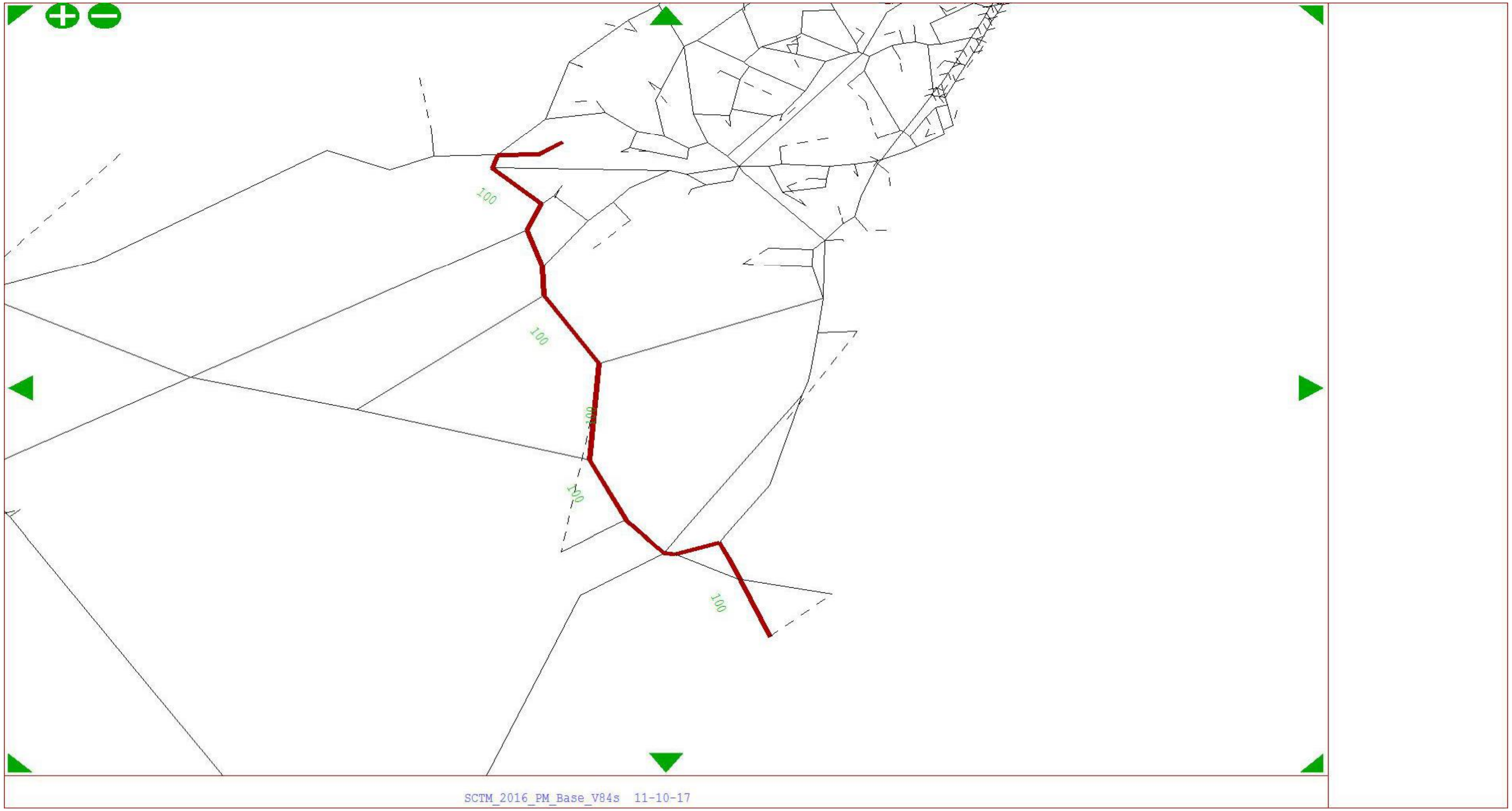
From Zone 639 To Zone 463 - User Class 1



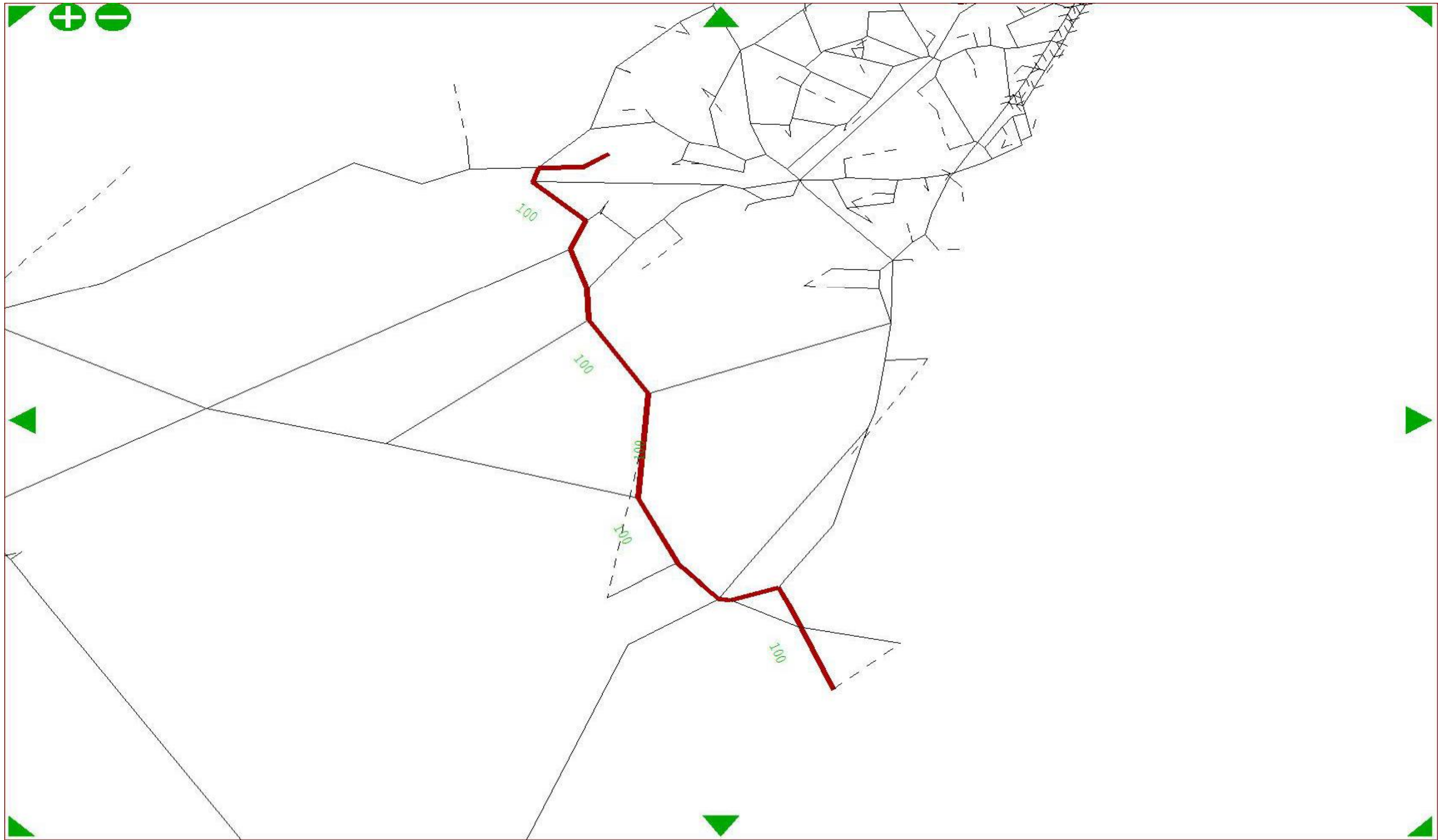
From Zone 639 To Zone 463 - User Class 10



From Zone 463 To Zone 639 - User Class 1

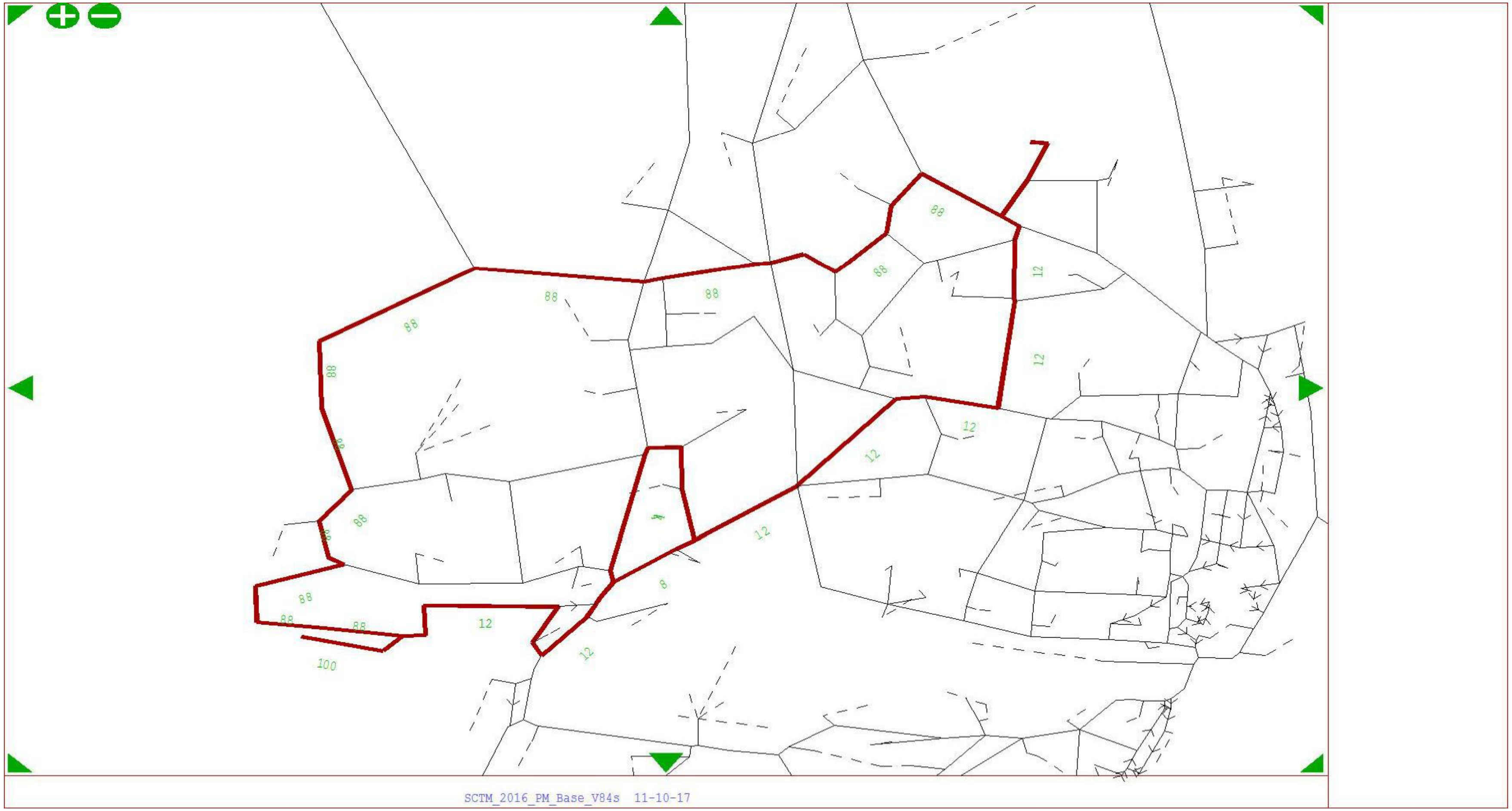


From Zone 463 To Zone 639 - User Class 10



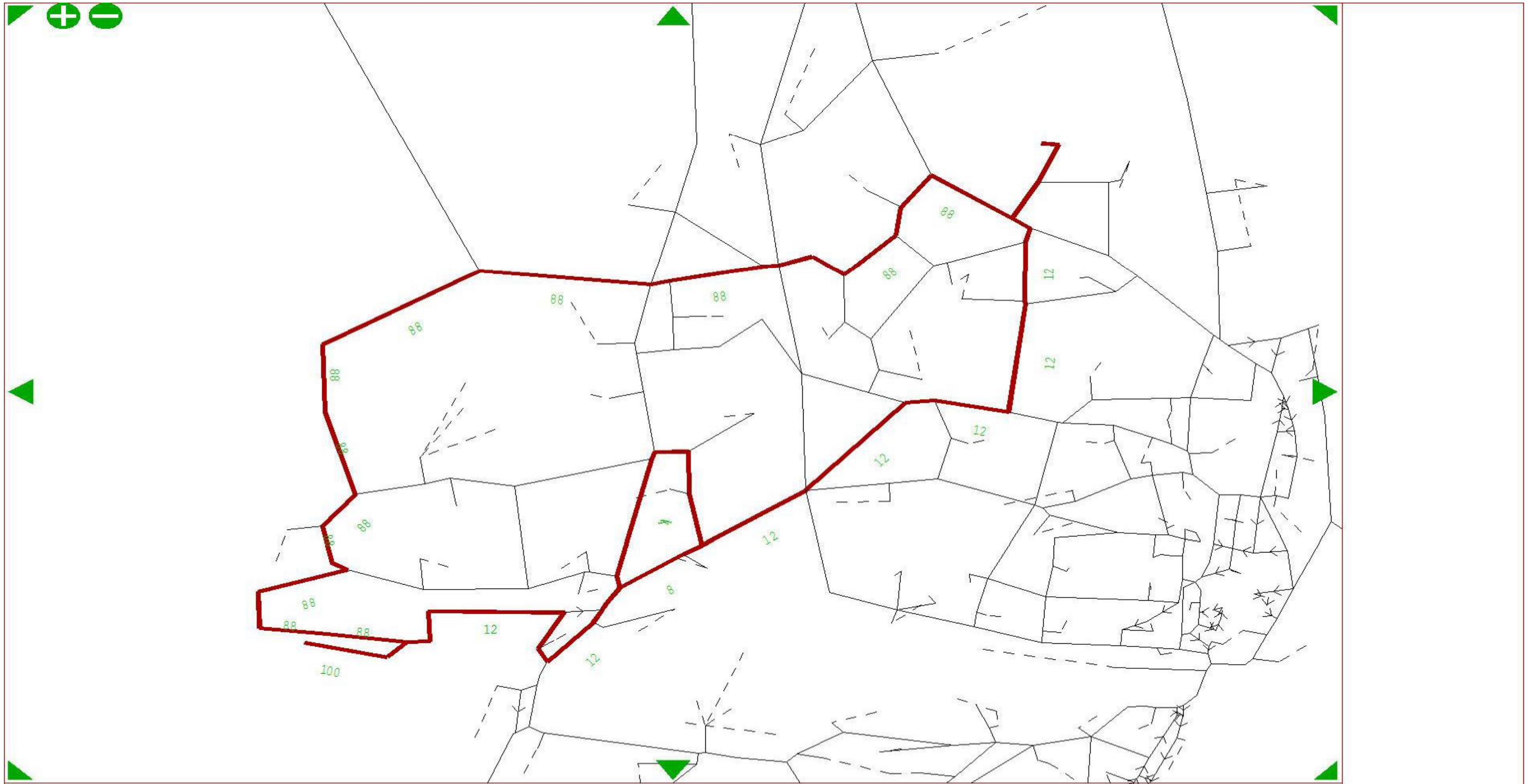
SCTM_2016_PM_Base_V84s 11-10-17

From Zone 409 To Zone 584 - User Class 1



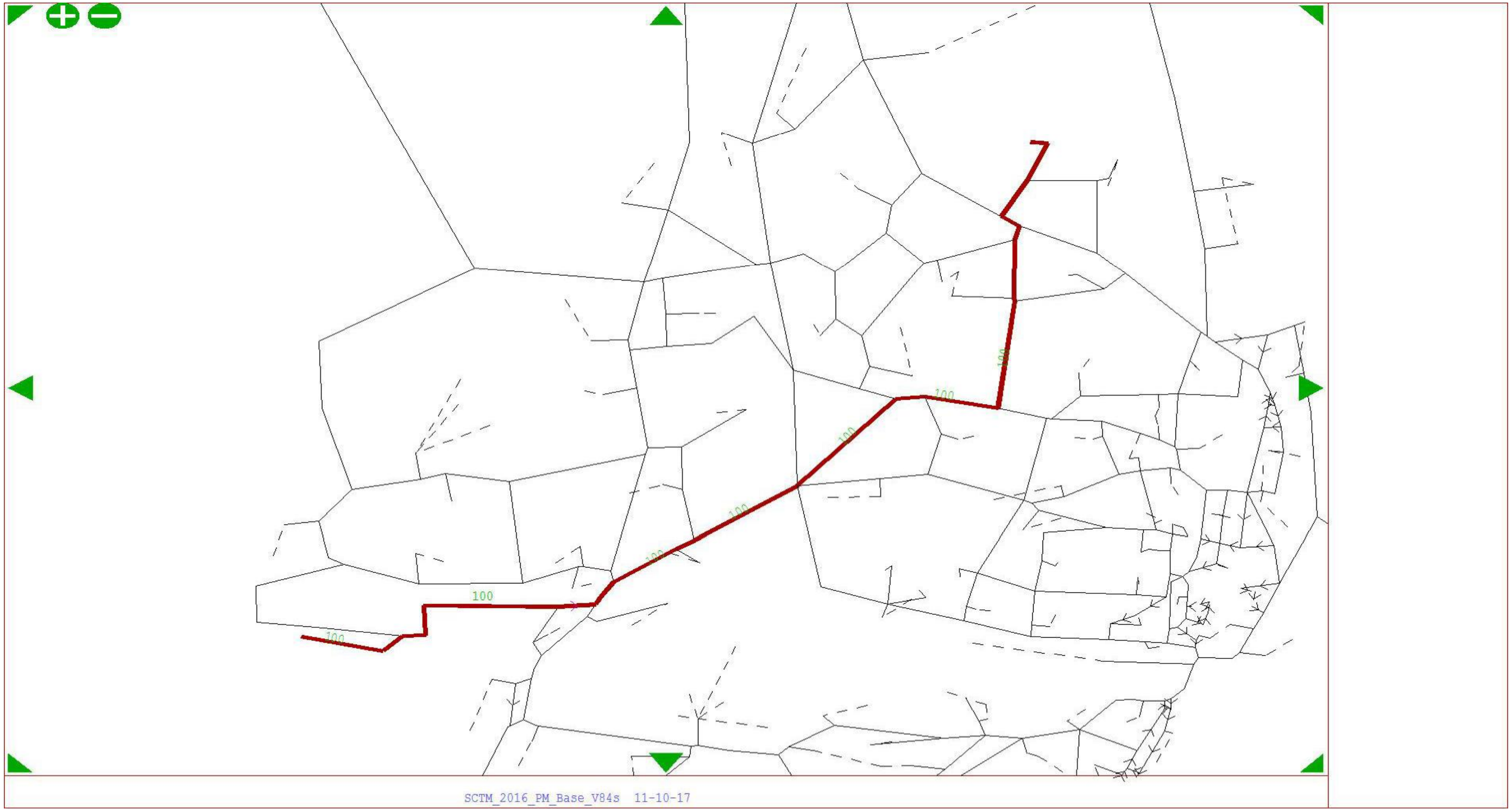
SCTM_2016_PM_Base_V84s 11-10-17

From Zone 409 To Zone 584 - User Class 10

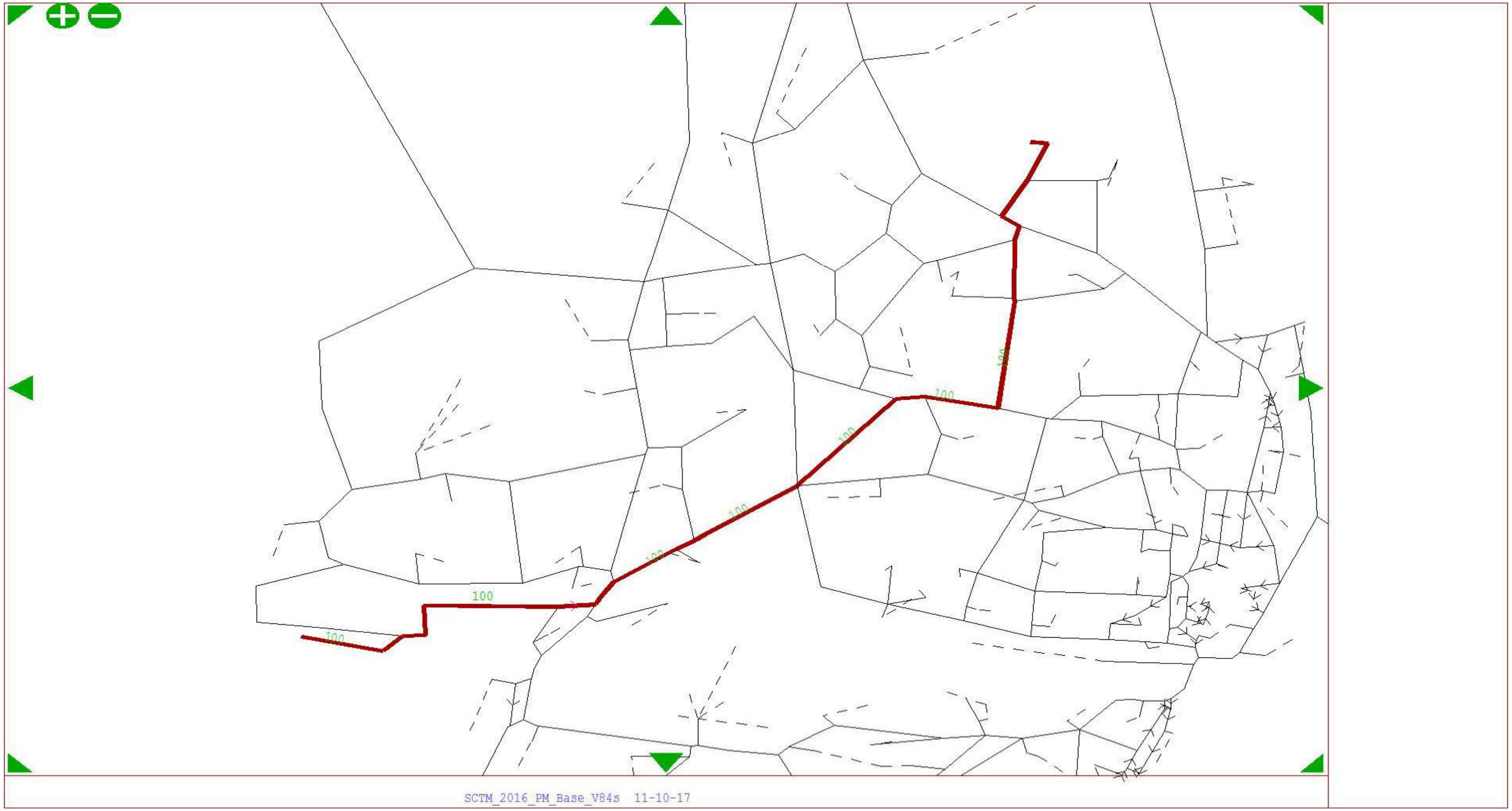


SCTM_2016_PM_Base_V84s 11-10-17

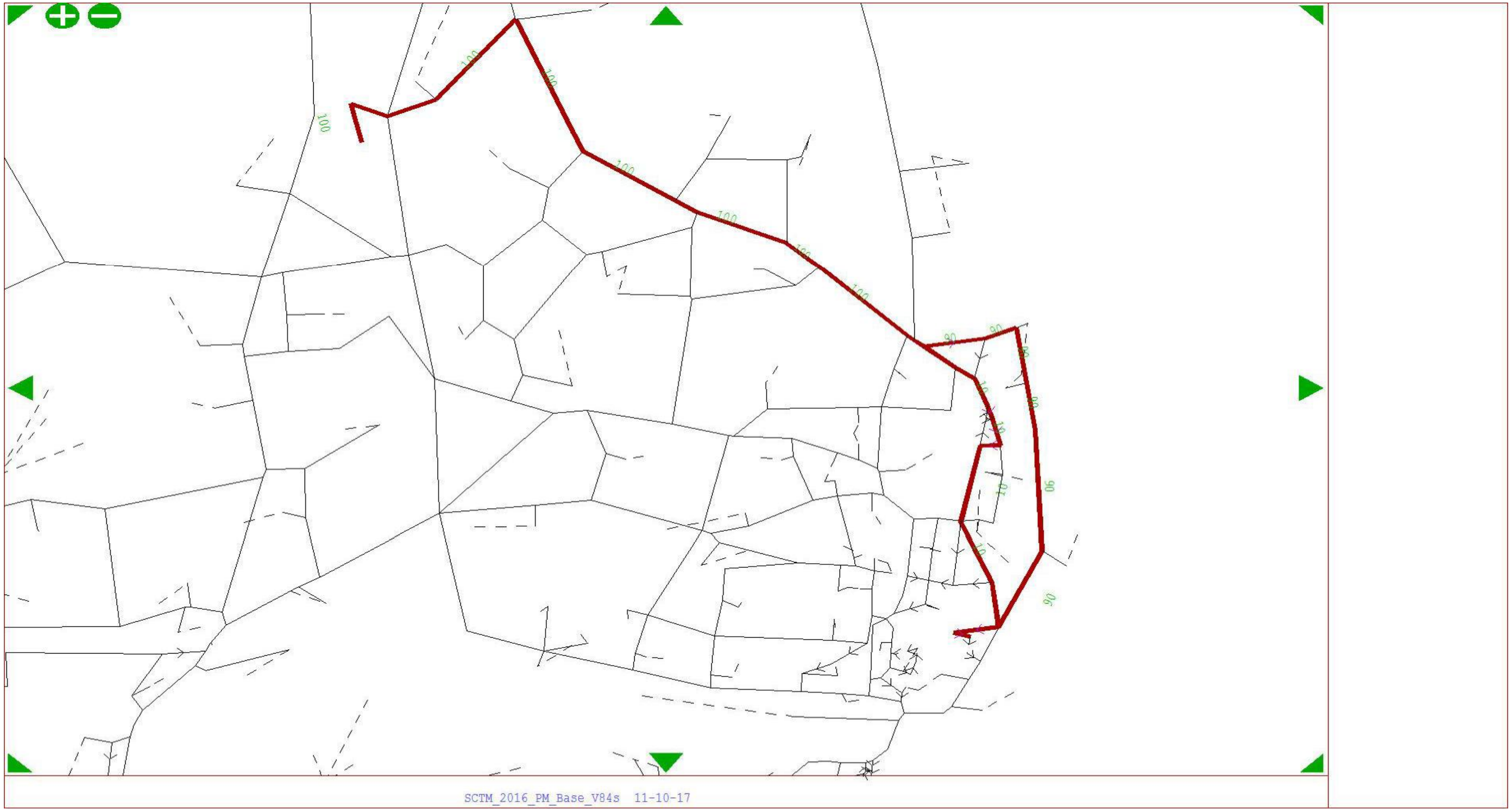
From Zone 584 To Zone 409 - User Class 1



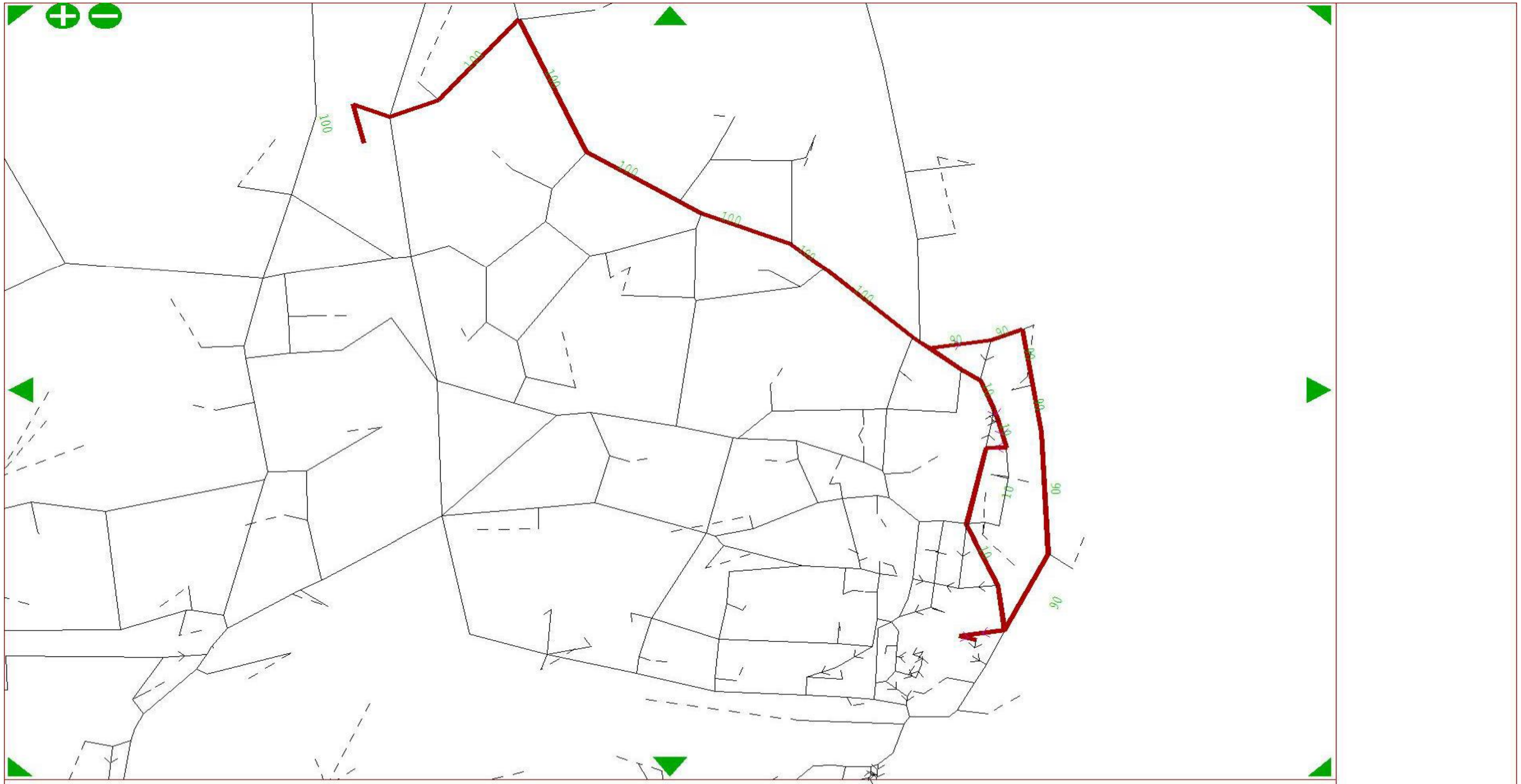
From Zone 584 To Zone 409 - User Class 10



From Zone 586 To Zone 762 - User Class 1

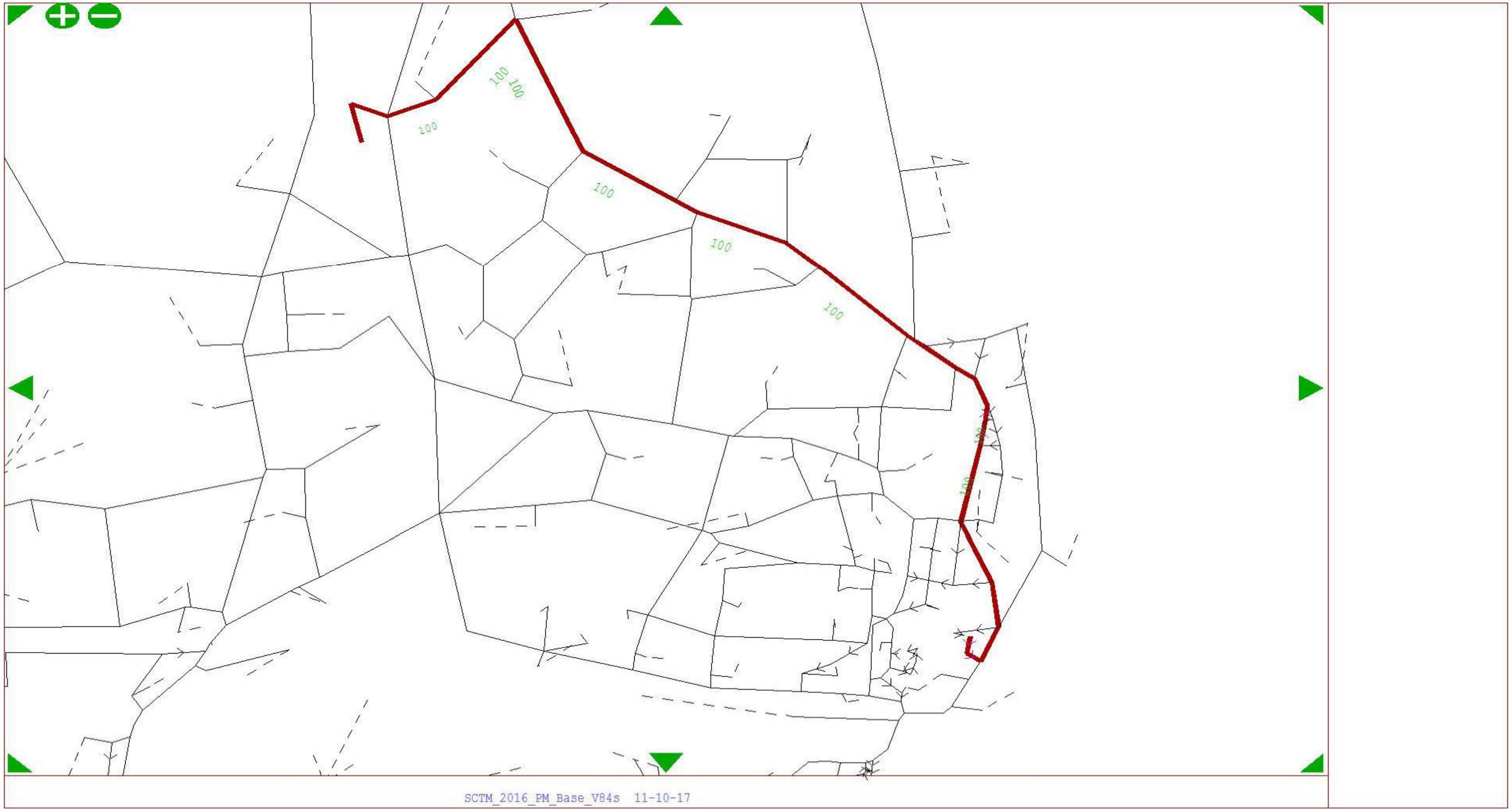


From Zone 586 To Zone 762 - User Class 10

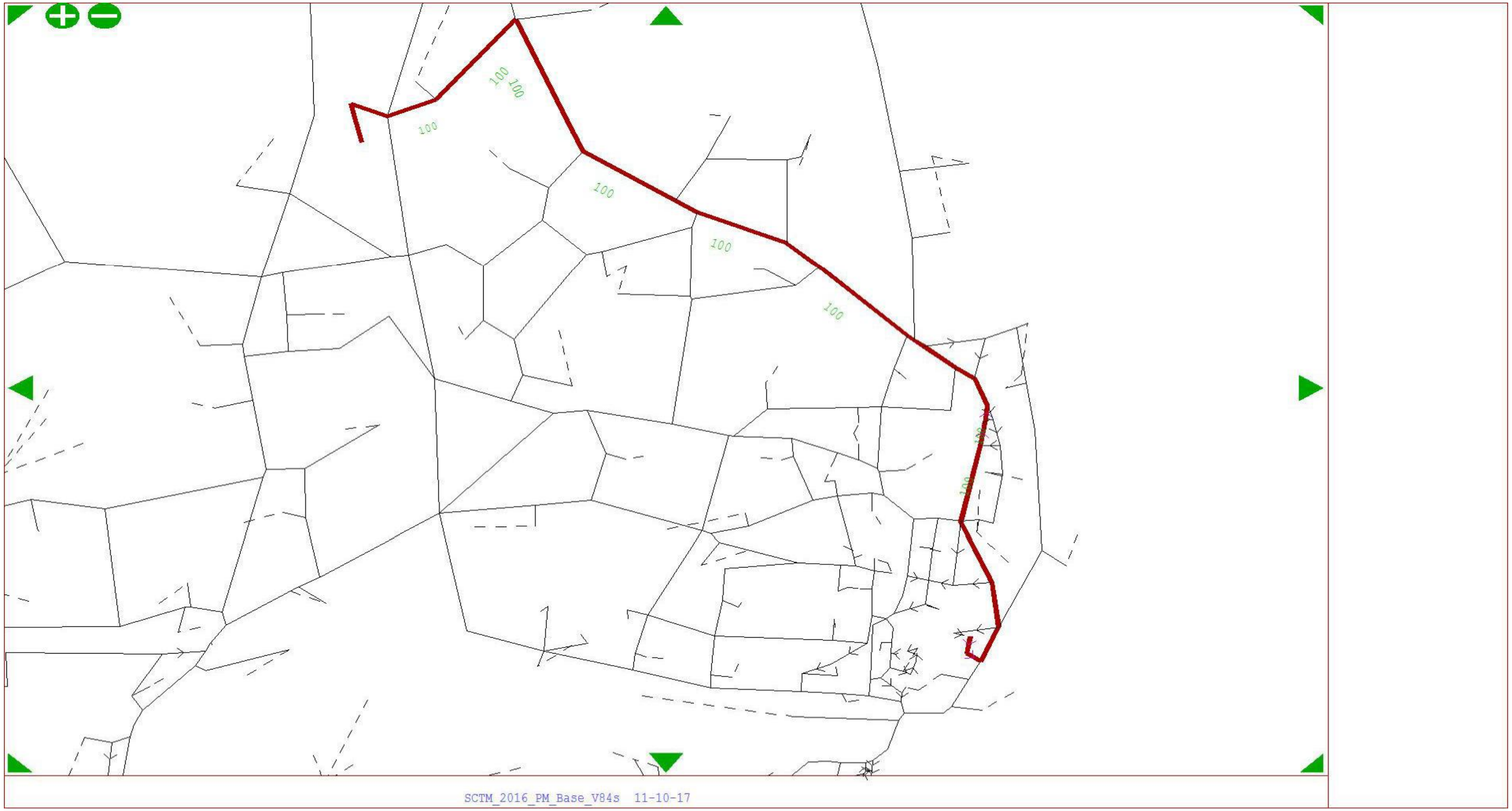


SCTM_2016_PM_Base_V84s 11-10-17

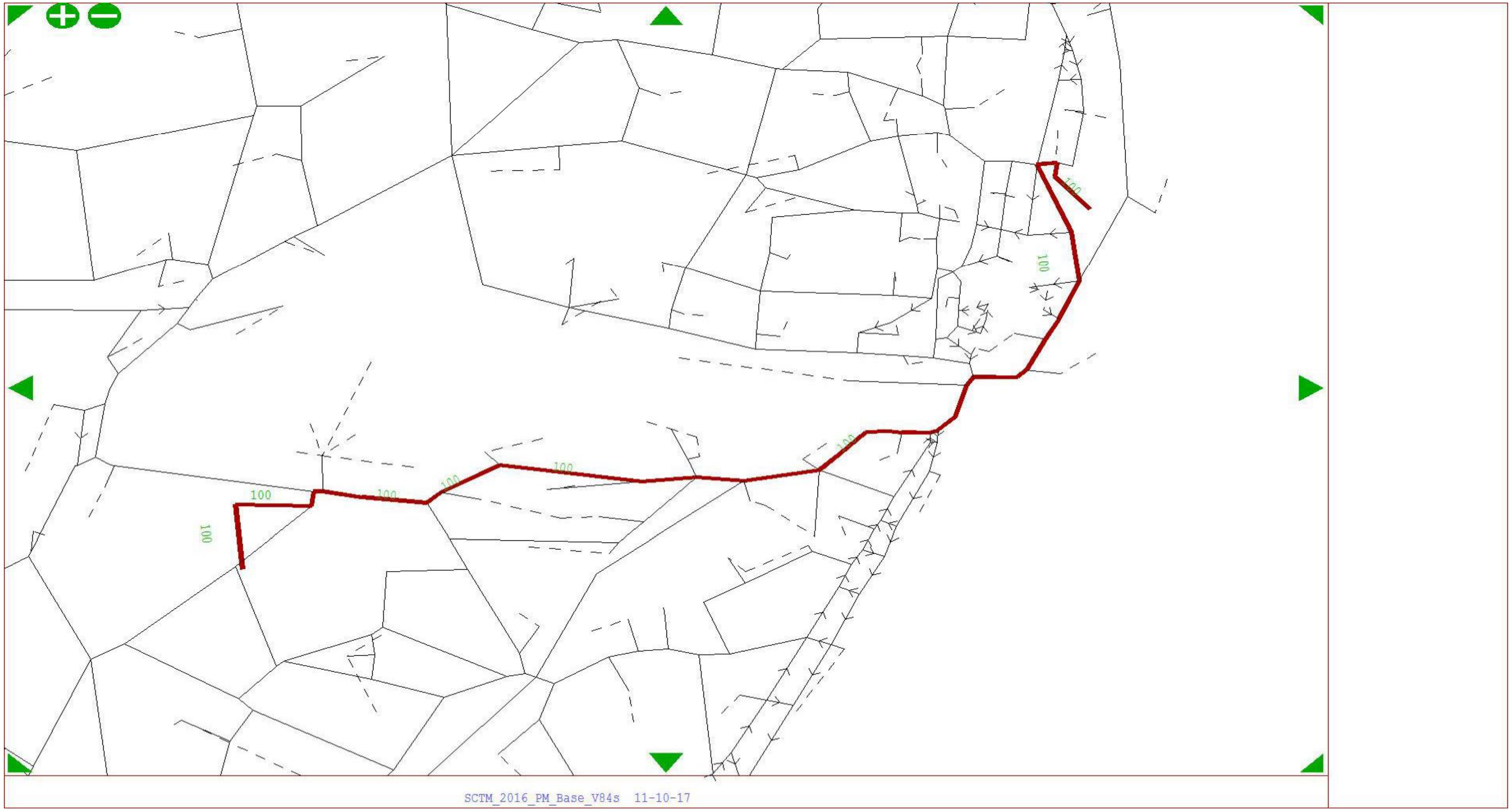
From Zone 762 To Zone 586 - User Class 1



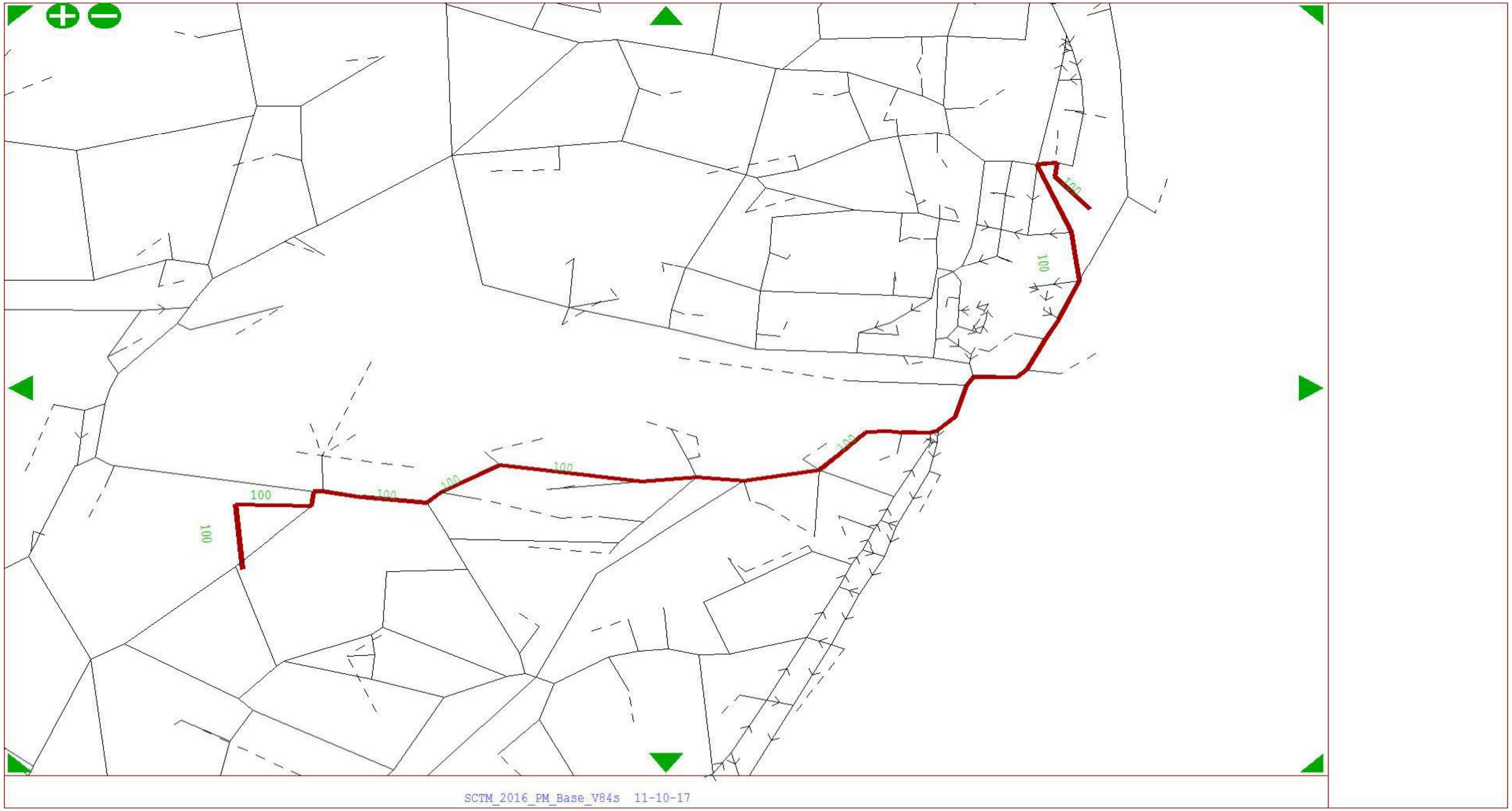
From Zone 762 To Zone 586 - User Class 10



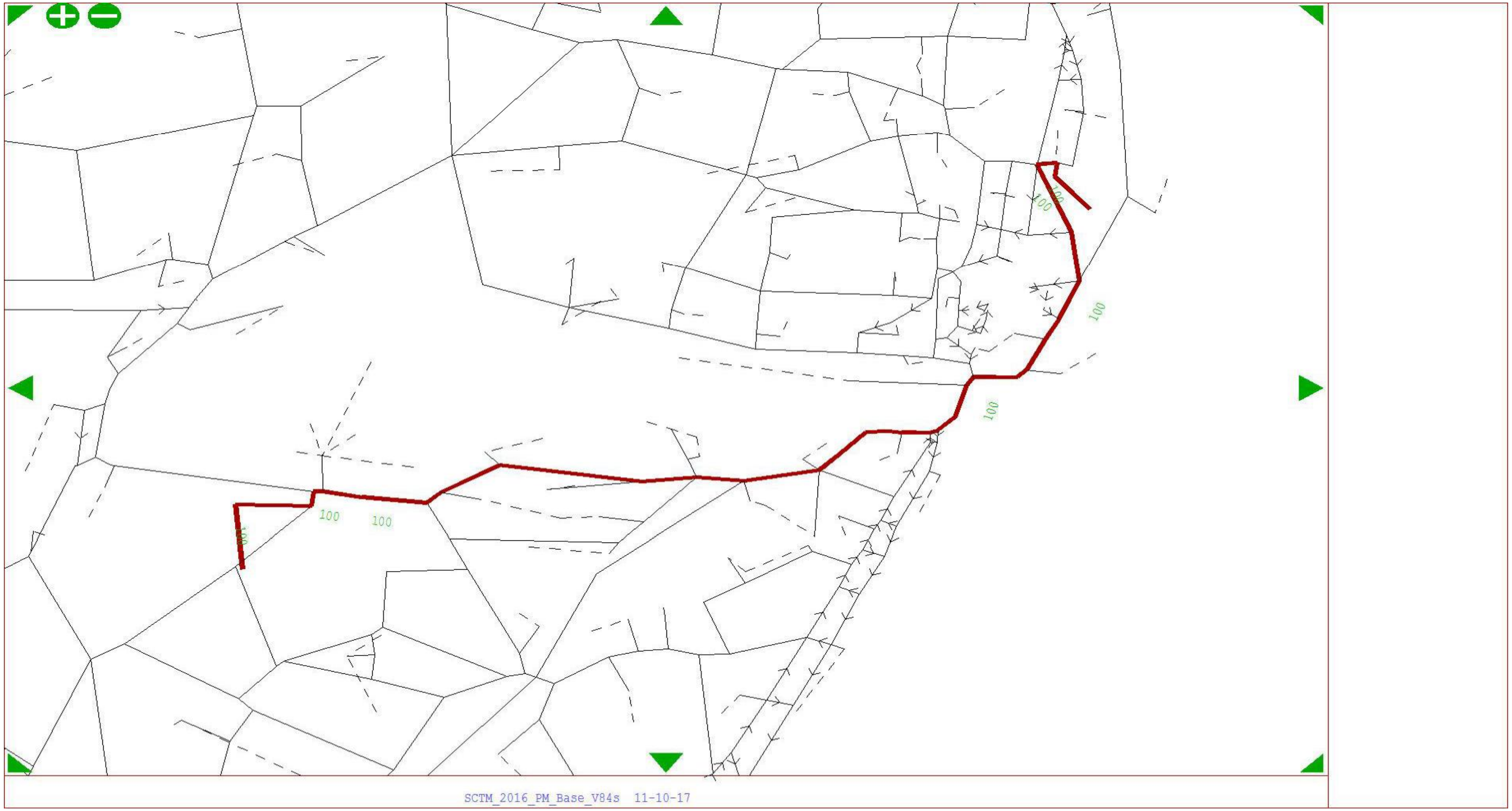
From Zone 432 To Zone 761 - User Class 1



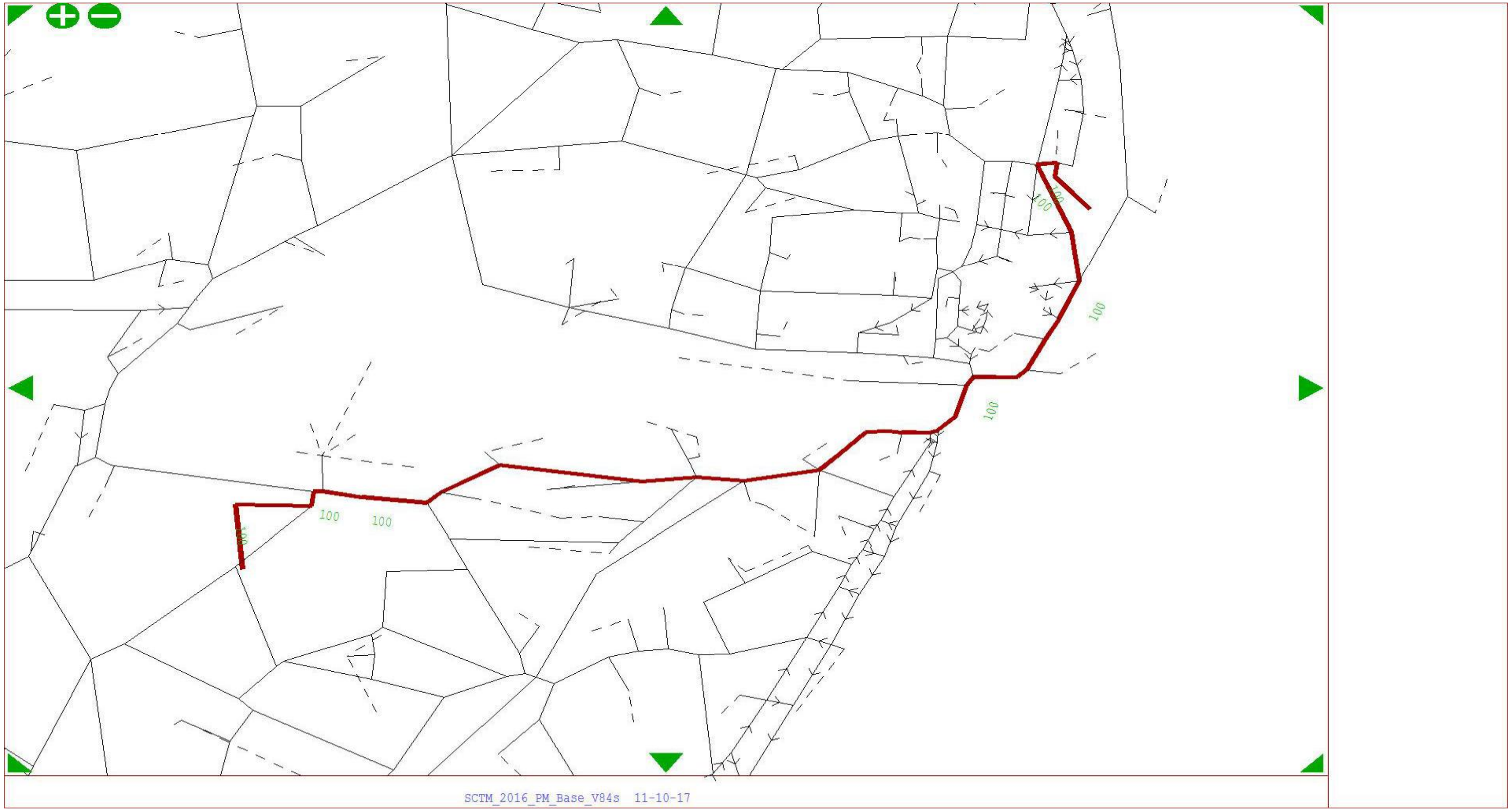
From Zone 432 To Zone 761 - User Class 10



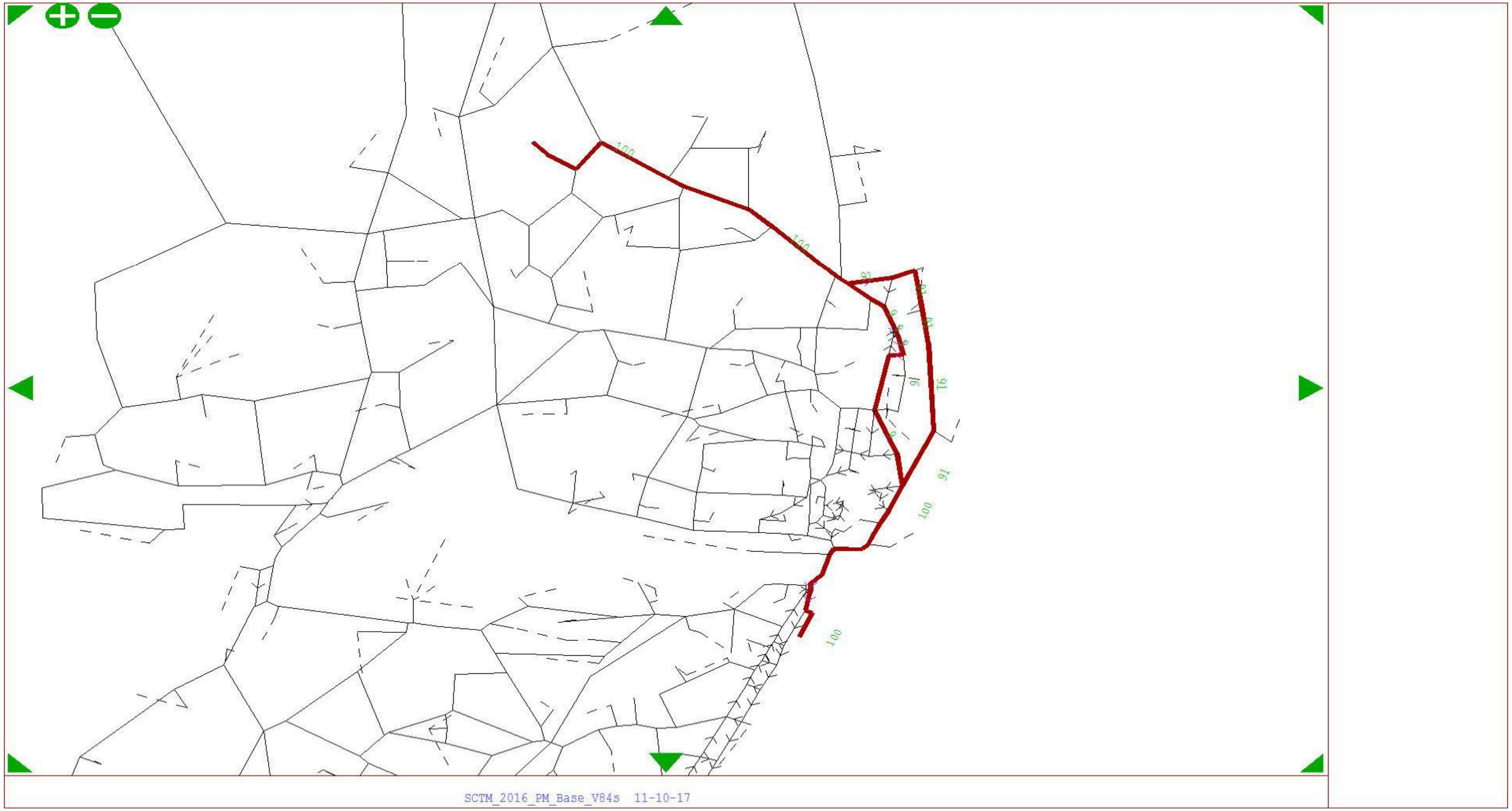
From Zone 761 To Zone 432 - User Class 1



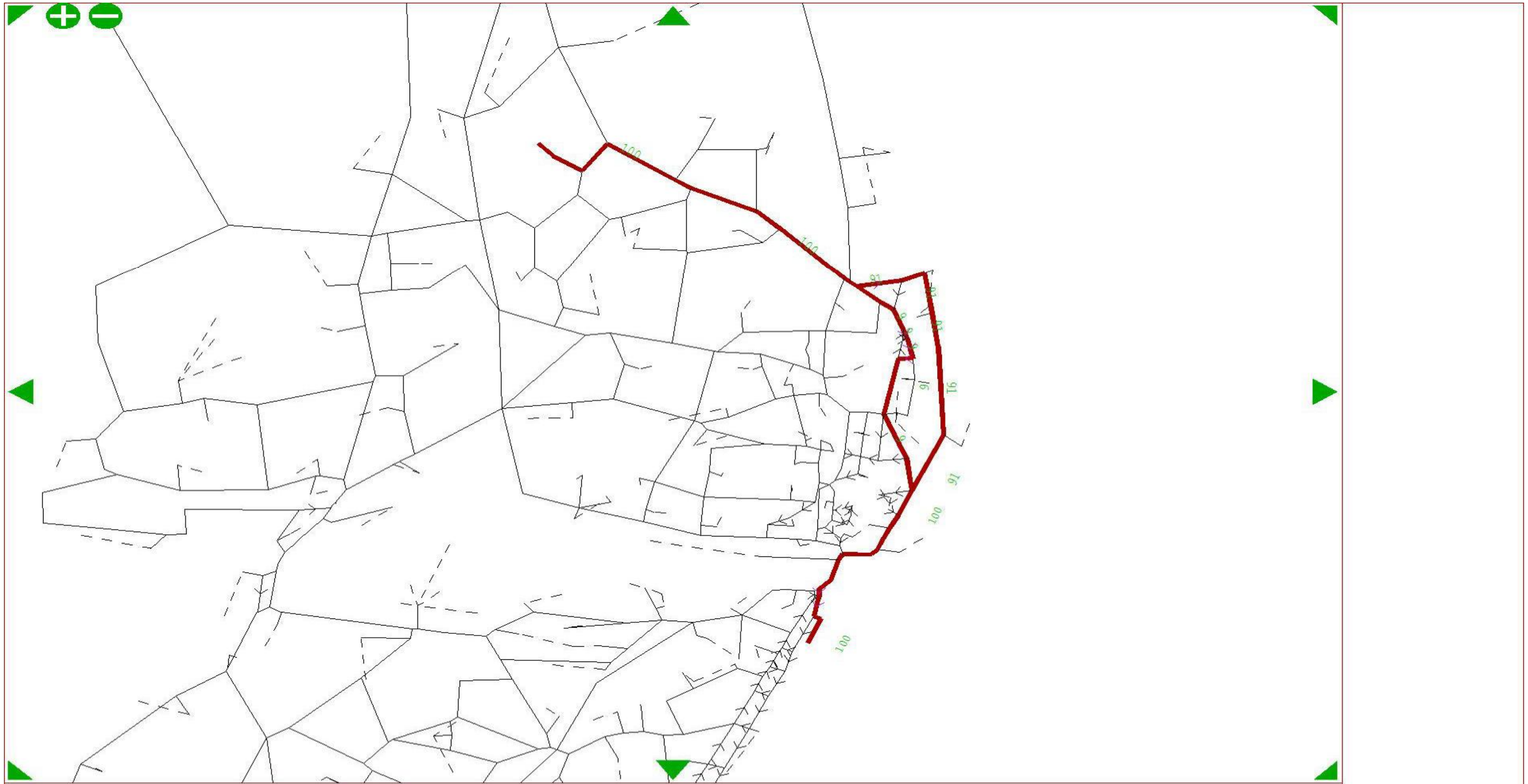
From Zone 761 To Zone 432 - User Class 10



From Zone 416 To Zone 588 - User Class 1

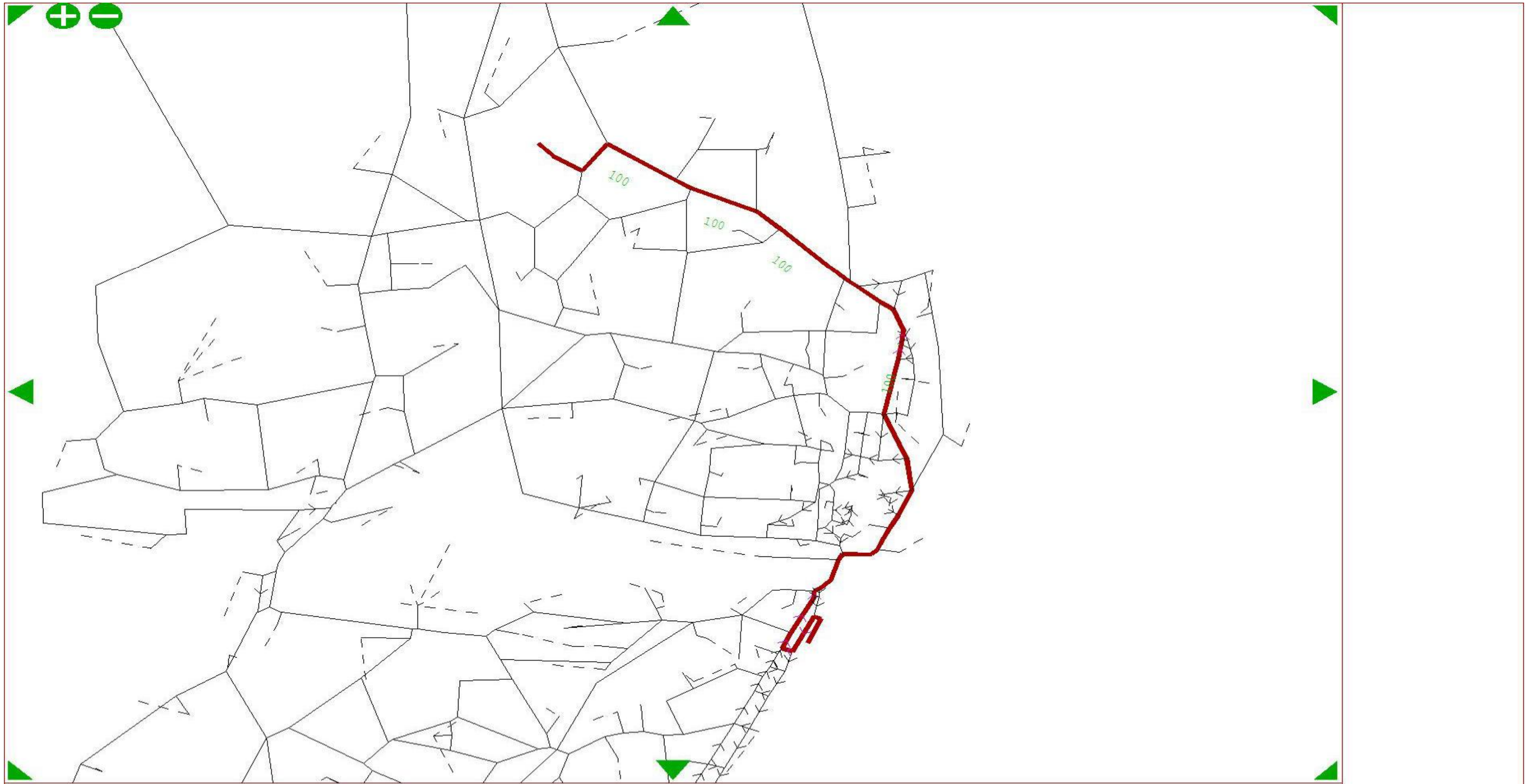


From Zone 416 To Zone 588 - User Class 10



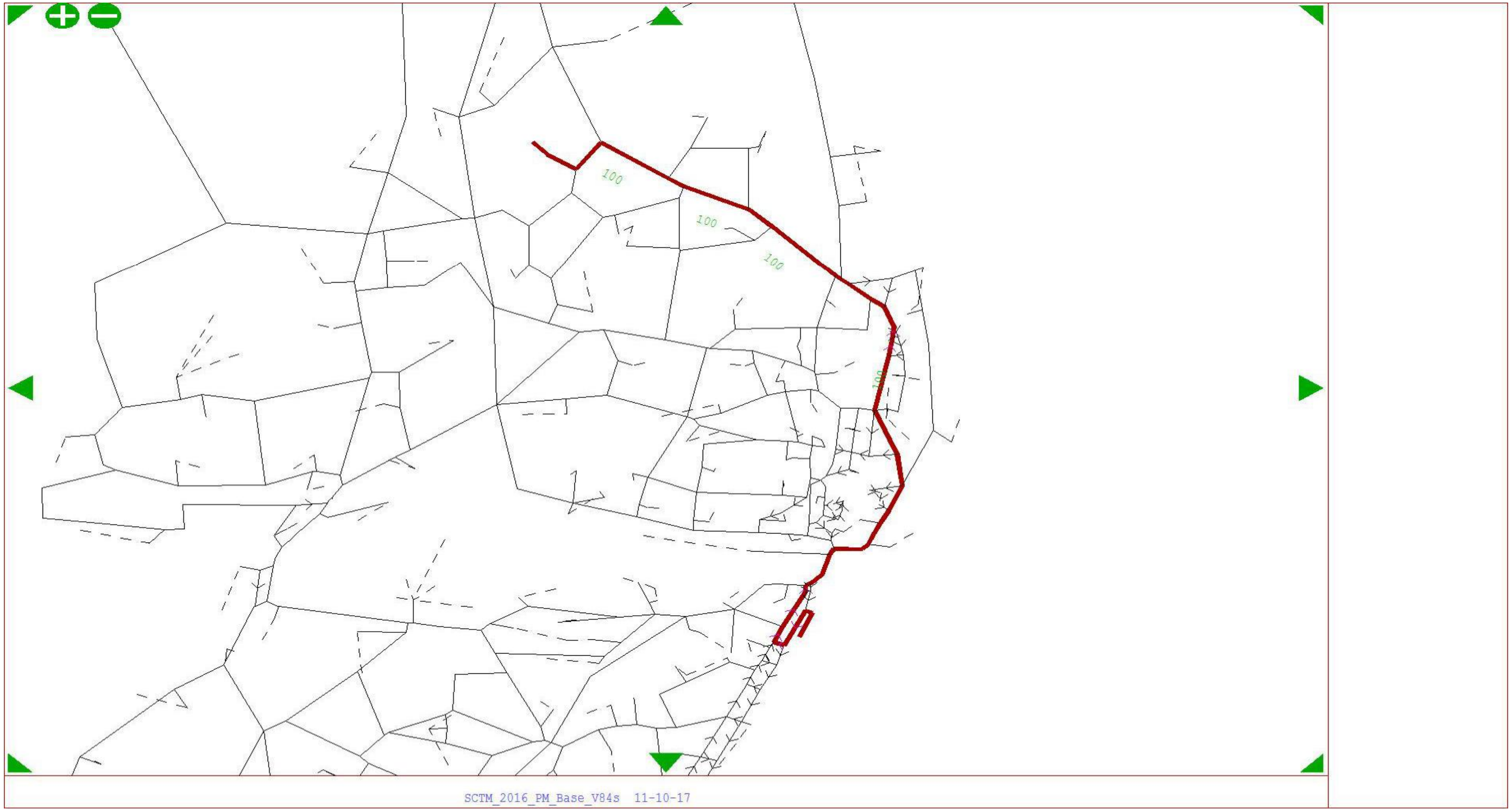
SCTM_2016_PM_Base_V84s 11-10-17

From Zone 588 To Zone 416 - User Class 1

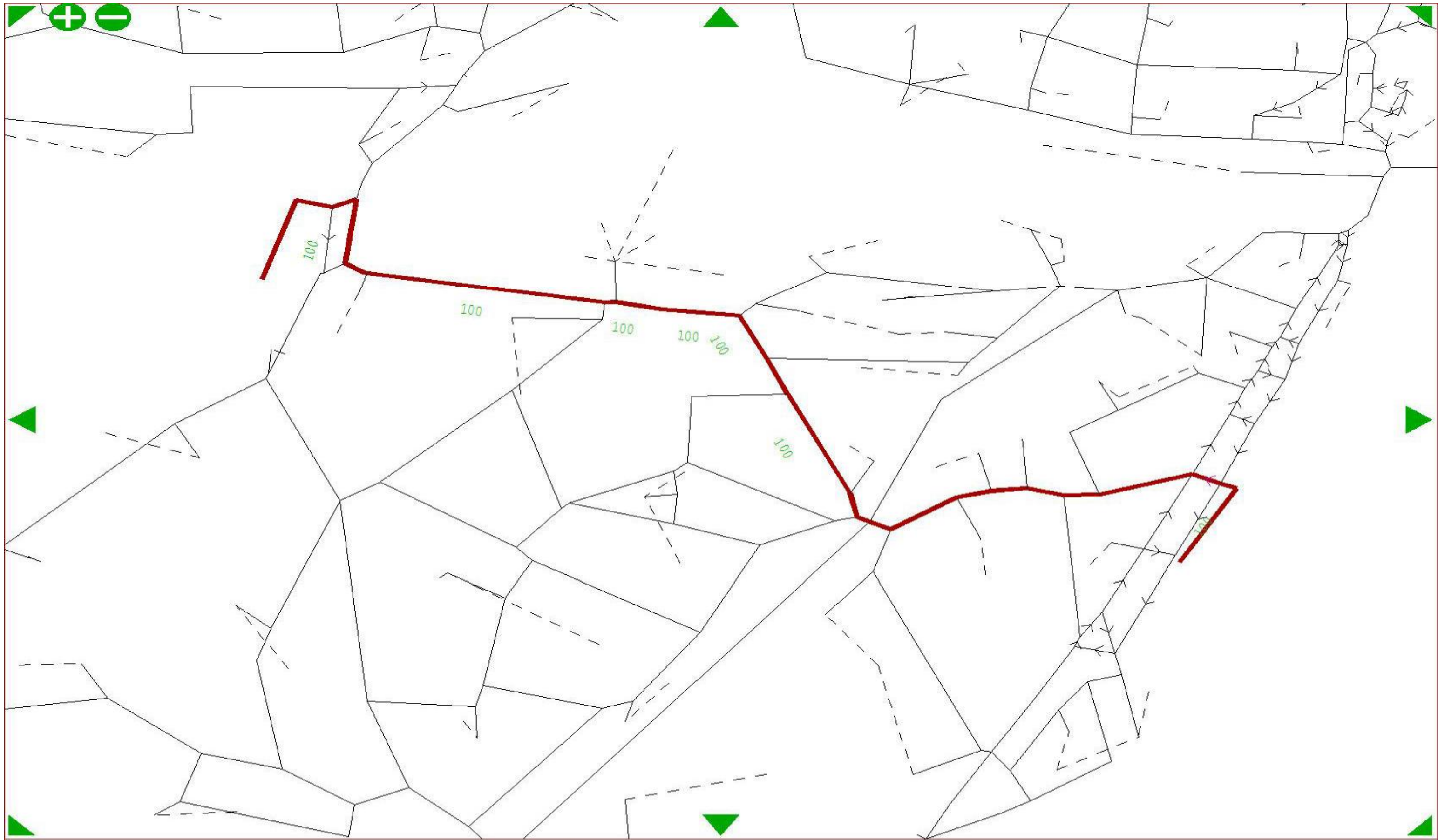


SCTM_2016_PM_Base_V84s 11-10-17

From Zone 588 To Zone 416 - User Class 10

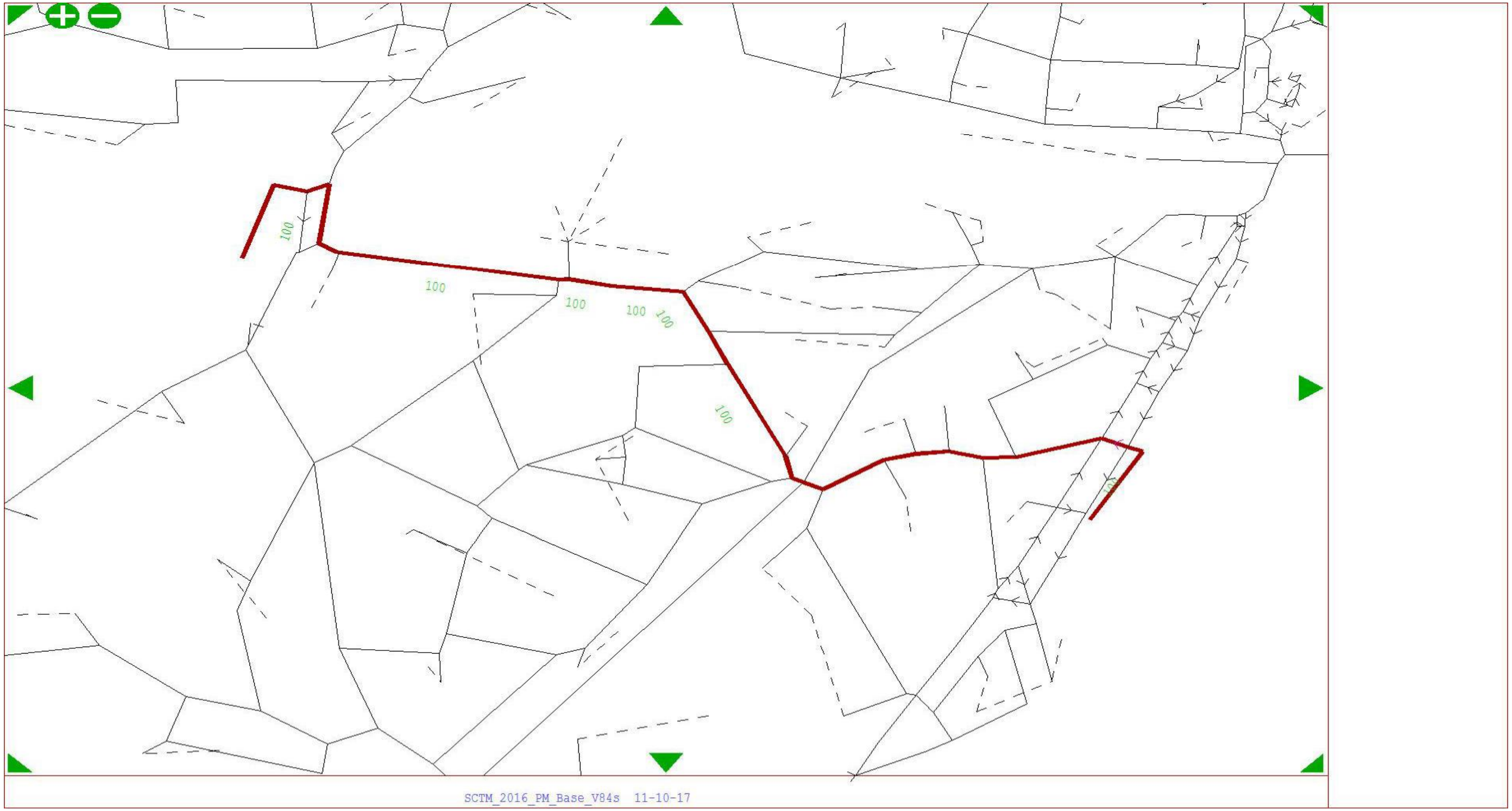


From Zone 593 To Zone 598 - User Class 1

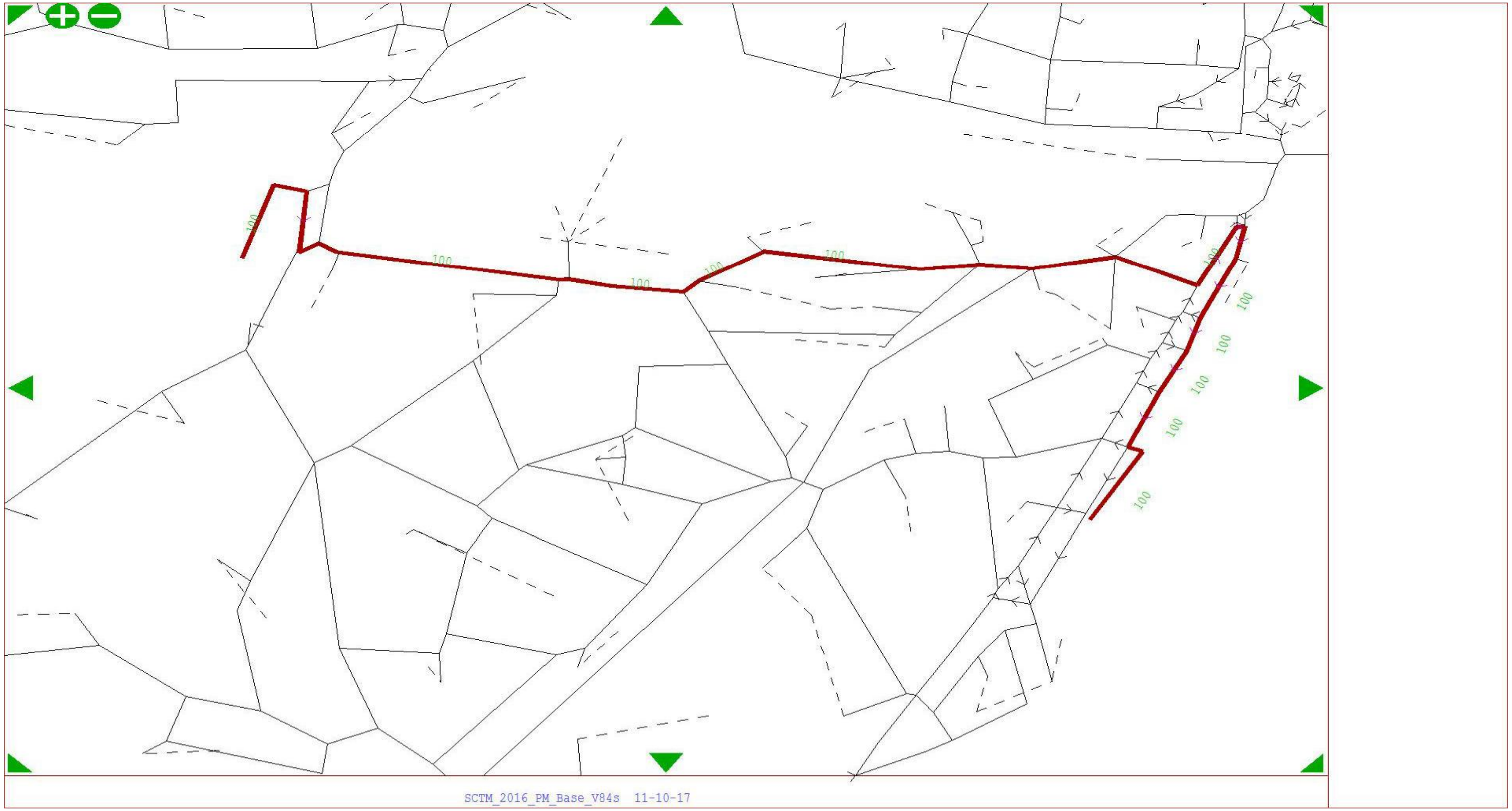


SCTM_2016_PM_Base_V84s 11-10-17

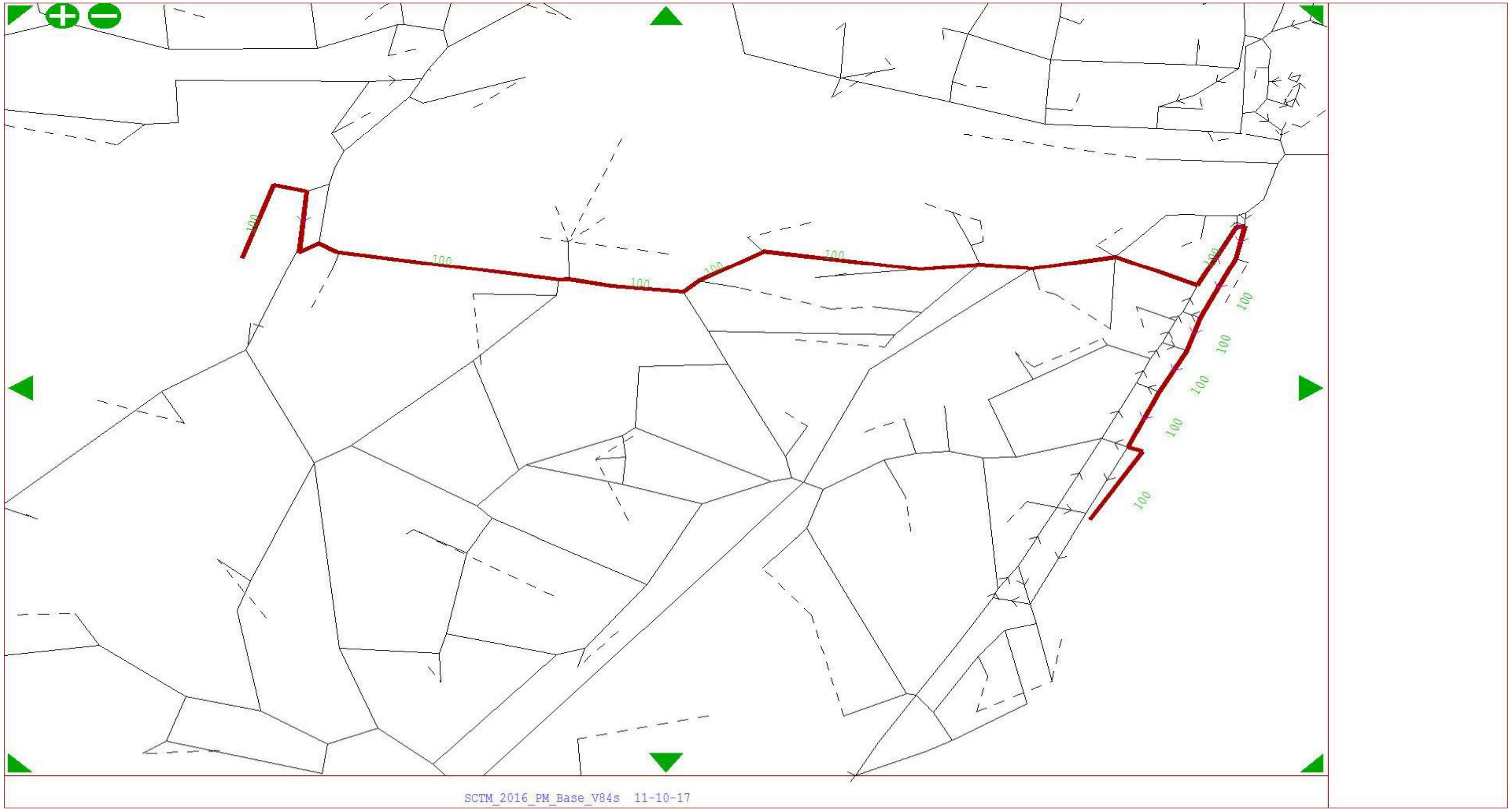
From Zone 593 To Zone 598 - User Class 10



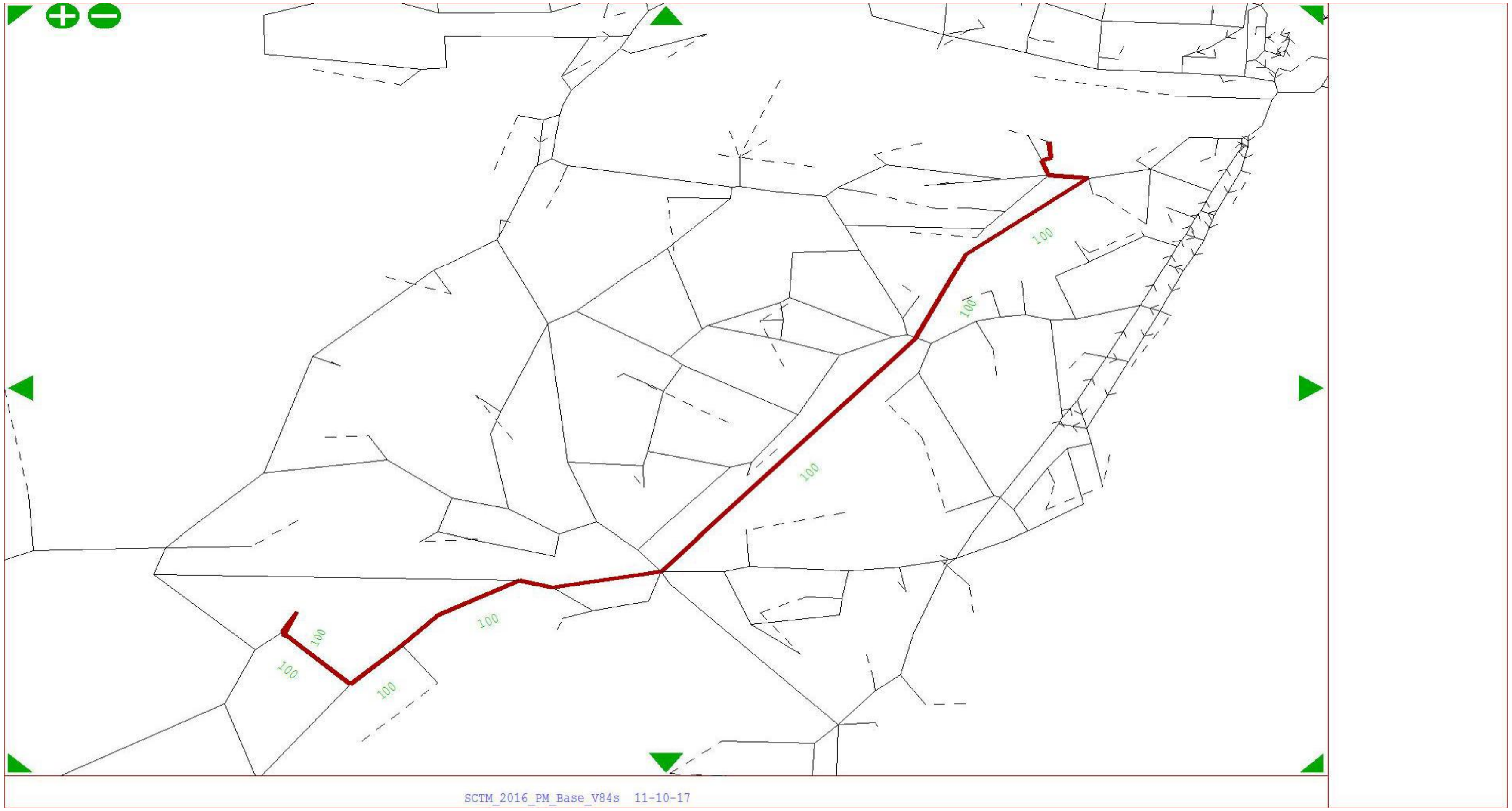
From Zone 598 To Zone 593 - User Class 1



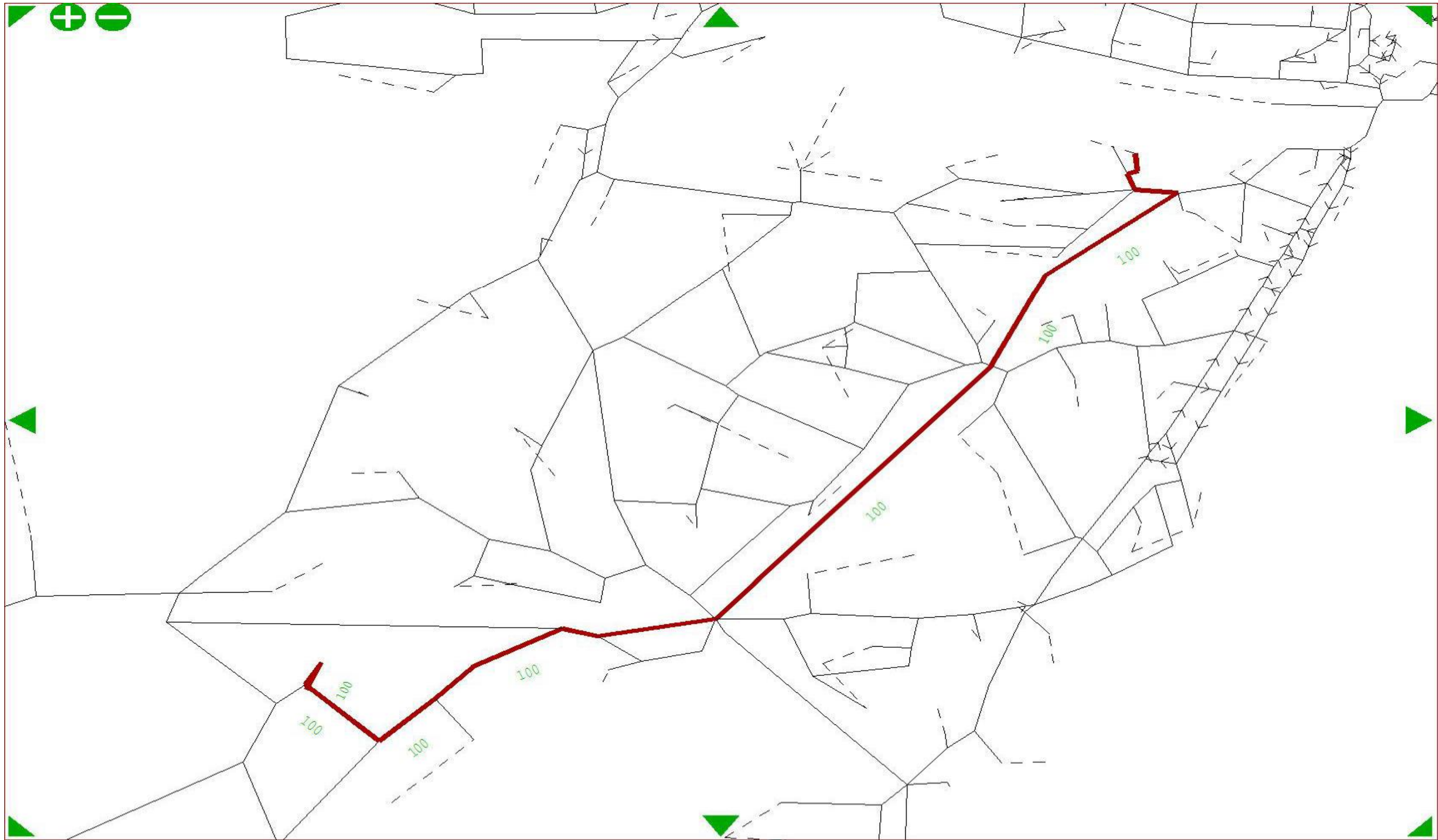
From Zone 598 To Zone 593 - User Class 10



From Zone 773 To Zone 782 - User Class 1

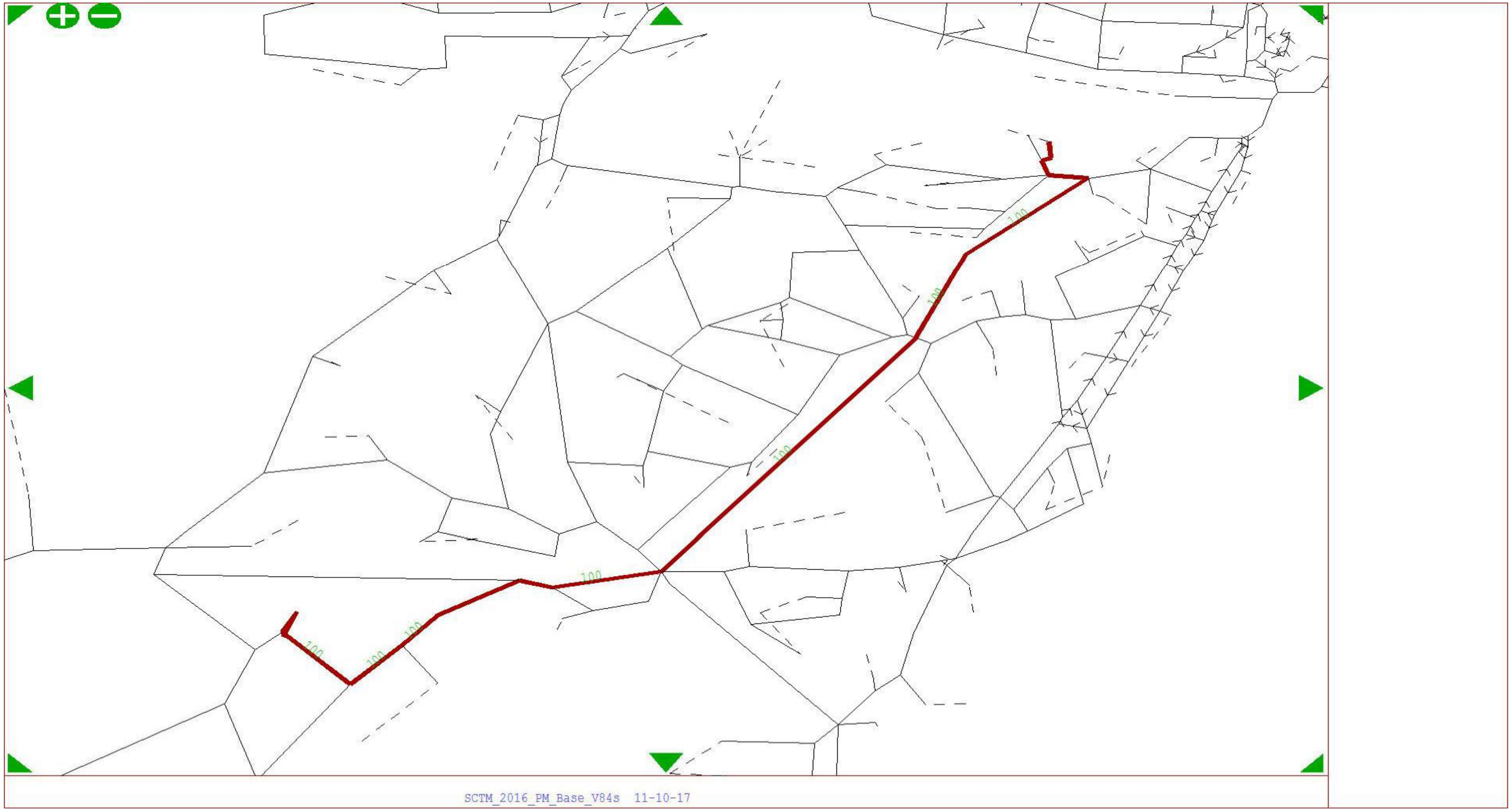


From Zone 773 To Zone 782 - User Class 10

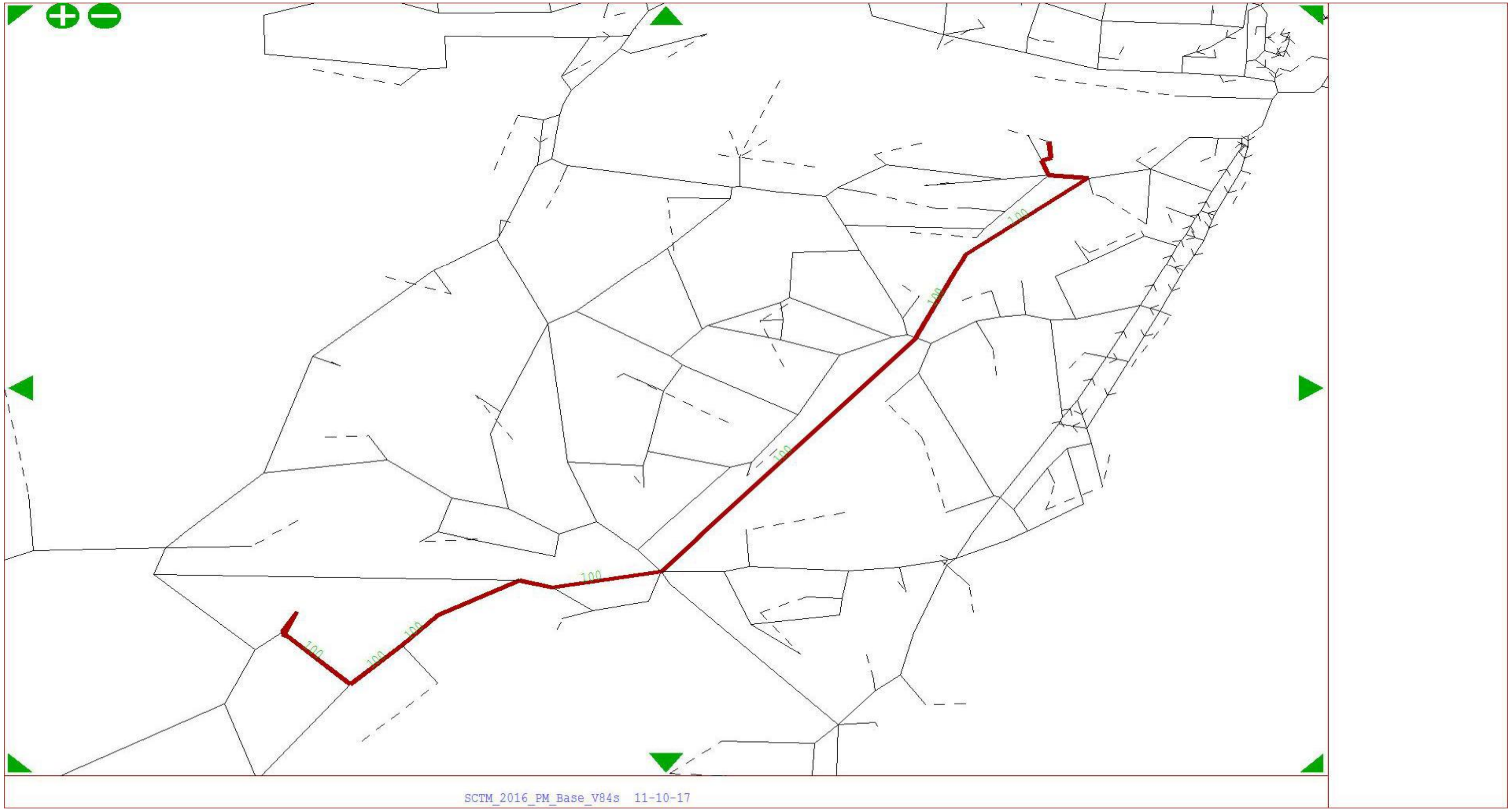


SCTM_2016_PM_Base_V84s 11-10-17

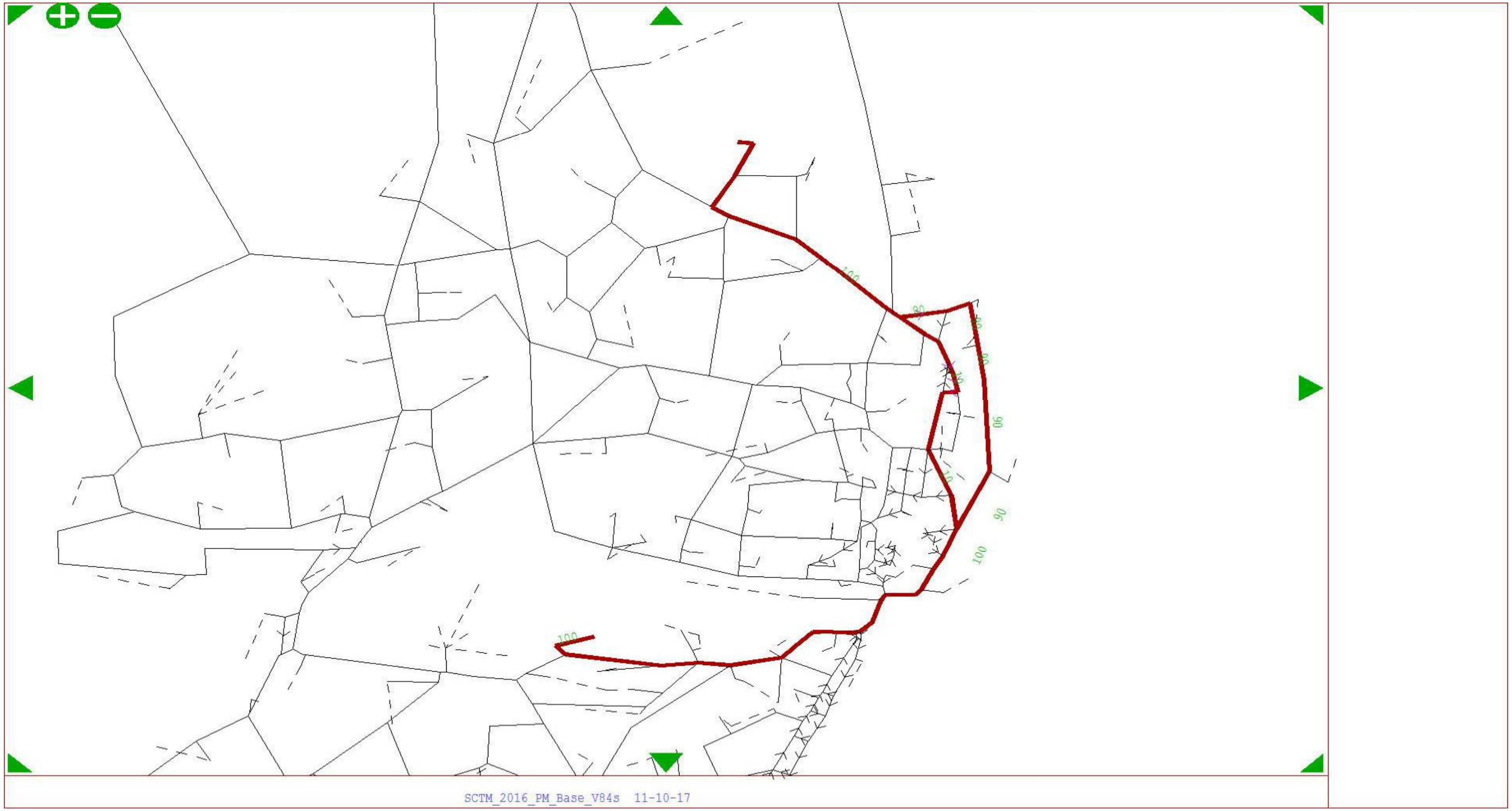
From Zone 782 To Zone 773 - User Class 1



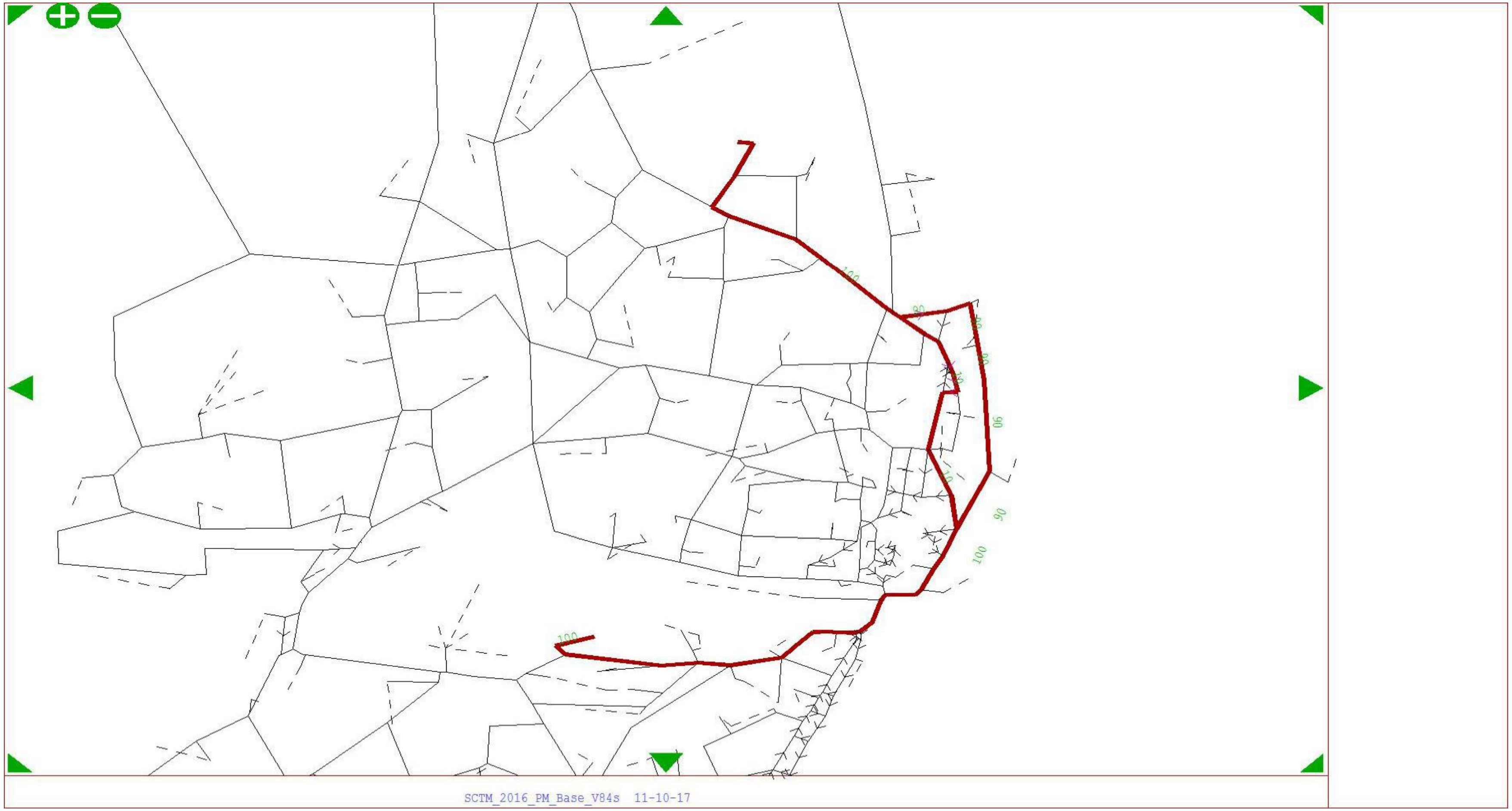
From Zone 782 To Zone 773 - User Class 10



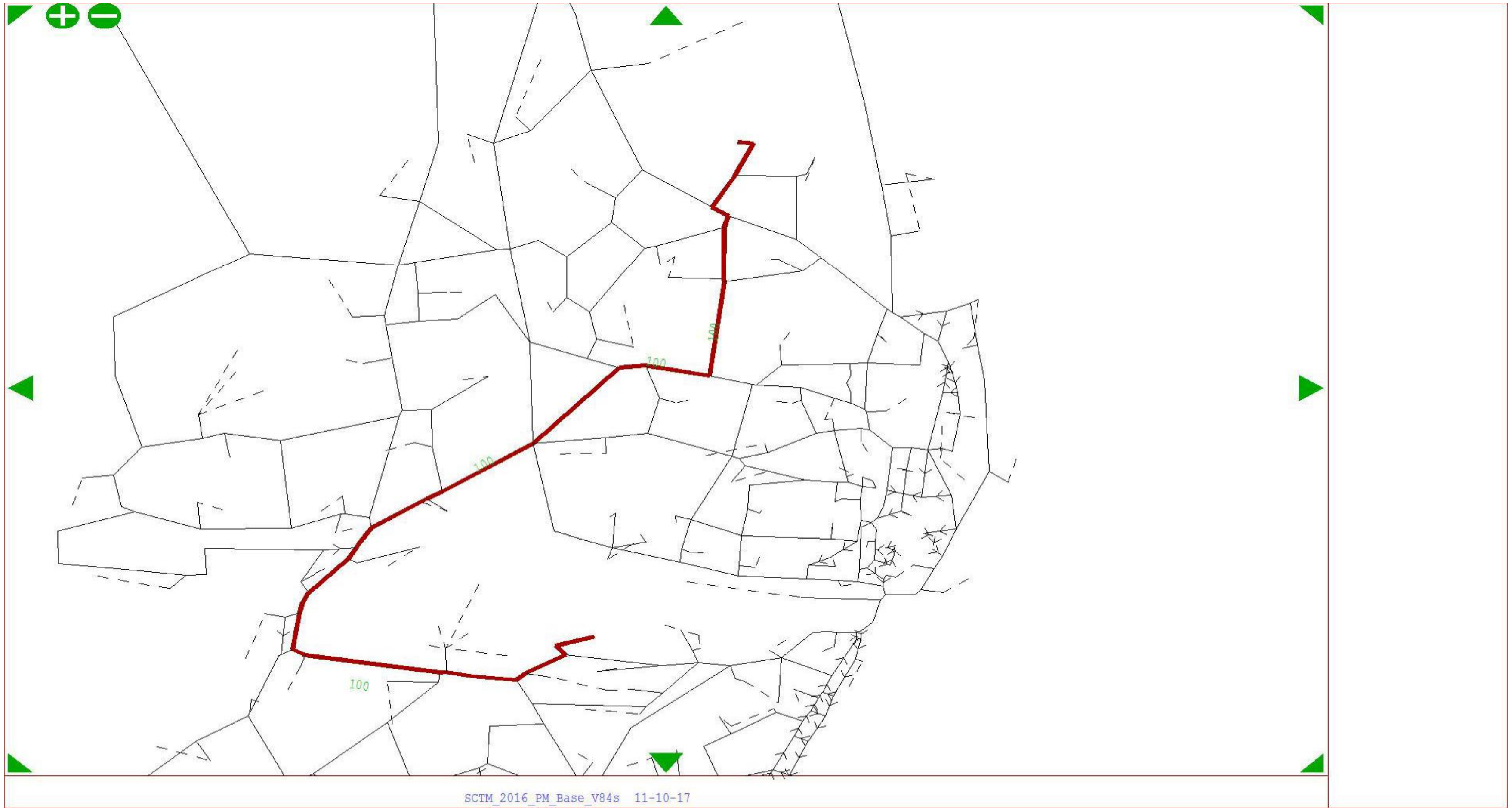
From Zone 409 To Zone 589 - User Class 1



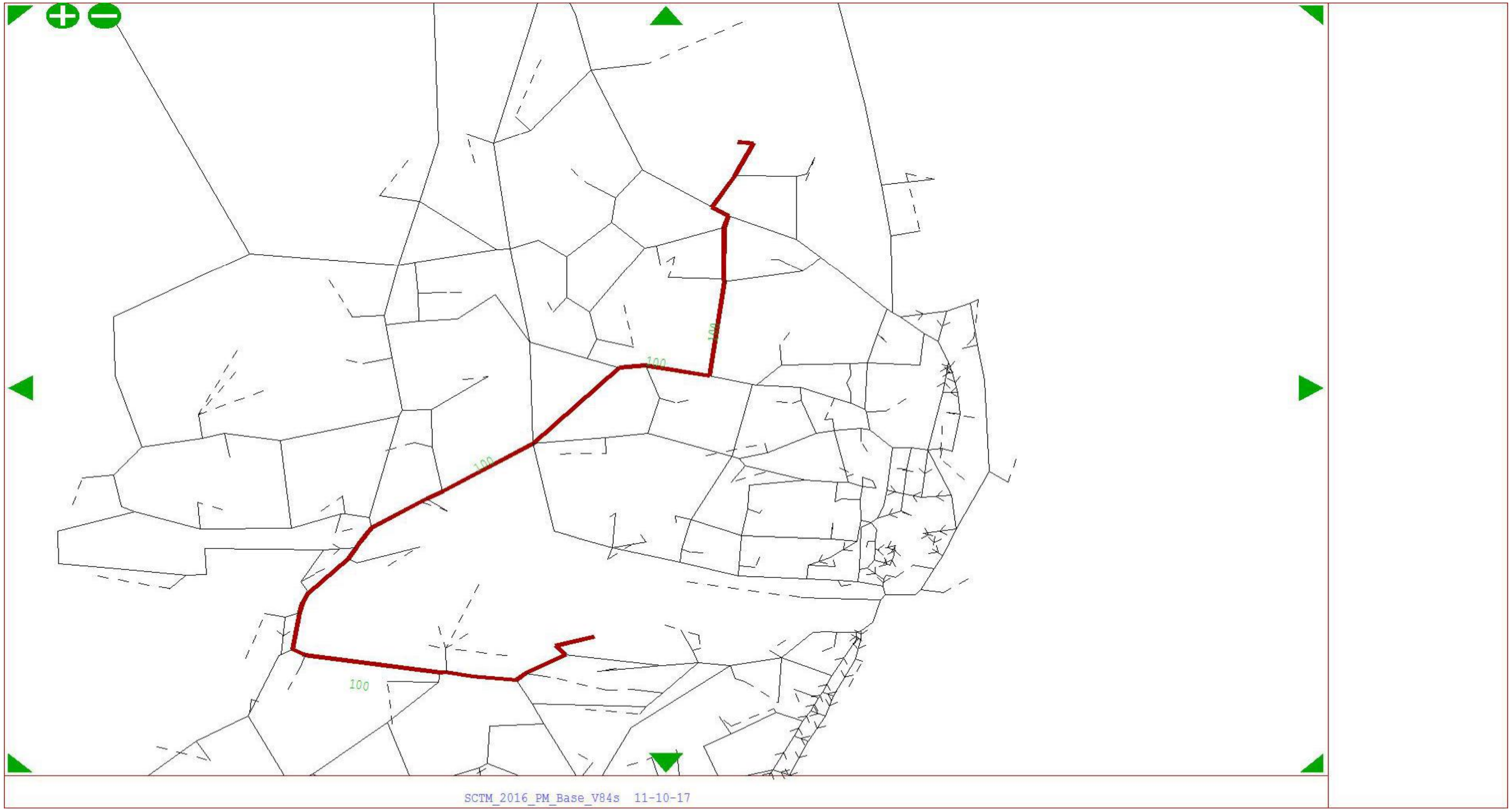
From Zone 409 To Zone 589 - User Class 10



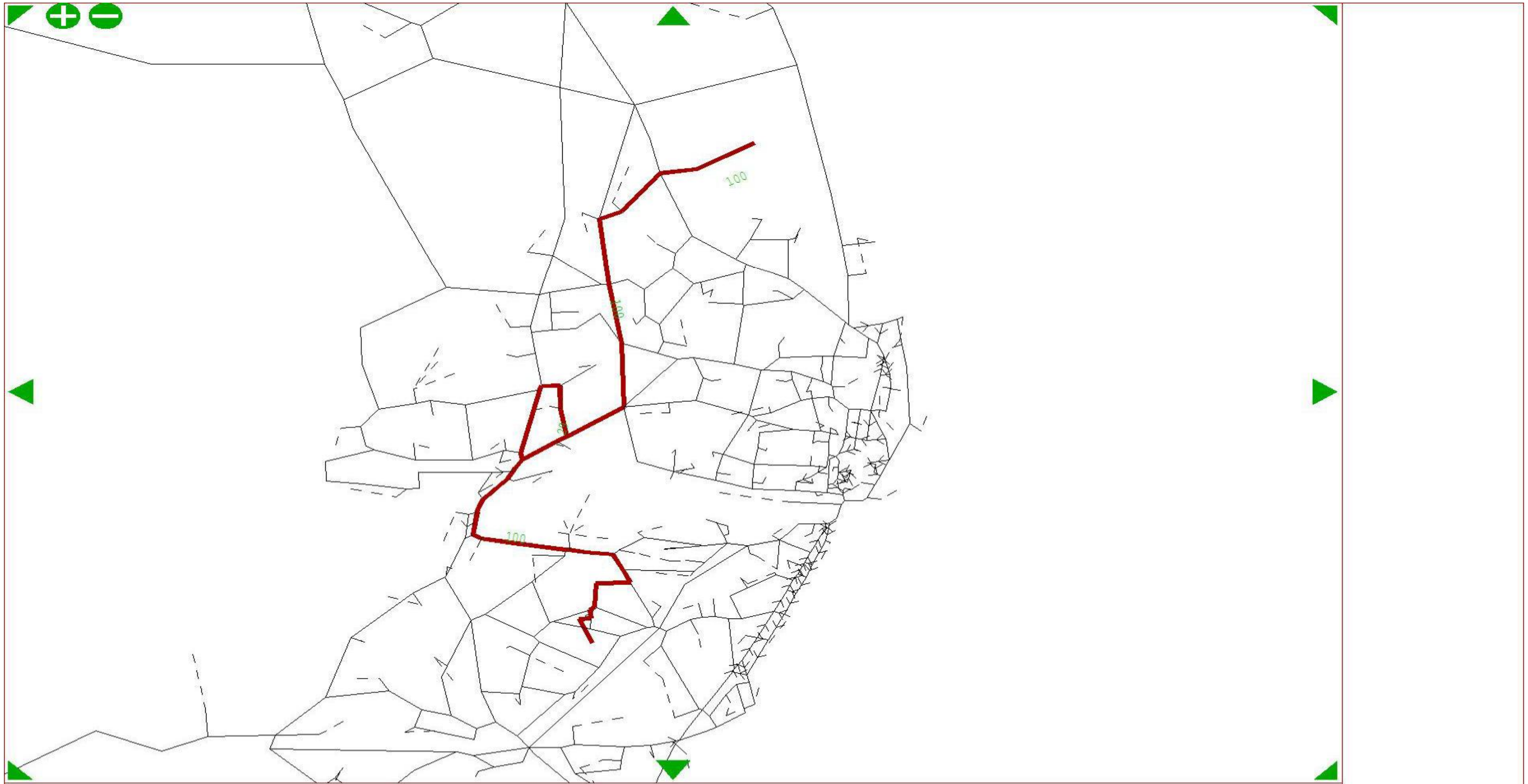
From Zone 589 To Zone 409 - User Class 1



From Zone 589 To Zone 409 - User Class 10

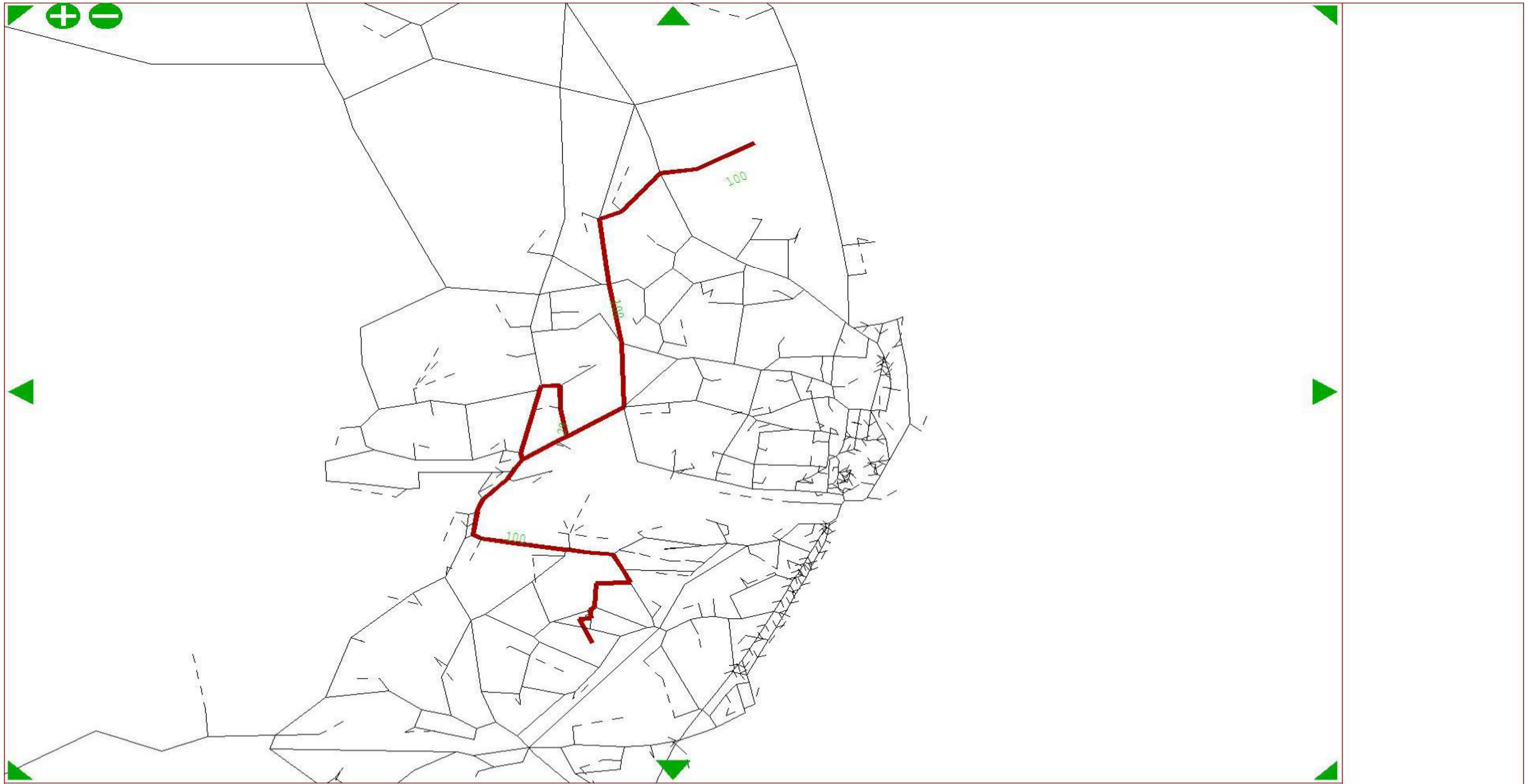


From Zone 587 To Zone 779 - User Class 1



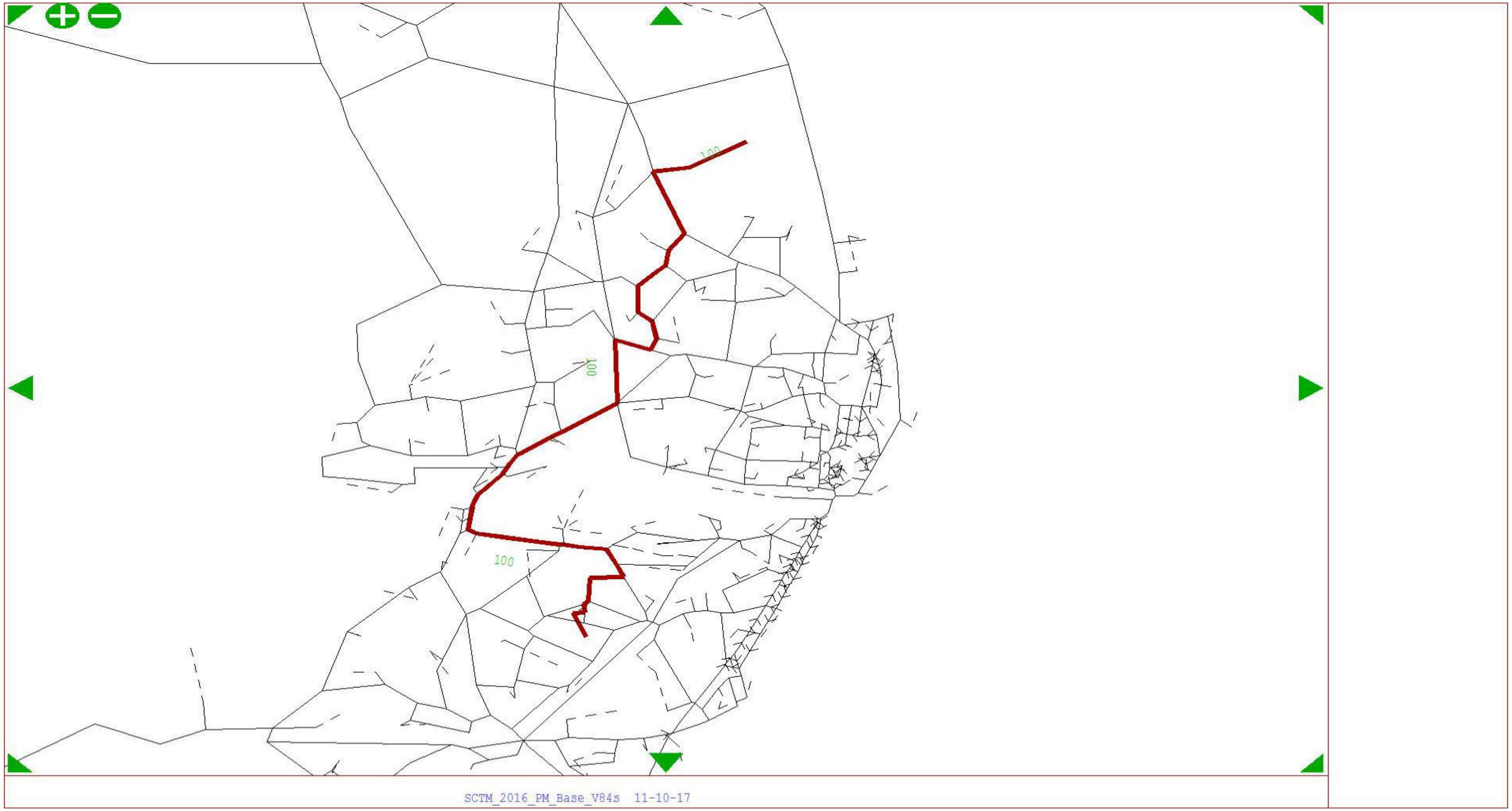
SCTM_2016_PM_Base_V84s 11-10-17

From Zone 587 To Zone 779 - User Class 10

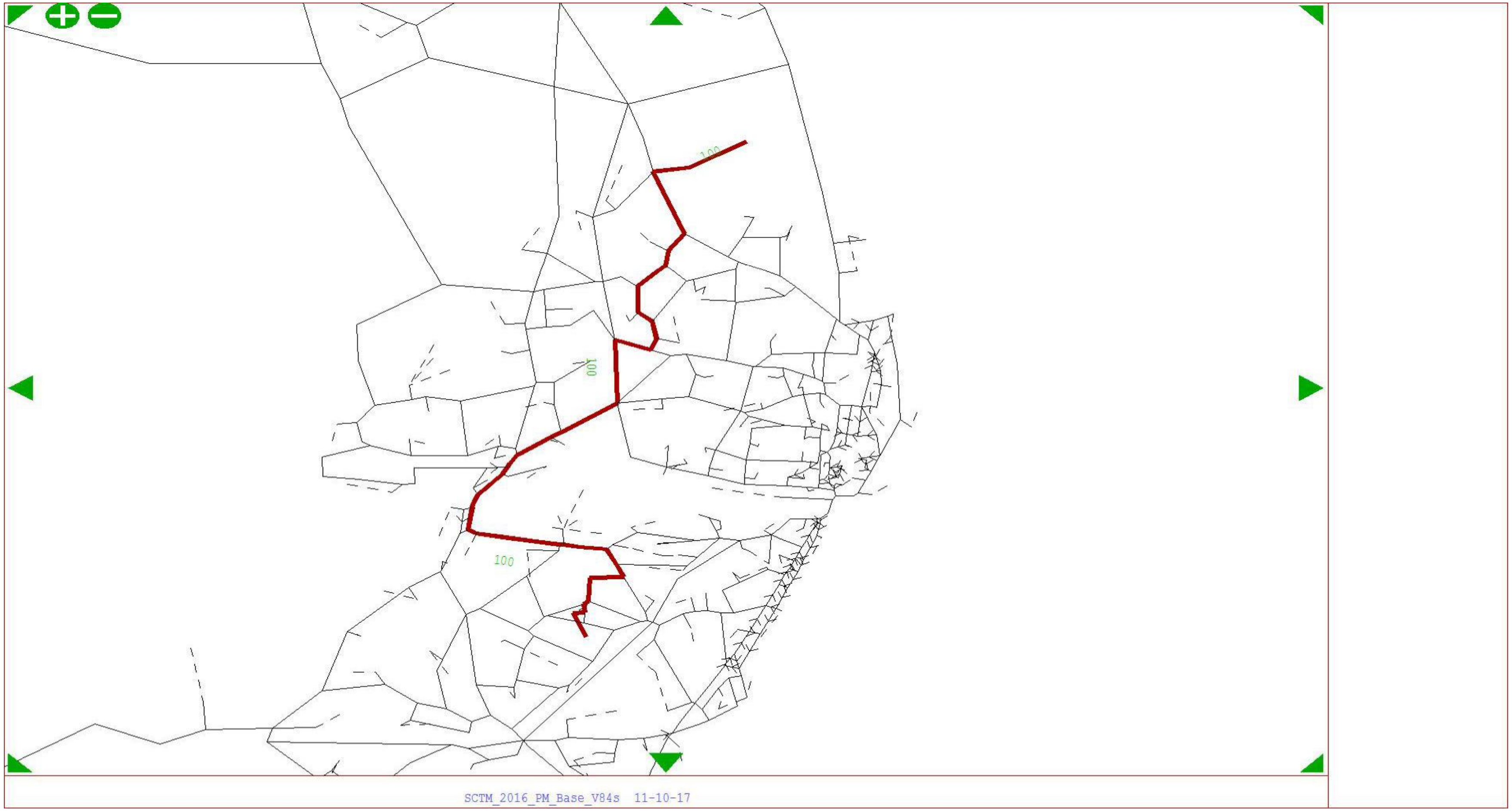


SCTM_2016_PM_Base_V84s 11-10-17

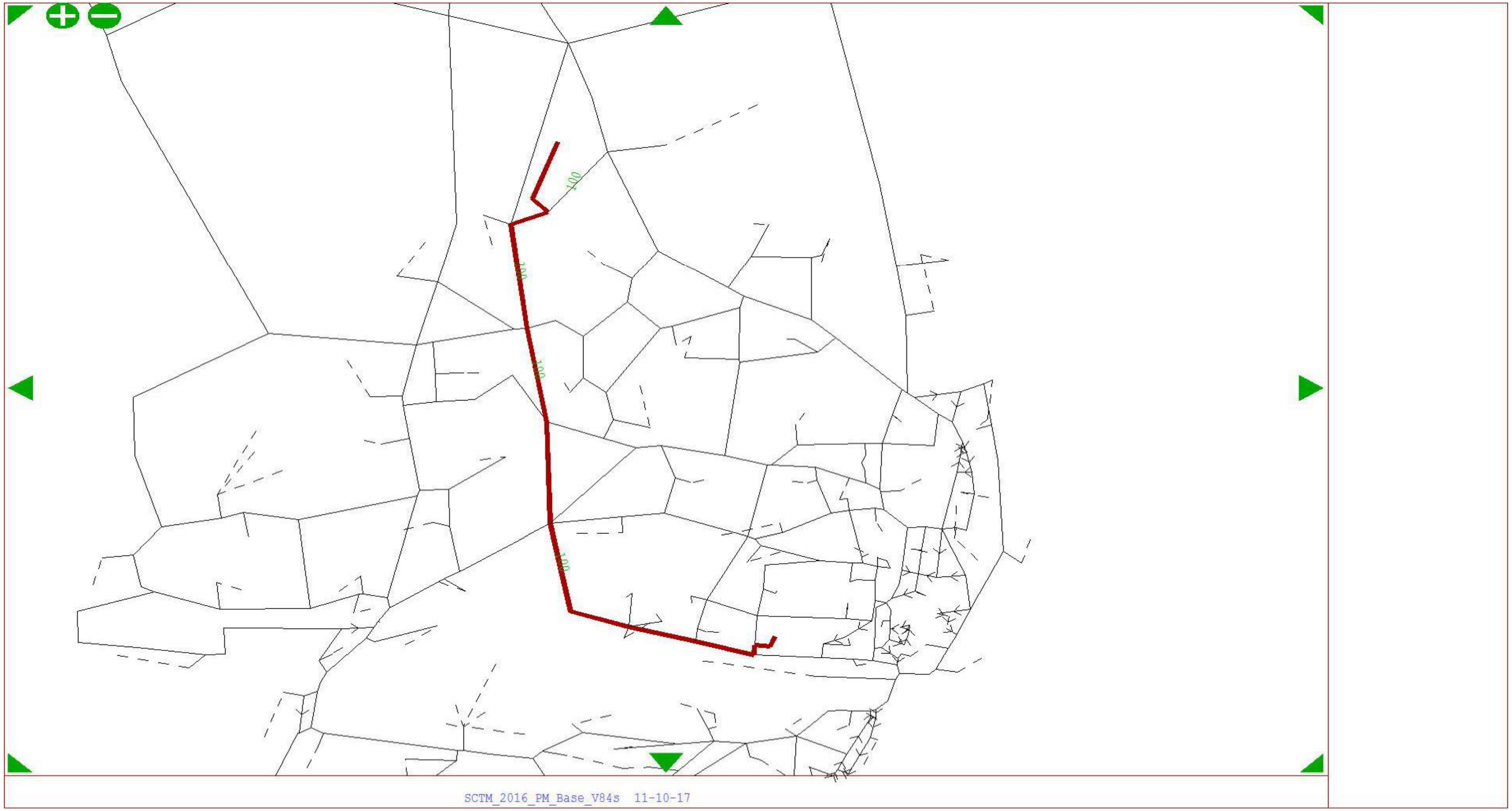
From Zone 779 To Zone 587 - User Class 1



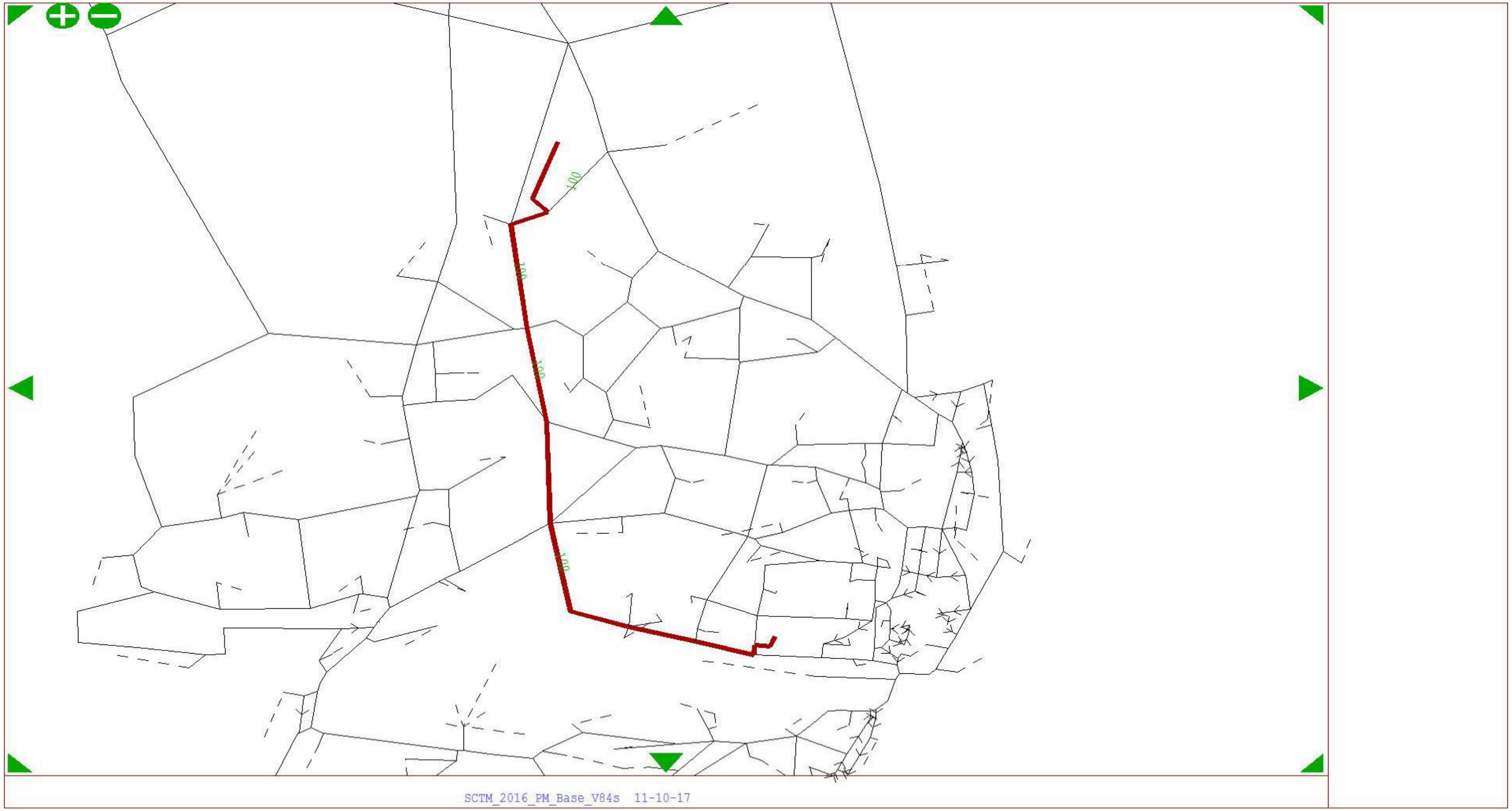
From Zone 779 To Zone 587 - User Class 10



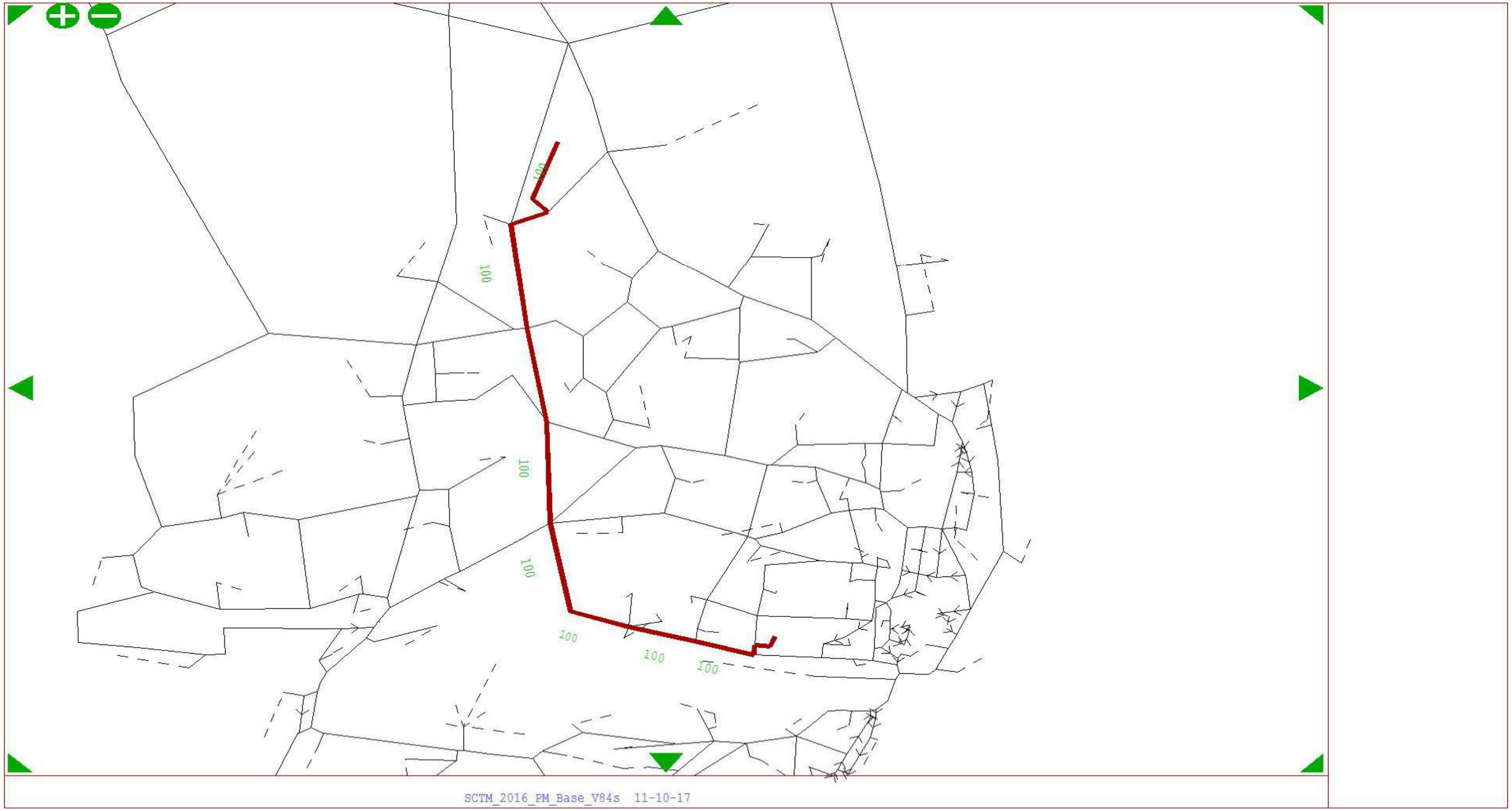
From Zone 766 To Zone 427 - User Class 1



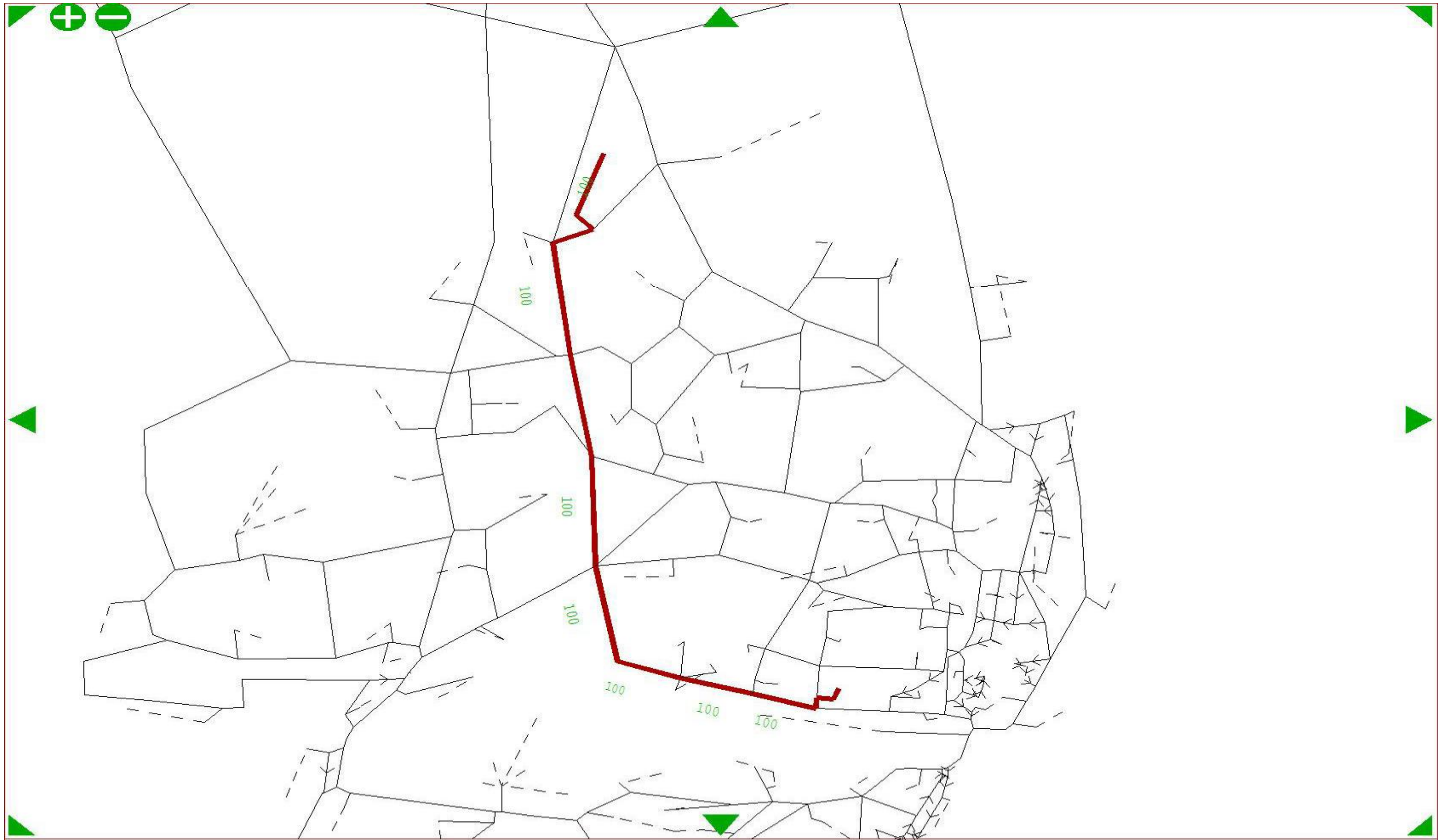
From Zone 766 To Zone 427 - User Class 10



From Zone 427 To Zone 766 - User Class 1

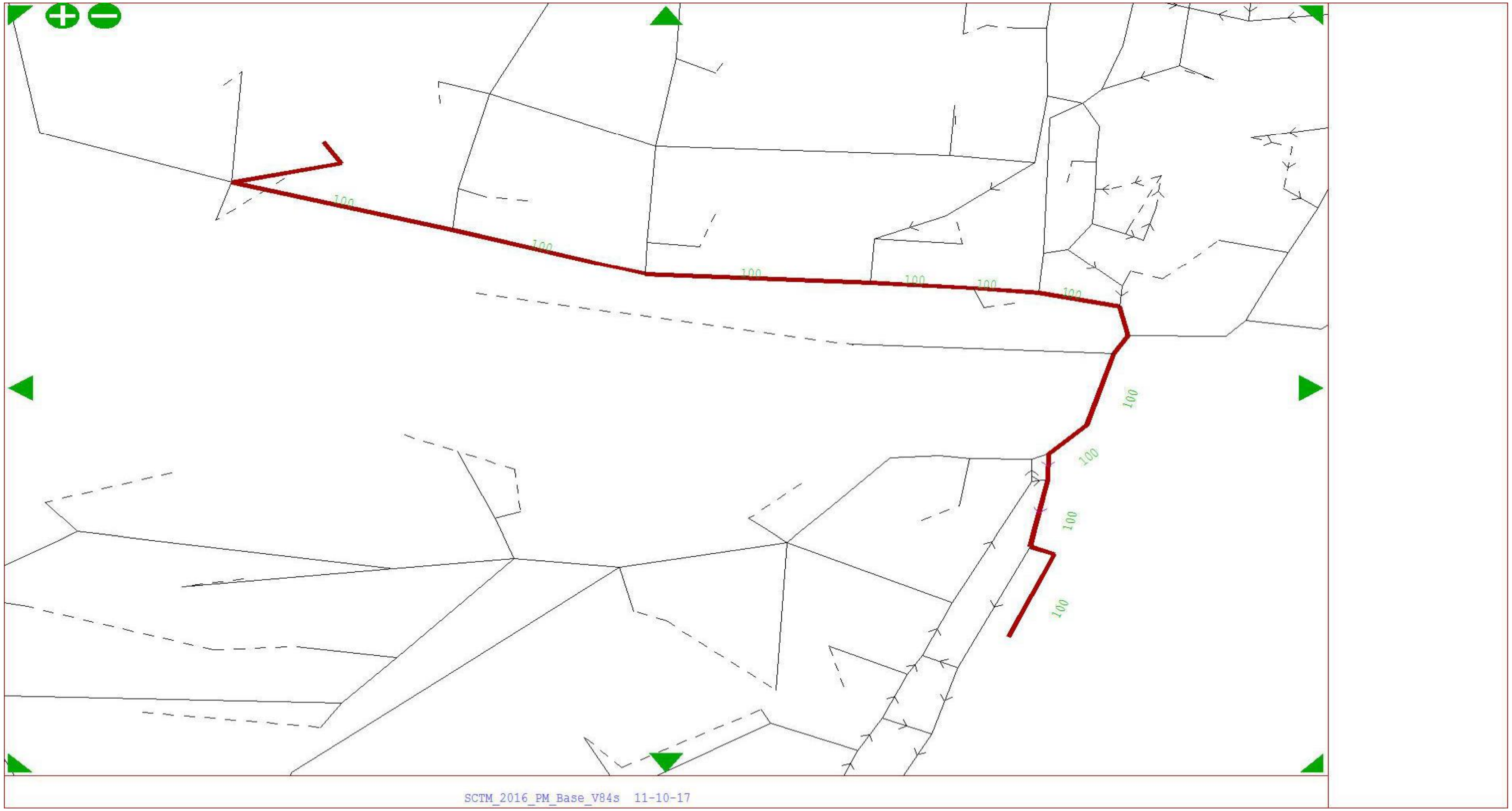


From Zone 427 To Zone 766 - User Class 10

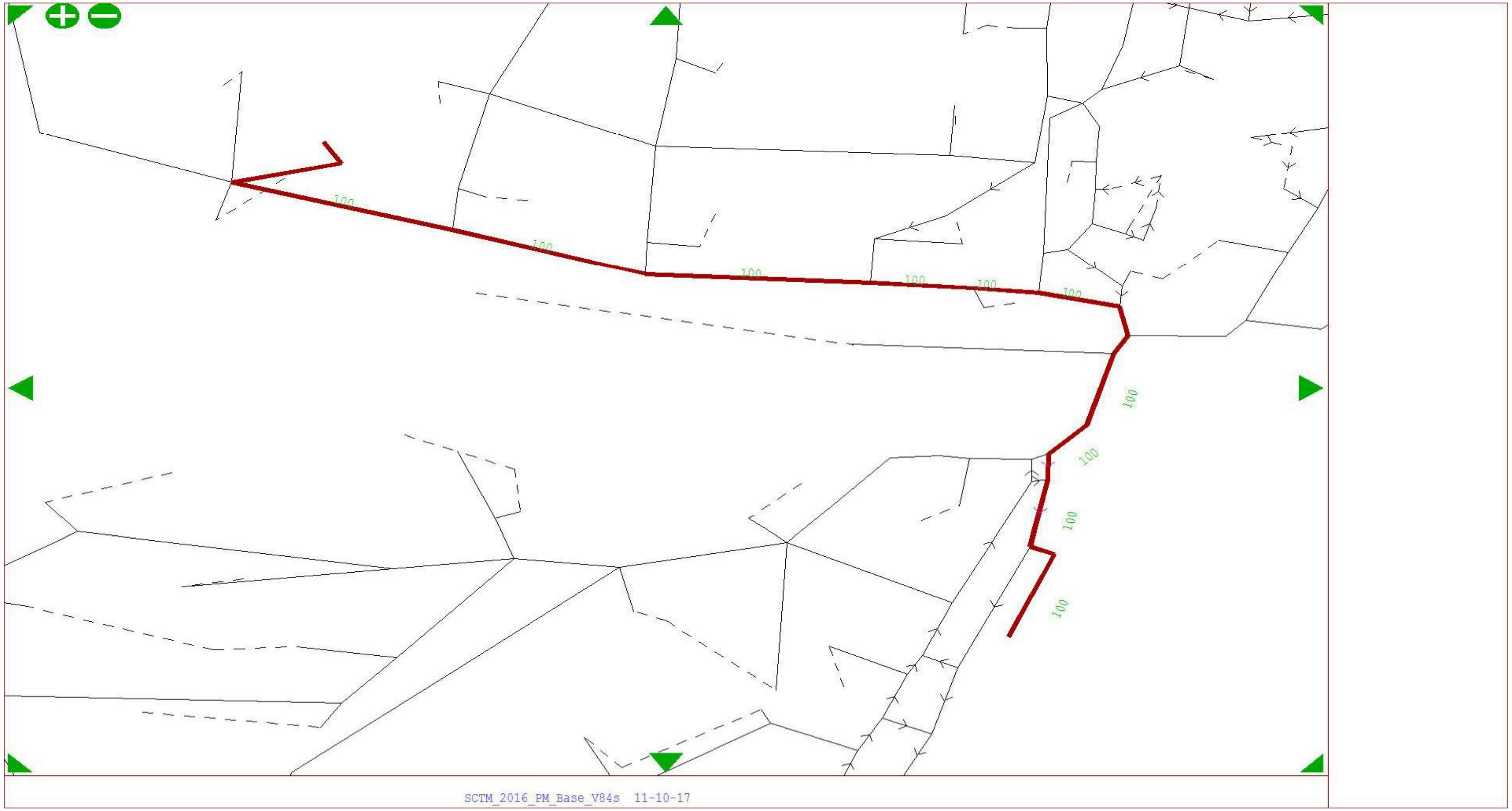


SCTM_2016_PM_Base_V84s 11-10-17

From Zone 819 To Zone 588 - User Class 1

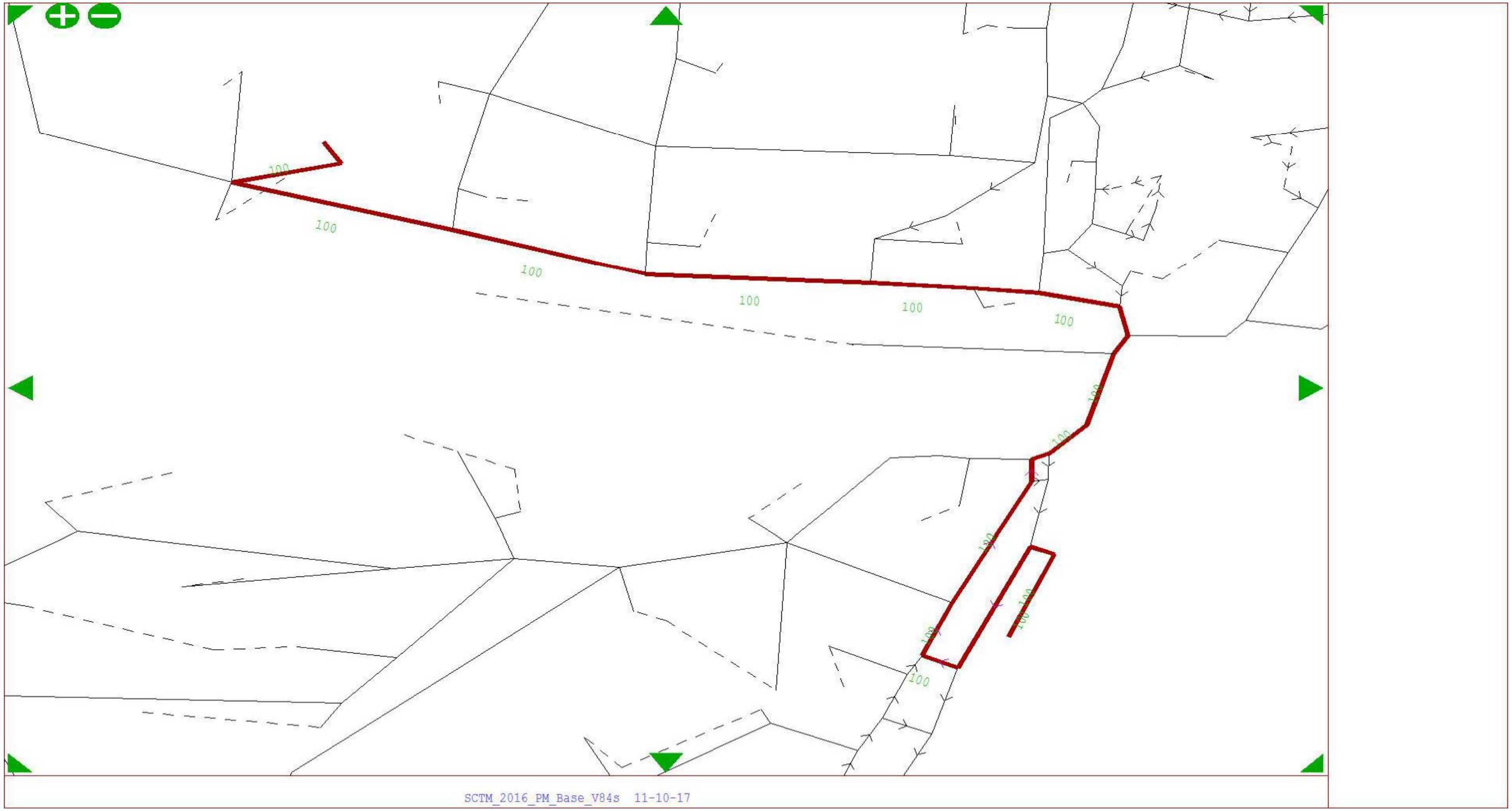


From Zone 819 To Zone 588 - User Class 10

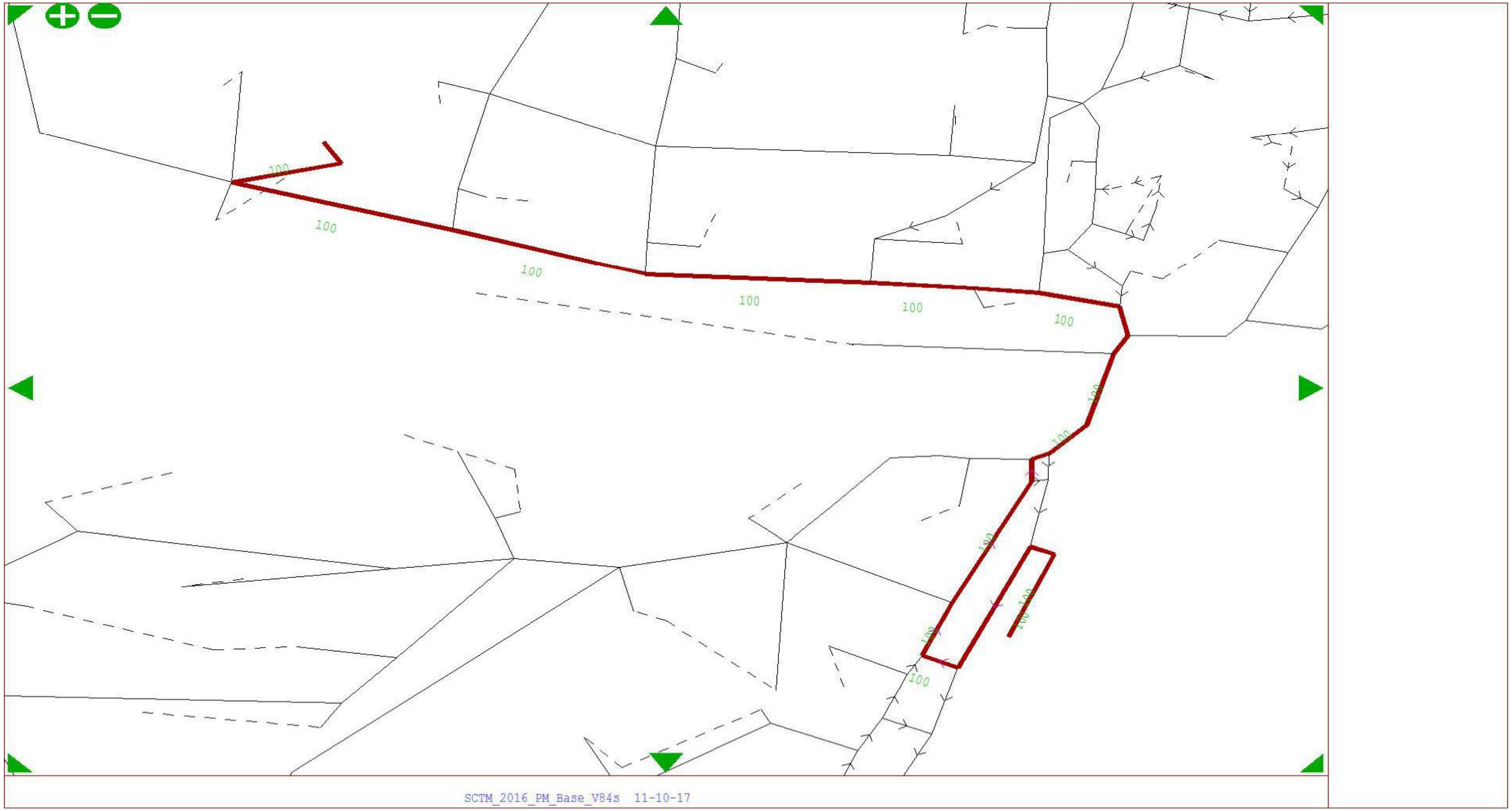


SCTM_2016_PM_Base_V84s 11-10-17

From Zone 588 To Zone 819 - User Class 1



From Zone 588 To Zone 819 - User Class 10



Appendix E

SITE SPECIFIC DEVELOPMENTS

District	Site Code	Dev Type	LPA	Location	Easting (X)	Northing (Y)	Primary Source	Policy	Description (All major land uses)	Floorspace (split if multiple land uses)	(1) - Floorspace Type (NIA / GEA /	(3) - Dwelling Total	Forecast Year (Full completion)	(4) - Uncertainty Assumption	SATURN_Zone	Dwelling Split	Dwelling Projections 2022	Dwelling Projections 2037
Waveney	LOW3 DC/15/4547/FUL	Housing	Waveney	Town Hall, offices and car parks, Mariners Street, Lowestoft	655074	293881	SSA	LOW3		N/A	N/A	8	2017/18	Near certain	764		8	8
Waveney	LOW4 DC/14/2322/FUL	Housing	Waveney	Council offices, Clapham Road, Lowestoft	654799	293246	SSA	LOW4		N/A	N/A	9	2016/17	Near certain	562		9	9
Waveney	LOW6	Housing	Waveney	Neeves Pit, Normanston Drive, Lowestoft	652823	293643	SSA	LOW6	Housing (retirement lodges)	N/A	N/A	49	2021/22	Near certain	582		49	49
Waveney	LOW7	Housing	Waveney	Gunton Park, off Old Lane, Lowestoft	653527	296466	SSA	LOW7	Housing	N/A	N/A	60	2021/22	More than likely	408		60	60
Waveney	LOW9	Housing	Waveney	Monckton Avenue Nursery, Lowestoft	653030	293819	SSA	LOW9	Housing	N/A	N/A	45	2022/23	Near certain	419		45	45
Waveney	BEC3	Housing	Waveney	Land at Cucumber Lane / Oak Lane, Beccles	643028	288809	SSA	BEC3	Housing	N/A	N/A	20	2017/18	Near certain	457		20	20
Waveney	BUN1 DC/14/4193/OUT	Housing	Waveney	Land west of A144, St John's Road, Bungay	634403	288607	SSA	BUN1	Outline Application with all matters rese	16300		150	2020/21	More than likely	470		150	150
Waveney	BUN3	Housing	Waveney	Community Centre, Upper Olland Street, Bungay	633769	289321	SSA	BUN3	Housing	N/A	N/A	8	2019/20	More than likely	818		8	8
Waveney	HAL4	Housing	Waveney	Dairy Farm, Saxons Way, Halesworth	638766	277278	SSA	HAL4		N/A	N/A	40	2019/20	Near certain	809		40	40
Waveney	SSP3_WAV	Housing	Waveney	Kirkley Waterfront and Sustainable Urban Neighbourhood, Lowestoft	653233	292651	AAP	SSP3	Approx 9.8ha remaining of 12 ha of rec	39200		157	start date 2020	Near Certain	589	1440	80	157
Waveney	SSP3_WAV	Housing	Waveney	Kirkley Waterfront and Sustainable Urban Neighbourhood, Lowestoft	653233	292651	AAP	SSP3	Approx 9.8ha remaining of 12 ha of rec	39200		83	start date 2020	Near Certain	431	1440	42	83
Waveney	SSP3_WAV	Housing	Waveney	Kirkley Waterfront and Sustainable Urban Neighbourhood, Lowestoft	653233	292651	AAP	SSP3	Approx 9.8ha remaining of 12 ha of rec	39200		365	start date 2020	Near Certain	856	1440	185	365
Waveney	SSP3_WAV	Housing	Waveney	Kirkley Waterfront and Sustainable Urban Neighbourhood, Lowestoft	653233	292651	AAP	SSP3	Approx 9.8ha remaining of 12 ha of rec	39200		522	start date 2020	Near Certain	857	1440	265	522
Waveney	SSP3_WAV	Housing	Waveney	Kirkley Waterfront and Sustainable Urban Neighbourhood, Lowestoft	653233	292651	AAP	SSP3	Approx 9.8ha remaining of 12 ha of rec	39200		209	start date 2020	Near Certain	858	1440	106	209
Waveney	SSP3_WAV	Housing	Waveney	Kirkley Waterfront and Sustainable Urban Neighbourhood, Lowestoft	653233	292651	AAP	SSP3	Approx 9.8ha remaining of 12 ha of rec	39200		104	start date 2020	Near Certain	859	1440	53	104
Waveney	SSP6_WAV	Housing	Waveney	Western End of Lake Lothing, Lowestoft	652280	292586	AAP	SSP6	Waterfront tourism; Small-scale residential development of 57			57	Start Date: by 202	Near Certain	431		0	57
Waveney	SSP7 DC/15/3748/FUL	Housing	Waveney	Oswald's Boatyard, Lowestoft	652206	292826	AAP	SSP7	80 flats; replacement library; A3 coffee	N/A	N/A	80	Start Date: by 202	Near Certain	583		80	80
Waveney	SSP8 DC/15/4311/FUL	Housing	Waveney	The Scrores, Lowestoft	655217	293816	AAP	SSP8	Small scale residential and employment development will be su			30	Start Date: by 202	Near Certain	760		30	30
Waveney	DC/01/0977/OUT DC/14/1755/ARM DC/14/2	Housing	Waveney	Woods Meadow, Oulton	652555	294796	PP	toric alloca	Historic allocation - mixed use develop	N/A	N/A	556	Start Date: by 202	Near Certain	865	800	335	556
Waveney	DC/01/0977/OUT DC/14/1755/ARM DC/14/2	Housing	Waveney	Woods Meadow, Oulton	652555	294796	PP	toric alloca	Historic allocation - mixed use develop	N/A	N/A	244	Start Date: by 202	Near Certain	866	800	147	244
Waveney	DC/86/0517/OUT	Housing	Waveney	Dunston, Oulton	652173	294874	PP	toric alloca	Historic allocation - approximatley 50 d	N/A	N/A	50	2028/29	Near Certain	568		0	50
Waveney	DC/96/0058/OUT	Housing	Waveney	Carlton Hall Farm, Carlton Colville	651077	290719	PP	toric alloca	Historic allocation - approximatley 124	N/A	N/A	124	2034/35	Near Certain	639		0	124
Waveney	DC/05/0540/FUL	Housing	Waveney	Hillside Garage Hillside Road East Bungay NR35 1RX	634356	289064	PP	Windfall	Housing	N/A	N/A	10	2019/20	Near Certain	468		10	10
Waveney	DC/14/2252/FUL	Housing	Waveney	Carlton Hall Chapel Road Carlton Colville NR33 8AT	650943	290294	PP	Windfall	Housing (sheltered housing)	N/A	N/A	33	2021/22	Near Certain	782		33	33
Waveney	DC/14/2046/OUT	Housing	Waveney	Land at Fairview Road and Norwich Road Halesworth	639219	278526	PP	Windfall	Demolition of Existing Workshop and C	700	700	22	2018/19	Near Certain	477		22	22
Waveney	DC/13/0383/FUL	Housing	Waveney	Land at Lodge Road Holton [IP19 8RZ]	640107	277905	PP	Windfall	Housing	N/A	N/A	11	2016/17	Near Certain	812		11	11
Waveney	DC/12/1105/FUL	Housing	Waveney	Land off Heritage Green Kessingland NR33 7UP	652229	286964	PP	Windfall	Housing	N/A	N/A	30	2018/19	Near Certain	463		30	30
Waveney	DC/13/2169/FUL	Housing	Waveney	Land adjacent The Nordalls Kessingland	652998	286393	PP	Windfall	Housing	N/A	N/A	23	2017/18	Near Certain	463		23	23
Waveney	DC/02/0878/FUL	Housing	Waveney	Oulton Broad Caravan Site Saltwater Way Lowestoft	652131	292582	PP	toric alloca	Highways works keep planning permiss	N/A	N/A	56	2024/25	More than likely	431		25	56
Waveney	DC/11/0264/FUL	Housing	Waveney	Plots 1-11 Rodber Way Lowestoft	653366	295684	PP	Windfall	Housing	N/A	N/A	11	2016/17	Near Certain	416		11	11
Waveney	DC/13/0649/OUT	Housing	Waveney	Land off Foxborough Road Lowestoft	653339	294844	PP	toric alloca	Housing	N/A	N/A	50	2024/25	Near Certain	420		30	50
Waveney	DC/13/3638/FUL	Housing	Waveney	Longs Dairy St Margarets Road Lowestoft NR32 4HU	654365	294130	PP	Windfall	Housing (sheltered housing)	N/A	N/A	17	2016/17	Near Certain	413		17	17
Waveney	DC/14/2524/ARM	Housing	Waveney	Phase 4 land at Foxborough Road Lowestoft	653383	295009	PP	Windfall	Housing	N/A	N/A	10	2019/20	Near Certain	420		10	10
Waveney	DC/15/0417/FUL	Housing	Waveney	Tyndale Press, Wollaston Road Lowestoft	654591	293263	PP	Windfall	Housing	N/A	N/A	15	2016/17	Near Certain	578		15	15
Waveney	DC/03/0366/ARM	Housing	Waveney	Phase 3 Park Meadows Oulton	652935	295209	PP	toric alloca	Housing	N/A	N/A	119	2016/17	Near Certain	586		119	119
Waveney	DC/06/0271/FUL	Housing	Waveney	Service Station Site Mights Road Southwold	650499	276728	PP	Windfall	Housing	N/A	N/A	13	2018/19	Near Certain	814		13	13
Waveney	DC/15/0213/FUL	Housing	Waveney	Former Worlingham Primary School, Rectory Road Worlingham	644564	289784	PP	Windfall	15 dwellings and community centre [sit	N/A	N/A	15	2017/18	Near Certain	549		15	15
Waveney	DC/15/0712/FUL	Housing	Waveney	Former Meadowlands, Walker Gardens Wrentham	649685	282575	PP	Windfall	Housing	N/A	N/A	24	2018/19	Near Certain	475		24	24
Waveney	DC/15/3221/OUT	Housing	Waveney	Land rear of 34-48 Old Station Road Halesworth	638469	278323	PP	Windfall	Housing	N/A	N/A	15	2020/21	Near Certain	809		15	15

Site Code	Core	Initial FY	2022_AM_Orig	2022_AM_Dest	2022_IP_Orig	2022_IP_Dest	2022_PM_Orig	2022_PM_Dest	2037_AM_Orig	2037_AM_Dest	2037_IP_Orig	2037_IP_Dest	2037_PM_Orig	2037_PM_Dest
LOW3 DC/15/4547/FUL	1	2017	1.45	2.04	1.93	1.92	2.06	1.61	1.17	1.71	1.68	1.67	1.77	1.37
LOW4 DC/14/2322/FUL	1	2016	1.63	2.30	2.17	2.16	2.32	1.81	1.32	1.92	1.89	1.88	1.99	1.54
LOW6	1	2017	8.89	12.51	11.83	11.78	12.63	9.88	7.19	10.46	10.28	10.22	10.82	8.41
LOW7	1	2019	10.89	15.32	14.49	14.42	15.47	12.10	8.80	12.81	12.58	12.51	13.25	10.29
LOW9	1	2019	8.17	11.49	10.87	10.82	11.60	9.07	6.60	9.61	9.44	9.39	9.94	7.72
BEC3	1	2017	3.63	5.11	4.83	4.81	5.16	4.03	2.93	4.27	4.19	4.17	4.42	3.43
BUN1 DC/14/4193/OUT	1	2017	27.23	38.31	36.23	36.06	38.67	30.24	22.01	32.02	31.46	31.28	33.13	25.74
BUN3	1	2019	1.45	2.04	1.93	1.92	2.06	1.61	1.17	1.71	1.68	1.67	1.77	1.37
HAL4	1	2018	7.26	10.22	9.66	9.62	10.31	8.06	5.87	8.54	8.39	8.34	8.84	6.86
SSP3_WAV	1	2017	14.45	20.33	19.22	19.13	20.52	16.05	23.03	33.52	32.93	32.74	34.68	26.94
SSP3_WAV	1	2017	7.64	10.75	10.16	10.11	10.85	8.48	12.18	17.72	17.41	17.31	18.33	14.24
SSP3_WAV	1	2017	33.59	47.25	44.69	44.48	47.71	37.30	53.55	77.92	76.55	76.12	80.63	62.62
SSP3_WAV	1	2017	48.04	67.58	63.91	63.61	68.23	53.35	76.58	111.44	109.48	108.87	115.31	89.56
SSP3_WAV	1	2017	19.23	27.06	25.59	25.47	27.32	21.36	30.66	44.62	43.83	43.59	46.17	35.86
SSP3_WAV	1	2017	9.57	13.46	12.73	12.67	13.59	10.63	15.26	22.20	21.81	21.69	22.97	17.84
SSP6_WAV	1	2023							8.36	12.17	11.95	11.89	12.59	9.78
SSP7 DC/15/3748/FUL	1	2018	14.52	20.43	19.32	19.23	20.63	16.13	11.74	17.08	16.78	16.68	17.67	13.73
SSP8 DC/15/4311/FUL	1	2018	5.45	7.66	7.25	7.21	7.73	6.05	4.40	6.40	6.29	6.26	6.63	5.15
DC/01/0977/OUT DC/14/1755/ARM DC/14/2	1	2015	60.81	85.55	80.90	80.53	86.37	67.54	81.57	118.70	116.61	115.96	122.82	95.39
DC/01/0977/OUT DC/14/1755/ARM DC/14/2	1	2015	26.69	37.54	35.50	35.34	37.90	29.64	35.80	52.09	51.17	50.89	53.90	41.86
DC/86/0517/OUT	1	2023							7.34	10.67	10.49	10.43	11.04	8.58
DC/96/0058/OUT	1	2025							18.19	26.47	26.01	25.86	27.39	21.28
DC/05/0540/FUL	1	2016	1.82	2.55	2.42	2.40	2.58	2.02	1.47	2.13	2.10	2.09	2.21	1.72
DC/14/2252/FUL	1	2016	5.99	8.43	7.97	7.93	8.51	6.65	4.84	7.04	6.92	6.88	7.29	5.66
DC/14/2046/OUT	1	2018	3.99	5.62	5.31	5.29	5.67	4.44	3.23	4.70	4.61	4.59	4.86	3.77
DC/13/0383/FUL	1	2016	2.00	2.81	2.66	2.64	2.84	2.22	1.61	2.35	2.31	2.29	2.43	1.89
DC/12/1105/FUL	1	2017	5.45	7.66	7.25	7.21	7.73	6.05	4.40	6.40	6.29	6.26	6.63	5.15
DC/13/2169/FUL	1	2017	4.18	5.87	5.55	5.53	5.93	4.64	3.37	4.91	4.82	4.80	5.08	3.95
DC/02/0878/FUL	1	2021	4.54	6.38	6.04	6.01	6.45	5.04	8.22	11.95	11.74	11.68	12.37	9.61
DC/11/0264/FUL	1	2015	2.00	2.81	2.66	2.64	2.84	2.22	1.61	2.35	2.31	2.29	2.43	1.89
DC/13/0649/OUT	1	2017	5.45	7.66	7.25	7.21	7.73	6.05	7.34	10.67	10.49	10.43	11.04	8.58
DC/13/3638/FUL	1	2016	3.09	4.34	4.11	4.09	4.38	3.43	2.49	3.63	3.57	3.55	3.76	2.92
DC/14/2524/ARM	1	2016	1.82	2.55	2.42	2.40	2.58	2.02	1.47	2.13	2.10	2.09	2.21	1.72
DC/15/0417/FUL	1	2017	2.72	3.83	3.62	3.61	3.87	3.02	2.20	3.20	3.15	3.13	3.31	2.57
DC/03/0366/ARM	1	2015	21.60	30.39	28.74	28.61	30.68	23.99	17.46	25.40	24.96	24.82	26.29	20.42
DC/06/0271/FUL	1	2017	2.36	3.32	3.14	3.13	3.35	2.62	1.91	2.78	2.73	2.71	2.87	2.23
DC/15/0213/FUL	1	2017	2.72	3.83	3.62	3.61	3.87	3.02	2.20	3.20	3.15	3.13	3.31	2.57
DC/15/0712/FUL	1	2017	4.36	6.13	5.80	5.77	6.19	4.84	3.52	5.12	5.03	5.01	5.30	4.12
DC/15/3221/OUT	1	2017	2.72	3.83	3.62	3.61	3.87	3.02	2.20	3.20	3.15	3.13	3.31	2.57

Appendix F

TEMPRO ALTERNATIVE PLANNING ASSUMPTIONS

Comparison between Core Scenario Development & Tempro 7.2 for Waveney

Waveney

Years	Core Scenario Committed Dev (HH)	Core Scenario Committed Dev (Jobs)	Tempro 7.2 (HH)	Tempro 7.2 (Jobs)	HH Diff	Jobs Diff
2016 - 2022	2,233	1,776	2,559	1,776	-326	0
2016 - 2037	3,604	3,996	8,952	3,996	-5348	0

Future Year - Base Year (2016 - 2022) - Derivation of Alternate Planning Assumptions

Area Description	Name	< 16	16 to 74	75+	Total	HHs	Jobs	Workers	Original HHS	Original jobs
Study Area	Babergh	-80	-413	3,008	2,515	1,841	1,310	-622	41,655	41,027
Study Area	Forest He	1,533	1,941	1,233	4,708	2,560	1,286	831	30,156	37,424
Study Area	Ipswich	2,550	4,306	1,599	8,455	4,709	2,740	2,348	64,519	82,009
Study Area	Mid Suffo	-28	-198	2,953	2,727	2,063	1,498	-766	45,323	47,880
Study Area	St Edmun	1,763	4,439	3,453	9,655	5,023	2,523	2,262	53,483	68,031
Study Area	Suffolk Co	287	1,047	3,981	5,314	3,378	1,906	-41	60,185	61,760
Study Area	Waveney	712	-114	3,056	3,654	2,559	1,776	190	55,628	51,610

Alternative Assumptions input		AM Growth Factor with AA		IP Growth Factor with AA		PM Growth Factor with AA		AM Growth Factor WITHOUT AA		IP Growth Factor WITHOUT AA		PM Growth Factor WITHOUT AA	
HHs	Jobs	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination
41655	41027	1.023	1.0584	1.0649	1.0629	1.0503	1.0283	1.023	1.0584	1.0649	1.0628	1.0503	1.0282
30156	37424	1.0723	1.0744	1.0968	1.0971	1.0744	1.0722	1.0723	1.0744	1.0968	1.0971	1.0744	1.0722
64519	82009	1.0816	1.0674	1.0891	1.0898	1.0672	1.0745	1.0815	1.0673	1.0891	1.0898	1.0672	1.0745
45323	47880	1.0192	1.0552	1.0608	1.0584	1.0469	1.0243	1.0191	1.0551	1.0607	1.0583	1.0469	1.0242
53483	68031	1.0782	1.0737	1.0971	1.0968	1.0736	1.076	1.0782	1.0736	1.097	1.0967	1.0735	1.076
60185	61760	1.0341	1.0592	1.0702	1.0691	1.0549	1.0398	1.0341	1.0592	1.0702	1.069	1.0548	1.0397
53395	51610	1.0134	1.0599	1.0544	1.0531	1.047	1.0173	1.046	1.0648	1.0731	1.0725	1.0587	1.0464
		1.0713	1.073	1.0916	1.0915	1.0714	1.0704	1.0712	1.0729	1.0915	1.0914	1.0714	1.0704

Future Year - Base Year (2016 - 2037) - Derivation of Alternate Planning Assumptions

Area Description	Name	< 16	16 to 74	75+	Total	HHs	Jobs	Workers	Original HHS	Original jobs
Study Area	Babergh	-1,117	-2,977	8,324	4,230	4,887	3,073	-3,912	44,701	42,790
Study Area	Forest He	2,447	8,344	4,371	15,161	8,341	2,895	2,893	35,937	39,033
Study Area	Ipswich	3,213	12,386	7,101	22,700	13,834	6,266	3,869	73,644	85,535
Study Area	Mid Suffo	-1,057	-1,327	9,188	6,804	5,961	3,558	-3,819	49,221	49,940
Study Area	St Edmun	2,643	10,634	9,596	22,872	14,320	5,449	2,852	62,780	70,957
Study Area	Suffolk Co	905	5,145	12,872	18,921	13,061	4,563	85	69,868	64,417
Study Area	Waveney	638	1,400	8,703	10,740	8,952	3,996	-803	62,021	53,830

Alternative Assumptions input		AM Growth Factor with AA		IP Growth Factor with AA		PM Growth Factor with AA		AM Growth Factor WITHOUT AA		IP Growth Factor WITHOUT AA		PM Growth Factor WITHOUT AA	
HHs	Jobs	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination
44701	42790	1.0382	1.1704	1.1803	1.174	1.145	1.0615	1.0381	1.1704	1.1802	1.1739	1.1449	1.0614
35937	39033	1.2238	1.212	1.2955	1.2967	1.2208	1.227	1.2237	1.2119	1.2955	1.2966	1.2207	1.2269
73644	85535	1.2116	1.1966	1.267	1.2665	1.1965	1.2048	1.2116	1.1965	1.2669	1.2665	1.1965	1.2047
49221	49940	1.0425	1.1638	1.1791	1.1721	1.1415	1.0636	1.0425	1.1638	1.1791	1.172	1.1414	1.0636
62780	70957	1.1861	1.2035	1.2725	1.2709	1.2025	1.191	1.1861	1.2034	1.2724	1.2708	1.2024	1.1909
69868	64417	1.127	1.1825	1.2278	1.2258	1.1765	1.1431	1.127	1.1825	1.2278	1.2258	1.1764	1.1431
58417	53830	1.0799	1.1816	1.1919	1.1888	1.1577	1.093	1.1301	1.1894	1.2222	1.22	1.1761	1.138
		1.1898	1.1963	1.2699	1.2697	1.1987	1.1955	1.1898	1.1962	1.2699	1.2696	1.1987	1.1954

WSP House
70 Chancery Lane
London
WC2A 1AF

wsp.com

Suffolk County Council

DEMAND MODEL VALIDATION REPORT

Suffolk County Transport Model

Suffolk County Council

DEMAND MODEL VALIDATION REPORT

Suffolk County Transport Model

TYPE OF DOCUMENT (VERSION) CONFIDENTIAL

PROJECT NO. 70016133
OUR REF. NO. SCTM – DEMAND MODEL VALIDATION REPORT

DATE: NOVEMBER 2017

WSP
WSP House
70 Chancery Lane
London
WC2A 1AF
Phone: +44 20 7314 5000
Fax: +44 20 7314 5111
WSP.com

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2
Remarks	Draft	Draft	
Date	18th April 2017	27th October 2017	
Prepared by	Gaelle Samaha	Gaelle Samaha	
Signature			
Checked by	John Collins	John Collins	
Signature			
Authorised by		John Collins	
Signature			
Project number	70016133	70016133	
Report number	D5	D5	
File reference	170415 SCTM DMVR. docx	171101 SCTM DMVR_Lowestoft_New Template. docx	

CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1 MODEL OVERVIEW

1.1.1. Suffolk County Council (SCC) has commissioned WSP to fully upgrade the existing modelling tools available to SCC and develop an integrated county-wide multi-modal model known as the Suffolk County Transport Model (SCTM).

1.1.2. The SCTM comprises a full Transport Demand Model (TDM), with a separate Highway Assignment Model (HAM) and Public Transport Assignment Model (PTAM).

1.1.3. The aim of the SCTM is to provide a multi-purpose transport modelling tool for SCC to test a range of potential transport schemes and policies. These may include:

- Major highway scheme appraisal
- Major public transport scheme appraisal
- Inputs for transport business cases and funding applications
- Inputs for environmental appraisal
- Local plan / core strategy assessment
- Development impact assessment

1.1.4. The SCTM has been developed to the extent that it is able to serve as a high-level strategic assessment tool for all such applications; however, the level of detail required for any specific application should be reviewed prior to testing. It may be necessary to enhance a particular local area for a specific testing purpose.

1.2 ABOUT THIS REPORT

1.2.1. The purpose of this report is to document the development, assumptions and calibration of the SCTM TDM. It presents the results of the realism tests which have been undertaken to demonstrate that the model aligns well with Department for Transport (DfT) Transport Analysis Guidance (TAG) and is fit for the purposes outlined above.

1.2.2. This report is structured into the following chapters:

- Chapter 2: Model overview
- Chapter 3: Generalised cost calculations
- Chapter 4: Derivation of travel demand
- Chapter 5: Iteration and demand/supply convergence
- Chapter 6: Realism testing
- Chapter 7: Summary of model development

2 MODEL OVERVIEW

2.1.1. This chapter is an overview of the SCTM TDM. It mainly covers the model structure, the zoning system, the modes and submodes modelled, the time periods, demand segments, and the modelling of park-and-ride.

2.2 MODEL STRUCTURE

2.2.1. The SCTM TDM models behavioural responses relating to trip frequency, time period choice, main mode choice, trip distribution, and submode choice (i.e. the choice between park-and-ride and pure public transport). It also interacts with highway and public transport assignment models, allowing schemes such as bus priority measures that impact the highway and public transport assignments to be tested.

2.2.2. The hierarchy of the TDM is shown in Figure 1. The approach is a fairly conventional incremental model, with a nested hierarchy which is in line with DfT's TAG Unit M2 section 4.5 (Variable Demand Modelling, March 2017).

2.2.3. In the absence of local evidence, park-and-ride (submode) choice has been positioned below destination choice, as suggested in section 3.2.3 in TAG Unit M5.1 (Modelling of Parking and Park-and-ride, January 2014).

2.2.4. The two assignment models sit at the bottom of the hierarchy, with skim matrices extracted from the assignments and used within the demand model to calculate the generalised costs of travel and derive the corresponding demand responses.

2.2.5. The skims extracted from the SCTM HAM are listed below:

- Distance
- Time

2.2.6. The skims extracted from the SCTM PTAM are listed below:

- Distance
- In-vehicle time
- Origin wait time
- Transfer wait time
- Walk time
- Access time
- Egress time
- Number of transfers
- Fares

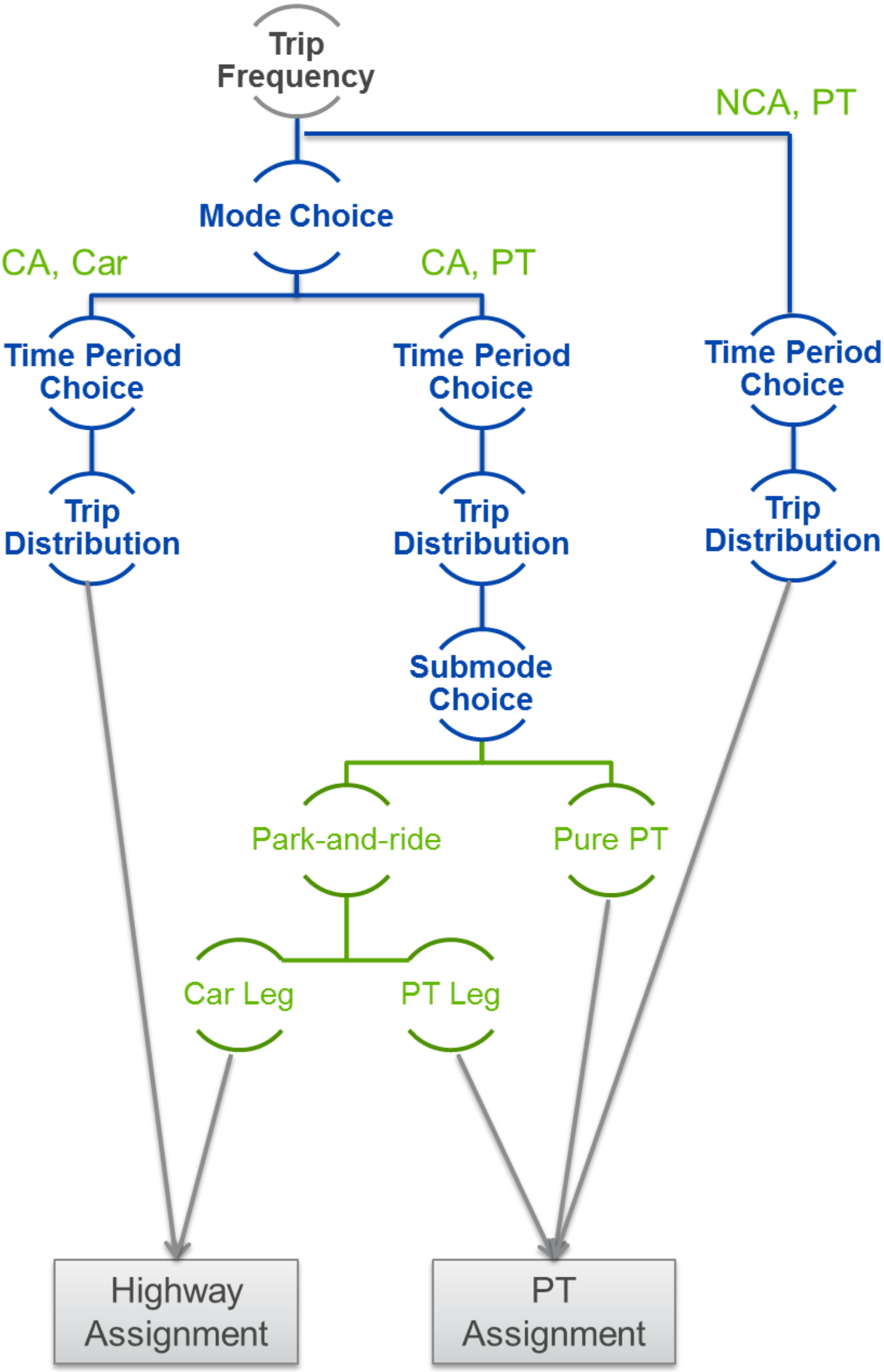


Figure 1 SCTM TDM Choice Hierarchy

2.3 STUDY AREA AND ZONING SYSTEM

2.3.1. The TDM zoning system is consistent with the HAM's and PTAM's and comprises 1200 zones. Suffolk County has been modelled in detail and has therefore been divided into relatively small zones; and larger zones have been used in adjacent counties within the East of England (Norfolk, Cambridgeshire, Essex, Hertfordshire, and Bedfordshire) and in the remainder of the UK.

2.3.2. 307 zones in the zone system do not represent any geographical area in the base year assignment models; they have been included to facilitate the forecasting process and help maintain the same zone structure in both the base year and forecasting models.

2.3.3. Rail station car parks and park-and-ride locations within Ipswich have been modelled as separate zones to allow the modelling of park-and-ride; these account for 26 zones in total. This approach facilitates the process of combining costs from the highway and public transport assignment models and the process of splitting park-and-ride trips into individual car and public transport legs prior to assignment.

2.3.4. The zones are grouped to create 33 sectors. The sectors are used in the process of converting demand matrices from peak hours to peak periods, as explained in section 2.7.

2.3.5. The sectoring system focusing on Suffolk can be seen in Figure 2. These sectors are defined by a combination of district boundaries and the major towns within the county.

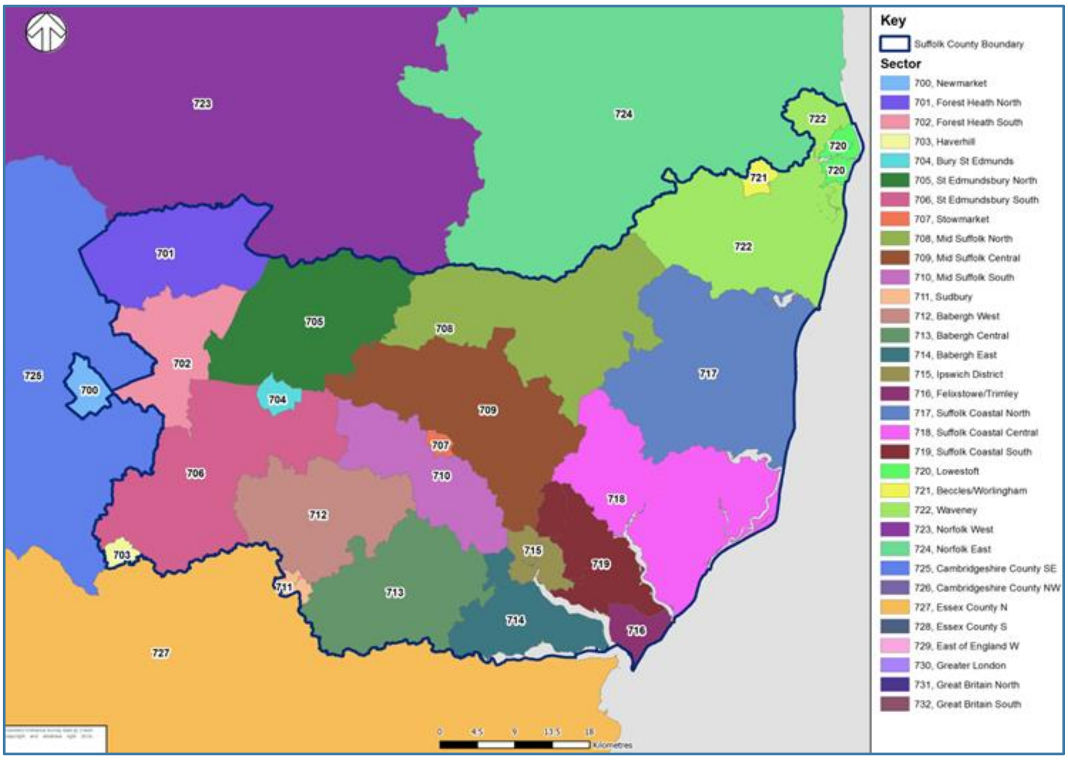


Figure 2 Internal Sectors Plan

2.3.6 Figure 3 shows the remainder of the sectoring system outside of Suffolk which was based on county and government office region boundaries.

2.3.7 More information on the zoning and sectoring systems can be found in the SCTM LMVR (November 2017).

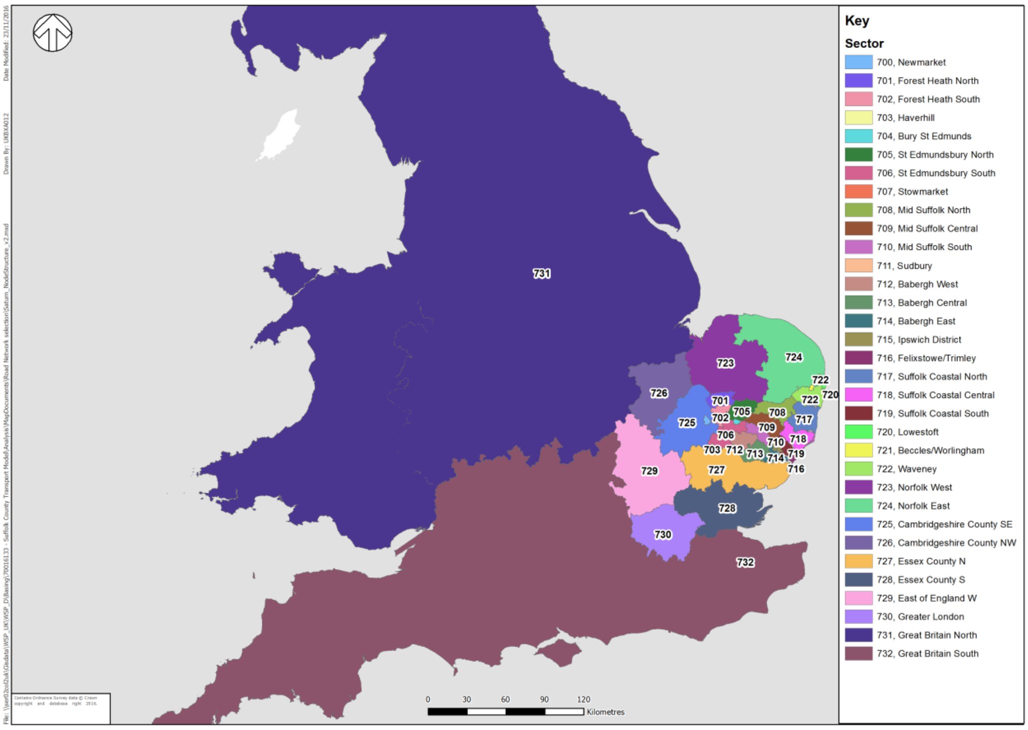


Figure 3 External Sectors

2.4 SOFTWARE PLATFORM

2.4.1. The SCTM TDM and PTAM are run in PTV Visum 15.00-15 and the HAM is run in SATURN (version 11.3.12 U).

2.4.2. The HAM and PTAM interact under the control of the demand model using the COM interface in PTV Visum which provides a convenient method of applying Visual Basic scripts to customise the operation of the demand model.

2.5 MODE AND SUBMODE CHOICES

2.5.1. The SCTM TDM models the following main modes:

- Car
- Public Transport (PT)

2.5.2. In the absence of local evidence and as outlined in the Model Specification Report (February 2016), park-and-ride has been positioned as a submode of public transport as car has been assumed to act like an access mode for relatively long public transport legs.

2.5.3. The SCTM TDM models the following submodes as part of the incremental model:

- Park-and-ride
- PT modes only

2.5.4. The SCTM TDM does not model walk and cycle as separate main modes. This reflects the expected usage of the model and the need to be proportionate, given the extra resource that would be required to obtain and analyse appropriate data and the likely limited impact of any further functionality. To model the transfer between active and mechanised modes, trip frequency has been modelled, as suggested in section 4.6.3 in DfT's TAG Unit M2 (Variable Demand Modelling, March 2017).

2.6 PARK-AND-RIDE

2.6.1. The SCTM TDM covers rail-based park-and-ride using rail station car parks and available parking facilities in the areas surrounding rail stations. As mentioned in section 2.3, these car parks are modelled as separate zones in the model. Table 1 shows the list of car parks that have been included along with their respective total capacities and parking charges.

Table 1 Modelled Car Parks and Characteristics

Zone	Station Name	Road Name	Capacity (spaces)	Charges for Commuters (in pence)	Charges for Non-Commuters (in pence)
739	Ipswich	Ipswich Station	444	731	610
771	Lowestoft	Lowestoft Station	112	324	340
787	Stowmarket	Stowmarket Station	382	430	320
788	Sudbury	Sudbury Station	140	106	0
789	Newmarket	Newmarket Station	12	0	0
790	Bury St Edmunds	Bury St Edmunds Station	23	350	350
791	Thurston	Station Hill	12	0	0
792	Brandon	Brandon Station	5	0	0
793	Needham Market	Station Yard	22	0	0
794	Manningtree	Station Rd	570	578	450
795	Woodbridge	Woodbridge Station	72	85	0
796	Melton	Wilford Bridge Rd	27	0	0
797	Wickham Market	Wickham Market Station	48	0	0
798	Saxmundham	Station Approach	18	0	0
799	Darsham	Darsham Station	22	0	0
800	Halesworth	Station Rd	15	0	0
801	Beccles	Beccles Station	10	0	0
802	Oulton Broad South	Oulton Broad South Station	6	0	0
803	Oulton Broad North	Oulton Broad North Station	4	0	0
804	Somerleyton	Station Rd	8	0	0
805	Diss	Station Rd	326	394	360
806	Trimley	Trimley Station	6	0	0
807	Bures	Station Hill	20	0	0

2.6.2. Total car park capacities have been collected from National Rail Enquiries website. Parking costs have also been derived from information on the same website: for non-commuters (employers' business and other trips) the parking charge has been set to the off-peak rate, whereas for commuters it was assumed to be the annual rate divided by 235 working days. More information on the need for capacities and parking charges in the model can be found in section 0.

2.6.3. The SCTM TDM does not explicitly model residential, workplace, on-street, or informal parking.

2.7 TIME PERIODS

2.7.1. There are differences in the time periods which the SCTM models represent, as shown in Table 2.

Table 2 SCTM Model Time Periods

Time Periods	AM Peak	Inter Peak	PM Peak	Off-Peak
TDM	07:00-10:00	10:00-16:00	16:00-19:00	19:00-07:00
HAM	08:00-09:00	Average hour 10:00-16:00	17:00-18:00	n/a
PTAM	08:00-09:00	11:00-12:00	17:00-18:00	n/a

2.7.2. As outlined in section 2.5.6 in DfT's TAG Unit M2 (Variable Demand Modelling, March 2017), the demand model is expected to operate at a 24-hour level in Production-Attraction (PA) format, so it is necessary to represent costs in the off peak period. However, validated base assignment models of the off-peak period have not been built for SCTM, as available data is much more restricted in this time period, and they are unlikely to provide significant benefits for any scheme assessment. Instead, the off peak models have been estimated based on the validated interpeak models and a simple factor has been applied to the validated interpeak matrix by sector to estimate the off peak demand. The estimated off peak models are run to produce skim matrices which are then used to calculate off peak costs.

2.7.3. To convert TDM outputs to HAM time periods, the ATC counts have been summed over the TDM and HAM time periods and the ratio of the sums taken for each time period and each site. The ratios have then been averaged across directions for each site, then across sites for each sector. For the sectors with no traffic count data available, the average factors have been applied. The ATC locations are illustrated in Figure 4.

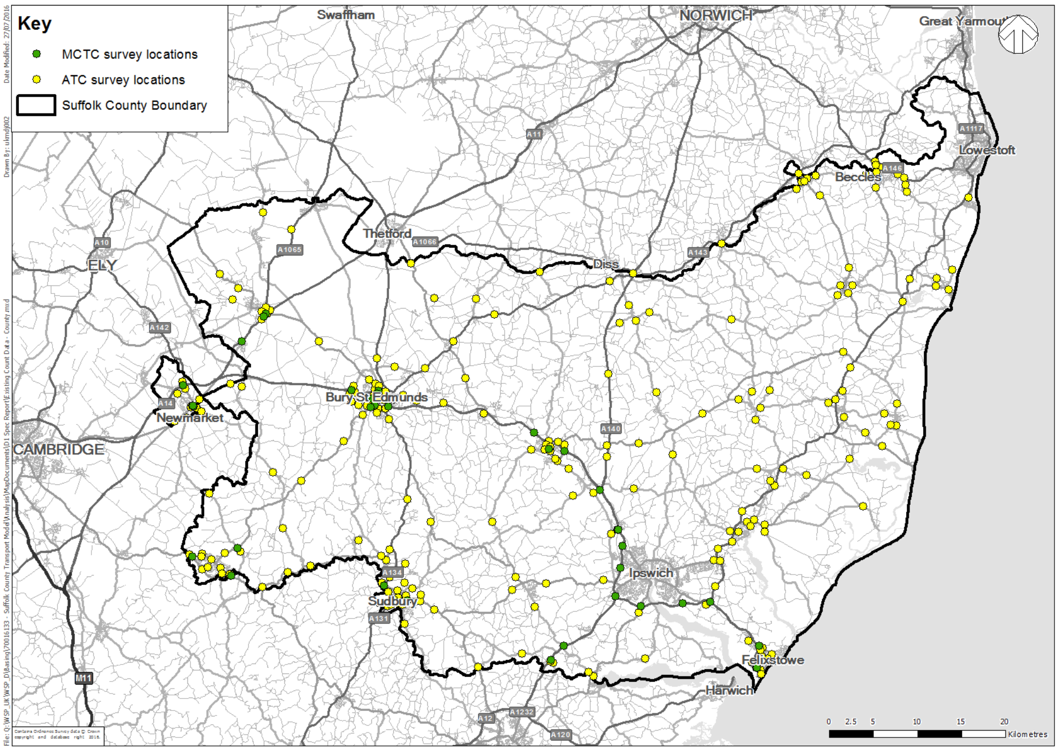


Figure 4 Commissioned Traffic Survey Locations

2.7.4. To convert TDM outputs to PTAM time periods, the onboard bus passenger counts have been summed over the TDM and PTAM time periods, and the ratio of the sums taken for each time period and each site in Ipswich. The ratios have then been averaged across sites. The Ipswich bus data has been used rather than Bury's or Lowestoft's as it has the largest flows and therefore the most robust. Bus counts have also been used in favour of rail given the vast majority of PT trips are by bus and bus is the only PT mode for which passenger flows are available - boarding and alighting data is available at rail stations but this informs trips ends, not flows.

2.7.5. HAM to TDM and PTAM to TDM conversion factors are shown in Table 3, along with IP to OP conversion factors. PT count data is only available from 0700 to 1900, therefore IP to OP conversion factors for the PTAM were assumed to be the same as for the HAM.

Table 3 Peak Hour to Peak Period and IP to OP Conversion Factors for the HAM

Sector Name	Sector Number	HAM			PTAM		
		Number of Counts	AM Peak Hour to Peak Period	PM Peak Hour to Peak Period	IP to OP period	AM Peak Hour to Peak Period	PM Peak Hour to Peak Period
Waveney	722	21	2.57	2.62	0.36	2.74	2.72
Suffolk Coastal North	717	20	2.55	2.68	0.34	2.74	2.72
St Edmundsbury South	706	19	2.54	2.60	0.45	2.74	2.72
Suffolk Coastal Central	718	16	2.52	2.62	0.33	2.74	2.72
Bury St Edmunds	704	15	2.46	2.70	0.38	2.74	2.72
Babergh West	712	13	2.61	2.59	0.41	2.74	2.72
Sudbury	711	12	2.62	2.58	0.41	2.74	2.72
Mid Suffolk Central	709	12	2.41	2.55	0.43	2.74	2.72
St Edmundsbury North	705	12	2.64	2.55	0.45	2.74	2.72
Babergh Central	713	9	2.63	2.53	0.39	2.74	2.72
Felixstowe/Trimley	716	10	2.29	2.62	0.49	2.74	2.72
Mid Suffolk North	708	9	2.47	2.56	0.43	2.74	2.72
Newmarket	700	8	2.62	2.53	0.45	2.74	2.72
Forest Heath South	702	7	2.72	2.67	0.51	2.74	2.72
Stowmarket	707	7	2.49	2.60	0.43	2.74	2.72
Mid Suffolk South	710	6	2.38	2.62	0.37	2.74	2.72
Haverhill	703	6	2.73	2.75	0.50	2.74	2.72
Beccles/Worlingham	721	3	2.87	2.67	0.39	2.74	2.72
Babergh East	714	5	2.65	2.66	0.50	2.74	2.72
Forest Heath North	701	5	2.75	2.56	0.51	2.74	2.72
Suffolk Coastal South	719	5	2.66	2.63	0.42	2.74	2.72
Essex County_N	727	1	2.69	2.36	0.46	2.74	2.72
Cambridgeshire County_SE	725	1	2.71	2.86	0.42	2.74	2.72
Average	**n/a**	**n/a**	**2.59**	**2.61**	**0.43**	**2.74**	**2.72**

Sector Name	Sector Number	HAM			PTAM		
		Number of Counts	AM Peak Hour to Peak Period	PM Peak Hour to Peak Period	IP to OP period	AM Peak Hour to Peak Period	PM Peak Hour to Peak Period
Essex County_S	728	0	2.59	2.61	0.43	2.74	2.72
East of England_W	729	0	2.59	2.61	0.43	2.74	2.72
Norfolk West	723	0	2.59	2.61	0.43	2.74	2.72
Norfolk East	724	0	2.59	2.61	0.43	2.74	2.72
Cambridgeshire County_NW	726	0	2.59	2.61	0.43	2.74	2.72
Great Britain North	731	0	2.59	2.61	0.43	2.74	2.72
Greater London	730	0	2.59	2.61	0.43	2.74	2.72
Ipswich District	715	0	2.59	2.61	0.43	2.74	2.72
Great Britain South	732	0	2.59	2.61	0.43	2.74	2.72
Lowestoft	720	0	2.59	2.61	0.43	2.74	2.72

2.8 DEMAND SEGMENTATION AND USER CLASSES

2.8.1. Traffic demand is split into the following two car availability segments in order to generate the correct responses in the demand model:

- Car Available (CA)
- No Car Available (NCA)

2.8.2. Demand is also segmented into the following journey purposes:

- Home-based work (HBW)
- Home-based employer's business (HBEB)
- Home-based other (HBO)
- Non-home-based employer's business (NHBEB)
- Non-home-based other (NHBO)

2.8.3. Table 4 shows the combinations of trip purpose and car availability that make trips within the SCTM TDM.

Table 4 SCTM TDM Demand Strata

Stratum	Description	Constraint Type	Demand Form
1	HBEB_CA	Singly	PA
2	HBEB_NCA	Singly	PA
3	HBO_CA	Singly	PA
4	HBO_NCA	Singly	PA
5	HBW_CA	Doubly	PA
6	HBW_NCA	Doubly	PA
7	NHBEB_CA	Singly	OD
8	NHBEB_NCA	Singly	OD
9	NHBO_CA	Singly	OD
10	NHBO_NCA	Singly	OD

2.8.4. All demand strata are singly (production-end) constrained, except HBW-CA and HBW-NCA, as suggested in DfT's TAG Unit M2 section 4.9.10 (Variable Demand Modelling, March 2017).

2.8.5. All home-based demand strata in the SCTM TDM are treated at tour or Production/Attraction (P/A) level and all non-home-based demand strata are treated at individual trip or Origin/Destination (O/D) level, as no overall tour assumptions can be incorporated without considerably more information and complexity. With tour modelling, demand responses are modelled on the basis of the total cost of travel for the outbound and return journeys combined, while with trip-based modelling the cost of travel for each individual trip is used separately.

2.9 REFERENCE DEMAND

2.9.1. All home-based and non-home-based reference demand matrices that are input into the TDM are derived from the validated assignment matrices using a series of conversion procedures.

2.9.2. The validated assignment matrices are first converted from HAM and PTAM time periods to TDM time periods using the conversion factors described in section 2.7.

2.9.3. All car reference demand matrices are then converted from PCUs to person units using the relevant base year occupancy rates for each demand strata and each time period. The occupancy factors used are outlined in Table 12. At this point, non-home-based matrices are ready to use in the TDM; however home-based matrices still need to be converted from O/D to P/A level.

2.9.4. To allow the conversion from O/D to P/A, outbound and inbound home-based matrices are aggregated across time periods then averaged to derive total daily home-based demand by mode and demand stratum. Tour proportions are then used to split these daily demand matrices into time period combinations. The tour proportions used are taken from the DIADEM 5.0 (SATURN) user manual (Appendix C).

2.9.5. The default tour proportions in DIADEM 5.0 are available for car, bus and rail, and have been derived from National Travel Survey data. As the bus and rail matrices are combined into one main mode in the SCTM TDM, a weighted average of the bus and rail tour proportions has been taken, using bus and rail patronages derived from observed data (82% for bus and 18% for rail). The car and combined PT tour proportions have then been furnessed to validated trip ends for application in the SCTM TDM. The furnessed proportions are shown in Table 5, Table 6, and Table 7, for car and public transport (CA and NCA), respectively.

Table 5 Tour Proportions for Car

Car	AM-AM	AM-IP	AM-PM	AM-OP	IP-IP	IP-PM	IP-OP	PM-PM	PM-OP	OP-OP
Employer's Business	0%	15.85%	49.83%	2.32%	6.28%	10.17%	0.56%	6.08%	1.91%	4.20%
Other	4.45%	14.85%	4.63%	0.11%	31.23%	12.35%	0.49%	10.8%	2.15%	17.24%
Commuting	2.06%	13.38%	52.16%	3.70%	5.00%	10.85%	2.97%	1.17%	0.73%	1.70%

Table 6 Tour Proportions for Public Transport (CA segments)

PT	AM-AM	AM-IP	AM-PM	AM-OP	IP-IP	IP-PM	IP-OP	PM-PM	PM-OP	OP-OP
Employer's Business	0%	16.79%	52.96%	3.25%	5.47%	8.89%	0.64%	3.53%	1.46%	4.64%
Other	3.82%	19.30%	10.82%	0.13%	25.28%	14.02%	0.77%	6.96%	2.01%	16.09%
Commuting	2.37%	11.42%	66.00%	3.38%	2.26%	7.19%	1.44%	0.66%	0.30%	0.95%

Table 7 Tour Proportions for Public Transport (NCA segments)

PT	AM-AM	AM-IP	AM-PM	AM-OP	IP-IP	IP-PM	IP-OP	PM-PM	PM-OP	OP-OP
Employer's Business	0%	16.96%	53.44%	3.62%	5.45%	8.85%	0.71%	3.43%	1.57%	4.11%
Other	4.77%	18.53%	10.63%	0.13%	25.05%	14.22%	0.79%	6.95%	2.02%	16.06%
Commuting	2.36%	12.12%	64.59%	3.94%	2.38%	6.96%	1.66%	0.63%	0.34%	1.07%

2.9.6. The furnessed tour proportions in the tables above are used to split the total daily home-based demand into P/A combinations.

2.9.7. The resulting split matrices are aggregated by outbound and inbound time periods and subtracted from the initial matrices on a cell by cell basis to calculate fitting-on factors. These factors help ensure that the O/D to P/A conversion process is reversible and also address the inaccuracies resulting from the use of national datasets and the omission of trips that occur in time period combinations that are not modelled in the SCTM TDM (IP-AM, PM-AM, PM-IP, OP-AM, OP-IP, and OP-PM).

2.10 DIMENSIONS AND UNITS

2.10.1. The dimensions and units used in the SCTM TDM are outlined in Table 8.

Table 8 Dimensions and Units of Input

Skims	Units
Time skims	Minutes (min)
Distance skims	Kilometres (km)
All Public Transport time skims (in-vehicle time, origin wait time, transfer wait time, walk time, access time and egress time)	Minutes (min)
Public Transport fare skims	Pence (p)
Public Transport number of interchange skims	Number of interchanges

Input Parameters	Units
Value of Time	Pence/minute (p/min)
Weight applied to time spent walking	n/a
Weight applied to time spent waiting	n/a
Occupancy rates	People/car
Value of Operating Cost (VOC)	Pence/Kilometre (p/km)

3 GENERALISED COSTS

3.1.1. This chapter outlines how the generalised costs have been calculated in the SCTM TDM and the equations and parameters used.

3.2 GENERALISED COST COMPONENTS

3.2.1. People's travel choices depend on both the monetary and time costs of the alternatives available to them. In the SCTM TDM, the generalised costs associated with each mode are all formulated as recommended in section 3 of DfT's TAG Unit M2 (Variable Demand Modelling, March 2017).

3.2.2. The generalised costs of travel in the TDM are expressed in units of time (in minutes) and include both the times and monetary costs associated with each trip.

3.2.3. The generalised costs have been derived using variables relating to the trips under consideration and others relating to the choice-making individuals. The variables relating to the trips (like ride time or trip distance) have been exported as skim matrices from the HAM and PTAM; and the variables relating to the choice-making individuals (like their values of time) have been extracted from the DfT's TAG data book (July 2017, release v1.8).

3.3 CAR GENERALISED COST FORMULATION

3.3.1. The car generalised costs for a specific OD pair, time of day and demand stratum are calculated in the SCTM TDM as follows:

$$G_{car} = t_{ride} + \frac{d * VOC}{occ * VOT}$$

Where:

- G_{car} is the car generalised cost (in min);
- t_{ride} is the journey time spent in the car (in min);
- d is the journey distance travelled by car (in km);
- VOC is the vehicle operating cost per km for the trip purpose (in p/km);
- occ is the number of people in the car (who are assumed to share the cost); and
- VOT is the value of time for the demand stratum (in p/min).

3.3.2. t_{ride} and d are exported as skim matrices from the calibrated base year HAM for each time period and each assigned user class. More details on these can be found in the SCTM LMVR (November 2017).

3.3.3. The walk time and parking cost components of the equation in section 3.1.6 in DfT's TAG Unit M2 (Variable Demand Modelling , March 2017) are not used in SCTM due to the lack of information on residential, on-street, and workplace car parks and on walking trips to and from car parks within the fully modelled (internal) area. Parking charges at the modelled park-and-ride sites have been included in the park-and-ride generalised cost formulation.

Intra-zonal Distances and Times

3.3.4. Intra-zonal costs are required in order to represent trips within a zone and must be realistic to allow the choice between intra-zonal and inter-zonal trips in the distribution model. DfT's TAG M2 A.1.17 (Variable Demand Modelling, March 2017) states:

> *Care should be taken when dealing with intra-zonal trips. Because most assignment models do not output intra-zonal costs (since intra-zonal trips are not assigned) there may be problems with using incremental models where there are observed intra-zonal trips in the base year trip matrix. It is desirable that robust estimates of intra-zonal costs should be estimated in these instances. These could be some function of the inter-zonal costs, for example half the minimum inter-zonal costs for that zone (of course factors such as the nature of juxtaposition of other zones and the size of the*

zone itself are considerations). Power function elasticity models will be particularly sensitive to very small intra-zonal costs, and this is one reason why they should be avoided when this is the case.

3.3.5. In line with this advice, intra-zonal distances and times have been derived by finding the minimum value for journeys to/from all other zones (i.e. the row and column minimum) and halving this. This calculation is updated at each iteration of the model.

3.4 PUBLIC TRANSPORT GENERALISED COST FORMULATION

3.4.1. The public transport generalised cost for a specific OD pair, time of day and demand stratum is the sum of the costs of the individual stages of the journey, such as accessing and waiting for public transport, riding on public transport, and egressing at the destination. It is calculated as follows:

$$G_{PT} = t_{walk} * v_{walktime} + t_{wait} * v_{waittime} + t_{ride} + \frac{c_{fare}}{VOT} + c_{interchange}$$

Where:

- G_{PT} is the public transport generalised cost (in min);
- t_{walk} is the total walking time to and from the PT service (in min);
- t_{wait} is the total waiting time for all PT services used on the journey (in min);
- $v_{walktime}$ and $v_{waittime}$ are the weights applied to time spent walking and waiting, respectively, to reflect increases in perceived time when walking and waiting for public transport;
- t_{ride} is the total in-vehicle journey time (in min);
- VOT is the value of time for the demand stratum (in p/min);
- c_{fare} is the fare (in pence); and
- $c_{interchange}$ is the interchange penalty if the journey involves transferring from one PT service to another (in min). It is calculated as a time penalty multiplied by the number of transfers.

3.4.2. t_{walk} consists of:

- Access time (from real origin to PT stop);
- Egress time (from PT stop to real destination); and
- Transfer time (between PT stops).

3.4.3. t_{wait} consists of:

- Origin wait time (time spent waiting for the first service on path); and
- Transfer wait time (time spent waiting for subsequent services).

3.4.4. The number of transfers, access time, egress time, transfer time, origin wait time, transfer wait time, and in-vehicle time attributes are exported as skim matrices from the calibrated base year PTAMs for each time period and user class. Passenger fares are not included in the PTAM; the section below outlines how they have been derived.

Intra-zonal Distances and Times

3.4.5. Given the size of the internal zones, it is assumed that no intra-zonal trips are made by public transport. The generalised costs on all intra-zonal OD pairs are set to a very large value, which prevents the TDM from allocating any trips to them.

Derivation of Public Transport Fares

3.4.6. Bus and rail fare structures vary considerably from one operator to another, which makes them challenging to model. Following an analysis of the fares across the boroughs of Suffolk County, the following assumptions have been made:

- Bus fares are fixed fares applied per boarding
- Rail fares are distance-based

3.4.7. Table 9 outlines some sample bus fares in the study area, showing that there is no strong correlation between distance and fare.

Table 9 Sample Bus Fares in the Study Area

From	To	Distance (km)	Day Ticket (£)
Ipswich	Stowmarket	28	£1.65
Ipswich	Felixstowe	24	£1.83
Ipswich	Aldeburgh	45	£1.93
Ipswich	Melton	16	£1.83
Southwold	Lowestoft	22	£1.75
Ipswich	Ipswich	4	£1.20
Ipswich	Ipswich	9	£1.20
Mildenhall	Thetford	40	£2.70
Bury St. Edmunds	Thetford	24	£1.98
Bury St. Edmunds	Bury St. Edmunds	15	£0.68
Sudbury	Colchester	33	£3.50
Bury St. Edmunds	Stowmarket	25	£2.90

3.4.8. Bus fares are assumed to be fixed and the same across all bus lines and operators within the study area. They have been set to £2.00 for commuters and £3.00 for others and have also been assumed not to vary by time period.

3.4.9. Rail fares per kilometre have been interpolated in PTV Visum based on the actual fares on selected flows with high passenger volumes. Distances on trips to and from London have been increased by 50km to reflect the higher fares on the corresponding services. A minimum fare of £3.00 has been set for commuters and £4.00 for others

3.4.10. Table 10 shows some sample rail fares in the study area.

Table 10 Sample Rail Fares in the Study Area

From	To	Distance (km)	Daily Equivalent of Season Ticket (1 - 6 months)	Any Time (Single)	Off Peak (Single)
Ipswich	Colchester	25	£4.39	£7.60	£7.60
Ipswich	Chelmsford	60	£8.18	£14.10	£14.10
Ipswich	Stratford (London)	101	£14.93	£49.20	£39.40
Ipswich	London Liverpool Street	107	£15.81	£49.20	£39.80
Ipswich	Norwich	71	£8.25	£15.20	£15.20
Stowmarket	Norwich	53	£6.96	£13.00	£13.00
Cambridge	Norwich	104	£10.88	£24.80	£17.60

3.4.11. In the SCTM, there is only one ticket type available for each demand segment. For employer's business and other purposes, anytime single ticket fares have been used for the AM peak, and off-peak fares for the other time periods. For commuting purposes, a daily equivalent fare has been derived from weekly / monthly / season tickets.

3.5 PARK-AND-RIDE GENERALISED COST FORMULATION

3.5.1. In the SCTM TDM, park-and-ride is modelled as a submode of public transport. Modelled park-and-ride trips involve people driving from their real origins to their respective train stations, parking their cars at the station car parks or nearby parking facilities, then using public transport services to reach their final destinations. In this model, people are assumed to use soft modes at the destination end of their trips i.e. from their last train stops to their real destinations (where they undertake their activity) - this part of their journeys is not modelled in the SCTM TDM. Walk movements between car parks and train stations have also been ignored for simplicity.

3.5.2. Additional procedure steps have been coded into the model in which parking sites are selected for each OD pair with park-and-ride demand. These steps make use of the in-built 'P+R Lot Choice' procedure in PTV Visum as described below.

PTV Visum 'P+R Lot Choice' Procedure

3.5.3. The objective of the 'P+R Lot Choice' procedure is to find the optimum park-and-ride sites for each OD pair and distribute the park-and-ride demand across them while accounting for the total park-and-ride capacity. Once a balanced distribution is reached, the procedure also determines the combined utility of travel using park-and-ride for each real origin to real destination pair.

3.5.4. For each zone where parking supply is represented, definitions of capacity and price are required. More information on modelled car park capacities and prices can be found in Table 1. Additional input parameters include generalised utilities of travel on the inbound (car) and outbound (public transport) legs, and a volume-delay function to account for capacity-dependent costs. Restrictions on parking durations and enforcement penalties are not covered.

3.5.5. As suggested in section 2.3.30 in DfT's TAG Unit M5.1 (Modelling Parking and Park-and-ride, January 2014), an iterative process is built into the procedure, during which the proportionate demand per demand stratum, OD pair and park-and-ride site is a variable that undergoes continuous adjustment throughout subsequent iterations.

3.5.6. The following section in the PTV Visum 15 manual provides more information on the iteration process:

At the beginning of each iteration, a shortest path search is performed for each OD pair and its total demand is distributed across the park-and-ride site found. This normally does not represent optimum distribution. The demand distributed across a single path is then scaled with the factor λ and added to the formula for distribution of the previous iteration step as follows:

$$R' = (1 - \lambda)R + \lambda\Gamma$$

Where:

R' is the new distribution calculated with this iteration step

R is the distribution according to the previous iteration step

Γ is the distribution of total demand according to shortest path search

λ is a scaling factor between 0 and 1

The scaling factor λ is first adjusted to reduce the gap. The gap expresses the ratio of a) the actual utilities, taking into account the distribution of demand across all parking lots in reach, and b) the utilities arising from distribution of the total demand across the shortest path found. Gap utility calculation is performed across all OD pairs and demand strata.

The procedure is finished when either the maximum number of iterations has been reached or the gap value defined is undershot.

3.5.7. The maximum number of iterations for the 'P+R Lot Choice' procedure has been set to 100 and the maximum gap to 0.01.

3.6 GENERALISED COST PARAMETERS

3.6.1. The value of time (VOT) is used to represent the relative importance of cost versus time for different trip purposes and demand strata. In the SCTM TDM, separate values have been used for:

- Business travel (travel in work time)
- Journeys to work (commuting)
- Other personal travel (recreation, shopping, etc).

3.6.2. As recommended in DfT's TAG Unit M2 (Variable Demand Modelling, March 2017) section 3.3.6, the values of time used in the generalised cost calculations have been assumed to vary with distance as follows:

$$VOT_d = VOT.\left(\frac{d}{d_0}\right)^{nc}$$

Where:

- d is the skimmed trip length (in kilometres)
- d_0 is the distance (in kilometres) underpinning the national average values of time. These distances have been taken from Table C1 in DfT's TAG Unit M2 (Variable Demand Modelling, March 2017)
- VOT is the average value of time listed in Table 11
- n_c is the distance elasticity assumed to be 0.248 for commuting, 0.315 for other, 0.387 for employers' business and 0.435 for rail employers' business

3.6.3. The average values of time in the equation above are listed in Table 11 by TAG trip purpose. They have been derived from the July 2017 version of the DfT's TAG data book (release v1.8) using Table A1.3.2 and 2016 perceived cost values. They are expressed in pence / minute.

Table 11 Average Values of Time (pence / min) per TAG Trip Purpose

TAG Trip Purpose	Value of Time (p/min)
Work	28.99
Other	8.14
Commuting	17.82

3.6.4. The vehicle occupancy rates per trip have been derived from Table A1.3.3 in the DfT's TAG data book (July 2017, release v1.8). They are listed in Table 12 by time period and TAG trip purpose.

Table 12 Occupancy Rates per TAG Trip Purpose

TAG Trip Purpose	AM Peak	Interpeak	PM Peak	Off-peak
Work	1.20	1.19	1.17	1.18
Other	1.68	1.65	1.71	1.66
Commuting	1.17	1.15	1.16	1.18

3.6.5. Vehicle operating costs (VOCs) have been implemented in the SCTM TDM to reconstruct the monetary cost of car journeys. They represent the monetary cost to users of running a specific type of vehicle over a certain distance. This cost consists of both fuel costs and non-fuel costs (e.g. oil, tyres, maintenance and depreciation). Table 13 summarises the VOC values (in pence / kilometre) used in the SCTM TDM by TAG trip purpose. They have been calculated using an average network speed of 57.3 kph in the AM peak, 60.7 kph in the IP and the OP, and 56.5 kph in the PM peak.

Table 13 Vehicle Operating Costs per TAG Trip Purpose

TAG Trip Purpose	AM Peak VOC (p/km)	Interpeak VOC (p/km)	PM Peak VOC (p/km)	Off-peak VOC (p/km)
Work	12.15	11.97	12.19	11.97
Other	5.79	5.74	5.80	5.74
Commuting	5.79	5.74	5.80	5.74

3.6.6. The correspondence between TAG and SCTM trip purposes is outlined in Table 14.

Table 14 Correspondence between SCTM Trip Purposes and DfT's TAG Trip Purposes

SCTM Trip Purpose	TAG Trip Purpose
HBEB	Work
HBO	Other
HBW	Commuting
NHBEB	Work
NHBO	Other

3.6.7. Weights are applied to the time spent walking and waiting for public transport to reflect increases in perceived time when walking to and from stops and waiting for services. They are taken as the midpoint values of the ranges in section 3.1.5 of DfT's TAG Unit M3.2 (Public Transport Assignment Modelling, January 2014) and are assumed to be 1.75 and 2 times in-vehicle time, respectively.

3.6.8. The public transport transfer time penalty is assumed to be 7.5 minutes of in-vehicle time per interchange, which is also the midpoint of the range recommended in section 3.1.5 of DfT's TAG Unit M3.2 (Public Transport Assignment Modelling, January 2014).

3.6.9. Table 15 summarises the TAG-recommended ranges as well as the values chosen in SCTM for the interchange penalty and the walk time and wait time weightings. These are consistent with the values used within the SCTM PTAM.

Table 15 TAG-Recommended Ranges and SCTM Values for the Interchange Penalty, Value of Walk Time, and Value of Wait Time

GC Component	Minimum Recommended	Maximum Recommended	Chosen Value
Value of walk time (factor of in-vehicle time)	1.5	2	1.75
Value of wait time (factor of in-vehicle time)	1.5	2.5	2
Interchange penalty (in minutes of in-vehicle time per interchange)	5	10	7.5

3.7 COST DAMPING

3.7.1. In most models, using generalised costs directly as calculated above results in the model's elastic response to car fuel price changes being dominated by very long trips in a way that does not seem to accord with actual experience. According to Section 3.3 of DfT's TAG Unit M2 (Variable Demand Modelling, March 2017), there is also evidence that the impact of changes in generalised costs on demand responses reduces with increasing trip length. It is therefore common practice to apply some form of cost damping to long distance trips in order to reduce the elasticity of response and get satisfactory realism test results.

3.7.2. The SCTM TDM applies the damping function below to car and public transport generalised costs and to all purposes:

$$G' = AG^{\gamma}$$

Where:

- G' is the damped generalised cost (in min);
- G is the generalised cost calculated as described in sections 3.3, 3.4, 3.5 (in min)
- A and γ are positive cost damping coefficients determined by trial and error to meet the requirements of realism tests. They vary by mode and trip purpose, as shown in Table 16. These variations were essential to achieve acceptable realism test results.

Table 16 Cost Damping Parameters

Demand Stratum	A_{Car}	A_{PT}	γ_{Car}	γ_{PT}
HBEB_CA	4.79	2.08	0.65	0.85
HBEB_NCA	4.79	4.33	0.65	0.70
HBO_CA	3.82	2.15	0.70	0.85
HBO_NCA	3.82	4.62	0.70	0.70
HBW_CA	3.77	2.09	0.70	0.85
HBW_NCA	3.77	4.37	0.70	0.70
NHBEB_CA	4.79	3.39	0.65	0.75
NHBEB_NCA	4.79	5.53	0.65	0.65
NHBO_CA	4.78	2.15	0.65	0.85
NHBO_NCA	4.78	4.62	0.65	0.70

3.7.3. For public transport travel, the damping is set at $\gamma = 0.70$ for most NCA strata and at $\gamma = 0.85$ for the corresponding CA strata on the assumption that CA segments are more sensitive to changes in PT costs. For car travel, a milder damping is applied to most purposes ($\gamma = 0.65$), except HBO and HBW which use $\gamma = 0.7$.

4 DERIVATION OF TRAVEL DEMAND

4.1.1. This chapter outlines how the travel demand has been derived in the SCTM TDM and the equations and parameters used in the modelling process.

4.2 MODEL STRUCTURE

4.2.1. As outlined in section 2.2, the SCTM TDM is an incremental model, where the following choice levels have been considered in the order outlined below:

- Trip frequency;
- Main mode choice;
- Macro time of day choice;
- Trip distribution; and
- Submode choice.

4.2.2. This hierarchy is shown in Figure 5.

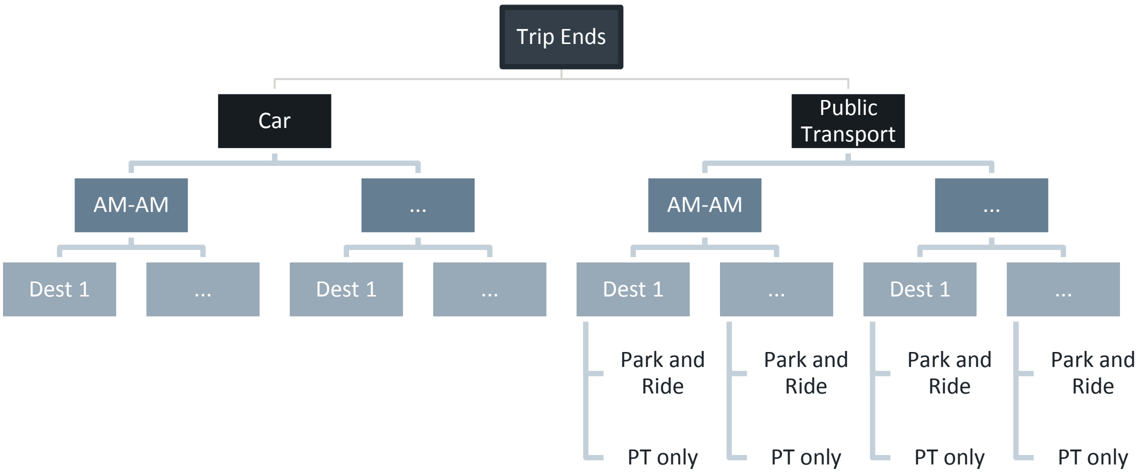


Figure 5 SCTM TDM Hierarchy

4.2.3. Appendix E in DfT's TAG Unit M2 (Variable Demand Modelling, March 2017) outlines the equations to use in incremental models that include mode choice, time period choice and trip distribution choice; however it does not explicitly cover cases where submode choice is also modelled. The general methodology in section E.1 has therefore been applied to understand the formulation to use in the SCTM TDM.

4.2.4. This section explains how the (composite) utility of travel, conditional probabilities, and updated trip matrices are derived for each level of the choice structure.

4.2.5. In the figures and equations in this section, the following notations are used for the indices:

- p refers to trip purposes
- c refers to person types
- i refers to trip origins
- j refers to trip destinations
- m refers to trip modes: C refers to car, and P refers to public transport
- t refers to trip time periods
- s refers to trip submodes

4.2.6. To avoid confusion, composite utilities are labelled as ΔU^* and changes in utility are labelled as ΔU.

4.2.7. In the SCTM TDM, the TAG-compliant composite utility and conditional probability calculations are derived using PTV's Nested Demand Model add-in. The formulae in the add-in have been revised so that a TAG-compliant choice formula with both lambda and theta parameters varying by mode could be used.

4.3 COMPOSITE UTILITIES

4.3.1. The base utility $\Delta U_{ijmtspc}$ determines choices at the lowest level of the hierarchy (assignment). It is derived from the cost in the relevant assignment model of a journey between two zones (i, j) in a specific time period t.

4.3.2. At higher stages in the hierarchy, costs across the more sensitive choices are combined for use in calculating the less sensitive choices. This is called "composite utility". The composite utilities at each of the higher levels of the choice model are derived by successively aggregating utilities from the lower levels. Table 17 shows how the composite utilities relate to the overall model hierarchy.

4.3.3. Sensitivity parameters are introduced at each stage of the hierarchy to reflect reducing sensitivity moving up the hierarchy. By convention, the sensitivity parameter at the level above assignment is denoted by λ. At higher levels, it is represented by θ, a scaling parameter which reflects the sensitivity of a choice level relative to another. At the bottom level of the hierarchy, λ is treated as a negative, to reflect the fact that cost is a disincentive to travel. At higher levels, this negative term is already incorporated into the formulation, so θ is positive. Both values are less than or equal to 1, in absolute terms, with smaller values reflecting lower levels of sensitivity.

Submode Choice

4.3.4. The submode choice model allows for the interaction between the highway and public transport networks, and is needed to accurately model specific park-and-ride services. It is only applied to car available (CA) person types.

4.3.5. The change in utility for the lowest level of the hierarchy is calculated using the equation below:

$$\Delta U_{ijPtspc} = -\lambda_{submode}(C_{ijPtspc} - C^0_{ijPtspc})$$

Where:

$\Delta U_{ijPtspc}$ refers to the change in the utility of travel by public transport for zone origin i, zone destination j, time of day t, and submode s

$C^0_{ijPtspc}$ is the corresponding reference generalised cost calculated from the base year calibrated and validated highway and public transport assignment models (in minutes)

$C_{ijPtspc}$ is the corresponding forecast generalised cost (in minutes)

$\lambda_{submode}$ is the sensitivity parameter for the submode choice stage

4.3.6. For home-based purposes, the generalised costs in the equation above refer to the total costs on tours. This combination of outbound and inbound costs is calculated internally as part of the in-built calculations in PTV Visum. As outlined in section 2.8.5, this is done by using the cost of travel from the origin zone to the destination zone in the outbound time period and the cost of travel from the destination zone back to the origin zone in the inbound time period (the input utility matrices always refer to a single macro time period). While this methodology is reasonable for the calculation of car OR public transport (single-mode) return costs, it causes two main issues when calculating park-and-ride return costs:

- For a specific OD pair, the origin and destination zones may not be associated with the same park-and-ride site.
- For a specific OD pair, the first leg of the inbound and outbound journey is always made by car and the second leg is always made by public transport.

This is a limitation in the software which PTV is aware of and has registered as a task for software development.

Trip Distribution

4.3.7. When calculating trip distribution, trips may be considered as either singly-constrained, where constraints apply only at the production end of the trip, or doubly-constrained, where constraints apply at both production and attraction ends. In the SCTM TDM, commuting and education trips are doubly-constrained, with other purposes being singly-constrained.

4.3.8. Trip distribution is at the bottom of the hierarchy under the car branch; the change in the utility of travel at this level is therefore calculated as follows:

$$\Delta U_{ijCtpc} = -\lambda_{dest}\left(C_{ijCtpc} - C^0_{ijCtpc}\right)$$

Where:

ΔU_{ijCtpc} refers to the change in the utility of travel by car for zone origin i, zone destination j, and time of day t

C^0_{ijCtpc} is the corresponding reference generalised cost calculated from the base year calibrated and validated highway assignment models (in minutes)

C_{ijCtpc} is the corresponding forecast generalised cost (in minutes)

λ_{dest} is the sensitivity parameter for the trip distribution stage

4.3.9. Under the public transport nest, trip distribution is not the lowest level in the hierarchy; therefore the change in utility at this level is the composite change over the submode choice alternatives, as shown below:

$$\Delta U^*{}_{ijPtpc} = ln \sum_s p^0_{s|ijPtpc} \exp(\Delta U_{ijPtspc})$$

Where $\Delta U_{ijPtspc}$ is calculated as above and $p^0_{s|ijPtpc}$ is the reference case probability calculated from the input reference demand for public transport $T^0_{ijPtspc}$ as follows:

$$p^0_{s|ijPtpc} = \frac{T^0_{ijPtspc}}{\sum_s T^0_{ijPtspc}} = \frac{T^0_{ijPtspc}}{T^0_{ijPtpc}}$$

Time Period Choice

4.3.10. The change in the composite utility at the time period choice level under the car nest is calculated using the equation below:

$$\Delta U^*{}_{iCtpc} = ln \sum_j B_{jp} p^0_{j|iCtpc} \exp\left(\Delta U_{ijCtpc}\right)$$

Where :

B_{jp} is the balancing factor for doubly constrained purposes

ΔU_{ijCtpc} is calculated as above, and

$p^0_{(j|iCtpc)}$ is the reference case probability calculated from the input reference demand for car $T^0_{ijCtspc}$as follows:

$$p^0_{j|iCtpc} = \frac{T^0_{ijCtpc}}{\sum_j T^0_{ijCtpc}} = \frac{T^0_{ijCtpc}}{T^0_{iCtpc}}$$

4.3.11. The change in the composite utility at the time period choice level under the public transport nest is calculated using the equation below:

$$\Delta U^*{}_{iPtpc} = ln \sum_j B_{jp} p^0_{j|iPtpc} \exp(\theta_{dest} \Delta U^*{}_{ijPtpc})$$

Where:

θ_{dest} is the scaling parameter for the destination choice stage

$\Delta U^*{}_{ijPtpc}$ is calculated as above, and

$p^0_{j|iPtpc}$ is the reference case probability calculated from the input reference demand for public transport $T^0_{ijPtspc}$as follows:

$$p^0_{j|iPtpc} = \frac{\sum_s T^0_{ijPtspc}}{\sum_{sj} T^0_{ijPtspc}} = \frac{T^0_{ijPtpc}}{T^0_{iPtpc}}$$

Main Mode Choice

4.3.12. The main mode choice model is only applied to car available (CA) person types.

4.3.13. The change in the composite utility at the main mode choice level is calculated using the equation below:

$$\Delta U^*{}_{impc} = ln \sum_t p^0_{t|impc} \exp\left(\theta_{time} \Delta U^*{}_{imtpc}\right)$$

Where:

θ_{time} is the scaling parameter for the time period choice stage

$\Delta U^*{}_{imtpc}$ is calculated for car and public transport as outlined above, and

$p^0_{t|impc}$ is the reference case probability calculated from the input reference demand $T^0_{ijmtspc}$ as follows:

$$Car: p^0_{t|iCpc} = \frac{\sum_j T^0_{ijCtpc}}{\sum_{jt} T^0_{ijCtpc}} = \frac{T^0_{iCtpc}}{T^0_{iCpc}}$$

$$PT: p^0_{t|iPpc} = \frac{\sum_{sj} T^0_{ijPtspc}}{\sum_{sjt} T^0_{ijPtspc}} = \frac{T^0_{iPtpc}}{T^0_{iPpc}}$$

Trip Frequency

4.3.14. Trip frequency is included as a trip response since the slow modes are not explicitly modelled in the SCTM TDM, so trip frequency acts as a proxy for this choice. It has been applied to all modelled demand strata (purposes and car availability characteristics).

4.3.15. Trip frequency is invariably the least sensitive response in the hierarchy. The composite cost at this level is calculated using the equation below:

$$\Delta U^*{}_{ipc} = ln \sum_m p^0_{m|ipc} \exp(\theta_{mode} \Delta U^*{}_{impc})$$

Where θ_{mode} is the scaling parameter for the main mode choice stage

$\Delta U^*{}_{impc}$ is calculated as above, and

$p^0_{m|ipc}$ is the reference case probability calculated from the input reference demand $T^0_{ijmtspc}$ as follows:

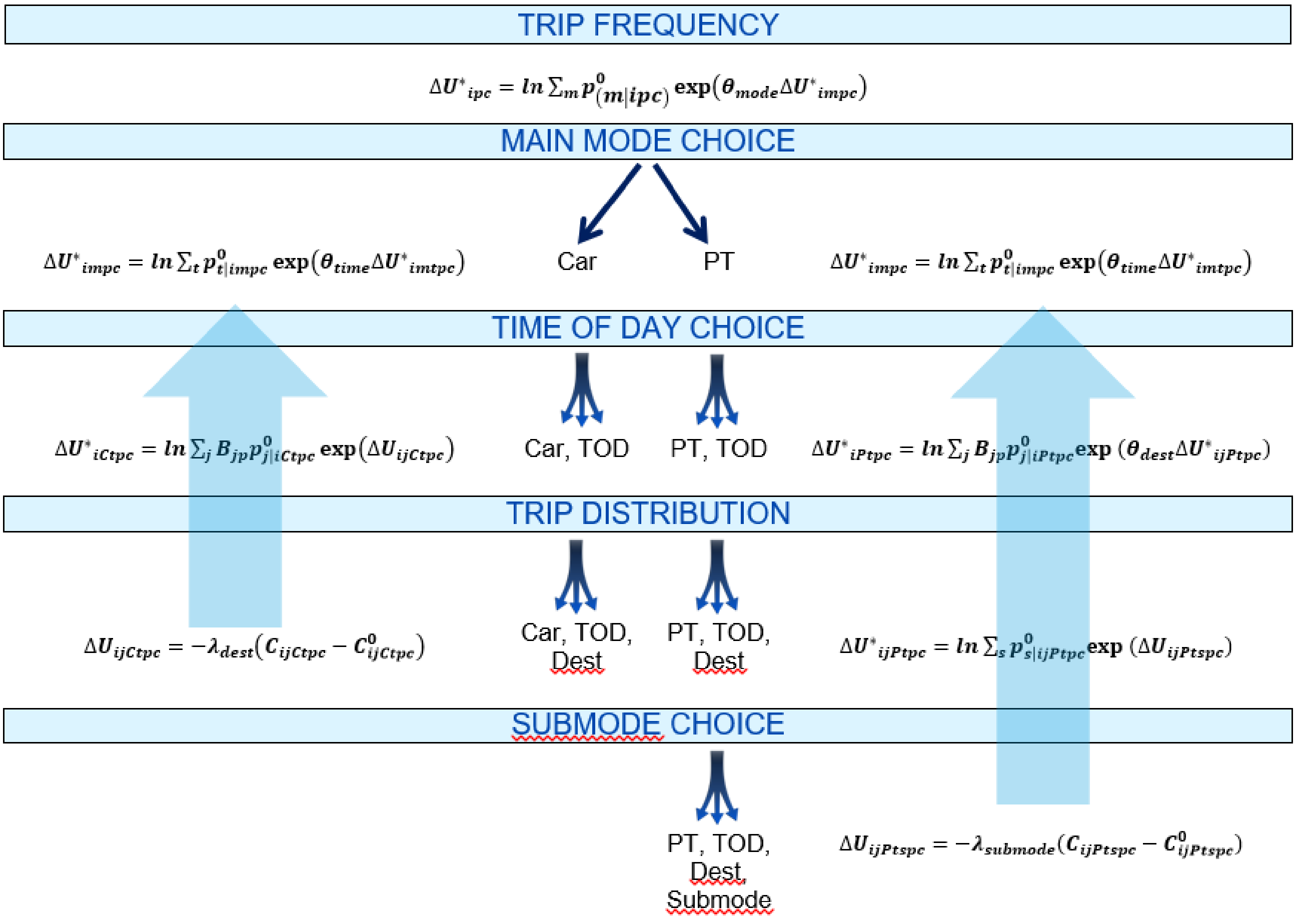
$$Car: p^0_{C|ipc} = \frac{\sum_{jt} T^0_{ijCtpc}}{\sum_{jtm} T^0_{ijmtpc}} = \frac{T^0_{iCpc}}{T^0_{ipc}}$$

$$PT: p^0_{P|ipc} = \frac{\sum_{sjt} T^0_{ijPtspc}}{\sum_{sjtm} T^0_{ijmtspc}} = \frac{T^0_{iPpc}}{T^0_{ipc}}$$

Summary of Utility Equations

4.3.16. Table 17 shows how the composite costs relate to the overall model hierarchy. At each of the higher levels of the choice model, they are derived by successively aggregating costs from the lower levels.

Table 17 Composite Utility Equations



4.4 CONDITIONAL PROBABILITIES

4.4.1. In order to update the trip matrix, conditional probabilities need to be calculated for each level using the composite utilities and reference case probabilities outlined above.

Main Mode Choice

4.4.2. The conditional probability at the main mode choice level is calculated as follows:

$$p_{m|ipc} = \frac{p^0_{m|ipc}\exp(\theta_{mode}\Delta U^*{}_{impc})}{\sum_k p^0_{k|ipc}\exp(\theta_{mode}\Delta U^*{}_{ikpc})}$$

Where:

θ_{mode} is the scaling parameter for the main mode choice stage, and

$p^0_{m|ipc}$ is the reference case probability calculated from the input reference demand $T^0_{ijmtspc}$as follows:

$$Car: p^0_{C|ipc} = \frac{\sum_{jt} T^0_{ijCtpc}}{\sum_{jtm} T^0_{ijCtpc}} = \frac{T^0_{iCpc}}{T^0_{ipc}}$$

$$PT: p^0_{P|ipc} = \frac{\sum_{sjt} T^0_{ijPtspc}}{\sum_{sjtm} T^0_{ijPtspc}} = \frac{T^0_{iPpc}}{T^0_{ipc}}$$

Time Period Choice

4.4.3. The conditional probability at the time period choice level is calculated as follows:

$$p_{t|impc} = \frac{p^0_{t|impc}\exp(\theta_{time}\Delta U^*{}_{imtpc})}{\sum_k p^0_{k|impc}\exp(\theta_{time}\Delta U^*{}_{imkpc})}$$

Where:

$p^0_{t|impc}$for car and public transport are $p^0_{t|iCpc}$ and $p^0_{t|iPpc}$ respectively, and

$\Delta U^*{}_{imtpc}$ for car and public transport are $\Delta U^*{}_{iCtpc}$ and $\Delta U^*{}_{iPtpc}$, respectively.

Trip Distribution

4.4.4. The conditional probabilities at the trip distribution choice level for the car and public transport modes are respectively calculated as follows:

$$p_{j|iCtpc} = \frac{B_{jp}p^0_{j|iCtpc}\exp\left(\Delta U_{ijCtpc}\right)}{\sum_k B_{kp}p^0_{k|iCtpc}\exp\left(\Delta U_{ikCtpc}\right)}$$

$$p_{j|iPtpc} = \frac{B_{jp}p^0_{j|iPtpc}\exp\left(\theta_{dest}\Delta U^*{}_{ijPtpc}\right)}{\sum_k B_{kp}p^0_{k|iPtpc}\exp\left(\theta_{dest}\Delta U^*{}_{ikPtpc}\right)}$$

Submode Choice

4.4.5. The conditional probability at the submode choice level is calculated as follows:

$$p_{s|ijPtpc} = \frac{p^0_{sijPtpc}\exp(\Delta U_{ijPtspc})}{\sum_k p^0_{sijPtpc}\exp(\Delta U_{ijPtkpc})}$$

4.5 UPDATED TRIP MATRIX

4.5.1. Having derived the conditional probabilities, the updated trip matrix can then be calculated for car and public transport using the formulae below, respectively:

$$T_{ijCtpc} = T^{0}_{ipc} p_{C|ipc} p_{t|iCpc} p_{j|iCtpc}$$

$$T_{sijPtpc} = T^{0}_{ipc} p_{P|ipc} p_{t|iPpc} p_{j|iPtpc} p_{s|ijPtpc}$$

4.6 APPLICATION OF TRIP FREQUENCY

4.6.1. As suggested in section E.8 of DfT's TAG Unit M2 (Variable Demand Modelling, March 2017), the trip frequency model is only applied after the above process has converged. It is applied at each demand/supply iteration using the equation below:

$$T'_{ijCtpc} = \exp(\theta_{freq} \Delta U^{*}{}_{ipc}) T_{ijCtpc}$$

$$T'_{sijPtpc} = \exp(\theta_{freq} \Delta U^{*}{}_{ipc}) T_{sijPtpc}$$

4.6.2. This gives the final trip and tour matrices for each demand/supply iteration.

4.7 PARAMETERS

4.7.1. Sensitivity parameters are introduced at each stage of the hierarchy to reflect reducing sensitivity moving up the hierarchy. They have been calibrated to achieve acceptable realism test results.

Mode Choice Scaling Parameters

4.7.2. As suggested in DfT's TAG Unit M2 section 5.6.17 (Variable Demand Modelling, March 2017), the mode choice and time of day sensitivity parameters (λ_{mode} and λ_{time}, respectively) have been assumed to be equal in all cases in the SCTM TDM. The mode choice scaling parameter θ_{mode}, defined as the ratio of λ_{mode} to λ_{time}, has thus been set to 1.

Time of Day Choice Scaling Parameters

4.7.3. Table 5.2 in DfT's TAG Unit M2 (Variable Demand Modelling, March 2017) lists illustrative values for the sensitivity of mode choice relative to destination choice (λ_{mode} / λ_{dist}). However, the sensitivity parameter of mode choice (λ_{mode}) has been assumed to be equal to that of time of day choice (λ_{time}), see section above. Therefore, the values in DfT's TAG also represent the ratio of λ_{time} to λ_{dist} i.e. θ_{time}.

4.7.4. The time of day scaling parameters used in SCTM for car and public transport are outlined in Table 18, along with the illustrative ranges listed in DfT's TAG, for comparison.

4.7.5. All θ_{time} values are less than or equal to one, which is consistent with the hierarchy adopted where destination choice follows time of day choice.

Table 18 Time of Day Choice Scaling Parameters

Trip Purpose	SCTM		Tag Illustrative Values			Cost Units
	$\theta_{time,Car}$	$\theta_{time,PT}$	Minimum	Median	Maximum	
HBW	0.51	0.68	0.50	0.68	0.83	Two-way
HBEB	0.36	0.45	0.26	0.45	0.65	Two-way
HBO	0.40	0.53	0.27	0.53	1.00	Two-way
NHBEB	0.55	0.73	0.73	0.73	0.73	One-way
NHBO	0.65	0.81	0.62	0.81	1.00	One-way

Trip Distribution and Submode choice Sensitivity Parameters

4.7.6. The trip distribution sensitivity parameters adopted in SCTM are outlined in Table 19 and Table 20 for car and public transport, respectively. These tables also show the illustrative ranges listed in DfT's TAG Unit M2 Table 5.1 (Variable Demand Modelling, March 2017), for comparison. As stated in paragraph 5.6.6 in DfT's TAG Unit M2, the illustrative sensitivity parameters relate to trip-based models and one-way generalised costs; they have thus been halved for home-based purposes in Table 19 and Table 20 for comparison with the values in SCTM.

4.7.7. $\lambda_{dist,m}$ tends to be numerically larger where there is more freedom to choose. Thus more optional travel, such as HBO trips, tends to be more elastic and has a numerically larger lambda value than, say, travel to work.

Table 19 Destination Choice Sensitivity Parameters for Car ($\lambda_{dest,car}$)

Trip Purpose	SCTM	Tag Illustrative Values			Cost Units
		Minimum	Median	Maximum	
HBW	0.024	0.027	0.033	0.057	Two-way
HBEB	0.027	0.019	0.034	0.053	Two-way
HBO	0.034	0.037	0.045	0.080	Two-way
NHBEB	0.061	0.069	0.081	0.107	One-way
NHBO	0.058	0.073	0.077	0.105	One-way

Table 20 Destination Choice Scaling Parameters for Public Transport ($\theta_{dest,PT}$) and Submode Choice Sensitivity Parameters $\lambda_{submode}$

Trip Purpose	SCTM		Tag Illustrative Values			Cost Units
	$\theta_{dest,PT}$	$\lambda_{submode}$	Minimum	Median	Maximum	
HBW	1.000	0.021	0.012	0.017	0.022	Two-way
HBEB	0.800	0.018	0.015	0.018	0.022	Two-way
HBO	1.000	0.018	0.017	0.018	0.031	Two-way
NHBEB	0.750	0.038	0.038	0.042	0.045	One-way
NHBO	0.800	0.033	0.032	0.033	0.035	One-way

4.7.8. To improve calibration and realism test results, some lambdas and thetas for car have been refined, but nevertheless remain within ±25% of the DfT's TAG medians. This is in line with TAG's advice in Unit M2 section 5.6.14 (Variable Demand Modelling, March 2017).

5 ITERATION AND DEMAND/SUPPLY CONVERGENCE

5.1.1. This chapter outlines the iteration process and the demand/supply convergence.

5.2 DEMAND/SUPPLY CONVERGENCE

5.2.1. It is critical that the entire model system converges to a satisfactory level to ensure that derived forecasts are free from model noise. In line with DfT's TAG M2 Section 6.3 (Variable Demand Modelling, March 2017), the recommended criterion for measuring convergence between demand and supply models is the demand/supply gap.

5.2.2. The demand/supply gap is calculated using the in-built 'Nested Demand Model Gap' procedure in PTV Visum where the gap is defined by the following formula:

$$\frac{\sum_a U_a \times (|D_a - PD_a|)}{\sum_a U_a \times PD_a} \times 100$$

Where:

PD_a is cell a in the demand matrices of the previous iteration

U_a is cell a in the generalised costs resulting from assigning PD_a

D_a is cell a in the demand matrices of the current iteration

a represents every combination of origin, destination, demand segment, time period, mode, and submode.

5.2.3. According to DfT's TAG, 'tests indicate that gap values of less than 0.1% can be achieved in many cases, although in more problematic systems this may be nearer to 0.2%'. The iteration process for the SCTM TDM is set up so that when a demand/supply gap of 0.2% is achieved, the model stops iterating - there may be a need to review this as part of the forecasting process for specific applications.

5.3 ITERATION PROCESS

5.3.1. The iteration process is illustrated in Figure 6.

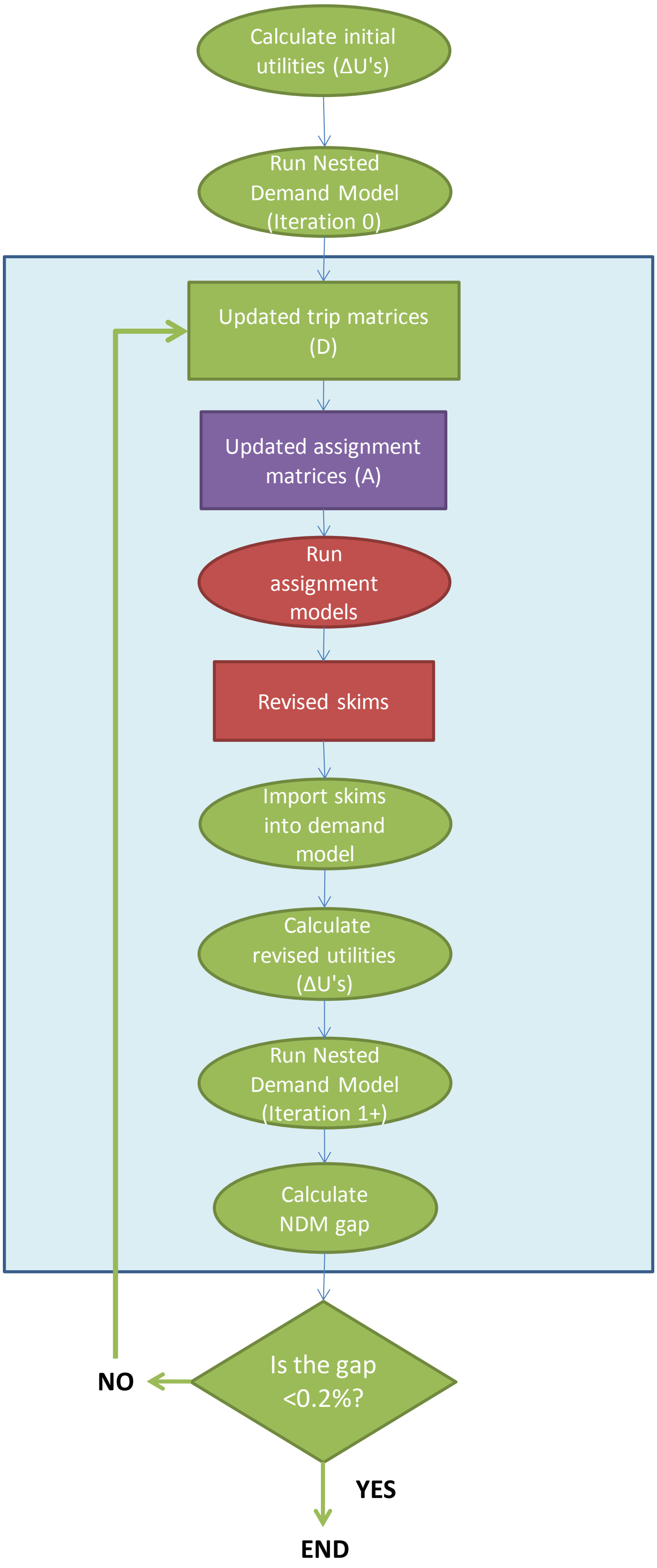


Figure 6 **Iteration Process**

5.3.2. Skims from the SCTM HAM and PTAM are imported and generalised costs calculated prior to every demand model run. The demand model procedure is run once before the iteration loop is initiated (iteration 0) and then once at every iteration within the iteration loop. For iteration 0, car and PT skims are taken from the calibrated base year HAM and PTAM.

5.3.3. All the parameters needed for each demand model run (lambdas, thetas, cost damping parameters) are kept the same at every iteration. The outputs from each demand model run are P/A demand matrices (D matrices) by demand segment, mode, time period, and submode.

5.3.4. For each iteration i within the loop:

- The demand matrices produced in iteration $i - 1$ are converted into a form directly comparable to the assignment matrices. This means:
  - Converting car person trips to car vehicle trips using the relevant base year occupancy rates for each demand stratum and each time period
  - Converting from P/A to O/D (except for NHB trips that are modelled as one-way trips) by summing all outbound and return trips in each time period
  - Converting from TDM time periods to HAM and PTAM time periods using the conversion factors described in section 2.7.
- The ratio of calculated and reference park-and-ride demand matrices is also derived for each time period and demand stratum. These factors are used to scale the reference demand for car legs of park-and-ride trips. This scaled demand is added to the converted car demand, resulting in A_i matrices that are passed on to the HAM at each iteration i, one for each assignment time period and user class.
- The AM peak, Interpeak, PM peak, and Off-peak base year HAMs are then assigned with the corresponding assignment matrices (A_i matrices) derived from the demand model run in iteration $i - 1$. Skims are then exported from these assignments and used for the demand model run in iteration i.
- All PT skim matrices remain the same as in iteration 0. The PT models do not need to be assigned at each iteration as they do not account for crowding and would thus not produce skims that are different to the ones in iteration 0.
- Once the demand model procedure has been run for iteration i, the demand/supply gap is calculated and compared to the target gap of 0.2%. Unless the calculated gap is less than the target or the maximum number of iterations (50) is reached, the loop is restarted.

6 REALISM TESTING

6.1.1. This chapter outlines the realism tests that have been carried out and the resulting elasticities.

6.2 REALISM TESTS

6.2.1. To validate the sensitivity of the SCTM base year TDM to changes in input values, a number of realism tests have been performed in line with DfT's TAG. This part of the process is ensuring the SCTM TDM validates to DfT's TAG criteria in its responses to changes in generalised costs via the elasticity (realism) tests.

6.2.2. The realism tests performed are the following:

- Test 1: 10% increase in car fuel cost
- Test 2: 10% increase in public transport fares
- Test 3: 10% increase in car journey time

6.2.3. All realism tests calculate an elasticity which is defined in DfT's TAG Unit M2 section 6.4.5 (Variable Demand Modelling, March 2017) as a measure of the proportionate change in travel in response to a proportionate change in cost. It is calculated as follows:

$$e = \frac{log(T_1) - log(T_0)}{log(C_1) - log(C_0)}$$

Where:

C_0 and C_1 are the costs before and after the change, respectively

T_0 and T_1 are the travel demands before and after the change in costs, respectively. T_0 and T_1 are expressed in vehicle-kms for Test 1, and person trips for Tests 2 and 3.

6.2.4. Table 21 summarises the elasticity ranges recommended by DfT's TAG for each of the realism tests.

Table 21 TAG-Recommended Elasticity Ranges

Elasticity Test	TAG Recommended Range	
	High	**Low**
Car Fuel Cost (veh-kms)	-0.35	-0.25
Public Transport Fare (person trips)	-0.9	-0.2
Car Journey Time (car trips)	No stronger than -2.0	

6.2.5. To account for congestion and crowding, the car fuel cost and PT fare elasticities have been calculated from converged runs of the demand/supply loop using the iteration procedure outlined in section 5.3. The car journey time test was not iterated because the TAG-recommended target values were derived from stated preference surveys.

6.3 CAR FUEL COST ELASTICITY

6.3.1. The car fuel cost elasticity is the percentage change in car vehicle-kms with respect to the percentage change in car fuel cost. It has been calculated for all purposes and time periods both on a matrix and network basis with a fully-converged run of the demand model. The change in car fuel cost has been applied to the car fuel cost component of the VOCs.

6.3.2. As per DfT's TAG Unit M2 section 6.4 (Variable Demand Modelling, March 2017), the combined average fuel cost elasticity should lie within the range of -0.25 to -0.35 across all journey purposes, with:

- Values for employers' business trips being nearer to -0.1
- Values for discretionary trips being nearer to -0.4
- Values for commuting being near the average
- Peak period values being generally lower than Inter-peak ones

Matrix-based Method

6.3.3. In the matrix-based method, the change in car vehicle-kms is calculated from the skimmed distance matrices and the car trip matrices which relate to the before and after fuel cost change model runs.

6.3.4. The calculations have been carried out on an OD basis, by time period and demand stratum. They have then been aggregated over time periods and demand strata to produce elasticities by trip purpose and an overall average elasticity.

6.3.5. As external to external trips are treated as fixed in the SCTM TDM, matrix-based calculations only use internal-internal, internal-external, and external-internal movements.

6.3.6. It is important to note that elasticity figures quoted are for changes in the demand matrices output from the TDM and have been calculated from a converged run of the demand/supply loop where the demand model reached an acceptable gap 0.06%.

6.3.7. Table 22 presents the car fuel cost realism results from an iterated run of the SCTM TDM. It shows the elasticity by trip purpose and the overall elasticity. Values by time period are shown in Table 23.

Table 22 Matrix-Based Car Fuel Cost Realism Results by Trip Purpose from Iterated Run

Trip Purpose	Matrix-Based Elasticity
HBEB	-0.10
HBO	-0.43
HBW	-0.24
NHBEB	-0.12
NHBO	-0.39
Overall	**-0.349**

Table 23 Matrix-Based Car Fuel Cost Realism Results by Peak Period from Iterated Run

Time Period	Matrix-Based Elasticity
AM	-0.30
IP	-0.39
PM	-0.31
OP	-0.42

6.3.8. The results show that for all purposes and time periods an acceptable level of elasticity is met. There is lower than average elasticities for HBEB and NHBEB, higher elasticities for HBO and NHBO, and lower elasticities in the peaks compared to the interpeak and the off-peak. This shows a good fit to DfT's TAG advice.

Network-based Method

6.3.9. In the network-based method, the car-kms are accumulated over converged runs of the HAM network before and after the cost change, and compared. The HAM network used for the calculations only covers the internal area over which the HAM has been validated.

6.3.10. The calculations have been carried out by time period and the results are shown in Table 24.

Table 24 Network-Based Car Fuel Cost Realism Results by Time Period

Time Period	Network-Based Elasticity
AM	-0.21
IP	-0.32
PM	-0.17

6.3.11. Table 24 shows that the car fuel cost elasticities are higher in the interpeak period, which is to be expected.

6.3.12. The elasticities in the AM and PM peaks are slightly below the DfT's TAG-recommended range. This occurs because the change in car-kms includes the fixed external-external trips that are passing through the internal area, therefore underestimating the model's responsiveness.

6.4 PUBLIC TRANSPORT FARE ELASTICITY

6.4.1. The public transport fare elasticity is the percentage change in public transport trips by all public transport modes with respect to the percentage change in public transport fares.

6.4.2. DfT's TAG recommends the use of separate elasticities for each PT submode (bus and rail), where possible. Since PT submode choice is handled at the assignment stage, it is not possible to calculate PT submode fare elasticities for the SCTM.

6.4.3. The calculations have been carried out on a matrix basis, by time period and demand stratum. They have then been aggregated over time periods and demand strata to produce elasticities by trip purpose and an overall average elasticity.

6.4.4. As external to external trips are treated as fixed in the SCTM TDM, matrix-based calculations have only used internal-internal, internal-external, and external-internal movements.

6.4.5. It is important to note that the elasticity figures quoted are for changes in the demand matrices output from the TDM and have been calculated from a converged run of the demand/supply loop where the demand model reached an acceptable gap of 0.01%.

6.4.6. Table 25 presents the public transport fare realism results by purpose from an iterated run of the SCTM TDM. Results by time period and car availability are shown in Table 26 and Table 27, respectively.

Table 25 Public Transport Fare Realism Results by Trip Purpose from Iterated Run

Trip Purpose	Matrix-Based Elasticity
HBEB	-0.12
HBO	-0.39
HBW	-0.26
NHBEB	-0.17
NHBO	-0.45
Overall	**-0.329**

Table 26 Public Transport Fare Realism Results by Time Period from Iterated Run

Time Period	Matrix-Based Elasticity
AM	-0.29
IP	-0.37
PM	-0.30
OP	-0.37

Table 27 Public Transport Fare Realism Results by Car Availability from Iterated Run

Car Availability	Matrix-Based Elasticity
CA	-0.32
NCA	-0.35

6.4.7. As advised in sections 6.4.21 and 6.4.22 of DfT's TAG Unit M2 (Variable Demand Modelling, March 2017), the public transport fare elasticity should lie in the range of -0.2 to -0.9 for all journey purposes, with values for non-discretionary purposes being lower than those for discretionary trips and values in the peak periods being lower than values in the interpeak. The results show that for all purposes an acceptable level of realism is met. There is lower than average elasticity for HBEB and higher elasticity for discretionary purposes, with NHBO trips having the greatest elasticity.

6.5 CAR JOURNEY TIME ELASTICITY

6.5.1. The car journey time elasticity is the percentage change in car trips with respect to the change in journey time. Unlike the fuel cost elasticity, it is calculated from a single run of the demand model using complete trips, from real origin to real destination.

6.5.2. Table 28 presents the car journey time realism results.

Table 28 Car Journey Time Realism (Single Run)

Trip Purpose	Matrix-Based Elasticity
Overall	-0.52

6.5.3. The results show that the overall car journey time elasticities is no stronger than -2.0, which is in line with DfT's TAG.

7 SUMMARY OF MODEL DEVELOPMENT

7.1.1. The SCTM comprises a full Transport Demand Model (TDM), with separate Highway Assignment Model (HAM) and Public Transport Assignment Model (PTAM) that interact under the control of the demand model, allowing schemes that impact both the highway and public transport networks to be tested. The SCTM TDM and PTAM are run in PTV Visum 15.00-15 and the HAM is run in SATURN 11.3.12 U.

7.1.2. This Demand Model Validation Report documents the development, assumptions and calibration of the SCTM TDM. It also presents the results of the realism tests which have been undertaken to help demonstrate that the model aligns well with Department for Transport (DfT) Transport Analysis Guidance (TAG).

7.1.3. The SCTM TDM is a fairly conventional incremental model, with a nested hierarchy which is in line with DfT's TAG Unit M2 section 4.5 (Variable Demand Modelling, March 2017). It represents travellers' responses in the order outlined below:

- Trip frequency
- Main mode choice (car vs. public transport)
- Macro time of day choice (AM peak: 0700-1000; Interpeak: 1000-1600, PM peak: 1600-1900, Off-peak: 1900-0700)
- Trip distribution among destinations
- Submode choice (park-and-ride vs. pure public transport)

7.1.4. Travellers are segmented by trip purpose, person type, and car availability. The SCTM TDM represents personal trips including commuting to work and employer's business trips. However it does not deal with demand responses for Heavy Goods Vehicles (HGV) and Light Goods Vehicles (LGV) (e.g. supermarket delivery trips). The SCTM LMVR provides more detail on the representation of HGVs and LGVs.

7.1.5. The two assignment models sit at the bottom of the hierarchy, with skim matrices extracted from the assignments and used within the demand model to calculate the generalised costs of travel and derive the demand responses.

7.1.6. In the SCTM TDM, park-and-ride is modelled as a submode of public transport. Modelled park-and-ride trips involve people driving from their real origins to their respective train stations, parking their cars at the station car parks or nearby parking facilities, then using public transport services to reach their final destinations. In this model, people are assumed to use soft modes at the destination end of their trips i.e. from their last train stops to their real destinations (where they undertake their activity) - this part of their journeys is not modelled in the TDM. Walk movements between car parks and train stations are also ignored for simplicity.

7.1.7. To validate the sensitivity of the SCTM Base Year TDM to changes in input values, a number of realism tests have been performed in line with DfT's guidance. This part of the process is ensuring the SCTM TDM validates to TAG criteria in its responses to changes in generalised costs via the elasticity (realism) tests. Table 29 summarises the results of the realism tests carried out.

Table 29 TAG-Recommended Elasticity Ranges

Elasticity Test	Overall Elasticity (SCTM)	TAG Recommended Range	
		High	**Low**
Car Fuel Cost (veh-kms)	-0.349	-0.35	-0.25
Public Transport Fare (person trips)	-0.329	-0.9	-0.2
Car Journey Time (car trips)	-0.52	No stronger than -2.0	

7.1.8. The realism tests show that an acceptable level of elasticity is met using parameters that align with DfT's TAG Unit M2 (Variable Demand Modelling, March 2017). The appropriateness of the model responses (as demonstrated in this report) shows that the SCTM TDM can be used with confidence to test a range of potential transport schemes and policies, including major highway scheme appraisals.

7.1.9. The SCTM has been developed to an extent that it is able to serve as a high-level strategic assessment tool. However, no strategic model is capable of representing a whole county in fine detail, so the level of detail required for each application should be reviewed prior to testing as it may be necessary to enhance a particular local area for a specific testing purpose.

WSP House
70 Chancery Lane
London
WC2A 1AF

wsp.com

Suffolk County Council

SUFFOLK COUNTY TRANSPORT MODEL (SCTM)

Highway Model Local Model Validation Report

70016133
DECEMBER 2017

CONFIDENTIAL

Suffolk County **Council**

SUFFOLK COUNTY TRANSPORT MODEL (SCTM)

Highway Model Local Model Validation Report

TYPE OF DOCUMENT (VERSION) CONFIDENTIAL

PROJECT NO. 70016133
OUR REF. NO. 70016133

DATE: DECEMBER 2017

WSP
Unit 9, The Chase
John Tate Road, Foxholes Business Park
Hertford
SG13 7NN
Phone: +44 1992 526 000
Fax: +44 1992 526 001
WSP.com

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft	Version 2		
Date	February 2017	December 2017		
Prepared by	Michael Johns	Michael Johns		
Signature		Chilvers, Matthew I am signing on behalf of Michael Johns 2017.12.18 15:58:21 Z		
Checked by	Matthew Chilvers	Matthew Chilvers		
Signature		Chilvers, Matthew I have reviewed this document 2017.12.18 15:58:58 Z		
Authorised by	Matthew Chilvers	Matthew Chilvers		
Signature		Chilvers, Matthew I am approving this document 2017.12.18 15:59:30 Z		
Project number	70016133	70016133		
Report number	v1.0	V2.0		
File reference	170215 D3 SCTM Highway LMVR - DRAFT.docx	170218 D3 SCTM Highway LMVR v2.0.docx		

CONTENTS

TABLES

FIGURES

APPENDICES

Appendix J - Modelled flow

Appendix J.1 - Modelled flow AM

Appendix J.2 - Modelled flow IP

Appendix J.3 - Modelled flow PM

1 INTRODUCTION

1.1 BACKGROUND

1.1.1. WSP has been commissioned by Suffolk County Council (SCC) to upgrade the existing transport modelling tools available to SCC and develop an integrated county-wide multi-modal model known as the Suffolk County Transport Model (SCTM). WSP is working in partnership with Kier under the Suffolk County Council Professional Services Framework.

1.1.2. The SCTM comprises a highway assignment model built in SATURN, as well as a public transport and demand model based in VISUM.

1.1.3. The SCTM highway assignment model incorporates the model networks used within the Ipswich Transport Model (ITM) and Lowestoft Traffic Model (LTM) which were previously used to inform the Outline Business Cases (OBCs) for The Upper Orwell Crossings (TUOC - formerly referred to as Wet Dock) and Lake Lothing Third Crossing.

1.2 MODEL PURPOSES

1.2.1. The SCTM will represent a substantial improvement to existing transport modelling tools within Suffolk and allow for a greater range of behavioural responses to be tested than at present. The SCTM will provide a robust evidence base for a range of possible applications.

1.2.2. The aim of the SCTM is that it will become a multi-purpose transport modelling tool for SCC to test a range of potential transport schemes and policies. These may include:

- Highway scheme appraisal
- Major public transport scheme appraisal
- Inputs for transport business cases and funding applications
- Inputs for environmental appraisals
- Local plan / core strategy assessment
- Development impact assessment.

1.2.3. The SCTM has been developed to an extent that it is able to serve as a high-level strategic assessment tool for all such applications. However, no strategic model is capable of representing a whole county in fine detail, so the level of detail required for each application should be reviewed prior to testing. It may be necessary to enhance a particular local area for a specific testing purpose

1.3 PURPOSE OF THE HIGHWAY LOCAL MODEL VALIDATION REPORT

1.3.1. The aim of the highway Local Model Validation Report (LMVR) is to demonstrate the SCTM highway model is fit for purpose and has been developed in accordance with WebTAG guidance.

1.4 EXISTING MODELS

1.4.1. There are two previously existing traffic models in Suffolk produced for SCC:

- Ipswich Traffic Model (ITM) – Created by AECOM. Validated to a 2008 base year, and recently partially updated to 2015 as part of the Upper Orwell Crossing Transport Business Case work. The model consists of a SATURN highway model and EMME public transport and demand model.
- Lowestoft Traffic Model (LTM) – Previously created by WSP. A highway assignment model using SATURN validated to a 2015 base with Variable Demand Modelling (VDM) carried out using DIADEM. This was recently updated as part of the Lake Lothing Third Crossing Transport Business Case, with demand matrices developed based on ANPR data and traffic survey data collected in 2015.

1.4.2. The networks and zone system for the ITM and LTM were incorporated into the SCTM and used to form the basis of the simulation network for Ipswich and Lowestoft. Road speeds were found to be considerably lower in the ITM compared to the WSP-produced LTM and were updated in order to be consistent with the rest of the SCTM. The network coding in terms of saturation flows and speed flow curves in the ITM and LTM were updated to be made consistent with the rest of the SCTM as per the conventions described in Section 5

1.5 PLANNED BASE YEAR MODELLING

1.5.1. Both Ipswich and Lowestoft Traffic Models have been updated substantially to ensure they are well aligned with the Department for Transport's (DfT) Transport Appraisal Guidance (TAG). Then they are then combined together and expanded to cover the entire county.

1.5.2. The SCTM has a base year of 2016 based on an average Monday to Thursday for neutral months.

1.5.3. The following three time periods have been modelled:

- AM peak hour (0800-0900)
- Inter peak average hour (1000-1600)
- PM peak hour (1700-1800)

1.5.4. Justification for the time periods modelled is based on extensive county-wide coverage of ATC, described in Section 3.6 and in the D2 SCTM Data Collection Report (December 2017).

1.6 REPORT STRUCTURE

1.6.1. 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

1.6.2. DfT TAG document "Guidance for the Technical Project Manager" (January 2014) details the required content within modelling reports. Section C.1.3 details what is required for an assignment model validation report. This guidance has been input into Table 1 as a checklist which provides details of which sections of the report contain the information required

Table 1 - DfT TAG Content Requirement Checklist for Assignment Model Validation Report

Requirement	Section of report
Description of the road traffic and public transport passenger assignment model development, including model network and zone plans, details of treatment of congestion on the road system and crowding on the public transport system.	Section 3
Description of the data used in model building and validation with a clear distinction made for any independent validation data.	Section 4
Evidence of the validity of the networks employed, including range checks, link length checks, and route choice evidence.	Section 5 Section 7
Details of the segmentation used, including the rationale for that chosen.	Section 2 Section 6
Validation of the trip matrices, including estimation of measurement and sample errors.	Section 6
Details of any 'matrix estimation' techniques used and evidence of the effect of the estimation process on the scale and pattern of the base travel matrices.	Section 8

Validation of the trip assignment, including comparisons of flows (on links and across screen-lines/cordons) and, for road traffic models, turning movements at key junctions.	Section 9
Journey time validation, including, for road traffic models, checks on queue pattern and magnitudes of delays/queues.	Section 9.3 Appendix D
Detail of the assignment convergence.	Section 9.1
Present year validation if the model is more than 5 years old.	N/A
A diagram of modelled traffic flows, both in the immediate corridor and other relevant corridors.	Appendix J

2 PROPOSED USES OF THE MODEL

2.1 INTERVENTIONS TO BE TESTED

2.1.1. It is intended the SCTM will be used to appraise a range of schemes including the following listed below. This is not an exhaustive list of schemes for which the SCTM will be used as more schemes may come forward for testing in the future.

- The Upper Orwell Crossing, Ipswich
- Lake Lothing Third Crossing, Lowestoft
- Suffolk Energy Gateway, Suffolk Coastal District
- Beccles Southern Relief Road
- Bury St. Edmunds Relief Road
- Sudbury Western Bypass
- Local Plan Assessments

2.2 SCENARIOS TO BE TESTED

2.2.1. Currently the SCTM highway model has various forecast models based on NTEM 7.2 growth in car traffic and National Road Traffic Forecast 2015 (NRTF15) growth from the National Transport Model (NTM) for LGV and HGV traffic.

2.2.2. The following forecast years have been developed for testing of the Lake Lothing Third Crossing to support the Development Consent Order process:

- 2022
  - Lake Lothing Third Crossing scheme opening year
  - Uncertainty log based on developments agreed with Waveney District Council
  - NTEM 7.2 / NRTF15 growth for other Suffolk districts and external zones
- 2037
  - Lake Lothing Third Crossing scheme opening year + 15 years
  - Uncertainty log based on developments agreed with Waveney District Council
  - NTEM 7.2 / NRTF15 growth for other Suffolk districts and external zones

2.2.3. The following forecast years have been developed for testing of the Suffolk Energy Gateway scheme to support the Outline Business Case:

- 2023
  - Suffolk Energy Gateway scheme opening year
  - Uncertainty log based on developments agreed with Waveney District Council and Suffolk Coastal District Council
  - NTEM 7.2 / NRTF15 growth for other Suffolk districts and external zones
- 2037
  - Suffolk Energy Gateway scheme opening year + 15 years
  - Uncertainty log based on developments agreed with Waveney District Council and Suffolk Coastal District Council
  - NTEM 7.2 / NRTF15 growth for other Suffolk districts and external zones

2.2.4. Further forecast year models will be developed going forward depending on the requirements of SCC.

2.2.5. It is envisaged the SCTM will be used for a range of different studies and local developer tests in the future which could require additional forecast years and growth assumptions to be considered

3 KEY FEATURES OF THE MODEL

3.1 STUDY AREA

3.1.1. The study area is set out in terms of a three-tier hierarchy as specified in WebTAG Unit M3.1, Section 2.2, comprising:

- Area of Detailed Modelling – covers all roads with significant traffic volumes and all realistic route choices available to drivers, with all major junctions modelled
- Rest of Fully Modelled Area – reduced level of detail, with principal strategic routes modelled and capacity restraint through the use of speed/flow curves and strategically important junctions
- External Area – simplified network allowing traffic to enter the Fully Modelled Area at the correct location, without capacity restraint. Skeletal network with approximate distances to allow demand model to capture full trip length.

3.1.2. The Area of Detailed Modelling (ADM) and Rest of the Fully Modelled Area (RoFMA) form the Fully Modelled Area (FMA) in which all modelled links are included as part of the simulation network. The locations designated as part of the ADM are the main urban areas within Suffolk and the local study area specified for the Suffolk Energy Gateway scheme appraisal. The External Area comprises locations outside of Suffolk County and contains the buffer network.

3.1.3. The hierarchy of the model area is shown in Figure 1

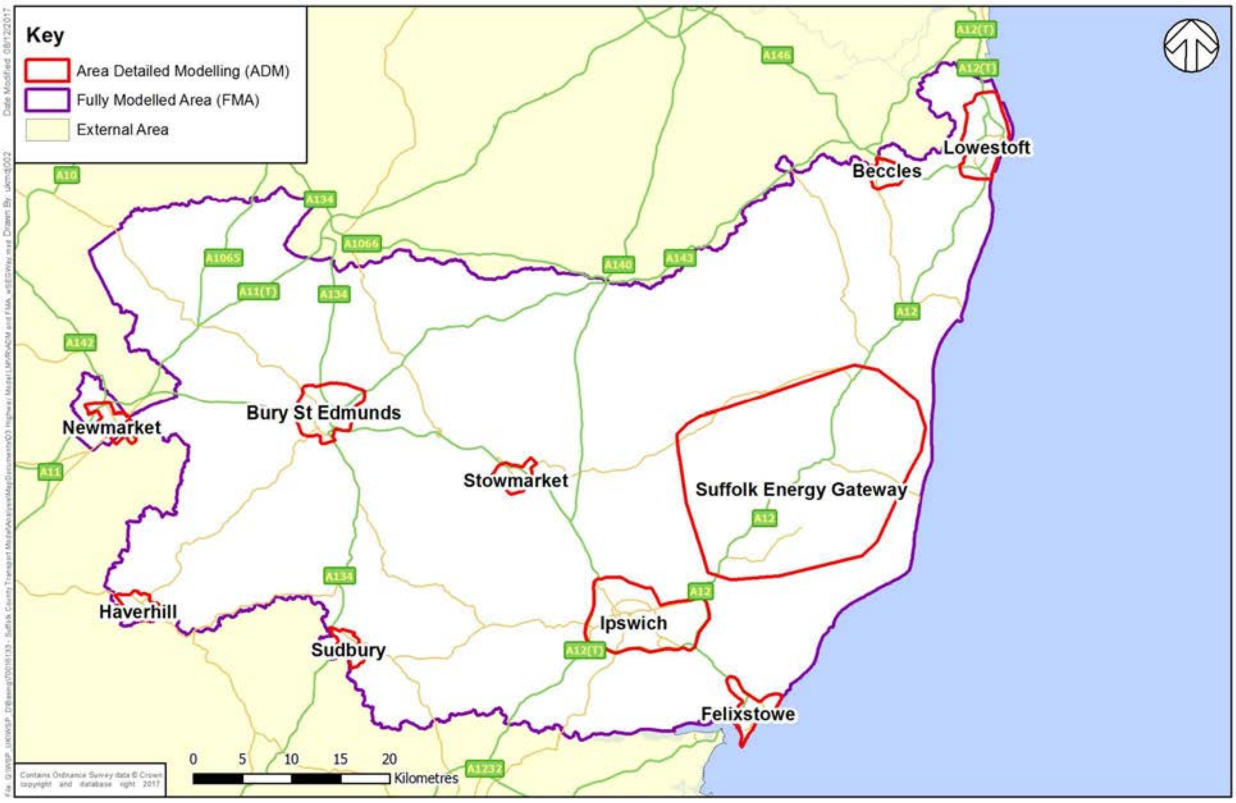


Figure 1 - Modelled Area

3.2 ZONING SYSTEM

3.2.1. The zoning system for the Mobile Network Data which underpins the traffic demand within the SCTM is based on 2011 Census boundaries:

- Lower Super Output Area (LSOA) level across Suffolk and locations west / north-west of Suffolk
- Middle Supper Output Area (MSOA) within the remainder of the cordon used for the MND
- District level in other adjacent counties within the East of England (Norfolk, Cambridgeshire, Essex, Hertfordshire, Bedfordshire)
- Regional level in remainder of UK outside of the East of England

3.2.2. The MND zoning system comprises 755 zones and was provided to Telefonica for processing the Mobile Network Data which has been used as the basis of the matrices for the SCTM.

Figure 2 shows the zone system at LSOA, MSOA and district level for Suffolk and the surrounding area.

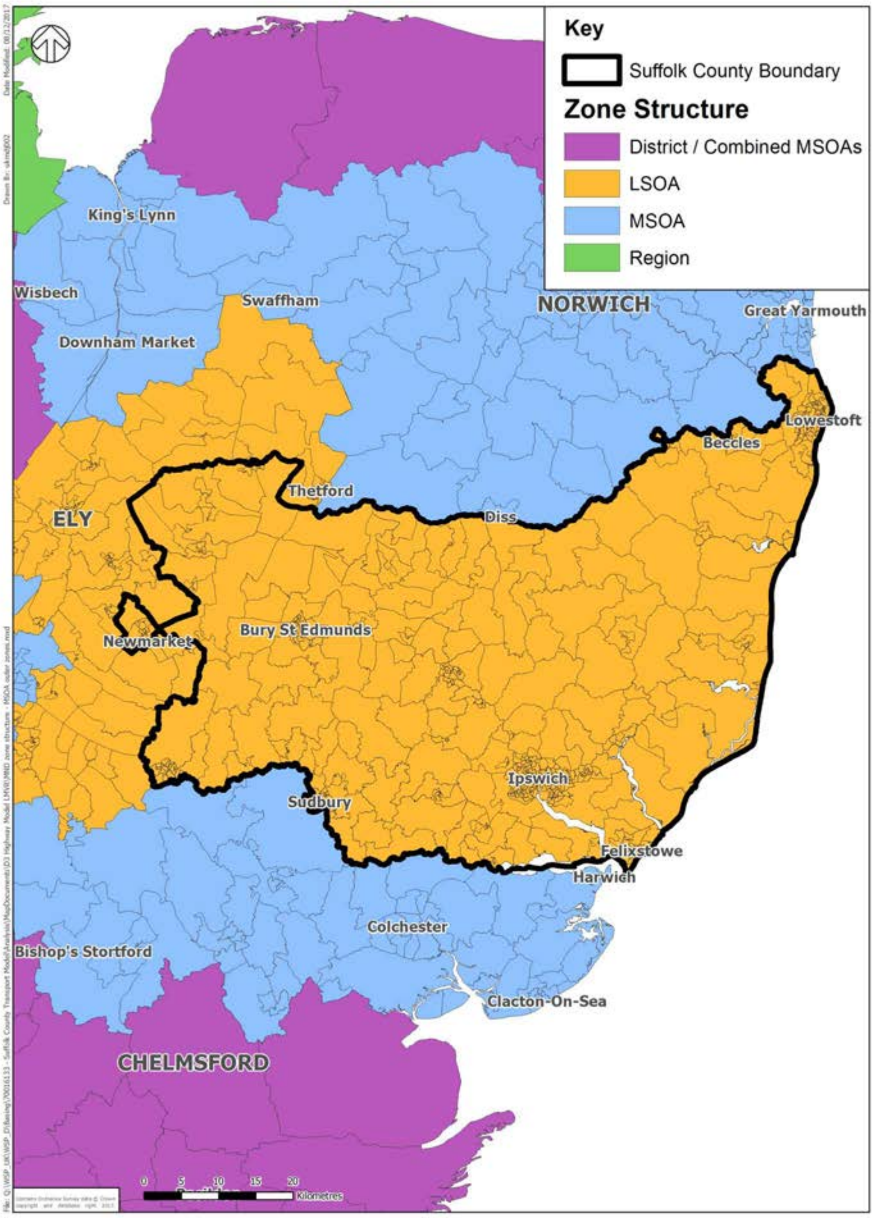


Figure 2 – Mobile Network Data Zone System

3.2.3. Figure 3 shows the full UK extent of the model zone system.

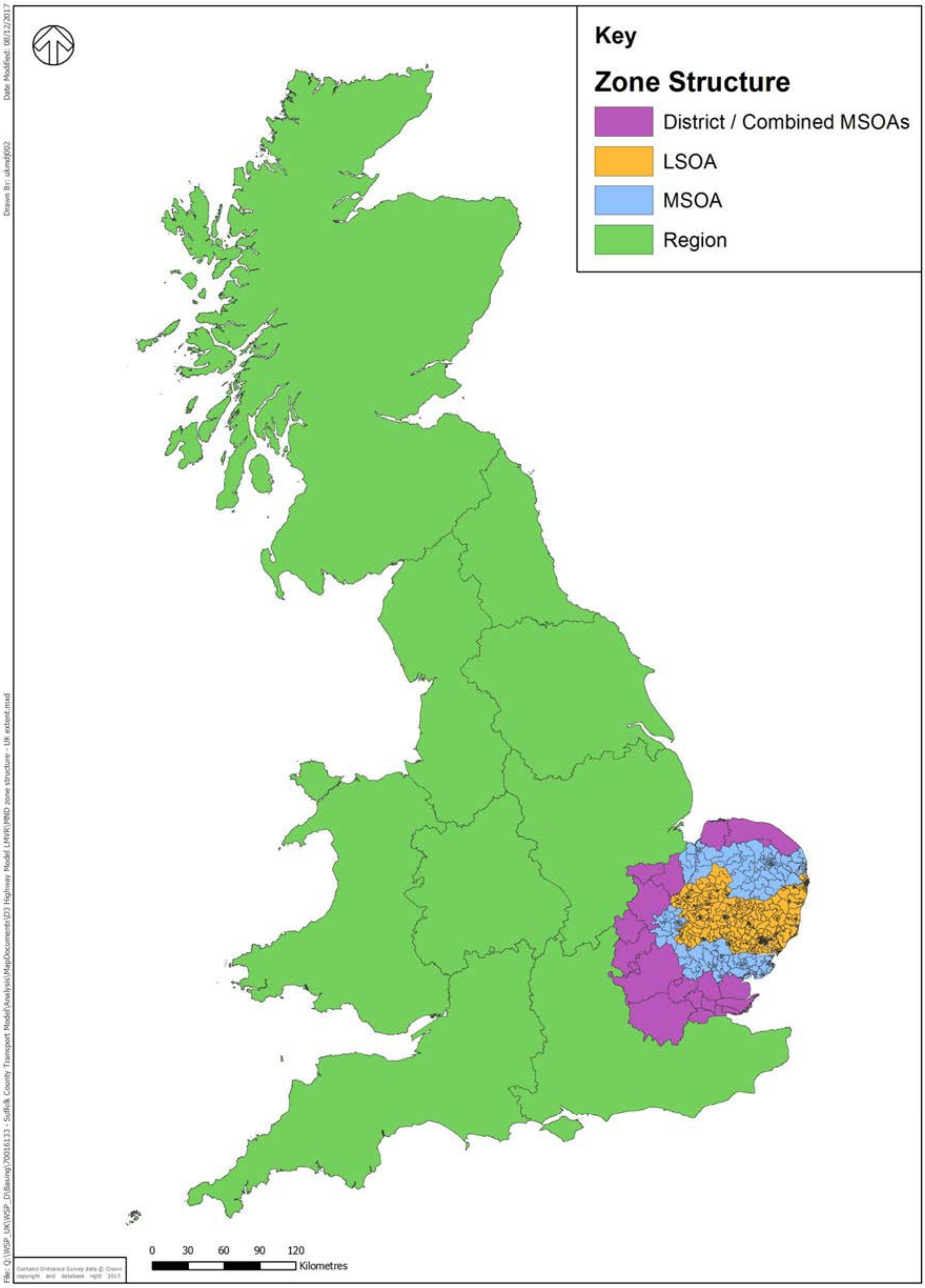


Figure 3 - Mobile Network Data Zone System – UK Extent

3.2.4. Additional detail was added to the MND zone system within Suffolk to create the assignment model zone system. Zones were split to better fit realistic zoning points and land uses, therefore the zone system is more detailed than LSOA level in the simulation network. Outside of Suffolk, the detail in the MND zone system was aggregated as MSOA / LSOA level of detail in external areas is currently not required in the assignment models. The detail for the MND zone system in these areas is such that it allows the opportunity to expand the detail of the simulation network beyond the edges of the Suffolk county boundary if required.

3.2.5. Following the disaggregation and aggregation of the MND zone system, the base year assignment model zone system comprises 857 polygon zones.

3.2.6. An additional 26 zones were created to represent rail station car parks and park & ride locations within Ipswich.

3.2.7. Figure 4 provides a comparison of the assignment model zone system (blue boundaries) compared to the MND zone system.

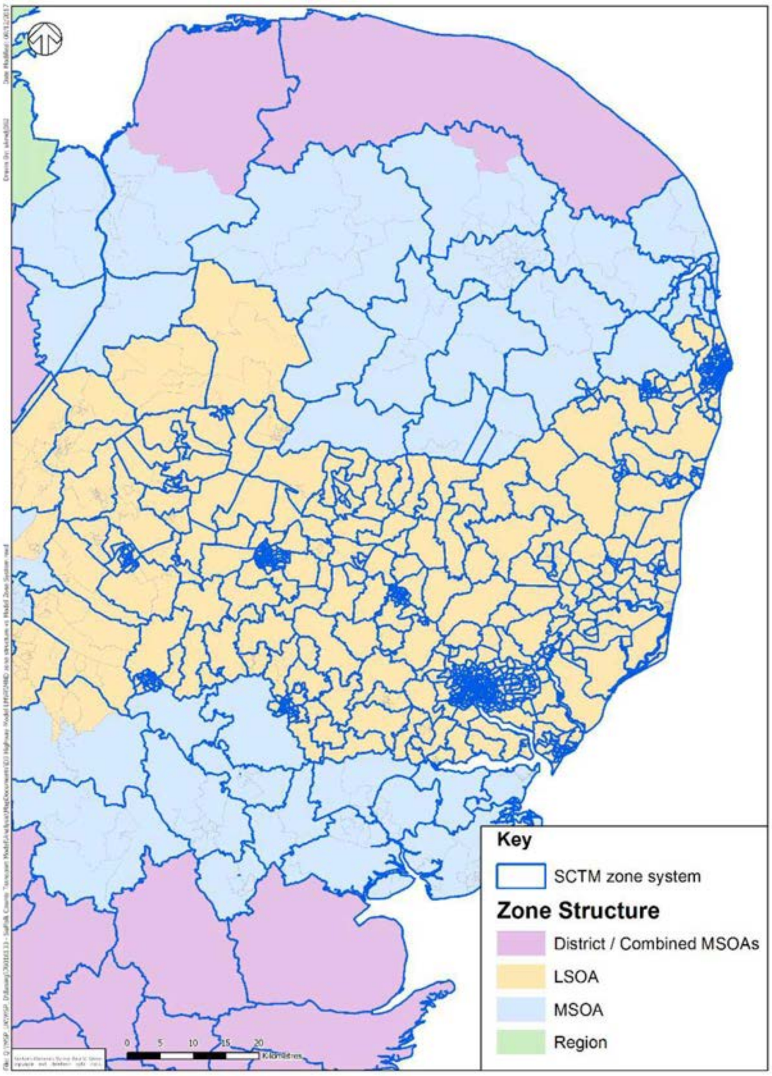


Figure 4 – Assignment Model Zone System Compared to Mobile Network Data Zone System

3.2.8. Following disaggregation of the MND zone system and zones related to park & ride, 883 zones are now present within the base year SCTM highway assignment model, with this zone system also utilised in the associated SCTM Public Transport Model and Demand Model.

3.2.9. Figure 5 details the breakdown of which zones within the assignment model are internal and external to the model.

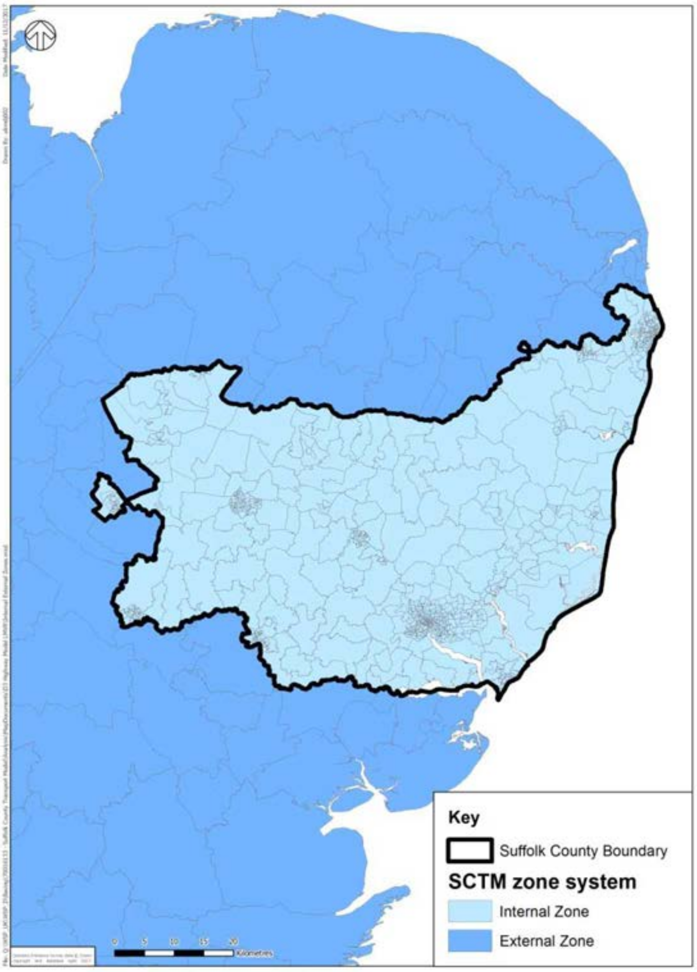


Figure 5 – Assignment Model Zone System – Internal / External

3.2.10. Appendix A-1 contains plots of the detail of the zone system for each of the Areas of Detailed Modelling specified in Figure 1, namely the following locations:

- Beccles
- Bury St. Edmunds
- Felixstowe
- Haverhill
- Ipswich
- Lowestoft
- Newmarket
- Suffolk Energy Gateway
- Stowmarket
- Sudbury

3.3 SECTOR SYSTEM

3.3.1. The MND and assignment model zone systems have been grouped to create 32 sectors, within Suffolk these were defined by a combination of district boundaries and the major towns within the county. The sectoring system has been used as part of the verification of the MND, detailed in Appendix F-2.

3.3.2. The sectoring system focusing on Suffolk can be seen in Figure 6.

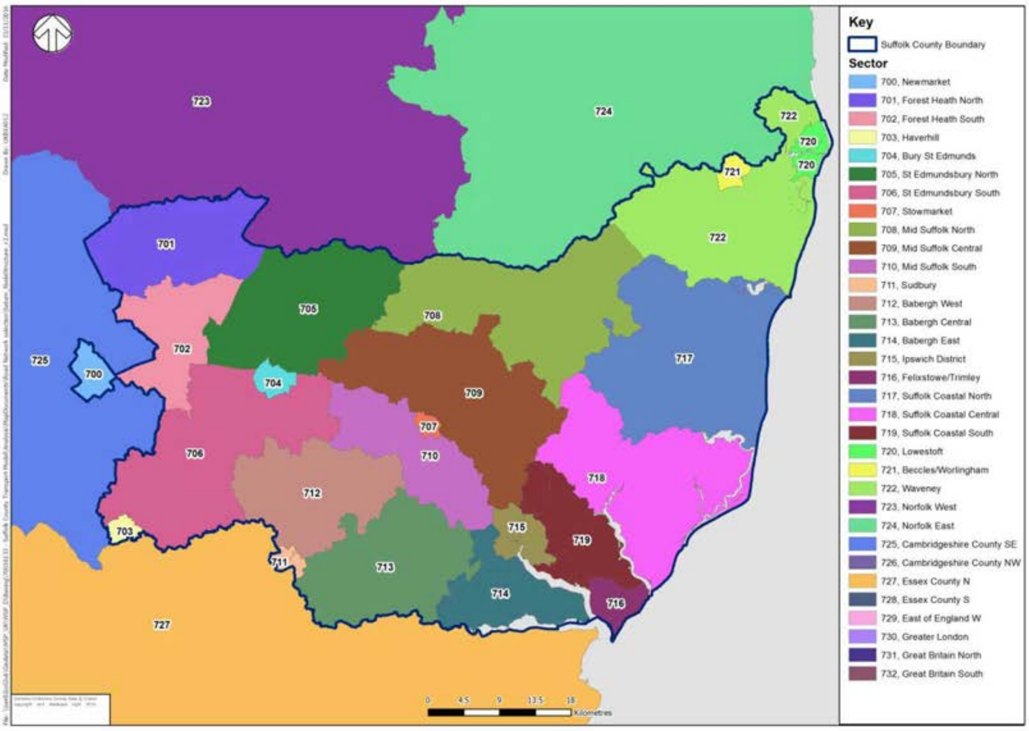


Figure 6 - Internal Sectors Plan

3.3.3. Figure 7 shows the remainder of the sectoring system outside of Suffolk which was based on county and government office region boundaries.

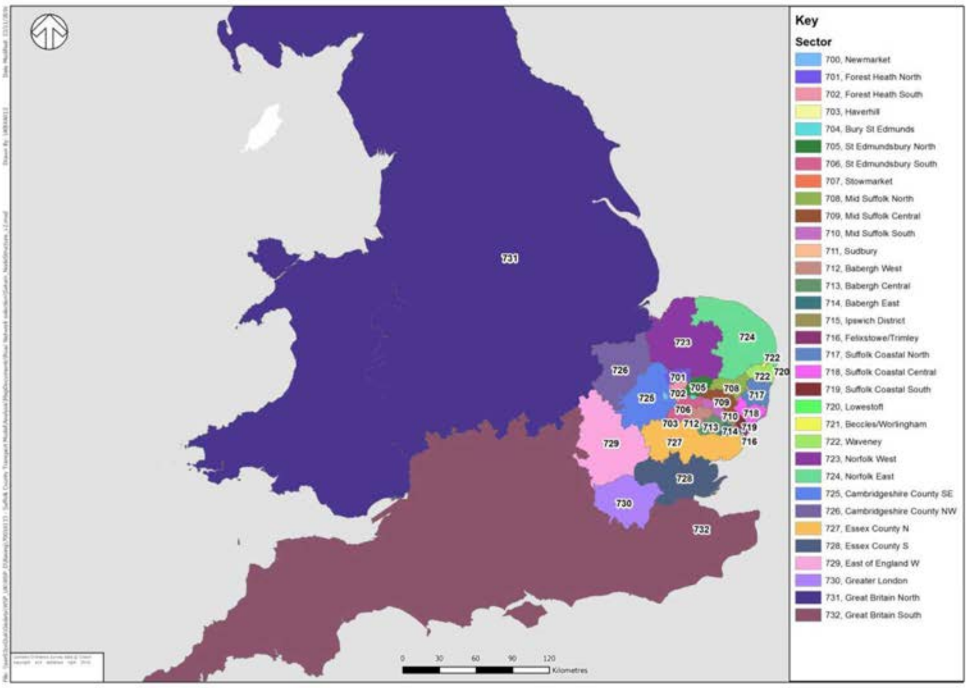


Figure 7 - External Sectors

3.4 NETWORK STRUCTURE

3.4.1. The area of detailed modelling covers the towns of Bury St Edmunds, Newmarket, Stowmarket, Ipswich, Felixstowe, Beccles, Lowestoft, Haverhill, and Sudbury. 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.

3.4.2. 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 constrained by speed flow curves but without delays associated within detailed junction design.

3.4.3. The network structure is shown in Figure 8

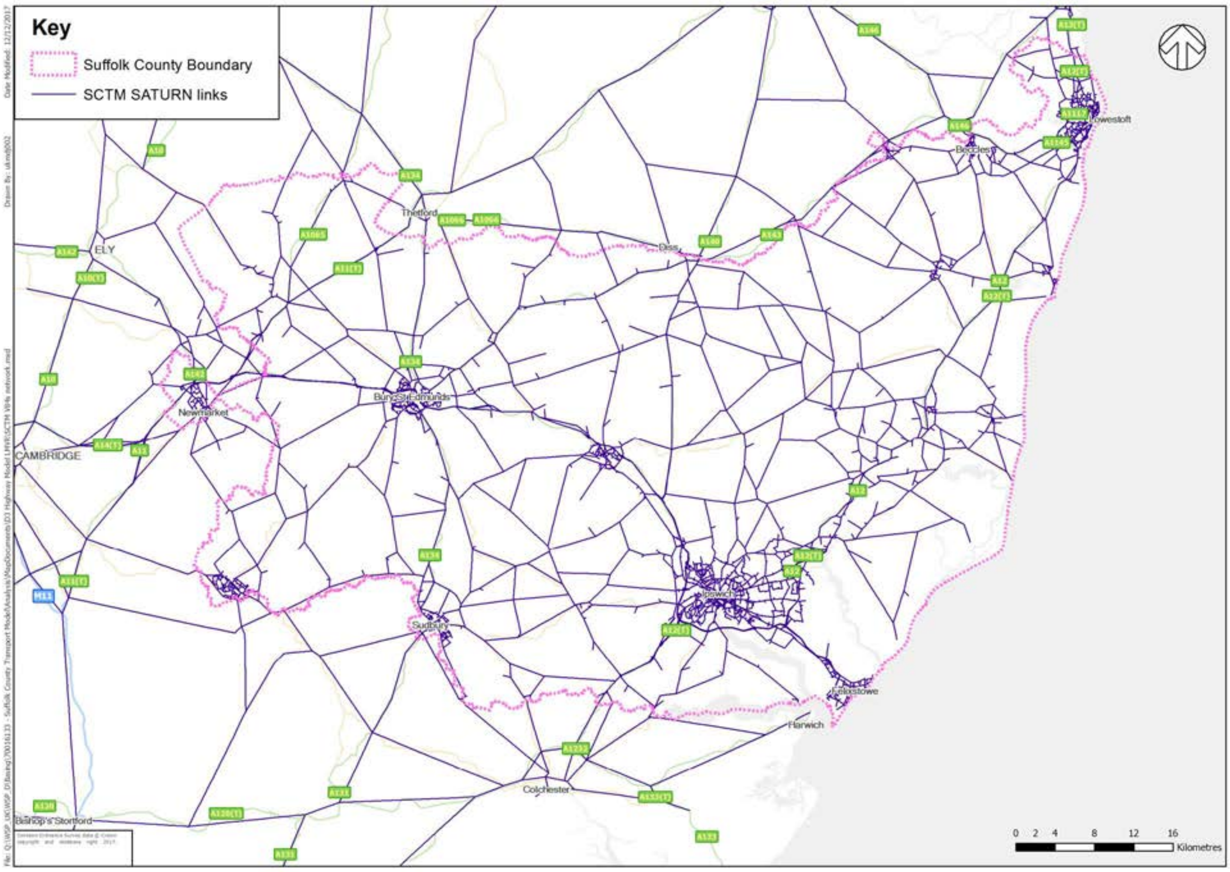


Figure 8 - Network Structure

3.4.4. Appendix A-2 contains plots of the detail of the network and junction type coding for each of the Areas of Detailed Modelling specified in Figure 1, namely the following locations:

- Beccles
- Bury St. Edmunds
- Felixstowe
- Haverhill
- Ipswich
- Lowestoft
- Newmarket
- Suffolk Energy Gateway
- Stowmarket
- Sudbury

3.4.5. Figure 9 details the extent of the simulation network which covers all of Suffolk including locations adjacent to Newmarket within Cambridgeshire due to geography of the county boundary. The buffer network is also shown and begins with the counties adjacent to Suffolk.

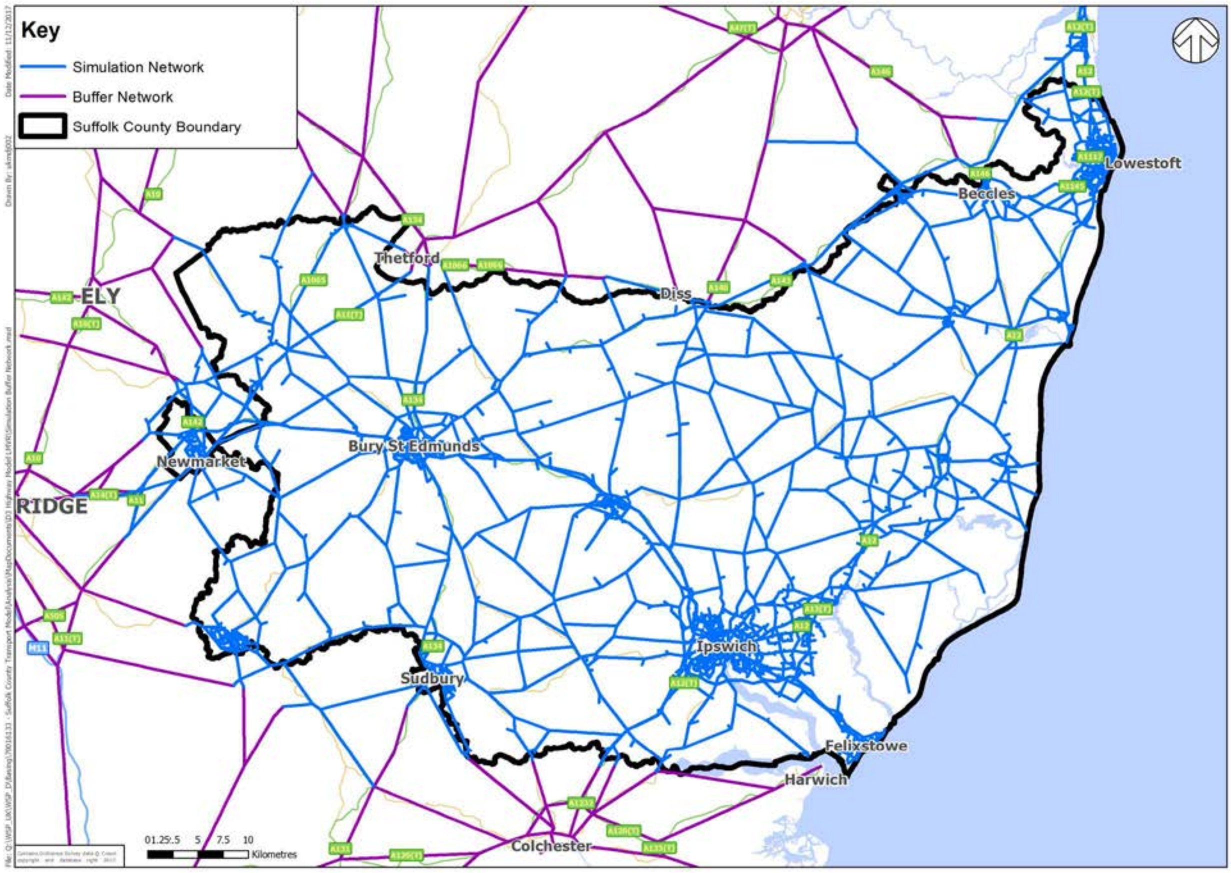


Figure 9– - Simulation and Buffer Network

3.5 CENTROID CONNECTORS

3.5.1. 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.

3.5.2. 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. In total, 807 zones load onto a single connector location. 75 zones are loaded onto the network using two centroid connector locations, 1 zone loads onto three centroid connector locations.

3.5.3. 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 in the majority of cases, 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.

3.5.4. 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.

3.5.5. 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.

3.6 TIME PERIODS

3.6.1. The SCTM highway model comprises the following modelled time periods

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

3.6.2. The appropriateness of these peak hours is detailed in the D2 SCTM Data Collection Report (December 2017). Analysis was conducted to identify the peak hours at each of the sites, and to confirm that the time periods set out in the D1 SCTM Model Specification Report (February 2016) have correctly been identified as the morning and evening peak hours. Analysis of peak hours is required in section 5 of WebTAG unit M3.1 (January 2014). This analysis considers the peak hours across Monday to Thursday.

3.6.3. Analysis of peak hours was carried out against the 225 ATCs specifically commissioned for the SCTM highway model. Table 2 shows which hour within the AM peak period (07:00-10:00) at each ATC site shows the highest average flow.

3.6.4. Table 2 shows the peak hour during the AM peak period is 08:00-09:00 for Cars and LGVs which make up the bulk of the road traffic modelled.

Table 2 – AM Peak Hour Analysis

TIME PERIOD STARTING	CAR	LGV	HGV
07:00	28	67	16
08:00	189	141	83
09:00	8	17	126
Total	225	225	225

3.6.5. Table 3 compares the average traffic flow by hour in the inter peak period (10:00-16:00), counting which hour across the ATC sites shows the highest flow. The analysis shows there is a clear peak between 15:00 and 16:00 for both Cars and LGVs. For HGVs there is not a definitive peak hour across the inter peak period.

Table 3 - Inter Peak Hour Analysis

TIME PERIOD STARTING	CAR	LGV	HGV
10:00	2	5	53
11:00	1	5	48
12:00	5	1	15
13:00	9	4	18
14:00	6	10	43
15:00	202	200	48
Total	225	225	225

3.6.6. Further analysis was carried out by determining the standard deviation based on the average flow for each inter peak hour. Upper and lower limits were calculated based on one and two standard deviations, with this value added and subtracted respectively from the overall inter peak period average hourly flow. It was found that across all 225 ATC sites, the average hourly flow between 10:00 and 15:00 (therefore excluding the 15:00 to 16:00) was within one standard deviations of the mean for the inter peak period in all cases in both directions. This analysis shows that despite the 15:00 to 16:00 hour clearly being the peak for Cars and LGVs, it is not significantly greater than the other inter peak hours. Therefore it is appropriate to use an average inter peak hour for the SCTM highway model.

3.6.7. Table 4 shows which hour within the PM peak period (16:00-19:00) has the highest flow at each ATC site. This comparison shows for cars the peak hour is between 17:00 and 18:00. For LGVs and HGVs, 16:00 to 17:00 is the peak hour.

Table 4 - PM Peak Hour Analysis

TIME PERIOD STARTING	CAR	LGV	HGV
16:00	23	143	218
17:00	200	81	7
18:00	2	1	0
Total	225	225	225

3.6.8. Figure 10 show the variation in the total car traffic across all 225 ATC sites by hour for an average weekday (Monday to Thursday). This further highlights the appropriateness of modelling 08:00-09:00 as the AM peak hour and 17:00-18:00 as the PM peak hour.

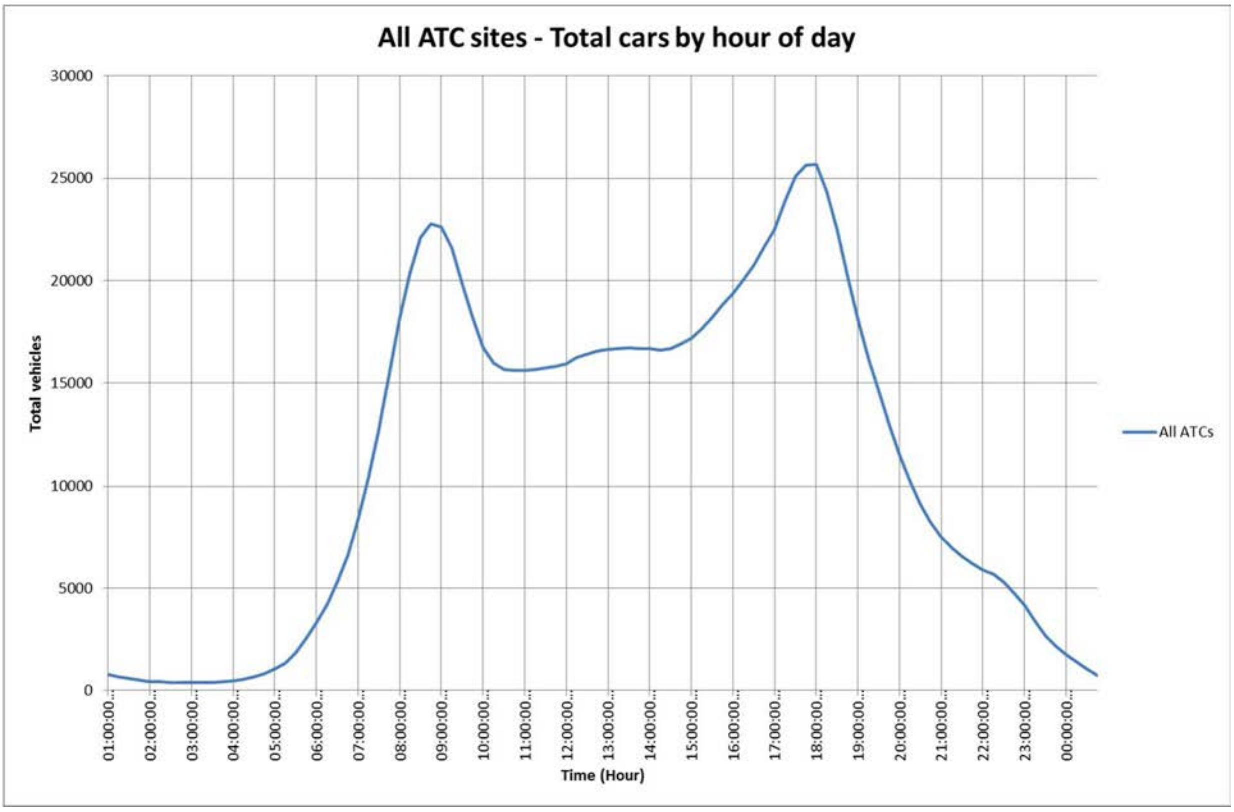


Figure 10 – Car Traffic Across All ATC Sites by Time of Day

3.6.9. It was determined that “pre-load” assignments representing shoulder (“pre”) peaks prior to the time periods modelled were not required in the highway assignment model. Delay leftover from time periods prior to the modelled time periods can have an impact on congestion and routing in the main modelled time periods if it reaches a significant level. Using only the modelled time periods without a pre-load assumes there is no congestion/delay at the start of assignment. Demand for the shoulder peak time periods was determined by deriving factors from the 225 ATCs across Suffolk to convert from the peak hour assignments to the pre peak hours, shown in Table 5.

Table 5 – Shoulder Peak ATC Conversion Factors

Modelled Time Period	Shoulder (Pre) Peak Time Period	ATC factor
08:00-09:00	07:00-08:00	0.826
17:00-18:00	16:00-17:00	0.931

3.6.10. The pre peak matrices where then assigned in the highway model with the queued flow at the end of the modelled time period determined. Appendix B contains plots of queued flow at the end of the modelled time period at the following extents:

- County wide
- Ipswich
- Lowestoft
- Suffolk Energy Gateway

3.6.11. The plots in Appendix B show the level of queued flow at the end of the shoulder peak assignments is not significant. There is no queued flow at the end of the time period in the area of detailed modelling for the Suffolk Energy Gateway scheme. Within Lowestoft, there is a small amount of queued traffic (18 pcus) left over on Normanston Drive during the PM pre-peak hour. In Ipswich there are various locations which highlight leftover queues, the highest value reaching 50 pcus, County wide there are other locations such as Sudbury and Bury St. Edmunds which have leftover queues of between 35-50 pcus.

3.7 USER CLASSES

3.7.1. The following user classes are modelled within the SCTM:

- UC1: Car – Home Based Work (Inbound)
- UC2: Car – Home Based Work (Outbound)
- UC3: Car – Home Based Employers Business (Inbound)
- UC4: Car – Home Based Employers Business (Outbound)
- UC5: Car – Non Home Based Employers Business
- UC6: Car – Home Based Other (Inbound)
- UC7: Car – Home Based Other (Outbound)
- UC8: Car – Non Home Based Other
- UC9: LGV
- UC10: HGV

3.7.2. The car user classes have changed from those specified in the D1 MSR (February 2016) which specified three car user classes: Commuting, Employers Business and Other. This change was made during the matrix building process to aid the conversion of highway assignment matrices in Origin-Destination format into Production-Attraction matrices in the SCTM Demand Model. The SCTM Demand Model needs to be able to distinguish which part of a trip is home-based, inbound; meaning an individual is heading towards their place of residence, and outbound; an individual is leaving their home at the start of the trip. This directionality of trips is available in the Mobile Network Data (MND) which was used to build the matrices and therefore this information was utilised rather than the SCTM Demand Model having to infer directionality of home-based trips artificially from user classes which combine the inbound and outbound direction of home-based trips.

3.8 ASSIGNMENT METHODOLOGY

3.8.1. 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:

3.8.2. "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."

3.8.3. 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.

3.9 GENERALISED COST FORMULATIONS AND PARAMETER VALUES

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

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

3.9.2. 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 TAG data book (July 2017). The value of time (PPM) for the HGVs was doubled from the value provided in the TAG data book. This is in line with TAG Unit A1.3 which advises for HGV that the driver's time does not take account of the influence of owners on the routing of these vehicles.

3.9.3. The parameters adopted for a 2016 base year are shown in Table 6. 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 HGVs. Average simulation network speeds were also used to derive the generalised cost parameters.

Table 6 - 2016 Generalised Cost Parameters

User Class	AM		IP		PM	
	PPM	PPK	PPM	PPK	PPM	PPK
Car Home Based Work	20.18	5.79	20.51	5.74	20.25	5.80
Car Employers Business	30.10	12.15	30.84	11.97	30.53	12.19
Car Other	13.92	5.79	14.83	5.74	14.58	5.80
LGV	21.27	13.31	21.27	13.35	21.27	13.30
HGV	43.19	45.72	43.19	45.88	43.19	49.15

3.10 RELATIONSHIP WITH DEMAND MODELS AND PUBLIC TRANSPORT ASSIGNMENT MODELS

3.10.1. The SCTM Public Transport assignment model utilises the same MND provided by Telefonica as the basis for the matrices. As discussed in Section 7 of this report, movements designated as "Road" in the MND are separated into Cars / LGVs and Bus movements, with the latter matrix then used in the public transport model.

3.10.2. The SCTM Demand Model will utilise time and distance skim matrices from the SCTM Highway Model, as well as skims from the public transport model in order to determine costs and the propensity for modal shift between different motorised modes. The SCTM Demand Model will be capable to taking into account trips which involve car usage at the start of a journey to then access the rail network and therefore create a composite cost for full park and ride trips, and therefore the potential for transport users to switch between modes taking into account congestion will occur on the highway network in the future

4 CALIBRATION AND VALIDATION DATA

4.1 INTRODUCTION

4.1.1. This section of the report details the sources of the traffic data which was used for traffic flow and journey time calibration and validation. It also provides details of the screenlines which have been used to assess the ability of the SCTM highway model to match to observed data across several sites representing key strategic movements within the county.

4.2 COMMISSIONED SURVEY DATA – 2016 DATA COLLECTION

4.2.1. WSP commissioned Intelligent Data to carry out traffic surveys across Suffolk during April 2016. These surveys were specifically commissioned for the purposes of building, validating and calibrating the county model. The survey data provides a suitable coverage of data across the county outside of Lowestoft and Ipswich. Section 5 of the D2 Traffic Data Collection Report (December 2017) provides greater detail on this data and how it has been processed. Table 7 summarises the data which was collected across the county.

Table 7 - Commissioned Survey Data

Survey Type	Number of Surveys	Survey Period	Time
Automatic Traffic Counts (ATC) - Links	227	7th to 25th April, 2016	All day
Manual Classified Turning Counts (MCTC)	34	12th April, 2016	All day
Classified Turning Count using ANPR	1	12th April, 2016	07:00–19:00

4.2.2. Figure 11 shows the coverage of the traffic surveys specifically commissioned for the SCTM.

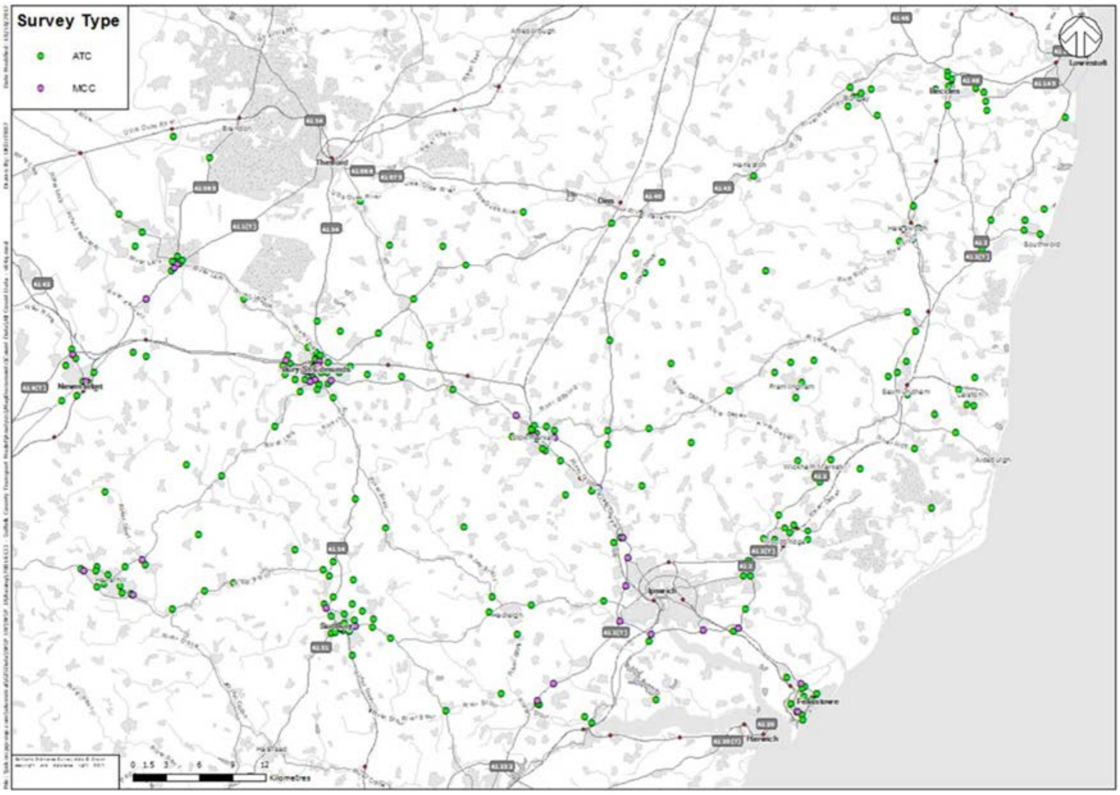


Figure 11 - Commissioned Traffic Survey Locations

4.2.3. Following consolidation of the commissioned survey data with existing data detailed in section 5.3, a total of 211 ATCs and 31 MCCs were used for validation and calibration of the SCTM highway model. This is due to duplication between data sources and issues affecting the data collection along the A14 around Ipswich between Junctions 57 and 58.

4.2.4. During the data collection period there was a road closure in Ipswich affecting southbound traffic on Nacton Road in Ipswich and subsequently the MCC at Junction 57. It is understood this road closure lead to re-routing of traffic on Felixstowe Road, therefore affecting the MCC carried out at Junction 58. For the Nacton Road Junction 57, the 2015 surveys carried out for the Upper Orwell Crossing Outline Business Case were therefore utilised for the calibration of the SCTM.

4.2.5. A new survey was carried out at the A14 Junction 58 on 13th October 2016 and has been used for calibration of the SCTM at this location. This new count demonstrated that the impact of the closure on the A14 was limited (apart from junction 57) as the impact on the J58 was relatively small.

4.2.6. To support the modelling required for Lake Lothing Third Crossing, 6 Manual Classified Turning Counts were undertaken on the 14th July 2016, the locations of which are described in Table 8

Table 8 – 2016 Lowestoft MCTCs

Ref	Site Location
1	A1117 Bridge Road
3	Denmark Road / Peto Way - Barnards Way
4	Denmark Road / Rotterdam Road - Rotterdam Road
5	A12 Pier Terrace
6	A12 Horn Hill / A12 Tom Crips Way / Waveney Drive
7	B1531 Waveney Drive / Waveney Crescent - Waveney Drive

4.3 COMMISSIONED SURVEY DATA – 2017 DATA COLLECTION

4.3.1. Additional traffic data was collected in 2017 in the following locations to support the following scheme appraisals:

- Ipswich - The Upper Orwell Crossing, Development Consent Order modelling
- East Suffolk - Suffolk Energy Gateway, Outline Business Case (OBC) modelling
- Lowestoft - Lake Lothing Third Crossing, Development Consent Order modelling

IPSWICH

4.3.2. Table 9 describes the locations of the 2017 traffic survey locations undertaken to support the appraisal of the Upper Orwell Crossings. Processing of this data is discussed in Section 8 of the D2 Traffic Data Collection Report (December 2017).

Table 9 – Ipswich 2017 Traffic Surveys

Survey Type	Total number of sites	Date undertaken
Automatic Traffic Counts (ATCs)	138	Main survey period: 10th May 2017 to 25th May 2017
1 day Manual Classified Turning Counts (MCTCs)	4	23rd May 2017
7 day Manual Classified Turning Counts (MCTCs)	1	5th to 12th December 2016

EAST SUFFOLK, SUFFOLK ENERGY GATEWAY

4.3.3. Table 10 describes the locations of the 2017 traffic survey locations undertaken to support the appraisal of the Suffolk Energy Gateways scheme. Processing of this data is discussed in Section 7 of the D2 Traffic Data Collection Report (December 2017).

Table 10 – Suffolk Energy Gateway 2017 Traffic Surveys

Survey Type	Total number of sites	Date undertaken
Automatic Traffic Counts (ATCs)	36	Main survey period: 9th May to 22nd May 2017 / June 2017
Manual Classified Turning Count	3	18th May 2017 0700-1900

LOWESTOFT

4.3.4. An additional MCTC was undertaken at Waveney Drive / Riverside Road / Durban Road on 5th July 2017. This is discussed in Section 6 of the D2 Traffic Data Collection Report (December 2017).

4.4 EXISTING SURVEY DATA

4.4.1. Existing ATC, MCC, ANPR and TRADS data was also obtained from other various sources as detailed in Table 11 below. Section 4 of the D2 Traffic Data Collection Report (December 2017) discusses in detail the sources and processing of the traffic data readily available from external sources which has not been specifically commissioned for the SCTM highway assignment model. In summary the additional sources of traffic survey data in Suffolk were as follows:

- 2015 traffic data collection to support Outline Business Case (OBC) submissions for the following schemes:
  - The Upper Orwell Crossings
  - Lake Lothing Third Crossing
- Suffolk County Council permanent ATC sites
- Highways England (HE) data from TRADS / WebTRIS

4.4.2. The ATC data provided by SCC was volumetric only, requiring the data to be split into the Car, LGV and HGV user classes used within the SCTM. Vehicle class factors were therefore derived from the ATC data commissioned for the SCTM and applied against the overall traffic volumes in the SCC ATC data,

Table 11 - External Survey Data

Survey Type	Source	Number of Surveys	Survey Period	Time
Automatic Traffic Counts (ATC) - Links	Suffolk County Council	96	2015 & 2016	All day
Manual Classified Counts (MCC)	2015 data collection from ITM & LTM	61	July 2015 & Oct 2016	All day
Classified Turning Count using ANPR	2015 data collection for LTM	3	July 2015	07:00-19:00
TRADS	HATRIS / Data.gov.uk / WebTRIS	82	April and May 2016, March and April 2015	All day

Figure 12 shows the locations of the TRADS counts which have been used for model calibration.

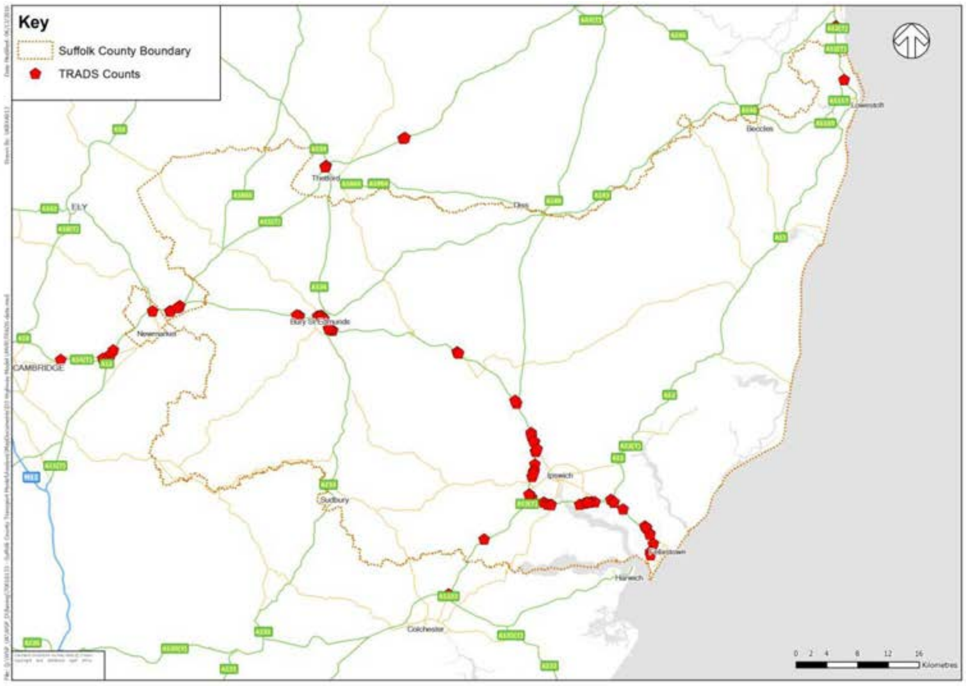


Figure 12 - TRADS Counts

4.4.3. Figure 13 shows the locations of the SCC ATC counts which have been used for model calibration and validation

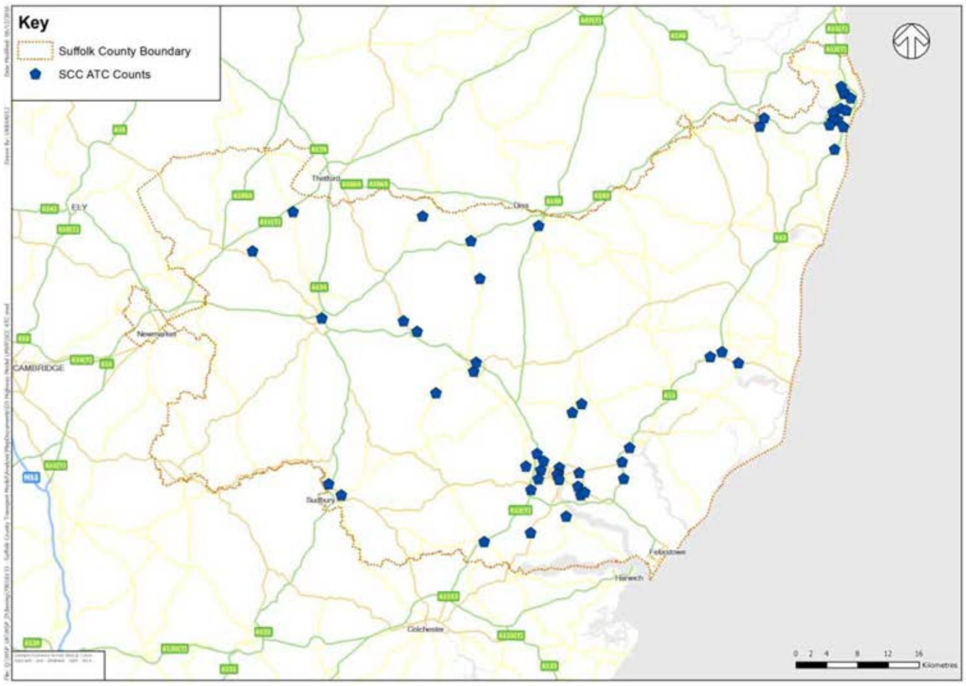


Figure 13 - SCC ATC Counts

4.4.4. Figure 14 shows the traffic surveys originally commissioned for the 2015 update of the LTM which were used for calibration and validation of the SCTM.

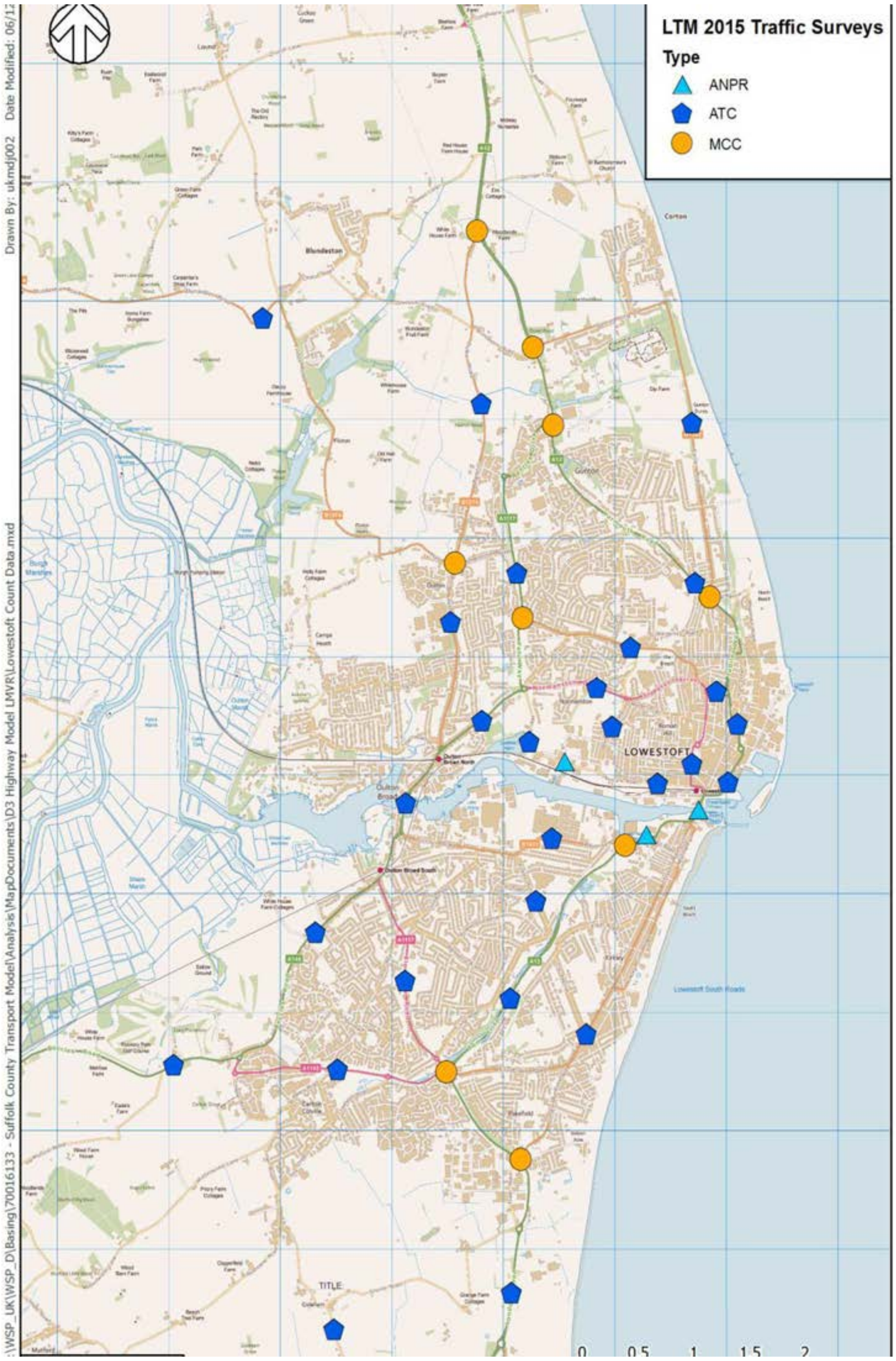


Figure 14 - Lowestoft Traffic Survey Data

4.4.5. Figure 15 details the location of the 2015 traffic surveys within Ipswich utilised for the Upper Orwell Crossing OBC. The majority of this data has been superseded by the 2017 traffic collection undertaken in Ipswich. However, 2015 data has been retained in some instances in order to provide suitable coverage of data and complete screenlines.

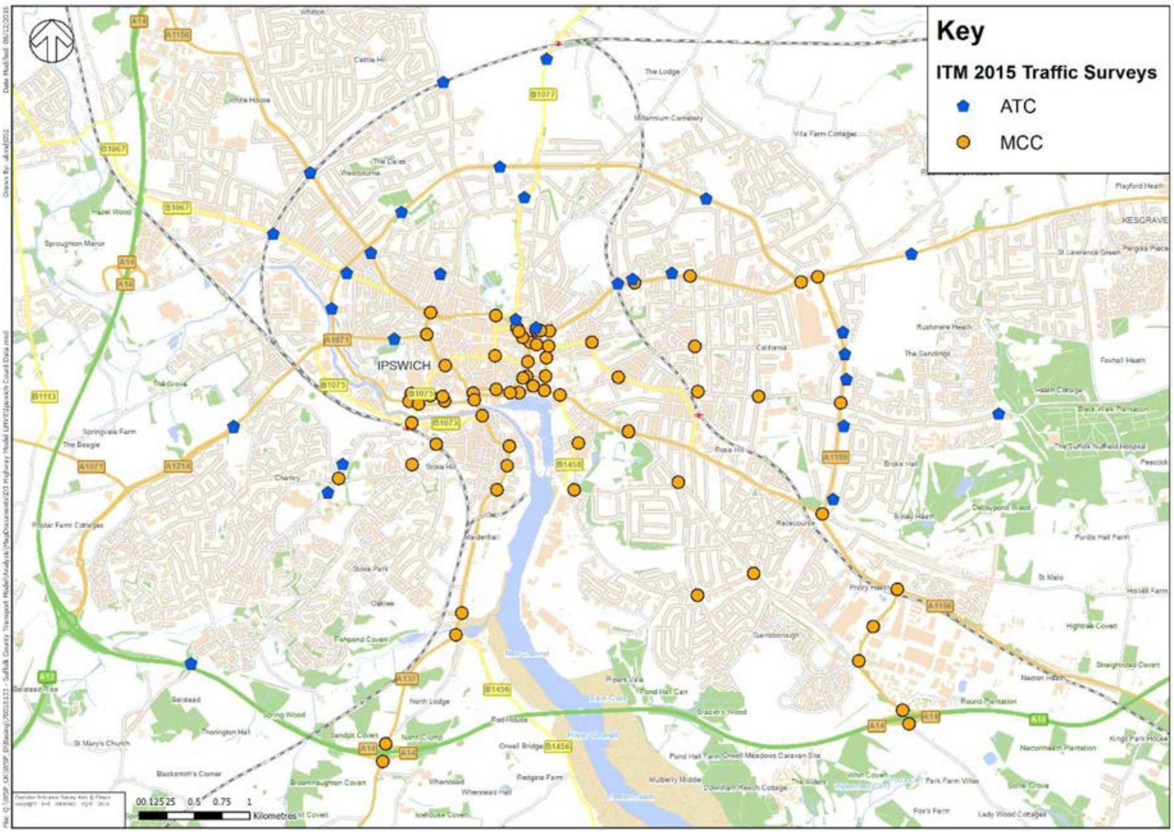


Figure 15 - Ipswich Traffic Survey Data

4.4.6. In combination with the commissioned surveys it is considered there is extensive coverage of traffic data which will provide a suitable basis for development of Suffolk County Transport Model (SCTM).

4.5 COUNT DATA CORRECTION TO 2016 BASE YEAR

4.5.1. Given the majority of the traffic data used within the SCTM highway assignment model was collected in 2016, this year is specified as the base year for the model.

4.5.2. As outlined above data from 2015 and 2017 has been used within the model. It has therefore been necessary to adjust this data in line with 2016 values. TEMPro factors at a district level have been used to factor the car trips, whilst NRTF factors have been used to adjust LGV and HGV observed values. For cars the conversion factors are time period specific, whilst for LGVs and HGVs the conversion factor for all peaks is the same. These factors are detailed in Section 3 of the D2 Traffic Data Collection Report (December 2017)

4.6 CALIBRATION AND VALIDATION COUNT DATA

4.6.1. Counts were split into calibration counts which were used for matrix estimation and validation counts which are independent of the matrix estimation process. The balance in terms of calibration and validation for the traffic counts is detailed in Table 12. It was ensured any counts used for matrix estimation or validation were designated in the same way in both directions.

Table 12 – Split of Counts in Calibration and Validation

Traffic count data type	Number of link counts
Calibration	1224
Validation	254
Total	**1478**

4.6.2. Figure 16 shows the coverage of traffic count data used for calibration and validation at a county wide level.

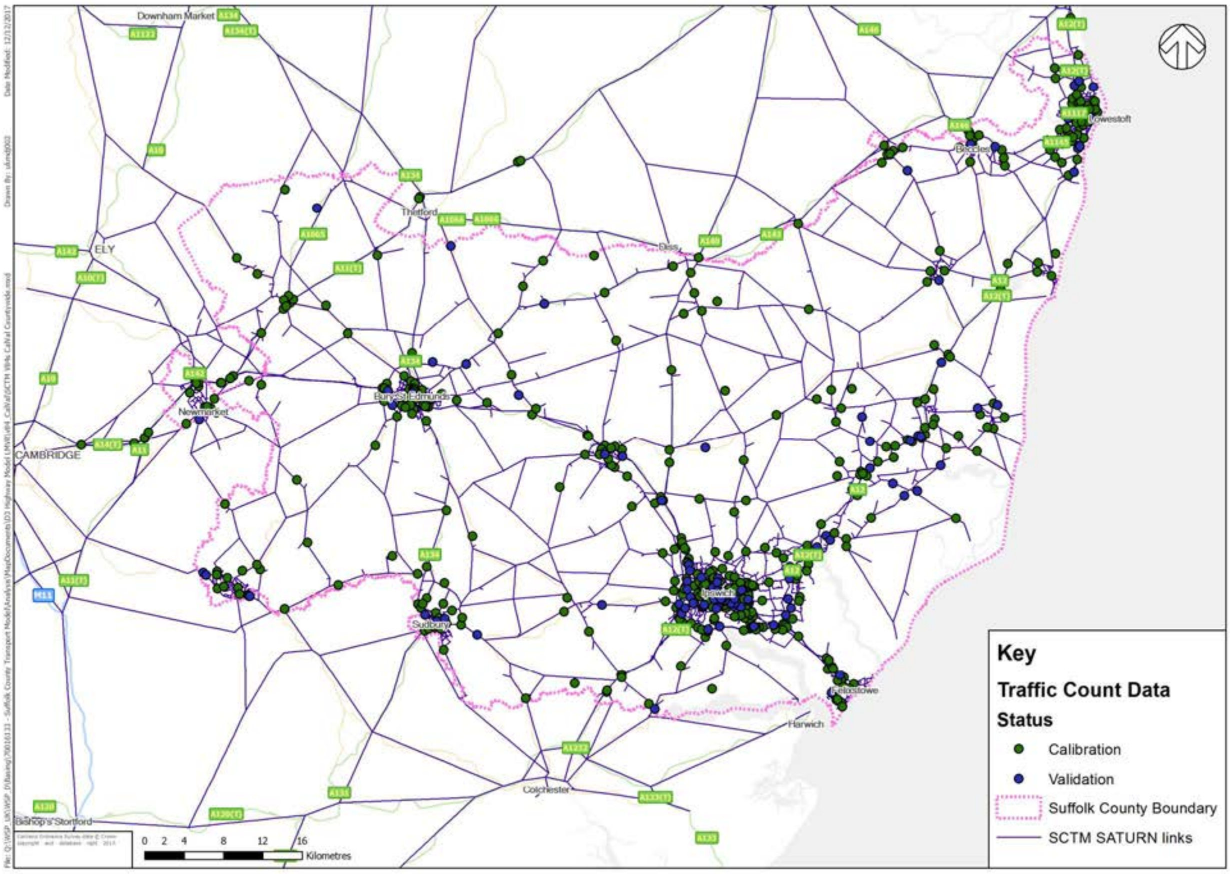


Figure 16 – County Wide Count Data in Calibration and Validation

4.6.3. Figure 17 shows the coverage of traffic count data used for calibration and validation within Ipswich.

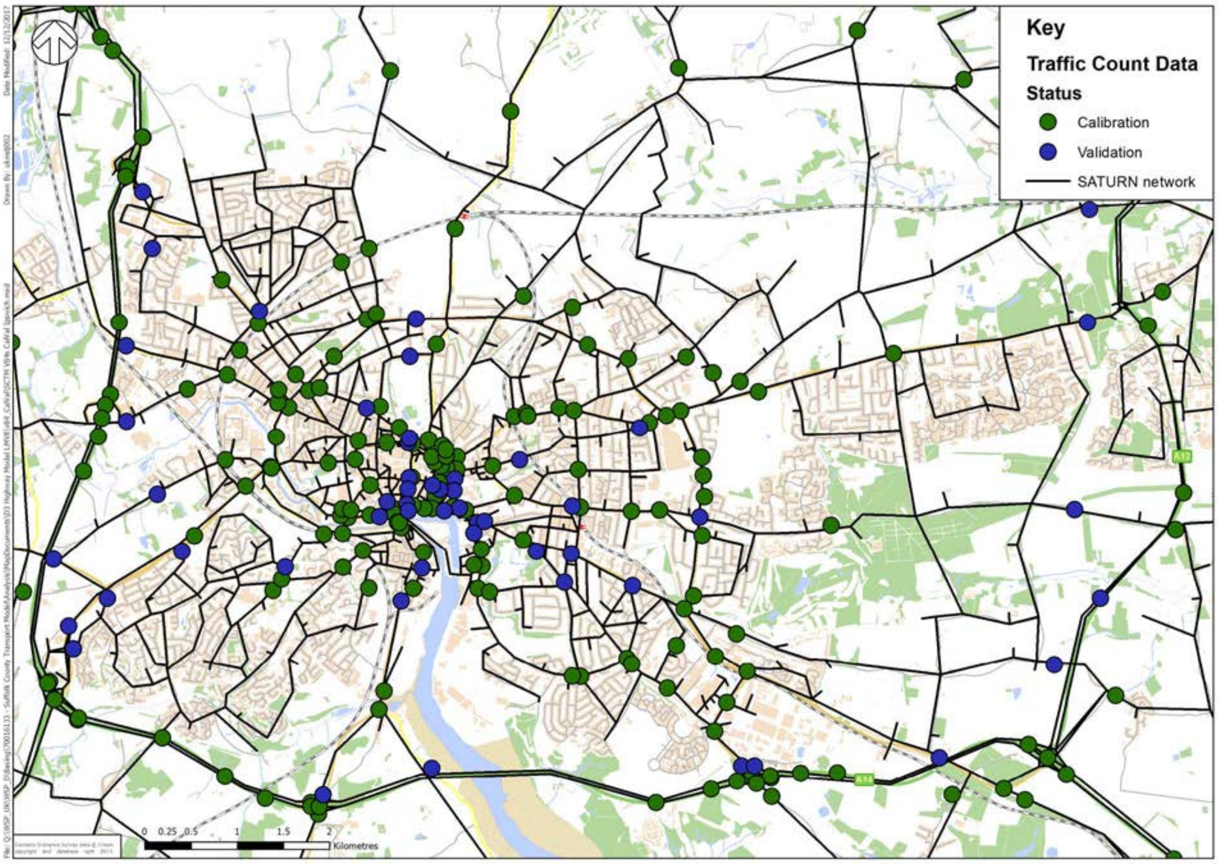


Figure 17 – Ipswich Count Data in Calibration and Validation

4.6.4. Figure 18 shows the coverage of traffic count data used for calibration and validation within Lowestoft.

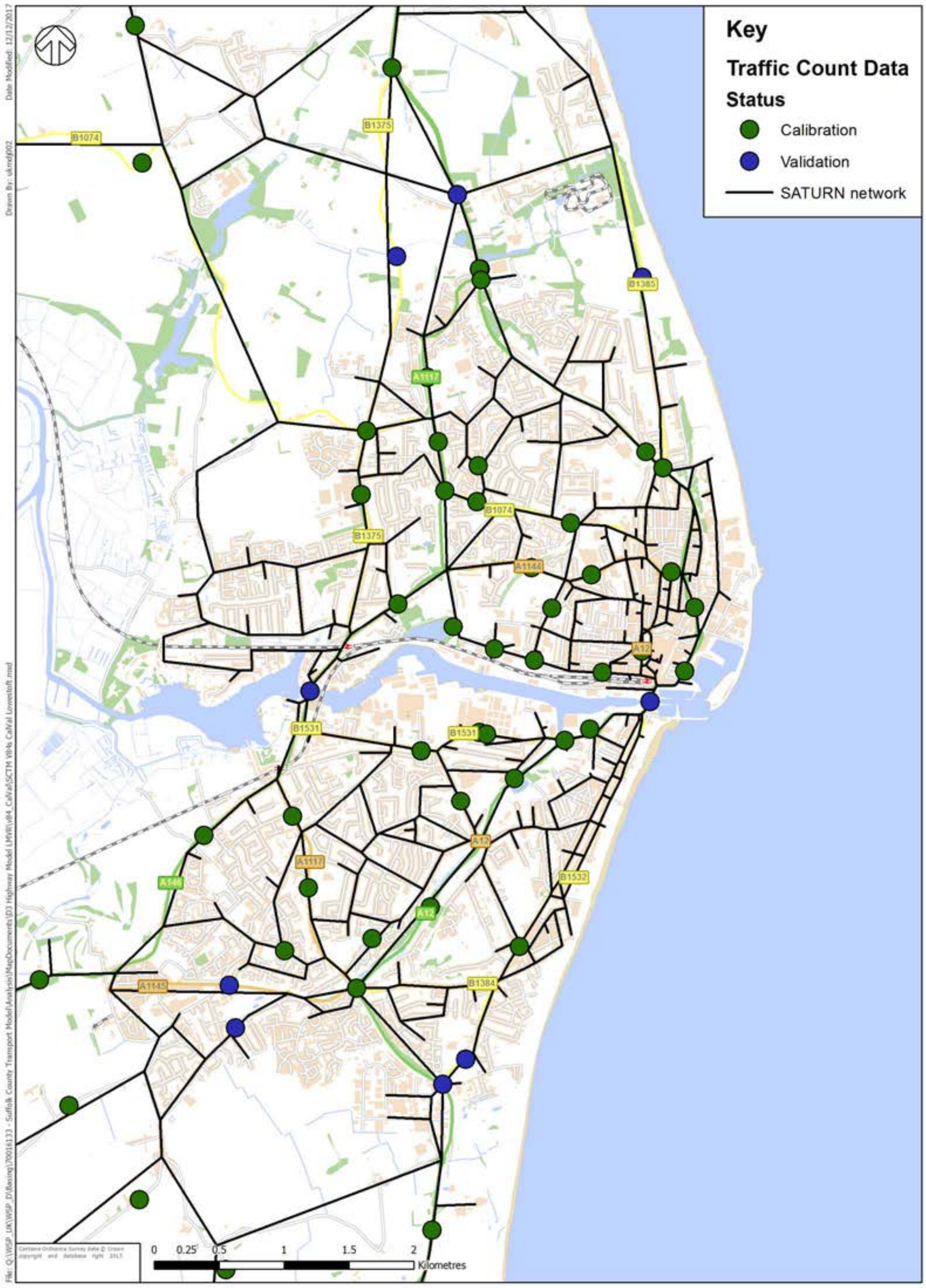


Figure 18 – Lowestoft Count Data in Calibration and Validation

4.6.5. Figure 19 shows the coverage of traffic count data used for calibration and validation for the area of detailed modelling relevant to the Suffolk Energy Gateway appraisal.

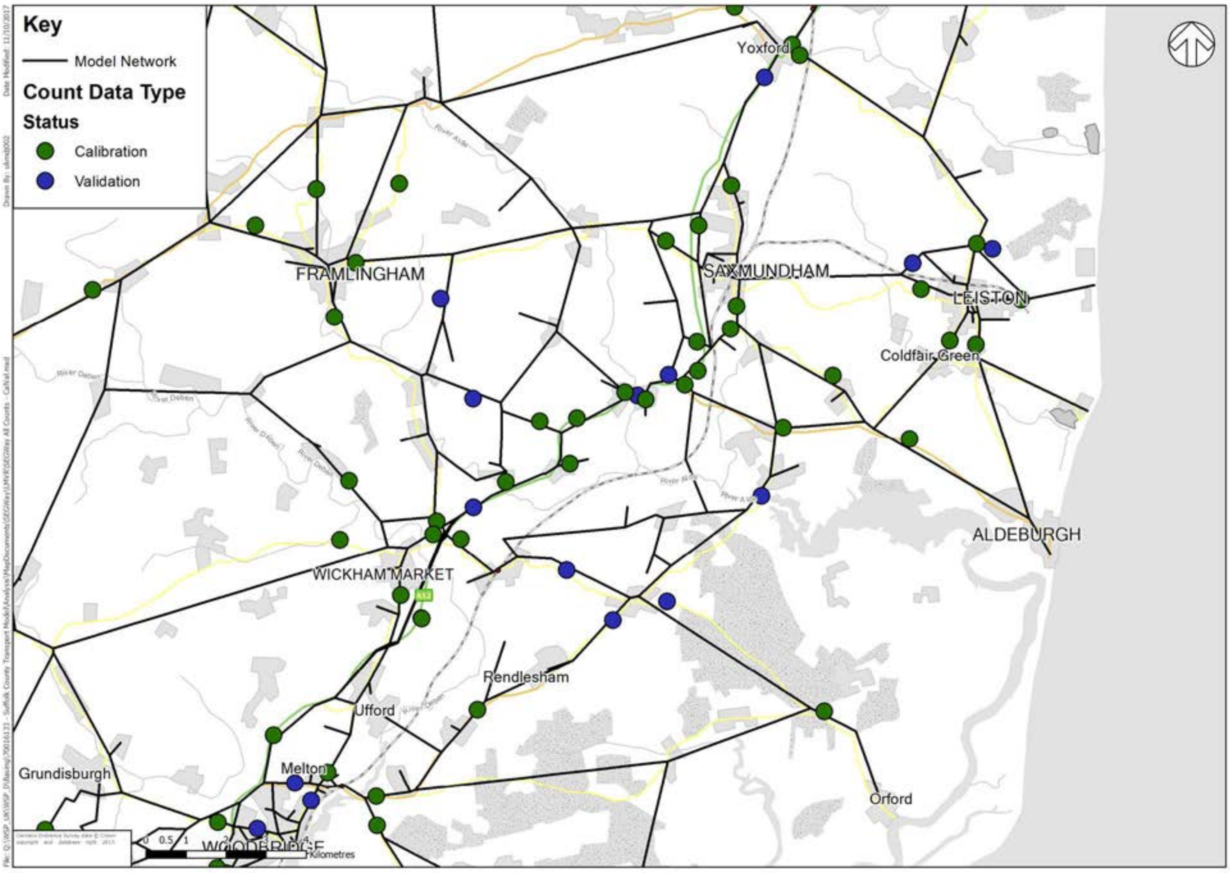


Figure 19 – Suffolk Energy Gateway Count Data in Calibration and Validation

4.7 COUNTY WIDE CALIBRATION SCREENLINES

4.7.1. Calibration screenlines were defined at a county wide level linking series of counts corresponding to similar strategic movements within the county. The calibration screenlines were run through the matrix estimation process.

4.7.2. Figure 20 shows the calibration screenlines which have been used within Suffolk outside of the local study areas relevant to scheme appraisal. 19 screenlines have been specified at a county level.

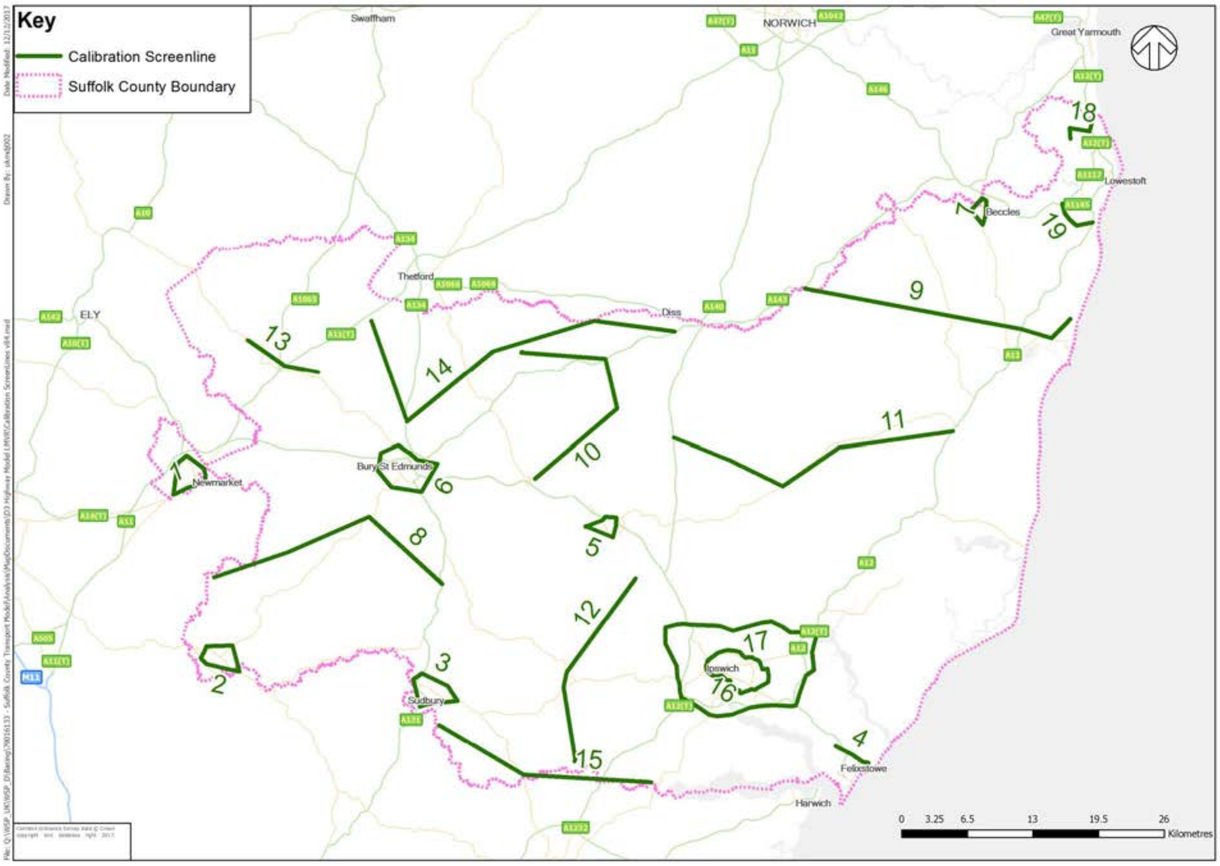


Figure 20 - Calibration Screenlines

4.7.3. Table 13 describes the calibration screenlines and the directional split used for each screenline for county wide model calibration outside of the local validation carried out for scheme appraisal.

Table 13 - Description of Calibration Screenlines

ID	Description	Direction
1	Newmarket	Inbound/ Outbound
2	Haverhill	Inbound/ Outbound
3	Sudbury	Inbound/ Outbound
4	Felixstowe	Inbound/ Outbound
5	Stowmarket	Inbound/ Outbound
6	Bury St. Edmunds	Inbound/ Outbound
7	Beccles	Inbound/ Outbound
8	South of Bury St. Edmunds	Northbound / Southbound
9	Waveney	Northbound / Southbound
10	East of Bury St. Edmunds	Eastbound / Westbound
11	Mid Suffolk / Suffolk Coastal	Northbound / Southbound
12	Babergh / Mid Suffolk	Eastbound / Westbound
13	Forest Heath	Northbound/ Southbound
14	North of Bury St. Edmunds	Northbound/ Southbound

15	South Babergh	Northbound/ Southbound
16	Ipswich (Inner)	Inbound/ Outbound
17	Ipswich (Outer)	Inbound/ Outbound
18	North Lowestoft	Inbound / Outbound
19	South Lowestoft	Inbound / Outbound

LOCAL CALIBRATION AND VALIDATION SCREENLINES

4.7.4. Detailed calibration and validation screenlines were specified for the local validation of the following locations:

- Ipswich
- Lowestoft
- East Suffolk; Suffolk Energy Gateway

4.7.5. Figure 21 shows the location of the validation and calibration screenlines within Ipswich

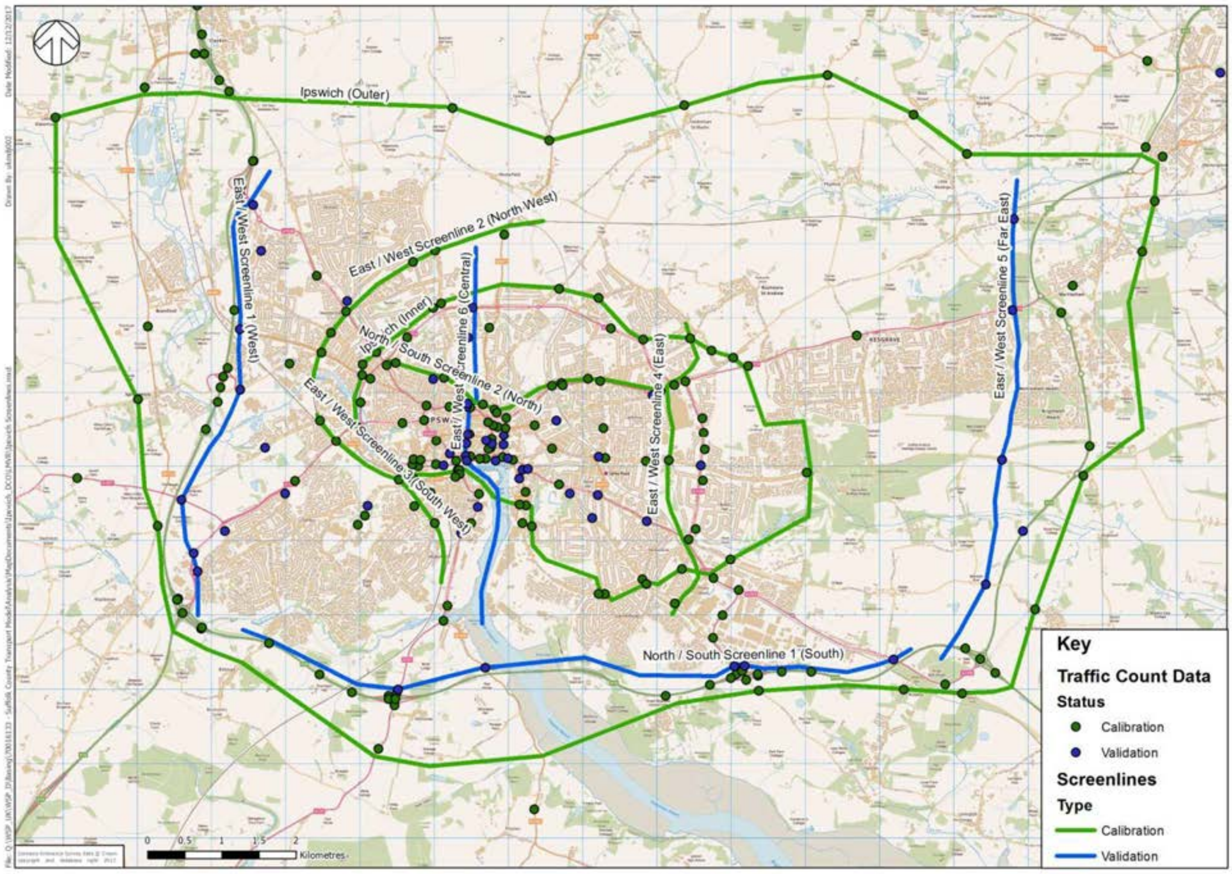


Figure 21 - Ipswich Screenlines

4.7.6. Table 14 describes the validation and calibration screenlines specific to Ipswich, including the Inner and Outer county wide screenlines.

Table 14 – Ipswich Screenlines

ID	Description	Direction	Type
1	East / West Screenline 1 (West)	East / West	Validation
2	East / West Screenline 2 (North West)	East / West	Calibration
3	East / West Screenline 3 (South West)	East / West	Calibration
4	East / West Screenline 4 (East)	East / West	Calibration
5	East / West Screenline 5 (Far East)	East / West	Validation
6	East / West Screenline 6 (Central)	East / West	Validation
7	North / South Screenline 1 (South)	North / South	Validation
8	North / South Screenline 2 (North)	North / South	Calibration
16	Ipswich (Inner)	Inbound/ Outbound	Calibration
17	Ipswich (Outer)	Inbound/ Outbound	Calibration

4.7.7. Figure 22 details the location of the local validation and calibrations screenlines within Lowestoft

Figure 22 - Lowestoft Screenlines

4.7.8. Table 15 describes the locations of the Lowestoft screenlines. The performance of the local Lowestoft screenlines is outlined in the local Lowestoft SCTM LMVR (November 2017).

Table 15 – Lowestoft Screenlines

ID	Description	Direction	Type
1	Lowestoft Screenline 1	North / South	Calibration
2	Lowestoft Screenline 2	North / South	Calibration
3	Lowestoft Screenline 3	East / West	Validation
4	Lowestoft Screenline 4	North / South	Validation
5	Lowestoft Screenline 5	North / South	Validation
18	North Lowestoft	Inbound / Outbound	Calibration
19	South Lowestoft	Inbound / Outbound	Calibration

4.7.9. Figure 23 shows the location of the validation and calibration screenlines within the area of detailed modelling for the Suffolk Energy Gateway scheme.

Figure 23 – Suffolk Energy Gateway Screenlines

4.7.10. Table 16 describes the locations of the screenlines for the Suffolk Energy Gateway scheme. The performance of the screenlines in the area of detailed modelling for the Suffolk Energy Gateway scheme is discussed in the local SEGWay LMVR (December 2017).

Table 16 – Suffolk Energy Gateway screenlines

Screenline ID	Type	Description
1	Calibration	Leiston
2	Calibration	North / West of A12
3	Calibration	South / East of A12
4	Calibration	Saxmundham
5	Calibration	Framlingham
6	Calibration	Woodbridge
7	Calibration	North / South screenline
8	Calibration	East / West screenline
9	Validation	NW / SW screenline
10	Validation	North / South screenline

4.8 A14 CORRIDOR TRAFFIC COUNT ADJUSTMENTS

4.8.1. Due to the density of the count data available along the A14 corridor around Ipswich between Junction 52 at Claydon and Junction 58 (A12 / Felixstowe Road) a systematic check was carried out to ensure the main carriageway and slip road flows balanced along each junction in order to reduce any issues of inconsistent count data and the impacts this could have on matrix estimation. Where the data was available, TRADS traffic volumes were generally relied upon over MCTCs, however in instances where both TRADS data and MCTCs were available, the TRADS traffic volume was used but with the MCTC vehicle split.

4.8.2. Tables in Appendix C provide details of the original survey data available along the specific sections of the A14, and the adjusted data used as calibration counts for matrix estimation. Instances where there was no change made to the original survey data have greyed out boxes in the 'Adjusted Survey Data' columns.

4.9 JOURNEY TIME SURVEYS FOR CALIBRATION AND VALIDATION

4.9.1. Trafficmaster GPS data was obtained from Suffolk County Council covering a period between September 2015 and August 2016. The data was filtered to only include data from the following neutral months:

- September 2015
- October 2015
- November 2015
- March 2016
- April 2016
- May 2016

4.9.2. The data was processed to provide an average weekday (Monday to Thursday) travel time by direction for each peak hour being modelled within the SCTM. Suffolk school holidays and bank holidays were excluded from the data used to derive the average travel times.

4.9.3. Travel time data was processed for a total of 78 routes across Suffolk in both directions. Following the guidance in WebTAG unit M1.2 it has been ensured the journey time routes were kept between 3km and 15km.

4.9.4. Analysis of the number of observations available for the Trafficmaster GPS data was carried out and is detailed in the D2 SCTM Highway Data Collection Report (December 2017). This led to route 25 being excluded from the list of journey time routes due to an inadequate number of observations being available. Analysis was also carried out in terms of the average speed along links, this information was used to assist in the calibration and validation of the SCTM journey time performance.

4.9.5. The journey time routes used for model calibration and validation are shown in Figure 24

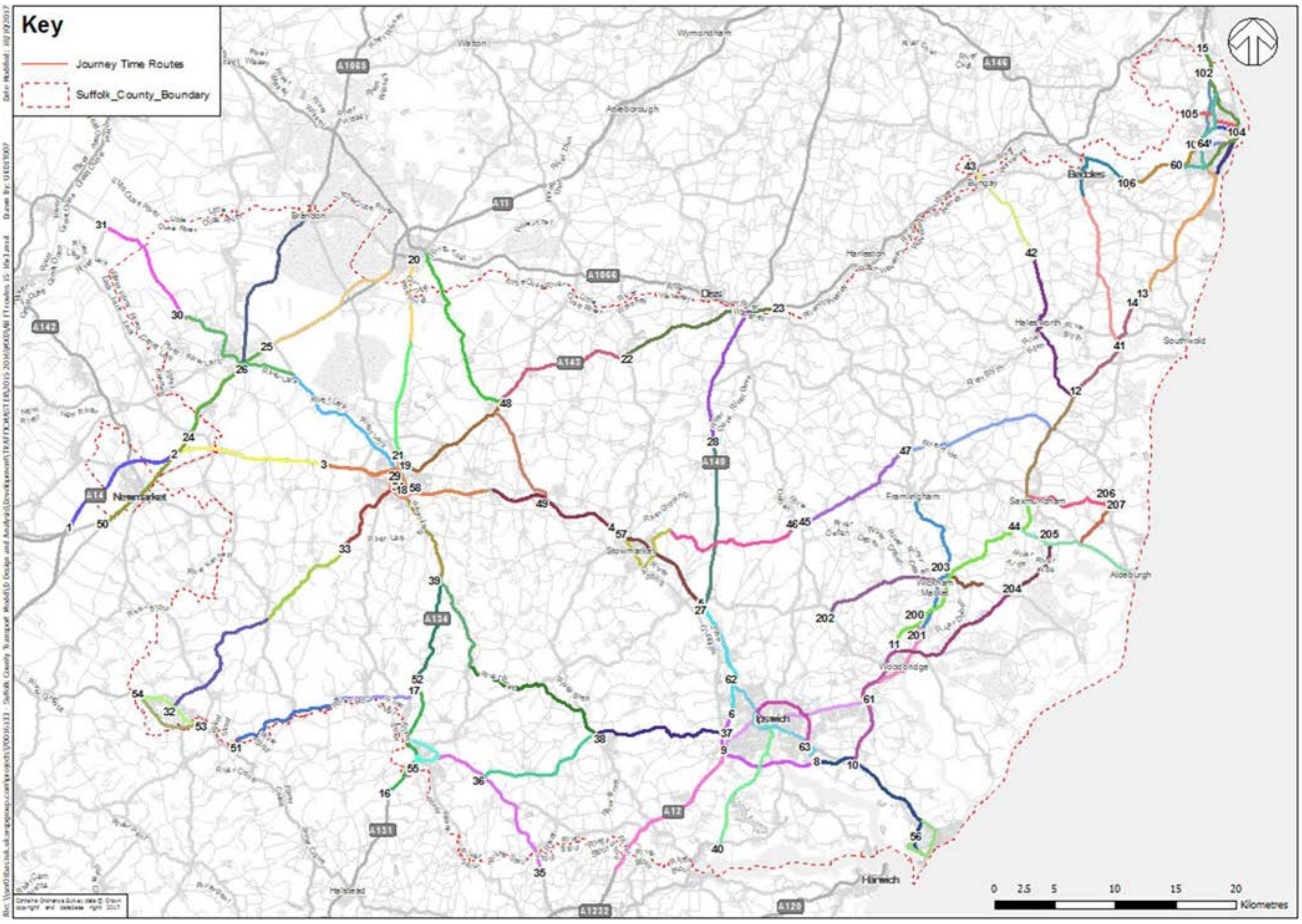


Figure 24 - Journey Time Routes

4.9.6. Appendix D-1 provides a description of the journey time routes used for calibration and validation.

5 NETWORK DEVELOPMENT

5.1 NETWORK DATA, CODING AND CHECKING

5.1.1. Network coverage was based on the hierarchy set out in section 3.1.

5.1.2. The network was verified through the use of ArcGIS 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.

5.1.3. The network errors and warnings generated by SATURN were checked to ensure the model network is free of coding errors. A key check which was undertaken was to ensure road speeds and link lengths were consistent on both sides of the highway, these appear as "Warning 32" errors within SATURN and were systematically checked for across the model network.

5.1.4. Traffic loads onto the model network from zones in the form of centroid connectors. The centroid zone connectors in the SCTM were designed 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 was used as a basis for connecting zones to the network via centroid connectors.

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

5.1.6. Separate zones were specified for any interchanges between car and public transport, such as railway stations with significant parking or park and ride sites. This is to allow car and public transport legs of a journey to be separated and assigned using the correct assignment model.

5.1.7. Major car parks in the town centres were modelled as separate zones so that correct vehicular origins and destinations are modelled, but these were not capacity constrained.

5.2 JUNCTIONS

5.2.1. Each junction included in the area of detailed modelling 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
- Saturation flows at roundabouts
- Gap times.

LANE ALLOCATIONS

5.2.2. Lane allocations were checked using satellite and street level imagery to ensure the correct number of lanes and allowed turning movements (where lane markings and/or signage was apparent) were coded for the approaches at each junction in the model.

JUNCTION TYPE

5.2.3. Checks were carried out for junction type using satellite imagery and street level data, with junctions split into the following types:

- Priority controlled junctions
- Signal controlled junctions
- Roundabouts (no u-turns allowed)
- Roundabouts (u-turns allowed)

5.2.4. Only mini roundabouts were coded to not allow u-turns. For all other roundabouts coded as a single node, the junction type was coded as a roundabout which allows u-turns.

5.2.5. For roundabouts which had a mixture of priority controlled and signalised approaches, or where the junction was complex e.g. major 'A' road junction with slip roads, the junction was coded as an "exploded" roundabout. This means multiple nodes were used to code the junction in detail, with each approach separately modelled.

SATURATION FLOWS AT SIGNAL CONTROLLED & PRIORITY CONTROLLED JUNCTIONS

5.2.6. 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) - 600 pcu/hr
- Minor straight ahead movement (opposed) – 600 pcu/hr

5.2.7. 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

5.2.8. 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.

SIGNAL TIMES, STAGES AND PHASES

5.2.9. Signal timings, staging and phases were extracted from controller specifications provided by Dynniq who manage the maintenance of numerous signalised junctions across Suffolk. The list of the signalised junctions for which controller IDs have been obtained are listed in Appendix E.

5.2.10. Rail level crossings were included in the model as signalised nodes, with a single stage. Generic timings were assumed at these locations, based on a total cycle time of 30 minutes (1800 seconds) as shown in Table 17

Table 17 - Level Crossing Signal Staging

Peak Hour	Total Cycle Time (Seconds)	Green Time (Seconds)	Red Time (Seconds)
Level Crossing Signal Staging	1800	1600	200

5.2.11. Within Lowestoft, the impact of the tidal flow section and eastern Bascule Bridge was also coded within the model. The tidal flow section was handled by use of a SATURN "$ Include" file which ensured two lanes eastbound / northbound in the AM peak; and two lanes westbound / southbound in the inter peak and PM peak on the A12 Belvedere Road.

SATURATION FLOWS AT ROUNDABOUTS

5.2.12. 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 18. These values have been adopted to replicate typical ARCADY capacity estimates and have previously been utilised in a range of other models.

Table 18 - 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

5.2.13. For roundabouts coded as a single node, the overall circulatory saturation flow was set to be the same as the highest saturation flow on the approach arms of the roundabout.

5.2.14. For "exploded" roundabouts coded in detail with multiple nodes, the saturation flow for circulatory movements on the roundabout was assumed to be 1,600 pcus per hour per lane. The saturation flows for the give-way approaches were coded using values in Table 18. Large gyratory systems were also coded as a series of priority junctions for a better representation of journey times through the junction.

GAP TIMES

5.2.15. Gap acceptance parameters in seconds applied to individual roundabouts are provided in Table 19.

Table 19 - 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

5.2.16. Global gap parameters were also defined as shown in Table 20 and were used in the absence of values being explicitly coded at junctions

Table 20 - Global Gap Acceptance Parameters

SATURN Parameter	Junction Type	Gap Acceptance (Seconds)
GAP	Priority / Signalised	1.5
GAPM	Merge	1.0

5.2.17. During calibration, junction capacities and gap times were altered from the default values listed above where appropriate. This occurred in instances where the modelled flows were found to match well in comparison to the observed flows, however the level of delay present in the Trafficmaster GPS data was not being emulated.

5.3 LINKS

5.3.1. Each link included in the area of detailed modelling network required several parameters as detailed below:

- Distance
- Speed
- Speed flow curves
- Number of lanes
- Penalties/bans.

DISTANCE

5.3.2. Distances in both the simulation and buffer network take into account the actual alignment of modelled road. Distances were measured using GIS incorporated detailed mapping and satellite imagery. Distances were also applied to zone connectors in the buffer network to better represent the travel time into the simulation network from the external zones.

SPEED

5.3.3. Within the urban area for links below 1km the use of the model speed flow curves were deemed not to be necessary due to capacity restraints from the junctions at either end of the link.

5.3.4. These links were given fixed speeds based on their individual speed limit as obtained from imagery and GIS data. Fixed speeds were adjusted were generally adjusted below the speed limit to allow for the impact of relief, road curvature, reduced capacity due to parked vehicles or other obstructions and distance of link between junctions. Fixed speeds limits were kept consistent between all time periods modelled.

5.3.5. These speeds will reflect the free flow speed whilst the delay at junctions will reflect the conditions in busier periods. During the validation process link speeds were revised in certain instances in order to ensure travel time and modelled flow matched the observed journey times and traffic survey data.

SPEED/FLOW CURVES

5.3.6. 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.

5.3.7. The speed flow curves that were used are shown in Table 21. Following a substantial increase in the network coverage in the highway model compared to what is outlined in the D1 SCTM Model Specification Report (February 2016) which was deemed to be required during model validation, an additional speed flow curve has been utilised for represent country lanes (ID 60) to represent additional routes of local significance. Speed flow curves were updated since the version of the SCTM reported in the D3 SCTM LMVR (February 2017) to better reflect COBA 10 speed-flow relationships s.

Table 21 - Model Speed Flow Curves

Description	ID	Free flow speed	Speed at capacity	Capacity	Power value
Rural - D4M Motorway - 4 lanes	1	116	45	9999	3.8
Rural - D3M Motorway - 3 lanes	2	116	45	7560	3.8
Rural - D2M Motorway - 2 lanes	3	112	45	4860	3.9
Rural - D3AP All-purpose - 3 lanes	4	109	45	6780	3.7
Rural – D2AP All-purpose - 2 lanes	5	105	45	4360	3.7
Rural – S2 Good	6	87	45	3280	2.2
Rural – S1 Good	7	87	45	1640	2.2
Rural – S2 Average	12	78	45	2760	2.1
Rural – S1 Average	13	78	45	1380	2.1
Rural – S2 Poor	14	67	45	2020	1.8
Rural – S1 Poor	15	67	45	1010	1.8

Suburban - Dual(Slight development)	16	78	35	3460	3.3
Suburban - Single(Slight development)	19	68	25	3460	3.7
Suburban - Single(Slight development)	20	68	25	1730	3.7
Suburban - Dual(Typical development)	21	61	25	2540	2.3
Suburban - Dual(Typical development)	22	61	25	1570	2.3
Suburban - Dual(Heavy development)	23	48	25	1000	1.6
Suburban - Dual(Heavy development)	24	48	25	500	1.6
Urban - Non-central(Good) - 2 lanes	25	54	25	1960	1.7
Urban - Non-central(Good) - 1 lane	26	54	25	980	1.7
Urban - Non-central(Typical) - 2 lanes	27	49	25	1560	1.6
Urban - Non-central(Typical) - 1 lane	28	49	25	780	1.6
Urban - Non-central(Poor) - 2 lanes	29	45	25	1300	1.5
Urban - Non-central(Poor) - 1 lane	30	45	25	650	1.5
Urban - Central(Good) - 2 lanes	31	37	15	1480	1.8
Urban - Central(Good) - 1 lane	32	37	15	740	1.8
Urban - Central(Typical) - 2 lanes	33	34	15	1260	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 development - 2 lanes	37	66	30	2600	3.0
Small Town - Light development - 1 lane	38	66	30	1300	3.0
Small Town - Typical development - 2 lanes	39	57	30	2000	3.4
Small Town - Typical development - 1 lane	40	57	30	1000	3.4
Small Town - Heavy development - 2 lanes	41	47	30	1760	2.5
Small Town - Heavy development - 1 lane	42	47	30	880	2.5
Suburban - Single(Slight development)	43	78	35	1730	3.7
Centroid Connector - Internal	50	87	87	9999	3.3
Country Lane	60	50	21	1200	2.15

NUMBER OF LANES

5.3.8. Checks were made to ensure the correct number of lanes were allocated to links in the model, It was ensured the coding of the number of lanes for a link matched the speed flow curve for instances where these capacity restraints were applied.

PENALTIES / BANS

5.3.9. During auditing and building of the network, instances where there were restrictions in terms of the vehicle types allowed along links were taken into account. Height and weight restrictions on roads were taken into account by banning the HGV user class in the matrix from using these links.

6 TRIP MATRIX DEVELOPMENT

6.1 INTRODUCTION

6.1.1. The trip matrix has been built directly from a combination of mobile network data and 2011 Census journey to work data and then factored using a number of other data sources to generate the journey purposes and vehicle classes required for the modelling work.

6.1.2. The matrices require the use of both mobile phone network data and a synthetic matrix generated from 2011 Census journey to work data to form the initial matrix for the model. This uses a synthetic trip matrix for short distance trips in conjunction with longer-range mobile network data trips. This is primarily to overcome a shortfall in shorter distance trips that the mobile network data has inherent to the data collection as a result of the size of mobile network 'cells' / tower ranges.

6.1.3. The mobile network data has been processed from a dataset provided by Telefonica into the format that is required for the modelling work; the process splits out vehicle types required and purposes required from the original data. The synthetic matrix has been generated using the Census data for one journey purpose, with the other journey purposes built up from this matrix using factors from the National Travel Survey.

6.1.4. Details on the processing for both the mobile network data and synthetic data are provided later in this section of this report. In summary, the following process has been undertaken to reach the prior matrices for the highway and public transport models:

- Create matrices from the mobile network data:
- Aggregate the data from an LSOA level to an MSOA level;
- Split out bus trips from the 'road' data into a bus matrix;
- Convert remaining 'road' data from person trips to vehicle trips;
- Split out LGV trips from the vehicle-based 'road' data into an LGV matrix;
- Split out additional purposes not included in the mobile network data;
- Disaggregate from MSOA level to model zone level;
- Create Synthetic matrices from Census journey to work data;
- Scale each of the matrices to the base year for the model;
- Combine the mobile network data matrices and synthetic matrices based on a distance threshold; and
- Redistribute rail trips into different legs due to trips otherwise representing full origin-destination trips as a pure-rail mode, while trips actually represent access legs as well as the rail trip(s).

6.1.5. Matrix estimation has then been used to determine final matrices for the highway and public transport models. These matrices have been used in the demand model, although some additional work has been carried out to split out some of the particular trip elements required for that model and is set out within the demand model LMVR.

6.2 WORKFLOW

6.2.1. Figure 25 contains a simplified overview of the process carried out to generate the initial matrices. Each of the sections in this chapter then describes the elements of the process.

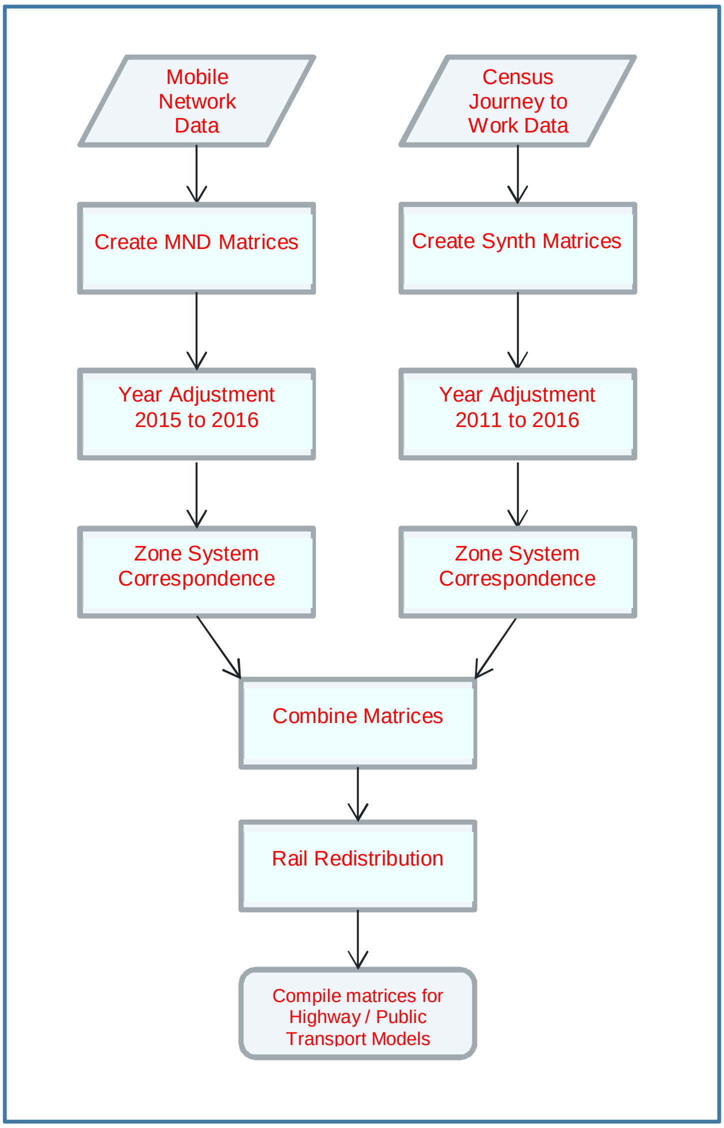


Figure 25 - Initial Matrix Development Process Overview

6.3 MATRIX LEVELS

6.3.1. The matrix build process has used a number of matrix 'levels' to make up the matrix. Each level represents a trip purpose (some per direction) or vehicle type.

HIGHWAY MATRIX LEVELS

6.3.2. There are 10 matrix levels in the highway matrix, where each level of the matrix is normally referred to as a user class for SATURN models.

1. [HBW IB]: Car home-based work (inbound);
2. [HBW OB]: Car home-based work (outbound);
3. [HBEmp IB]: Car home-based employers business (inbound);
4. [HBEmp OB]: Car home-based employers business (outbound);
5. [NHBEmp]: Car non-home-based employers business (both directions);
6. [HBO IB]: Car home-based other (inbound);
7. [HBO OB]: Car home-based other (outbound);

8. [NHBO]: Car non-home-based other (both directions);
9. Light Goods Vehicle (LGV) trips; and
10. Heavy Goods Vehicle (HGV) trips.

PUBLIC TRANSPORT MATRIX LEVELS

6.3.3. There are 8 matrix levels in the public transport matrix, which represent public transport users (rail and bus modes of transport) for each of the journey purposes listed as matrix levels 1-8 in the highway matrix levels above. These matrices have then been subdivided into two further matrices each, where one matrix represents the 'Car Available' (CA) travellers, and one matrix represents the 'No Car Available' (NCA) travellers. This split has been carried out to assist the demand model mode assignment.

6.3.4. The 'Car Available' matrix has been further subdivided into two modes of travel; those who travel by car and those who do not. Those who do not travel by car are full origin-destination trips, as their access legs to the rail station is assumed to be using sustainable modes, while those who do use car have been assigned directly as rail station to destination (with the access leg moved into the highway matrix). This process is detailed later in this section.

6.4 DATA SOURCES

6.4.1. The matrix development process has been informed by a number of data sources. Each data source has been carefully considered to make the matrix development process robust as far as possible. The data sources used include the following:

- Mobile network data (MND) provided by Telefonica for April 2015;
- National Travel Survey (NTS) 2015 for the East of England;
- National Trip End Model (NTEM) 7.2;
- Census 2011 data including the following elements:
  - Proportion of bus users compared to all road users from Journey to Work data;
  - Journey to Work data for car / bus / rail users;
  - Adults and Employed Persons numbers (Census Output Area basis)
  - Workplace population (Workplace Zones basis); and
  - Car ownership data.
- Values for vehicle occupancy from the WebTAG databook (July 2017 edition); and
- Land area per zone.

6.4.2. The data sources used have been detailed further throughout this section.

6.5 MOBILE NETWORK DATA MATRIX PROCESSING

6.5.1. A simplified overview of the Mobile Network Data processing is provided as Figure 26. Figure 27 is provided to expand on the LGV process, as this process is significantly more involved than is able to be shown in Figure 26.

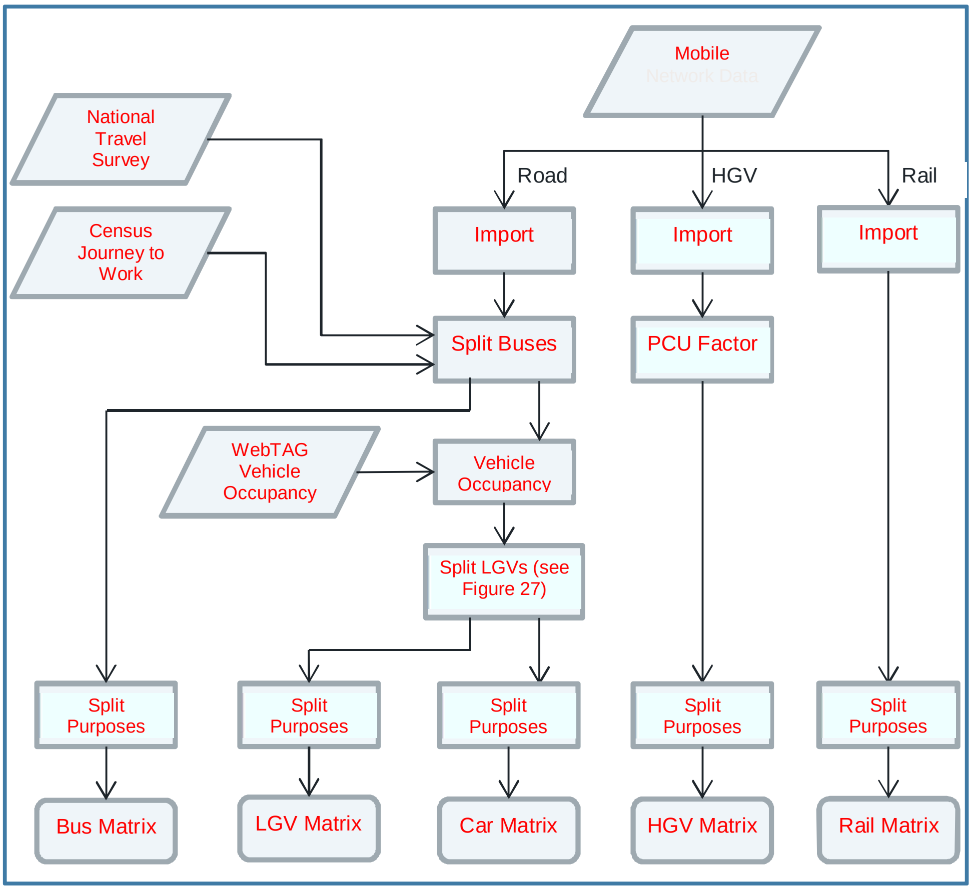


Figure 26 - Mobile Network Data Processing Overview

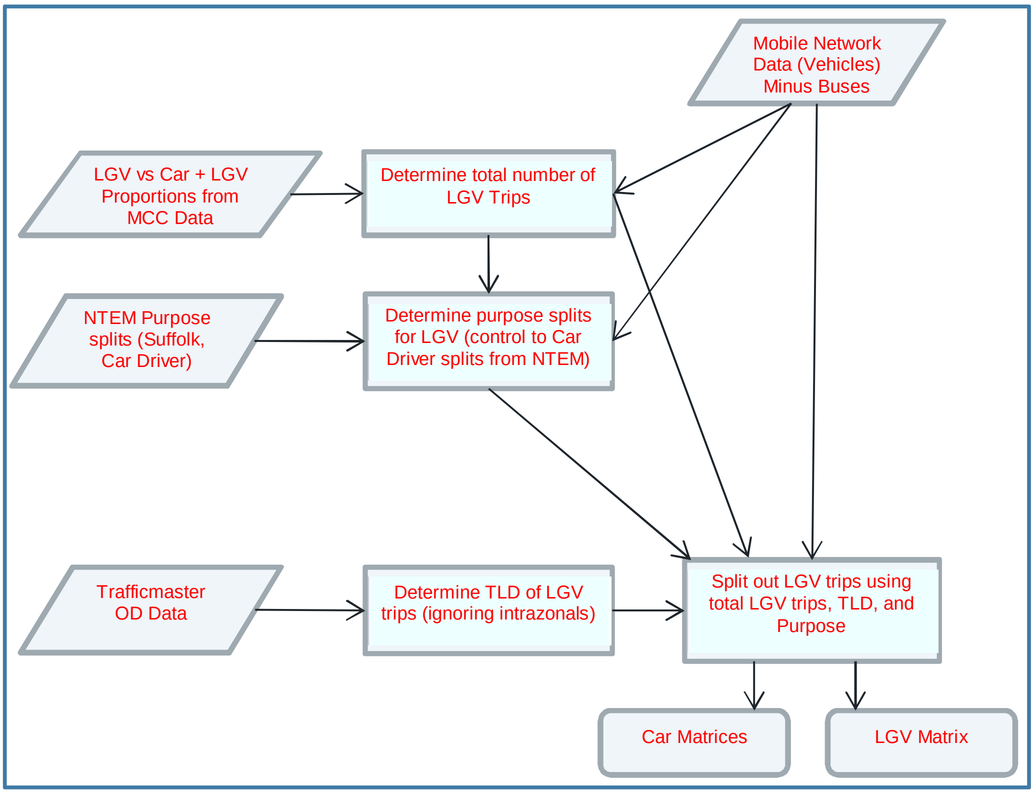


Figure 27 - LGV Split Process Overview

6.5.2. Telefonica were commissioned to provide mobile network data covering Suffolk and surrounding areas. The data collection period was set as April 13 to May 21 2015, for Mondays to Thursdays, excluding bank holidays and school holidays, resulting in 23 days of data. This complies with WebTAG unit M1.2 which defines the neutral periods of time for data collection throughout the year.

6.5.3. The mobile network data covers trips that start or end within the defined cordon area given to Telefonica. For the study area this covers all trips that might be expected to be made within the study area, as it is unlikely that there would be any trips made that would pass through the primary area of study without having an origin or destination within the area. MND was provided at an LSOA level within Suffolk. This data has been aggregated to MSOA level as the data provided by Telefonica indicated a lower level of accuracy at LSOA level.

6.5.4. The mobile network data has been provided for a full 24 hour period, split into the following time periods by Telefonica:

- Early Off Peak (00:00 to 07:00);
- AM Peak Period (07:00 to 10:00);
- AM Peak Hour (08:00 to 09:00);
- Inter Peak Period (10:00 to 16:00);
- PM Peak Period (16:00 to 19:00);
- PM Peak Hour (17:00 to 18:00); and
- Late Off Peak (19:00 to 00:00).

6.5.5. The AM Peak Hour (APH), Inter Peak Period (IP), and PM Peak Hour (PPH) have been used for the generation of the transport model matrices, with the IP factored by 1/6th to represent an average hour of this period for modelling purposes.

6.5.6. The mobile network data that was provided by Telefonica was provided as three matrices:

- ‘Road’ person matrix, representing all highway person trips other than HGV trips;
- ‘HGV’ person matrix, representing HGV person trips; and
- ‘Rail’ person matrix, representing all rail person trips.

6.5.7. The mobile network data trips were provided with road and rail trips split in to 5 purposes:

- Home-based work (inbound);
- Home-based work (outbound);
- Home-based other (inbound);
- Home-based other (outbound); and
- Non-home-based other (both directions).

6.5.8. Appendix F-1 contains the mobile network data technical note that Telefonica provided with the data, explaining how this trip data was generated.

6.5.9. This data has been put through a number of processes to split out the trips into the trip types required for the different transport models involved in this work.

6.5.10. A detailed verification of the mobile network data has been carried out to assess fitness for purpose for the transport modelling work. Initial checks of the data had been carried out by Telefonica; however these have been regarded as high level checks with more detailed analysis required. The verification has been carried out through comparison to the National Travel Survey, National Trip-End Model version 6.2, and 2011 Census Journey to Work data at Output area to Work Place Zone level.

6.5.11. Appendix F-2 contains a report which details the extensive verification of the MND which has been carried out by WSP.

INITIAL ROAD PERSON MATRIX PROCESSING

6.5.12. The road person matrix has been processed through the following major steps to get relevant matrices for this modelling work in terms of car vehicle trips, LGV vehicle trips, and person bus trips:

- Split bus person trips into a separate matrix;
- Convert the remaining person trips into vehicle trips; and
- Split LGV trips into a separate matrix.

6.5.13. Bus trips were split off from the provided road matrices through factors calculated from National Travel Survey (NTS) data combined with Census Journey to Work data. The Census Journey to Work data was used to work out the proportion of bus users per zone-to-zone movement for outbound home-based work trips, with the NTS data then used to determine proportion matrices for the other purposes.

6.5.14. The conversion of trips from person trips to vehicle trips has been carried out using the WebTAG databook July 2017 edition, which contains vehicle occupancy values for the year 2000 along with adjustments per year. Vehicle occupancies have been applied on both a purpose and time period basis, calculated from the relevant WebTAG values, with an allowance for a proportion of LGVs.

6.5.15. The LGV split has been calculated using:

- MCC Data to work out the proportion of LGVs compared to Cars & LGVs as a whole;
- Trafficmaster OD Data to work out a trip length distribution for the LGV trips; and
- NTEM Purpose Split information for Car Drivers, which has been used to control the resulting car driver proportions once LGVs are removed.

6.5.16. The total number of LGVs based upon the MCC data are then proportioned across purposes to give the total number of LGVs being split out of each purpose, then this is split into trip length bands and removed from those elements of the matrix to give an LGV matrix of the correct size.

6.5.17. The car and LGV trips are required in passenger car units (PCUs) for the highway model rather than vehicles, but it has been assumed for this work that both car and LGV vehicles are equivalent to a single PCU and therefore no change has been made to these matrices to account for this.

6.5.18. Table 22 shows the matrix changes as these processes are applied.

Table 22 - MND Initial Road Matrix Totals

Time Period	Purpose	Raw MND	Post-Bus	Vehicle Occupancy	Post-LGV
AM	HBW Inbound	267	254	216	203
	HBW Outbound	228,023	213,268	181,721	170,268
	HBO Inbound	22,586	21,218	14,963	14,041
	HBO Outbound	190,562	178,704	126,025	117,775
	NHB	97,242	92,887	68,602	43,377
IP	HBW Inbound	24,848	23,033	20,029	20,029
	HBW Outbound	22,863	20,813	18,098	18,098
	HBO Inbound	108,470	100,875	65,080	65,080
	HBO Outbound	117,359	108,191	69,801	69,801
	NHB	128,423	121,792	86,426	50,407
PM	HBW Inbound	210,456	197,187	169,784	165,984
	HBW Outbound	1,322	1,216	1,047	1,025
	HBO Inbound	209,104	194,217	131,673	128,821
	HBO Outbound	72,999	67,687	45,889	44,919
	NHB	124,036	117,744	85,014	54,438

6.5.19. The total matrix changes are summarised in Table 23. These percentages are shown as the total matrix change, however the factors are different per purpose within the matrix.

Table 23 - Changes in Matrix Proportions as a Result of Processes

Time Period	Proportion of Bus Trips	Vehicle Occupancy Reduction	Proportion of LGV Trips
AM	6.0%	22.7%	11.7%
IP	6.8%	30.8%	13.9%
PM	6.5%	25.0%	8.8%

INITIAL HGV PERSON MATRIX PROCESSING

6.5.20. The highway matrices are required as passenger car units (PCUs), with HGV trips being factored by 2.3 to provide the relevant PCU equivalent. HGVs have been assumed to be one person per vehicle so no occupancy factor has been applied.

INITIAL RAIL PERSON MATRIX PROCESSING

6.5.21. The rail matrices are required as person trips and therefore no processing has been carried out on the rail matrices at this stage.

PURPOSE SPLITTING

6.5.22. All of the matrices from the mobile network data have had a further split applied to the 'other' trips (purposes 6, 7, and 8) to determine the employers business trips (purposes 3, 4, and 5). This split has been carried out using NTEM data, calculated individually for each of car, rail and bus trips. Car trips use data at an MSOA level, while rail and bus trips use data at a district level.

6.5.23. Table 24 shows the proportions applied to split out the Employers Business trips.

Table 24 - Employers Business Purpose Split Proportions

Time Period	Original Purpose	Car / LGV / HGV		Public Transport	
		Original Purpose Proportion	Employers Business Purpose Proportion	Original Purpose Proportion	Employers Business Purpose Proportion
AM	HBO Inbound	91.3%	8.7%	67.9%	32.1%
	HBO Outbound	91.3%	8.7%	67.8%	32.2%
	NHB	69.8%	30.2%	32.8%	67.2%
IP	HBO Inbound	96.5%	3.5%	87.3%	12.7%
	HBO Outbound	96.6%	3.4%	87.3%	12.7%
	NHB	78.8%	21.2%	61.5%	38.5%
PM	HBO Inbound	93.4%	6.6%	79.3%	20.7%
	HBO Outbound	93.3%	6.7%	79.3%	20.7%
	NHB	82.0%	18.0%	80.4%	19.6%

6.6 SYNTHETIC MATRIX CREATION

6.6.1. A simplified overview of the synthetic matrix generation process is provided as Figure 28.

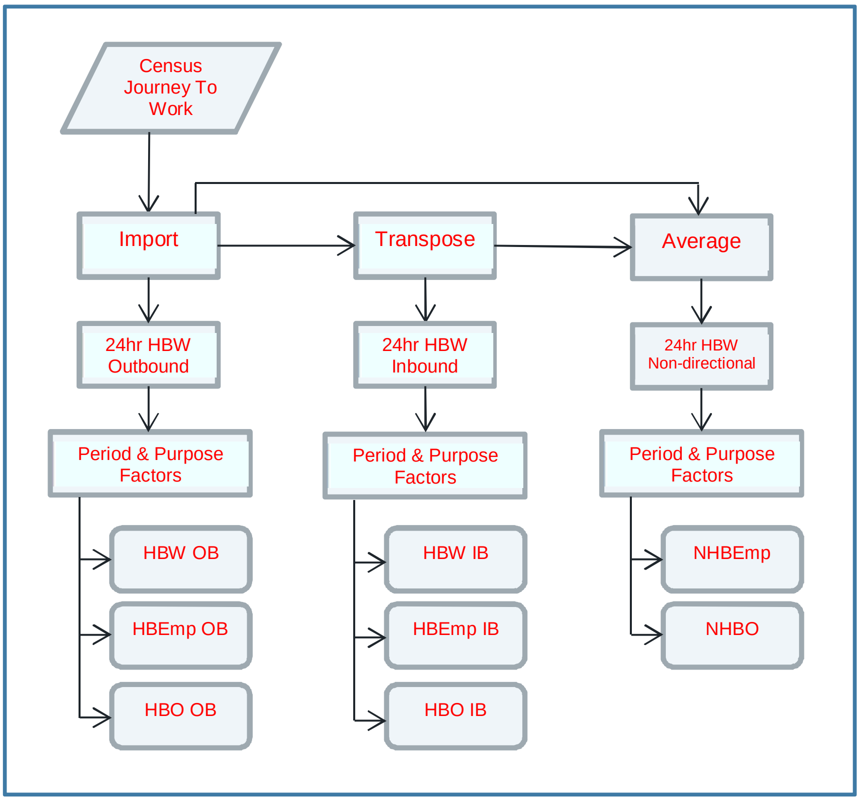


Figure 28 - Synthetic Matrix Creation Process

6.6.2. Synthetic matrices have been generated from Census Journey to Work 2011 data. This data has been used to form a synthetic matrix of trips that represents a 24 hour period for home-based work (outbound) trip purpose for car, rail, and bus trips. This base matrix has been used to create the remaining trip purposes. An initial 24 hour home-based work trips (inbound) matrix has been generated from the transpose of the outbound matrix. These matrices have been created for each of car, rail, and bus modes, as the census data does not cover LGV and HGV data. The inbound and outbound matrices have then been averaged to generate a non-directional matrix for use when estimating the purposes that have no direction.

6.6.3. National Travel Survey data has then been used to generate an 'all-modes' factor for each journey purpose for each time period, as the survey data for the East of England has too low a sample rate to be able to get specific factors for each mode of travel in this manner. The resulting factored matrices have a distribution of trips that is the same as the journey to work data, but the total number of trips is representative of the purpose required.

6.6.4. The synthetic matrices have then been scaled to include education trips for relevant purposes (home-based work trips) as Census journey to work does not include education trip purposes.

6.7 MATRIX SCALING TO BASE YEAR

6.7.1. The mobile network dataset and synthetic matrices have a different year of origin than the base year of the transport models. Scaling factors have been calculated from the National Trip End Model 7.2 dataset, using the software TEMPro 7, to scale each of these matrices so that the data is more representative of the target base year. The factors calculated have been determined for car-driver (applied to Car, LGV, and HGV trips), rail users, and bus users.

6.7.2. The mobile network data matrix has had a scaling factor from 2015 to 2016 calculated and applied as the mobile network data has been taken from April 2015 data, with the synthetic matrix having a 2011 to 2016 scaling factor applied as it is based on 2011 Census data.

6.7.3. Scaling factors have been determined for each district within Suffolk and for the East of England region, with zones scaled depending on what area they fall within. Scaling factor application has been carried out using an average of the origin and destination scaling factors.

6.7.4. Table 25 shows how the final matrix totals have been adjusted based on the scaling factors applied. The proportions shown are the changes in total numbers of trips that result from the district-level scaling factors applied.

Table 25 - Proportional Difference When Applying Yearly Factors

Time Period	MND					Synthetic		
	Car	LGV	HGV	Rail	Bus	Car	Rail	Bus
AM	99.2%	102.9%	100.6%	99.4%	99.7%	96.3%	96.5%	98.5%
IP	99.9%	102.9%	100.6%	104.7%	99.9%	99.4%	99.8%	99.9%
PM	99.4%	102.9%	100.6%	163.4%	99.6%	97.1%	97.7%	98.3%

6.8 ZONE SYSTEMS AND CORRESPONDENCE

6.8.1. The transport models have a zone system of 883 zones (numbered up to 906, with a gap between 854 and 878). All of the transport model elements (the highway model, public transport model, and demand model) use the same zone system for ease of data transfer.

6.8.2. The initial zone system used by the mobile network data and used for generating the synthetic matrix data is at a Lower Super Output Area level within Suffolk, with external areas using MSOA, District, or regional areas to represent the zones, with 755 zones in total. The mismatch in the number of zones between this initial system and the transport model system means that a correspondence process has been carried out in order to assign each of the initial zones into the transport model zones within it.

6.8.3. The correspondence process has been applied to the matrices using a number of datasets. These datasets are:

- Number of Adults from Census 2011;
- Number of Employed People from Census 2011;
- Workplace Population from Census 2011;
- Land area per zone information from GIS.

6.8.4. The Census 2011 data has been proportioned out to the relevant zones that intersect the Census features. In some cases, the Census data has been manually adjusted after this intersect process to ensure that populations are in the correct places e.g. the workplace population associated with Ipswich Hospital would have been assigned to the transport network in the wrong place if it had been left in the original assignment position from the intersect, so this workplace population has been moved to an adjacent zone to correct this.

6.8.5. Each trip purpose has been disaggregated using a different combination of datasets, applying the disaggregation as set out in Table 26.

Table 26 - Matrix Disaggregation Datasets by Trip Purpose

Matrix Level	Purpose	Origin	Destination
1	Home-based work (inbound)	Workplace Pop.	Employed People
2	Home-based work (outbound)	Employed People	Workplace Pop.
3	Home-based employers business (inbound)	Workplace Pop.	Employed People
4	Home-based employers business (outbound)	Employed People	Workplace Pop.
5	Non-home-based employers business	Workplace Pop.	Workplace Pop.
6	Home-based other (inbound)	Workplace Pop	Adults

7	Home-based other (outbound)	Adults	Workplace Pop
8	Non-home-based other	Workplace Pop	Workplace Pop
9	LGV	Workplace Pop.	Workplace Pop.
10	HGV	Workplace Pop.	Workplace Pop.

6.8.6. The correspondence process determines how many trips would be expected to come out of any specific area within these initial zones based on a relevant dataset. For example, home-based work trips for the outbound direction should have origins of homes, and destinations of workplaces (which in this case include places of education). This enables an initial zone that contains say a large residential area, and a large employment area, but where the final zones have these two areas as separate zones, to be split in a way that means the final trip matrices better represent the individual purposes of trips compared to just splitting proportionally by area (or using some other dataset or combination of datasets proportionally) in all cases.

6.9 COMBINATION OF MATRICES

6.9.1. The mobile network data and synthetic matrices have been combined to create the final set of matrices. All of the trip pairs in the matrix have had distances determined. These distances have been used to carry out the following:

- Remove all trip pairs with a distance of less than two kilometres for the mobile network data matrices;
- Remove all trip pairs with a distance of equal to or more than two kilometres for the synthetic matrices;
- Combine the two sets of matrices which will now have no zone pairs that overlap.

6.9.2. These combined matrices have been created for each of car, rail, and bus trips. Table 27 shows the matrix totals for each of the matrices for each period. LGV and HGV trips have not been combined as no synthetic matrix has been created for them. The table shows that in general the resulting combined totals are between the MND and synthetic matrix totals. The trip totals exclude intrazonal trips (trips from a zone to itself) as these are not included in the transport modelling process. Trip totals are for the sum of all purpose levels.

Table 27 - Matrix Totals (vehicles) for Combination Process

Vehicle Type	Matrix Type	AM	IP	PM
Car	MND	343,036	223,116	392,837
	Synthetic	472,530	527,654	628,577
	Combined	412,096	298,514	458,034
Bus	MND	32,231	27,221	39,720
	Synthetic	30,163	33,797	40,733
	Combined	31,940	26,544	36,475
Rail	MND	29,834	13,551	30,218
	Synthetic	32,932	37,623	45,109
	Combined	29,899	14,243	30,579

6.9.3. Car availability has been applied to the combined matrices for bus and rail modes to split these into two separate sets of matrices that represent the 'car available' and 'no car available' matrices. The car availability data has come from Census household data on car ownership levels, looking at the percentage of households with zero cars versus total households, on a zone-zone basis.

6.10 RAIL REDISTRIBUTION

6.10.1. The rail trip matrices are generated from origin to destination data, where the primary trip is a rail trip but the origin and destination represent the actual origin and destination of the trip rather than the station to station movement. These trips are in actuality made up of (at least) three legs:

- An initial access leg for travel from the origin to the station (which could itself be made up of multiple parts, such as driving to a park and ride site before taking a bus to the station);
- A rail trip that goes from one station to another station (this may have multiple parts, changing at stations in between or even with other modes such as an underground or bus trip in the middle); and
- A final egress leg for travel from the station to the destination (again could be made up of multiple parts).

6.10.2. In essence, this means that the 'rail' trip is only part of the total trip in the matrix. The following assumptions have been made in order to turn this rail trip in to what is modelled in the transport models:

- The initial leg of the trip is made by car if more than two kilometres in length or sustainable modes if less than two kilometres in length;
- The weighting of which station a traveller will use to determine the destination of the initial leg is based on a gravity model depending on their origin zone;
- Zones external to Suffolk are large enough and provide enough choice of station that travellers from within one of these zones do not need to travel in to another zone in order to get to a station, and therefore their trips are representative of the rail leg entirely;
- The rail trip is the dominant element of the trip with intermediate trips being insignificant; and
- The final leg is a minor element of the trip, and most likely to be made by a sustainable mode and be of a relatively short distance from the end station and therefore negligible in terms of the modelling work being carried out.

6.10.3. These assumptions result in a process that splits the rail trips into two forms; those that access by car and carry out a 'park and ride' trip, and those that do not access by car. The park and ride trips are split up, so that the car elements can be put into the highway matrices and the rail elements can be put into the public transport matrices as a separate type of trip, while those that do not access by car are left as full origin-destination trips for the public transport matrices. The non-car-available trips are assumed to be entirely non-car access trips (due to not having a car available), while the car-available trips have gone through a process to get a 'park and ride' public transport matrix and a number of trips to add to the highway matrix.

6.10.4. The full redistribution process is summarised in Figure 29. The non-car-available (NCA) matrices are not shown, but the process is simple for these matrices as the NCA rail and bus matrices are added directly together to form a NCA public transport set of matrices

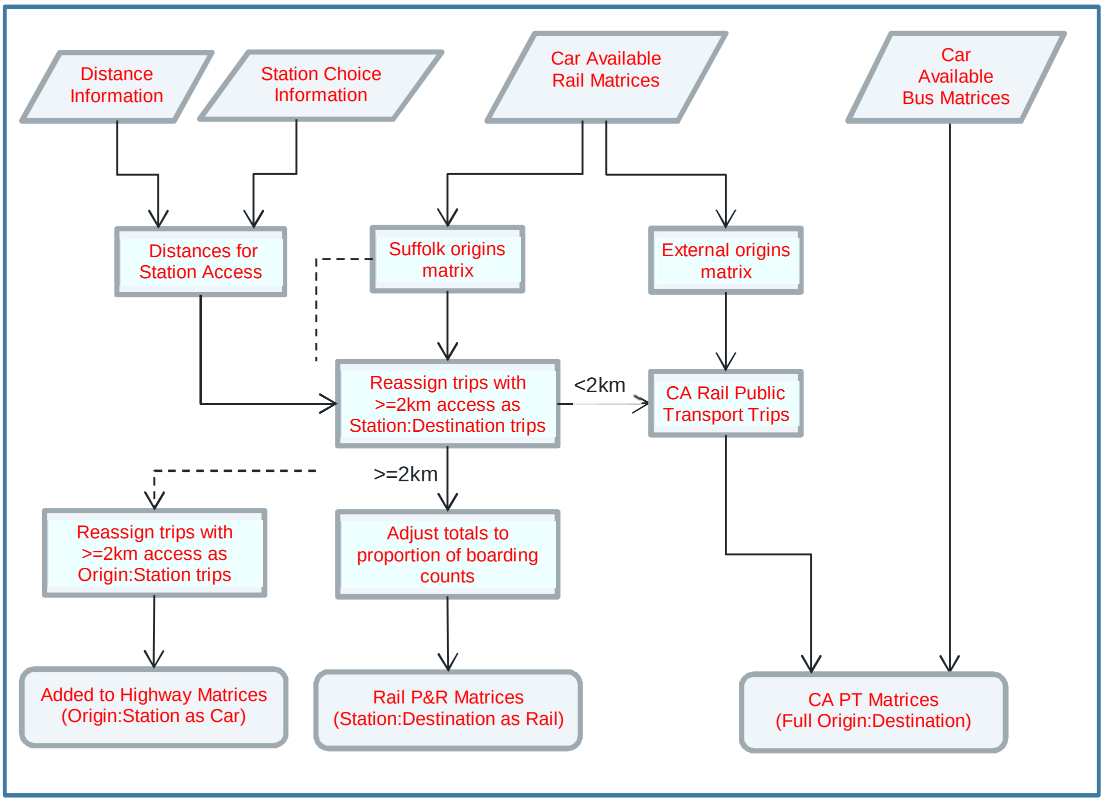


Figure 29 - Rail Redistribution Process

6.10.5. The gravity model that has been used to work out the split per origin zone for park and ride type trips uses travel time from the origin zone to the station, station parking availability, and rail service frequency to determine a ranking of the 5 most popular stations. The trips from that origin zone have then been split based on the weighting for these stations.

6.10.6. The resulting car matrix that has come out of the initial trip leg has been added to the highway car matrices. Table 28 shows the additional car trips added to the highway matrices.

Table 28 - Additional Car Trips as a Result of the Rail Redistribution Process

	AM	IP	PM
Total	1,620	637	941

7 ROUTE CHOICE CALIBRATION AND VALIDATION

7.1 ROUTE CHOICE CALIBRATION

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

7.1.2. 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 appraisal of transport projects in England. These values are present in the July 2016 TAG data book and follow the guidance within the latest version of TAG Unit A1.3 (November 2016). The values calculated for the base year model in terms of Pence per Minute (PPM) and Price per Kilometre (PPK) are shown in Table 6.

7.2 ROUTE CHOICE VALIDATION

7.2.1. The routes chosen to validate the route choice were based on the criteria set out in TAG Unit M3.1 (January 2014) and have the following attributes:

- 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
- Study areas for specific scheme appraisals

7.2.2. 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 determines as follows:

7.2.3. Number of OD pairs = (number of zones)^0.25 x number of user classes

7.2.4. Based on the assignment model zoning system, this equates to 54 routes. The routes that were chosen in the D1 Model Specification Report (February 2016) are described in Table 29 with additional routes related to local study areas for specific scheme appraisals added. These routes were used to validate route choice within the model.

Table 29 – County-Wide Origin-Destination Route Checks

Route	Origin Zone	Origin Description	Destination Zone	Destination Description	Type
1	391	Felixstowe	412	Lowestoft	County wide
2	238	Stowmarket	455	Beccles	County wide
3	287	Bury St. Edmunds	391	Felixstowe	County wide
4	316	Haverhill	412	Lowestoft	County wide
5	455	Beccles	95	Newmarket	County wide
6	146	Ipswich	33	Sudbury	County wide
7	412	Lowestoft	238	Stowmarket	County wide
8	33	Sudbury	95	Newmarket	County wide
9	391	Felixstowe	95	Newmarket	County wide
10	238	Stowmarket	391	Felixstowe	County wide
11	316	Haverhill	238	Stowmarket	County wide
12	412	Lowestoft	287	Bury St. Edmunds	County wide

13	287	Bury St. Edmunds	316	Haverhill	County wide
14	95	Newmarket	455	Beccles	County wide
15	33	Sudbury	146	Ipswich	County wide
16	287	Bury St. Edmunds	412	Lowestoft	County wide
17	455	Beccles	33	Sudbury	County wide
18	146	Ipswich	412	Lowestoft	County wide
19	412	Lowestoft	146	Ipswich	County wide
20	287	Bury St. Edmunds	412	Lowestoft	County wide
21	412	Lowestoft	287	Bury St. Edmunds	County wide
22	146	Ipswich	287	Bury St. Edmunds	County wide
23	391	Felixstowe	412	Lowestoft	County wide
24	455	Beccles	238	Stowmarket	County wide
25	332	A12 Near Yoxford	259	Woodbridge Road Near	Suffolk Energy
26	359	Woodbridge Road	332	A12 Near Yoxford	Suffolk Energy
27	348	Yarmouth road near	897	B119 Near Saxmundham	Suffolk Energy
28	897	B119 Near	348	Yarmouth road near	Suffolk Energy
29	902	167 Carr Avenue	895	7 Woodbridge Road near	Suffolk Energy
30	895	7 Woodbridge Road	902	167 Carr Avenue near	Suffolk Energy
31	896	A12 near	356	School Lane, Bromeswell	Suffolk Energy
32	356	School Lane,	896	A12 near Saxmundham	Suffolk Energy
33	362	A12, Woodbridge,	572	Dunwich Rd,	Suffolk Energy
34	572	Dunwich Rd,	362	A12, Woodbridge, Melton	Suffolk Energy
35	408	Stirrups Lane	465	A12 Near the Hollies	Lowestoft
36	465	A12 Near the Hollies	408	Stirrups Lane	Lowestoft
37	84	395 Whapload Road	782	40-50 Rectory Road	Lowestoft
38	782	40-50 Rectory Road	84	395 Whapload Road	Lowestoft
39	409	5 Lowry Way	584	51-55 Borrow Road	Lowestoft
40	584	51-55 Borrow Road	409	5 Lowry Way	Lowestoft
41	409	5 Lowry Way	589	138 Waveney Drive	Lowestoft
42	589	138 Waveney Drive	409	5 Lowry Way	Lowestoft
43	767	5 Lulworth Park	434	17 Smith's Walk	Lowestoft
44	434	17 Smith's Walk	767	5 Lulworth Park	Lowestoft
45	586	2 The Lease	781	Hadenham Road (Near	Lowestoft

46	781	Hadenham Road	586	2 The Lease	Lowestoft
47	673	Martlesham	482	Copdock Interchange	Ipswich
48	482	Copdock Interchange	673	Martlesham	Ipswich
49	253	Claydon	676	Brightwell	Ipswich
50	676	Brightwell	253	Claydon	Ipswich
51	114	Castle Hill	185	Chantry	Ipswich
52	185	Chantry	114	Castle Hill	Ipswich
53	735	Hadleigh Road	194	Nacton Road	Ipswich
54	194	Nacton Road	735	Hadleigh Road Industrial	Ipswich

7.2.5. The results of the route choice validation can be in seen in Appendix G.

7.2.6. The routes generated were based on Origin-Destination forests as well as showing the lowest cost route, also show other potential routes which are considered by SATURN during assignment.

7.2.7. The figures in Appendix G show the routing between the O-D pairs is consistent across all three peaks and logical, following expecting routes through the simulation network

8 TRIP MATRIX CALIBRATION AND VALIDATION

8.1 TRIP MATRIX VALIDATION

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

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

8.1.3. 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. TAG recommends that this should apply to "all, or nearly all" screenlines.

8.1.4. It is considered a GEH across the screenline of 4.0 or below is acceptable and has been considered in this report when looking at screenline performance. This approach is well aligned with previous versions of WebTAG.

8.1.5. This section provides a discussion of the performance of two different assignments of the SCTM highway model:

- Prior matrix assignment: assignment of matrix which has been unaffected by matrix scaling or matrix estimation
- Post matrix-estimation assignment: the final assignment which is based on the prior matrix being run through matrix estimation

8.1.6. The performance of these two assignments will be discussed in terms of screenline performance.

8.2 PRIOR MATRIX ASSIGNMENT

8.2.1. Table 30 to Table 32 show the performance of the prior assignment in terms of the county screenlines. These tables show that the prior matrix has a significantly higher level of traffic compared to the observed traffic across all screenlines. This is because the main data source for the prior matrix is the MND which provides total demand within the study area, whereas the SCTM network represents a simplification of the road network, only including key strategic routes outside of the main towns. This means the total traffic demand where it is represented by zone to zone movements is forced to use the major routes in the model network whereas in reality traffic uses local routes which it would not be feasible to include within a strategic county model.

8.2.2. Table 30 show the performance of the prior matrix against the calibration screenlines in the AM peak

Table 30 - Prior Matrix: Calibration Screenlines – AM peak

ID	Description	Dir	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Newmarket	IB	2380	2631	10.6%	OB	2671	3005	12.5%
2	Haverhill	IB	1538	1409	-8.4%	OB	1747	2003	14.7%
3	Sudbury	IB	3162	3521	11.4%	OB	2730	3673	34.5%
4	Felixstowe	IB	1552	1801	16.1%	OB	1559	1576	1.1%
5	Stowmarket	IB	2149	2409	12.1%	OB	1733	2210	27.5%
6	Bury St. Edmunds	IB	4406	6340	43.9%	OB	4335	4011	-7.5%
7	Beccles	IB	1144	1130	-1.3%	OB	1037	1102	6.3%
8	South of Bury St. Edmunds	NB	811	1357	67.3%	OB	1315	2321	76.5%
9	Waveney	NB	1268	1776	40.1%	SB	1069	2143	100.3%
10	East of Bury St. Edmunds	EB	1244	1584	27.4%	WB	690	1101	59.5%
11	Mid Suffolk / Suffolk Coastal	NB	879	1550	76.3%	SB	1046	1682	60.8%

12	Babergh / Mid Suffolk	EB	961	1827	90.1%	WB	941	1555	65.2%
13	Forest Heath	NB	1467	2492	69.9%	SB	2380	3476	46.1%
14	North of Bury St. Edmunds	NB	1251	1942	55.2%	SB	1134	1914	68.8%
15	South Babergh	NB	818	952	16.4%	SB	980	1422	45.1%
16	Ipswich (Inner)	IB	10385	12902	24.2%	OB	8923	8980	0.6%
17	Ipswich (Outer)	IB	10796	15426	42.9%	OB	10548	12925	22.5%
18	North Lowestoft	IB	1194	1624	36.0%	OB	1454	2226	53.1%
19	South Lowestoft	IB	1747	2289	31.1%	OB	1741	2131	22.4%

8.2.3. Table 30 shows the following screenlines have modelled flow within 5% of observed flow in the AM peak prior assignment:

- Felixstowe Inbound
- Beccles Inbound
- Ipswich Inner Outbound

8.2.4. Table 31 details the performance of the county wide screenlines for the inter peak prior assignment.

Table 31 - Prior Matrix: Calibration Screenlines – Inter peak

ID	Description	Dir	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Newmarket	IB	1818	1631	-10.3%	OB	1873	1518	-18.9%
2	Haverhill	IB	1289	1066	-17.3%	OB	1249	1083	-13.3%
3	Sudbury	IB	2345	2453	4.6%	OB	2565	2576	0.4%
4	Felixstowe	IB	1152	1021	-11.4%	OB	1143	1073	-6.1%
5	Stowmarket	IB	1465	1370	-6.5%	OB	1387	1154	-16.8%
6	Bury St. Edmunds	IB	2907	3149	8.3%	OB	2945	3202	8.7%
7	Beccles	IB	1050	752	-28.4%	OB	1087	726	-33.2%
8	South of Bury St. Edmunds	NB	645	1124	74.1%	OB	659	1273	93.1%
9	Waveney	NB	961	1307	35.9%	SB	957	1259	31.6%
10	East of Bury St. Edmunds	EB	663	783	18.1%	WB	646	771	19.3%
11	Mid Suffolk / Suffolk Coastal	NB	604	1036	71.4%	SB	618	1018	64.6%
12	Babergh / Mid Suffolk	EB	642	1017	58.4%	WB	645	927	43.6%
13	Forest Heath	NB	1569	1991	26.9%	SB	1751	1978	13.0%
14	North of Bury St. Edmunds	NB	789	1073	36.0%	SB	828	1191	43.8%
15	South Babergh	NB	574	748	30.4%	SB	561	740	31.8%
16	Ipswich (Inner)	IB	7895	7911	0.2%	OB	7993	7612	-4.8%
17	Ipswich (Outer)	IB	6823	9135	33.9%	OB	7672	9038	17.8%
18	North Lowestoft	IB	1052	1148	9.2%	OB	1027	1132	10.2%

8.2.5. Table 31 shows the following screenlines show modelled flow within 5% of observed flow in the inter peak prior assignment:

- Sudbury Inbound & Outbound
- Ipswich Inner Inbound & Outbound

8.2.6. Table 32 details the performance of the county wide screenlines in the PM peak prior assignment.

Table 32 - Prior Matrix: Calibration Screenlines – PM peak

ID	Description	Dir	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Newmarket	IB	2941	2969	0.9%	OB	2872	2813	-2.1%
2	Haverhill	IB	2068	2164	4.6%	OB	1712	1580	-7.7%
3	Sudbury	IB	3091	3537	14.4%	OB	3586	4121	14.9%
4	Felixstowe	IB	1517	1735	14.4%	OB	1512	1818	20.2%
5	Stowmarket	IB	2036	2820	38.5%	OB	2075	2271	9.4%
6	Bury St. Edmunds	IB	4599	4437	-3.5%	OB	4348	6617	52.2%
7	Beccles	IB	1323	1389	5.0%	OB	1286	1133	-11.9%
8	South of Bury St. Edmunds	NB	1211	1986	64.0%	OB	903	1857	105.8%
9	Waveney	NB	1109	2038	83.8%	SB	1378	2004	45.5%
10	East of Bury St. Edmunds	EB	827	1128	36.4%	WB	1286	1763	37.1%
11	Mid Suffolk / Suffolk Coastal	NB	971	1492	53.7%	SB	872	1573	80.3%
12	Babergh / Mid Suffolk	EB	982	1828	86.1%	WB	1052	1701	61.7%
13	Forest Heath	NB	2534	3845	51.7%	SB	2109	2251	6.7%
14	North of Bury St. Edmunds	NB	1194	2029	69.9%	SB	1314	1925	46.6%
15	South Babergh	NB	1009	1443	43.0%	SB	787	1075	36.6%
16	Ipswich (Inner)	IB	9633	10365	7.6%	OB	9900	12439	25.6%
17	Ipswich (Outer)	IB	9953	14673	47.4%	OB	12100	14888	23.0%
18	North Lowestoft	IB	1851	2251	21.6%	OB	1211	1661	37.2%

8.2.7. Table 32 shows the following screenlines show modelled flow within 5% of observed flow in the inter peak prior assignment:

- Haverhill Inbound
- Bury St. Edmunds Inbound
- Beccles Inbound

8.2.8. In summary, the results of the screenlines suggest the prior matrix over-estimates the modelled traffic compared the observed flows for key strategic movements covered by the screenlines. This is again deemed to be due to the issue of the MND representing total travel demand being assigned to a simplified highway network.

8.3 PRIOR MATRIX SCALING

8.3.1. In order to improve the performance of the model validation and calibration in Lowestoft, scaling was undertaken in instances of observed data being available for zone connector links related to land uses such as retail parks and supermarkets where there was a single point of access. These adjustments lead to a net increase in the size of the final matrix of 0.1% in the AM peak, 0.1% in the inter peal and 0.2% in the PM peak.

8.3.2. The final assignments detailed in this report are consistent with those reported in the local Lowestoft SCTM LMVR (November 2017). The assignment differs from that reported in the local SEGWay SCTM LMVR (December 2017) due to the Lowestoft prior matrix adjustments. These differences did not lead to significant changes in flow in the area of detailed modelling for the Suffolk Energy Gateway scheme appraisal.

8.4 POST MATRIX-ESTIMATION MATRIX ASSIGNMENT

8.4.1. Following analysis of the screenline performance of the prior matrix assignment, matrix estimation was used to provide a final adjustment to the matrix. The post matrix-estimation matrix forms the final assignment of the SCTM highway model.

8.4.2. Table 33 compares the scaled prior matrix totals to the post matrix-estimation totals.

Table 33 - Scaled Prior and Post ME 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 HBW IB	3046	3719	7557	7899	61232	53969
UC2 – Car HBW OB	64460	56288	6322	6562	1315	1485
UC3 – Car HEB IB	302	316	956	1036	4041	4031
UC4 – Car HEB OB	4433	4207	853	892	958	967
UC5 – Car NHEB	7588	8186	6209	6846	7165	7662
UC6 – Car HBO IB	4928	5510	26251	28444	40921	37366
UC7 – Car HBO OB	37957	34885	26809	28389	16164	16567
UC8 – Car NHBO	6298	6037	13800	15004	12191	11579
UC9 – LGV	14806	12629	11563	10611	11689	10292
UC10 – HGV	4458	8810	4631	9070	4988	6085
Total	148275	140587	104951	114752	160665	150004

8.4.3. Table 33 shows that in the AM peak, matrix estimation leads to an decrease in the size of the matrix of -5%, in the inter-peak there is an increase of 9%, whilst in the PM peak there is a decrease of -7%.

COUNTYWIDE CALIBRATION SCREENLINES

8.4.4. Table 34 to Table 36 details the calibration screenline performance for the post matrix estimation assignments in all peak hours modelled.

Table 34 - Post ME Matrix: Calibration Screenlines – AM peak

ID	Description	Dir	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Newmarket - Inbound	IB	2380	2364	-0.7%	OB	2671	2664	-0.3%
2	Haverhill - Inbound	IB	1538	1538	0.0%	OB	1747	1746	0.0%
3	Sudbury - Inbound	IB	3162	3213	1.6%	OB	2730	2834	3.8%
4	Felixstowe - Inbound	IB	1552	1546	-0.3%	OB	1559	1570	0.7%
5	Stowmarket - Inbound	IB	2149	2126	-1.1%	OB	1733	1732	-0.1%
6	Bury St. Edmunds – Inbound	IB	4406	4468	1.4%	OB	4335	4349	0.3%
7	Beccles – Inbound	IB	1144	1141	-0.3%	OB	1037	1030	-0.6%
8	South of Bury St. Edmunds	NB	811	868	7.0%	OB	1315	1316	0.1%
9	Waveney	NB	1268	1259	-0.7%	SB	1069	1063	-0.6%
10	East of Bury St. Edmunds	EB	1244	1245	0.1%	WB	690	696	0.9%
11	Mid Suffolk / Suffolk Coastal	NB	879	897	2.1%	SB	1046	1048	0.2%
12	Babergh / Mid Suffolk - Eastbound	EB	961	960	-0.1%	WB	941	945	0.4%
13	Forest Heath - Northbound	NB	1467	1472	0.3%	SB	2380	2393	0.6%
14	North of Bury St. Edmunds	NB	1251	1258	0.6%	SB	1134	1130	-0.3%
15	South Babergh	NB	818	815	-0.4%	SB	980	982	0.2%
16	Ipswich (Inner)	IB	10385	10516	1.3%	OB	8923	9090	1.9%
17	Ipswich (Outer)	IB	10796	10852	0.5%	OB	10548	10561	0.1%
18	North Lowestoft	IB	1194	1191	-0.3%	OB	1454	1452	-0.1%
19	South Lowestoft	IB	1747	1626	-6.9%	OB	1741	1541	-11.5%

8.4.5. Table 34 shows 35 of the 38 screenlines (92%) shows a flow difference between modelled and observed of less than 5%.

8.4.6. Table 35 shows the performance of the county wide screenlines in the inter peak.

Table 35 - Post ME Matrix: Calibration Screenlines – Inter peak

ID	Description	Dir	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Newmarket	IB	1818	1819	0.1%	OB	1873	1870	-0.2%
2	Haverhill	IB	1289	1286	-0.2%	OB	1249	1249	0.0%
3	Sudbury	IB	2345	2367	0.9%	OB	2565	2588	0.9%
4	Felixstowe	IB	1152	1145	-0.6%	OB	1143	1198	4.8%
5	Stowmarket	IB	1465	1465	0.0%	OB	1387	1386	-0.1%
6	Bury St. Edmunds	IB	2907	2922	0.5%	OB	2945	2956	0.4%
7	Beccles	IB	1050	1043	-0.7%	OB	1087	1086	-0.1%
8	South of Bury St. Edmunds	NB	645	705	9.2%	OB	659	660	0.2%
9	Waveney	NB	961	962	0.0%	SB	957	957	0.0%
10	East of Bury St. Edmunds	EB	663	664	0.2%	WB	646	648	0.3%
11	Mid Suffolk / Suffolk Coastal	NB	604	602	-0.4%	SB	618	617	-0.2%
12	Babergh / Mid Suffolk - Eastbound	EB	642	643	0.1%	WB	645	647	0.2%
13	Forest Heath	NB	1569	1565	-0.3%	SB	1751	1753	0.1%
14	North of Bury St. Edmunds	NB	789	790	0.1%	SB	828	829	0.2%
15	South Babergh	NB	574	574	0.0%	SB	561	561	0.0%
16	Ipswich (Inner)	IB	7895	7907	0.1%	OB	7993	7994	0.0%
17	Ipswich (Outer)	IB	6823	6819	-0.1%	OB	7672	7678	0.1%
18	North Lowestoft	IB	1052	1030	-2.1%	OB	1027	1009	-1.7%
19	South Lowestoft	IB	1665	1587	-4.7%	OB	1662	1595	-4.0%

8.4.7. Table 35 shows 37 of the 38 screenlines (97%) return a difference between modelled and observed flow of less than 5%.

8.4.8. Table 36 outlines the performance of the calibration screenlines in the PM peak.

Table 36 - Post ME Matrix: Calibration Screenlines – PM peak

ID	Description	Dir	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Newmarket - Inbound	IB	2941	2978	1.2%	OB	2872	2911	1.3%
2	Haverhill - Inbound	IB	2068	2071	0.1%	OB	1712	1716	0.2%
3	Sudbury - Inbound	IB	3091	3120	1.0%	OB	3586	3662	2.1%
4	Felixstowe - Inbound	IB	1517	1512	-0.3%	OB	1512	1565	3.5%
5	Stowmarket - Inbound	IB	2036	2031	-0.2%	OB	2075	2065	-0.5%
6	Bury St. Edmunds – Inbound	IB	4599	4662	1.4%	OB	4348	4357	0.2%
7	Beccles – Inbound	IB	1323	1318	-0.3%	OB	1286	1283	-0.3%
8	South of Bury St. Edmunds	NB	1211	1205	-0.5%	OB	903	906	0.4%
9	Waveney	NB	1109	1112	0.2%	SB	1378	1371	-0.5%
10	East of Bury St. Edmunds	EB	827	832	0.6%	WB	1286	1300	1.1%
11	Mid Suffolk / Suffolk Coastal	NB	971	974	0.3%	SB	872	875	0.3%
12	Babergh / Mid Suffolk - Eastbound	EB	982	984	0.2%	WB	1052	1056	0.4%
13	Forest Heath - Northbound	NB	2534	2540	0.2%	SB	2109	2133	1.1%
14	North of Bury St. Edmunds	NB	1194	1199	0.5%	SB	1314	1305	-0.6%
15	South Babergh	NB	1009	1006	-0.3%	SB	787	789	0.3%
16	Ipswich (Inner)	IB	9633	9784	1.6%	OB	9900	10034	1.4%
17	Ipswich (Outer)	IB	9953	9998	0.5%	OB	12100	12126	0.2%
18	North Lowestoft	IB	1851	1829	-1.2%	OB	1211	1207	-0.3%
19	South Lowestoft	IB	2021	1899	-6.1%	OB	1725	1784	3.4%

8.4.9. Table 36 shows 37 of the 38 calibration screenlines (97%) achieve a difference between modelled and observed flow of less than 5%.

8.4.10. Analysis of the screenline performance for the county wide screenlines shows a high level of performance in terms of the model being able to replicate observed flows, particularly for the calibration screenlines. The majority of screenlines show a flow difference within 5% between modelled and observed flow. This gives confidence the SCTM shows a close match between the observed and modelled flow for the key strategic movements within the county.

8.4.11. Appendix H provides details of GEH and flow performance of counts within the county wide screenlines.

IPSWICH LOCAL SCREENLINES

8.4.12. Table 37 shows the performance of the screenlines within Ipswich.

Table 37 - Post ME Matrix: Ipswich Screenlines – AM peak

ID	Description	Dir	Type	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	East / West Screenline 1 (western)	EB	Val	4423	3574	-19.2%	WB	4073	3396	-16.6%
2	East / West Screenline 2 (North West)	EB	Cal	2578	2655	3.0%	WB	1862	1919	3.1%
3	East / West Screenline 3 (South West)	EB	Cal	2694	2707	0.5%	WB	1674	1704	1.8%
4	East / West Screenline 4 (East)	EB	Cal	3588	3643	1.5%	WB	3397	3418	0.6%
5	East / West Screenline 5 (Far East)	EB	Val	2062	1796	-12.9%	WB	1206	880	-27.1%
6	East / West Screenline 6 (Central)	EB	Val	2428	2814	15.9%	WB	3235	3302	2.1%
7	North / south Screenline 1 (Northern)	NB	Cal	1212	1215	0.2%	SB	2088	2044	-2.1%
8	North / south Screenline 2 (Southern)	NB	Val	4297	4274	-0.5%	SB	3368	3121	-7.3%
16	Ipswich (Inner)	IB	Cal	10385	10516	1.3%	OB	8923	9090	1.9%
17	Ipswich (Outer)	IB	Cal	10796	10852	0.5%	OB	10548	10561	0.1%

8.4.13. Table 37 shows all calibration screenlines show differences between modelled and observed flow of less than 5%. Validation screenlines are shown to generally show differences of greater than 5%.

8.4.14. Table 38 details the performance of the local Ipswich screenlines in the inter peak.

Table 38 - Post ME Matrix: Ipswich Screenlines – Inter peak

ID	Description	Dir	Type	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	East / West Screenline 1 (western)	EB	Val	3101	2826	-8.9%	WB	3342	2929	-12.4%
2	East / West Screenline 2 (North West)	EB	Cal	1745	1745	0.0%	WB	1743	1723	-1.2%
3	East / West Screenline 3 (South West)	EB	Cal	1714	1718	0.2%	WB	1647	1660	0.8%
4	East / West Screenline 4 (East)	EB	Cal	2913	2916	0.1%	WB	3105	3093	-0.4%
5	East / West Screenline 5 (Far East)	EB	Val	1156	921	-20.3%	WB	1224	926	-24.3%
6	East / West Screenline 6 (Central)	EB	Val	2334	2296	-1.7%	WB	2486	2659	7.0%
7	North / south Screenline 1 (Northern)	NB	Cal	985	989	0.5%	SB	988	990	0.2%
8	North / south Screenline 2 (Southern)	NB	Val	2628	2714	3.3%	SB	2655	2685	1.1%
16	Ipswich (Inner)	IB	Cal	7895	7907	0.1%	OB	7993	7994	0.0%
17	Ipswich (Outer)	IB	Cal	6823	6819	-0.1%	OB	7672	7678	0.1%

8.4.15. Table 38 shows all calibration screenlines show modelled flows within 5% of observed flows in the inter peak. Validation screenlines are shown to generally show differences of greater than 5%.

8.4.16. Table 39 details the performance of the local Ipswich screenlines in the PM peak.

Table 39 - Post ME Matrix: Ipswich Screenlines – PM peak

ID	Description	Dir	Type	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	East / West Screenline 1 (western)	EB	Val	4293	3891	-9.4%	WB	4744	3875	-18.3%
2	East / West Screenline 2 (North West)	EB	Cal	2205	2281	3.5%	WB	2320	2328	0.3%
3	East / West Screenline 3 (South West)	EB	Cal	2108	2096	-0.6%	WB	2380	2448	2.9%
4	East / West Screenline 4 (East)	EB	Cal	3295	3364	2.1%	WB	4076	4089	0.3%
5	East / West Screenline 5 (Far East)	EB	Val	1374	976	-29.0%	WB	2322	1801	-22.5%
6	East / West Screenline 6 (Central)	EB	Val	2849	2940	3.2%	WB	2544	2757	8.4%
7	North / south Screenline 1 (Northern)	NB	Cal	1909	1910	0.1%	SB	1255	1255	0.0%
8	North / south Screenline 2 (Southern)	NB	Val	3456	3333	-3.6%	SB	3885	4397	13.2%
16	Ipswich (Inner)	IB	Cal	9633	9784	1.6%	OB	9900	10034	1.4%
17	Ipswich (Outer)	IB	Cal	9953	9998	0.5%	OB	12100	12126	0.2%

8.4.17. Table 39 shows all calibration screenlines show modelled flows within 5% of observed flows in the PM peak. Validation screenlines are shown to generally show differences of greater than 5%

8.4.18. In summary, the local screenlines show the calibration screenlines match well in terms of modelled flow compared to observed flow. The validation screenlines indicate further improvements are required to the model within Ipswich.

LOWESTOFT LOCAL SCREENLINES

8.4.19. Table 40 describes the performance of the local Lowestoft screenlines within the AM peak.

Table 40 - Post ME Matrix: Lowestoft Screenlines – AM peak

ID	Description	Dir	Type	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Lowestoft Screenline 1	NB	Cal	2207	2207	0.0%	SB	1685	1693	0.5%
2	Lowestoft Screenline 2	NB	Cal	2866	2872	0.2%	SB	2095	2114	0.9%
3	Lowestoft Screenline 3	EB	Val	1747	1626	-6.9%	WB	1741	1541	-11.5%
4	Lowestoft Screenline 4	NB	Val	2419	2308	-4.6%	SB	1732	1883	8.7%
5	Lowestoft Screenline 5	NB	Val	1359	1344	-1.1%	SB	1024	1052	2.7%
18	North Lowestoft	IB	Cal	1194	1191	-0.3%	OB	1454	1452	-0.1%
19	South Lowestoft	IB	Cal	1421	1452	2.2%	OB	1330	1364	2.6%

8.4.20. Table 40 shows all calibration screenlines show modelled flows within 5% of observed flows in the AM peak within Lowestoft.

8.4.21. Table 41 describes the performance of the local Lowestoft screenlines within the inter peak.

Table 41 - Post ME Matrix: Lowestoft Screenlines – Inter peak

ID	Description	Dir	Type	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Lowestoft Screenline 1	NB	Cal	1826	1828	0.1%	SB	1873	1876	0.1%
2	Lowestoft Screenline 2	NB	Cal	2473	2481	0.3%	SB	2635	2628	-0.3%
3	Lowestoft Screenline 3	EB	Val	1665	1587	-4.7%	WB	1662	1595	-4.0%
4	Lowestoft Screenline 4	NB	Val	1857	2036	9.6%	SB	2013	2188	8.7%
5	Lowestoft Screenline 5	NB	Val	940	936	-0.5%	SB	905	936	3.4%
18	North Lowestoft	IB	Cal	1052	1030	-2.1%	OB	1027	1009	-1.7%
19	South Lowestoft	IB	Cal	1326	1339	1.0%	OB	1347	1361	1.0%

8.4.22. Table 41 shows all calibration screenlines show modelled flows within 5% of observed flows in the inter peak within Lowestoft. Validation screenlines are shown to have differences of within 5% in the majority of cases.

8.4.23. Table 42 describes the performance of the local Lowestoft screenlines within the PM peak

Table 42 - Post ME Matrix: Lowestoft Screenlines – PM peak

ID	Description	Dir	Type	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Lowestoft Screenline 1	NB	Cal	2145	2145	0.0%	SB	2284	2292	0.3%
2	Lowestoft Screenline 2	NB	Cal	2471	2473	0.1%	SB	3219	3228	0.3%
3	Lowestoft Screenline 3	EB	Val	2021	1899	-6.1%	WB	1725	1784	3.4%
4	Lowestoft Screenline 4	NB	Val	2041	2113	3.5%	SB	2528	3001	18.7%
5	Lowestoft Screenline 5	NB	Val	1129	1116	-1.2%	SB	1598	1699	6.3%
18	North Lowestoft	IB	Cal	1851	1829	-1.2%	OB	1211	1207	-0.3%
19	South Lowestoft	IB	Cal	1792	1801	0.5%	OB	1517	1536	1.2%

8.4.24. Table 42 shows all calibration screenlines show modelled flows within 5% of observed flows in the PM peak within Lowestoft.

8.4.25. In summary the screenlines within Lowestoft show the model is able to replicate key strategic movements within this locality.

SUFFOLK ENERGY GATEWAY LOCAL SCREENLINES

8.4.26. The values in this report related to the local Suffolk Energy Gateway screenlines differ to those presented in the local LMVR for this scheme appraisal due to the adjustments undertaken to the prior matrix in Lowestoft. The modelled flows are based on the post matrix estimation based on this updated prior matrix.

8.4.27. Table 43 describes the performance of the local Suffolk Energy Gateway screenlines within the AM peak.

Table 43 - Post ME Matrix: Suffolk Energy Gateway Screenlines – AM peak

ID	Description	Dir	Type	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Leiston	IB	Cal	755	764	1.2%	OB	912	910	-0.3%
2	North / West of A12	NB	Cal	588	584	-0.7%	SB	693	688	-0.8%
3	South / East of A12	NB	Cal	1051	1078	2.6%	SB	1010	1003	-0.7%
4	Saxmundham	IB	Cal	1018	1021	0.3%	OB	915	920	0.6%
5	Framlingham	IB	Cal	941	934	-0.7%	OB	678	678	0.0%
6	Woodbridge	IB	Cal	2536	2535	0.0%	OB	1987	1986	-0.1%
7	North / South screenline	NB	Cal	1276	1277	0.1%	SB	1804	1806	0.1%
8	East / West screenline	EB	Cal	1069	1071	0.2%	WB	1105	1107	0.2%
9	NE / SW screenline	NEB	Val	815	898	10.3%	SWB	1095	1074	-1.9%
10	North / South screenline	EB	Val	933	919	-1.6%	WB	1072	1167	9.0%

8.4.28. Table 43 shows all of the calibration screenlines are within 5% in the AM peak, whilst this is the case for half of the validation screenlines.

8.4.29. Table 44 describes the performance of the local Suffolk Energy Gateway screenlines within the inter peak.

Table 44 - Post ME Matrix: Suffolk Energy Gateway Screenlines – Inter peak

ID	Description	Dir	Type	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Leiston	IB	Cal	704	714	1.3%	SB	703	704	0.1%
2	North / West of A12	NB	Cal	435	435	-0.1%	SB	458	459	0.2%
3	South / East of A12	NB	Cal	872	873	0.1%	SB	869	869	0.1%
4	Saxmundham	IB	Cal	818	819	0.1%	SB	828	832	0.5%
5	Framlingham	IB	Cal	509	508	-0.2%	SB	503	503	-0.1%
6	Woodbridge	IB	Cal	1606	1608	0.1%	SB	1636	1633	-0.2%
7	North / South screenline	NB	Cal	1125	1125	0.0%	SB	1144	1146	0.2%
8	East / West screenline	EB	Cal	958	958	-0.1%	SB	968	969	0.1%
9	NE / SW screenline	NEB	Val	754	801	6.2%	SB	761	792	4.1%
10	North / South screenline	EB	Val	967	915	-5.3%	SB	922	901	-2.3%

8.4.30. Table 44 shows all calibration screenlines in the inter peak return a very close match between modelled and observed flow. All validation screenlines show differences within 5% when comparing modelled and observed flow.

8.4.31. Table 45 describes the performance of the local Suffolk Energy Gateway screenlines within the PM peak.

Table 45 - Post ME Matrix: Suffolk Energy Gateway Screenlines – PM peak

ID	Description	Dir	Type	Obs	Mod	Diff	Dir	Obs	Mod	Diff
1	Leiston	IB	Cal	912	920	0.9%	SB	920	920	0.0%
2	North / West of A12	NB	Cal	620	618	-0.4%	SB	598	592	-1.0%
3	South / East of A12	NB	Cal	949	954	0.6%	SB	1107	1103	-0.3%
4	Saxmundham	IB	Cal	901	905	0.5%	SB	1009	1013	0.4%
5	Framlingham	IB	Cal	626	624	-0.2%	SB	744	744	0.0%
6	Woodbridge	IB	Cal	1902	1917	0.8%	SB	2565	2568	0.1%
7	North / South screenline	NB	Cal	1637	1631	-0.4%	SB	1449	1453	0.2%
8	East / West screenline	EB	Cal	1139	1136	-0.3%	SB	1045	1048	0.3%
9	NE / SW screenline	NEB	Val	1045	1083	3.5%	SB	903	894	-1.1%
10	North / South screenline	EB	Val	1235	1211	-1.9%	SB	892	834	-6.4%

8.4.32. Table 45 shows all calibration screenlines in the PM peak show a very close match between modelled and observed flow. All validation screenlines show differences within or close to 5% when comparing modelled and observed flow.

8.4.33. In summary, the screenlines within the area of detailed modelling for the Suffolk Energy Gateway show key strategic movements are matched well between observed and modelled flows. This forms a suitable basis from which to undertake scheme appraisal.

IMPACT OF MATRIX ESTIMATION

8.4.34. Figure 30 to Figure 32 shows graphs which compared the proportion of trips in the scaled prior assignment and post matrix-estimation assignment by trip length band in kilometres. This analysis provides a check that matrix estimation is not fundamentally changing the distribution of the prior matrix.

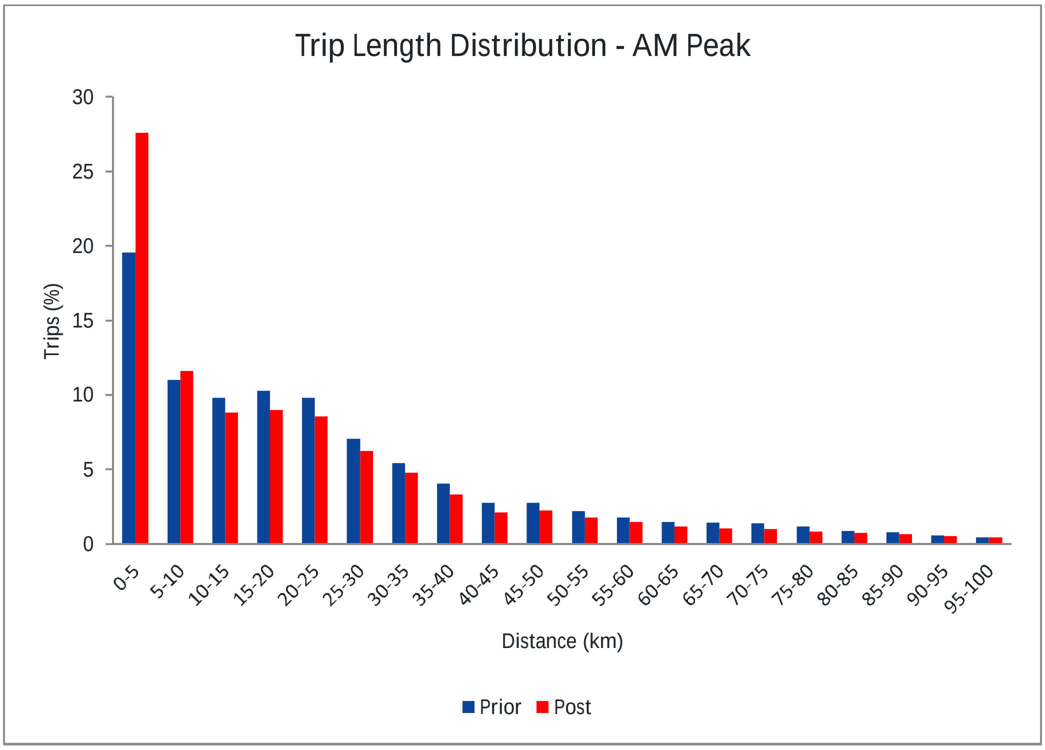


Figure 30 - AM Peak Trip Length Distribution

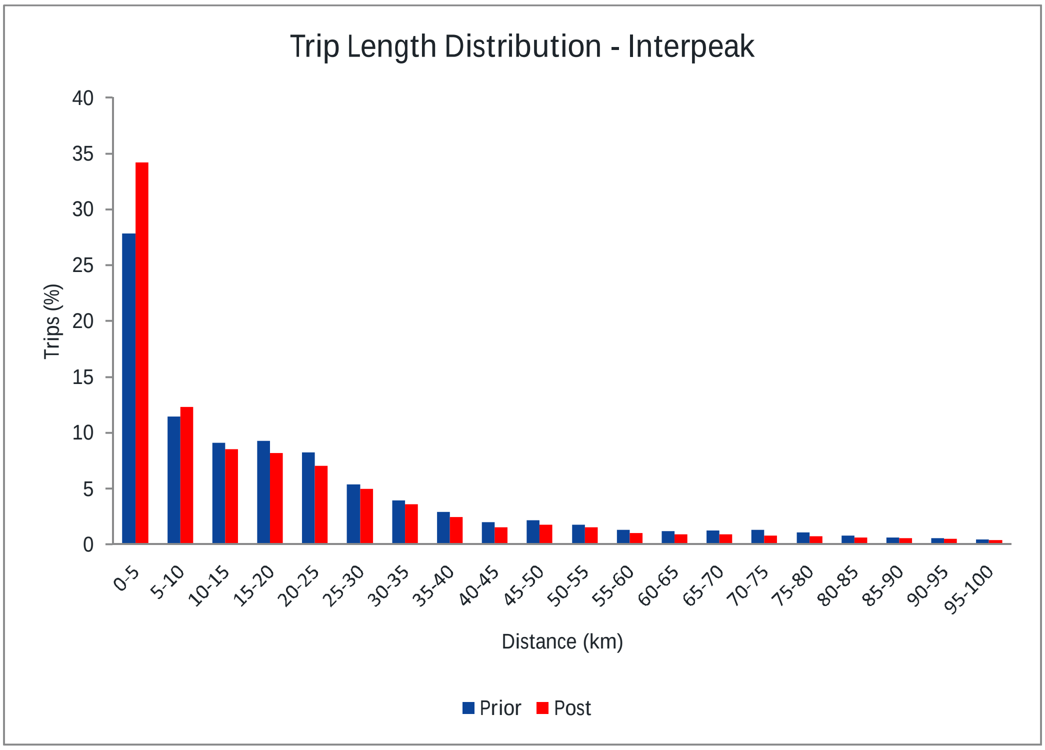


Figure 31 - Inter peak Trip Length Distribution

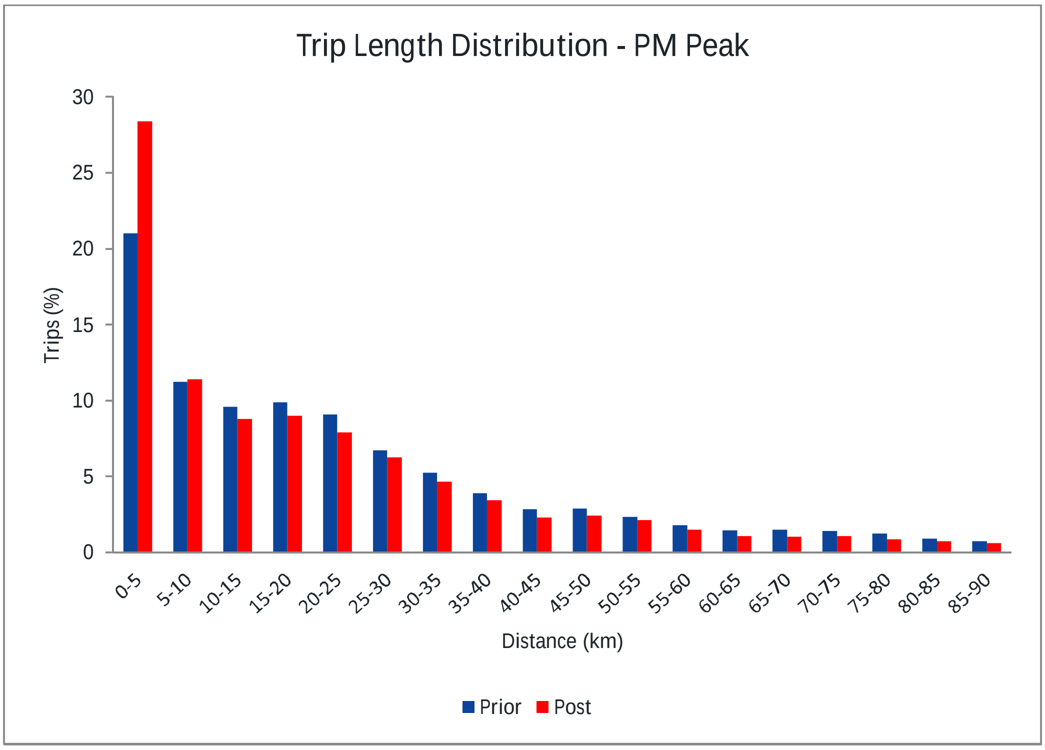


Figure 32 - PM Peak Trip Length Distribution

8.4.35. The graphs across all three peaks show similar proportions between the prior matrix and final matrix in terms of proportions of trips longer than 5km. Matrix estimation is shown to most significantly increase the proportion of trips below 5km, by between 5-8% across all three peaks.

8.4.36. Table 46 to Table 48 provide details of the regression statistics which looks at the changes occurring in the matrix as a result of matrix estimation.

Table 46 - Regression Statistics AM Peak

Measurement		Requirement	Value	Pass?
Cells	Slope	Within 0.98 and 1.02	0.99	Yes
	Intercept	Near 0	-0.01	Yes
	R-Sq	> 0.95	0.98	Yes
Rows	Slope	Within 0.99 and 1.01	0.92	No
	Intercept	Near 0	3.90	Yes
	R-Sq	> 0.98	0.95	No
Columns	Slope	Within 0.99 and 1.01	0.87	No
	Intercept	Near 0	10.0	Yes
	R-Sq	> 0.98	0.94	No
Mean	Prior	Within 5%	26.95	No
	Post		24.90	
	Diff		8%	
SD	Prior	Within 5%	95.95	Yes
	Post		96.18	
	Diff		1%	

8.4.37. Table 46 shows that in the AM peak, the changes to the matrix following matrix estimation pass the criteria in terms of cells. For all other criteria the model is either close to or meets criteria.

Table 47 - Regression Statistics Inter Peak

Measurement		Requirement	Value	Pass?
Cells	Slope	Within 0.98 and 1.02	1	Yes
	Intercept	Near 0	0.007	Yes
	R-Sq	> 0.95	0.99	Yes
Rows	Slope	Within 0.99 and 1.01	0.99	Yes
	Intercept	Near 0	9.21	Yes
	R-Sq	> 0.98	0.95	No
Columns	Slope	Within 0.99 and 1.01	0.99	No
	Intercept	Near 0	9.39	Yes
	R-Sq	> 0.98	0.95	No
Mean	Prior	Within 5%	25.37	No
	Post		23.45	
	Diff		7.6%	
SD	Prior	Within 5%	130.78	Yes
	Post		124.78	
	Diff		4.6%	

8.4.38. Table 47 shows that in the inter peak, the changes to the matrix following matrix estimation pass the criteria in terms of cells. For all other criteria the model is either close to or meets criteria.

Table 48 - Regression Statistics PM Peak

Measurement		Requirement	Value	Pass?
Cells	Slope	Within 0.98 and 1.02	1.00	Yes
	Intercept	Near 0	-0.01	Yes
	R-Sq	> 0.95	0.00	Yes
Rows	Slope	Within 0.99 and 1.01	0.99	No
	Intercept	Near 0	0.90	Yes
	R-Sq	> 0.98	4.54	No
Columns	Slope	Within 0.99 and 1.01	0.07	No
	Intercept	Near 0	0.94	Yes
	R-Sq	> 0.98	0.92	No
Mean	Prior	Within 5%	26.53	No
	Post		23.91	
	Diff		10%	
SD	Prior	Within 5%	91.73	Yes
	Post		92.27	
	Diff		1%	

8.4.39. Table 48 shows that in the PM peak, the changes to the matrix following matrix estimation pass the criteria in terms of cells. For all other criteria the model is either close to or meets criteria.

8.4.40. The results for all three peaks show that at an individual cell level the impacts of matrix estimation are all within the criteria stipulated within WebTAG.

9 ASSIGNMENT CALIBRATION AND VALIDATION

9.1 MODEL CONVERGENCE

9.1.1. Table 49 to Table 51 shows the convergence results against WebTAG criteria for each peak hour modelled.

Table 49 - AM peak Convergence Results

Iteration	Delta	%Flow	%Gap
18	0.0179	98	0.014
19	0.0161	98.4	0.012
20	0.0147	98.7	0.011
21	0.0139	99	0.0093

Table 50 - Inter peak Convergence Results

Iteration	Delta	%Flow	%Gap
16	0.0062	98.4	0.023
17	0.0063	98.8	0.01
18	0.0064	98.7	0.0065
19	0.0044	98.4	0.0056

Table 51 - PM peak Convergence Results

Iteration	Delta	%Flow	%Gap
20	0.0182	98.1	0.034
21	0.0206	98.5	0.035
22	0.0263	98.2	0.034
23	0.0196	98.5	0.03

9.1.2. The model convergence results show the SCTM successfully converges to the WebTAG requirements in all three peaks.

9.2 ASSIGNMENT CALIBRATION

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

- 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.

9.3 ASSIGNMENT VALIDATION

9.3.1. Link flow validation and calibration results for the final post matrix estimation shown an improved situation compared to the scaled matrix. Section 10 details the final assignment and shows a close match between modelled and observed flows across an array of screenlines.

VALIDATION AND CALIBRATION – INDIVIDUAL COUNT PERFORMANCE

9.3.2. The calibration and validation results for all user classes in the AM peak are shown in Table 52. This shows in terms of calibration counts, 82% achieve a GEH below 5 which is marginally outside the target specified in WebTAG.

Table 52 – AM Peak - 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	1022	884	86%	200	140	70%
700 - 2,700 vph	±15%	> 85 % of links	195	173	89%	54	38	70%
> 2,700 vph	±400 vph	> 85 % of links	7	7	100%	0	0	0%
GEH Criteria								
GEH Statistic for individual links < 5		> 85 % of links	1224	1011	83%	254	166	65%

9.3.3. Table 53 shows the breakdown of calibration and validation count performance by GEH band for the AM peak. This shows that when calibration and validation count performance is combined, 80% achieve a GEH of 5 or less which achieves the target outlined in WebTAG. This rises to 84% for a GEH below 6, and 89% for a GEH below 8, this implies there are a number of counts falling marginally outside the WebTAG target for a GEH below 5. For all flow criteria categories, the requirement of 85% or greater is achieved for calibration counts in the AM peak.

Table 53 - AM Peak – All User Classes – Calibration and Validation results

GEH Range	Calibration		Validation		Combined	
GEH < 2	780	64%	11	4%	791	54%
GEH < 4	943	77%	138	54%	1081	73%
GEH < 6	1059	87%	186	73%	1245	84%
GEH < 8	1113	91%	209	82%	1322	89%
GEH < 10	1157	95%	223	88%	1380	93%
GEH <5	1011	83%	166	65%	1177	80%

9.3.4. The calibration and validation results for all user classes in the Inter peak are shown in Table 54. This shows 86% of calibration counts achieve a GEH of 5 or less which is above the target of 85% stipulated in WebTAG. In combination with validation counts, 83% of counts have a GEH below 5 which is marginally outside the target outlined within WebTAG. For the "< 700 vph" and "700-2700vph" flow criteria categories, the requirement of 85% or greater is achieved for calibration counts in the inter peak.

Table 54 - Inter Peak – 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	1085	1007	93%	228	177	78%
700 - 2,700 vph	±15%	> 85 % of links	139	129	93%	26	21	81%
> 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	1224	1053	86%	254	181	71%

9.3.5. Table 55 details the performance of the calibration and validation counts in the inter peak by GEH band. This analysis shows 86% of calibration counts are achieve a GEH below 5. Relaxing the GEH criteria to 6 shows 88% of counts achieve a GEH below 6, highlighting a number of counts have a GEH marginally outside WebTAG guidance.

Table 55 - Inter Peak – All User Classes – Calibration and Validation results

GEH Range	Calibration		Validation		Combined	
GEH < 2	846	69%	5	2%	851	58%
GEH < 4	999	82%	164	65%	1163	79%
GEH < 6	1099	90%	196	77%	1295	88%
GEH < 8	1159	95%	220	87%	1379	93%
GEH < 10	1195	98%	234	92%	1429	97%
GEH <5	1053	86%	181	71%	1234	83%

9.3.6. The calibration and validation results for all user classes in the PM peak are shown in Table 56. This shows in terms of calibration counts, 82% achieve a GEH of 5 or less which is below the target outlined within WebTAG. Combined with calibration counts this values falls to 79% of counts with a GEH below 5. However, for all flow criteria categories, the requirement of 85% or greater is achieved for calibration counts in the PM peak.

Table 56 - PM Peak – 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	985	859	87%	190	125	66%
700 - 2,700 vph	±15%	> 85 % of links	230	200	87%	64	45	70%
> 2,700 vph	±400 vph	> 85 % of links	9	9	100%	0	0	0%
GEH Criteria								
GEH Statistic for individual links < 5		> 85 % of links	1224	1007	82%	254	162	64%

9.3.7. Table 57 shows the GEH performance by band for the calibration and validation counts in the PM peak. Relaxing the GEH criteria to 8 shows 90% of counts achieve a GEH below 8, highlighting a number of counts marginally have a GEH marginally outside WebTAG requirements.

Table 57 - PM Peak – All User Classes – Calibration and Validation results

GEH Range	Calibration		Validation		Combined	
GEH < 2	773	63%	8	3%	781	53%
GEH < 4	949	78%	142	56%	1091	74%
GEH < 6	1051	86%	187	74%	1238	84%
GEH < 8	1109	91%	216	85%	1325	90%
GEH < 10	1152	94%	225	89%	1377	93%
GEH <5	1007	82%	162	64%	1169	79%

9.3.8. In summary the calibration results for individual counts show that in terms of flow criteria, the targets stipulated in WebTAG is achieved in all time periods. In terms of GEH values below 5 this falls marginally below the target of 85% stipulated in WebTAG, given the scale of the count data used with the county model it is considered this performance shows the county model still generally matches observed traffic flows well.

9.3.9. LMVRs regarding the local validation of Lowestoft and Suffolk Energy Gateway show that for these locations, the model achieves the required level of calibration stipulated within WebTAG. It is considered that once the validation of Ipswich is updated to inform the Development Consent Order modelling for The Upper Orwell Crossings, the overall county model validation will improve and reach the required level required in WebTAG.

9.3.10. Appendix I contains details of the performance for each individual link count used in validation or calibration in terms of GEH and flow by peak hour modelled.

9.3.11. Appendix J contains plots of the modelled flow in pcus for the following localities relevant to the scheme appraisals in Ipswich, Lowestoft and East Suffolk.

JOURNEY TIME PERFORMANCE

9.3.12. Table 58 provides a summary of the number of journey time routes which have been modelled within 15% of the observed journey time across all three peaks. This summary shows the SCTM does not achieve the requirement of 85% stipulated within WebTAG in the AM and PM peak. In the inter peak, 89% of routes are within 15% suggesting the model validates well to more free-flow conditions.

Table 58 - Journey Time Route Performance – Modelled Within 15% of Observed

Peak Hour	Total Journey Time Route	Modelled Journey Time Routes within 15% of Observed	Percentage
AM	154	123	80%
IP	154	138	89%
PM	154	125	81%

9.3.13. Table 59 shows that if the criteria is relaxed to modelled journey times being with 20% of observed then nearly every route (97%) in the inter peak shows a close fit between modelled and observed. This change also means 85% of routes in the AM peak and 88% of routes in the PM peak show modelled journey times within 20% of the observed. This analysis shows there are a number of routes which fall marginally outside the criteria stipulated in WebTAG for journey time validation. This gives confidence at a county wide level that the model generally represents strategic journey times well.

Table 59 - Journey Time Route Performance – Modelled Within 20% of Observed

Peak Hour	Total Journey Time Route	Modelled Journey Time Routes within 20% of Observed	Percentage
AM	154	131	85%
IP	154	149	97%
PM	154	135	88%

9.3.14. Detailed journey time route coverage has been specified within the area of detailed modelling for Lowestoft and Suffolk Energy Gateway. This is detailed in the respective local LMVRs relevant to each of these locations. The journey time validation within these reports shows journey time validation of 85% or greater in terms of modelled travel time compared to observed journey time validation is achieved in all modelled time periods. For the forthcoming local validation of Ipswich a detailed series of additional journey time routes will be added.

9.3.15. Appendix D-2 provides a summary of the performance of each individual journey time route for each peak hour, comparing the overall observed and modelled journey time. Appendix D-3 also contains graphs which detail provide a comparison of the modelled journey time and observed journey time for each individual journey time route and direction by peak hour

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

10.1.1. This D3 Local Model Validation Report (LMVR) details the fitness for purpose of the SATURN model which forms the Suffolk County Transport Model (SCTM). This highway model will be used in conjunction with a public transport and demand model which have been developed in VISUM.

10.1.2. The SCTM highway model represents a base year of 2016, and has incorporated the networks previously developed in the Ipswich Transport Model (ITM) and Lowestoft Transport Model (LTM) which were used in 2015 for the Outline Business Cases for the Upper Orwell Crossing in Ipswich and Lake Lothing Third Crossing in Lowestoft.

10.1.3. It is proposed the SCTM highway model can be used as a stand-alone highway model from which to build forecast highway assessments, but also in conjunction with the public transport model and demand model to test the impacts of multi-modal changes and interventions. The version of the SCTM detailed within this report will be used to support the Lake Lothing Third Crossing scheme through the DCO process, as well as the Outline Business Case for the Suffolk Energy Gateway scheme. The county wide model validation will be updated and improved within Ipswich to inform the DCO process for The Upper Orwell Crossing. It will also be used to test various other proposed schemes, local authority growth strategies and developer testing.

10.1.4. The validation and calibration has referenced the latest guidelines stipulated in WebTAG as the basis for determining the fitness for purpose of the SCTM highway model.

10.1.5. An extensive data collection exercise was carried out predominantly in April 2016 in order to collect appropriate data to develop the SCTM highway model. Analysis of this data is reported in the D2 SCTM Highway Data Collection Report (December 2017). This commissioned data has been supplemented by ATC data from permanent count sites provided by Suffolk County Council, Highways England's TRADS database and the 2015 data collection carried out in Ipswich and Lowestoft for the Outline Business Cases. Traffic surveys undertaken in 2017 to inform local validation for the Suffolk Energy Gateway and Ipswich have also been utilised. The range of traffic data collected is considered appropriate and sufficient to create a strategic highway assignment. Further data collection will have to be considered going forward for any local testing of schemes and developments which need to be carried out.

10.1.6. The trip matrices used for both the highway model and public transport model have been derived predominantly from Mobile Network Data (MND) supplied by Telefonica, supplemented with a synthetic matrix derived from 2011 Census Journey to Work data. Extensive verification of the MND has been carried out, detailed in Appendix F, comparing the data against established data sources such as NTEM, 2011 Census and 2015 National Travel Survey to ensure the MND is fit for purpose to form the basis for model matrices. The methodology which has been employed to build the matrices may need to be refined following review by third parties, and related to guidance within WebTAG, with regard to matrix construction and verification of MND.

10.1.7. As part of the validation process, route choice validation has been carried out, detailed in Appendix G, for the stipulated number of routes defined by a formula in WebTAG. The results of the route choice validation show the SCTM highway model shows realistic minimum cost routes between the selected O-D pairs.

10.1.8. An extensive range of screenlines how been presented in this report, covering key strategic movements across Suffolk. Assignment of the prior matrix showed the requirement for matrix estimation to improve model calibration and performance against WebTAG guidelines. The final post matrix estimate assignment is shown to match well across the array of screenlines, achieving a flow difference within 5% in the majority of cases.

10.1.9. The impacts of the matrix estimation process have been discussed in Section 8 in terms of trip totals, trip length distribution and regression analysis. These results provide confidence the matrix estimate process has not fundamentally altered the prior matrix assignment.

10.1.10. The model is shown to converge satisfactorily across all three peaks. In terms of combined calibration and validation counts, the model is shown to achieve close to 85% of counts with a GEH of below 5 across all three peaks. In terms of flow criteria, the model achieves the required criteria outlined in WebTAG for calibration counts. The analysis of the breakdown of GEH values suggests there are significant number of counts with a GEH marginally outside a value of 5.

10.1.11. A comprehensive coverage of journey time routes have been included in the SCTM highway model. Taking into account directionality there are 154 routes which have been used to analyse journey time performance across the key strategic routes within the county. In terms of the WebTAG requirement of observed modelled journey times being within 15% of the modelled journey times, this has been achieved for 80% of routes in the AM peak, 89% in the inter peak and 81% in the PM peak. For the AM peak and PM peak this is below the 85% threshold stipulated in WebTAG, however the threshold is achieved in the inter peak period. Relaxing this criteria to 20% in terms of the difference between modelled and observed journey times shows the 85% threshold is achieved. It is considered the model generally matches travel time and peak specific congestion across key routes within the county

10.1.12. It is considered the SCTM highway model has been shown to provide a reasonable match to observed traffic count and journey time data. Local validation undertaken within Lowestoft and the area of detailed modelling for the Suffolk Energy Gateway scheme shows the required flow, GEH and journey time performance is achieved. This is reported in separate local LMVRs relevant to the scheme appraisals being undertaken for these localities. The SCTM highway model provides a robust basis from which to create forecast assignments for future scheme and development testing. It is advised for local interventions however that further refinement and validation of the SCTM highway model in the local area may be required.

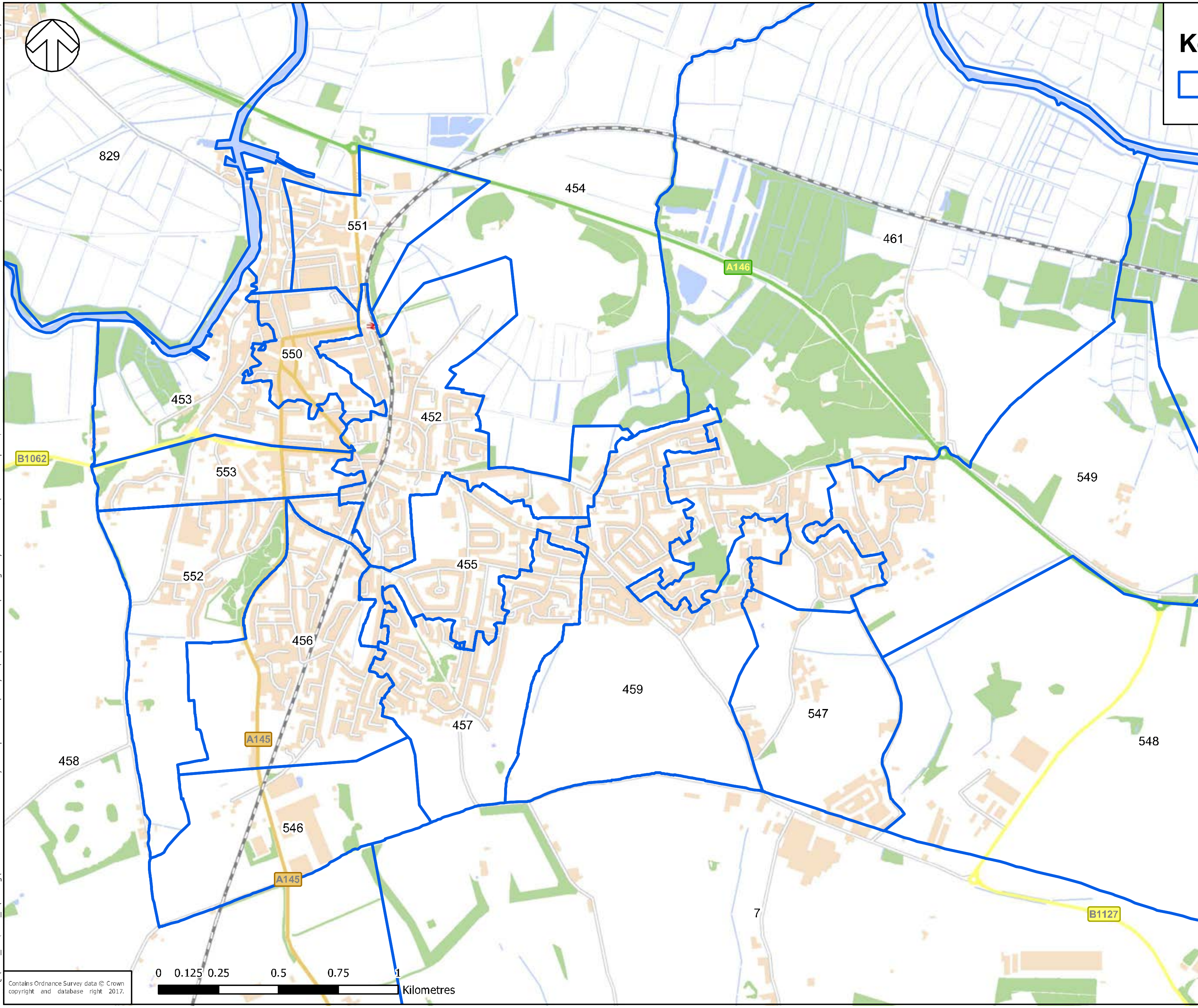
10.1.13. The validation and calibration performance of the model will be improved as part of the updated modelling within Ipswich to inform the DCO process for The Upper Orwell Crossings. Generally, further refinement of the model will be required to improve its performance in relation to WebTAG requirements and any subsequent changes which are made to WebTAG guidance going forward.

Appendix A

AREA OF DETAIL MODELLING

Appendix A.1

ZONAL DETAIL



TITLE:

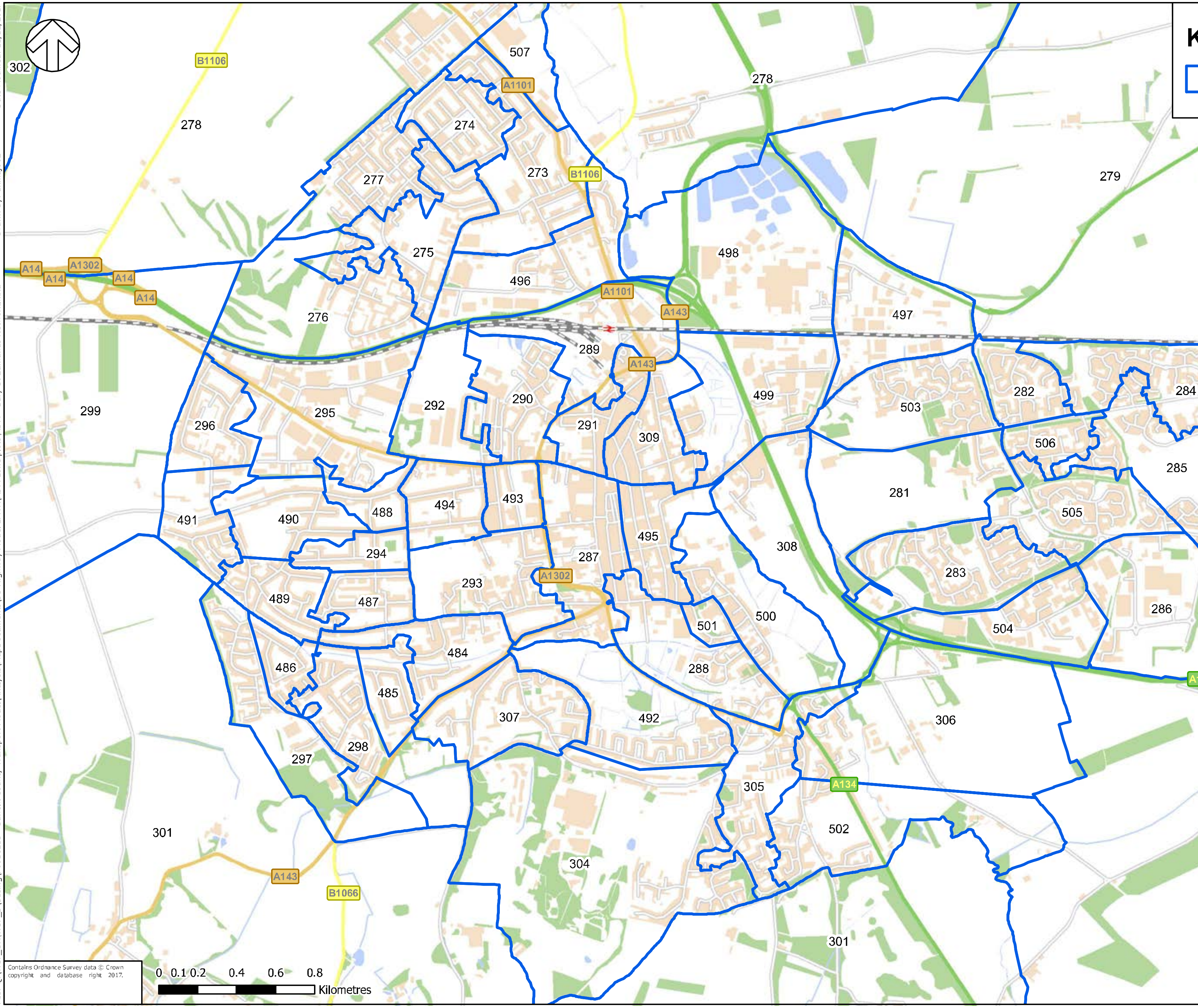
BECCLES
ZONAL DETAIL

FIGURE No:

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Beccles Zones.mxd

Drawn By: ukmdj002

Date Modified: 11/12/2017



wsp

TITLE:

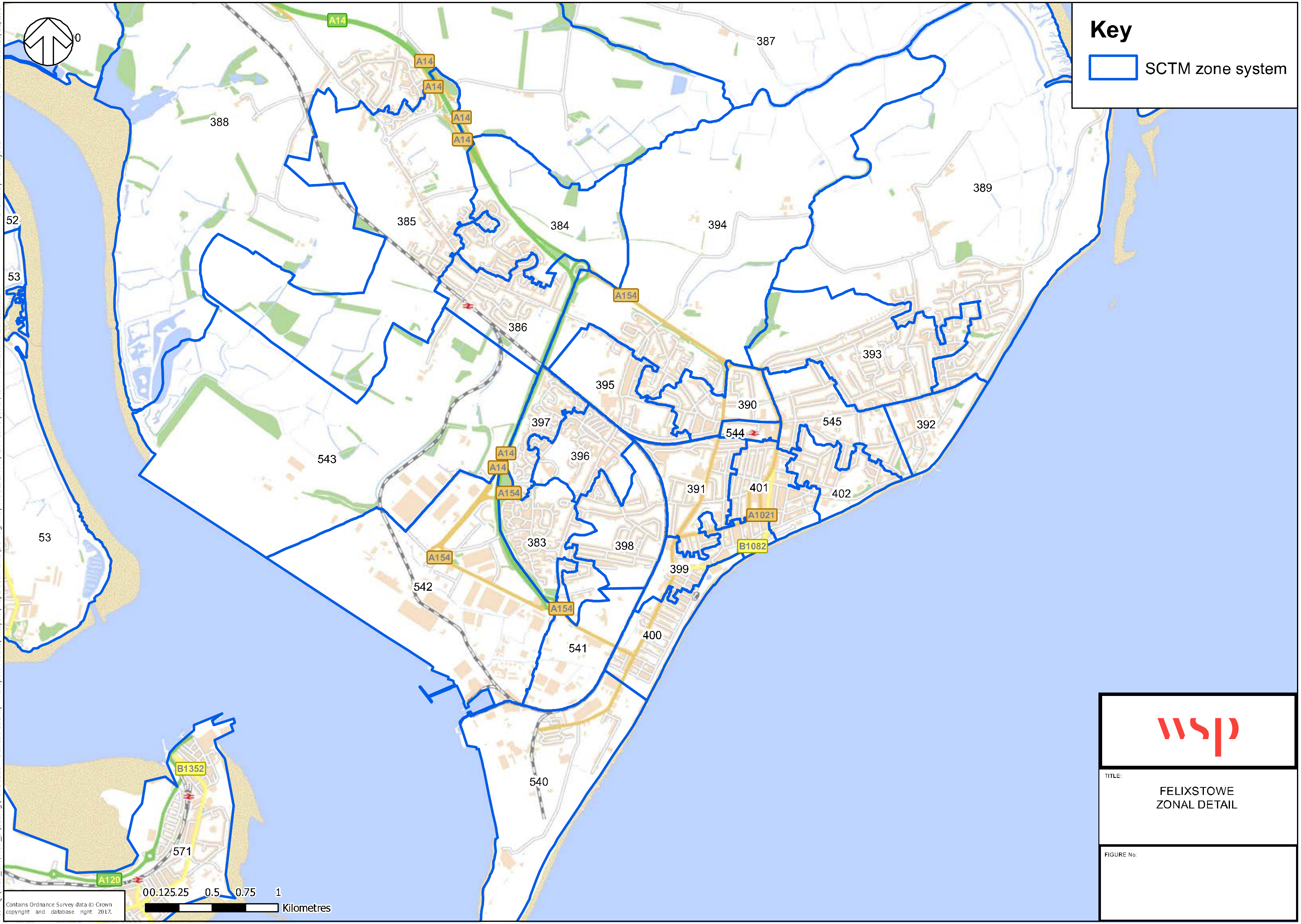
BURY ST EDMUNDS
ZONAL DETAIL

FIGURE No:

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Bury St Edmunds Network.mxd

Drawn By: ukmdj002

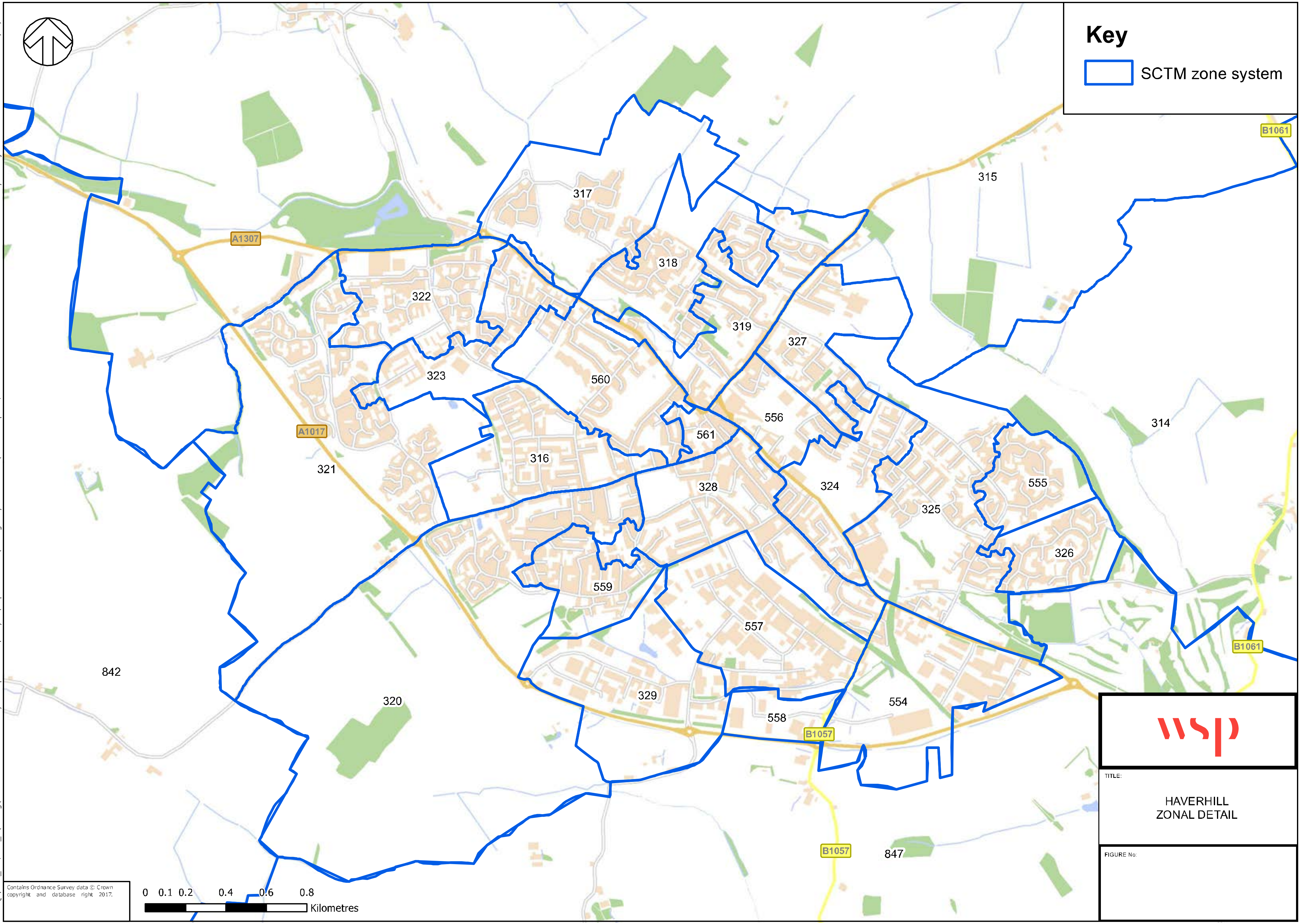
Date Modified: 11/12/2017



File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Felixstowe Zones.mxd

Drawn By: ukmdj002

Date Modified: 11/12/2017



TITLE:

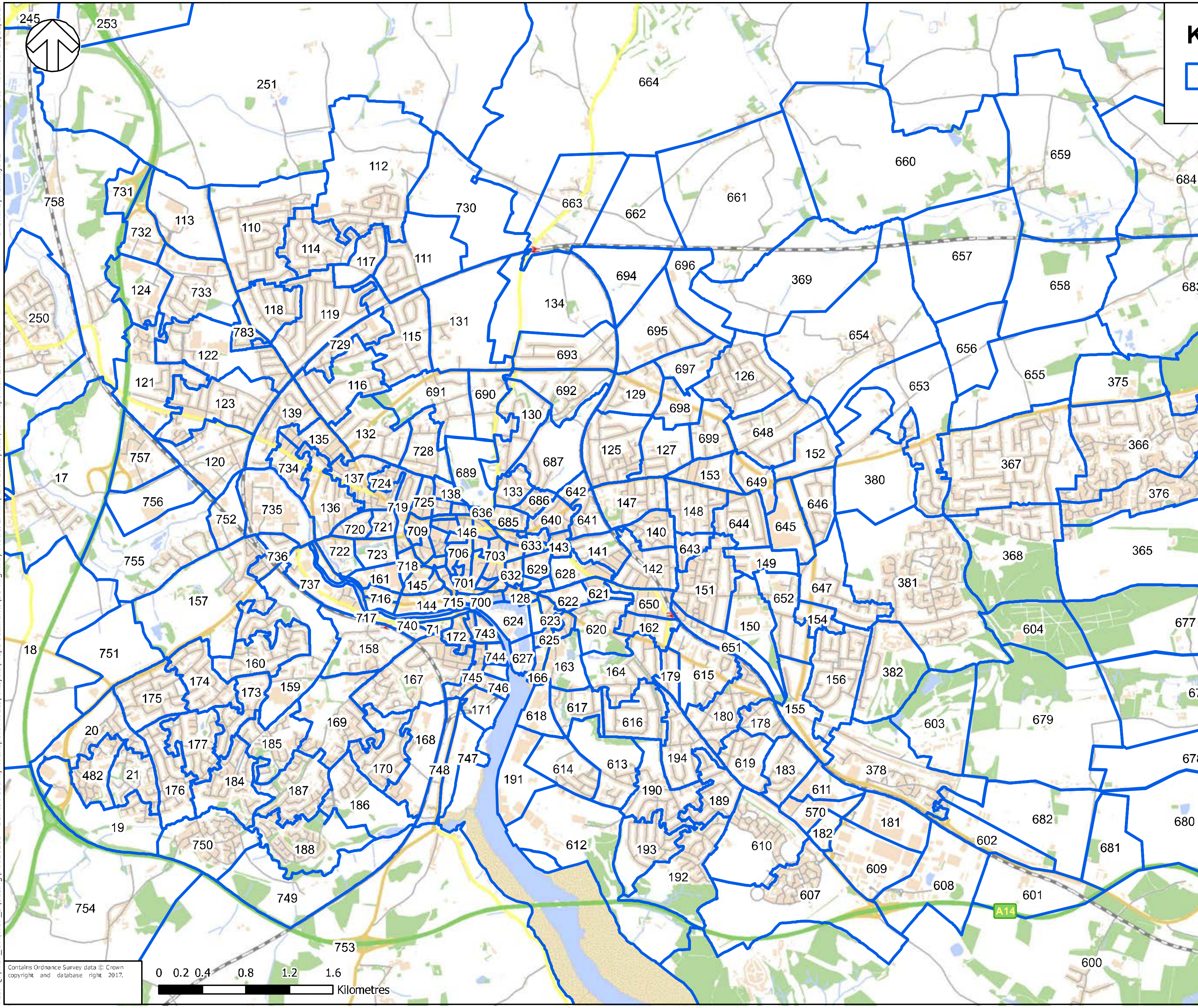
HAVERHILL
ZONAL DETAIL

FIGURE No:

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Haverhill Zones.mxd

Drawn By: ukmdj002

Date Modified: 11/12/2017



wsp

TITLE:

IPSWICH
ZONAL DETAIL

FIGURE No:

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Ipswich Zones.mxd

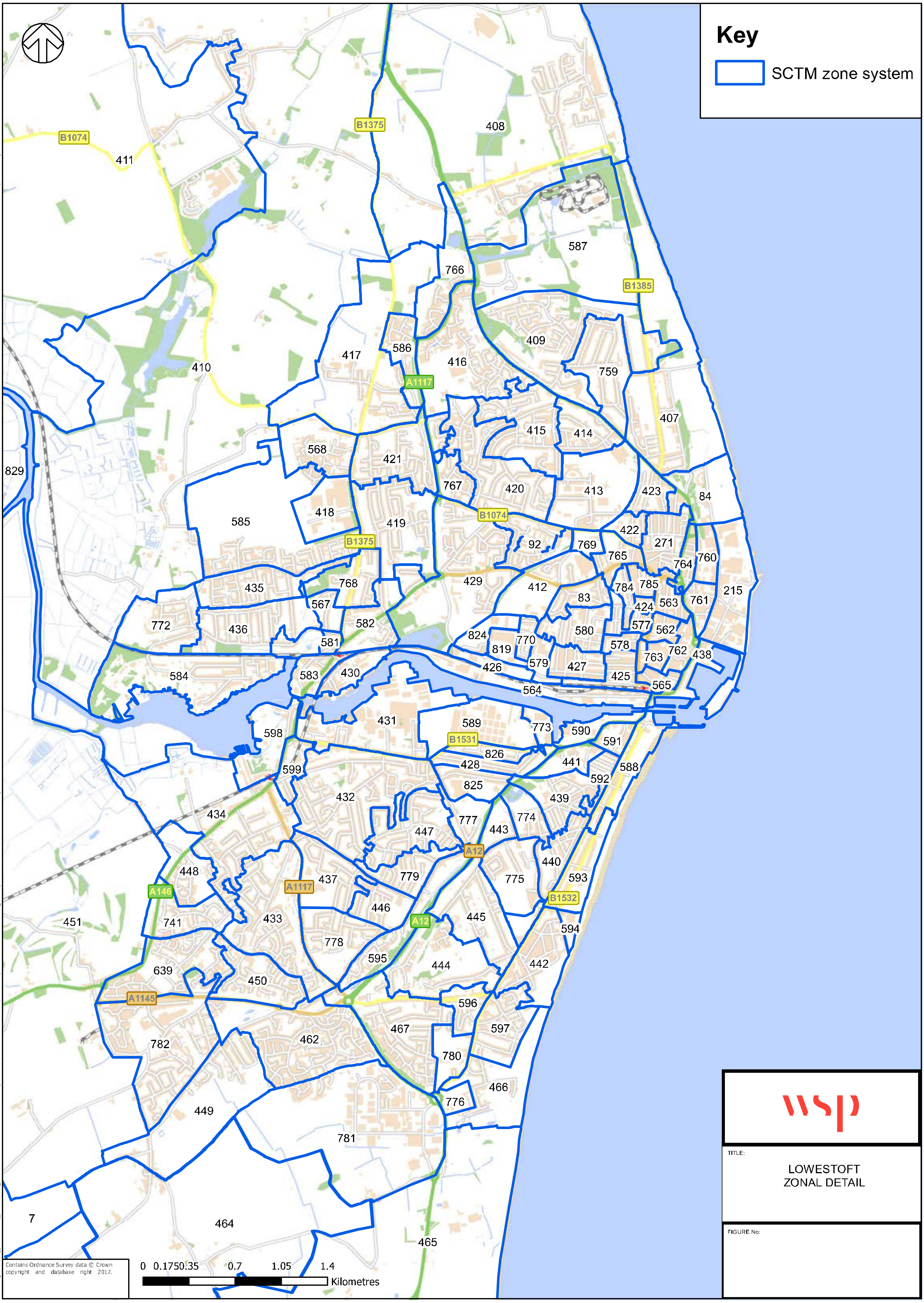
Drawn By: ukmdj002

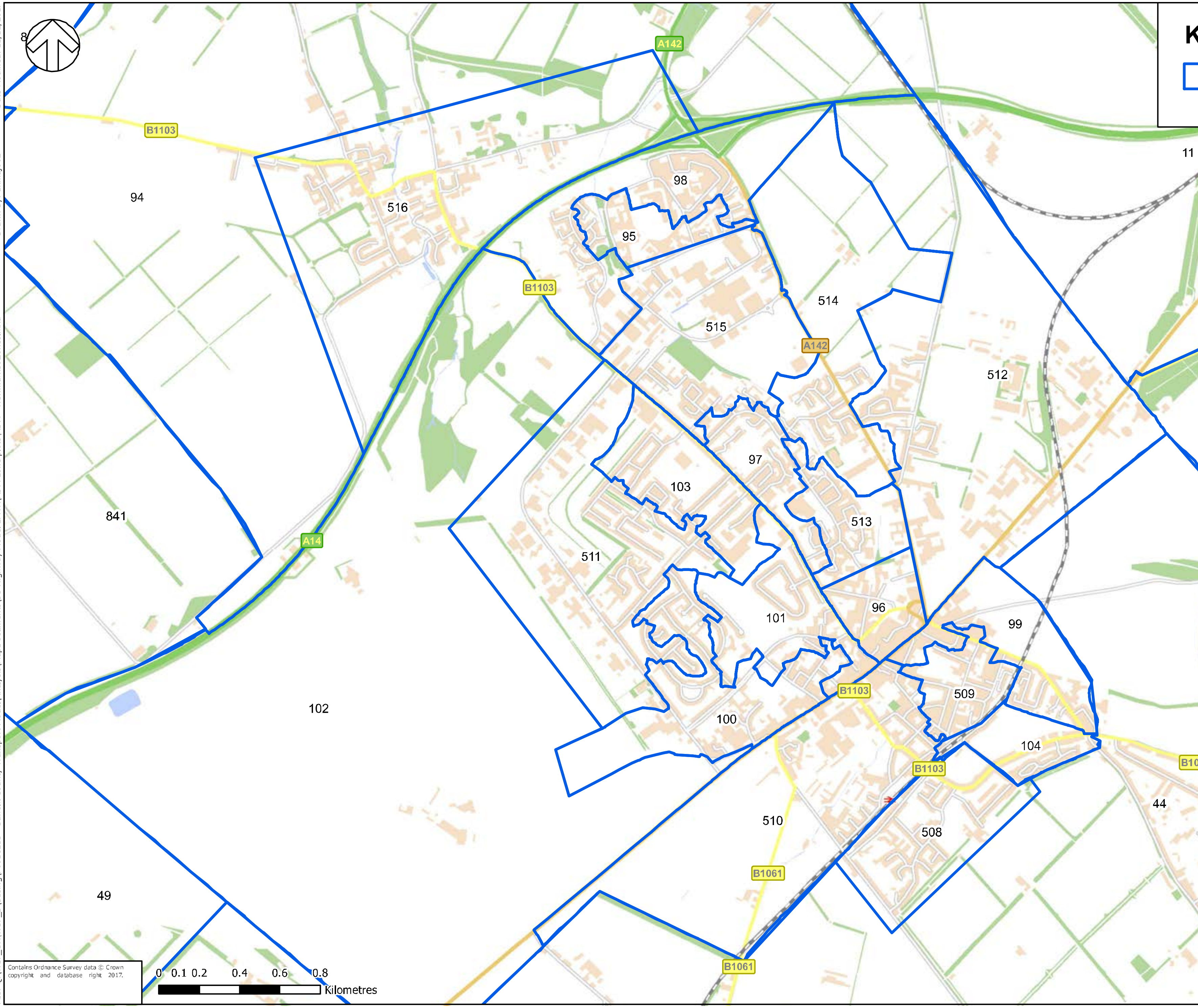
Date Modified: 11/12/2017

Date Modified: 11/12/2017

Drawn By: ukmdj002

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Lowestoft Zones.mxd





Contains Ordnance Survey data © Crown copyright and database right 2017.

TITLE:

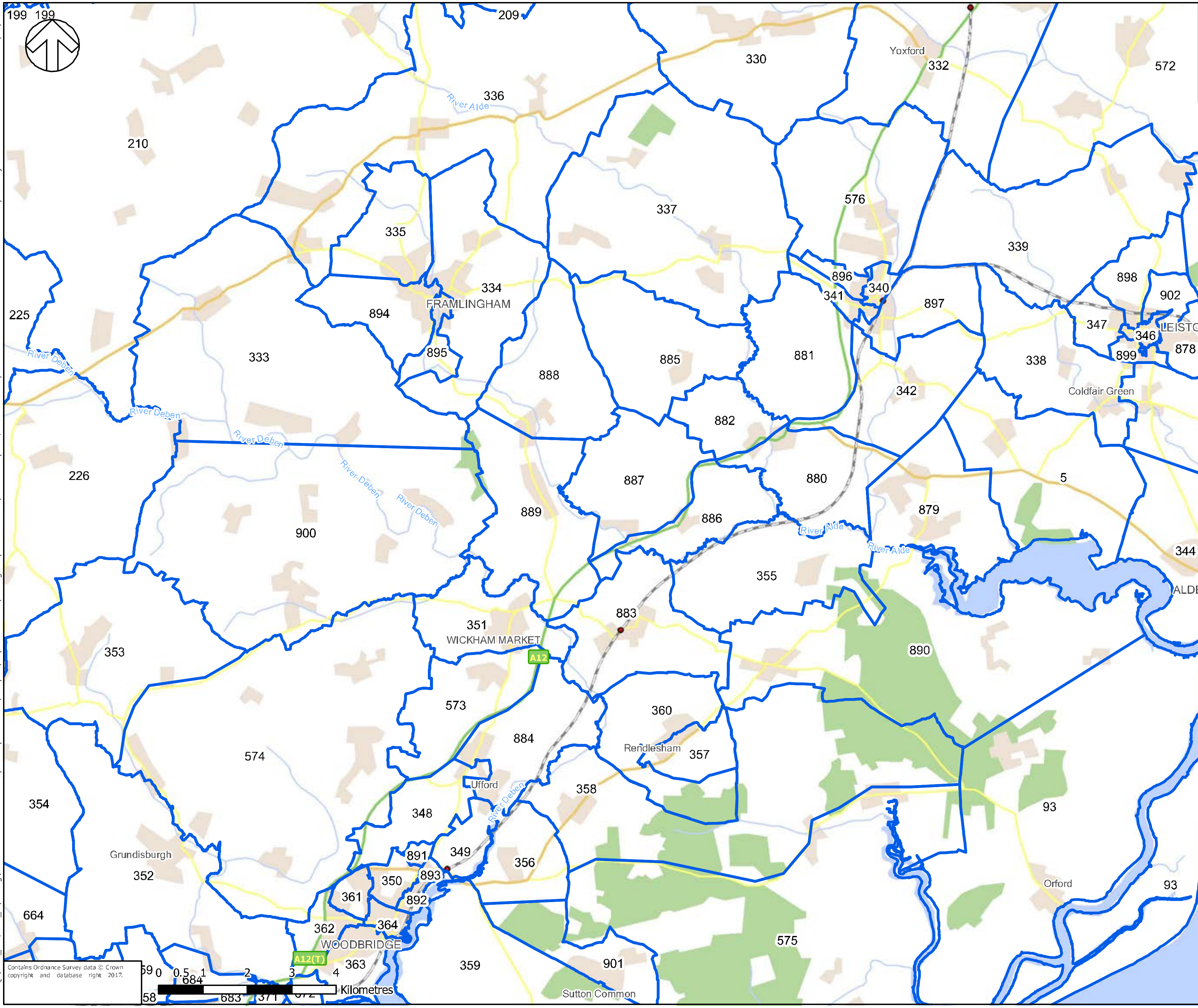
NEWMARKET
ZONAL DETAIL

FIGURE No:

Date Modified: 11/12/2017

Drawn By: ukmdj002

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Newmarket Zones.mxd



wsp

TITLE:

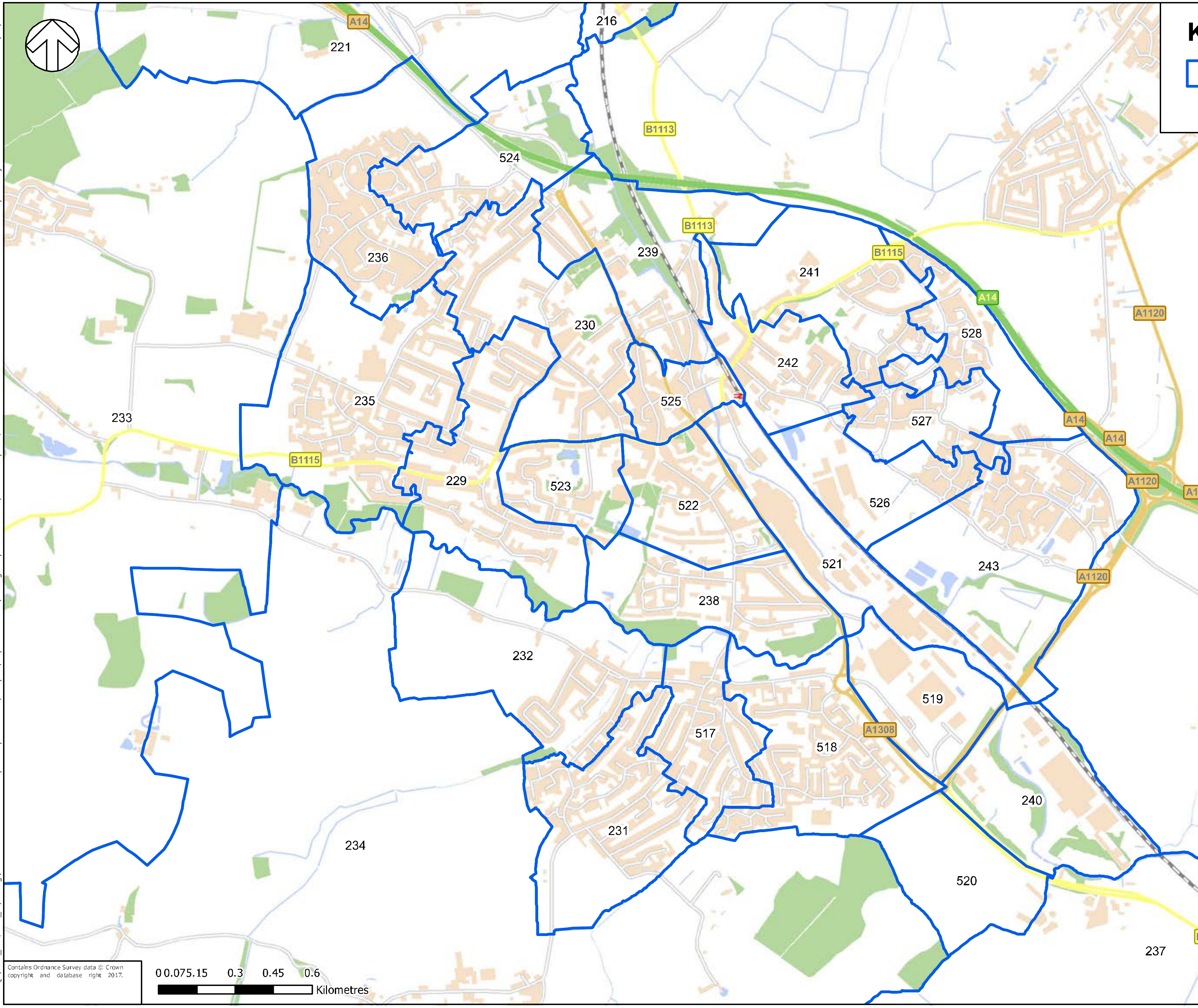
SUFFOLK ENERGY GATEWAY
ZONAL DETAIL

FIGURE No:

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - SEGWay Zones.mxd

Drawn By: ukmdj002

Date Modified: 11/12/2017



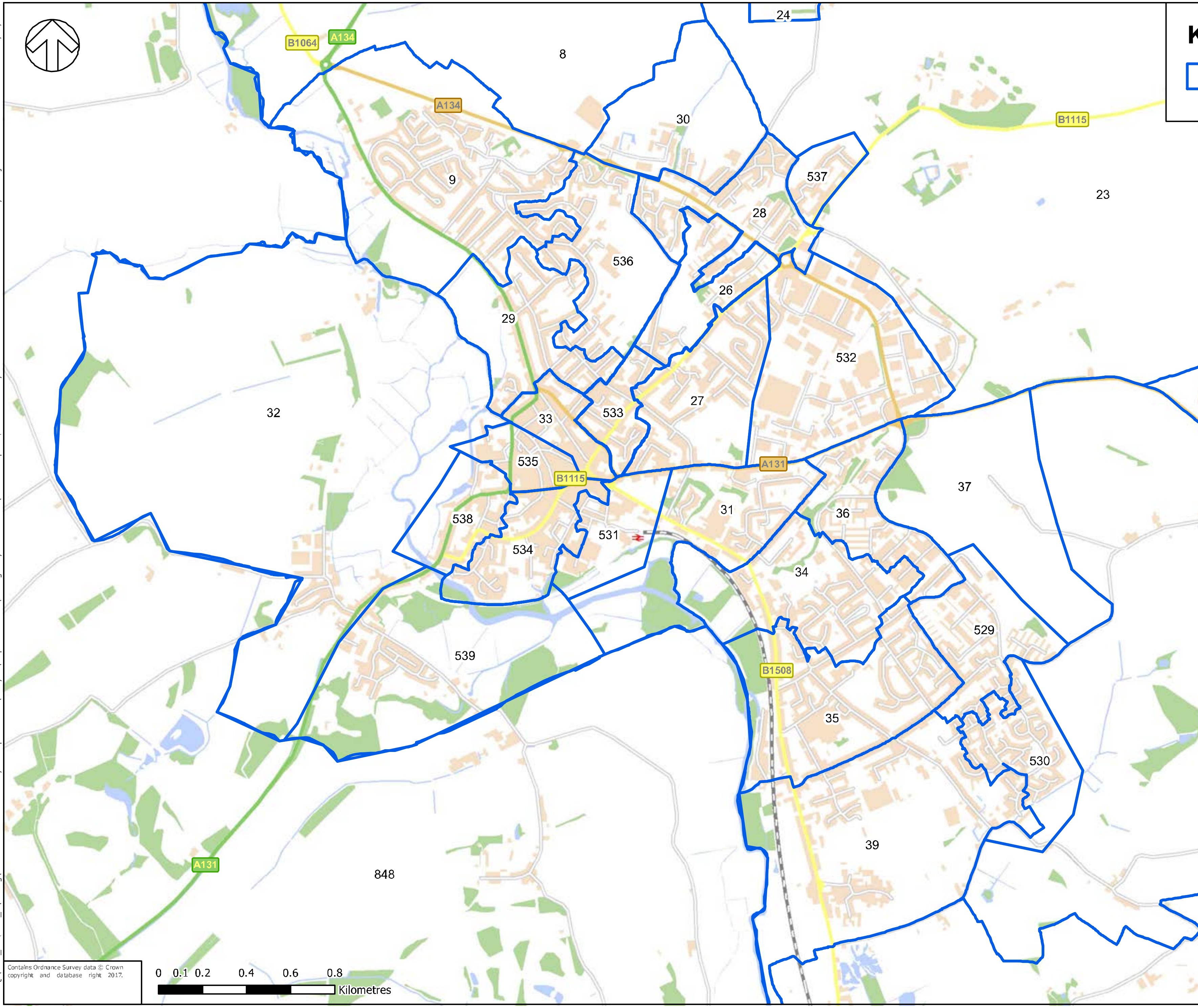
TITLE:
STOWMARKET
ZONAL DETAIL

FIGURE No:

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Stowmarket Zones.mxd

Drawn By: ukmdj002

Date Modified: 11/12/2017



TITLE:

SUDBURY
ZONAL DETAIL

FIGURE No:

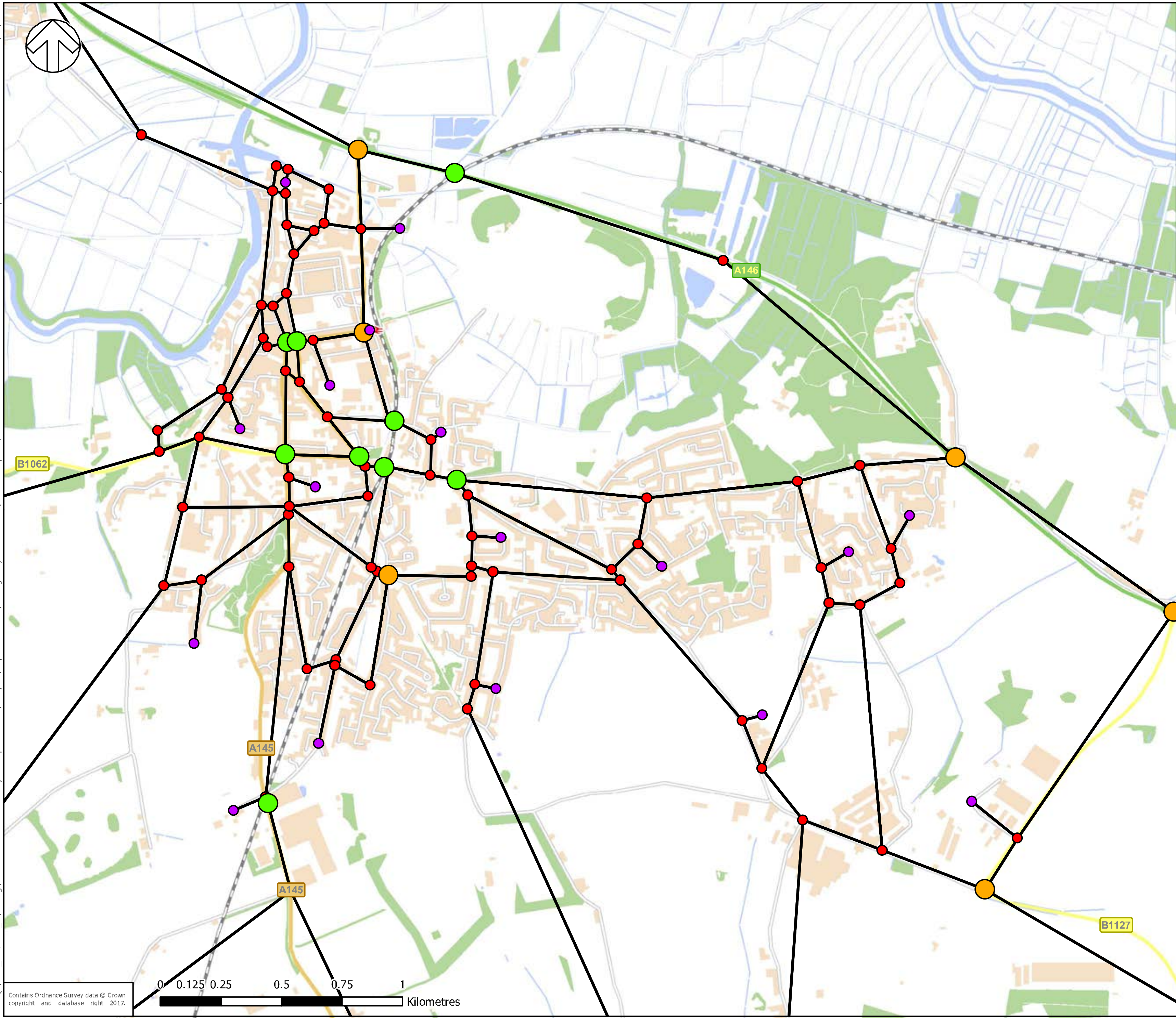
File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Sudbury Zones.mxd

Drawn By: ukmdj002

Date Modified: 11/12/2017

Appendix A.2

NETWORK DETAIL



wsp

TITLE:

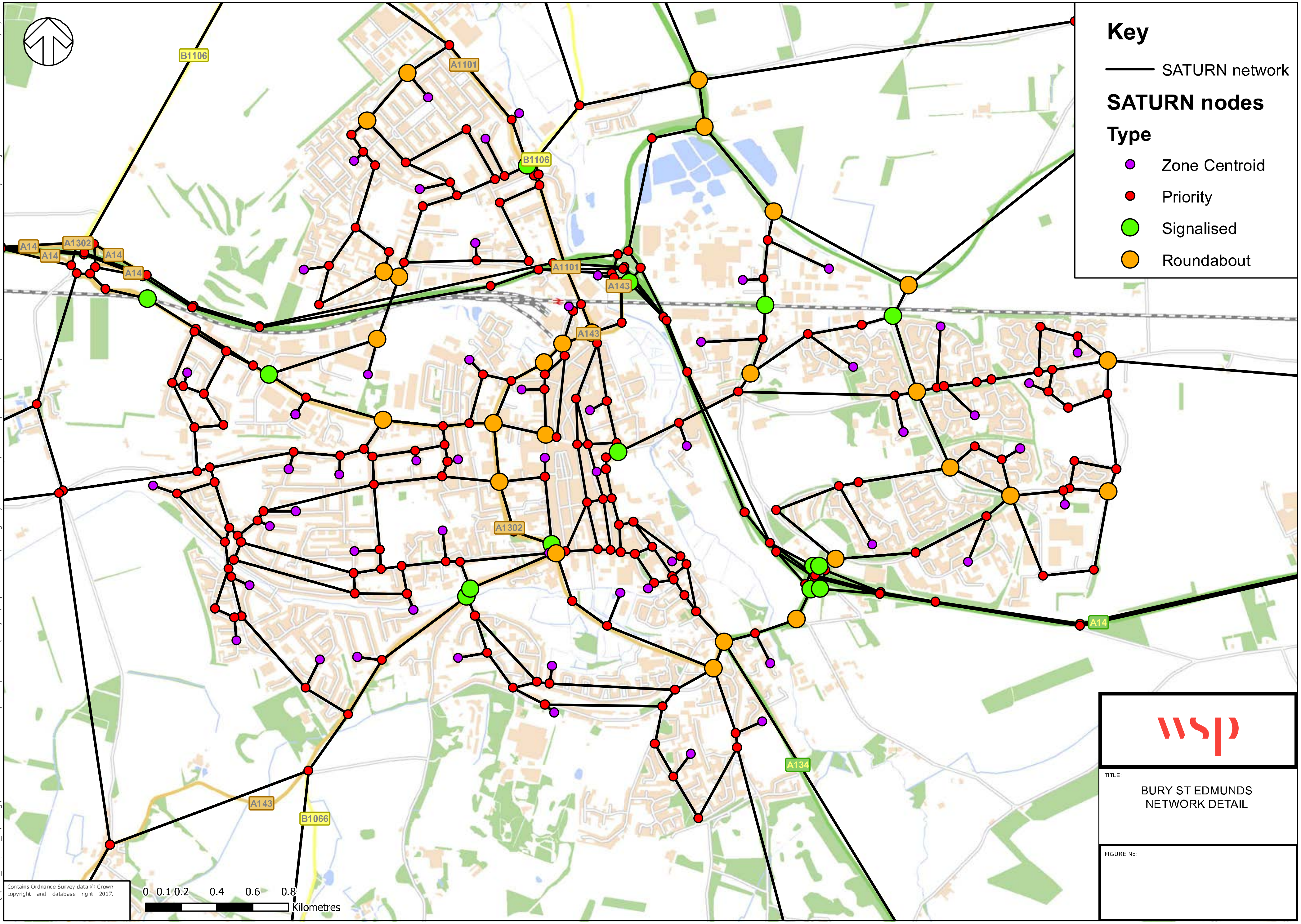
BECCLES
NETWORK DETAIL

FIGURE No:

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Beccles Network.mxd

Drawn By: ukmdj002

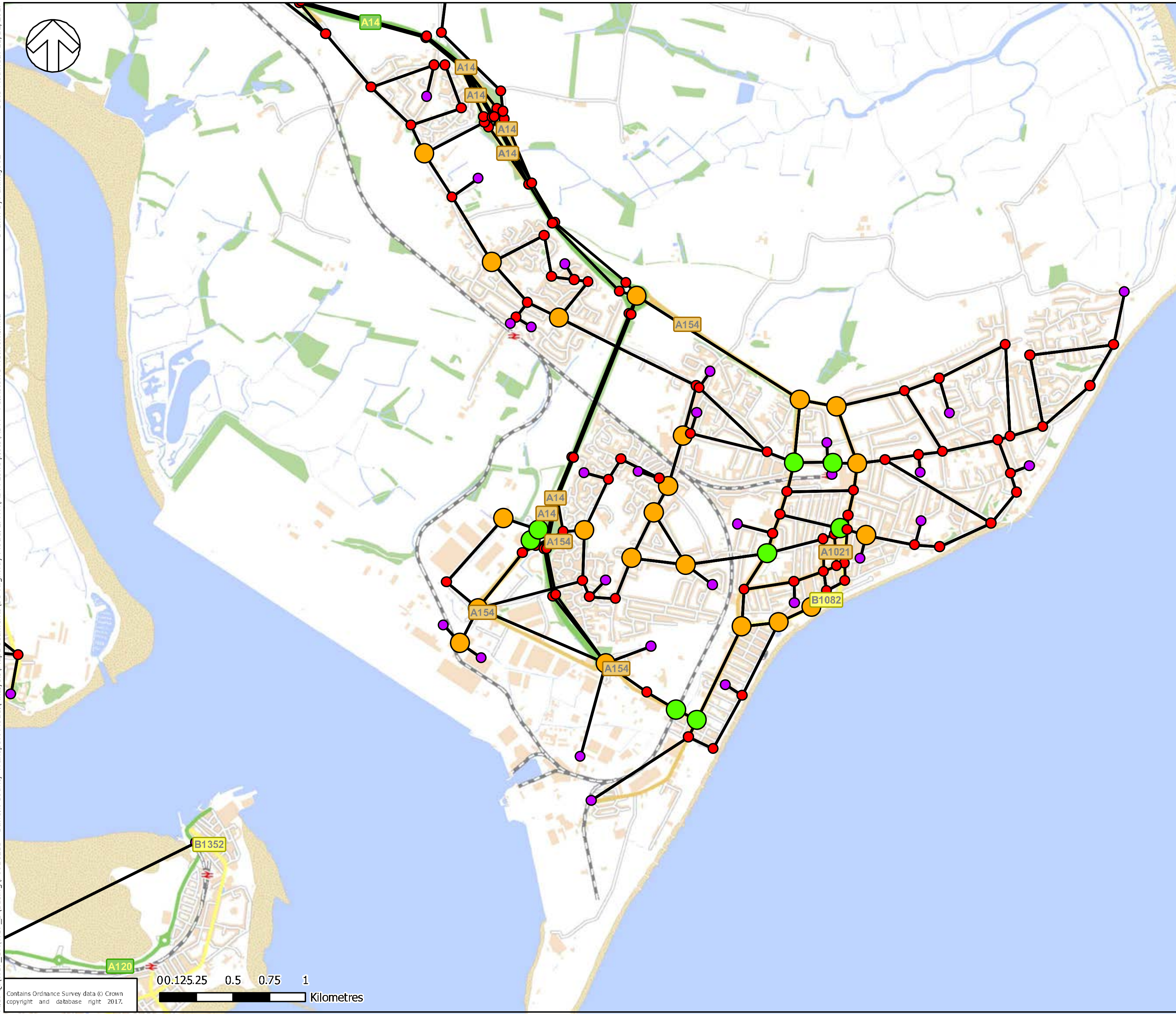
Date Modified: 11/12/2017



File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Bury St Edmunds Network.mxd

Drawn By: ukmdj002

Date Modified: 11/12/2017

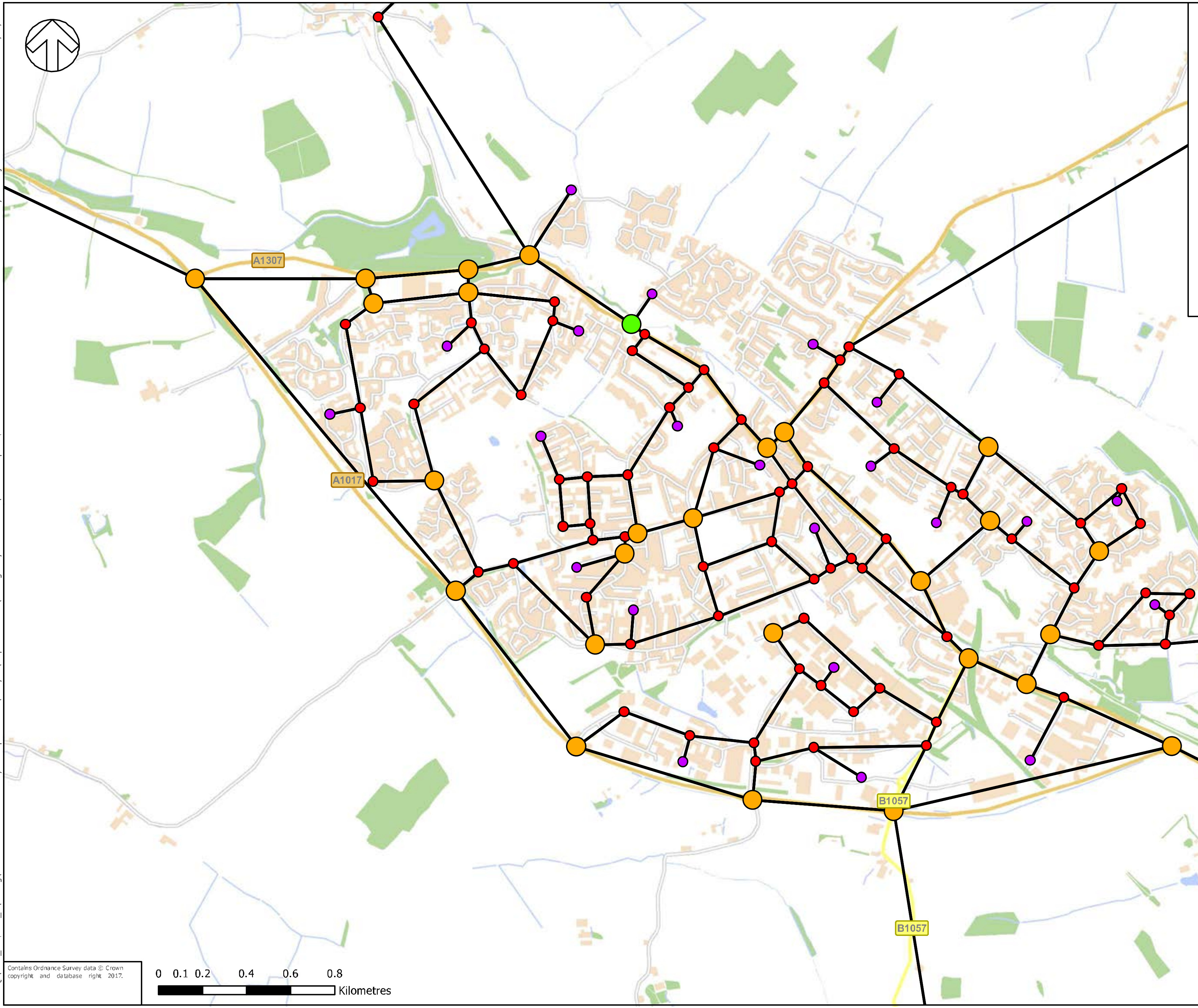


TITLE:

FELIXSTOWE
NETWORK DETAIL

FIGURE No:

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Felixstowe Network.mxd
Drawn By: ukmdj002
Date Modified: 11/12/2017



wsp

TITLE:

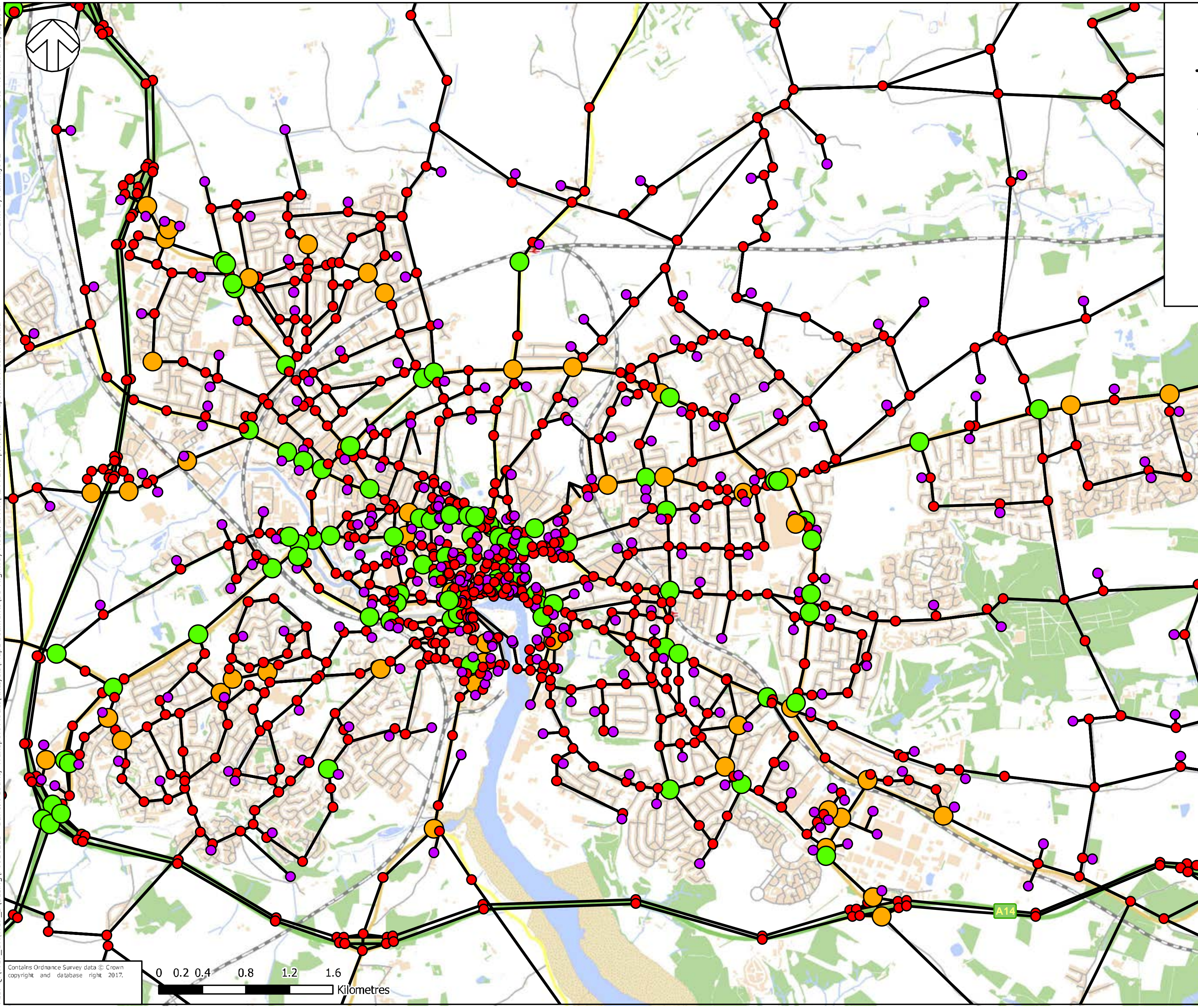
HAVERHILL
NETWORK DETAIL

FIGURE No:

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Haverhill Network.mxd

Drawn By: ukmdj002

Date Modified: 11/12/2017



wsp

TITLE:

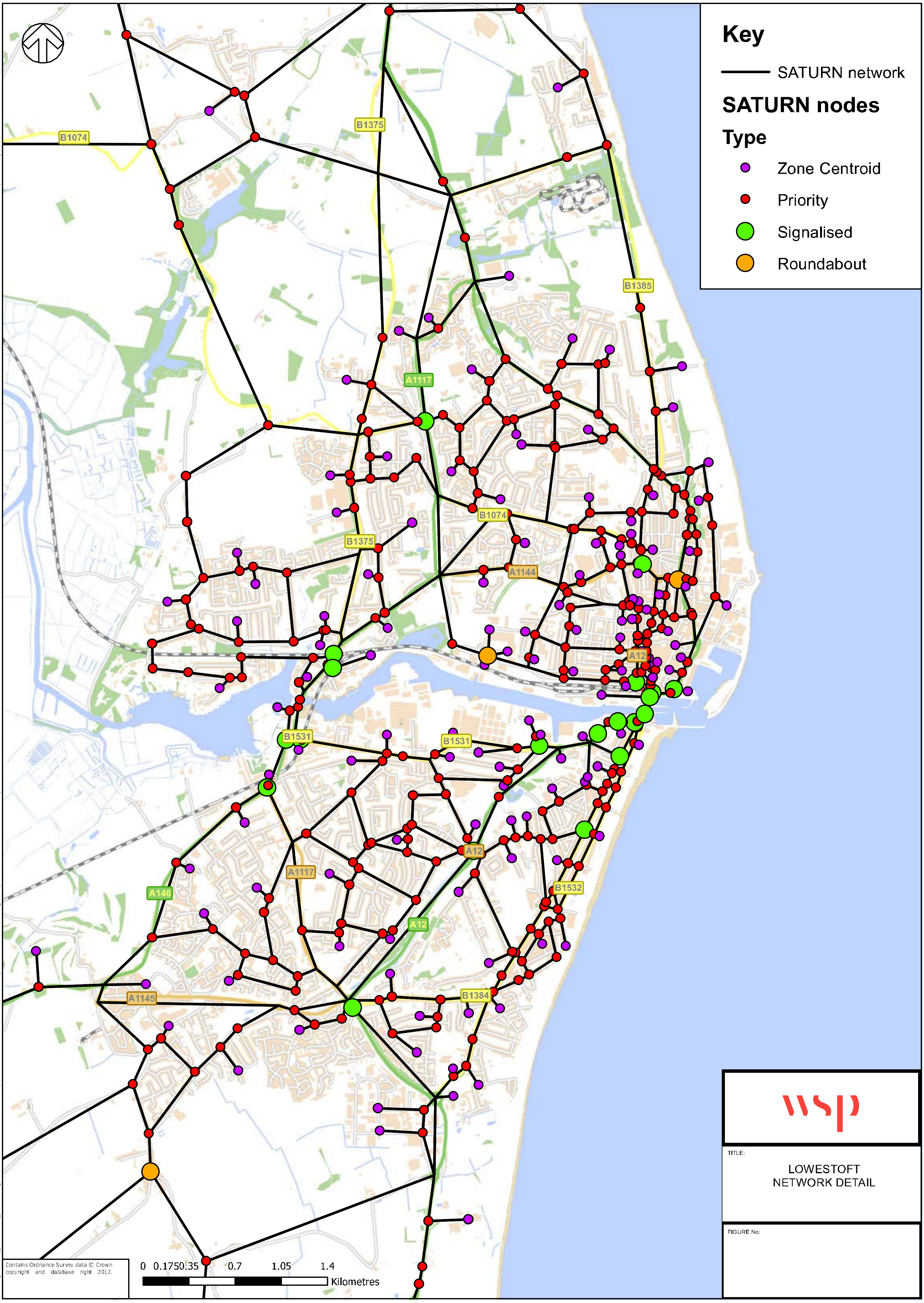
IPSWICH
NETWORK DETAIL

FIGURE No:

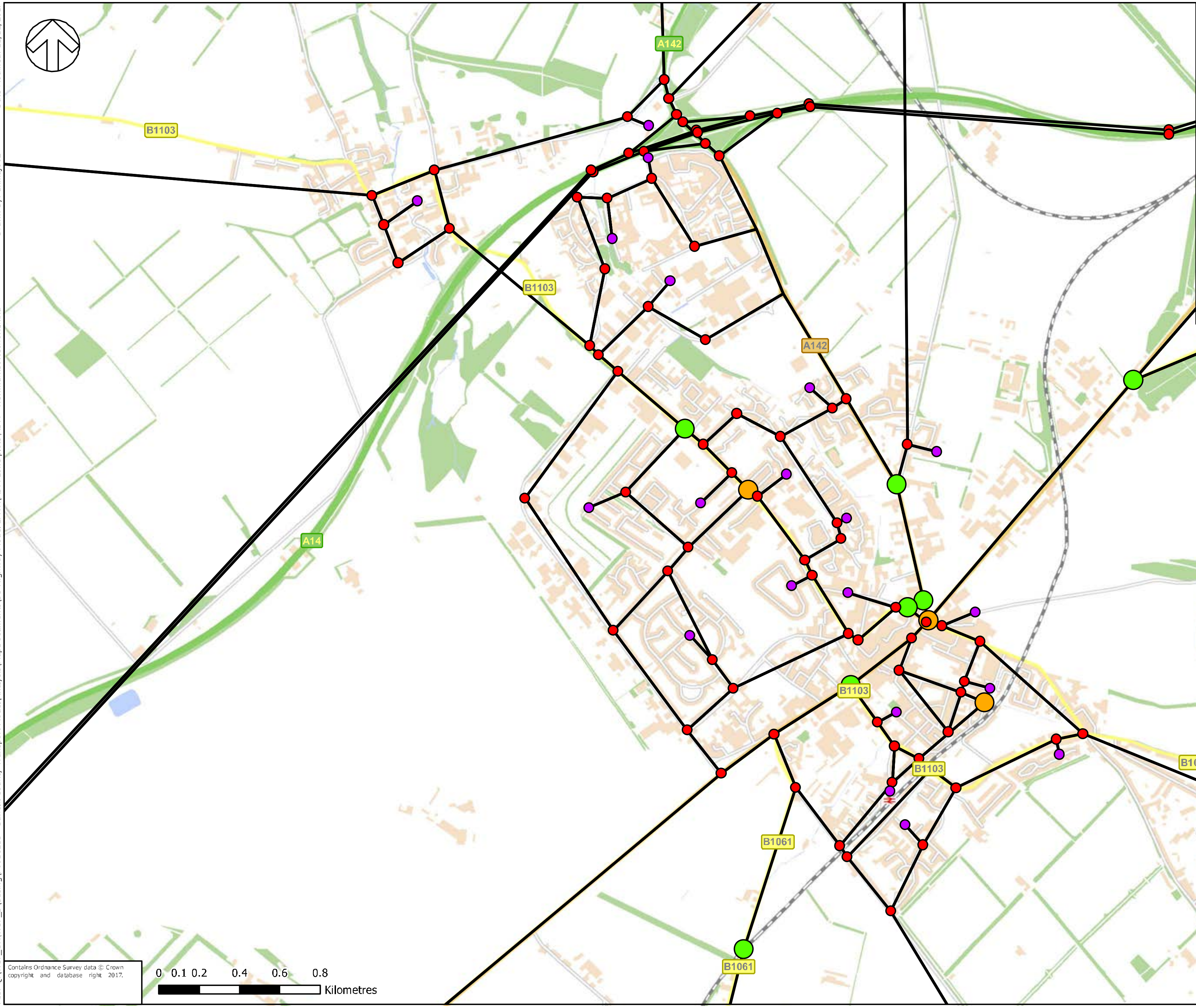
File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Ipswich Network.mxd

Drawn By: ukmdj002

Date Modified: 11/12/2017



Date Modified: 11/12/2017
Drawn By: ukmdj002
File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Lowestoft Network.mxd



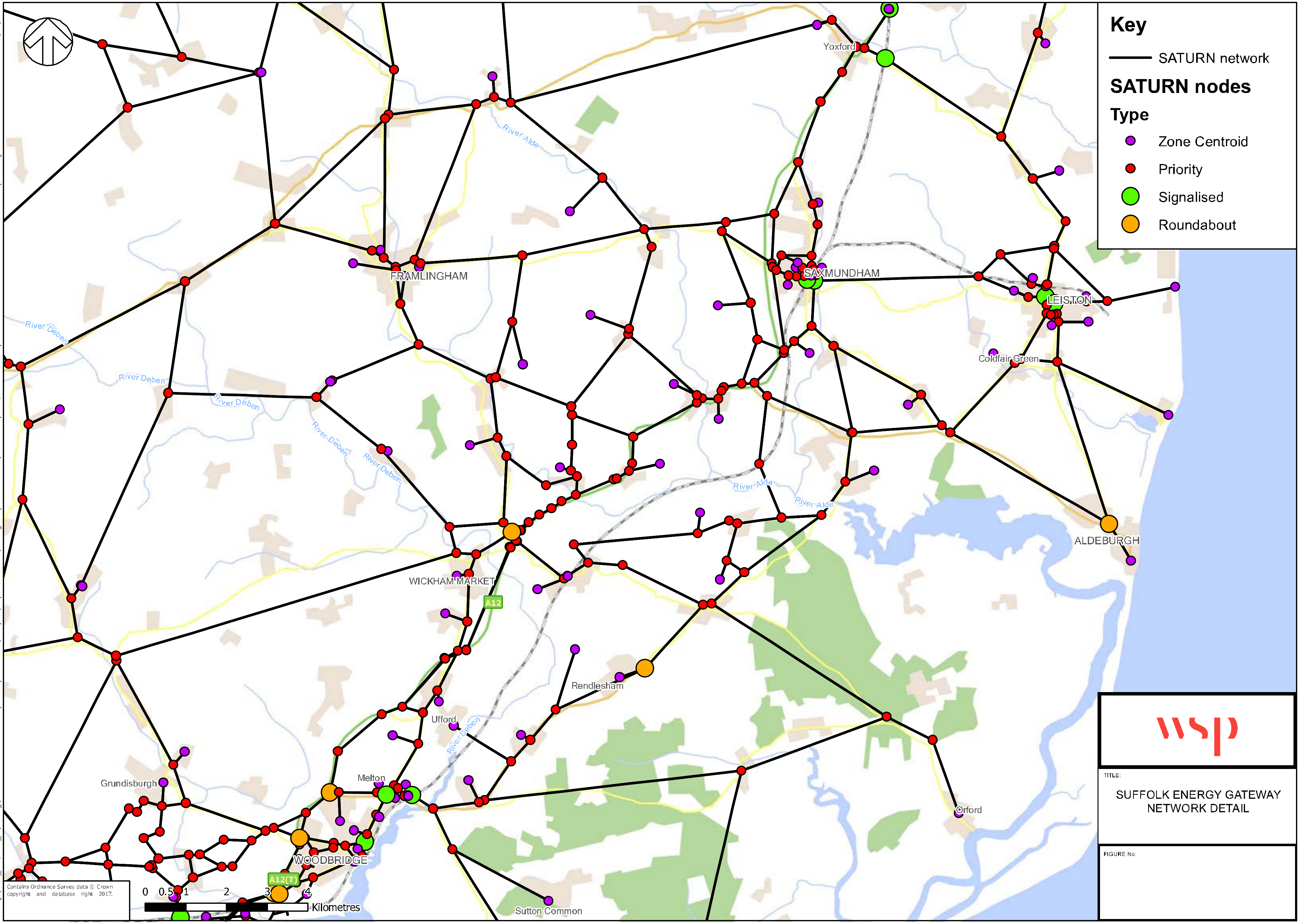
TITLE:
NEWMARKET
NETWORK DETAIL

FIGURE No:

File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Newmarket Network.mxd

Drawn By: ukmdj002

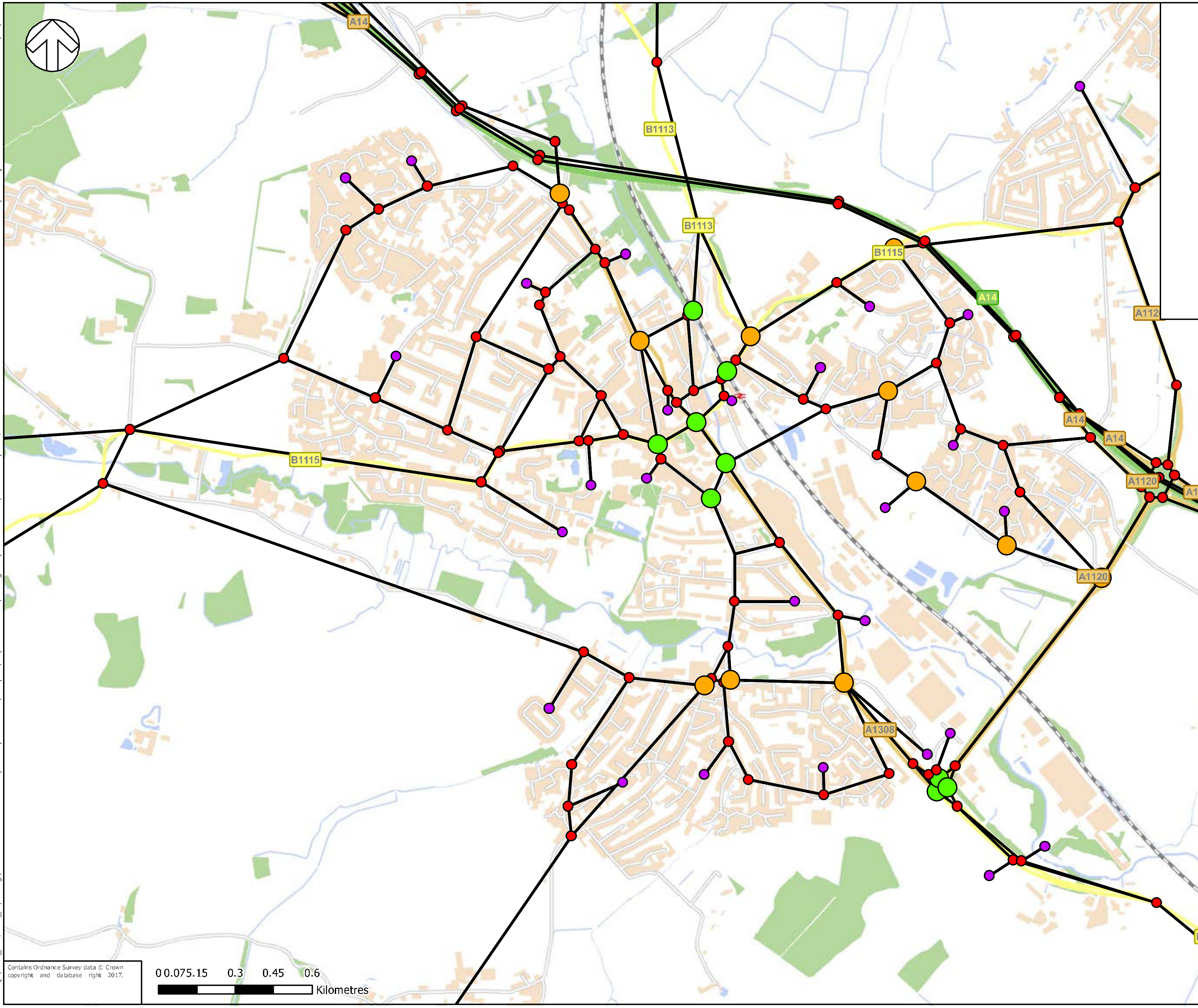
Date Modified: 11/12/2017



TITLE:
SUFFOLK ENERGY GATEWAY
NETWORK DETAIL

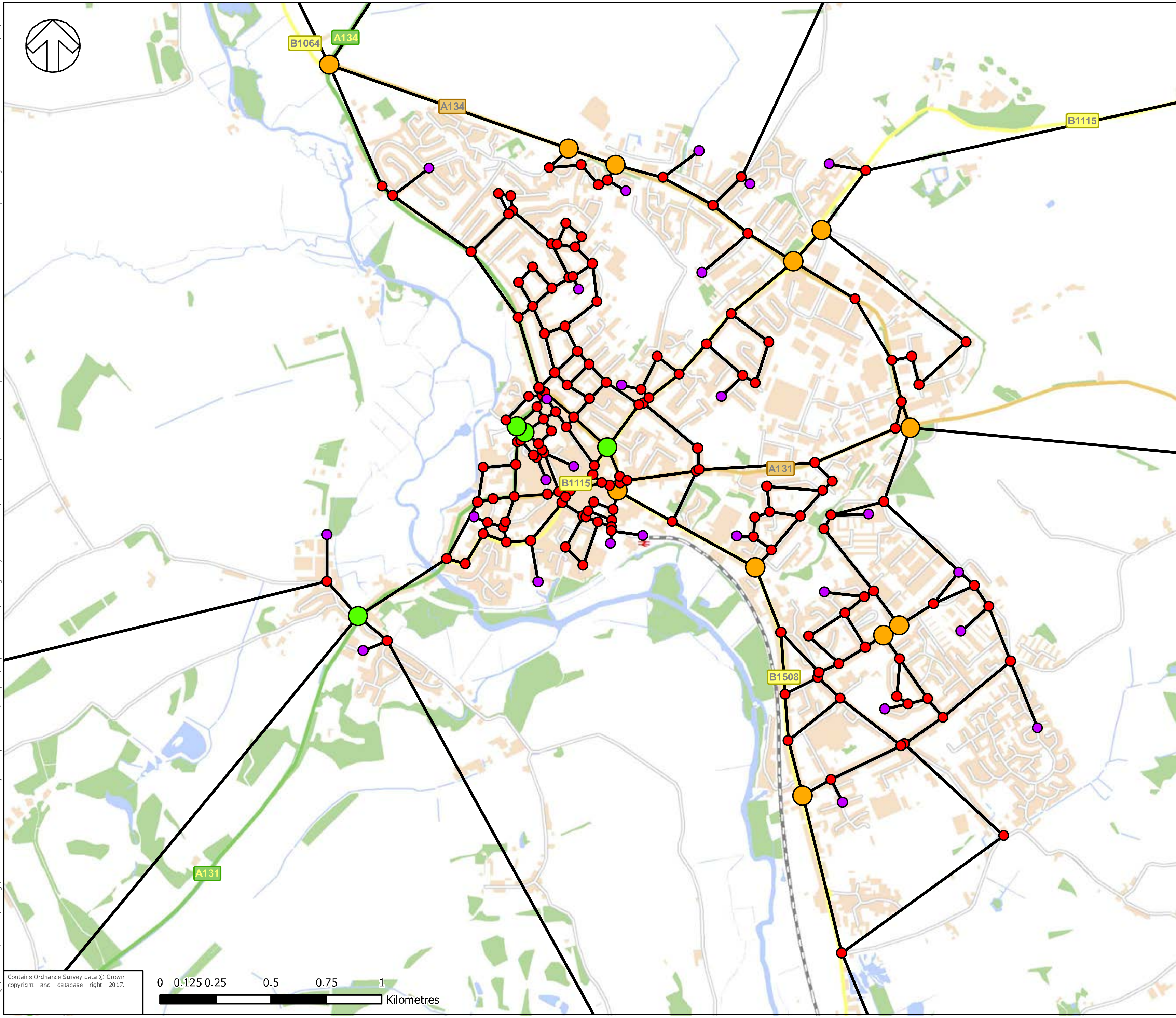
FIGURE No:

Date Modified: 11/12/2017
Drawn By: ukmdj002
File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - SEGWay Network.mxd



TITLE:
STOWMARKET
NETWORK DETAIL

FIGURE No:



TITLE: SUDBURY NETWORK DETAIL

FIGURE No:

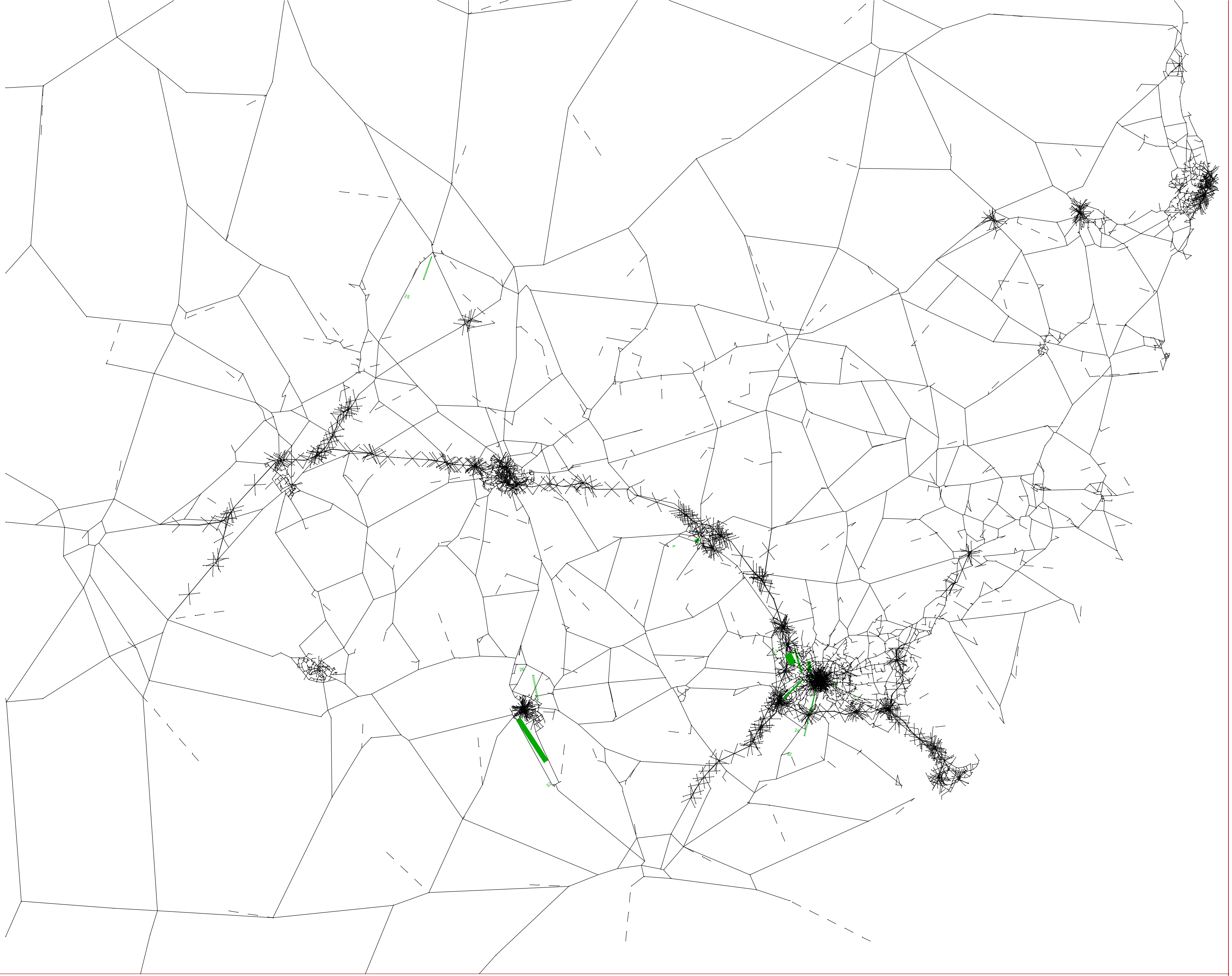
File: Q:\WSP_UK\WSP_D\Basing\70016133 - Suffolk County Transport Model\Analysis\MapDocuments\D3 Highway Model LMVR\ADM zone plots\ADM - Sudbury Network.mxd

Drawn By: ukmdj002

Date Modified: 11/12/2017

Appendix B

QUEUED FLOW AT END OF TIME PERIOD



SATURN

Atkins Ltd /

DVV / ITS

TM_2016_AM_B
ase_V84s.UFS

Scale 480568

Link Annot:

Q at end

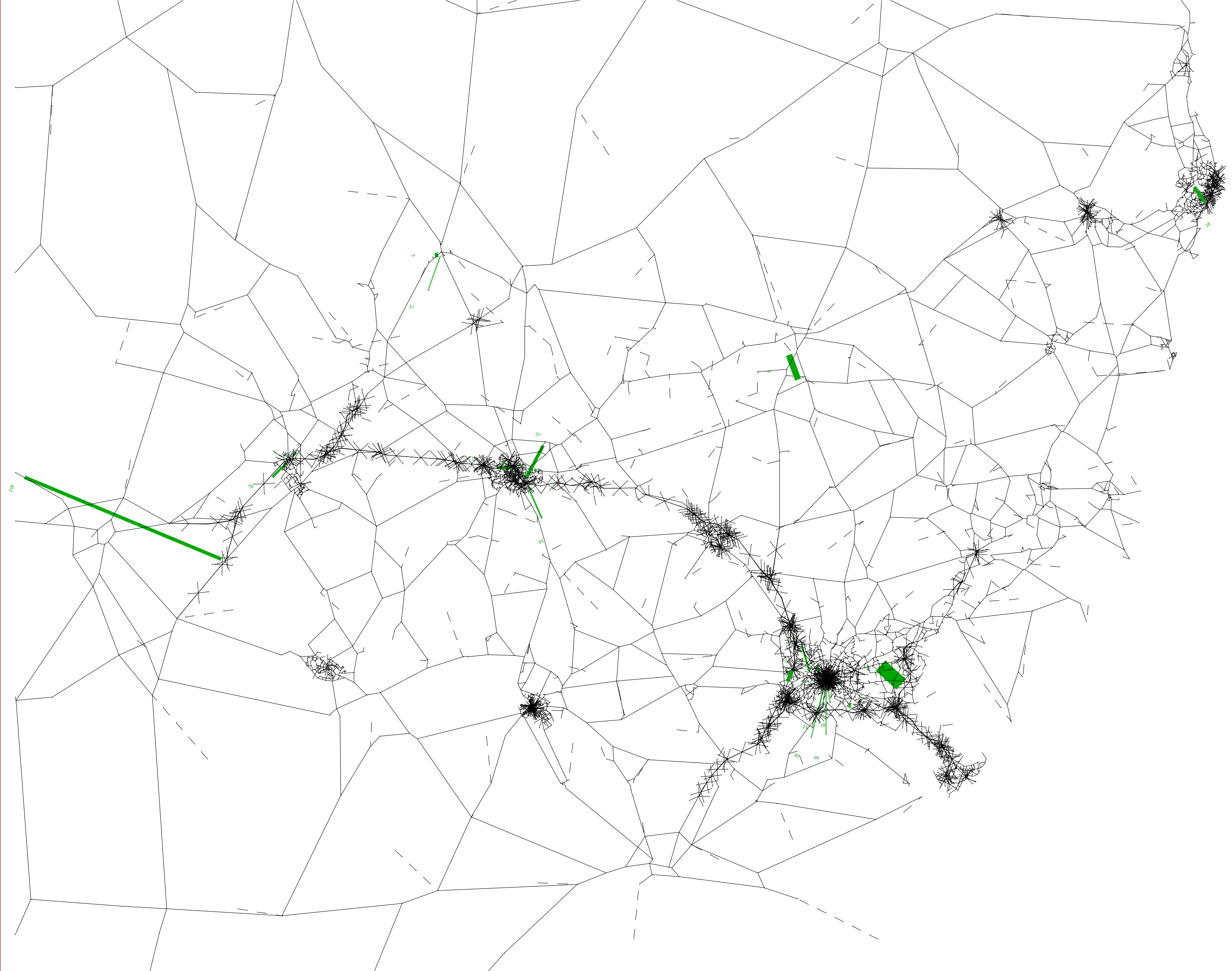
Bandwidths =
5./mm

AM Peak
Queued flow at end of time period
County wide

28-11-17

WSP GROUP (S

SCTM_2016_AM_Base_V84s 28-11-17



SATURN

Atkins Ltd /

DVV / ITS

TM_2016_PM_Base_V84s.UFS

Scale 480568

Link Annot:

Q at end

Bandwidths =

5./mm

PM Peak
Queued flow at end of time period
County wide

28-11-17

WSP GROUP (S

SATURN

Atkins Ltd /
DVV / ITS

TM_2016_AM_Base_V84s.UFS

Scale 63270

Link Annot:

Q at end

Bandwidths =
5./mm

AM Peak
Queued flow at end of time period
Ipswich

28-11-17
WSP GROUP (S

SCTM_2016_AM_Base_V84s 28-11-17

SATURN

Atkins Ltd /
DVV / ITS

TM_2016_PM_Base_V84s.UFS

Scale 63270

Link Annot:

Q at end

Bandwidths =
5./mm

PM Peak
Queued flow at end of time period
Ipswich

28-11-17

WSP GROUP (S

SCTM_2016_PM_Base_V84s 28-11-17

SATURN

Atkins Ltd /
DVV / ITS

TM_2016_AM_B
ase_V84s.UFS

Scale 55885

Link Annot:

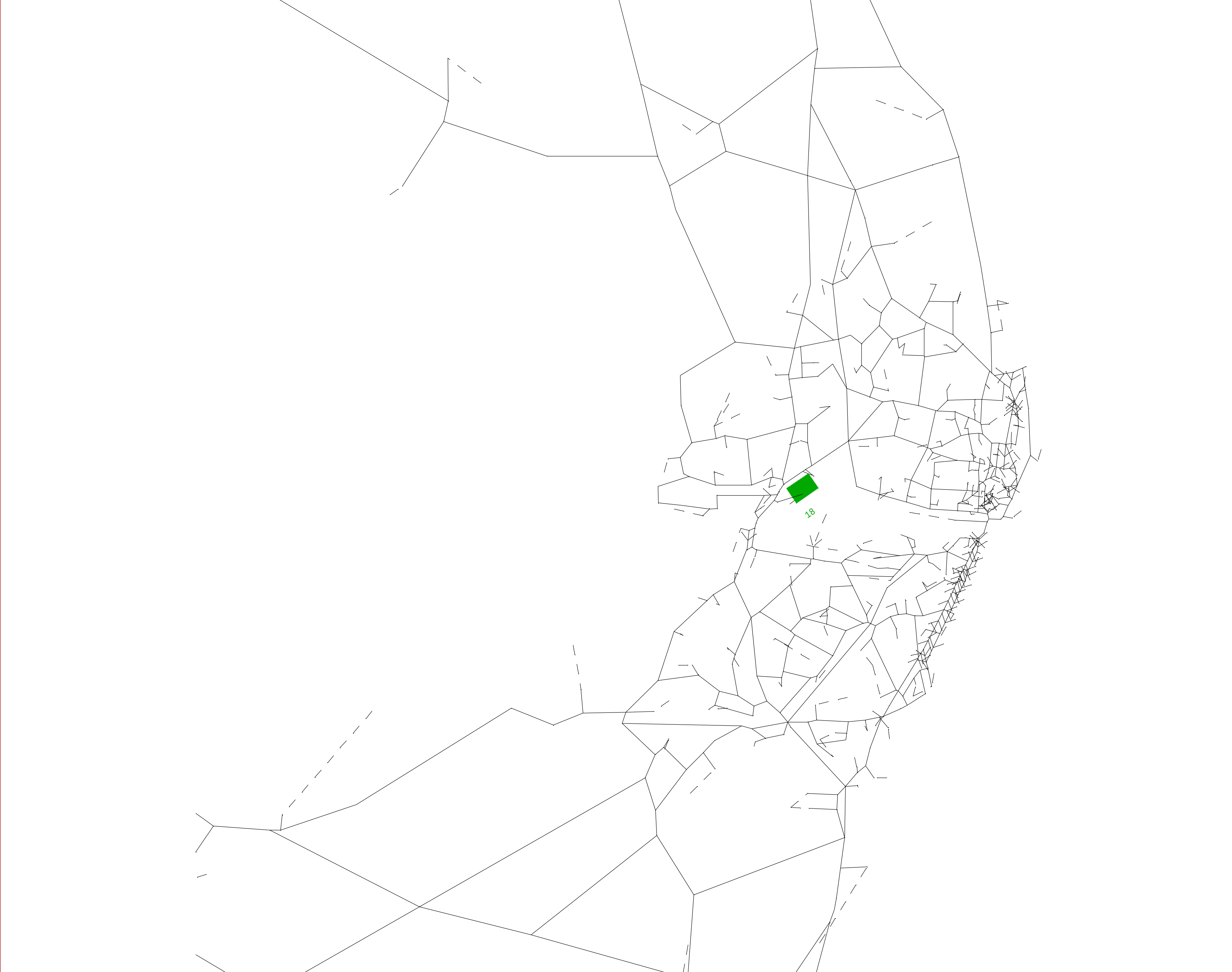
Q at end

Bandwidths =
1./mm

AM Peak
Queued flow at end of time period
Lowestoft

28-11-17
WSP GROUP (S

SCTM_2016_AM_Base_V84s 28-11-17



SATURN

Atkins Ltd /
DVV / ITS

TM_2016_PM_B
ase_V84s.UFS

Scale 55885

Link Annot:

Q at end

Bandwidths =
5./mm

PM Peak
Queued flow at end of time period
Lowestoft

28-11-17
WSP GROUP (S

SCTM_2016_PM_Base_V84s 28-11-17

Appendix C

A14 COUNT DATA ADJUSTMENTS

A14 JUNCTION 52, CLAYDON

Table C-1 – A14 Junction 52, Claydon traffic count adjustments – AM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	2899	2412	176	311				
Off-slip	EB	TRADS	315	270	13	32	315	247	36	32
On-slip	EB	MCTC	775	622	101	52				
Prior to junction	WB	TRADS	2694	2116	169	409	2694	1783	487	424
Off-slip	WB	TRADS	706	603	38	66	706	540	106	60
On-slip	WB	MCTC	243	158	57	28				

Table C-2 – A14 Junction 52, Claydon traffic count adjustments – Inter peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	1664	1127	128	409				
Off-slip	EB	TRADS	153	108	11	34	153	86	33	34
On-slip	EB	MCTC	540	381	94	65				
Prior to junction	WB	TRADS	1913	1406	131	376	1913	1272	317	324
Off-slip	WB	TRADS	507	401	34	71	507	343	88	76
On-slip	WB	MCTC	155	92	33	30				

Table C-3 – A14 Junction 52, Claydon traffic count adjustments – PM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	2638	2184	178	276				
Off-slip	EB	TRADS	283	258	10	15	283	208	60	15
On-slip	EB	MCTC	827	693	118	16				
Prior to junction	WB	TRADS	2974	2606	103	265	2974	2409	297	268
Off-slip	WB	TRADS	684	618	32	33	684	566	91	27
On-slip	WB	MCTC	286	241	36	9				

A14 JUNCTION 53, BURY ROAD

Table C-4 – A14 Junction 53, Bury Road traffic count adjustments – AM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Off-slip	EB	TRADS	1023	932	49	42	1023	871	110	42
Within junction	EB	TRADS	2427	1928	186	313	2336	1855	192	289
On-slip	EB	MCTC	457	317	118	22				
Off-slip	WB	TRADS	514	463	33	19	454	391	56	7
Within junction	WB	TRADS	1901	1388	132	381	1901	1148	353	400
On-slip	WB	MCTC	754	604	127	23	793	635	134	24

Table C-5 – A14 Junction 53, Bury Road traffic count adjustments – Inter peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Off-slip	EB	TRADS	659	593	36	31	659	516	112	31
Within junction	EB	TRADS	1414	873	132	410	1392	830	153	409
On-slip	EB	MCTC	358	263	68	27				
Off-slip	WB	TRADS	289	243	23	23	257	188	56	13
Within junction	WB	TRADS	1321	860	101	360	1321	795	214	313
On-slip	WB	MCTC	637	514	111	12	592	478	103	11

Table C-6 – A14 Junction 53, Bury Road traffic count adjustments – PM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Off-slip	EB	TRADS	843	798	33	12	843	693	138	12
Within junction	EB	TRADS	2166	1750	170	246	2339	1871	203	265
On-slip	EB	MCTC	582	513	62	7				
Off-slip	WB	TRADS	414	381	20	13	366	293	67	7
Within junction	WB	TRADS	2095	1747	87	261	2095	1621	217	256
On-slip	WB	MCTC	959	859	87	13	880	788	80	12

A14 JUNCTION 54, SPROUGHTON ROAD

Table C-7 – A14 Junction 54, Sproughton Road traffic count adjustments – AM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to Junction	EB	TRADS	2900	2319	233	348	2793	2172	310	311
Off-slip	EB	TRADS	427	373	26	28	427	312	88	28
On-slip	EB	MCTC	502	396	85	21	645	509	109	27
Off-slip	WB	TRADS	277	218	37	22	277	198	59	20
On-slip	WB	MCTC	291	205	67	19				

Table C-8 – A14 Junction 54, Sproughton Road traffic count adjustments – Inter peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to Junction	EB	TRADS	1738	1167	147	423	1750	1093	221	436
Off-slip	EB	TRADS	230	192	18	20	230	145	65	20
On-slip	EB	MCTC	210	143	51	16	280	191	68	21
Off-slip	WB	TRADS	202	148	29	25	202	127	56	20
On-slip	WB	MCTC	194	131	45	18				

Table C-9 – A14 Junction 54, Sproughton Road traffic count adjustments – PM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to Junction	EB	TRADS	2734	2308	175	251	2921	2384	265	272
Off-slip	EB	TRADS	377	353	15	10	377	308	59	10
On-slip	EB	MCTC	388	336	48	4	391	338	48	4
Off-slip	WB	TRADS	446	390	37	19	446	371	65	10
On-slip	WB	MCTC	355	294	50	11				

A14 JUNCTION 55, COPDOCK INTERCHANGE

Table C-10 – A14 Junction 55, Copdock Interchange traffic count adjustments – AM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	3011	2358	279	374	3011	2369	332	310
Off-slip	EB	TRADS	1320	1071	99	150	1299	950	233	116
Within junction	EB	TRADS	1792	1419	99	194				
On-slip	EB	MCTC	1362	1051	207	104	1450	1119	220	111
Off-slip	WB	TRADS	1171	916	75	180	1171	835	202	134
Within junction	WB	TRADS	1371	1042	91	239	1214	744	217	253
On-slip	WB	MCTC	977	683	159	135	1127	788	183	156
After junction	WB	TRADS	2341	1805	152	384	2341	1532	401	408

Table C-11 – A14 Junction 55, Copdock Interchange traffic count adjustments – Inter peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	1799	1219	167	413	1799	1138	224	437
Off-slip	EB	TRADS	920	714	66	140	859	523	161	175
Within junction	EB	TRADS	940	615	63	262				
On-slip	EB	MCTC	961	628	154	179	951	622	152	177
Off-slip	WB	TRADS	934	718	61	155	934	650	156	128
Within junction	WB	TRADS	857	566	64	227	786	480	117	189
On-slip	WB	MCTC	753	469	154	130	799	498	163	138
After junction	WB	TRADS	1586	1096	124	366	1586	978	281	327

Table C-12 – A14 Junction 55, Copdock Interchange traffic count adjustments – PM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	2934	2484	196	254	2934	2414	254	266
Off-slip	EB	TRADS	1477	1334	61	82	1470	1169	192	109
Within junction	EB	TRADS	1464	1245	62	157				
On-slip	EB	MCTC	1340	1074	168	98	1243	996	156	91
Off-slip	WB	TRADS	1315	1139	51	125	1315	1120	118	76
Within junction	WB	TRADS	1675	1417	65	193	1480	1166	129	186
On-slip	WB	MCTC	956	736	152	68	1072	825	170	76
After junction	WB	TRADS	2552	2180	108	264	2552	1991	299	262

A14 JUNCTION 56, A137 WHERSTEAD

Table C-13– A14 Junction 56, A137 Wherstead traffic count adjustments – AM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	3162	2518	295	349	3162	2538	319	305
Off-slip	EB	TRADS	562	484	29	49	542	467	51	24
Within junction	EB	TRADS	2619	2179	156	284	2619	2070	268	281
On-slip	EB	MCTC	906	835	54	17	882	813	53	17
Off-slip	WB	MCTC	676	594	68	14				
On-slip	WB	MCTC	538	411	80	47	516	394	77	45
After junction	WB	TRADS	2385	1780	196	409	2385	1579	419	387

Table C-14 – A14 Junction 56, A137 Wherstead traffic count adjustments – Inter peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	1891	1232	172	487	1891	1237	215	439
Off-slip	EB	TRADS	320	263	20	37	307	221	53	33
Within junction	EB	TRADS	1584	1041	99	444	1584	1016	162	406
On-slip	EB	MCTC	386	301	61	24	359	280	57	22
Off-slip	WB	MCTC	338	260	57	21				
On-slip	WB	MCTC	348	245	56	47	298	210	48	40
After junction	WB	TRADS	1720	1202	145	373	1720	1130	273	317

Table C-15– A14 Junction 56, A137 Wherstead traffic count adjustments – PM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	2707	2210	214	284	2707	2241	218	248
Off-slip	EB	TRADS	509	465	25	19	332	263	63	6
Within junction	EB	TRADS	2376	1936	116	323	2376	1978	155	242
On-slip	EB	MCTC	785	708	66	11	634	572	53	9
Off-slip	WB	MCTC	815	707	94	14				

On-slip	WB	MCTC	619	544	64	11	444	390	46	8
After junction	WB	TRADS	2795	2371	138	286	2795	2286	247	262

A14 JUNCTION 57, A1189 NACTON ROAD

Table C-16 – A14 Junction 57, A1189 Nacton Road traffic count adjustments – AM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	3501	2951	228	322	3501	2883	321	297
Off-slip	EB	TRADS	1549	1323	167	59				
Within junction	EB	TRADS	1981	1602	133	247	1952	1560	154	238
On-slip	EB	MCTC	350	208	82	59	164	98	39	28
Off-slip	WB	TRADS	512	469	11	32	512	450	31	30
Within junction	WB	TRADS	1964	1557	97	310	1806	1273	235	298
On-slip	WB	MCTC	791	541	188	62	740	506	176	58

Table C-17– A14 Junction 57, A1189 Nacton Road traffic count adjustments – Inter peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	1943	1345	135	462	1943	1295	219	429
Off-slip	EB	TRADS	749	536	133	80				
Within junction	EB	TRADS	1194	752	70	371	1194	760	86	348
On-slip	EB	MCTC	350	208	82	59	314	187	74	53
Off-slip	WB	TRADS	278	230	15	33	278	187	51	40
Within junction	WB	TRADS	1317	937	88	292	1281	818	199	263
On-slip	WB	MCTC	745	562	129	54	479	362	83	35

Table C-18 – A14 Junction 57, A1189 Nacton Road traffic count adjustments – PM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	3010	2578	144	288	3010	2550	209	251
Off-slip	EB	TRADS	897	710	143	44				
Within junction	EB	TRADS	2092	1740	90	261	2113	1840	66	206
On-slip	EB	MCTC	350	208	82	59	553	329	130	94
Off-slip	WB	TRADS	197	166	7	24	197	124	14	59
Within junction	WB	TRADS	2071	1736	84	250	1841	1141	187	243
On-slip	WB	MCTC	1523	1369	124	29	1325	1192	108	25

A14 JUNCTION 58, A12 / A1156 FELIXSTOWE ROAD

Table C-19 – A14 Junction 58, A12 / Felixstowe Road traffic count adjustments – AM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	2146	1673	195	278	2116	1658	193	266
Off-slip	EB	TRADS	1364	1154	88	122				
On-slip	EB	MCTC	588	512	64	12				
Prior to junction	WB	TRADS	1661	1219	142	300				
Off-slip	WB	MCTC	566	484	60	22	533	456	56	21
Within junction	WB	TRADS	1047	764	35	247	1128	763	86	279
On-slip	WB	MCTC	1189	979	160	50				
After junction	WB	TRADS	2491	1949	185	357	2317	1742	246	329

Table C-20 – A14 Junction 58, A12 / Felixstowe Road traffic count adjustments – Inter peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	1507	984	114	409	1507	946	159	402
Off-slip	EB	TRADS	795	645	56	93				
On-slip	EB	MCTC	381	319	47	15				
Prior to junction	WB	TRADS	1098	752	112	234				
Off-slip	WB	MCTC	449	376	58	15	434	363	56	14
Within junction	WB	TRADS	654	390	42	222	664	389	56	220
On-slip	WB	MCTC	894	659	158	77				
After junction	WB	TRADS	1547	1049	156	342	1558	1048	214	297

Table C-21 – A14 Junction 58, A12 / Felixstowe Road traffic count adjustments – PM peak

Junction Movement	Direction	Data Source	Original Survey Data				Adjusted Survey Data			
			Total	Cars	LGVs	HGVs	Total	Cars	LGVs	HGVs
Prior to junction	EB	TRADS	2645	2271	126	247	2666	2169	196	300
Off-slip	EB	TRADS	1546	1452	55	39				
On-slip	EB	MCTC	571	516	53	2				
Prior to junction	WB	TRADS	1631	1272	131	228				
Off-slip	WB	MCTC	631	571	57	3	666	602	60	3
Within junction	WB	TRADS	985	718	36	231	966	670	71	225
On-slip	WB	MCTC	1073	908	123	42				
After junction	WB	TRADS	2344	1891	162	291	2039	1578	194	267

Appendix D

JOURNEY TIME ROUTES

Appendix D.1

JOURNEY TIME ROUTE

DESCRIPTIONS

Table D-1 Journey Time Routes

Route	Length (km)	Road	Description
1	11.4	A14	J36-J38 through Newmarket
2	12.6	A14	J38-J41
3	14.4	A14	J41-J46 through Bury St Edmunds
4	11.0	A14	J46-J49
5	9.8	A14	J49-J51 through Stowmarket
6	9.6	A14	J51-J54 to Ipswich
7	10.9	A14	J54-J57 through Ipswich
8	13.6	A14	J57- J62 through Felixstowe
9	13.8	A12	Dedham to Ipswich (J55)
10	11.9	A12	J58 to Woodbridge
11	18.3	A12	Woodbridge to Farnham
12	9.4	A12	Farnham to Darsham
13	10.5	A12	Darsham to Wangford
14	14.1	A12	Wangford to Pakefield
15	12.0	A12	Pakefield to Blundeston (through Lowestoft)
16	10.6	A134	Middleton to Long Melford
17	9.3	A134	Long Melford to Stanningfield
18	8.2	A134	Stanningfield to Bury St Edmunds
19	10.0	A134	Bury St Edmunds to Airfield
20	6.2	A134	Airfield to Thetford
21	10.7	A143	Bury St Edmunds to Ixworth
22	11.8	A143	Ixworth to Rickinghall
23	13.6	A143	Rickinghall to Scole
24	10.4	A11	Kennett to Mildenhall
26	13.9	A1065	Mildenhall to Lakenheath
27	14.2	A140	Coddenham to Wickham Skeith
28	11.5	A140	Wickham Skeith to Scole
29	12.6	A1101	Bury St Edmunds to Icklingham
30	12.0	A1101	Icklingham to Beck Row
31	10.4	A1101	Beck Row to Burnt Fen
32	12.3	A143	Haverhill to Stradishall
33	8.8	A143	Stradishall to Chevington
34	7.6	A143	Chevington to Bury St Edmunds
35	13.2	A134	Great Conard to Nayland
36	11.1	A1071	Newton to Hadleigh

Route	Length (km)	Road	Description
37	11.5	A1071	Hadleigh to Ipswich
38	14.1	A1141	Hadleigh to Lavenham
39	8.1	A1141	Lavenham to Stanningfield
40	12.1	A137	Brantham to Ipswich
41	13.0	A145	Weston to Blythburgh
42	13.4	A144	Darsham to St Lawrence
43	9.3	A144	St Lawrence to Ditchingham
44	10.2	A1094	Farnham to Aldeburgh
45	12.9	A1120	Stowupland to Peats Corner
46	11.7	A1120	Peats Corner to Dennington
47	12.9	A1120	Dennington to Yoxford
48	15.1	A1088	Thretford to Ixworth
49	8.7	A1088	Ixworth to Woolpit
50	9.0	A1303	Kennett to Newmarket Heath
51	10.1	A1092	Wixoe to Cavendish
52	6.8	A1092	Cavendish to Stanstead
53	5.5	A1307	through Haverhill
54	5.6	A1017	through Haverhill
55	5.7	A134	through Sudbury
56	5.9	A154	through Felixstowe
57	7.1	A1308	through Stowmarket
58	5.5	A1302	through Bury St Edmunds
59	7.4	A145	through Beccles
60	9.0	A1145	through Lowestoft
61	13.5	A1214	through Ipswich
62	11.8	A1156	through Ipswich
63	7.9	A1214	through Ipswich
64	7.4	A145	Beccles to Lowestoft
101	4.5	B1375	B1375 Gorleston Road
102	6.1	A12	A12 Yarmouth Road / Katwijk Way
103	3.2	A1117 / A1144	A1117 Normanston Drive / A1144 St Peter's Street
104	6.8	A12 / B1532	A12 London Road / B1532 London Road South
105	3.6	B1074 / A1117	B1074 / A1117 Millennium Way / Oulton Road
106	9.5	A146	A146 Beccles Road / A146 Waveney Drive
200	7.3	B1438	Yarmouth Road / Melton Road (Woodbridge)
201	13.5	B1116	B1116 / B1078 / B1438

Route	Length (km)	Road	Description
202	9.9	B1078	B1078 Ipswich Road
203	3.7	B1078	B1078 Ash Road
204	11.5	A1152	A1152
205	6.0	B1069	B1069 (South of A1094)
206	4.3	B1069	B1069 Snape Road (North of A1094)
207	7.6	B1119	B1119 Saxmundham Road

Appendix D.2

JOURNEY TIME ROUTE

PERFORMANCE SUMMARY

			AM Peak				
ID	Name	Observed (s)	Modelled (s)	Diff	%	Pass?
1	1-EB	380	392	12	3%	Yes
2	1-WB	513	539	26	5%	Yes
3	2-EB	444	462	18	4%	Yes
4	2-WB	461	562	101	22%	No
5	3-EB	505	523	18	4%	Yes
6	3-WB	606	743	137	23%	No
7	4-EB	390	398	8	2%	Yes
8	4-WB	418	492	74	18%	No
9	5-EB	385	376	-9	-2%	Yes
10	5-WB	425	392	-33	-8%	Yes
11	6-EB	380	511	131	35%	No
12	6-WB	376	476	100	27%	No
13	7-EB	481	674	193	40%	No
14	7-WB	477	524	47	10%	Yes
15	8-EB	534	504	-30	-6%	Yes
16	8-WB	520	534	14	3%	Yes
17	9-NB	963	571	-392	-41%	No
18	9-SB	549	495	-54	-10%	Yes
19	10-NB	637	624	-13	-2%	Yes
20	10-SB	800	693	-107	-13%	Yes
21	11-EB	841	897	56	7%	Yes
22	11-WB	888	975	87	10%	Yes
23	12-NB	504	514	10	2%	Yes
24	12-SB	500	514	14	3%	Yes
25	13-NB	534	494	-40	-8%	Yes
26	13-SB	536	494	-42	-8%	Yes
27	14-NB	766	760	-6	-1%	Yes
28	14-SB	782	751	-31	-4%	Yes
29	15-NB	544	538	-6	-1%	Yes
30	15-SB	479	479	0	0%	Yes
31	16-NB	725	659	-66	-9%	Yes
32	16-SB	857	1134	277	32%	No
33	17-NB	523	497	-26	-5%	Yes
34	17-SB	489	490	1	0%	Yes
35	18-NB	825	519	-306	-37%	No
36	18-SB	501	490	-11	-2%	Yes
37	19-NB	525	543	18	3%	Yes
38	19-SB	546	523	-23	-4%	Yes
39	20-NB	353	332	-21	-6%	Yes
40	20-SB	363	364	1	0%	Yes
41	21-EB	623	638	15	2%	Yes
42	21-WB	743	778	35	5%	Yes
43	22-EB	630	603	-27	-4%	Yes
44	22-WB	720	693	-27	-4%	Yes
45	23-EB	686	647	-39	-6%	Yes
46	23-WB	704	643	-61	-9%	Yes
47	24-NB	381	505	124	33%	No
48	24-SB	440	567	127	29%	No
51	26-NB	759	757	-2	0%	Yes
52	26-SB	787	819	32	4%	Yes
53	27-NB	800	736	-64	-8%	Yes
54	27-SB	871	780	-91	-10%	Yes
55	28-NB	637	585	-52	-8%	Yes
56	28-SB	614.459274	622	8	1%	Yes

		AM Peak				
ID	Name	Observed (s)	Modelled (s)	Diff	%	Pass?
57	29-NB	857	772	-85	-10%	Yes
58	29-SB	953	755	-198	-21%	No
59	30-EB	946	809	-137	-15%	Yes
60	30-WB	933	764	-169	-18%	No
61	31-NB	508	494	-14	-3%	Yes
62	31-SB	523	498	-25	-5%	Yes
63	32-EB	689	619	-70	-10%	Yes
64	32-WB	684	636	-48	-7%	Yes
65	33-NB	469	398	-71	-15%	Yes
66	33-SB	459	408	-51	-11%	Yes
67	34-EB	655	586	-70	-11%	Yes
68	34-WB	542	537	-5	-1%	Yes
69	35-NB	801	822	21	3%	Yes
70	35-SB	775	837	62	8%	Yes
71	36-EB	567	638	71	13%	Yes
72	36-WB	638	648	10	2%	Yes
73	37-EB	1167	794	-373	-32%	No
74	37-WB	734	720	-14	-2%	Yes
75	38-SB	875	818	-57	-6%	Yes
76	38-NB	940	821	-119	-13%	Yes
77	39-NB	577	709	132	23%	No
78	39-SB	481	470	-11	-2%	Yes
79	40-NB	1638	926	-712	-43%	No
80	40-SB	987	895	-92	-9%	Yes
81	41-NB	689	671	-18	-3%	Yes
82	41-SB	694	690	-4	-1%	Yes
83	42-NB	922.025737	781	-141	-15%	Yes
84	42-SB	902	776	-126	-14%	Yes
85	43-NB	613	533	-80	-13%	Yes
86	43-SB	616	538	-78	-13%	Yes
87	44-EB	559	494	-65	-12%	Yes
88	44-WB	540	502	-38	-7%	Yes
89	45-EB	813	772	-41	-5%	Yes
90	45-WB	820	779	-41	-5%	Yes
91	46-EB	736	558	-178	-24%	No
92	46-WB	690	557	-133	-19%	No
93	47-EB	779	797	18	2%	Yes
94	47-WB	795	791	-4	0%	Yes
95	48-NB	779	687	-92	-12%	Yes
96	48-SB	798	702	-96	-12%	Yes
97	49-NB	533	478	-55	-10%	Yes
98	49-SB	521	485	-36	-7%	Yes
99	50-EB	628	543	-85	-14%	Yes
100	50-WB	832	691	-141	-17%	No
101	51-EB	728	649	-79	-11%	Yes
102	51-WB	732	691	-41	-6%	Yes
103	52-EB	424	462	38	9%	Yes
104	52-WB	431	466	35	8%	Yes
105	53-EB	524	508	-16	-3%	Yes
106	53-WB	509	506	-3	-1%	Yes
107	54-EB	297	292	-5	-2%	Yes
108	54-WB	311	308	-3	-1%	Yes
109	55-NB	532	574	42	8%	Yes
110	55-SB	498	405	-93	-19%	No

ID	Name	AM Peak Observed (s)	Modelled (s)	Diff	%	Pass?
111	56-NB	601	559	-42	-7%	Yes
112	56-SB	665	535	-130	-20%	No
113	57-EB	642	565	-77	-12%	Yes
114	57-WB	714	553	-161	-23%	No
115	58-NB	694	602	-92	-13%	Yes
116	58-SB	853	594	-259	-30%	No
117	59-EB	600	593	-7	-1%	Yes
118	59-WB	670	650	-20	-3%	Yes
119	60-NB	1025	894	-131	-13%	Yes
120	60-SB	956	889	-67	-7%	Yes
121	61-EB	2250	1849	-401	-18%	No
122	61-WB	2359	1726	-633	-27%	No
123	62-EB	2321	1411	-910	-39%	No
124	62-WB	2081	1592	-489	-23%	No
125	63-EB	1336	762	-574	-43%	No
126	63-WB	1502	826	-676	-45%	No
127	64-EB	316	306	-10	-3%	Yes
128	64-WB	311	317	6	2%	Yes
129	101-NB	356	412	56	16%	Yes
130	101-SB	412	361	-51	-12%	Yes
131	102-NB	701	662	-39	-6%	Yes
132	102-SB	753	668	-85	-11%	Yes
133	103-EB	383	375	-8	-2%	Yes
134	103-WB	372	428	56	15%	Yes
135	104-NB	543	518	-25	-5%	Yes
136	104-SB	390	401	11	3%	Yes
137	105-EB	505	462	-43	-8%	Yes
138	105-WB	447	365	-82	-18%	No
139	106-EB	620	480	-140	-23%	No
140	106-WB	515	502	-13	-3%	Yes
141	200-NB	702	635	-67	-10%	Yes
142	200-SB	799	682	-117	-15%	Yes
143	201-NB	1041	890	-151	-14%	Yes
144	201-SB	1046	902	-144	-14%	Yes
145	202-EB	590	563	-27	-5%	Yes
146	202-WB	588	574	-14	-2%	Yes
147	203-EB	280	274	-6	-2%	Yes
148	203-WB	292	276	-16	-5%	Yes
149	204-EB	753	763	10	1%	Yes
150	204-WB	865	908	43	5%	Yes
151	205-NB	392	383	-8	-2%	Yes
152	205-SB	364	395	31	8%	Yes
153	206-NB	327	374	47	14%	Yes
154	206-SB	314	345	31	10%	Yes
155	207-EB	617	620	3	1%	Yes
156	207-WB	596	596	0	0%	Yes

		Interpeak				
ID	Name	Observed (s)	Modelled (s)	Diff	%	Pass?
1	1-EB	391	400	9	2%	Yes
2	1-WB	395	406	11	3%	Yes
3	2-EB	442	460	18	4%	Yes
4	2-WB	433	456	23	5%	Yes
5	3-EB	525	517	-8	-2%	Yes
6	3-WB	516	513	-3	-1%	Yes
7	4-EB	391	391	0	0%	Yes
8	4-WB	388	387	-1	0%	Yes
9	5-EB	378	349	-29	-8%	Yes
10	5-WB	381	327	-54	-14%	Yes
11	6-EB	352	398	46	13%	Yes
12	6-WB	351	394	43	12%	Yes
13	7-EB	413	452	39	9%	Yes
14	7-WB	407	431	24	6%	Yes
15	8-EB	527	495	-32	-6%	Yes
16	8-WB	520	495	-25	-5%	Yes
17	9-NB	555	513	-42	-7%	Yes
18	9-SB	509	489	-20	-4%	Yes
19	10-NB	623	589	-34	-6%	Yes
20	10-SB	639	554	-85	-13%	Yes
21	11-EB	845	876	31	4%	Yes
22	11-WB	879	886	7	1%	Yes
23	12-NB	507	502	-5	-1%	Yes
24	12-SB	515	498	-17	-3%	Yes
25	13-NB	547	485	-62	-11%	Yes
26	13-SB	551	484	-67	-12%	Yes
27	14-NB	814	753	-61	-7%	Yes
28	14-SB	787	746	-41	-5%	Yes
29	15-NB	560	622	62	11%	Yes
30	15-SB	514	438	-76	-15%	Yes
31	16-NB	725	639	-86	-12%	Yes
32	16-SB	861	756	-105	-12%	Yes
33	17-NB	523	456	-67	-13%	Yes
34	17-SB	498	468	-30	-6%	Yes
35	18-NB	527	461	-66	-12%	Yes
36	18-SB	513	478	-35	-7%	Yes
37	19-NB	518	500	-18	-3%	Yes
38	19-SB	522	492	-30	-6%	Yes
39	20-NB	348	325	-23	-7%	Yes
40	20-SB	330	339	9	3%	Yes
41	21-EB	616	630	14	2%	Yes
42	21-WB	630	624	-6	-1%	Yes
43	22-EB	633	599	-34	-5%	Yes
44	22-WB	645	619	-26	-4%	Yes
45	23-EB	681	631	-50	-7%	Yes
46	23-WB	687	631	-56	-8%	Yes
47	24-NB	389	517	128	33%	No
48	24-SB	386	509	123	32%	No
51	26-NB	775	762	-13	-2%	Yes
52	26-SB	767	769	2	0%	Yes
53	27-NB	785	698	-87	-11%	Yes
54	27-SB	802	698	-104	-13%	Yes
55	28-NB	603	554	-49	-8%	Yes
56	28-SB	594	560	-34	-6%	Yes

ID	Name		Interpeak				
			Observed (s)	Modelled (s)	Diff	%	Pass?
57	29-NB		838	745	-93	-11%	Yes
58	29-SB		855	743	-112	-13%	Yes
59	30-EB		957	774	-183	-19%	No
60	30-WB		862	742	-120	-14%	Yes
61	31-NB		569	494	-75	-13%	Yes
62	31-SB		528	494	-34	-6%	Yes
63	32-EB		657	605	-52	-8%	Yes
64	32-WB		660	604	-56	-8%	Yes
65	33-NB		473	383	-90	-19%	No
66	33-SB		468	384	-84	-18%	No
67	34-EB		565	546	-19	-3%	Yes
68	34-WB		539	522	-17	-3%	Yes
69	35-NB		791	750	-41	-5%	Yes
70	35-SB		778	743	-35	-5%	Yes
71	36-EB		573	632	59	10%	Yes
72	36-WB		597	634	37	6%	Yes
73	37-EB		699	745	46	7%	Yes
74	37-WB		735	702	-33	-5%	Yes
75	38-SB		946	816	-130	-14%	Yes
76	38-NB		939	805	-134	-14%	Yes
77	39-NB		550	479	-71	-13%	Yes
78	39-SB		536	470	-66	-12%	Yes
79	40-NB		943	860	-83	-9%	Yes
80	40-SB		911	843	-68	-7%	Yes
81	41-NB		710	675	-35	-5%	Yes
82	41-SB		718	683	-35	-5%	Yes
83	42-NB		880	768	-112	-13%	Yes
84	42-SB		898	772	-126	-14%	Yes
85	43-NB		624	522	-102	-16%	No
86	43-SB		634	527	-107	-17%	No
87	44-EB		582	499	-83	-14%	Yes
88	44-WB		587	498	-89	-15%	Yes
89	45-EB		810	748	-62	-8%	Yes
90	45-WB		825	748	-77	-9%	Yes
91	46-EB		721	551	-170	-24%	No
92	46-WB		710	552	-158	-22%	No
93	47-EB		814	794	-20	-2%	Yes
94	47-WB		795	791	-4	0%	Yes
95	48-NB		769	683	-86	-11%	Yes
96	48-SB		783	691	-92	-12%	Yes
97	49-NB		510.69732	460	-51	-10%	Yes
98	49-SB		520	458	-62	-12%	Yes
99	50-EB		649	549	-100	-15%	Yes
100	50-WB		631.845153	621	-10	-2%	Yes
101	51-EB		703	648	-55	-8%	Yes
102	51-WB		714	656	-58	-8%	Yes
103	52-EB		444	461	17	4%	Yes
104	52-WB		453	454	1	0%	Yes
105	53-EB		538	505	-33	-6%	Yes
106	53-WB		542	495	-47	-9%	Yes
107	54-EB		292	290	-2	-1%	Yes
108	54-WB		303	290	-13	-4%	Yes
109	55-NB		537	482	-55	-10%	Yes
110	55-SB		535	393	-142	-27%	No

ID	Name	Interpeak Observed (s)	Modelled (s)	Diff	%	Pass?
111	56-NB	577	529	-48	-8%	Yes
112	56-SB	619	541	-78	-13%	Yes
113	57-EB	604	522	-82	-14%	Yes
114	57-WB	630	526	-104	-17%	No
115	58-NB	556	544	-12	-2%	Yes
116	58-SB	648	566	-82	-13%	Yes
117	59-EB	622	579	-43	-7%	Yes
118	59-WB	654	613	-41	-6%	Yes
119	60-NB	873	958	85	10%	Yes
120	60-SB	887	954	67	8%	Yes
121	61-EB	1652	1673	21	1%	Yes
122	61-WB	1746	1662	-84	-5%	Yes
123	62-EB	1709	1365	-344	-20%	No
124	62-WB	1645	1500	-145	-9%	Yes
125	63-EB	901	729	-172	-19%	No
126	63-WB	872	761	-111	-13%	Yes
127	64-EB	311	299	-12	-4%	Yes
128	64-WB	311	302	-9	-3%	Yes
129	101-NB	344	368	24	7%	Yes
130	101-SB	387	358	-29	-7%	Yes
131	102-NB	723	632	-91	-13%	Yes
132	102-SB	868	690	-178	-20%	No
133	103-EB	359	388	29	8%	Yes
134	103-WB	401	474	73	18%	No
135	104-NB	641	516	-125	-20%	No
136	104-SB	401	395	-6	-1%	Yes
137	105-EB	464	446	-18	-4%	Yes
138	105-WB	423	426	3	1%	Yes
139	106-EB	532	481	-51	-10%	Yes
140	106-WB	483	515	32	7%	Yes
141	200-NB	709.97515	626	-84	-12%	Yes
142	200-SB	703.380395	631	-72	-10%	Yes
143	201-NB	1005.43087	880	-126	-13%	Yes
144	201-SB	1028.48444	878	-150	-15%	Yes
145	202-EB	589.922961	559	-31	-5%	Yes
146	202-WB	594.21187	560	-34	-6%	Yes
147	203-EB	296	271	-25	-8%	Yes
148	203-WB	295	275	-20	-7%	Yes
149	204-EB	752.363064	758	6	1%	Yes
150	204-WB	781.897221	805	23	3%	Yes
151	205-NB	411.813582	389	-23	-5%	Yes
152	205-SB	396.237111	386	-11	-3%	Yes
153	206-NB	329	362	33	10%	Yes
154	206-SB	309.479604	341	32	10%	Yes
155	207-EB	673.877994	616	-57	-9%	Yes
156	207-WB	624.44435	598	-26	-4%	Yes

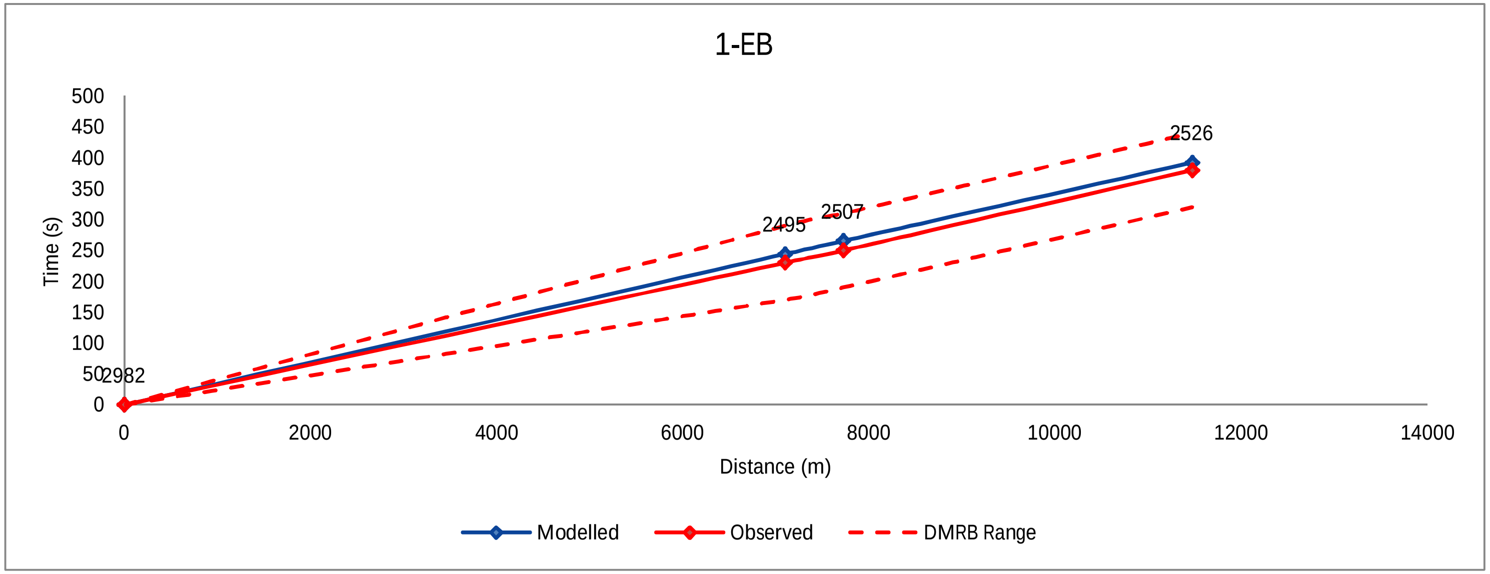
ID	Name		PM Peak				
			Observed (s)	Modelled (s)	Diff	%	Pass?
1	1-EB		404	466	62	15%	Yes
2	1-WB		385	409	24	6%	Yes
3	2-EB		451	533	82	18%	No
4	2-WB		437	464	27	6%	Yes
5	3-EB		597	655	58	10%	Yes
6	3-WB		504	529	25	5%	Yes
7	4-EB		393	466	73	19%	No
8	4-WB		382	400	18	5%	Yes
9	5-EB		381	386	5	1%	Yes
10	5-WB		384	355	-29	-8%	Yes
11	6-EB		367	491	124	34%	No
12	6-WB		363	477	114	31%	No
13	7-EB		450	564	114	25%	No
14	7-WB		465	584	119	26%	No
15	8-EB		521	530	9	2%	Yes
16	8-WB		515	525	10	2%	Yes
17	9-NB		778	570	-208	-27%	No
18	9-SB		508	498	-10	-2%	Yes
19	10-NB		790	699	-91	-12%	Yes
20	10-SB		671	577	-94	-14%	Yes
21	11-EB		821	933	112	14%	Yes
22	11-WB		847	891	44	5%	Yes
23	12-NB		484	516	32	7%	Yes
24	12-SB		498	500	2	0%	Yes
25	13-NB		534	500	-34	-6%	Yes
26	13-SB		522	485	-37	-7%	Yes
27	14-NB		882	775	-107	-12%	Yes
28	14-SB		743	746	3	0%	Yes
29	15-NB		584	521	-63	-11%	Yes
30	15-SB		499	541	42	8%	Yes
31	16-NB		801	676	-125	-16%	No
32	16-SB		877	872	-5	-1%	Yes
33	17-NB		513	481	-32	-6%	Yes
34	17-SB		491	533	42	9%	Yes
35	18-NB		512	479	-33	-6%	Yes
36	18-SB		514	559	45	9%	Yes
37	19-NB		512	569	57	11%	Yes
38	19-SB		529	497	-32	-6%	Yes
39	20-NB		363	336	-27	-7%	Yes
40	20-SB		324	340	16	5%	Yes
41	21-EB		777	754	-23	-3%	Yes
42	21-WB		633	660	27	4%	Yes
43	22-EB		642	653	11	2%	Yes
44	22-WB		638	631	-7	-1%	Yes
45	23-EB		673	652	-21	-3%	Yes
46	23-WB		684	637	-47	-7%	Yes
47	24-NB		390	615	225	58%	No
48	24-SB		389	518	129	33%	No
51	26-NB		753	815	62	8%	Yes
52	26-SB		879	775	-104	-12%	Yes
53	27-NB		785.408675	772	-13	-2%	Yes
54	27-SB		792	728	-64	-8%	Yes
55	28-NB		596	607	11	2%	Yes
56	28-SB		597	606	9	2%	Yes

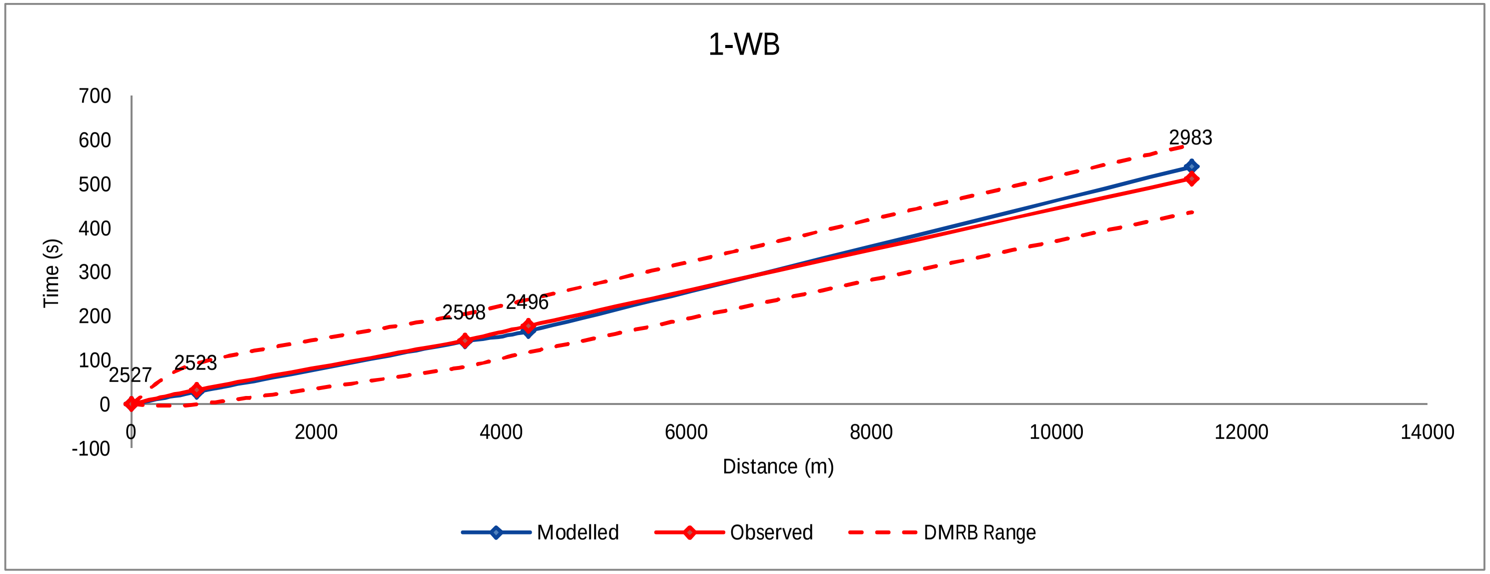
		PM Peak				
ID	Name	Observed (s)	Modelled (s)	Diff	%	Pass?
57	29-NB	884	927	43	5%	Yes
58	29-SB	902	767	-136	-15%	Yes
59	30-EB	998	799	-199	-20%	No
60	30-WB	848	789	-59	-7%	Yes
61	31-NB	487	501	14	3%	Yes
62	31-SB	502	494	-8	-2%	Yes
63	32-EB	640	628	-12	-2%	Yes
64	32-WB	650	620	-30	-5%	Yes
65	33-NB	459	393	-66	-14%	Yes
66	33-SB	460	399	-61	-13%	Yes
67	34-EB	568	542	-26	-5%	Yes
68	34-WB	551	531	-20	-4%	Yes
69	35-NB	794	835	41	5%	Yes
70	35-SB	760	823	63	8%	Yes
71	36-EB	585	640	55	9%	Yes
72	36-WB	640	655	15	2%	Yes
73	37-EB	719	728	9	1%	Yes
74	37-WB	704	734	30	4%	Yes
75	38-SB	909	822	-87	-10%	Yes
76	38-NB	862	817	-45	-5%	Yes
77	39-NB	525	486	-39	-7%	Yes
78	39-SB	502	478	-24	-5%	Yes
79	40-NB	1384	907	-477	-34%	No
80	40-SB	1180	954	-226	-19%	No
81	41-NB	680	694	14	2%	Yes
82	41-SB	712	684	-28	-4%	Yes
83	42-NB	843.312359	774	-70	-8%	Yes
84	42-SB	851	778	-73	-9%	Yes
85	43-NB	583	531	-52	-9%	Yes
86	43-SB	630	537	-93	-15%	Yes
87	44-EB	549	501	-48	-9%	Yes
88	44-WB	544	498	-46	-9%	Yes
89	45-EB	773	776	3	0%	Yes
90	45-WB	800	769	-31	-4%	Yes
91	46-EB	676	559	-117	-17%	No
92	46-WB	689	555	-134	-19%	No
93	47-EB	819	795	-24	-3%	Yes
94	47-WB	760	792	32	4%	Yes
95	48-NB	801	690	-111	-14%	Yes
96	48-SB	775	708	-67	-9%	Yes
97	49-NB	508.012052	489	-19	-4%	Yes
98	49-SB	490	474	-16	-3%	Yes
99	50-EB	639	637	-2	0%	Yes
100	50-WB	608	582	-26	-4%	Yes
101	51-EB	705	667	-38	-5%	Yes
102	51-WB	696	658	-38	-5%	Yes
103	52-EB	412	467	55	13%	Yes
104	52-WB	440	458	18	4%	Yes
105	53-EB	600	536	-64	-11%	Yes
106	53-WB	565	501	-64	-11%	Yes
107	54-EB	290	302	12	4%	Yes
108	54-WB	301	294	-7	-2%	Yes
109	55-NB	579	518	-61	-10%	Yes
110	55-SB	606	405	-201	-33%	No

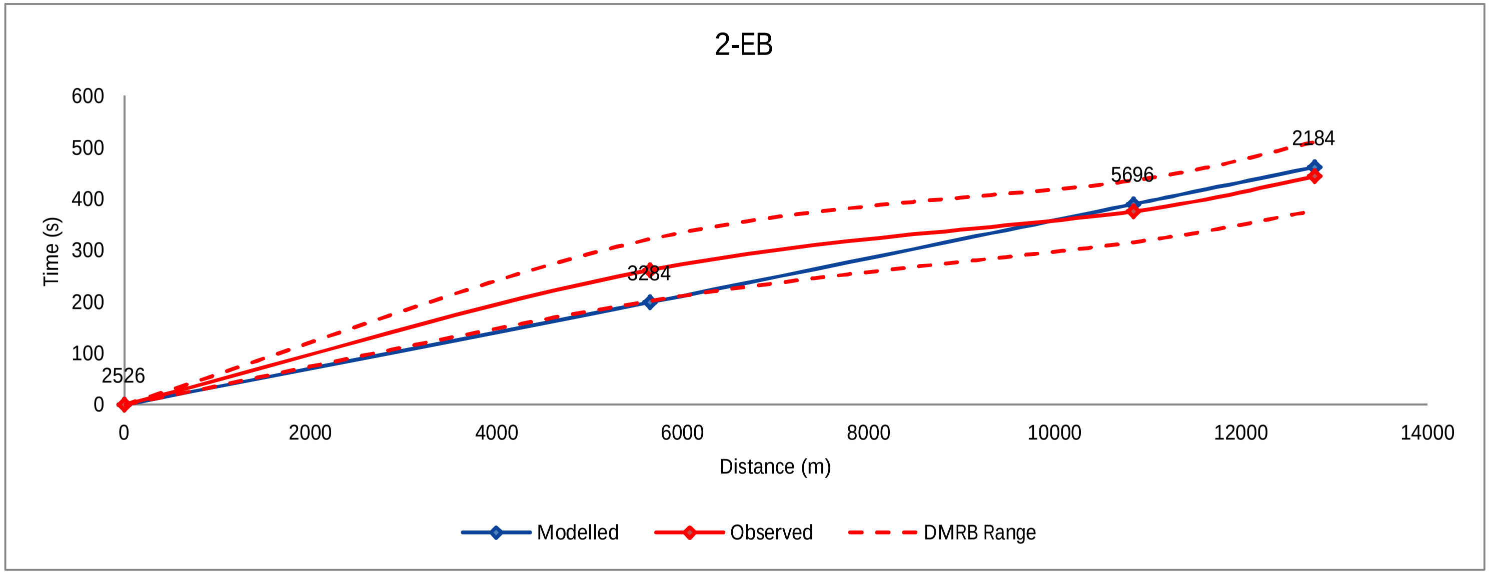
ID	Name		PM Peak Observed (s)	Modelled (s)	Diff	%	Pass?
111	56-NB		595	541	-54	-9%	Yes
112	56-SB		615	572	-43	-7%	Yes
113	57-EB		662	553	-109	-16%	No
114	57-WB		699	546	-153	-22%	No
115	58-NB		869	625	-244	-28%	No
116	58-SB		972	653	-319	-33%	No
117	59-EB		603	629	26	4%	Yes
118	59-WB		622	626	4	1%	Yes
119	60-NB		958	958	0	0%	Yes
120	60-SB		941	1005	64	7%	Yes
121	61-EB		2491	1683	-808	-32%	No
122	61-WB		2228	1738	-490	-22%	No
123	62-EB		2458	1330	-1128	-46%	No
124	62-WB		2808	1807	-1001	-36%	No
125	63-EB		1303	748	-555	-43%	No
126	63-WB		1131	845	-286	-25%	No
127	64-EB		323	344	21	7%	Yes
128	64-WB		312	314	2	1%	Yes
129	101-NB		341	376	35	10%	Yes
130	101-SB		467	432	-35	-8%	Yes
131	102-NB		683	630	-53	-8%	Yes
132	102-SB		760	708	-52	-7%	Yes
133	103-EB		352	369	17	5%	Yes
134	103-WB		468	488	20	4%	Yes
135	104-NB		655	546	-109	-17%	No
136	104-SB		359	399	40	11%	Yes
137	105-EB		462	444	-18	-4%	Yes
138	105-WB		412	440	28	7%	Yes
139	106-EB		677	483	-194	-29%	No
140	106-WB		570	548	-22	-4%	Yes
141	200-NB		673.08282	634	-39	-6%	Yes
142	200-SB		737.282279	640	-97	-13%	Yes
143	201-NB		983.804215	884	-100	-10%	Yes
144	201-SB		1001.79803	888	-114	-11%	Yes
145	202-EB		554.51515	566	12	2%	Yes
146	202-WB		554.963935	568	13	2%	Yes
147	203-EB		269	273	4	1%	Yes
148	203-WB		321	276	-45	-14%	Yes
149	204-EB		778.469468	826	48	6%	Yes
150	204-WB		771.010842	807	36	5%	Yes
151	205-NB		393.816157	396	2	0%	Yes
152	205-SB		377.123742	382	5	1%	Yes
153	206-NB		313	374	61	19%	No
154	206-SB		322.831513	347	24	7%	Yes
155	207-EB		592.584831	624	31	5%	Yes
156	207-WB		594.142846	597	3	0%	Yes

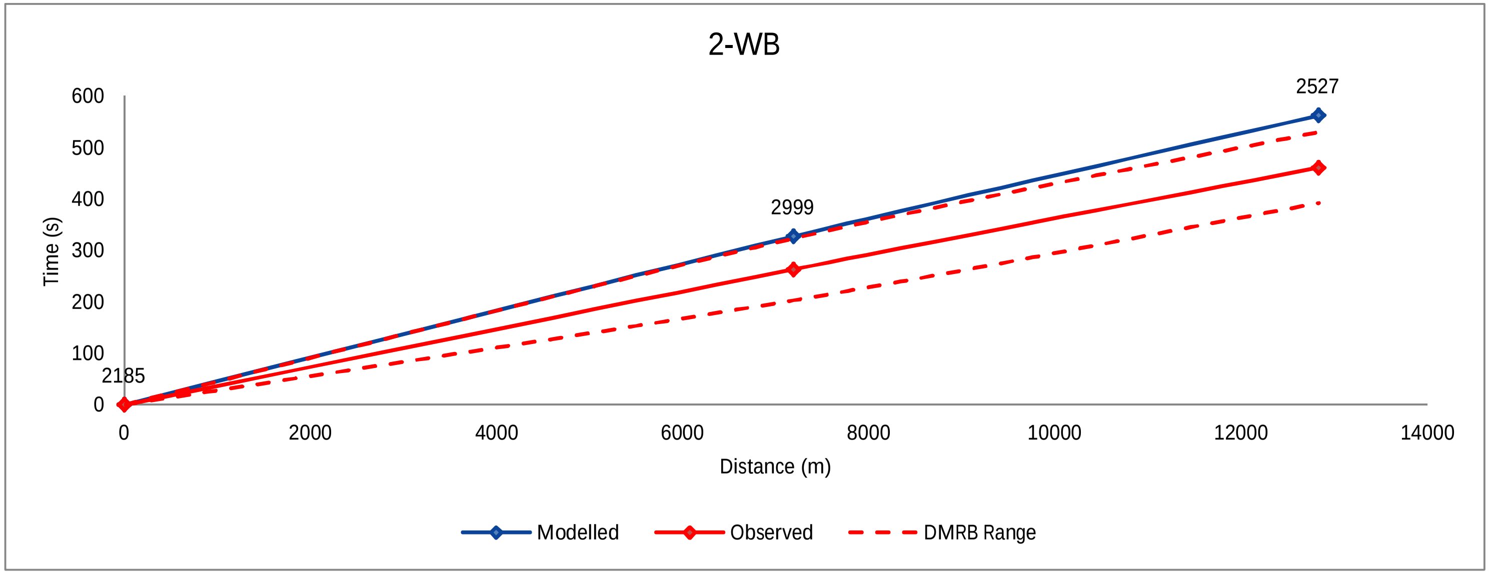
Appendix D.3

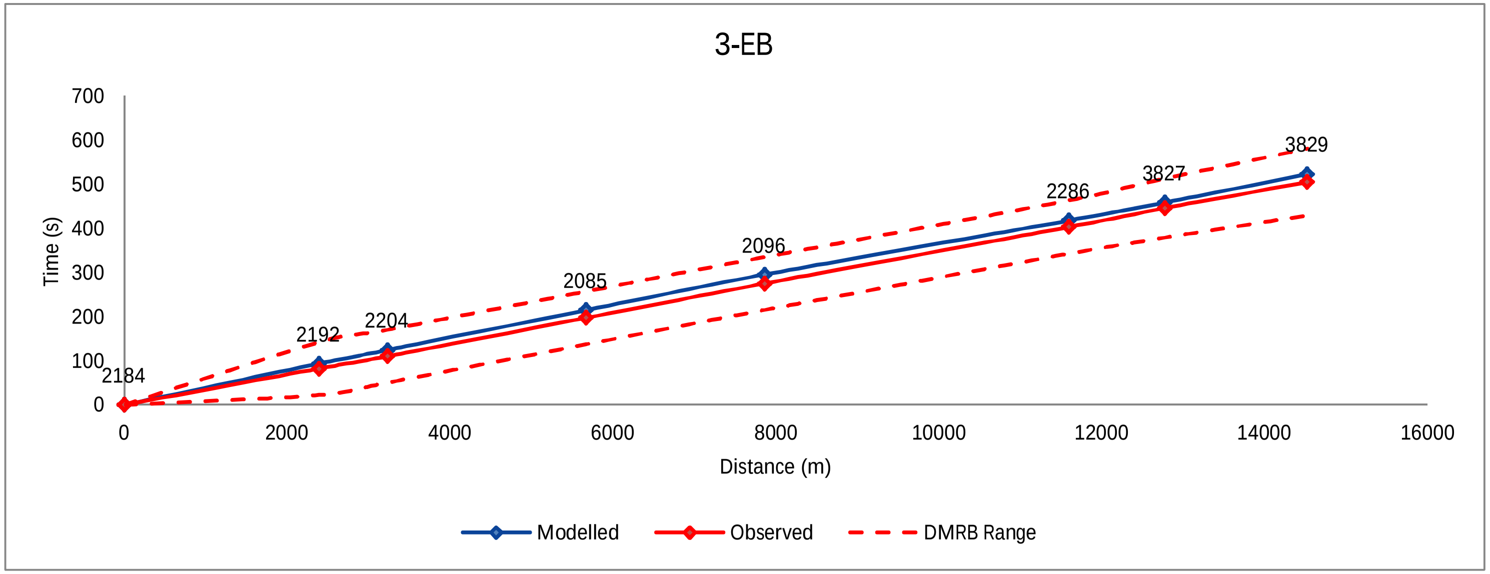
JOURNEY TIME ROUTE GRAPHS AM

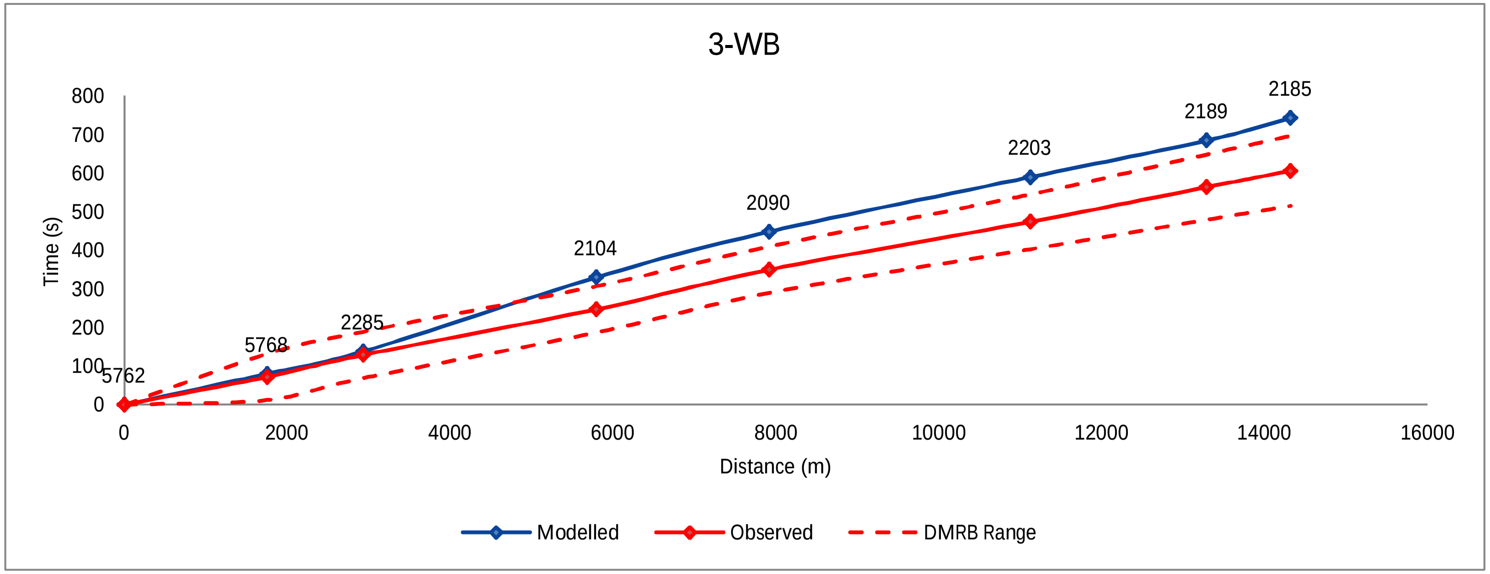

1-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
2982
2495
2507
2526
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range

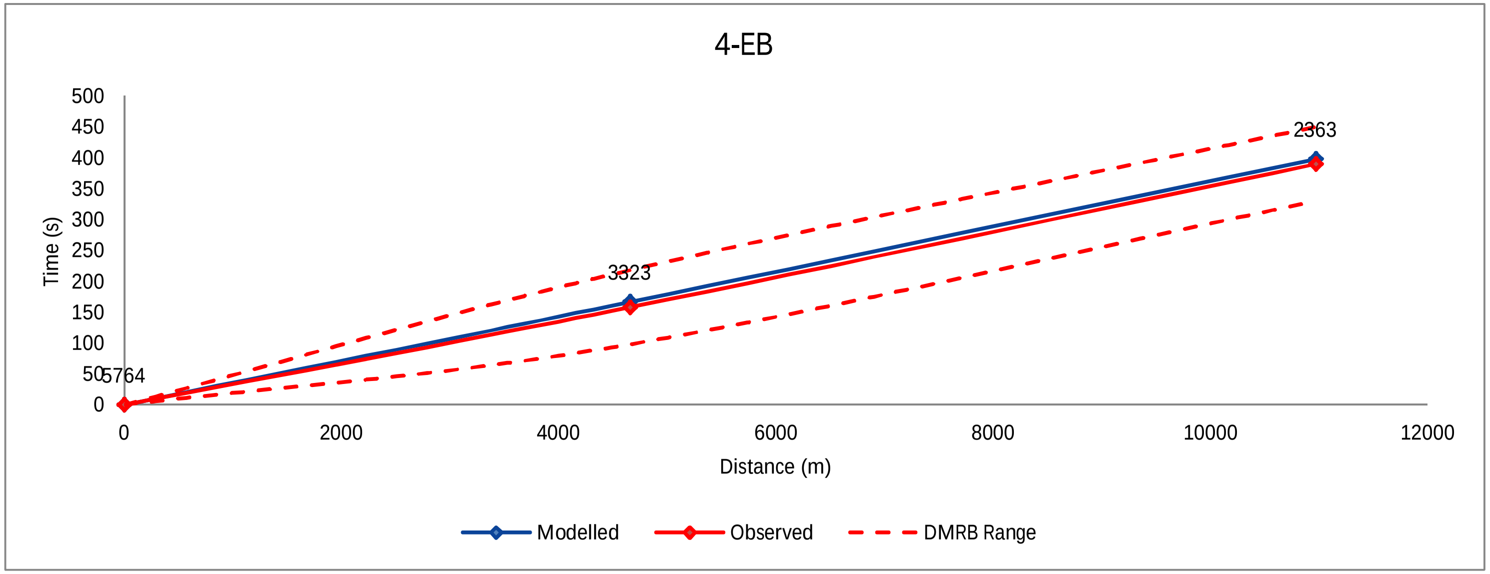

1-WB
Time (s)
700
600
500
400
300
200
100
0
-100
2527
2523
2508
2496
2983
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range

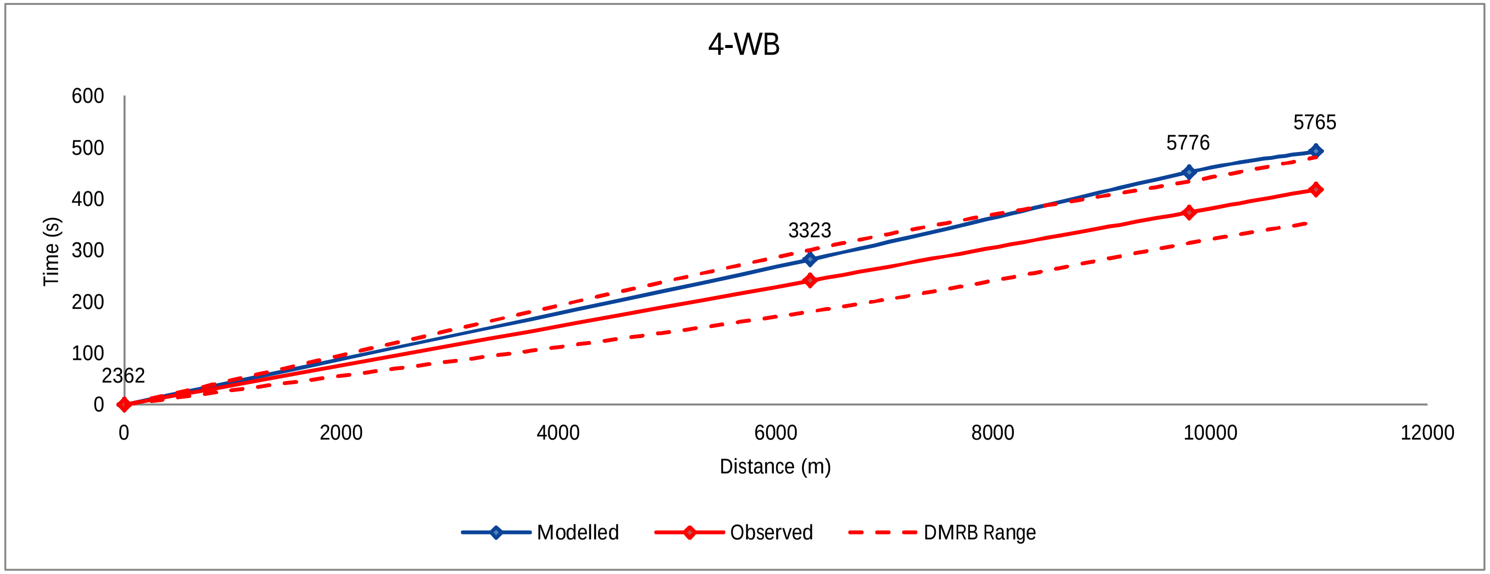

2-EB
Time (s)
600
500
400
300
200
100
0
2526
3284
5696
2184
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range

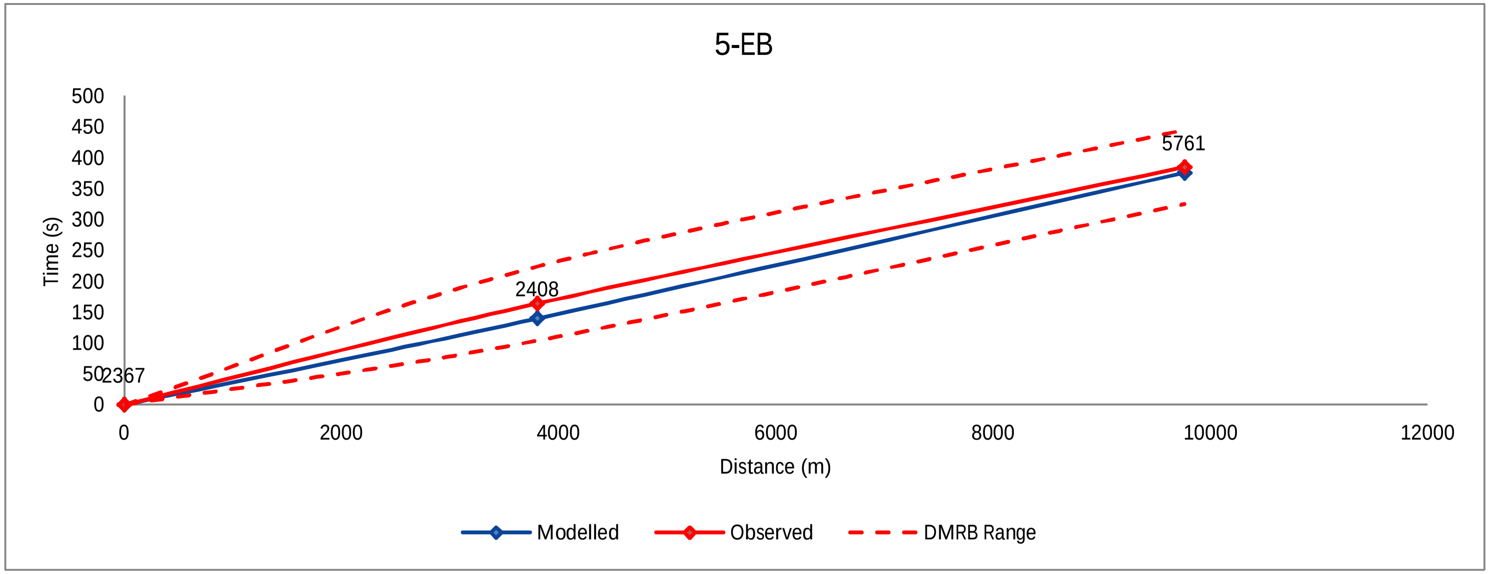

2-WB
Time (s)
600
500
400
300
200
100
0
2185
2999
2527
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range

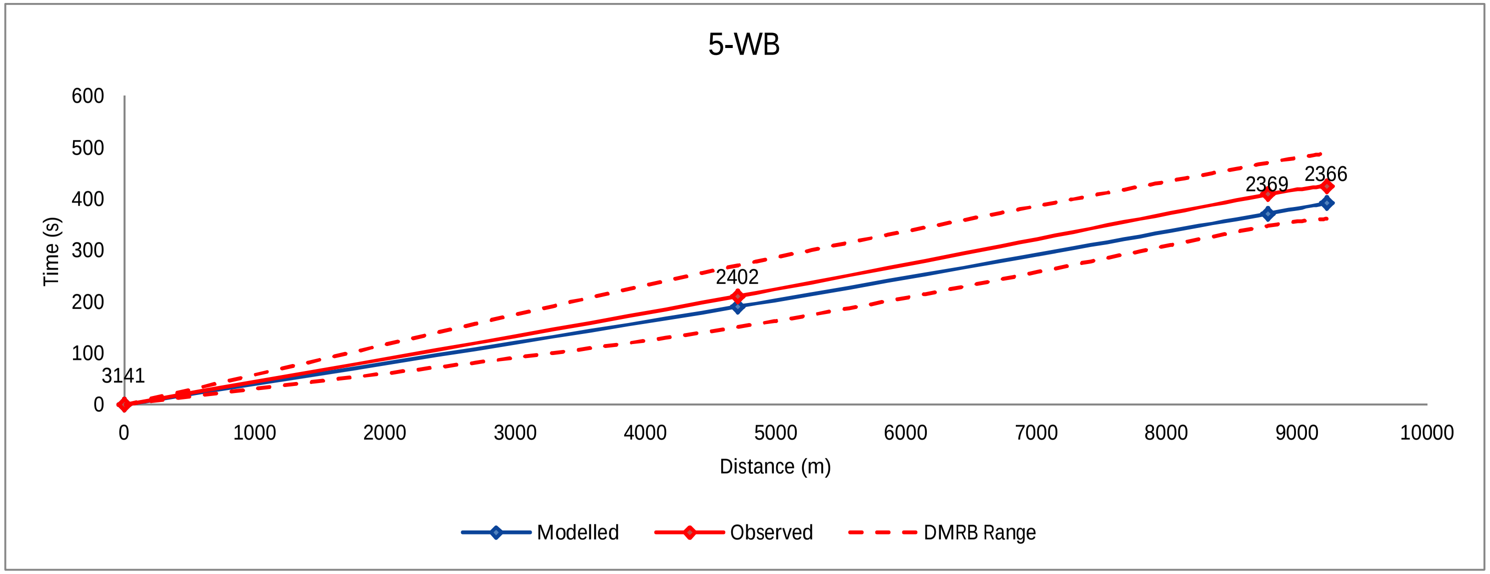

3-EB
Time (s)
700
600
500
400
300
200
100
0
2184
2192
2204
2085
2096
2286
3827
3829
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range

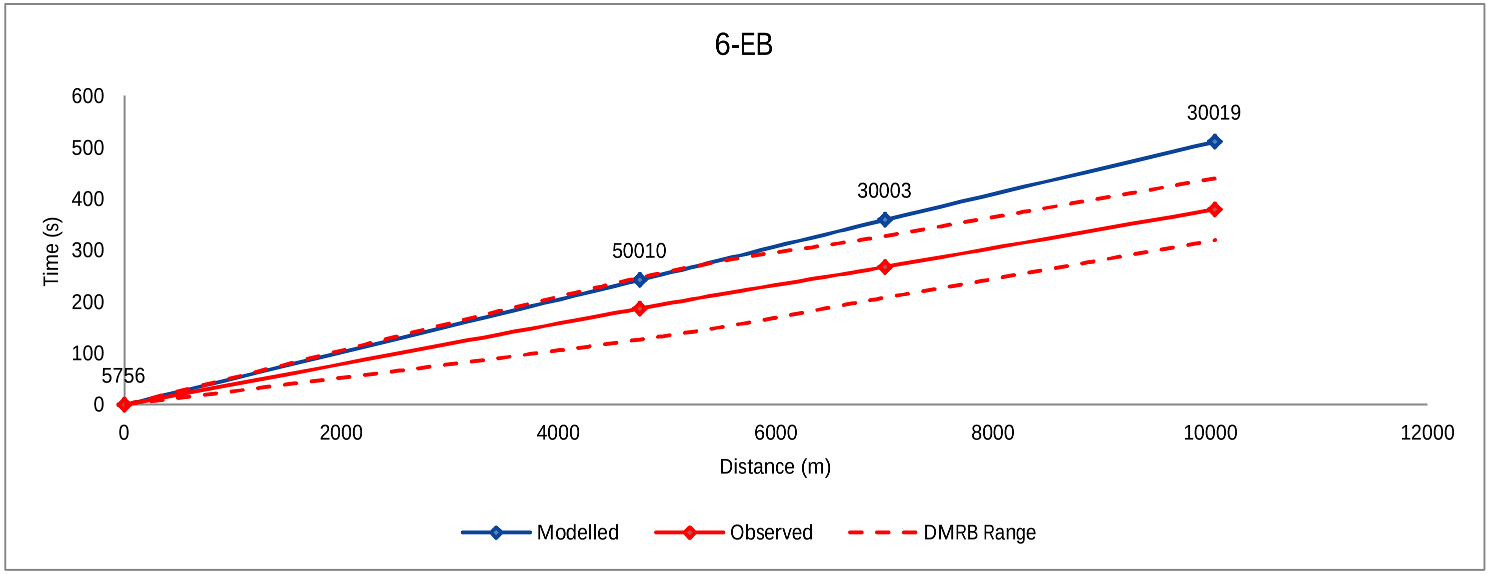

3-WB
Time (s)
800
700
600
500
400
300
200
100
0
5762
5768
2285
2104
2090
2203
2189
2185
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range

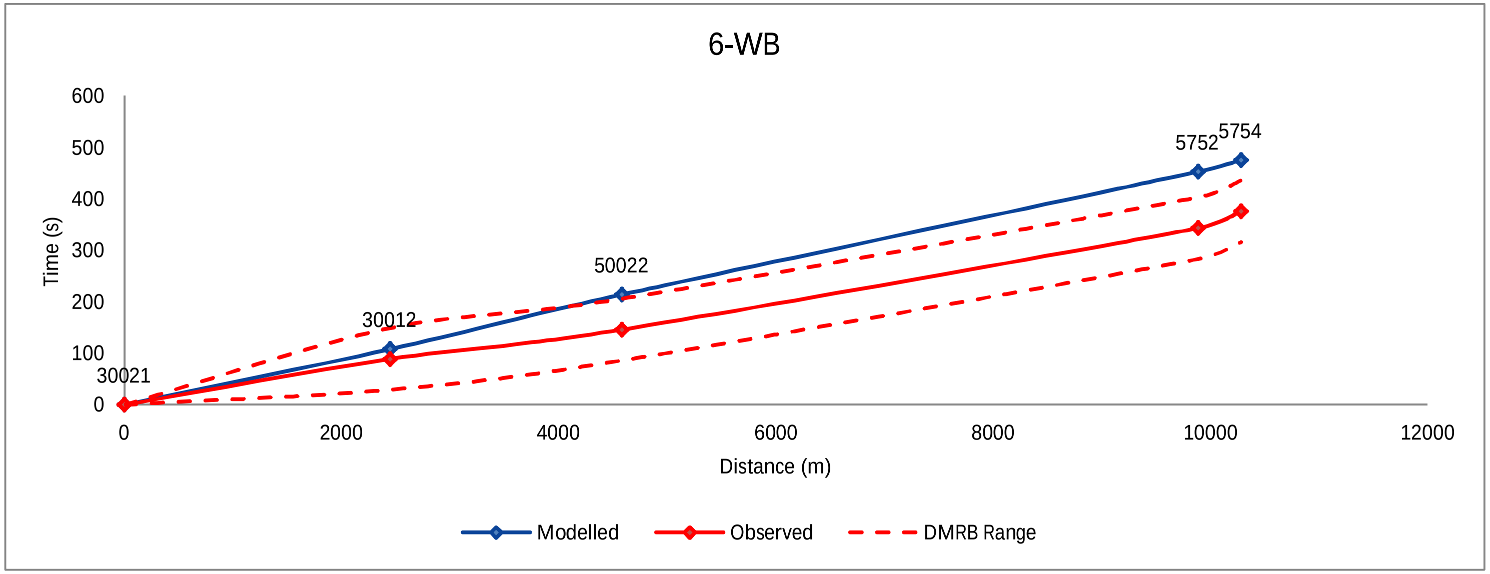

4-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
5764
3323
2363
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

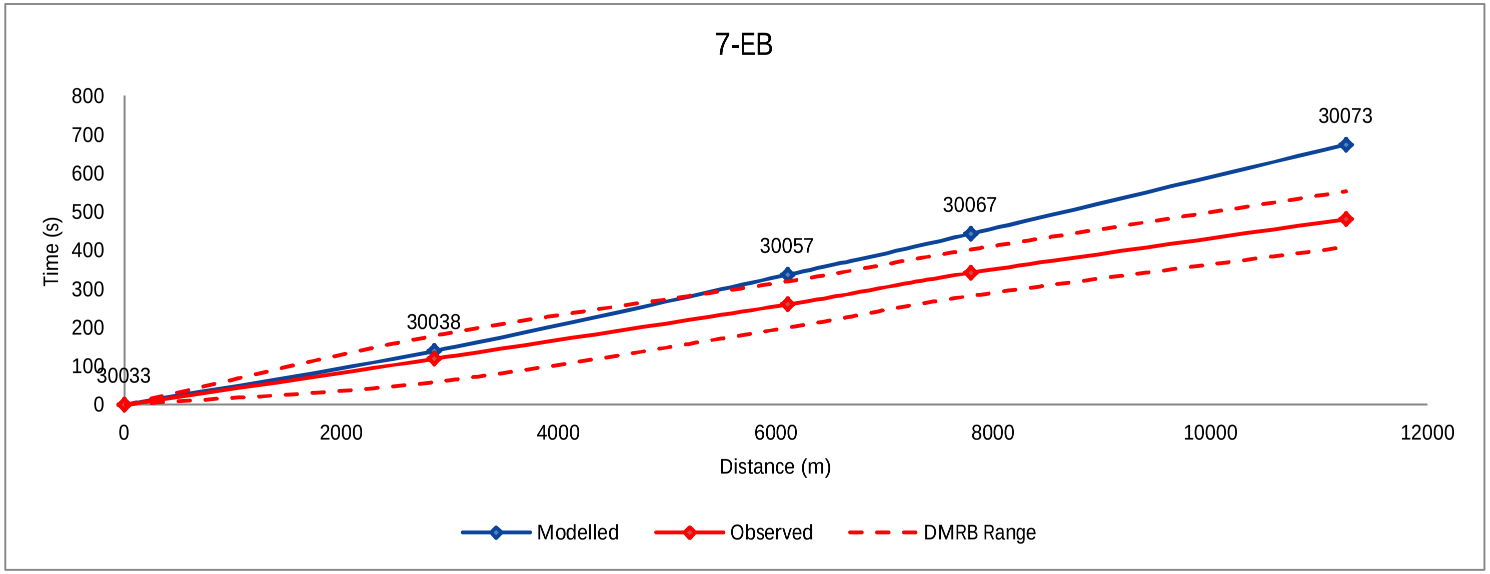

4-WB
Time (s)
600
500
400
300
200
100
0
2362
3323
5776
5765
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range


5-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
2367
2408
5761
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

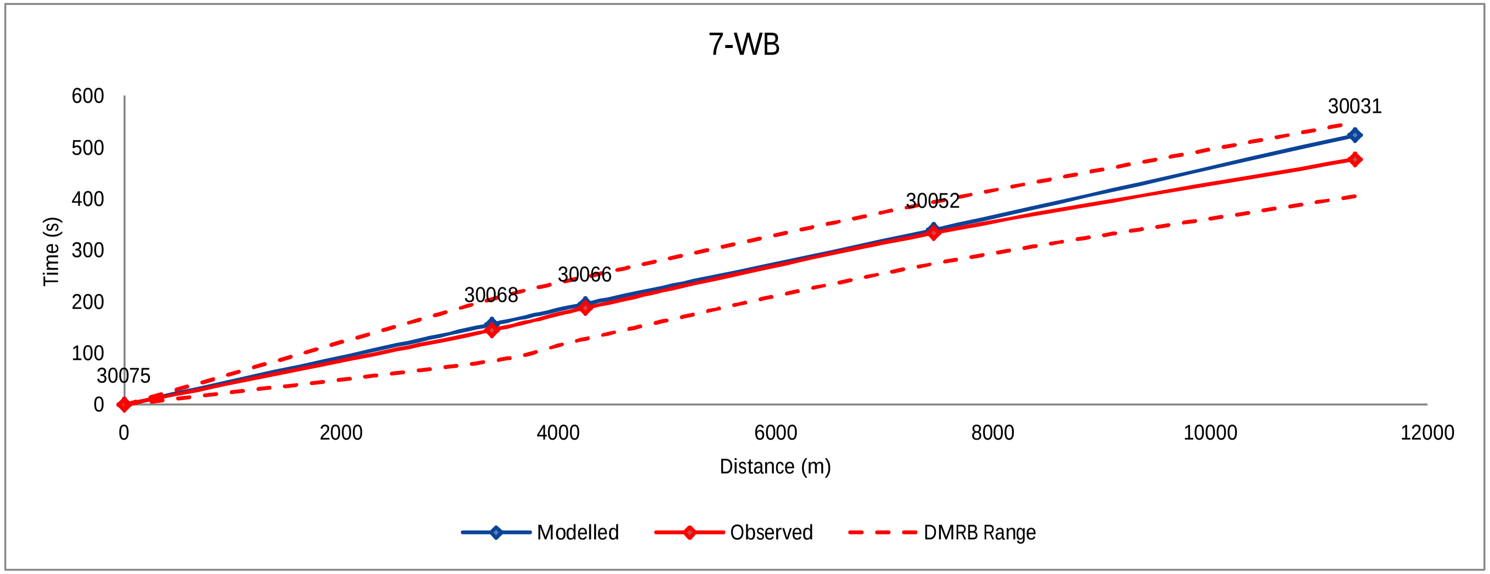

5-WB
Time (s)
600
500
400
300
200
100
0
3141
2402
2369
2366
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range


6-EB
Time (s)
600
500
400
300
200
100
0
5756
50010
30003
30019
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

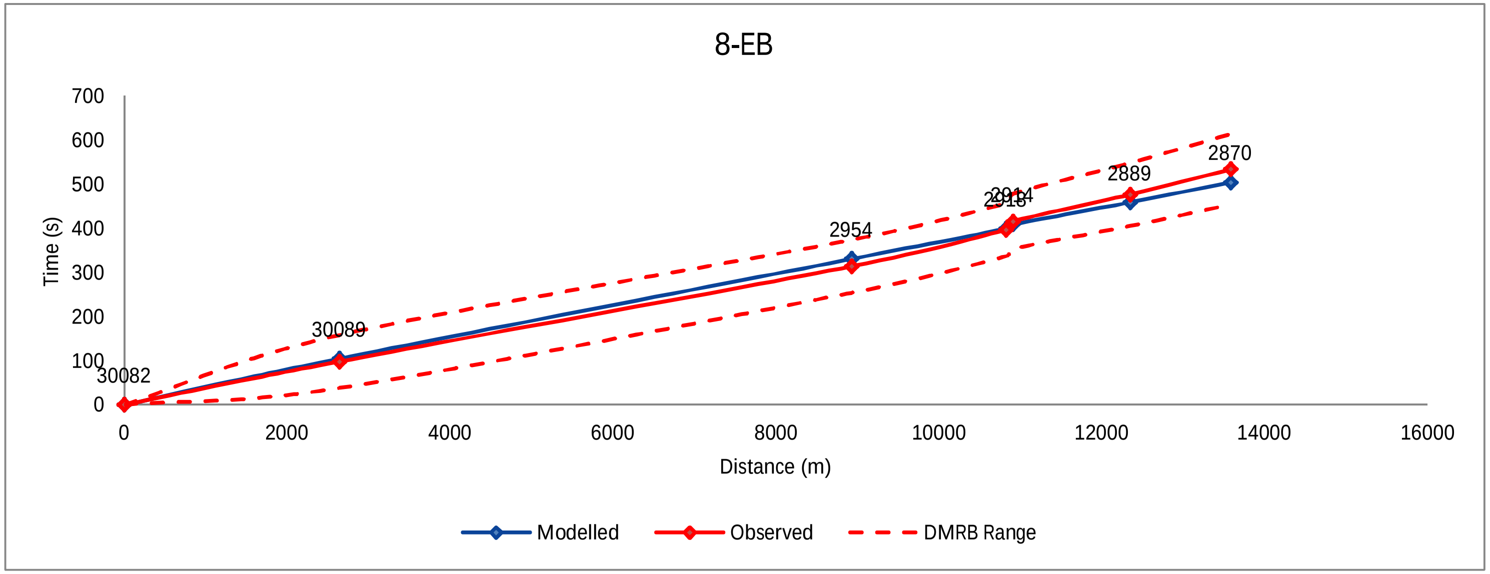

6-WB
Time (s)
600
500
400
300
200
100
0
30021
30012
50022
5752
5754
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

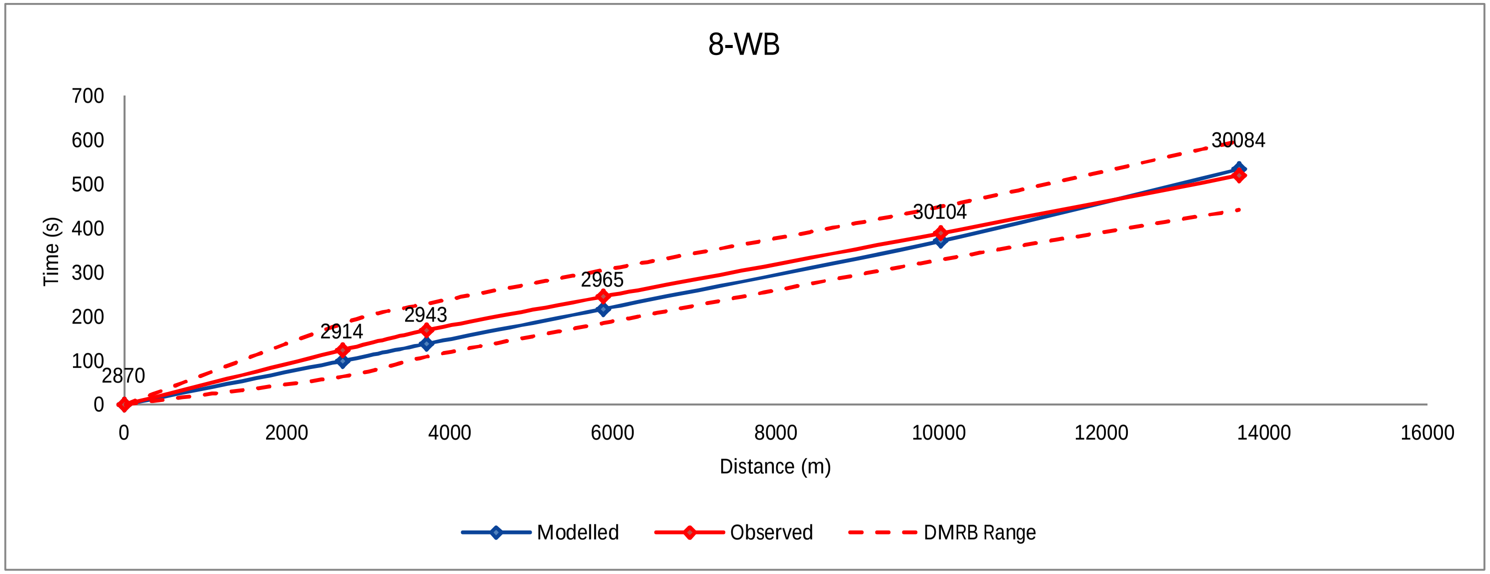


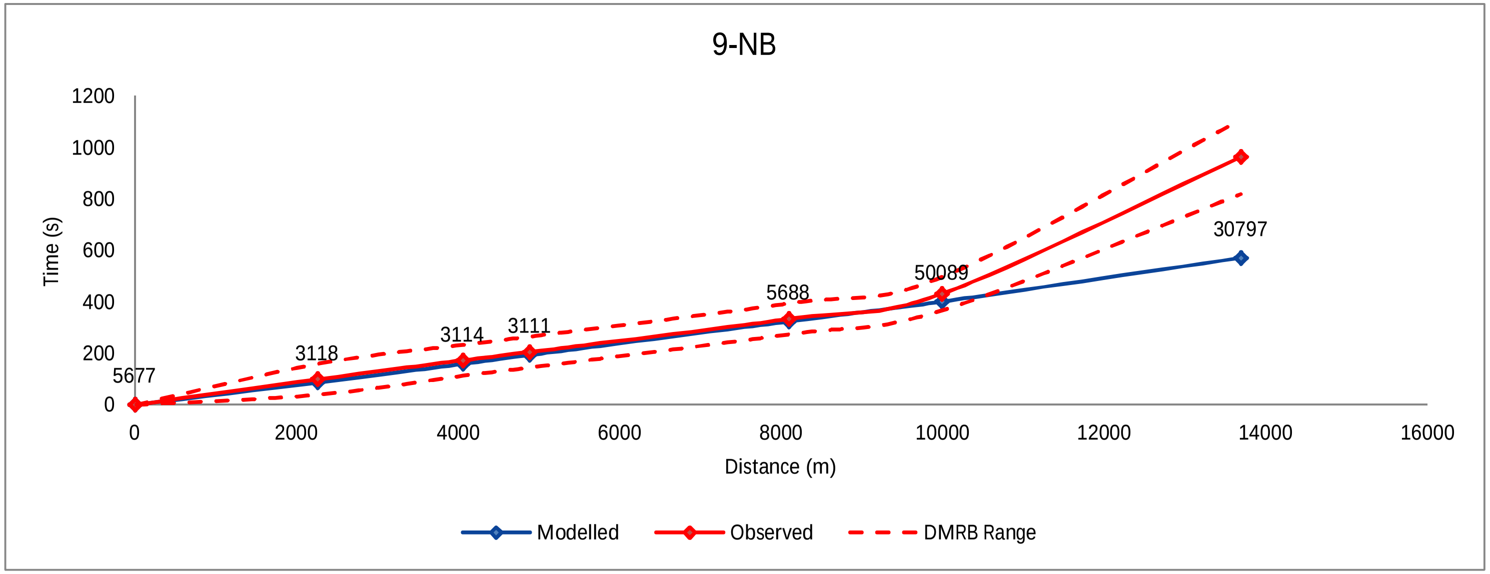
7-EB
Time (s)
800
700
600
500
400
300
200
100
0
30033
30038
30057
30067
30073
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

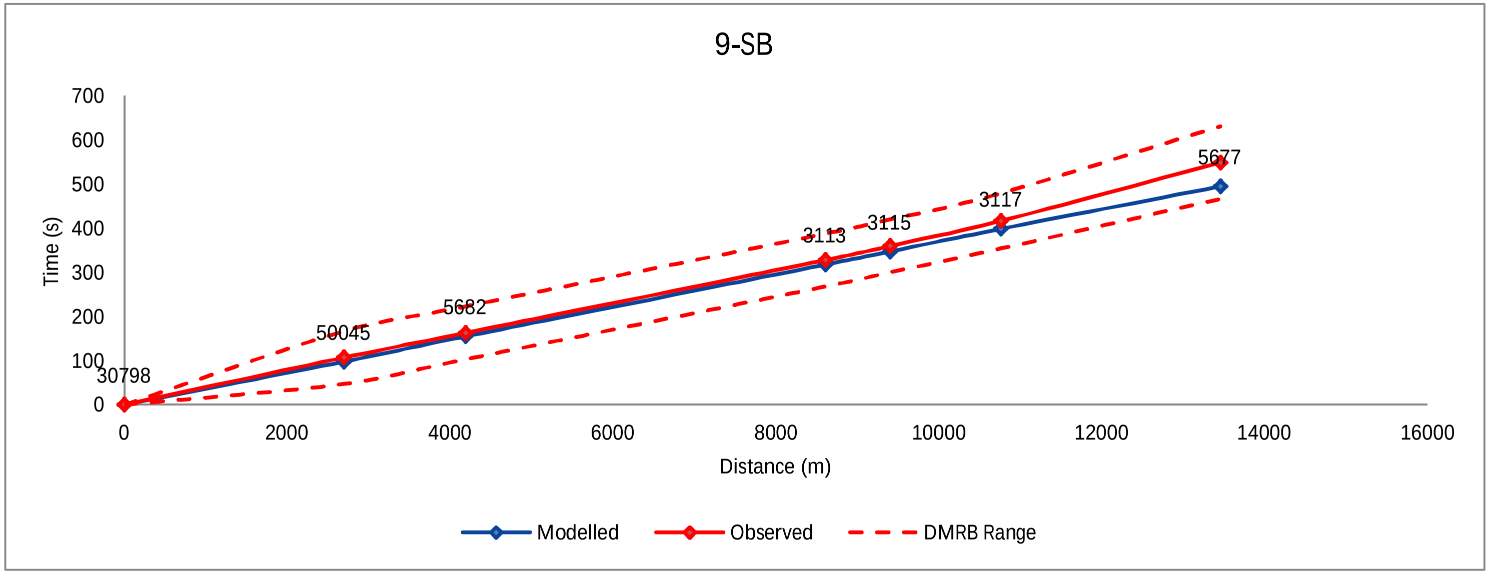


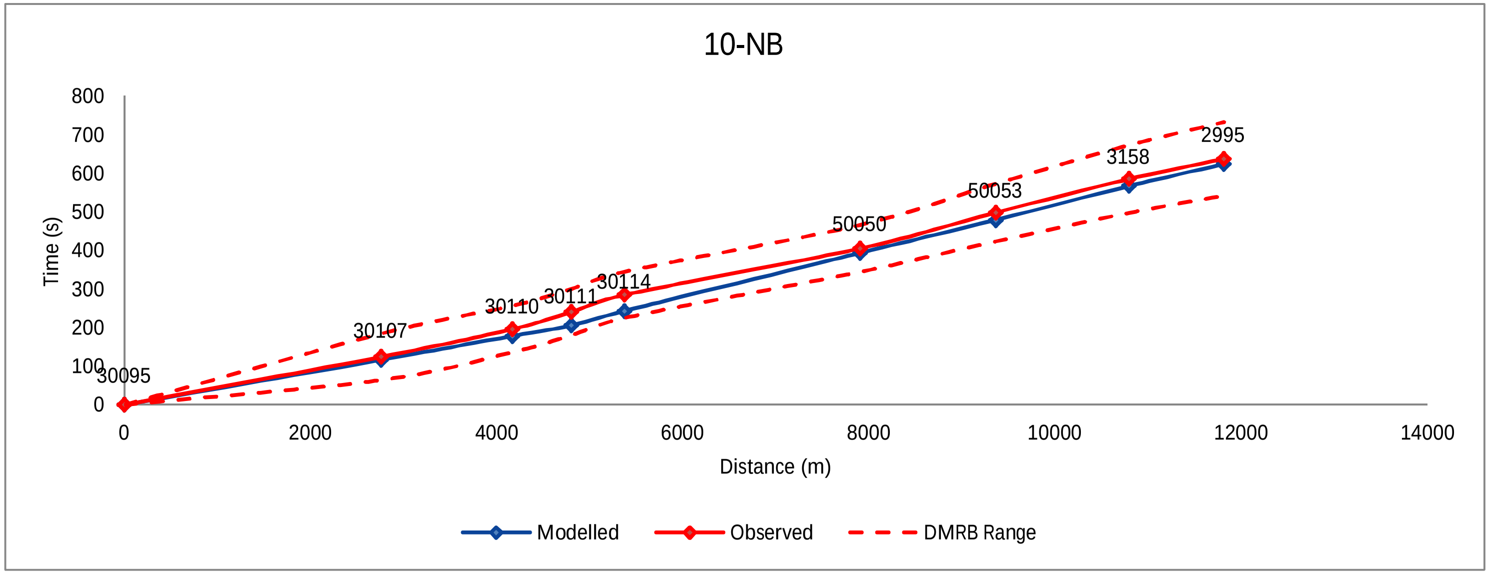
7-WB
Time (s)
600
500
400
300
200
100
0
30075
30068
30066
30052
30031
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range


8-EB
Time (s)
700
600
500
400
300
200
100
0
30082
30089
2954
2914
2918
2889
2870
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range

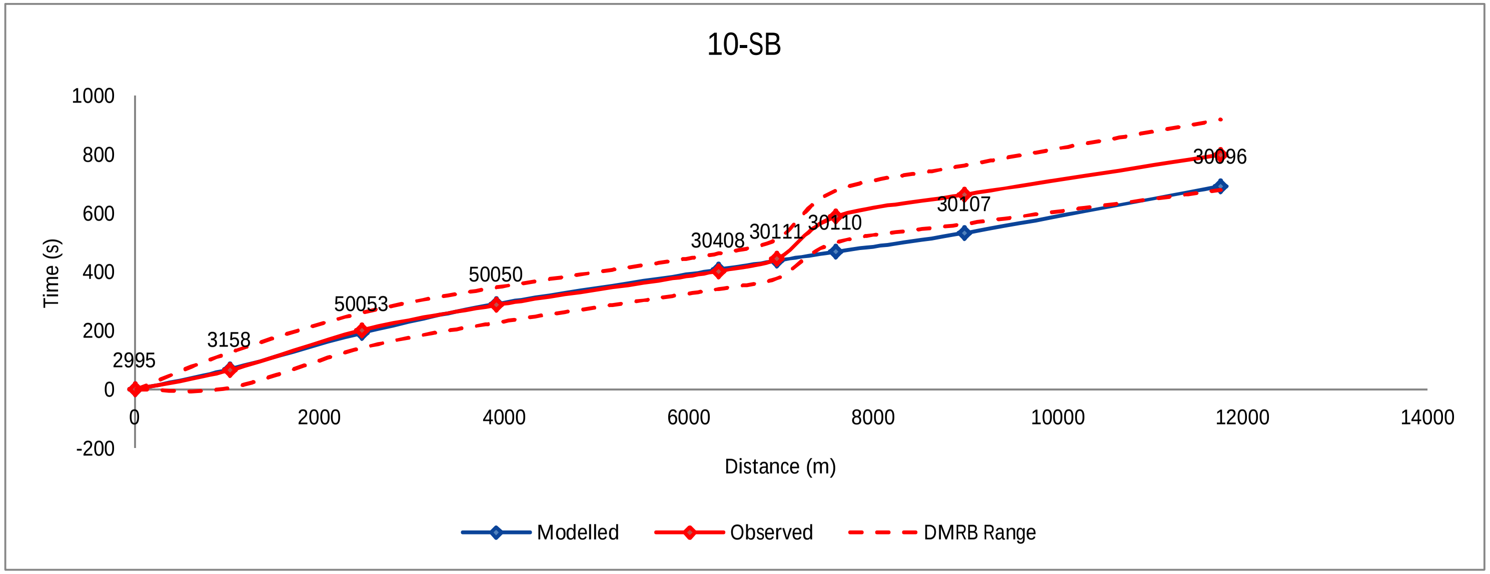

8-WB
Time (s)
700
600
500
400
300
200
100
0
2870
2914
2943
2965
30104
30084
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range


9-NB
Time (s)
1200
1000
800
600
400
200
0
5677
3118
3114
3111
5688
50089
30797
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range

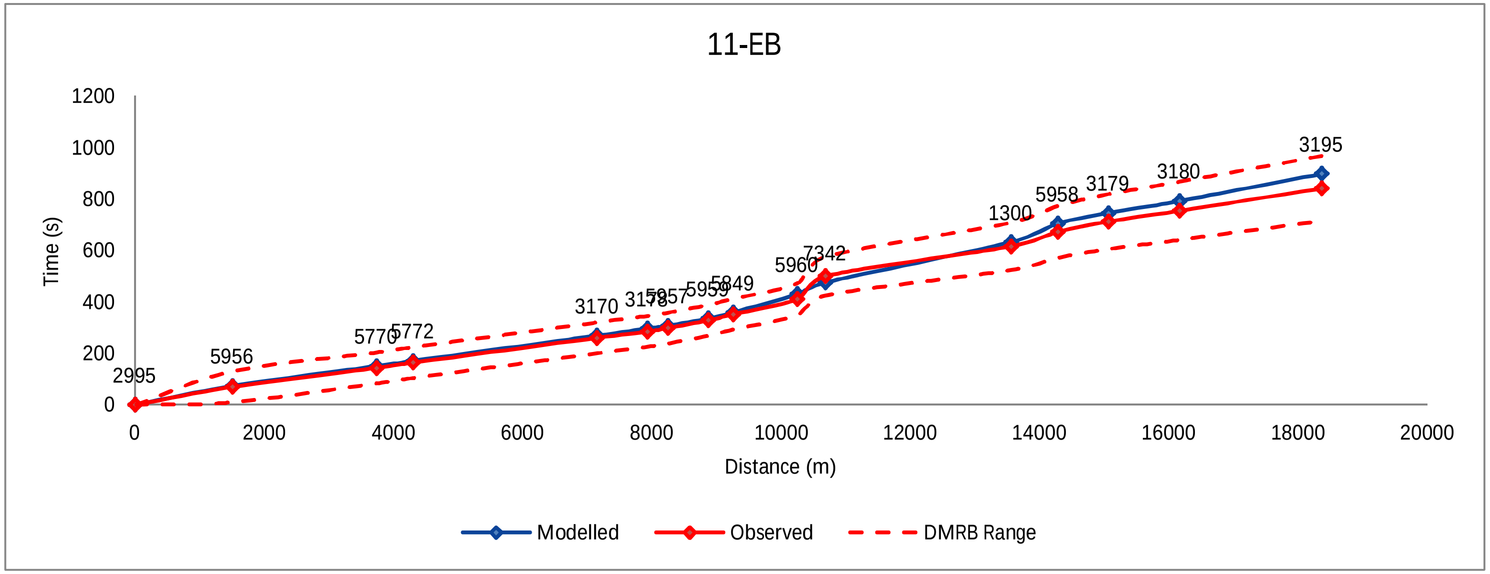

9-SB
Time (s)
700
600
500
400
300
200
100
0
30798
50045
5682
3113
3115
3117
5677
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range

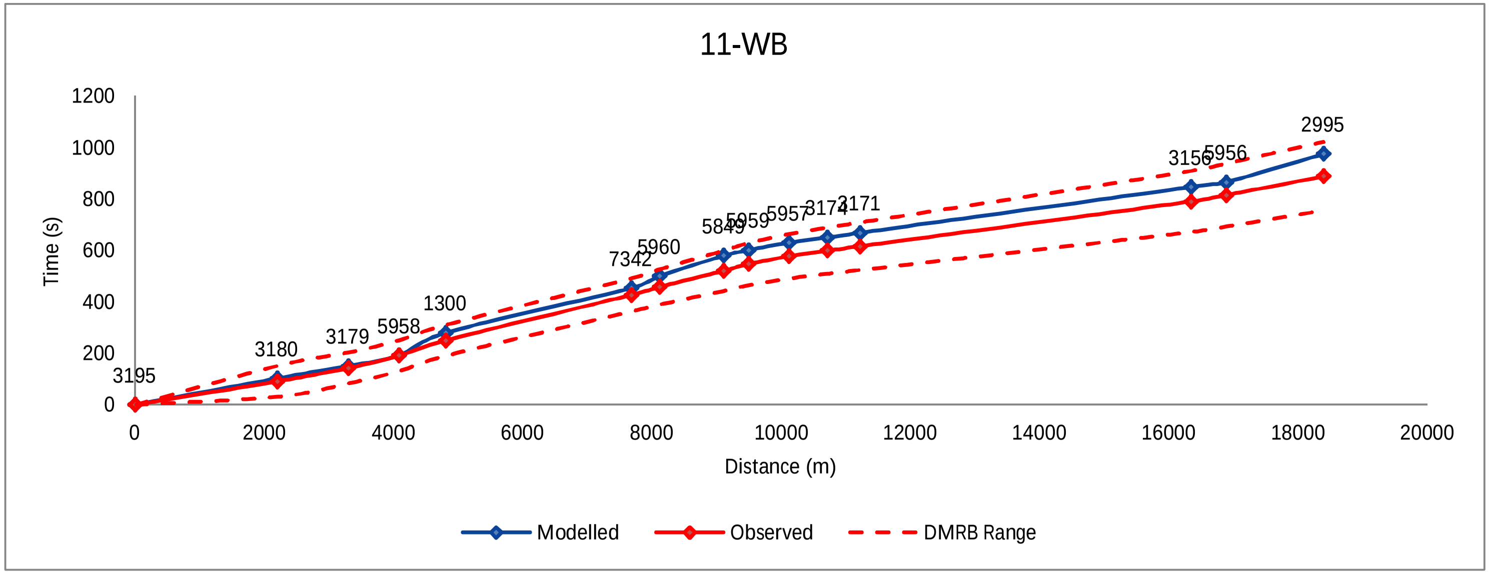


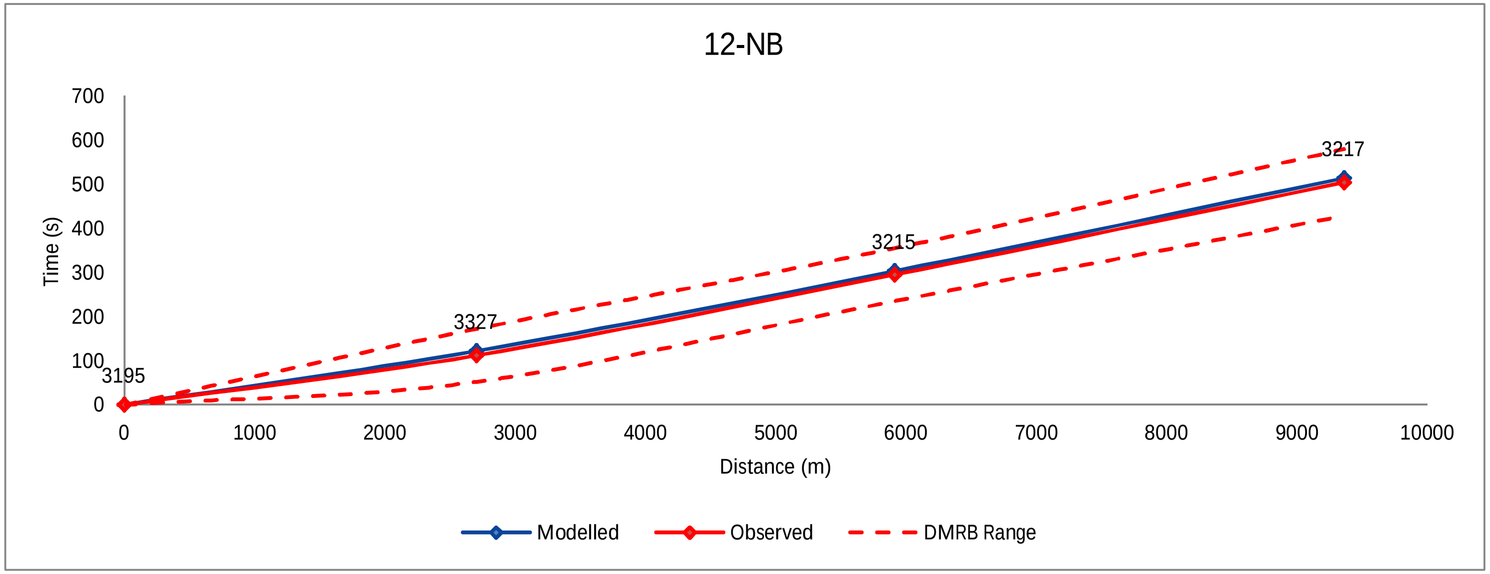
10-NB
Time (s)
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
30095
30107
30110
30111
30114
50050
50053
3158
2995
Modelled
Observed
DMRB Range

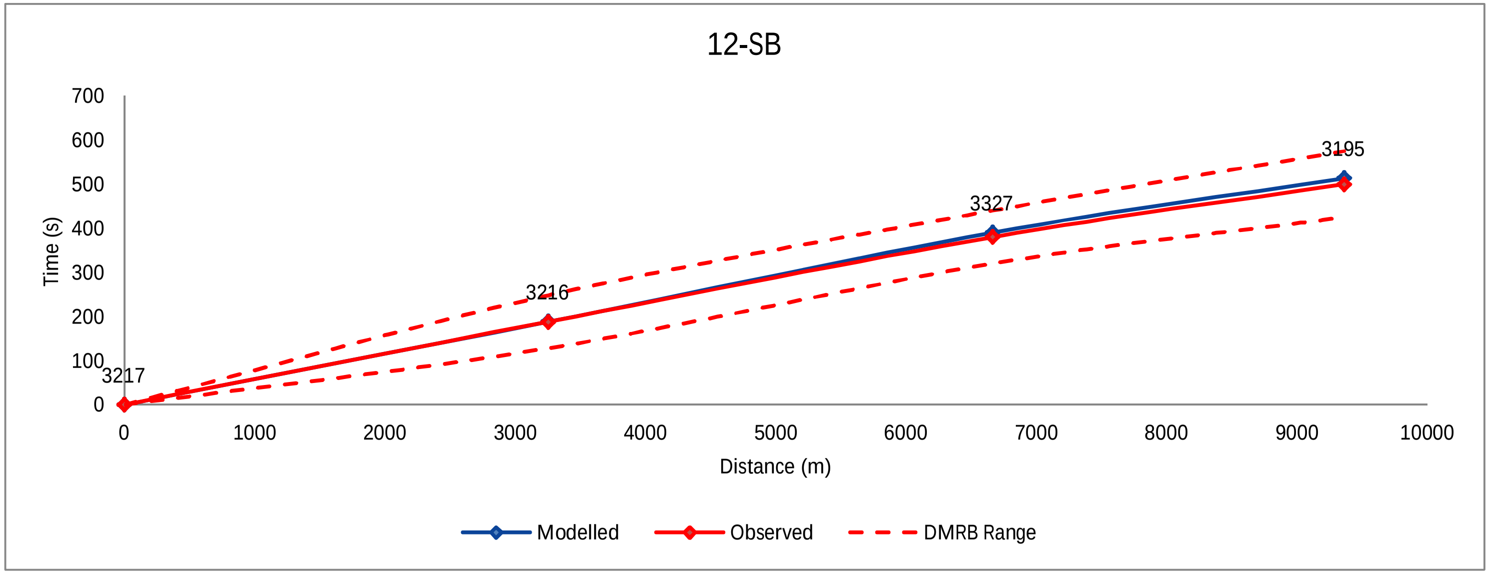


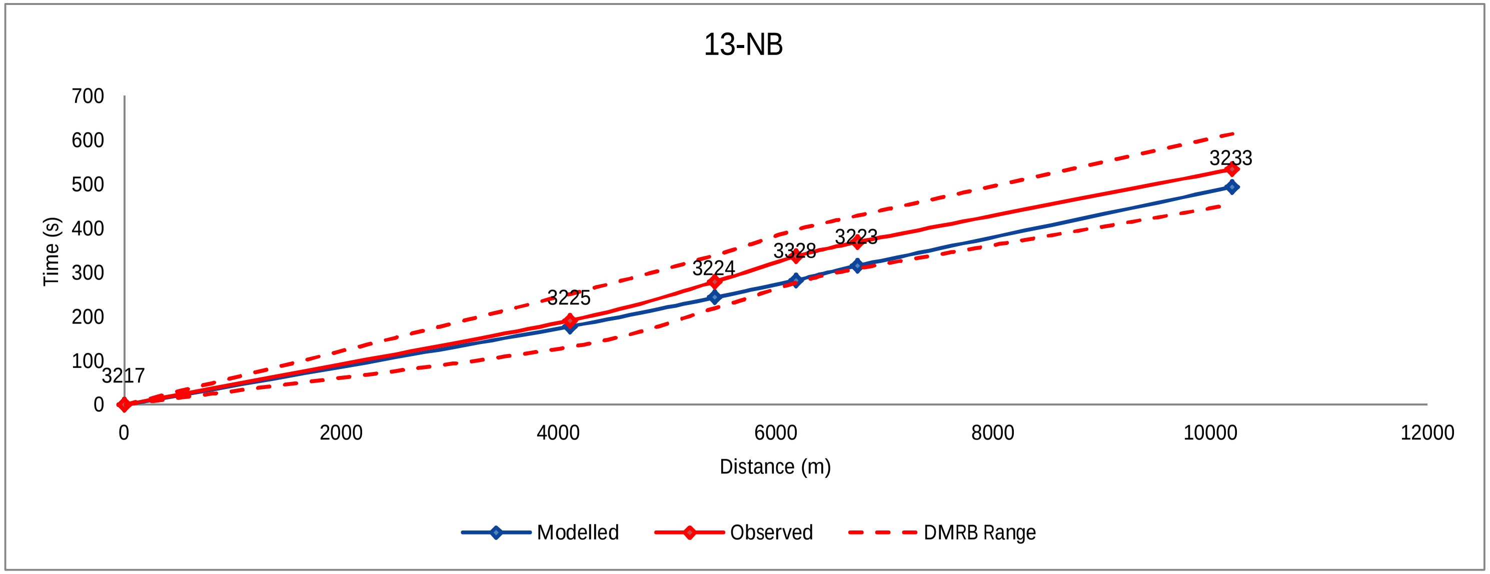
10-SB
Time (s)
1000
800
600
400
200
0
-200
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
2995
3158
50053
50050
30408
30111
30110
30107
30096
Modelled
Observed
DMRB Range

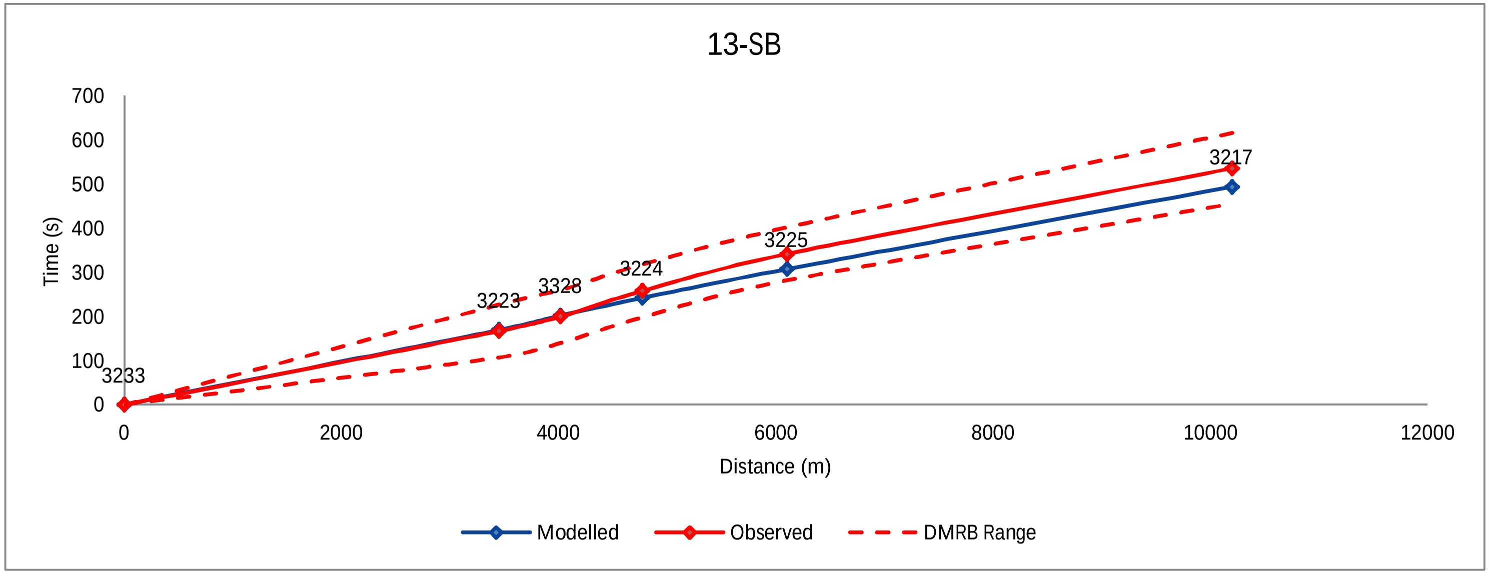

11-EB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
20000
Distance (m)
2995
5956
5770
5772
3170
3178
5957
5959
5849
5960
7342
1300
5958
3179
3180
3195
Modelled
Observed
DMRB Range

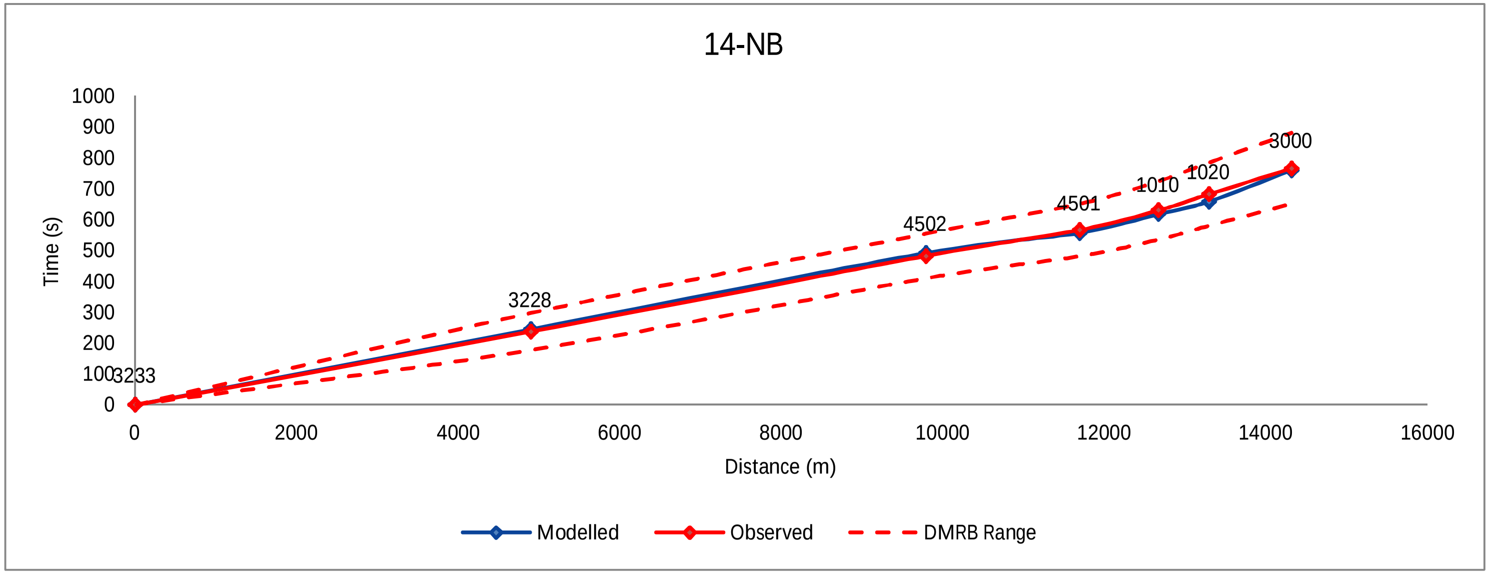

11-WB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
20000
Distance (m)
3195
3180
3179
5958
1300
7342
5960
5849
5959
5957
3174
3171
3156
5956
2995
Modelled
Observed
DMRB Range

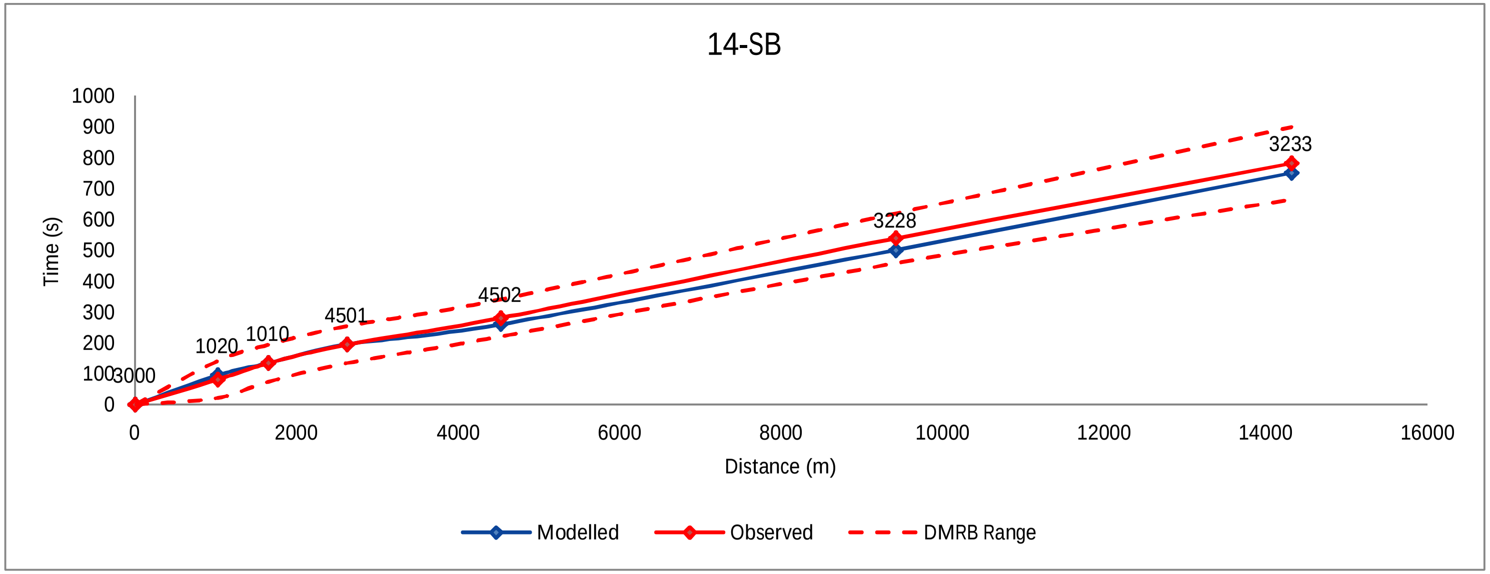

12-NB
Time (s)
700
600
500
400
300
200
100
0
3195
3327
3215
3217
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range

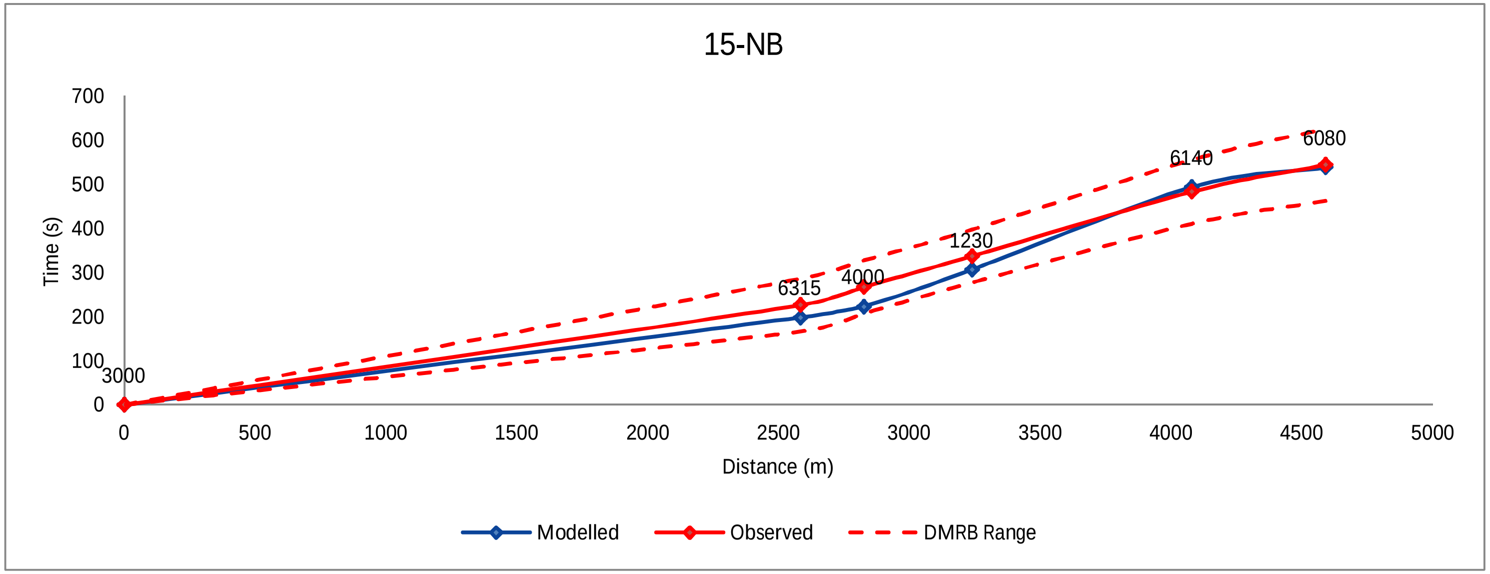

12-SB
Time (s)
700
600
500
400
300
200
100
0
3217
3216
3327
3195
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range

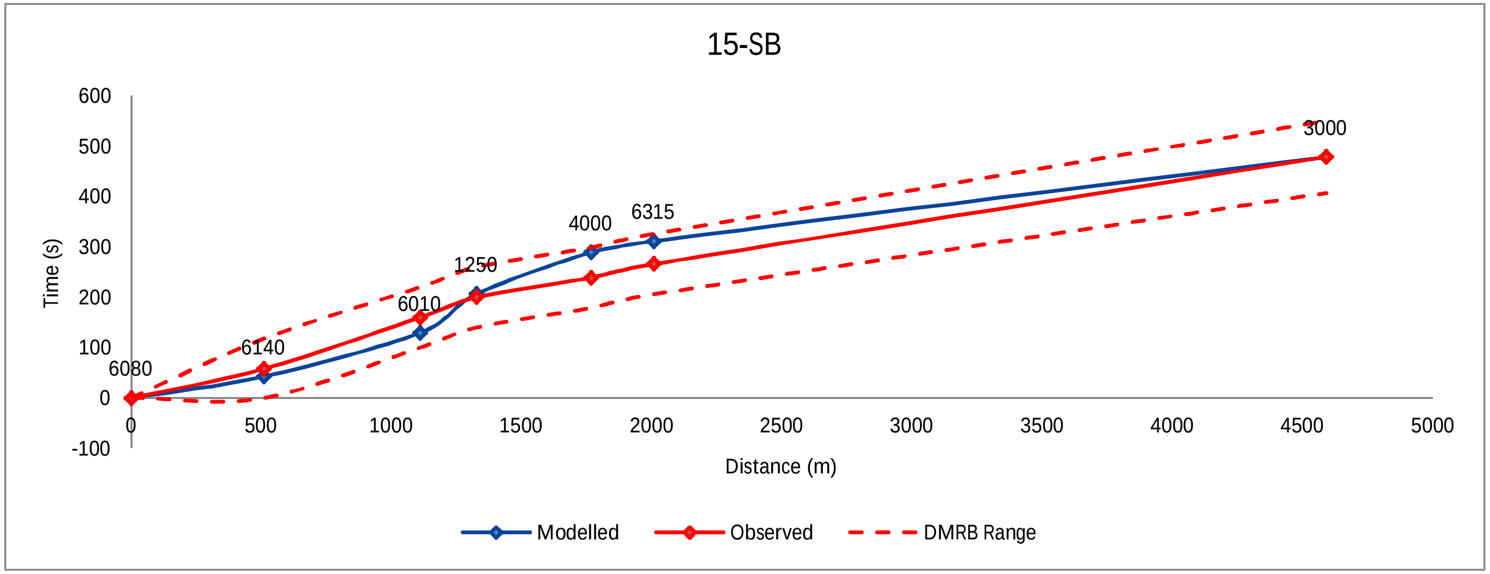

13-NB
Time (s)
700
600
500
400
300
200
100
0
3217
3225
3224
3328
3223
3233
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

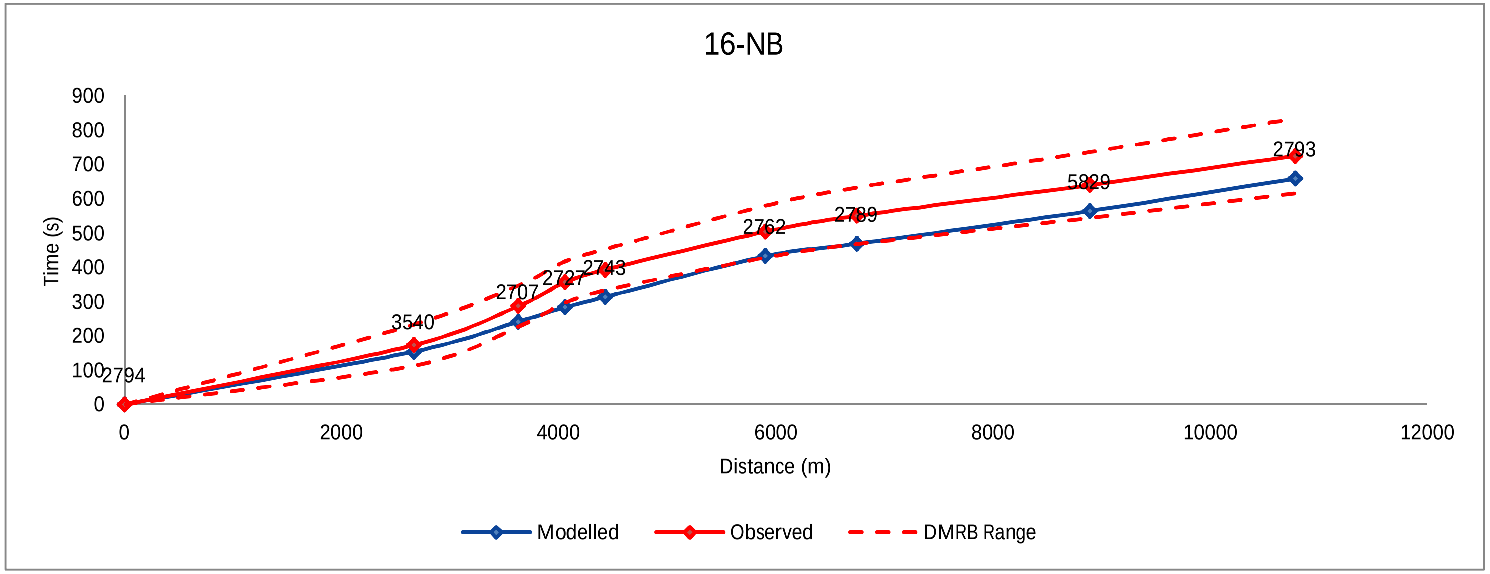

13-SB
Time (s)
700
600
500
400
300
200
100
0
3233
3223
3328
3224
3225
3217
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

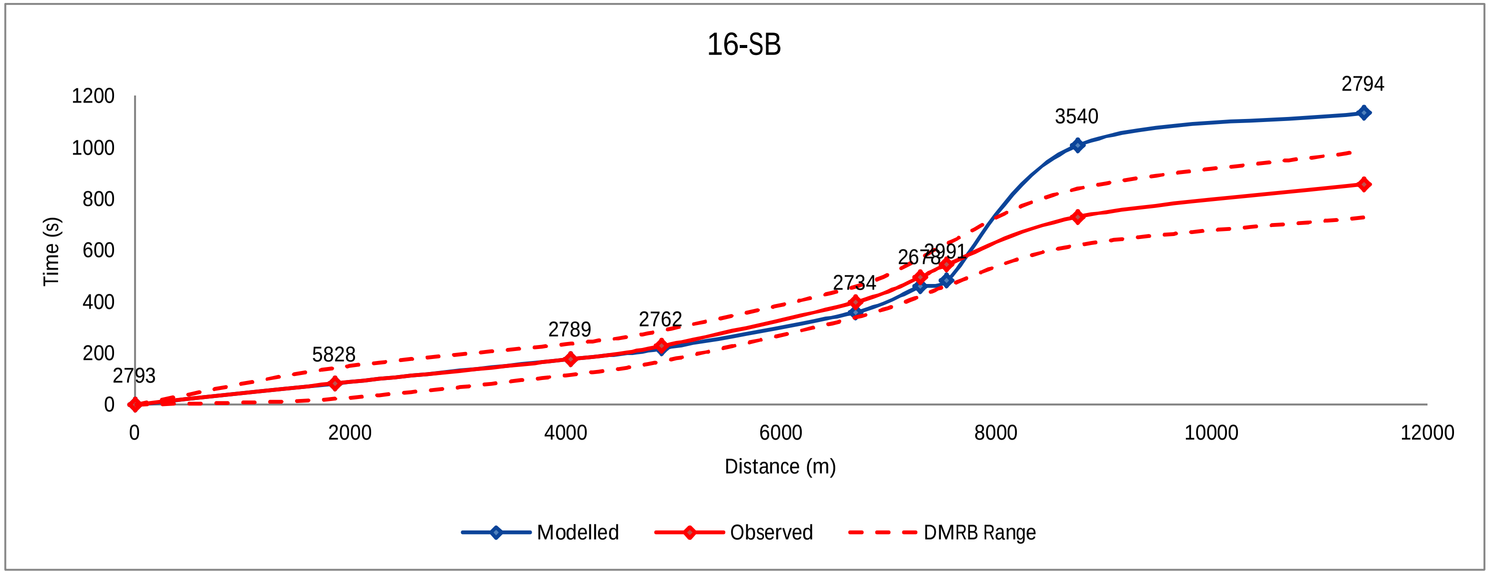

14-NB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3233
3228
4502
4501
1010
1020
3000
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range

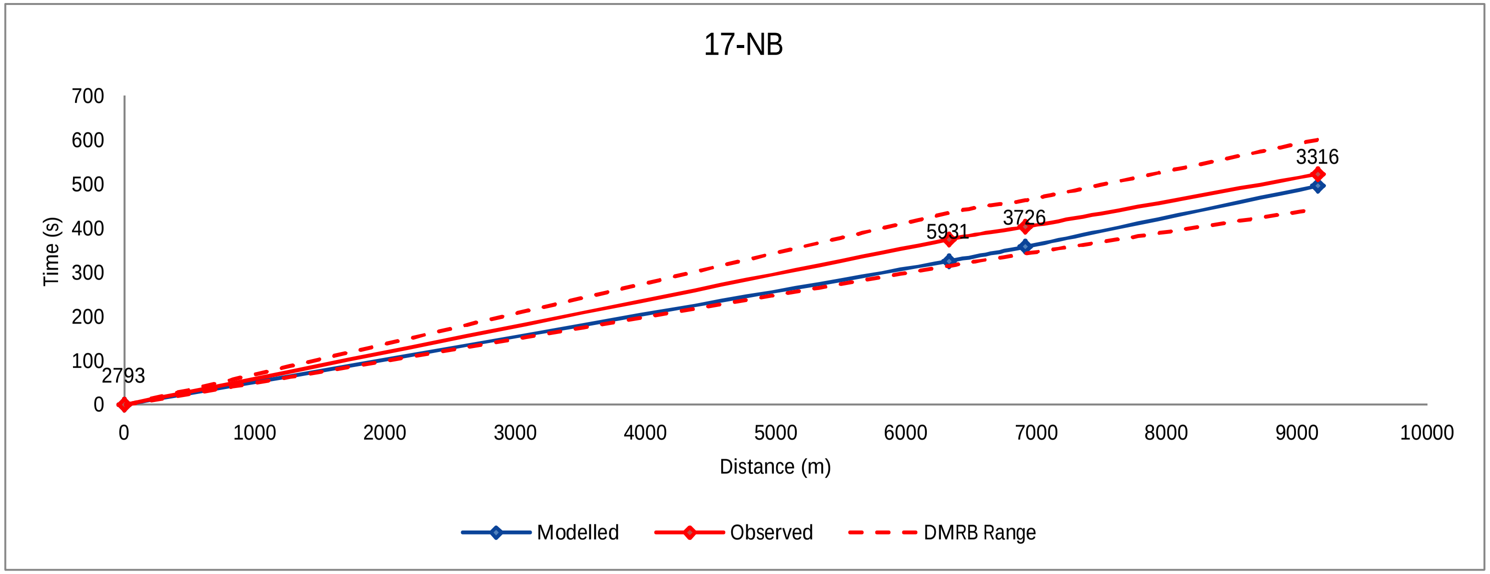

14-SB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3000
1020
1010
4501
4502
3228
3233
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range

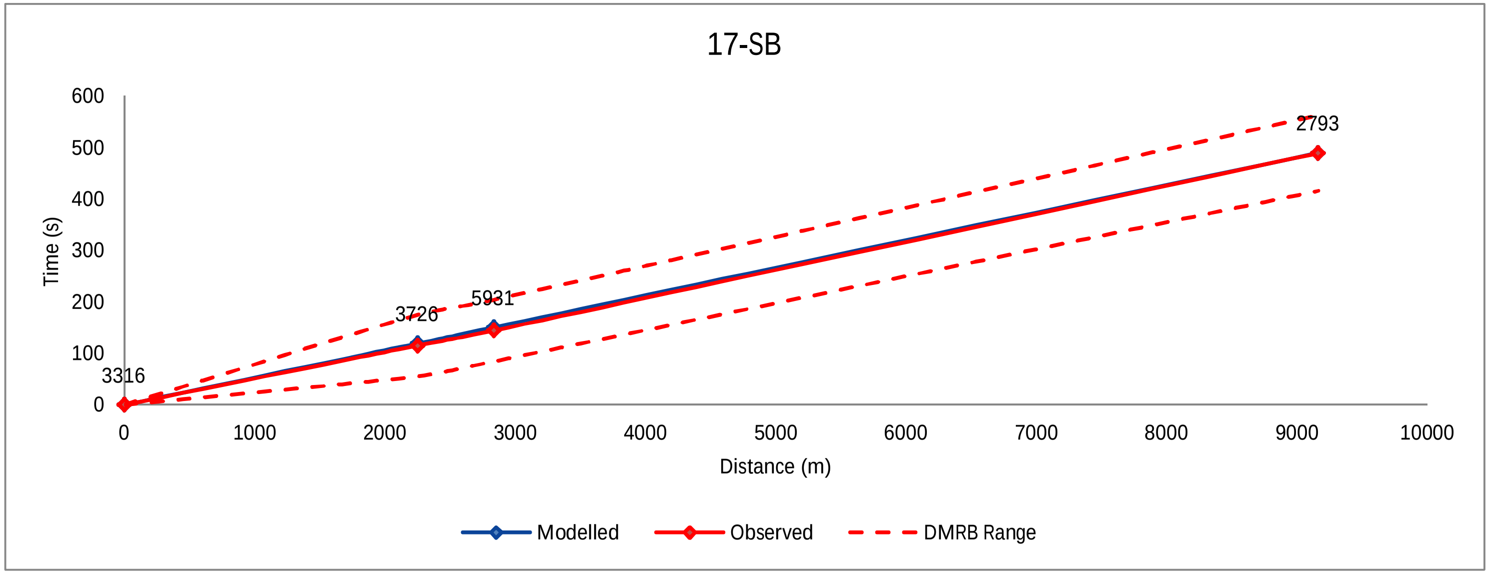

15-NB
Time (s)
700
600
500
400
300
200
100
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
3000
6315
4000
1230
6140
6080
Modelled
Observed
DMRB Range

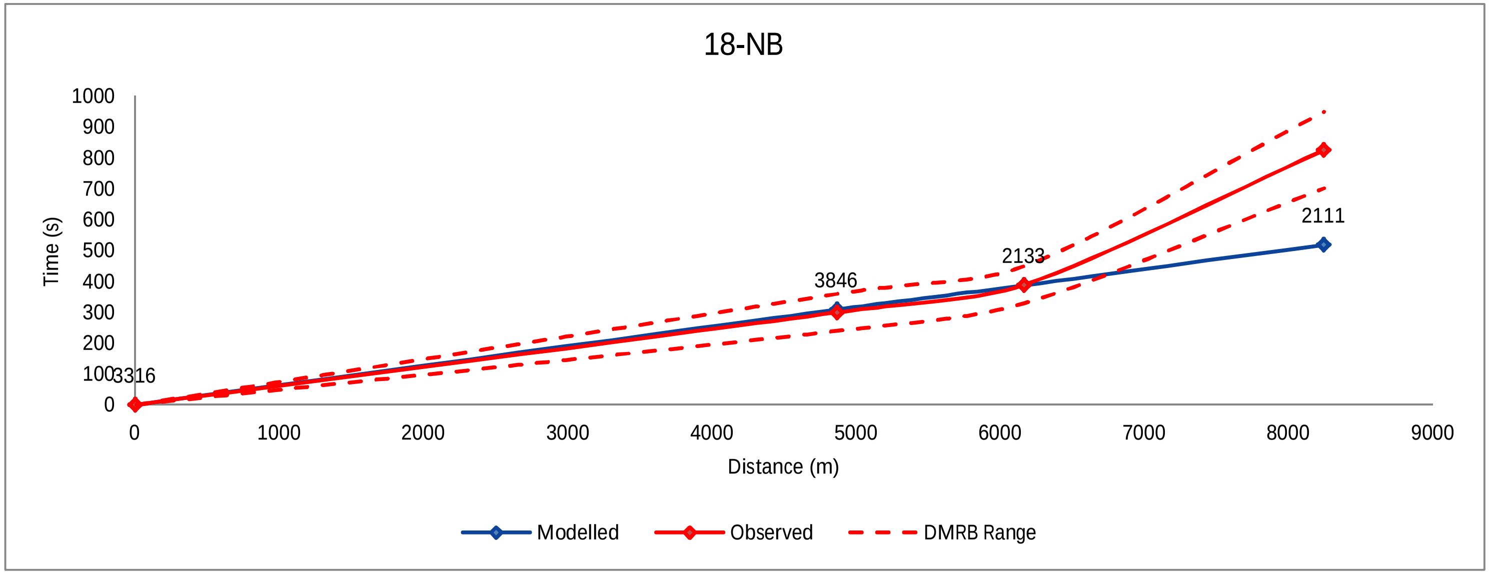

15-SB
Time (s)
600
500
400
300
200
100
0
-100
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
6080
6140
6010
1250
4000
6315
3000
Modelled
Observed
DMRB Range

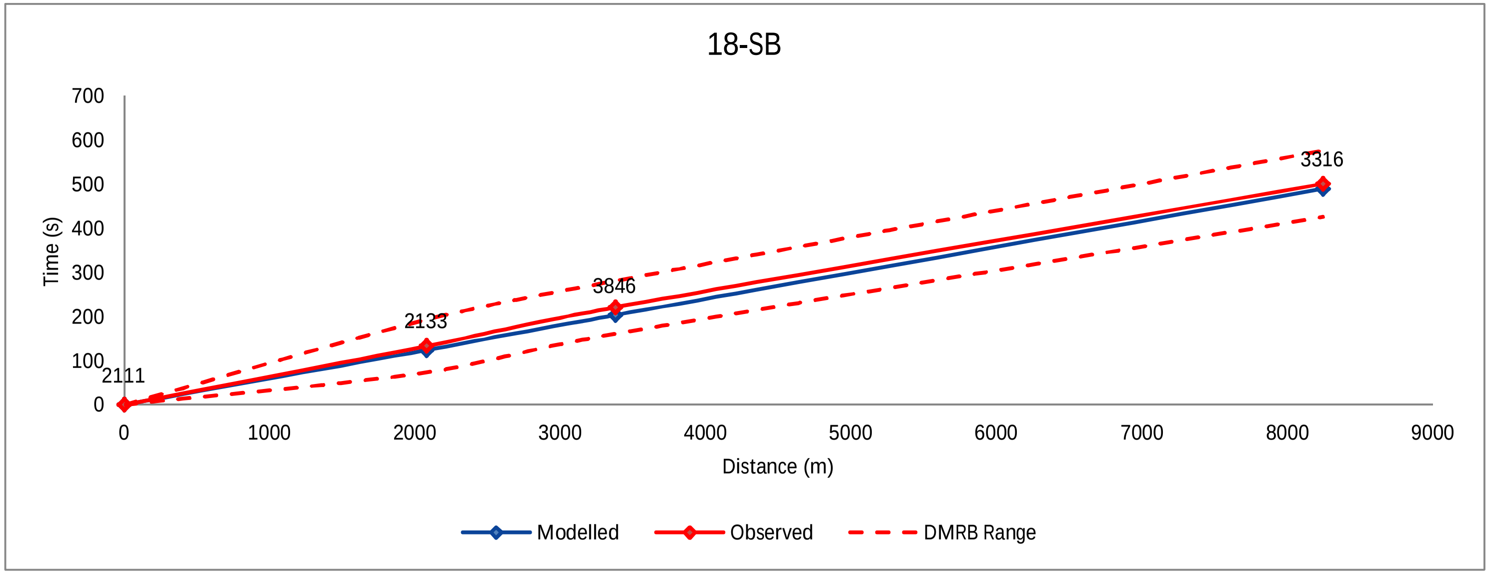

16-NB
Time (s)
Distance (m)
2794
3540
2707
2727
2743
2762
2789
5829
2793
Modelled
Observed
DMRB Range

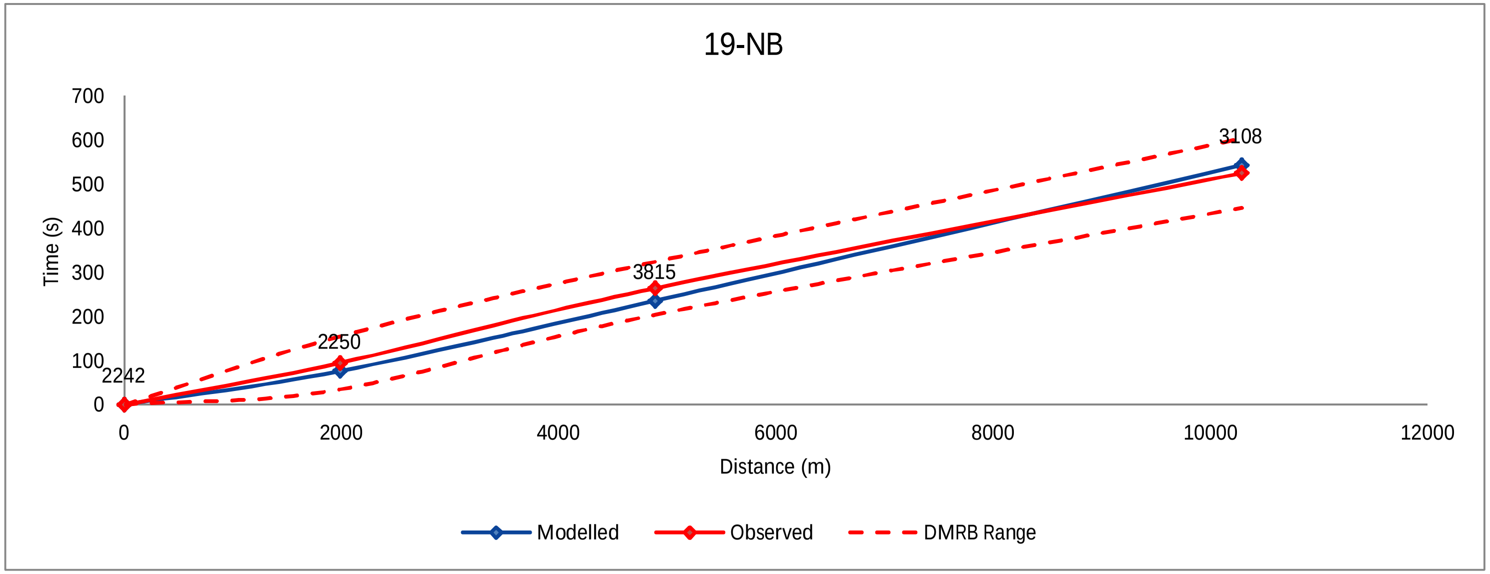

16-SB
Time (s)
Distance (m)
2793
5828
2789
2762
2734
2678
2991
3540
2794
Modelled
Observed
DMRB Range

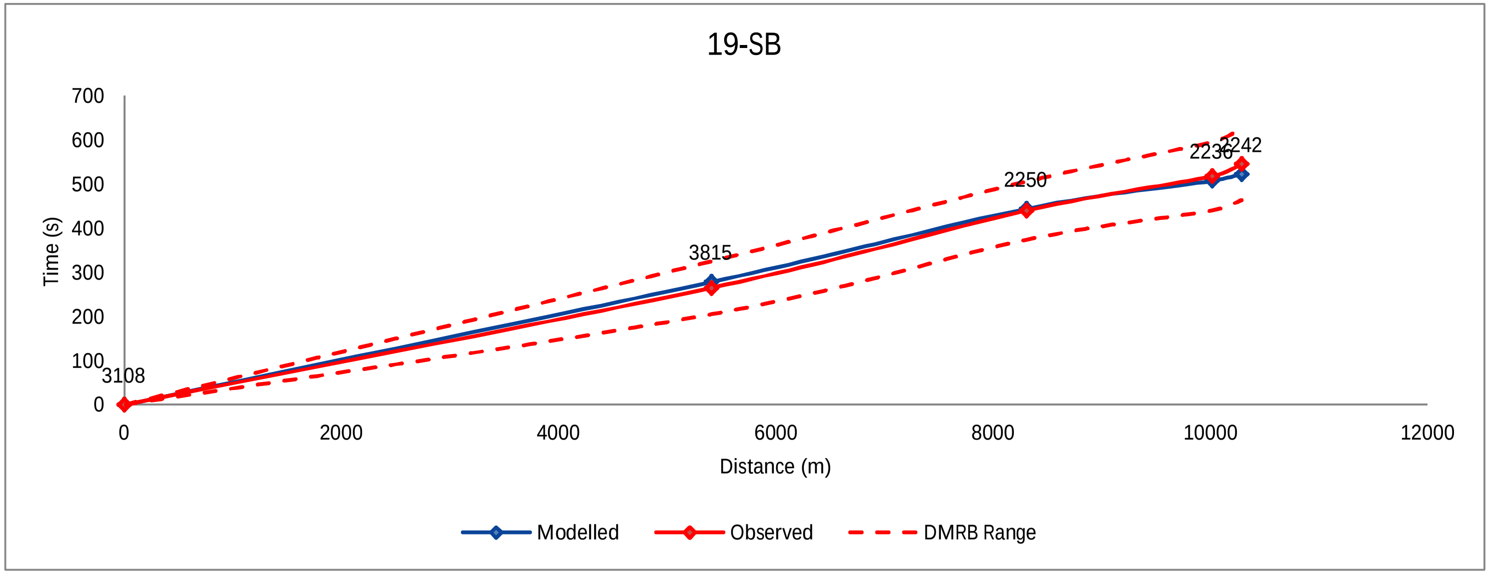

17-NB
Time (s)
700
600
500
400
300
200
100
0
2793
5931
3726
3316
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range

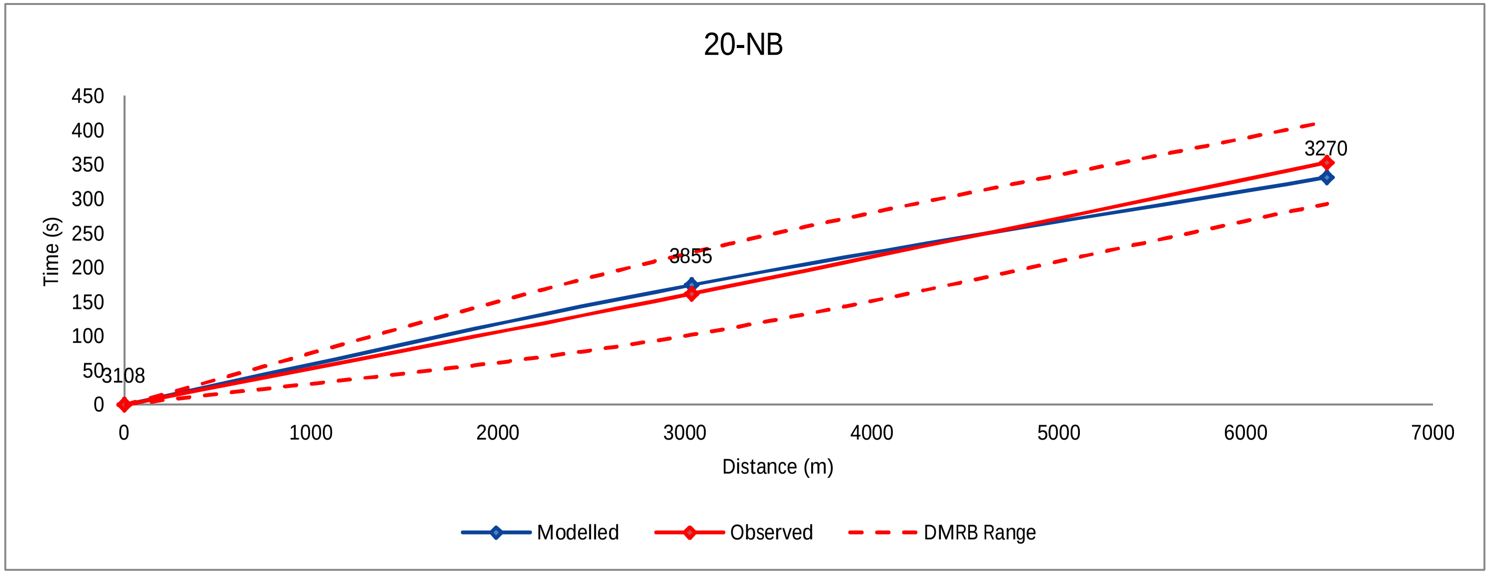

17-SB
Time (s)
600
500
400
300
200
100
0
3316
3726
5931
2793
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range

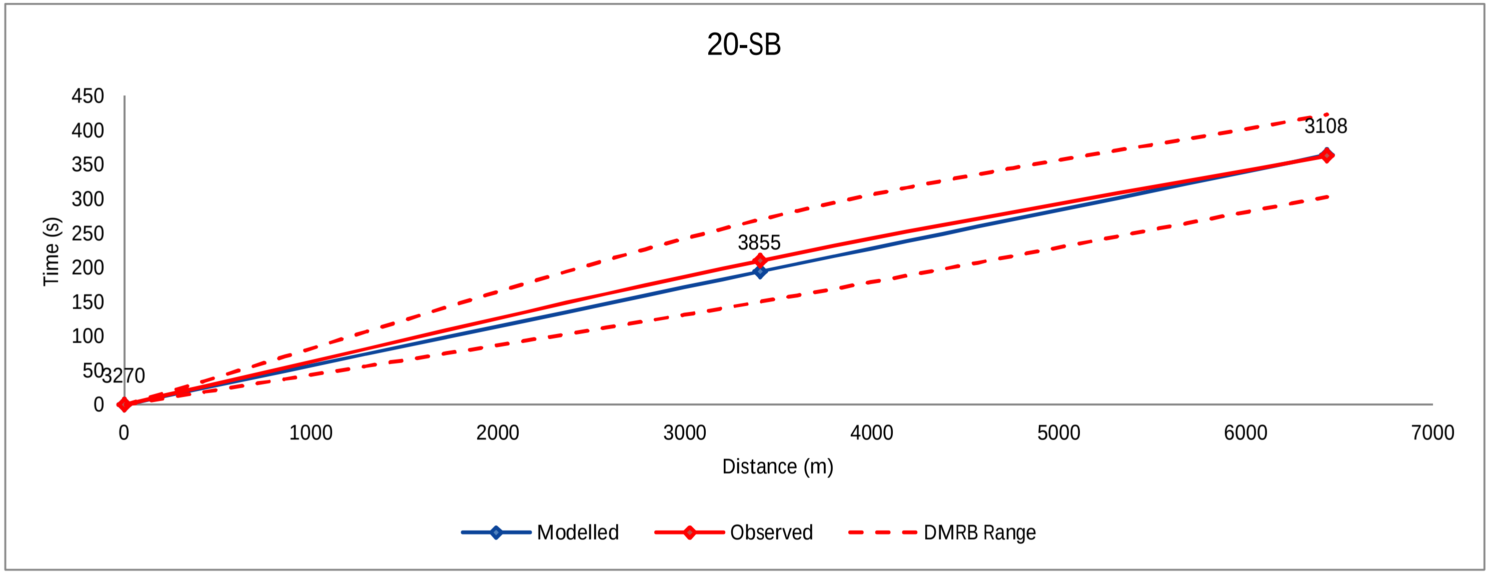

18-NB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3316
3846
2133
2111
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range

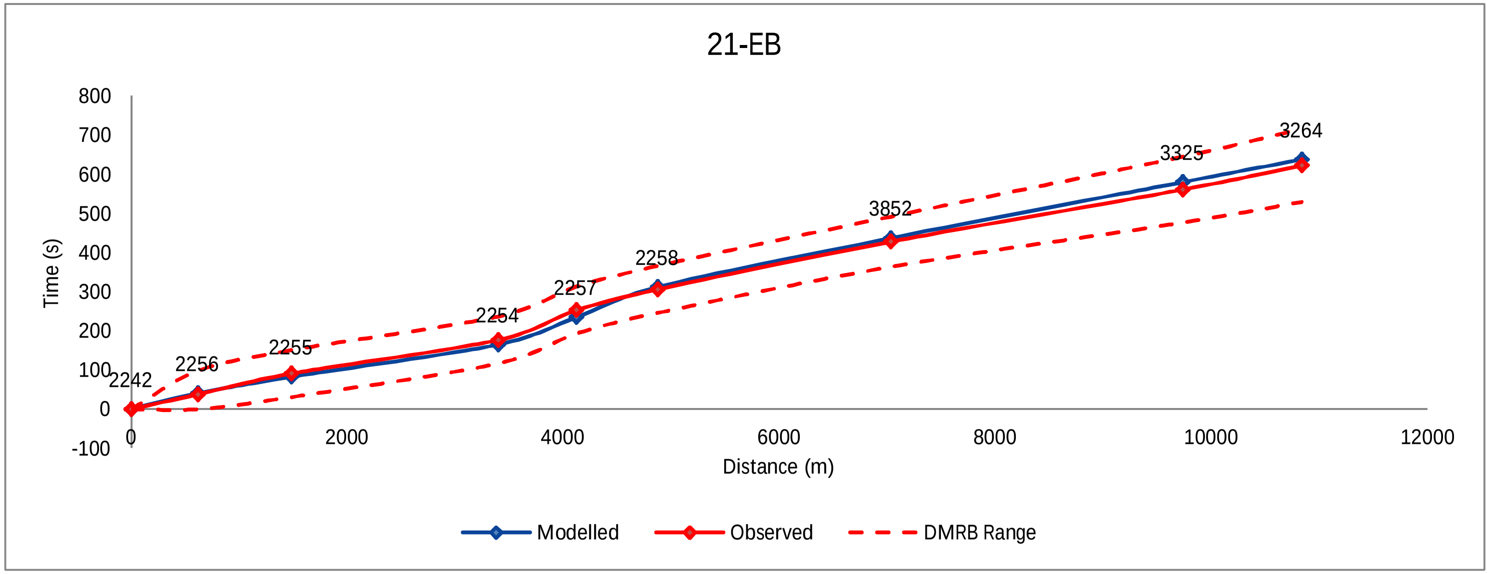

18-SB
Time (s)
700
600
500
400
300
200
100
0
2111
2133
3846
3316
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range

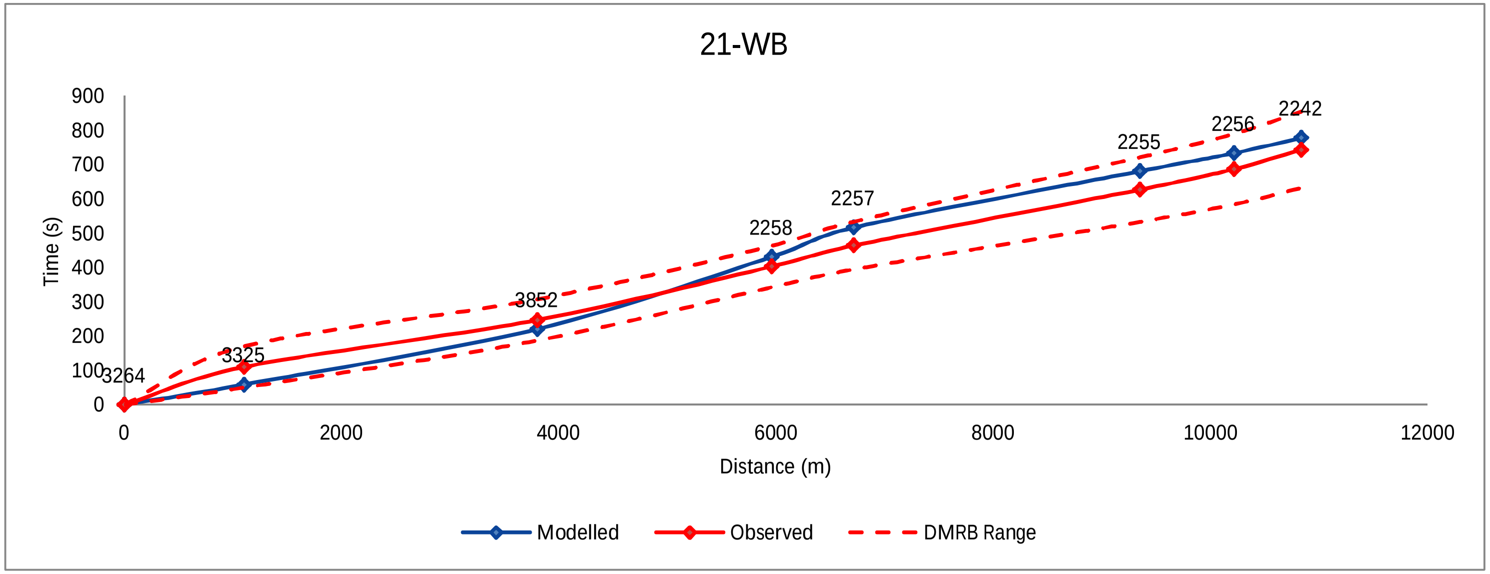

19-NB
Time (s)
700
600
500
400
300
200
100
0
2242
2250
3815
3108
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

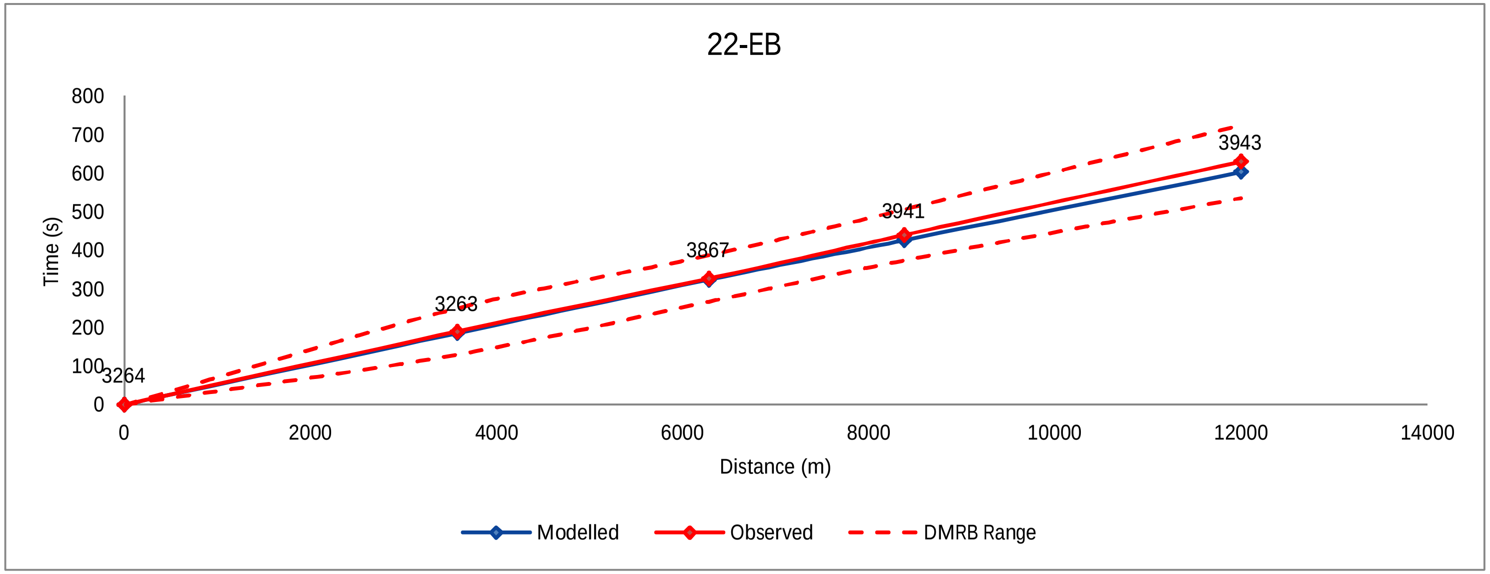

19-SB
Time (s)
700
600
500
400
300
200
100
0
3108
3815
2250
2236
2242
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

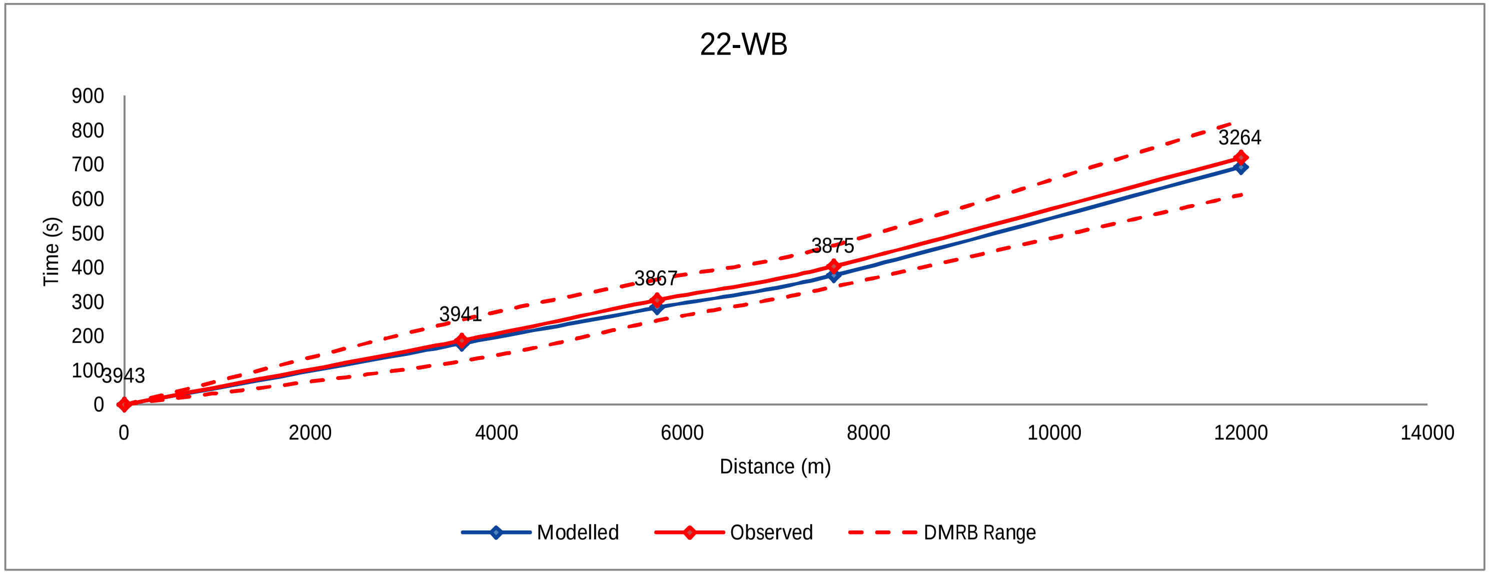

20-NB
Time (s)
450
400
350
300
250
200
150
100
50
0
3108
3855
3270
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range

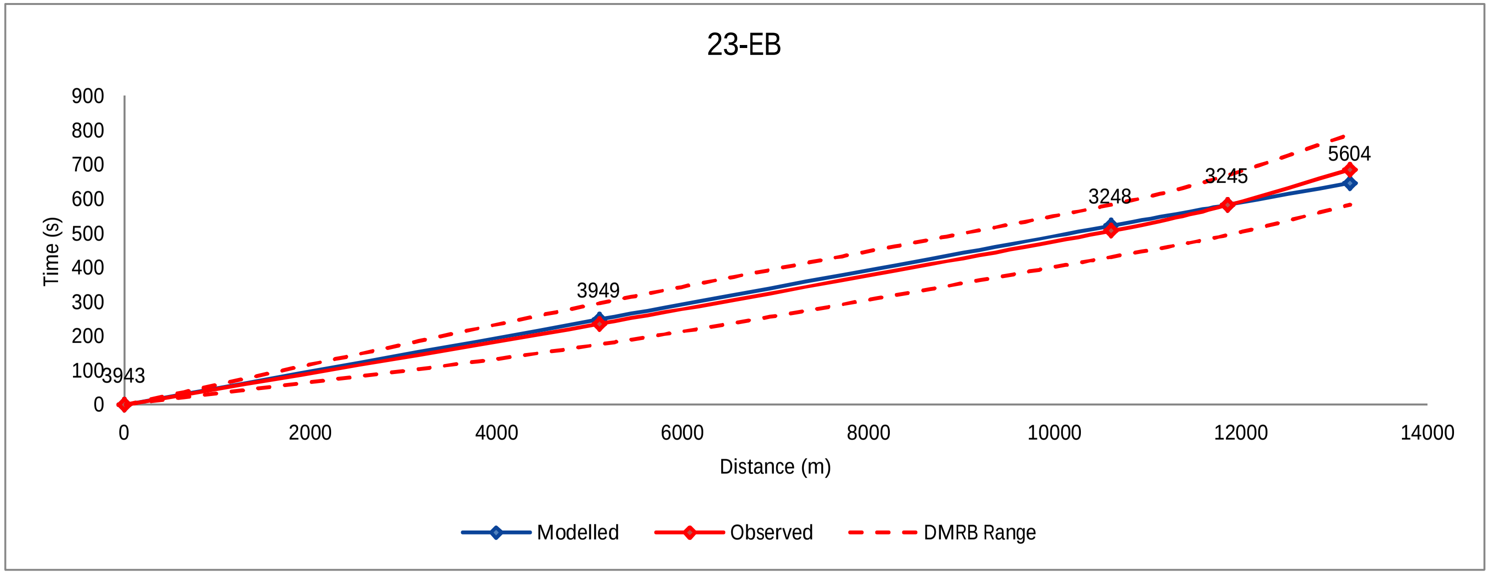

20-SB
Time (s)
450
400
350
300
250
200
150
100
50
0
3270
3855
3108
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range

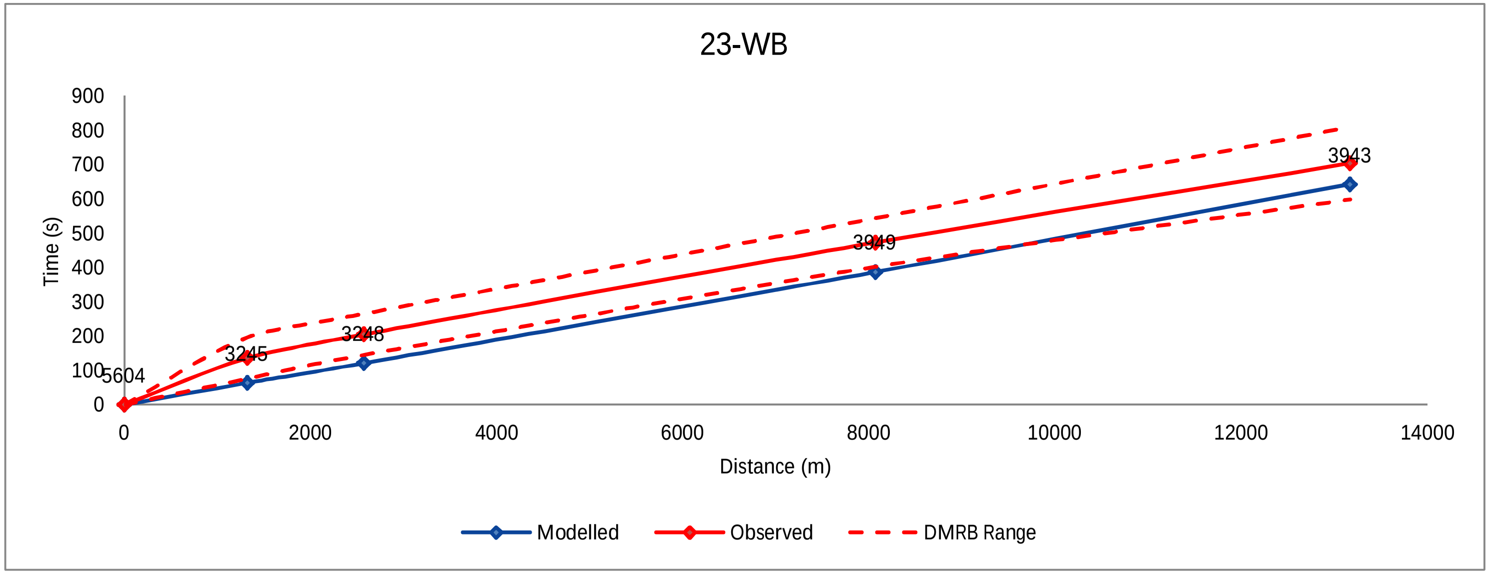

21-EB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
Distance (m)
2242
2256
2255
2254
2257
2258
3852
3325
3264
Modelled
Observed
DMRB Range

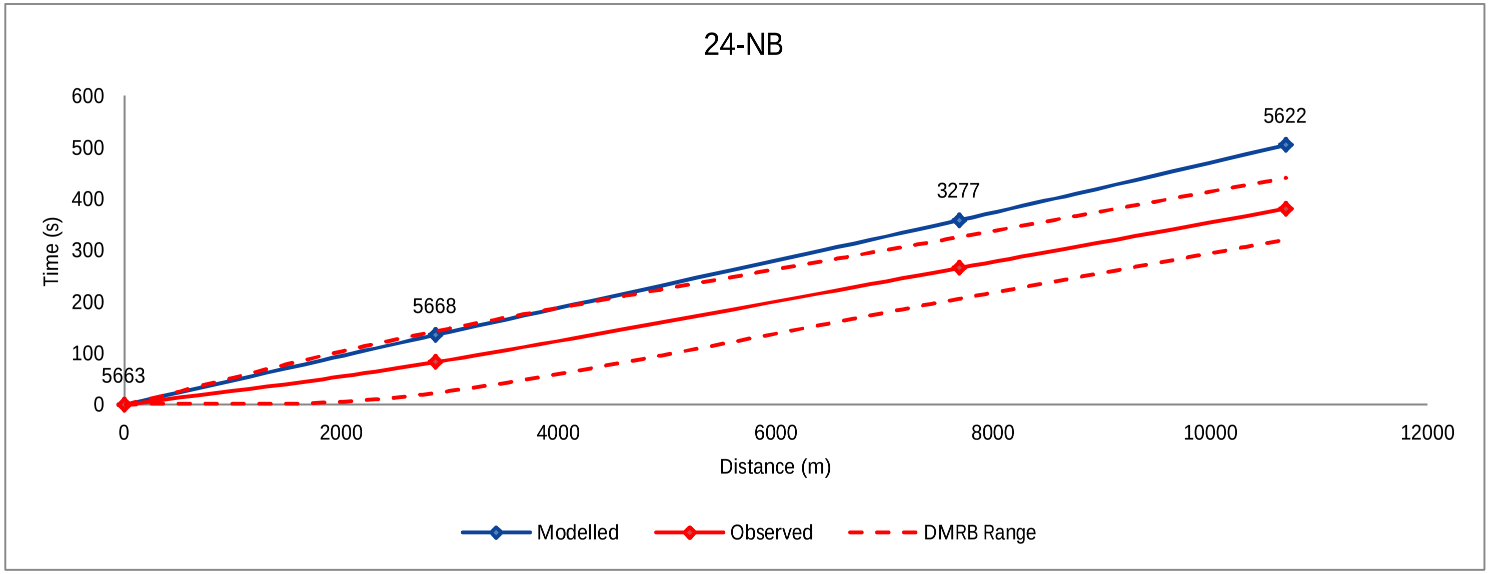

21-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
Distance (m)
3264
3325
3852
2258
2257
2255
2256
2242
Modelled
Observed
DMRB Range

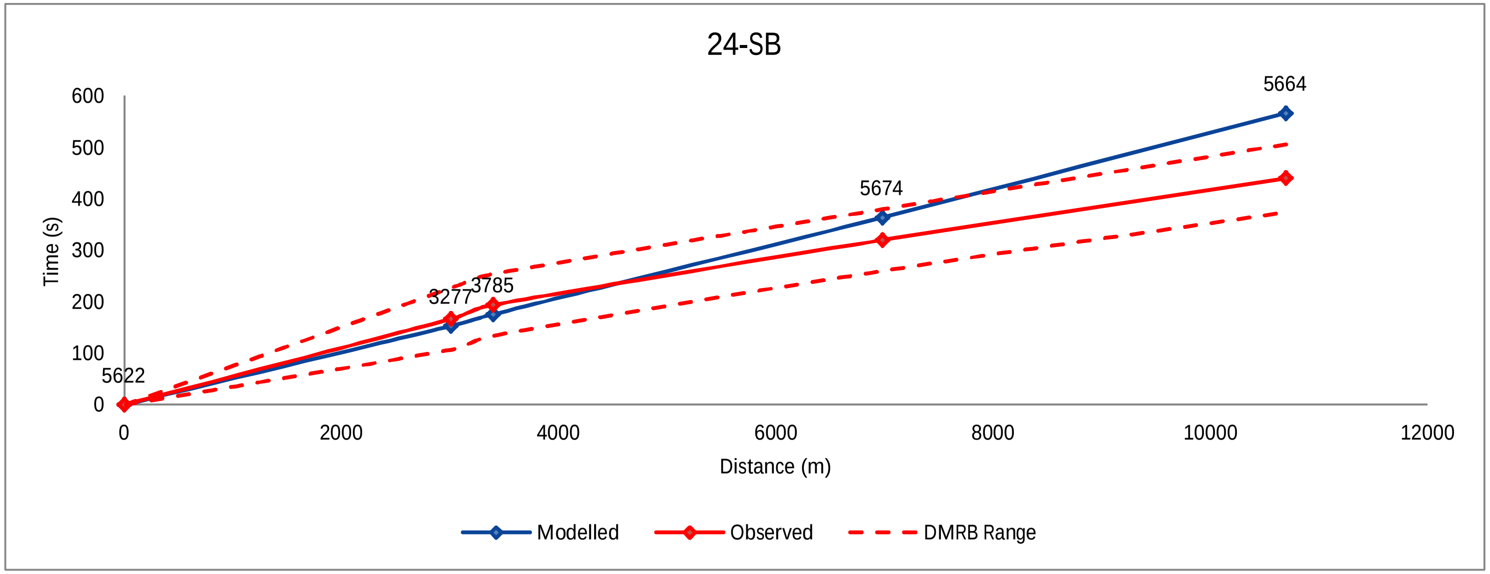

22-EB
Time (s)
800
700
600
500
400
300
200
100
0
3264
3263
3867
3941
3943
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range

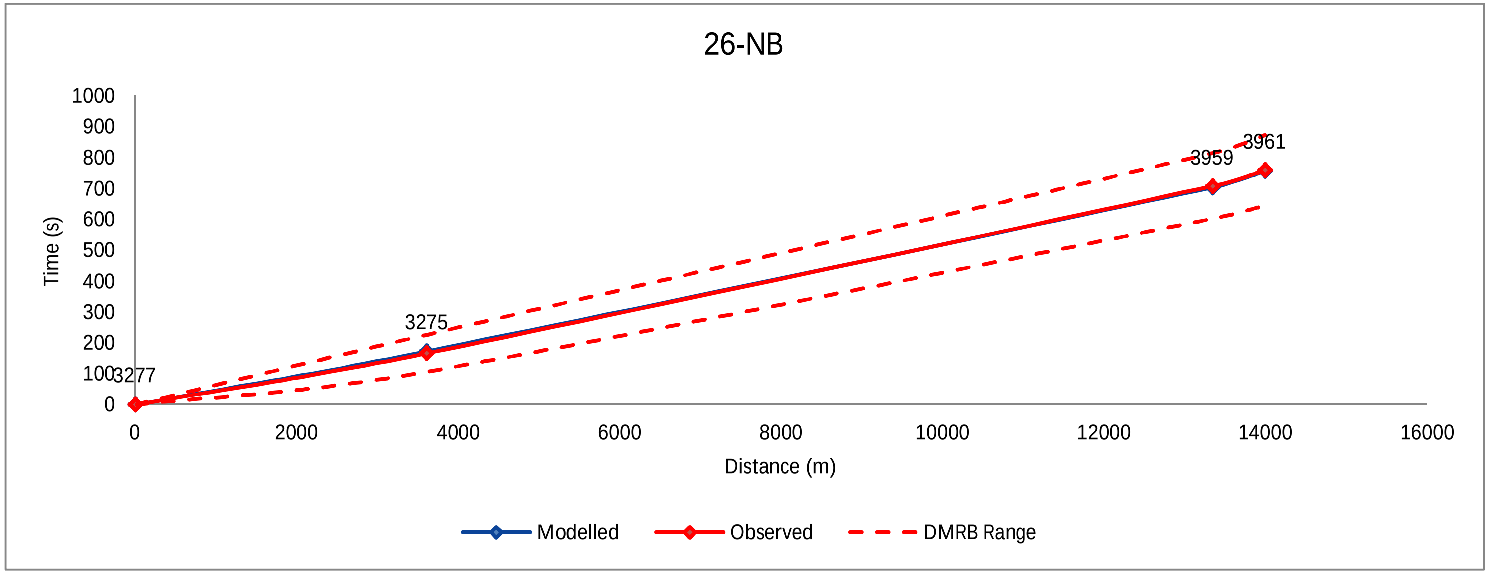

22-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
3943
3941
3867
3875
3264
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range

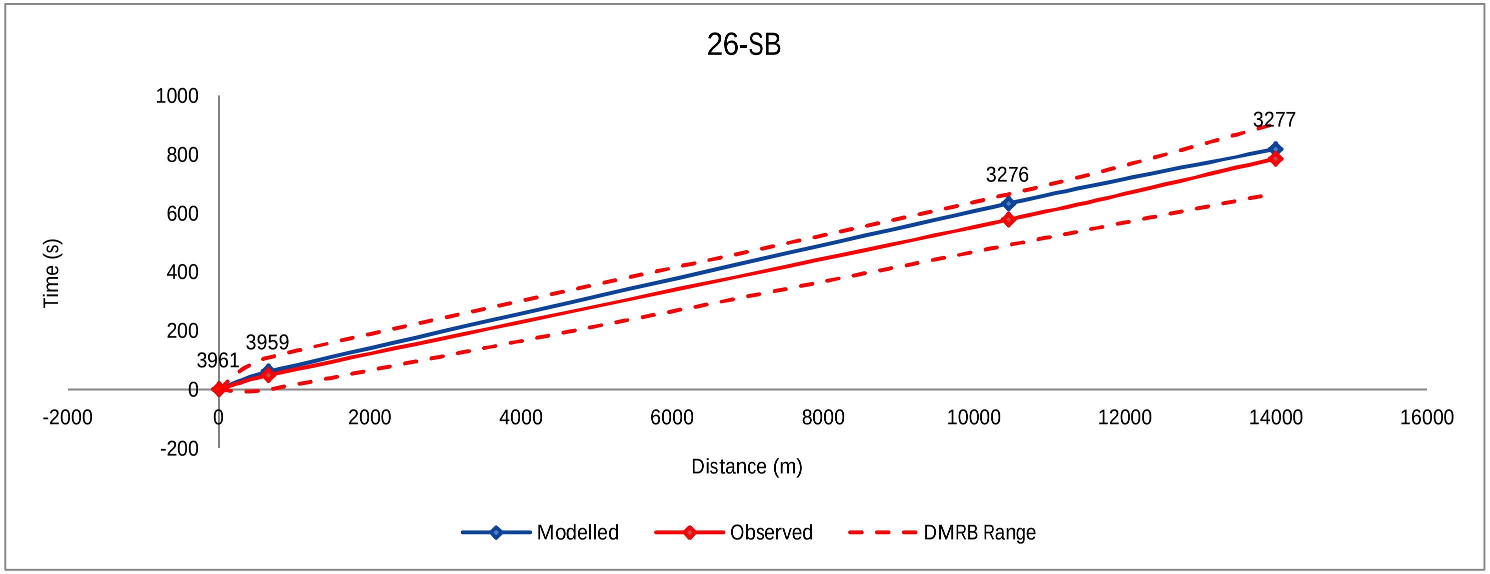

23-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
3943
3949
3248
3245
5604
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range

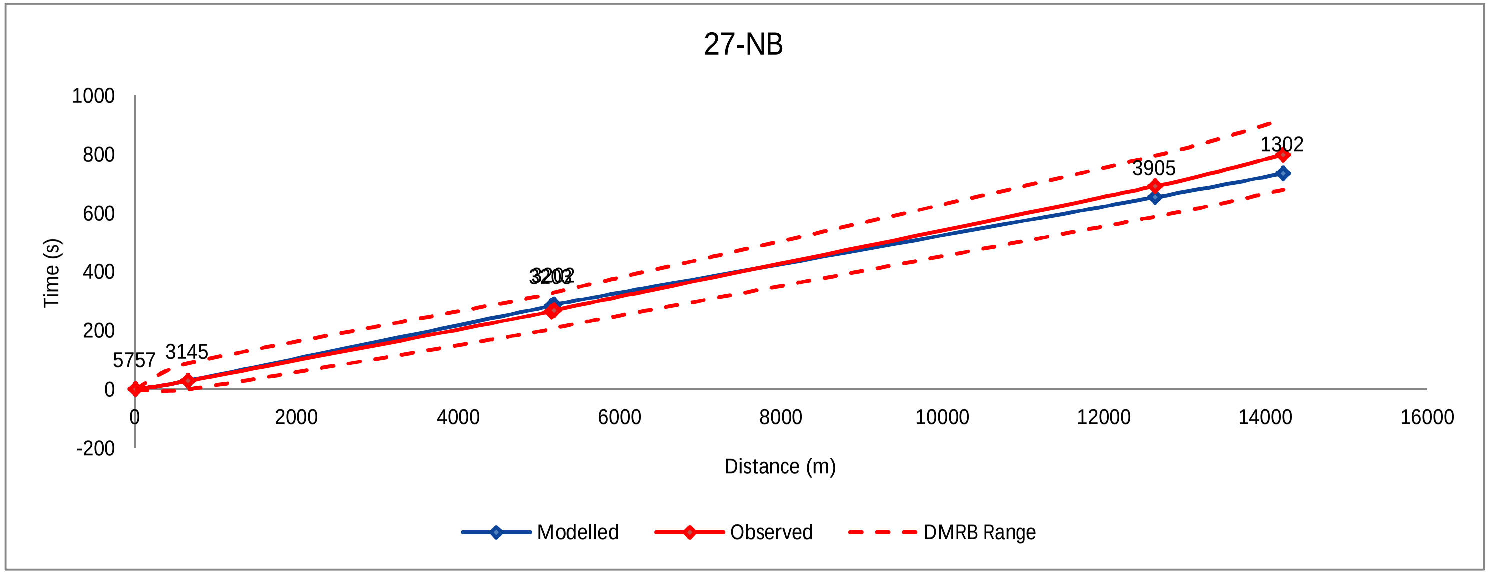

23-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
5604
3245
3248
3949
3943
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range


24-NB
Time (s)
600
500
400
300
200
100
0
5663
5668
3277
5622
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

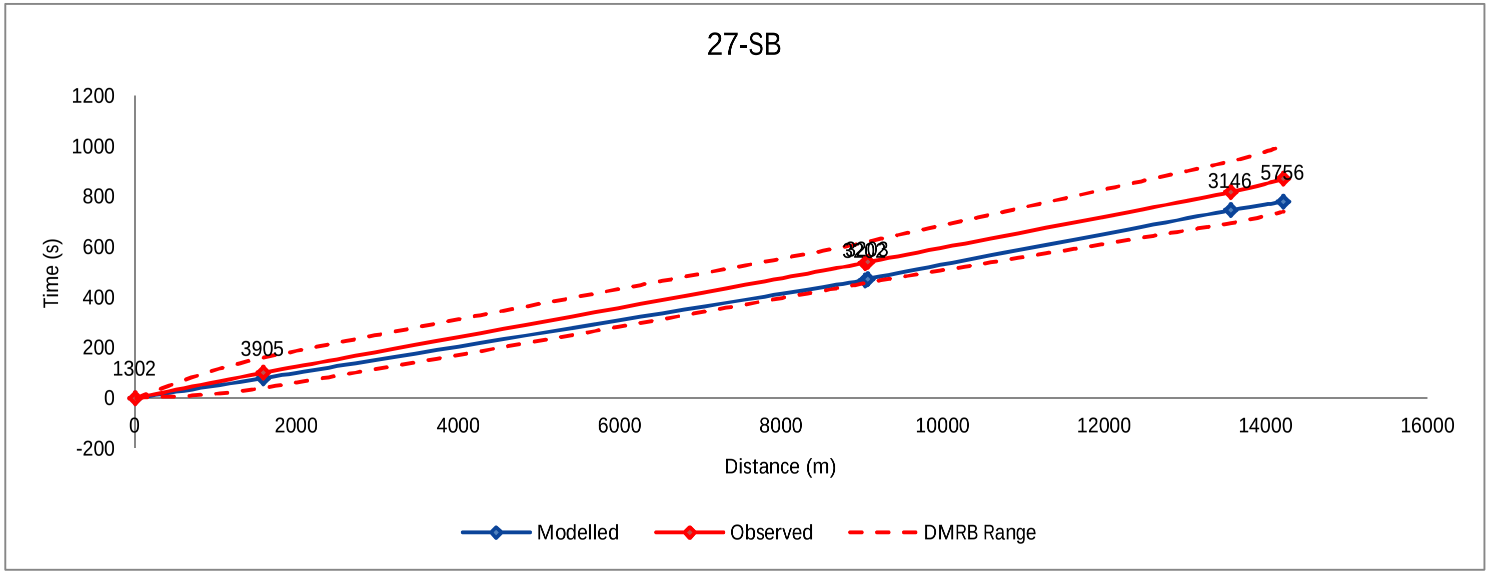

24-SB
Time (s)
600
500
400
300
200
100
0
5622
3277
3785
5674
5664
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range


26-NB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3277
3275
3959
3961
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range

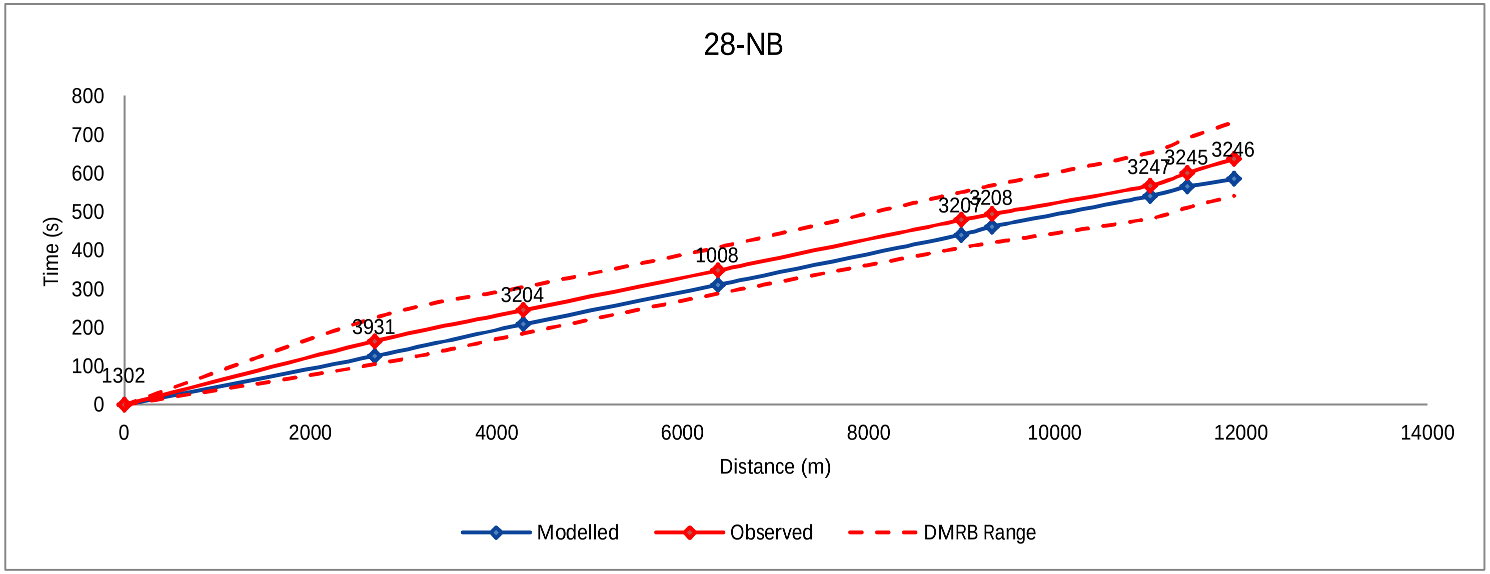

26-SB
Time (s)
1000
800
600
400
200
0
-200
3961
3959
3276
3277
-2000
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range

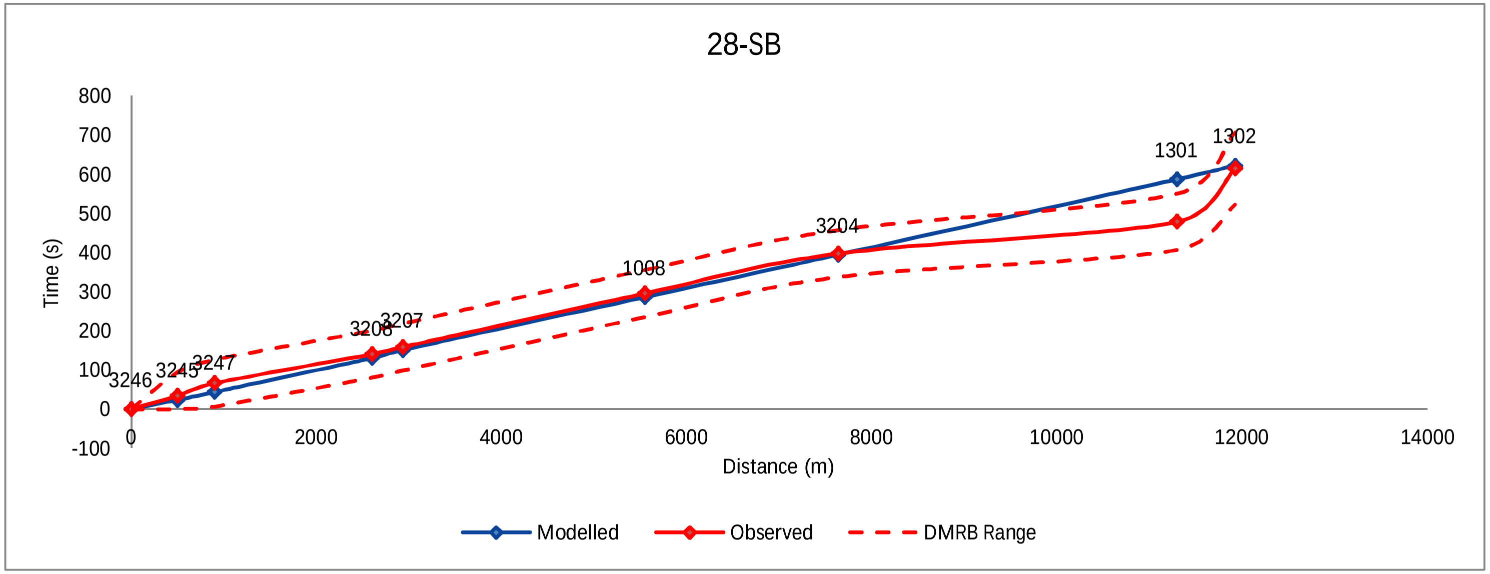


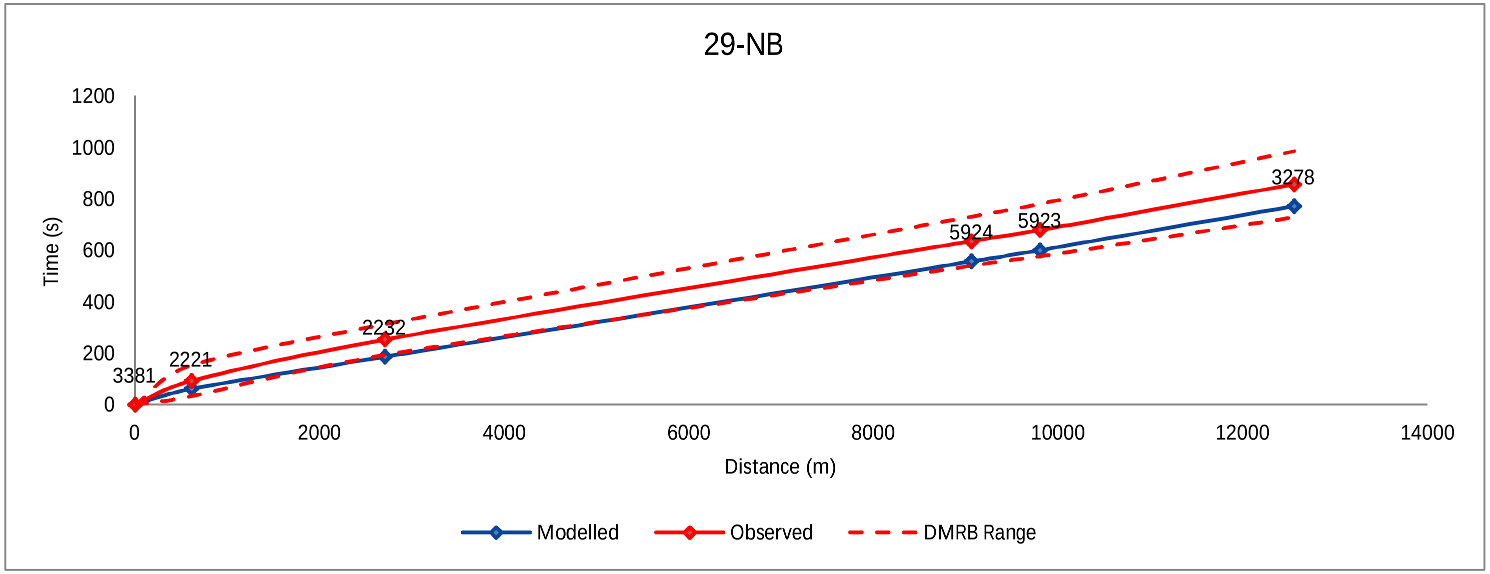
27-NB
Time (s)
Distance (m)
5757
3145
3202
3905
1302
Modelled
Observed
DMRB Range

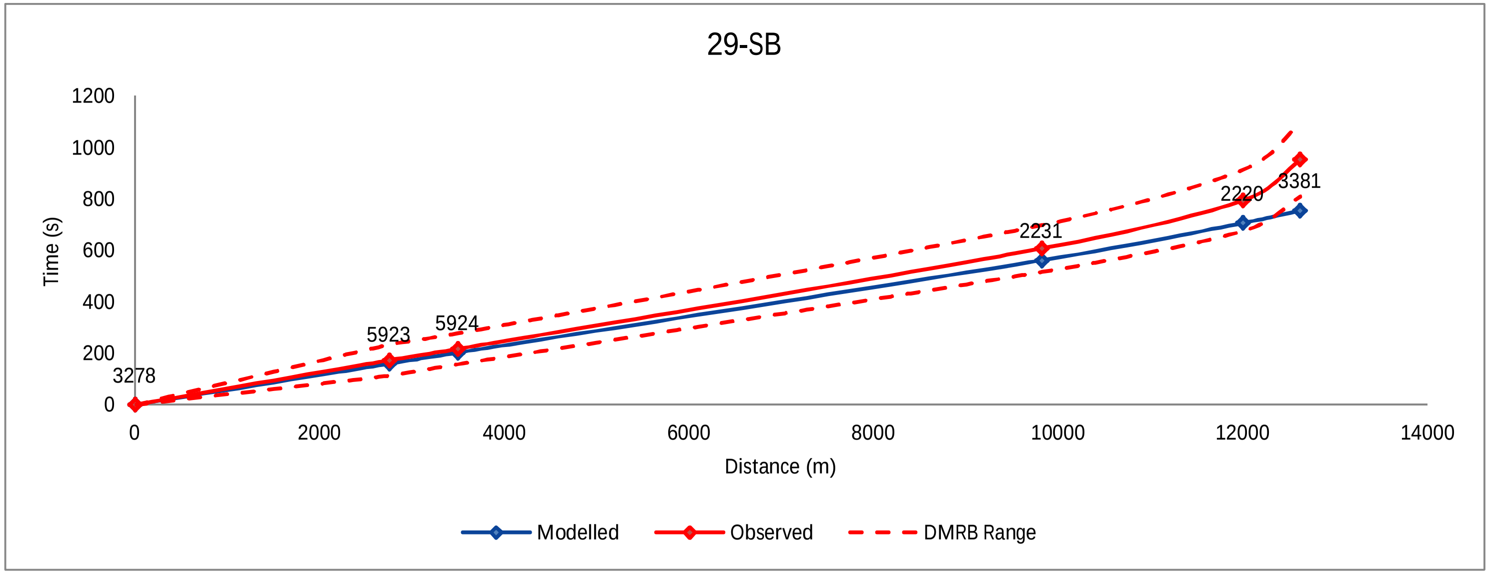


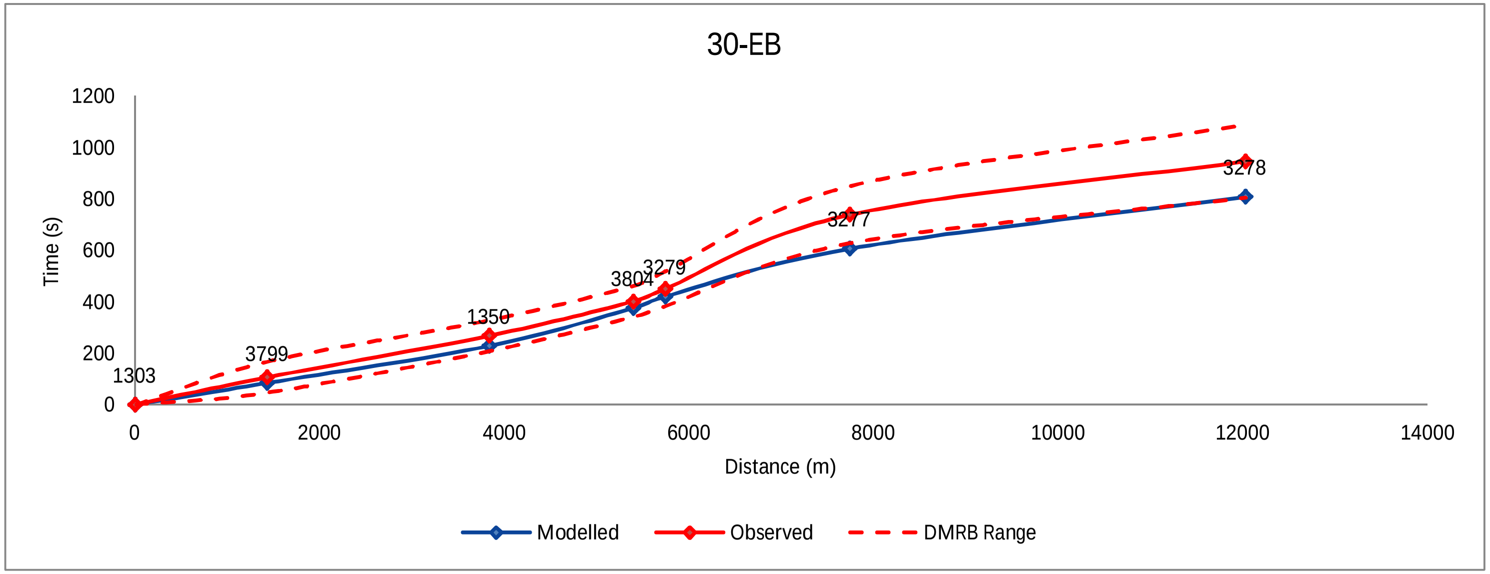
27-SB
Time (s)
Distance (m)
1302
3905
3203
3146
5756
Modelled
Observed
DMRB Range

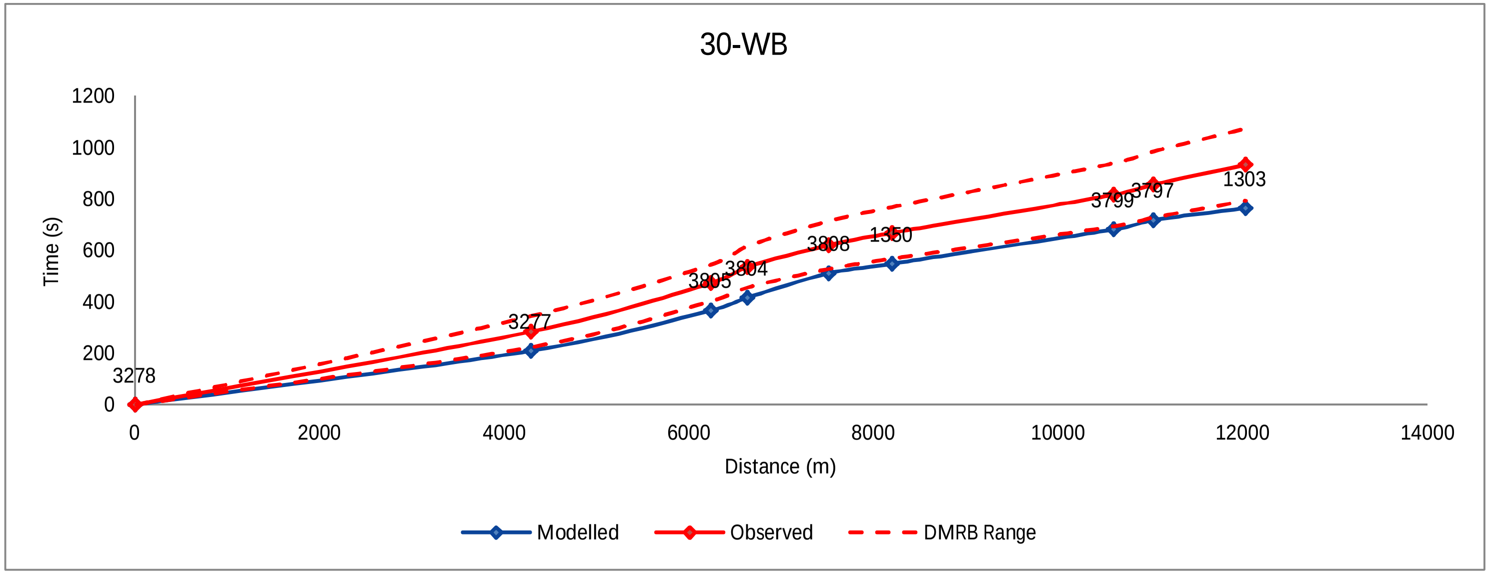

28-NB
Time (s)
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
1302
3931
3204
1008
3207
3208
3247
3245
3246
Modelled
Observed
DMRB Range

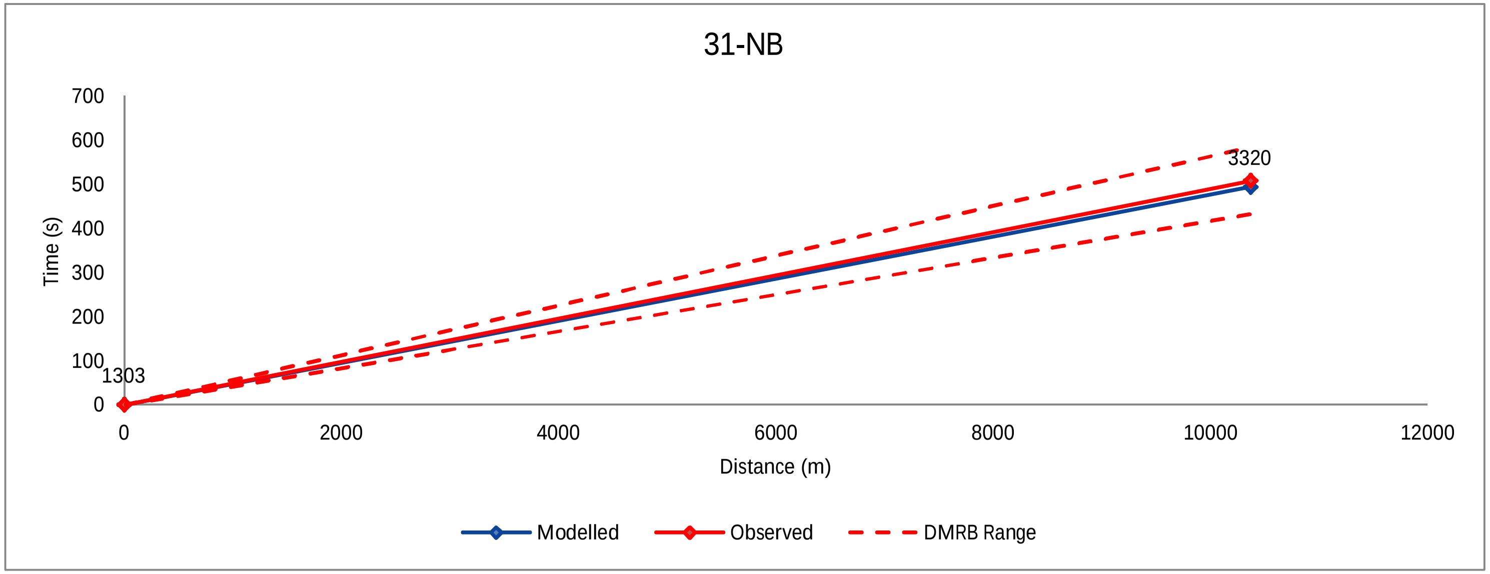

28-SB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3246
3245
3247
3208
3207
1008
3204
1301
1302
Modelled
Observed
DMRB Range

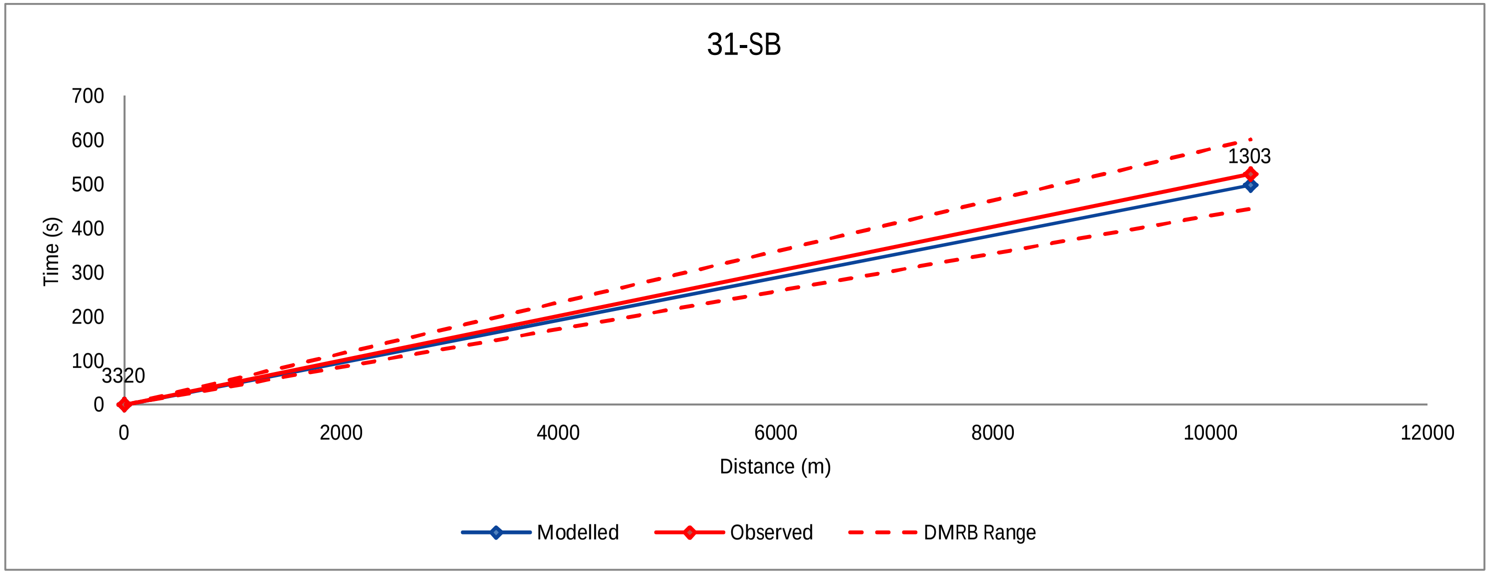

29-NB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3381
2221
2232
5924
5923
3278
Modelled
Observed
DMRB Range

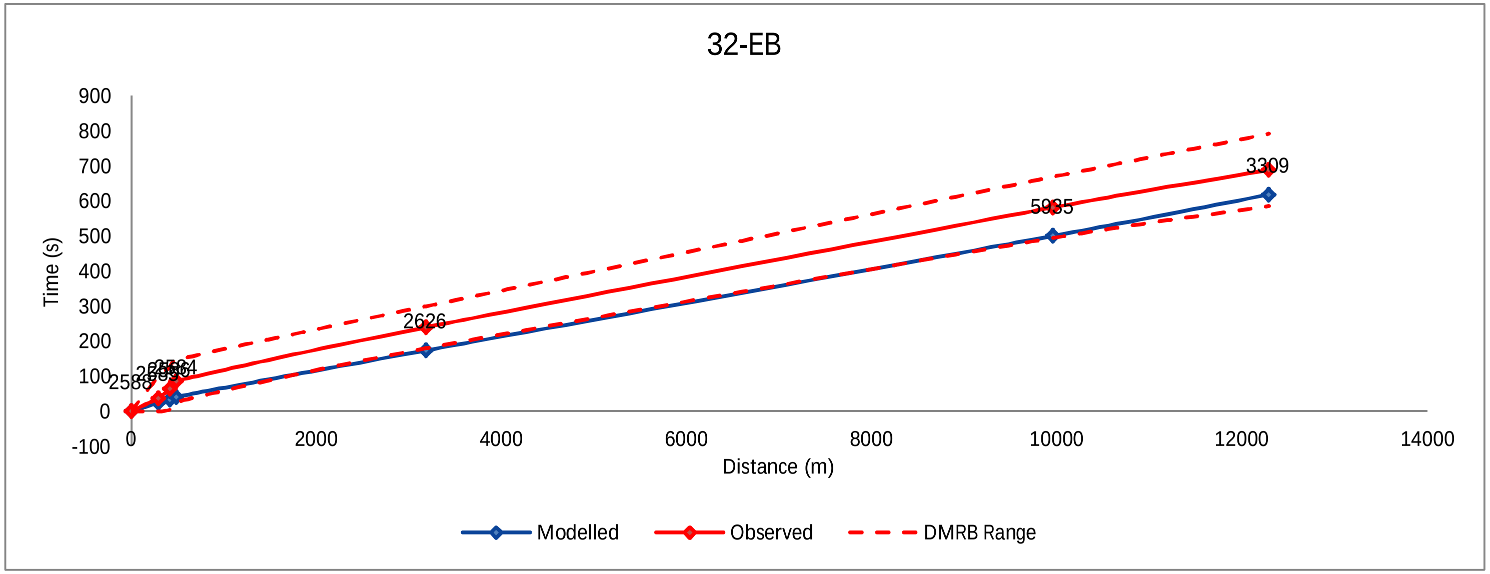

29-SB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3278
5923
5924
2231
2220
3381
Modelled
Observed
DMRB Range

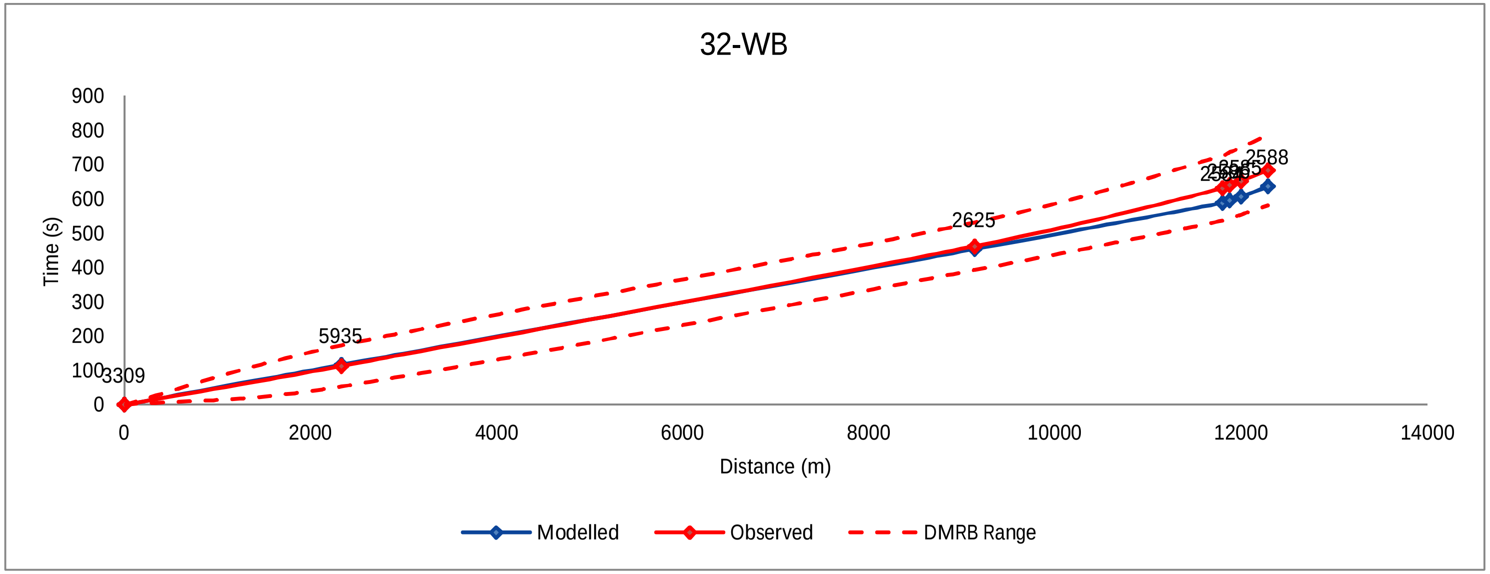

30-EB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
1303
3799
1350
3804
3279
3277
3278
Modelled
Observed
DMRB Range

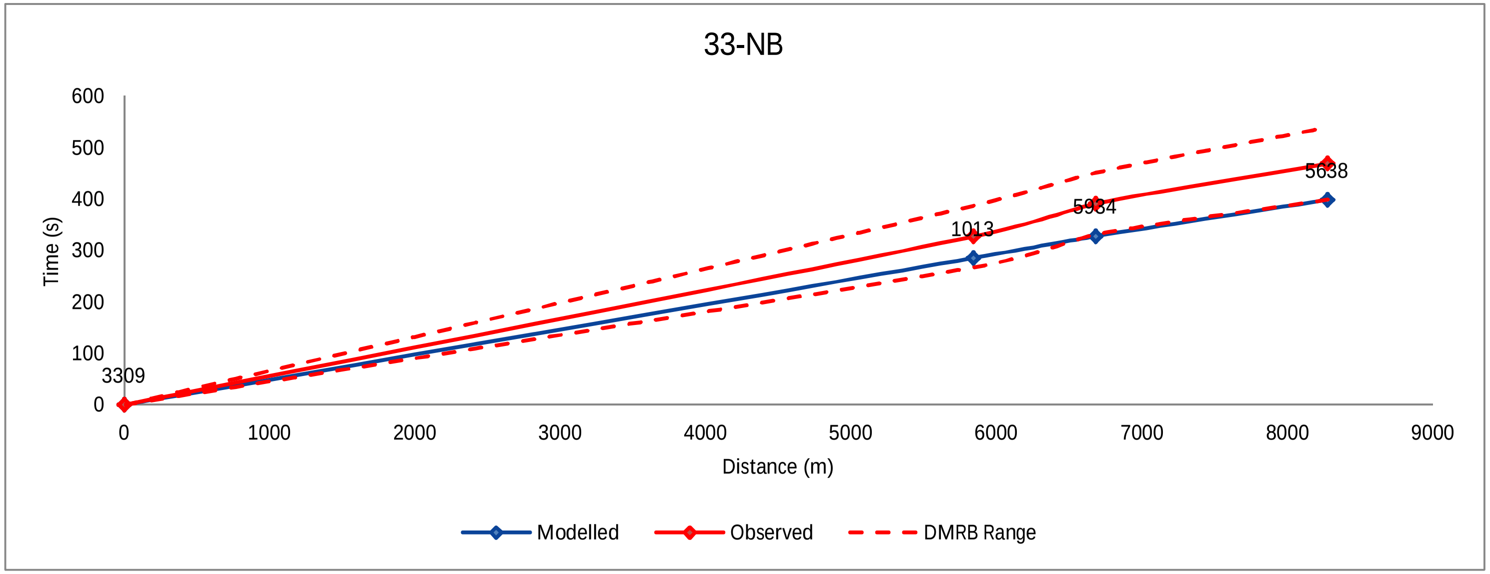

30-WB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3278
3277
3805
3804
3808
1350
3799
3797
1303
Modelled
Observed
DMRB Range

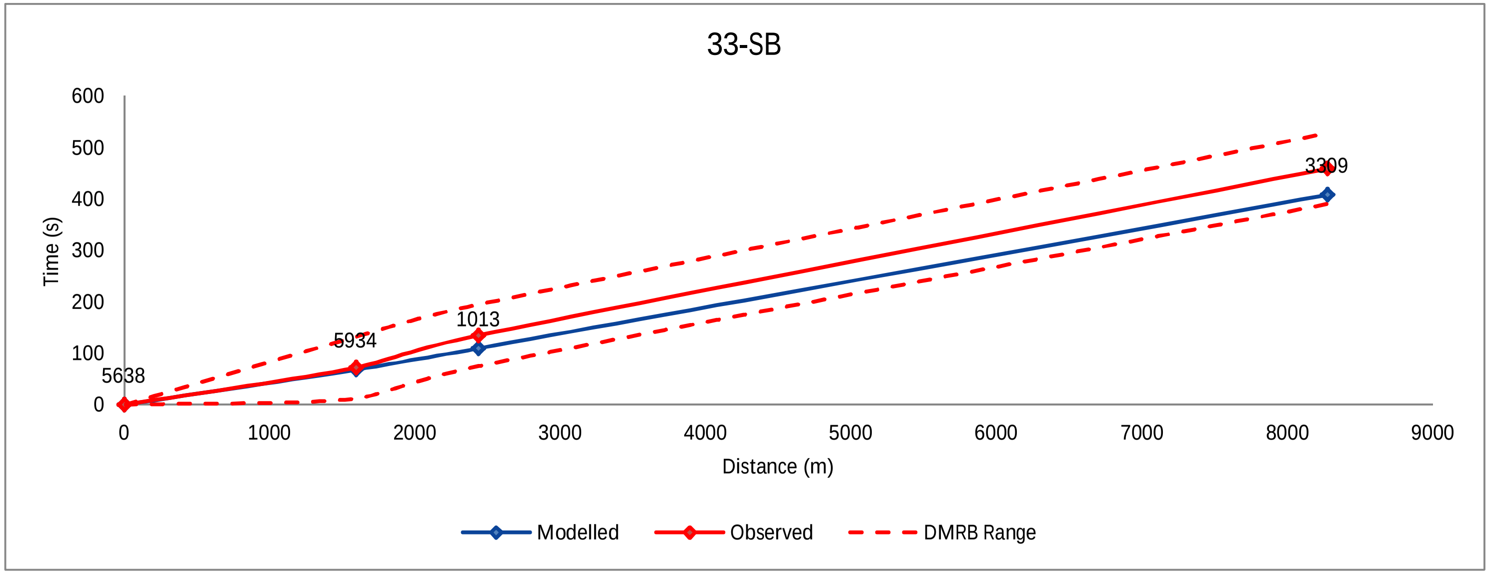

31-NB
Time (s)
700
600
500
400
300
200
100
0
1303
3320
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

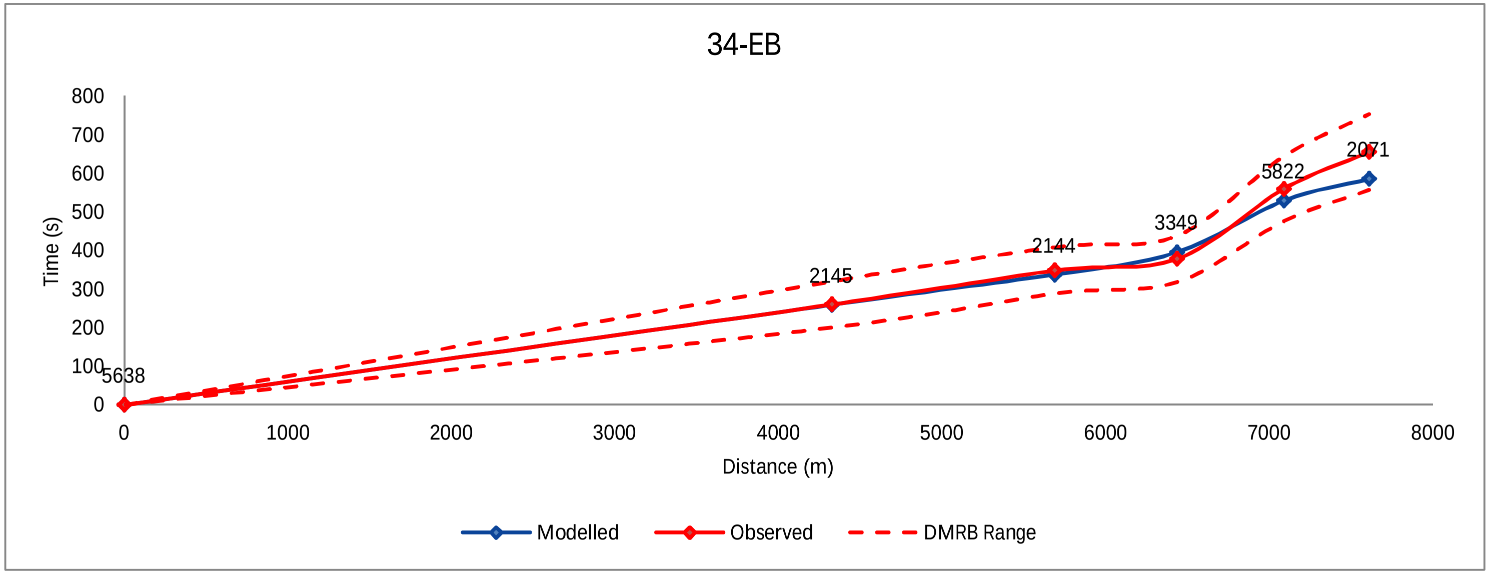

31-SB
Time (s)
700
600
500
400
300
200
100
0
3320
1303
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

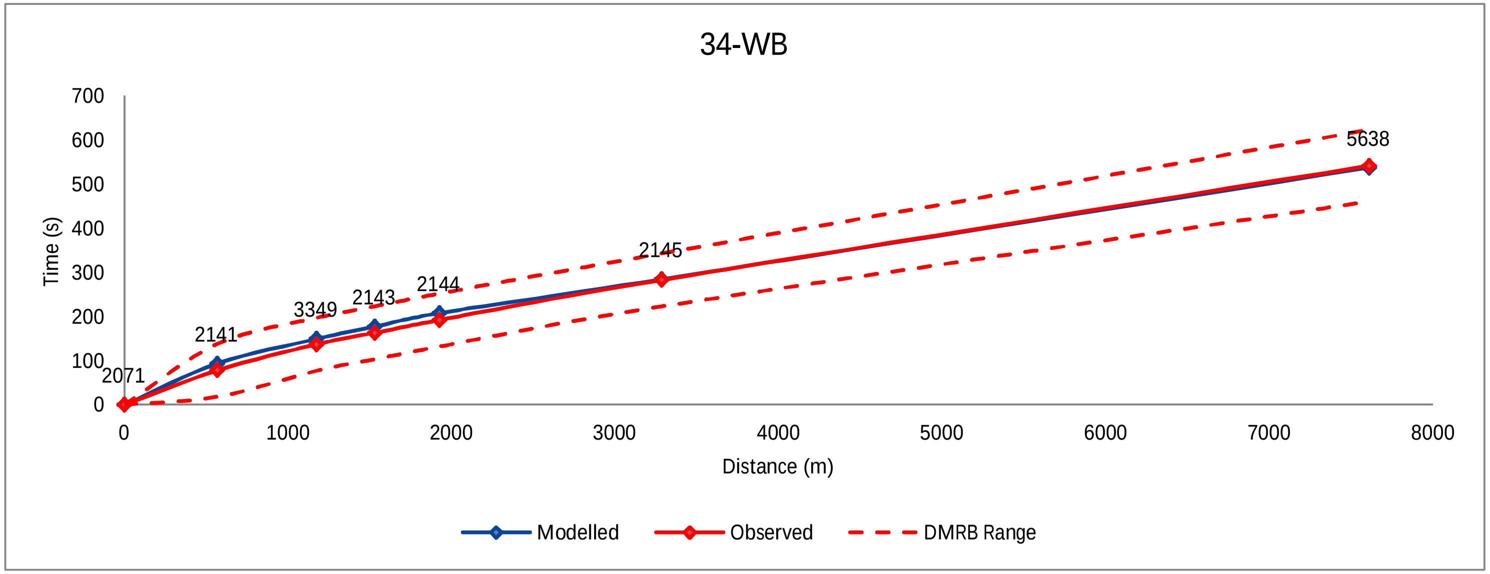

32-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
2626
5935
3309
Modelled
Observed
DMRB Range

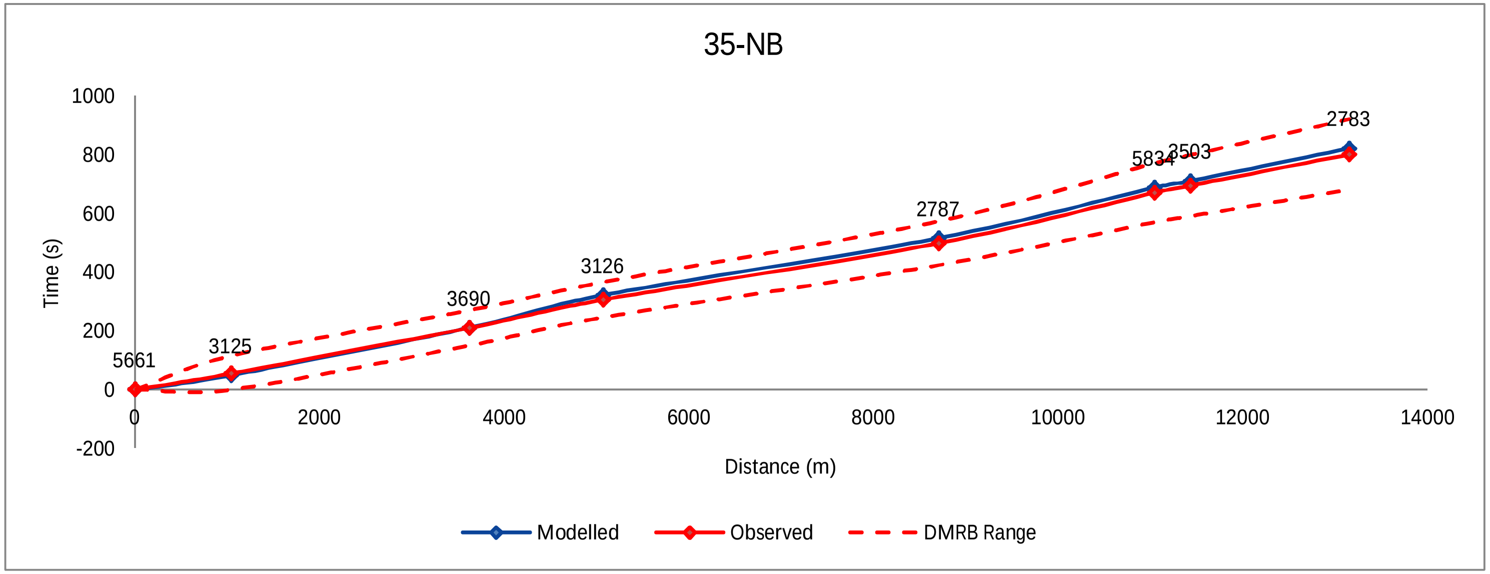

32-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3309
5935
2625
2588
Modelled
Observed
DMRB Range

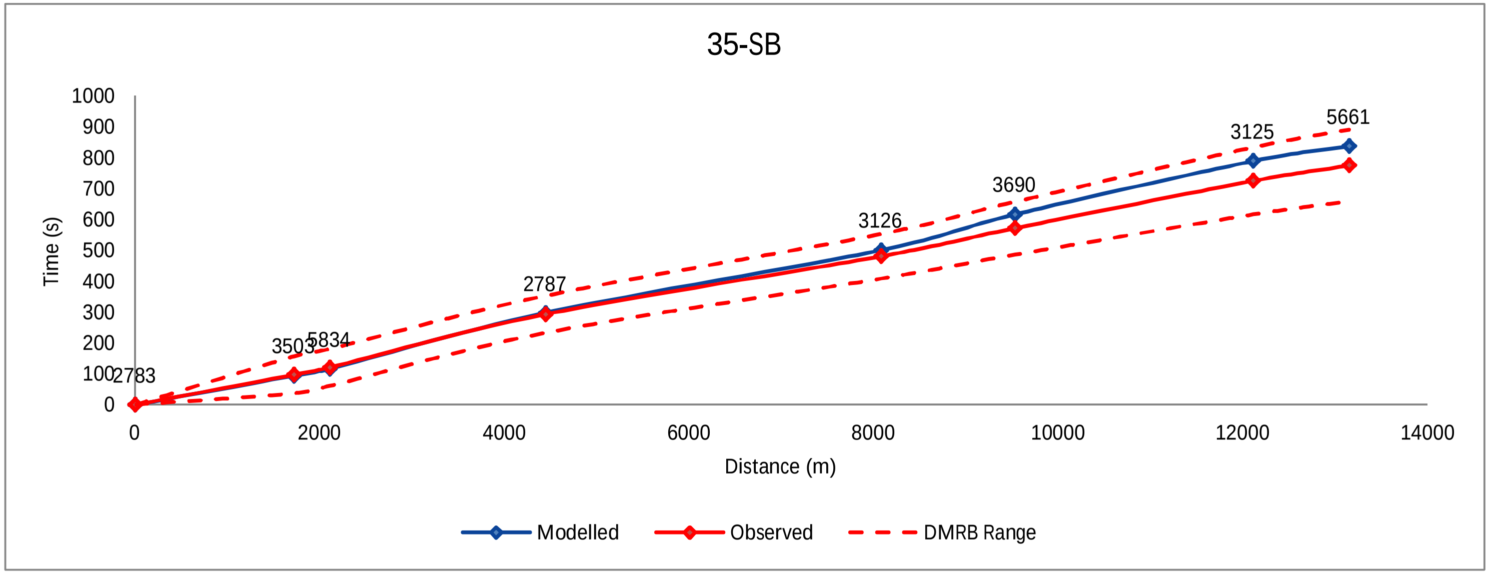

33-NB
Time (s)
600
500
400
300
200
100
0
3309
1013
5934
5638
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range

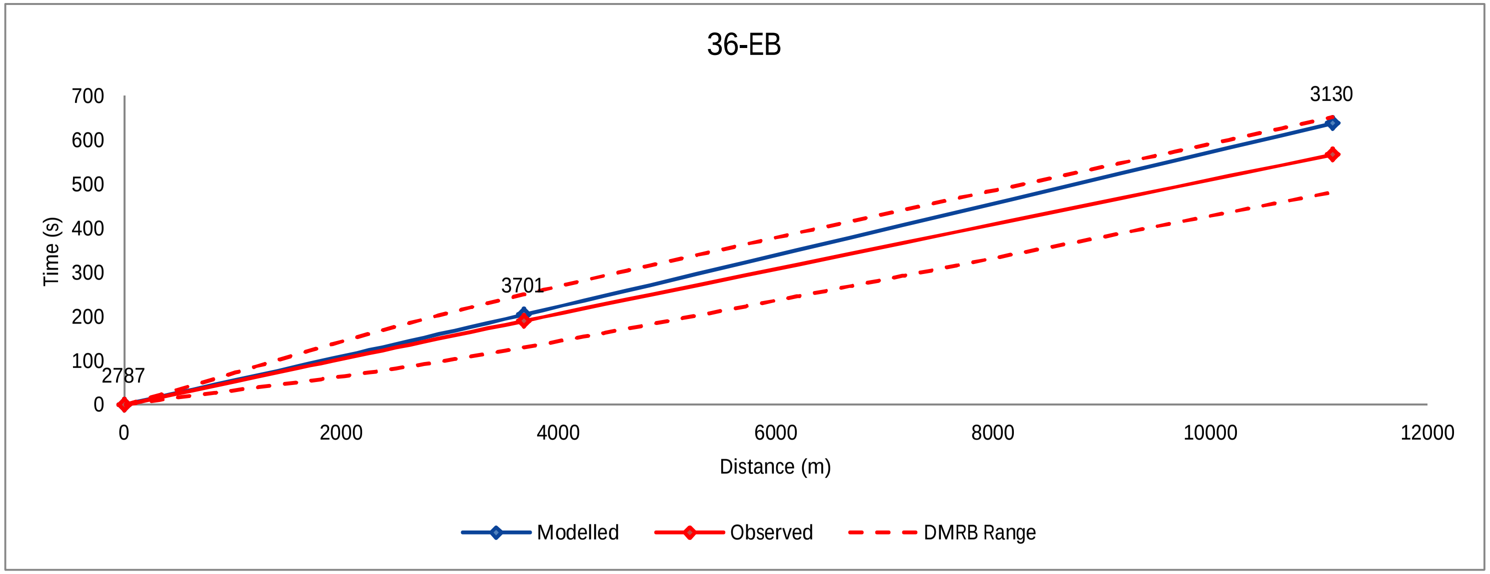

33-SB
Time (s)
600
500
400
300
200
100
0
5638
5934
1013
3309
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range

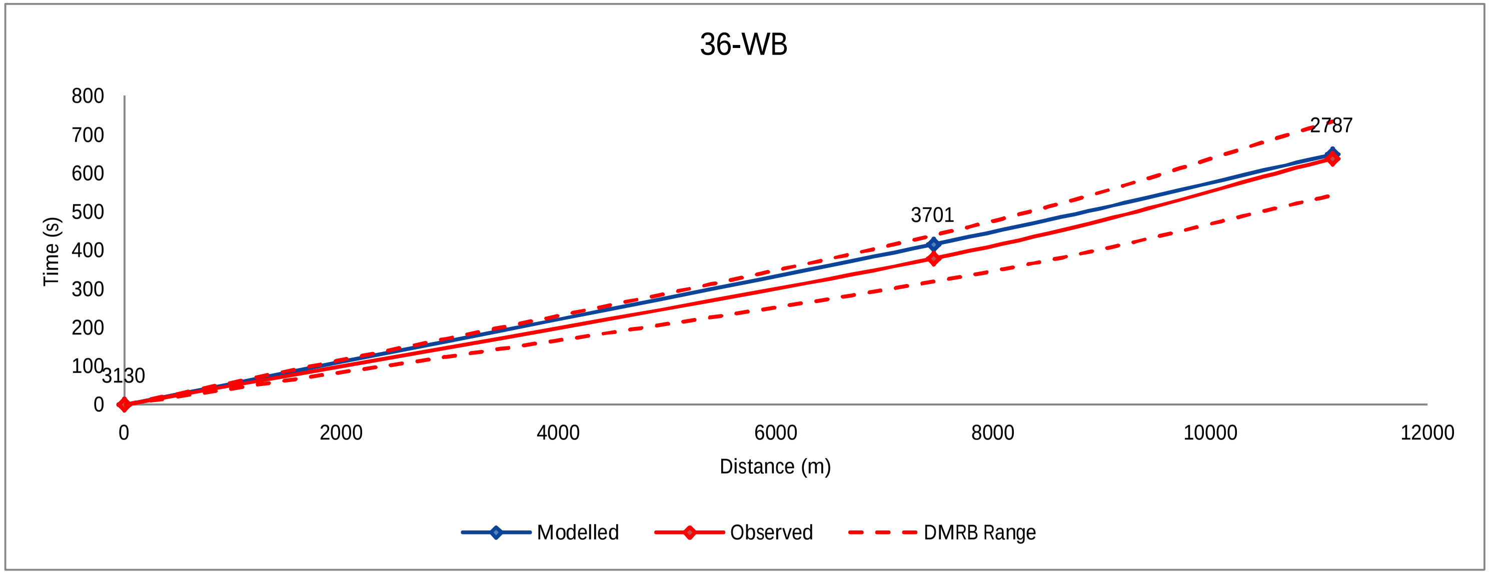

34-EB
Time (s)
800
700
600
500
400
300
200
100
0
5638
2145
2144
3349
5822
2071
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
Modelled
Observed
DMRB Range

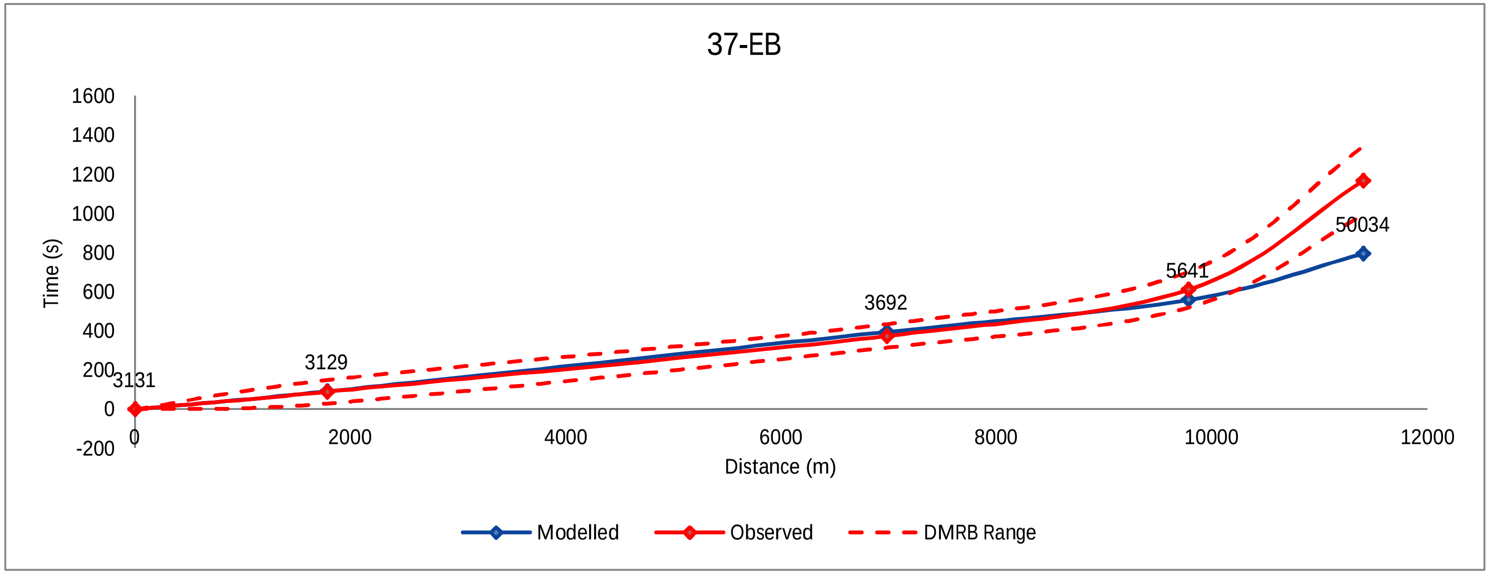

34-WB
Time (s)
700
600
500
400
300
200
100
0
2071
2141
3349
2143
2144
2145
5638
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
Modelled
Observed
DMRB Range

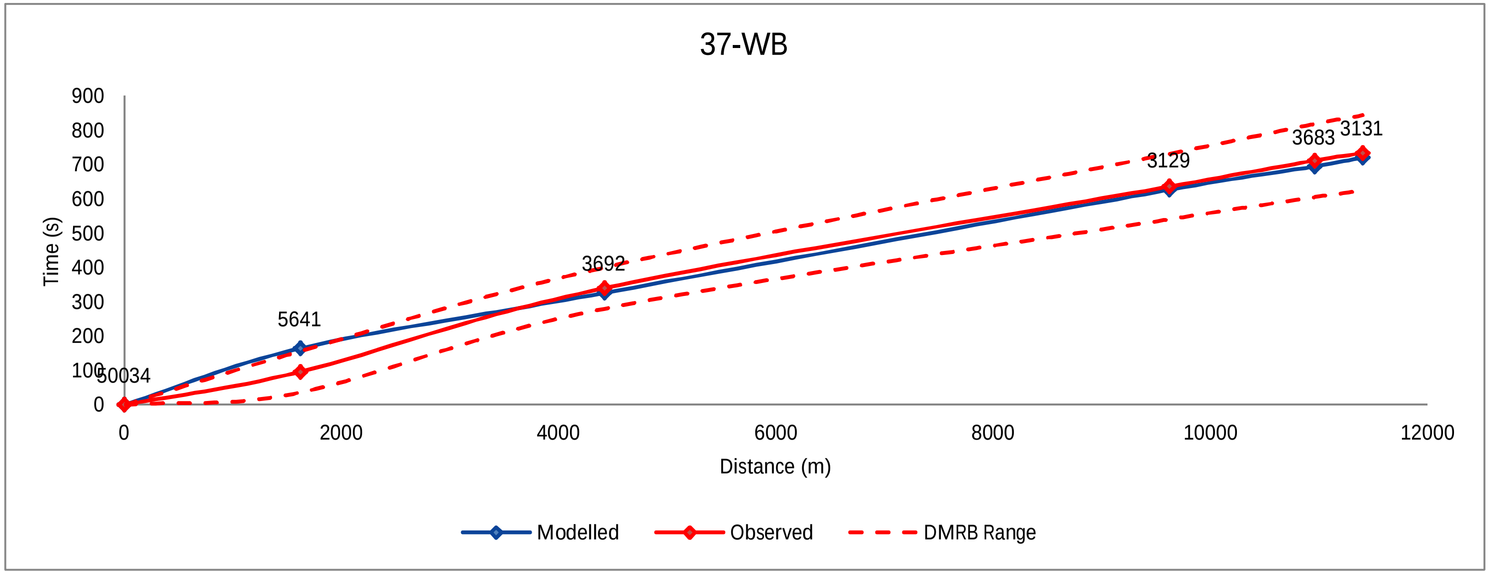

35-NB
Time (s)
Distance (m)
5661
3125
3690
3126
2787
5834
3503
2783
Modelled
Observed
DMRB Range

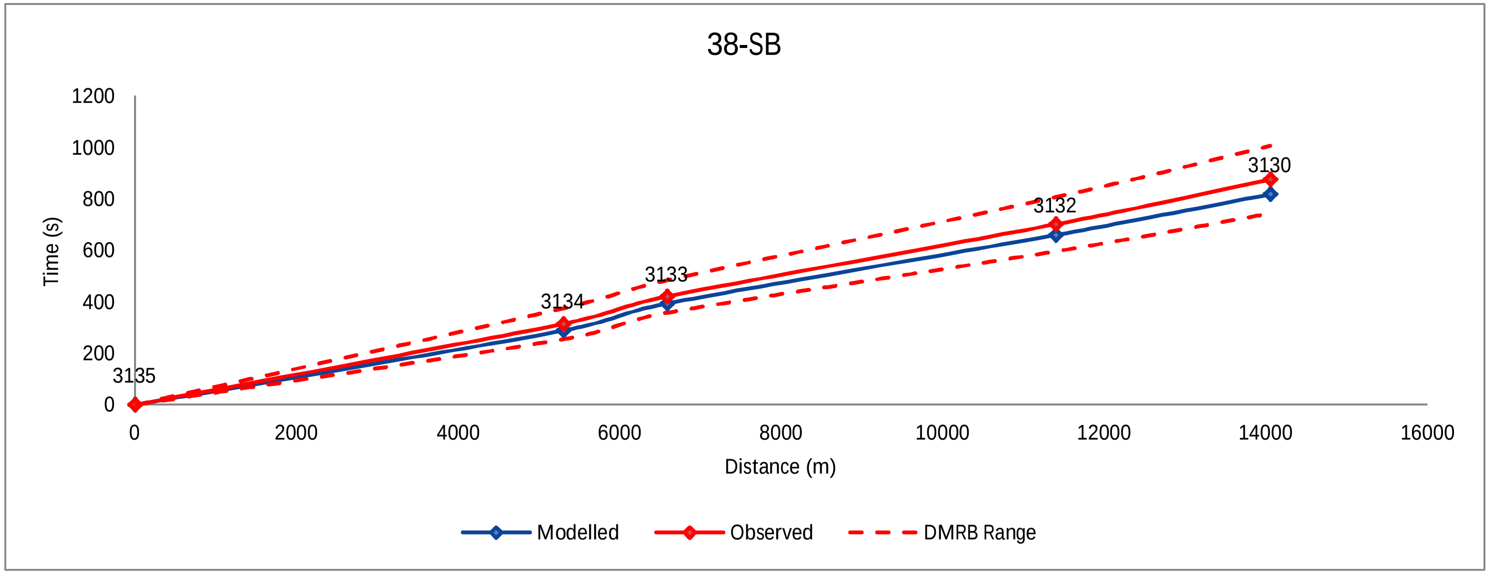

35-SB
Time (s)
Distance (m)
2783
3503
5834
2787
3126
3690
3125
5661
Modelled
Observed
DMRB Range

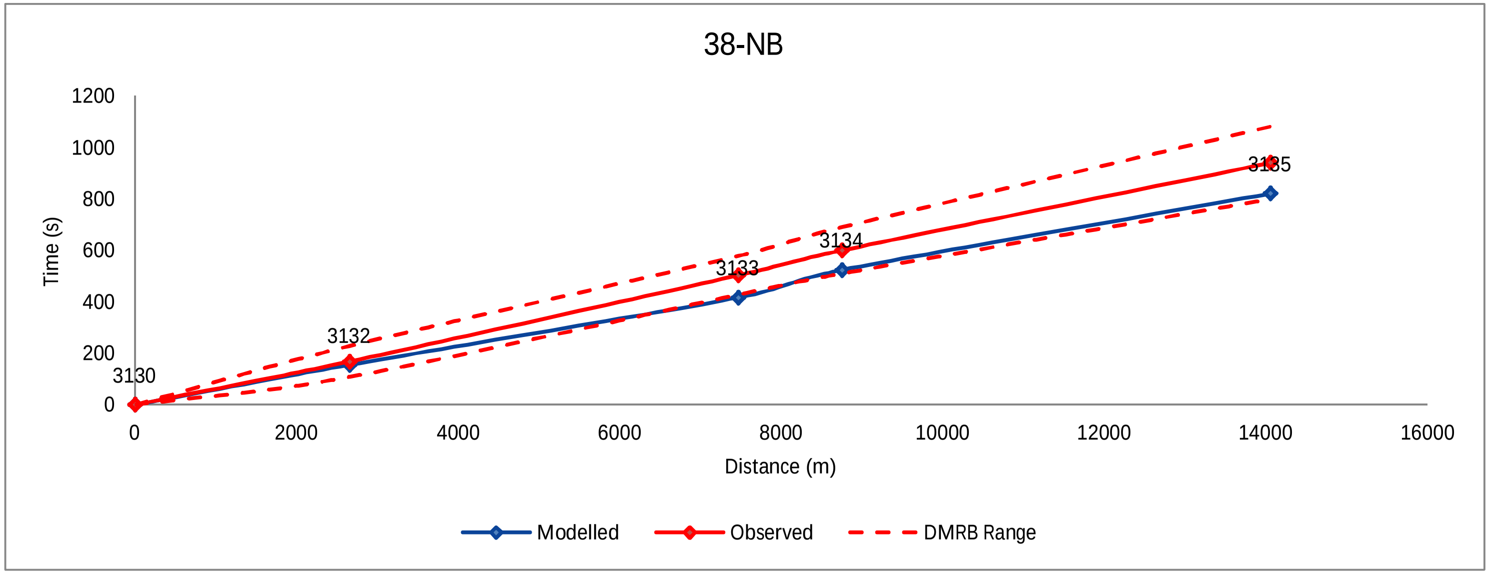

36-EB
Time (s)
700
600
500
400
300
200
100
0
2787
3701
3130
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

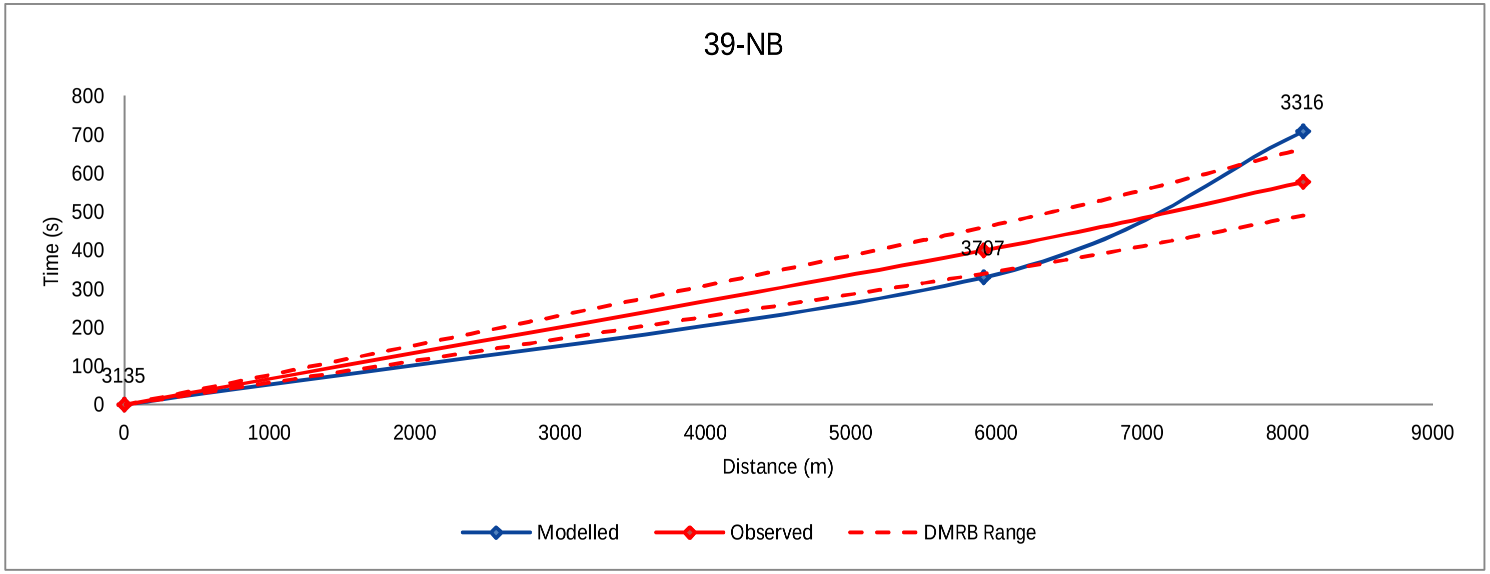

36-WB
Time (s)
800
700
600
500
400
300
200
100
0
3130
3701
2787
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

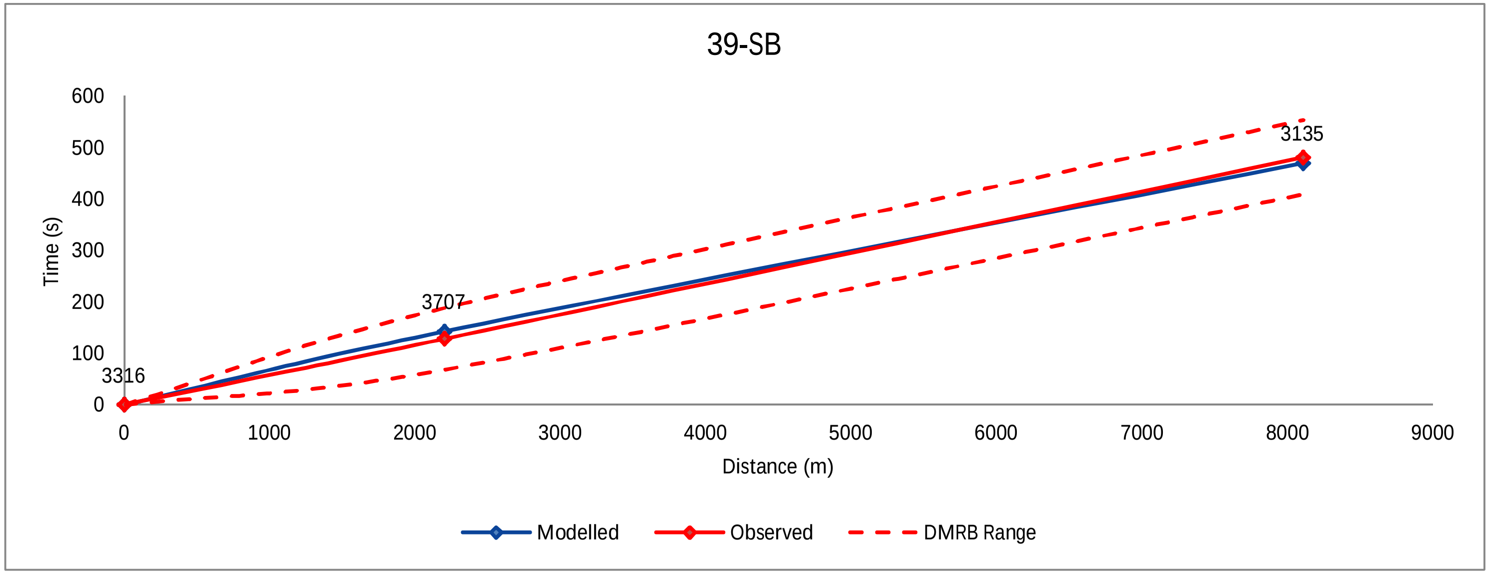

37-EB
Time (s)
1600
1400
1200
1000
800
600
400
200
0
-200
3131
3129
3692
5641
50034
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

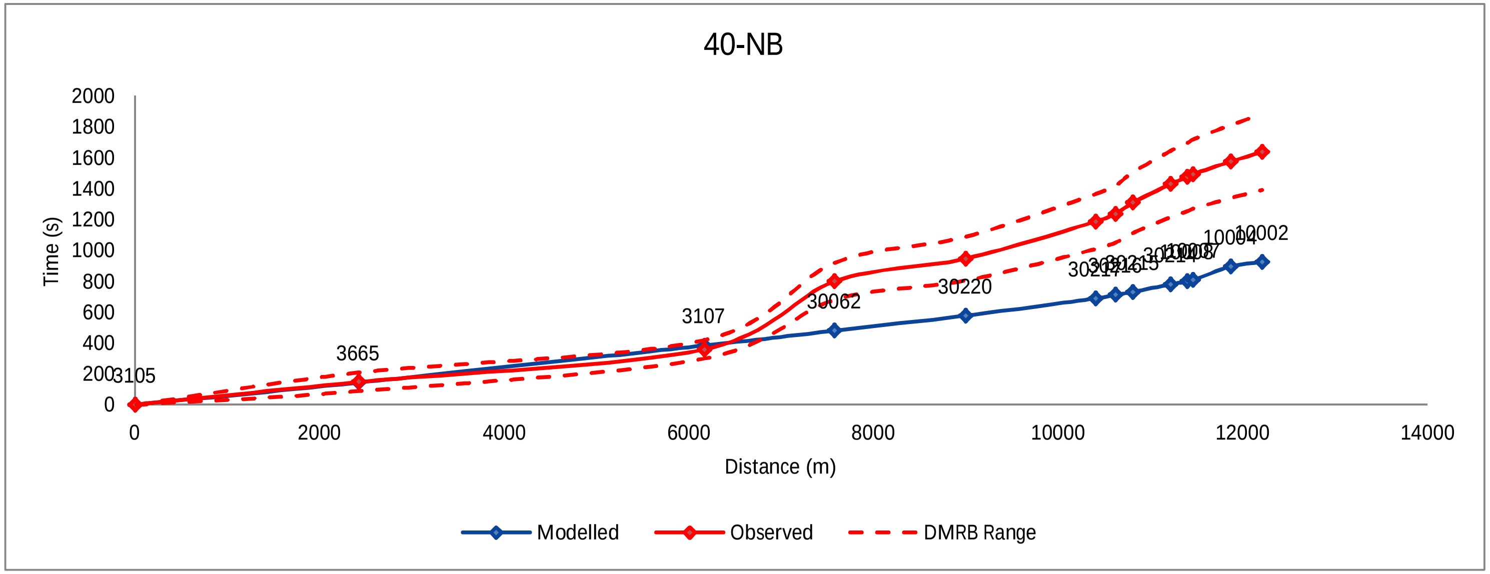

37-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
50034
5641
3692
3129
3683
3131
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

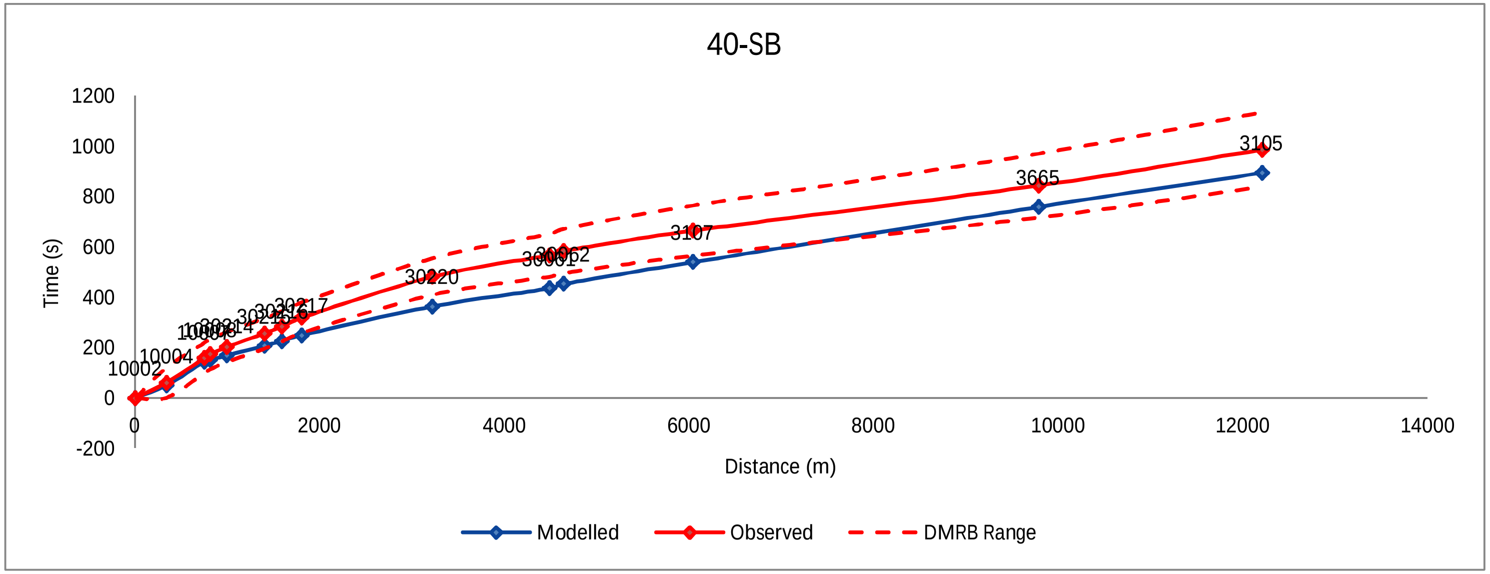

38-SB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3135
3134
3133
3132
3130
Modelled
Observed
DMRB Range

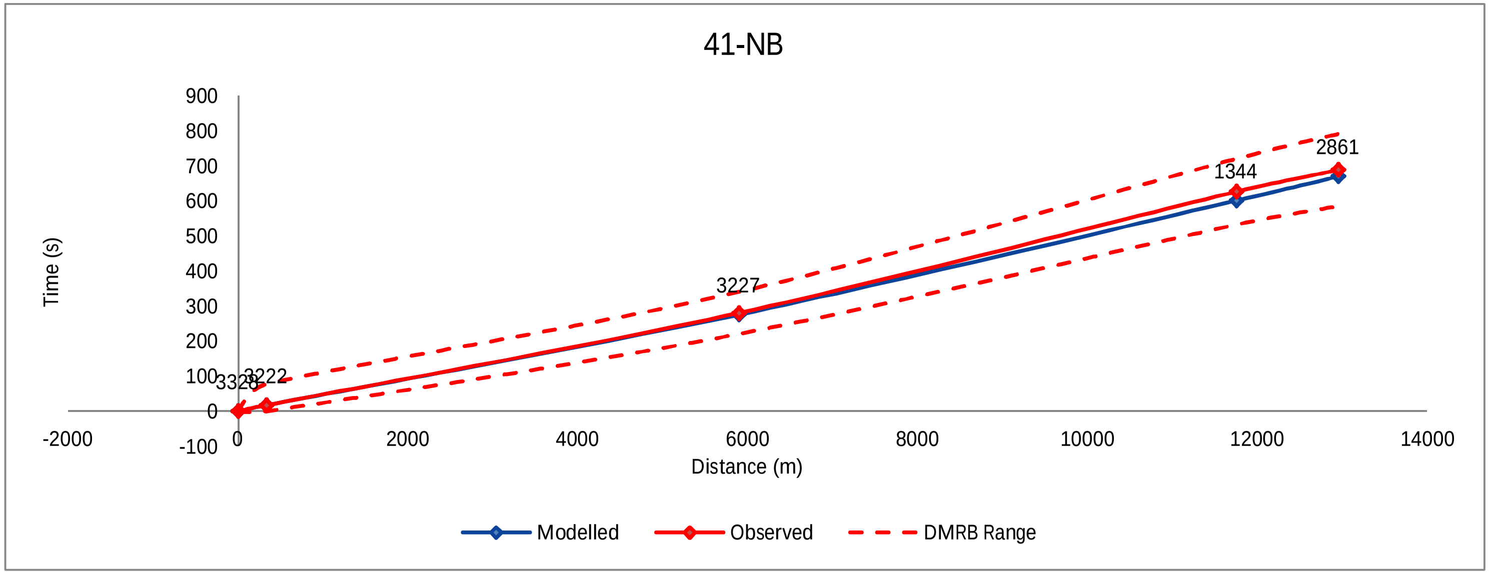

38-NB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3130
3132
3133
3134
3135
Modelled
Observed
DMRB Range

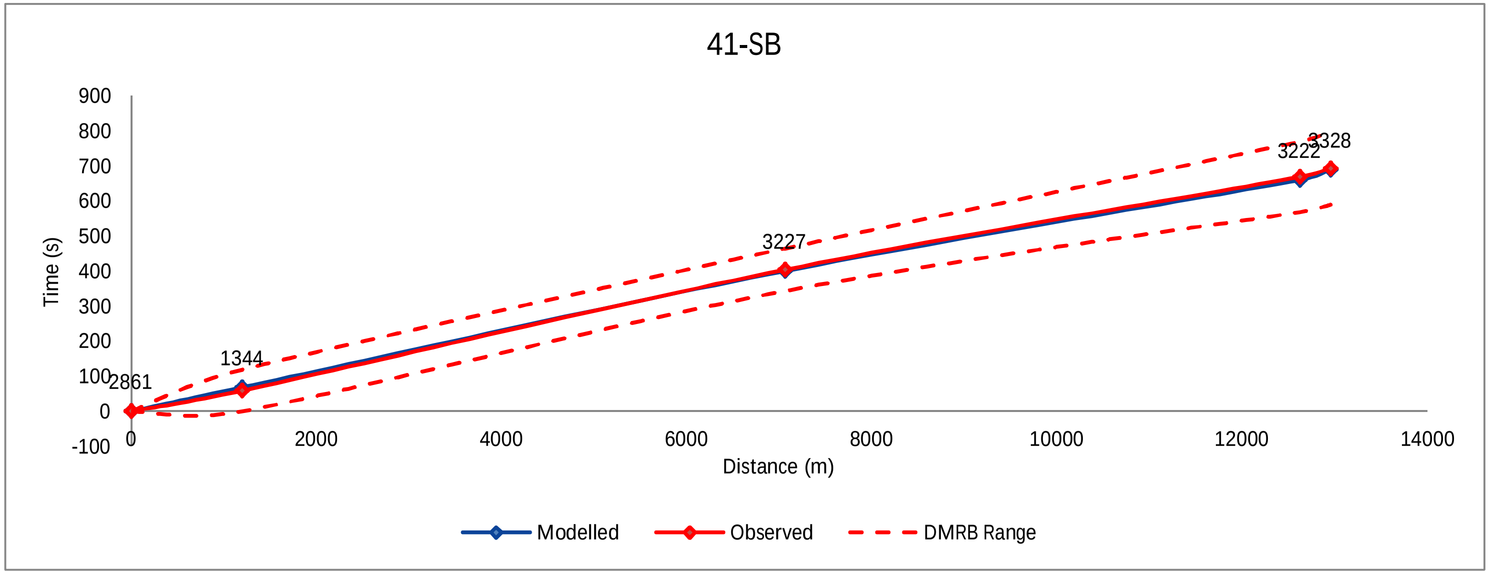

39-NB
Time (s)
Distance (m)
3135
3707
3316
Modelled
Observed
DMRB Range

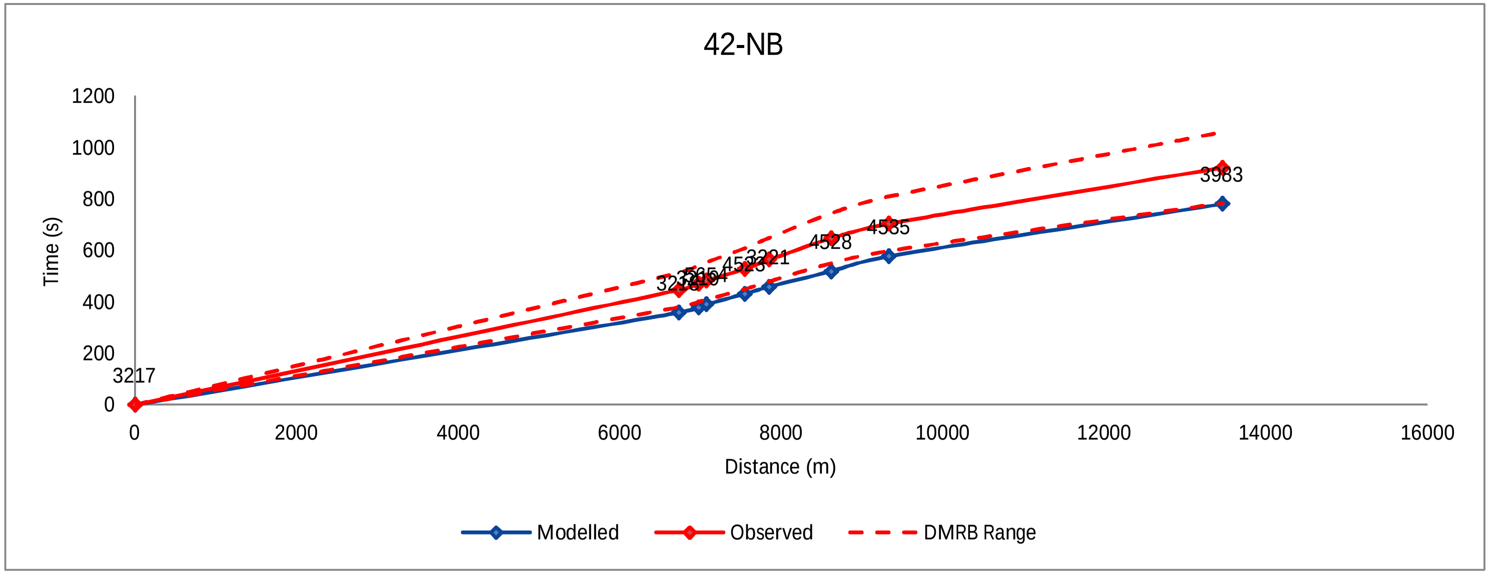

39-SB
Time (s)
Distance (m)
3316
3707
3135
Modelled
Observed
DMRB Range

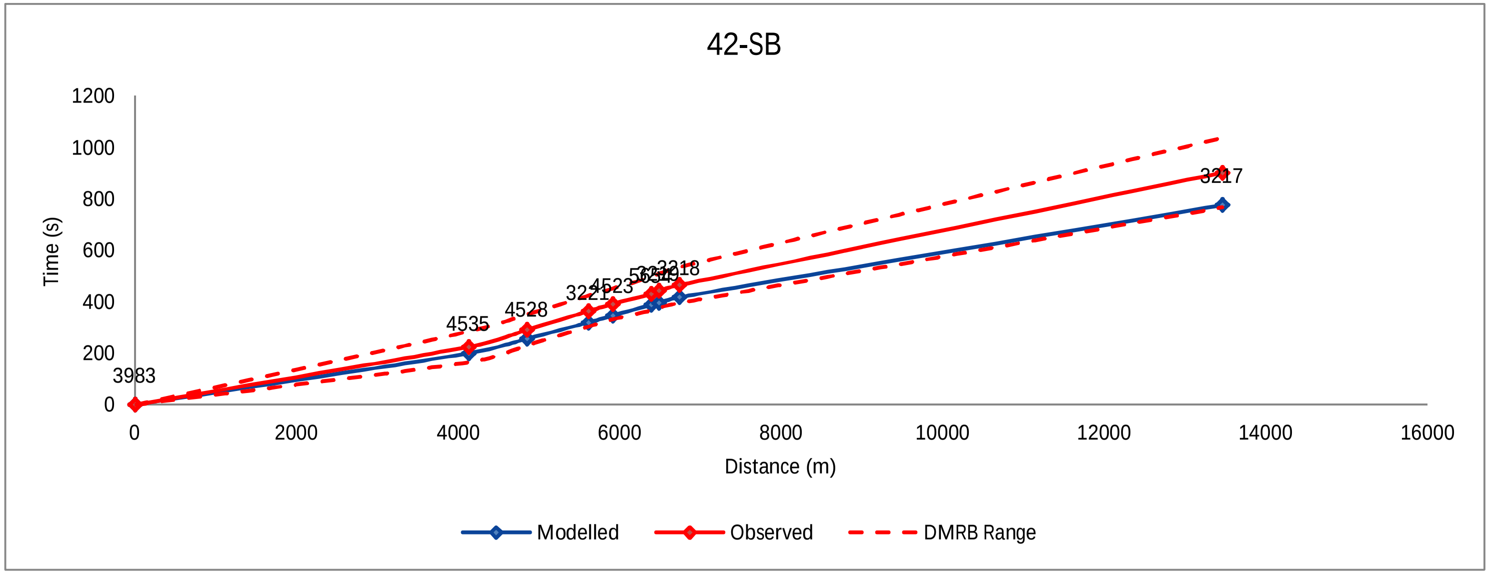

40-NB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
3105
3665
3107
30062
30220
10004
10002

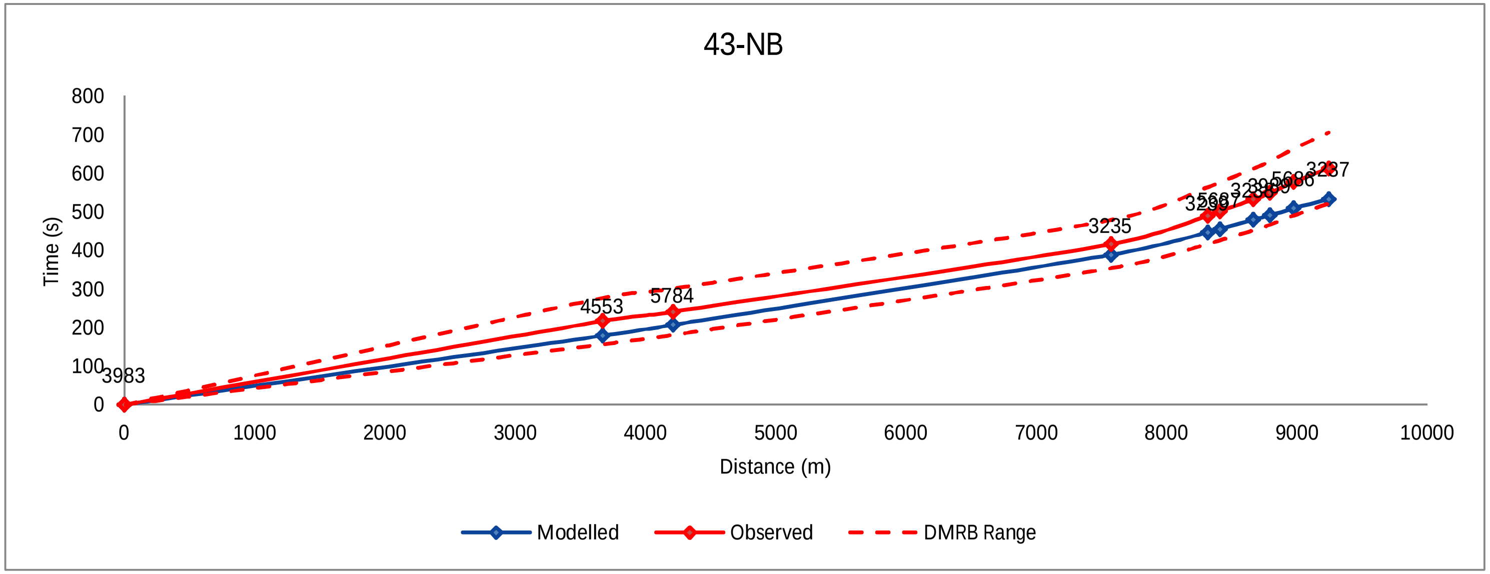

40-SB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
10002
10004
30220
3107
3665
3105


41-NB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
-2000
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3328
3222
3227
1344
2861
Modelled
Observed
DMRB Range

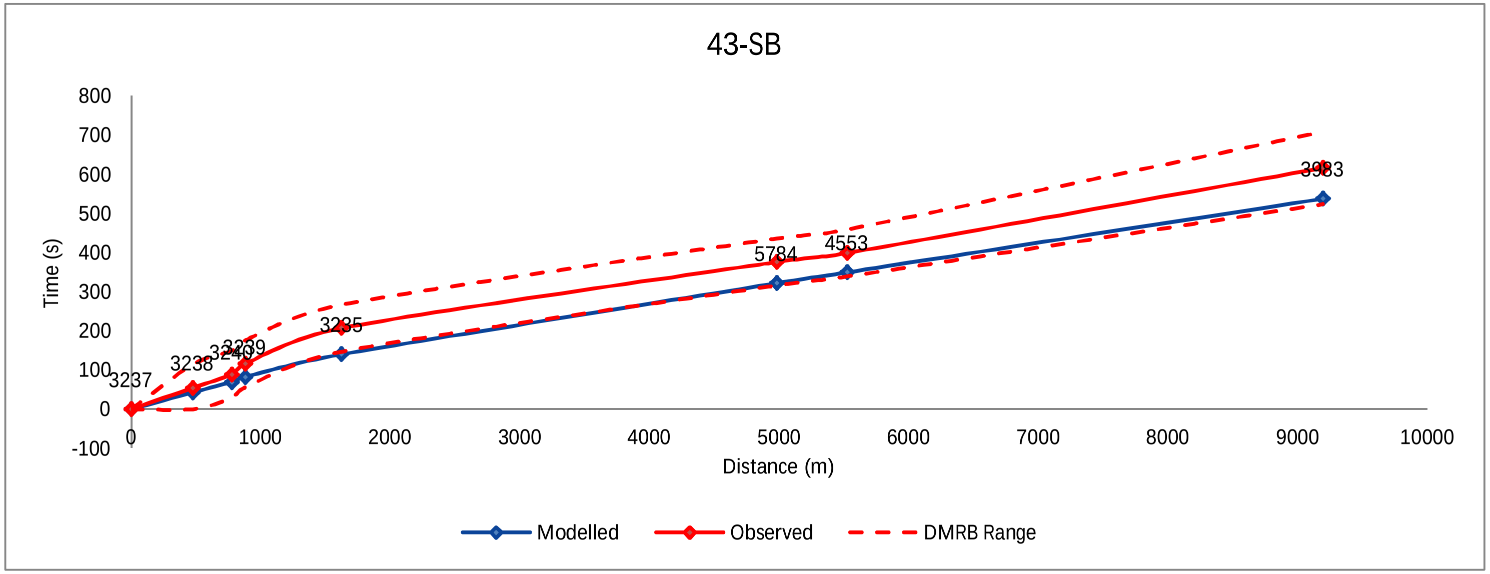

41-SB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
2861
1344
3227
3222
3328
Modelled
Observed
DMRB Range


42-NB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3217
4528
4535
3983
Modelled
Observed
DMRB Range

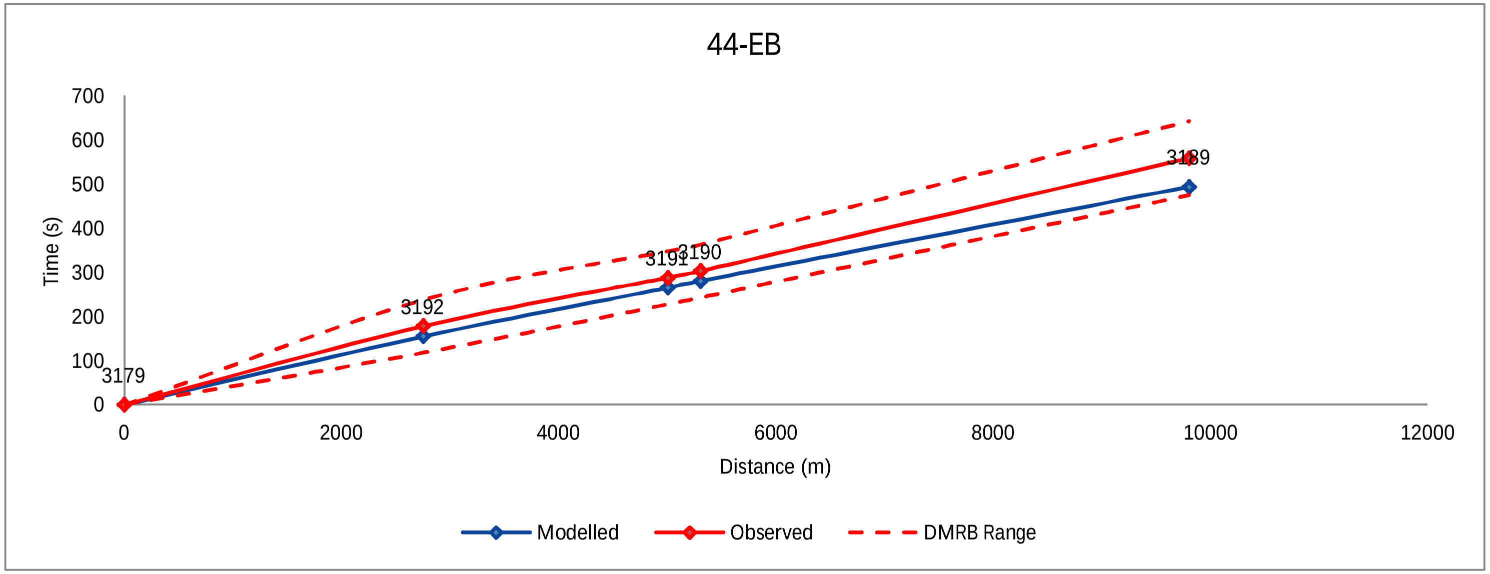

42-SB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3983
4535
4528
3221
4523
3217
Modelled
Observed
DMRB Range

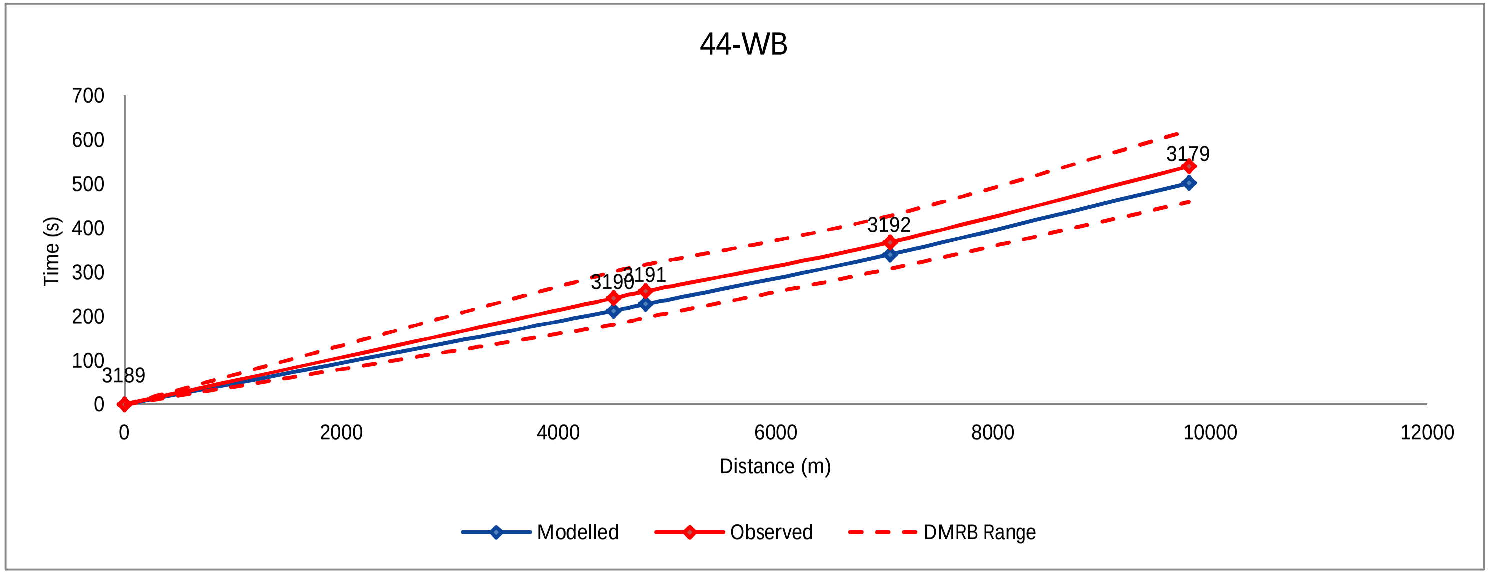


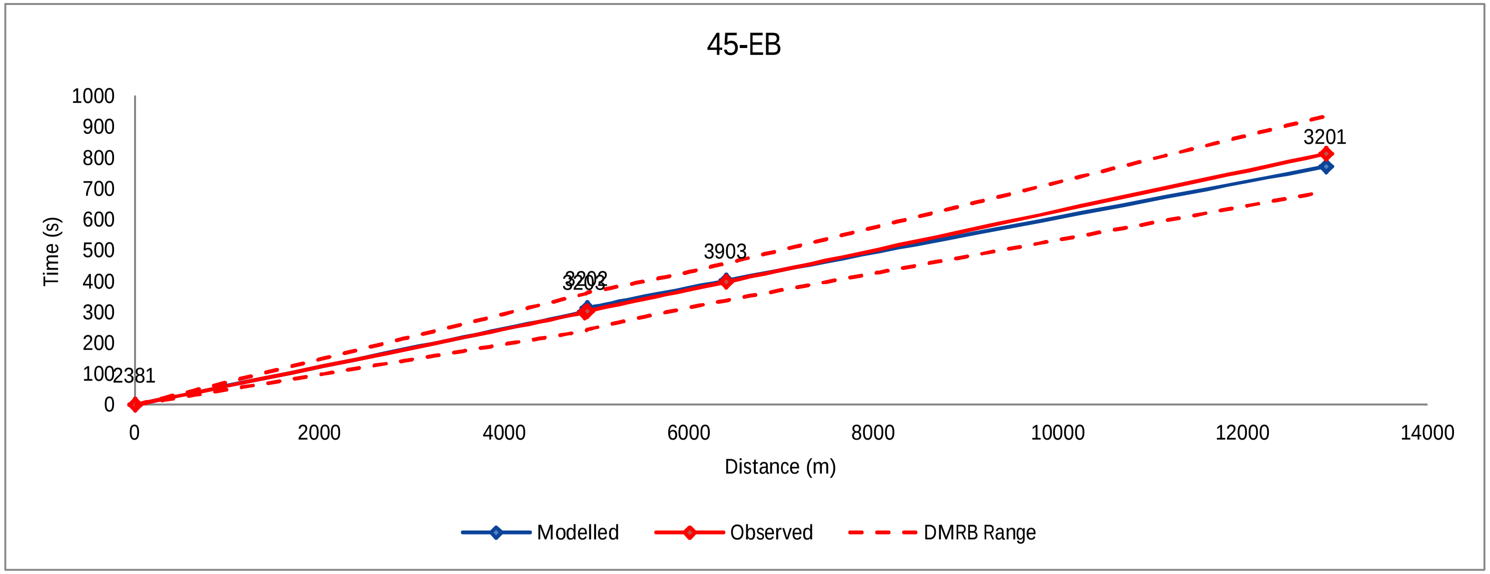
43-NB
Time (s)
Distance (m)
4553
5784
3235
3983
3237
Modelled
Observed
DMRB Range

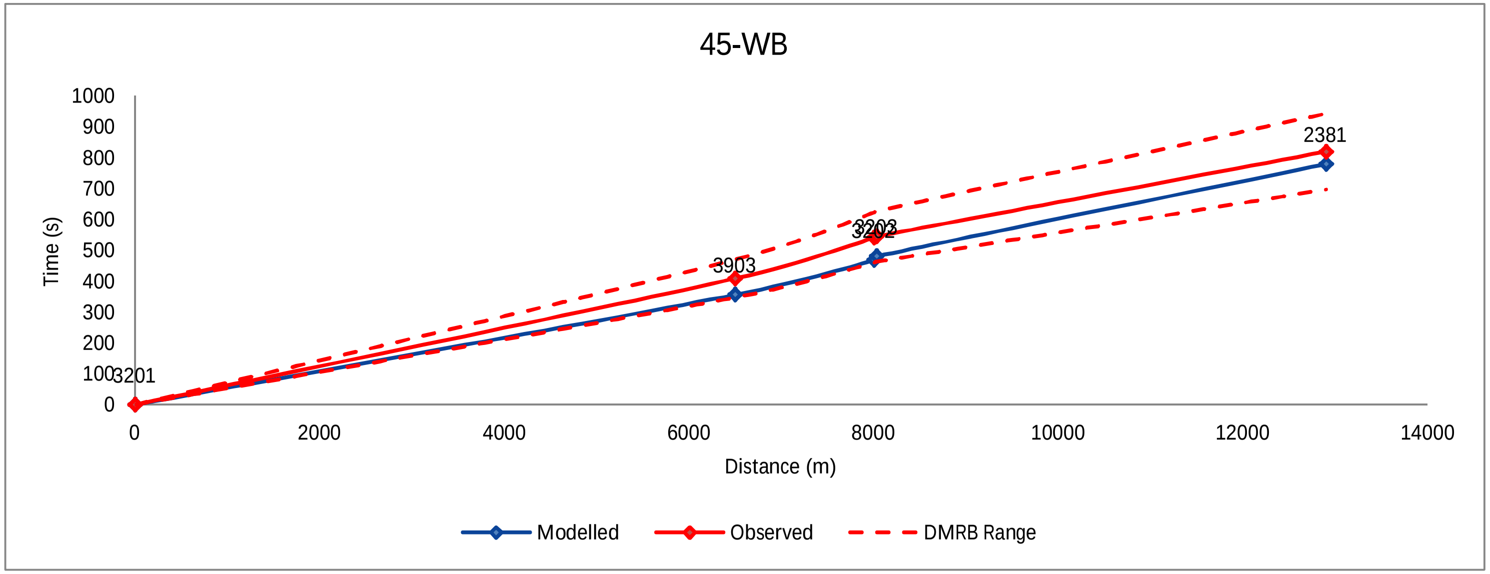


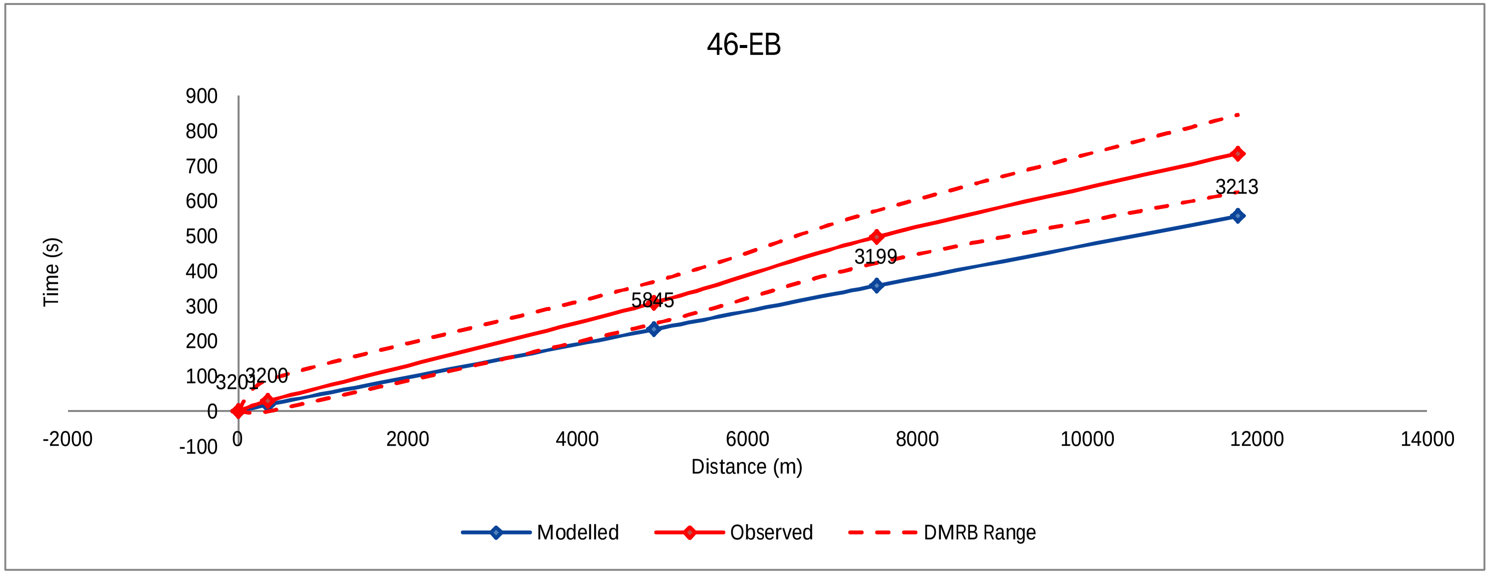
43-SB
Time (s)
Distance (m)
3237
3238
3235
5784
4553
3983
Modelled
Observed
DMRB Range


44-EB
Time (s)
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
Distance (m)
3179
3192
3191
3190
3189
Modelled
Observed
DMRB Range

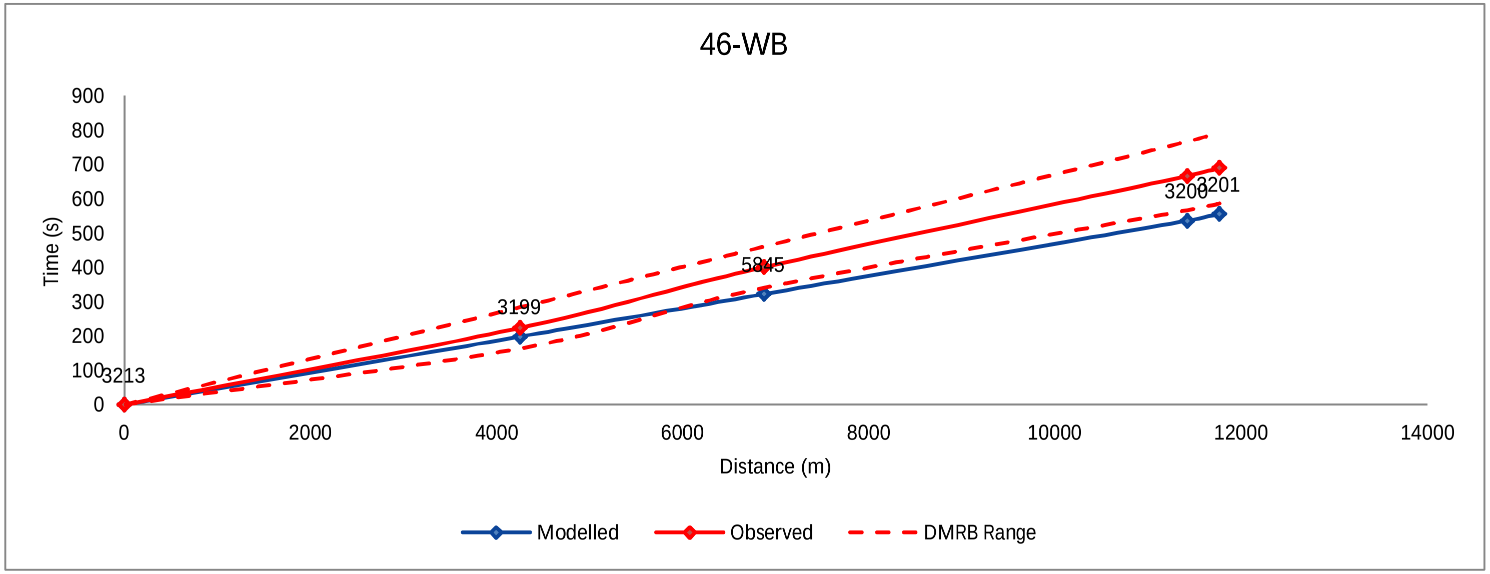

44-WB
Time (s)
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
Distance (m)
3189
3190
3191
3192
3179
Modelled
Observed
DMRB Range


45-EB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
2381
3202
3203
3903
3201
Modelled
Observed
DMRB Range

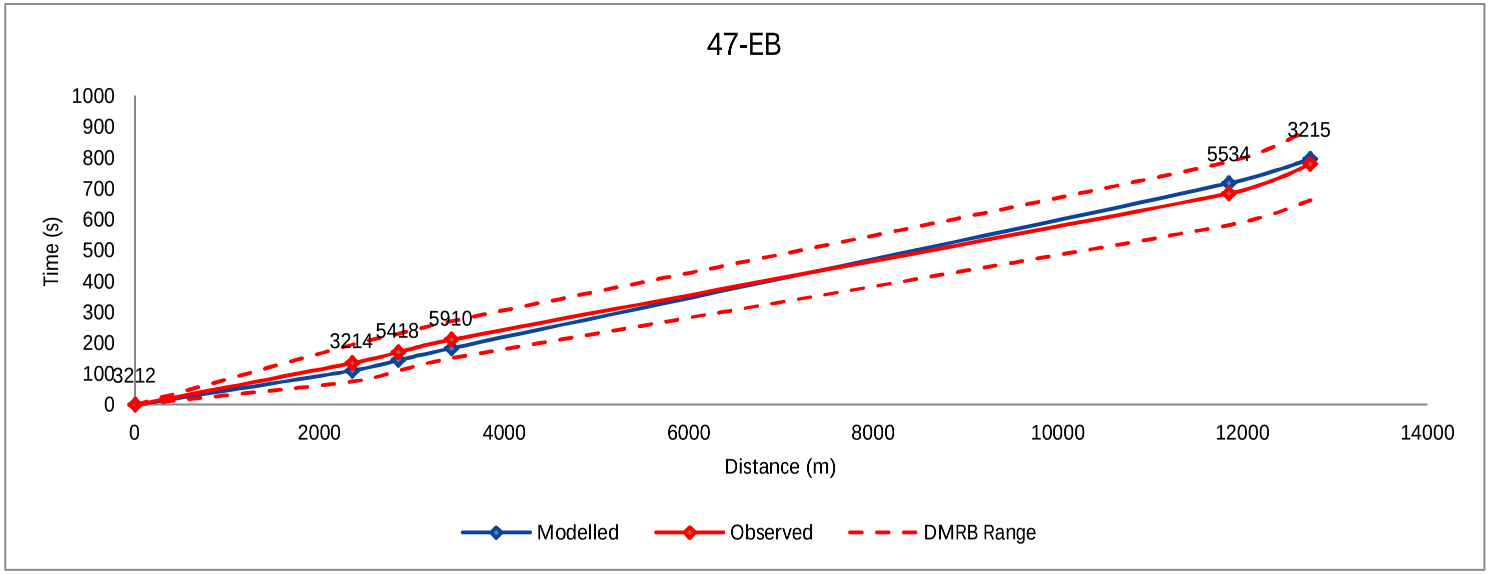

45-WB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3201
3903
3203
3202
2381
Modelled
Observed
DMRB Range

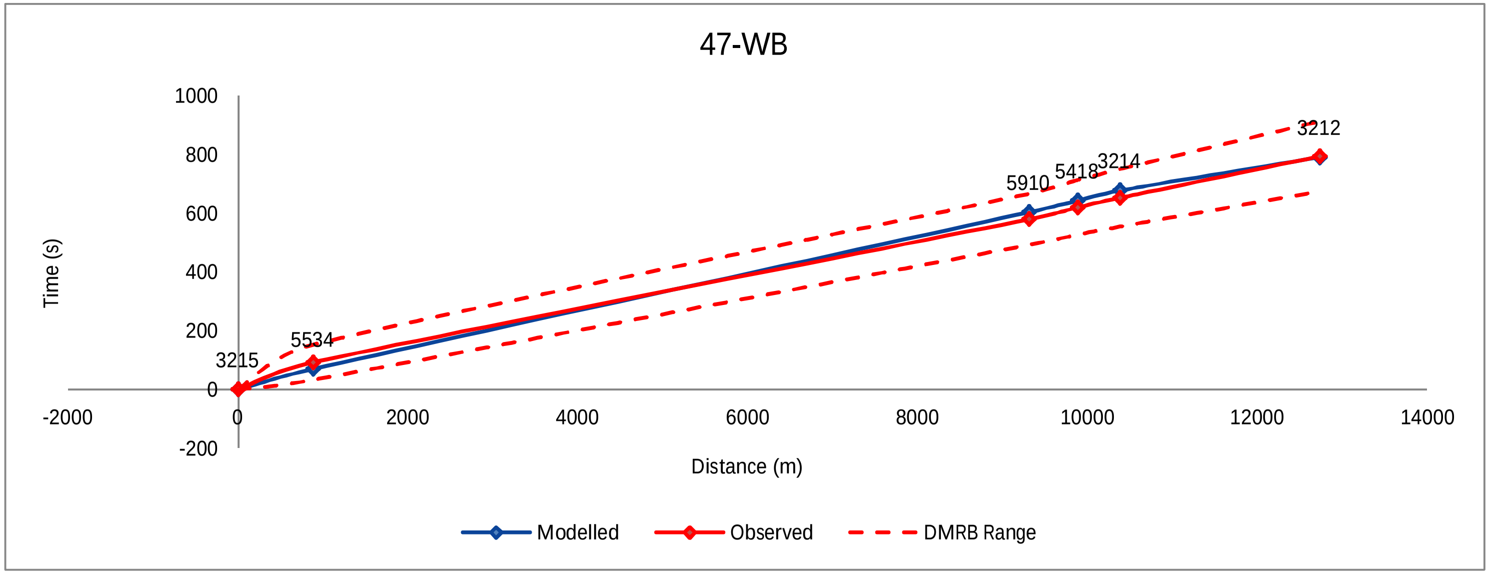


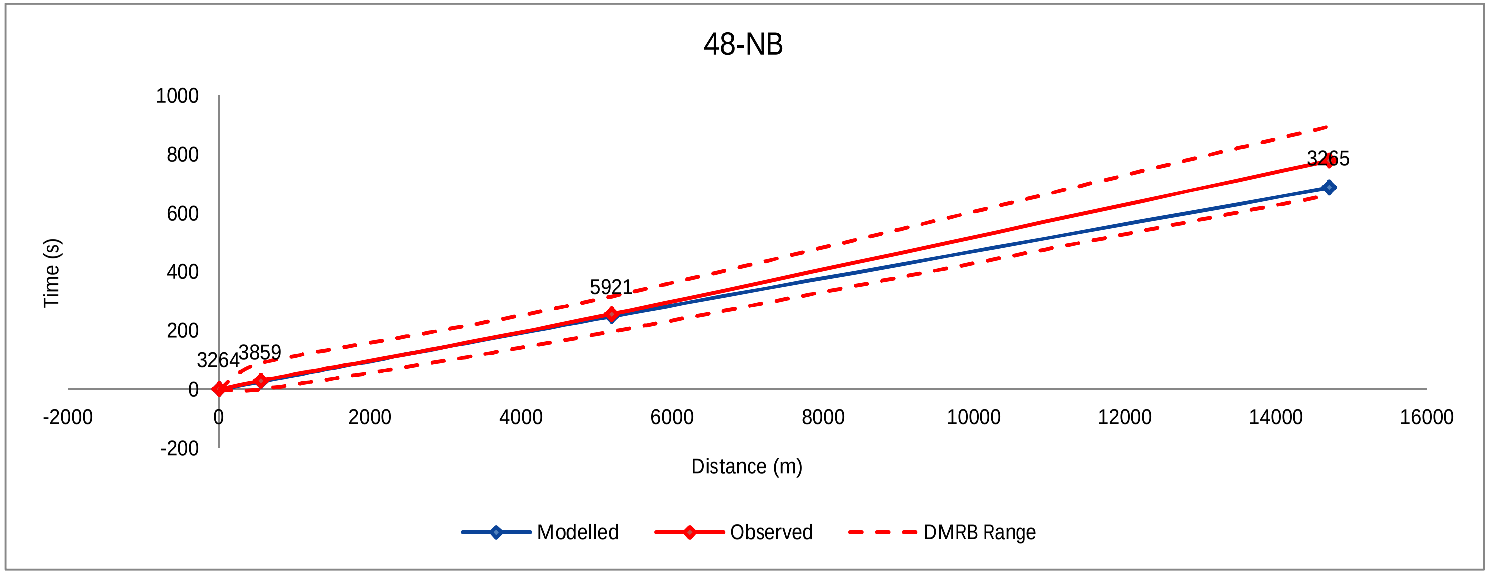
46-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
3201
3200
5845
3199
3213
-2000
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range



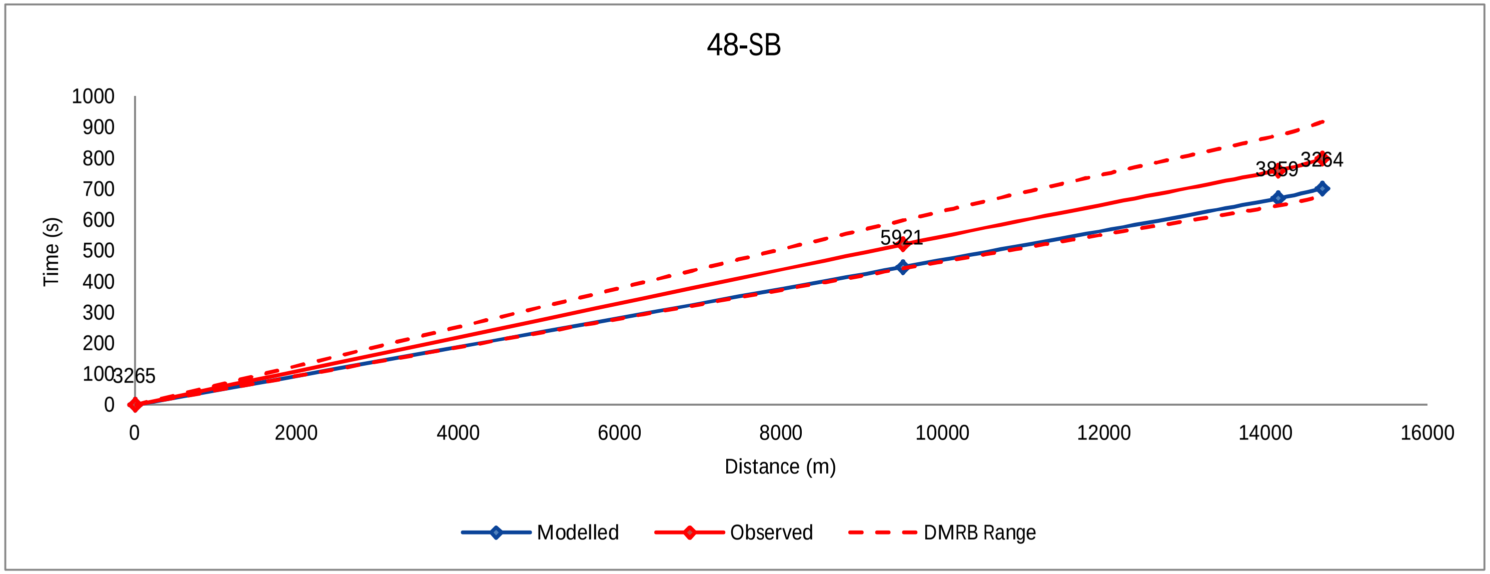
46-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
3213
3199
5845
3200
3201
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range


47-EB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3212
3214
5418
5910
5534
3215
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range

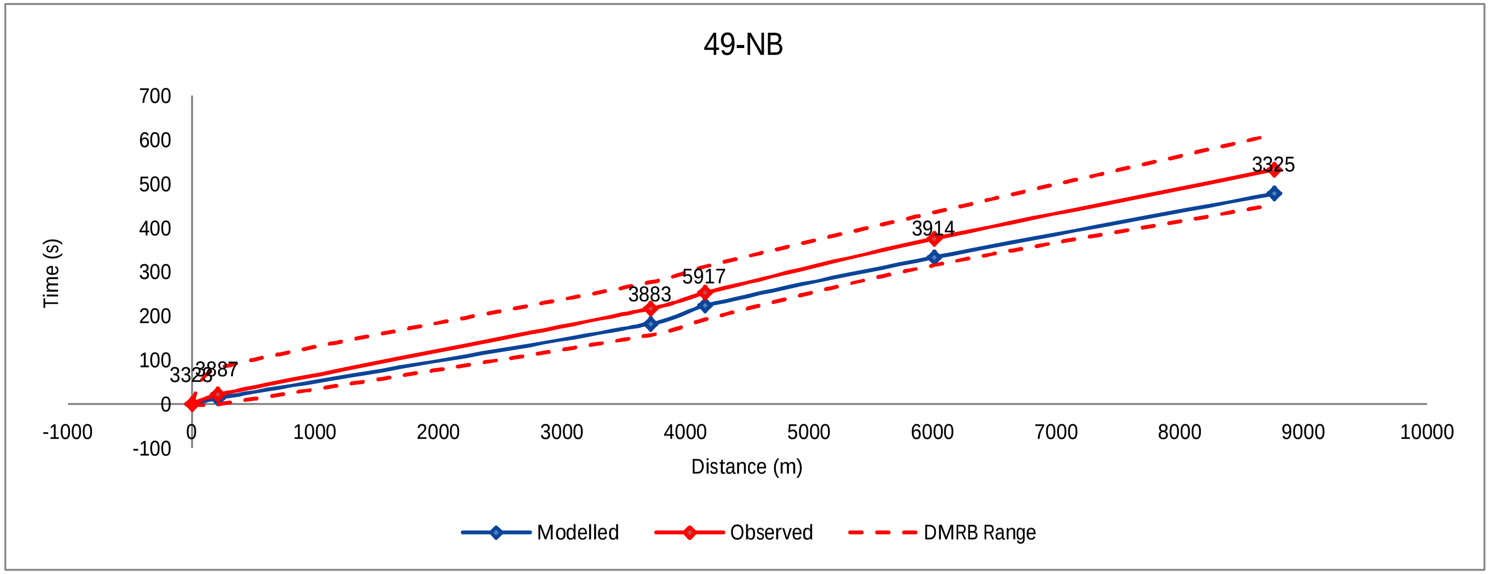

47-WB
Time (s)
1000
800
600
400
200
0
-200
3215
5534
5910
5418
3214
3212
-2000
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range

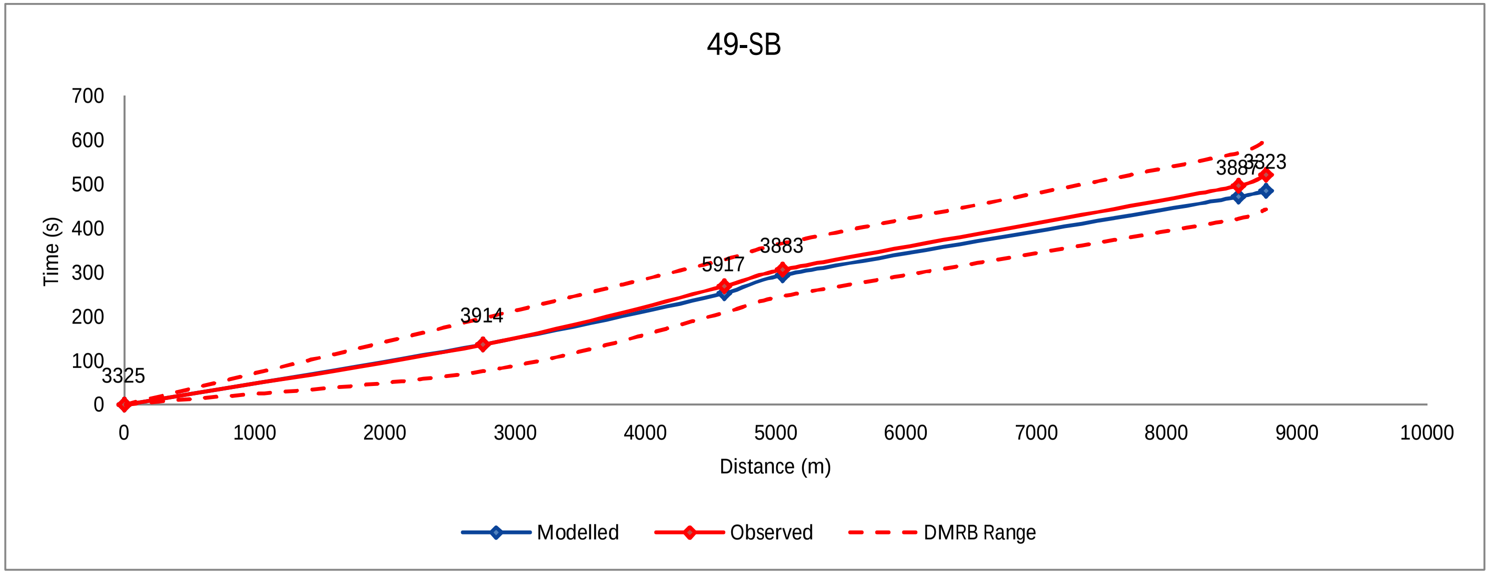


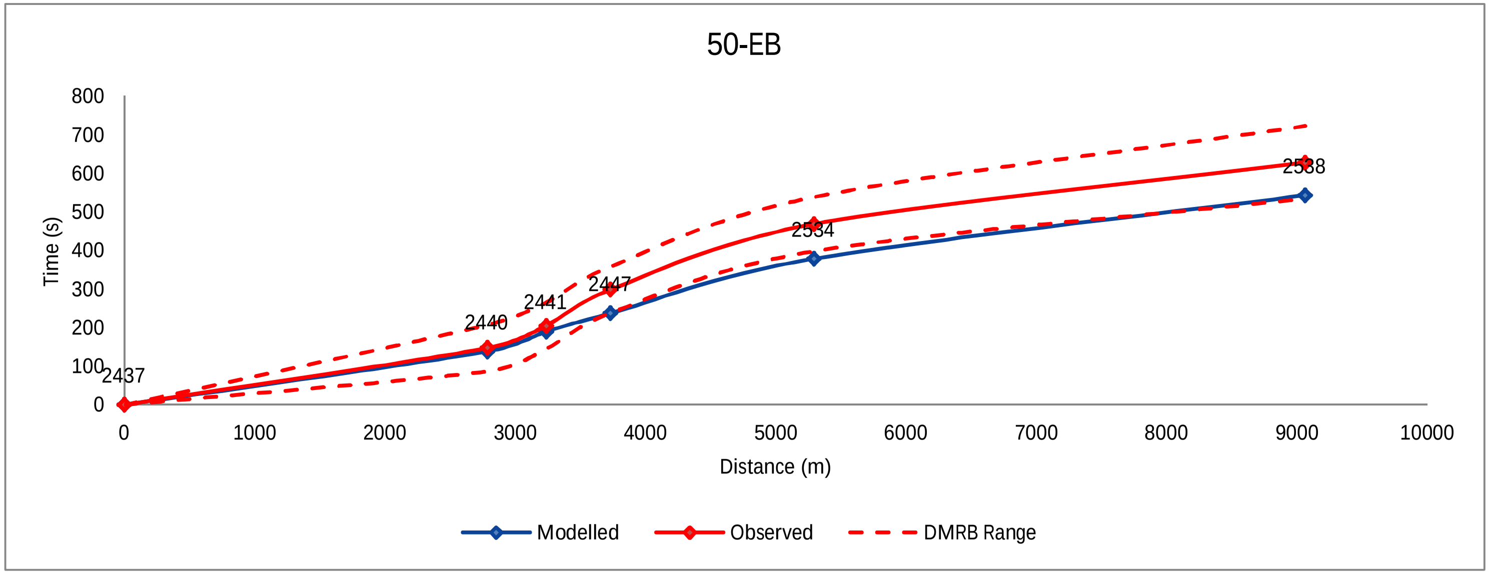
48-NB
Time (s)
1000
800
600
400
200
0
-200
-2000
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3264
3859
5921
3265
Modelled
Observed
DMRB Range

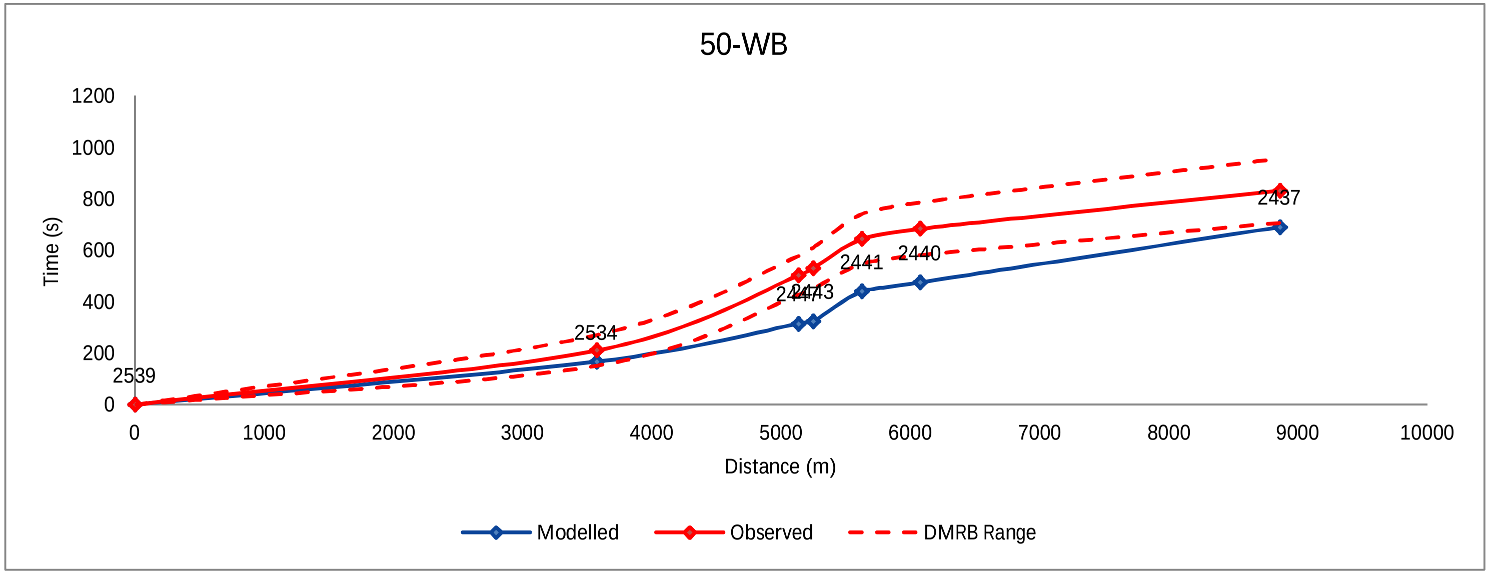


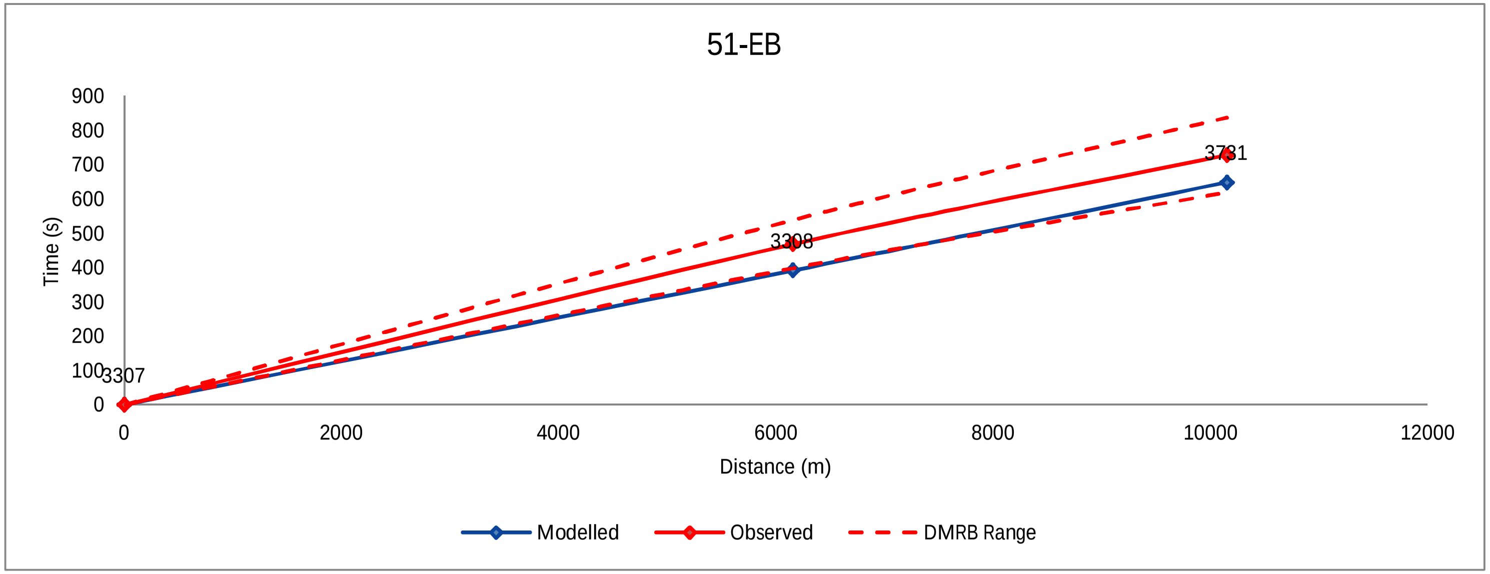
48-SB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3265
5921
3859
3264
Modelled
Observed
DMRB Range


49-NB
Time (s)
700
600
500
400
300
200
100
0
-100
-1000
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
3325
3887
3883
5917
3914
3325
Modelled
Observed
DMRB Range

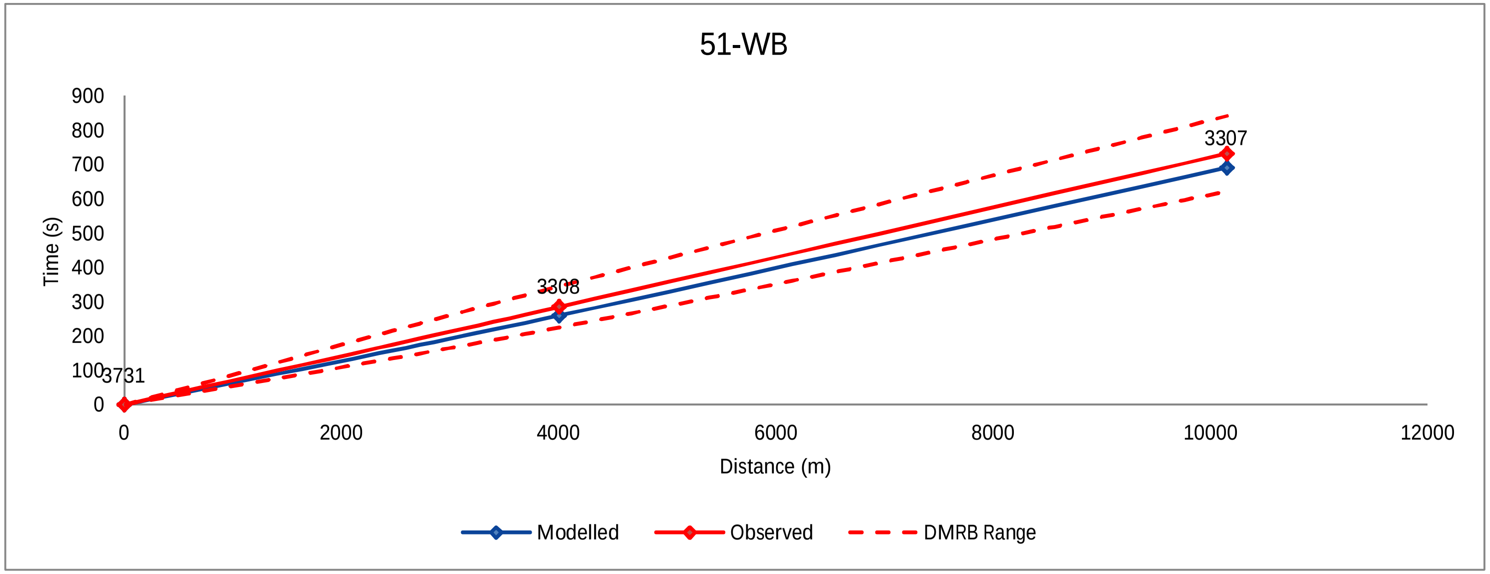

49-SB
Time (s)
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
3325
3914
5917
3883
3887
3323
Modelled
Observed
DMRB Range


50-EB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
2437
2440
2441
2447
2534
2538

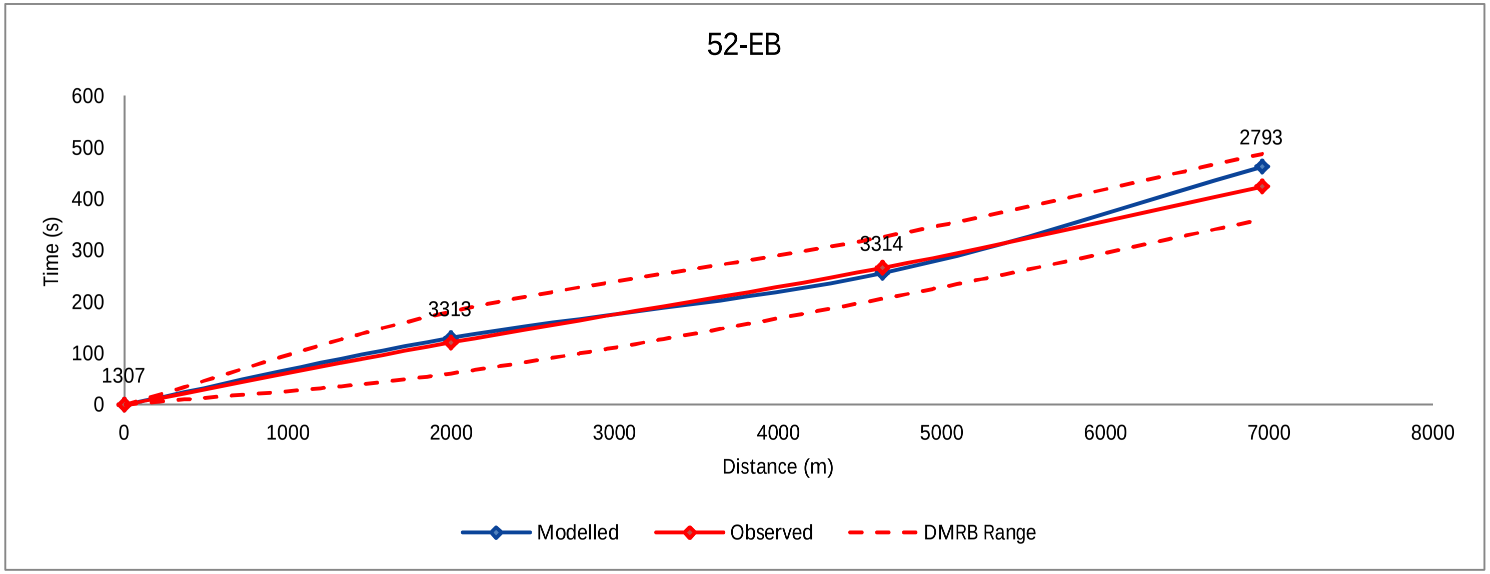

50-WB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
2539
2534
2447
2443
2441
2440
2437

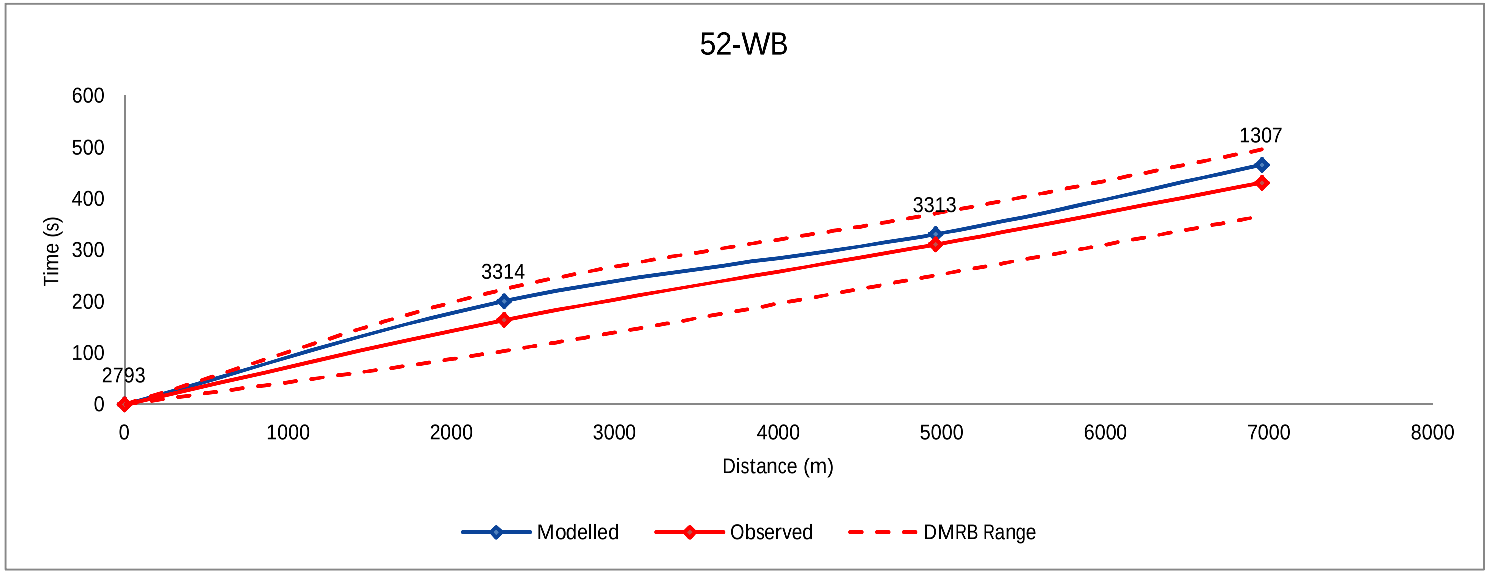


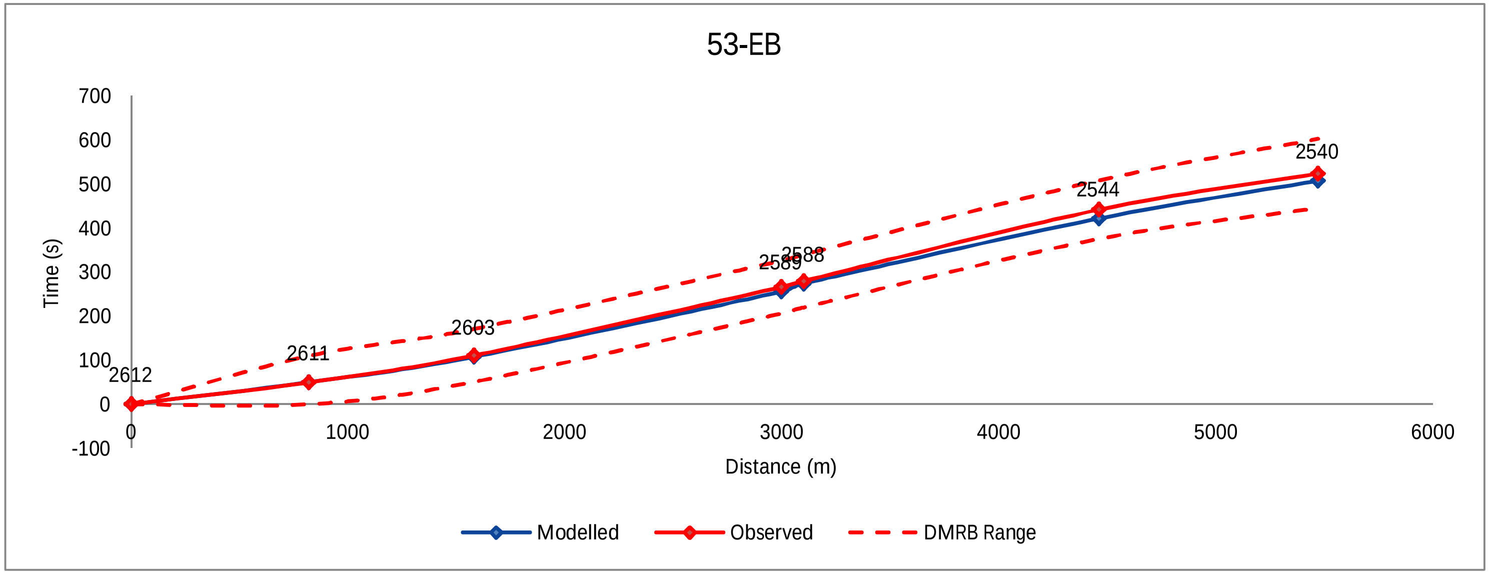
51-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
3307
3308
3731
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

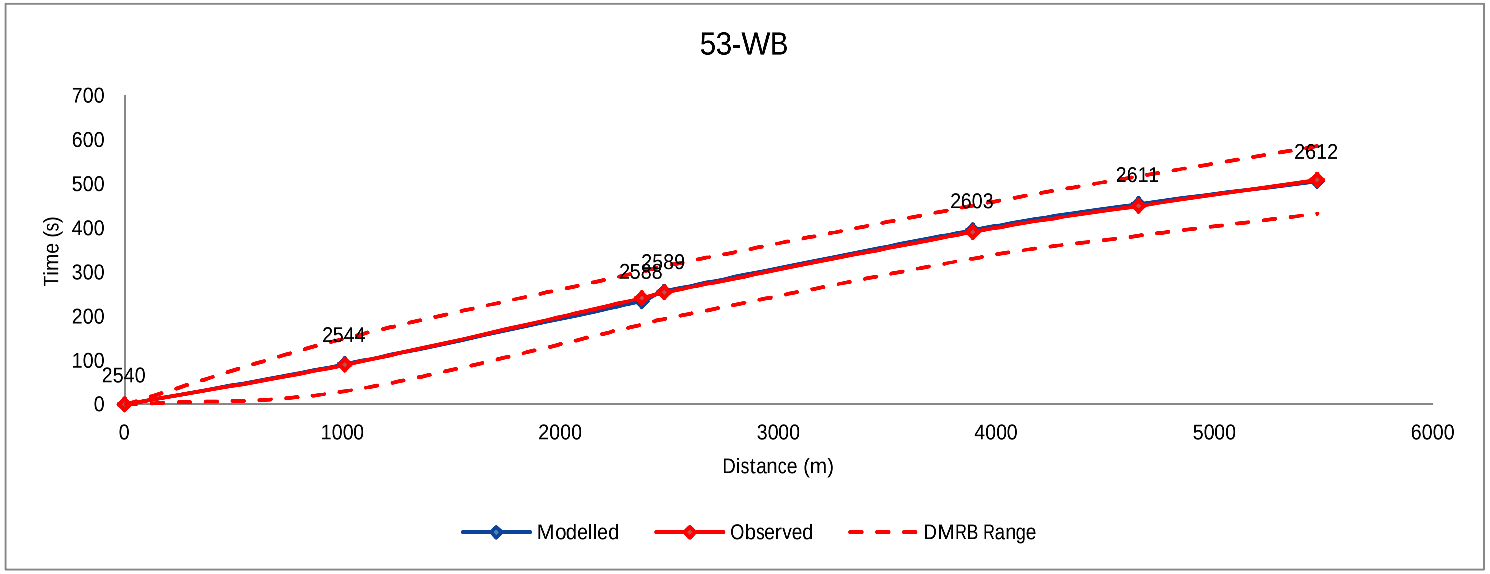


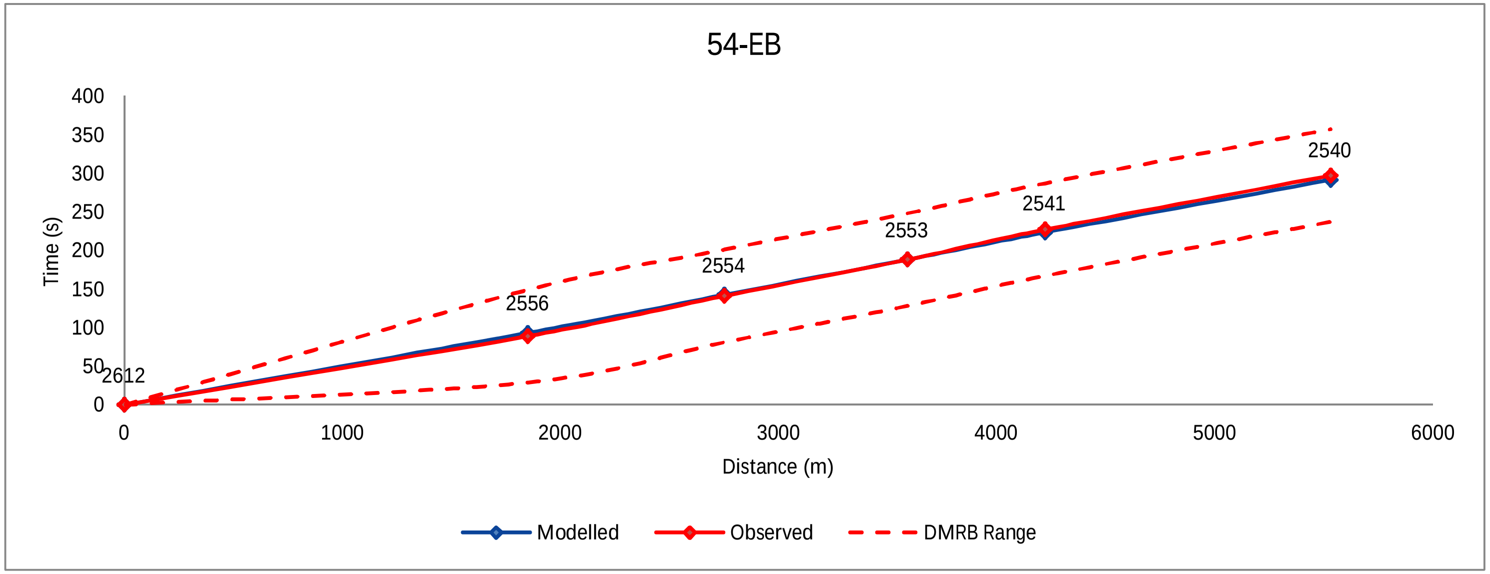
51-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
3731
3308
3307
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

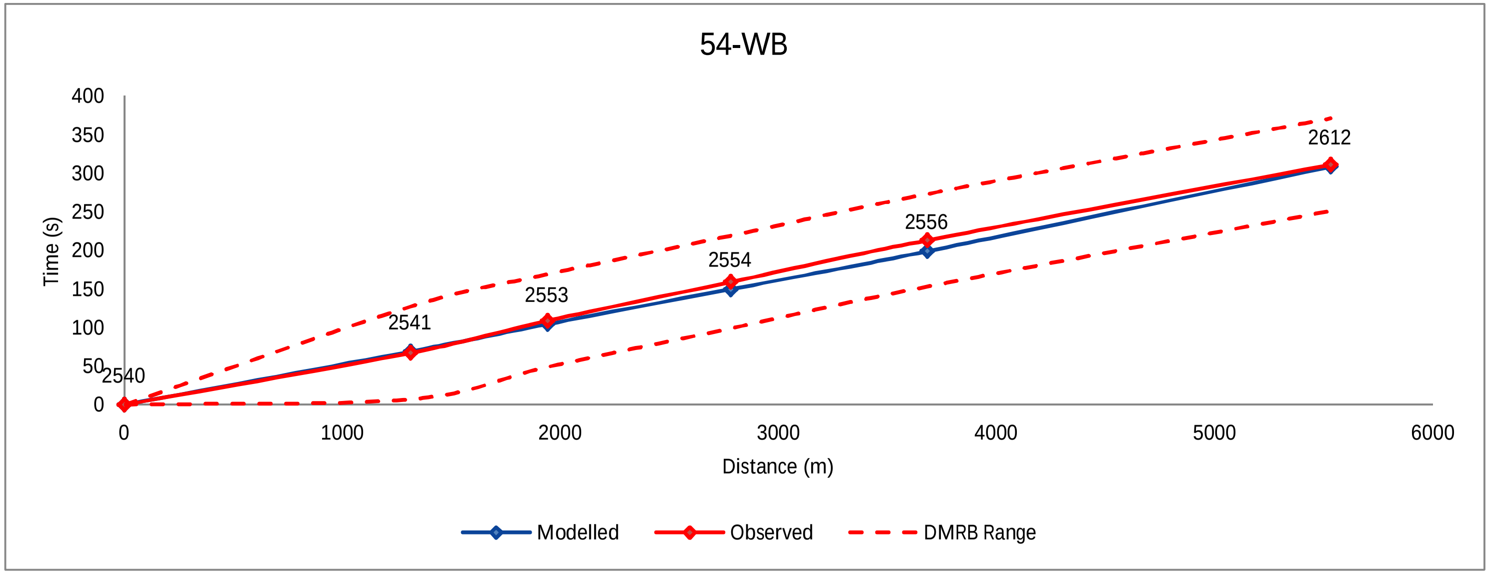

52-EB
Time (s)
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
1307
3313
3314
2793
Modelled
Observed
DMRB Range

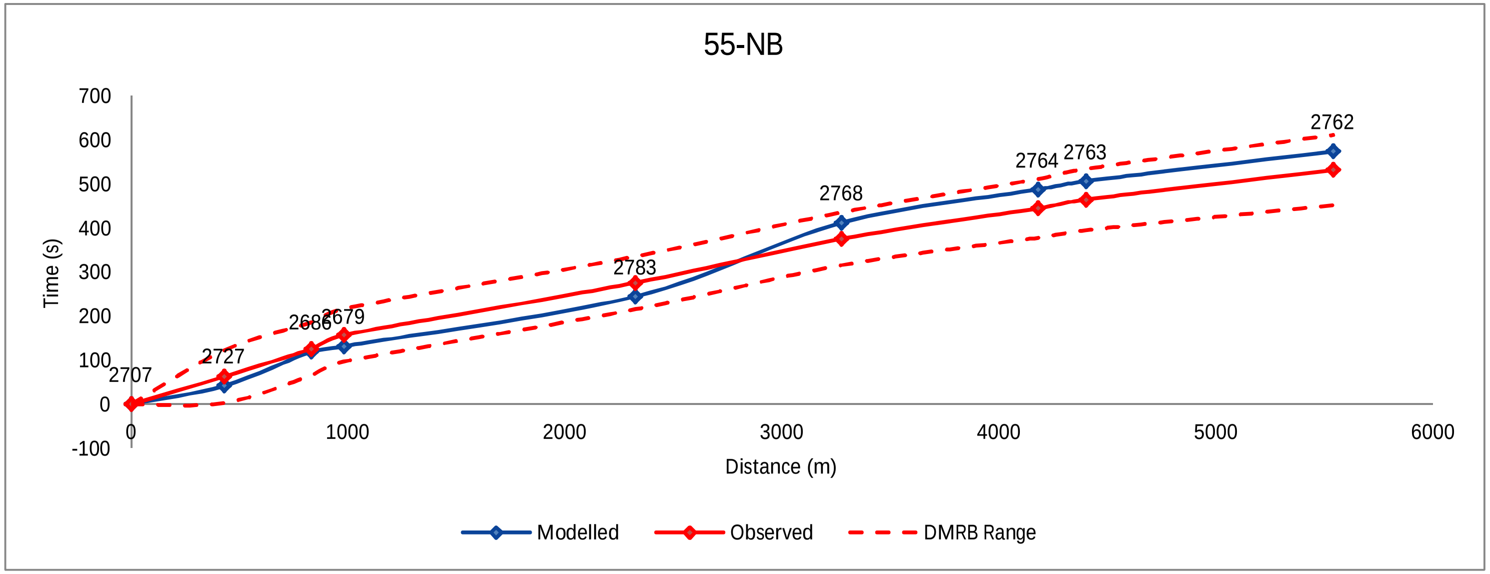

52-WB
Time (s)
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
2793
3314
3313
1307
Modelled
Observed
DMRB Range

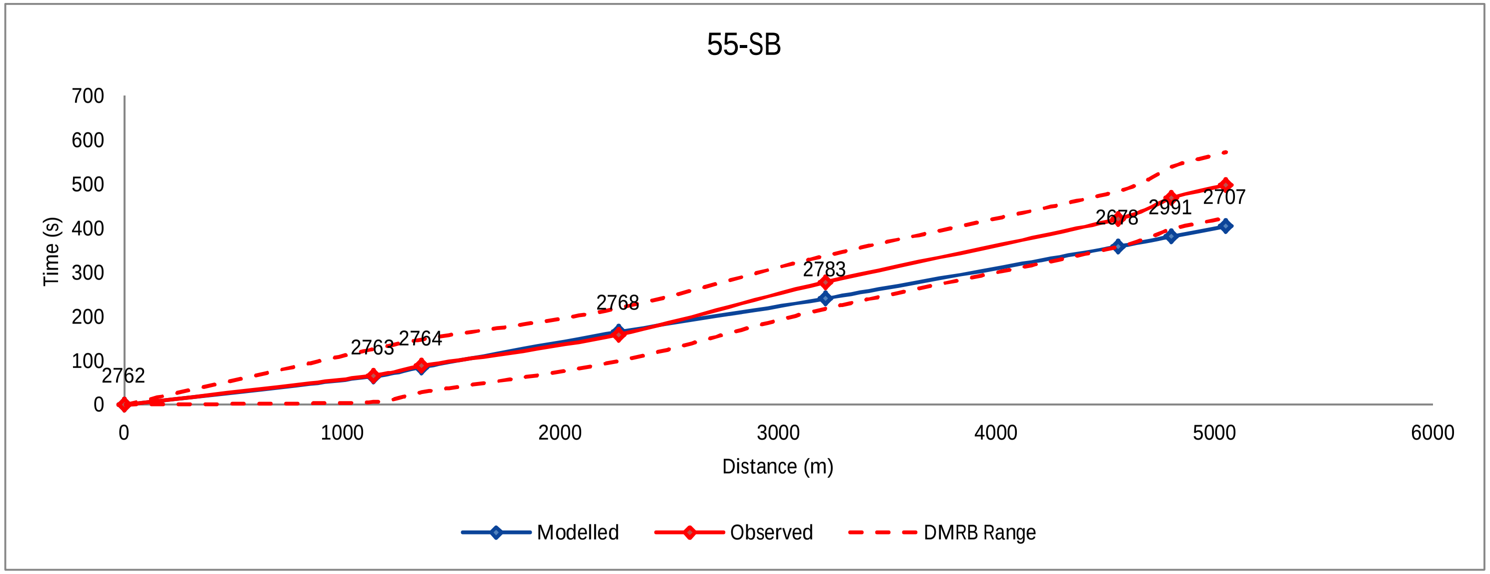

53-EB
Time (s)
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
Distance (m)
2612
2611
2603
2589
2588
2544
2540
Modelled
Observed
DMRB Range

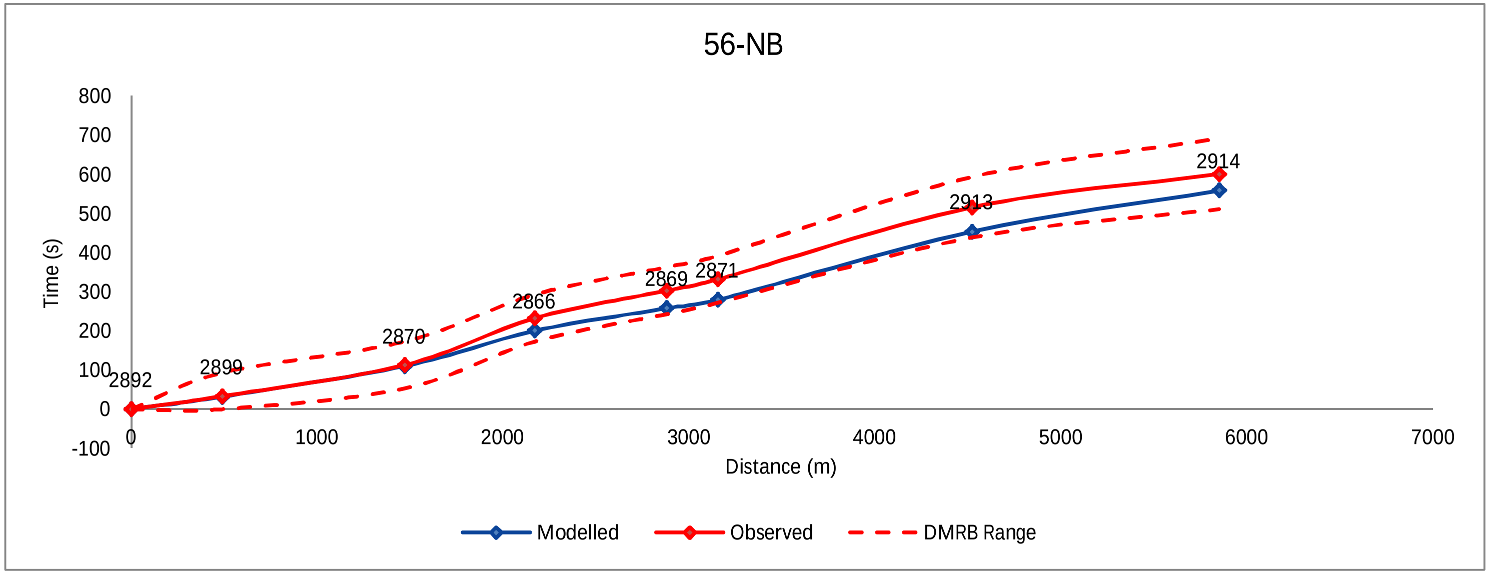

53-WB
Time (s)
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
Distance (m)
2540
2544
2588
2589
2603
2611
2612
Modelled
Observed
DMRB Range

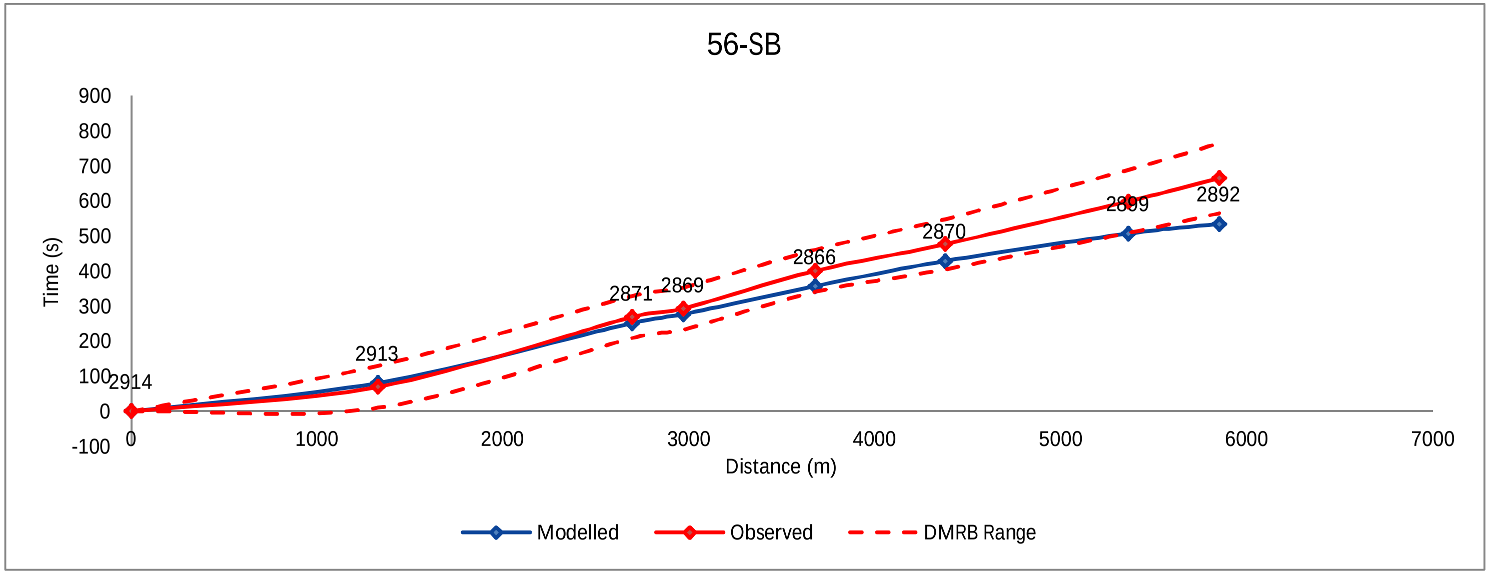

54-EB
Time (s)
400
350
300
250
200
150
100
50
0
0
1000
2000
3000
4000
5000
6000
Distance (m)
2612
2556
2554
2553
2541
2540
Modelled
Observed
DMRB Range

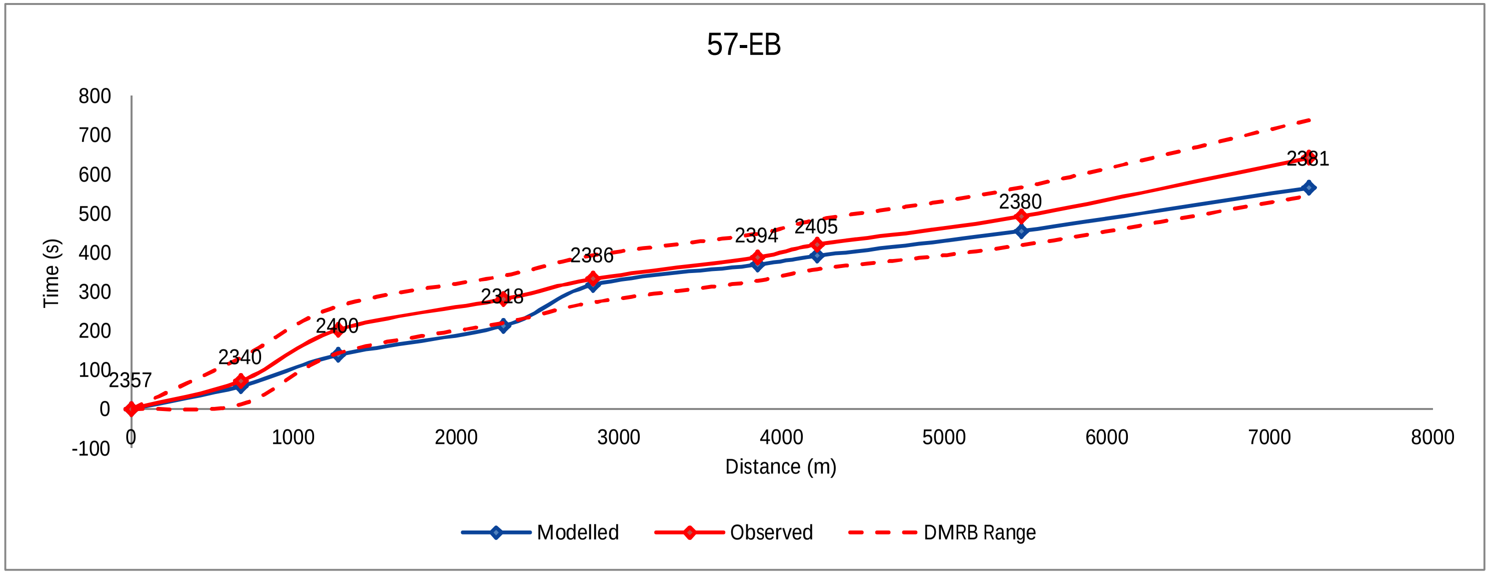

54-WB
Time (s)
400
350
300
250
200
150
100
50
0
0
1000
2000
3000
4000
5000
6000
Distance (m)
2540
2541
2553
2554
2556
2612
Modelled
Observed
DMRB Range

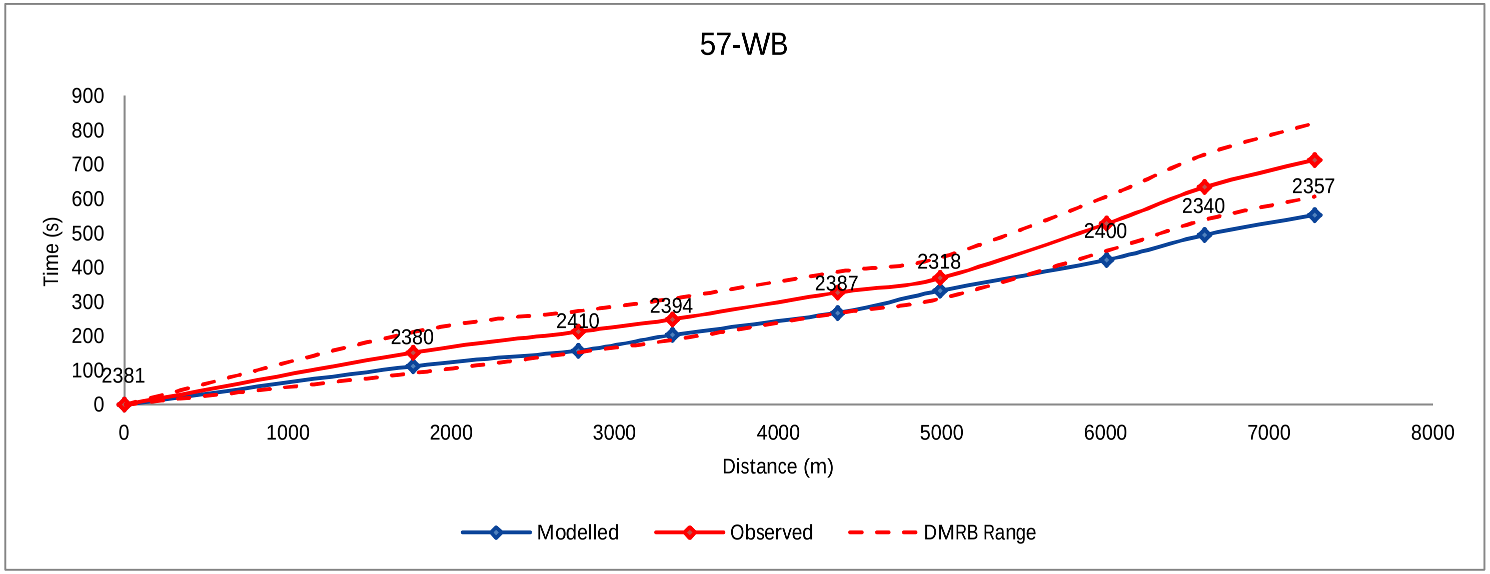

55-NB
Time (s)
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
Distance (m)
2707
2727
2686
2679
2783
2768
2764
2763
2762
Modelled
Observed
DMRB Range

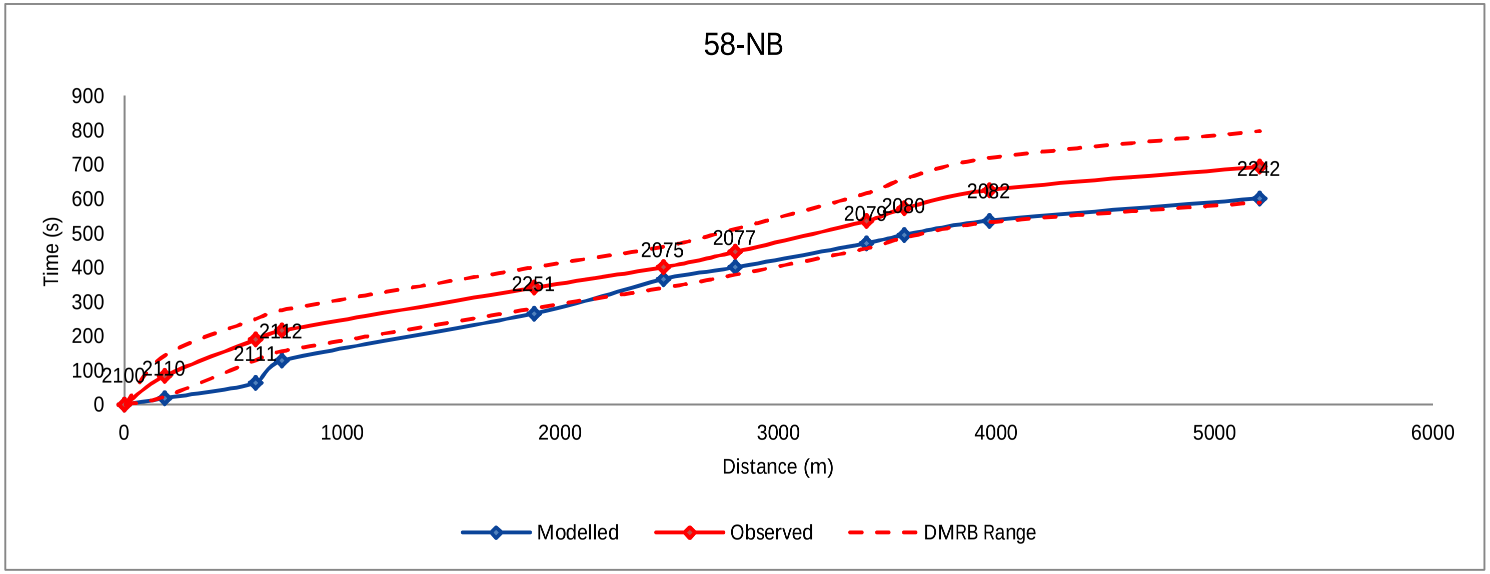

55-SB
Time (s)
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
Distance (m)
2762
2763
2764
2768
2783
2678
2991
2707
Modelled
Observed
DMRB Range

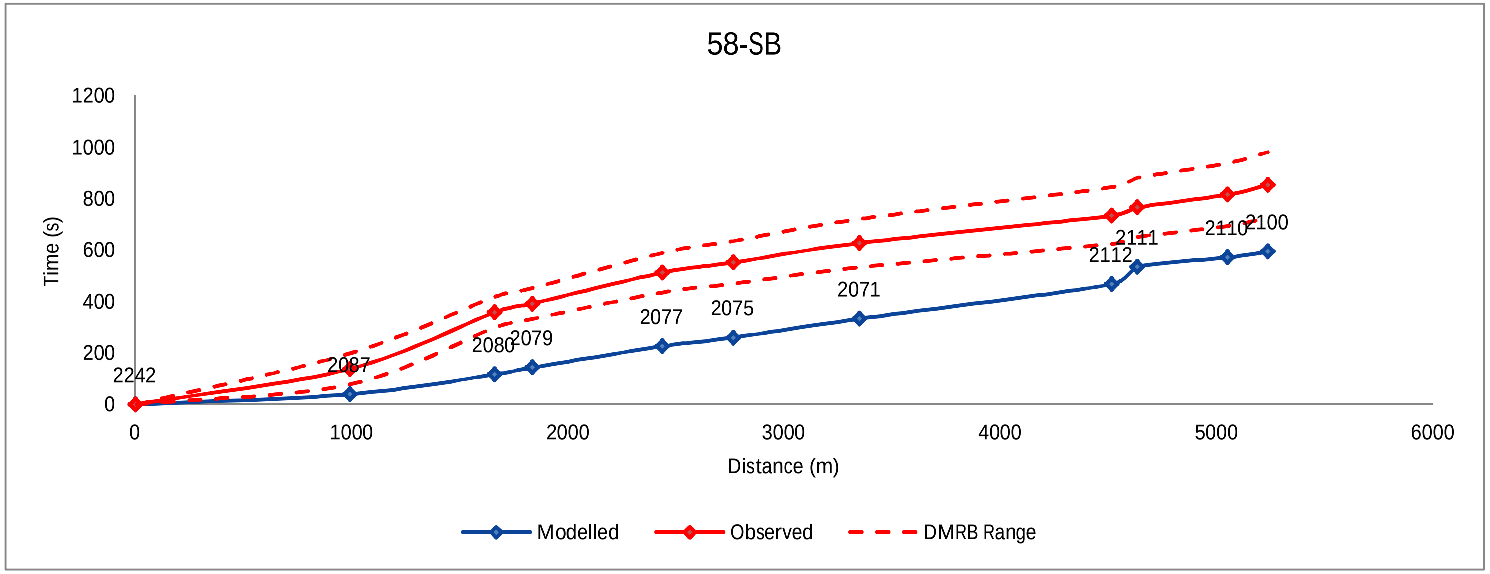

56-NB
Time (s)
800
700
600
500
400
300
200
100
0
-100
2892
2899
2870
2866
2869
2871
2913
2914
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range

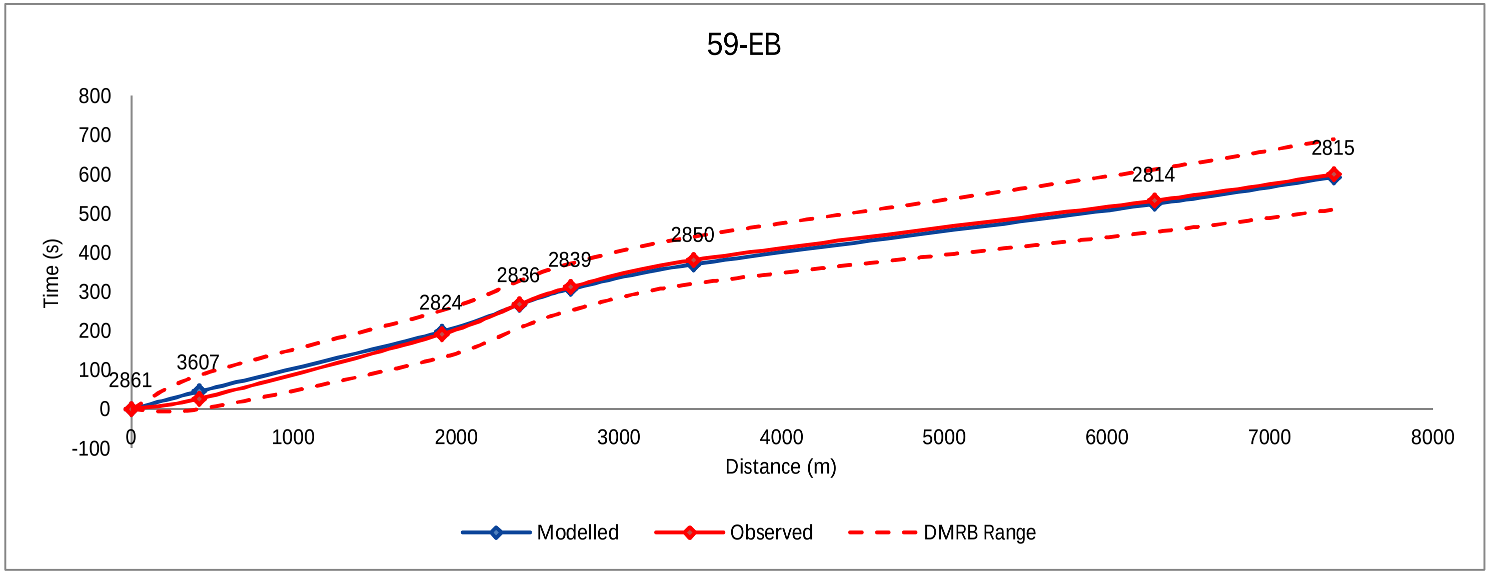

56-SB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
2914
2913
2871
2869
2866
2870
2899
2892
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range

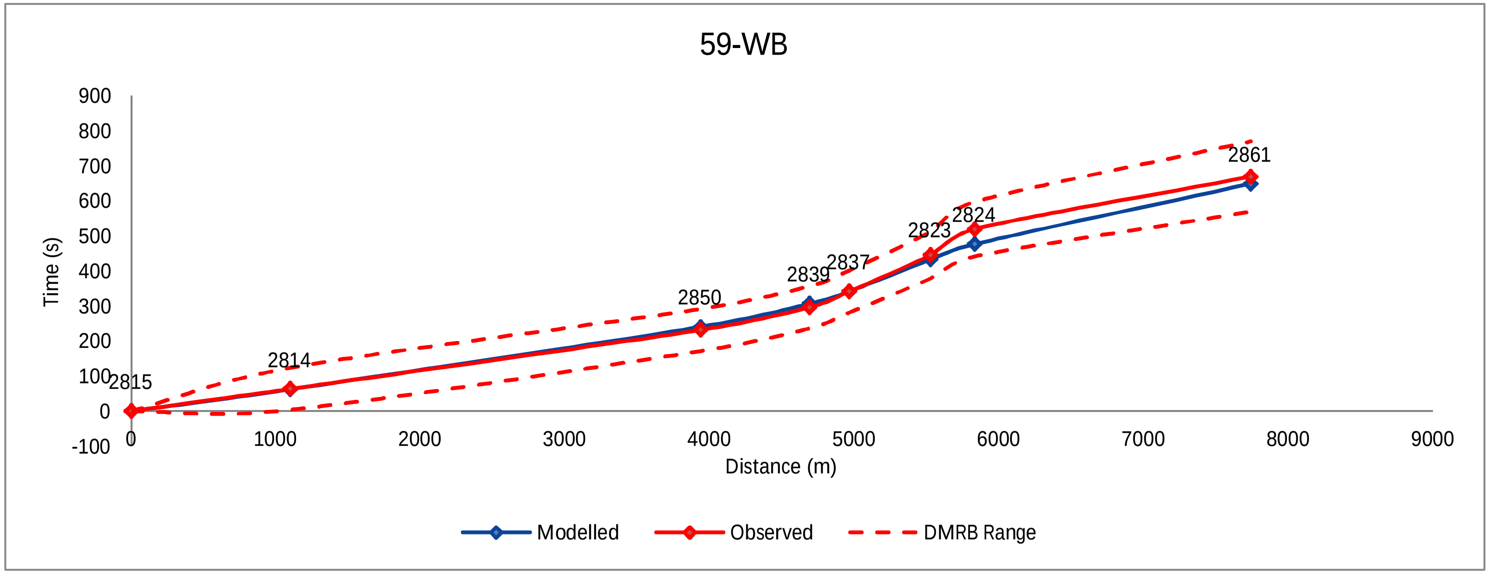

57-EB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
2357
2340
2400
2318
2386
2394
2405
2380
2381

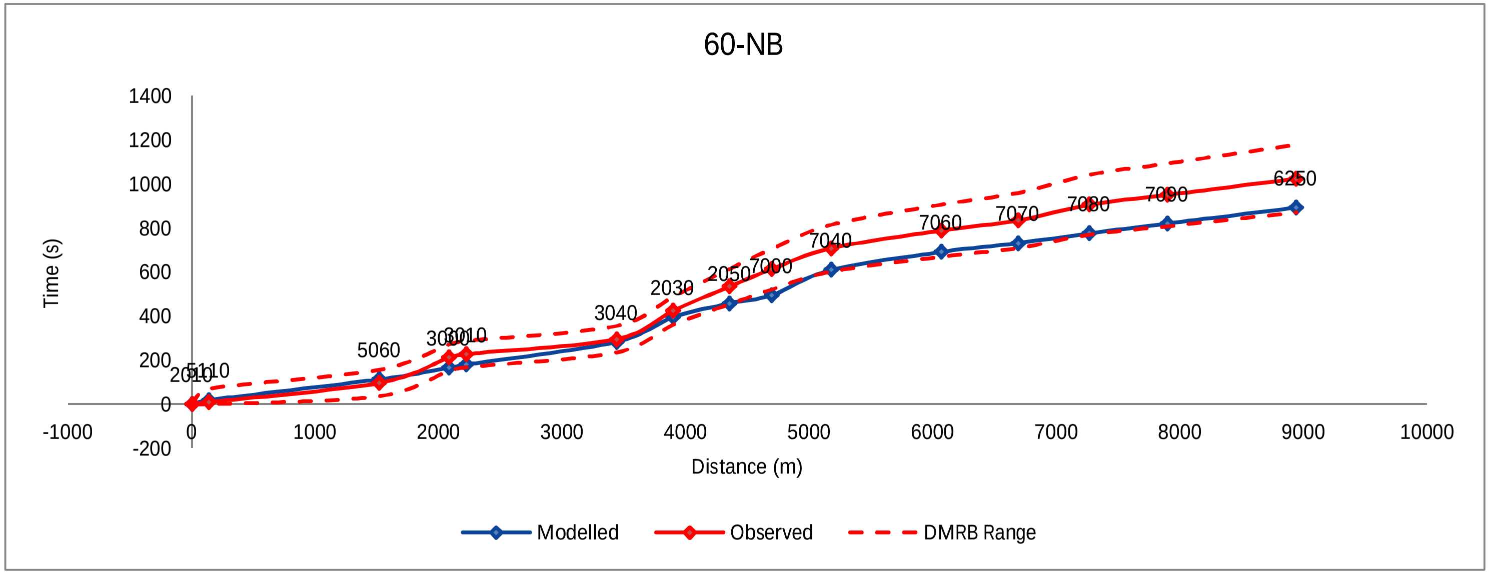

57-WB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
2381
2380
2410
2394
2387
2318
2400
2340
2357


58-NB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
2100
2110
2111
2112
2251
2075
2077
2079
2080
2082
2242

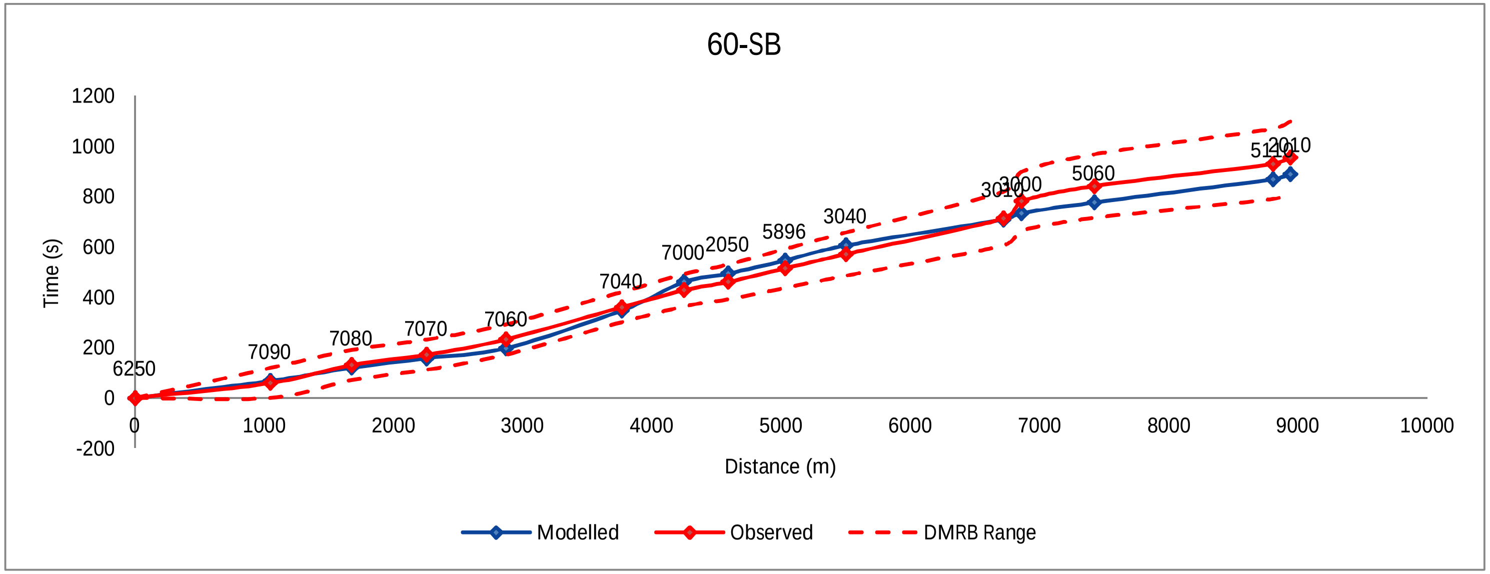

58-SB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
2242
2087
2080
2079
2077
2075
2071
2112
2111
2110
2100


59-EB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
2861
3607
2824
2836
2839
2850
2814
2815
Modelled
Observed
DMRB Range

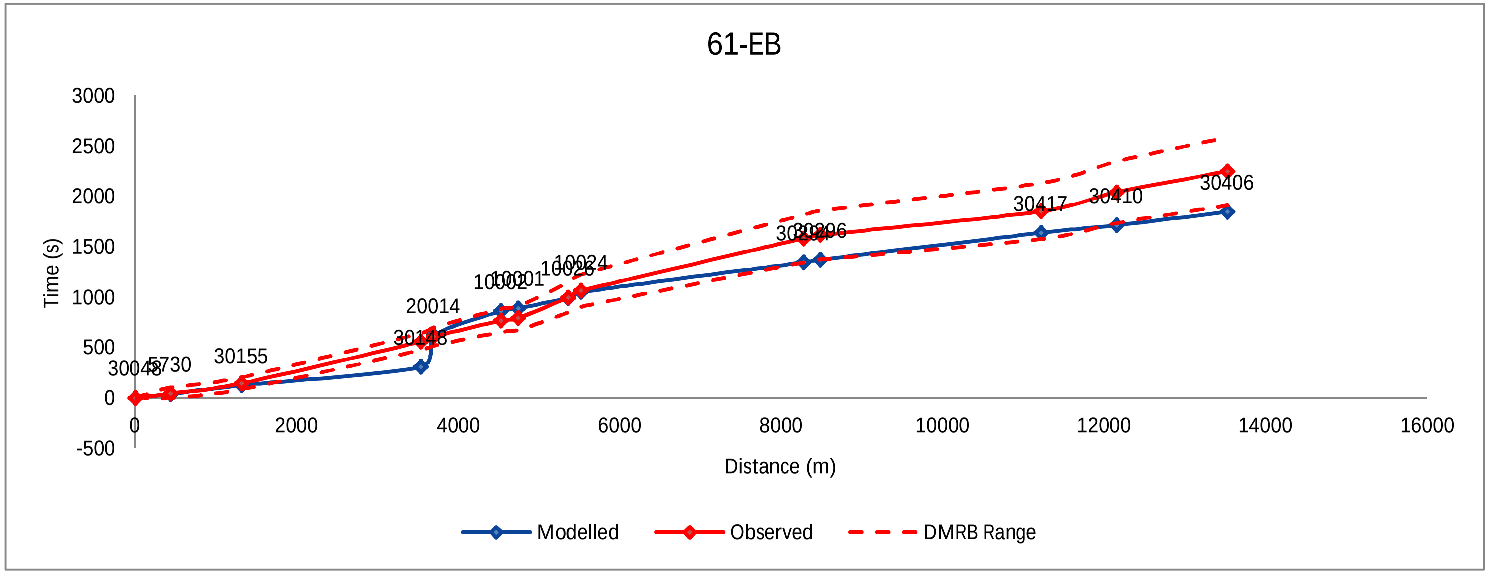

59-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
2815
2814
2850
2839
2837
2823
2824
2861
Modelled
Observed
DMRB Range

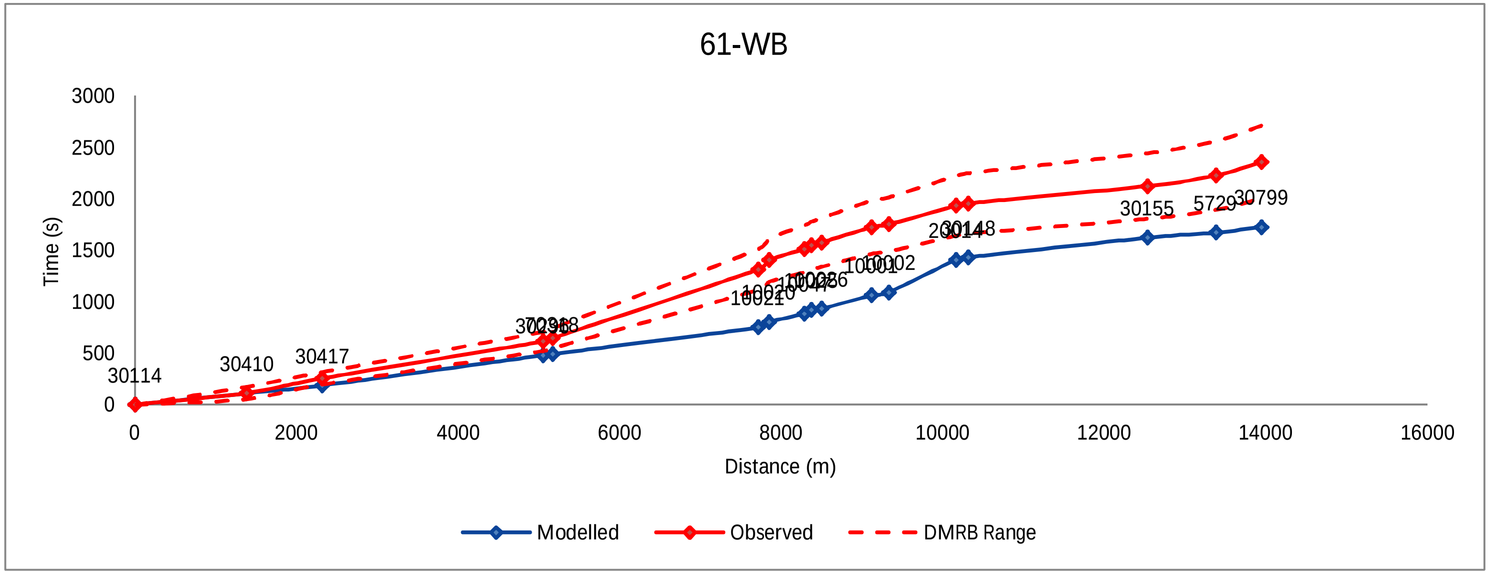


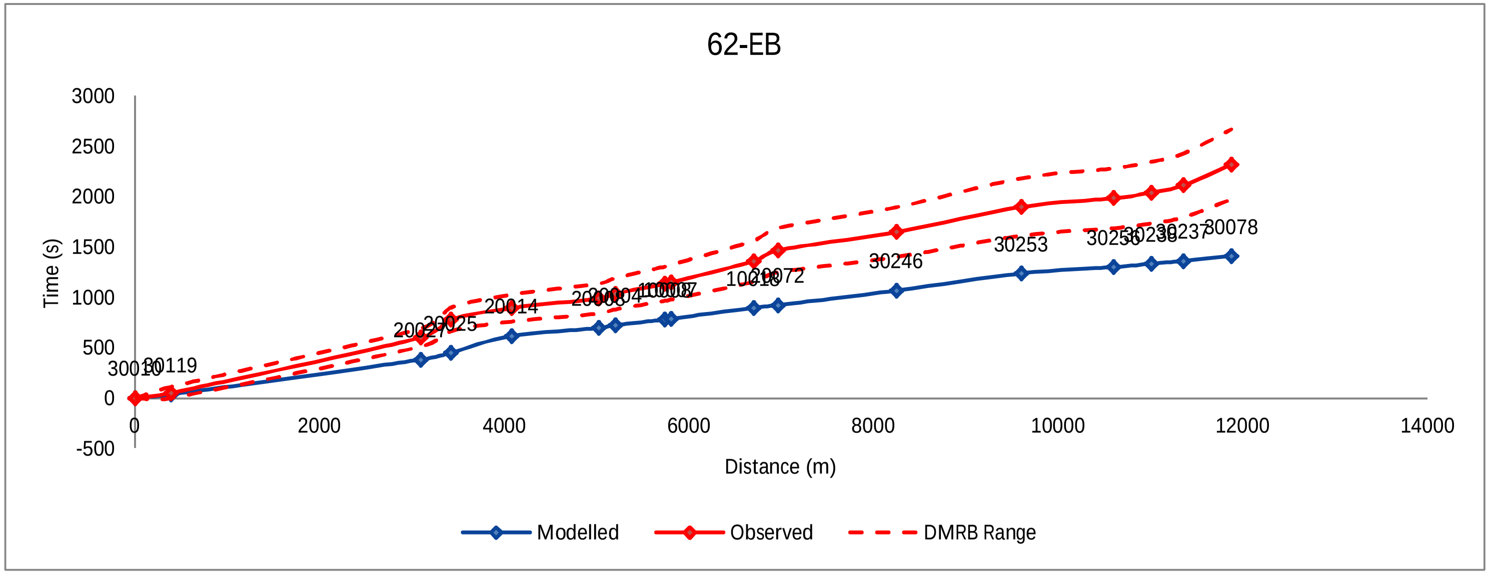
60-NB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range

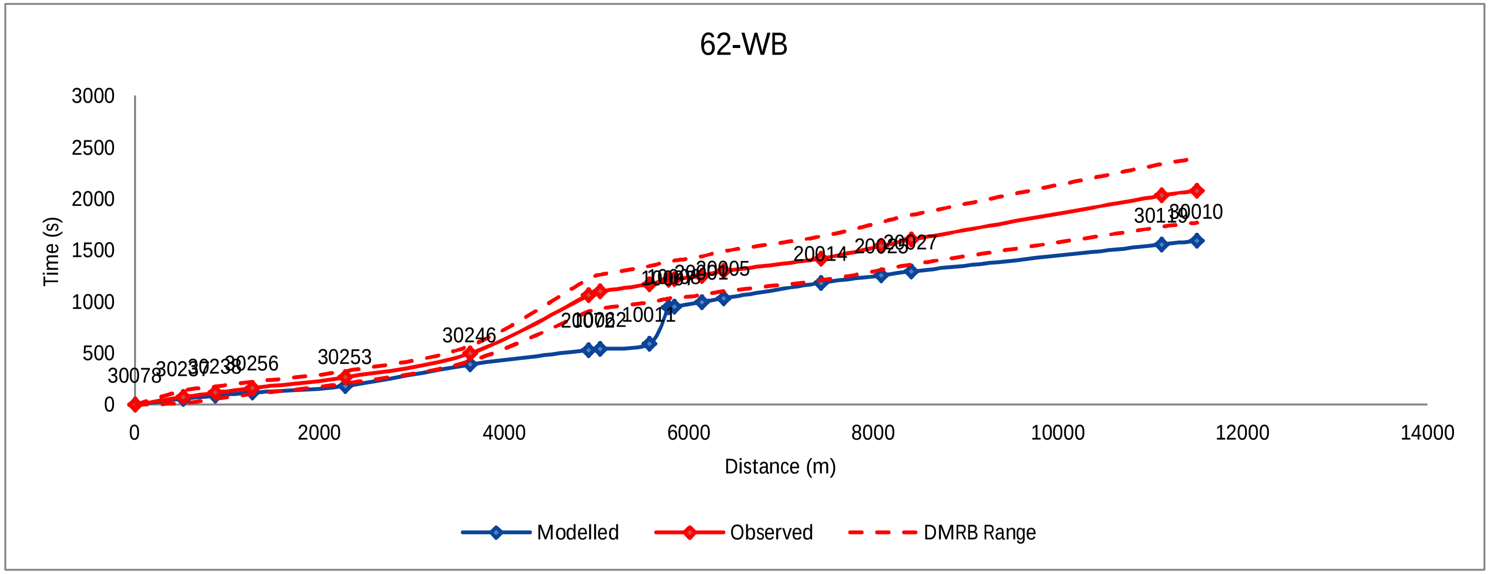


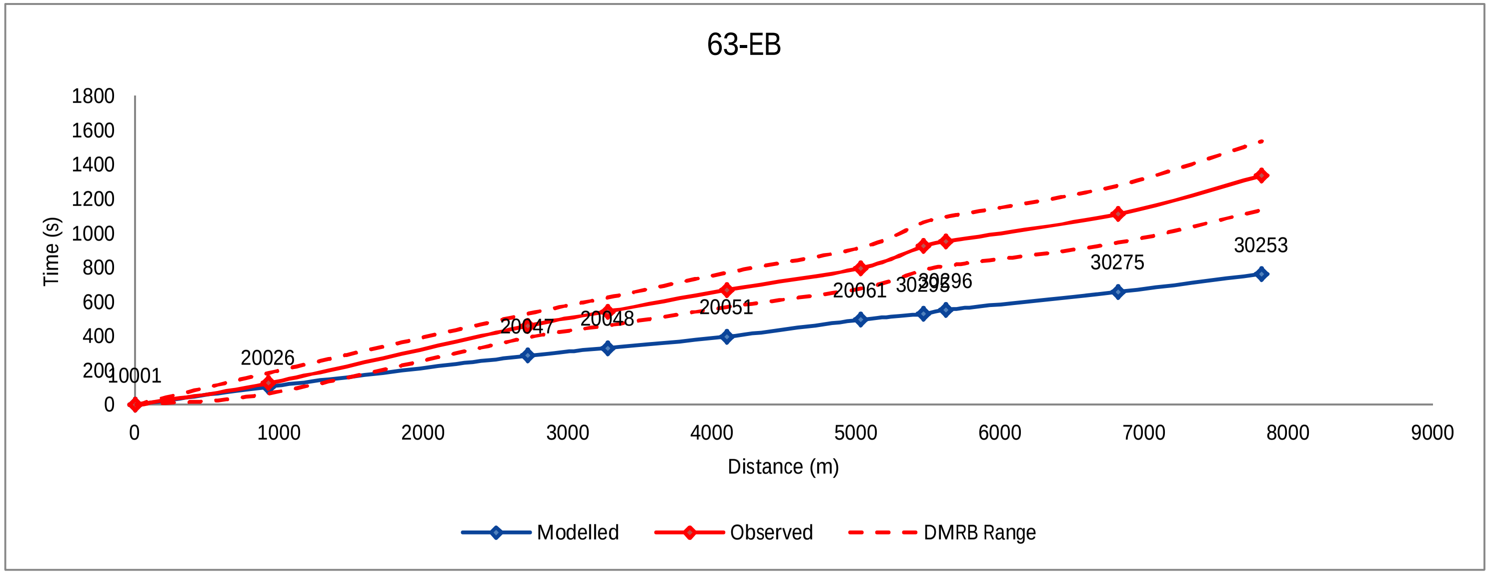
60-SB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range

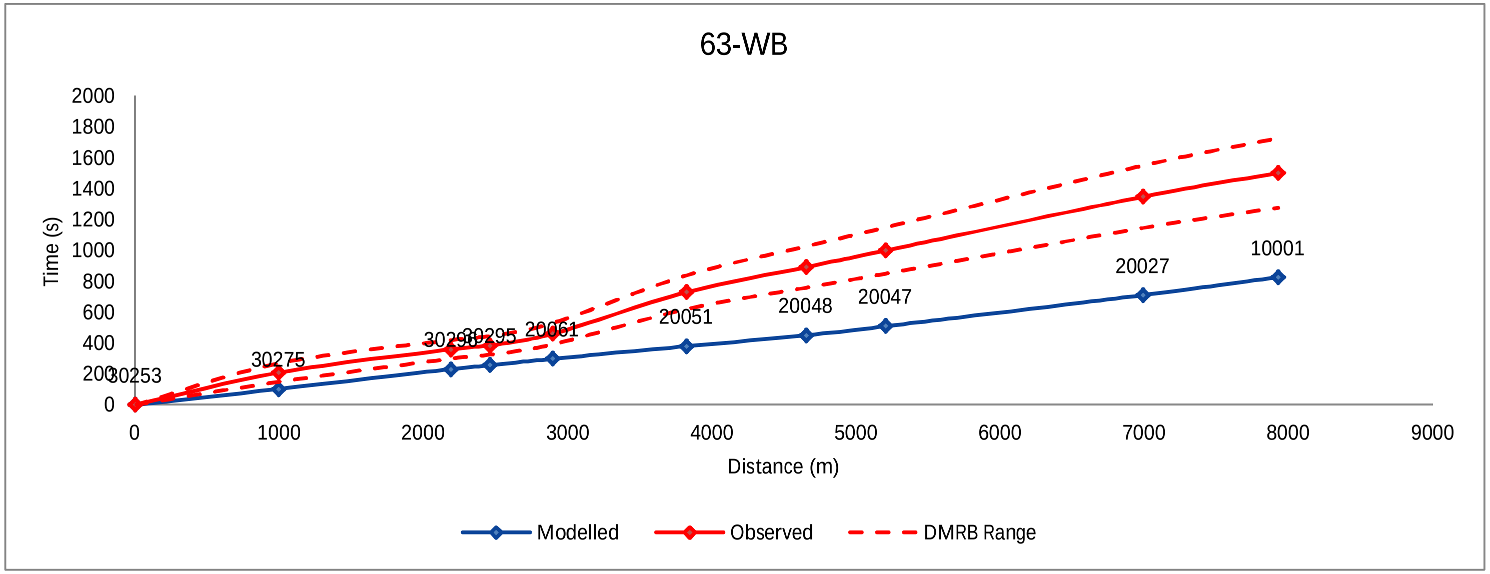

61-EB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
30048
5730
30155
30148
20014
10002
10001
10026
10024
30406
30417
30410

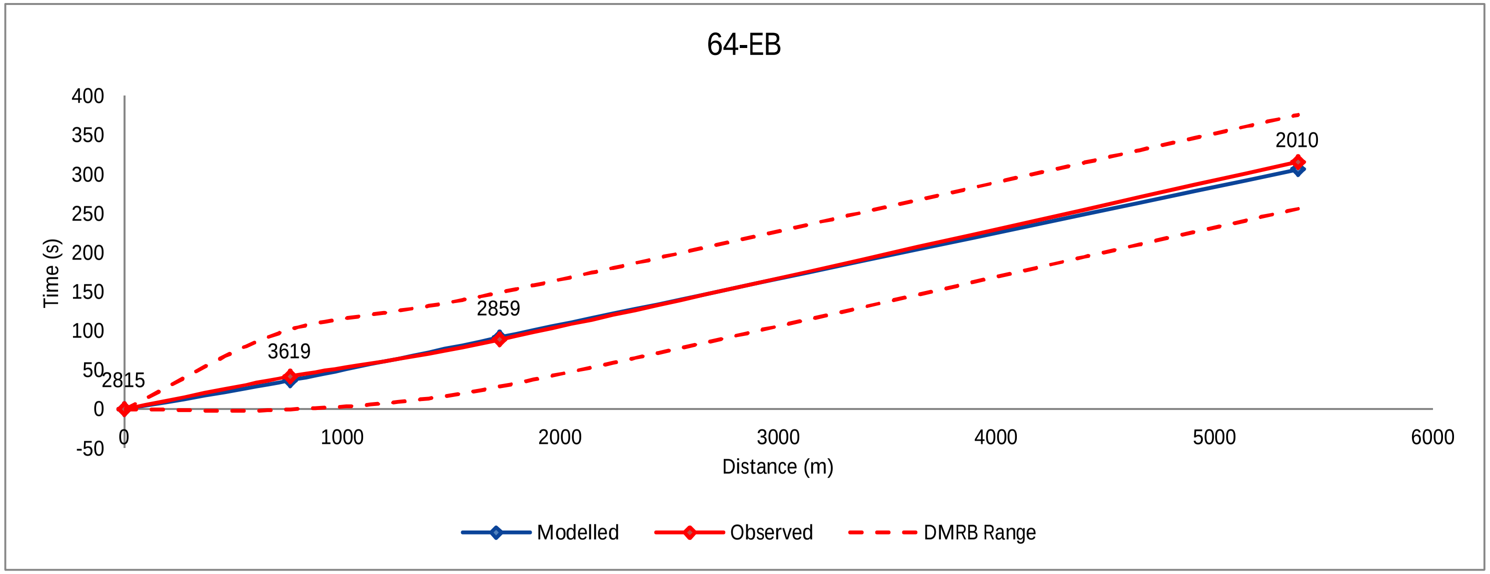

61-WB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
30114
30410
30417
30155
5729
30799
10002
10001
20014
30148
10021
10026

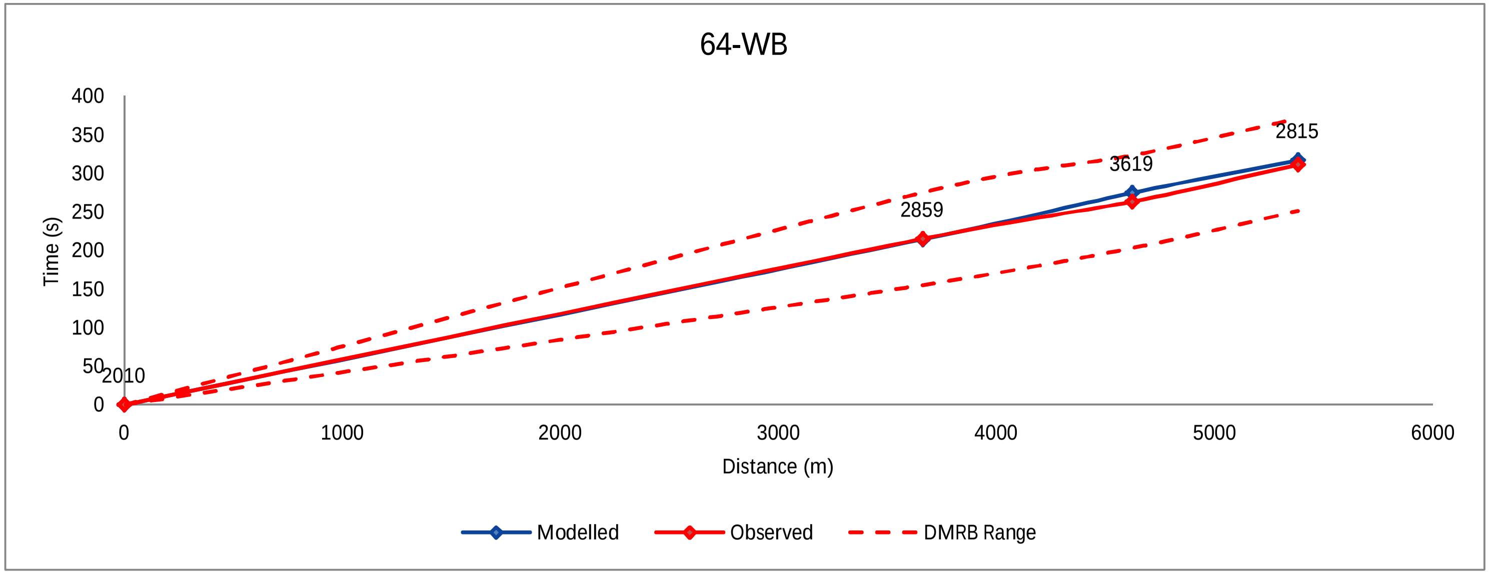

62-EB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range

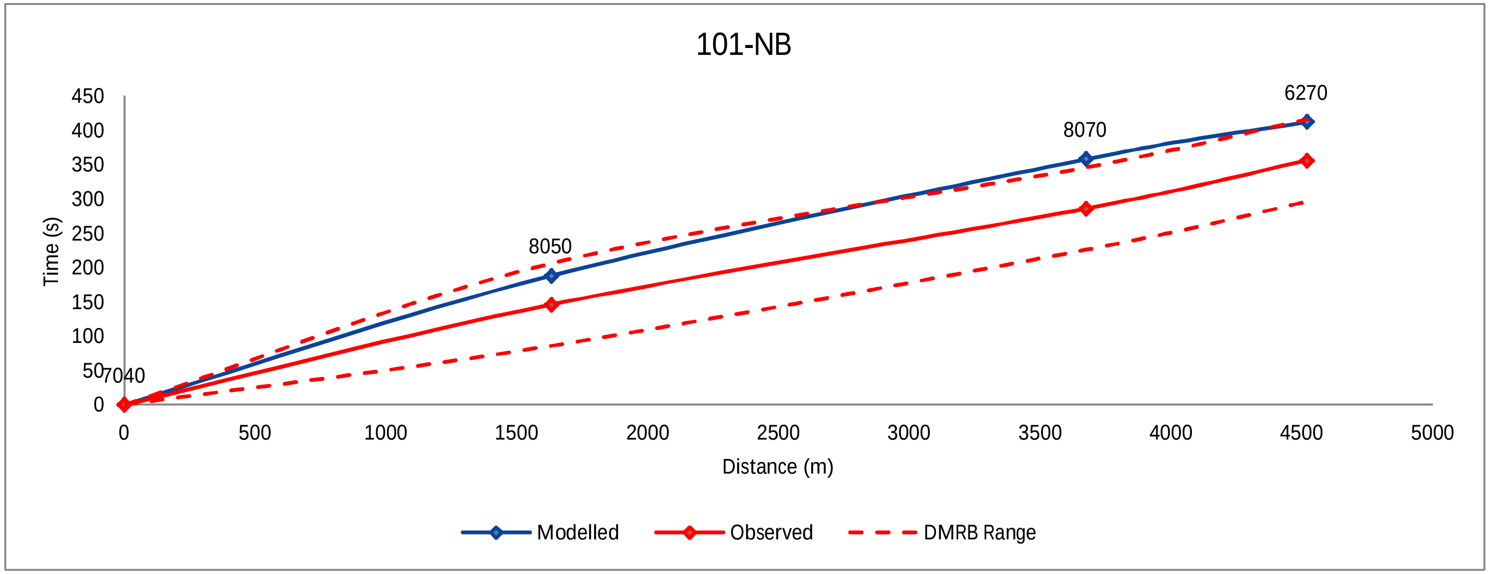

62-WB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range


63-EB
Time (s)
1800
1600
1400
1200
1000
800
600
400
200
0
10001
20026
20047
20048
20051
20061
30296
30253
30275
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range

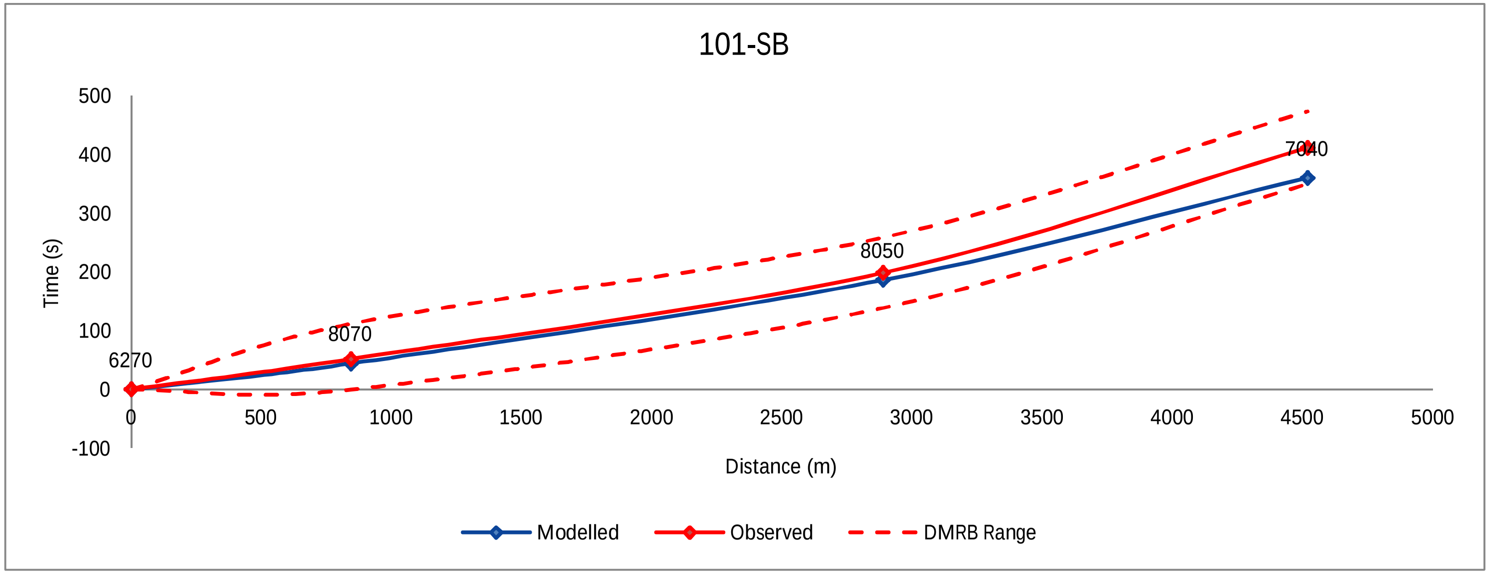

63-WB
Time (s)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
30253
30275
30295
20061
20051
20048
20047
20027
10001
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range


64-EB
Time (s)
400
350
300
250
200
150
100
50
0
-50
2815
3619
2859
2010
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range

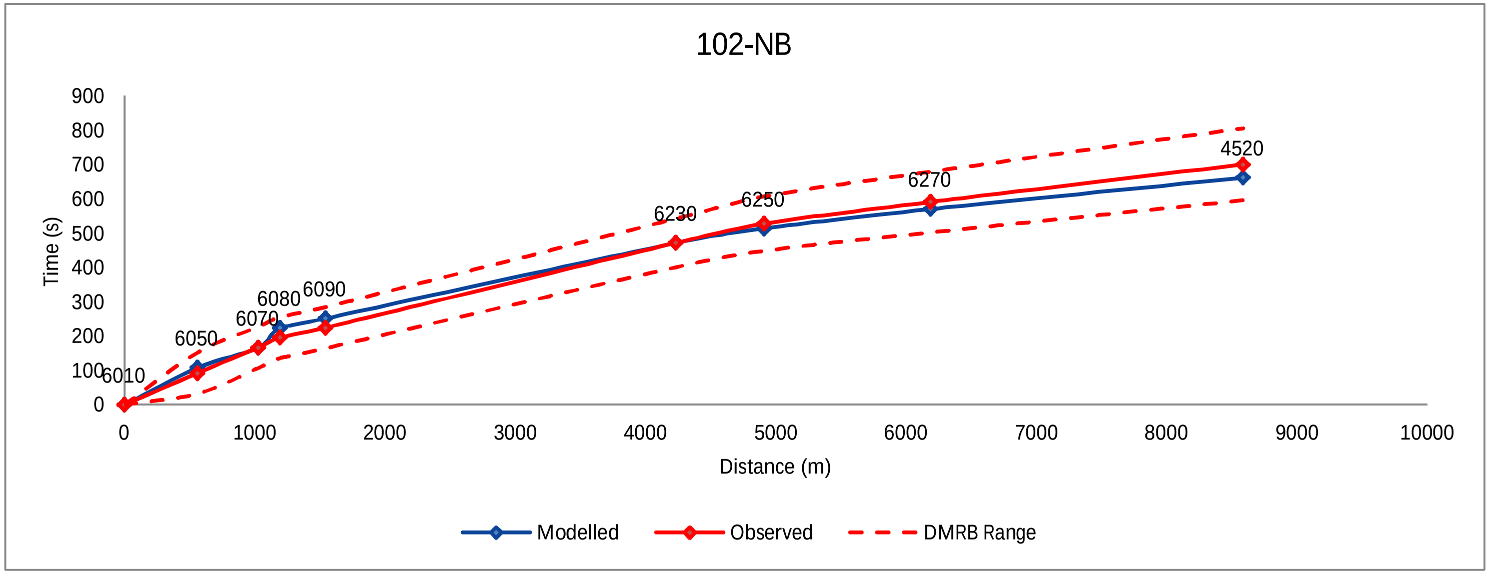

64-WB
Time (s)
400
350
300
250
200
150
100
50
0
2010
2859
3619
2815
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range

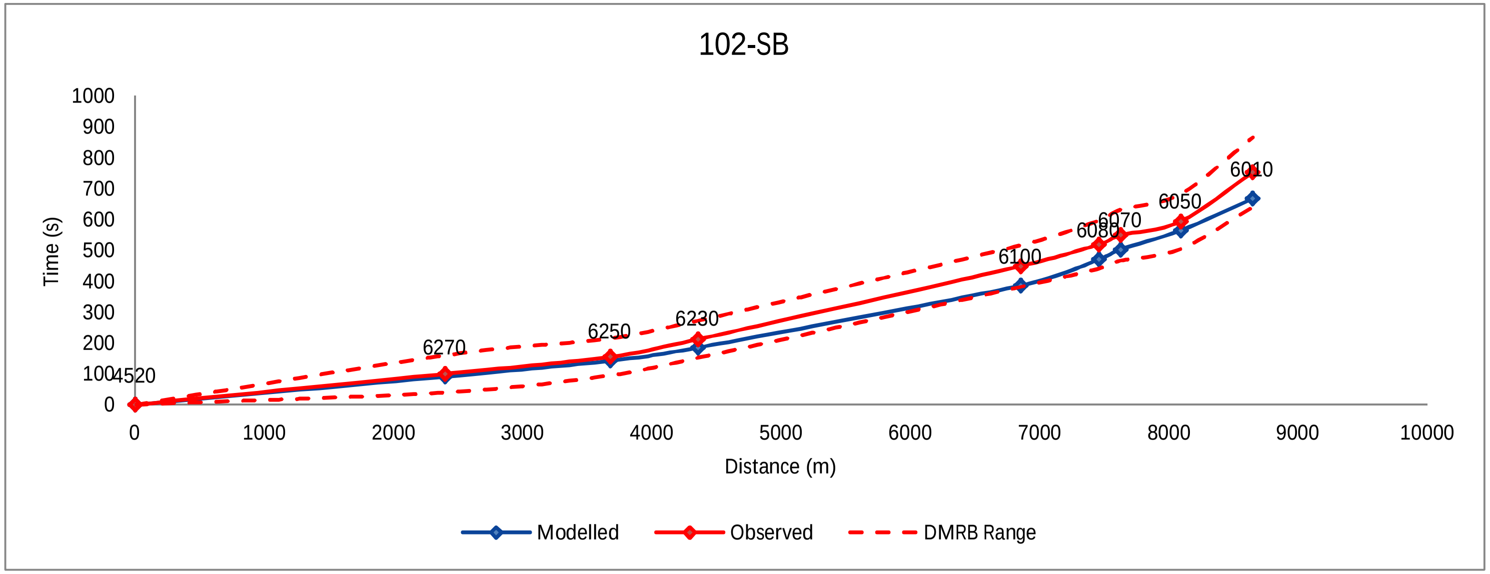


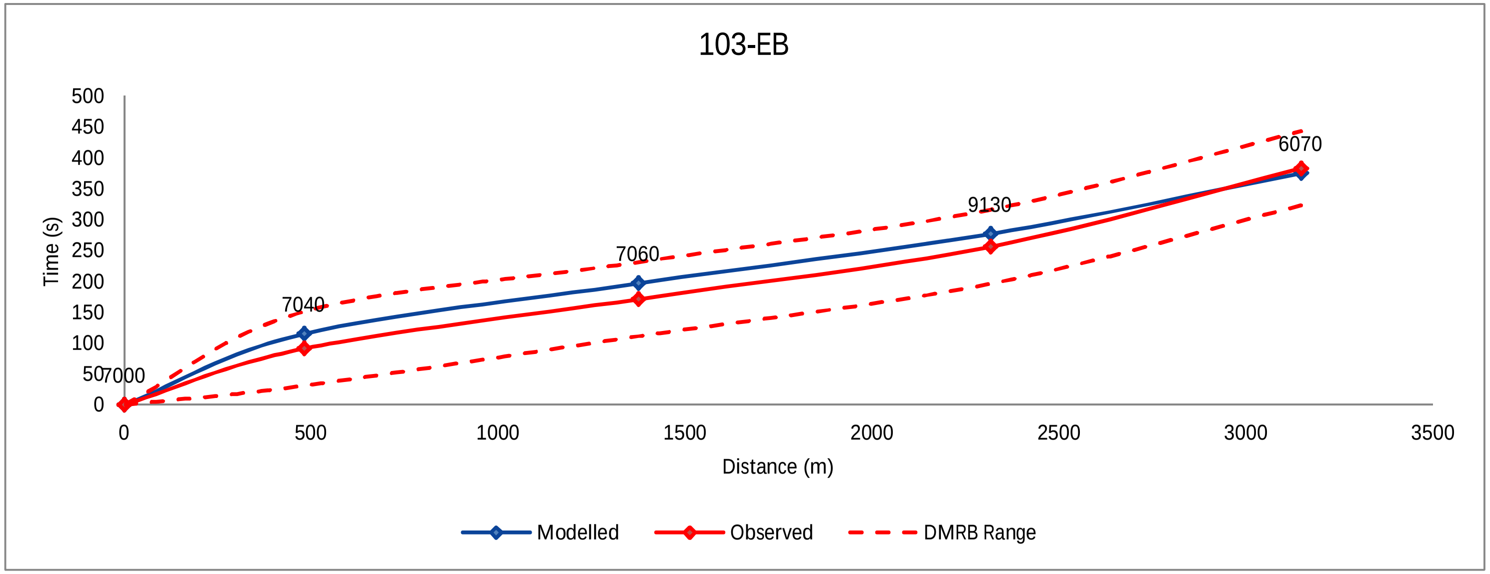
101-NB
Time (s)
450
400
350
300
250
200
150
100
50
0
7040
8050
8070
6270
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range

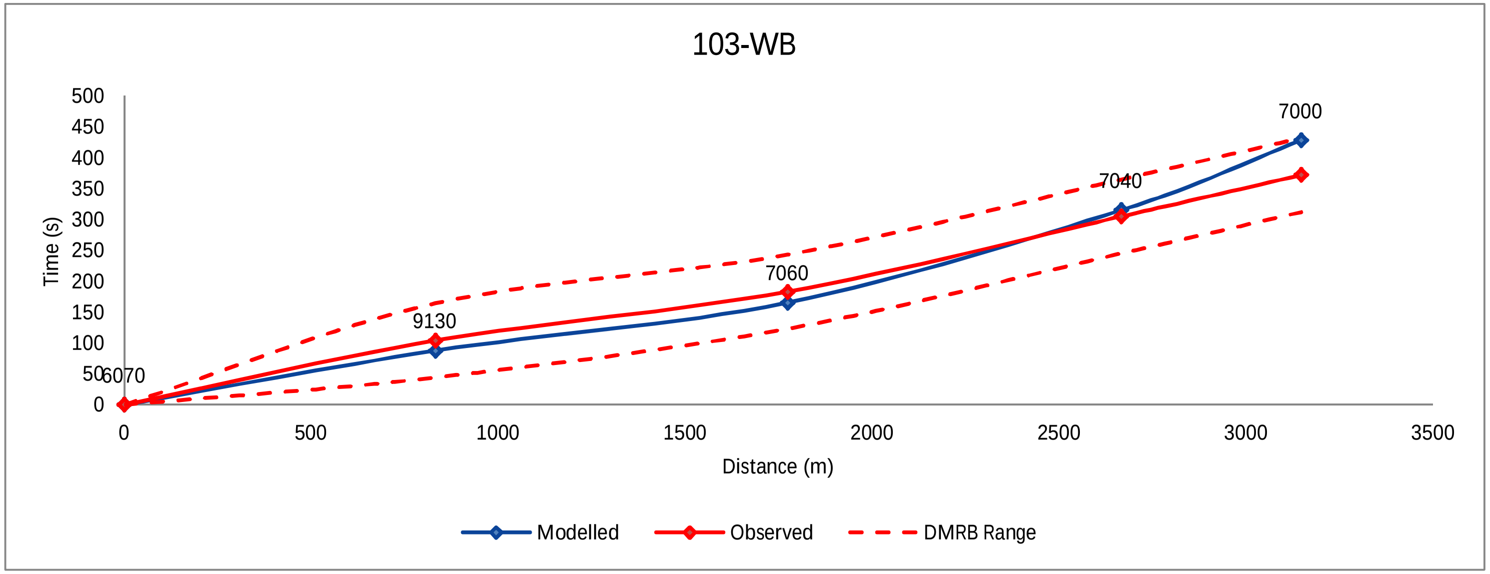


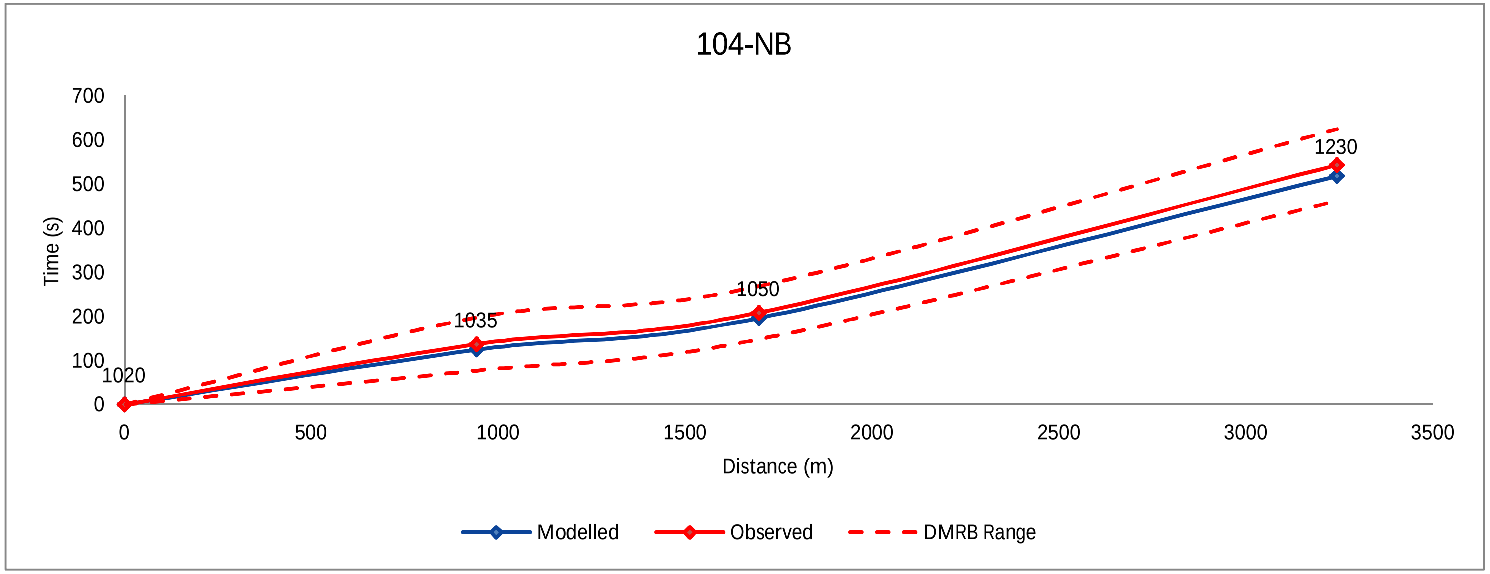
101-SB
Time (s)
500
400
300
200
100
0
-100
6270
8070
8050
7040
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range

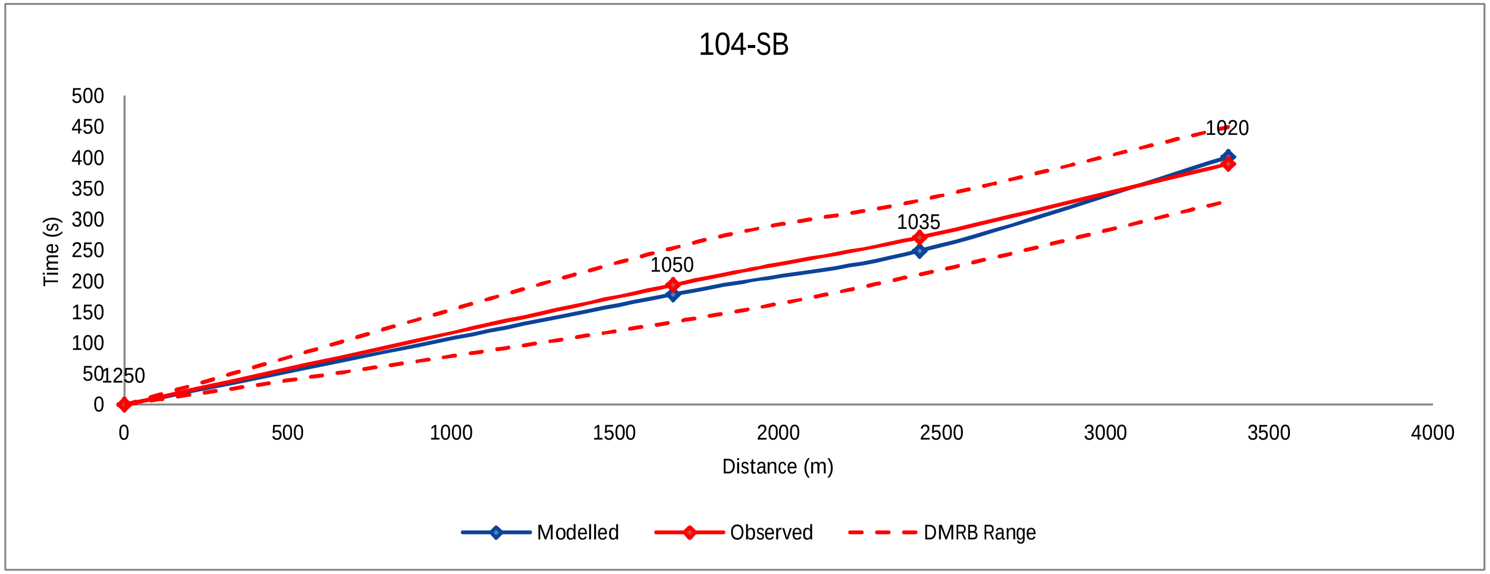

102-NB
Time (s)
900
800
700
600
500
400
300
200
100
0
6010
6050
6070
6080
6090
6230
6250
6270
4520
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range

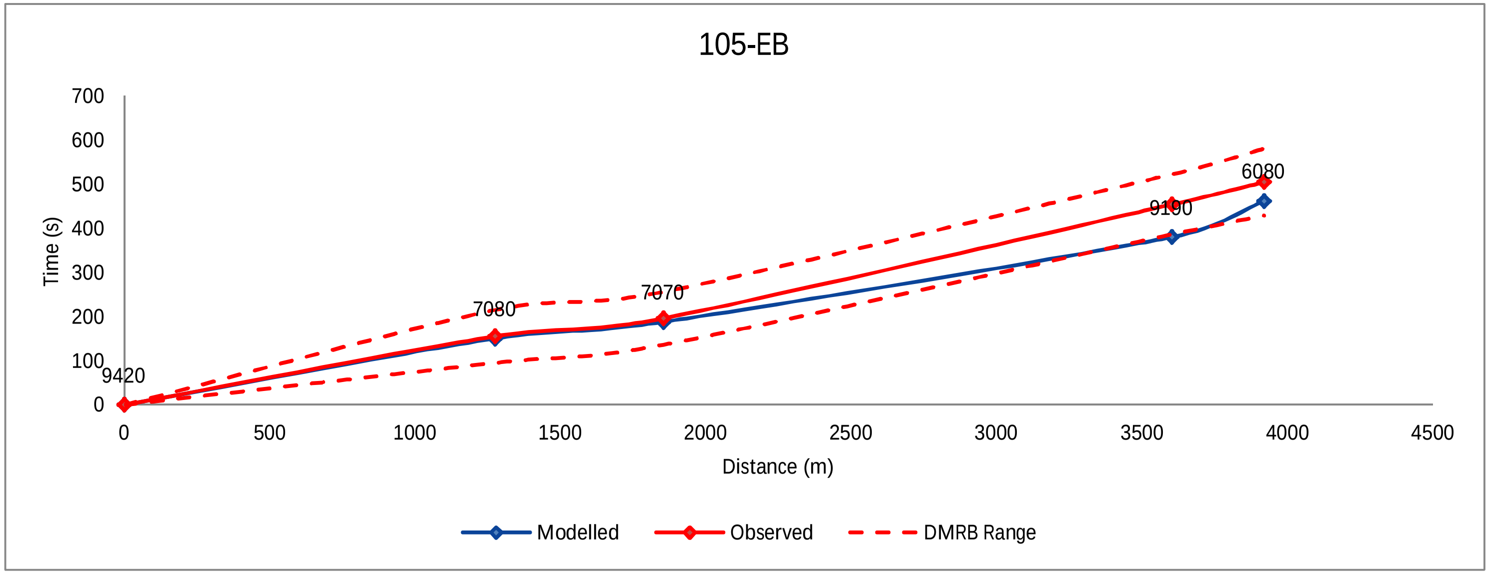

102-SB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
4520
6270
6250
6230
6100
6080
6070
6050
6010
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range

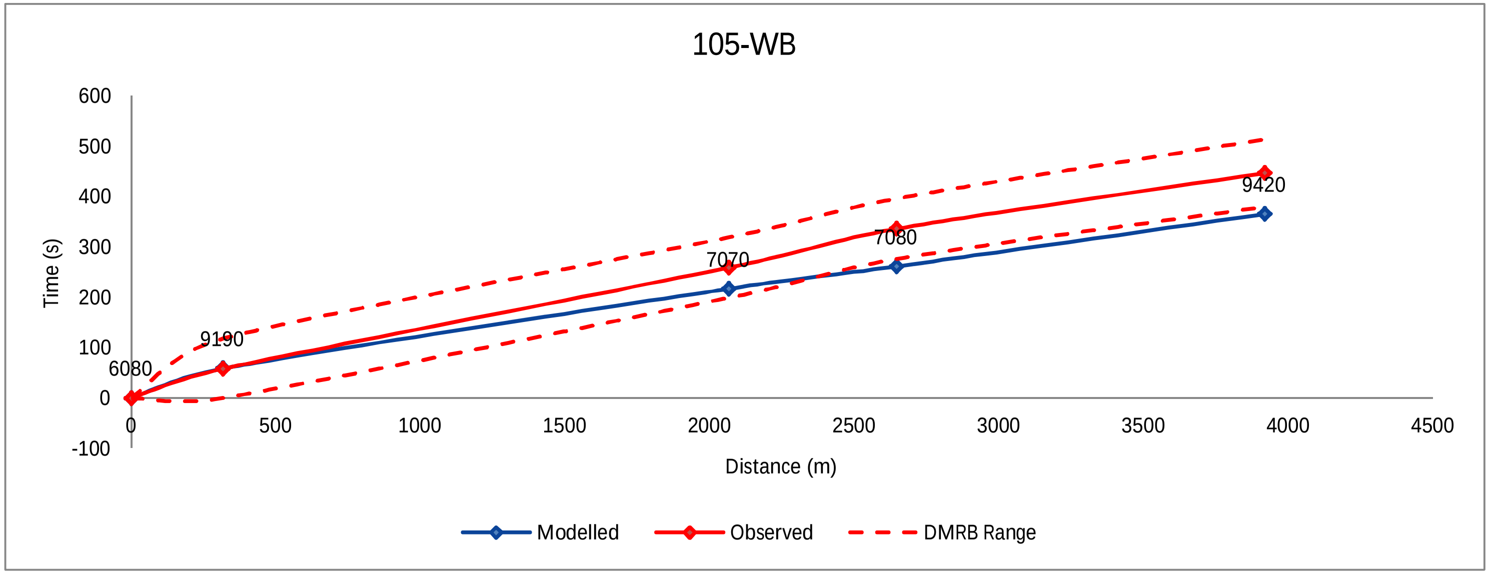

103-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
7000
7040
7060
9130
6070
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range

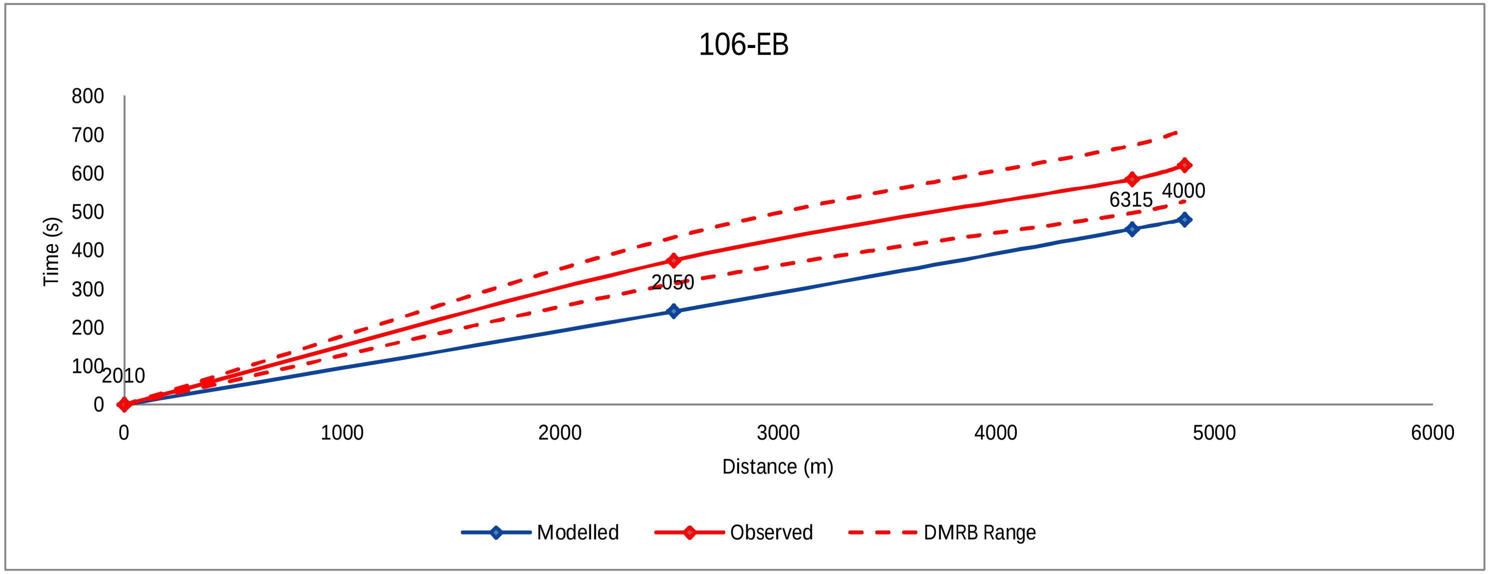

103-WB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
6070
9130
7060
7040
7000
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range

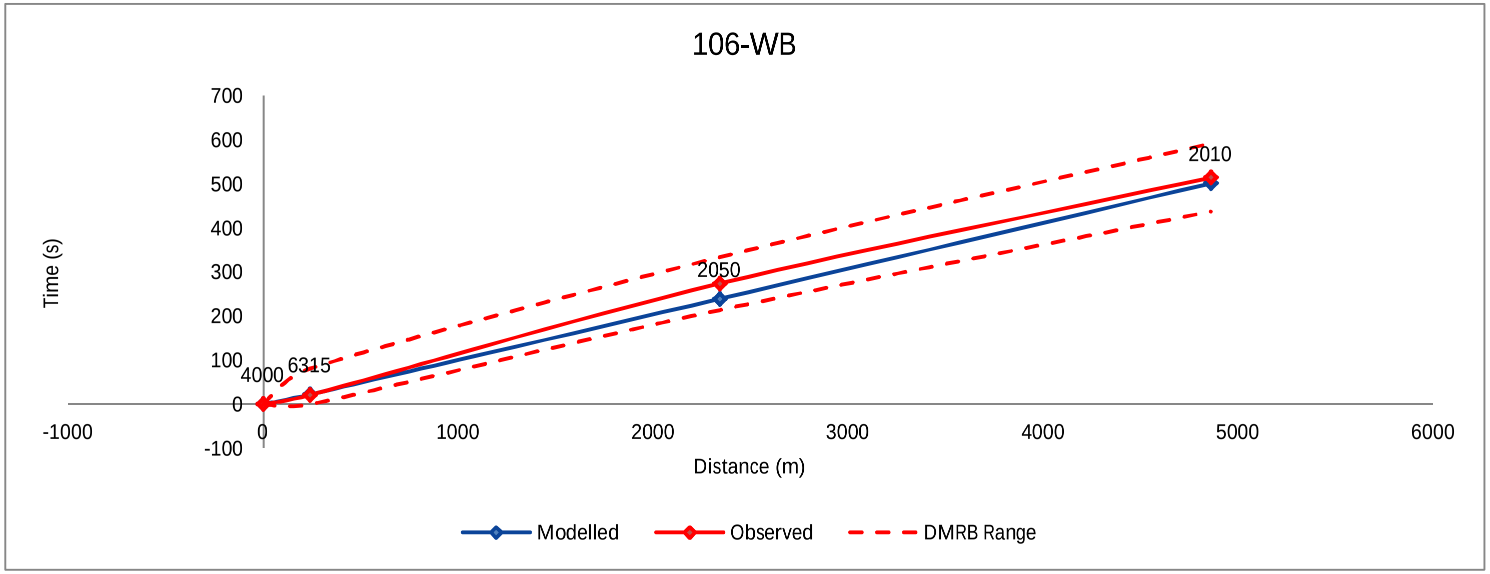

104-NB
Time (s)
700
600
500
400
300
200
100
0
1020
1035
1050
1230
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range

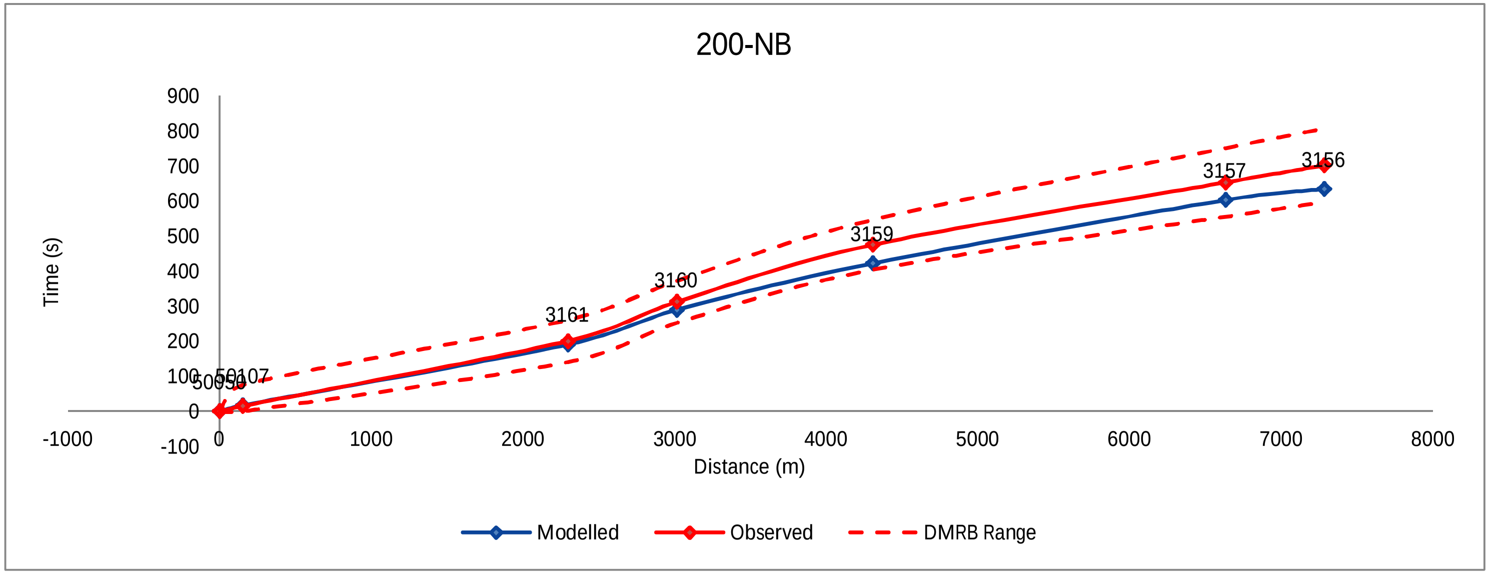

104-SB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
1250
1050
1035
1020
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
Modelled
Observed
DMRB Range

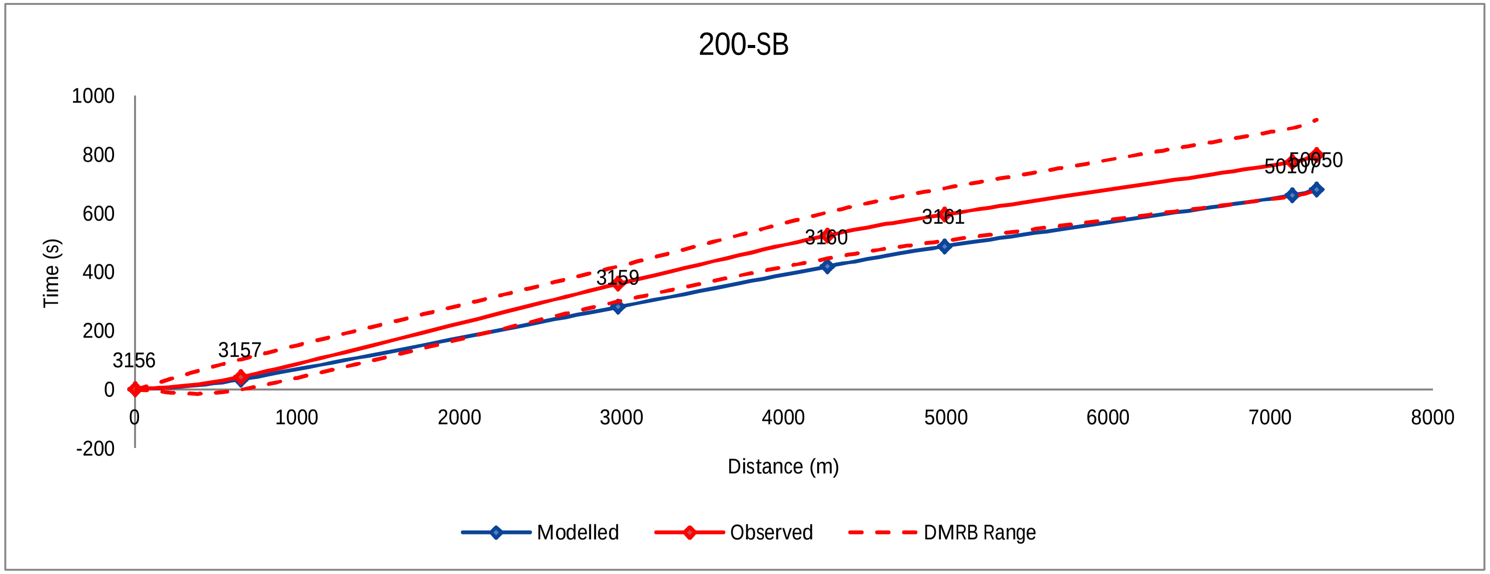

105-EB
Time (s)
700
600
500
400
300
200
100
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Distance (m)
9420
7080
7070
9190
6080
Modelled
Observed
DMRB Range

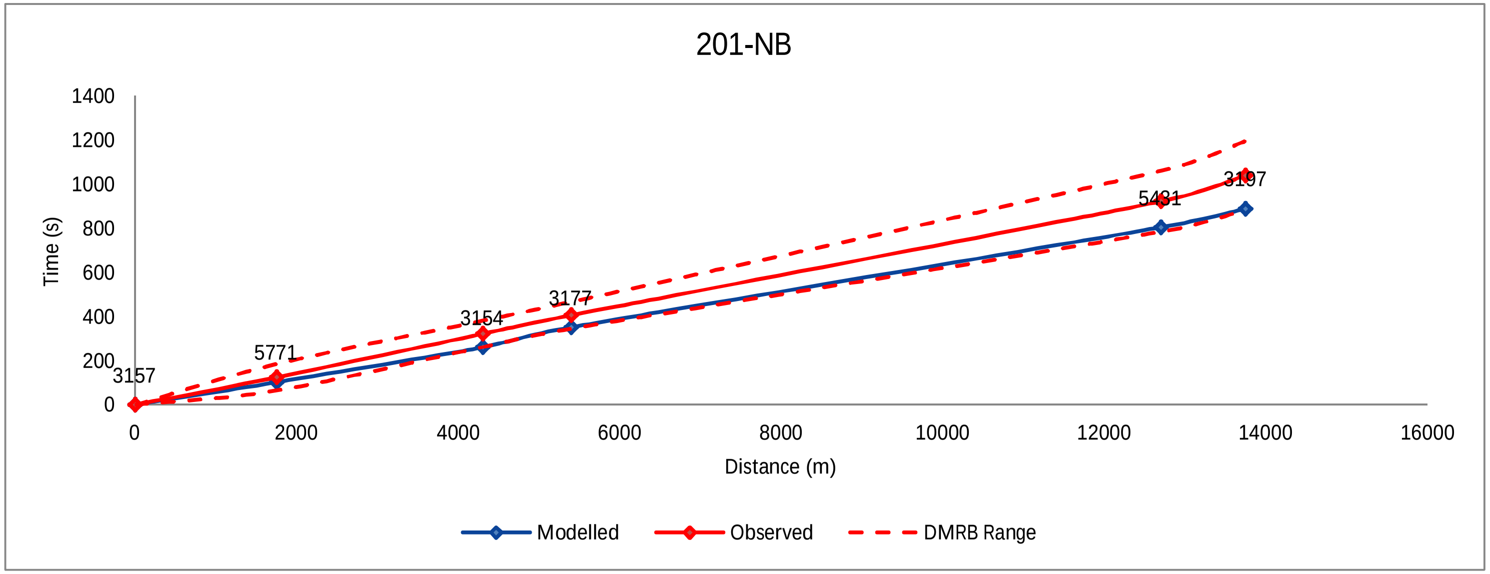

105-WB
Time (s)
600
500
400
300
200
100
0
-100
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Distance (m)
6080
9190
7070
7080
9420
Modelled
Observed
DMRB Range

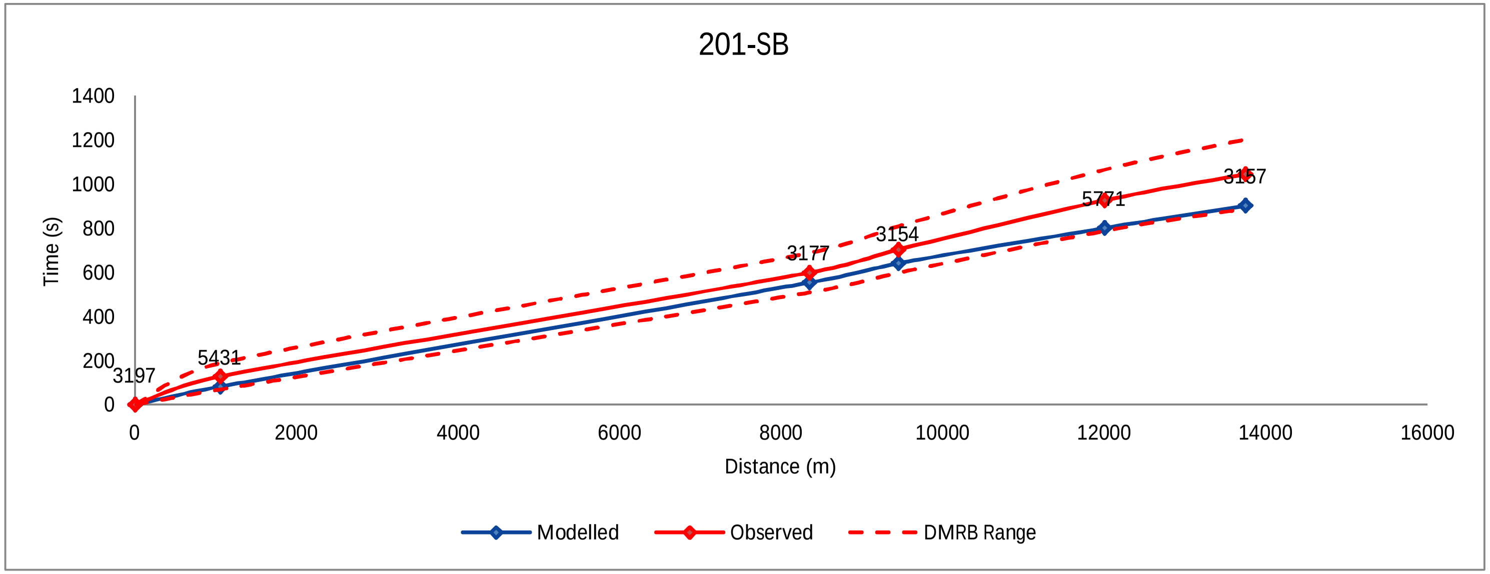

106-EB
Time (s)
800
700
600
500
400
300
200
100
0
2010
2050
6315
4000
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range

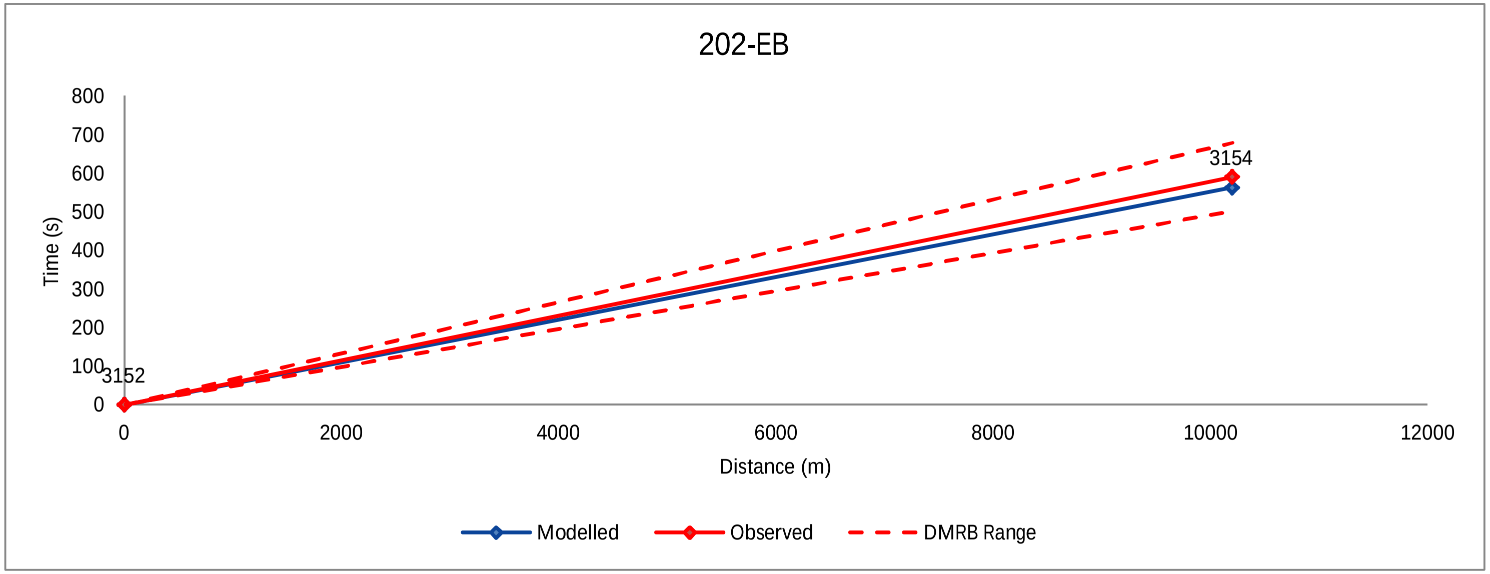

106-WB
Time (s)
700
600
500
400
300
200
100
0
-100
4000
6315
2050
2010
-1000
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range

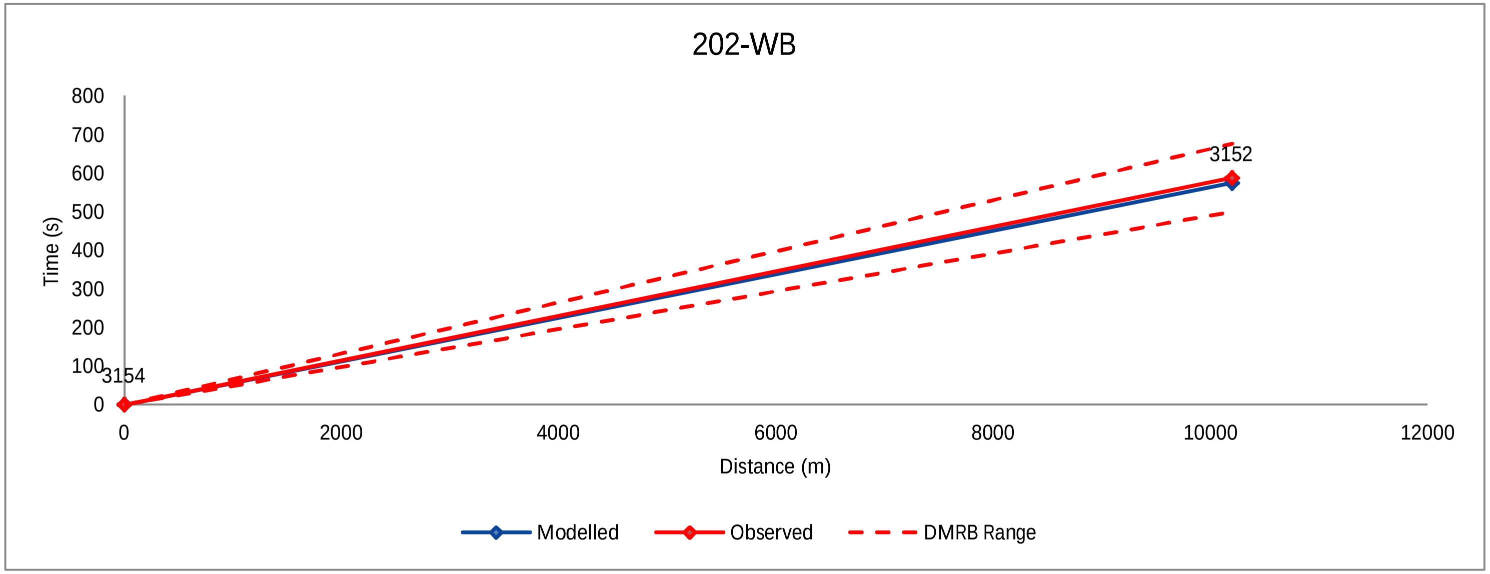

200-NB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
3156
3157
3159
3160
3161
50107
50050

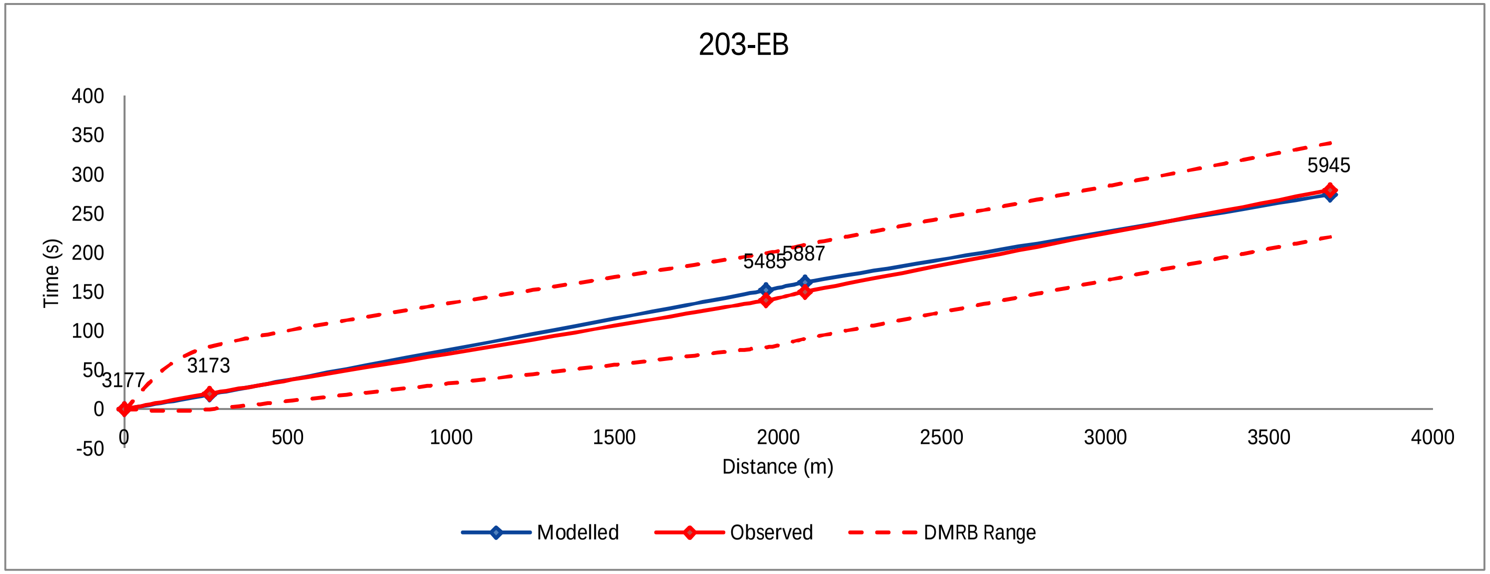

200-SB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
3156
3157
3159
3160
3161
50107
50050

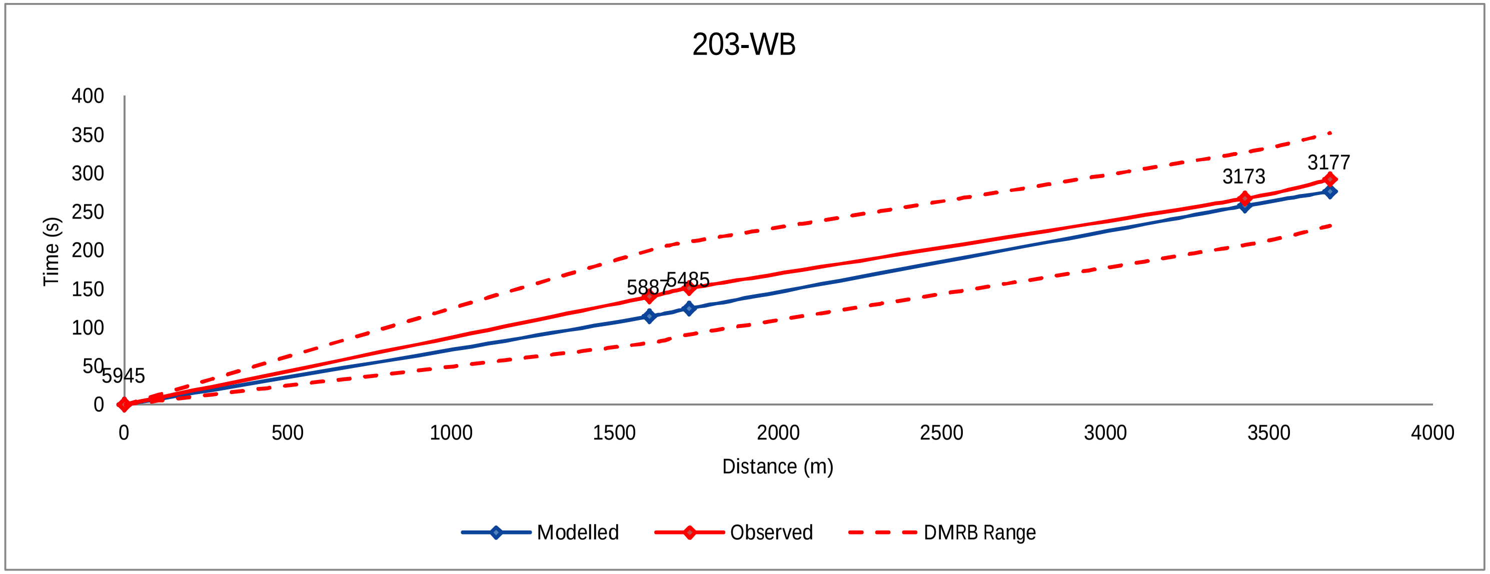

201-NB
Time (s)
1400
1200
1000
800
600
400
200
0
3157
5771
3154
3177
5431
3197
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range

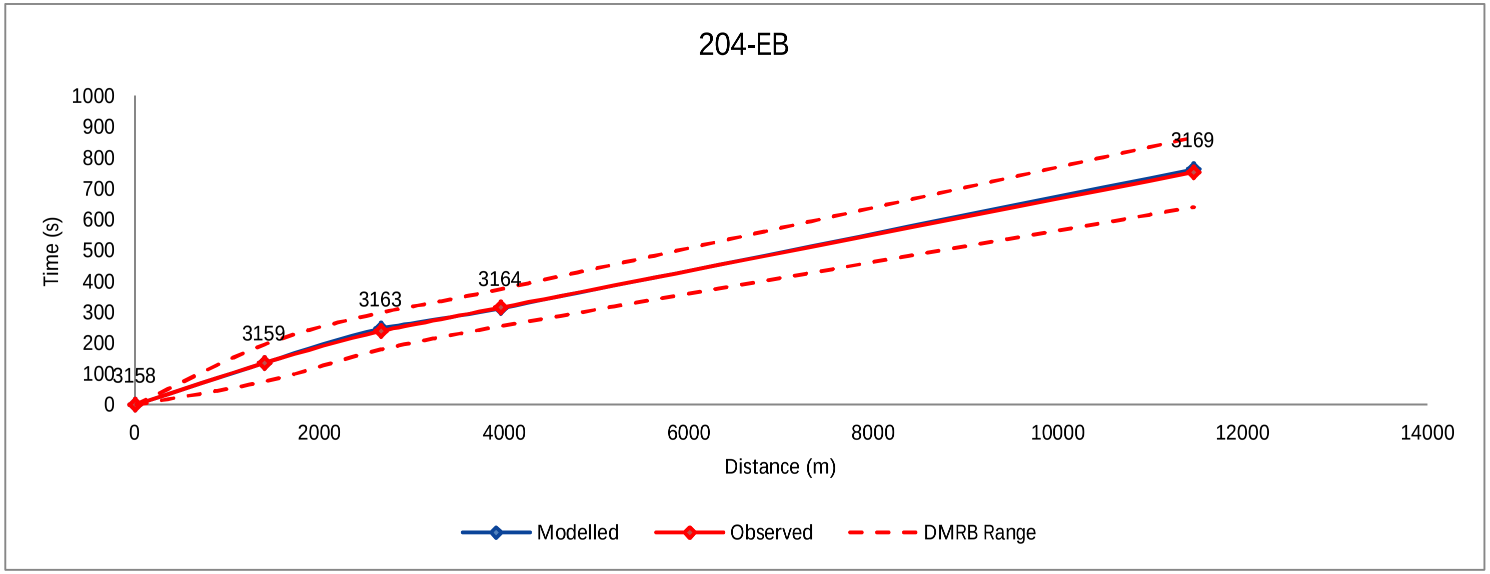

201-SB
Time (s)
1400
1200
1000
800
600
400
200
0
3197
5431
3177
3154
5771
3157
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range

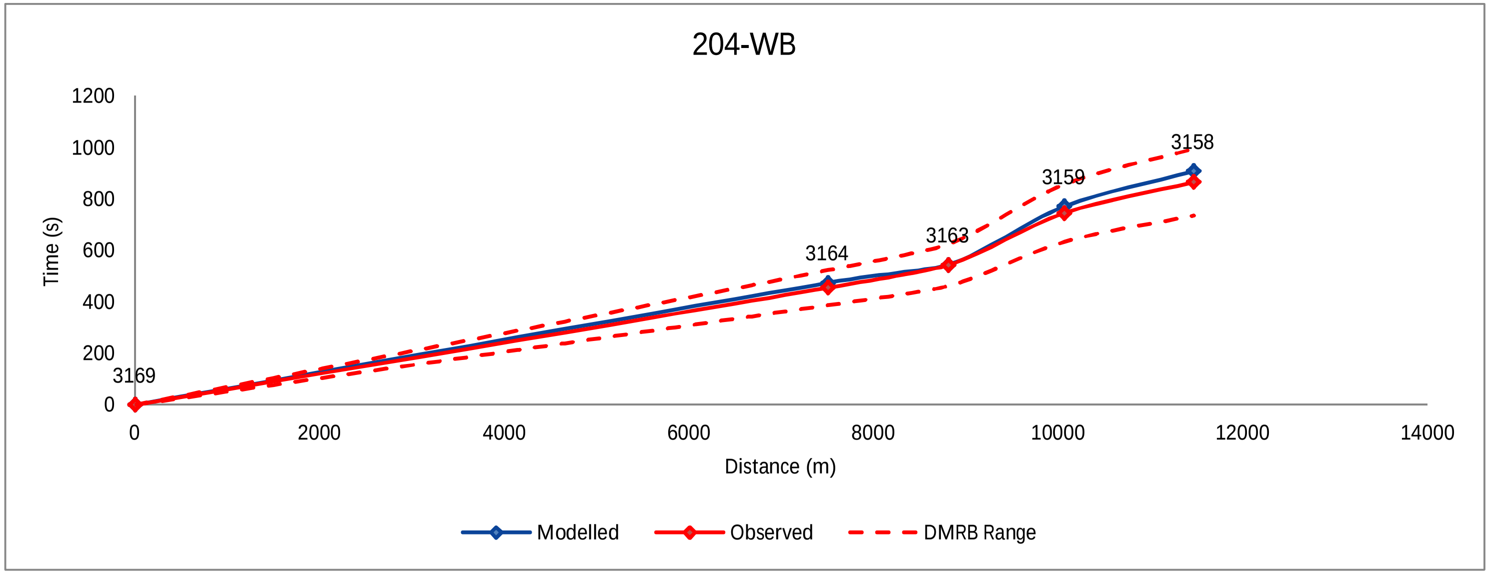

202-EB
Time (s)
800
700
600
500
400
300
200
100
0
3152
3154
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

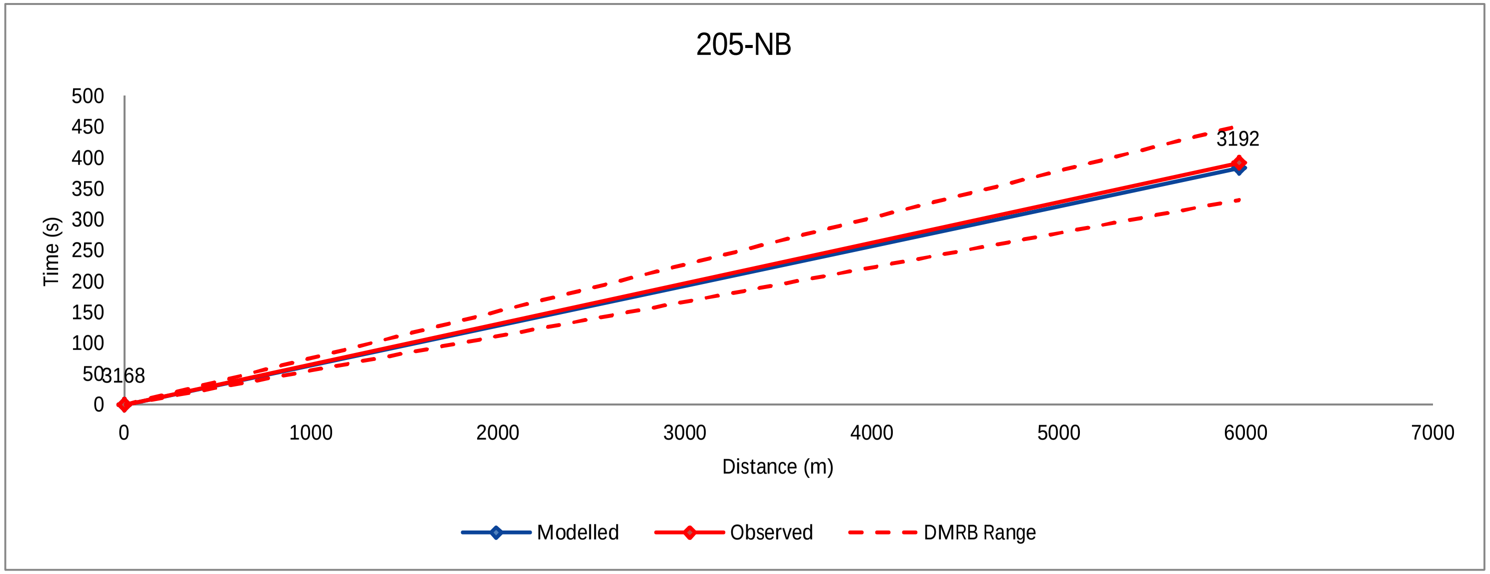

202-WB
Time (s)
800
700
600
500
400
300
200
100
0
3154
3152
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range

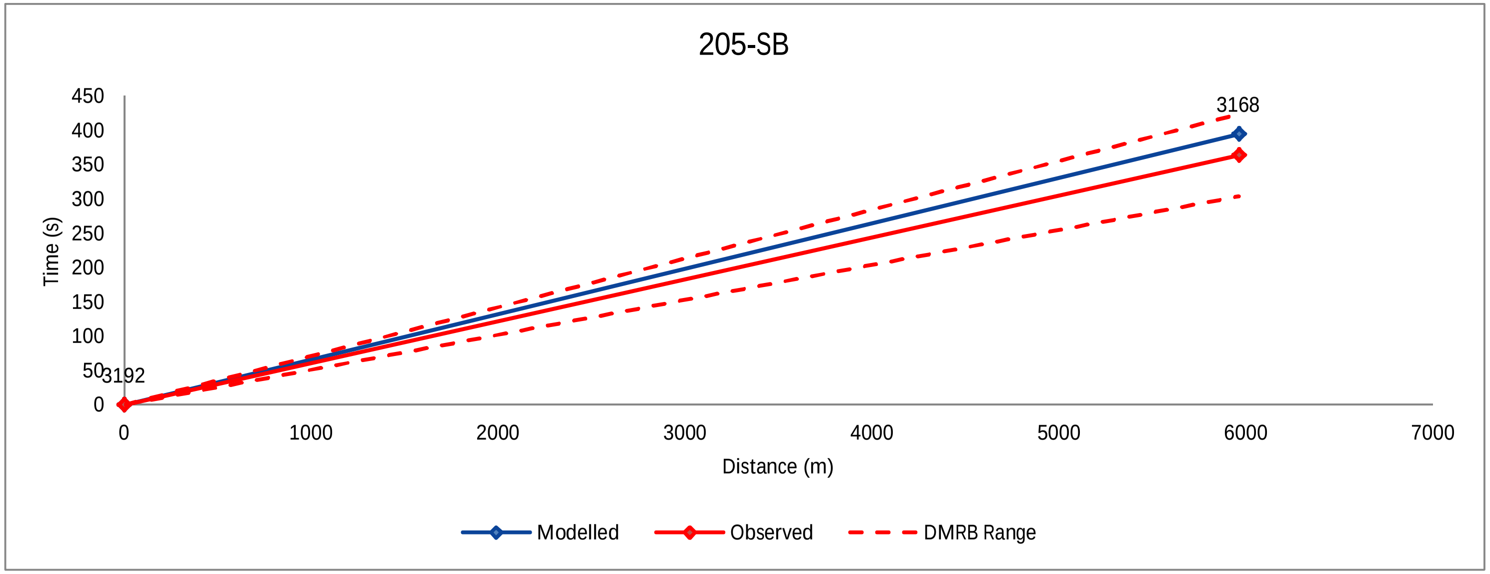

203-EB
Time (s)
400
350
300
250
200
150
100
50
0
-50
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
3177
3173
5485
5887
5945
Modelled
Observed
DMRB Range

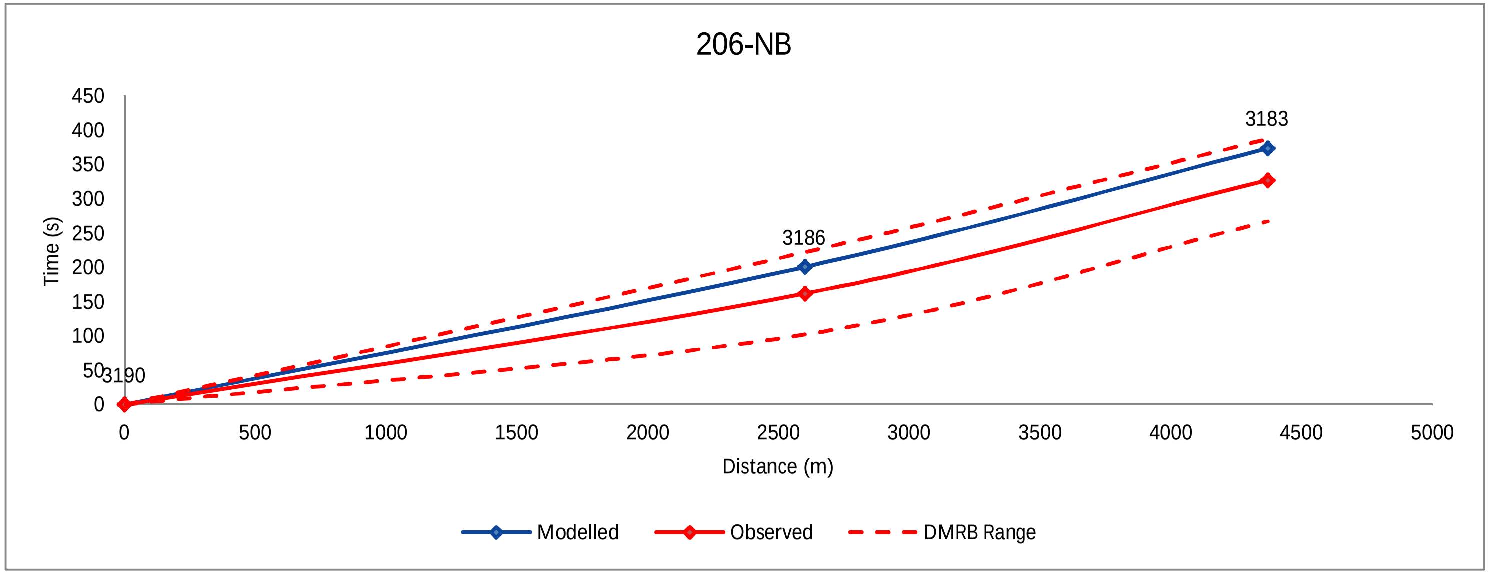

203-WB
Time (s)
400
350
300
250
200
150
100
50
0
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
5945
5887
5485
3173
3177
Modelled
Observed
DMRB Range

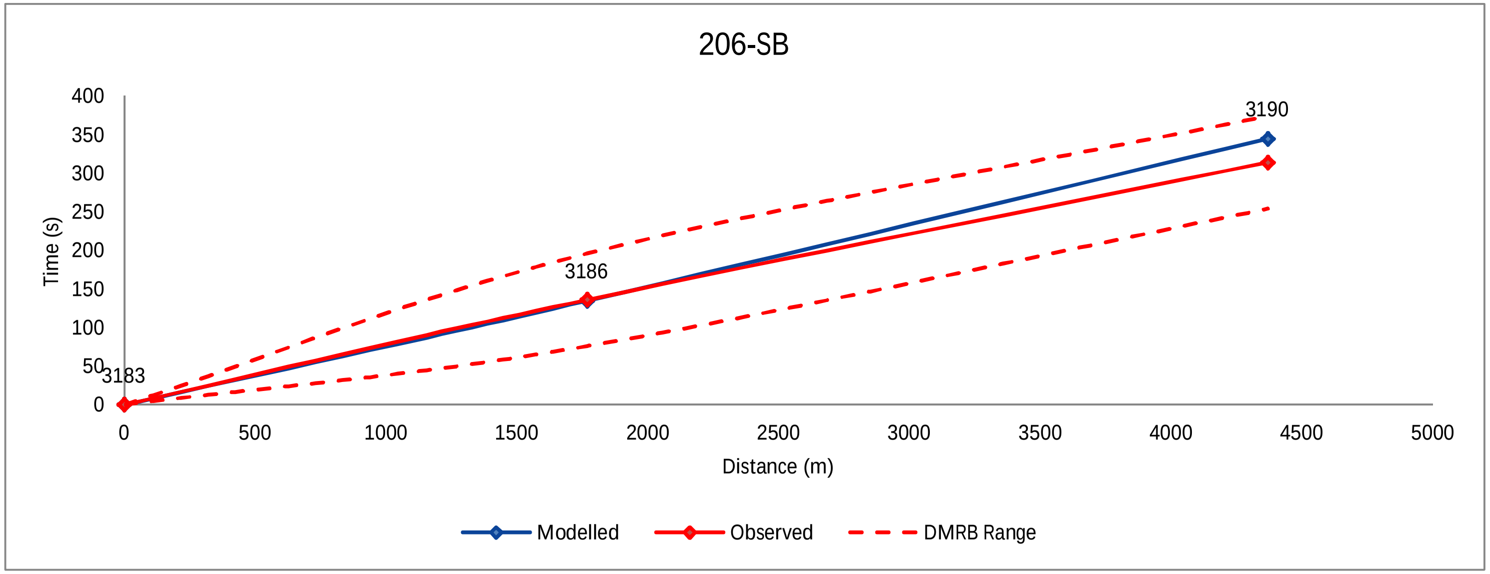

204-EB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3158
3159
3163
3164
3169
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range

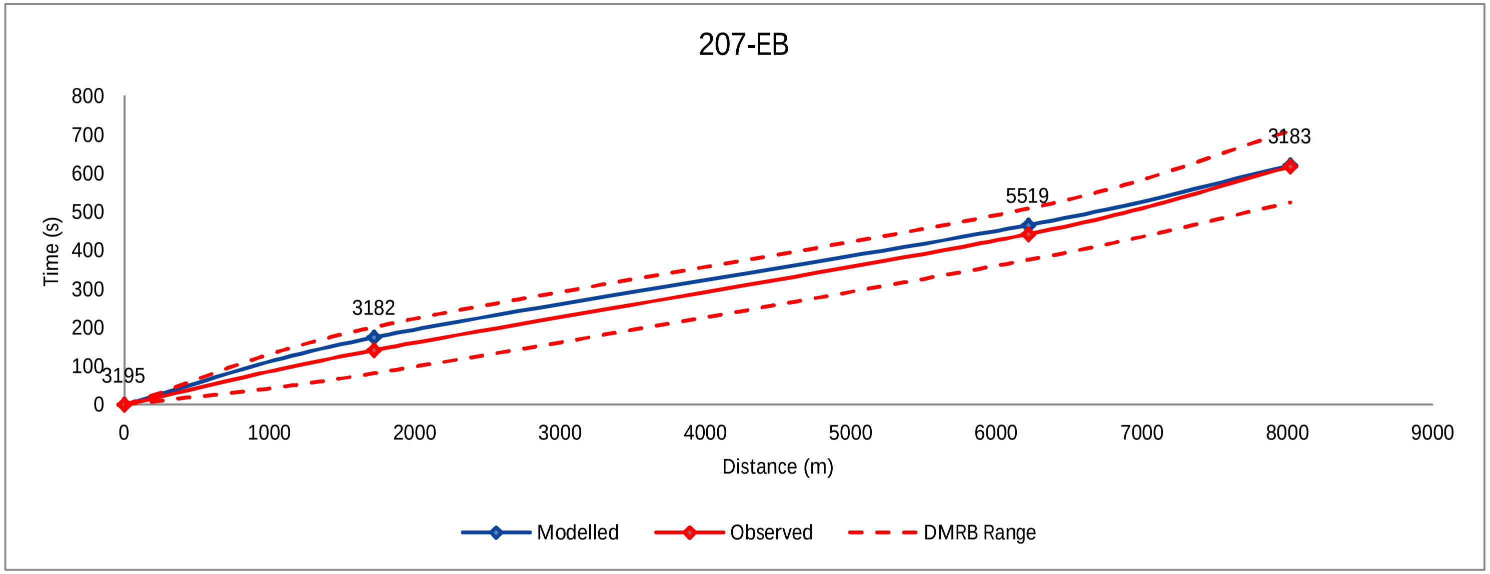

204-WB
Time (s)
1200
1000
800
600
400
200
0
3169
3164
3163
3159
3158
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range

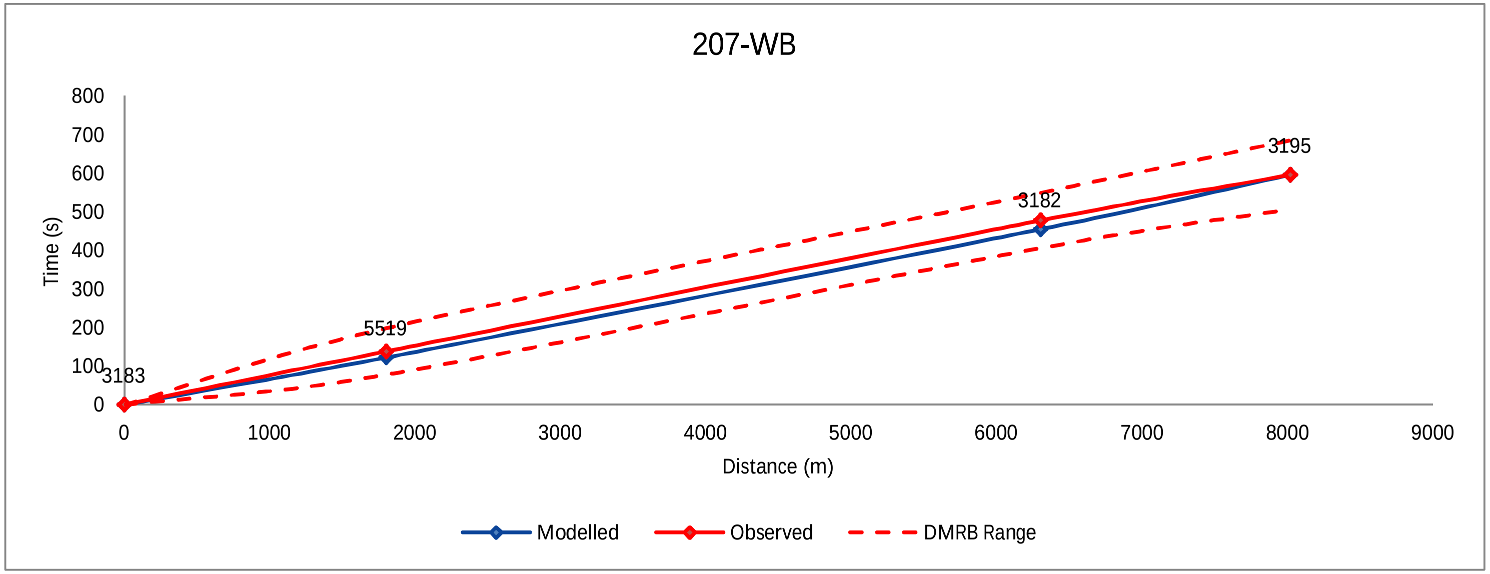

205-NB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
3168
3192
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range


205-SB
Time (s)
450
400
350
300
250
200
150
100
50
0
3192
3168
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range


206-NB
Time (s)
450
400
350
300
250
200
150
100
50
0
3190
3186
3183
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range


206-SB
Time (s)
400
350
300
250
200
150
100
50
0
3183
3186
3190
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range

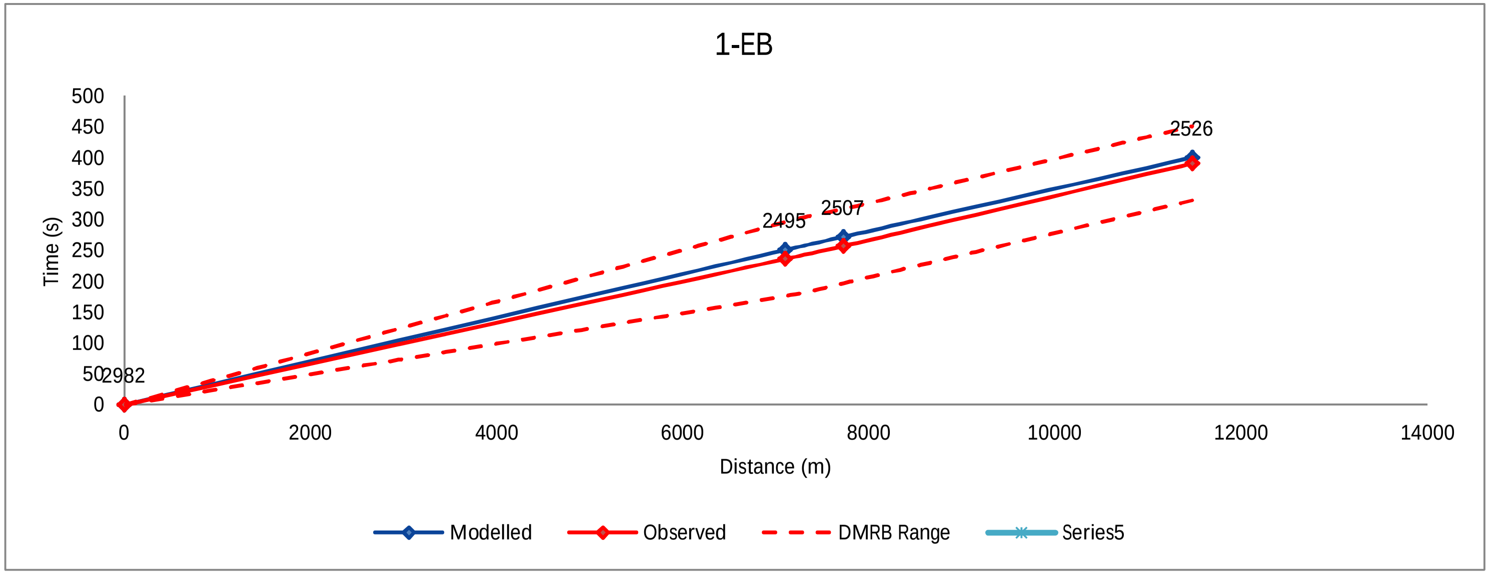

207-EB
Time (s)
800
700
600
500
400
300
200
100
0
3195
3182
5519
3183
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range

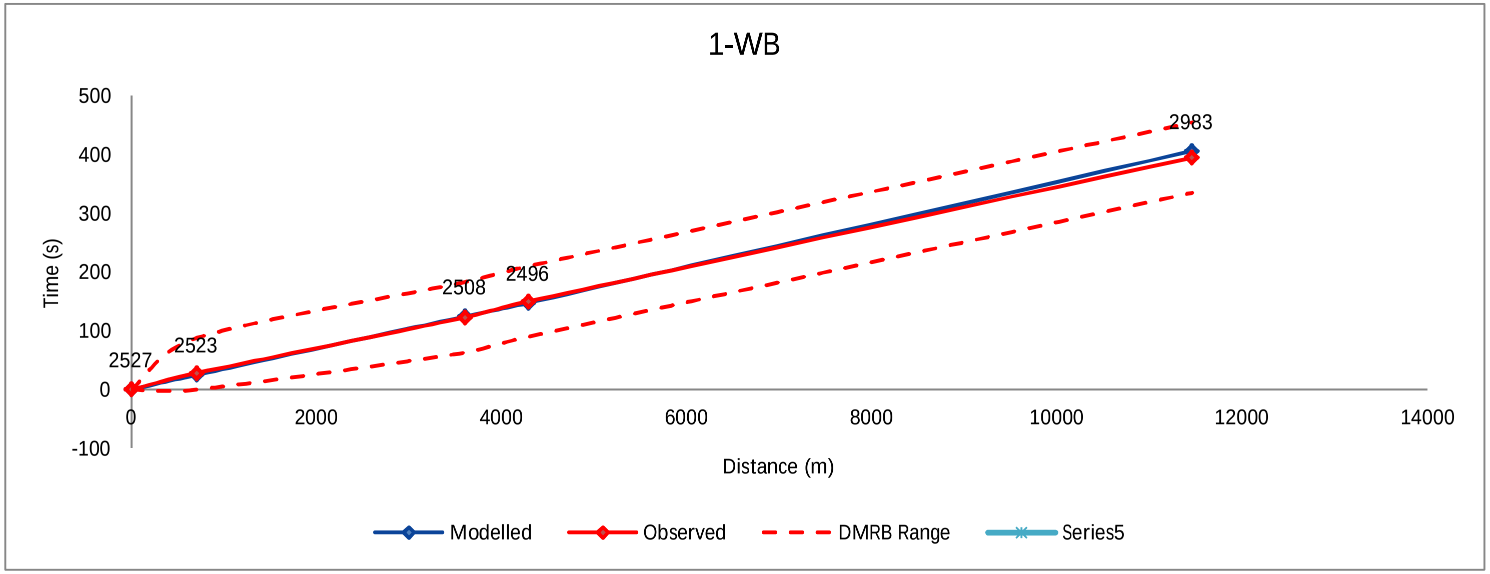

207-WB
Time (s)
800
700
600
500
400
300
200
100
0
3183
5519
3182
3195
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range

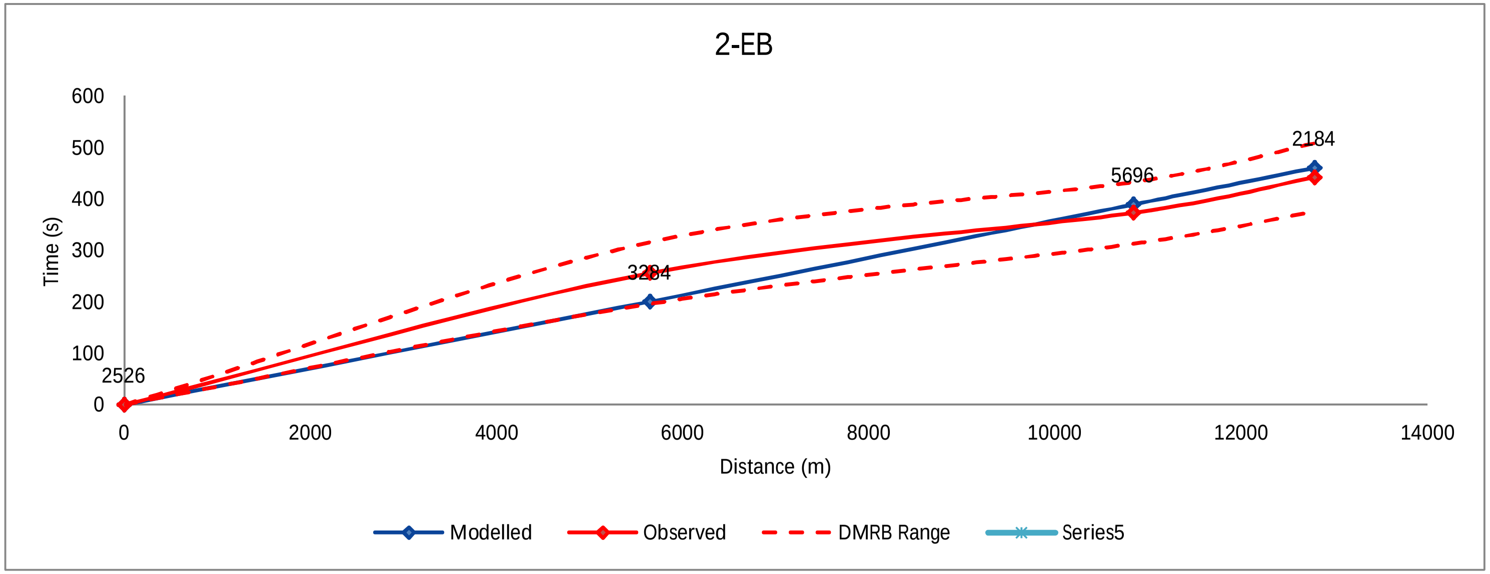
Appendix D.4

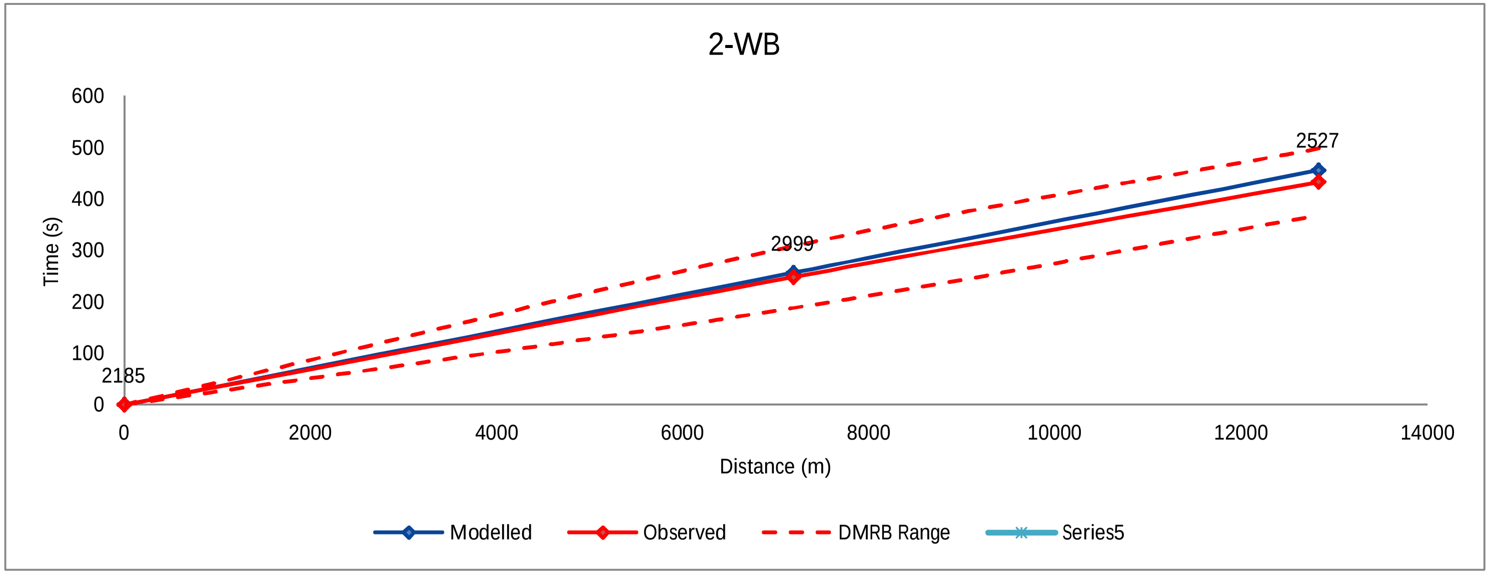
JOURNEY TIME ROUTE GRAPHS

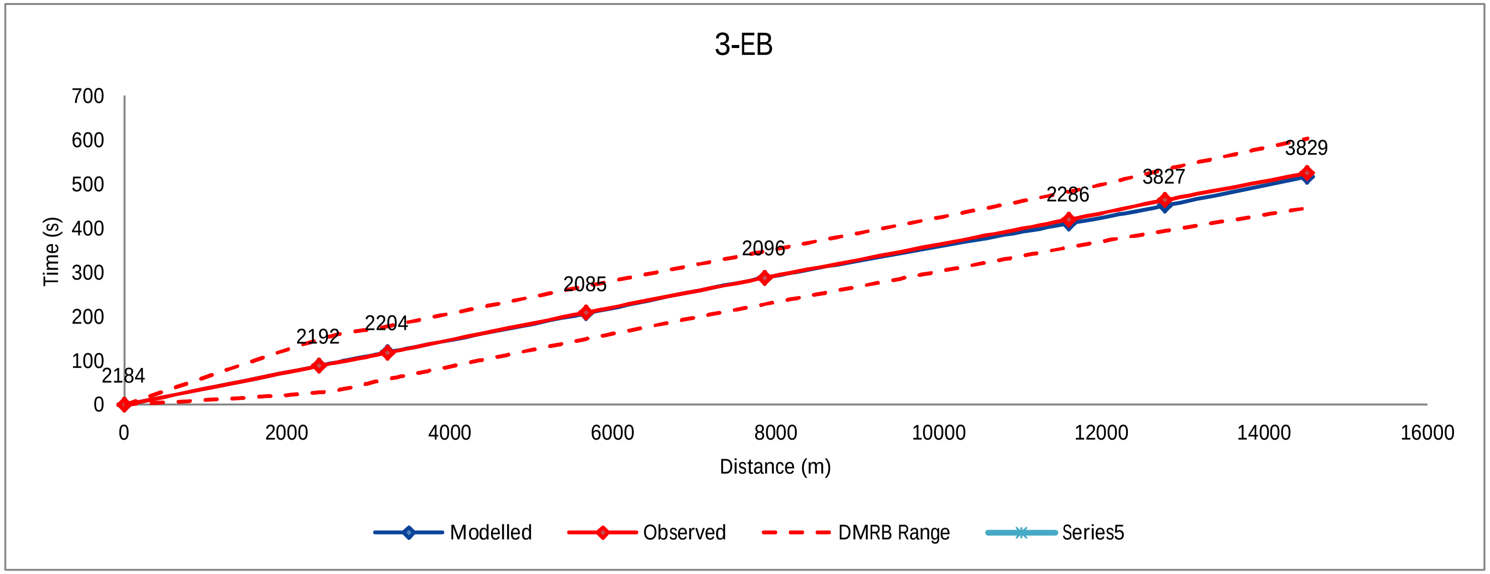
INTER PEAK

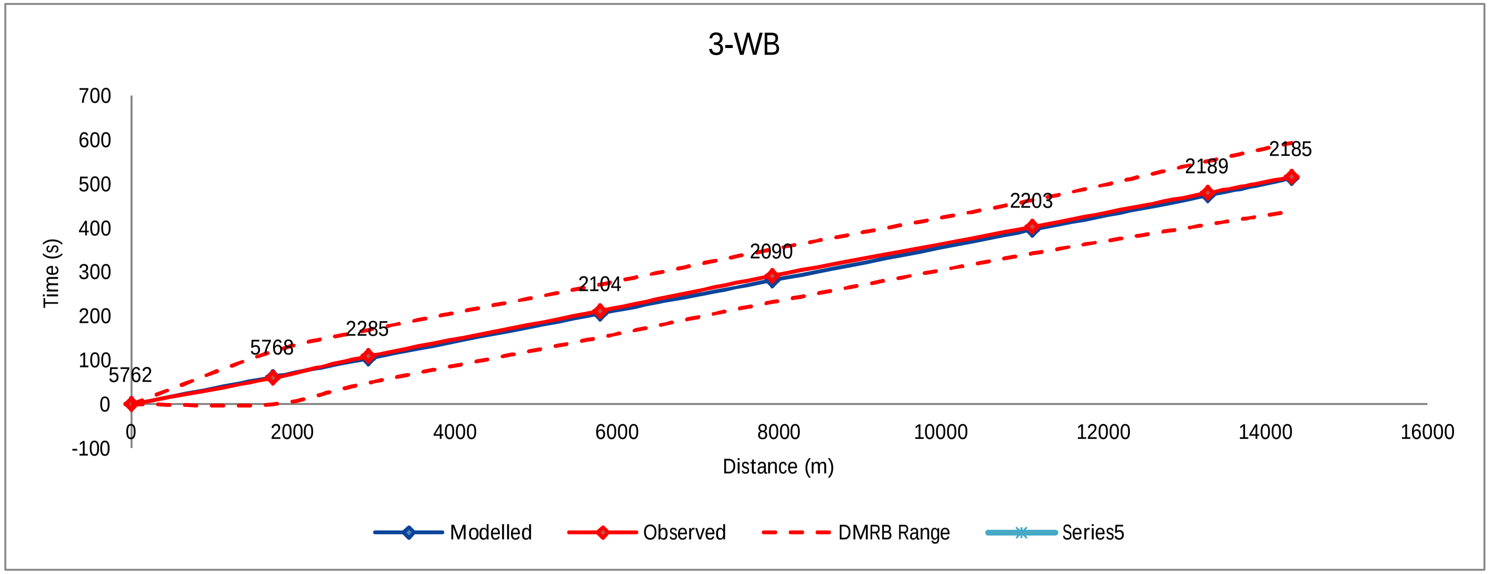

1-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
2982
2495
2507
2526
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

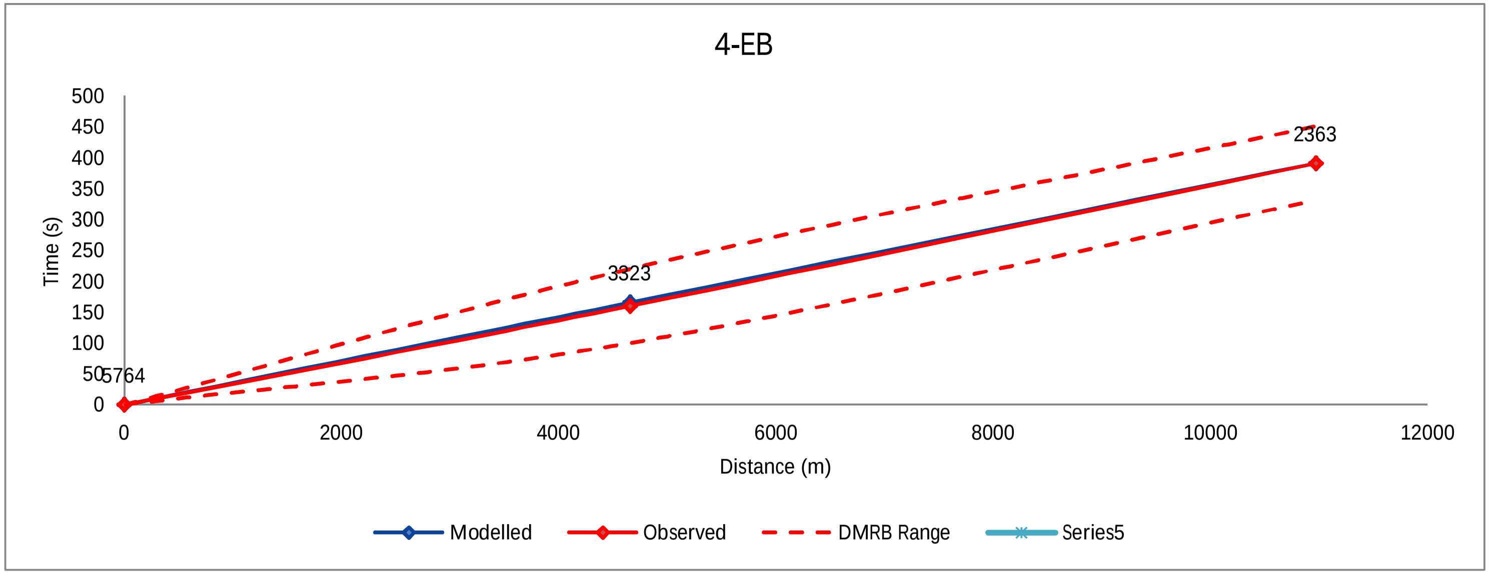

1-WB
Time (s)
500
400
300
200
100
0
-100
2527
2523
2508
2496
2983
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

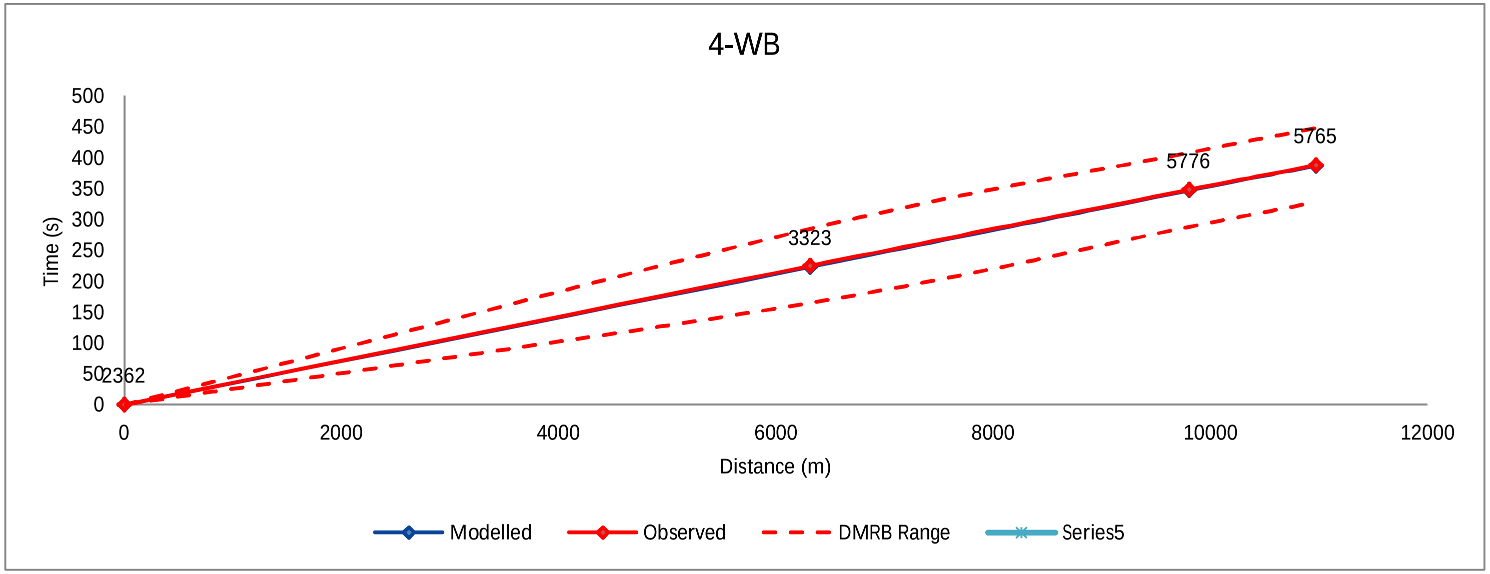

2-EB
Time (s)
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
2526
3284
5696
2184
Modelled
Observed
DMRB Range
Series5

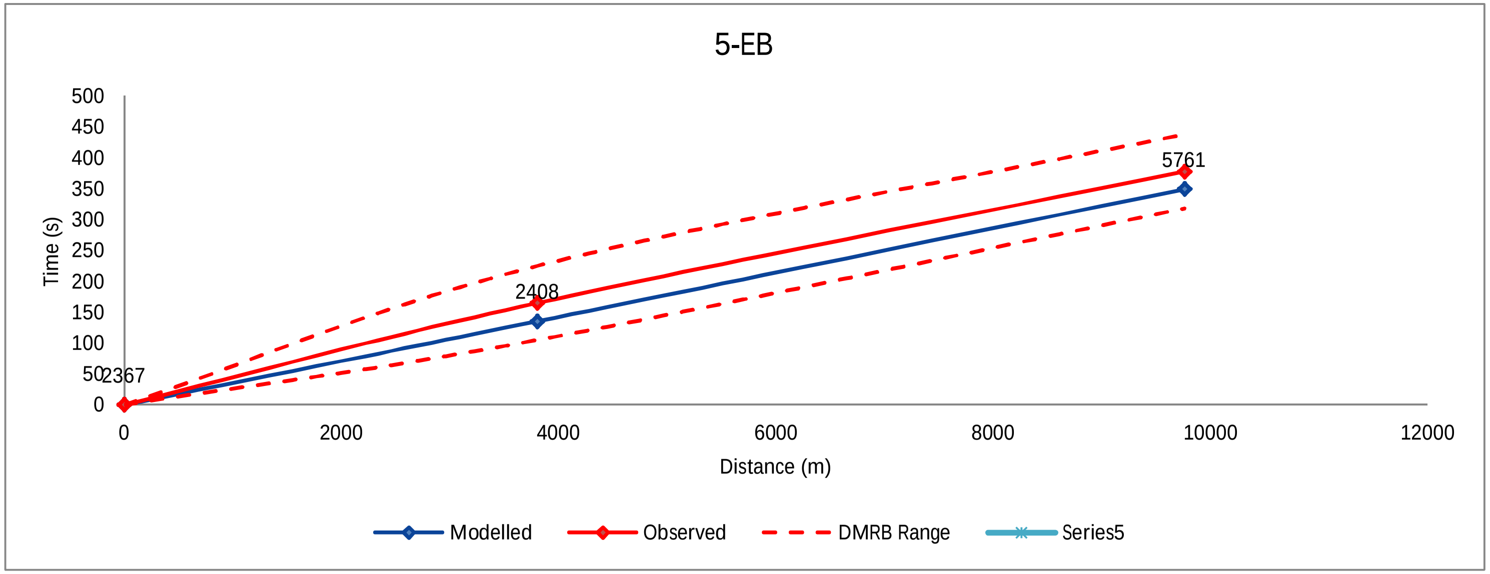

2-WB
Time (s)
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
2185
2999
2527
Modelled
Observed
DMRB Range
Series5

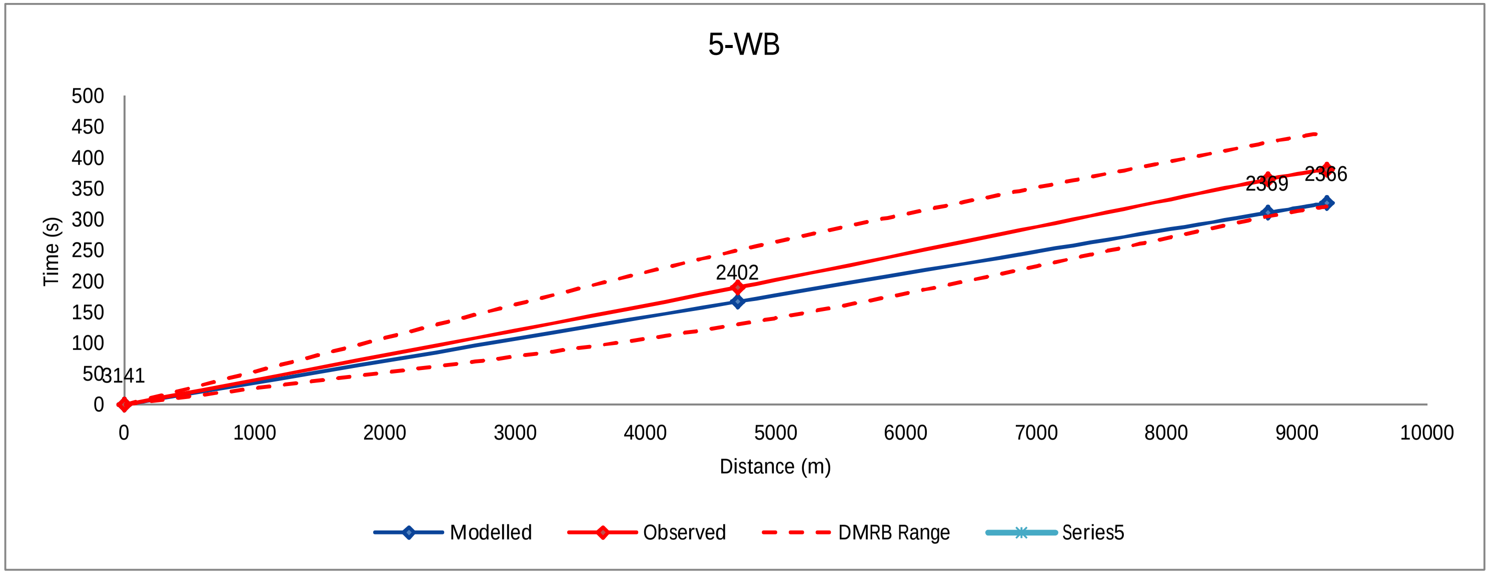

3-EB
Time (s)
700
600
500
400
300
200
100
0
2184
2192
2204
2085
2096
2286
3827
3829
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

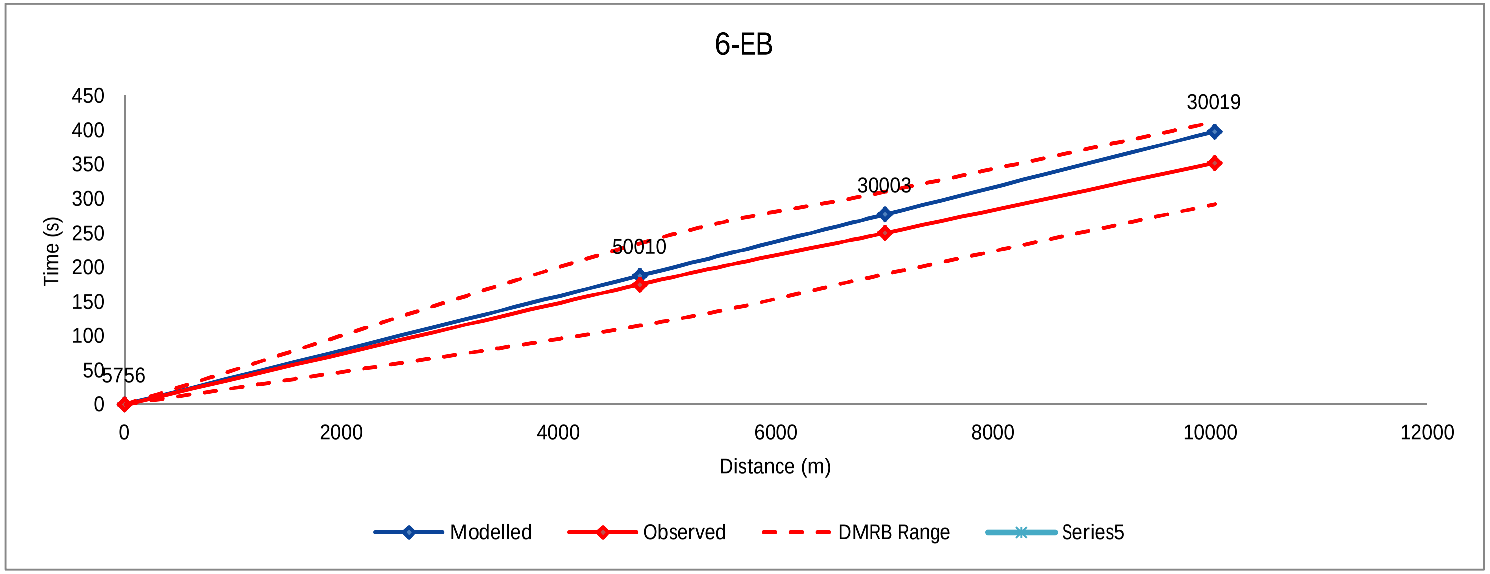

3-WB
Time (s)
700
600
500
400
300
200
100
0
-100
5762
5768
2285
2104
2090
2203
2189
2185
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

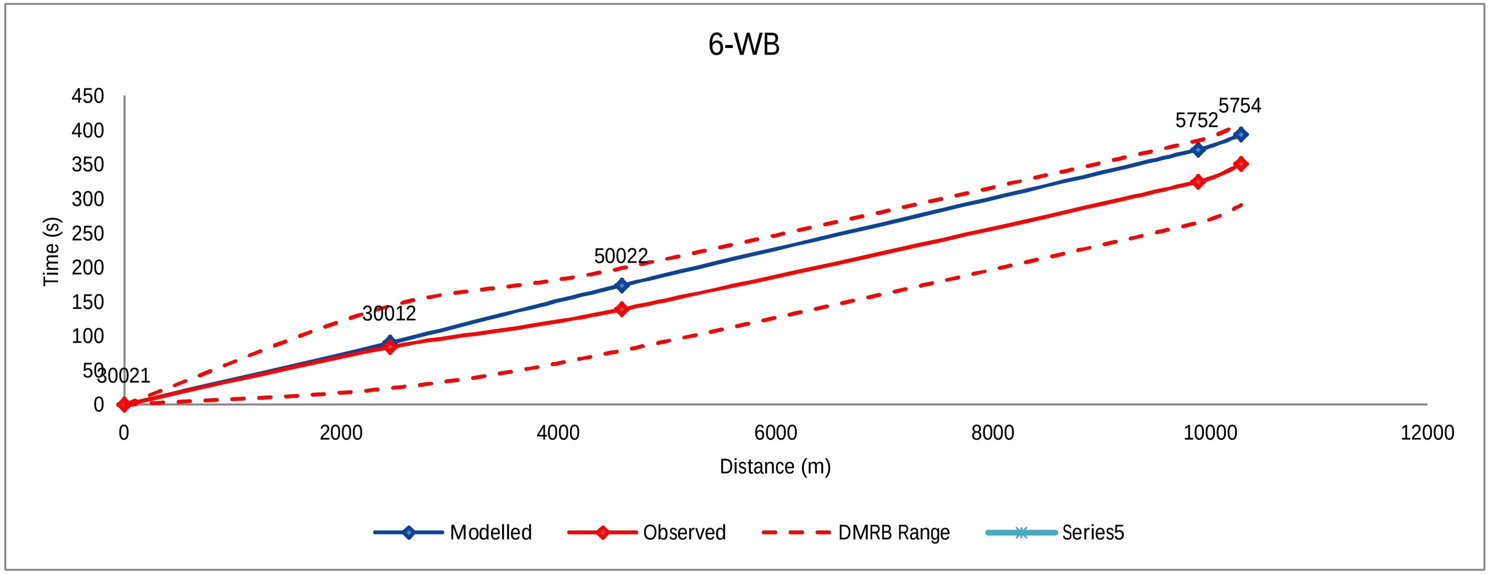

4-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
5764
3323
2363
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

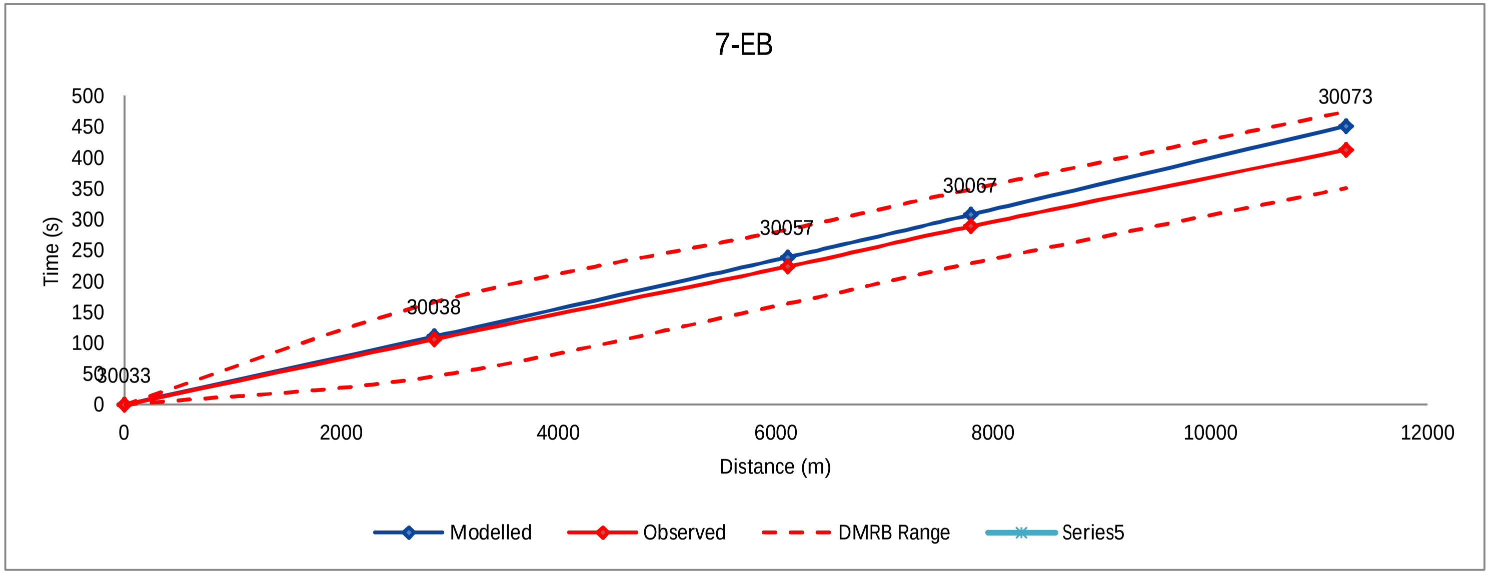

4-WB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
2362
3323
5776
5765
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

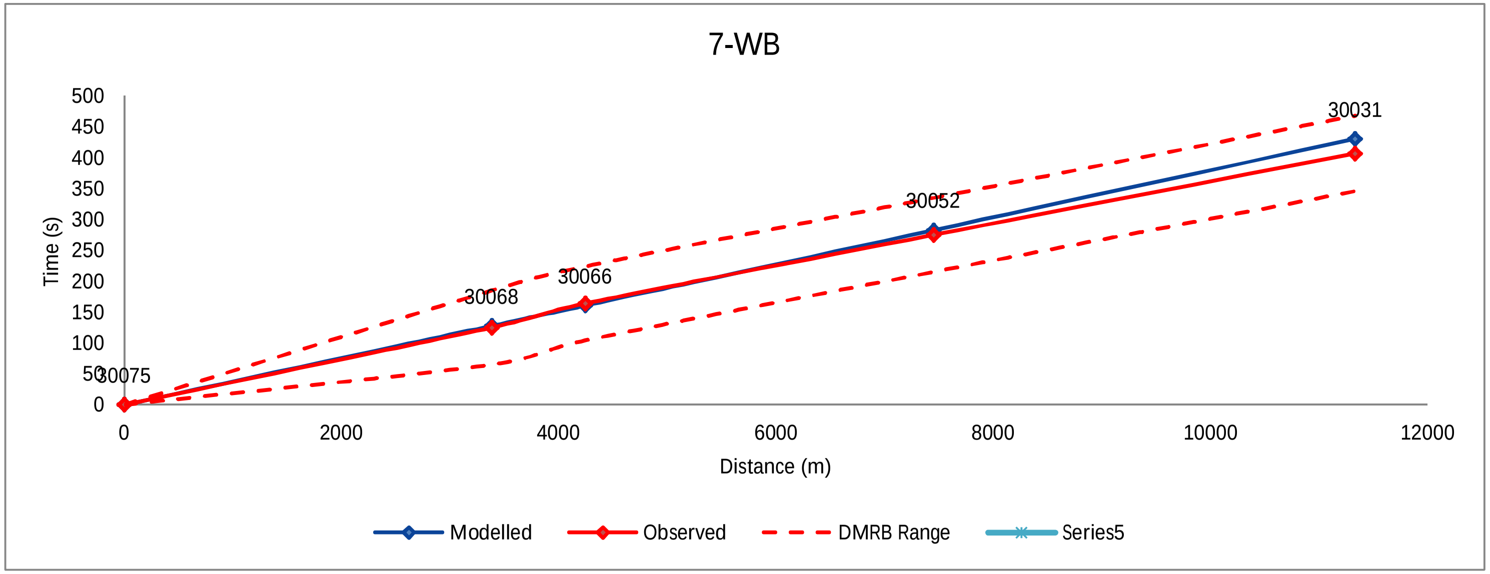

5-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
2367
2408
5761
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

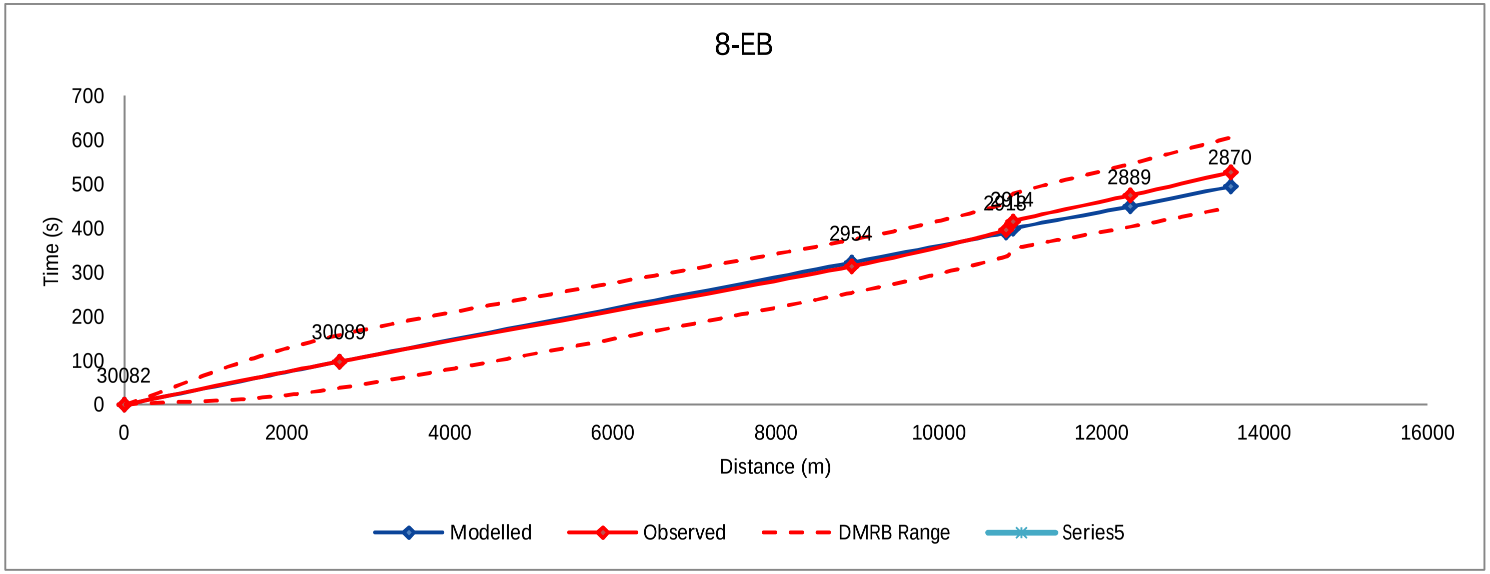

5-WB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
3141
2402
2369
2366
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5


6-EB
Time (s)
450
400
350
300
250
200
150
100
50
0
5756
50010
30003
30019
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

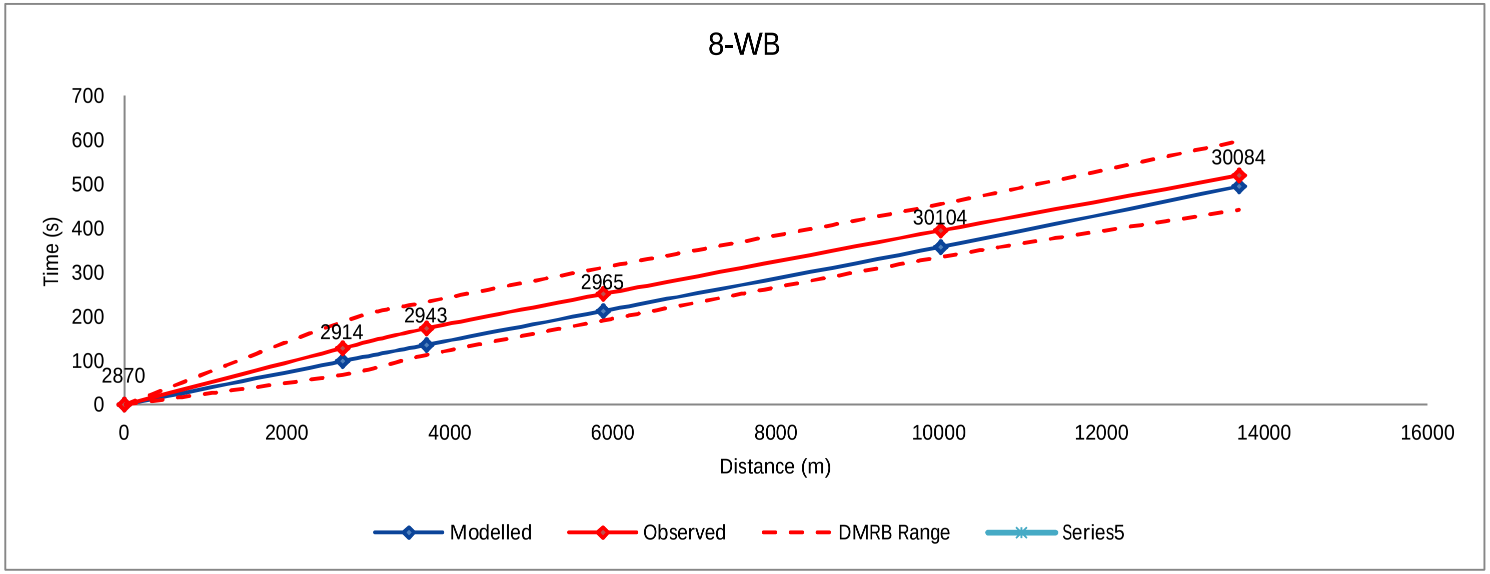

6-WB
Time (s)
450
400
350
300
250
200
150
100
50
0
30021
30012
50022
5752
5754
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5


7-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
30033
30038
30057
30067
30073
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

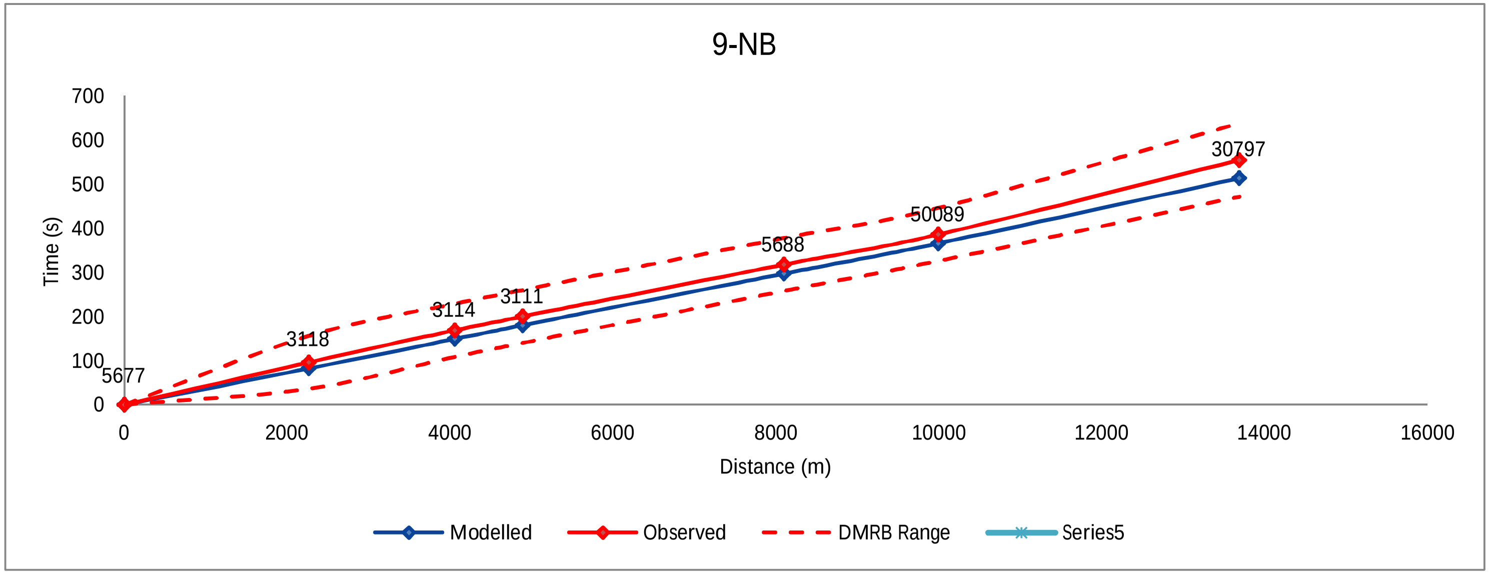

7-WB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
30075
30068
30066
30052
30031
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

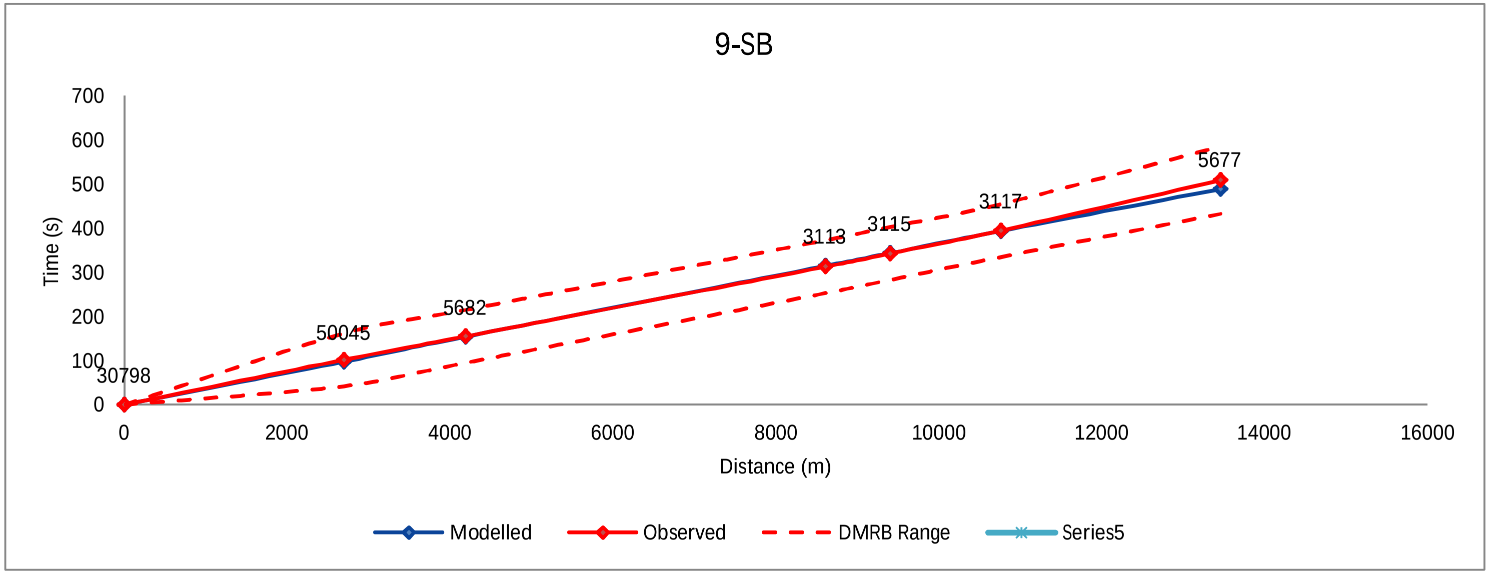


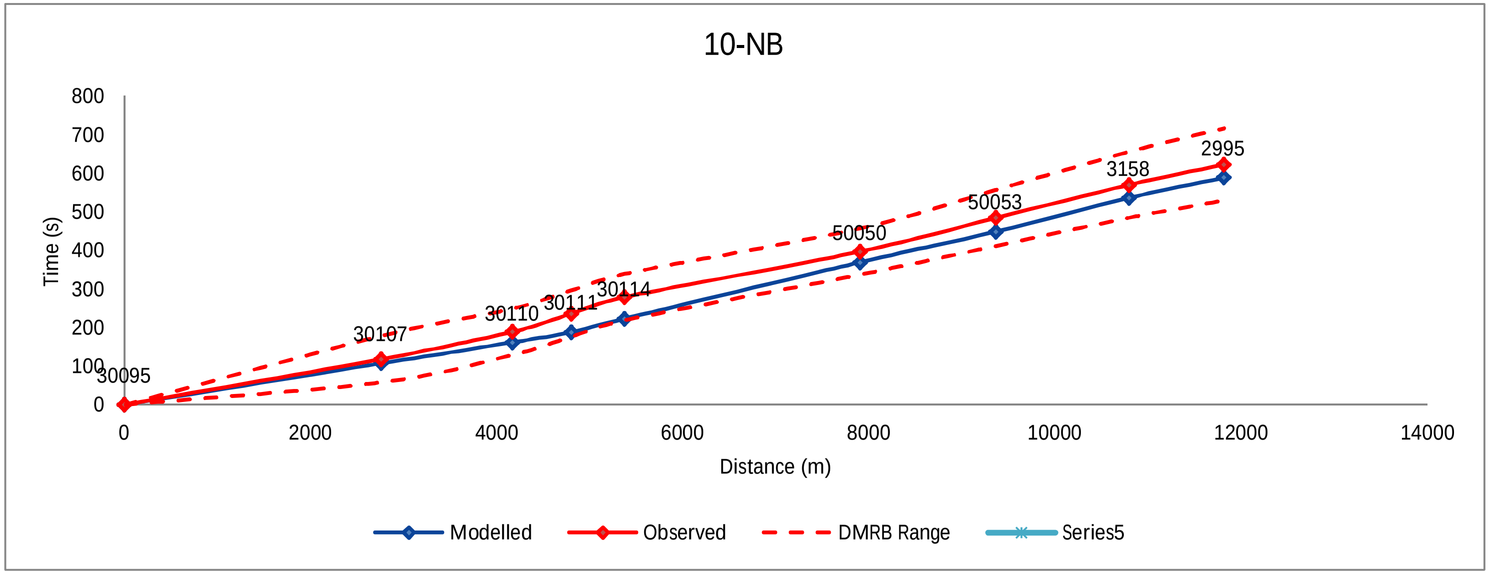
8-EB
Time (s)
700
600
500
400
300
200
100
0
30082
30089
2954
2889
2870
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

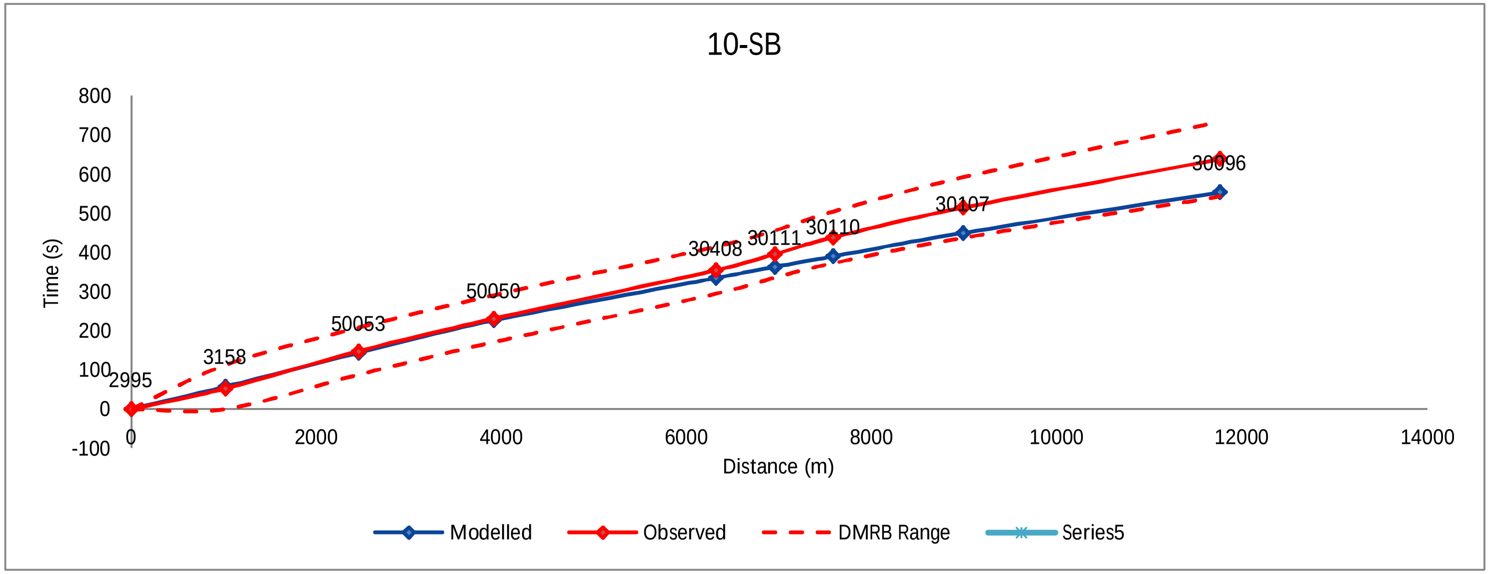


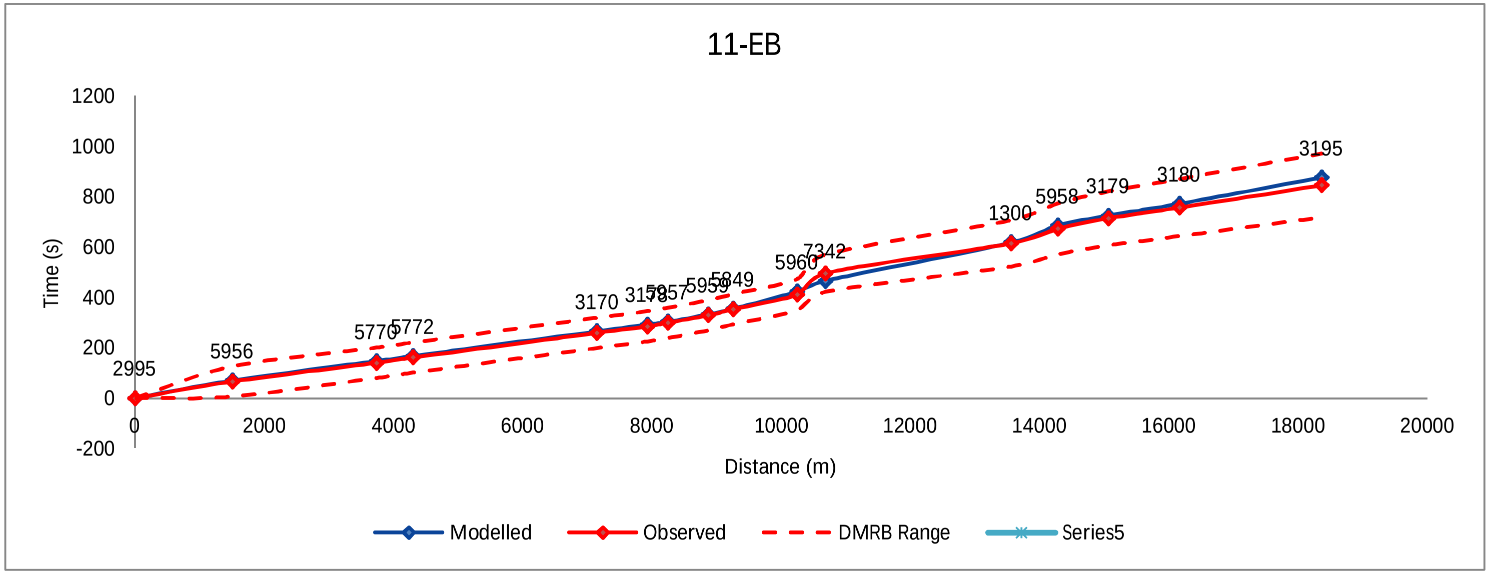
8-WB
Time (s)
700
600
500
400
300
200
100
0
2870
2914
2943
2965
30104
30084
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

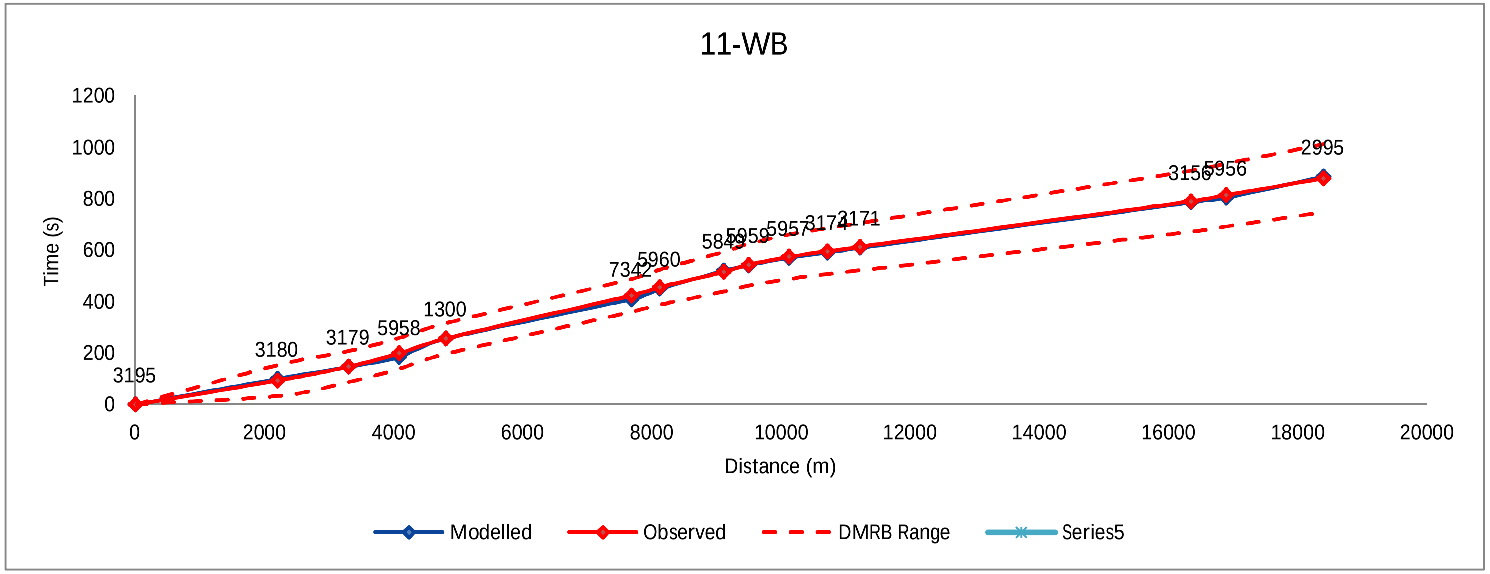

9-NB
Time (s)
700
600
500
400
300
200
100
0
5677
3118
3114
3111
5688
50089
30797
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

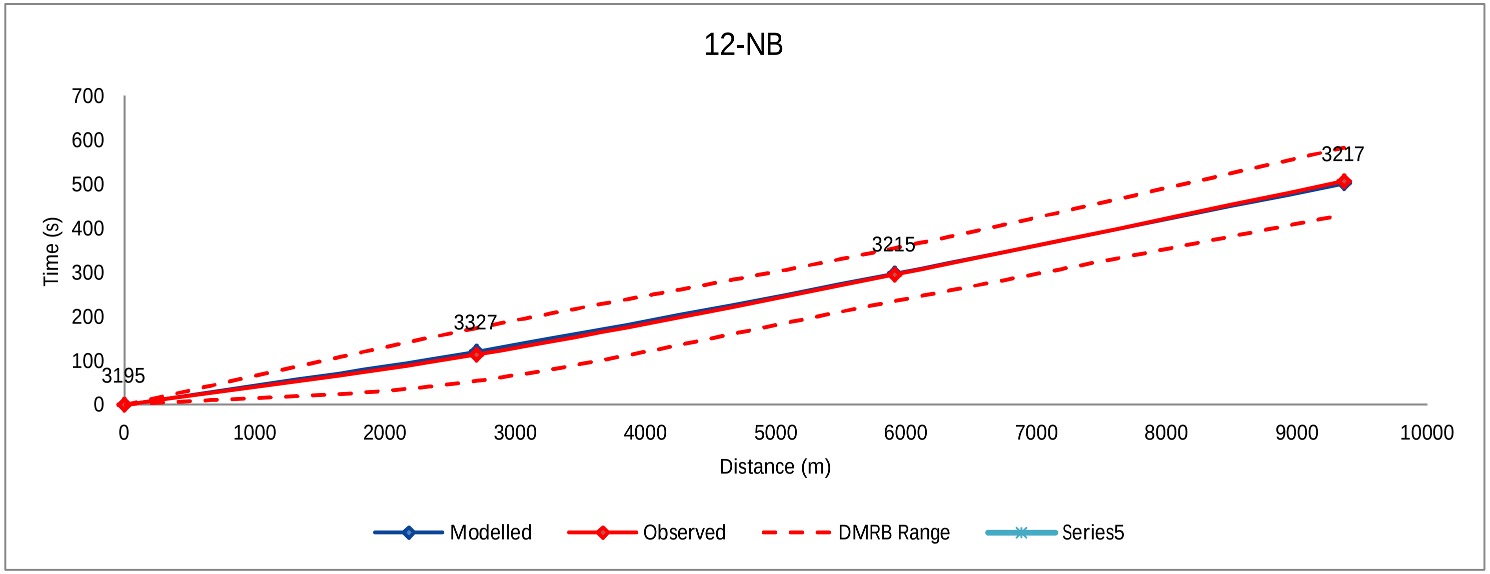

9-SB
Time (s)
700
600
500
400
300
200
100
0
30798
50045
5682
3113
3115
3117
5677
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

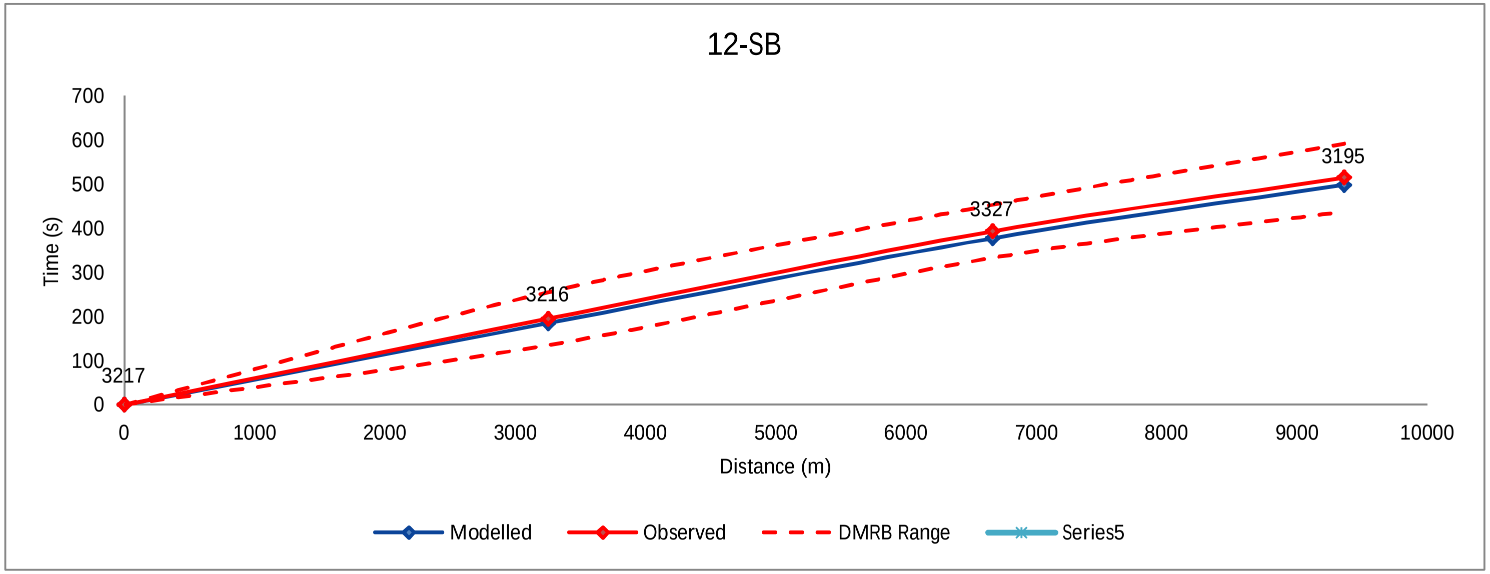

10-NB
Time (s)
800
700
600
500
400
300
200
100
0
30095
30107
30110
30111
30114
50050
50053
3158
2995
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

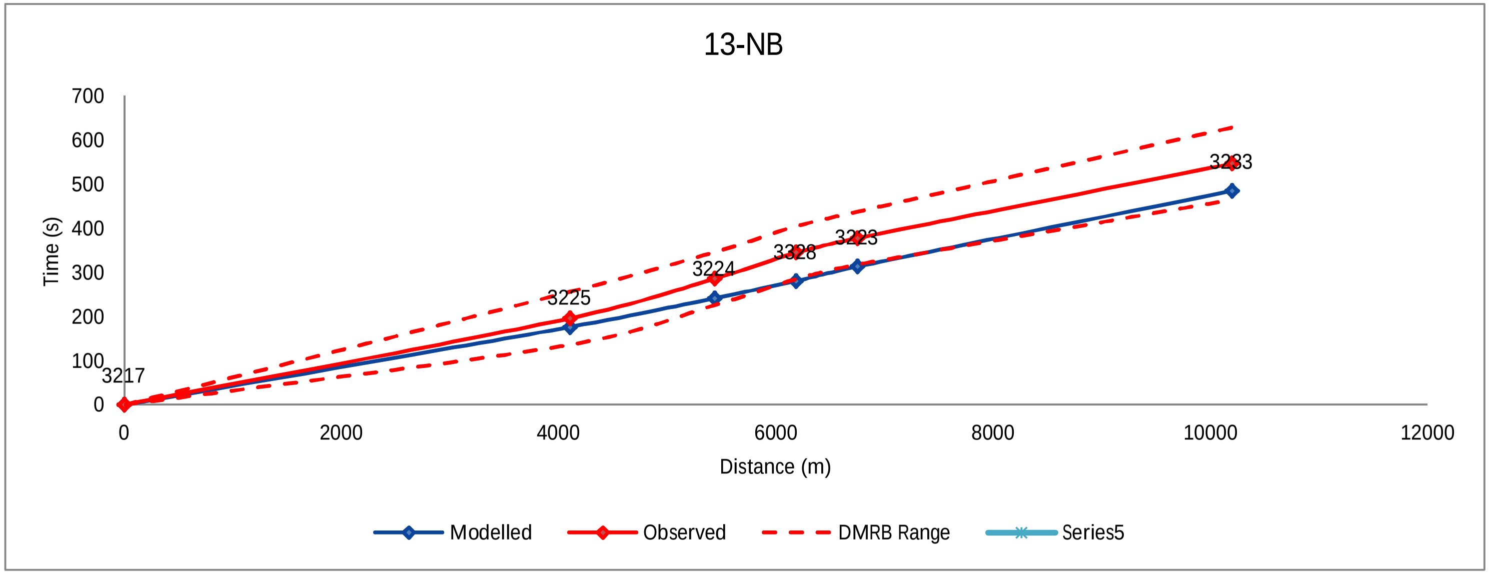

10-SB
Time (s)
800
700
600
500
400
300
200
100
0
-100
2995
3158
50053
50050
30408
30111
30110
30107
30096
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

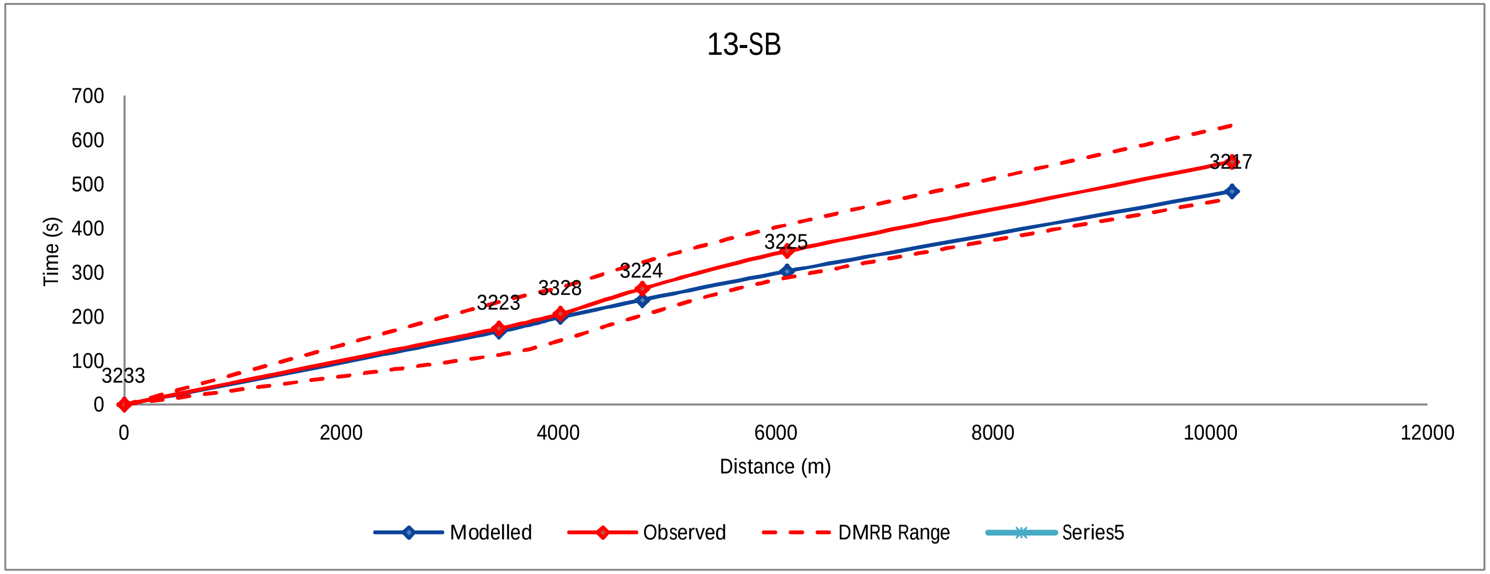

11-EB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5

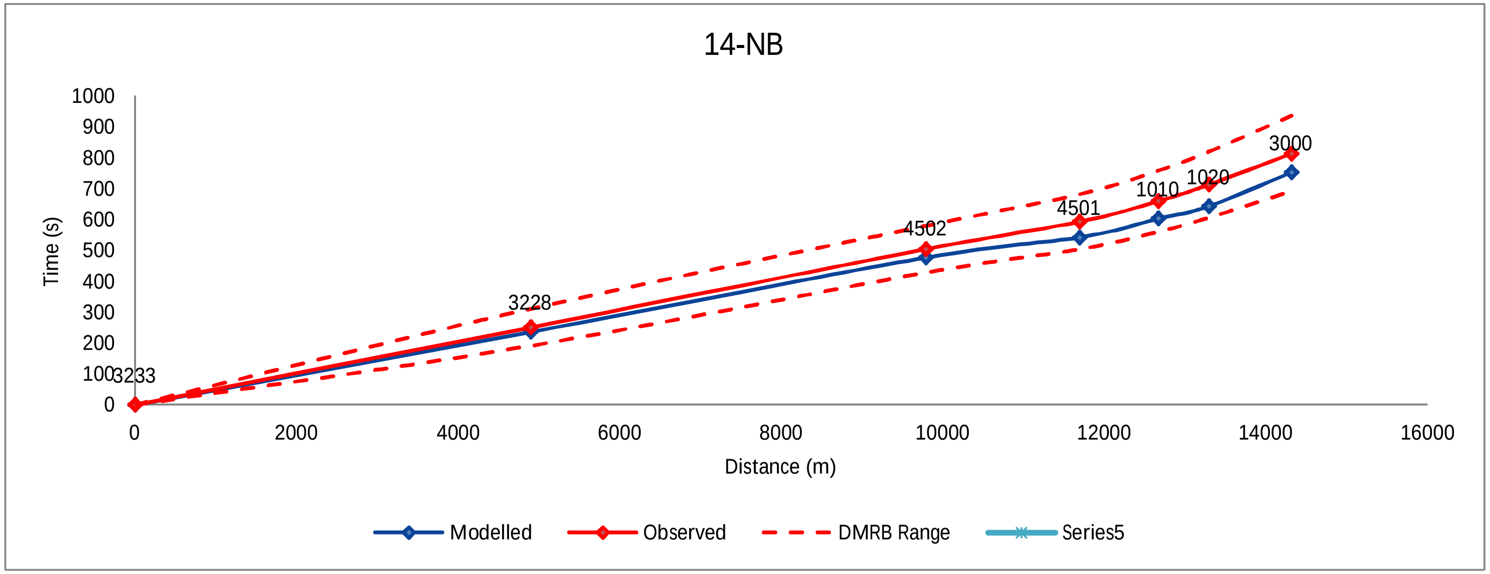

11-WB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5


12-NB
Time (s)
700
600
500
400
300
200
100
0
3195
3327
3215
3217
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5

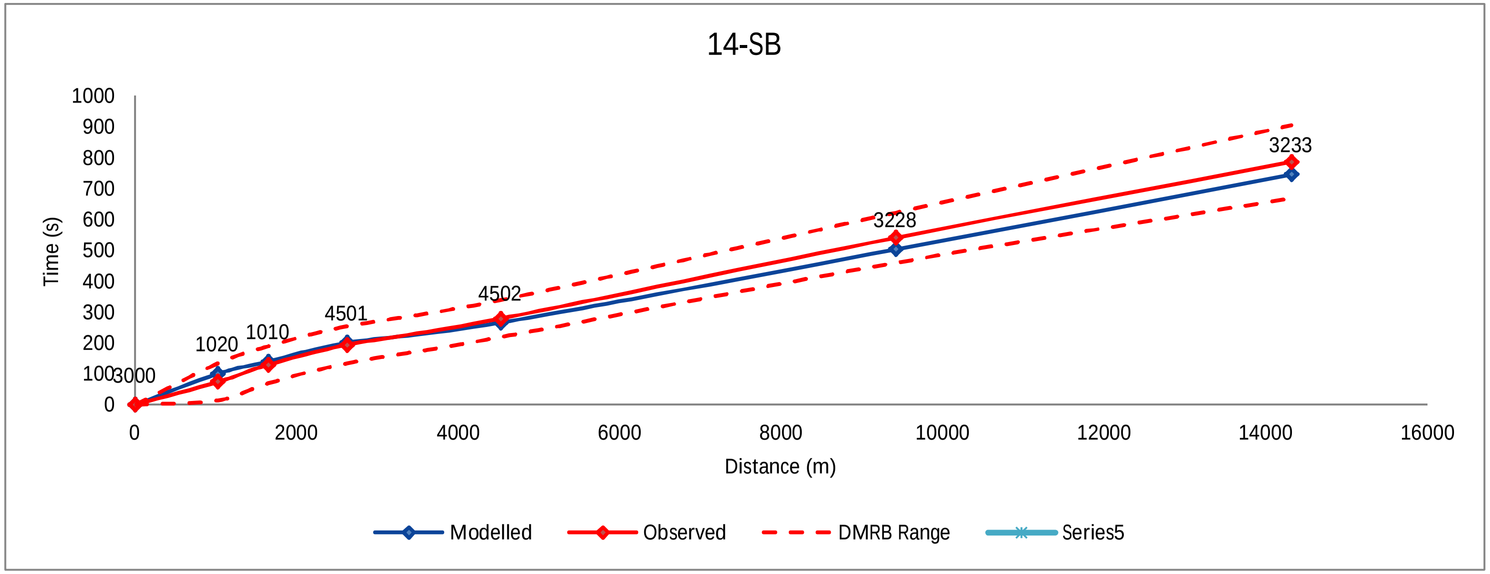

12-SB
Time (s)
700
600
500
400
300
200
100
0
3217
3216
3327
3195
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5


13-NB
Time (s)
700
600
500
400
300
200
100
0
3217
3225
3224
3328
3223
3233
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

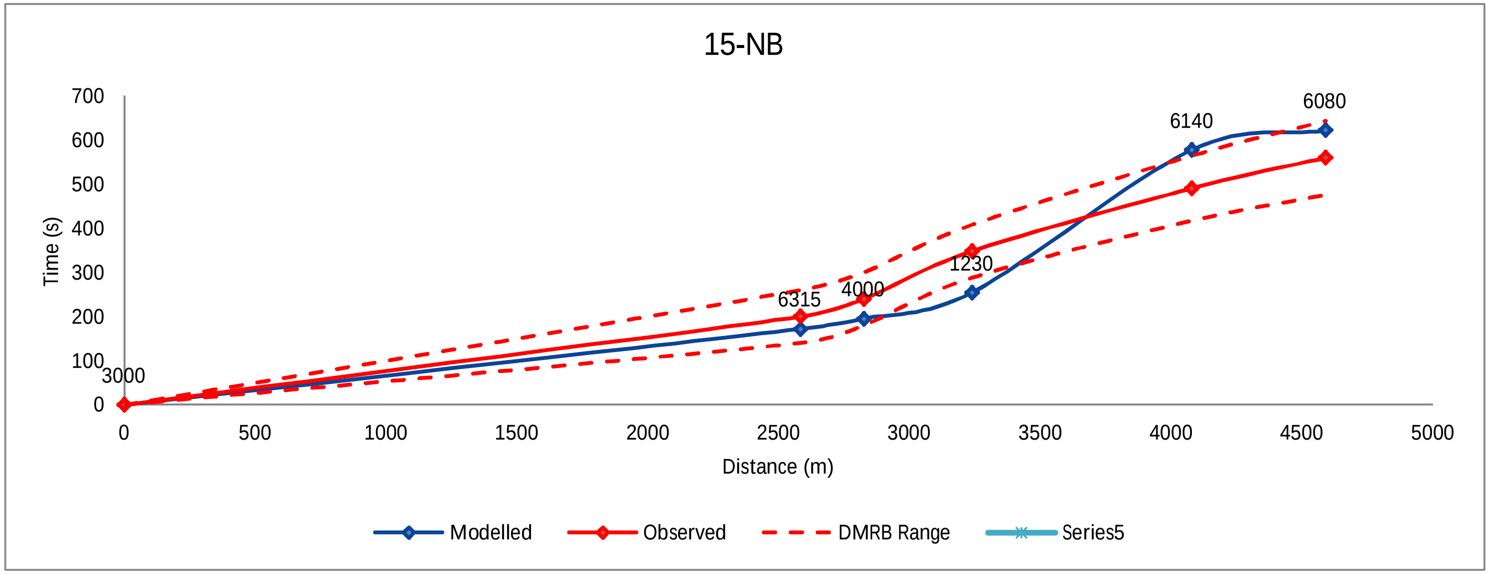

13-SB
Time (s)
700
600
500
400
300
200
100
0
3233
3223
3328
3224
3225
3217
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

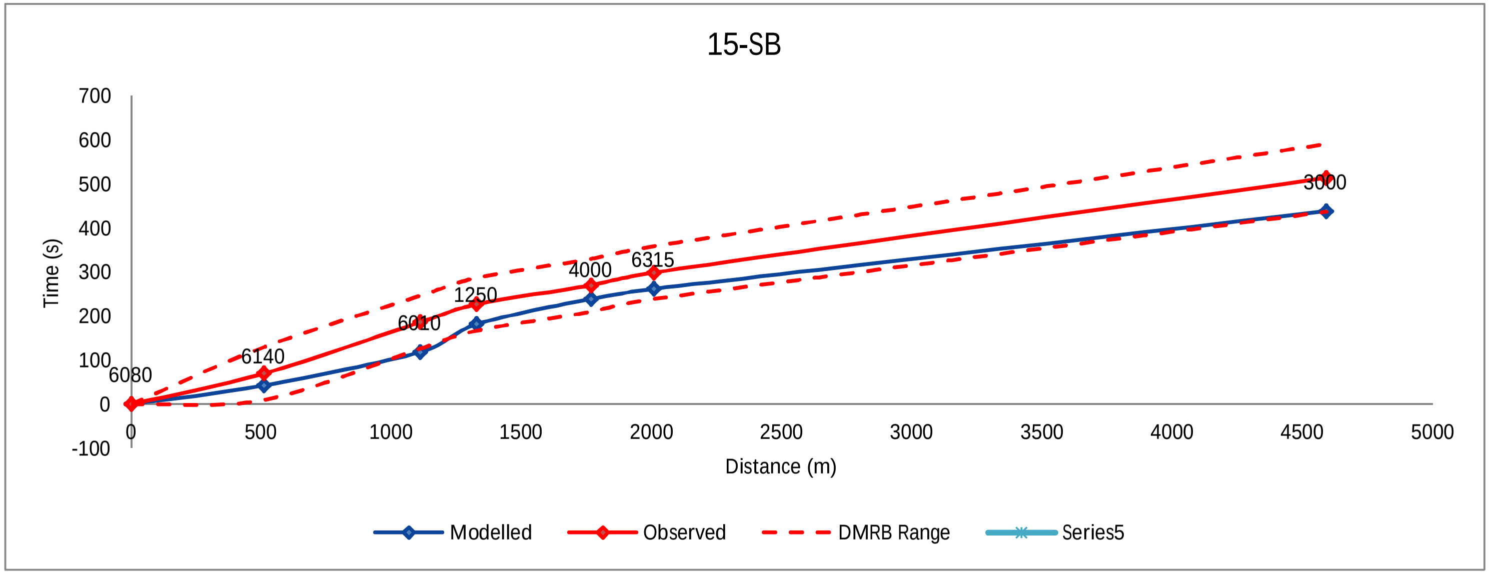


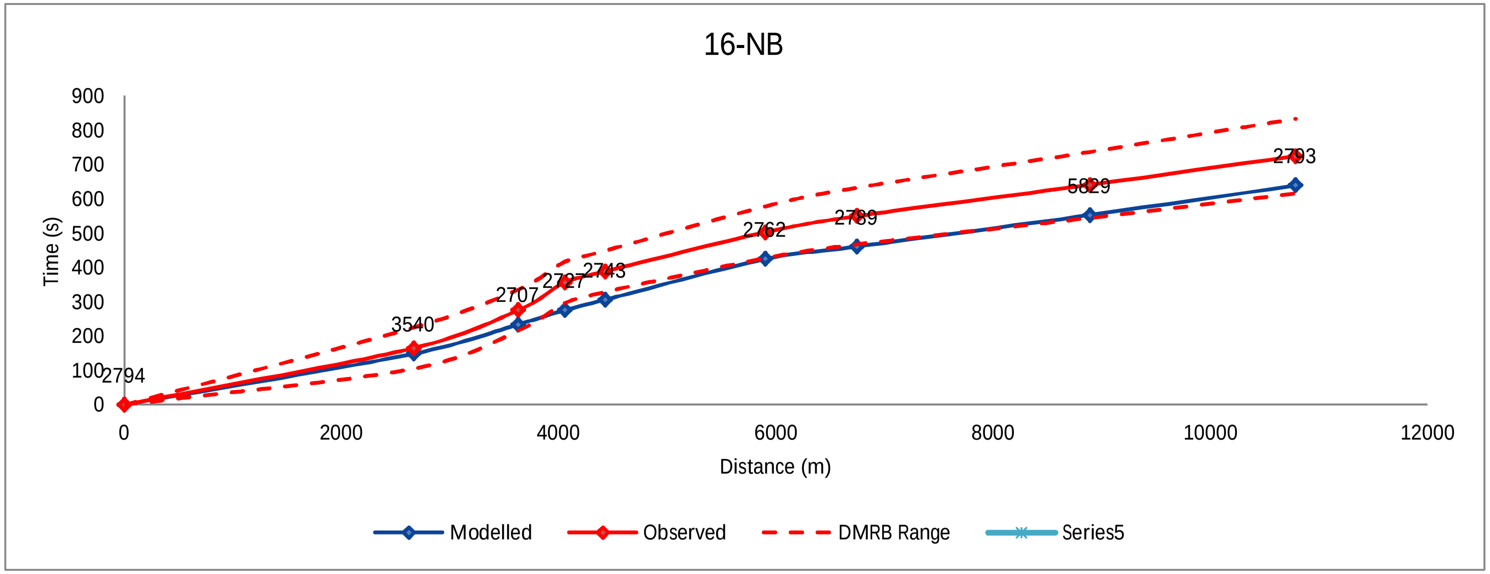
14-NB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3233
3228
4502
4501
1010
1020
3000
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

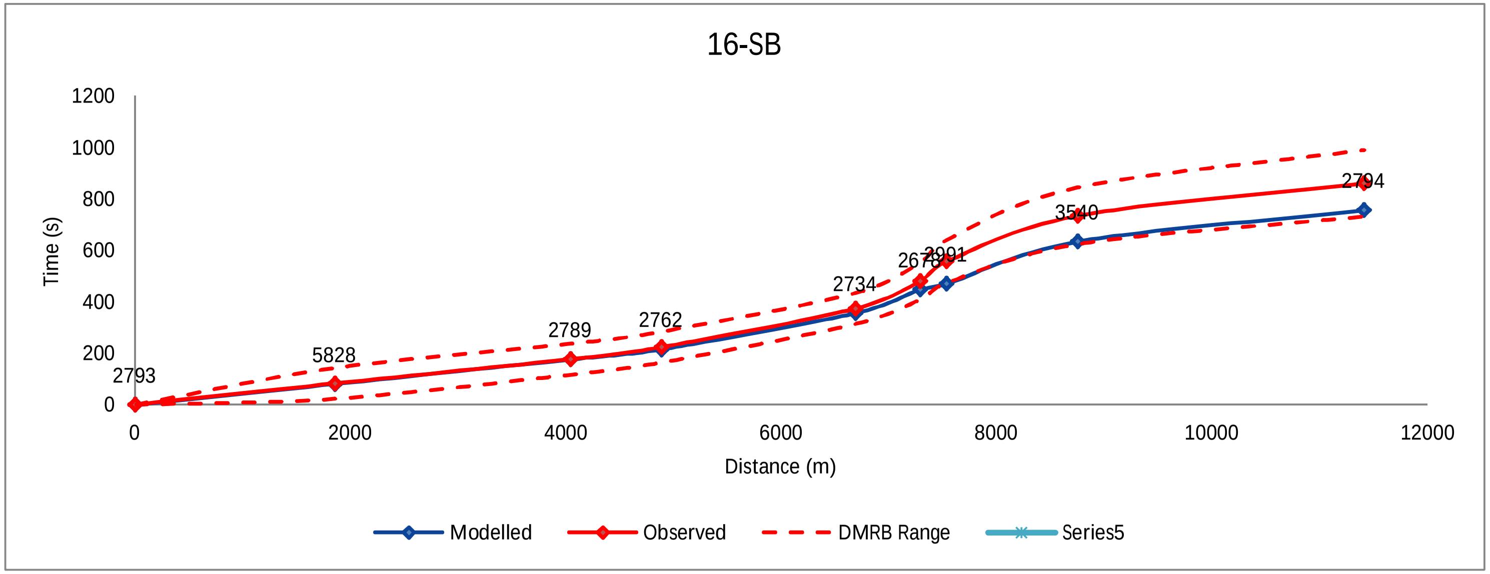


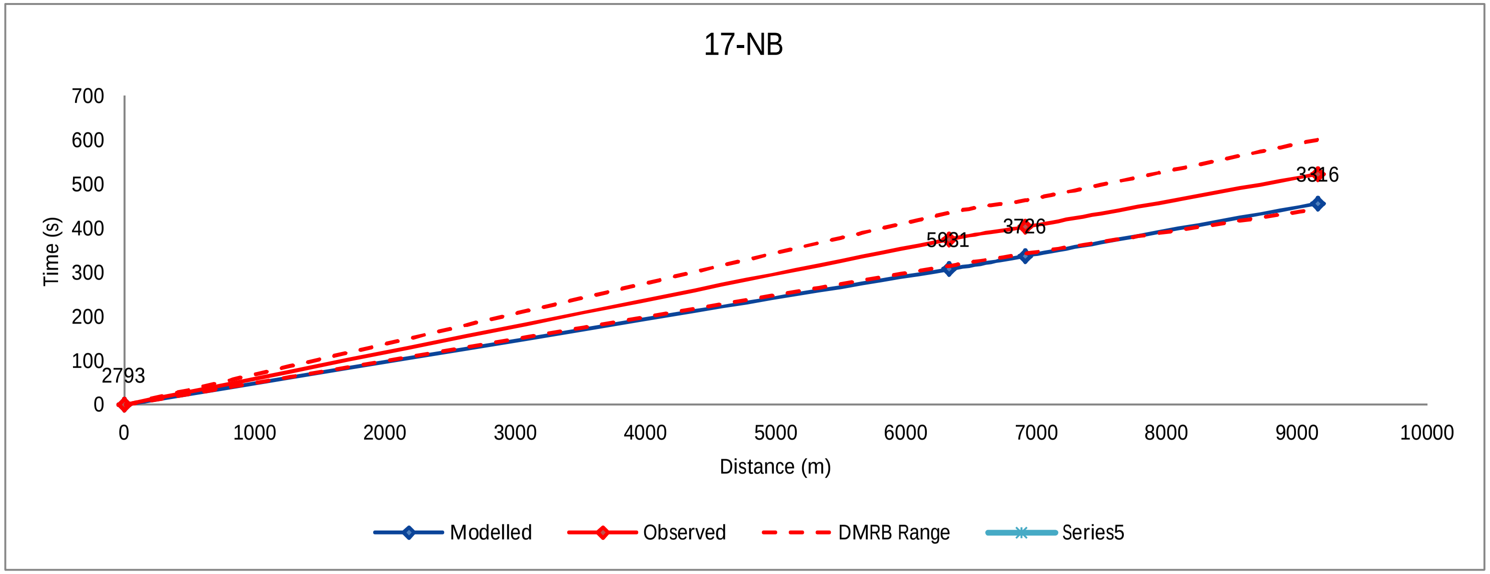
14-SB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3000
1020
1010
4501
4502
3228
3233
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

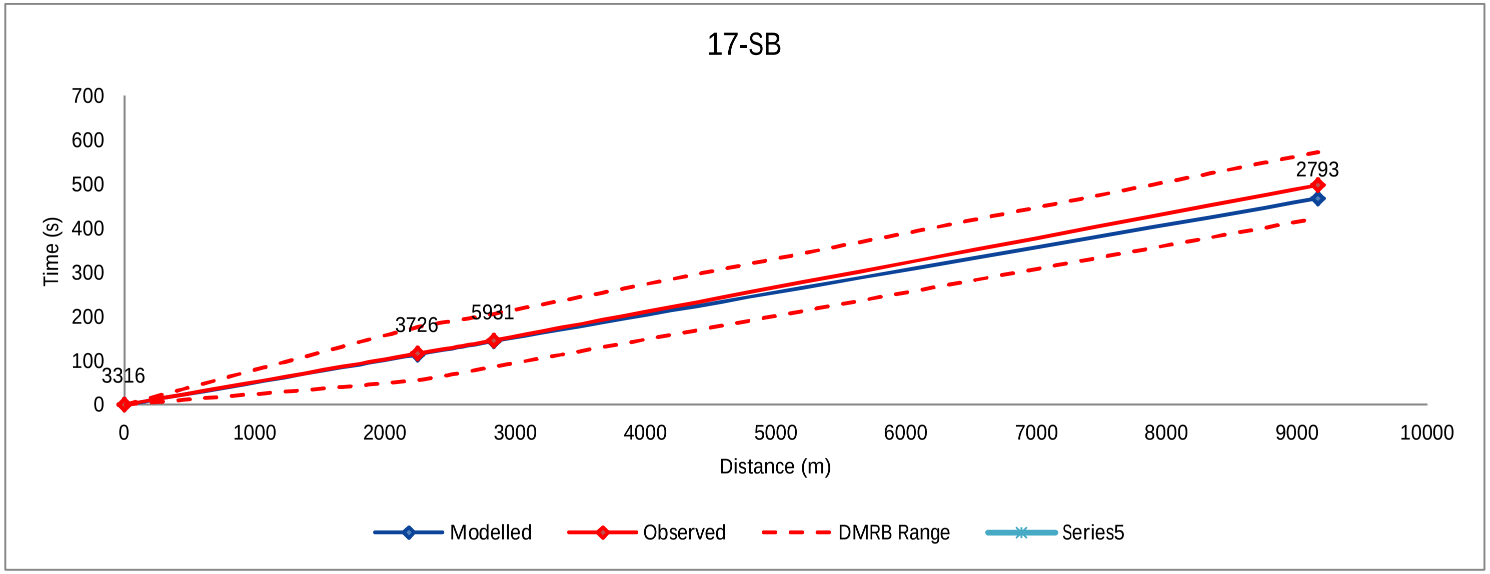

15-NB
Time (s)
700
600
500
400
300
200
100
0
3000
6315
4000
1230
6140
6080
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

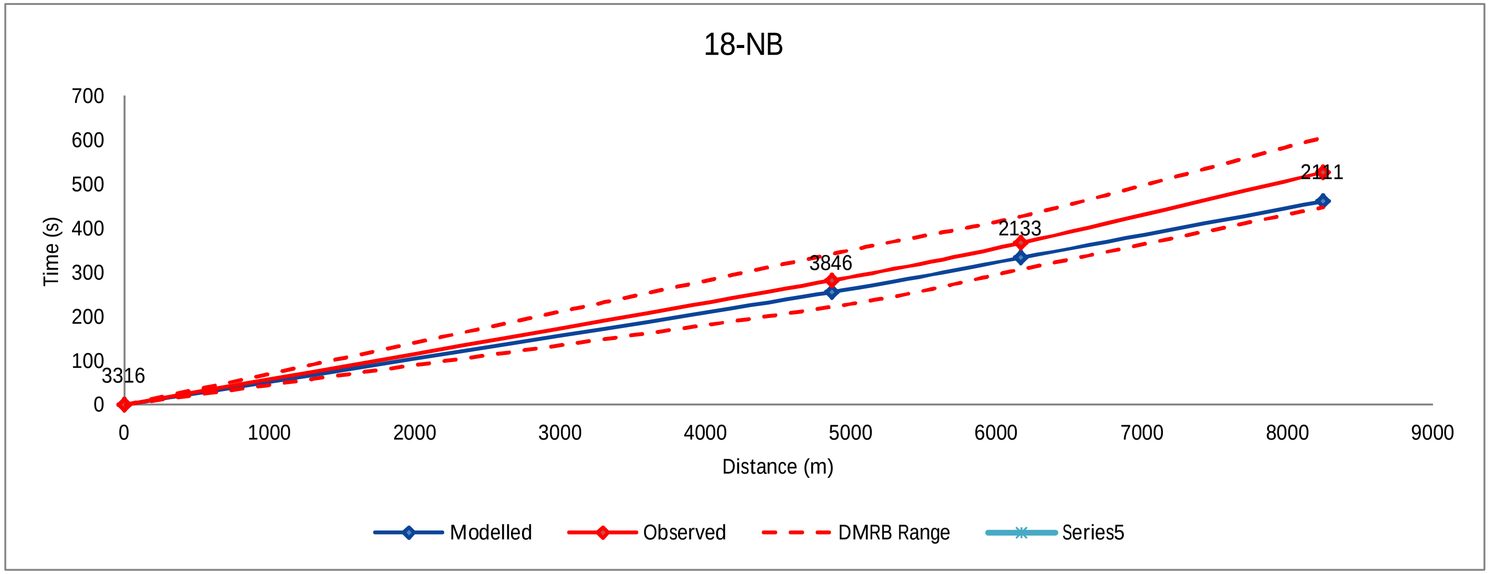

15-SB
Time (s)
700
600
500
400
300
200
100
0
-100
6080
6140
6010
1250
4000
6315
3000
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

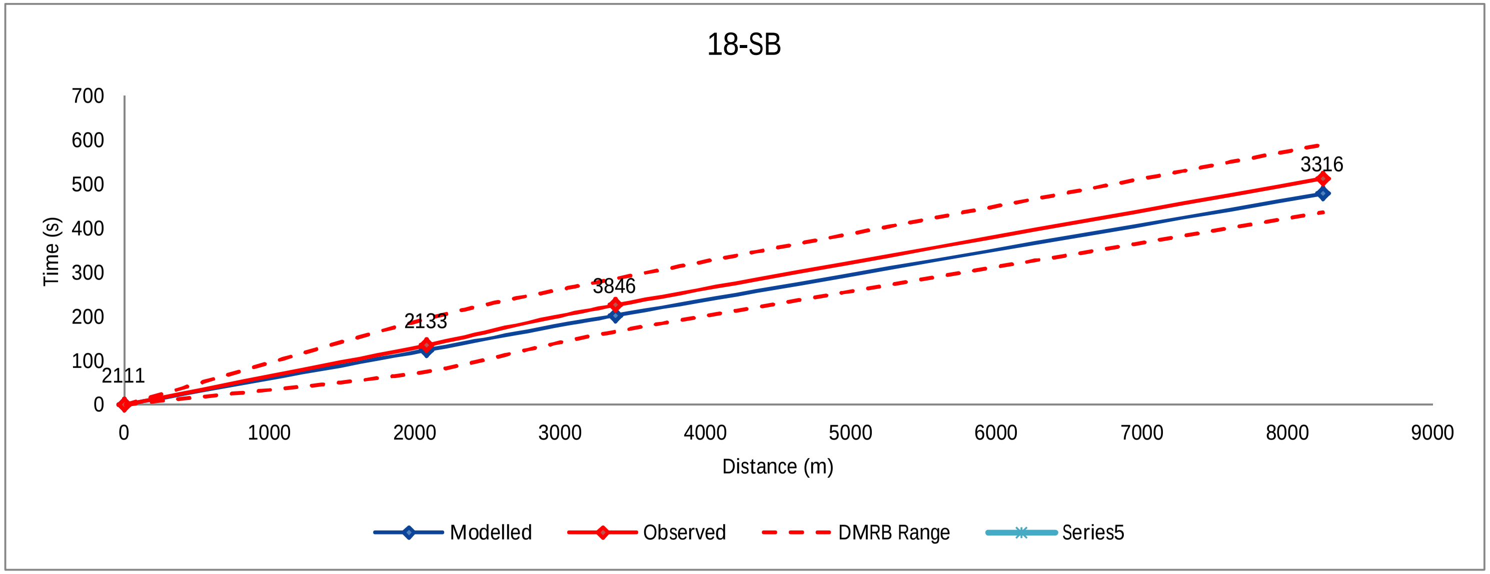

16-NB
Time (s)
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
Distance (m)
2794
3540
2707
2727
2743
2762
2789
5829
2793
Modelled
Observed
DMRB Range
Series5

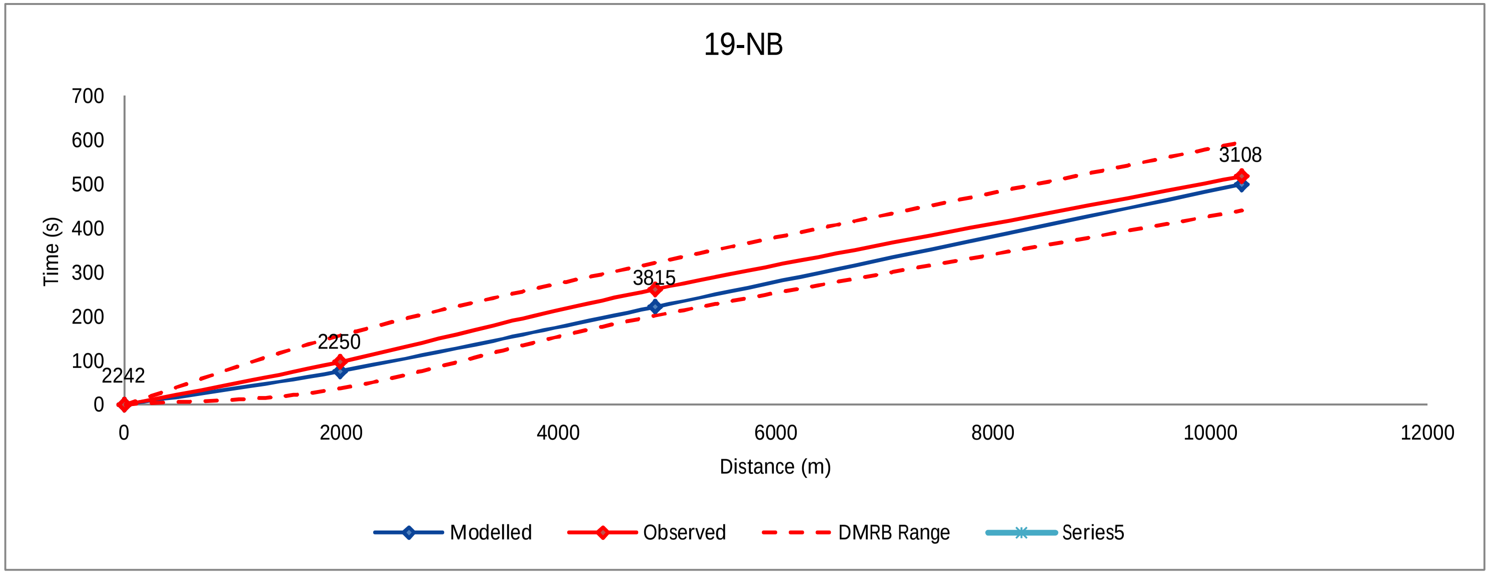

16-SB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
Distance (m)
2793
5828
2789
2762
2734
2678
2991
3540
2794
Modelled
Observed
DMRB Range
Series5

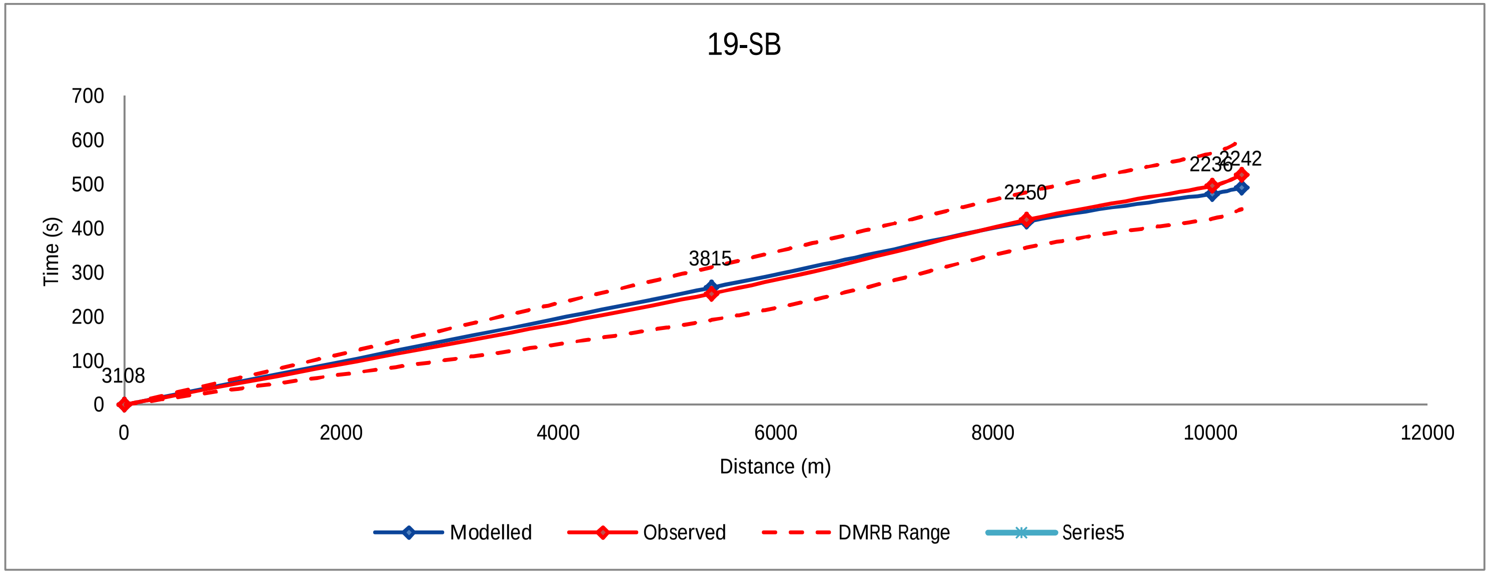

17-NB
Time (s)
700
600
500
400
300
200
100
0
2793
5931
3726
3316
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5

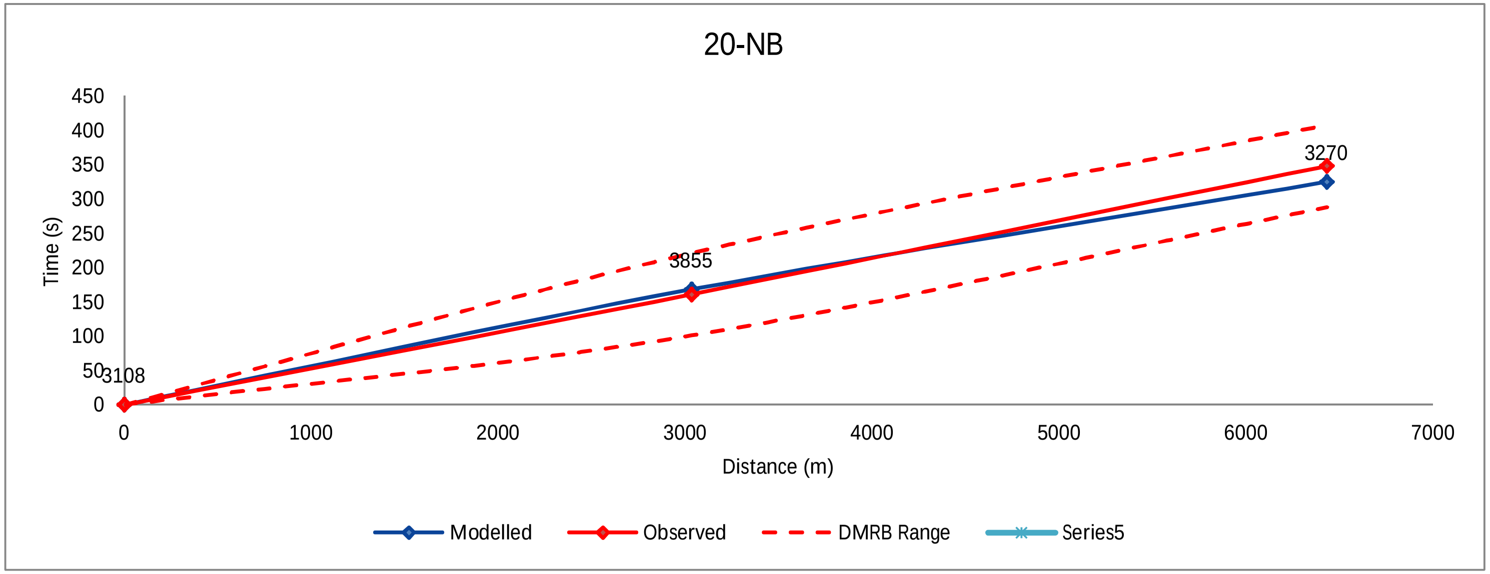

17-SB
Time (s)
700
600
500
400
300
200
100
0
3316
3726
5931
2793
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5

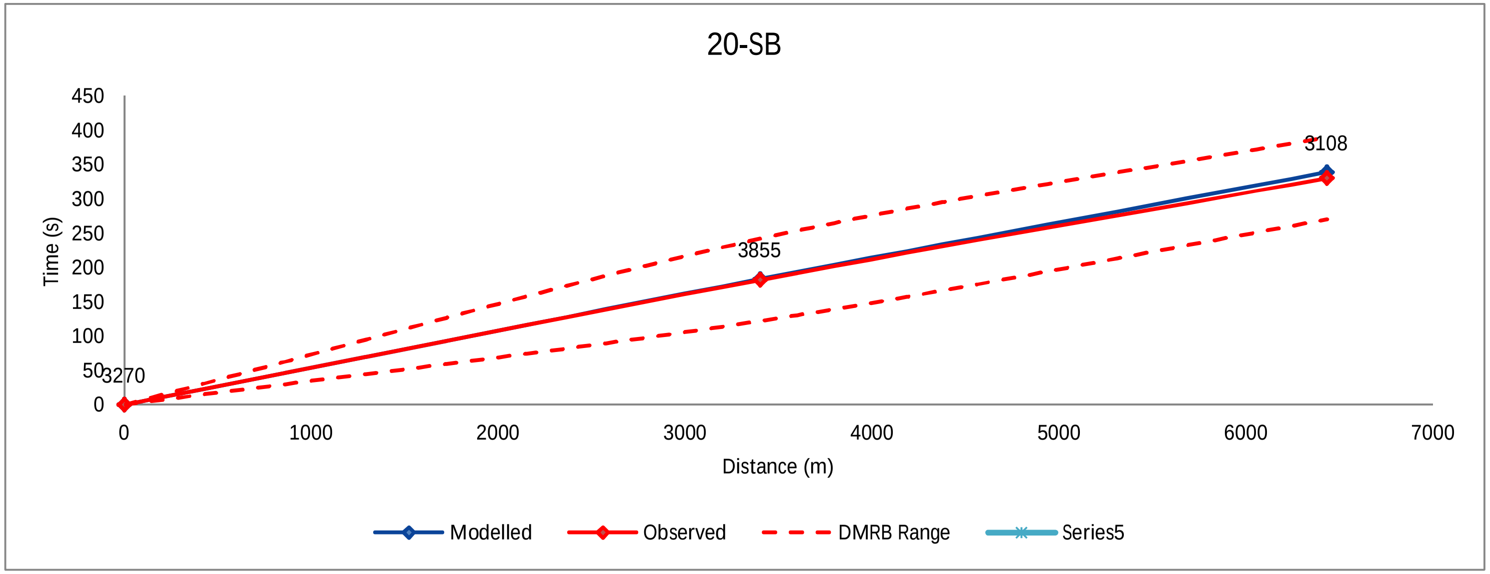

18-NB
Time (s)
700
600
500
400
300
200
100
0
3316
3846
2133
2111
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

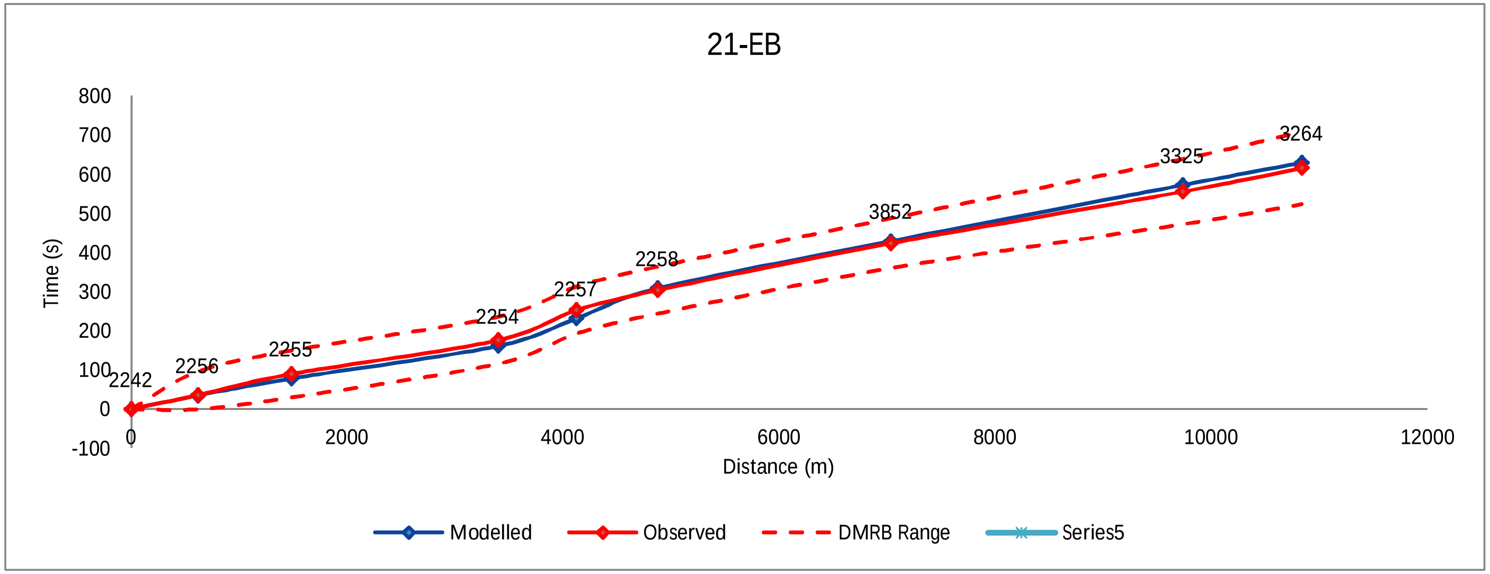

18-SB
Time (s)
700
600
500
400
300
200
100
0
2111
2133
3846
3316
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

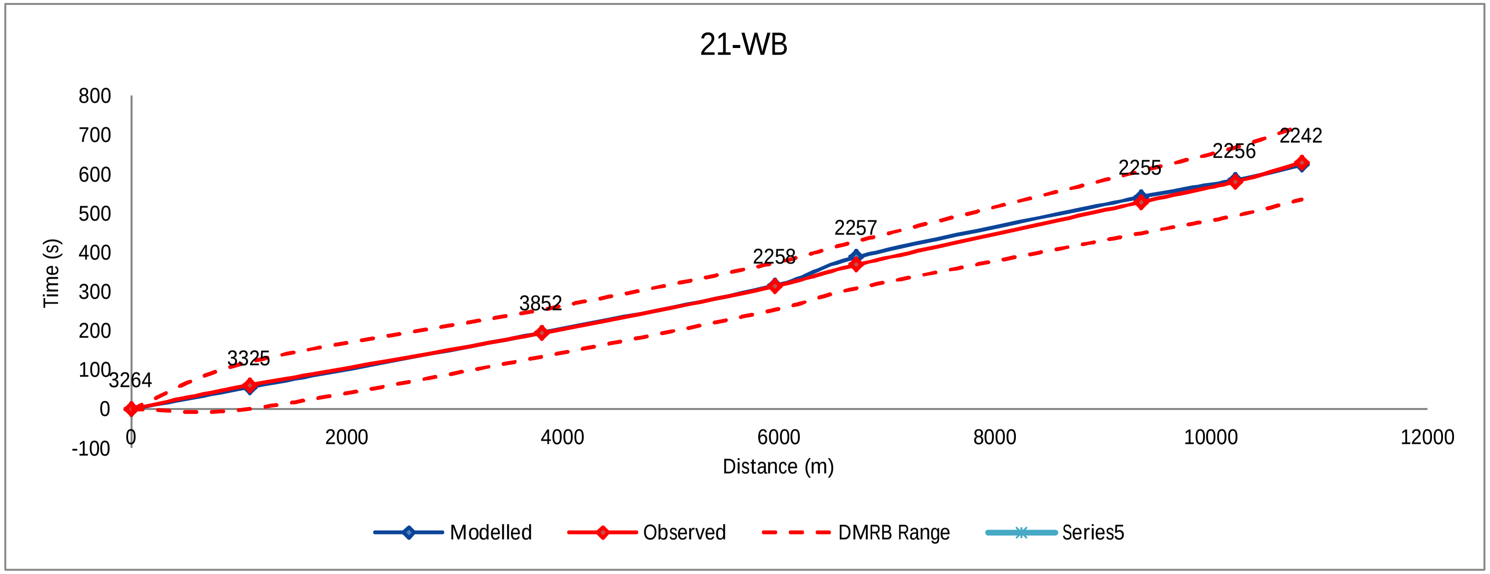

19-NB
Time (s)
700
600
500
400
300
200
100
0
2242
2250
3815
3108
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

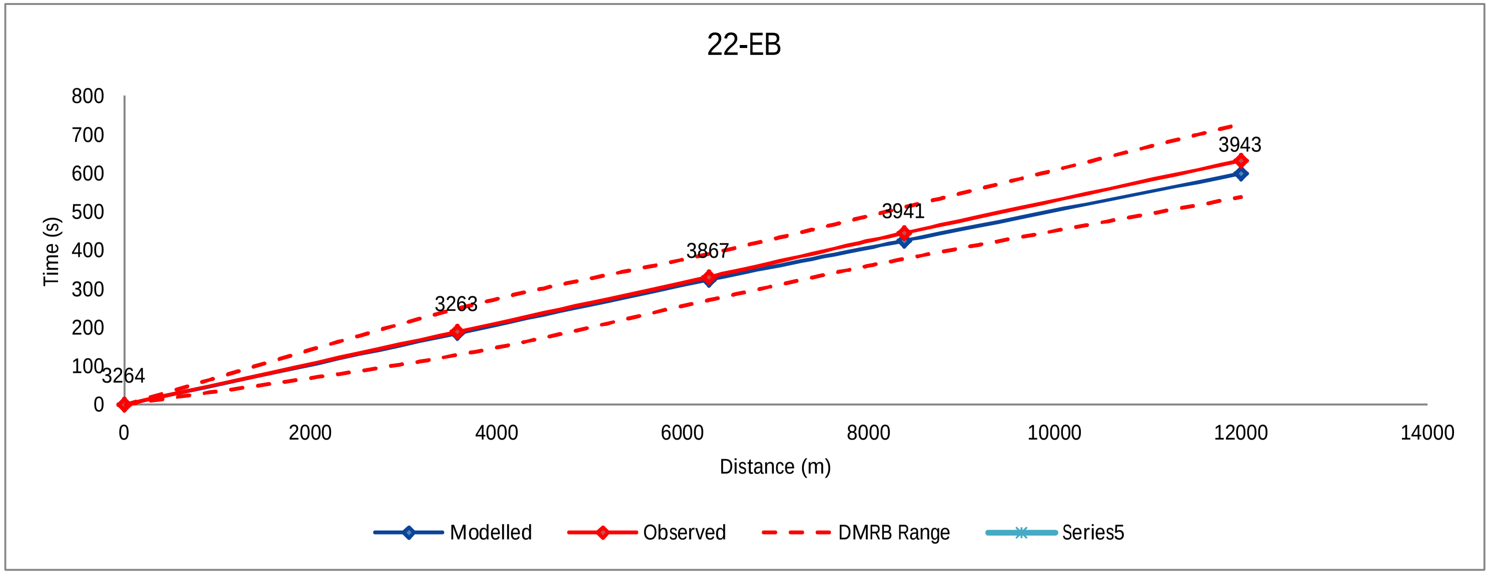

19-SB
Time (s)
700
600
500
400
300
200
100
0
3108
3815
2250
2236
2242
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

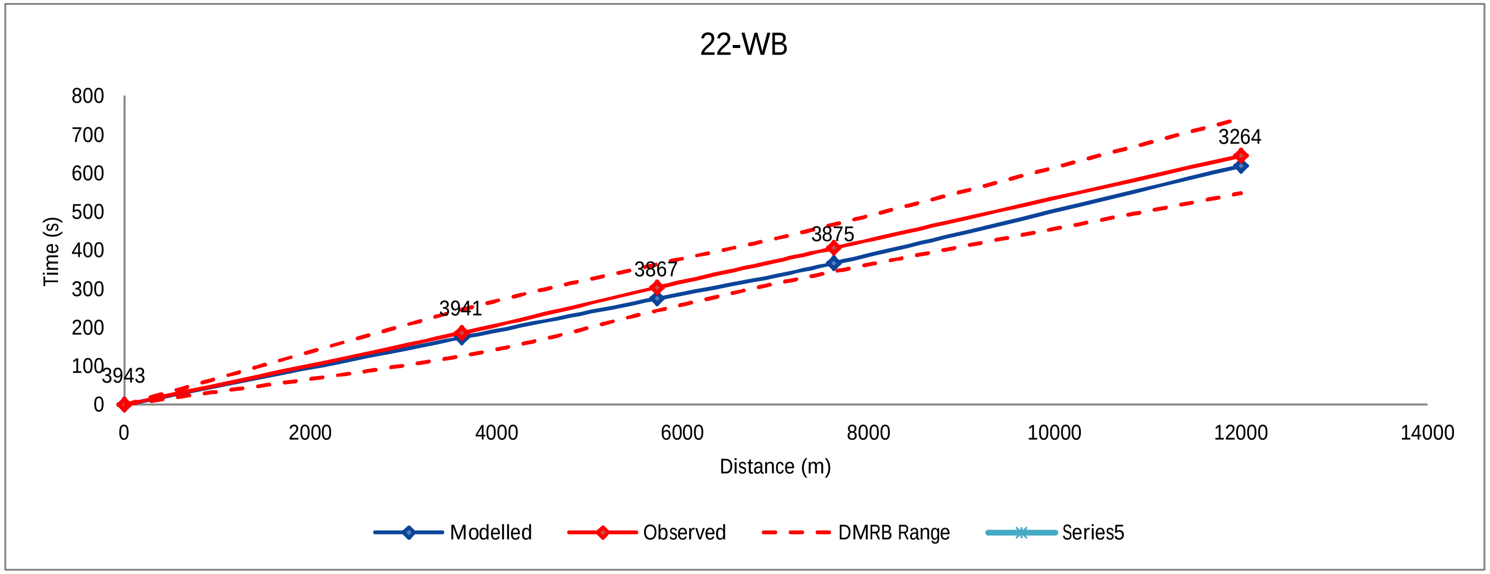

20-NB
Time (s)
450
400
350
300
250
200
150
100
50
0
3108
3855
3270
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range
Series5

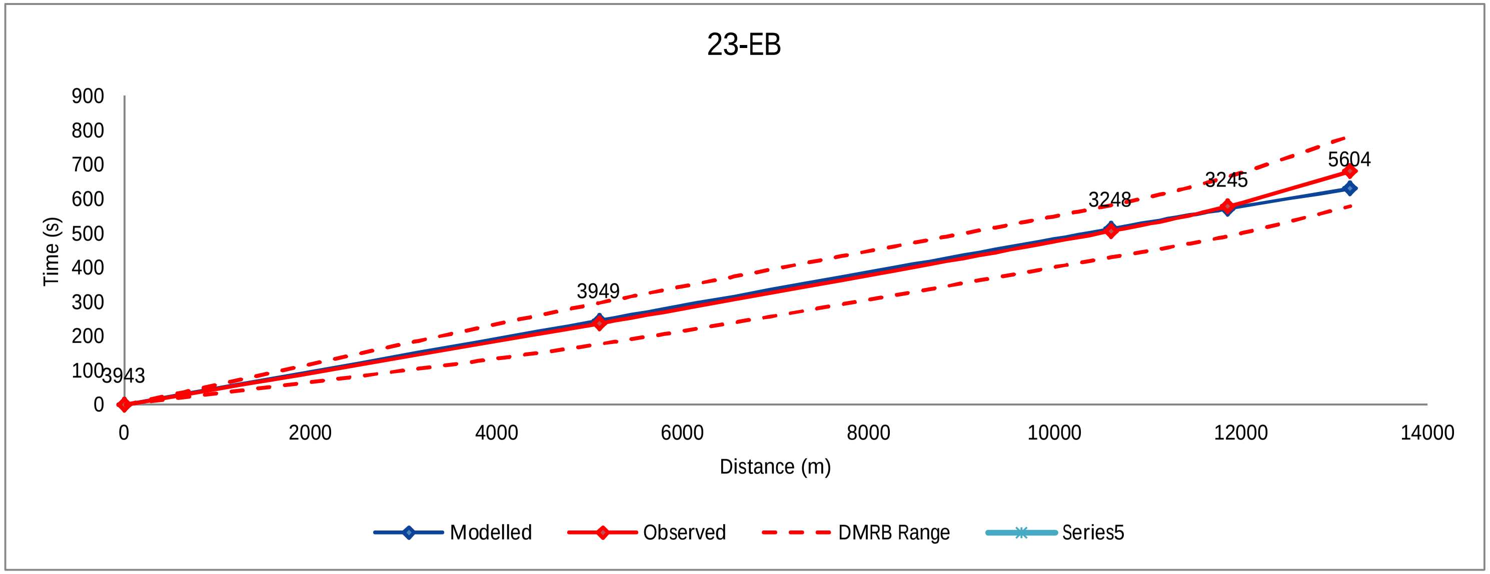

20-SB
Time (s)
450
400
350
300
250
200
150
100
50
0
3270
3855
3108
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range
Series5

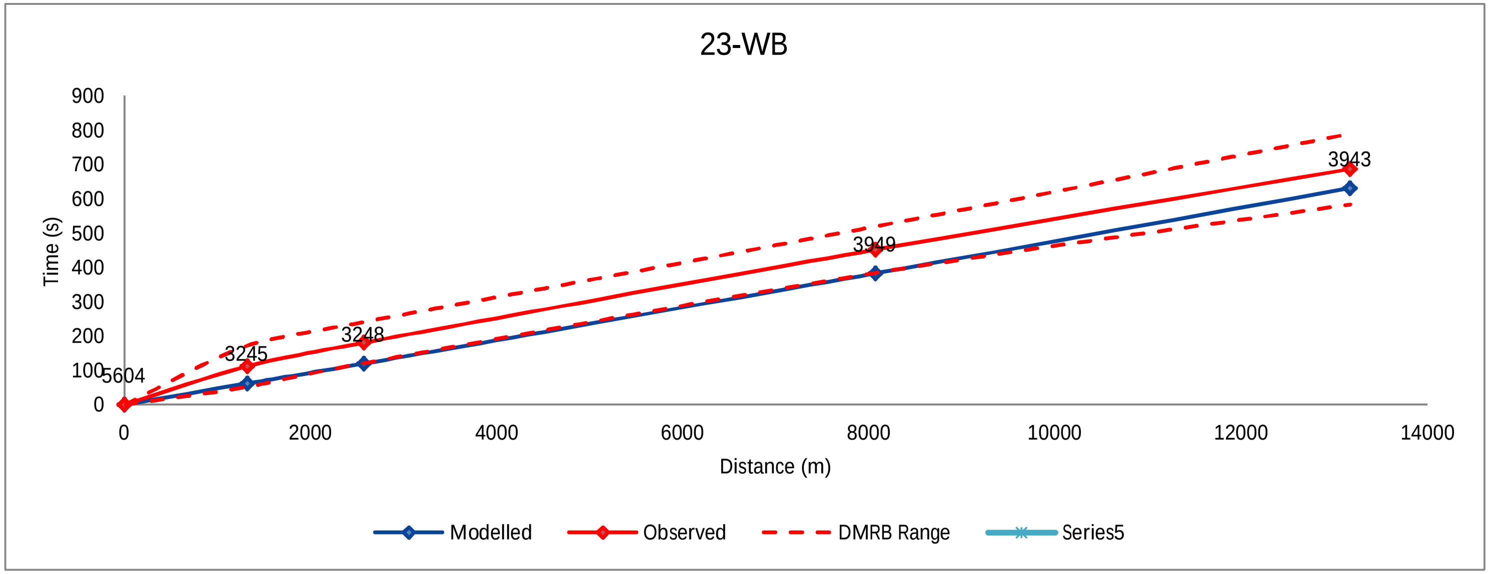

21-EB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
Distance (m)
2242
2256
2255
2254
2257
2258
3852
3325
3264
Modelled
Observed
DMRB Range
Series5

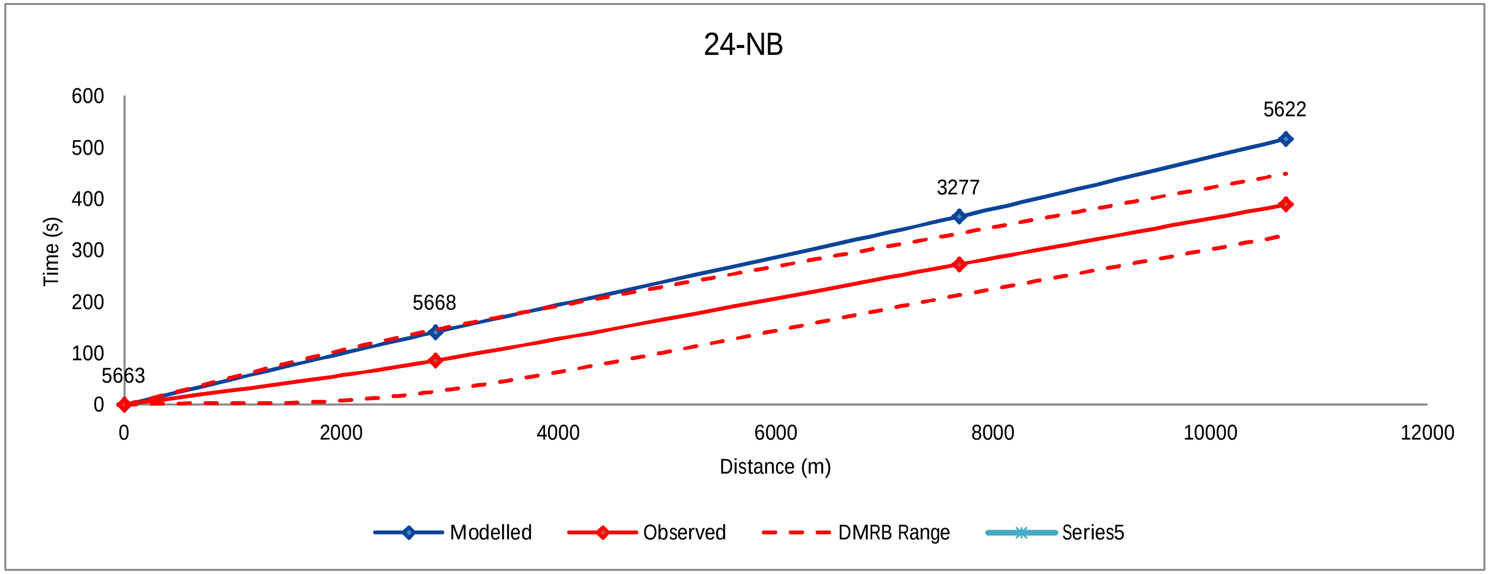

21-WB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
Distance (m)
3264
3325
3852
2258
2257
2255
2256
2242
Modelled
Observed
DMRB Range
Series5

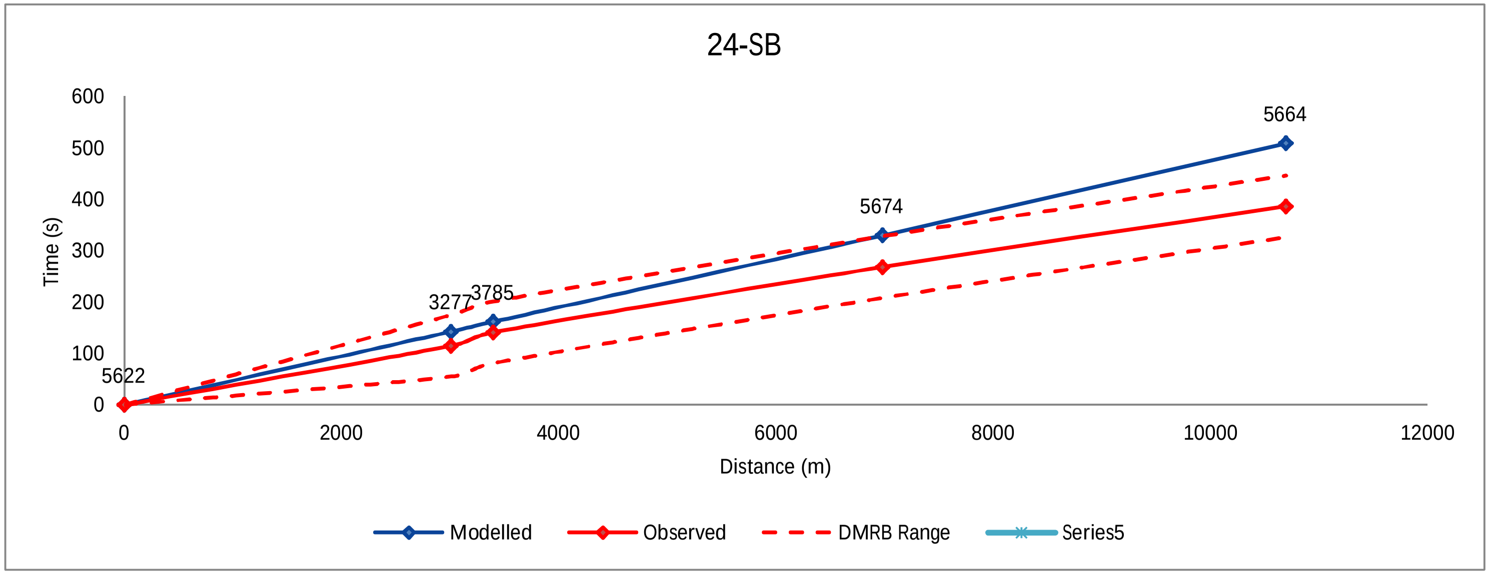

22-EB
Time (s)
800
700
600
500
400
300
200
100
0
3264
3263
3867
3941
3943
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

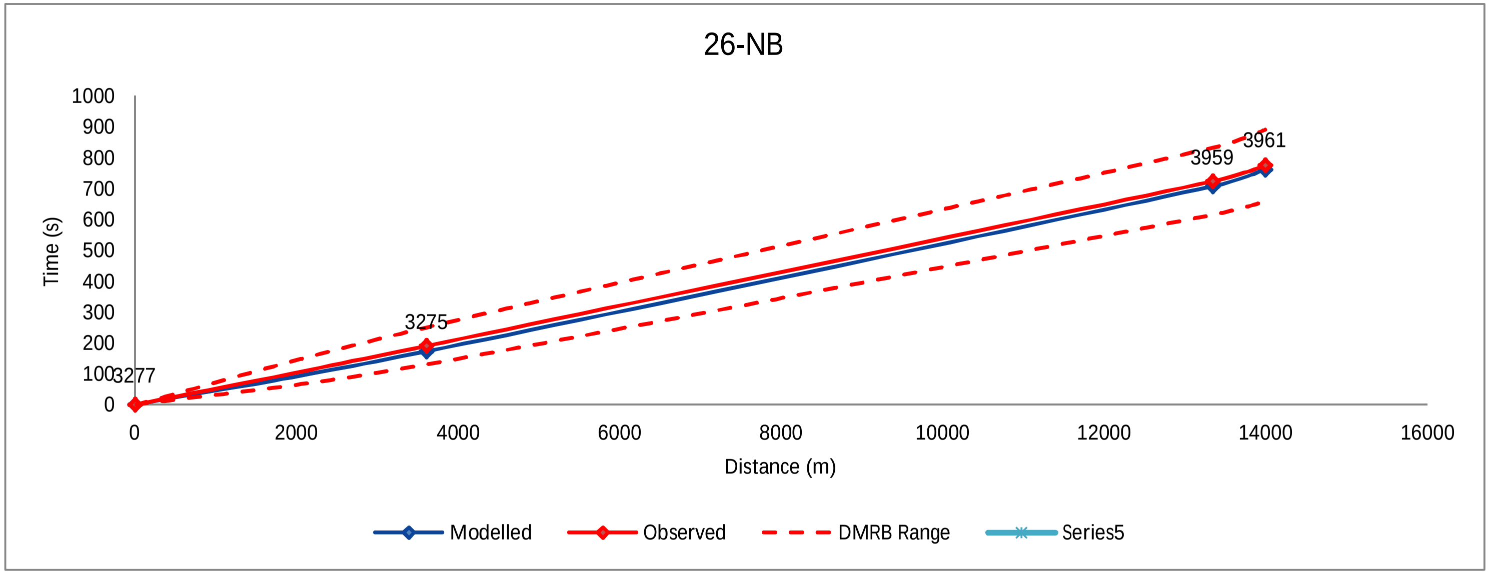

22-WB
Time (s)
800
700
600
500
400
300
200
100
0
3943
3941
3867
3875
3264
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

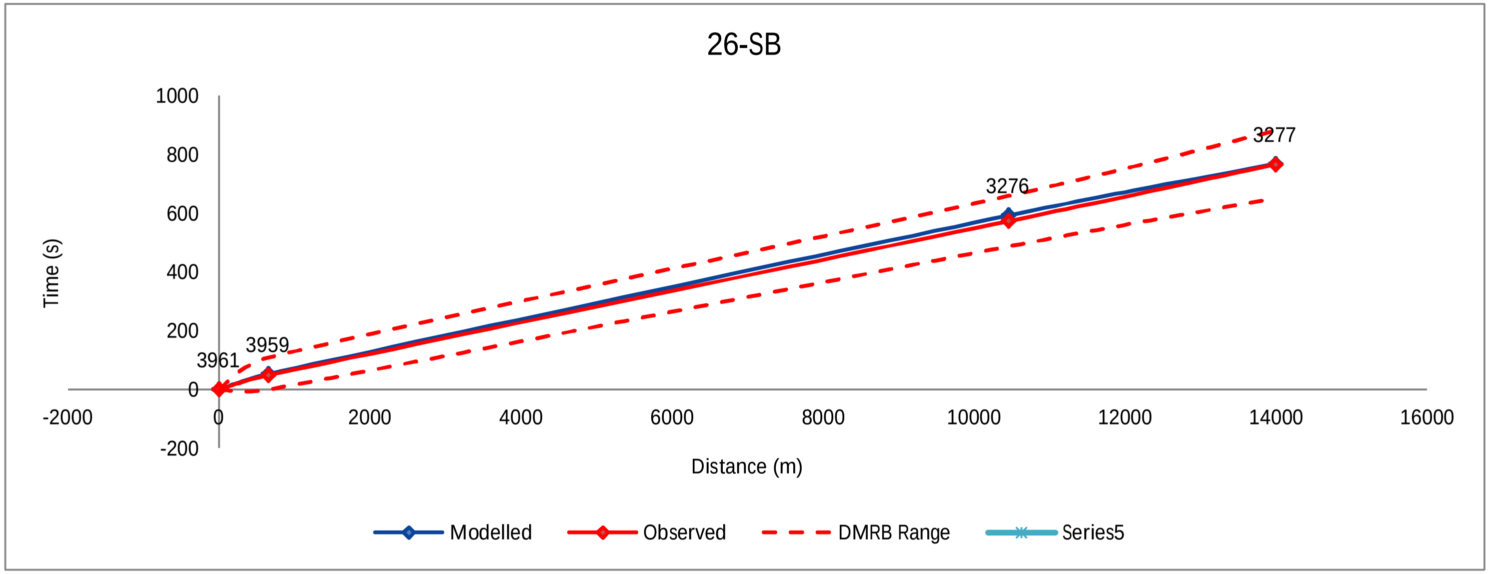

23-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
3943
3949
3248
3245
5604
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

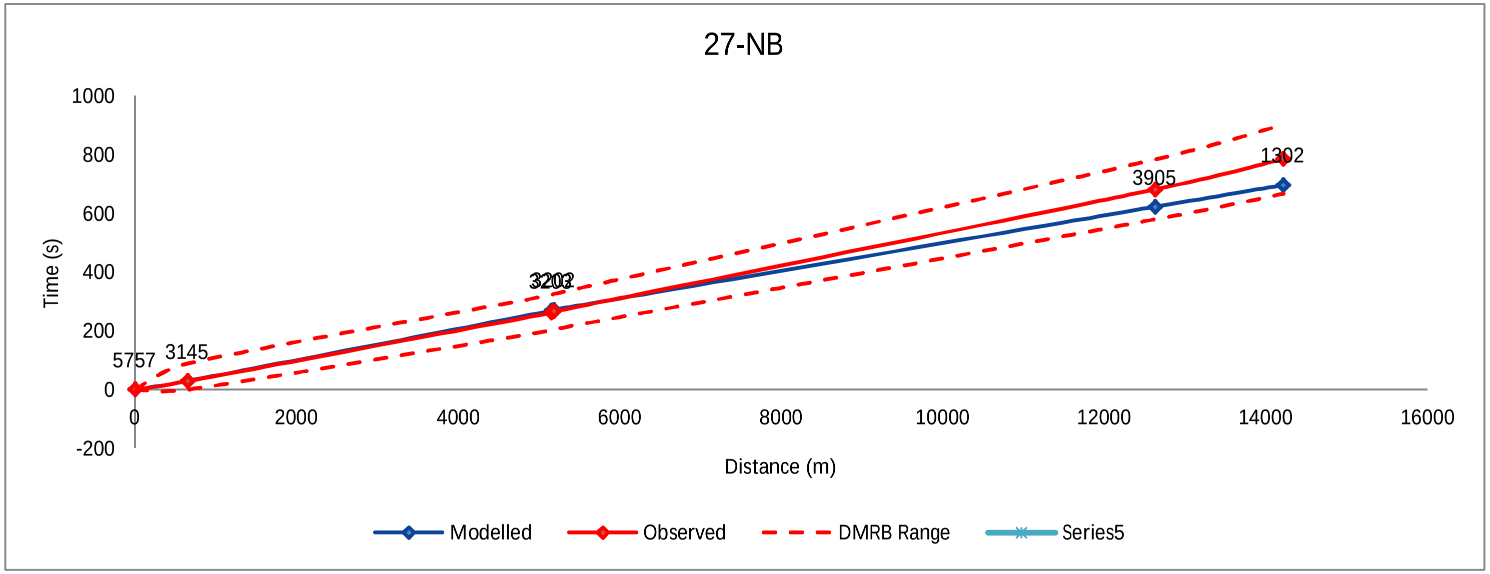

23-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
5604
3245
3248
3949
3943
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

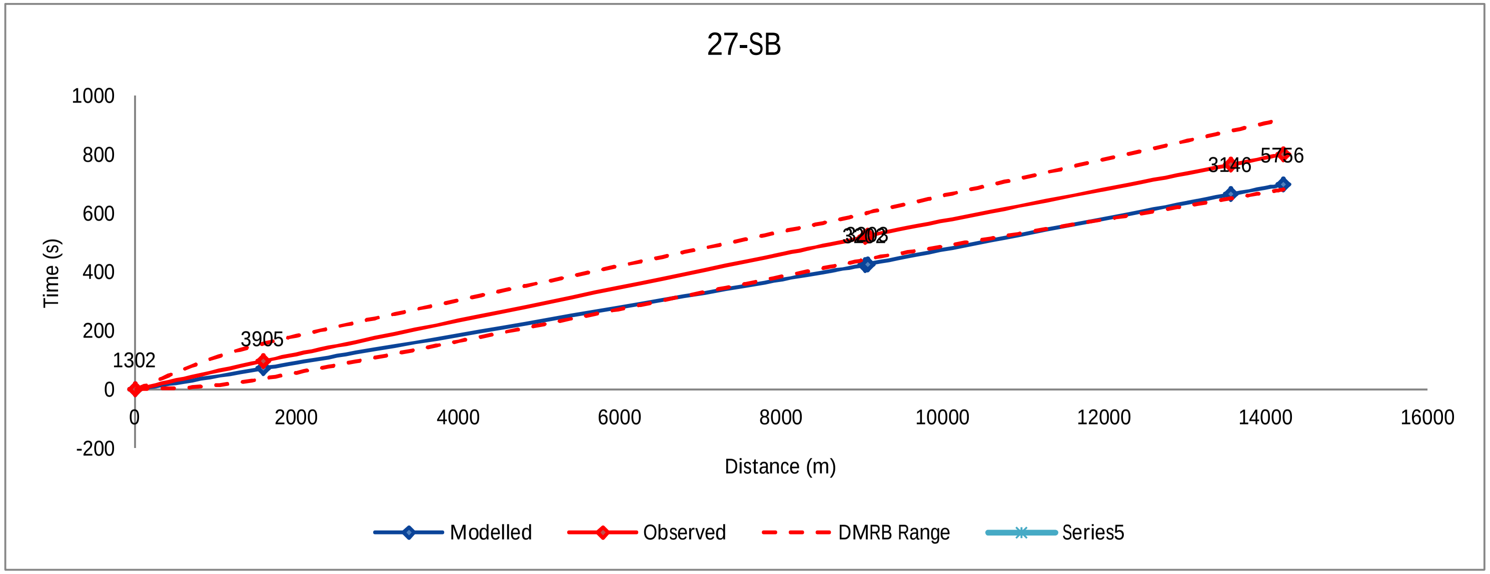

24-NB
Time (s)
600
500
400
300
200
100
0
5663
5668
3277
5622
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

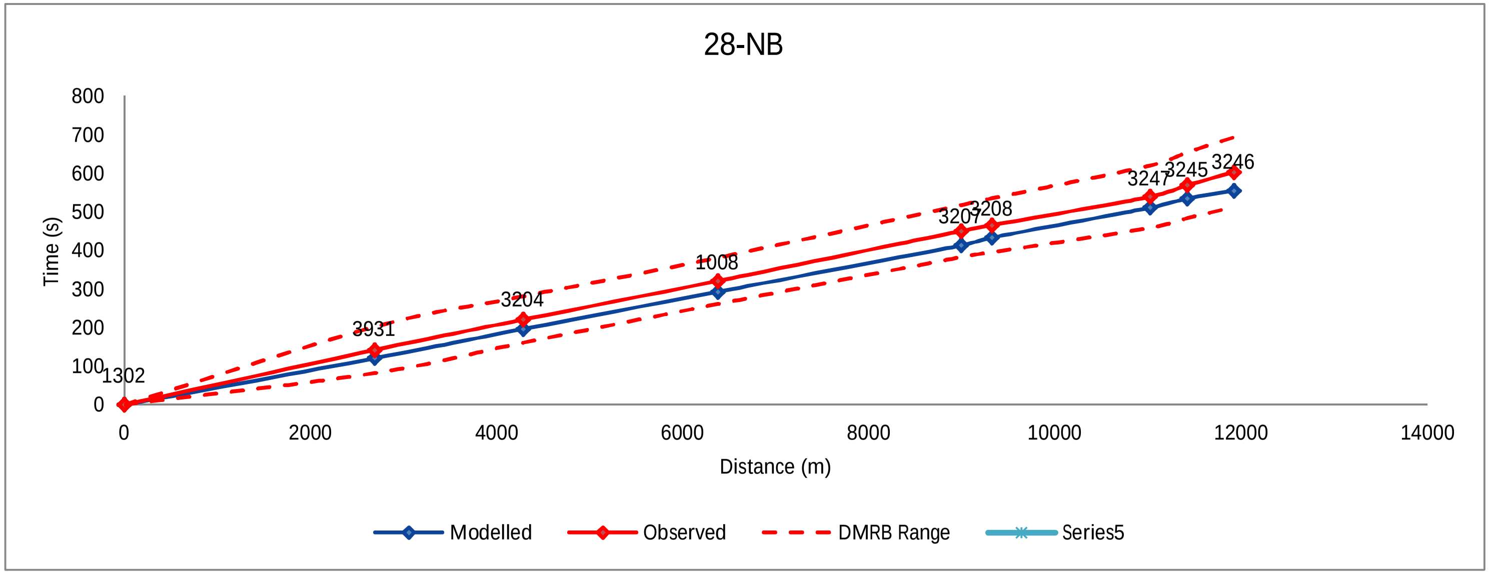

24-SB
Time (s)
600
500
400
300
200
100
0
5622
3277
3785
5674
5664
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

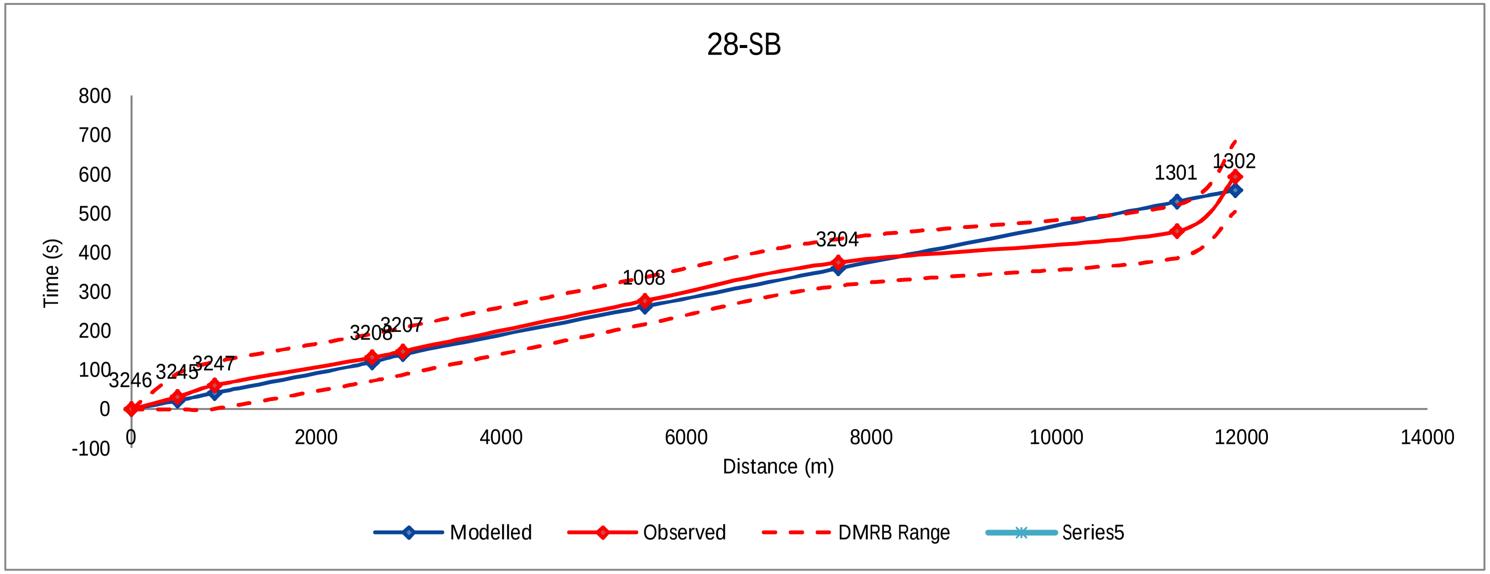

26-NB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3277
3275
3959
3961
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

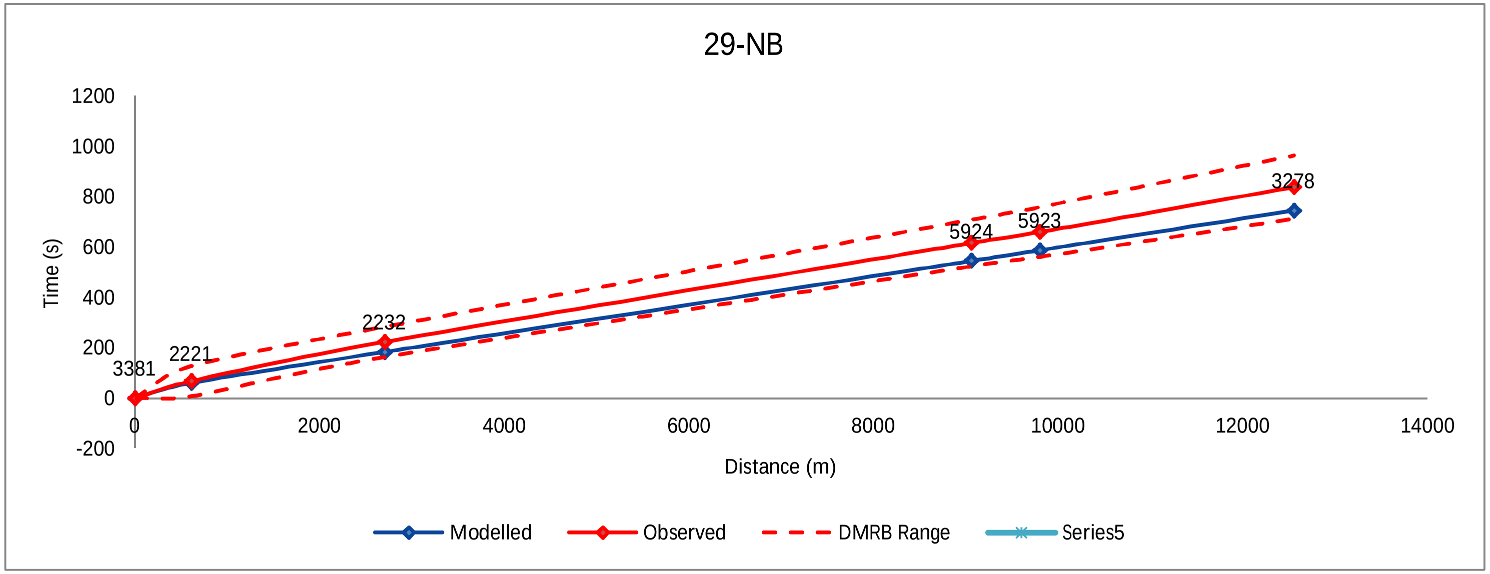

26-SB
Time (s)
1000
800
600
400
200
0
-200
3961
3959
3276
3277
-2000
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

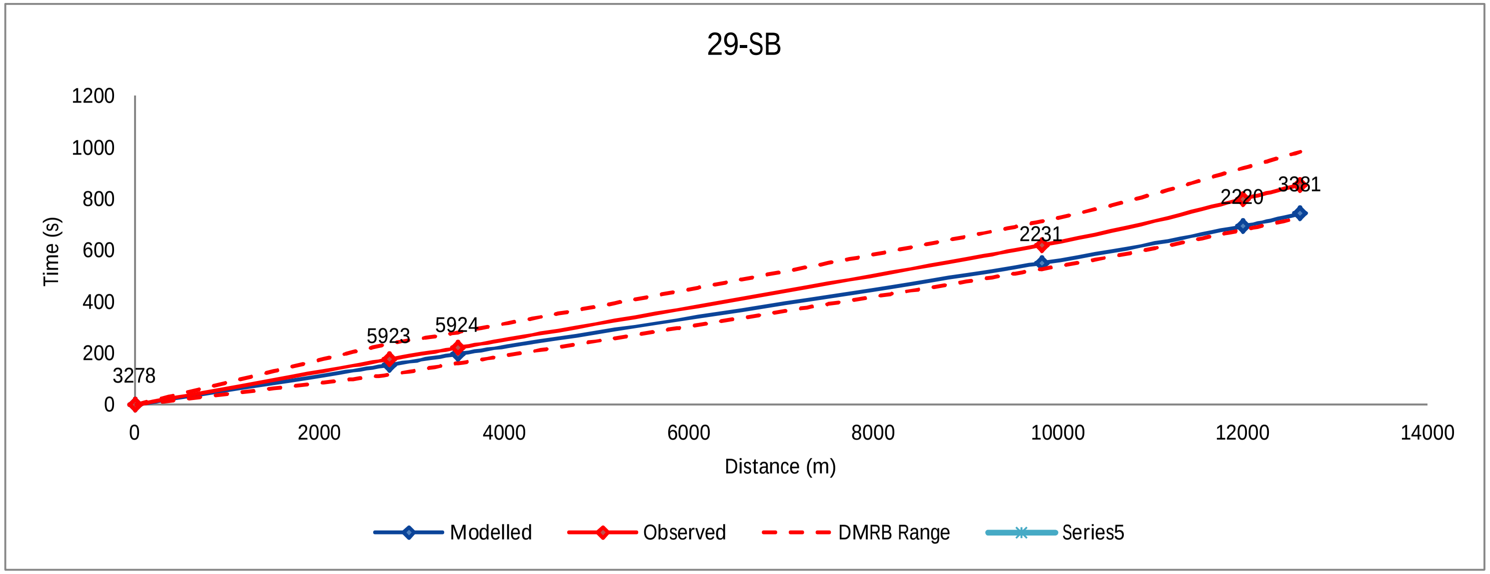

27-NB
Time (s)
1000
800
600
400
200
0
-200
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
5757
3145
1302
3905
Modelled
Observed
DMRB Range
Series5

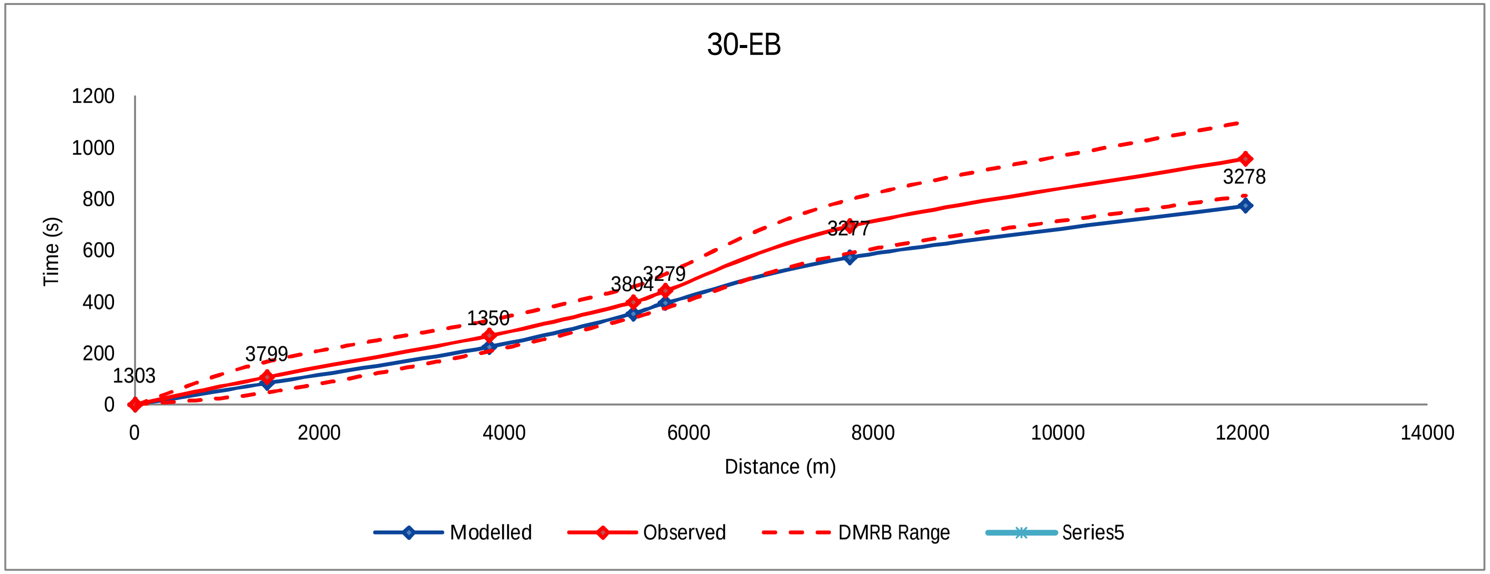

27-SB
Time (s)
1000
800
600
400
200
0
-200
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
1302
3905
5756
Modelled
Observed
DMRB Range
Series5

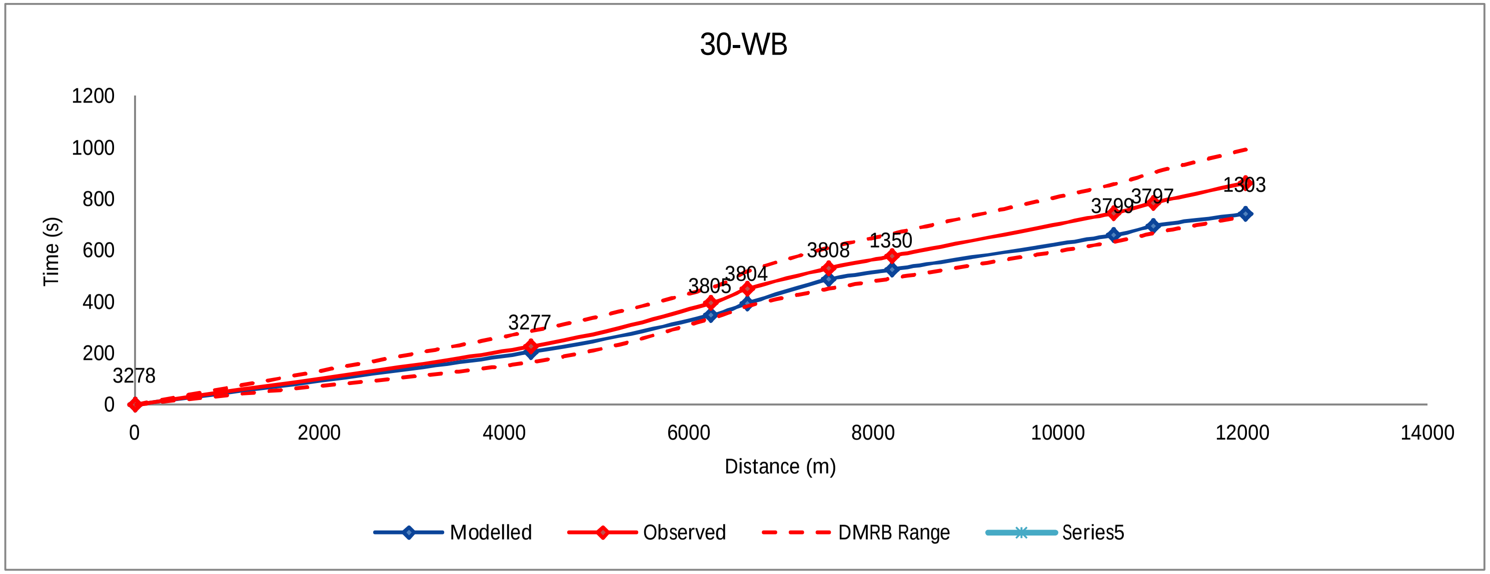

28-NB
Time (s)
800
700
600
500
400
300
200
100
0
1302
3931
3204
1008
3207
3208
3247
3245
3246
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

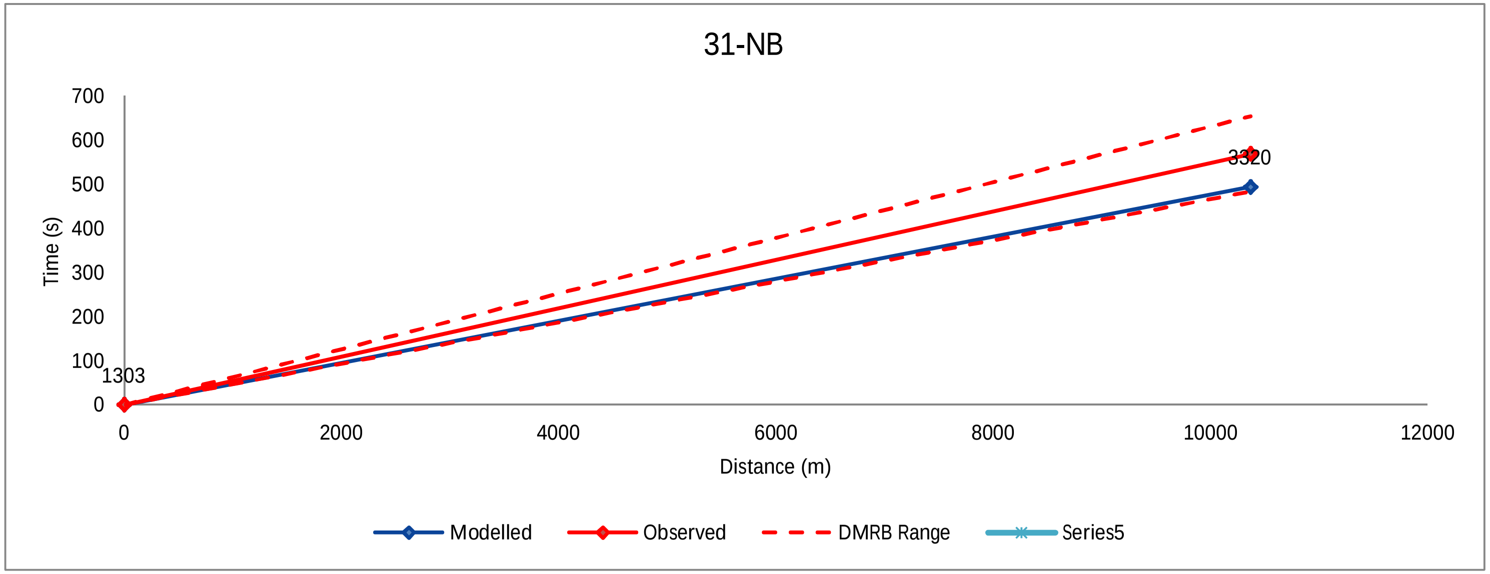

28-SB
Time (s)
800
700
600
500
400
300
200
100
0
-100
3246
3245
3247
3208
3207
1008
3204
1301
1302
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

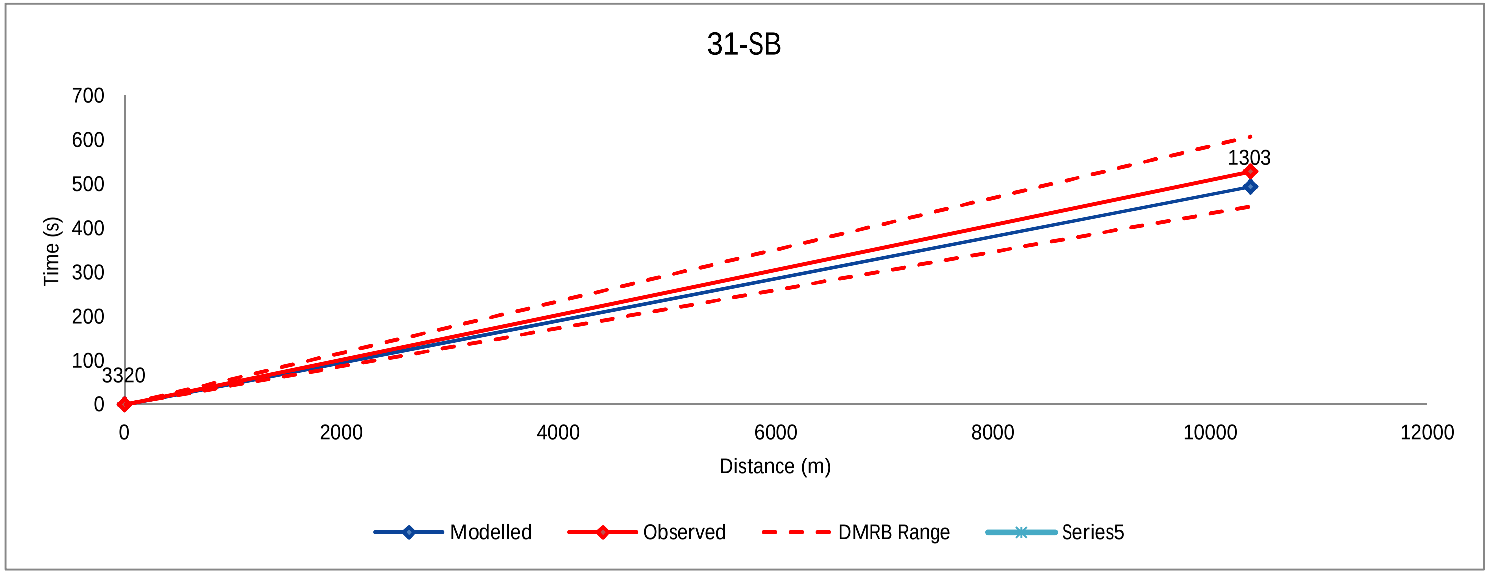

29-NB
Time (s)
1200
1000
800
600
400
200
0
-200
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3381
2221
2232
5924
5923
3278
Modelled
Observed
DMRB Range
Series5

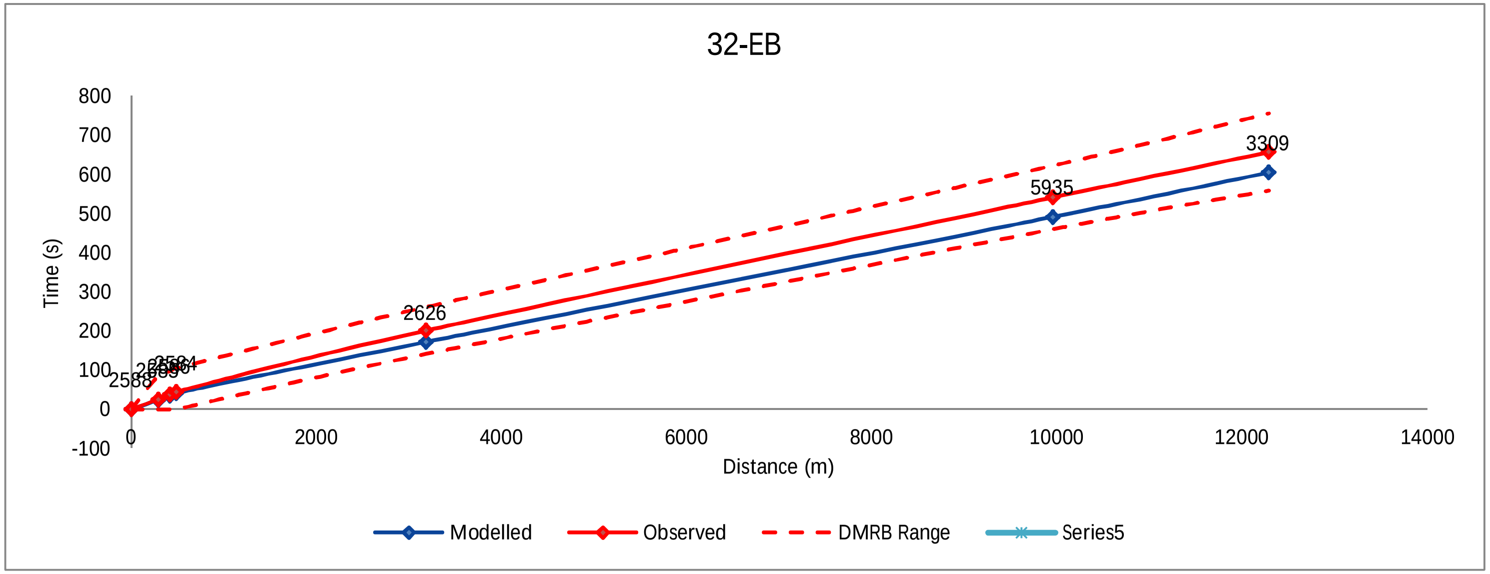

29-SB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3278
5923
5924
2231
2220
3381
Modelled
Observed
DMRB Range
Series5

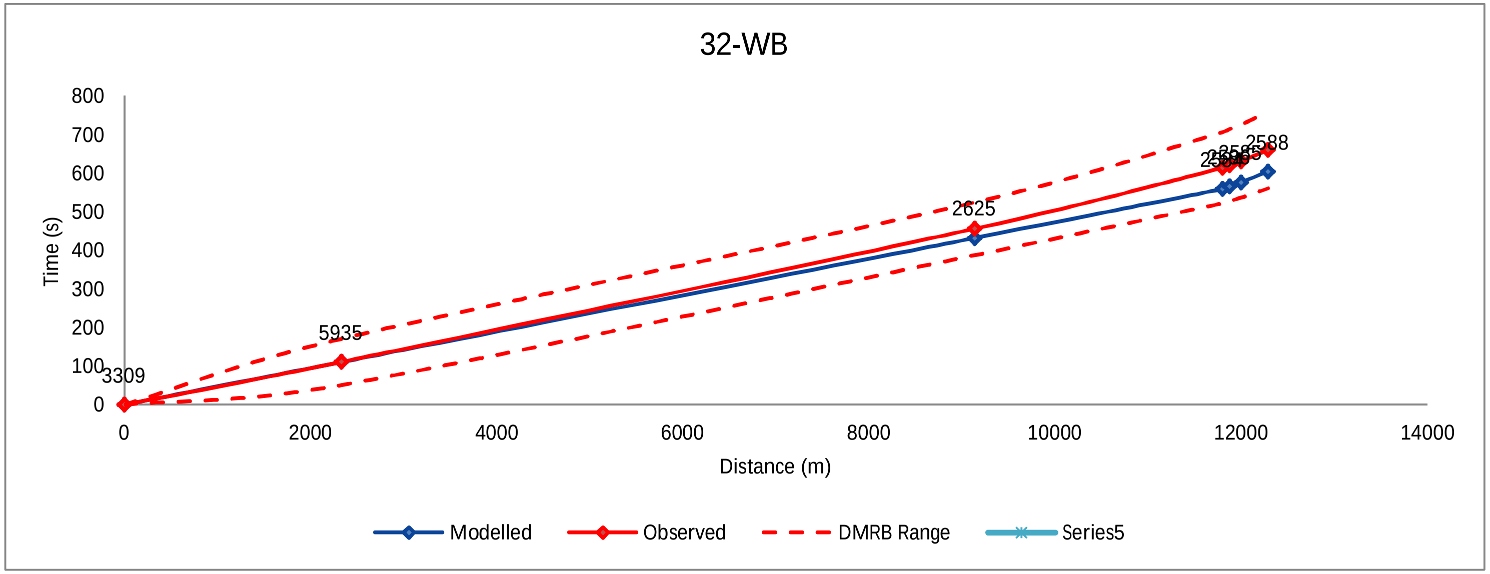

30-EB
Time (s)
1200
1000
800
600
400
200
0
1303
3799
1350
3804
3279
3277
3278
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

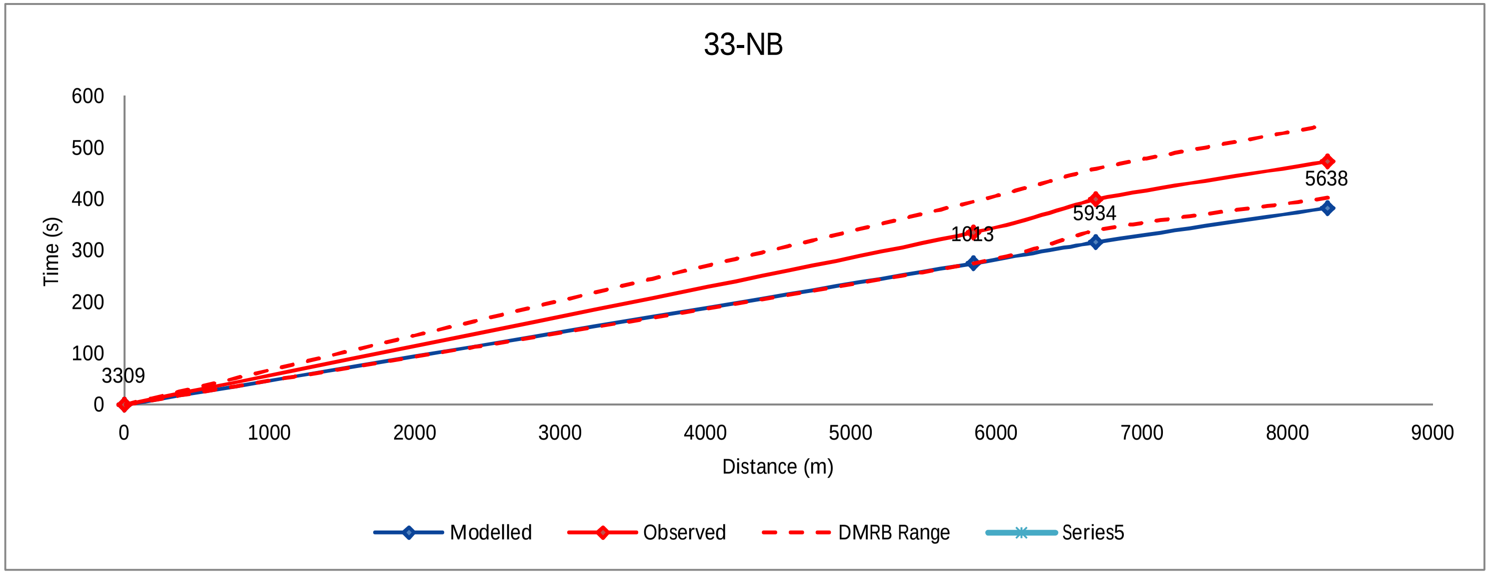

30-WB
Time (s)
1200
1000
800
600
400
200
0
3278
3277
3805
3804
3808
1350
3799
3797
1303
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

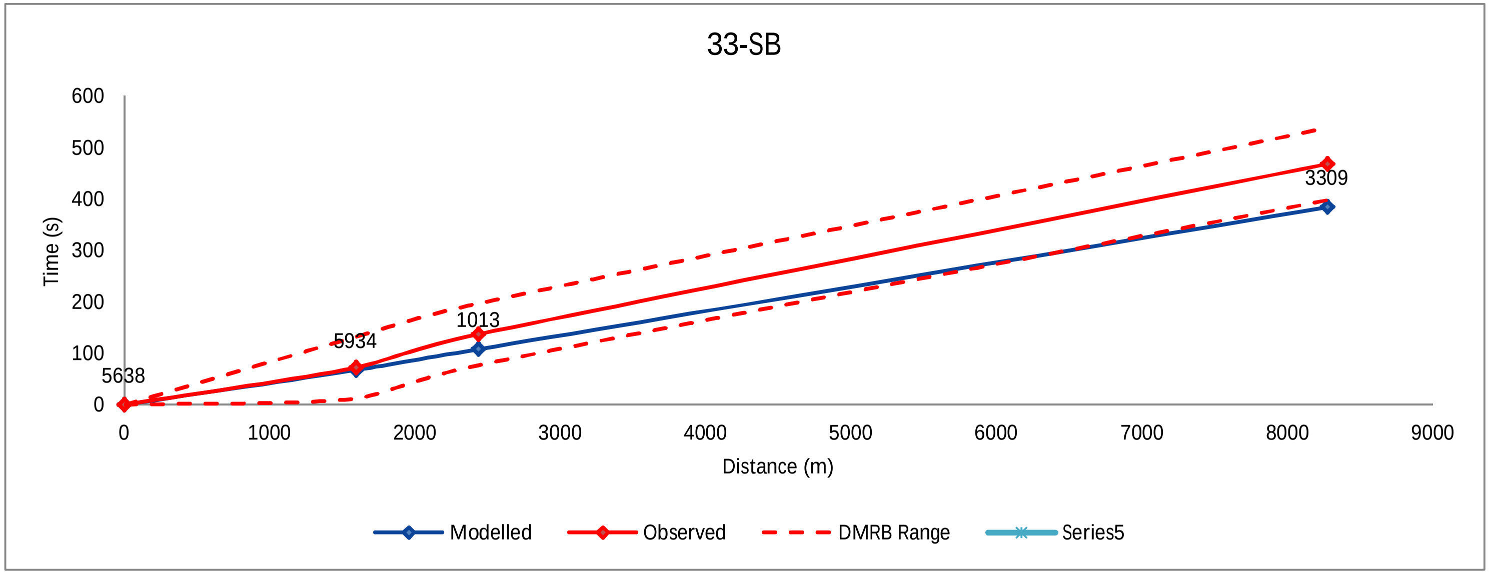

31-NB
Time (s)
700
600
500
400
300
200
100
0
1303
3320
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

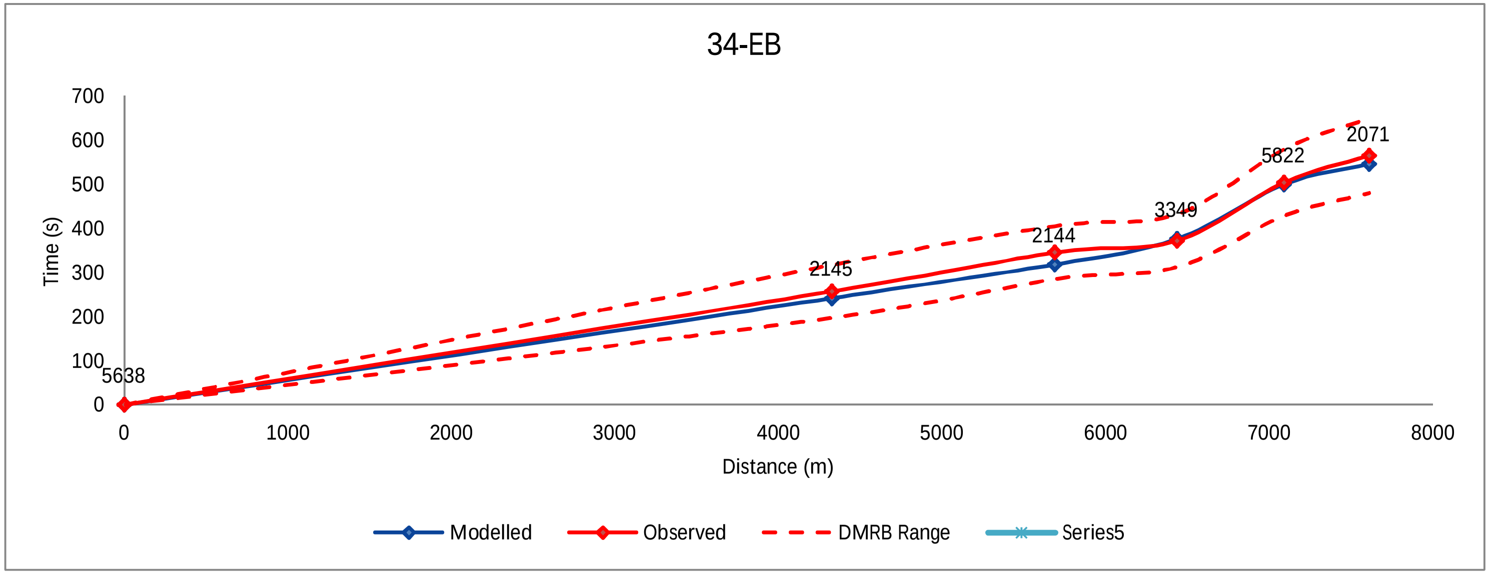

31-SB
Time (s)
700
600
500
400
300
200
100
0
3320
1303
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

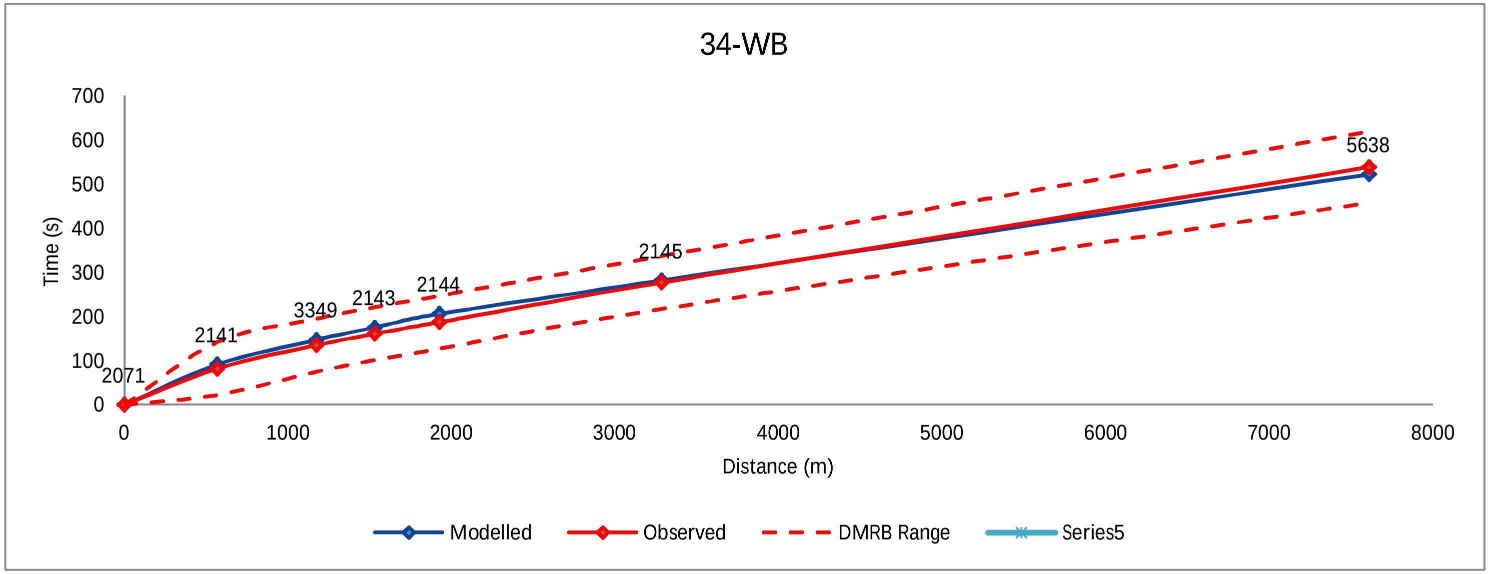

32-EB
Time (s)
Distance (m)
2626
5935
3309
Modelled
Observed
DMRB Range
Series5

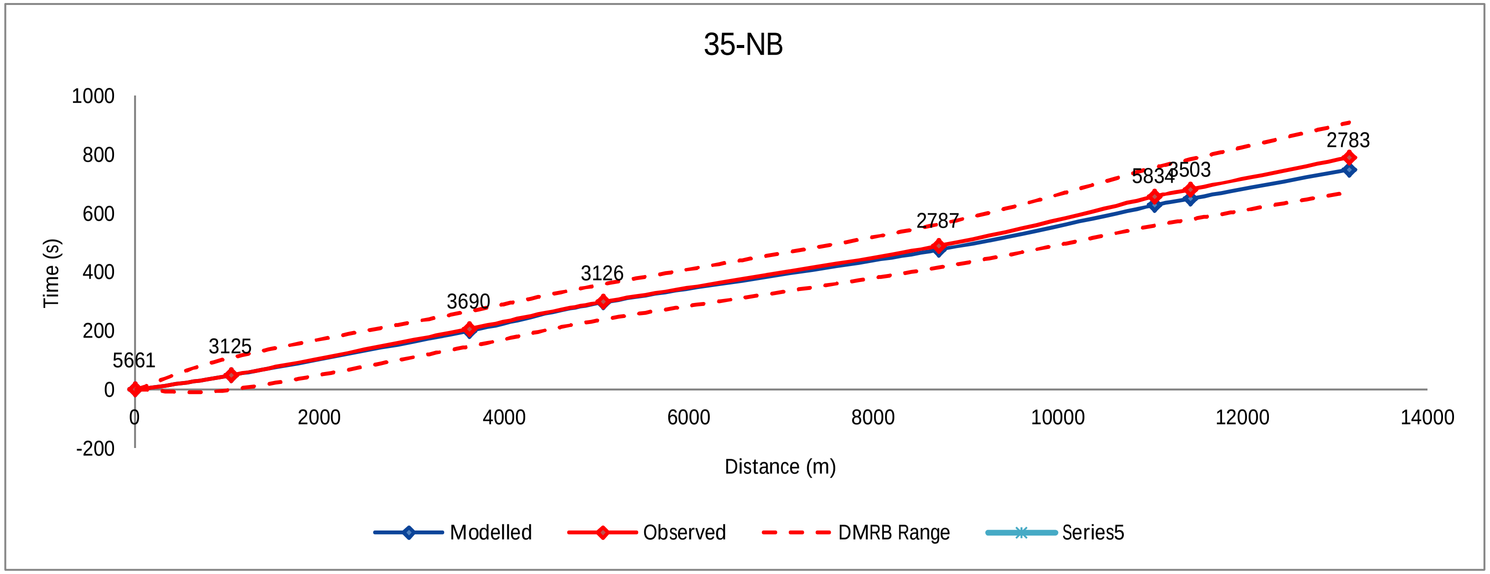

32-WB
Time (s)
Distance (m)
3309
5935
2625
2588
Modelled
Observed
DMRB Range
Series5


33-NB
Time (s)
600
500
400
300
200
100
0
3309
1013
5934
5638
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

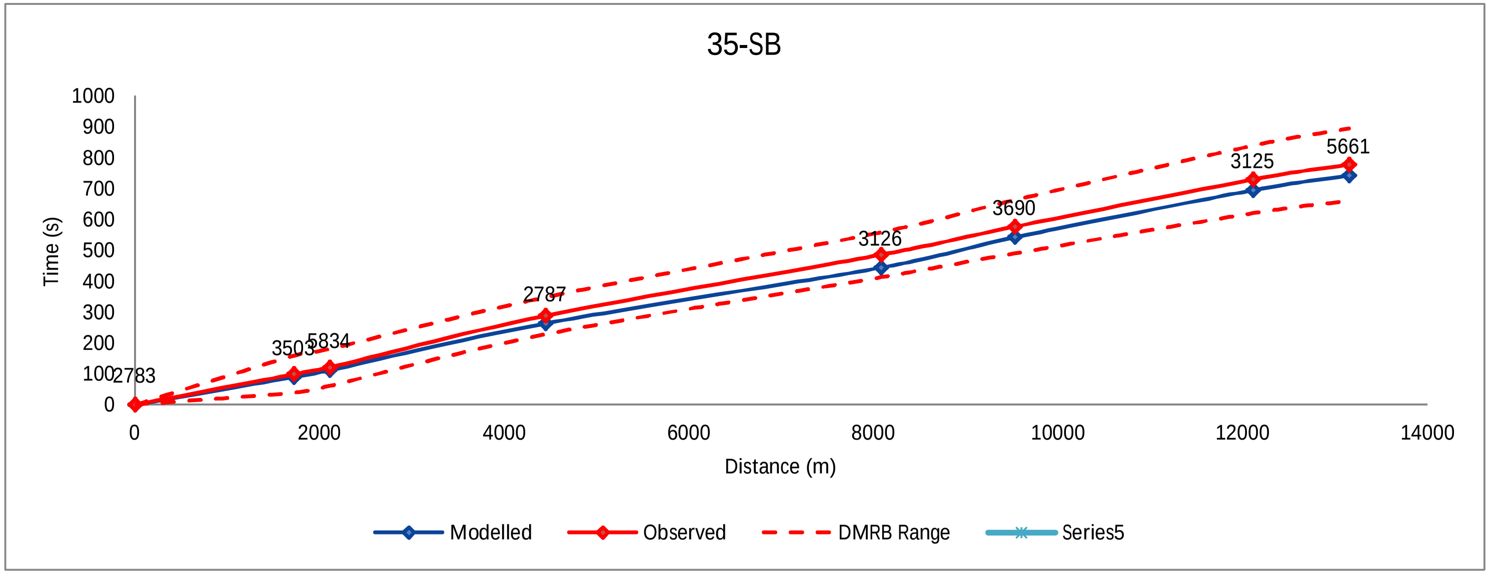

33-SB
Time (s)
600
500
400
300
200
100
0
5638
5934
1013
3309
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5


34-EB
Time (s)
700
600
500
400
300
200
100
0
5638
2145
2144
3349
5822
2071
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
Modelled
Observed
DMRB Range
Series5

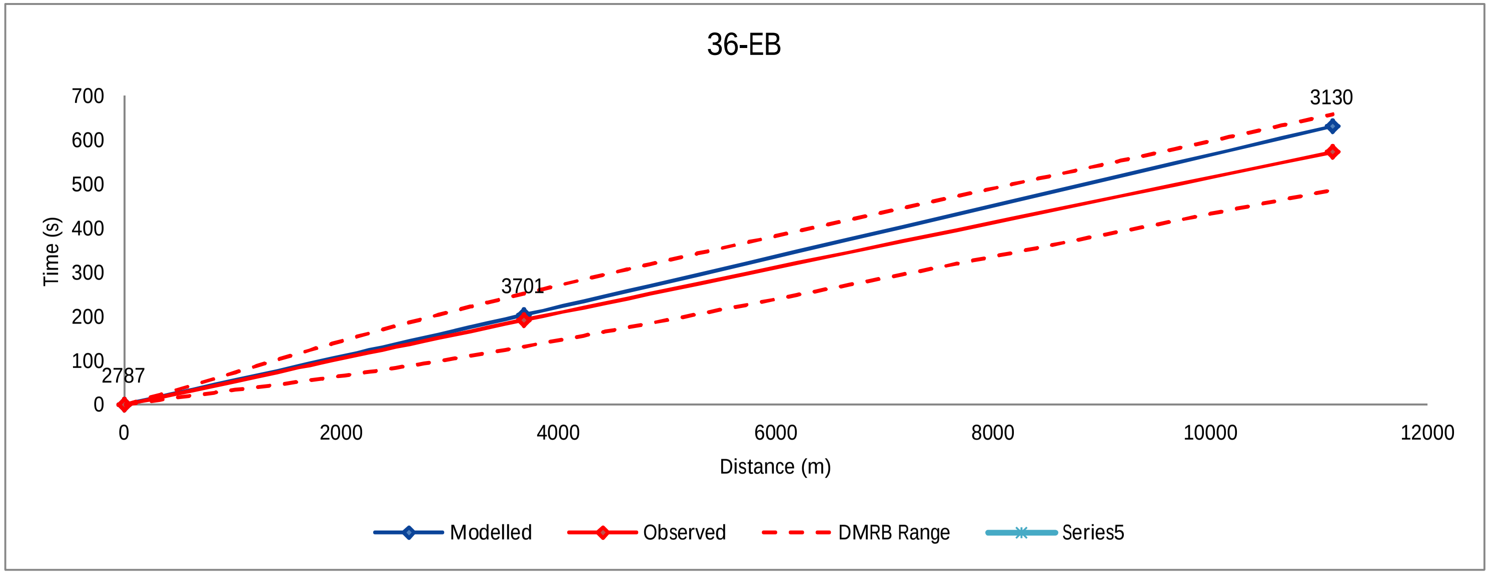

34-WB
Time (s)
700
600
500
400
300
200
100
0
2071
2141
3349
2143
2144
2145
5638
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
Modelled
Observed
DMRB Range
Series5

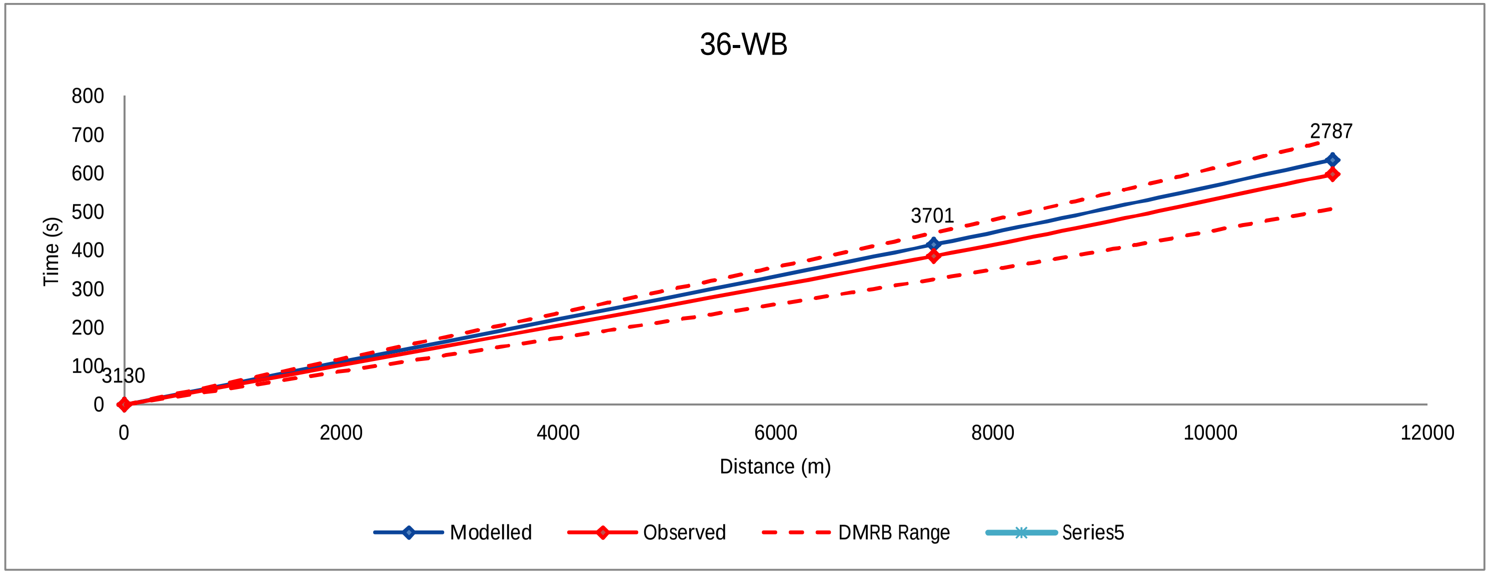


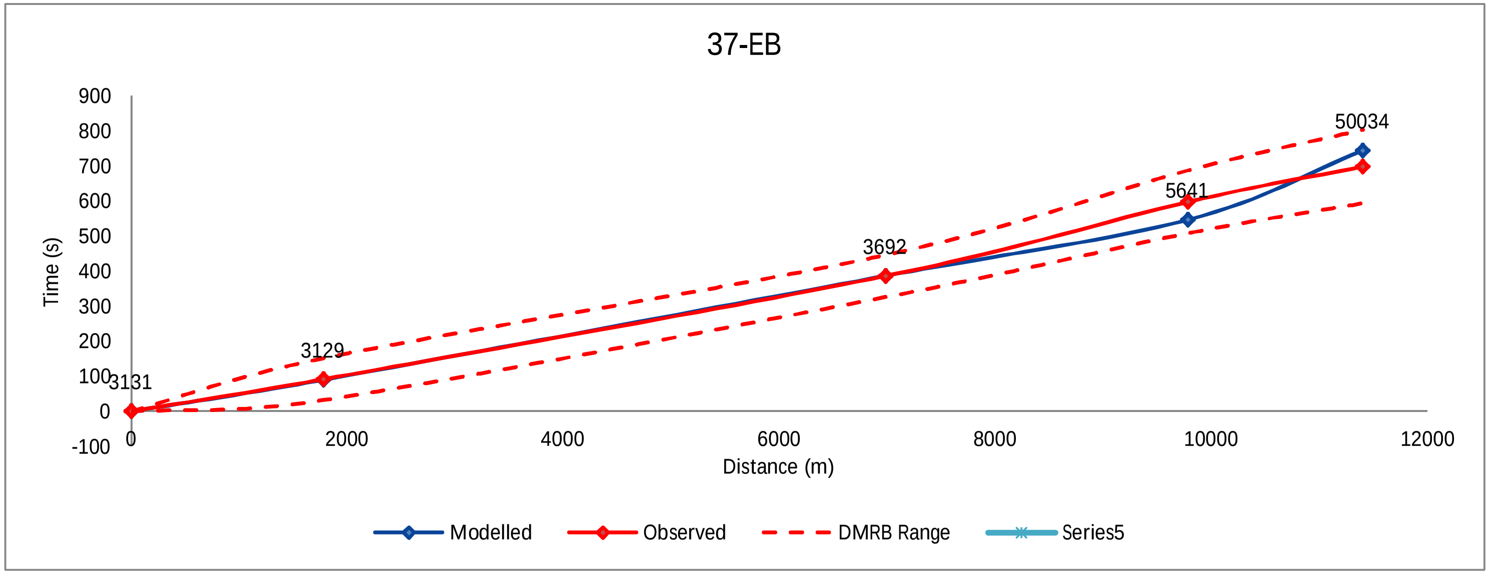
35-NB
Time (s)
1000
800
600
400
200
0
-200
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
5661
3125
3690
3126
2787
5834
3503
2783
Modelled
Observed
DMRB Range
Series5

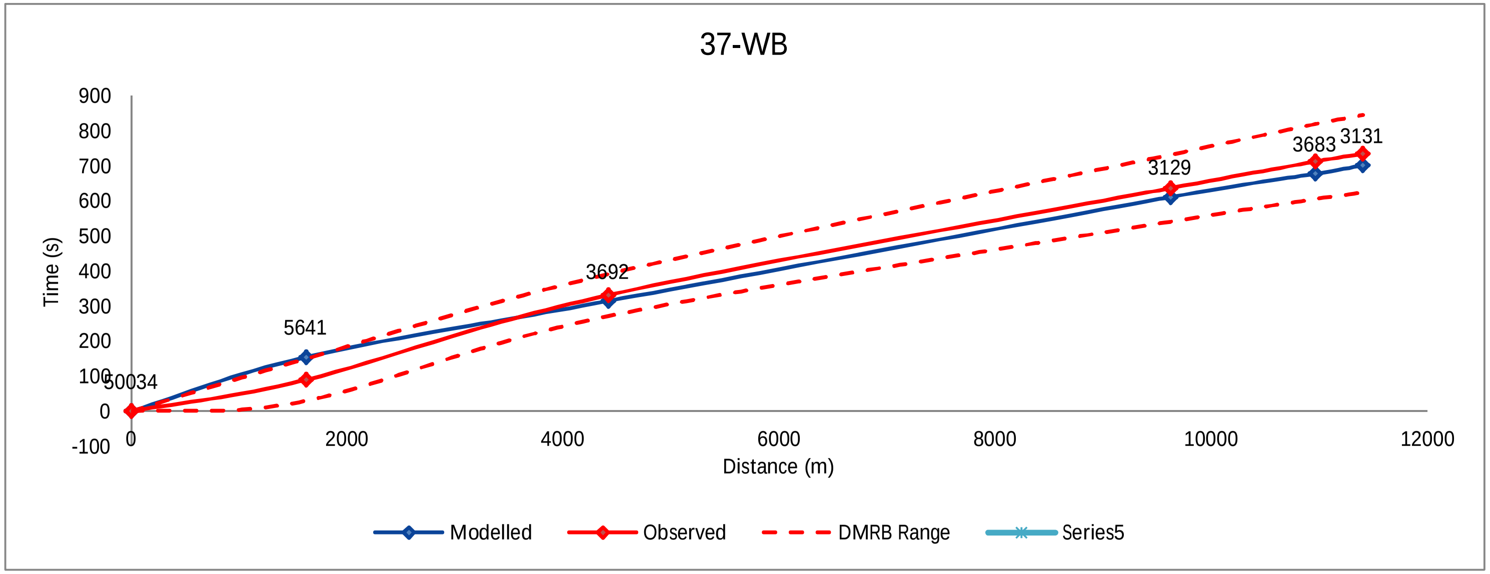


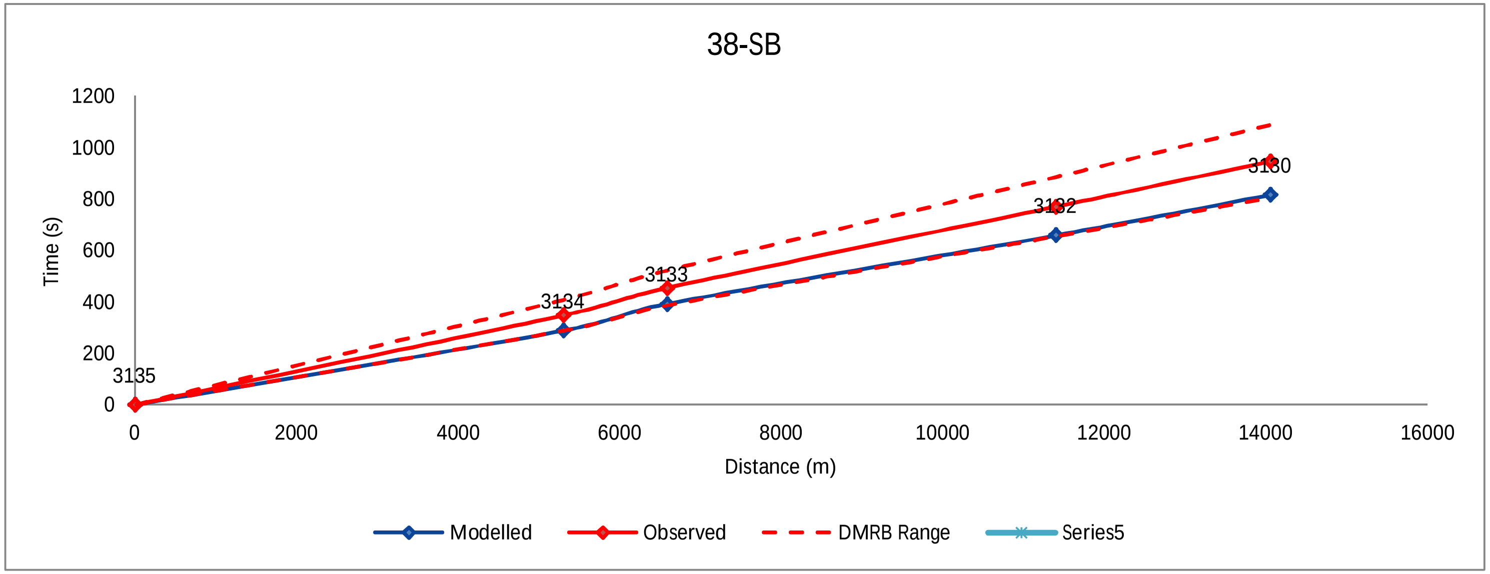
35-SB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
2783
3503
5834
2787
3126
3690
3125
5661
Modelled
Observed
DMRB Range
Series5

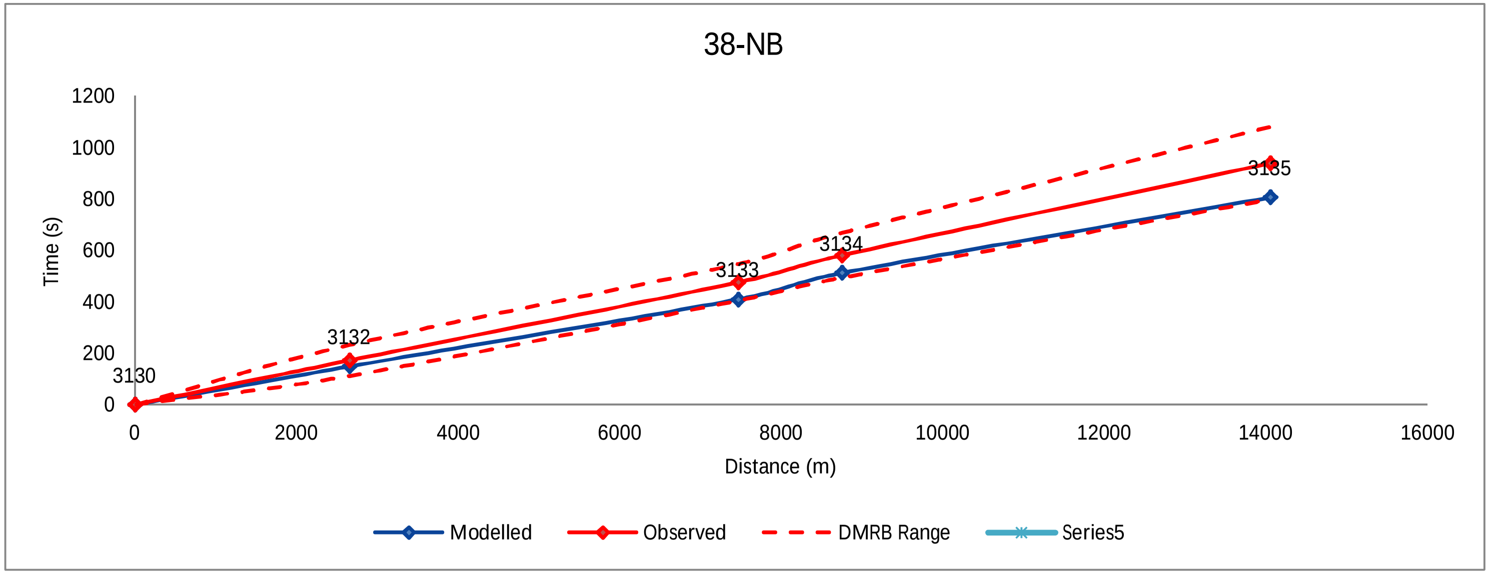

36-EB
Time (s)
700
600
500
400
300
200
100
0
2787
3701
3130
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

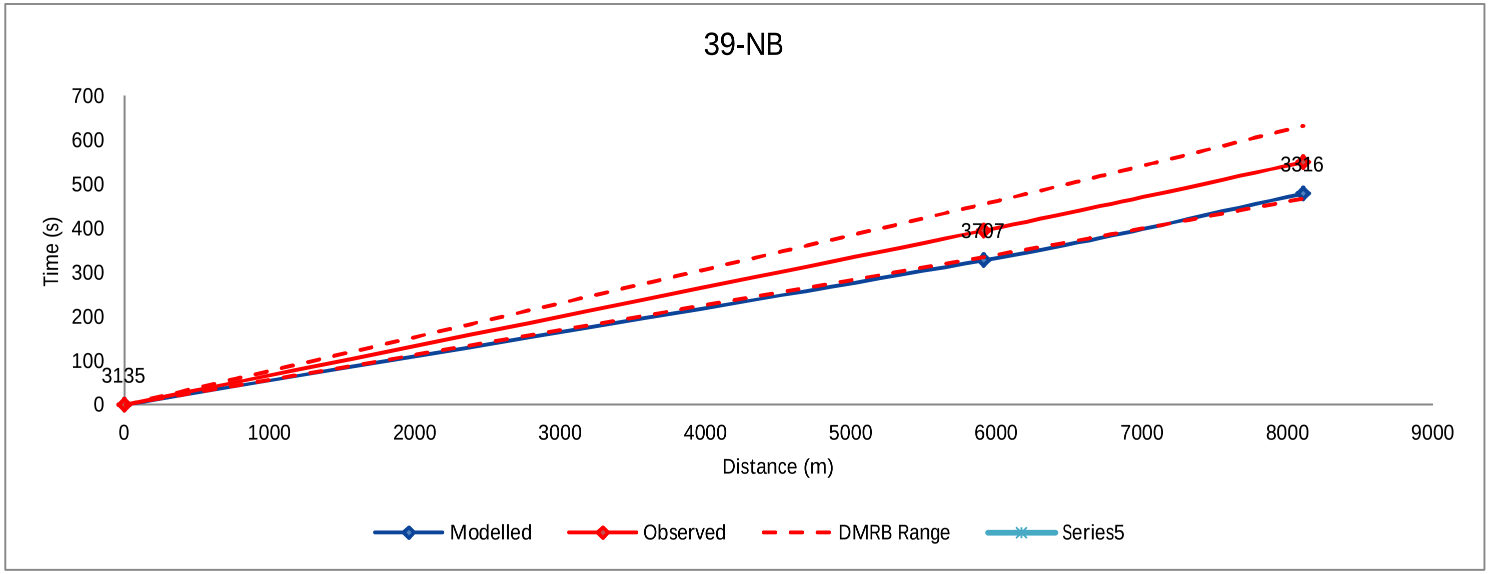

36-WB
Time (s)
800
700
600
500
400
300
200
100
0
3130
3701
2787
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

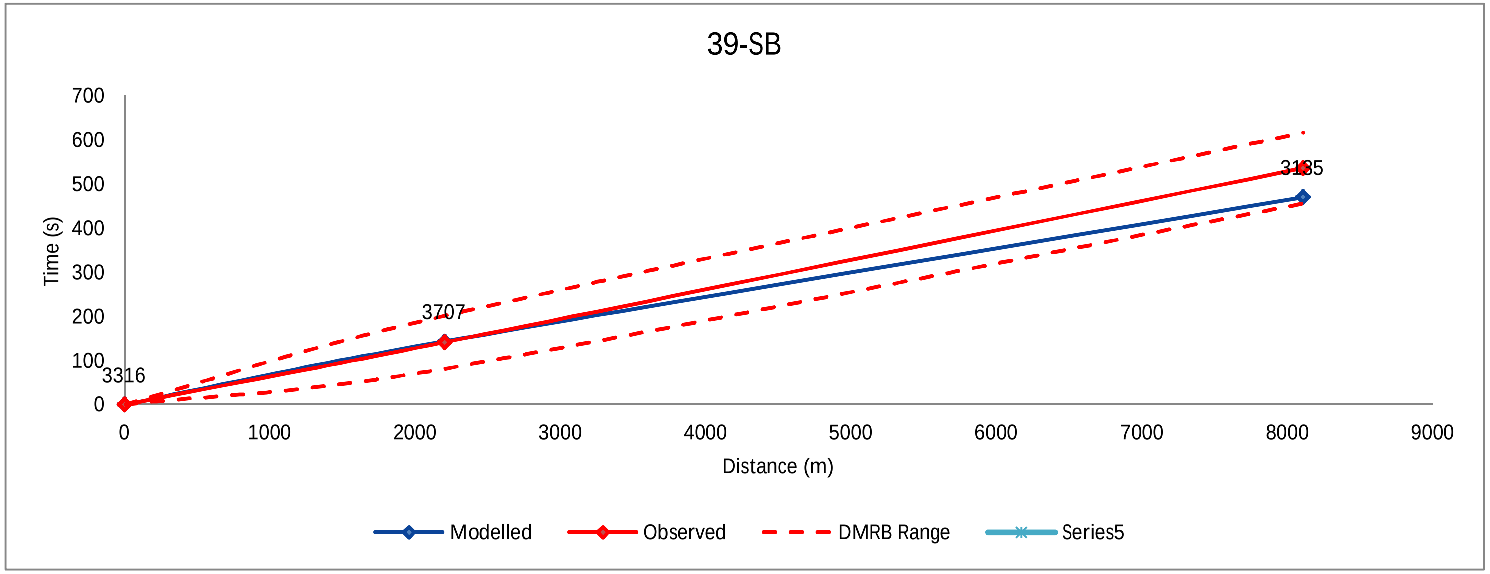

37-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
Distance (m)
3131
3129
3692
5641
50034
Modelled
Observed
DMRB Range
Series5

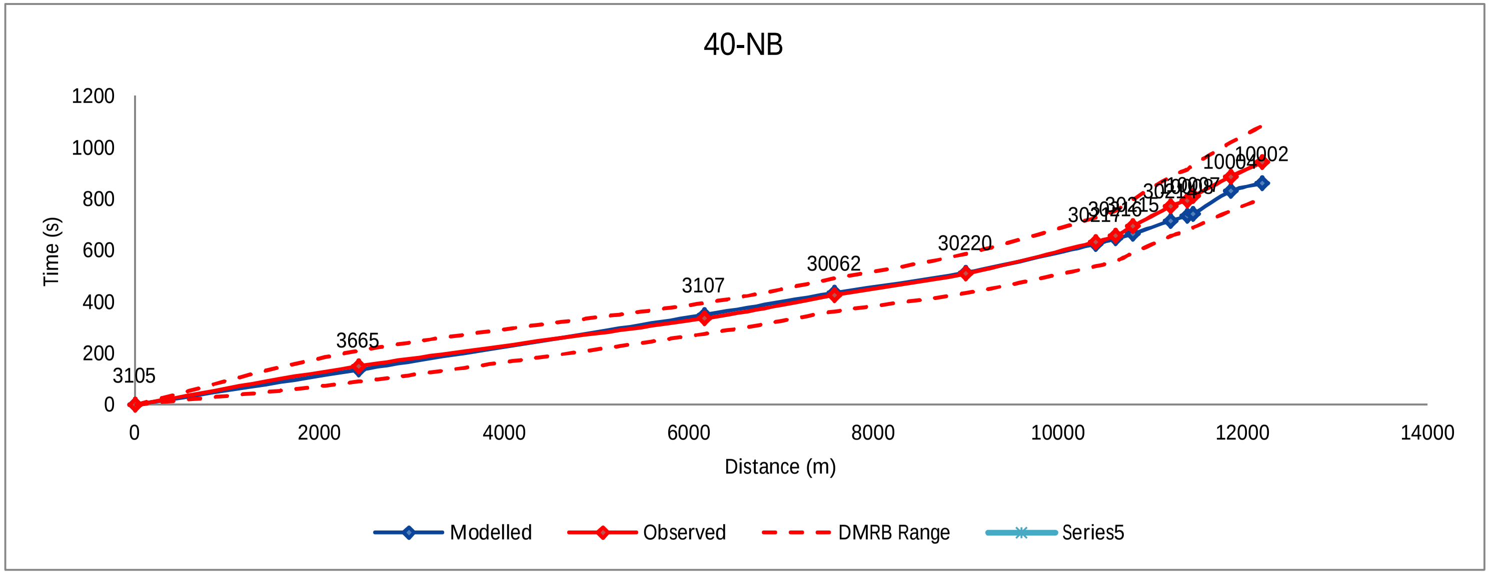

37-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
Distance (m)
50034
5641
3692
3129
3683
3131
Modelled
Observed
DMRB Range
Series5

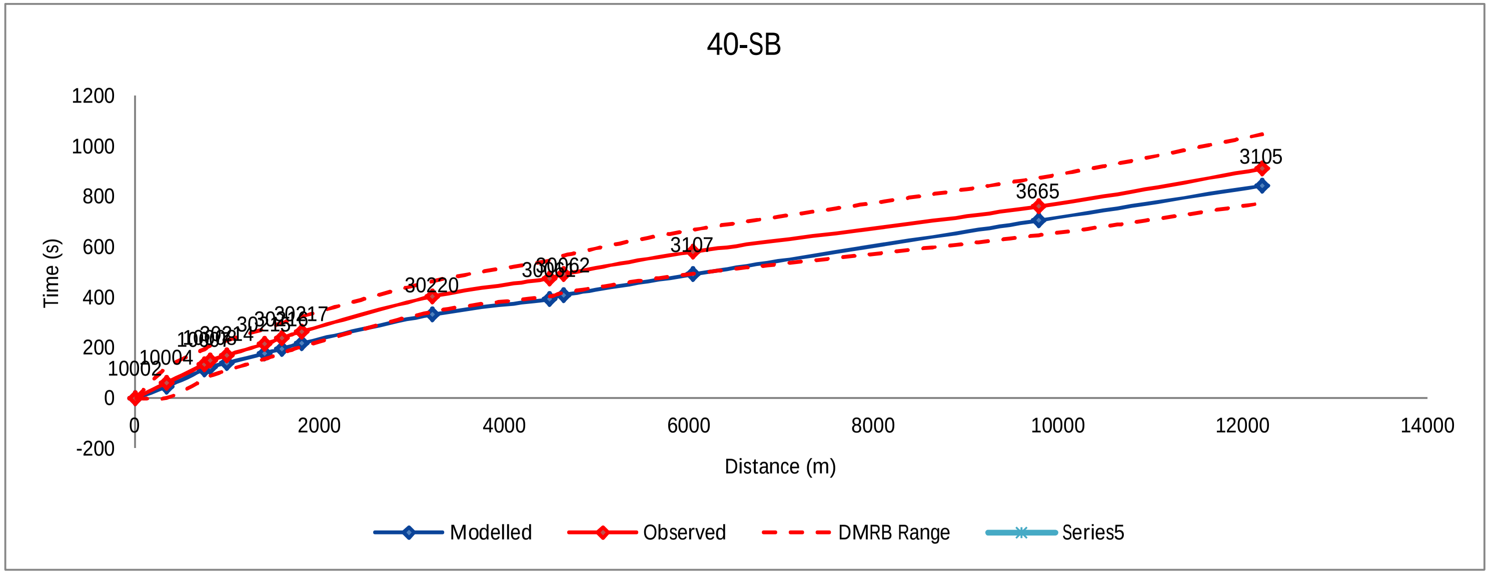

38-SB
Time (s)
1200
1000
800
600
400
200
0
3135
3134
3133
3132
3130
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

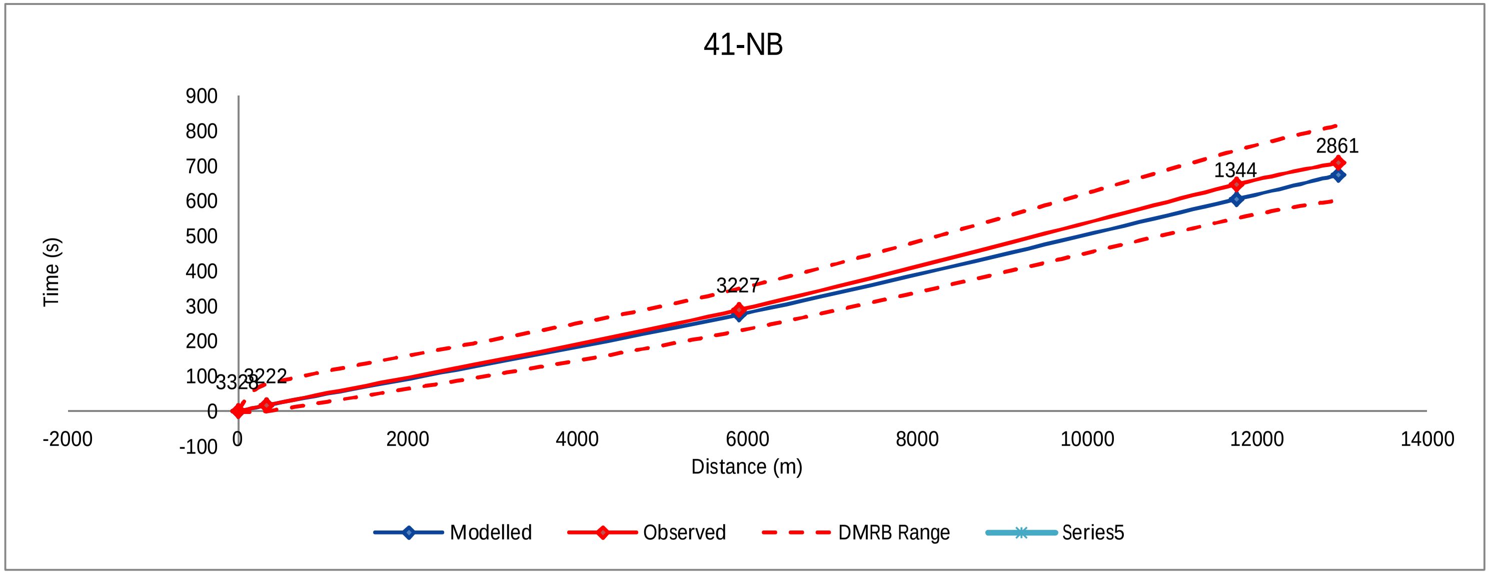

38-NB
Time (s)
1200
1000
800
600
400
200
0
3130
3132
3133
3134
3135
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

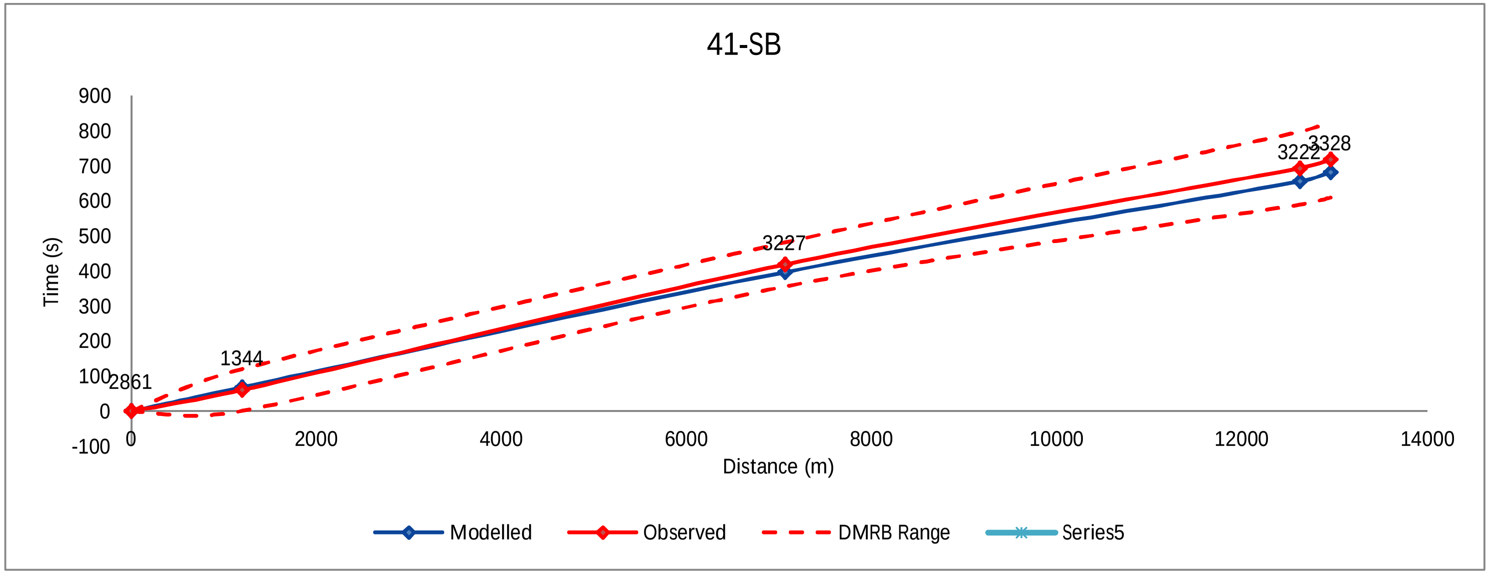

39-NB
Time (s)
0
100
200
300
400
500
600
700
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
3135
3707
3316
Modelled
Observed
DMRB Range
Series5

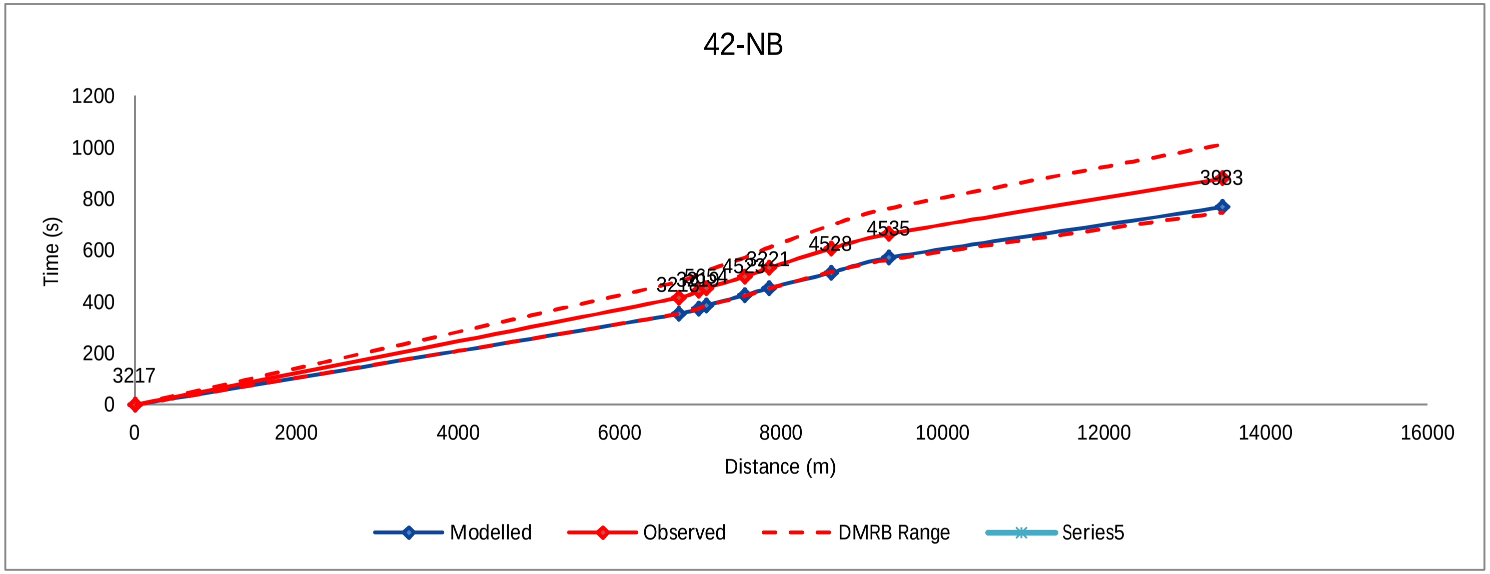

39-SB
Time (s)
0
100
200
300
400
500
600
700
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
3316
3707
3135
Modelled
Observed
DMRB Range
Series5

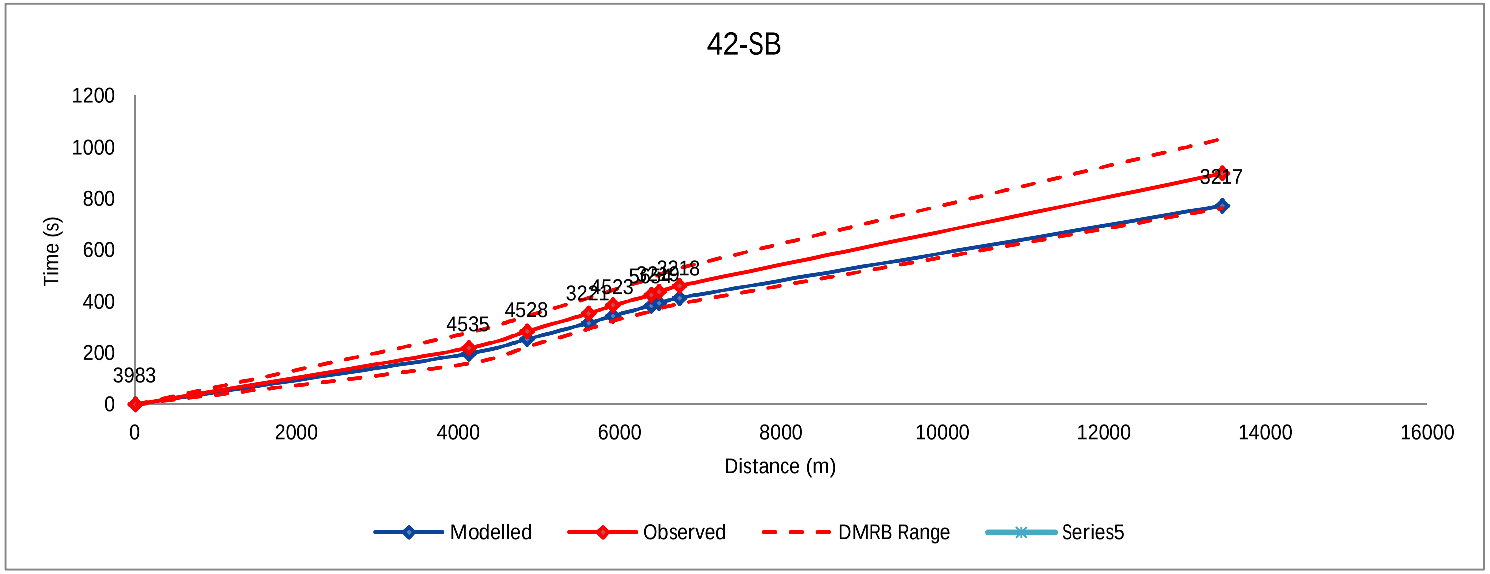

40-NB
Time (s)
Distance (m)
3105
3665
3107
30062
30220
10002
Modelled
Observed
DMRB Range
Series5

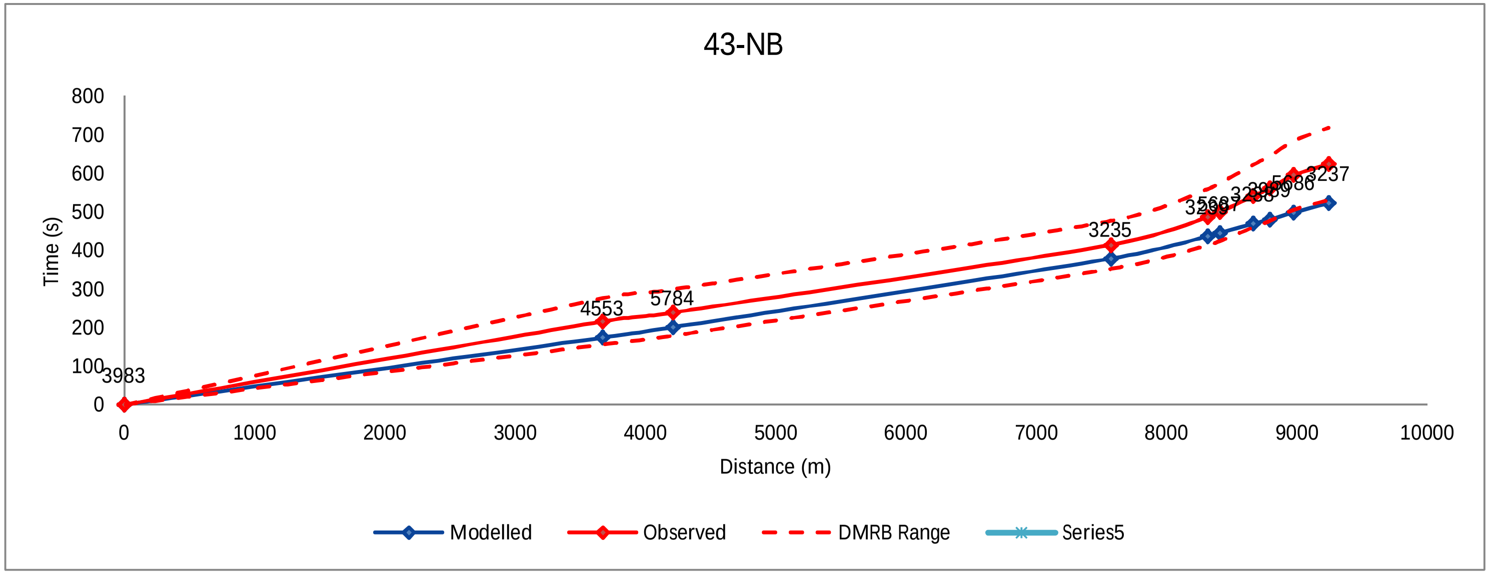

40-SB
Time (s)
Distance (m)
10002
10004
30220
3107
3665
3105
Modelled
Observed
DMRB Range
Series5

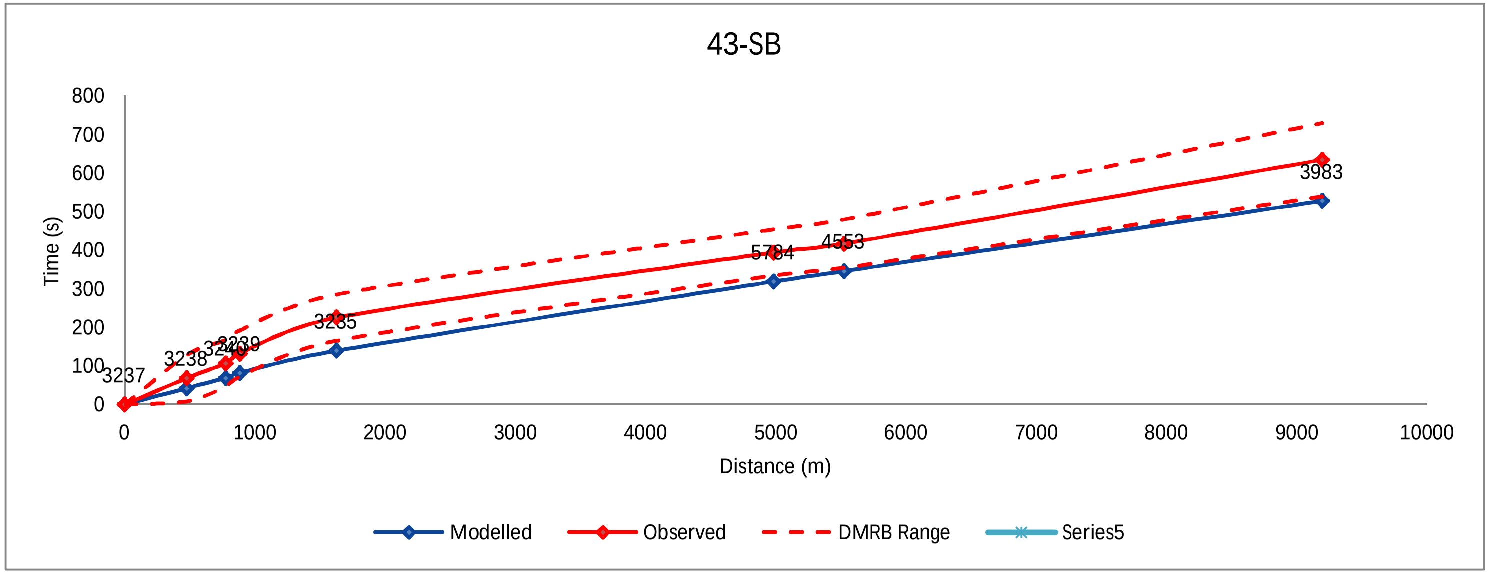

41-NB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
-2000
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3328
3222
3227
1344
2861
Modelled
Observed
DMRB Range
Series5

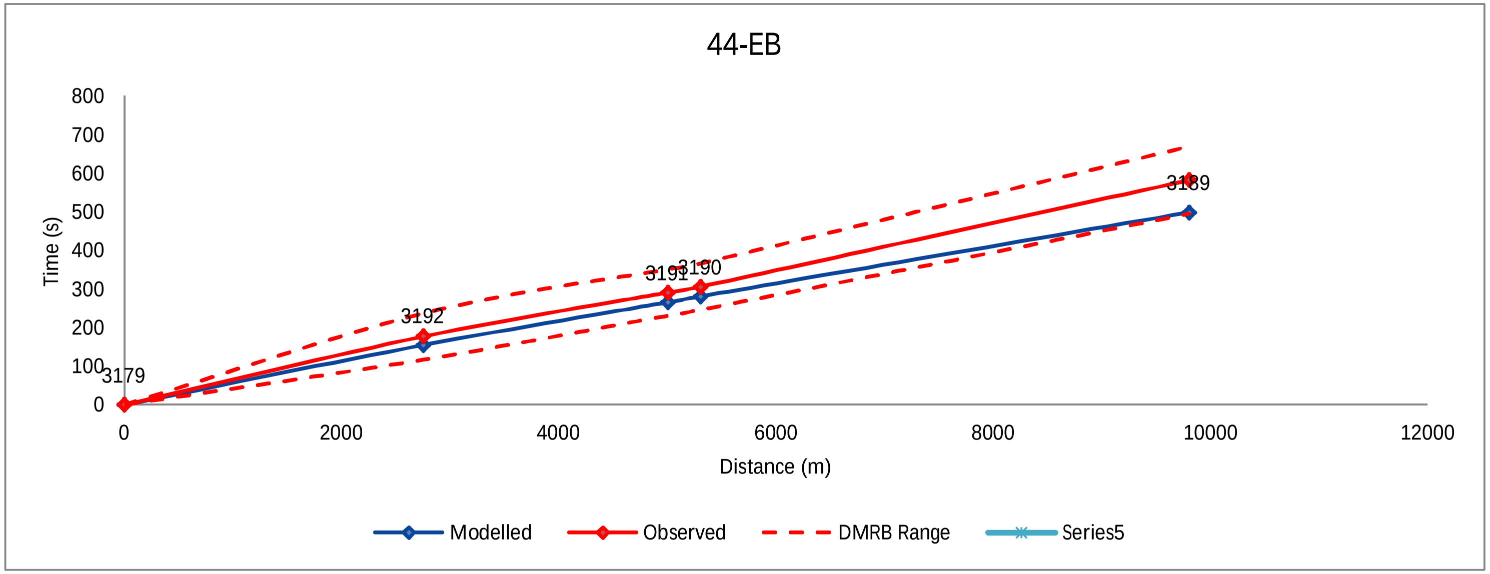

41-SB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
2861
1344
3227
3222
3328
Modelled
Observed
DMRB Range
Series5

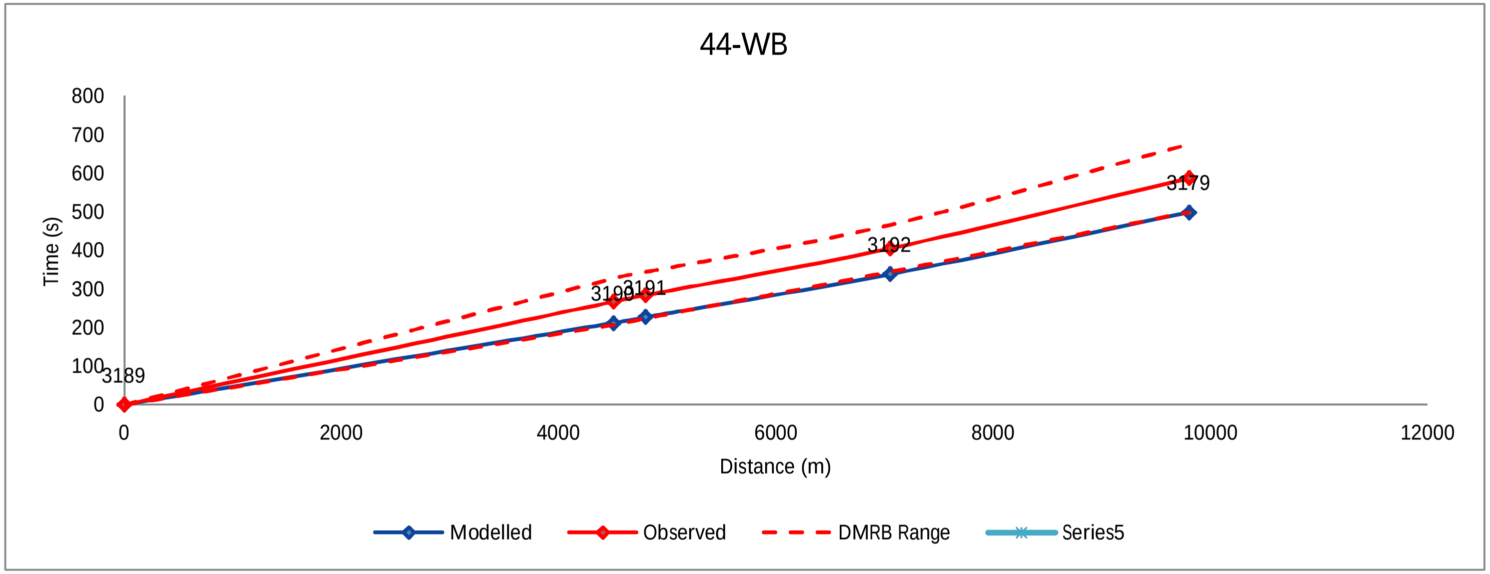

42-NB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5

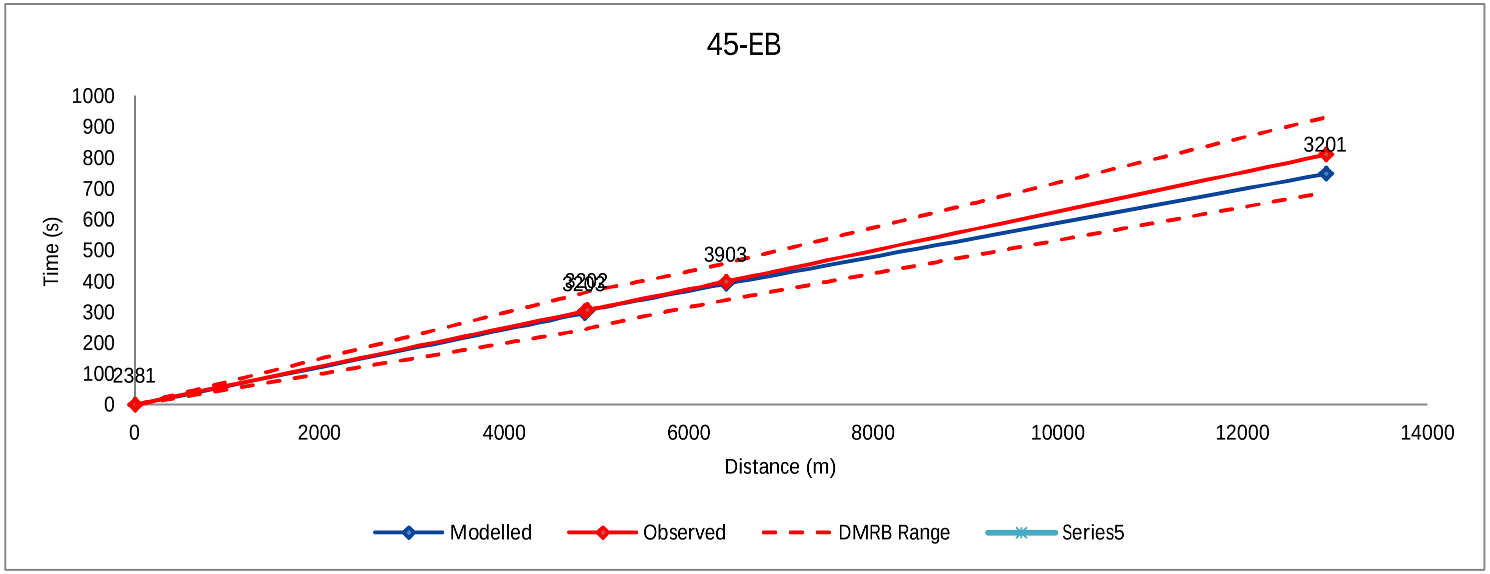

42-SB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5

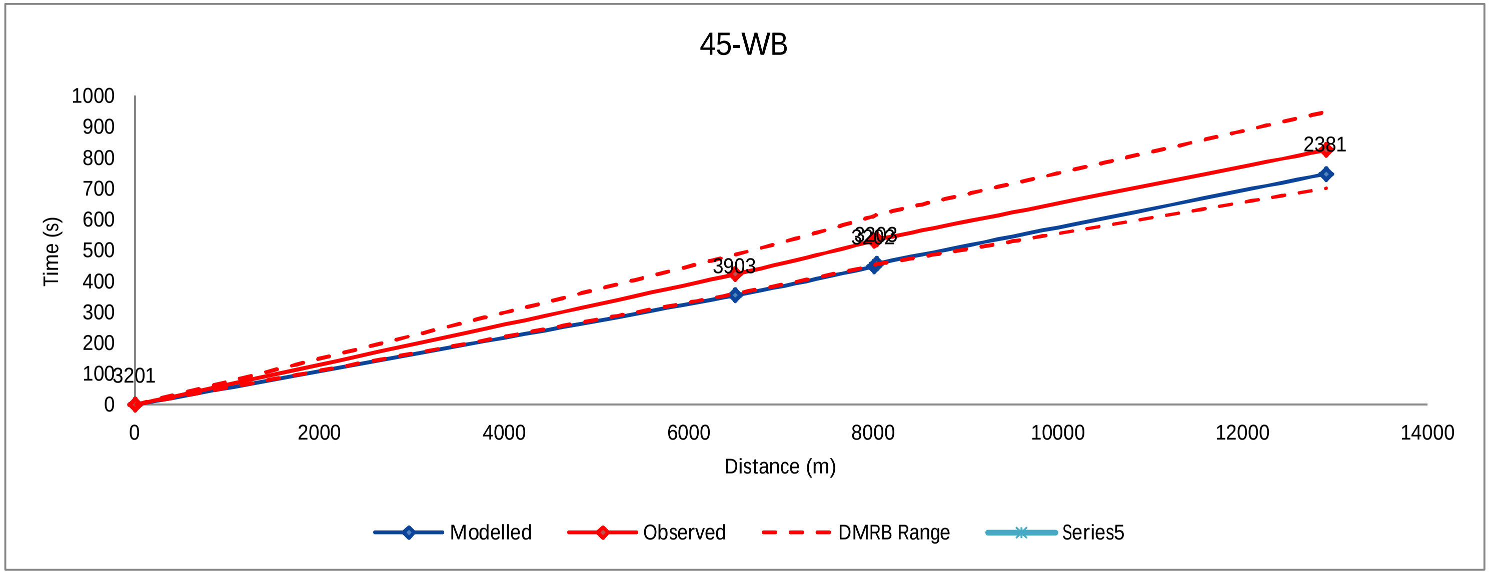

43-NB
Time (s)
Distance (m)
0
100
200
300
400
500
600
700
800
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
3983
4553
5784
3235
3237
Modelled
Observed
DMRB Range
Series5

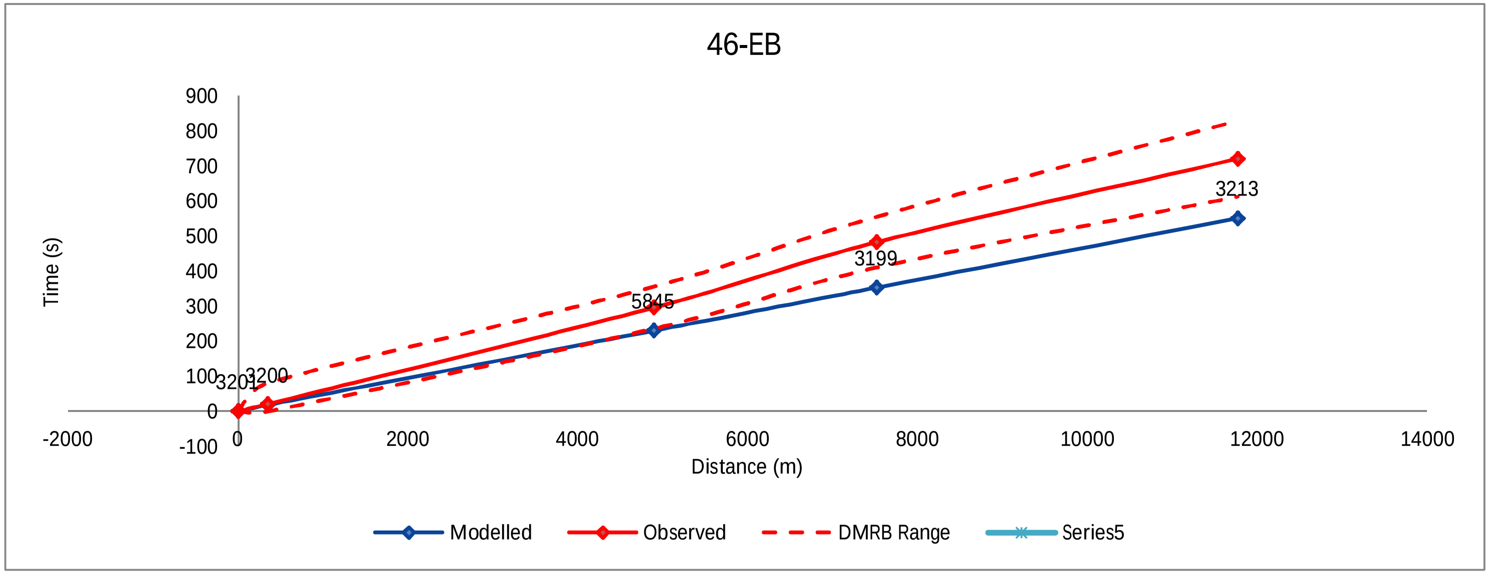

43-SB
Time (s)
Distance (m)
0
100
200
300
400
500
600
700
800
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
3237
3238
3235
5784
4553
3983
Modelled
Observed
DMRB Range
Series5

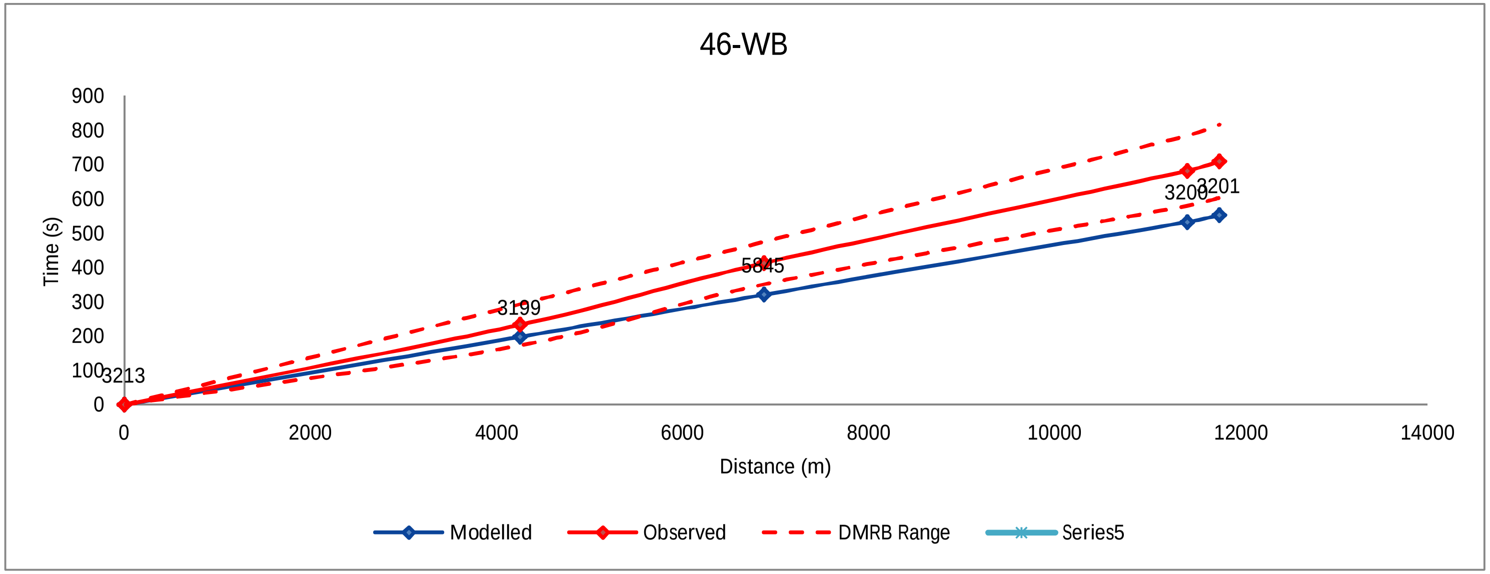

44-EB
Time (s)
800
700
600
500
400
300
200
100
0
3179
3192
3191
3190
3189
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

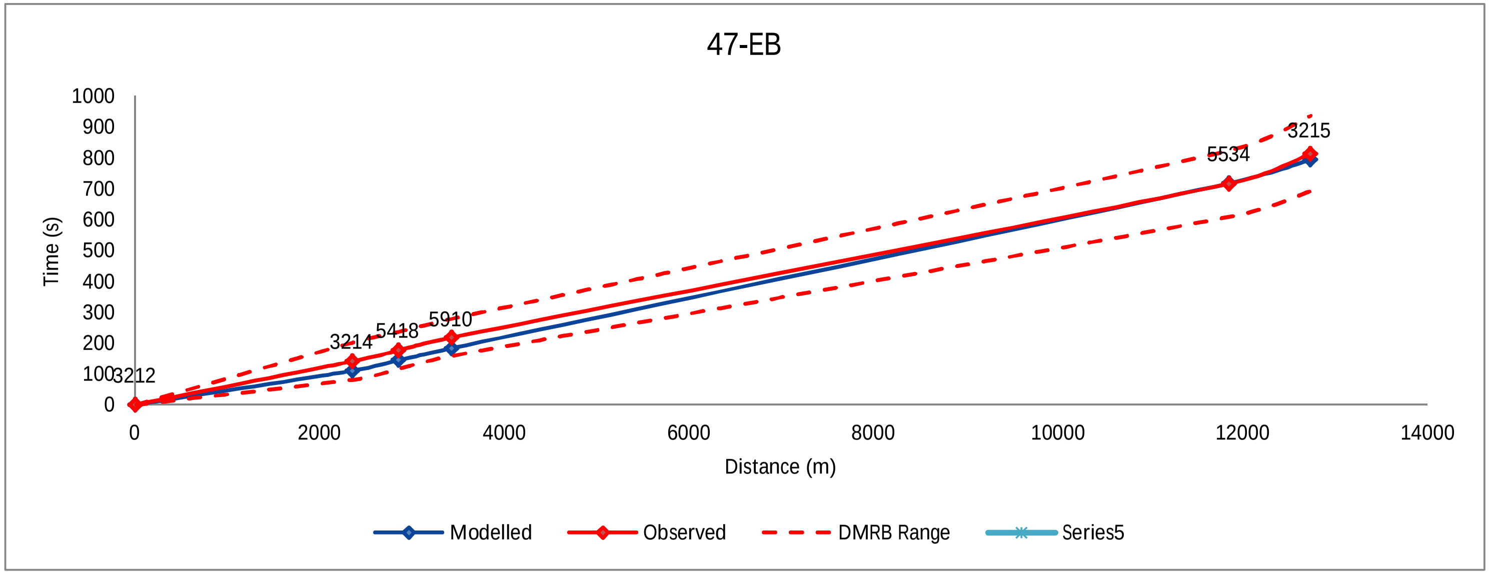

44-WB
Time (s)
800
700
600
500
400
300
200
100
0
3189
3190
3191
3192
3179
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5


45-EB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
Distance (m)
0
2000
4000
6000
8000
10000
12000
14000
2381
3202
3203
3903
3201
Modelled
Observed
DMRB Range
Series5

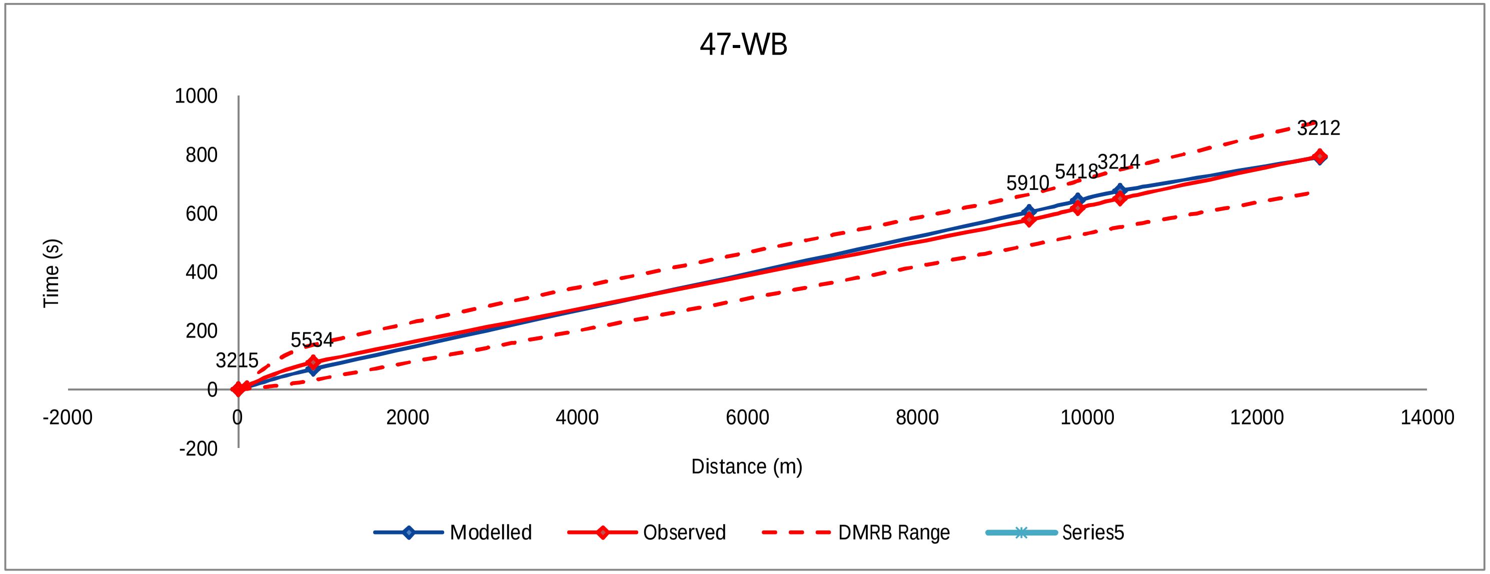

45-WB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
Distance (m)
0
2000
4000
6000
8000
10000
12000
14000
3201
3903
3202
2381
Modelled
Observed
DMRB Range
Series5


46-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
-2000
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3201
3200
5845
3199
3213
Modelled
Observed
DMRB Range
Series5

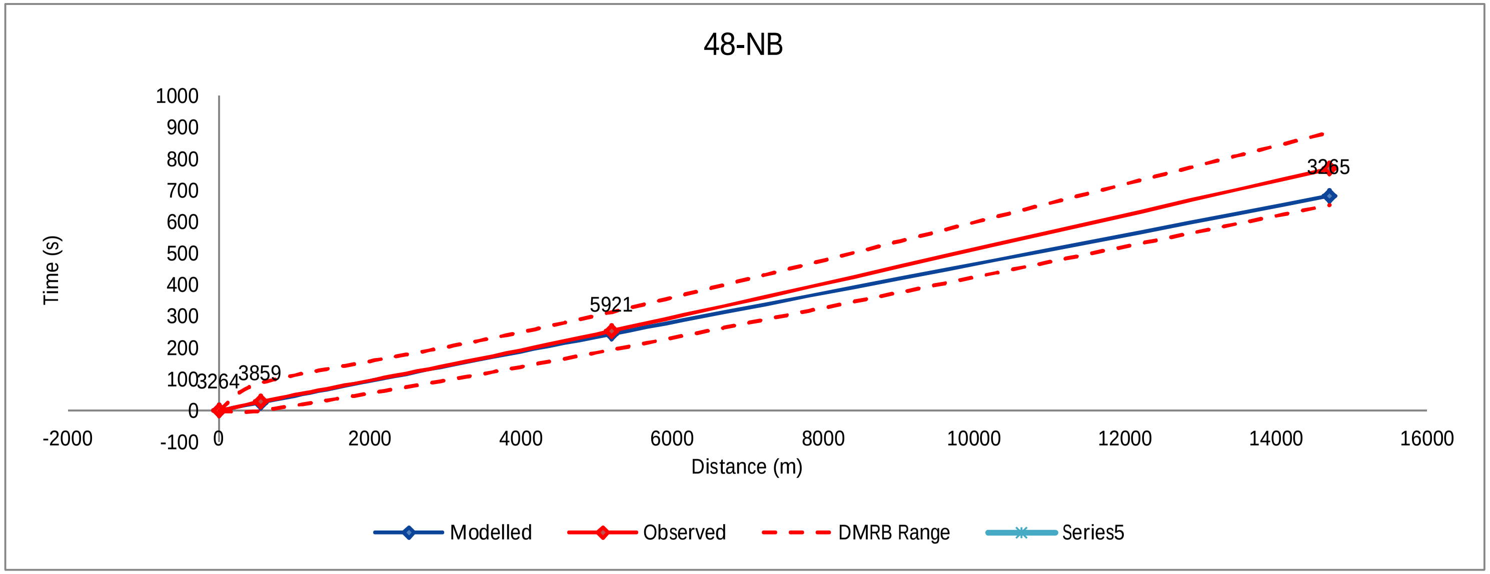

46-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3213
3199
5845
3200
3201
Modelled
Observed
DMRB Range
Series5

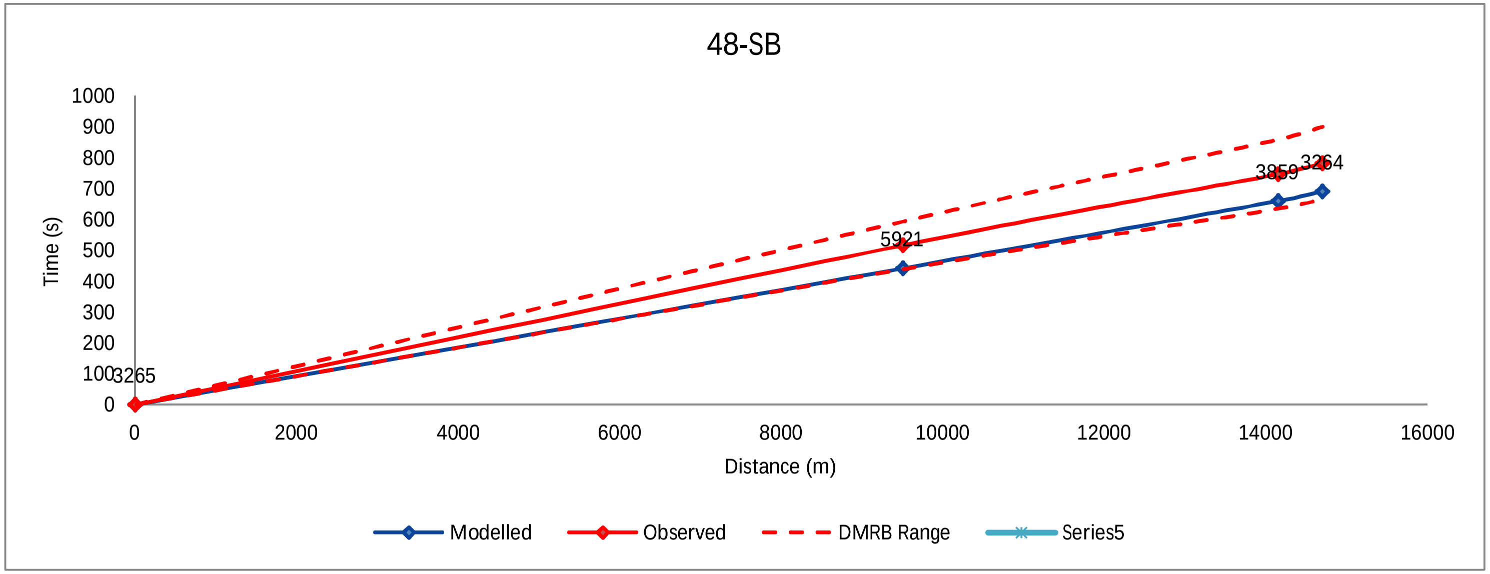


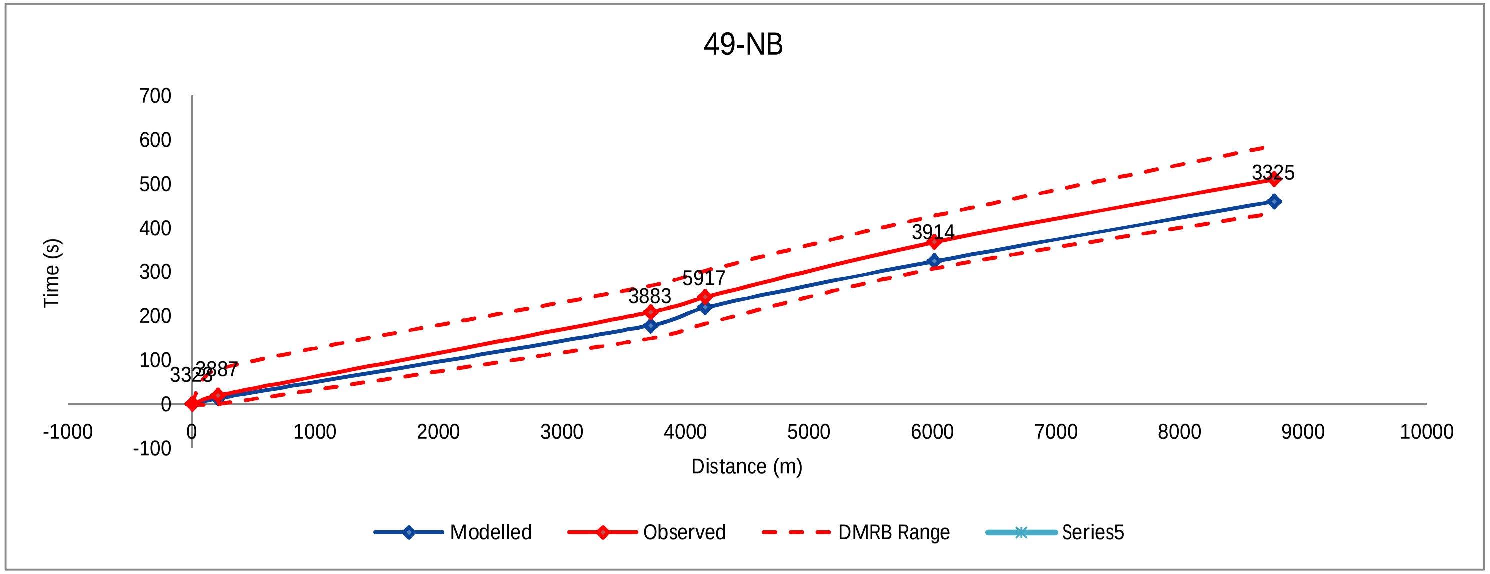
47-EB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3212
3214
5418
5910
5534
3215
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

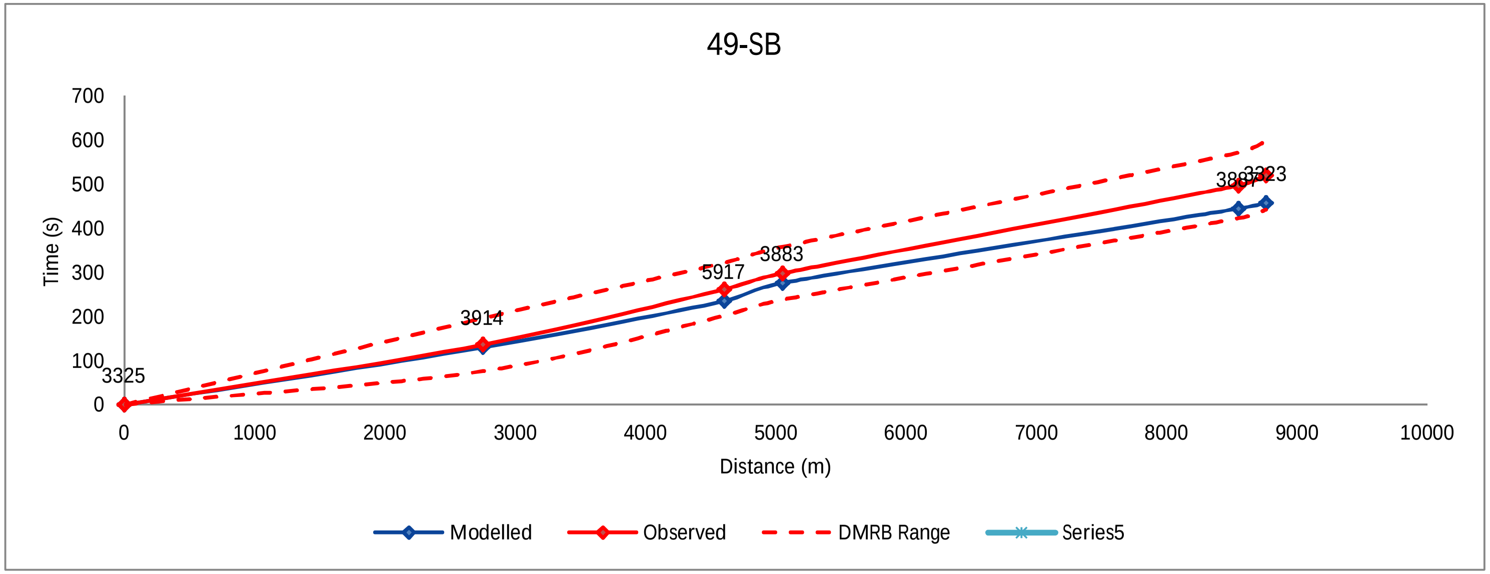


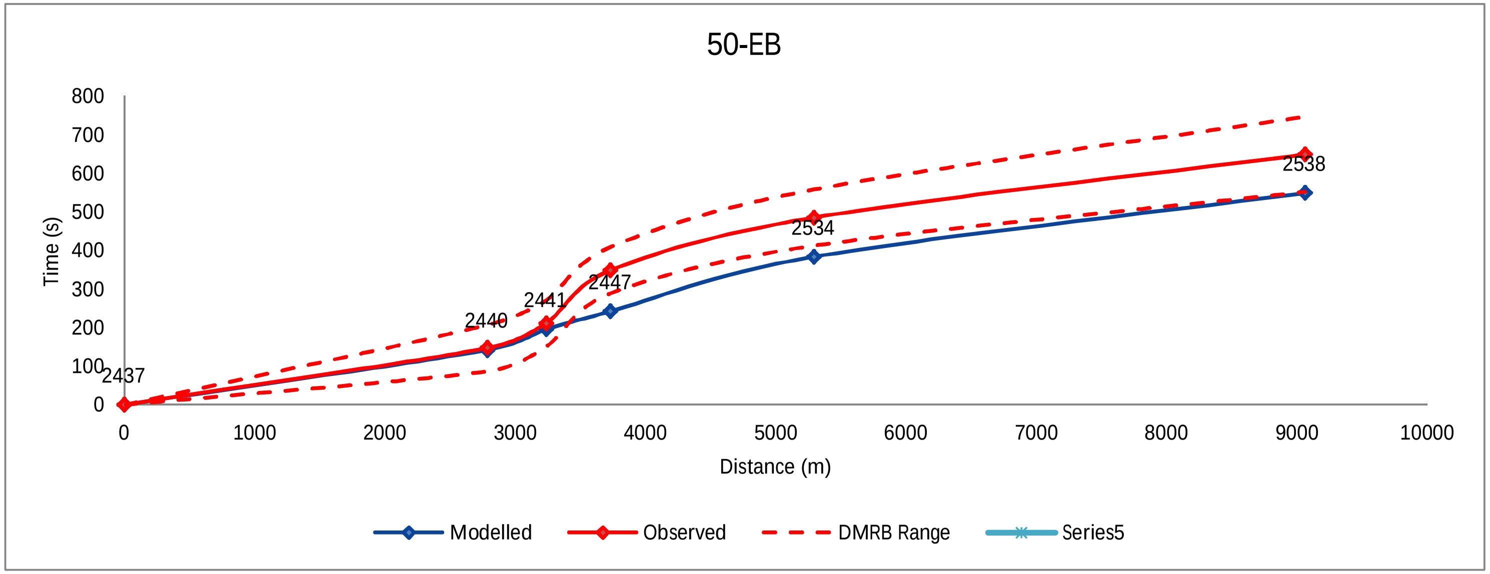
47-WB
Time (s)
1000
800
600
400
200
0
-200
3215
5534
5910
5418
3214
3212
-2000
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

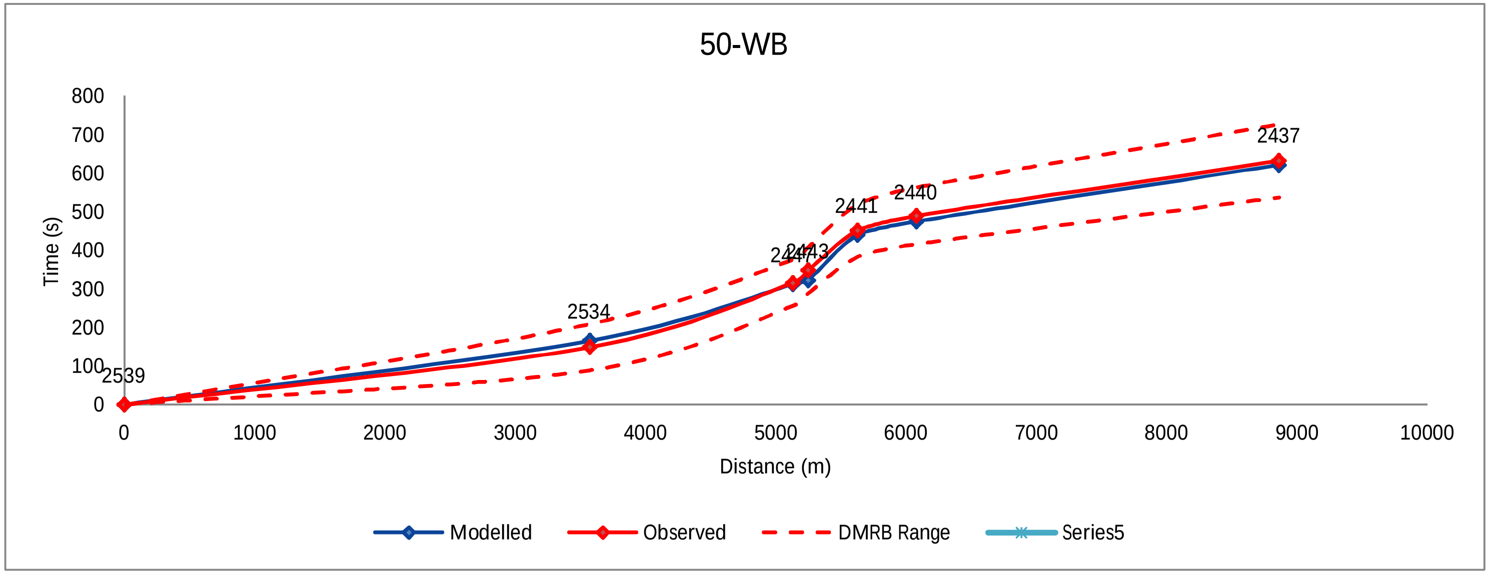

48-NB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
-100
-2000
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3264
3859
5921
3265
Modelled
Observed
DMRB Range
Series5

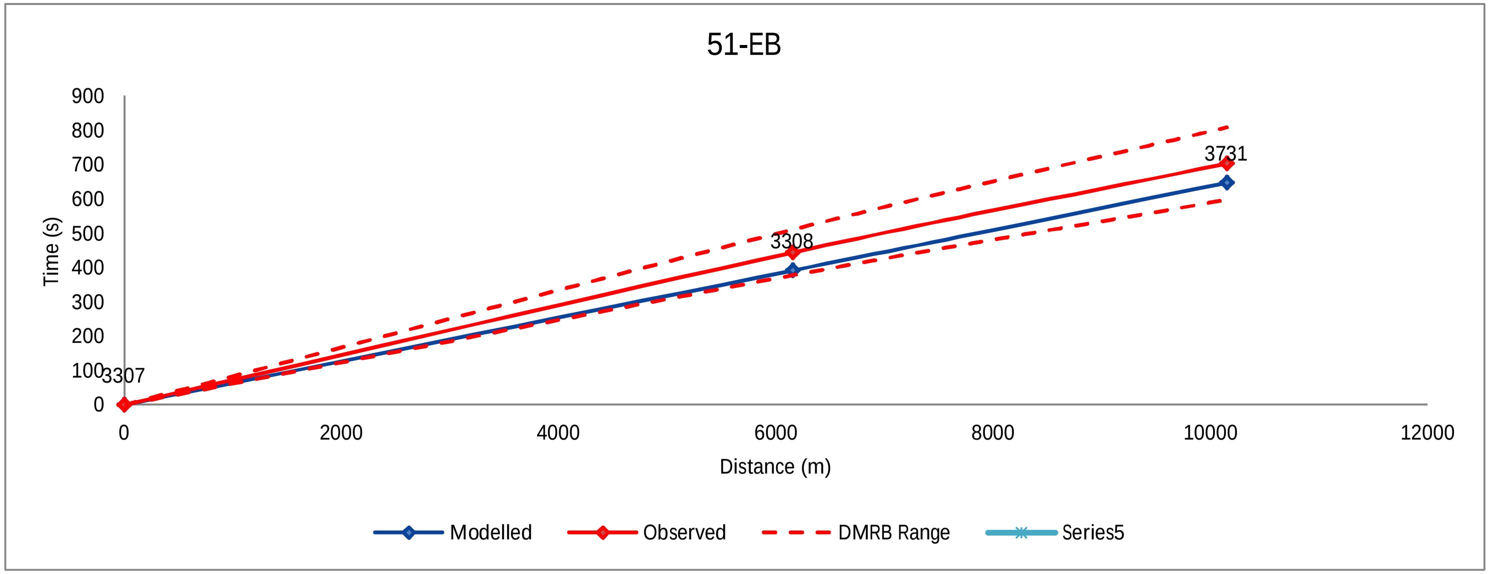

48-SB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3265
5921
3859
3264
Modelled
Observed
DMRB Range
Series5

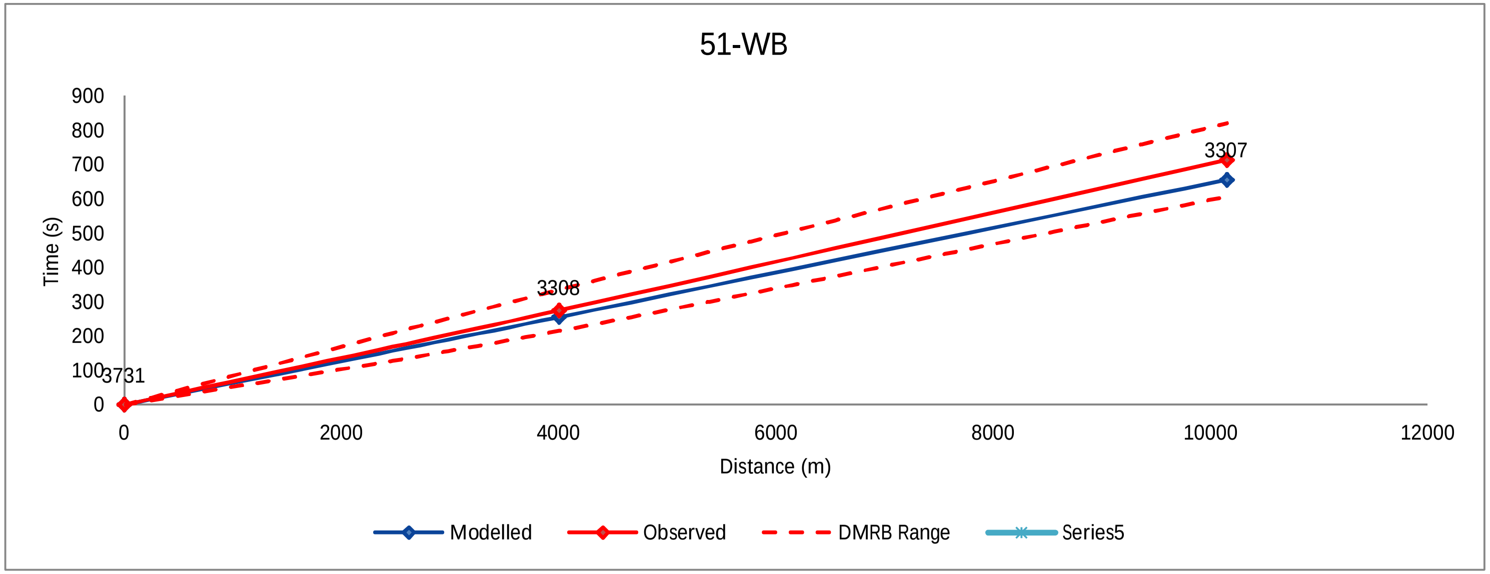

49-NB
Time (s)
700
600
500
400
300
200
100
0
-100
-1000
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
3887
3883
5917
3914
3325
Modelled
Observed
DMRB Range
Series5

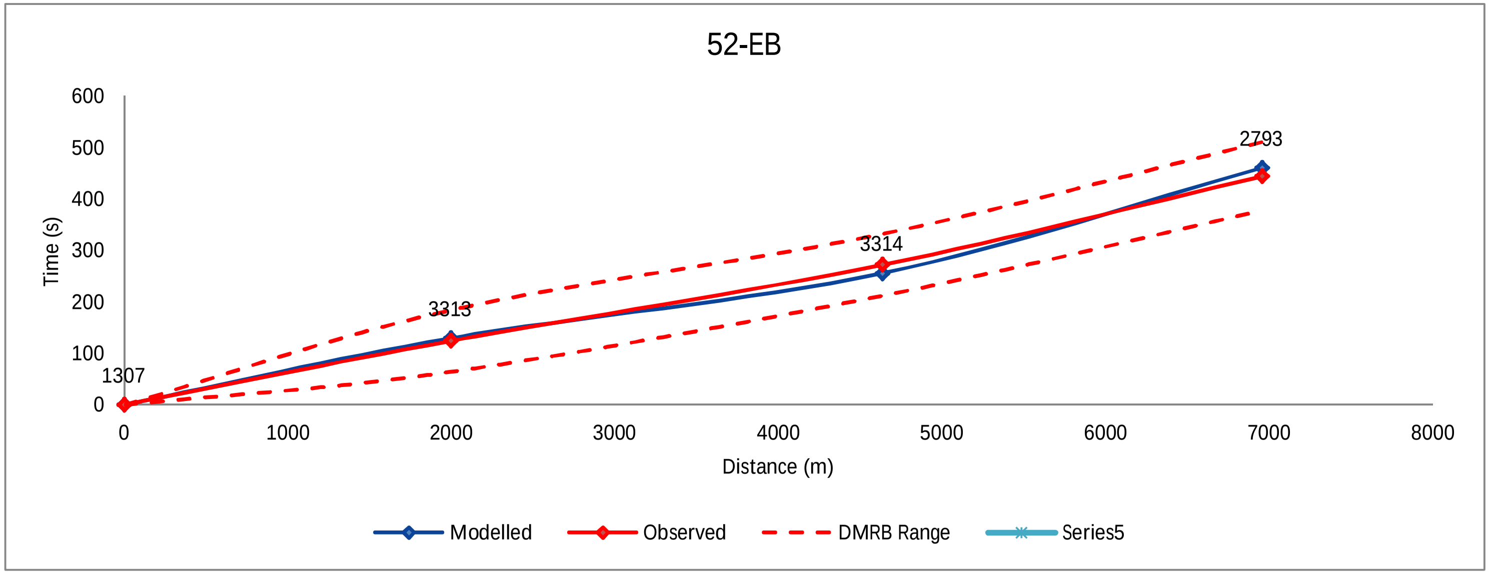

49-SB
Time (s)
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
3325
3914
5917
3883
3323
Modelled
Observed
DMRB Range
Series5

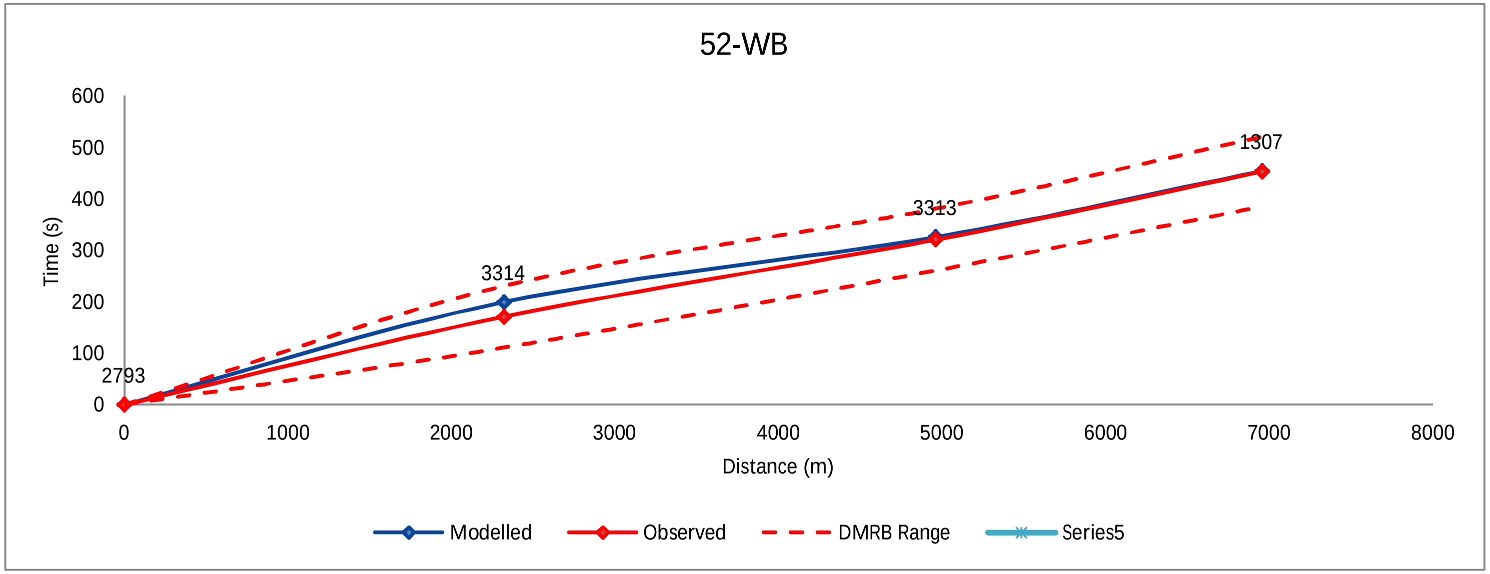

50-EB
Time (s)
Distance (m)
2437
2440
2441
2447
2534
2538
Modelled
Observed
DMRB Range
Series5

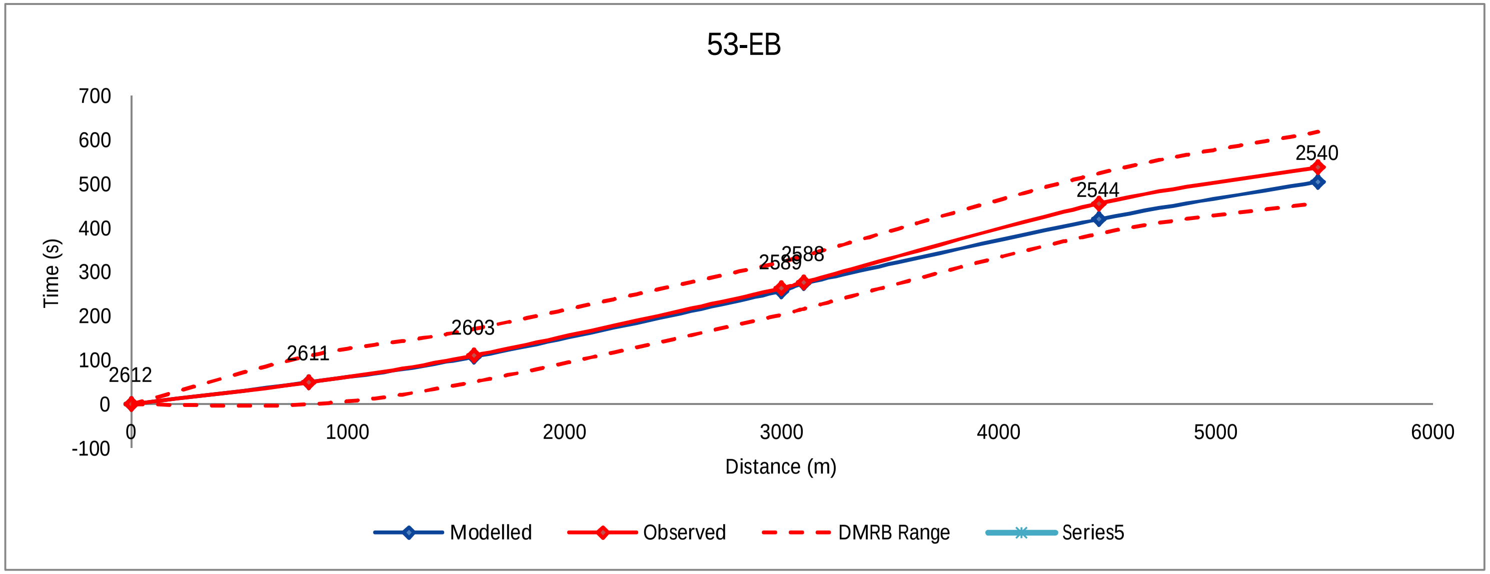

50-WB
Time (s)
Distance (m)
2539
2534
2441
2440
2437
Modelled
Observed
DMRB Range
Series5

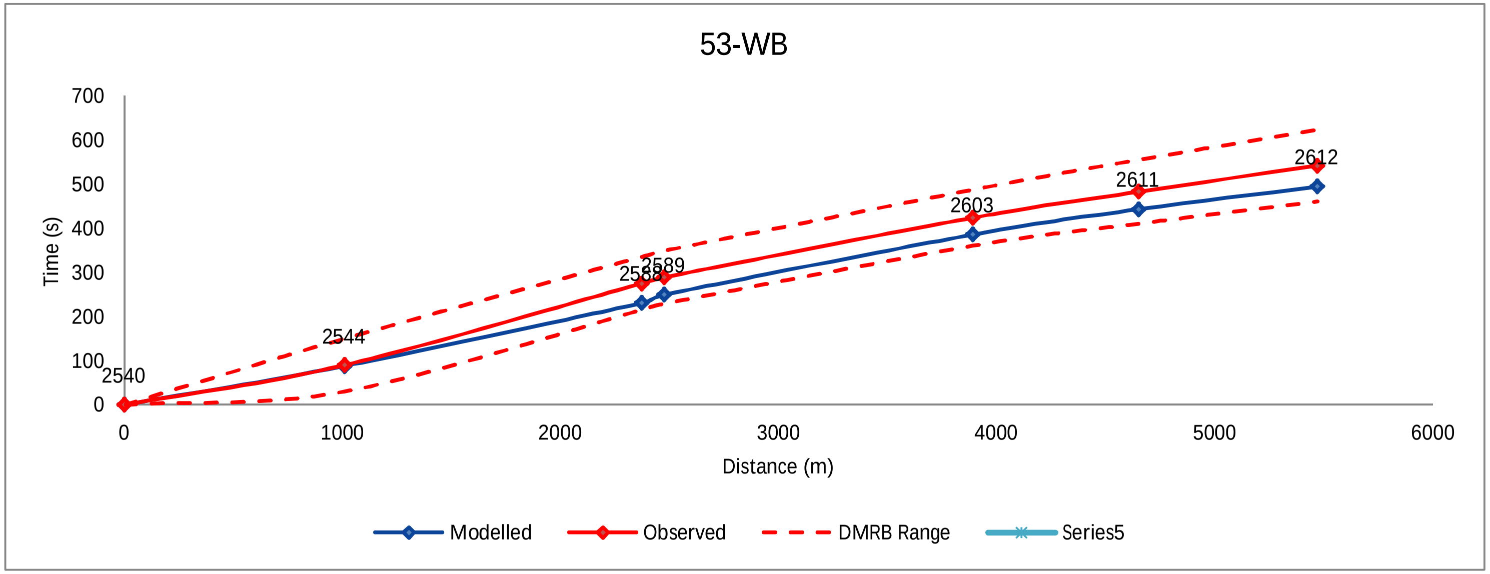

51-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
3307
3308
3731
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

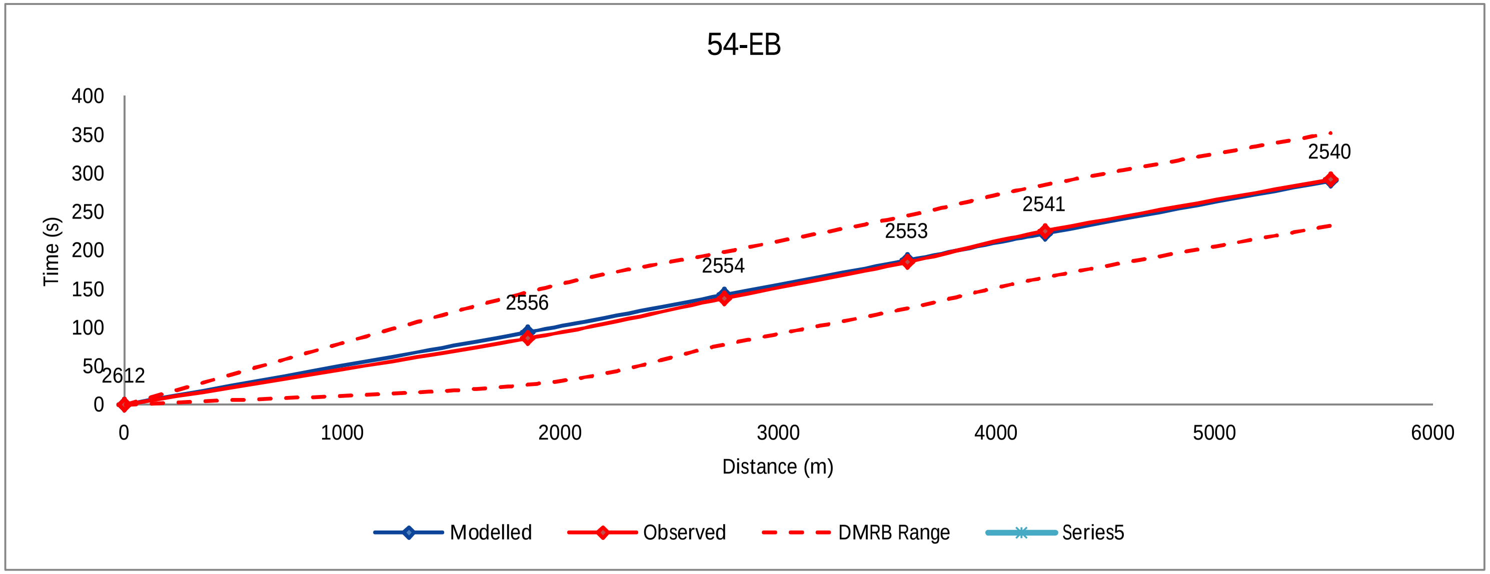

51-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
3731
3308
3307
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5


52-EB
600
500
400
300
200
100
0
Time (s)
1307
3313
3314
2793
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
Modelled
Observed
DMRB Range
Series5

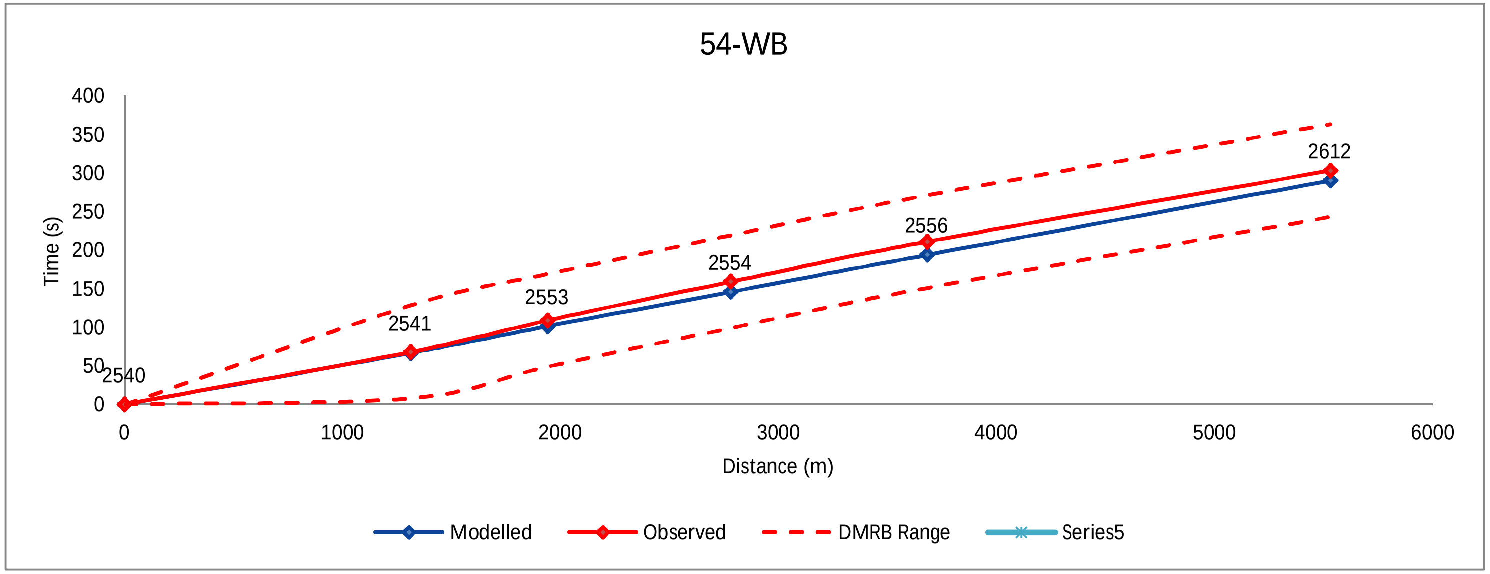

52-WB
600
500
400
300
200
100
0
Time (s)
2793
3314
3313
1307
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
Modelled
Observed
DMRB Range
Series5


53-EB
Time (s)
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
Distance (m)
2612
2611
2603
2589
2588
2544
2540
Modelled
Observed
DMRB Range
Series5

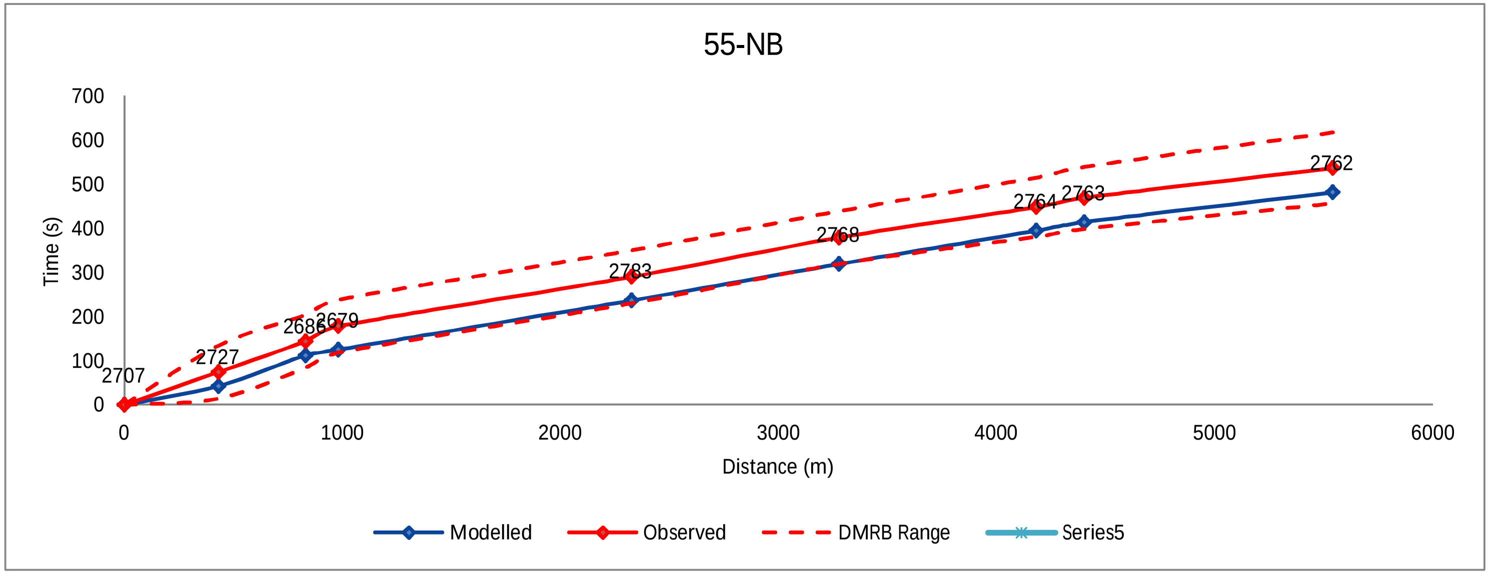

53-WB
Time (s)
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
Distance (m)
2540
2544
2588
2589
2603
2611
2612
Modelled
Observed
DMRB Range
Series5

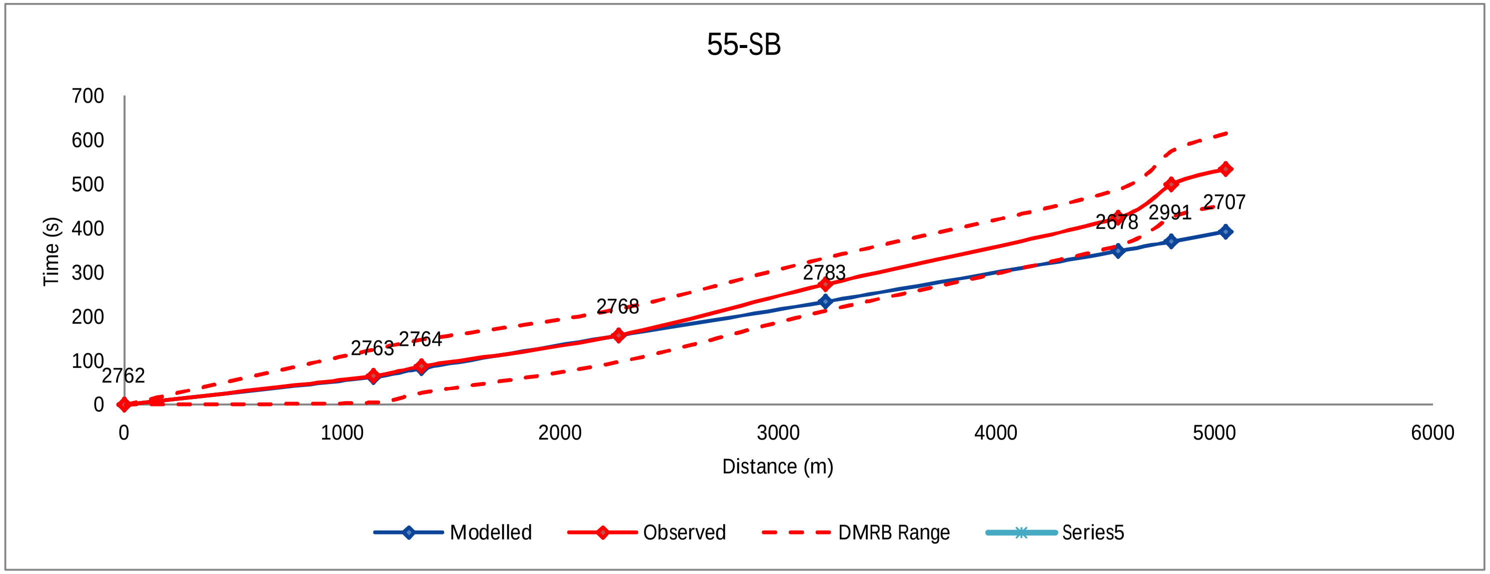


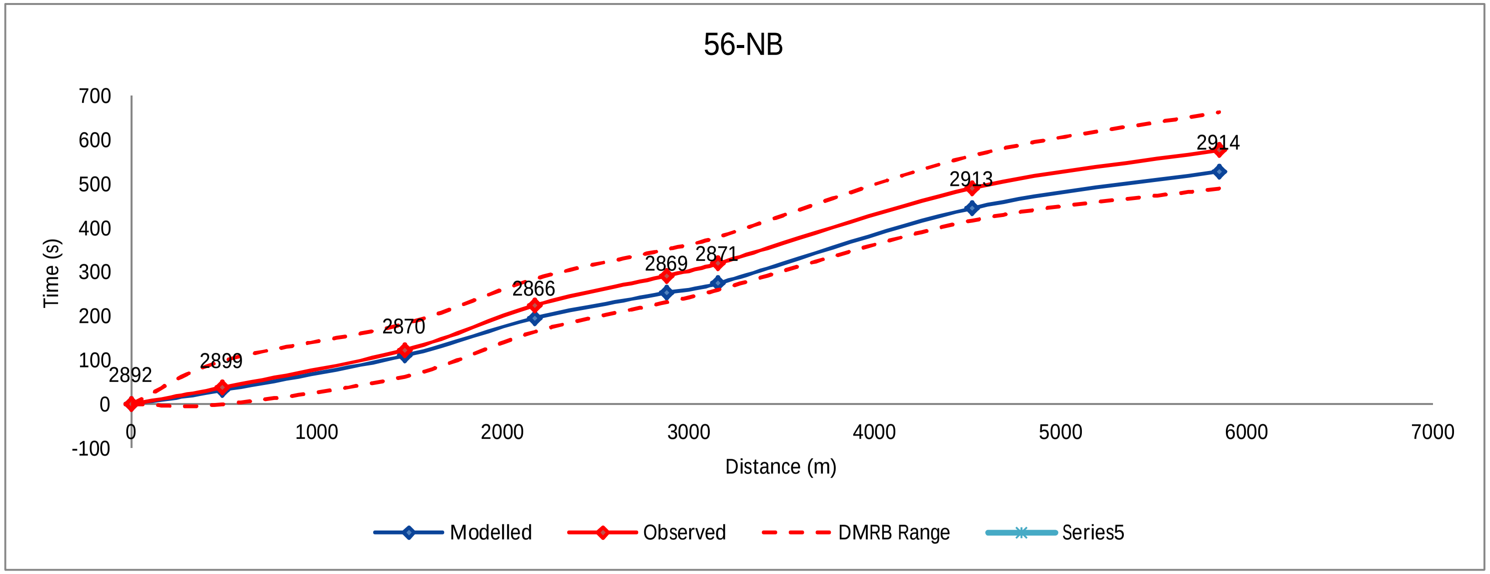
54-EB
Time (s)
400
350
300
250
200
150
100
50
0
2612
2556
2554
2553
2541
2540
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

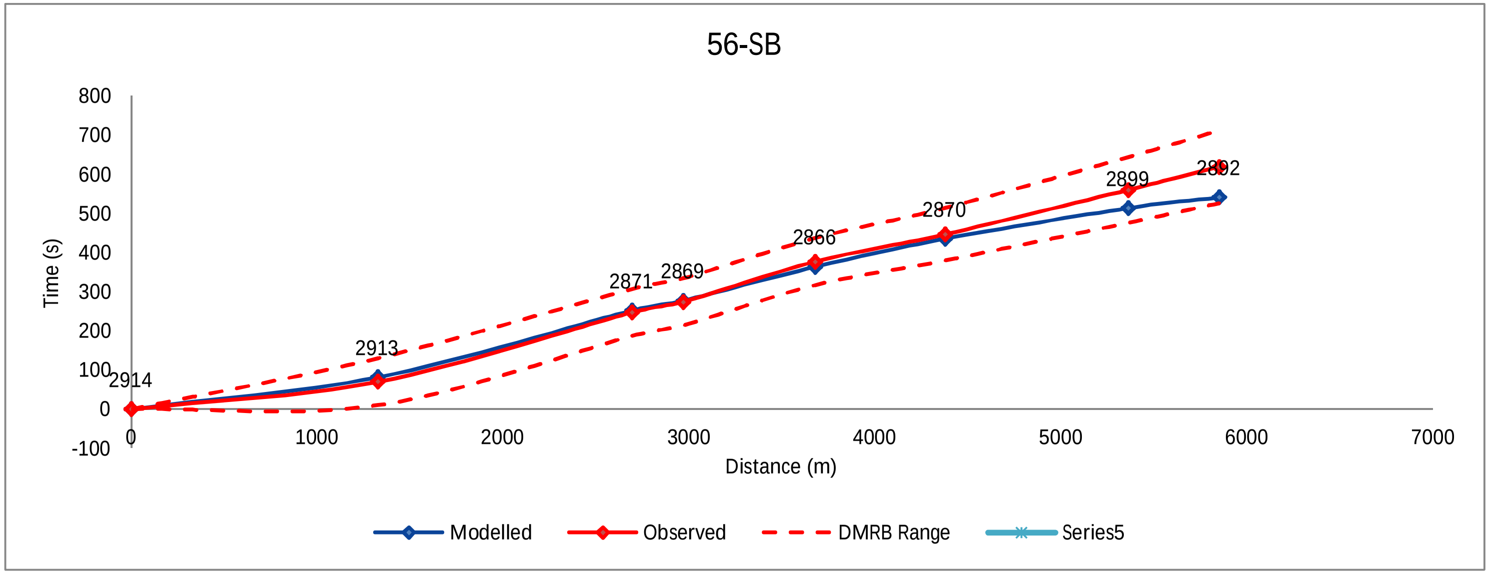


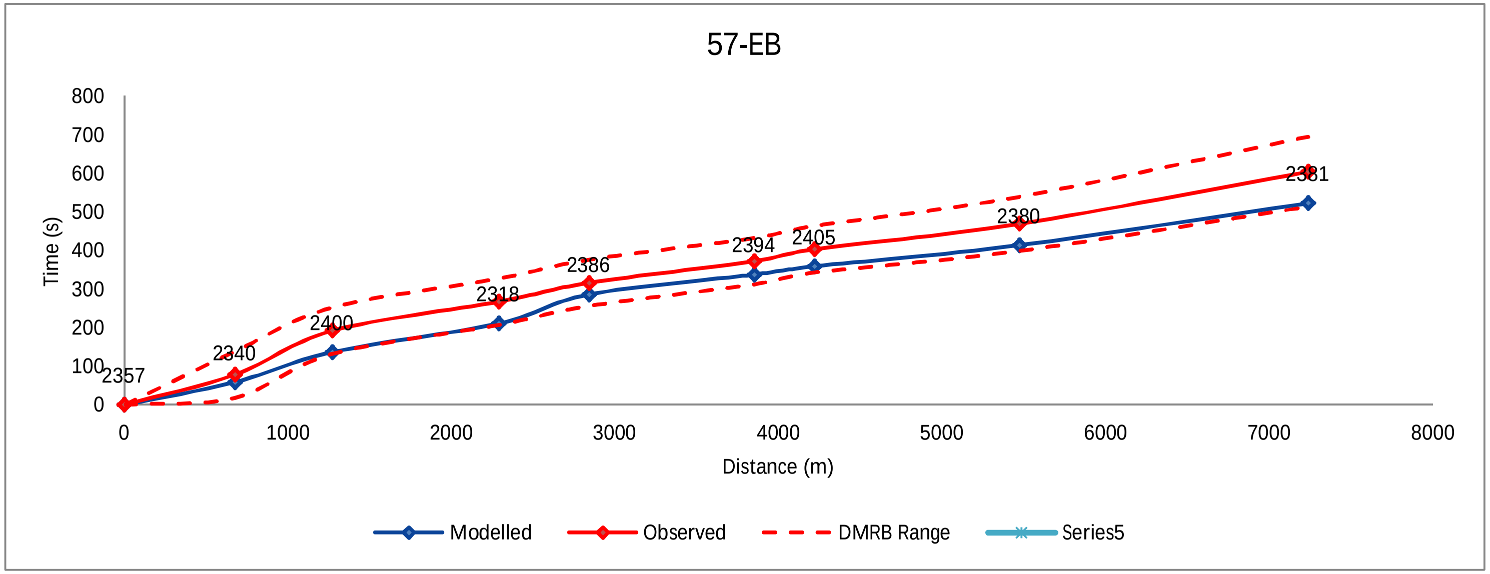
54-WB
Time (s)
400
350
300
250
200
150
100
50
0
2540
2541
2553
2554
2556
2612
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

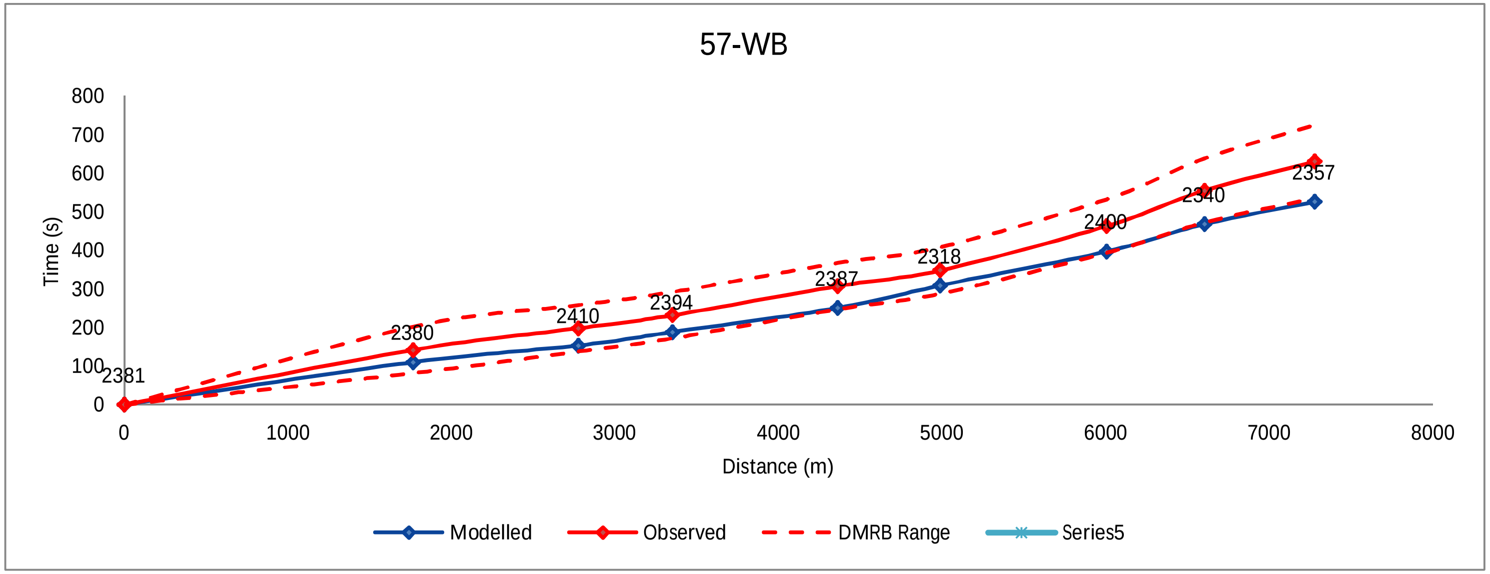

55-NB
Time (s)
700
600
500
400
300
200
100
0
2707
2727
2686
2679
2783
2768
2764
2763
2762
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

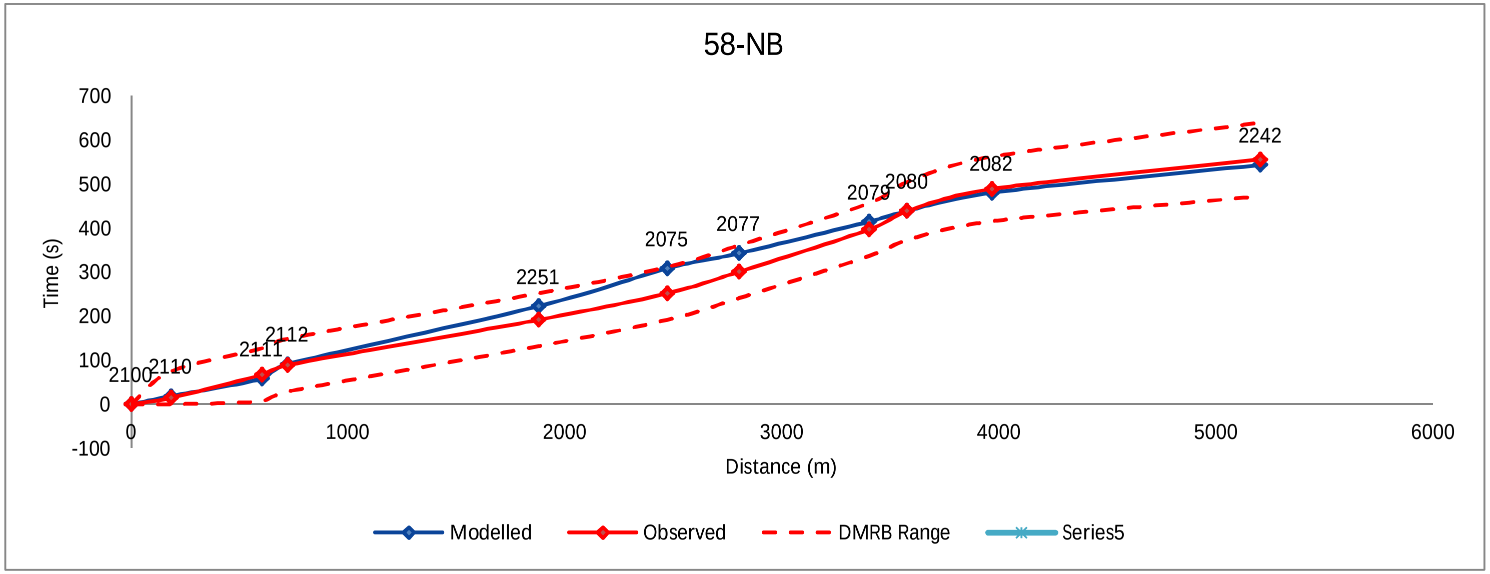

55-SB
Time (s)
700
600
500
400
300
200
100
0
2762
2763
2764
2768
2783
2678
2991
2707
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

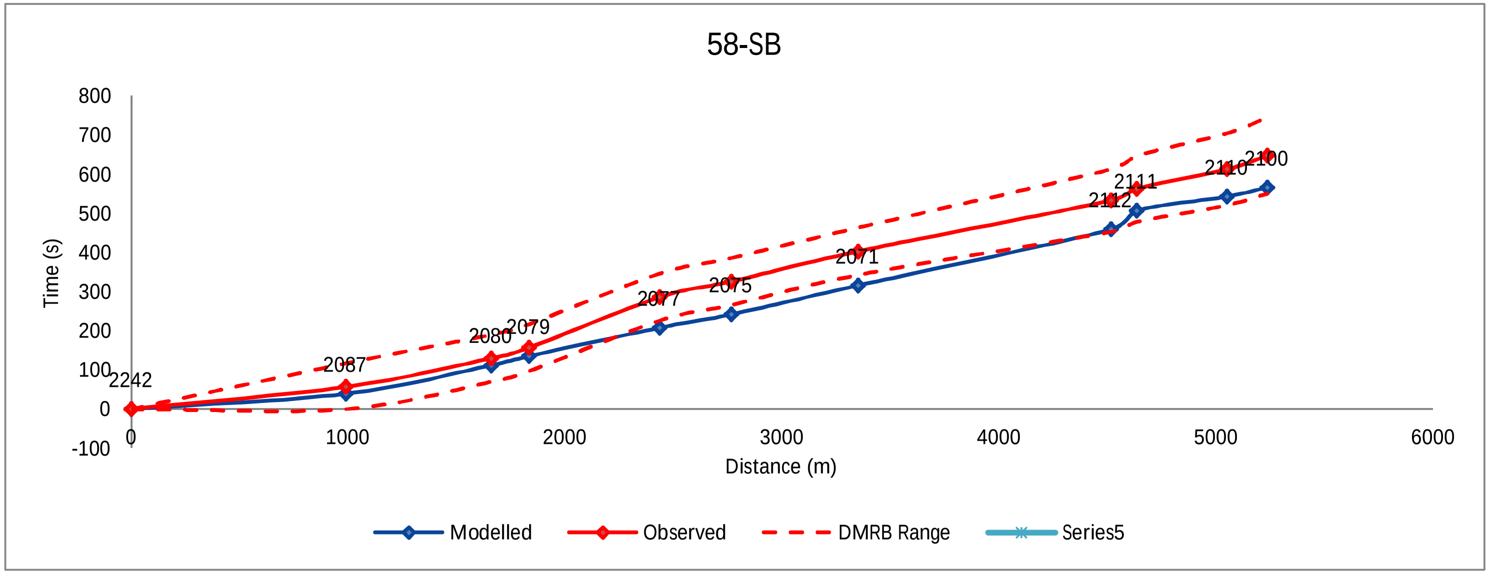

56-NB
Time (s)
700
600
500
400
300
200
100
0
-100
2892
2899
2870
2866
2869
2871
2913
2914
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range
Series5

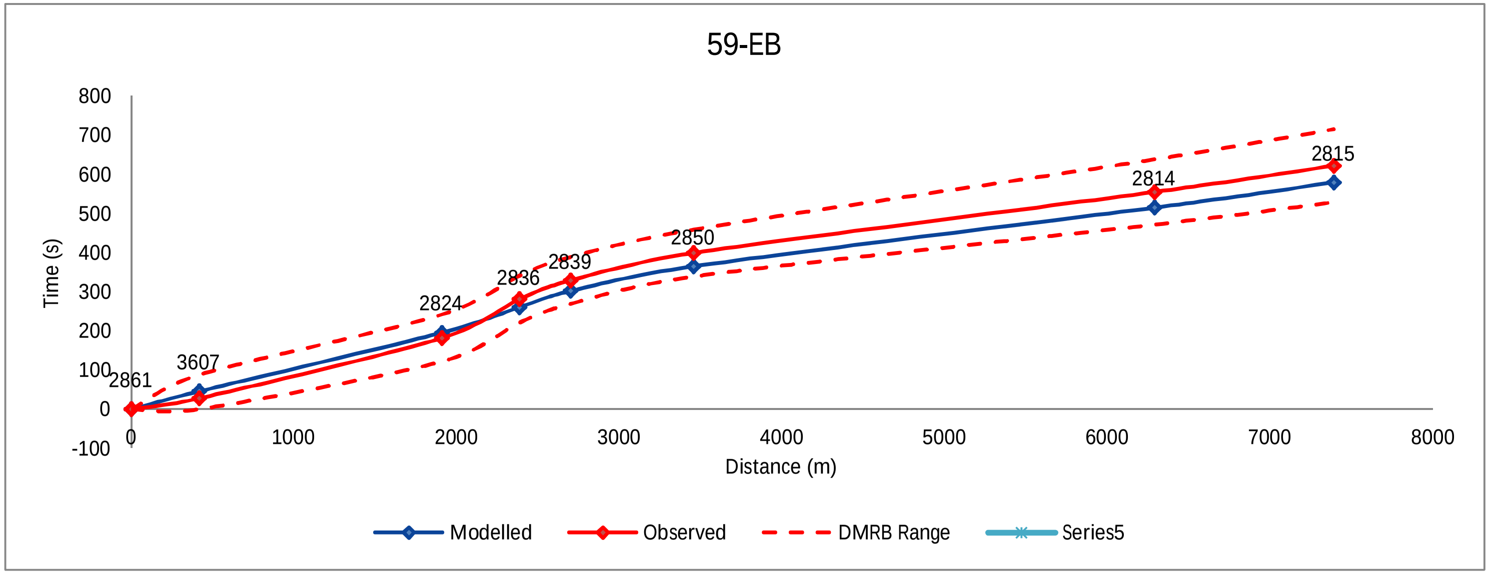

56-SB
Time (s)
800
700
600
500
400
300
200
100
0
-100
2914
2913
2871
2869
2866
2870
2899
2892
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range
Series5

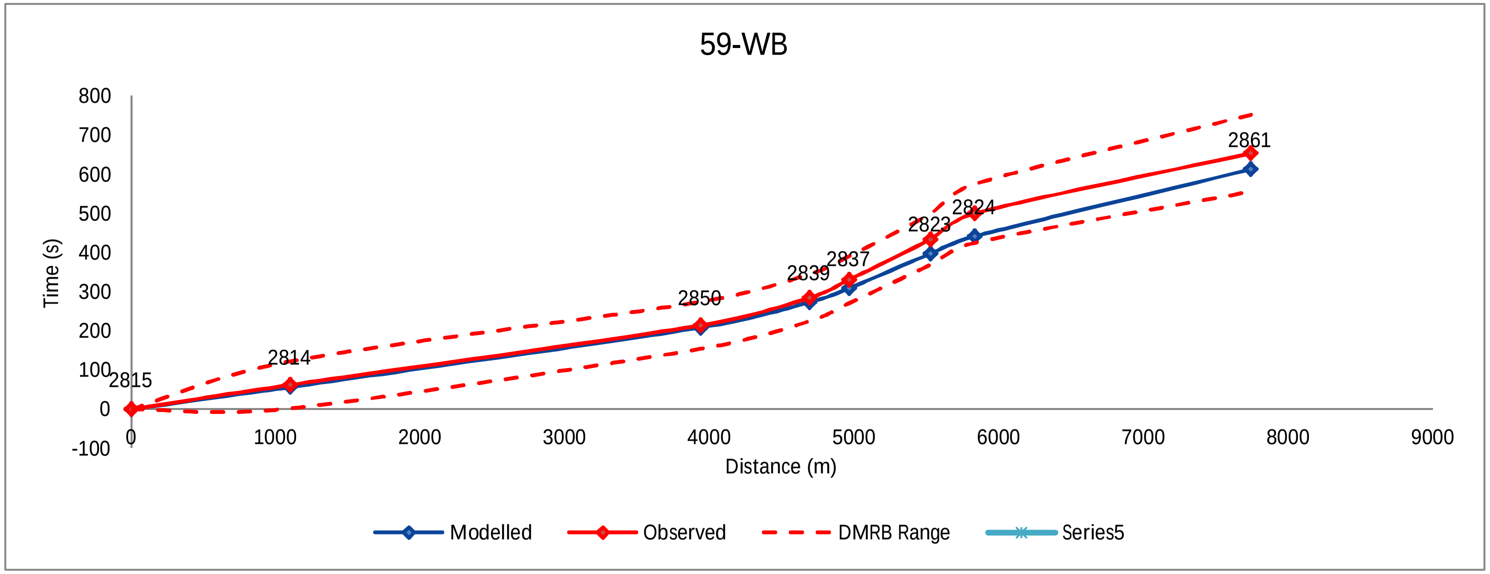

57-EB
Time (s)
0
100
200
300
400
500
600
700
800
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
2357
2340
2400
2318
2386
2394
2405
2380
2381
Modelled
Observed
DMRB Range
Series5

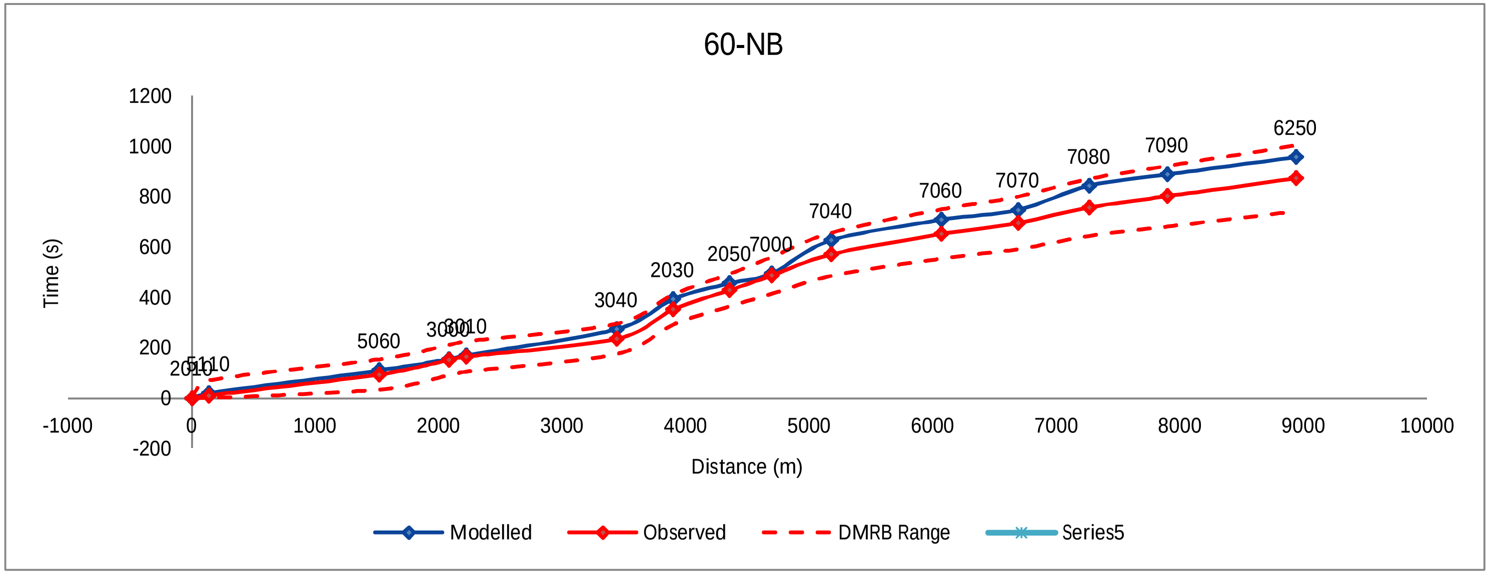

57-WB
Time (s)
0
100
200
300
400
500
600
700
800
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
2381
2380
2410
2394
2387
2318
2400
2340
2357
Modelled
Observed
DMRB Range
Series5

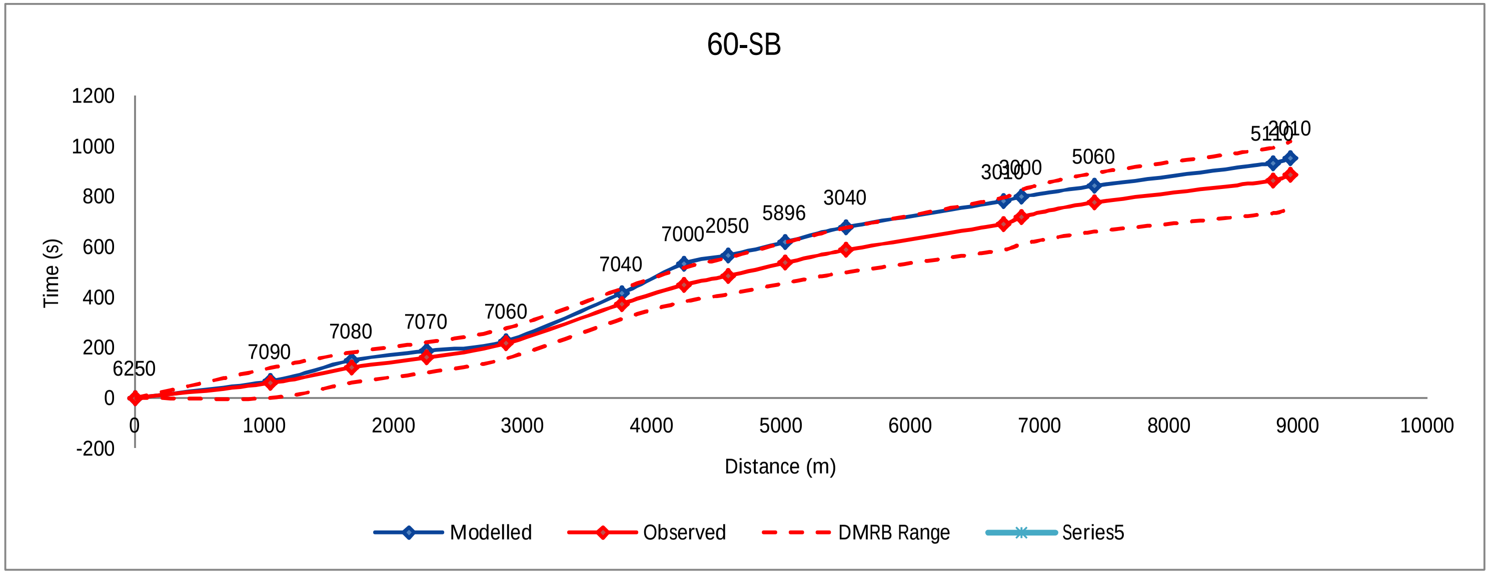

58-NB
Time (s)
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
Distance (m)
2100
2110
2111
2112
2251
2075
2077
2079
2080
2082
2242
Modelled
Observed
DMRB Range
Series5

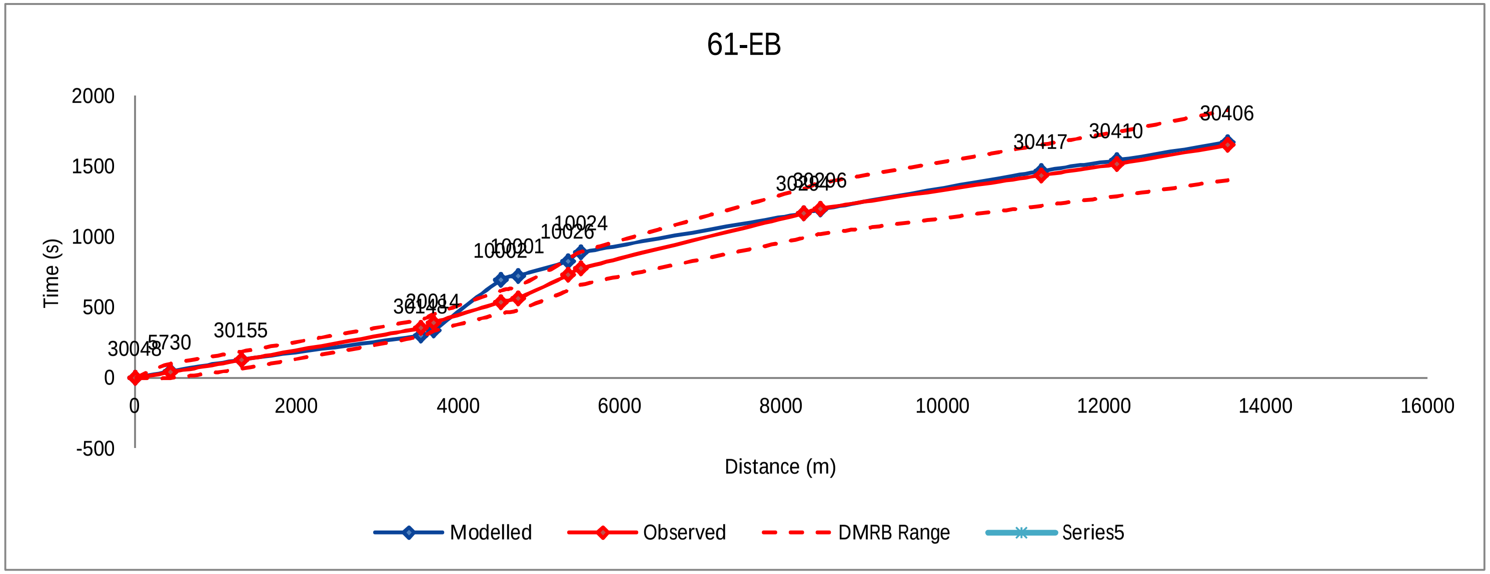

58-SB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
Distance (m)
2242
2087
2080
2079
2077
2075
2071
2112
2111
2110
2100
Modelled
Observed
DMRB Range
Series5

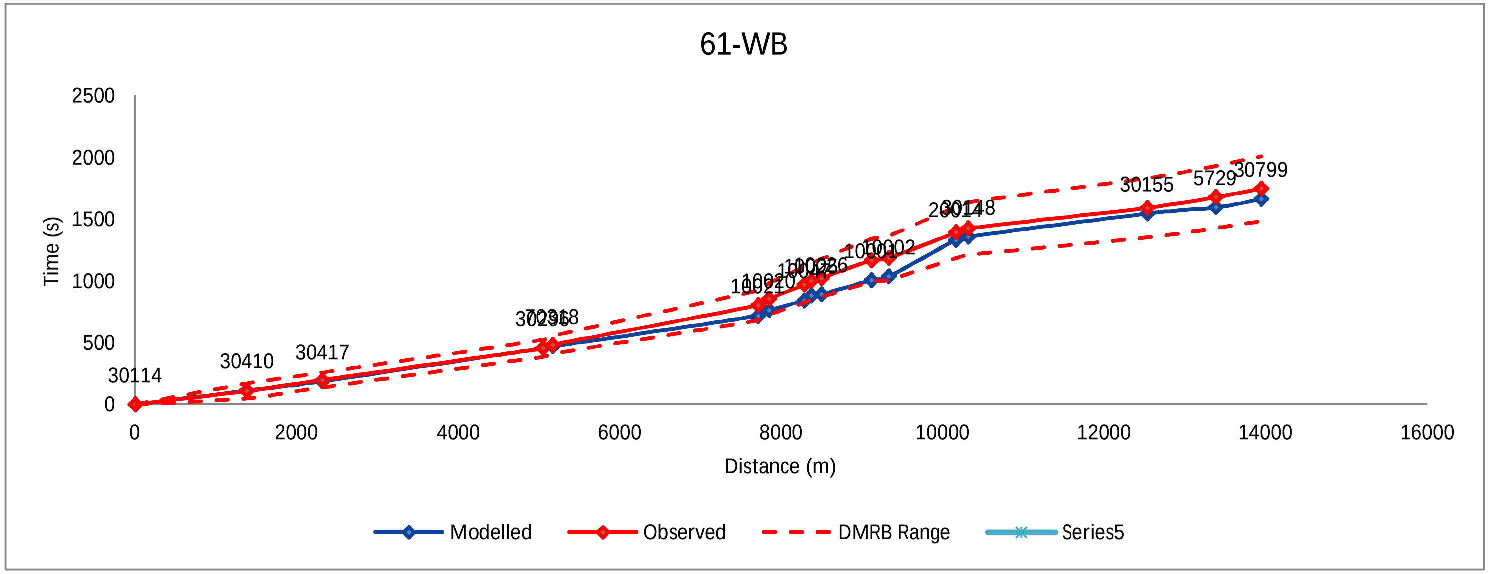

59-EB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
2861
3607
2824
2836
2839
2850
2814
2815
Modelled
Observed
DMRB Range
Series5

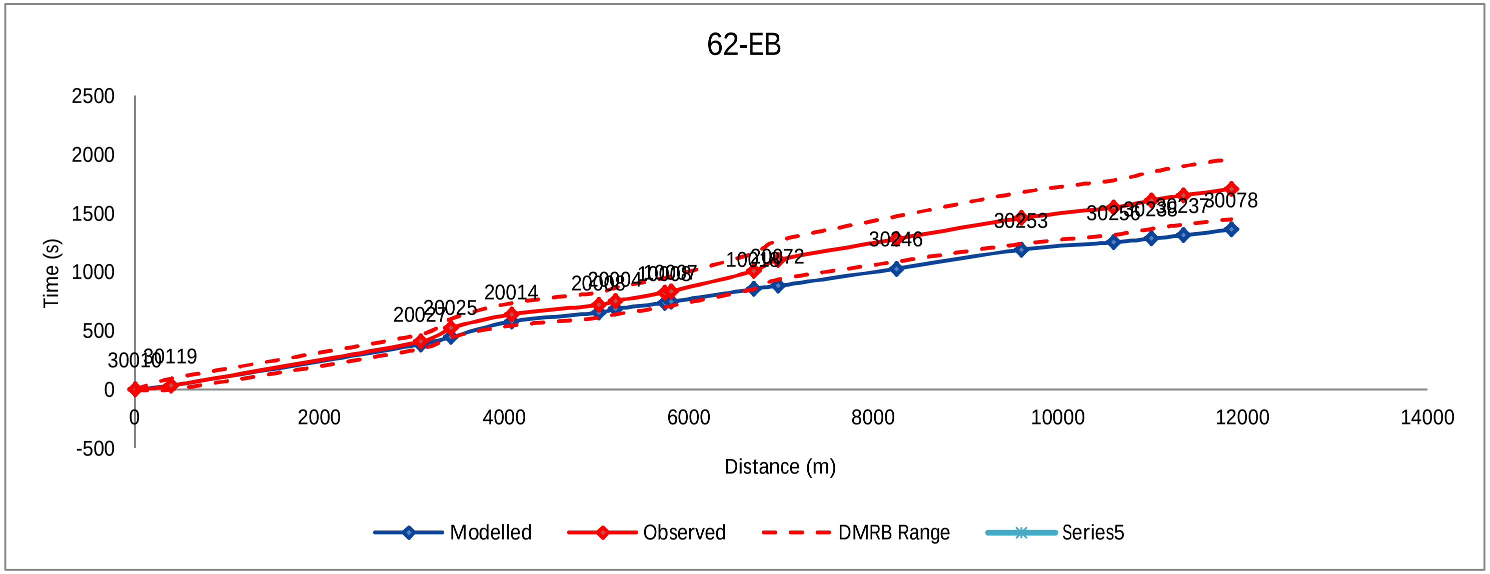

59-WB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
2815
2814
2850
2839
2837
2823
2824
2861
Modelled
Observed
DMRB Range
Series5

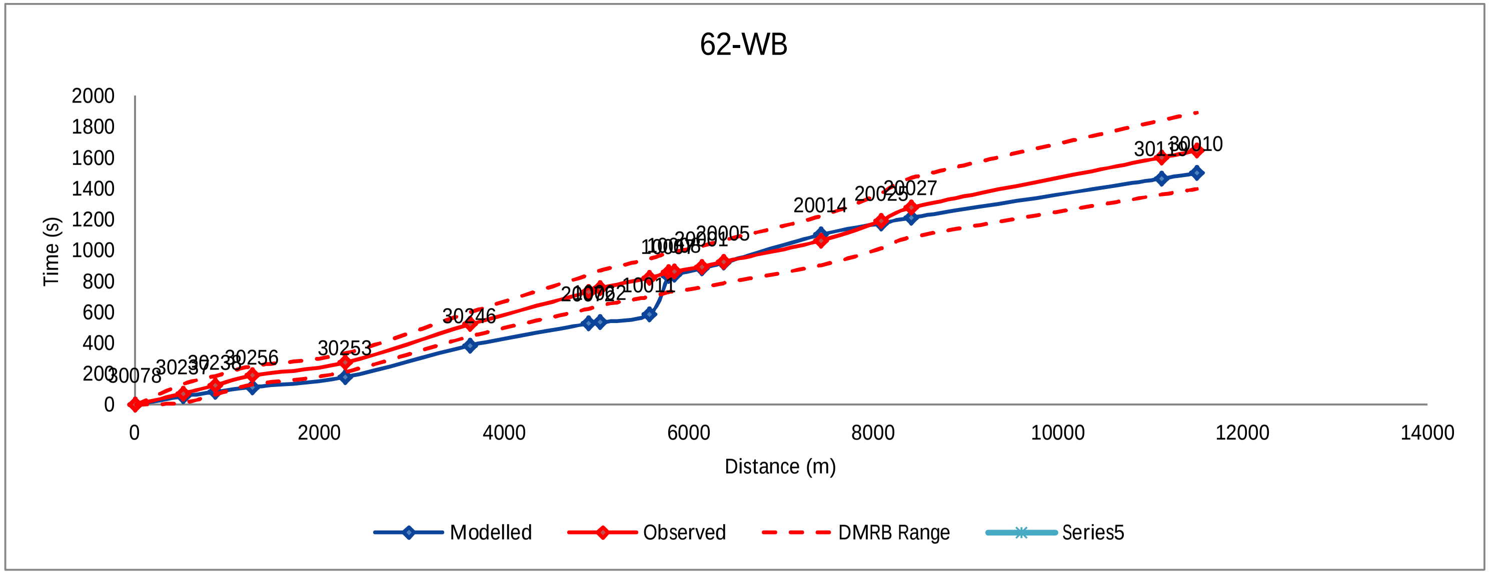

60-NB
Time (s)
1200
1000
800
600
400
200
0
-200
-1000
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
2010
5110
5060
3000
3010
3040
2030
2050
7000
7040
7060
7070
7080
7090
6250
Modelled
Observed
DMRB Range
Series5

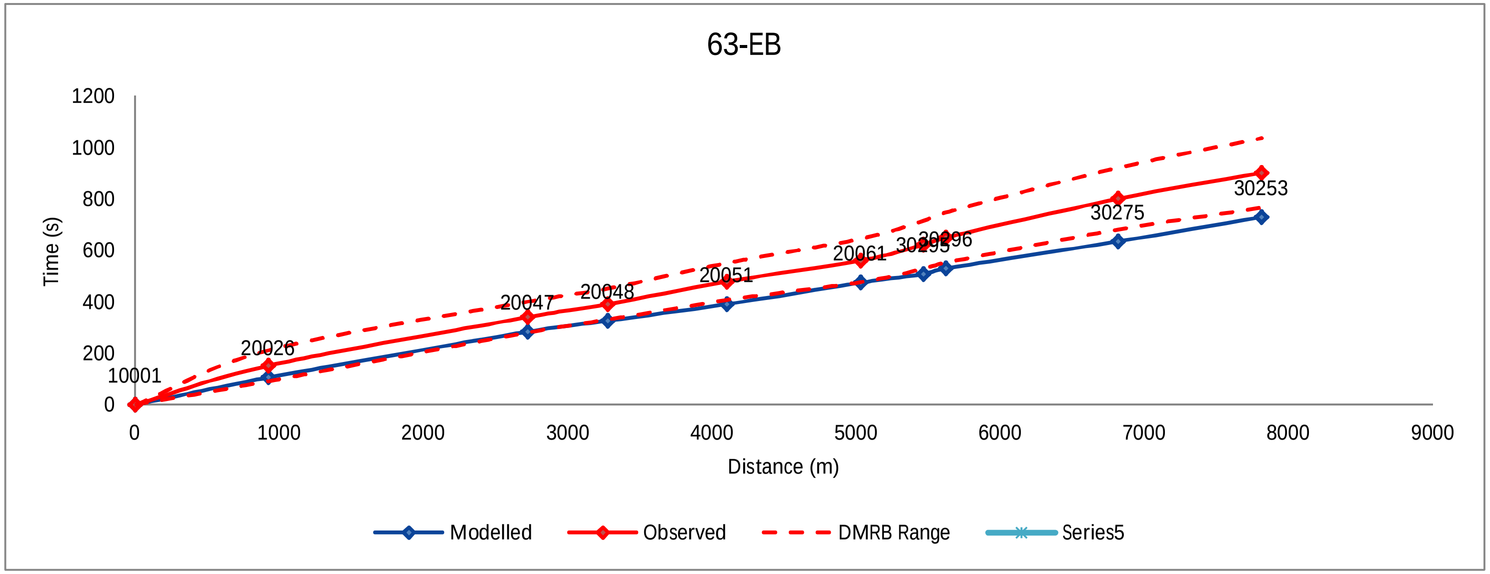

60-SB
Time (s)
1200
1000
800
600
400
200
0
-200
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
6250
7090
7080
7070
7060
7040
7000
2050
5896
3040
3010
3000
5060
5110
2010
Modelled
Observed
DMRB Range
Series5


61-EB
Time (s)
Distance (m)
30406
30417
30410
10024
10026
10001
10002
30155
5730
30048
Modelled
Observed
DMRB Range
Series5

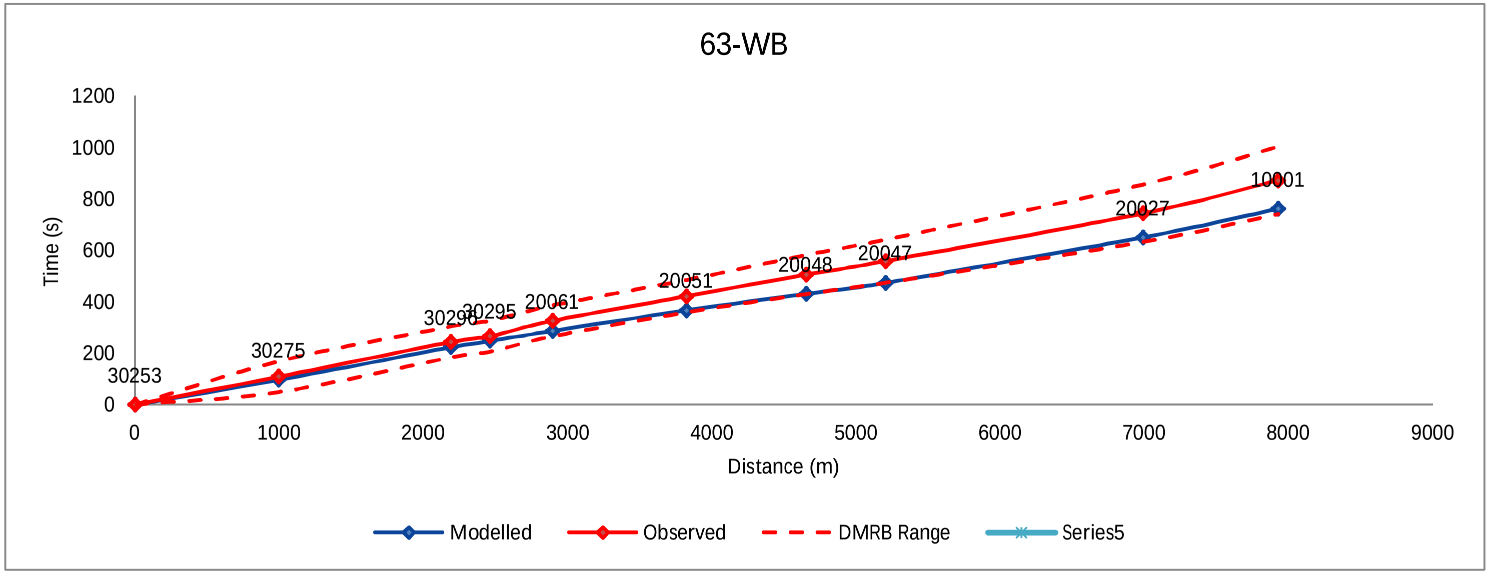

61-WB
Time (s)
Distance (m)
30799
5729
30155
30114
30410
30417
10002
Modelled
Observed
DMRB Range
Series5


62-EB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5

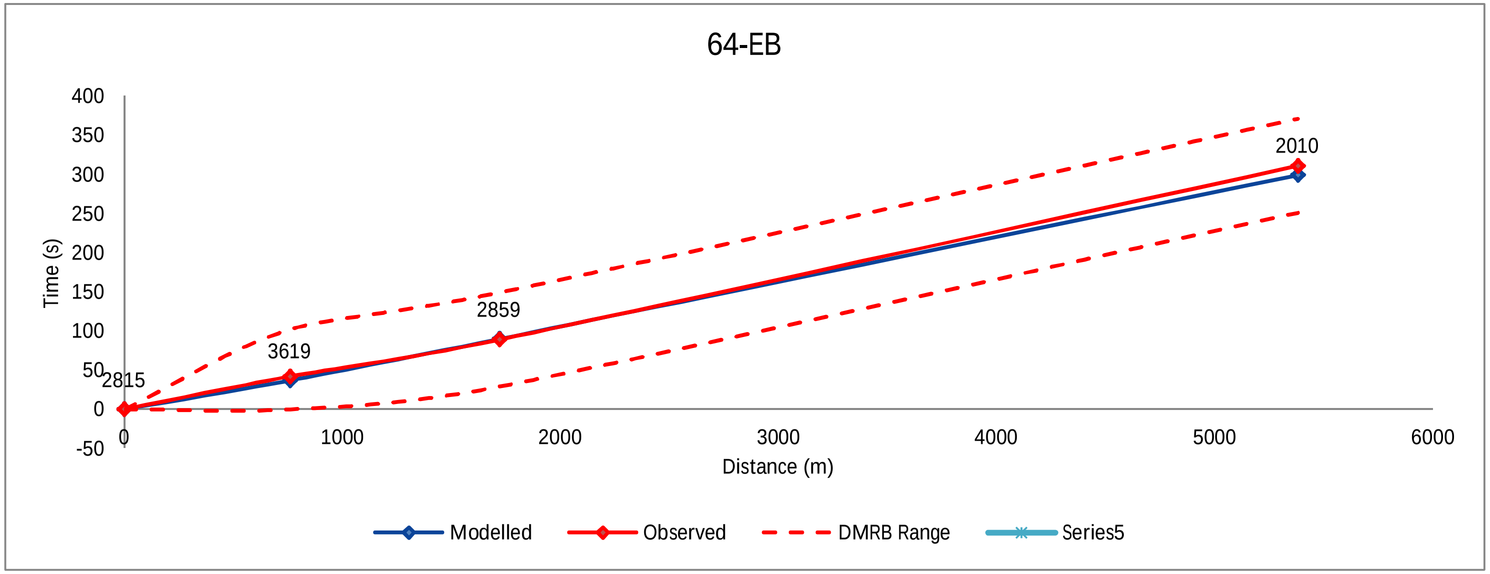

62-WB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5

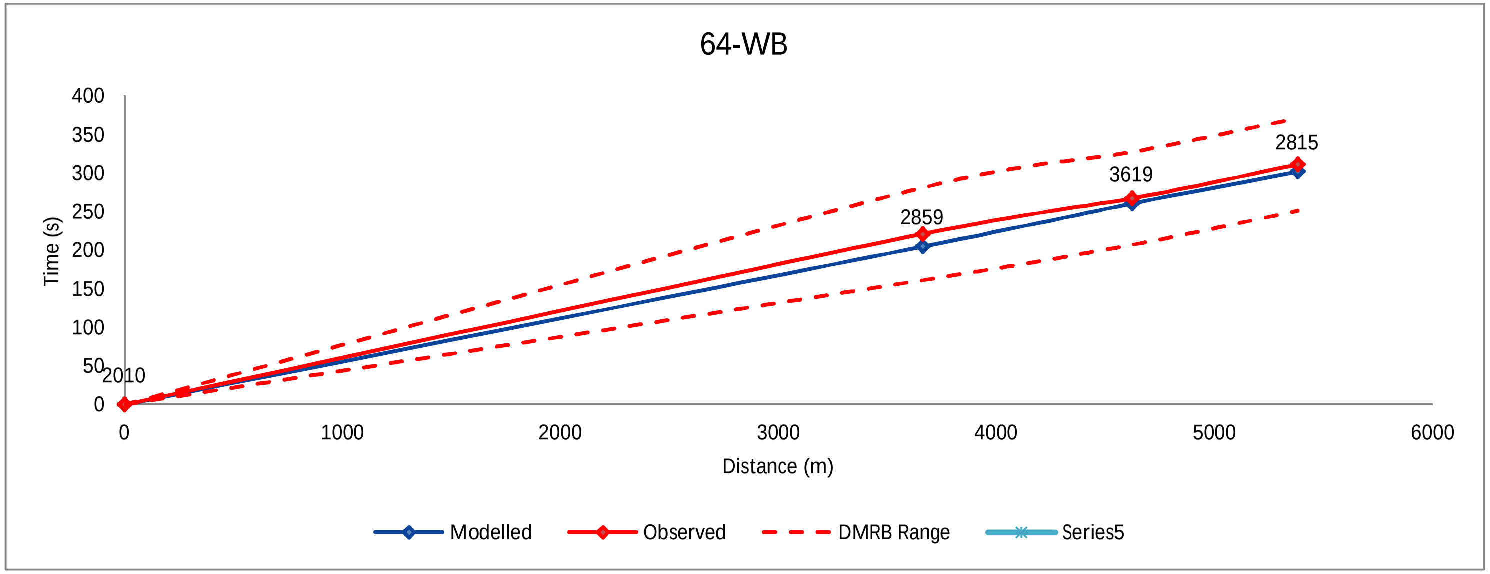


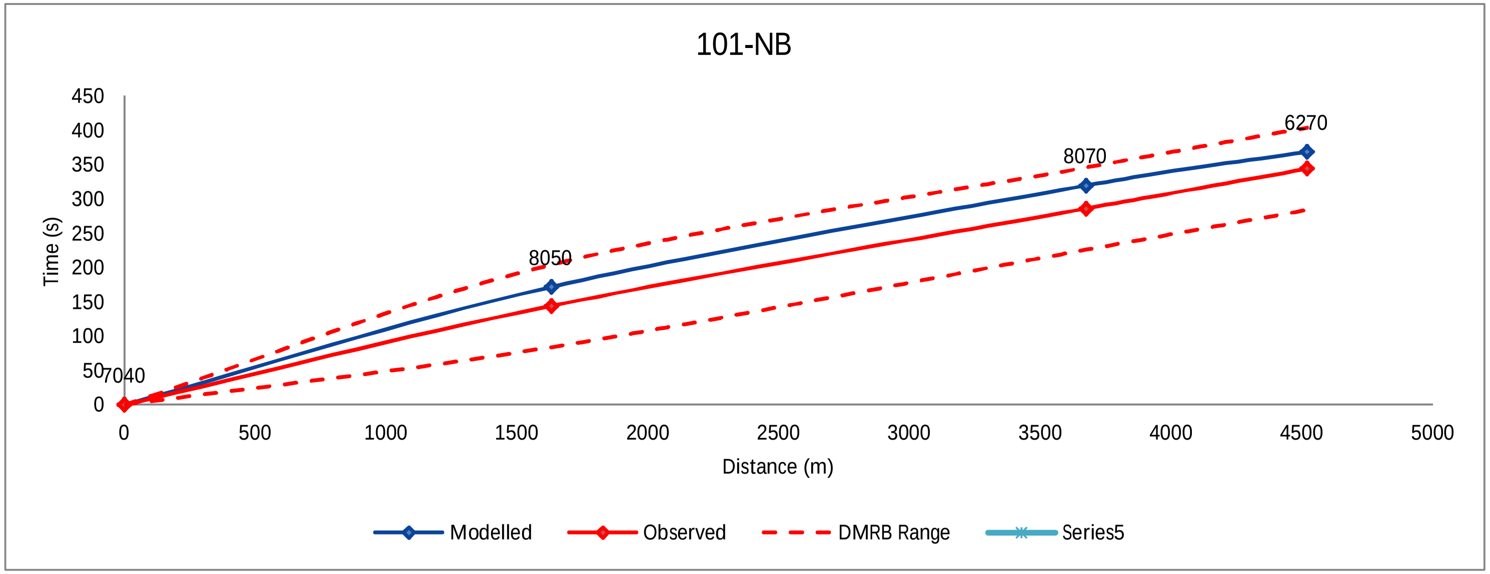
63-EB
Time (s)
1200
1000
800
600
400
200
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
10001
20026
20047
20048
20051
20061
30295
30296
30275
30253
Modelled
Observed
DMRB Range
Series5

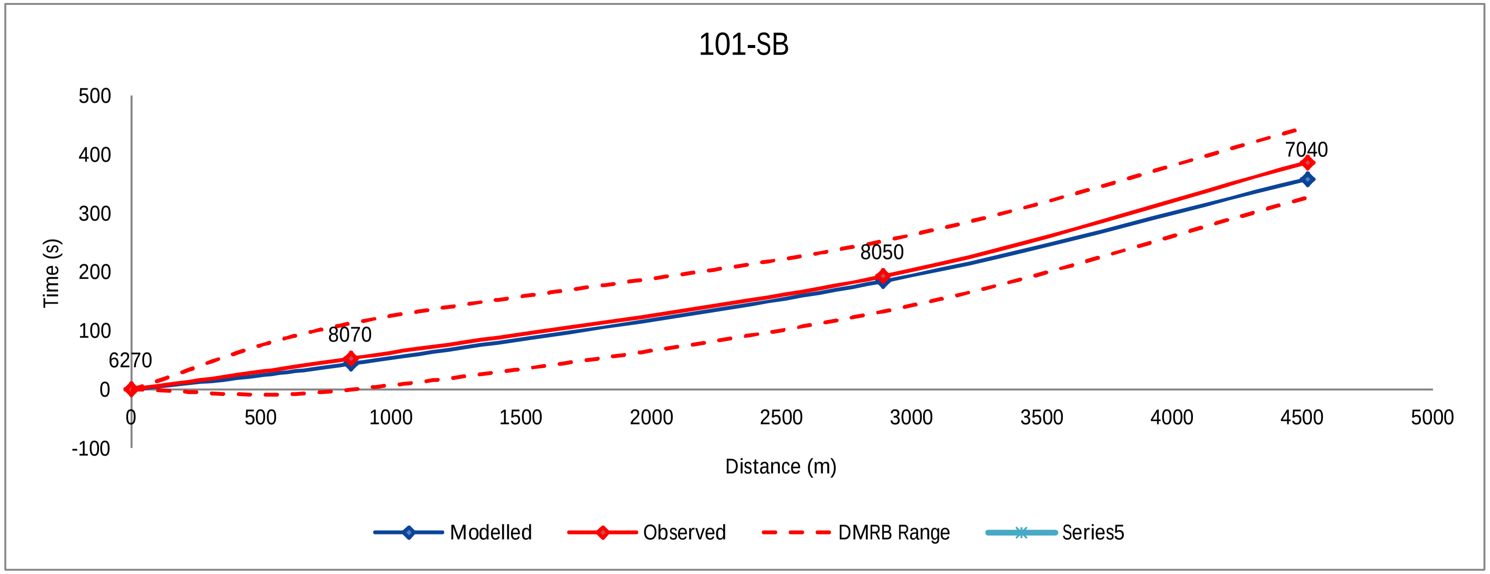


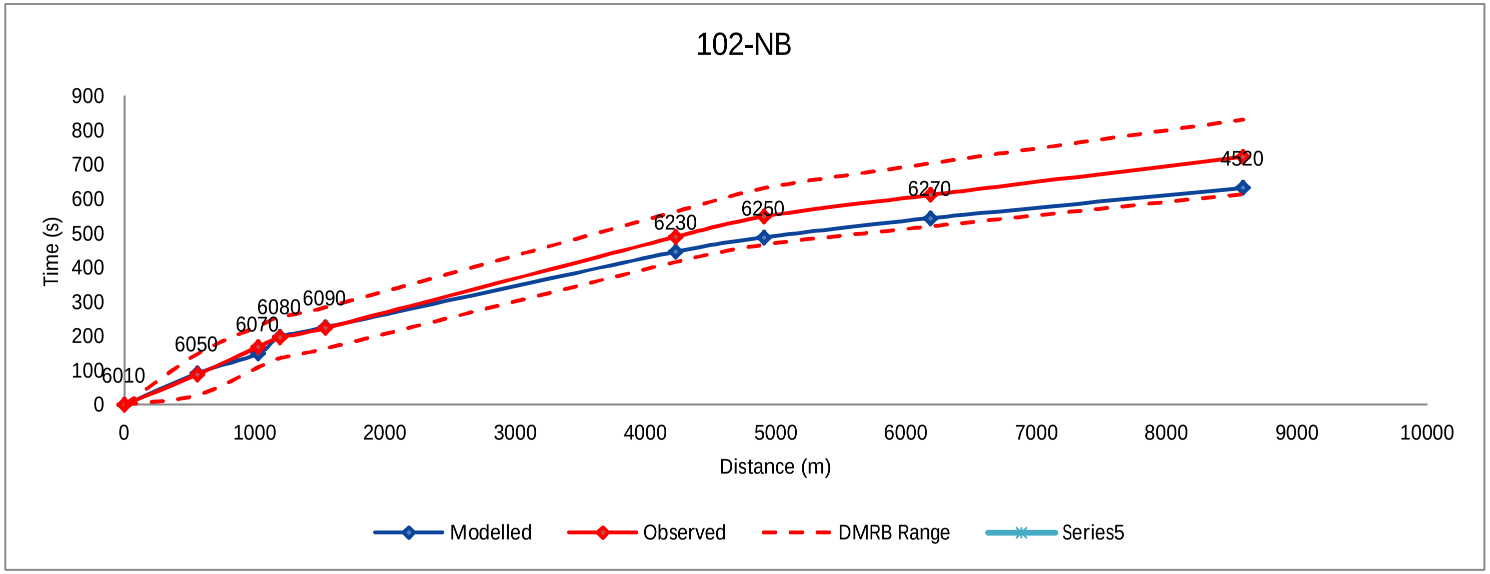
63-WB
Time (s)
1200
1000
800
600
400
200
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
30253
30275
30296
30295
20061
20051
20048
20047
20027
10001
Modelled
Observed
DMRB Range
Series5

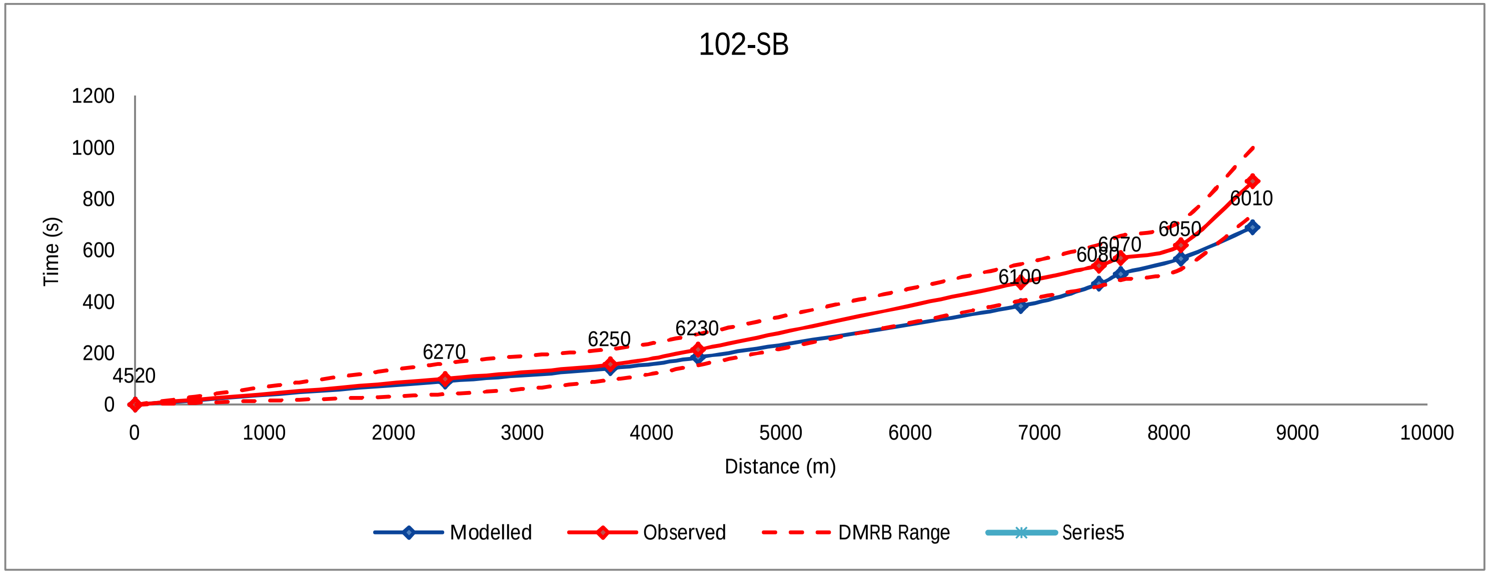

64-EB
Time (s)
400
350
300
250
200
150
100
50
0
-50
2815
3619
2859
2010
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

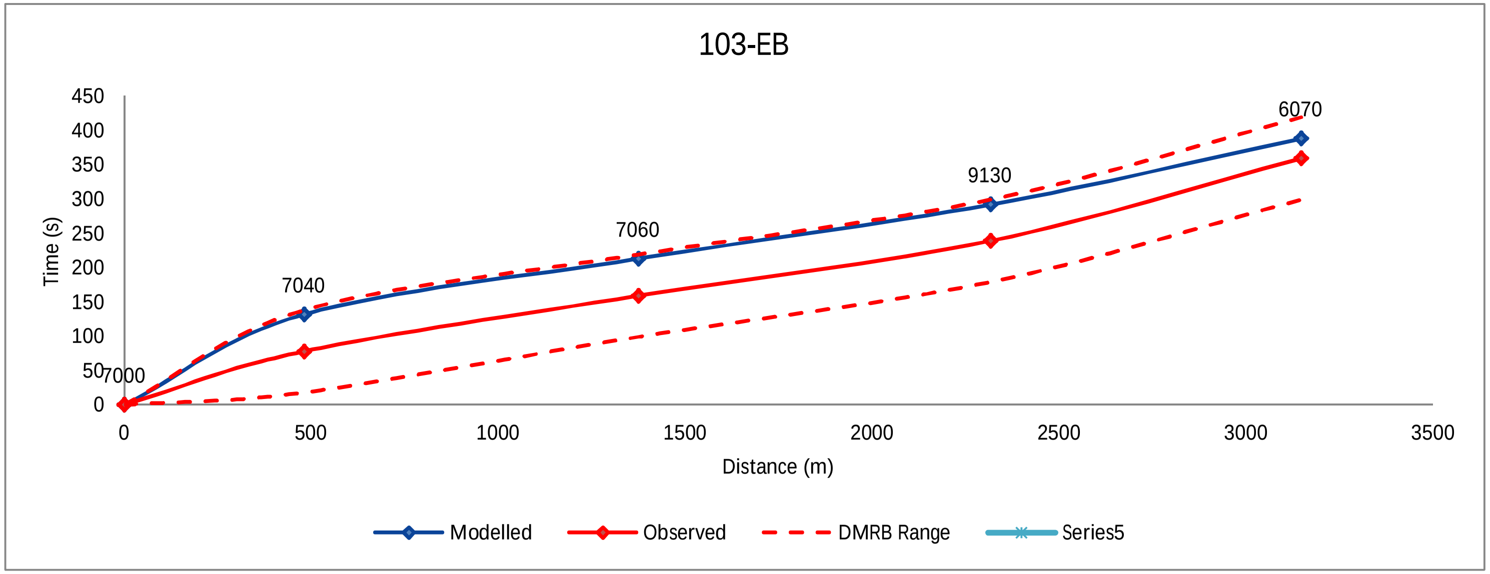

64-WB
Time (s)
400
350
300
250
200
150
100
50
0
2010
2859
3619
2815
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

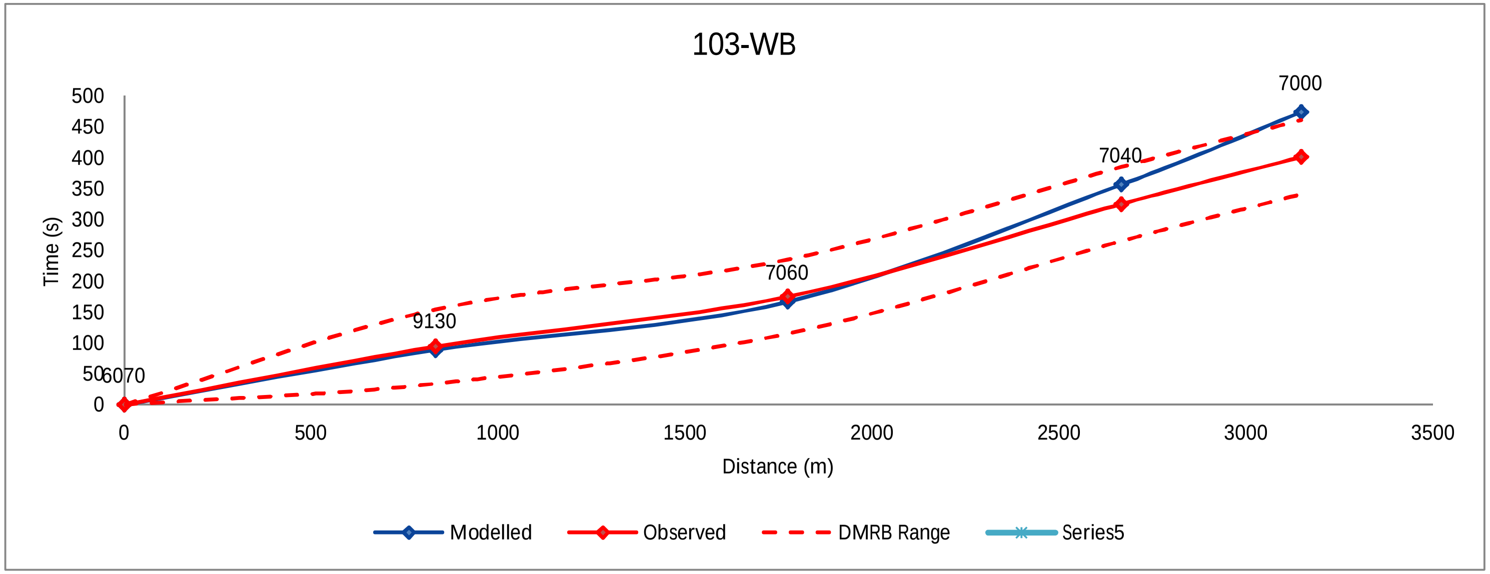

101-NB
Time (s)
450
400
350
300
250
200
150
100
50
0
7040
8050
8070
6270
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

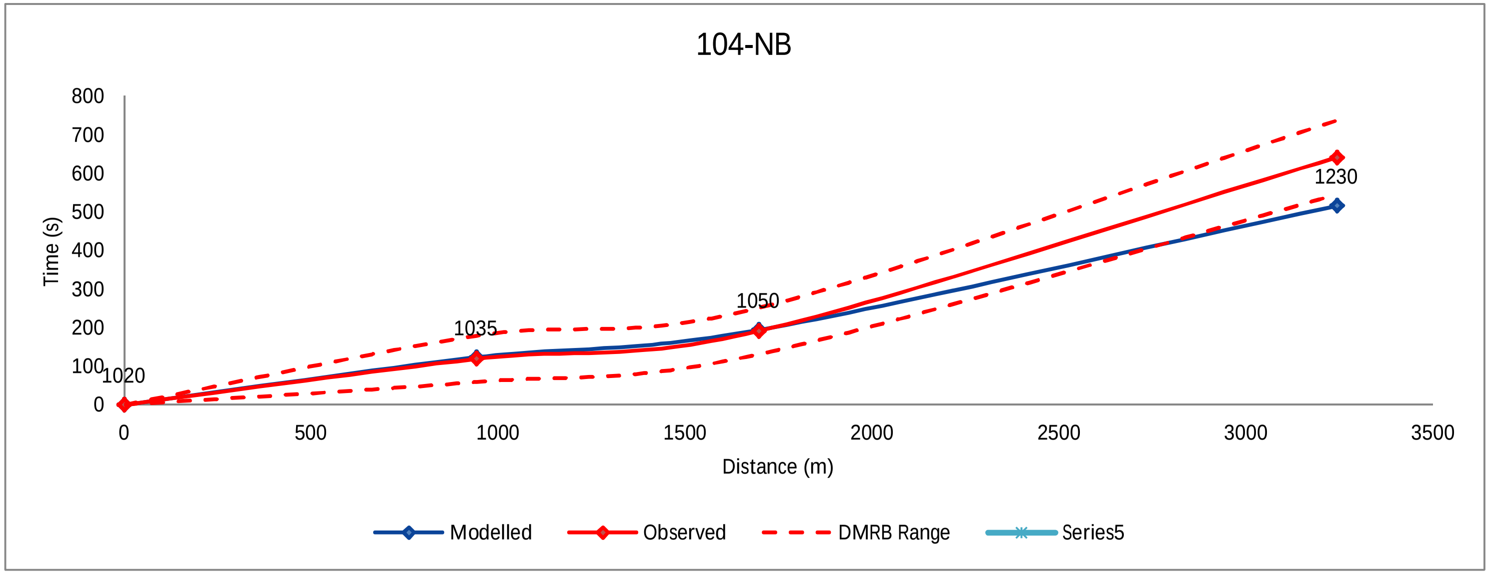

101-SB
Time (s)
500
400
300
200
100
0
-100
6270
8070
8050
7040
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

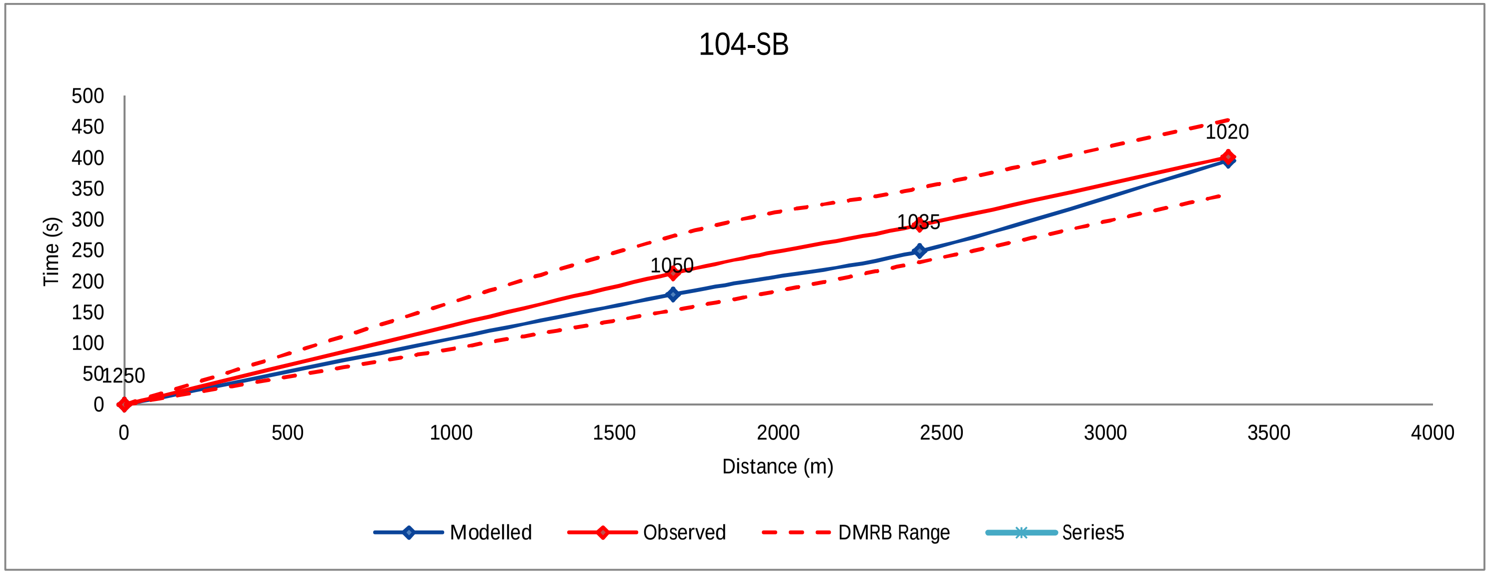

102-NB
Time (s)
900
800
700
600
500
400
300
200
100
0
6010
6050
6070
6080
6090
6230
6250
6270
4520
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5

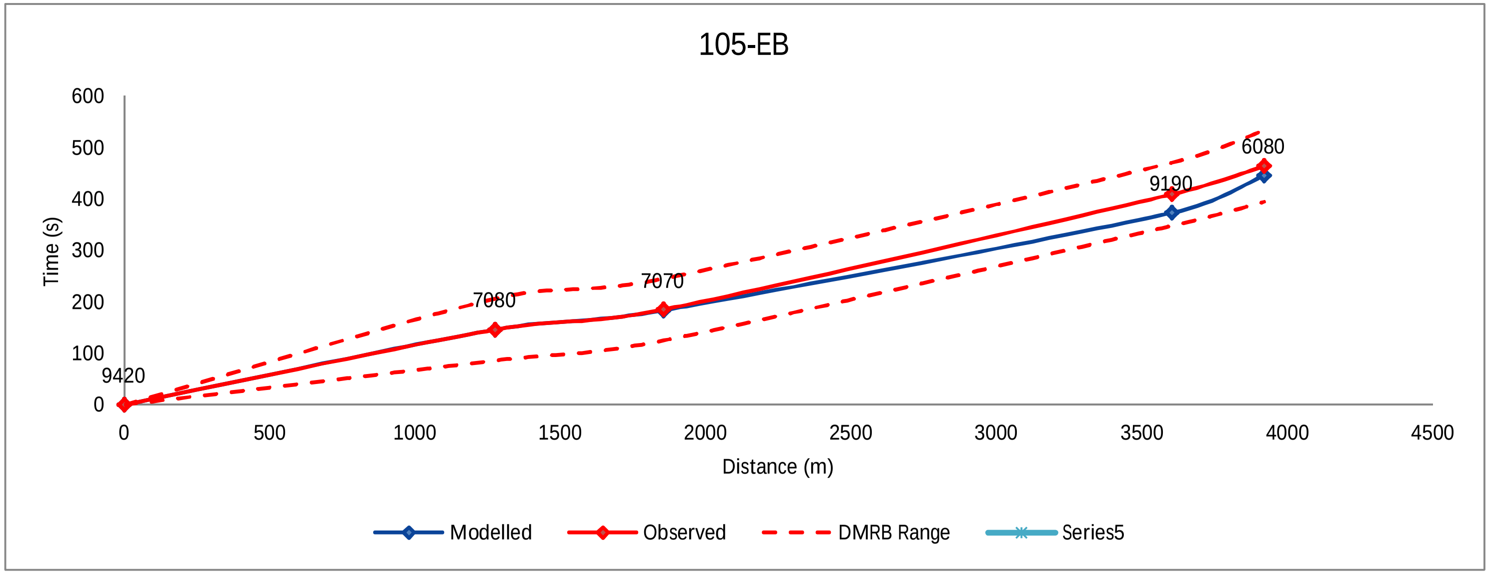

102-SB
Time (s)
1200
1000
800
600
400
200
0
4520
6270
6250
6230
6100
6080
6070
6050
6010
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5


103-EB
Time (s)
450
400
350
300
250
200
150
100
50
0
7000
7040
7060
9130
6070
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5

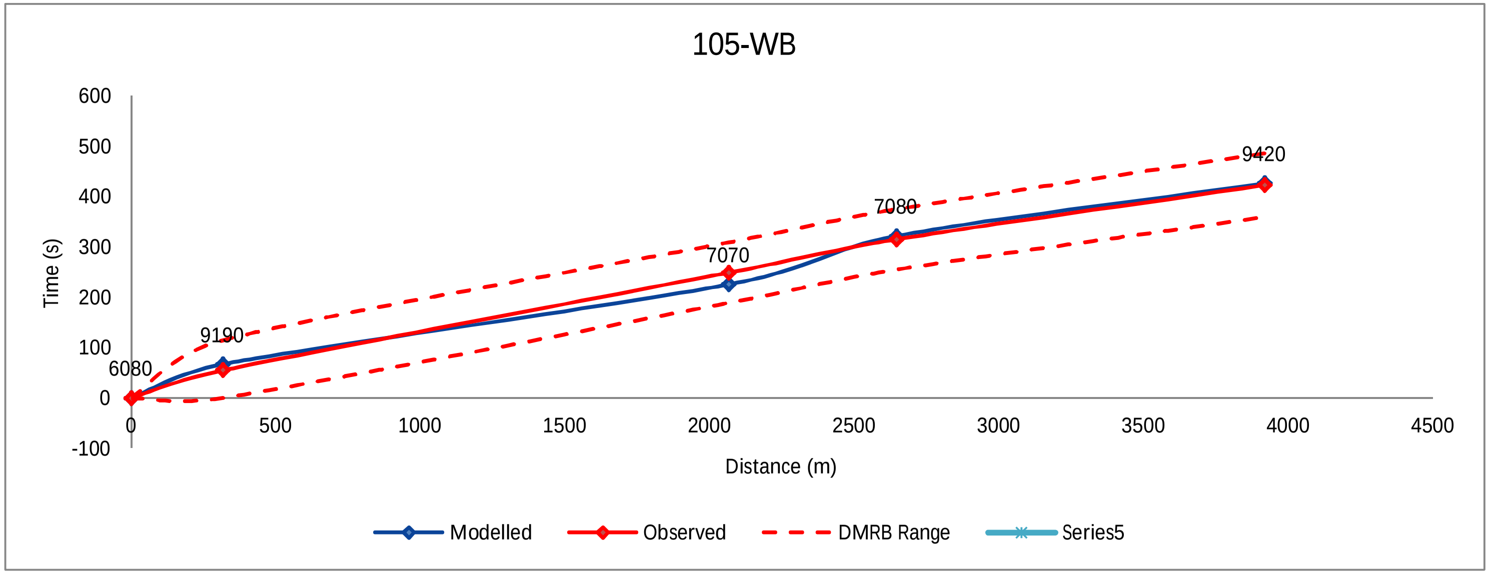

103-WB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
6070
9130
7060
7040
7000
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5


104-NB
Time (s)
800
700
600
500
400
300
200
100
0
1020
1035
1050
1230
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5

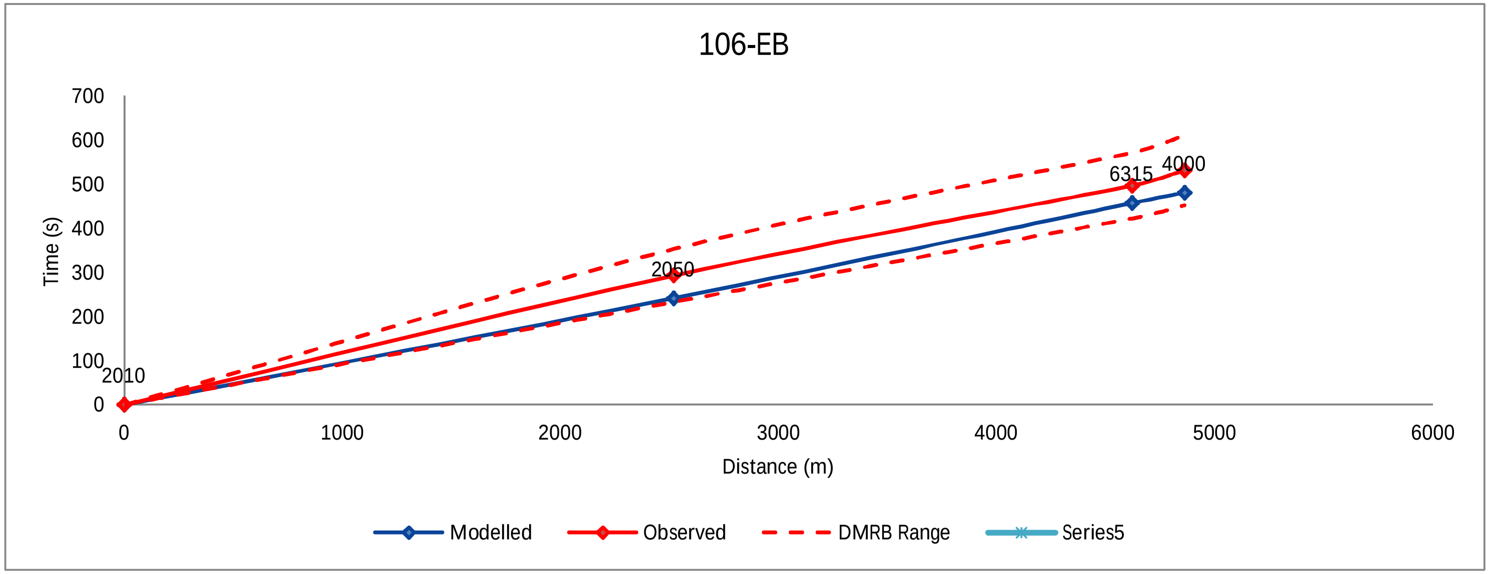

104-SB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
1250
1050
1035
1020
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
Modelled
Observed
DMRB Range
Series5

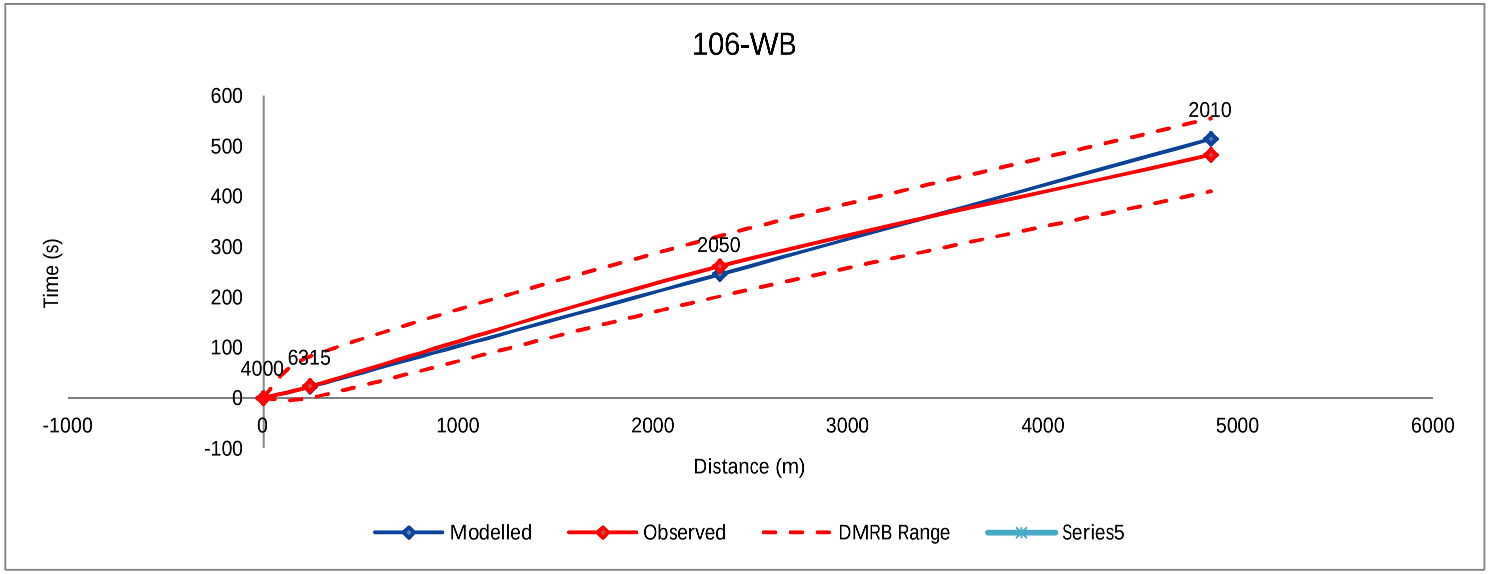


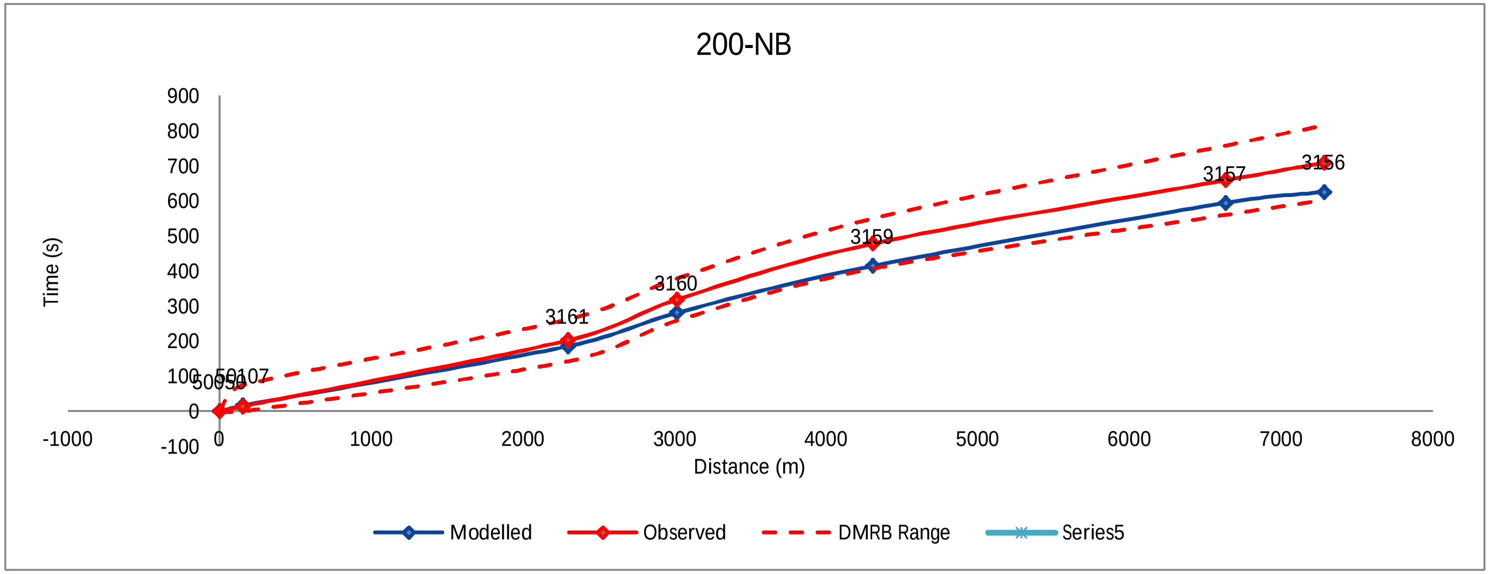
105-EB
Time (s)
600
500
400
300
200
100
0
9420
7080
7070
9190
6080
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Distance (m)
Modelled
Observed
DMRB Range
Series5

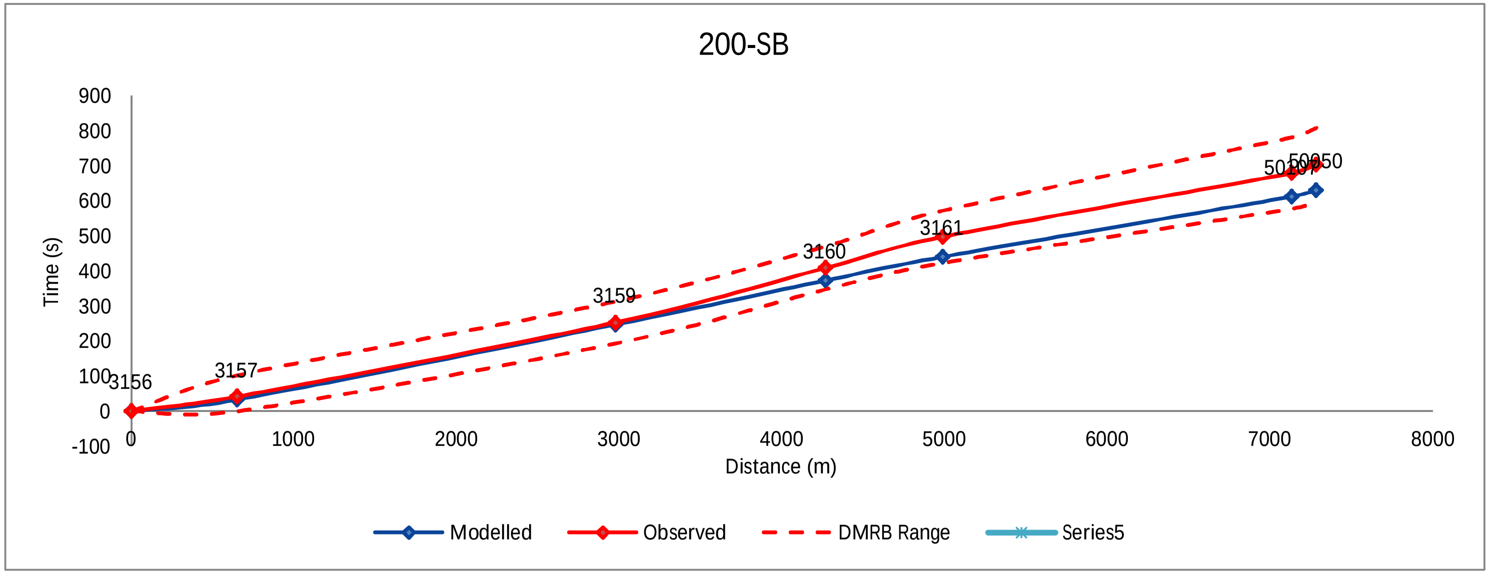


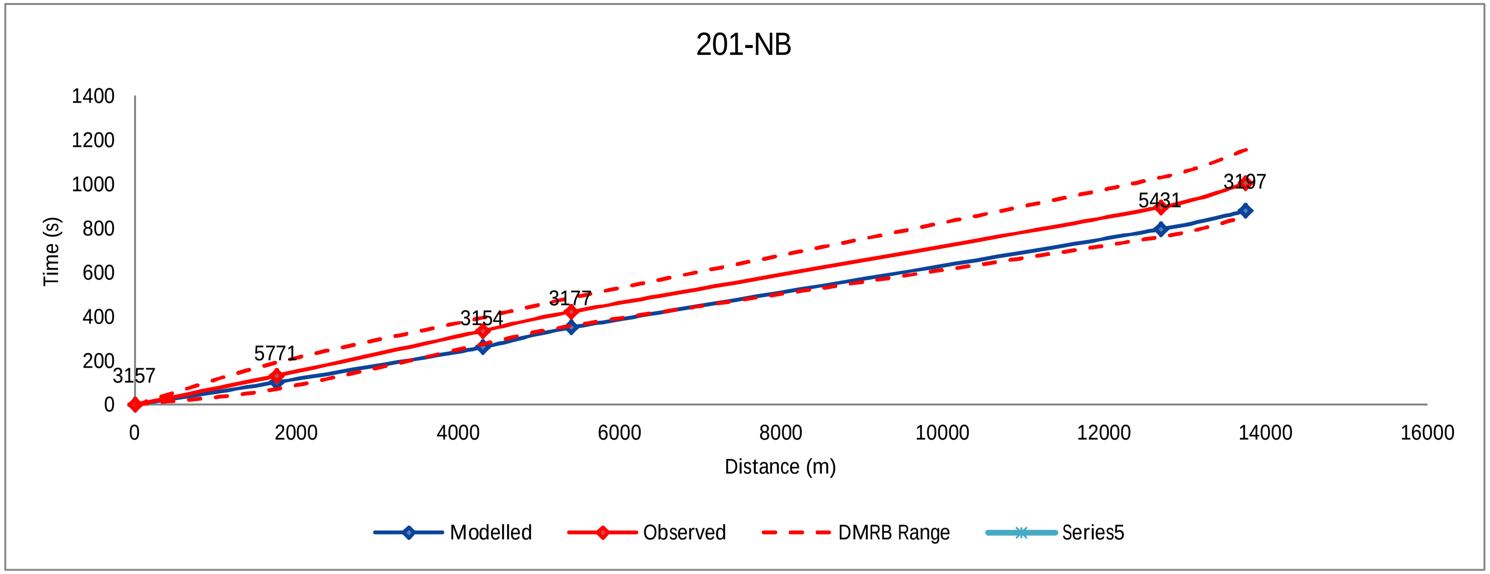
105-WB
Time (s)
600
500
400
300
200
100
0
-100
6080
9190
7070
7080
9420
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Distance (m)
Modelled
Observed
DMRB Range
Series5

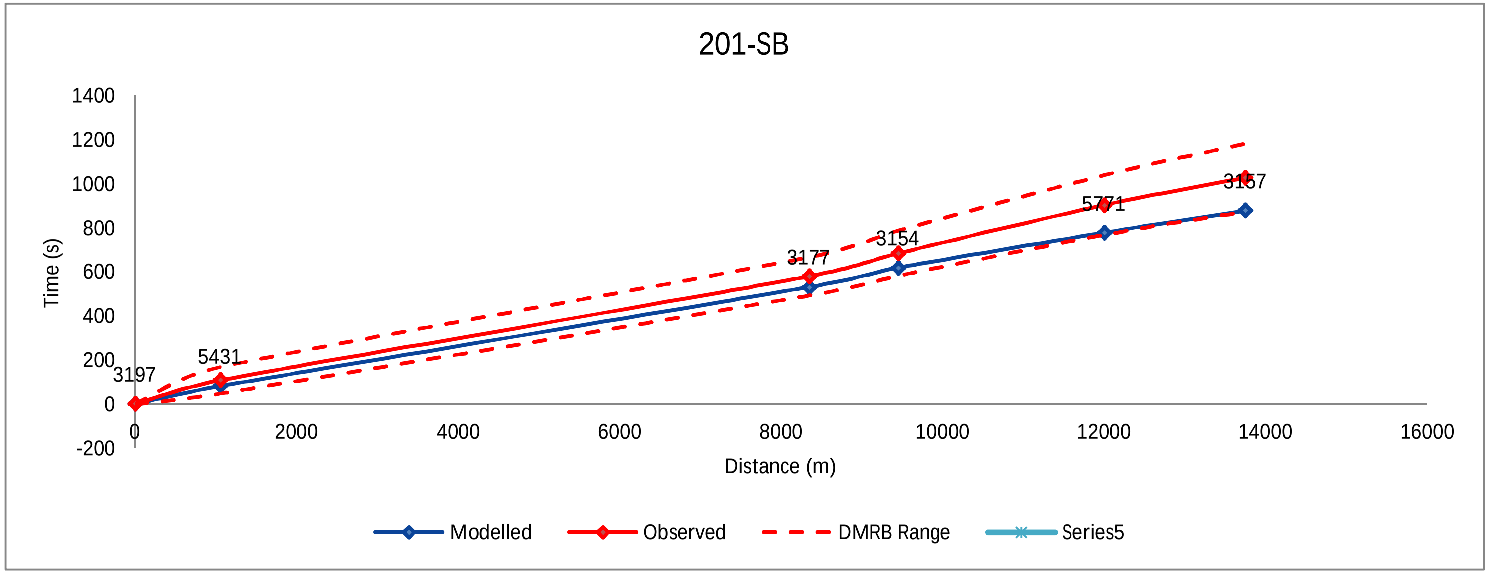

106-EB
Time (s)
700
600
500
400
300
200
100
0
2010
2050
6315
4000
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

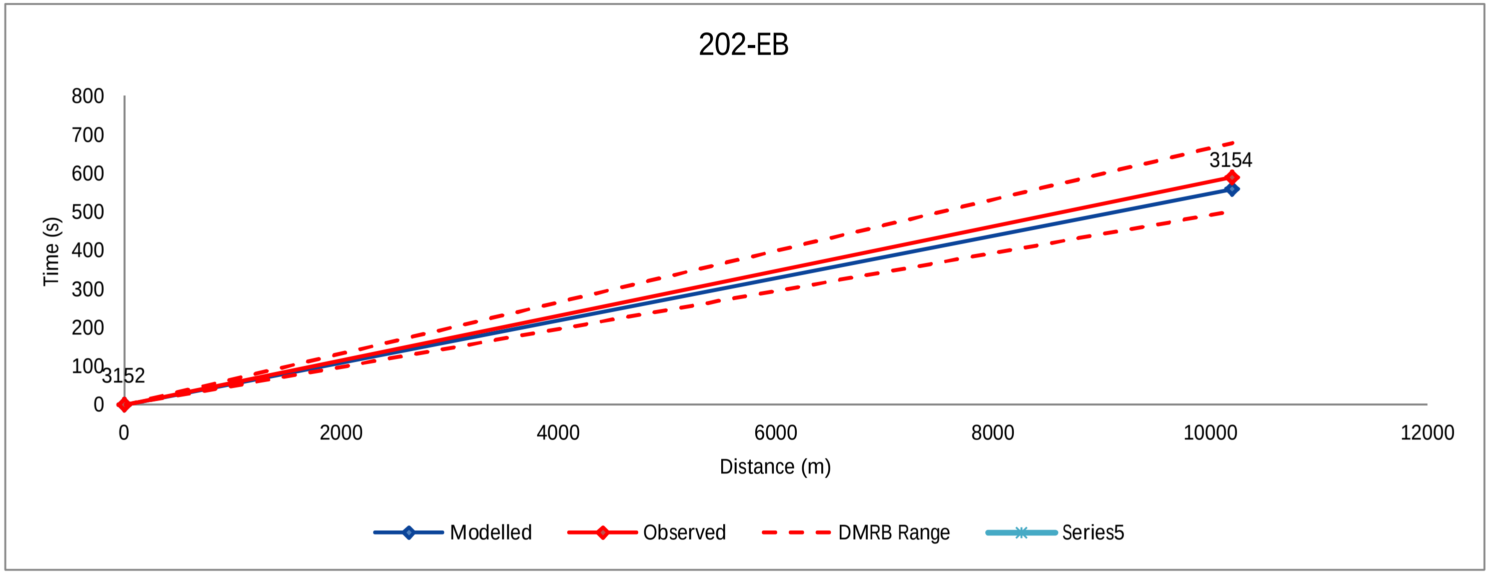

106-WB
Time (s)
600
500
400
300
200
100
0
-100
4000
6315
2050
2010
-1000
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

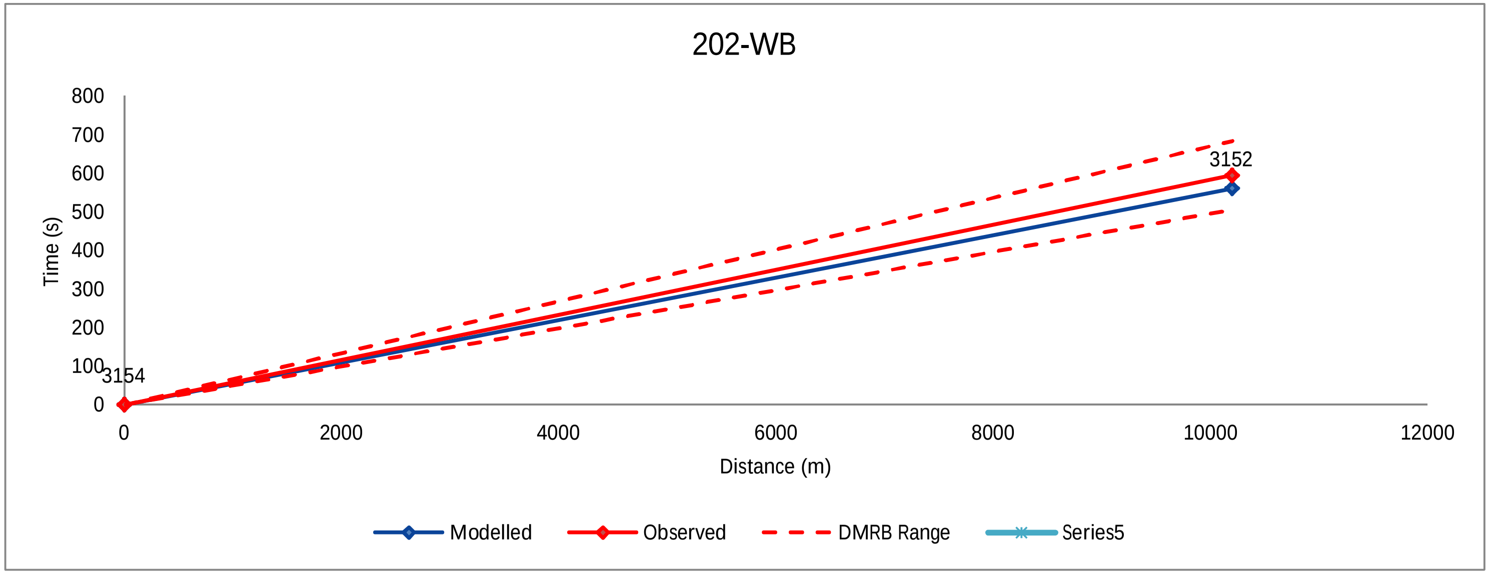

200-NB
Time (s)
Distance (m)
3156
3157
3159
3160
3161
50107
50050
Modelled
Observed
DMRB Range
Series5

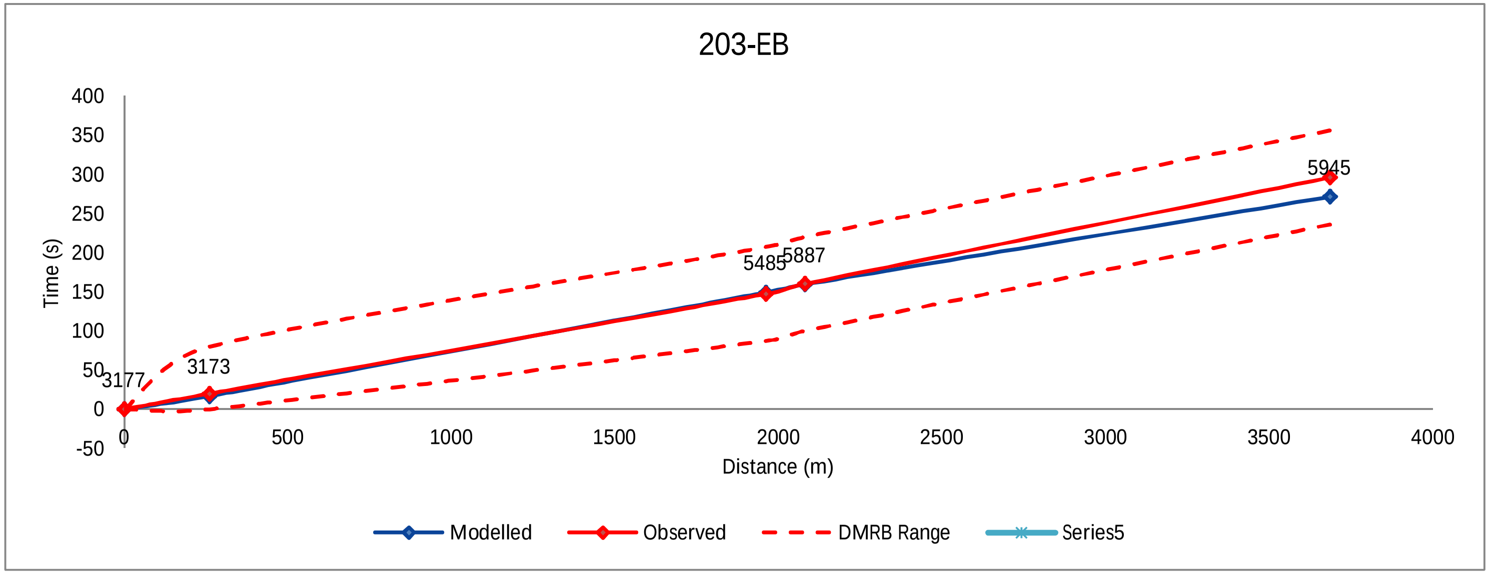

200-SB
Time (s)
Distance (m)
3156
3157
3159
3160
3161
50107
50050
Modelled
Observed
DMRB Range
Series5

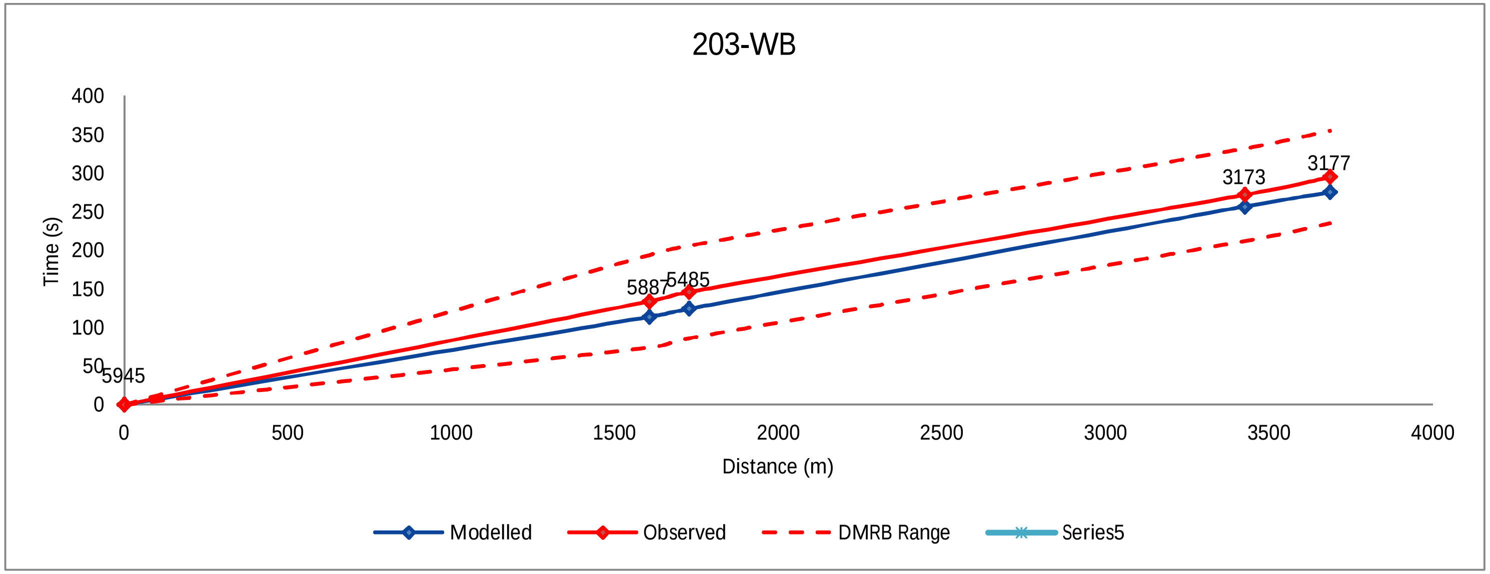

201-NB
Time (s)
1400
1200
1000
800
600
400
200
0
3157
5771
3154
3177
5431
3197
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

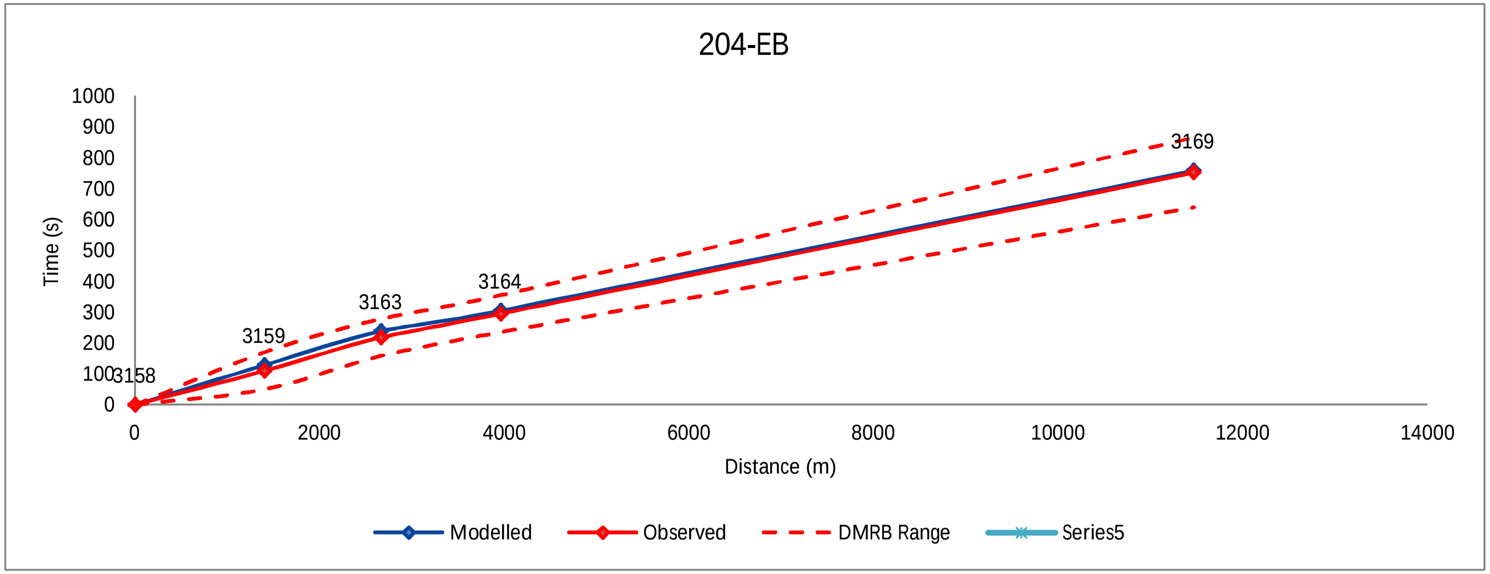

201-SB
Time (s)
1400
1200
1000
800
600
400
200
0
-200
3197
5431
3177
3154
5771
3157
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

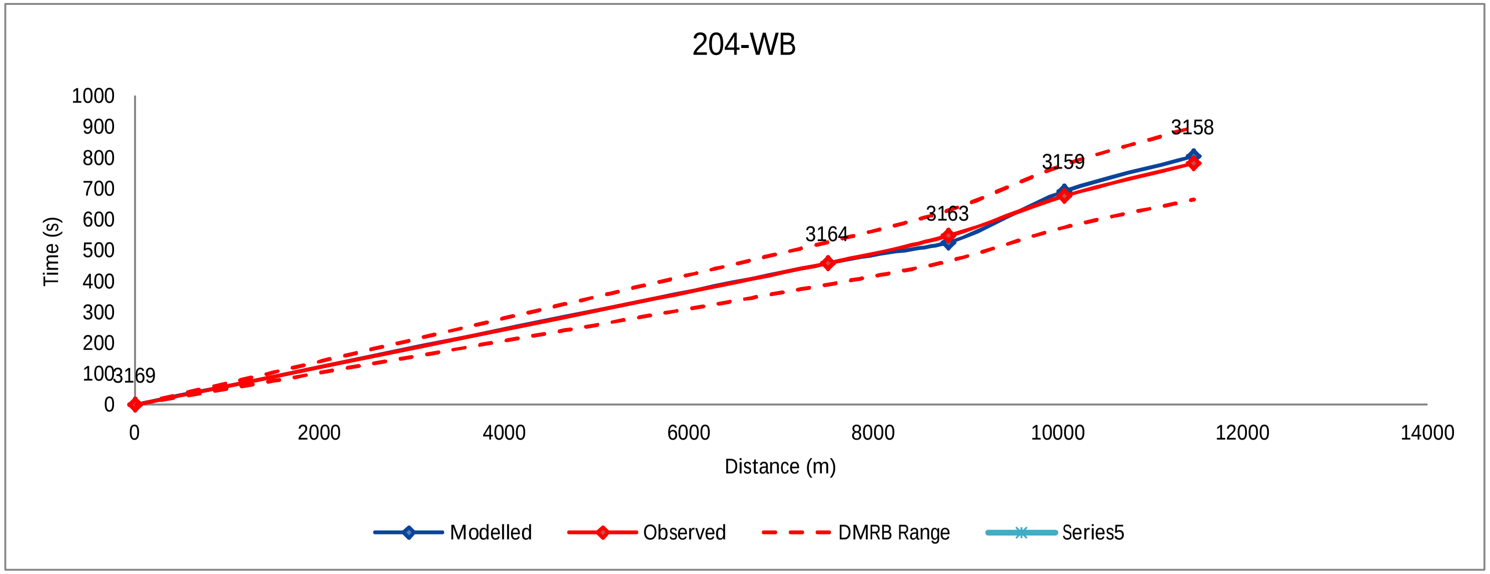

202-EB
Time (s)
800
700
600
500
400
300
200
100
0
3152
3154
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

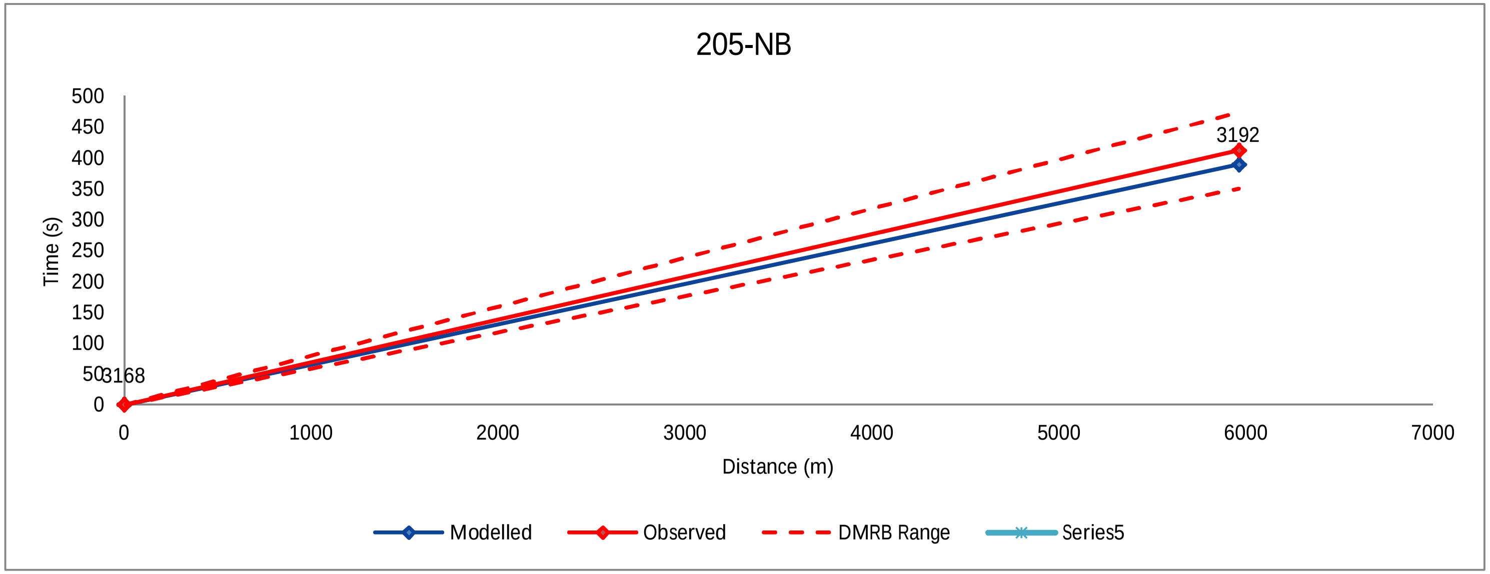

202-WB
Time (s)
800
700
600
500
400
300
200
100
0
3154
3152
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

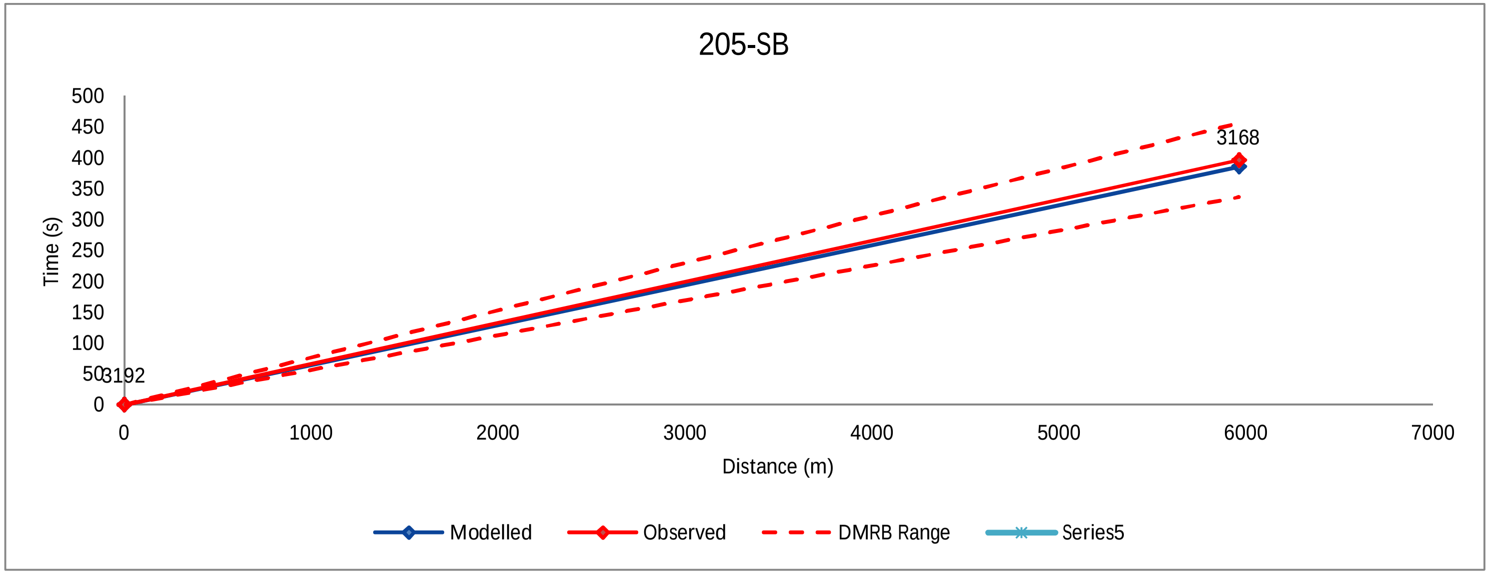

203-EB
Time (s)
400
350
300
250
200
150
100
50
0
-50
3177
3173
5485
5887
5945
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
Modelled
Observed
DMRB Range
Series5

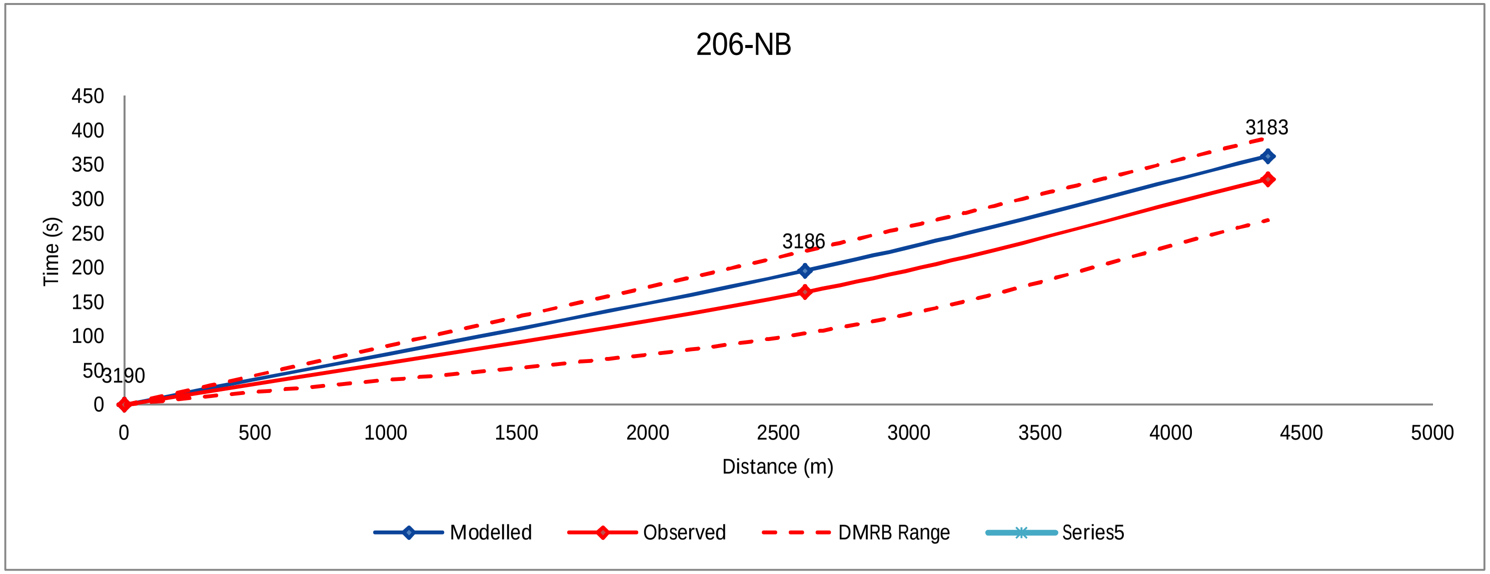

203-WB
Time (s)
400
350
300
250
200
150
100
50
0
5945
5887
5485
3173
3177
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
Modelled
Observed
DMRB Range
Series5

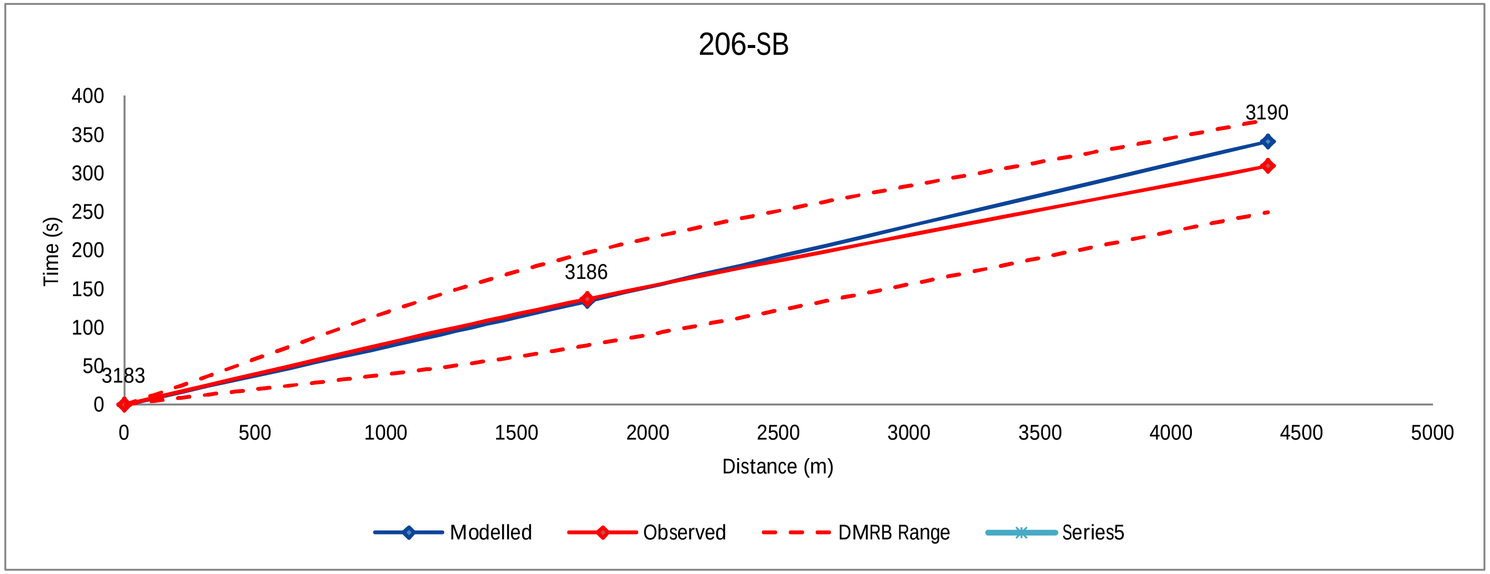

204-EB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3158
3159
3163
3164
3169
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

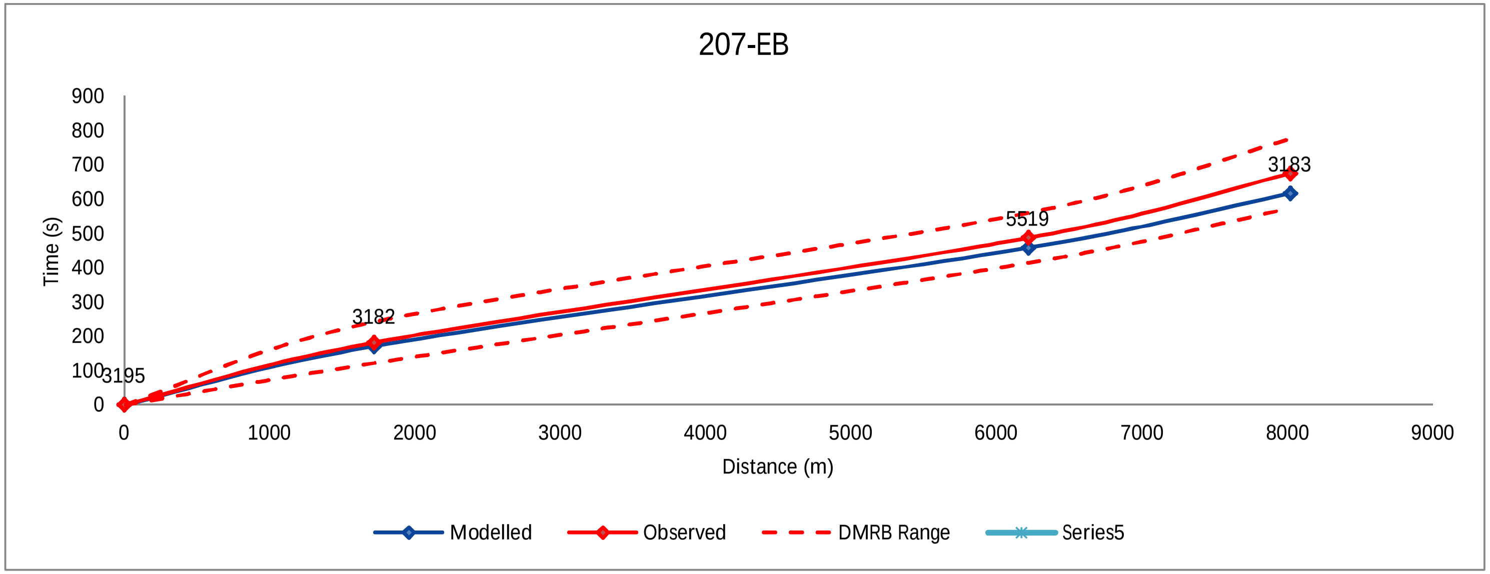

204-WB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3169
3164
3163
3159
3158
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

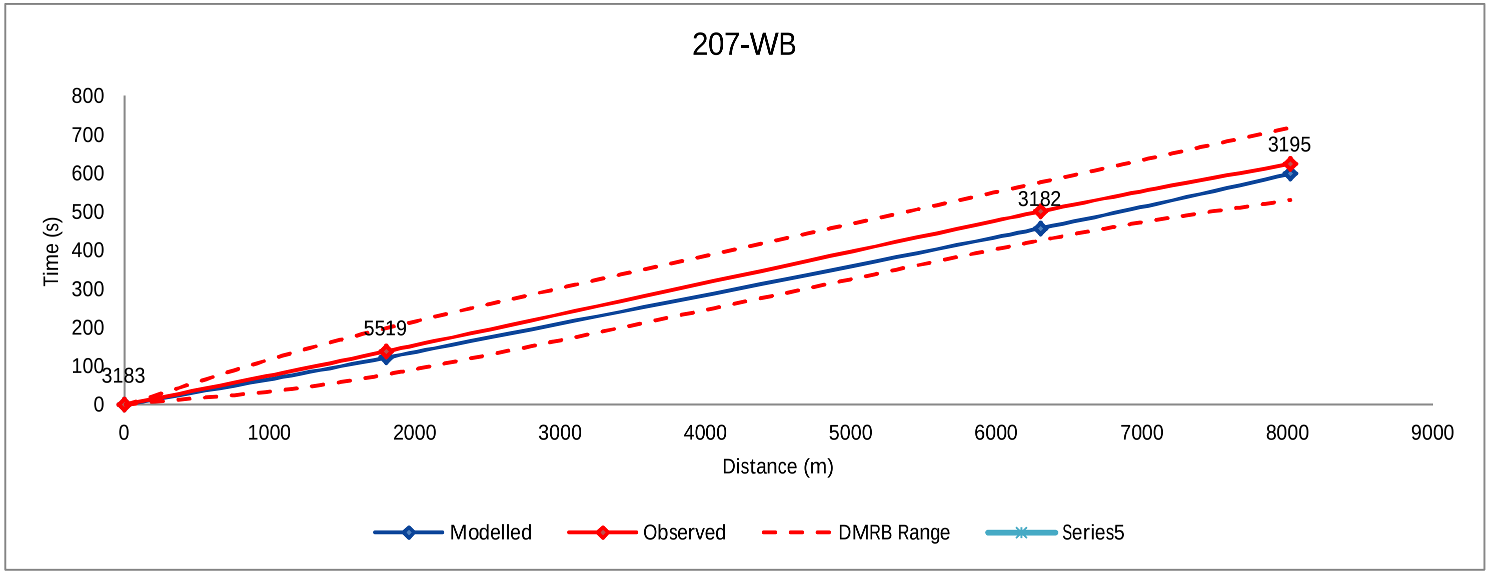

205-NB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
3168
3192
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range
Series5


205-SB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
3192
3168
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range
Series5


206-NB
Time (s)
450
400
350
300
250
200
150
100
50
0
3190
3186
3183
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

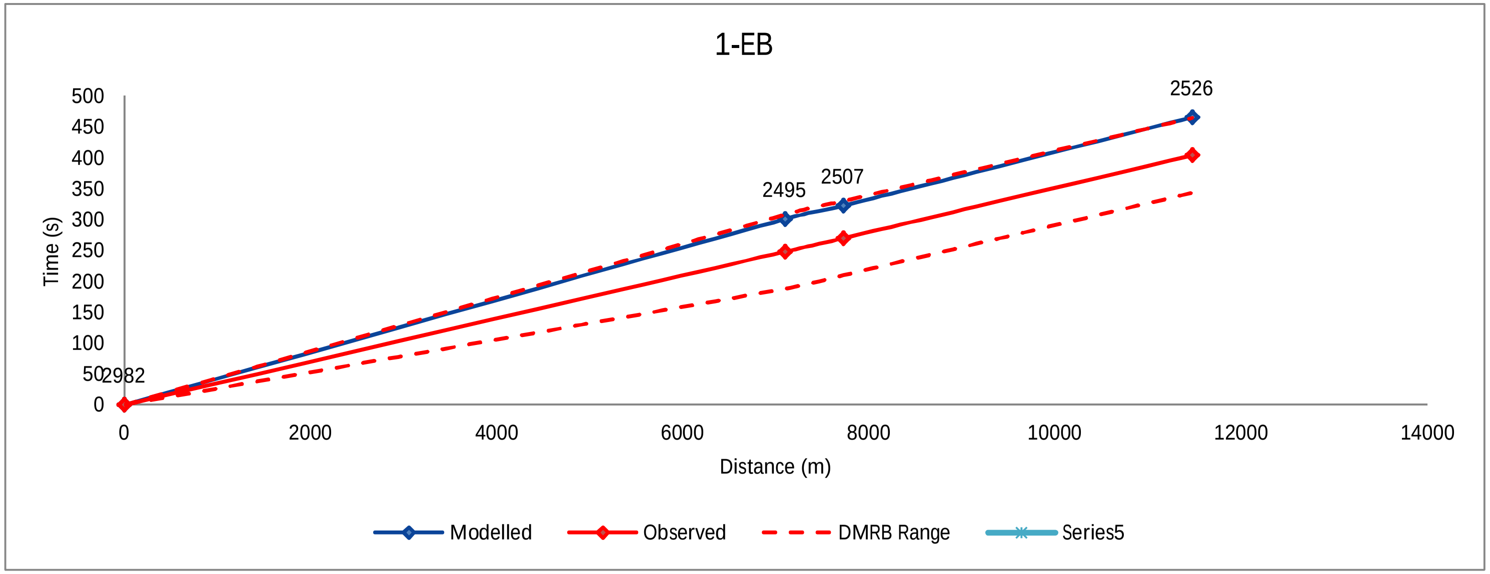

206-SB
Time (s)
400
350
300
250
200
150
100
50
0
3183
3186
3190
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

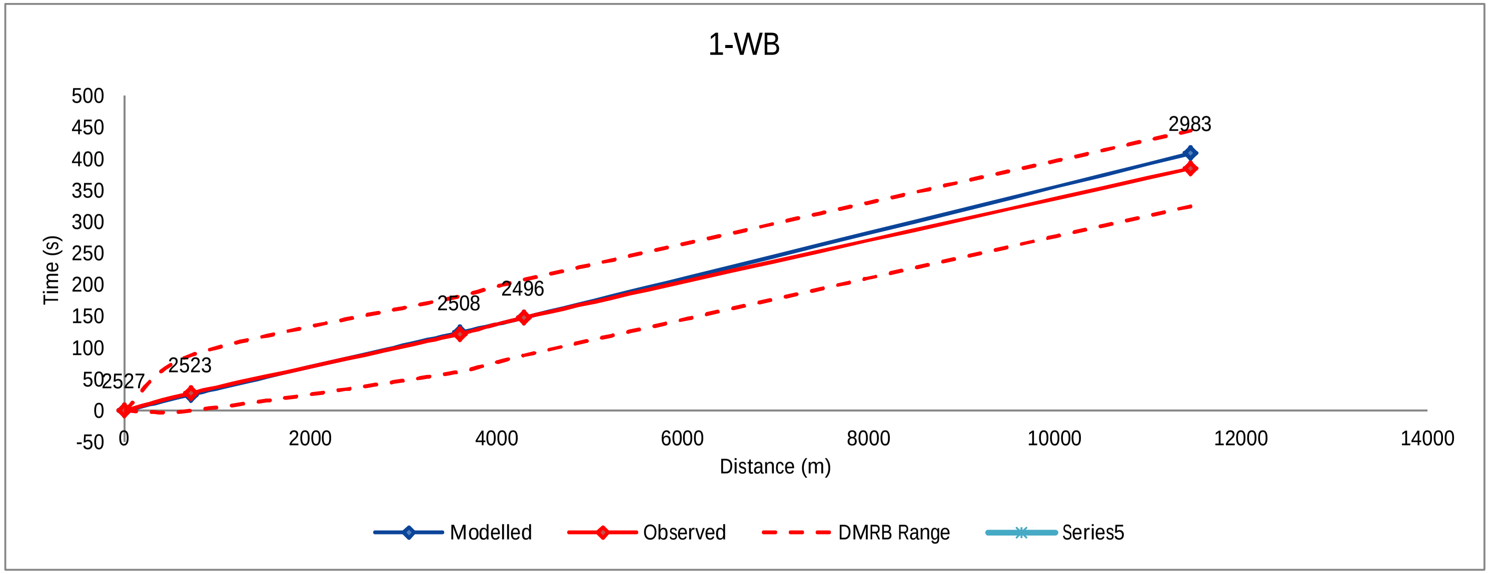

207-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
3195
3182
5519
3183
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

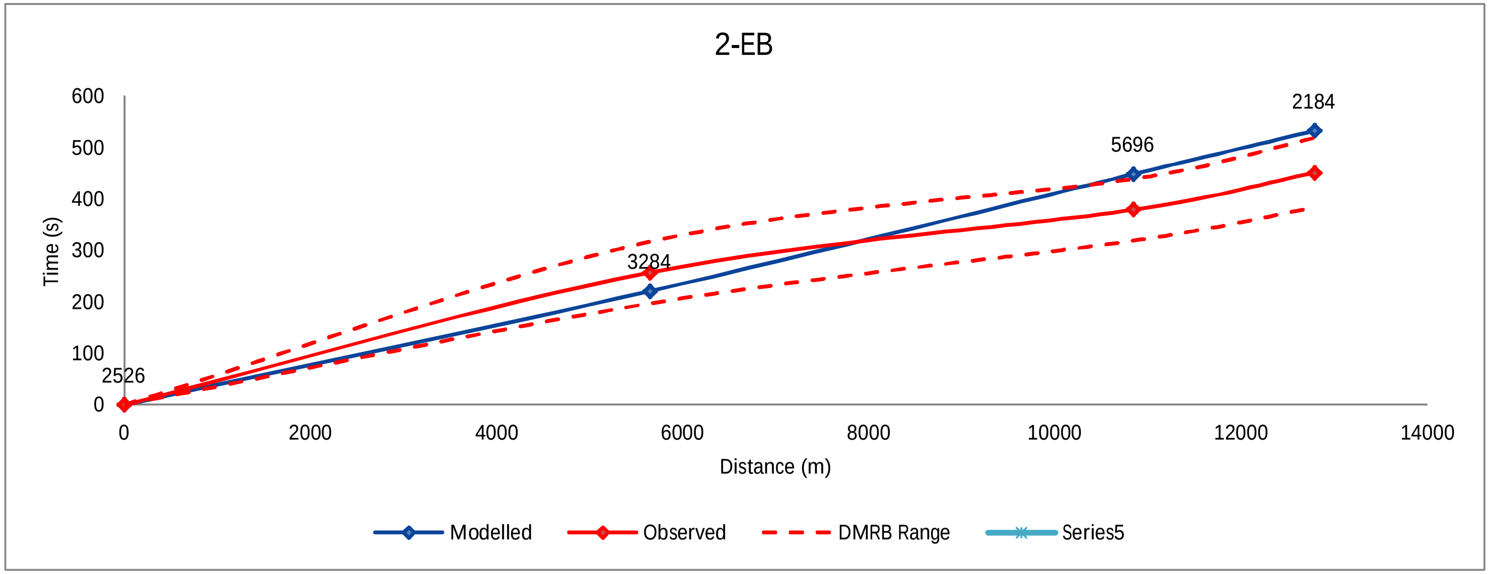

207-WB
Time (s)
800
700
600
500
400
300
200
100
0
3183
5519
3182
3195
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

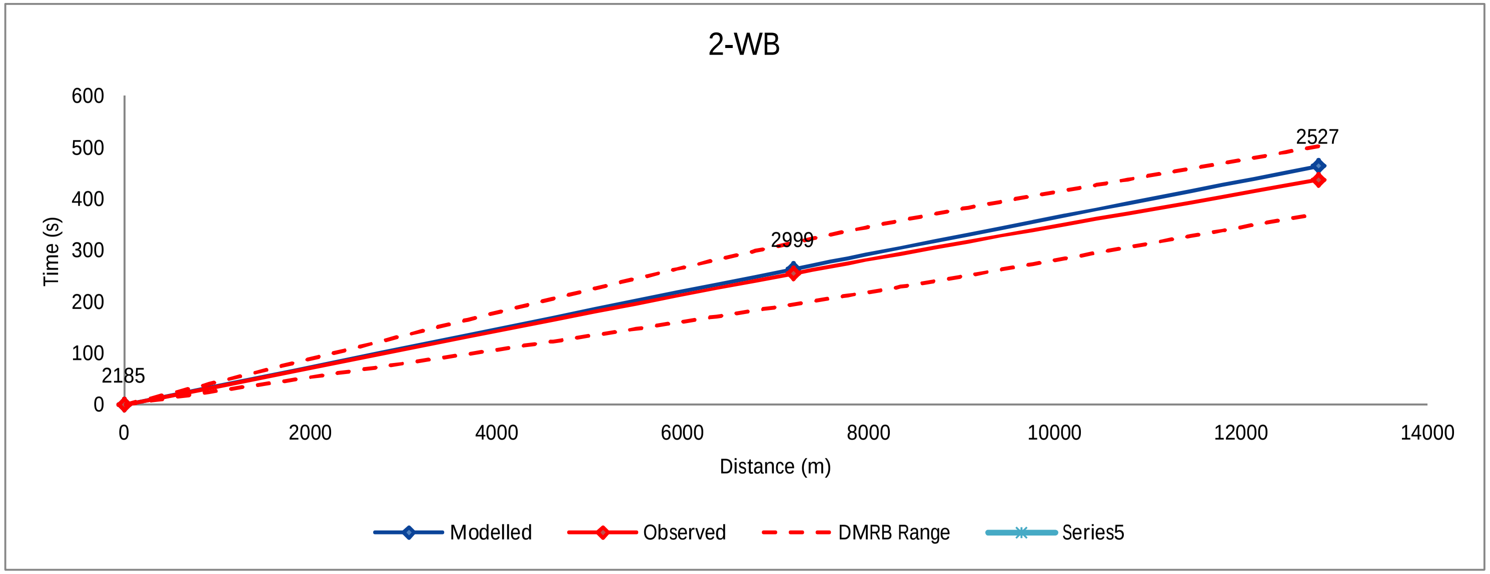
Appendix D.5

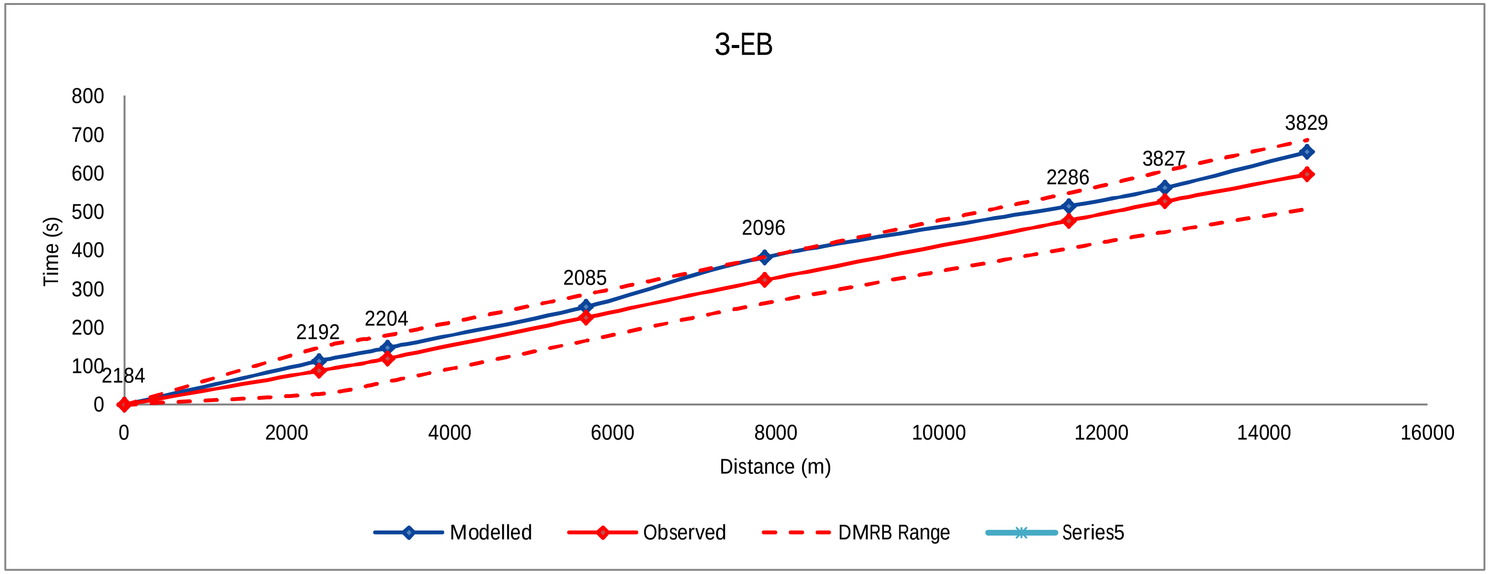
JOURNEY TIME ROUTE GRAPHS PM

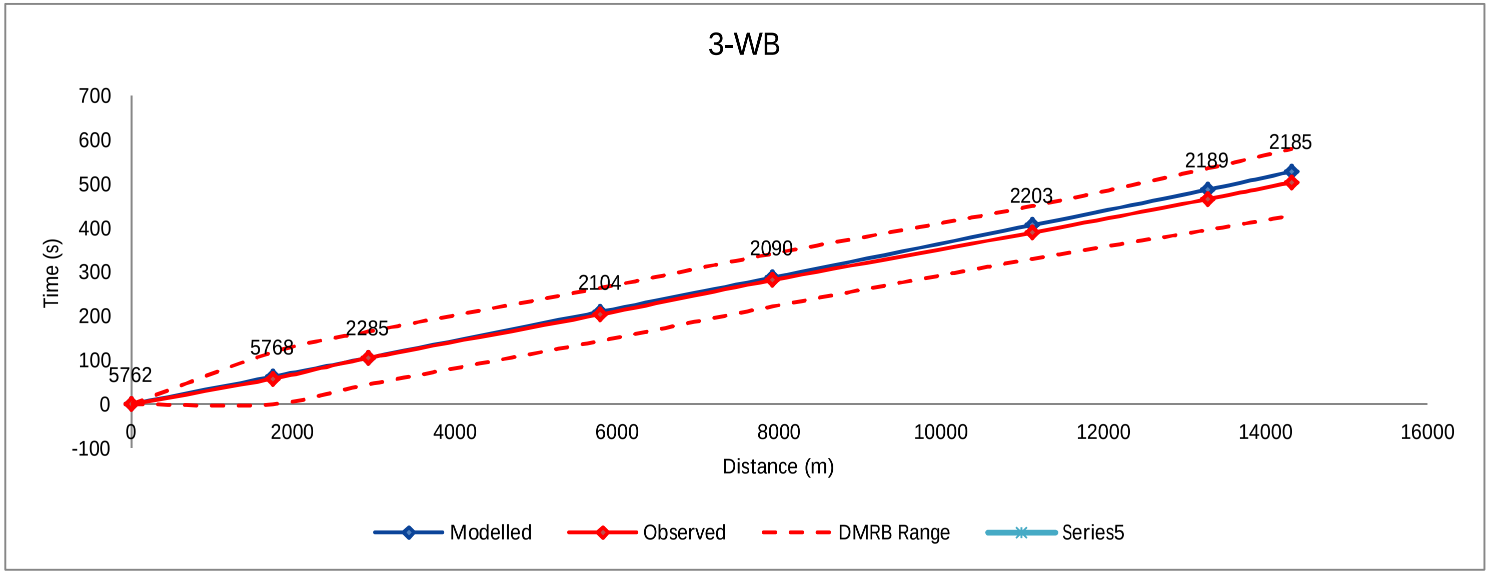

1-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
2982
2495
2507
2526
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

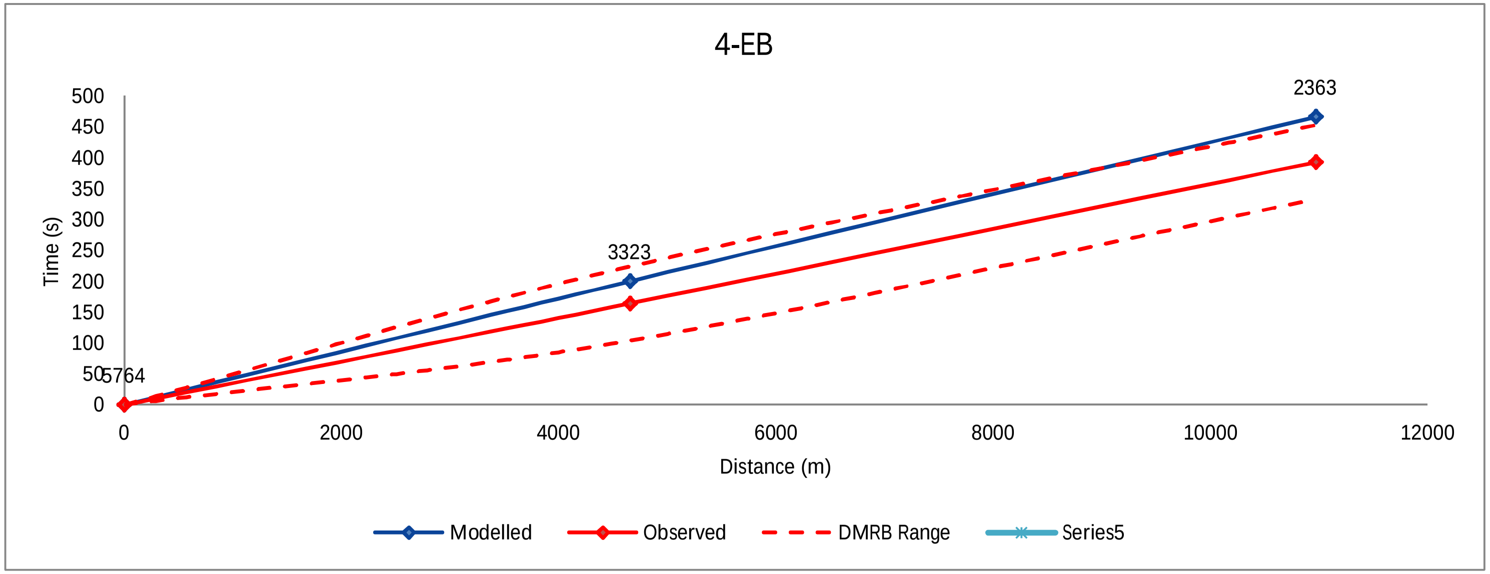

1-WB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
-50
2527
2523
2508
2496
2983
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

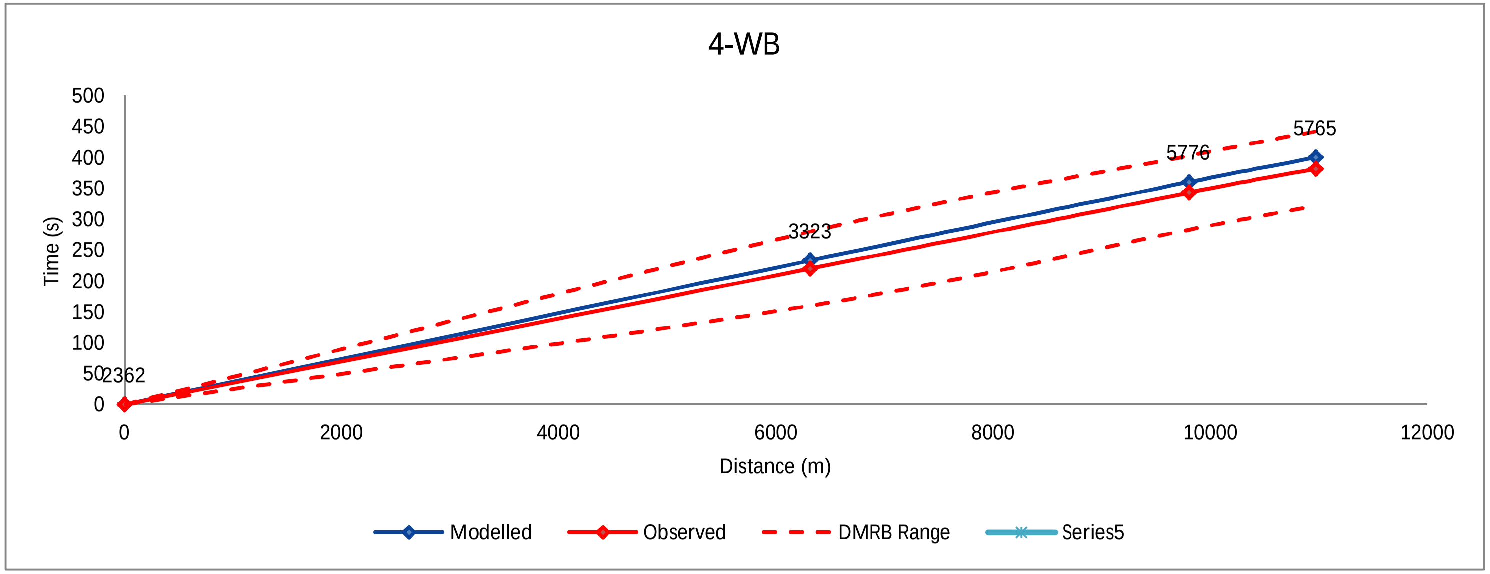

2-EB
Time (s)
600
500
400
300
200
100
0
2526
3284
5696
2184
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

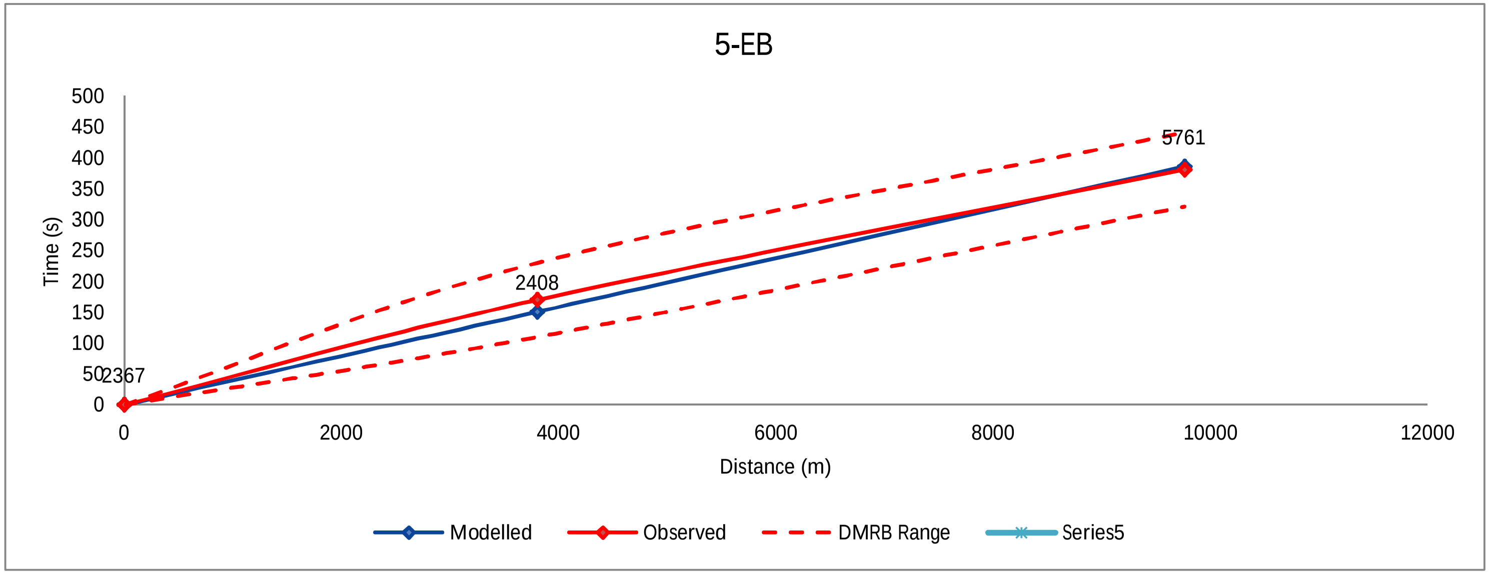

2-WB
Time (s)
600
500
400
300
200
100
0
2185
2999
2527
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

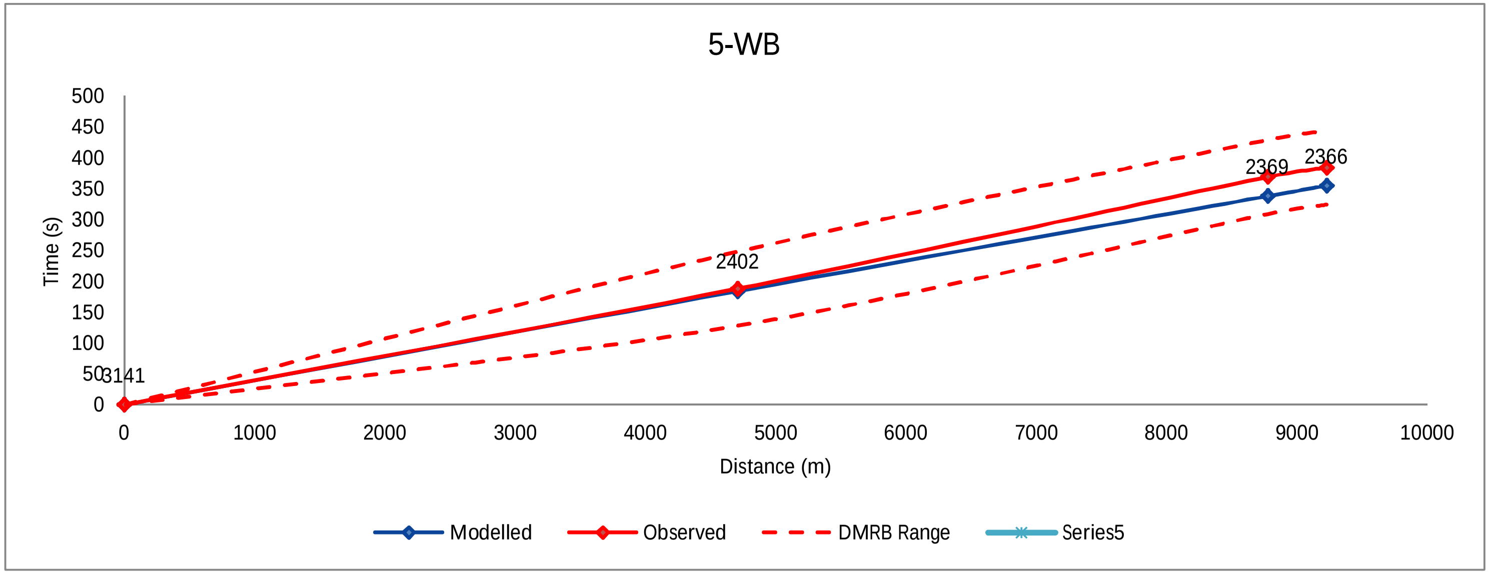

3-EB
Time (s)
800
700
600
500
400
300
200
100
0
2184
2192
2204
2085
2096
2286
3827
3829
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

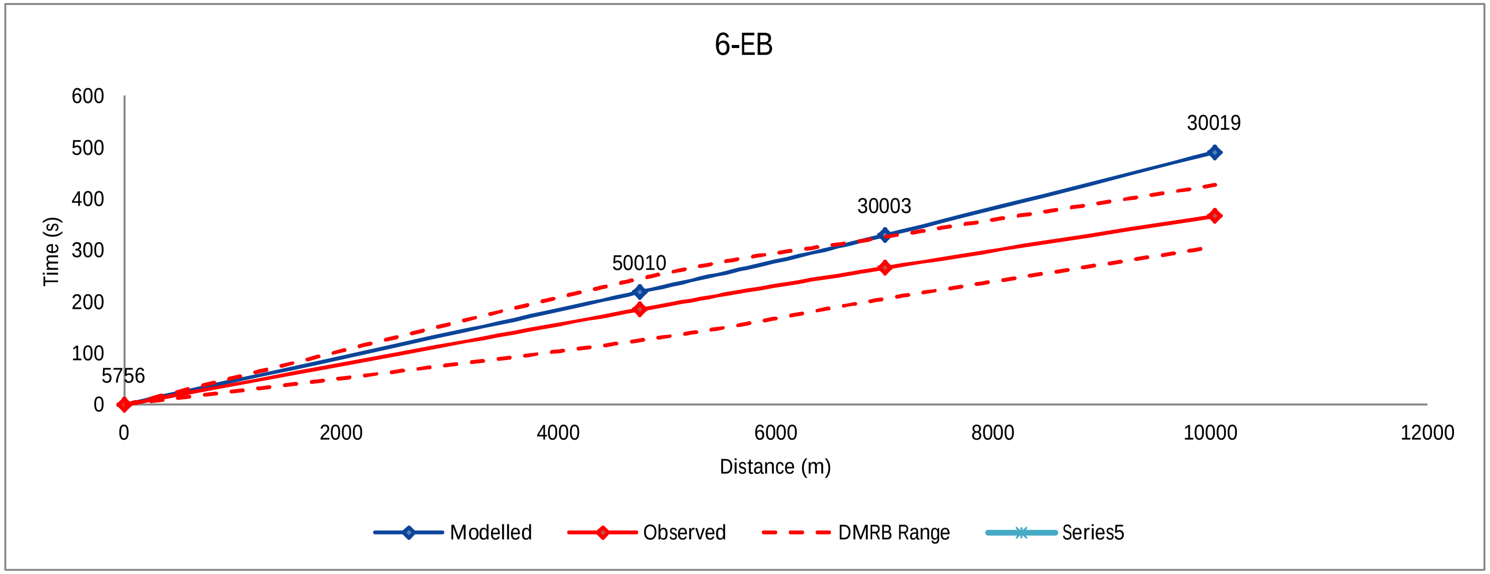

3-WB
Time (s)
700
600
500
400
300
200
100
0
-100
5762
5768
2285
2104
2090
2203
2189
2185
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

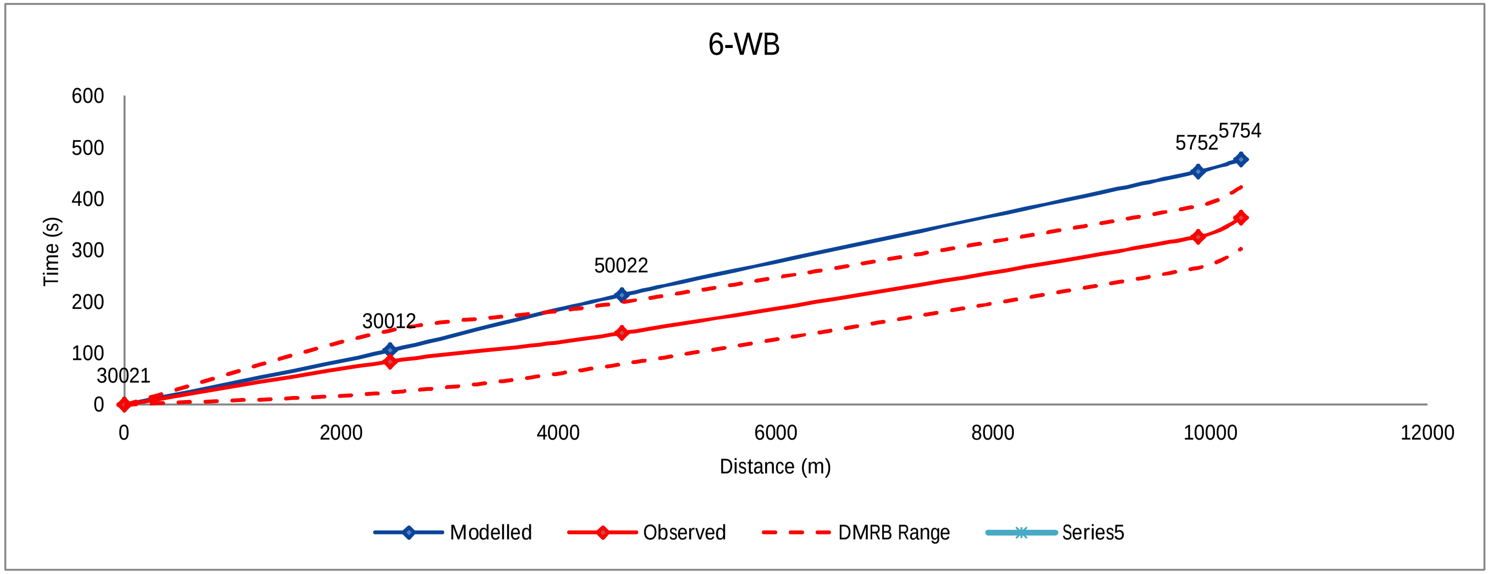

4-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
5764
3323
2363
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

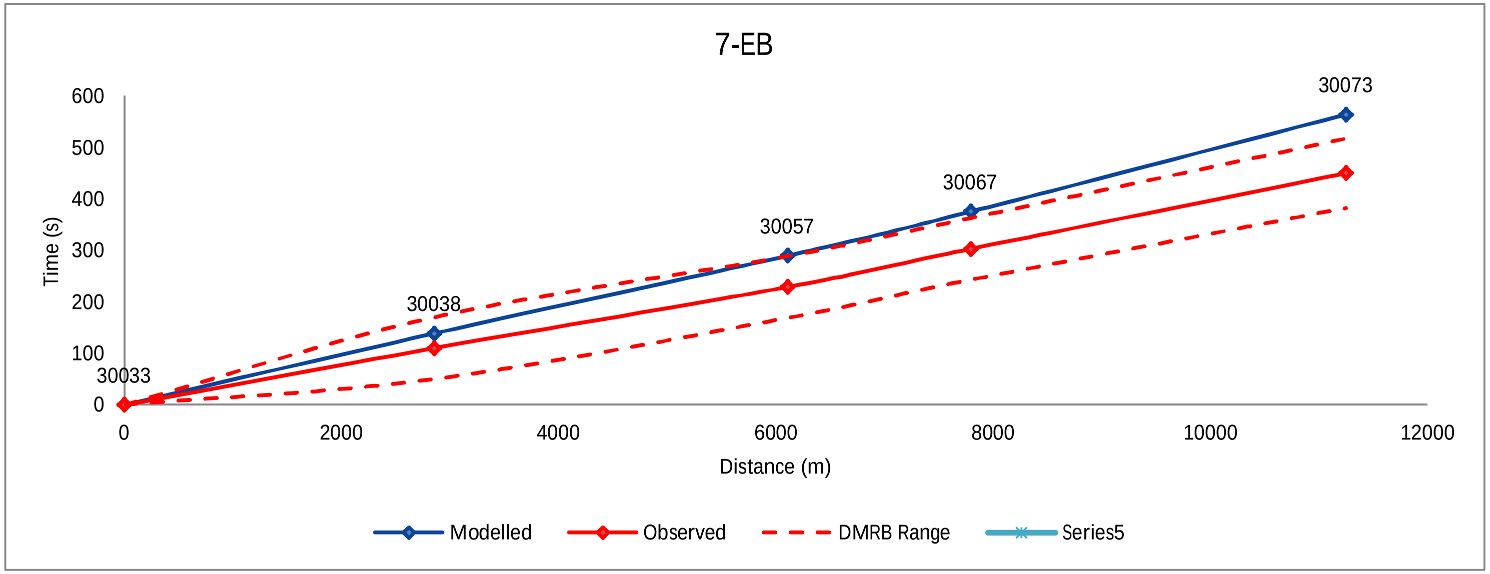

4-WB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
2362
3323
5776
5765
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

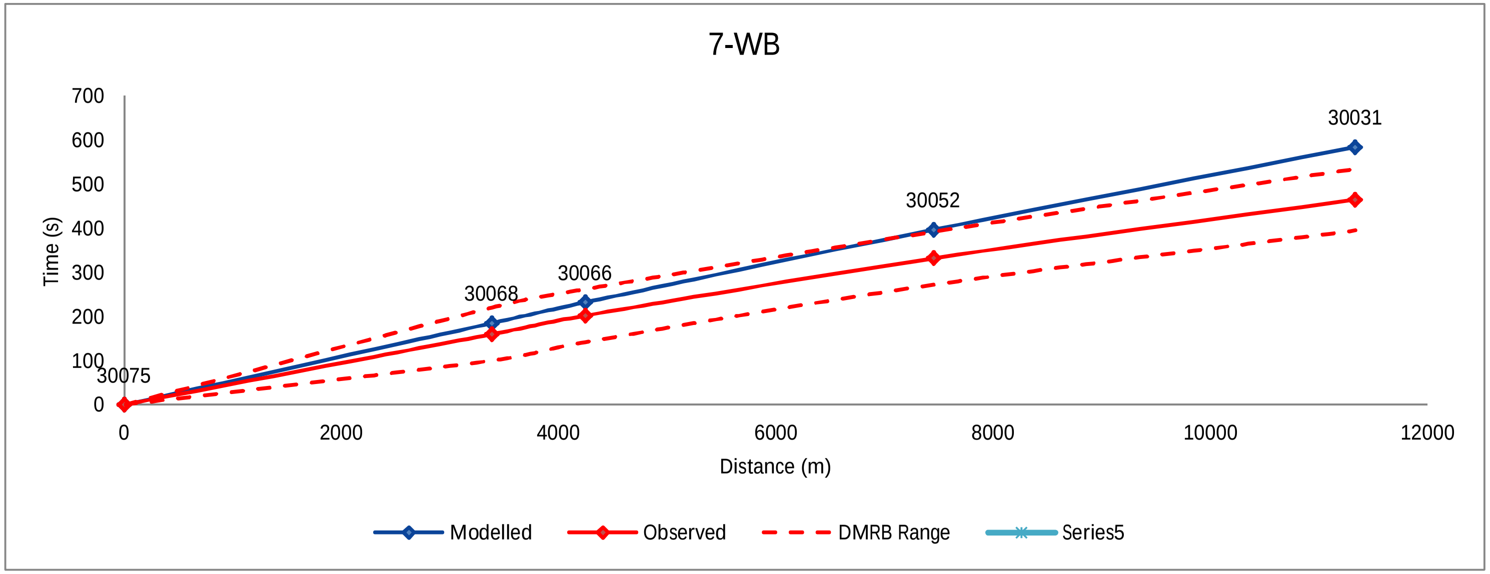

5-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
2367
2408
5761
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

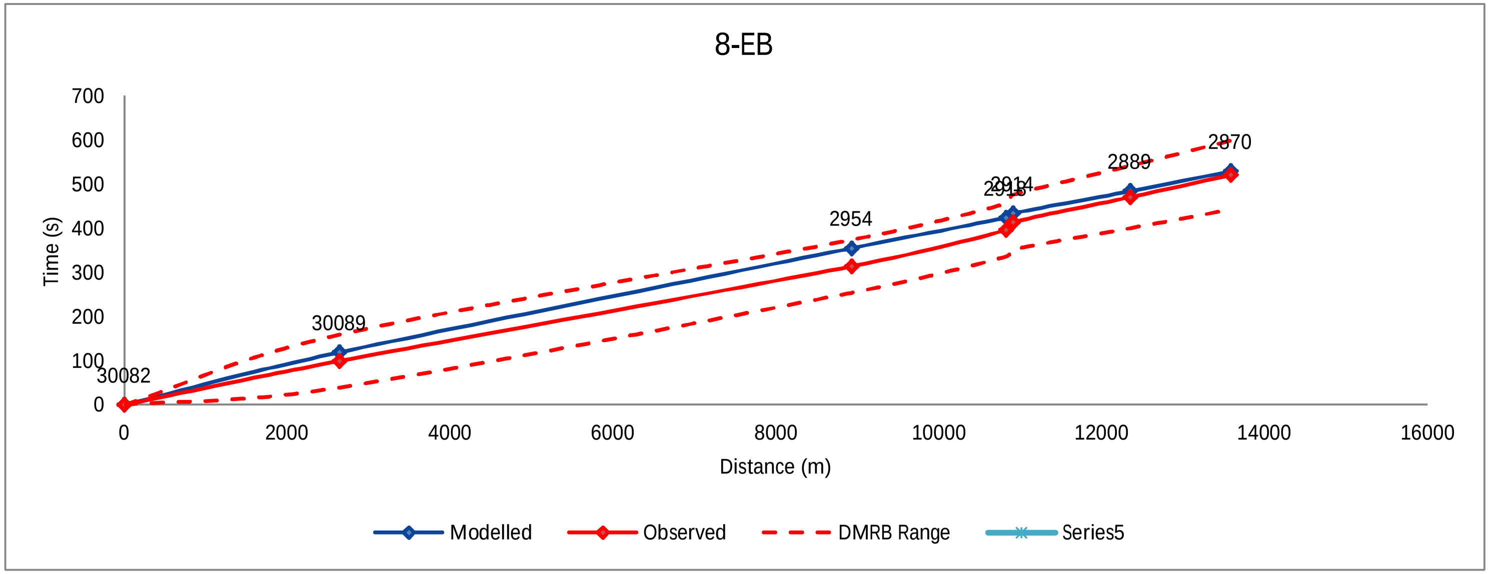

5-WB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
3141
2402
2369
2366
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5

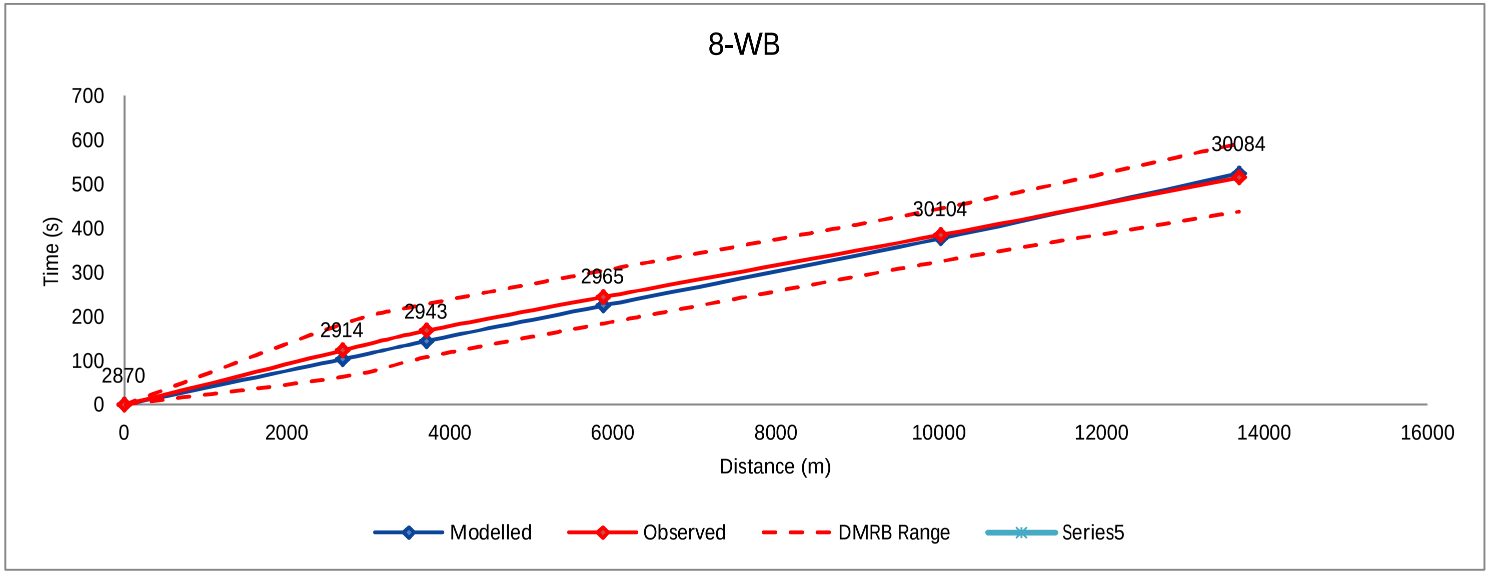

6-EB
Time (s)
600
500
400
300
200
100
0
5756
50010
30003
30019
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

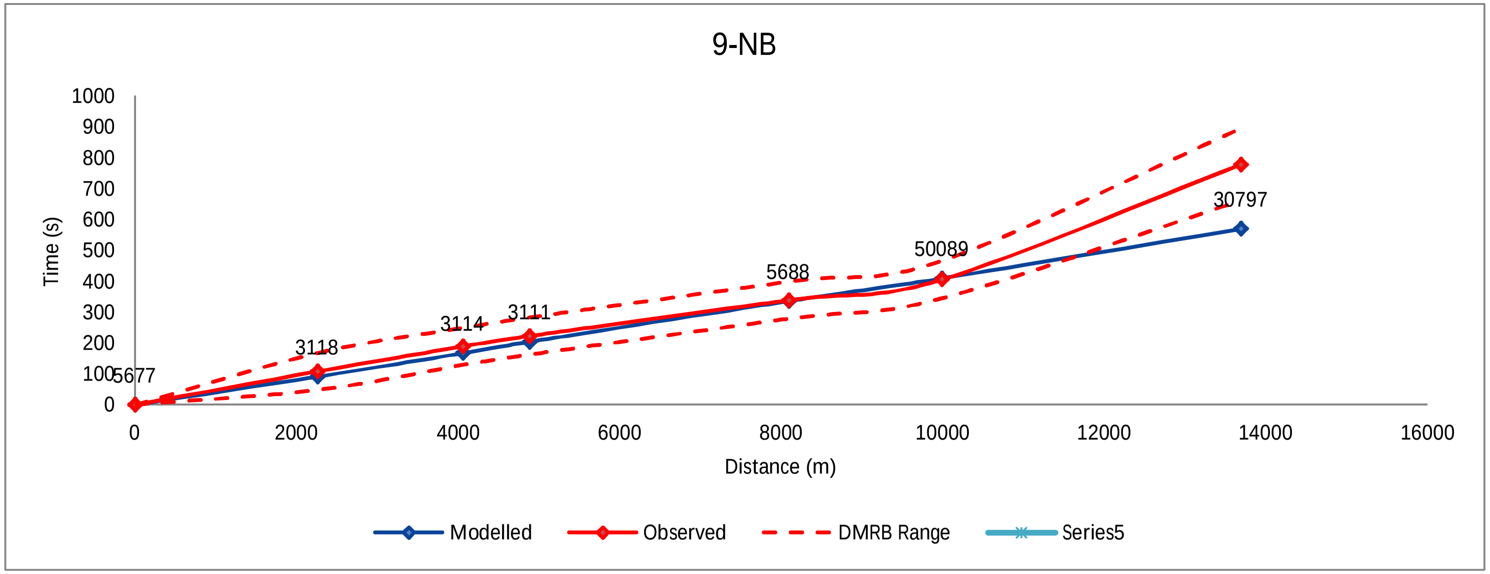

6-WB
Time (s)
600
500
400
300
200
100
0
30021
30012
50022
5752
5754
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

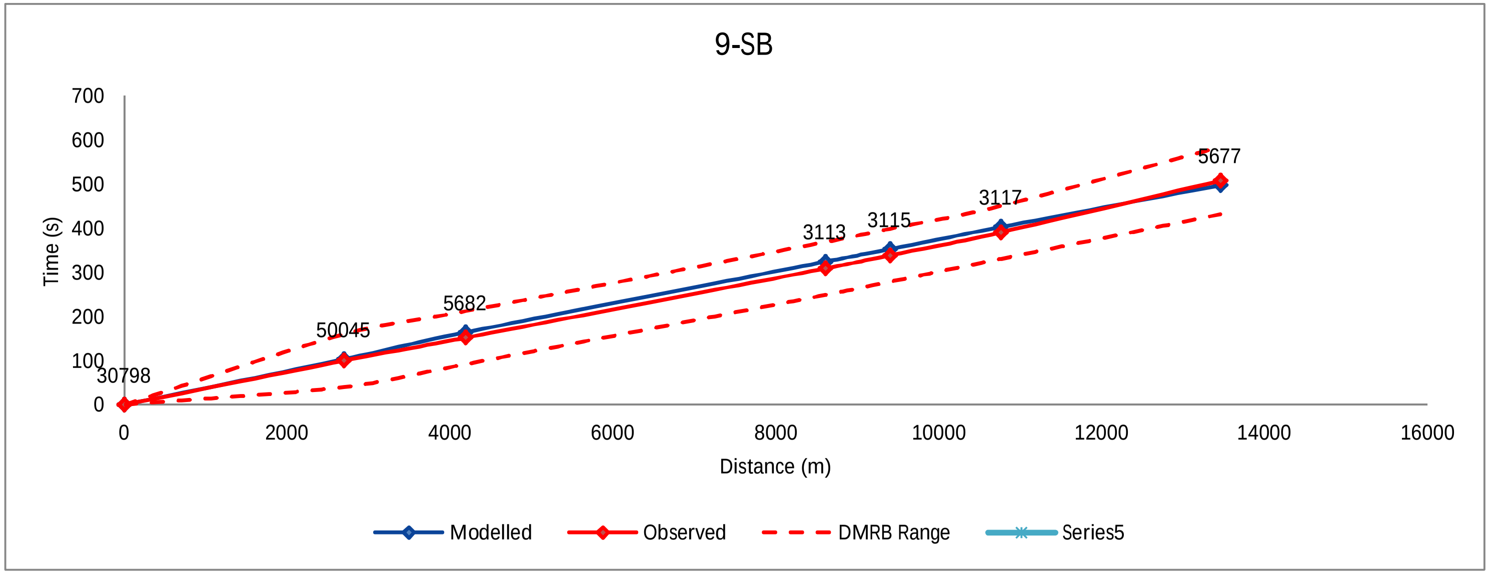

7-EB
Time (s)
600
500
400
300
200
100
0
30033
30038
30057
30067
30073
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

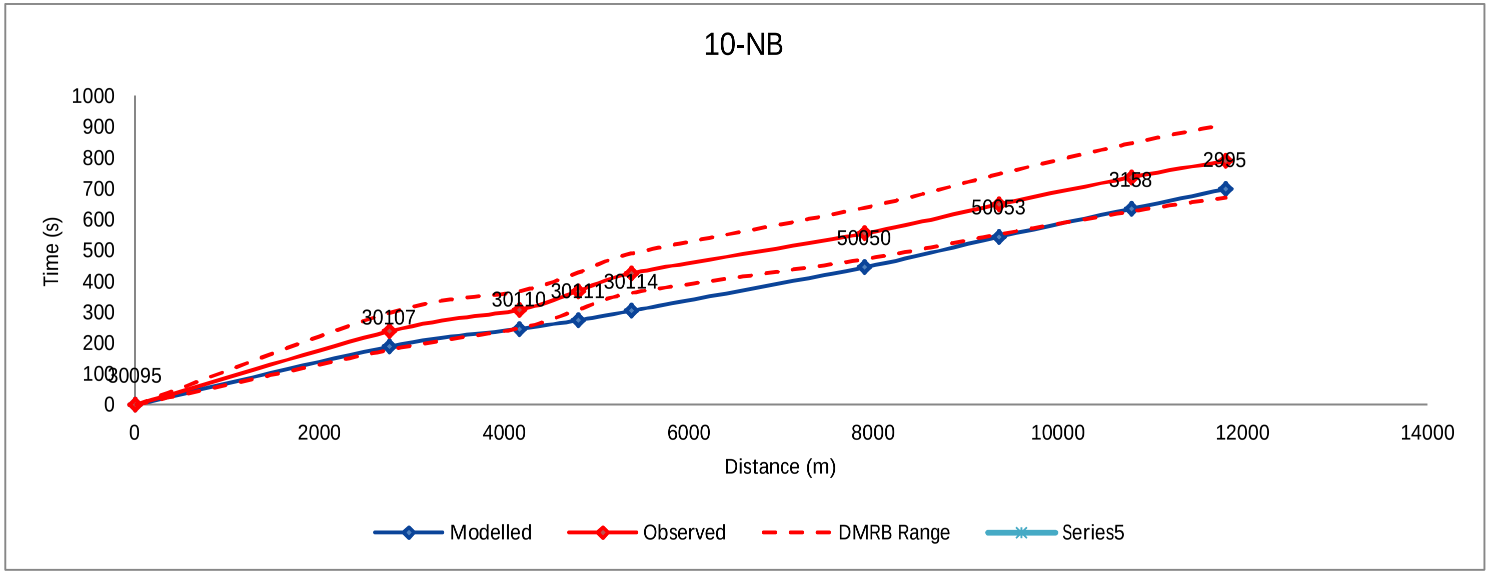

7-WB
Time (s)
700
600
500
400
300
200
100
0
30075
30068
30066
30052
30031
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

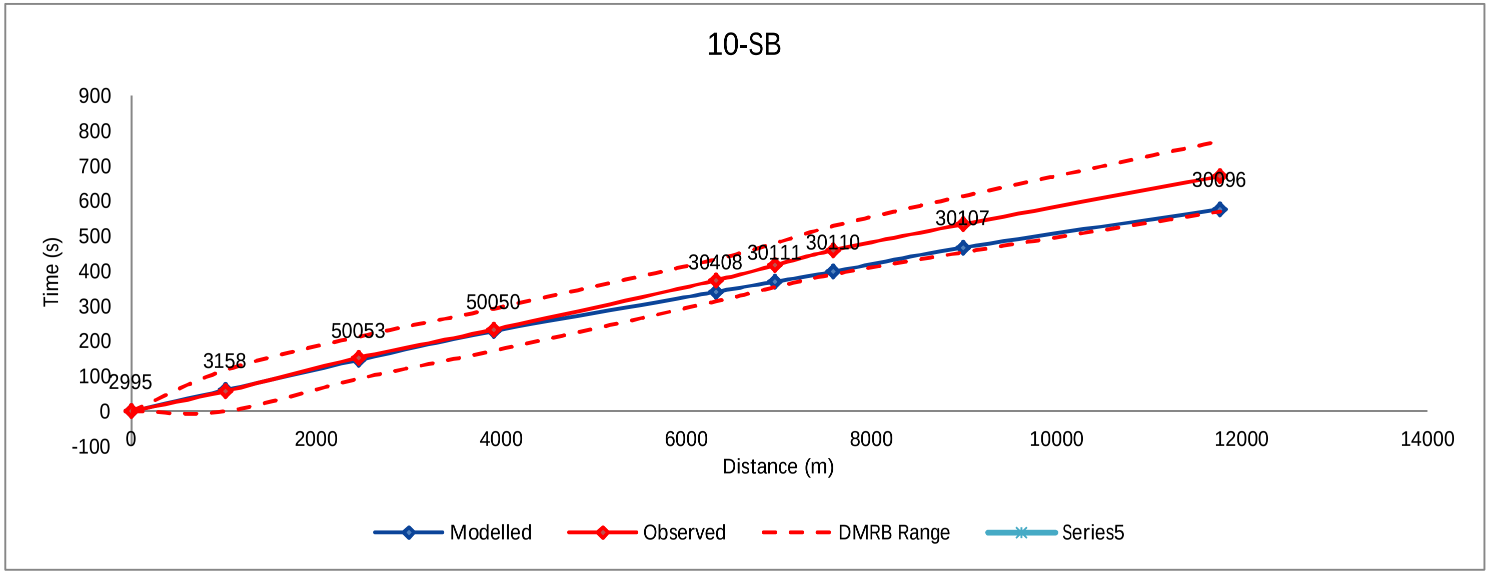

8-EB
Time (s)
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
30082
30089
2954
2914
2889
2870
Modelled
Observed
DMRB Range
Series5

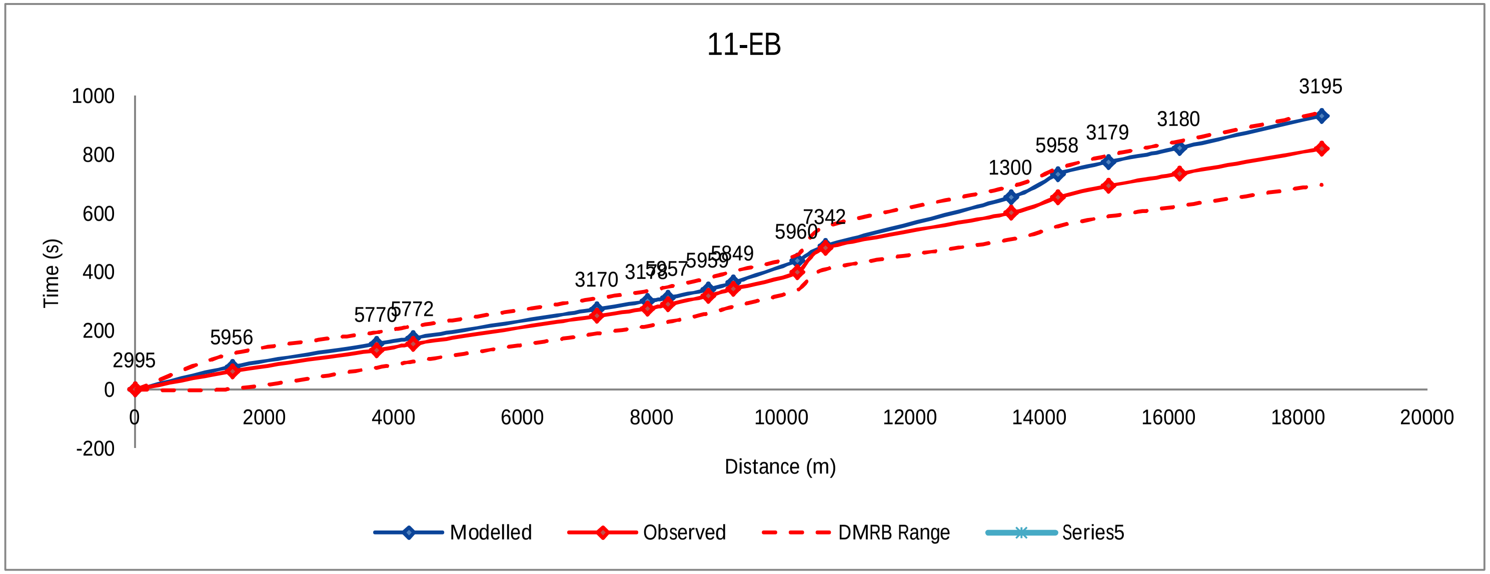

8-WB
Time (s)
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
2870
2914
2943
2965
30104
30084
Modelled
Observed
DMRB Range
Series5

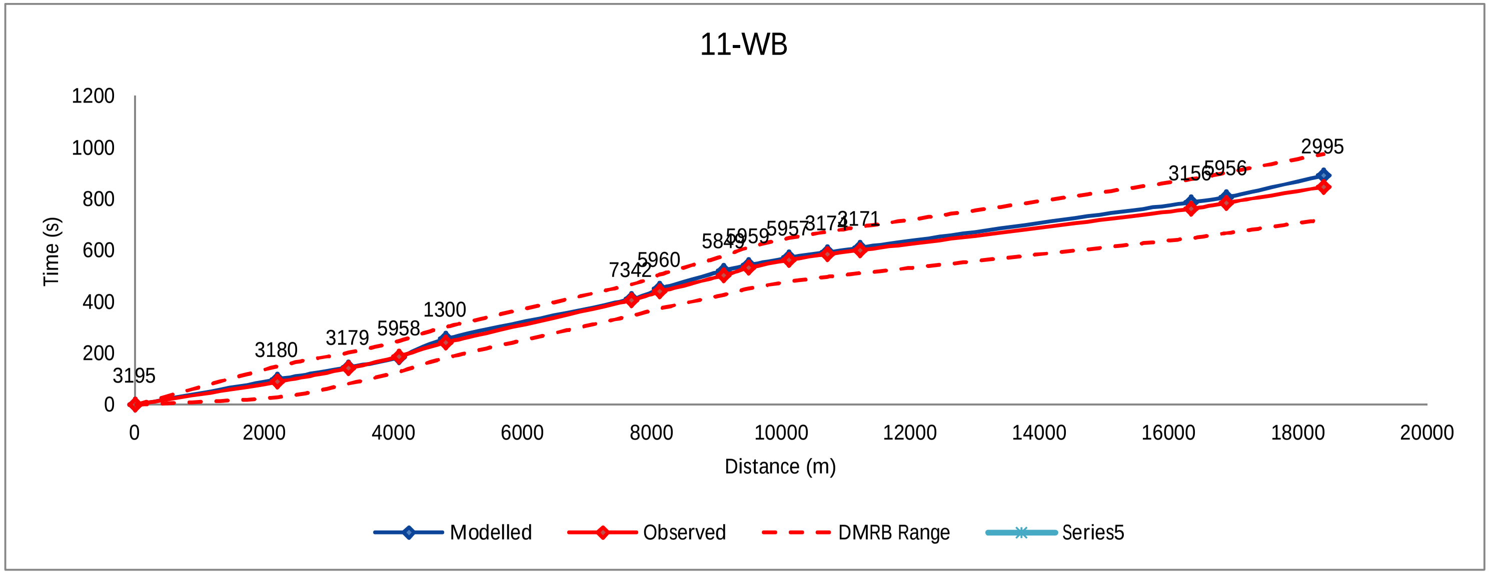

9-NB
Time (s)
Distance (m)
5677
3118
3114
3111
5688
50089
30797
Modelled
Observed
DMRB Range
Series5

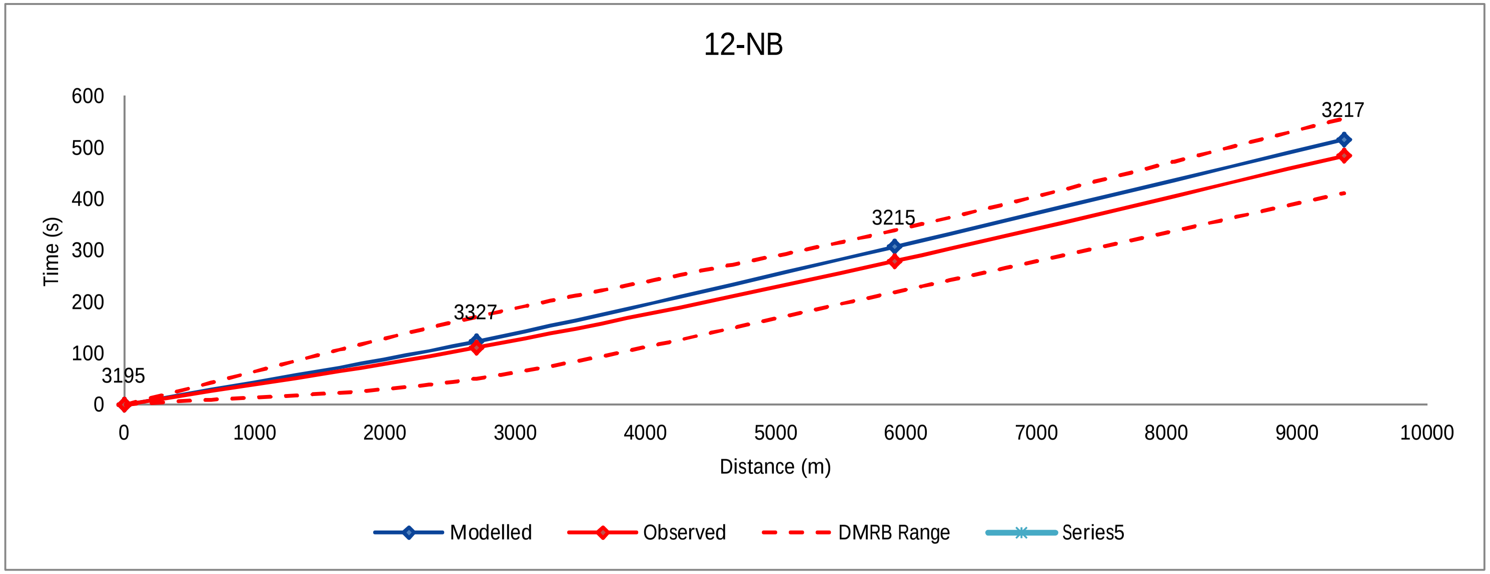

9-SB
Time (s)
Distance (m)
30798
50045
5682
3113
3115
3117
5677
Modelled
Observed
DMRB Range
Series5

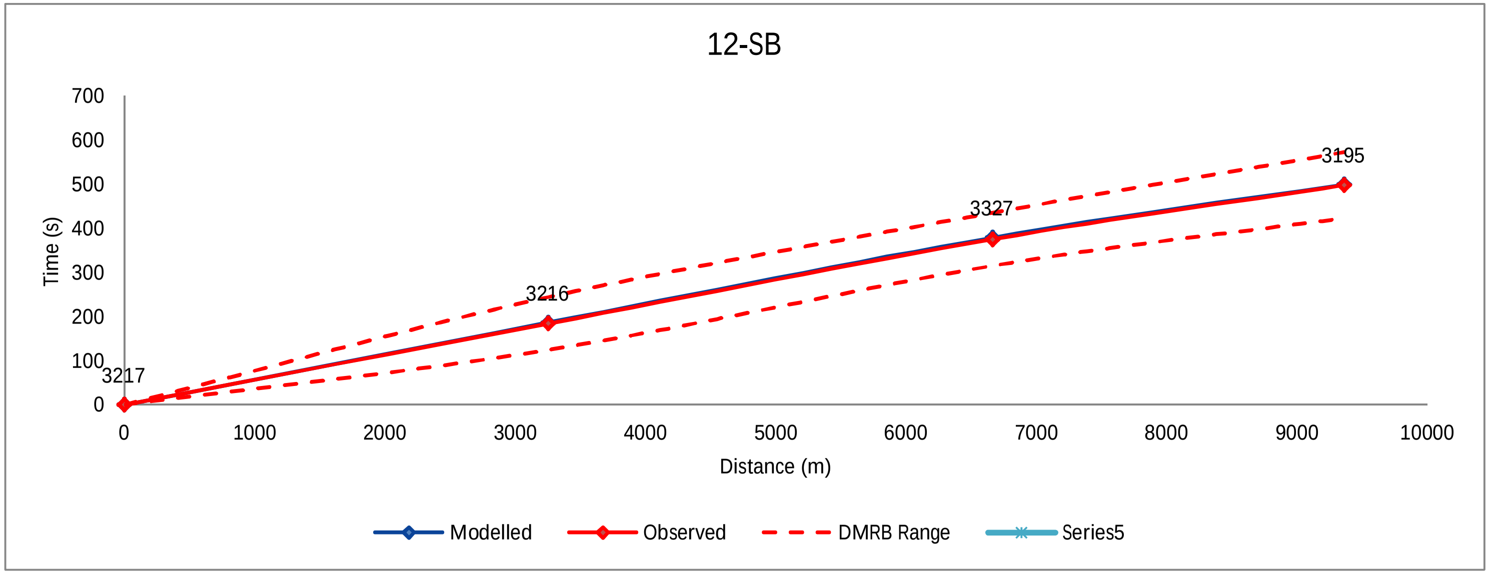

10-NB
Time (s)
Distance (m)
30095
30107
30110
30111
30114
50050
50053
3158
2995
Modelled
Observed
DMRB Range
Series5

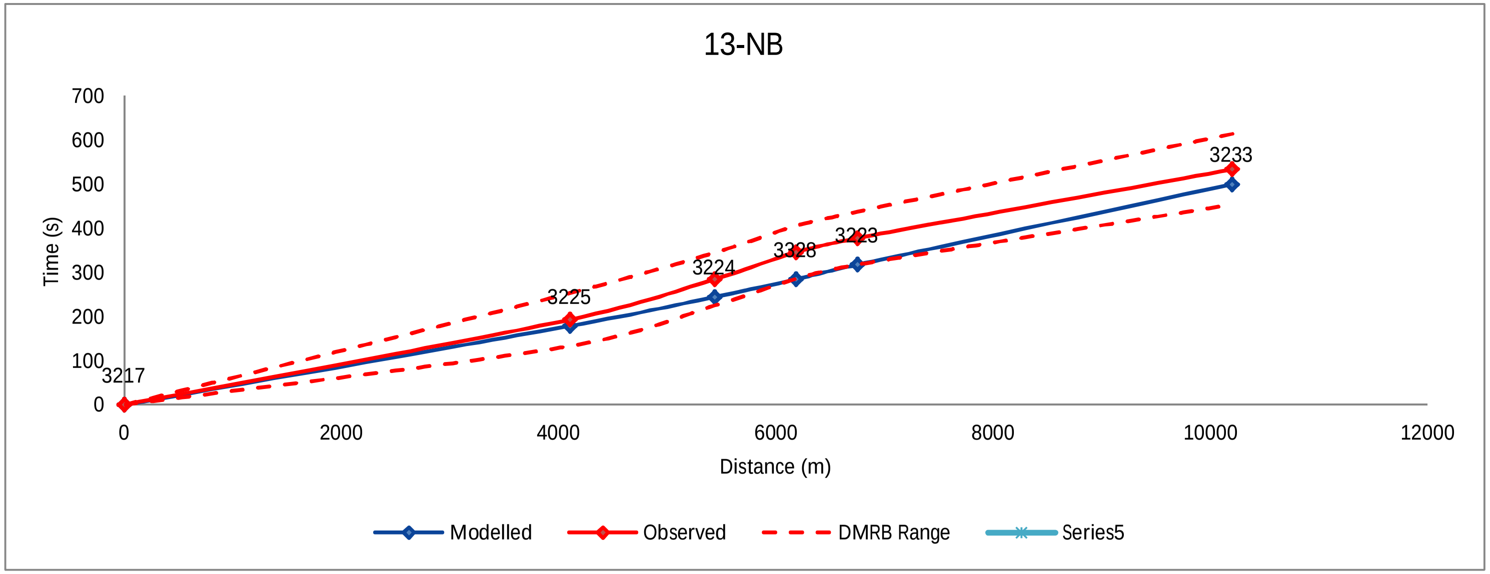

10-SB
Time (s)
Distance (m)
2995
3158
50053
50050
30408
30111
30110
30107
30096
Modelled
Observed
DMRB Range
Series5

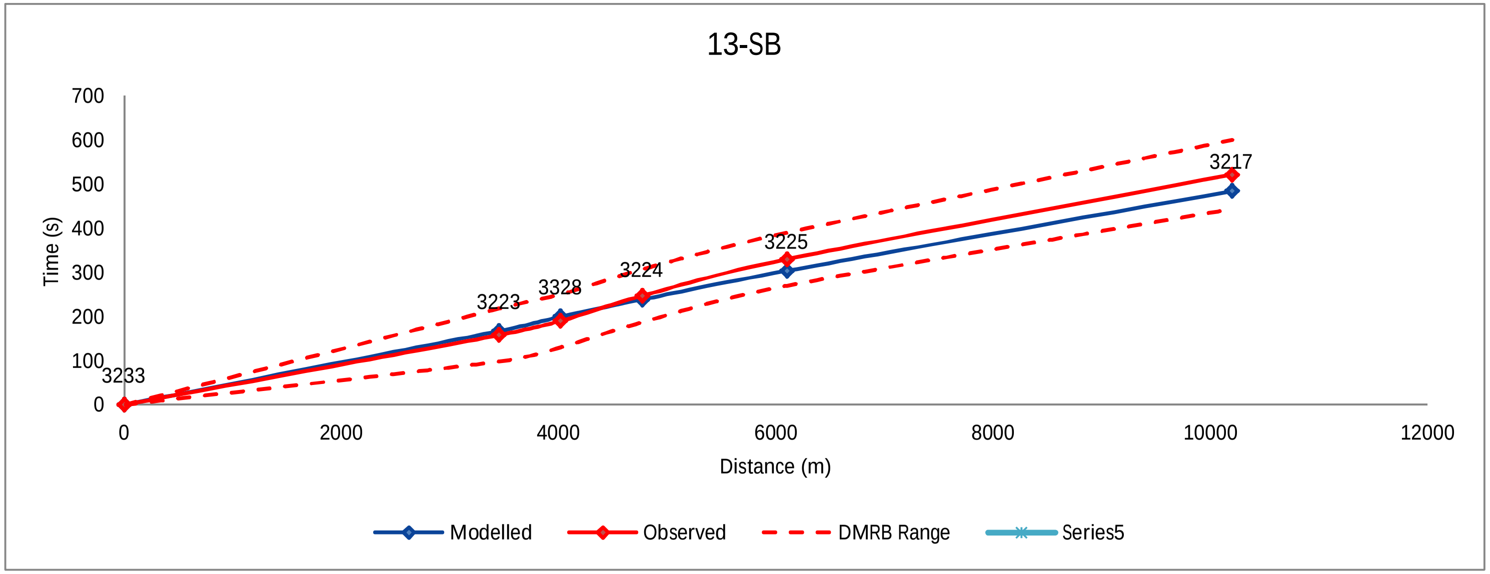

11-EB
Time (s)
Distance (m)
2995
5956
5770
5772
3170
3178
5957
5959
5849
5960
7342
1300
5958
3179
3180
3195
Modelled
Observed
DMRB Range
Series5

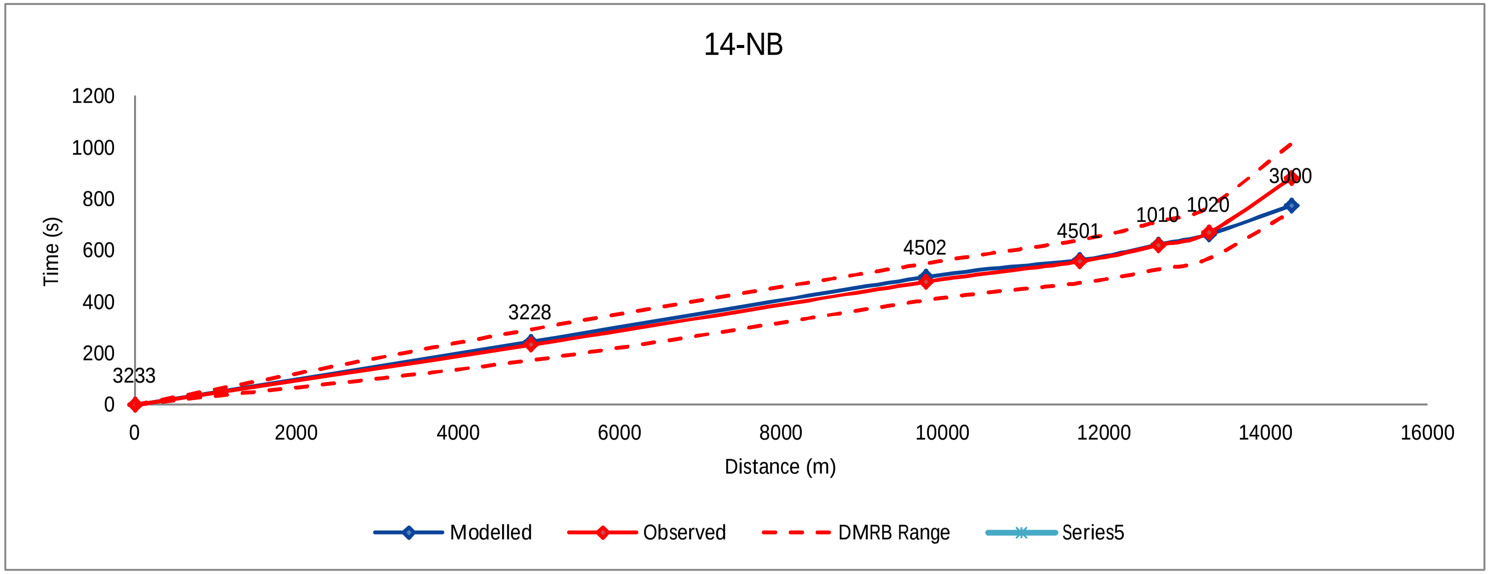

11-WB
Time (s)
Distance (m)
3195
3180
3179
5958
1300
7342
5960
5849
5959
5957
3172
3171
3156
5956
2995
Modelled
Observed
DMRB Range
Series5


12-NB
Time (s)
600
500
400
300
200
100
0
3195
3327
3215
3217
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5

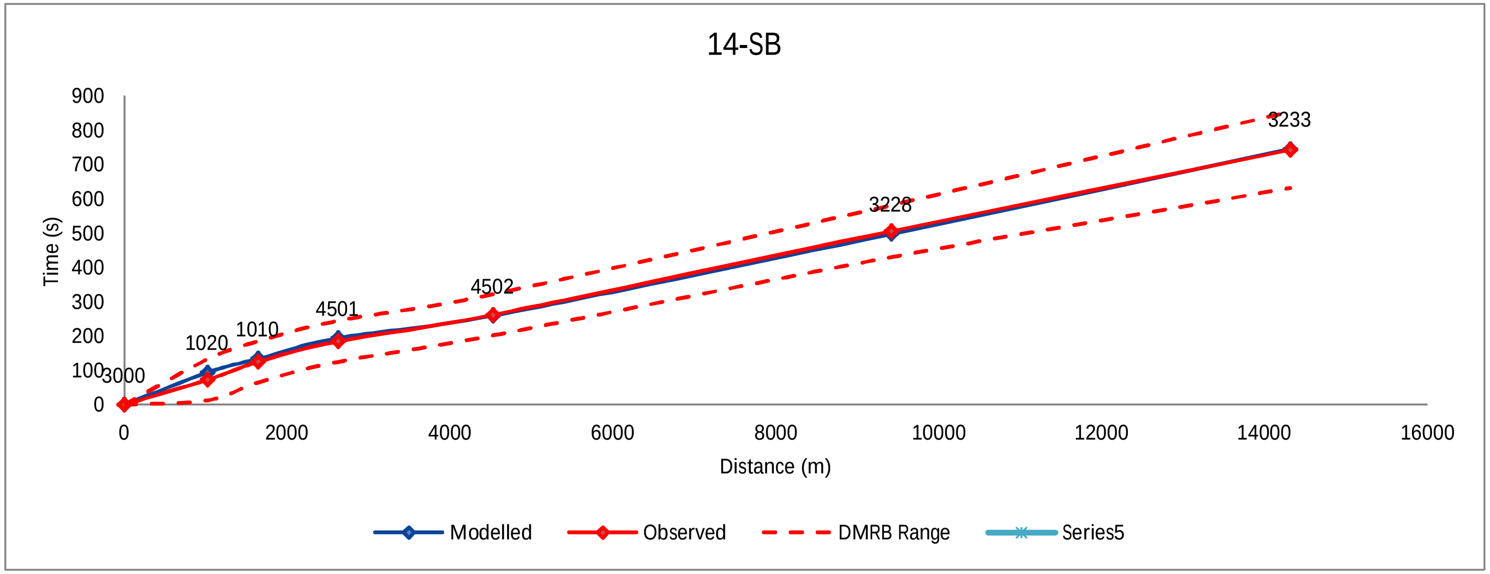

12-SB
Time (s)
700
600
500
400
300
200
100
0
3217
3216
3327
3195
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5


13-NB
Time (s)
700
600
500
400
300
200
100
0
3217
3225
3224
3328
3223
3233
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

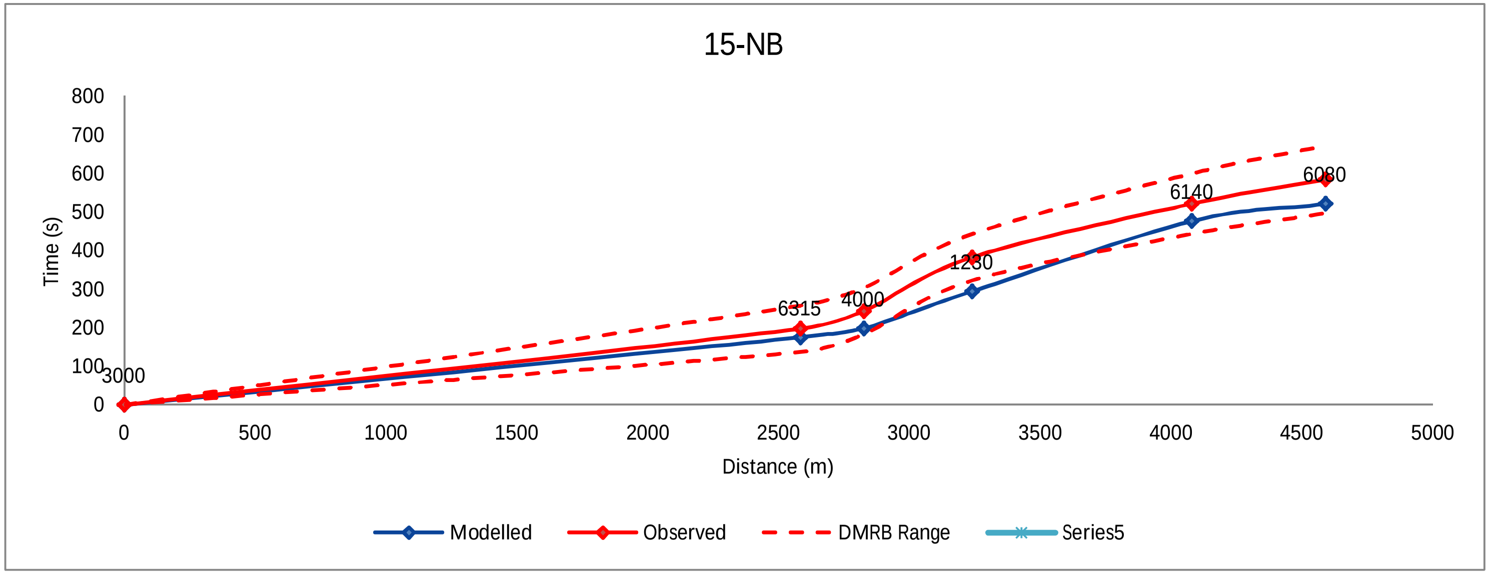

13-SB
Time (s)
700
600
500
400
300
200
100
0
3233
3223
3328
3224
3225
3217
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

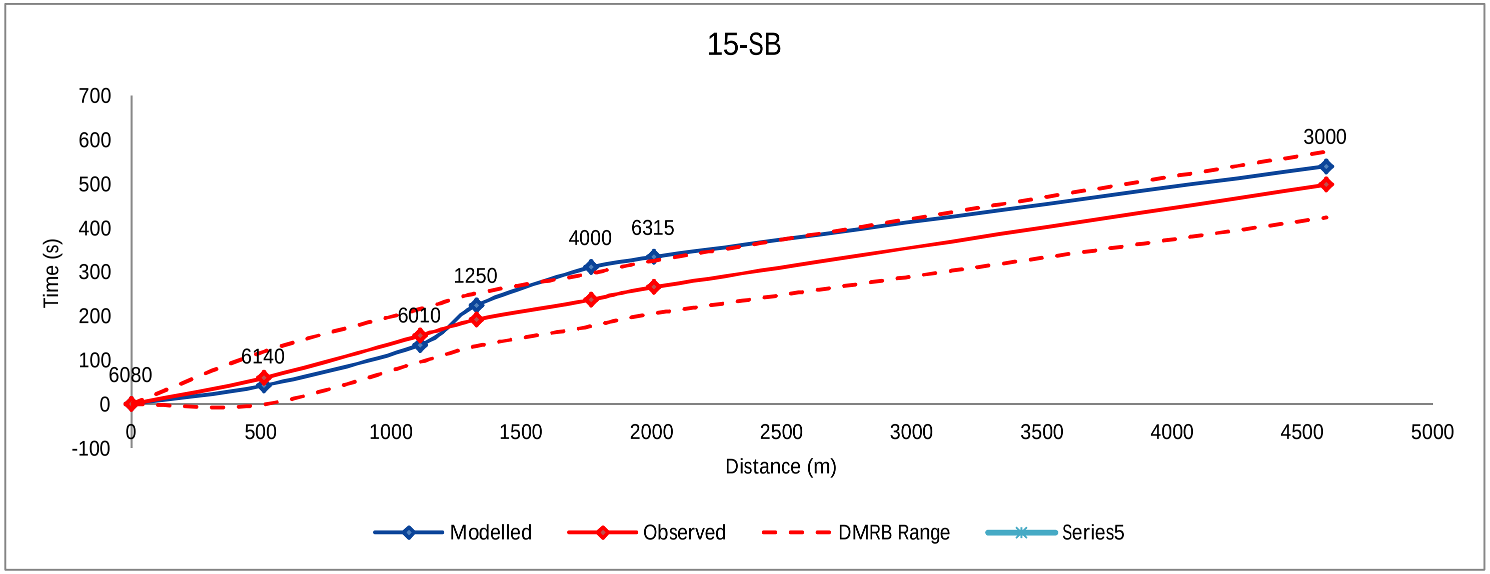


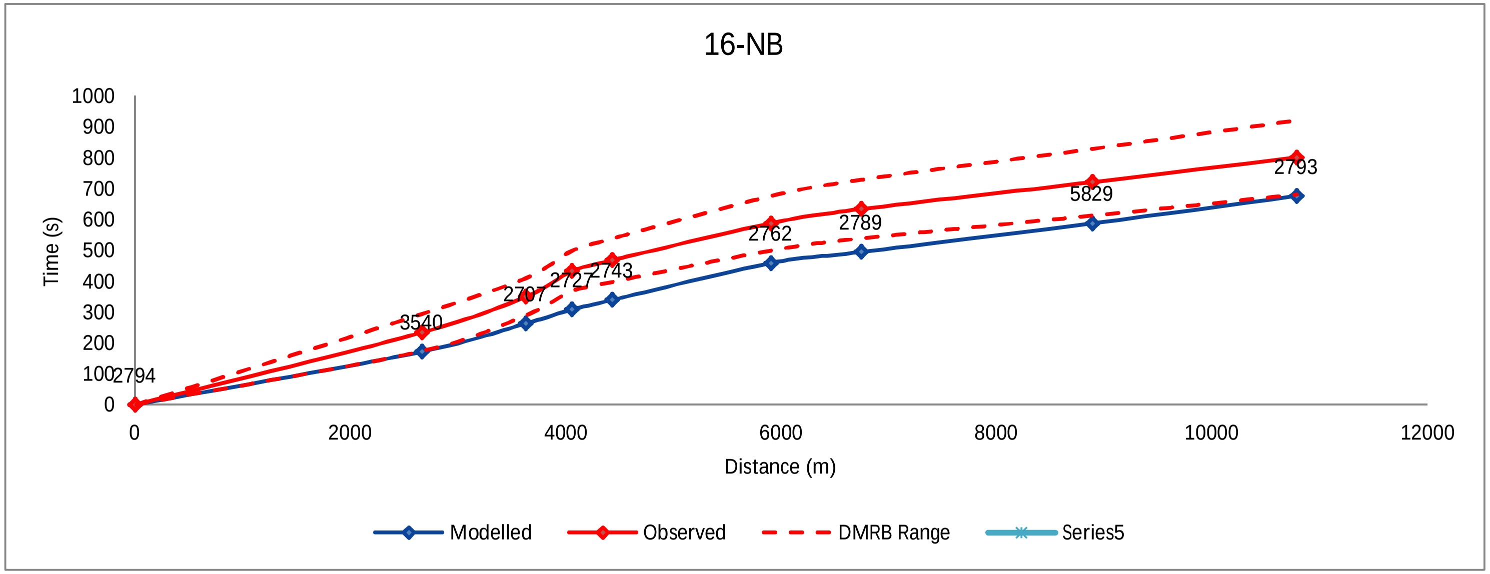
14-NB
Time (s)
1200
1000
800
600
400
200
0
3233
3228
4502
4501
1010
1020
3000
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

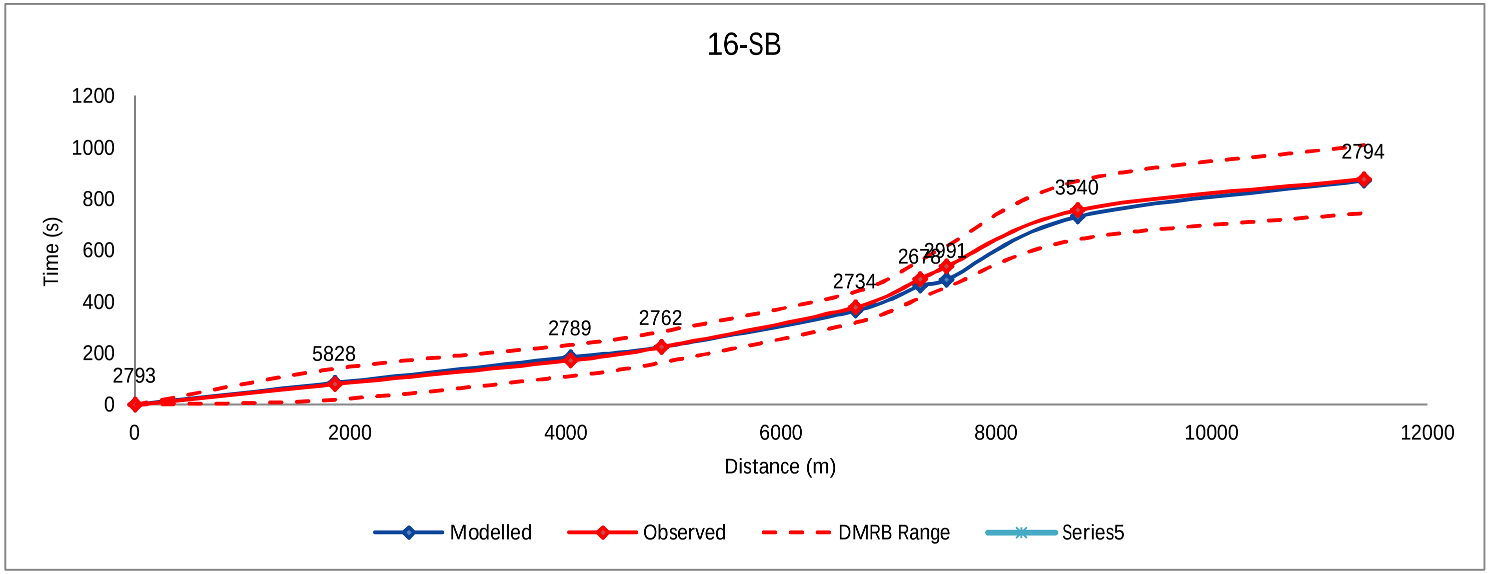


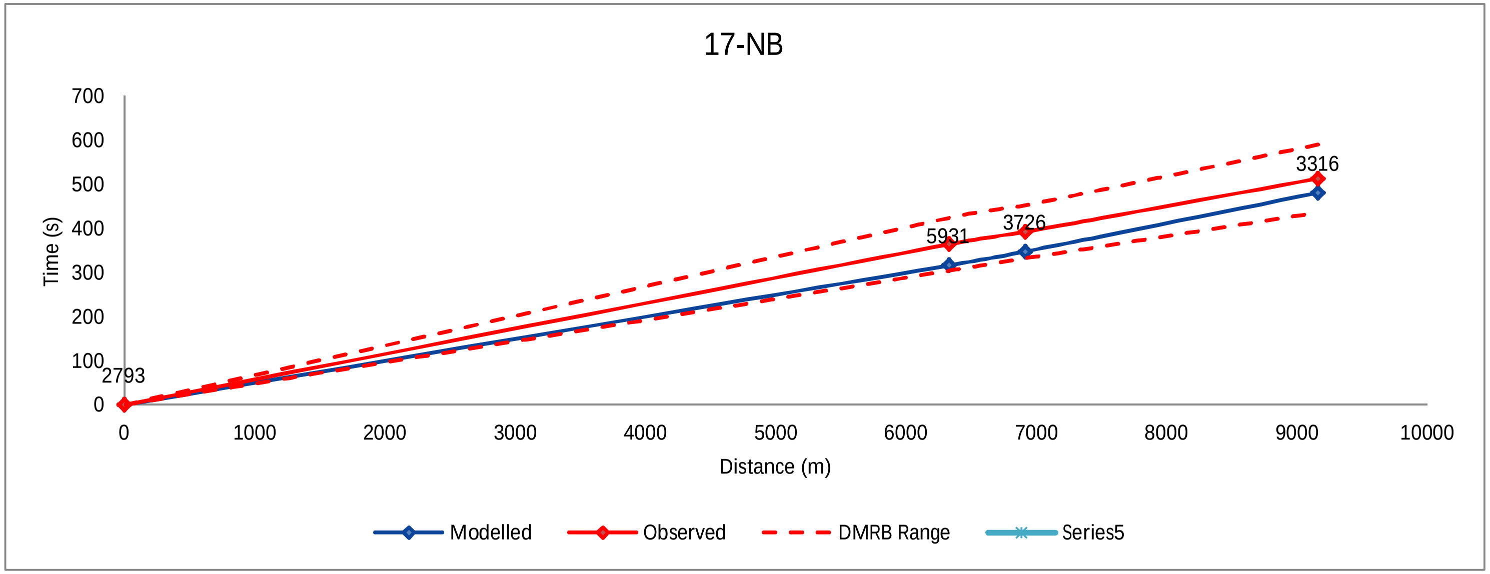
14-SB
Time (s)
900
800
700
600
500
400
300
200
100
0
3000
1020
1010
4501
4502
3228
3233
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

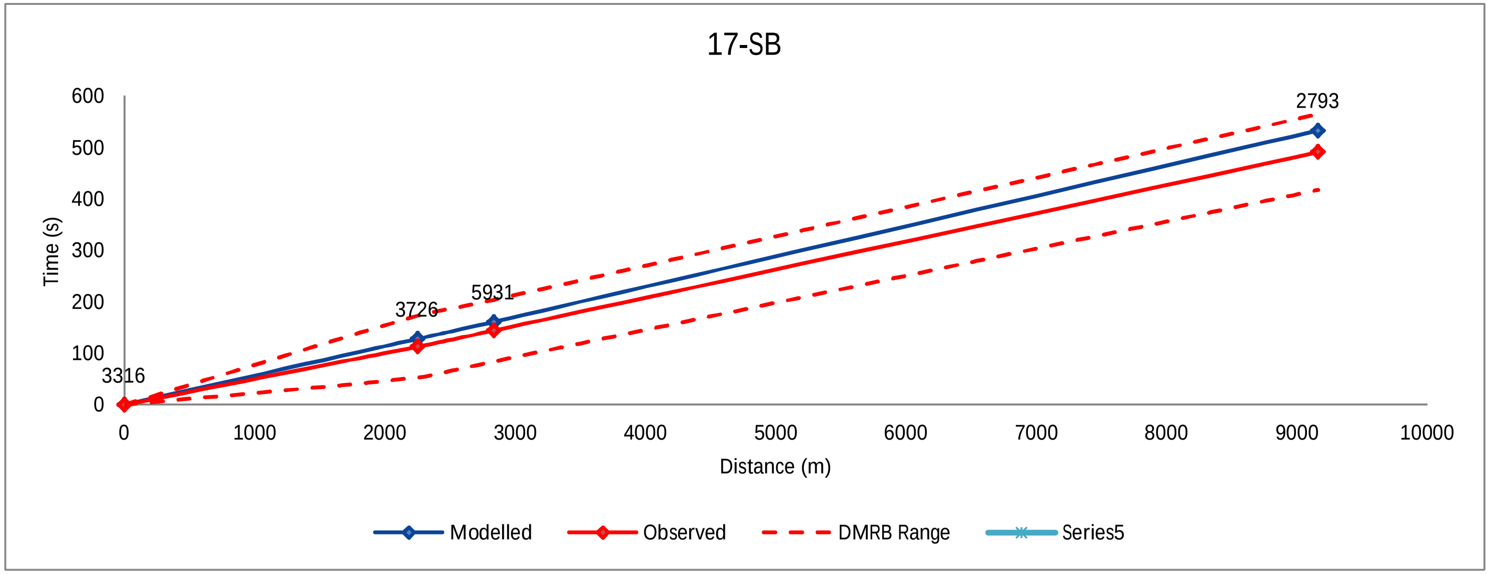

15-NB
Time (s)
800
700
600
500
400
300
200
100
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
3000
6315
4000
1230
6140
6080
Modelled
Observed
DMRB Range
Series5

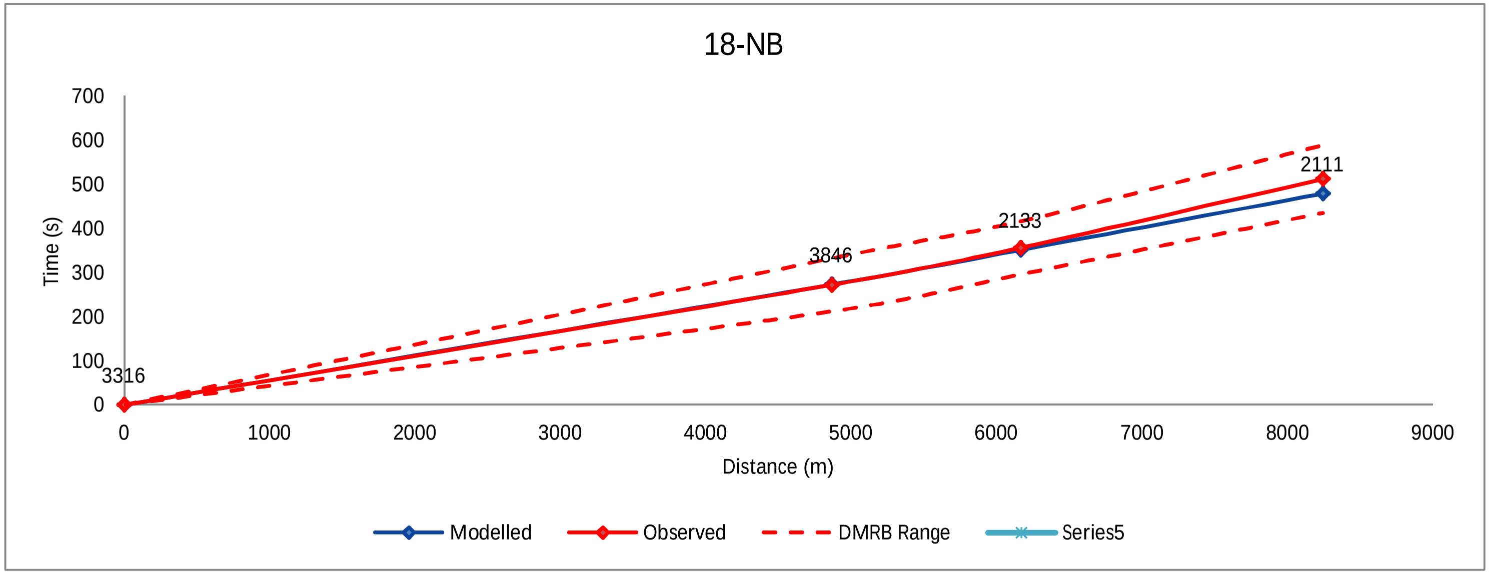

15-SB
Time (s)
700
600
500
400
300
200
100
0
-100
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
6080
6140
6010
1250
4000
6315
3000
Modelled
Observed
DMRB Range
Series5

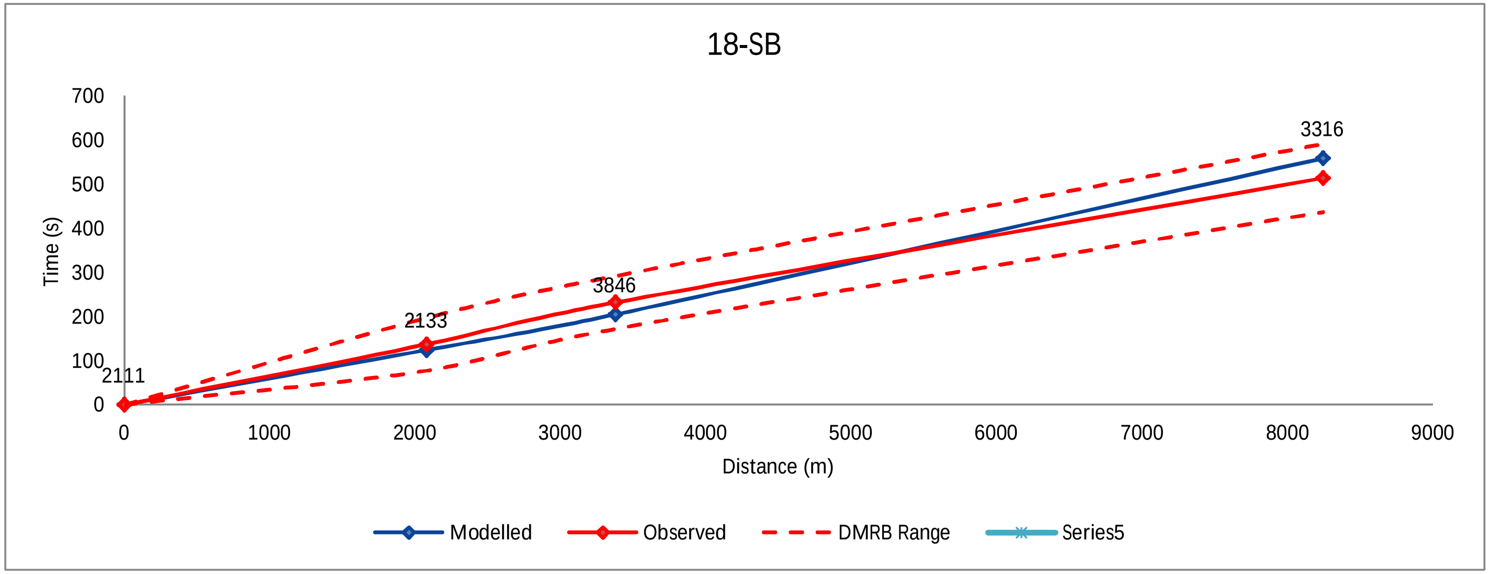

16-NB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
Distance (m)
2794
3540
2707
2727
2743
2762
2789
5829
2793
Modelled
Observed
DMRB Range
Series5

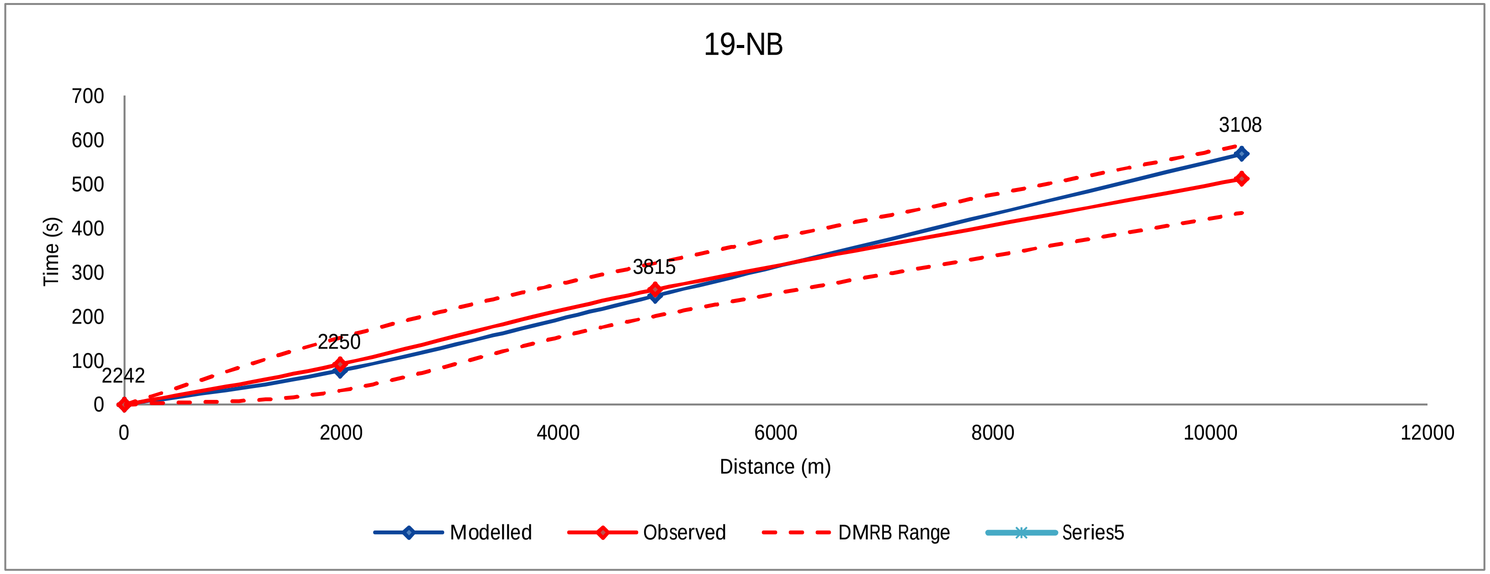

16-SB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
Distance (m)
2793
5828
2789
2762
2734
2678
2991
3540
2794
Modelled
Observed
DMRB Range
Series5

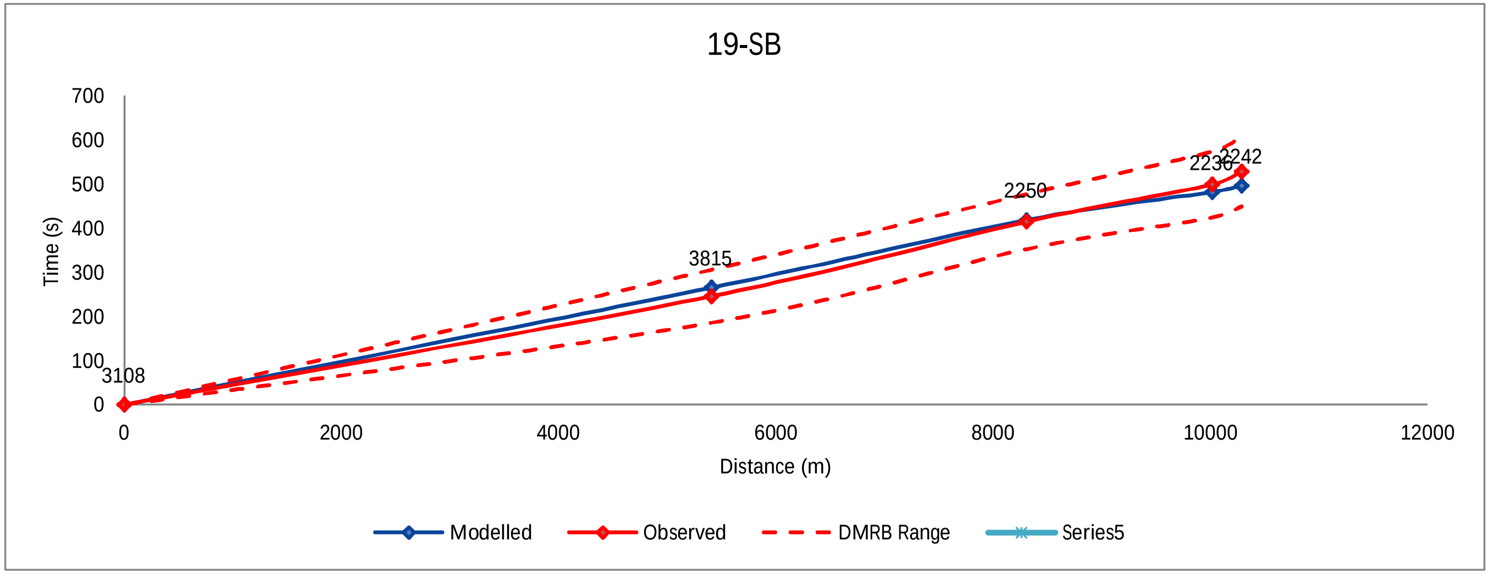

17-NB
Time (s)
700
600
500
400
300
200
100
0
2793
5931
3726
3316
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5

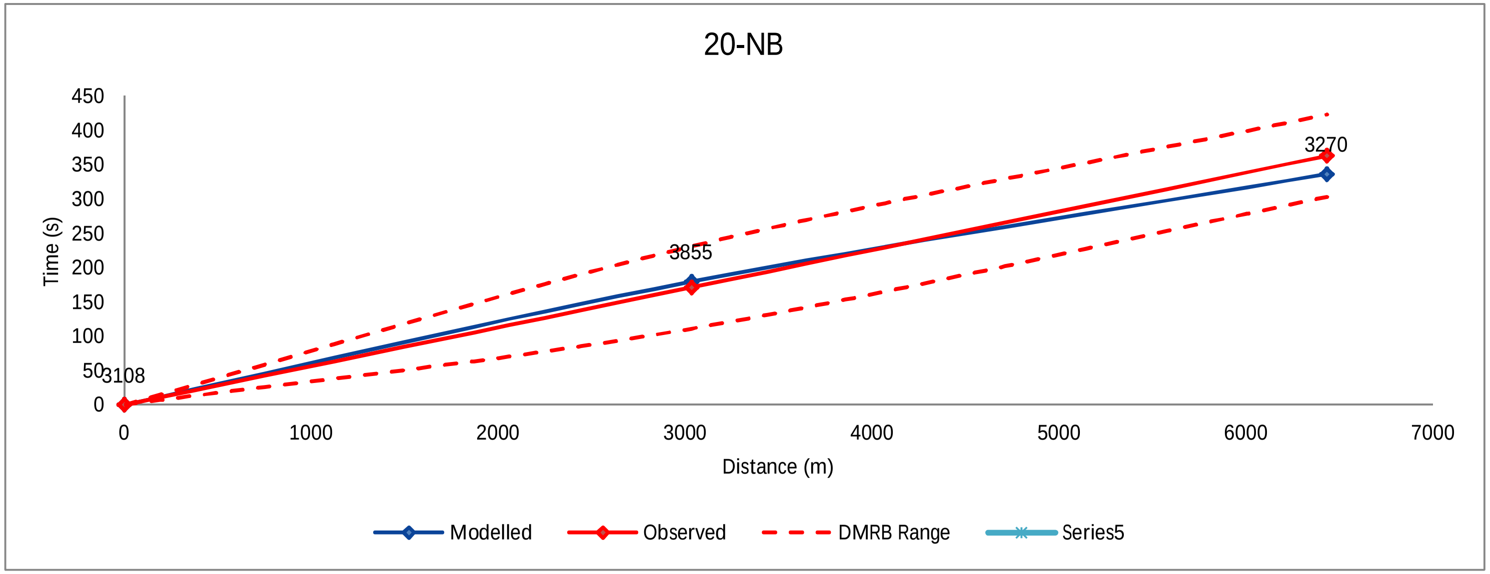

17-SB
Time (s)
600
500
400
300
200
100
0
3316
3726
5931
2793
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
Modelled
Observed
DMRB Range
Series5

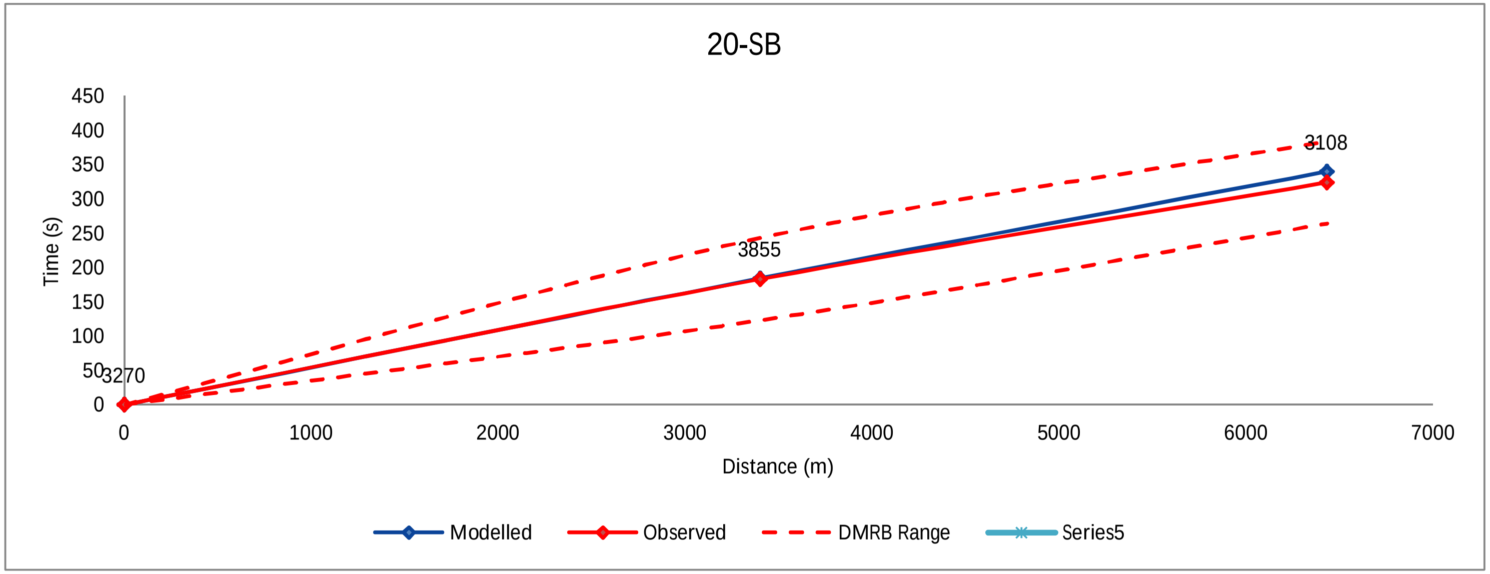

18-NB
Time (s)
700
600
500
400
300
200
100
0
3316
3846
2133
2111
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

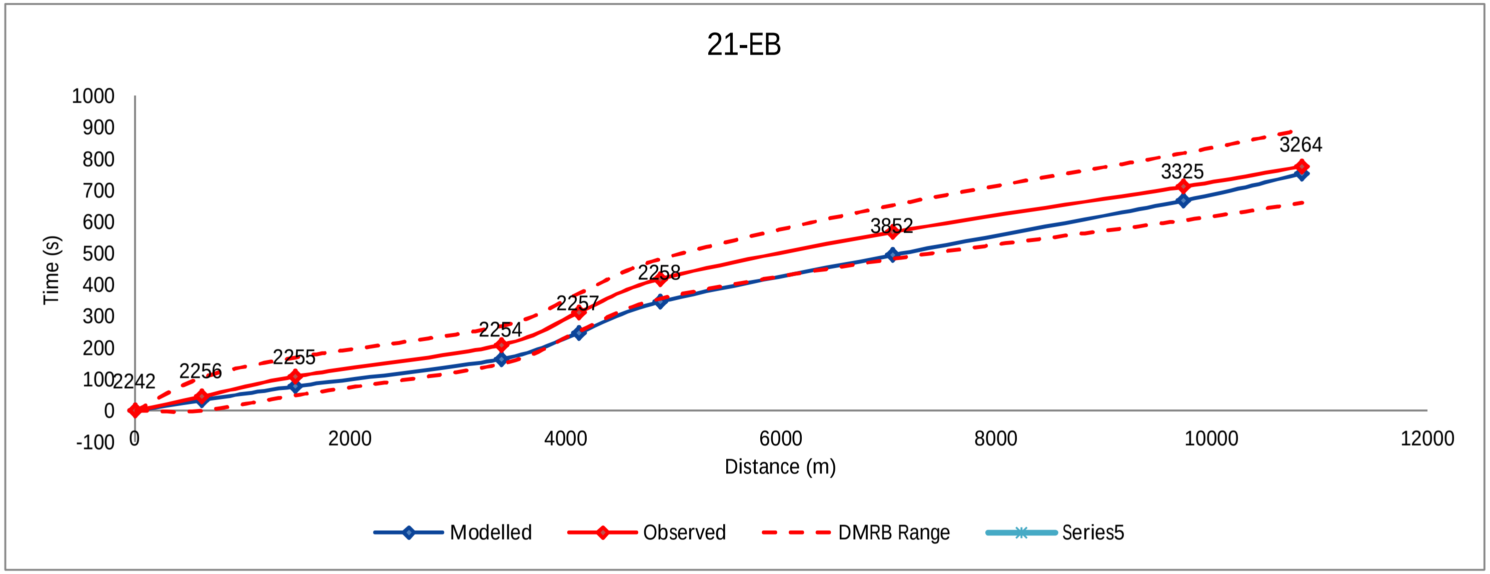

18-SB
Time (s)
700
600
500
400
300
200
100
0
2111
2133
3846
3316
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

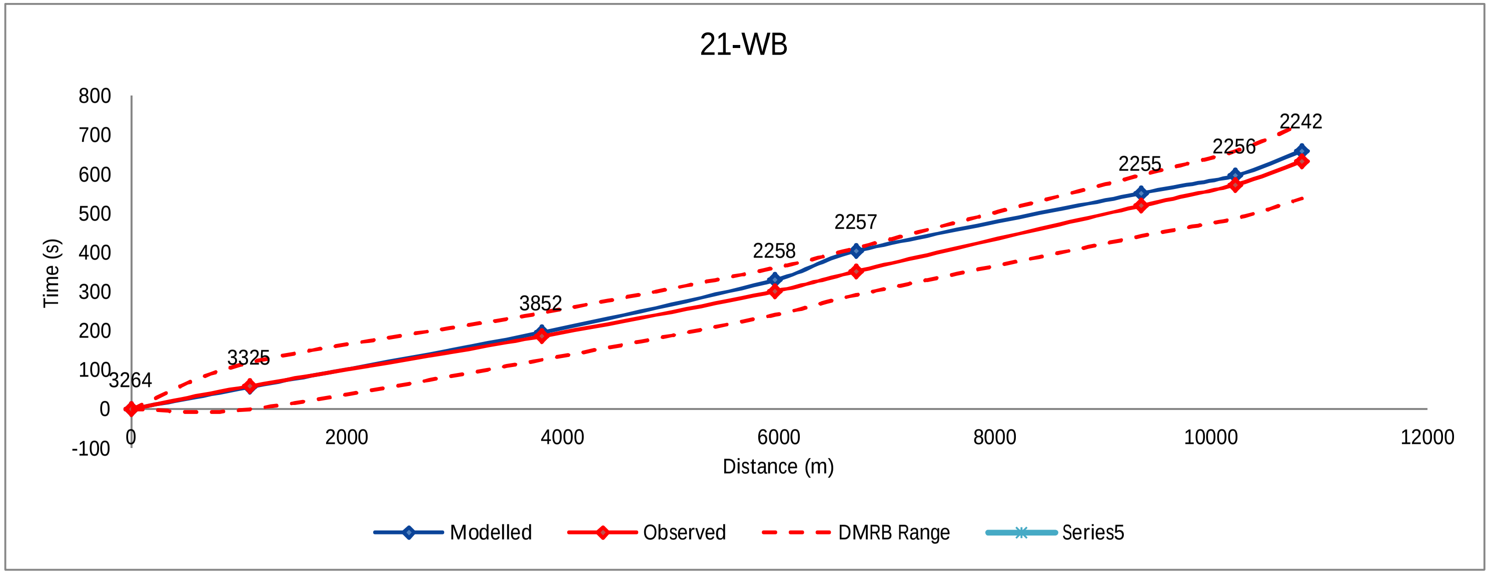

19-NB
Time (s)
700
600
500
400
300
200
100
0
2242
2250
3815
3108
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

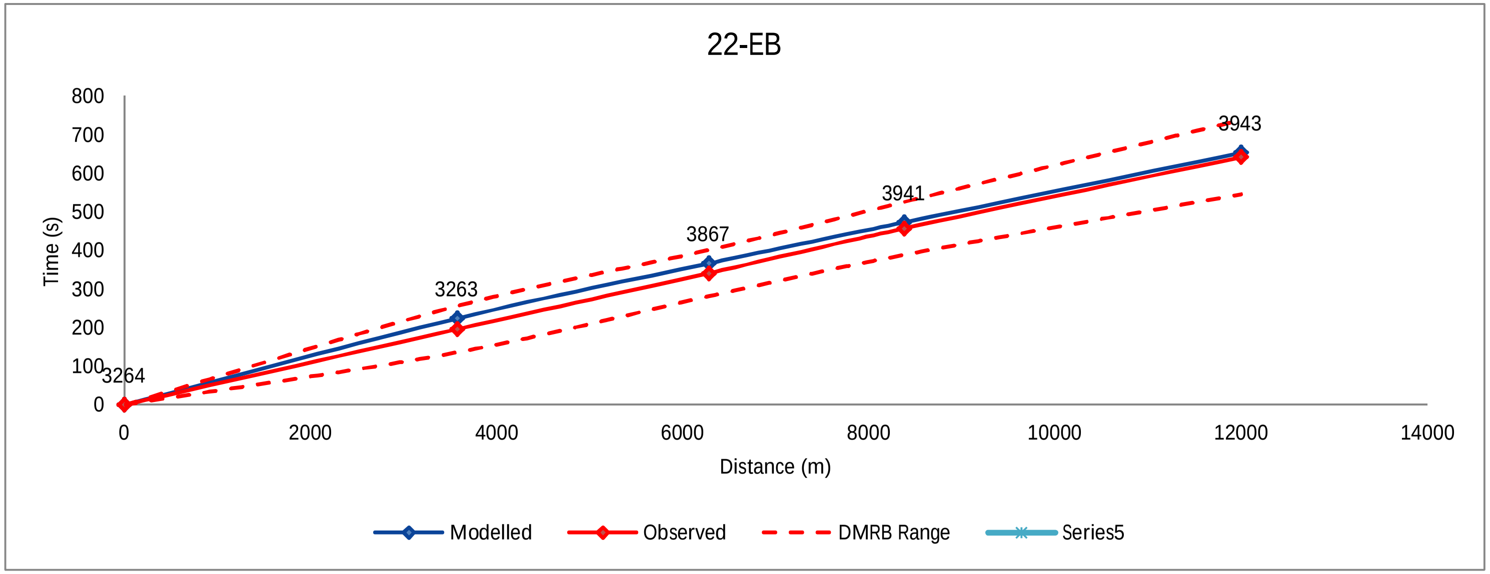

19-SB
Time (s)
700
600
500
400
300
200
100
0
3108
3815
2250
2236
2242
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

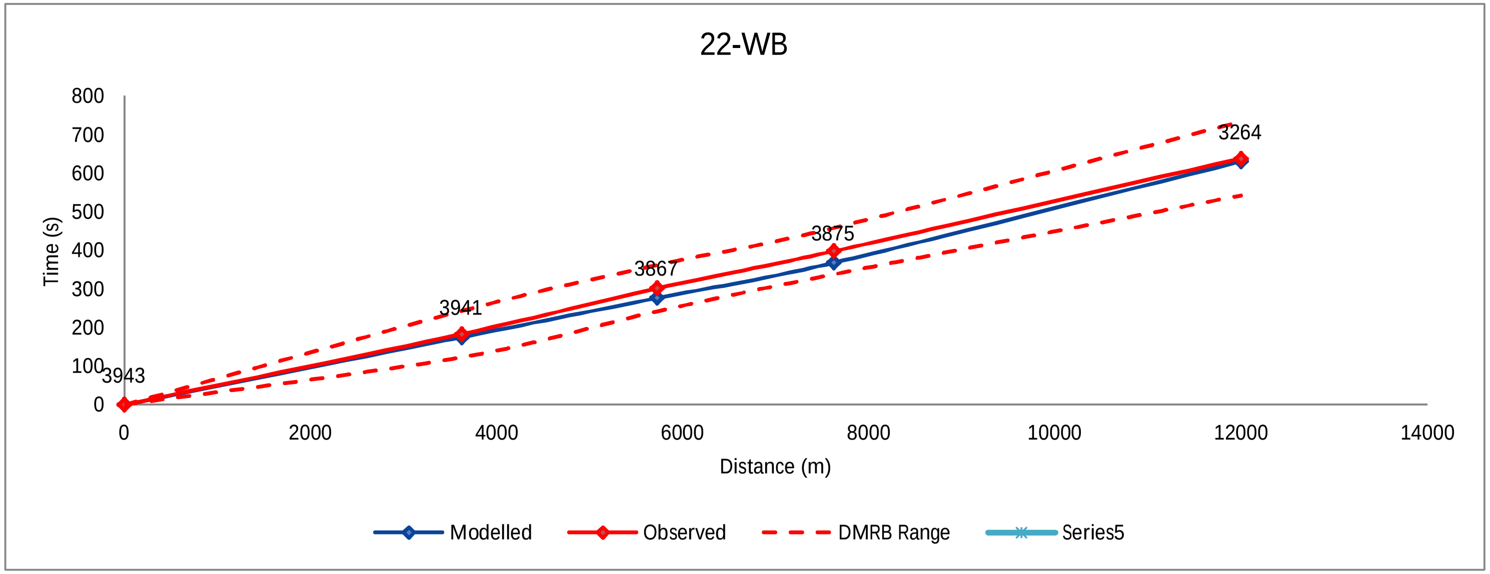

20-NB
Time (s)
450
400
350
300
250
200
150
100
50
0
3108
3855
3270
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range
Series5

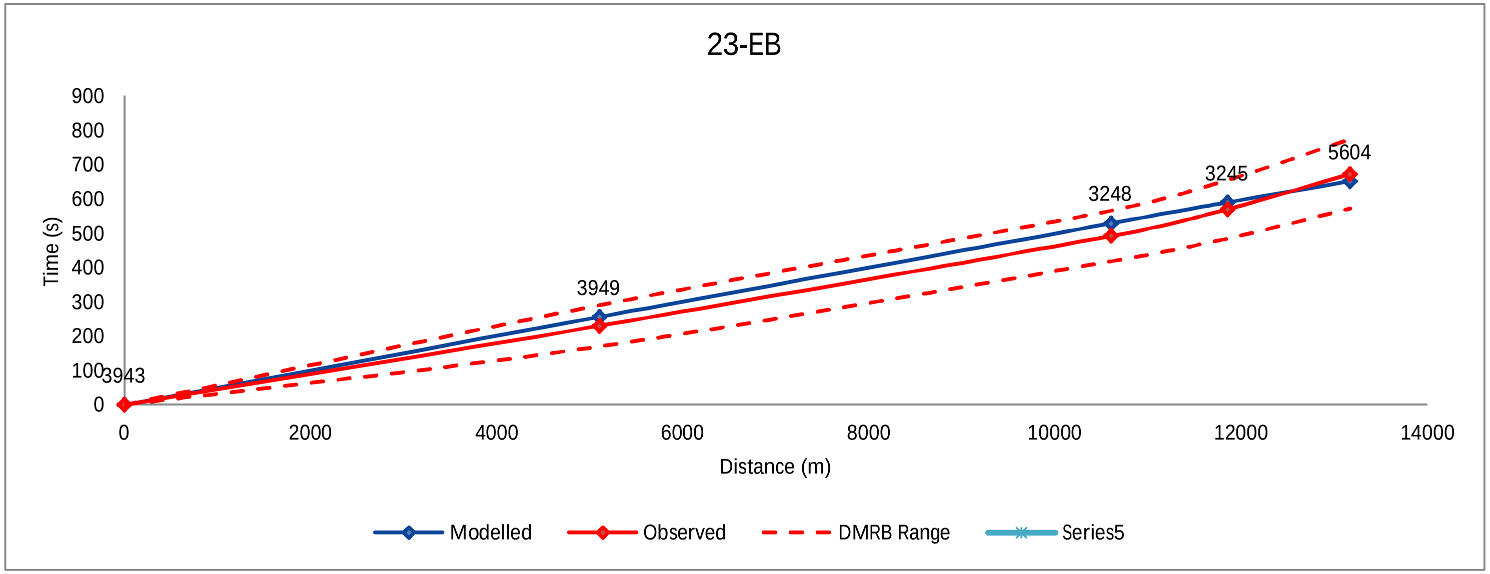

20-SB
Time (s)
450
400
350
300
250
200
150
100
50
0
3270
3855
3108
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range
Series5

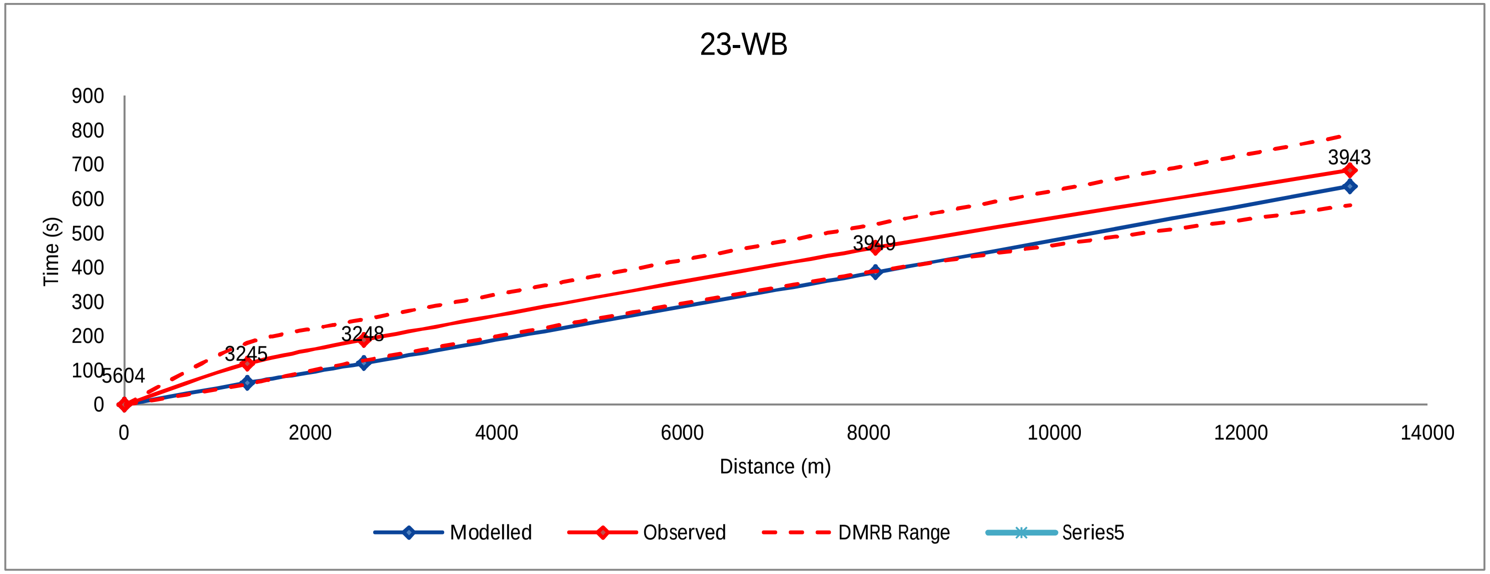

21-EB
Time (s)
Distance (m)
2242
2256
2255
2254
2257
2258
3852
3325
3264
Modelled
Observed
DMRB Range
Series5

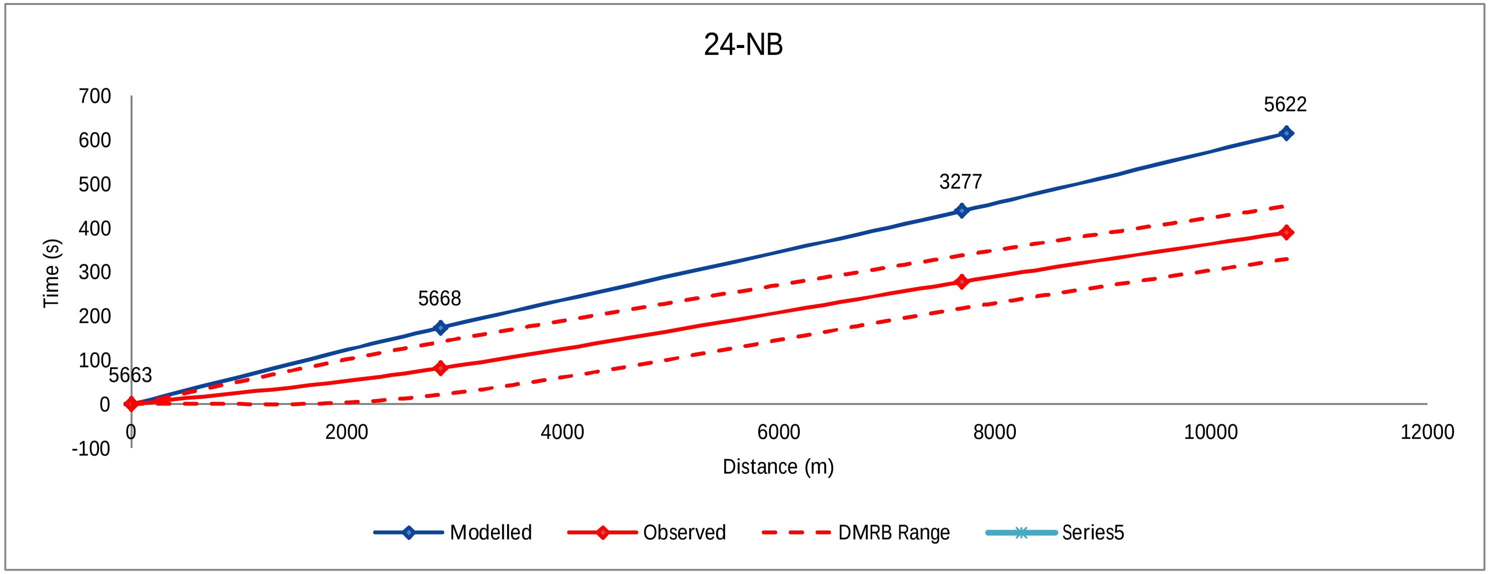

21-WB
Time (s)
Distance (m)
3264
3325
3852
2258
2257
2255
2256
2242
Modelled
Observed
DMRB Range
Series5

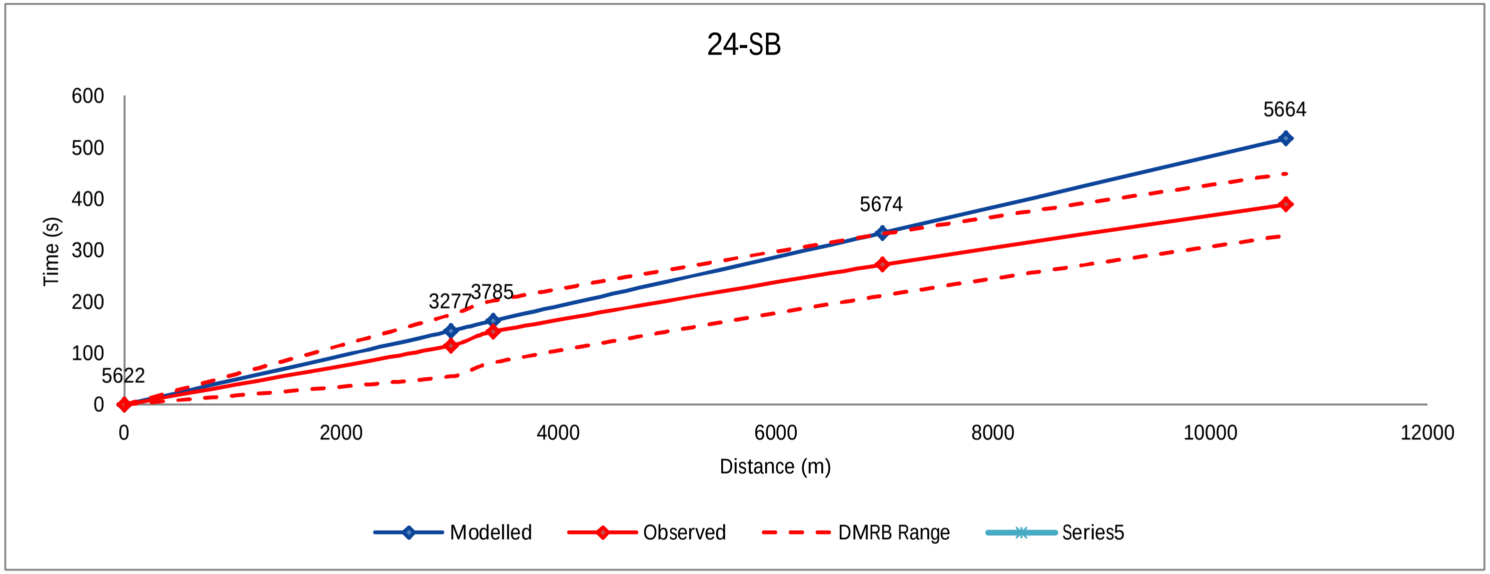

22-EB
Time (s)
800
700
600
500
400
300
200
100
0
3264
3263
3867
3941
3943
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

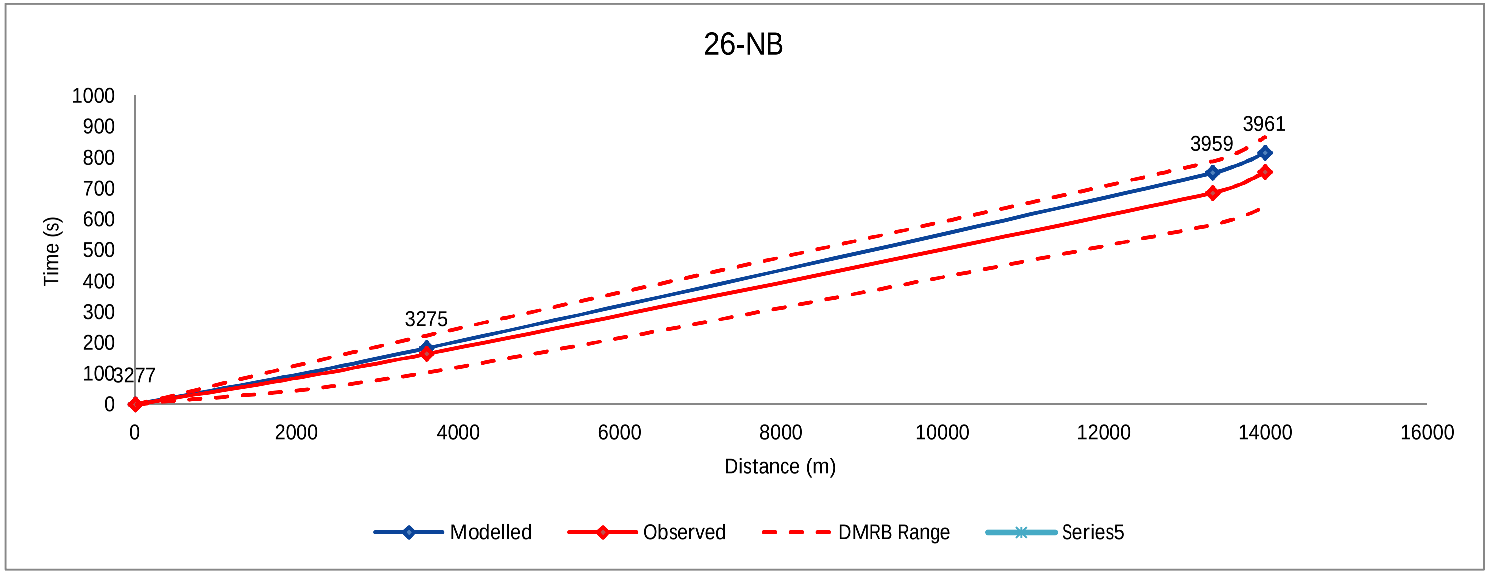

22-WB
Time (s)
800
700
600
500
400
300
200
100
0
3943
3941
3867
3875
3264
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

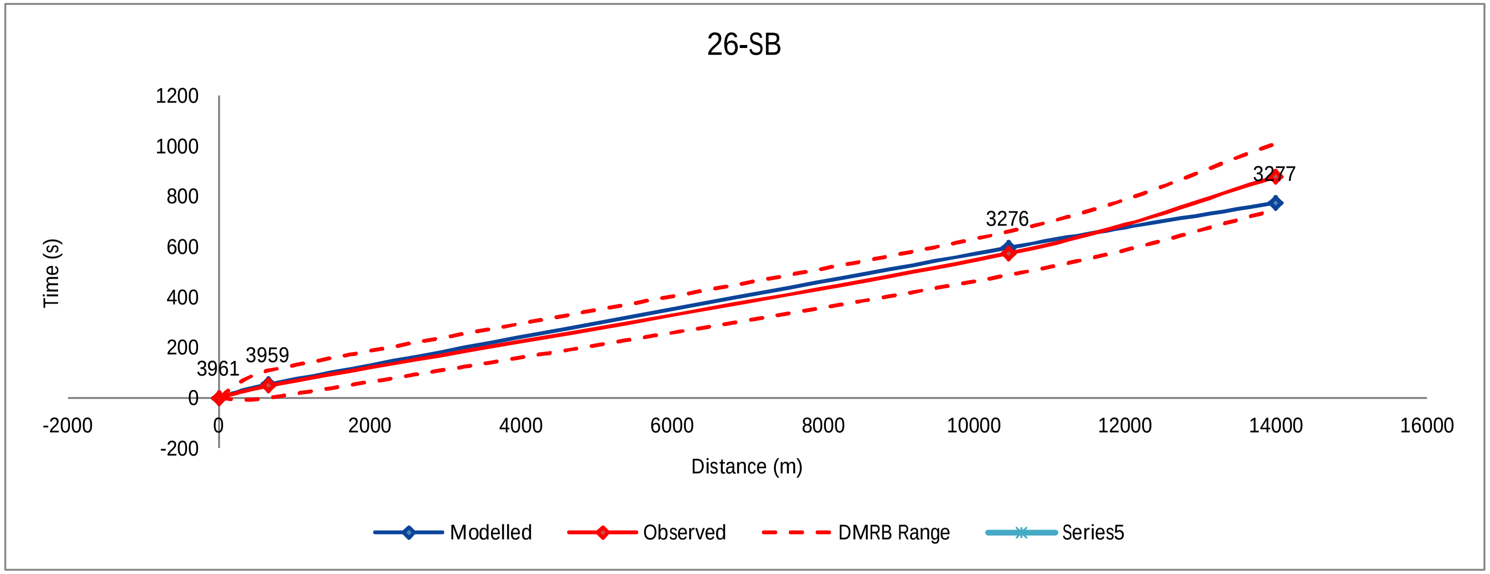

23-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
3943
3949
3248
3245
5604
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

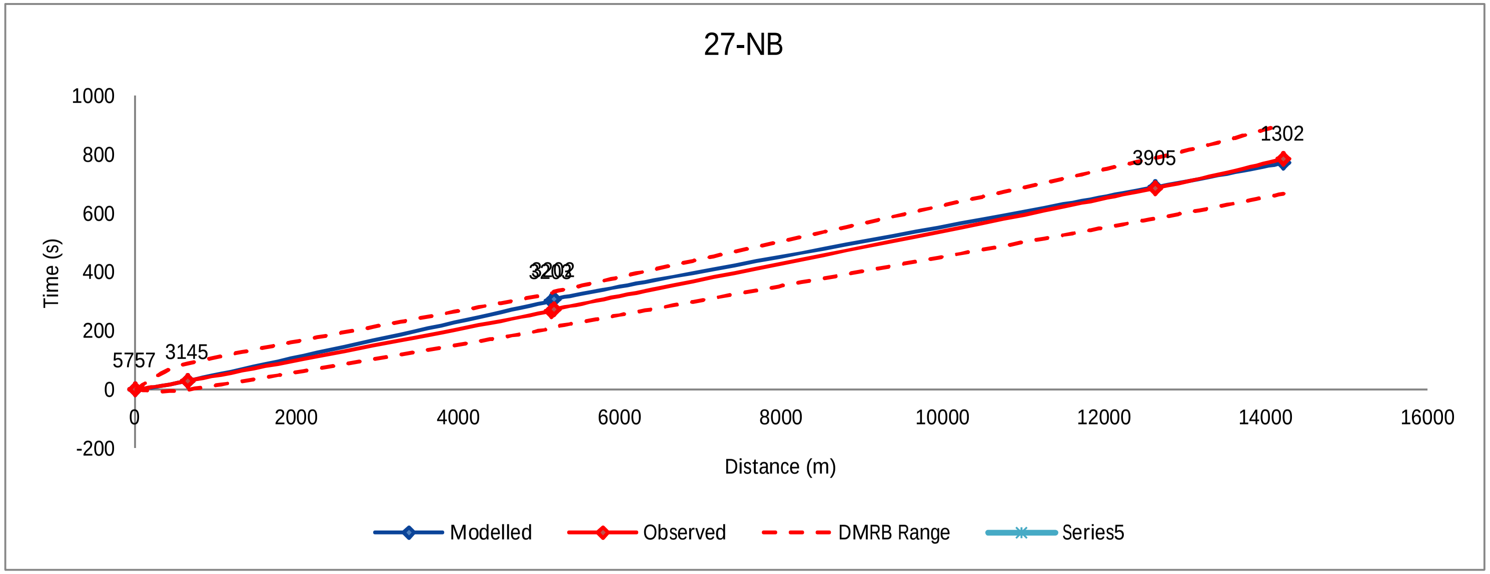

23-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
5604
3245
3248
3949
3943
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

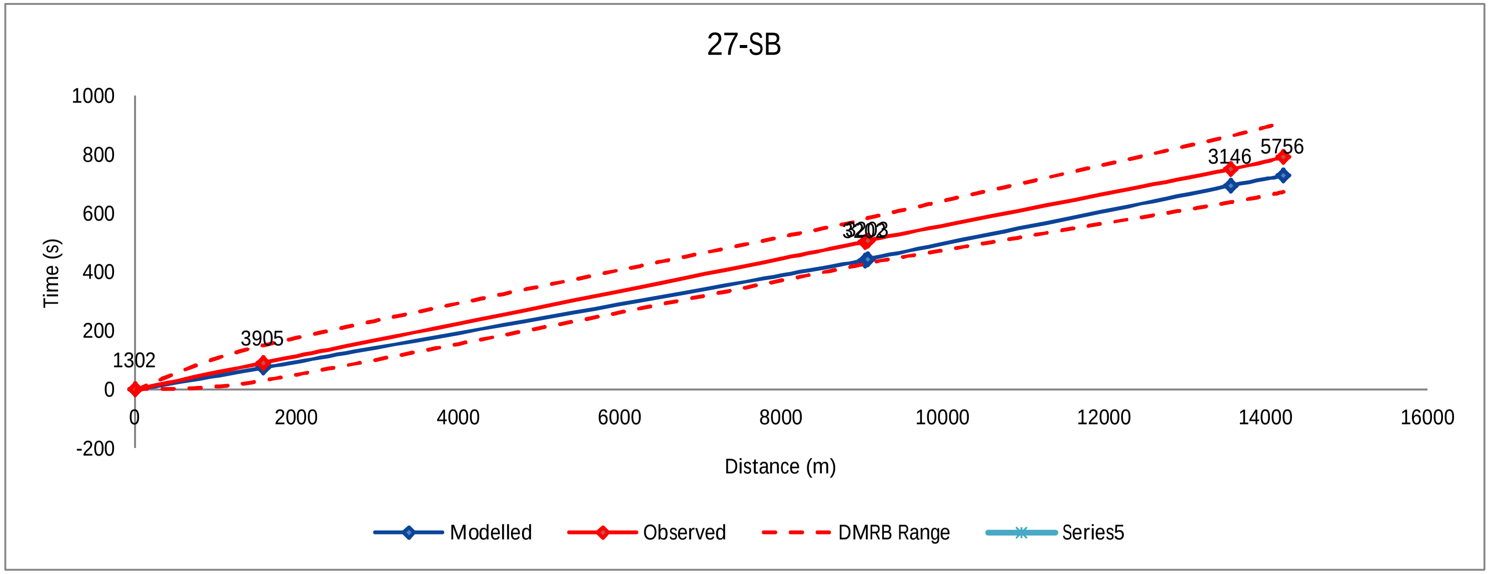

24-NB
Time (s)
700
600
500
400
300
200
100
0
-100
5663
5668
3277
5622
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

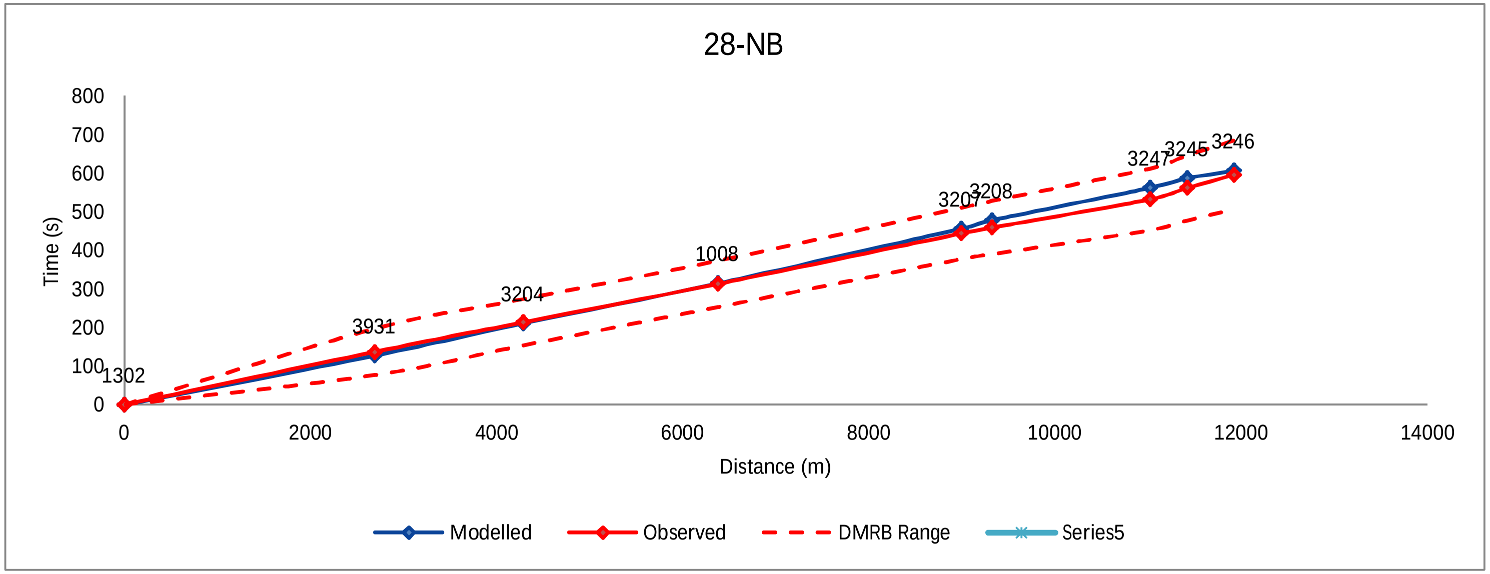

24-SB
Time (s)
600
500
400
300
200
100
0
5622
3277
3785
5674
5664
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

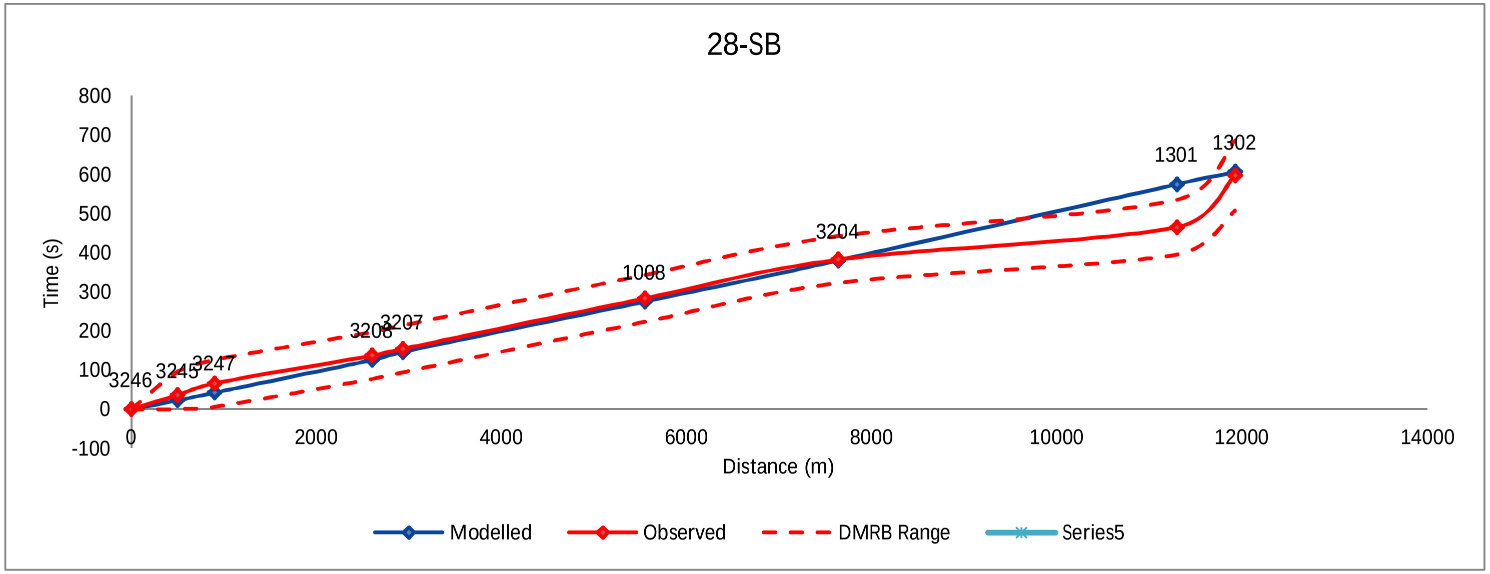

26-NB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3277
3275
3959
3961
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

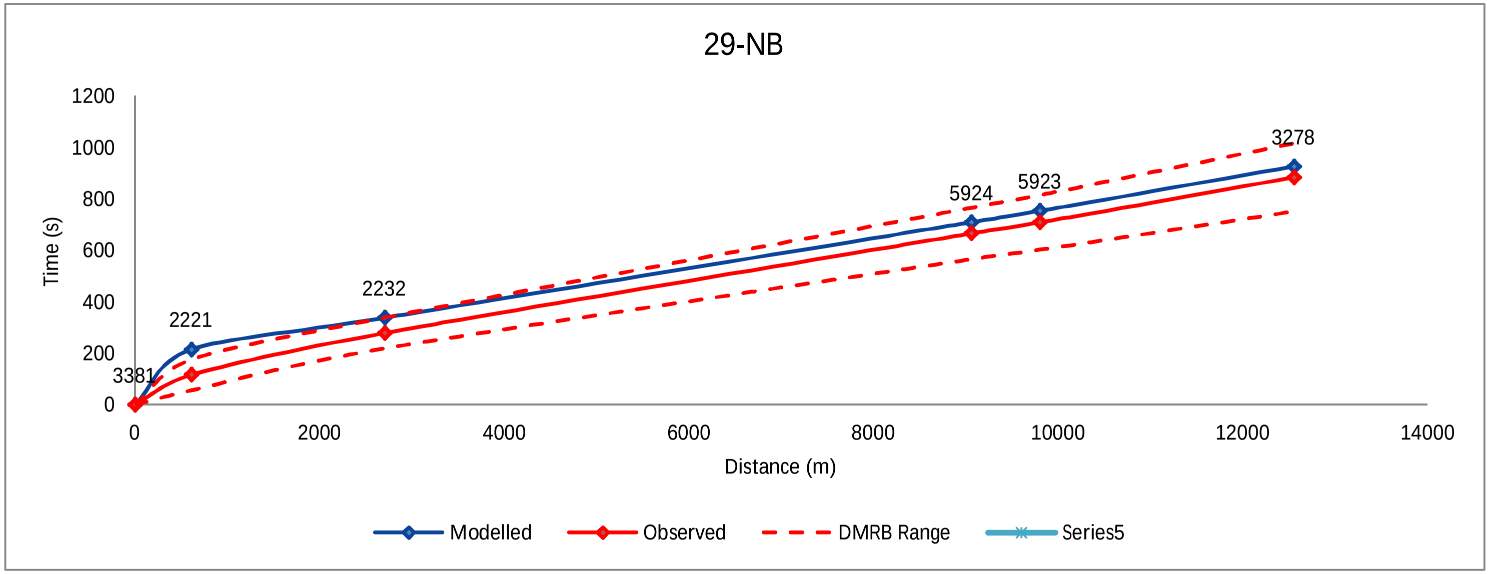

26-SB
Time (s)
1200
1000
800
600
400
200
0
-200
3961
3959
3276
3277
-2000
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
Modelled
Observed
DMRB Range
Series5

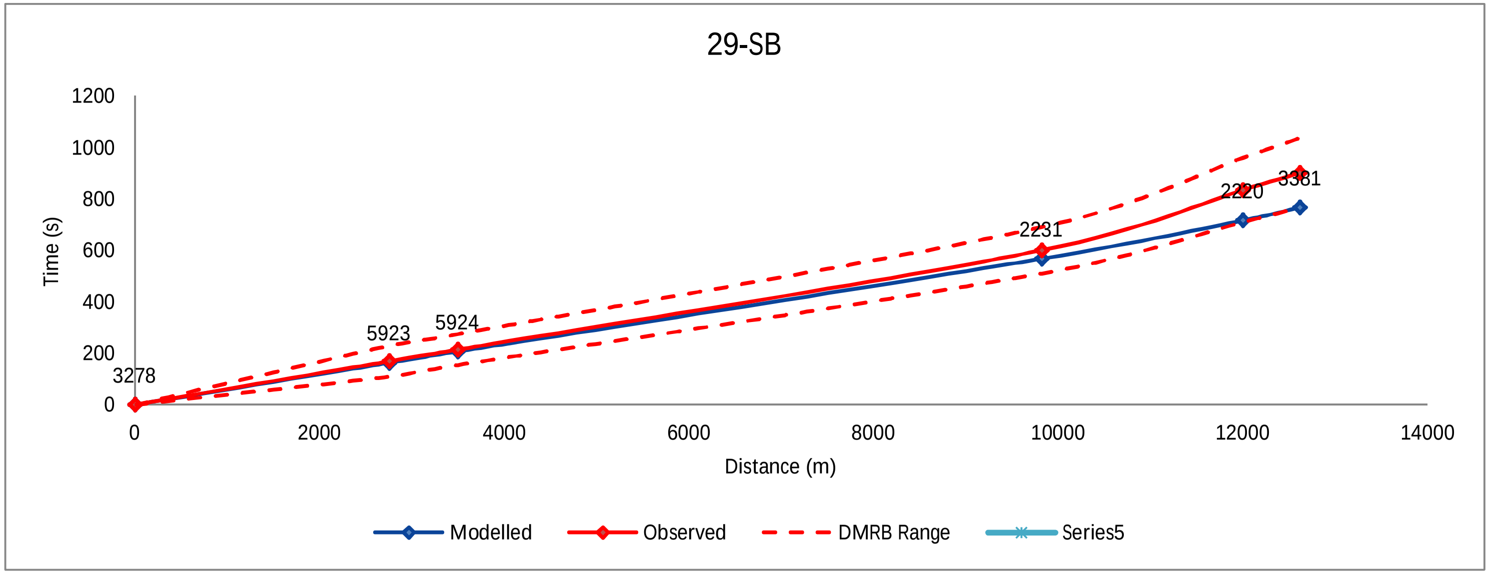

27-NB
Time (s)
1000
800
600
400
200
0
-200
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
5757
3145
3202
3905
1302
Modelled
Observed
DMRB Range
Series5

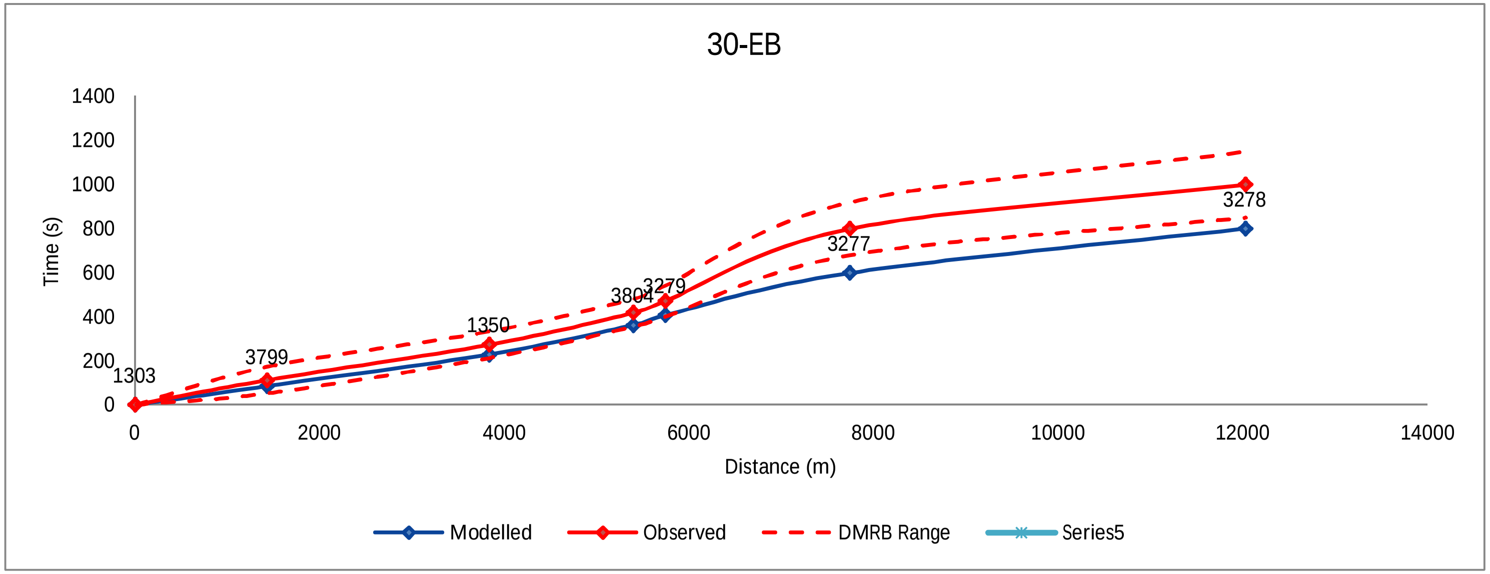

27-SB
Time (s)
1000
800
600
400
200
0
-200
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
1302
3905
3203
3146
5756
Modelled
Observed
DMRB Range
Series5

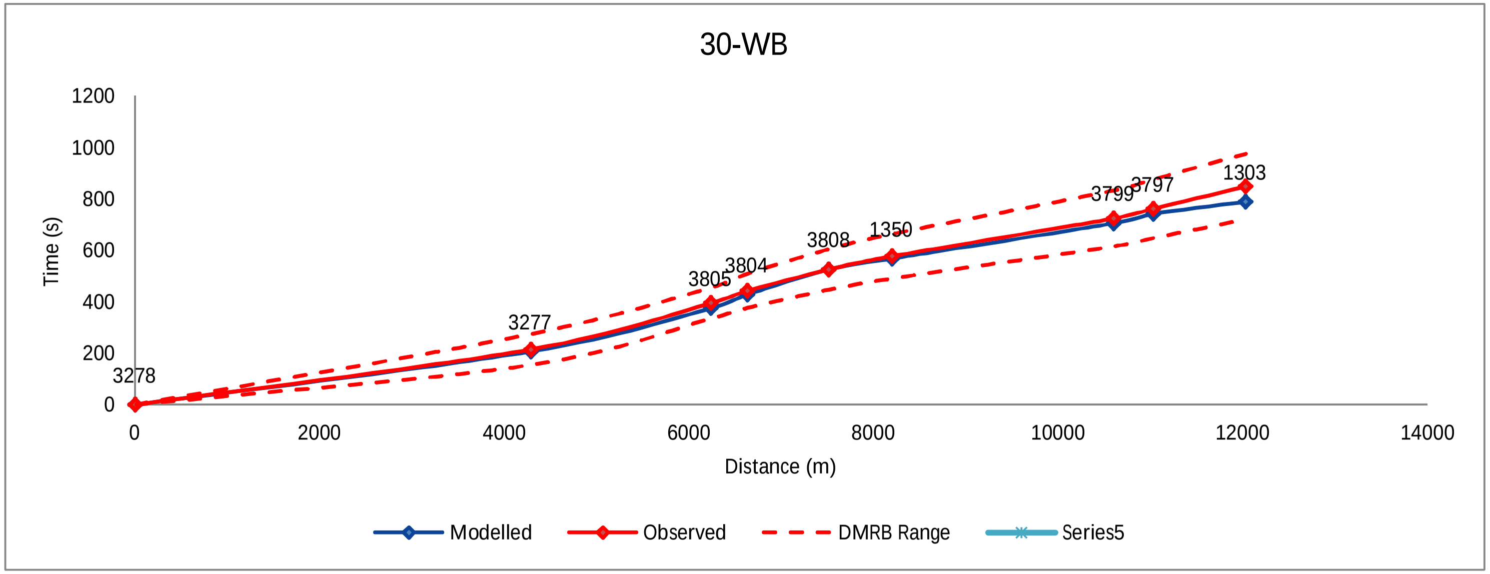

28-NB
Time (s)
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
1302
3931
3204
1008
3207
3208
3247
3245
3246
Modelled
Observed
DMRB Range
Series5

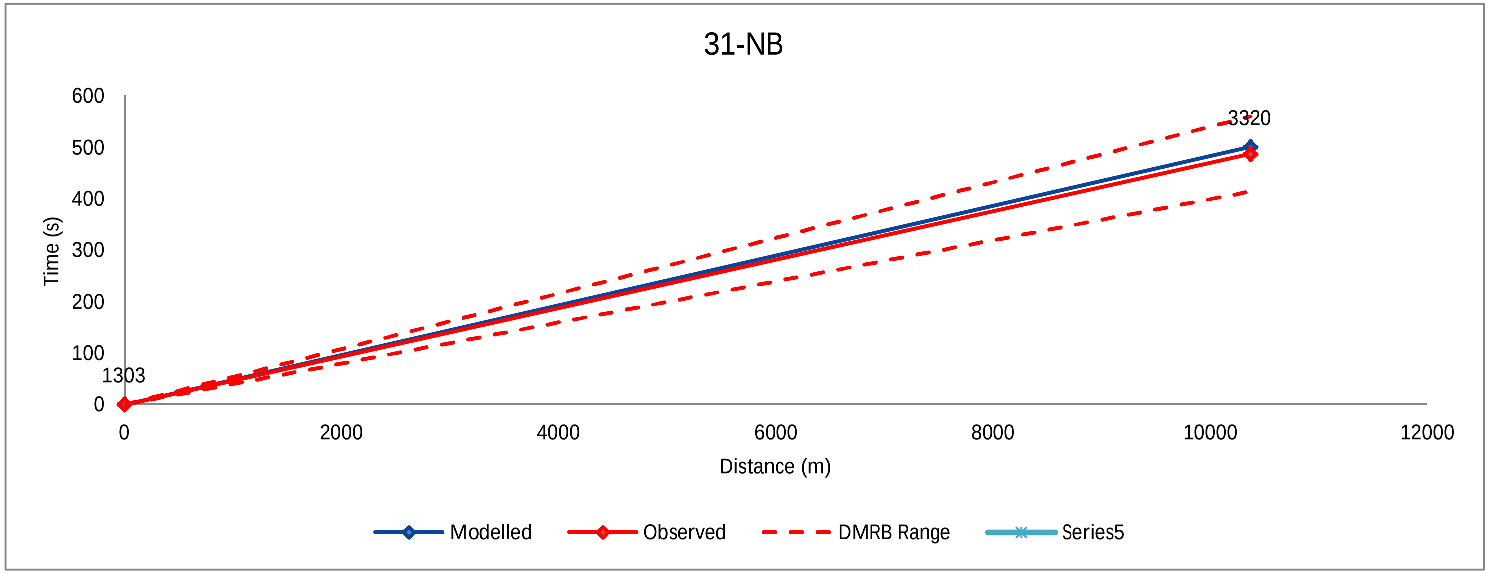

28-SB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3246
3245
3247
3208
3207
1008
3204
1301
1302
Modelled
Observed
DMRB Range
Series5

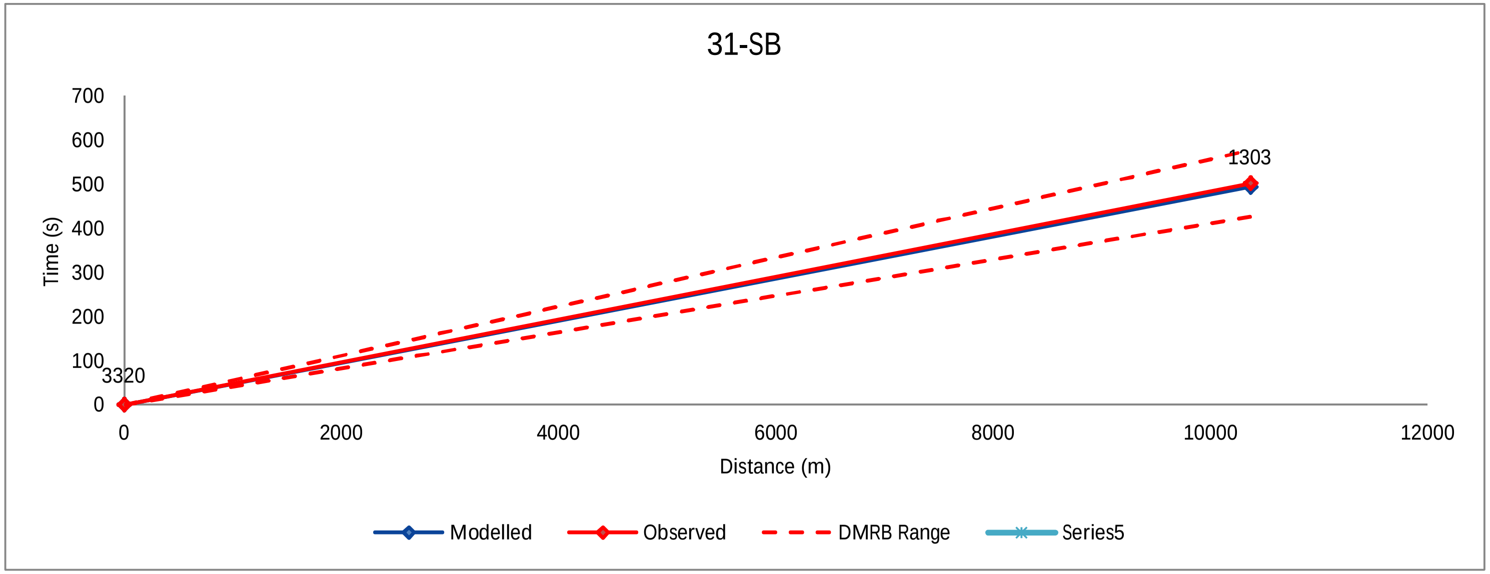

29-NB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3381
2221
2232
5924
5923
3278
Modelled
Observed
DMRB Range
Series5

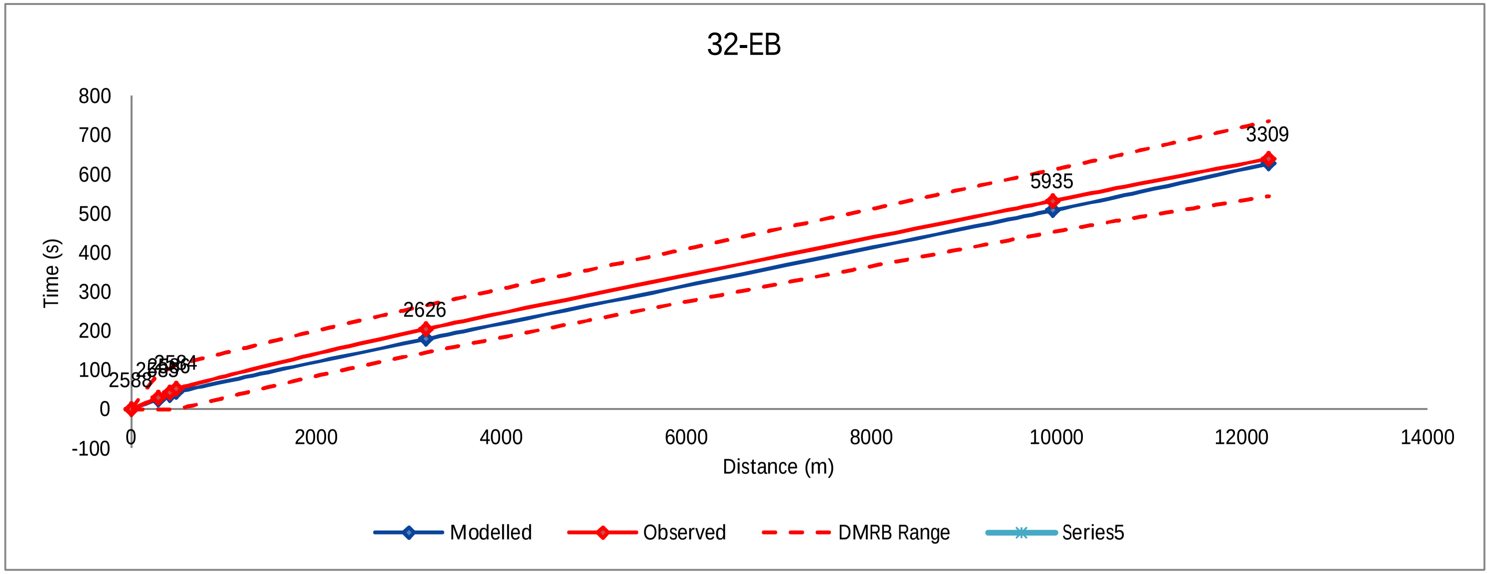

29-SB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3278
5923
5924
2231
2220
3381
Modelled
Observed
DMRB Range
Series5

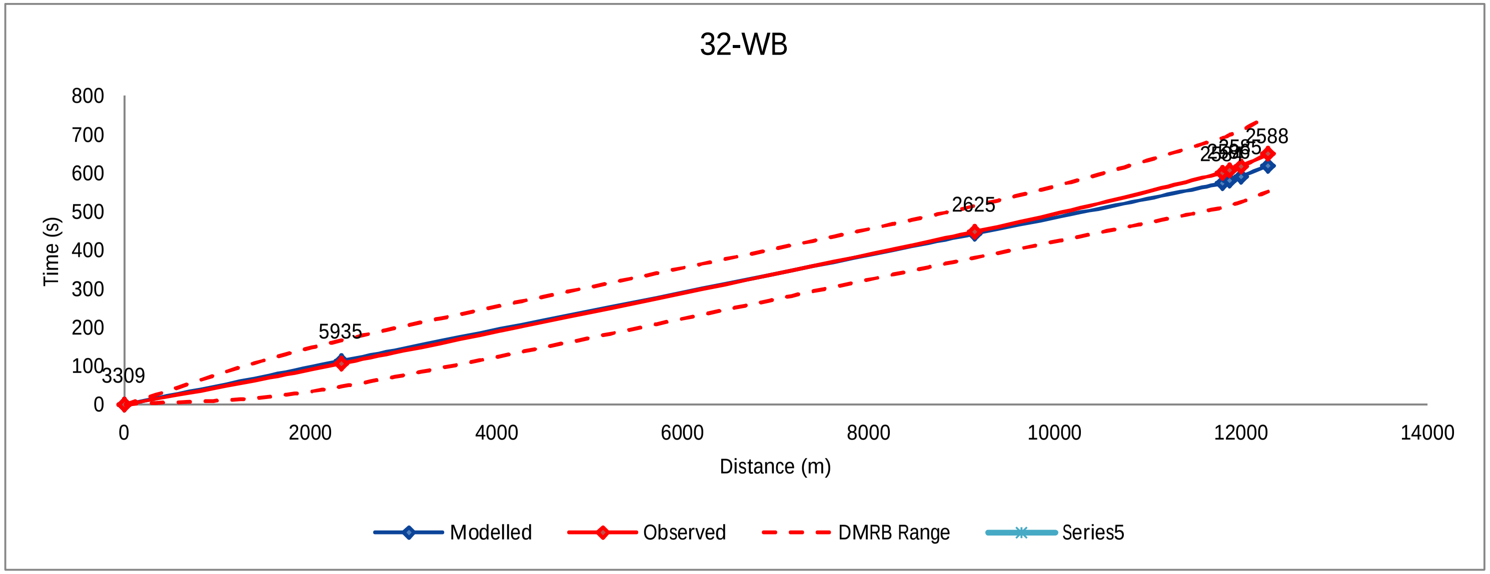

30-EB
Time (s)
1400
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
1303
3799
1350
3804
3279
3277
3278
Modelled
Observed
DMRB Range
Series5

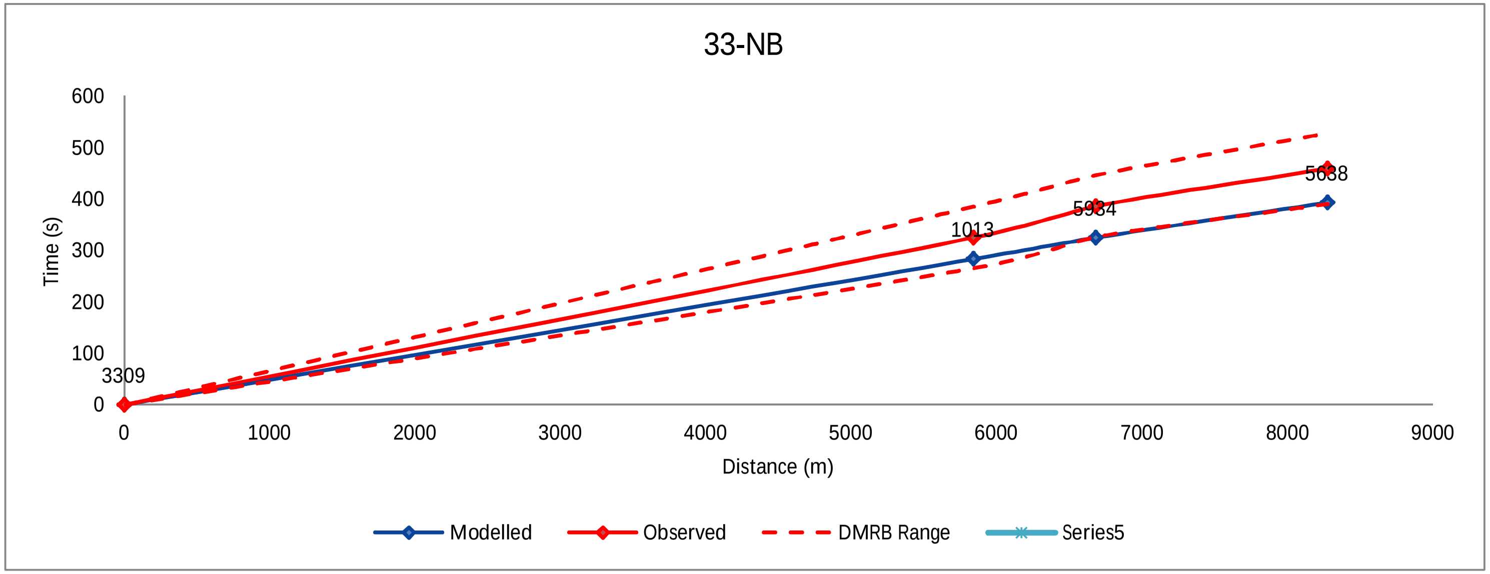

30-WB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3278
3277
3805
3804
3808
1350
3799
3797
1303
Modelled
Observed
DMRB Range
Series5


31-NB
Time (s)
600
500
400
300
200
100
0
1303
3320
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

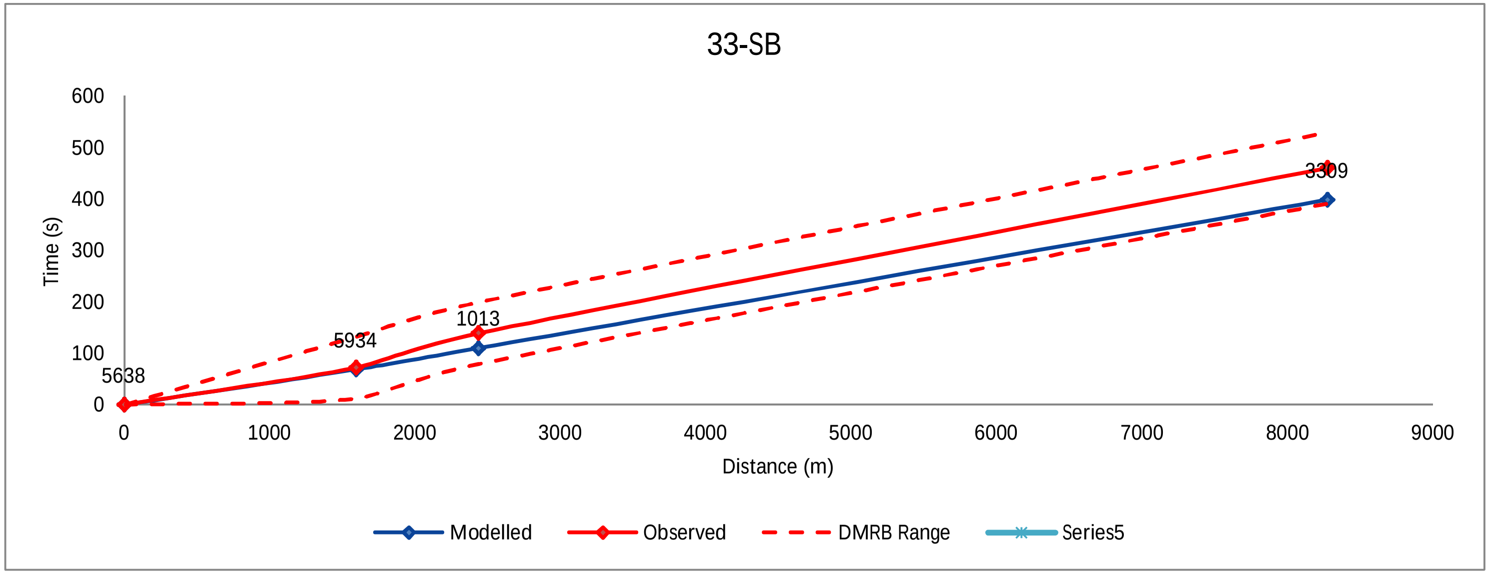

31-SB
Time (s)
700
600
500
400
300
200
100
0
3320
1303
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5


32-EB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
2588
2626
5935
3309
Modelled
Observed
DMRB Range
Series5

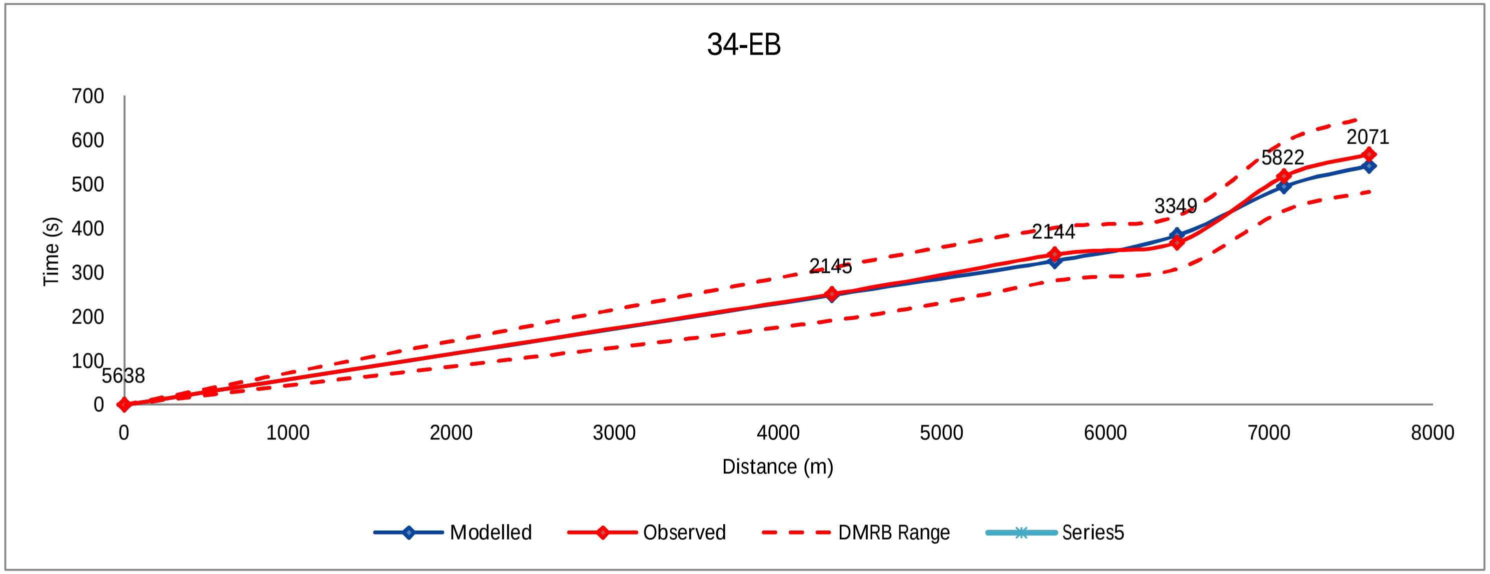

32-WB
Time (s)
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3309
5935
2625
2588
Modelled
Observed
DMRB Range
Series5

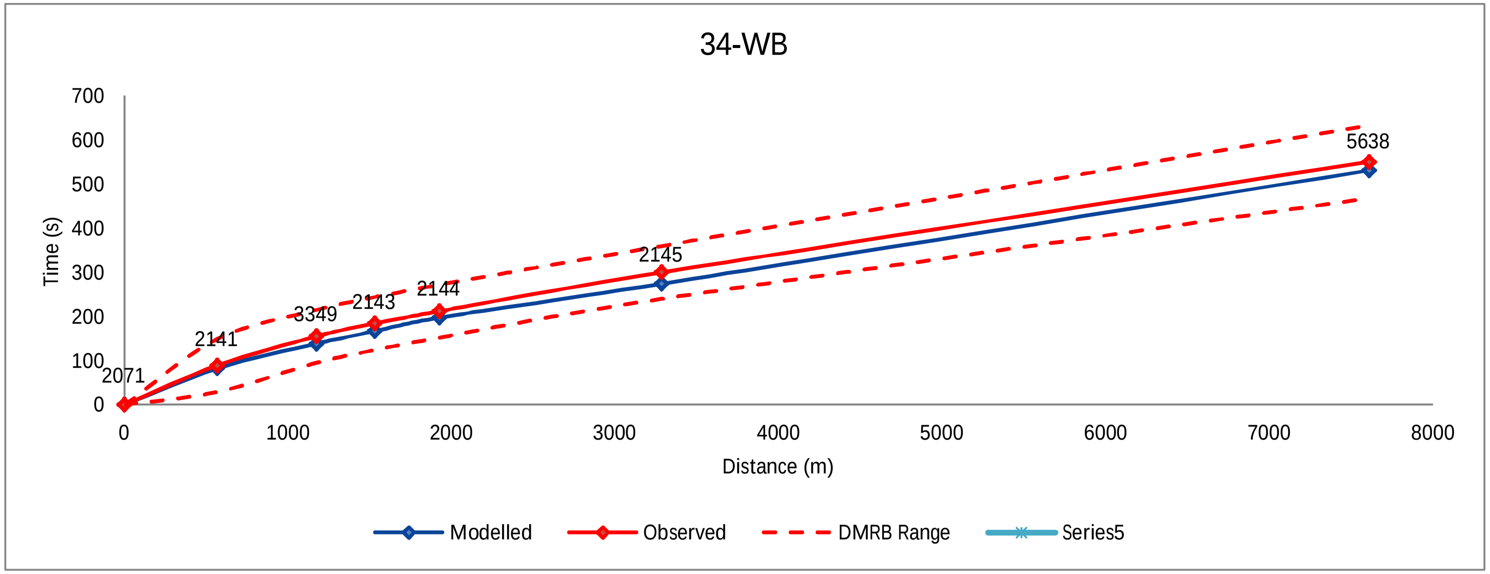


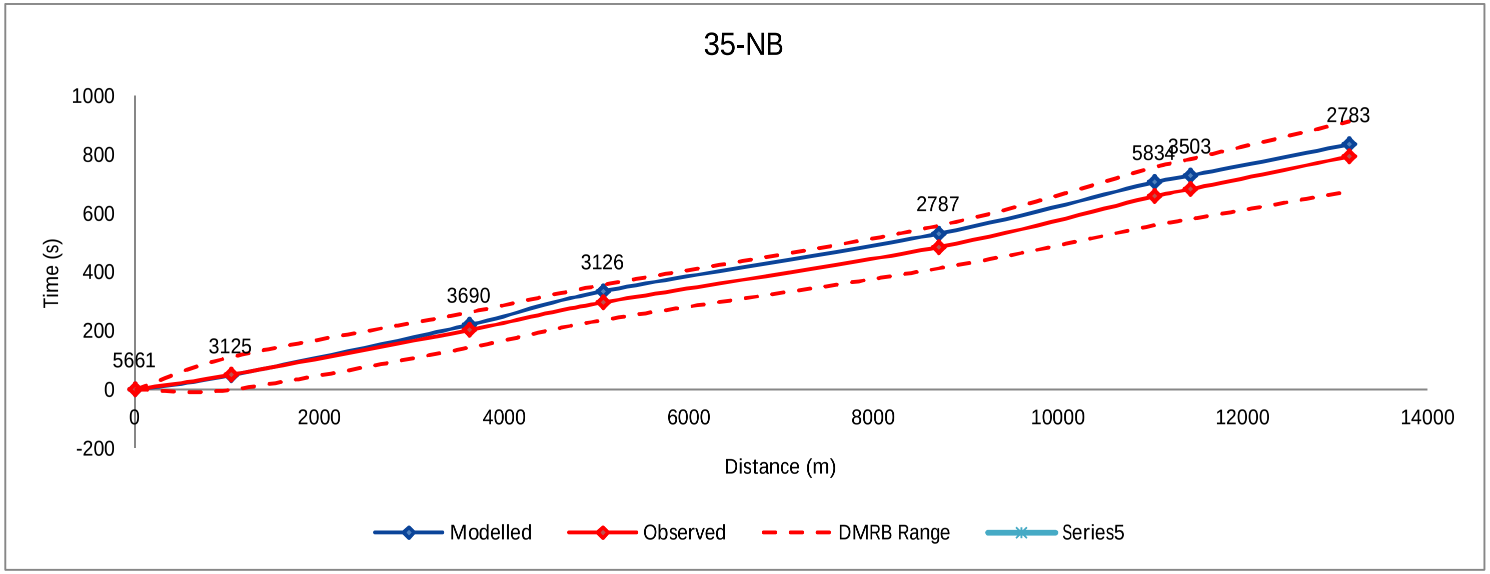
33-NB
Time (s)
600
500
400
300
200
100
0
3309
1013
5934
5638
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

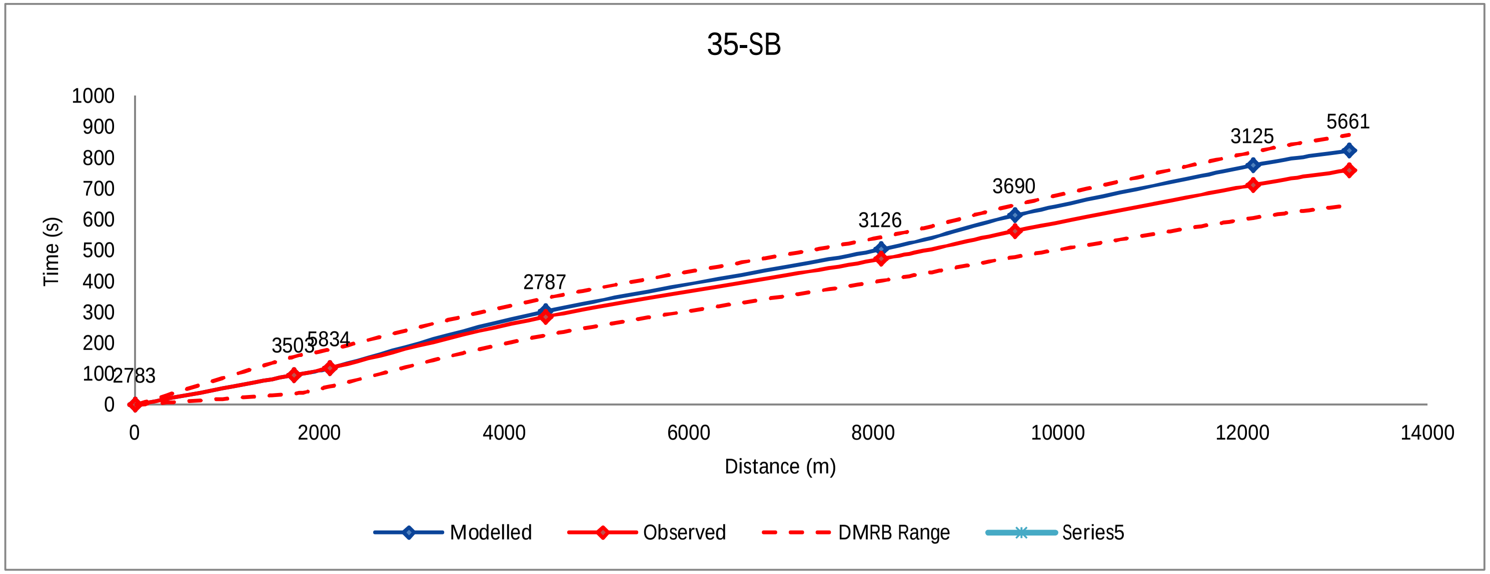


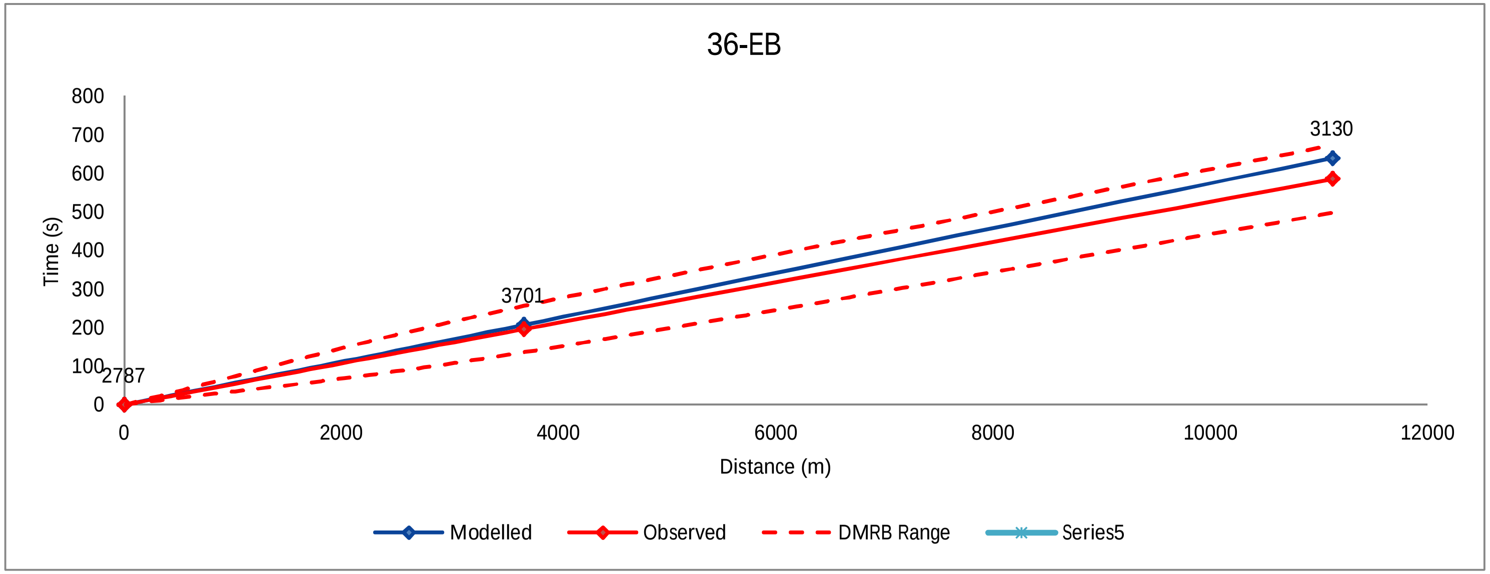
33-SB
Time (s)
600
500
400
300
200
100
0
5638
5934
1013
3309
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

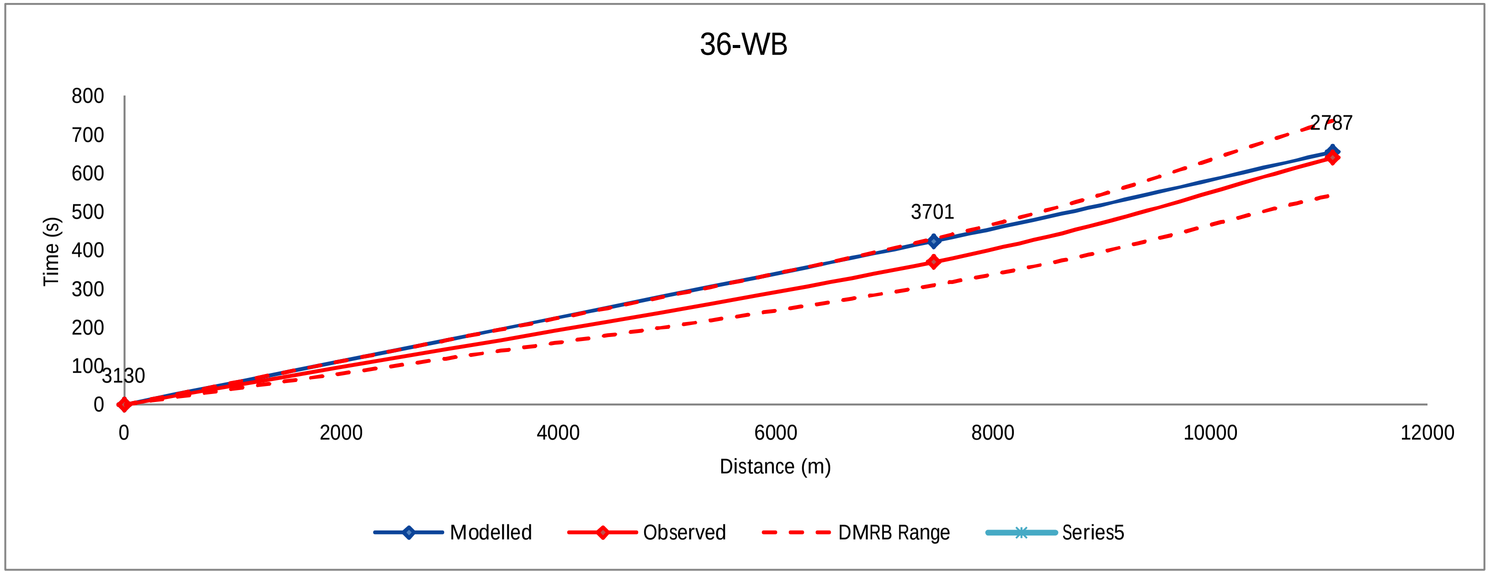

34-EB
Time (s)
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
5638
2145
2144
3349
5822
2071
Modelled
Observed
DMRB Range
Series5

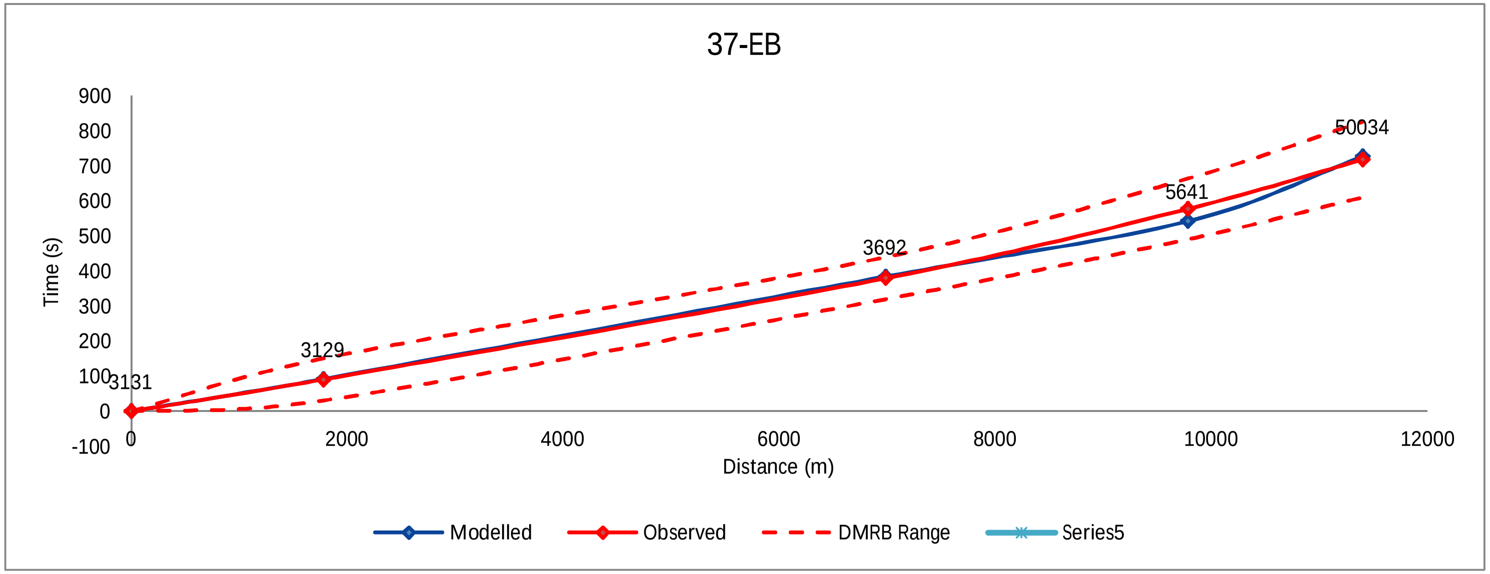

34-WB
Time (s)
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
2071
2141
3349
2143
2144
2145
5638
Modelled
Observed
DMRB Range
Series5

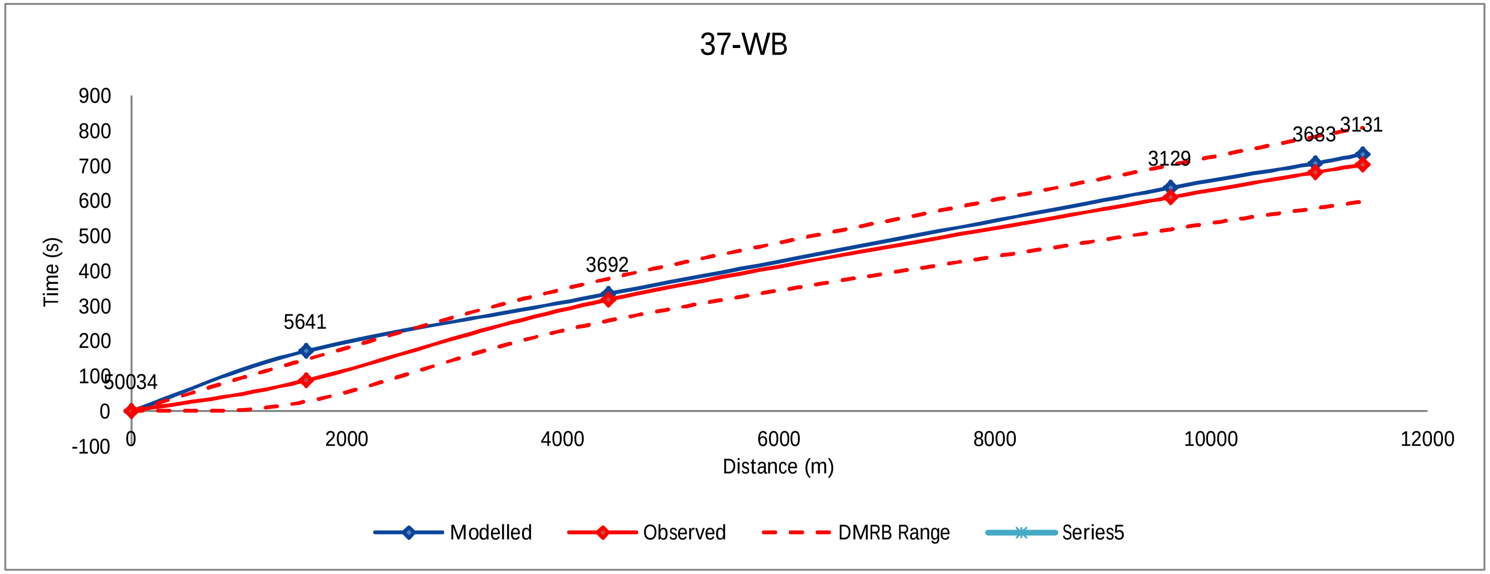

35-NB
Time (s)
1000
800
600
400
200
0
-200
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
5661
3125
3690
3126
2787
5834
3503
2783
Modelled
Observed
DMRB Range
Series5

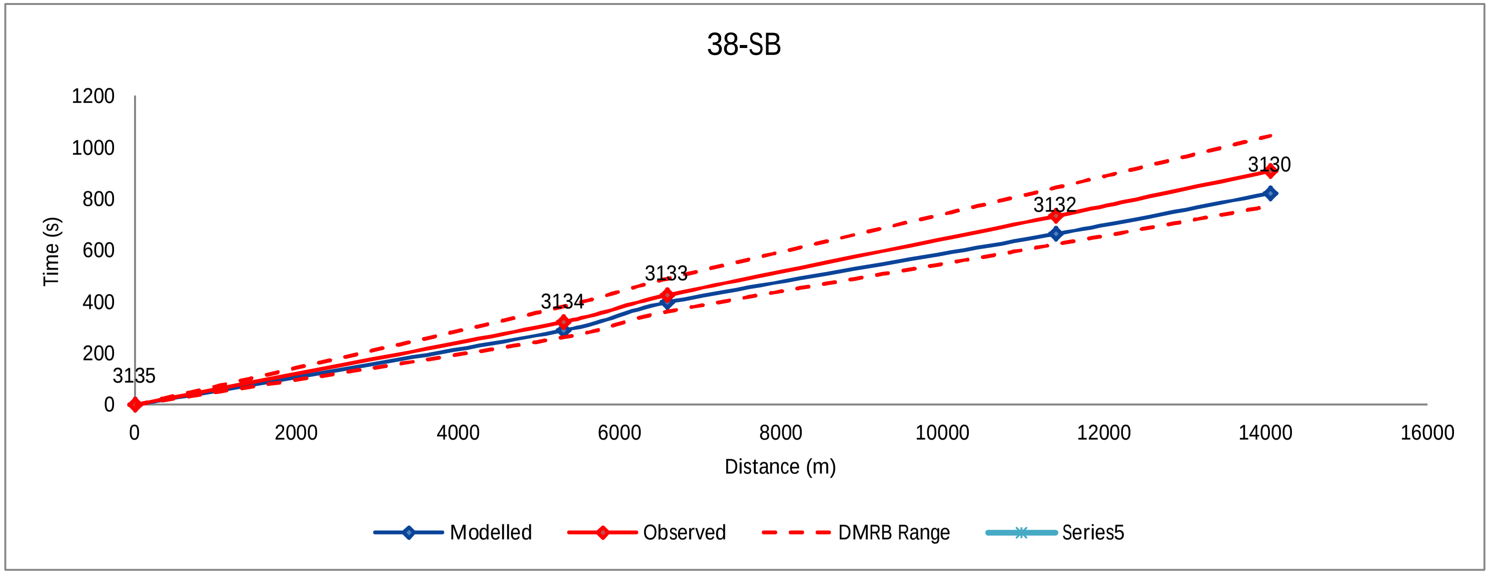

35-SB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
2783
3503
5834
2787
3126
3690
3125
5661
Modelled
Observed
DMRB Range
Series5


36-EB
Time (s)
800
700
600
500
400
300
200
100
0
2787
3701
3130
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

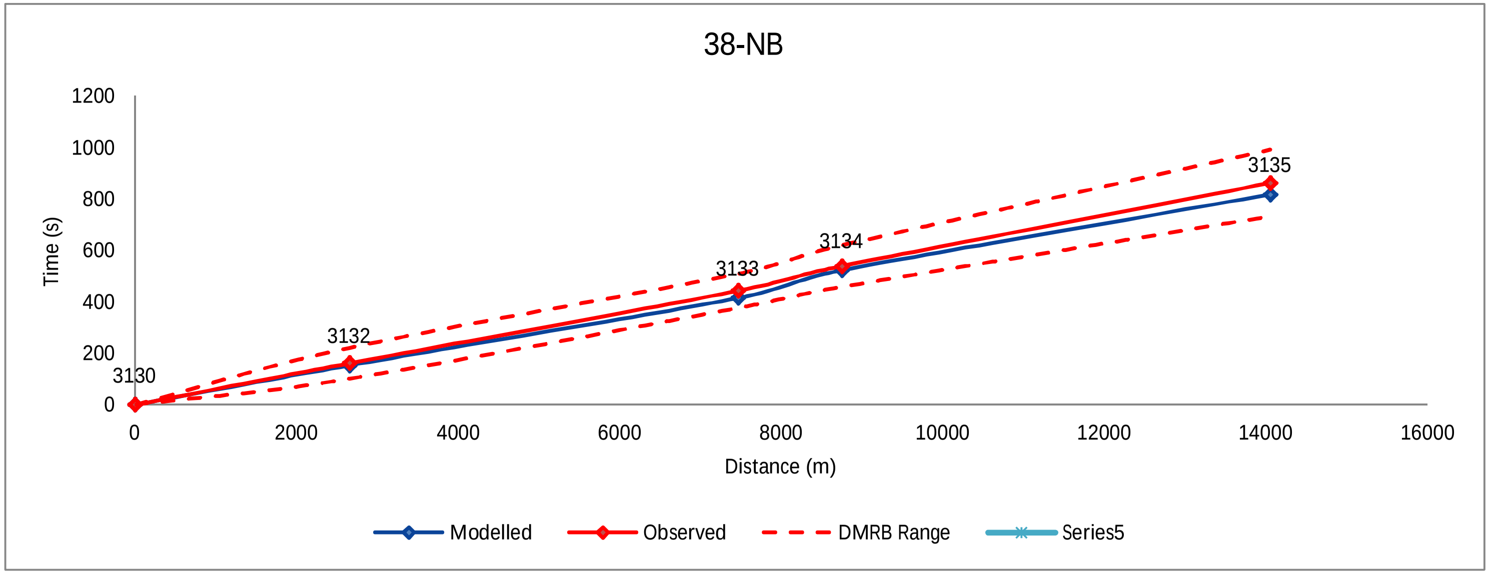

36-WB
Time (s)
800
700
600
500
400
300
200
100
0
3130
3701
2787
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5


37-EB
Time (s)
Distance (m)
3131
3129
3692
5641
50034
Modelled
Observed
DMRB Range
Series5

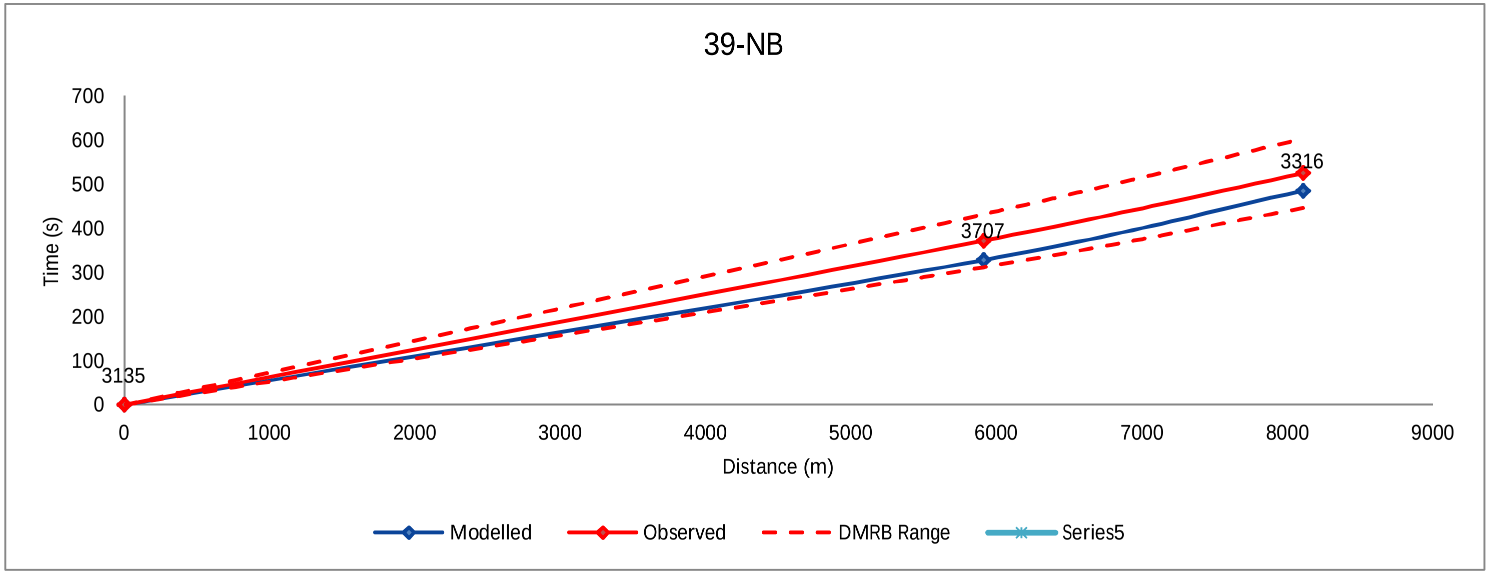

37-WB
Time (s)
Distance (m)
50034
5641
3692
3129
3683
3131
Modelled
Observed
DMRB Range
Series5

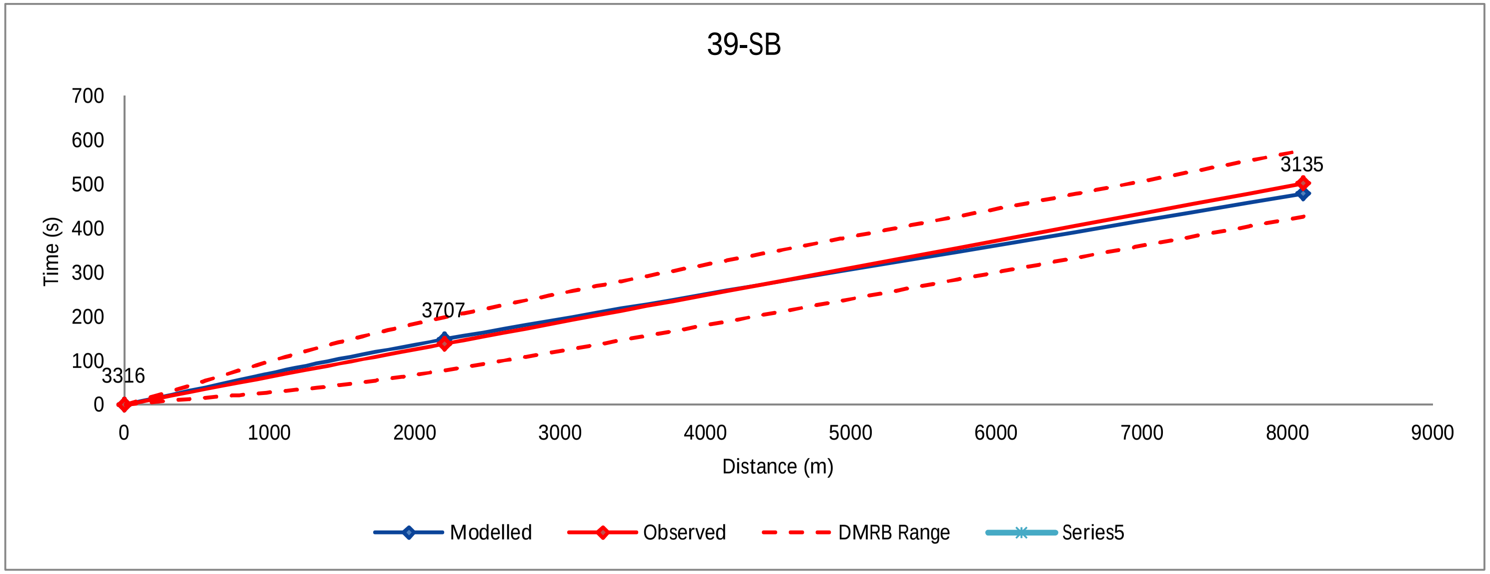


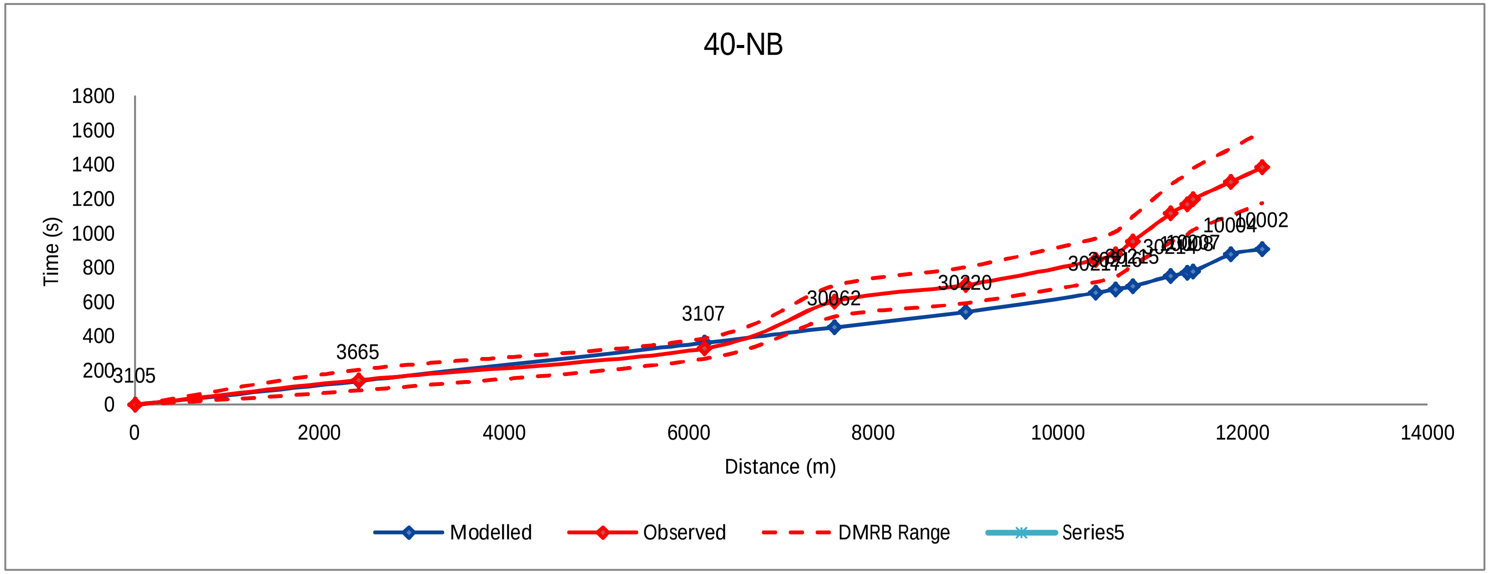
38-SB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3135
3134
3133
3132
3130
Modelled
Observed
DMRB Range
Series5

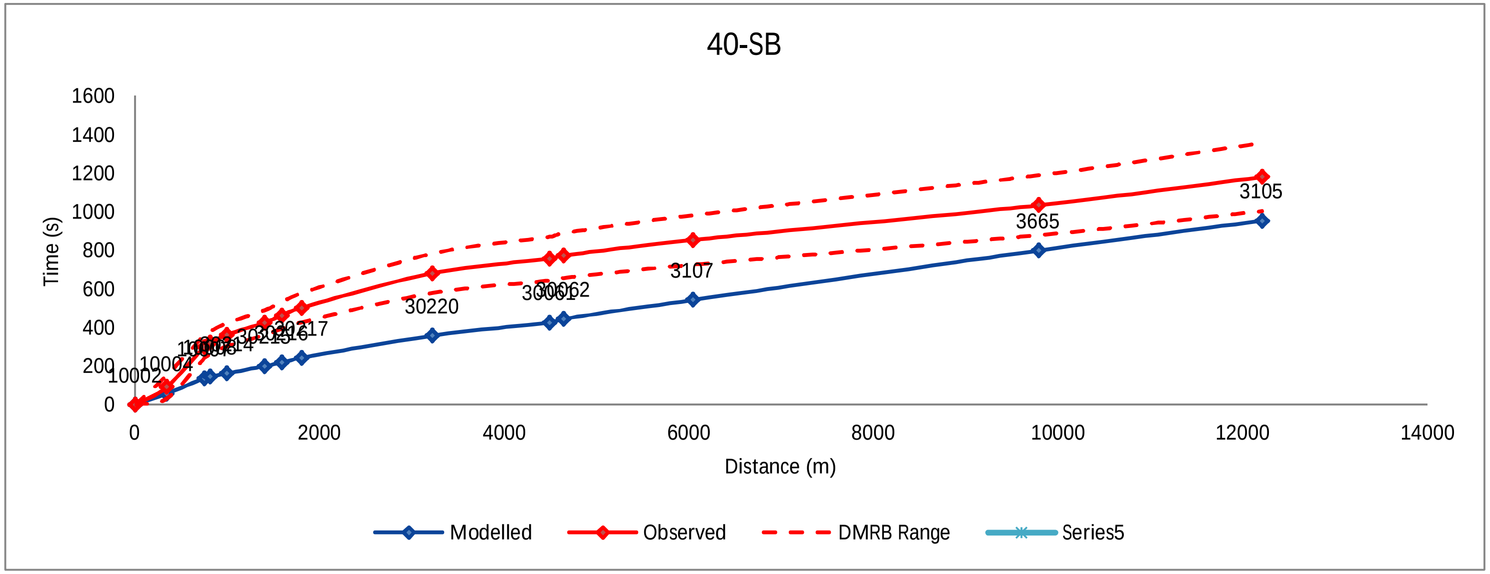


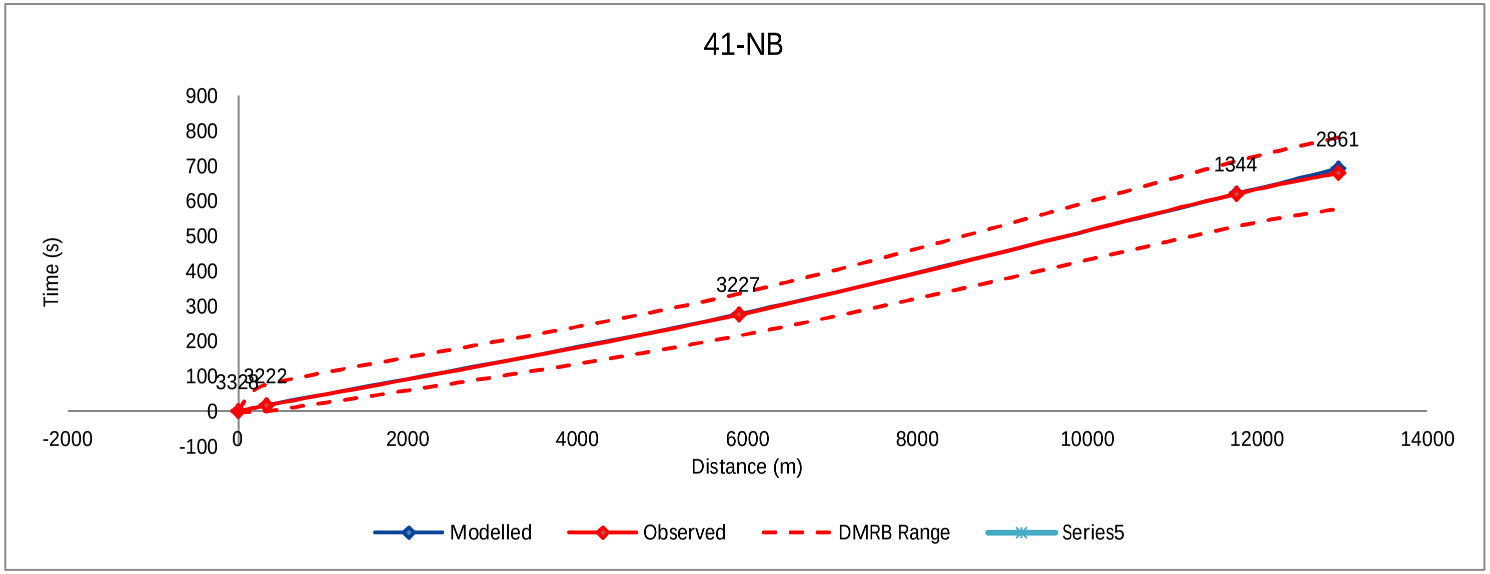
38-NB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3130
3132
3133
3134
3135
Modelled
Observed
DMRB Range
Series5

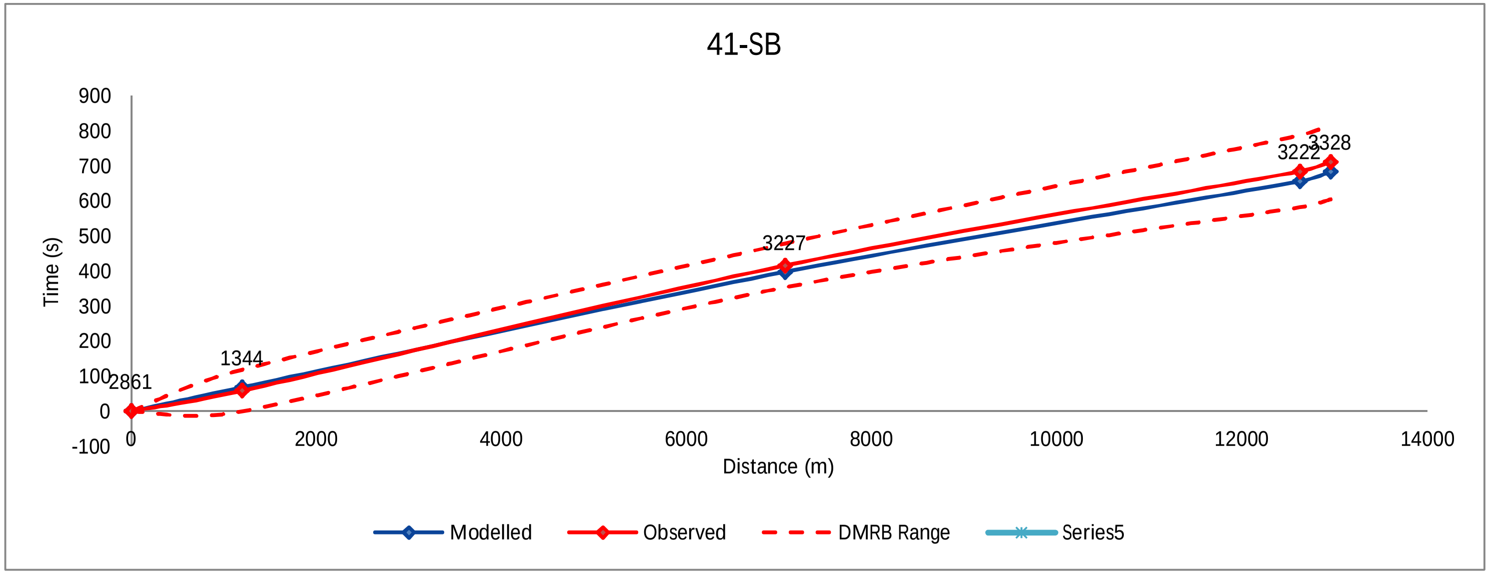

39-NB
Time (s)
700
600
500
400
300
200
100
0
3135
3707
3316
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

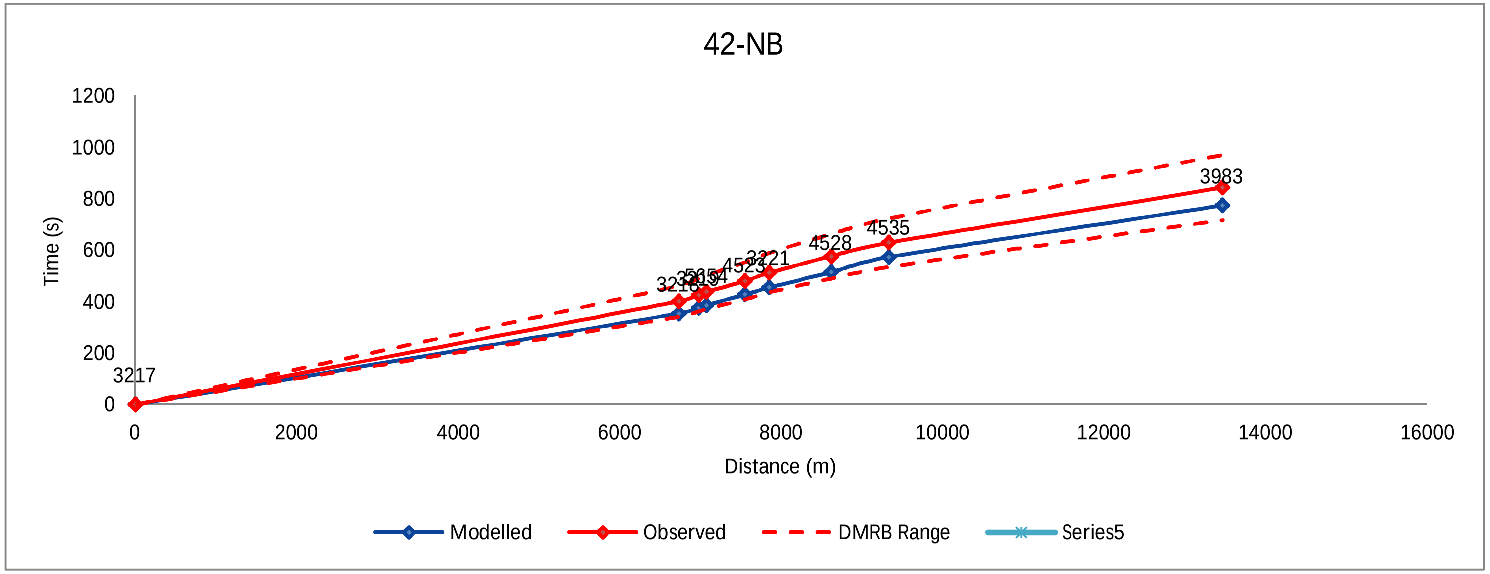

39-SB
Time (s)
700
600
500
400
300
200
100
0
3316
3707
3135
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

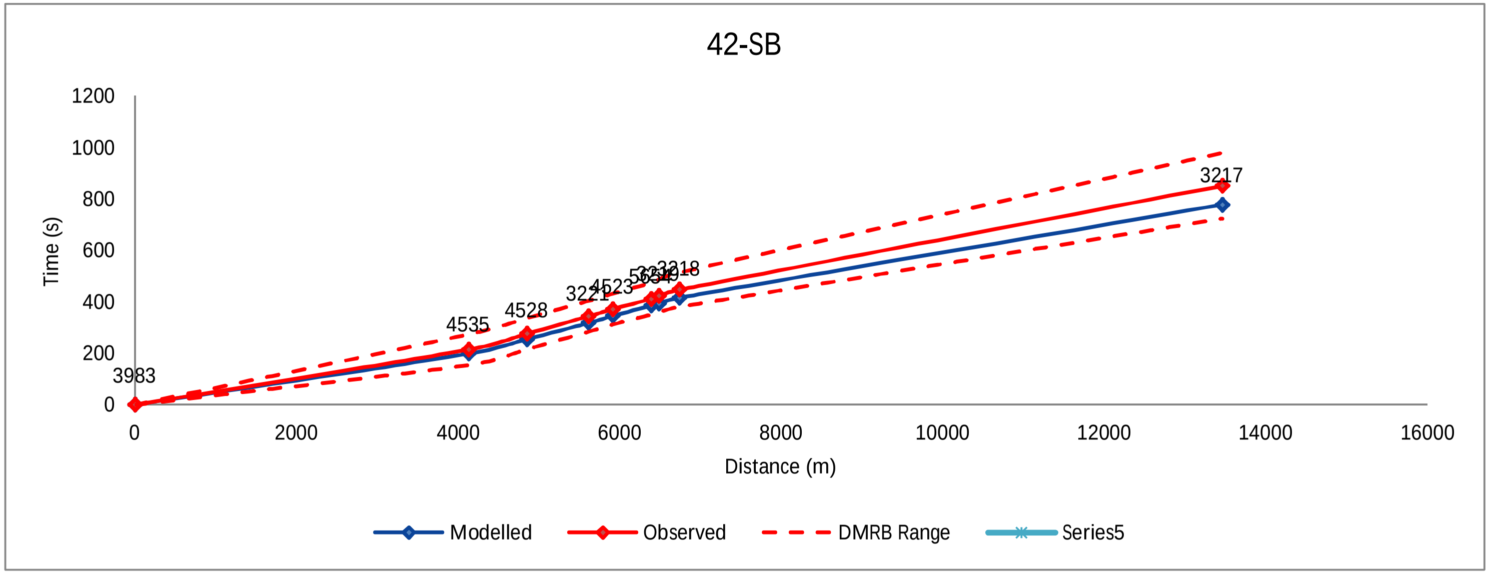

40-NB
Time (s)
Distance (m)
3105
3665
3107
30062
30220
10004
10002
Modelled
Observed
DMRB Range
Series5

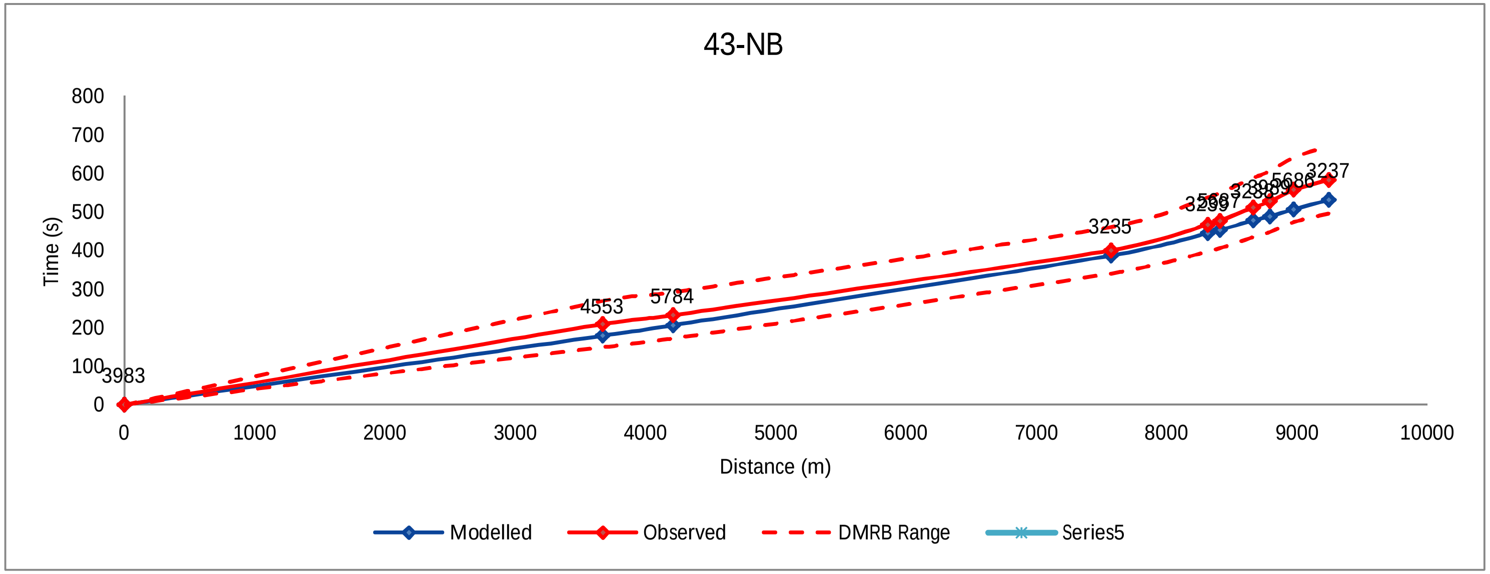

40-SB
Time (s)
Distance (m)
10002
10004
30220
3107
3665
3105
Modelled
Observed
DMRB Range
Series5

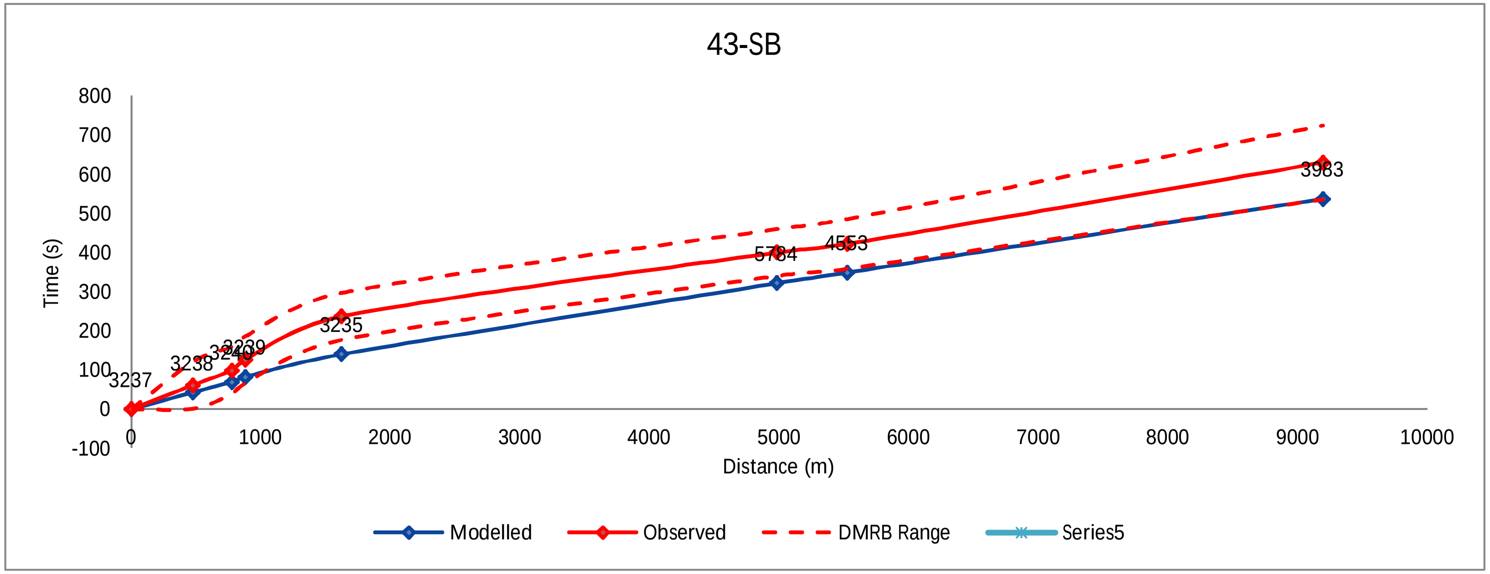

41-NB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
-2000
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
3328
3222
3227
1344
2861
Modelled
Observed
DMRB Range
Series5

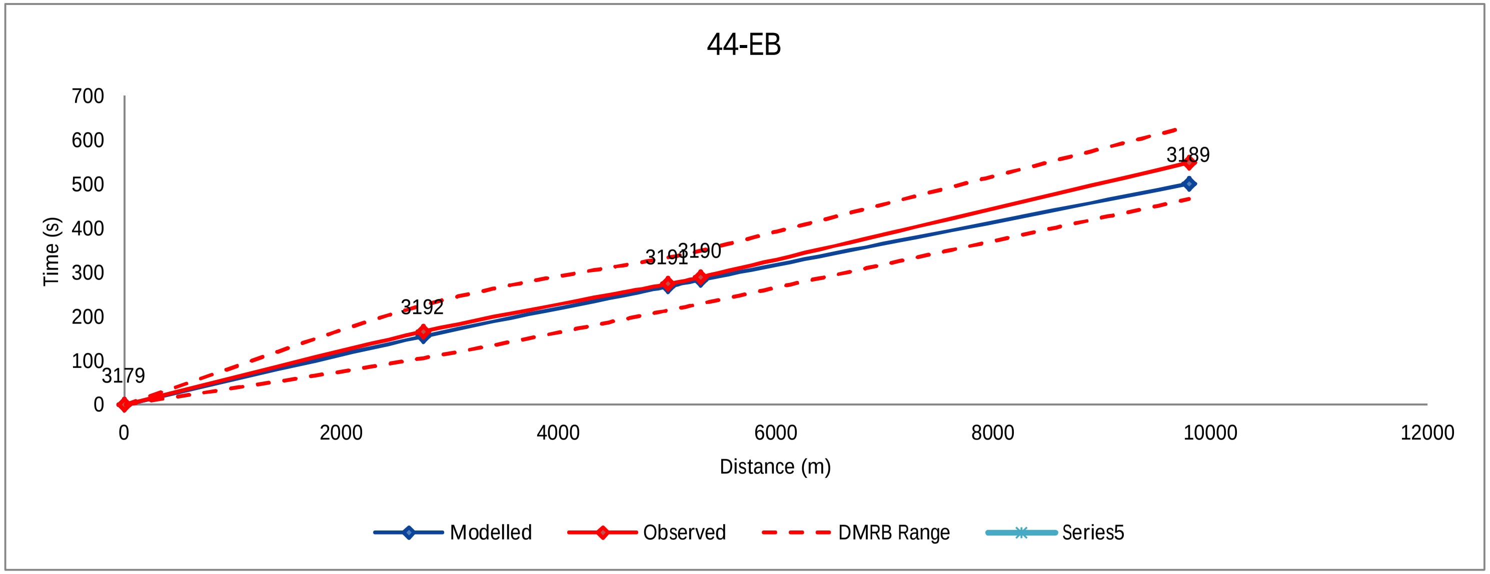

41-SB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
2861
1344
3227
3222
3328
Modelled
Observed
DMRB Range
Series5

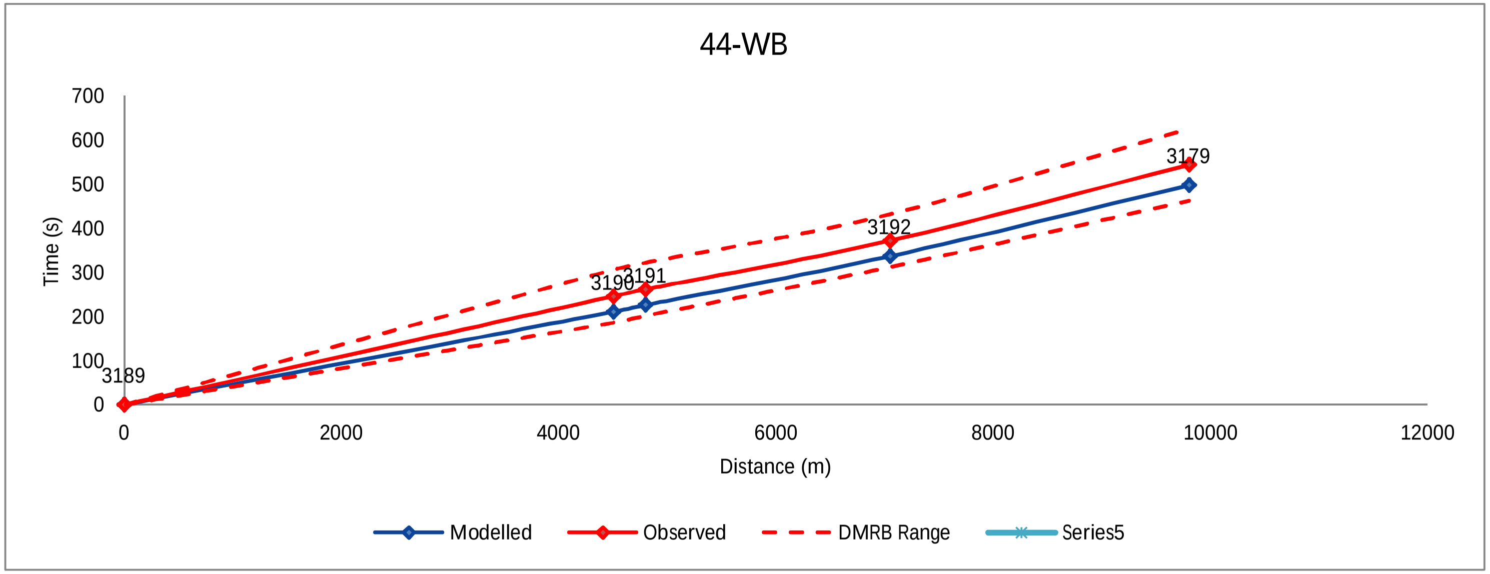

42-NB
Time (s)
Distance (m)
3217
3983
4535
4528
3221
4523
Modelled
Observed
DMRB Range
Series5

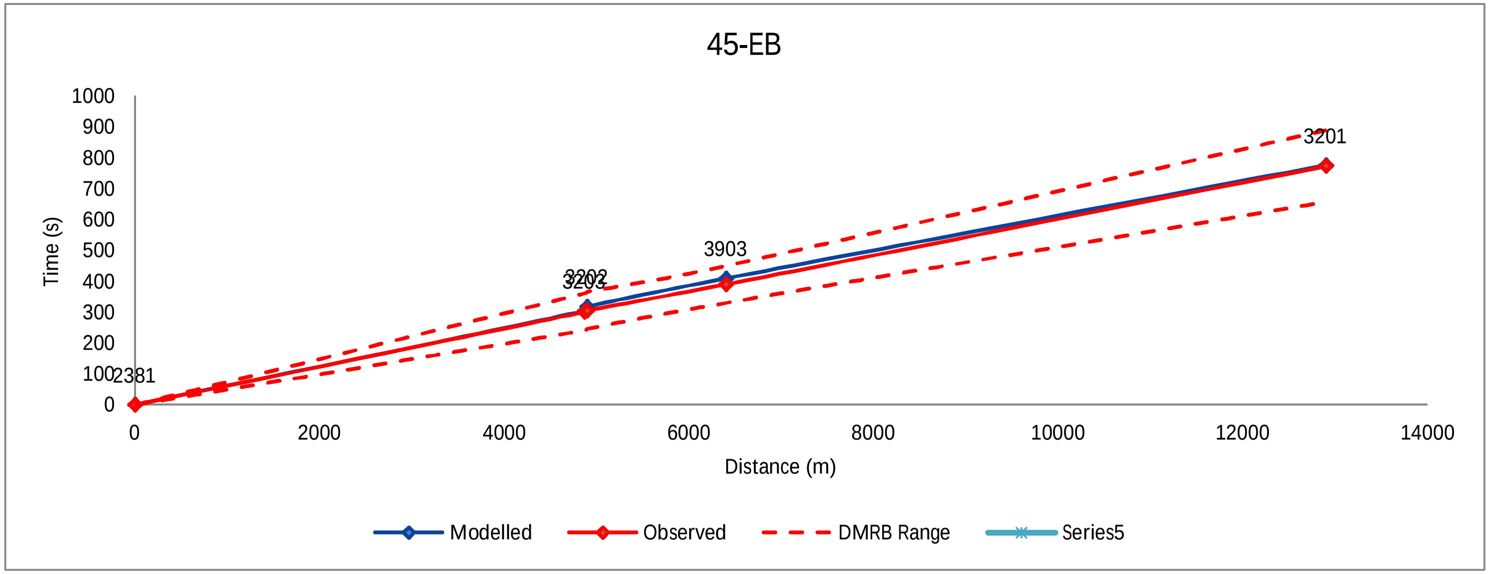

42-SB
Time (s)
Distance (m)
3983
4535
4528
3221
4523
3218
3217
Modelled
Observed
DMRB Range
Series5

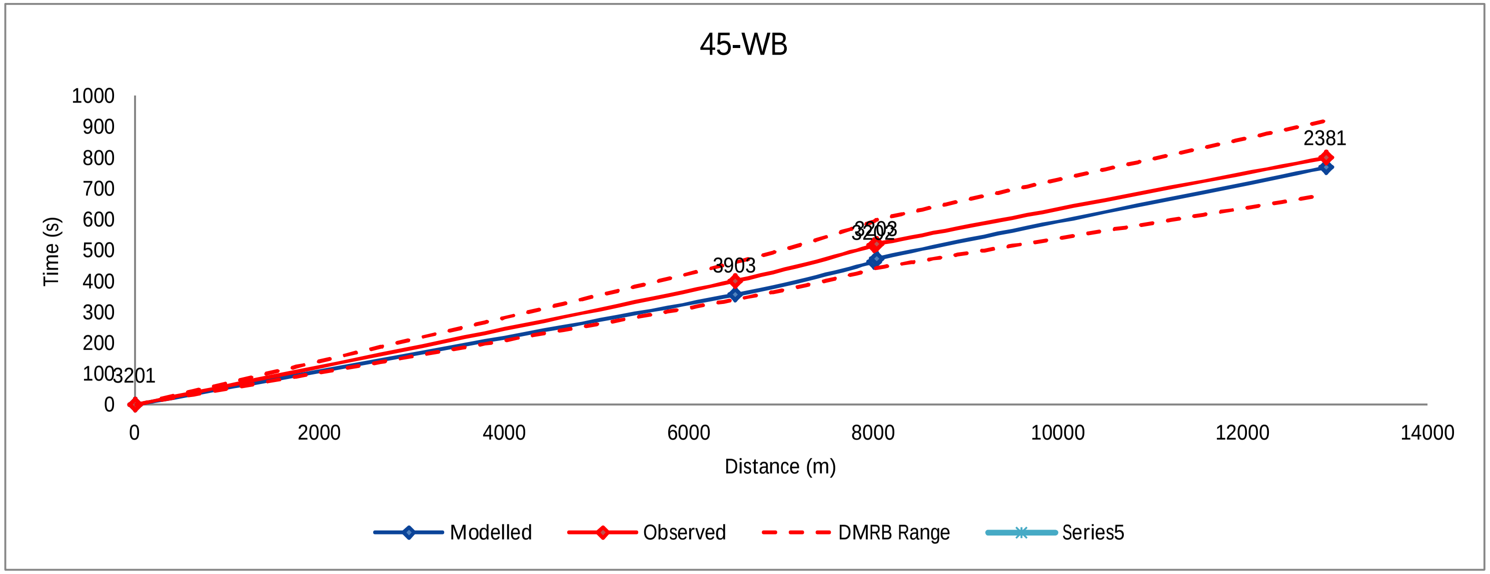

43-NB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5
3983
4553
5784
3235
3237

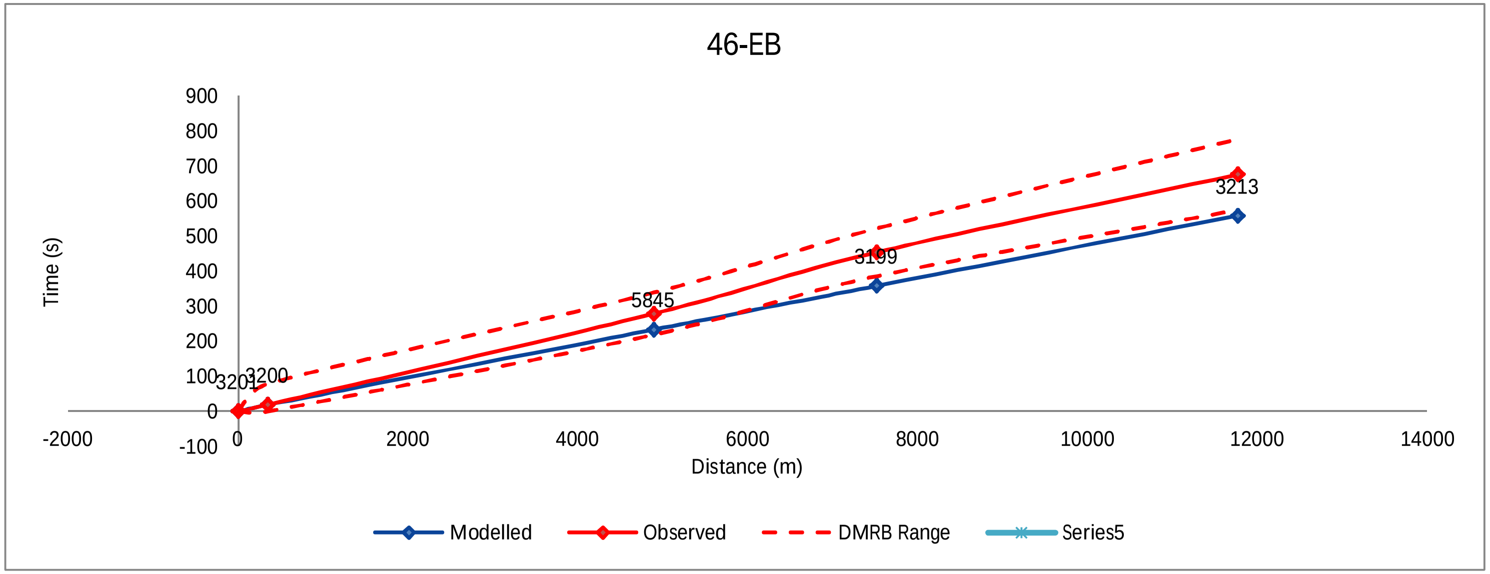

43-SB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5
3237
3238
3235
5784
4553
3983

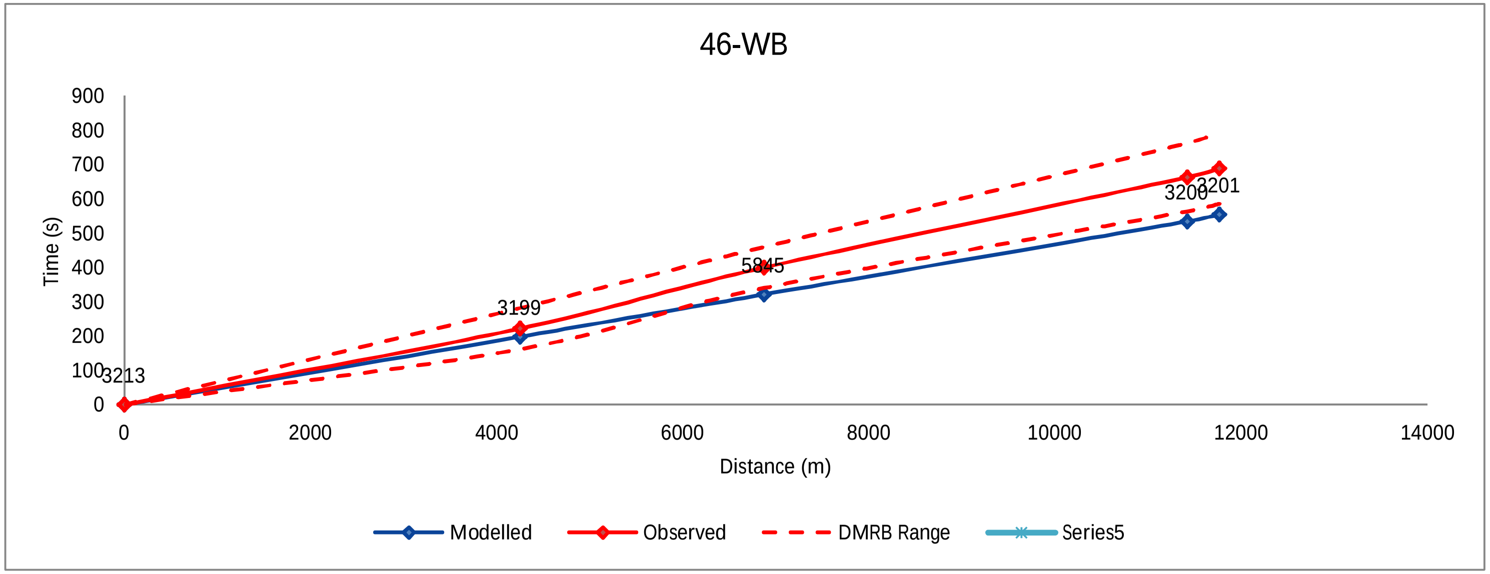

44-EB
Time (s)
700
600
500
400
300
200
100
0
Distance (m)
0
2000
4000
6000
8000
10000
12000
3179
3192
3191
3190
3189
Modelled
Observed
DMRB Range
Series5

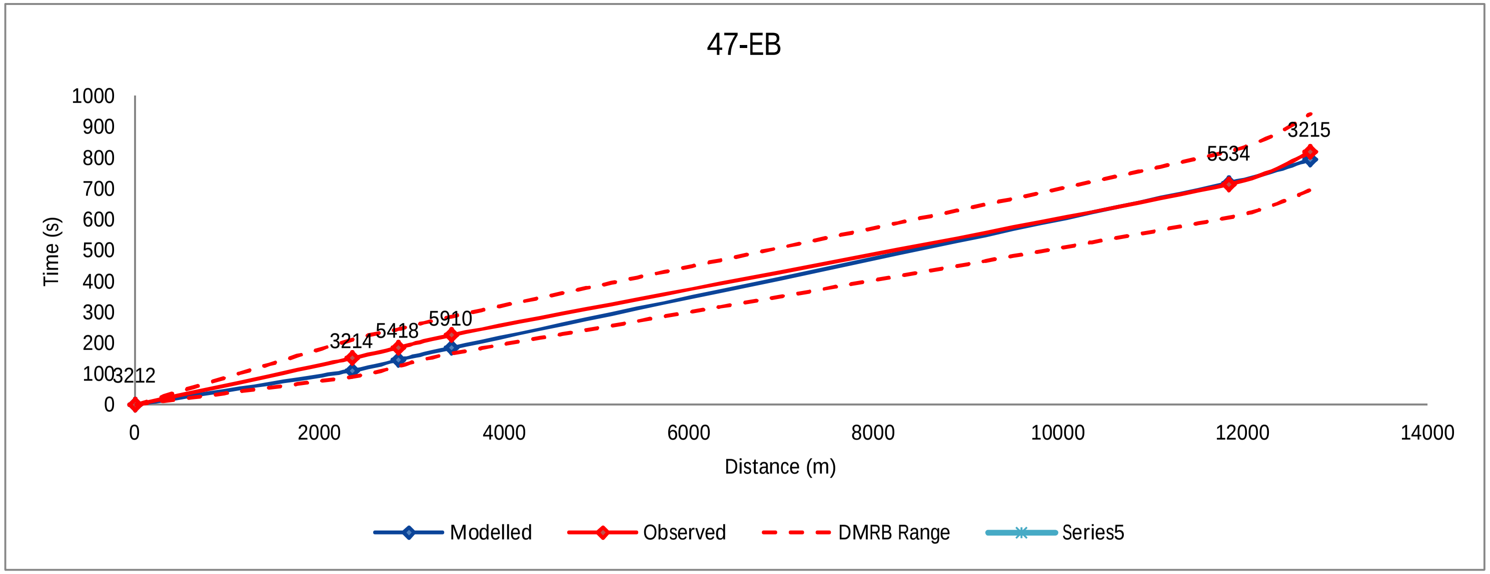

44-WB
Time (s)
700
600
500
400
300
200
100
0
Distance (m)
0
2000
4000
6000
8000
10000
12000
3189
3190
3191
3192
3179
Modelled
Observed
DMRB Range
Series5


45-EB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
2381
3202
3203
3903
3201
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

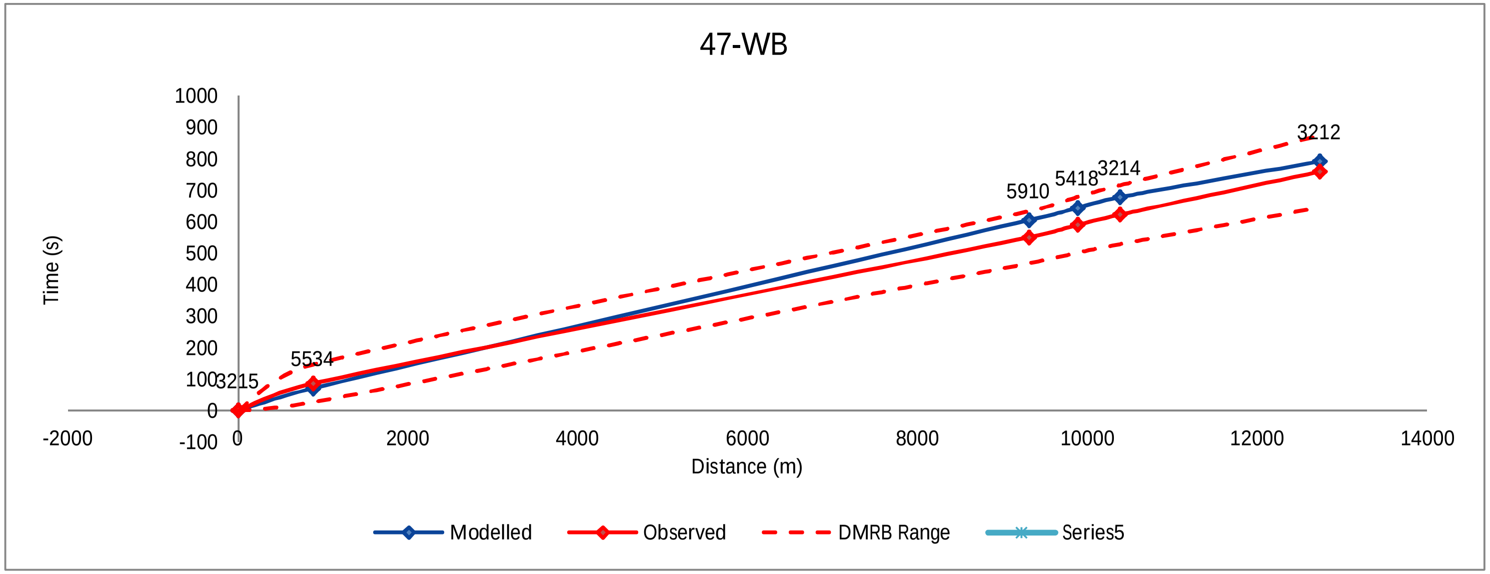

45-WB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3201
3903
3203
3202
2381
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5


46-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
-100
3201
3200
5845
3199
3213
-2000
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

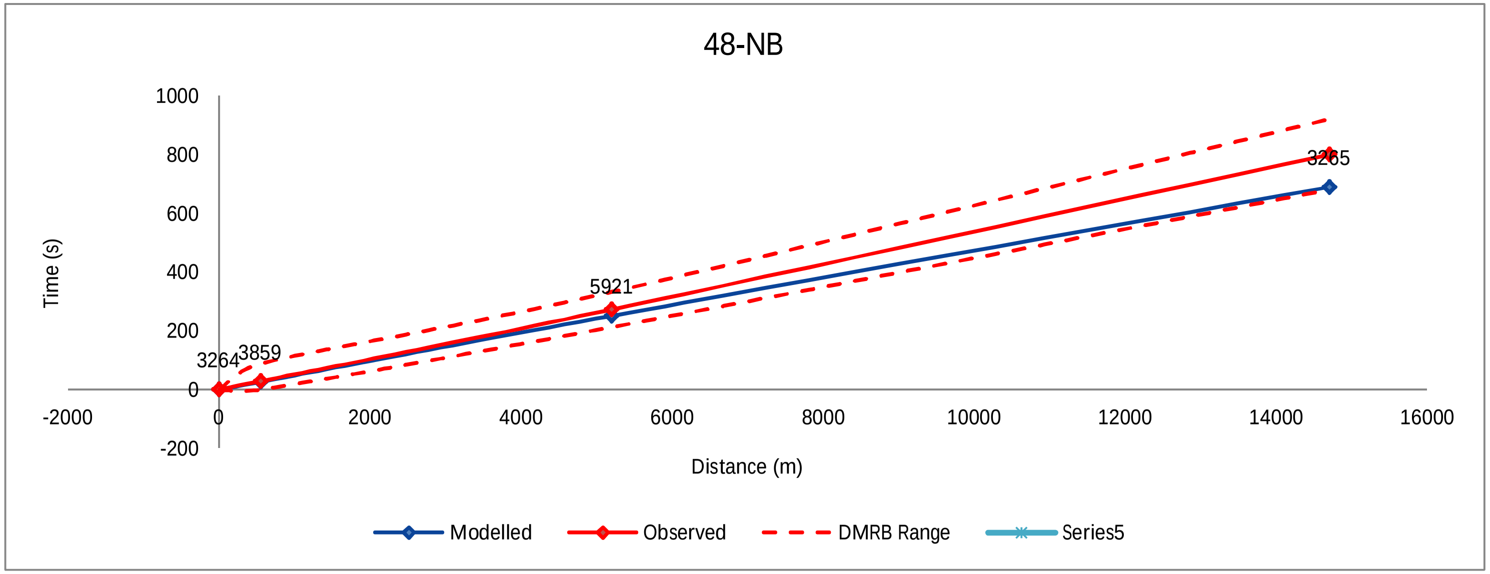

46-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
3213
3199
5845
3200
3201
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

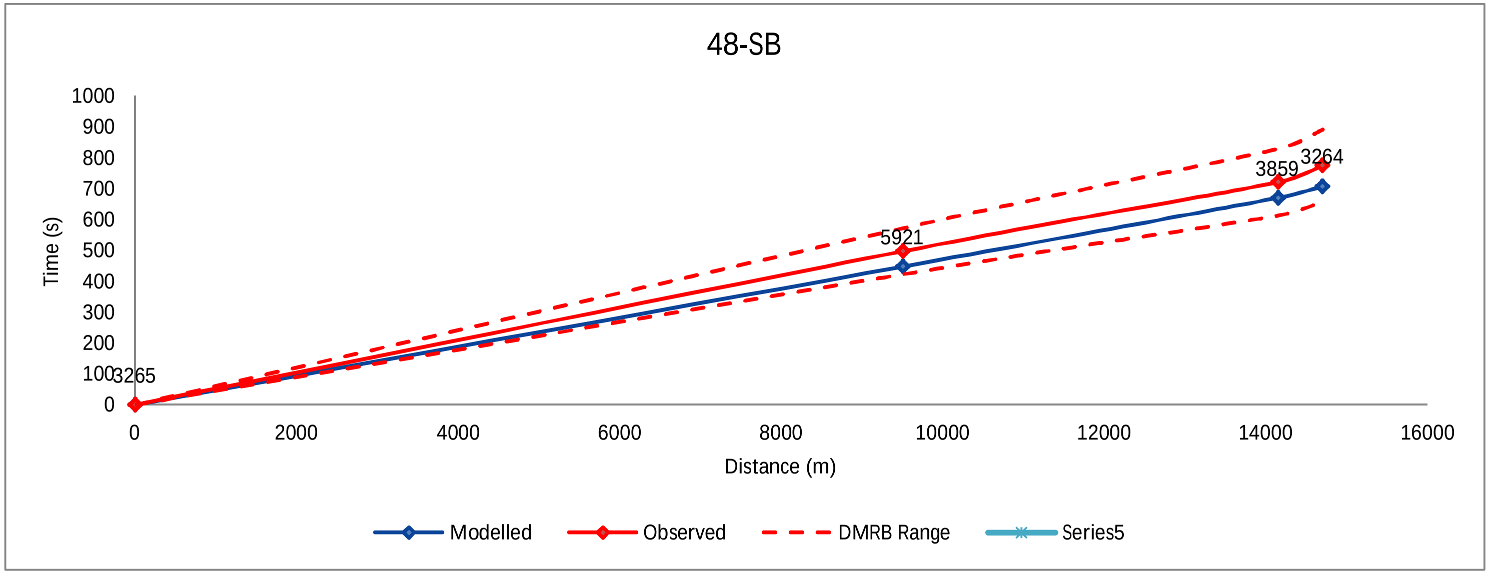


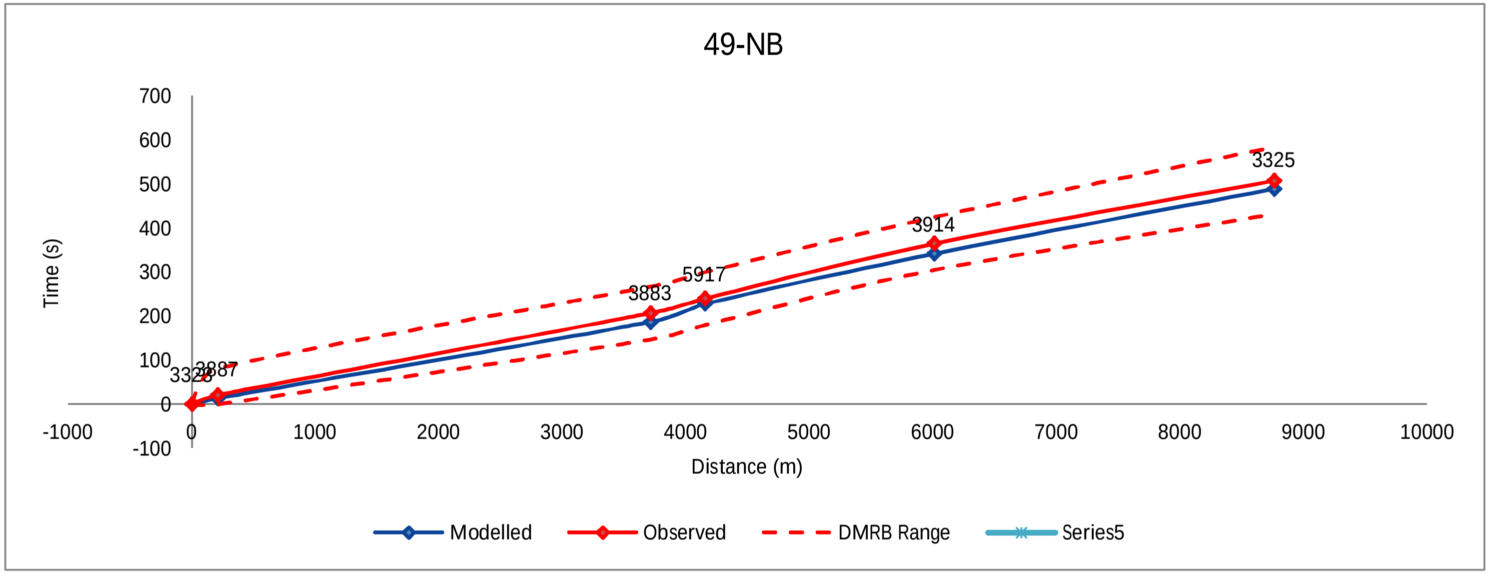
47-EB
Time (s)
Distance (m)
3212
3214
5418
5910
5534
3215
Modelled
Observed
DMRB Range
Series5

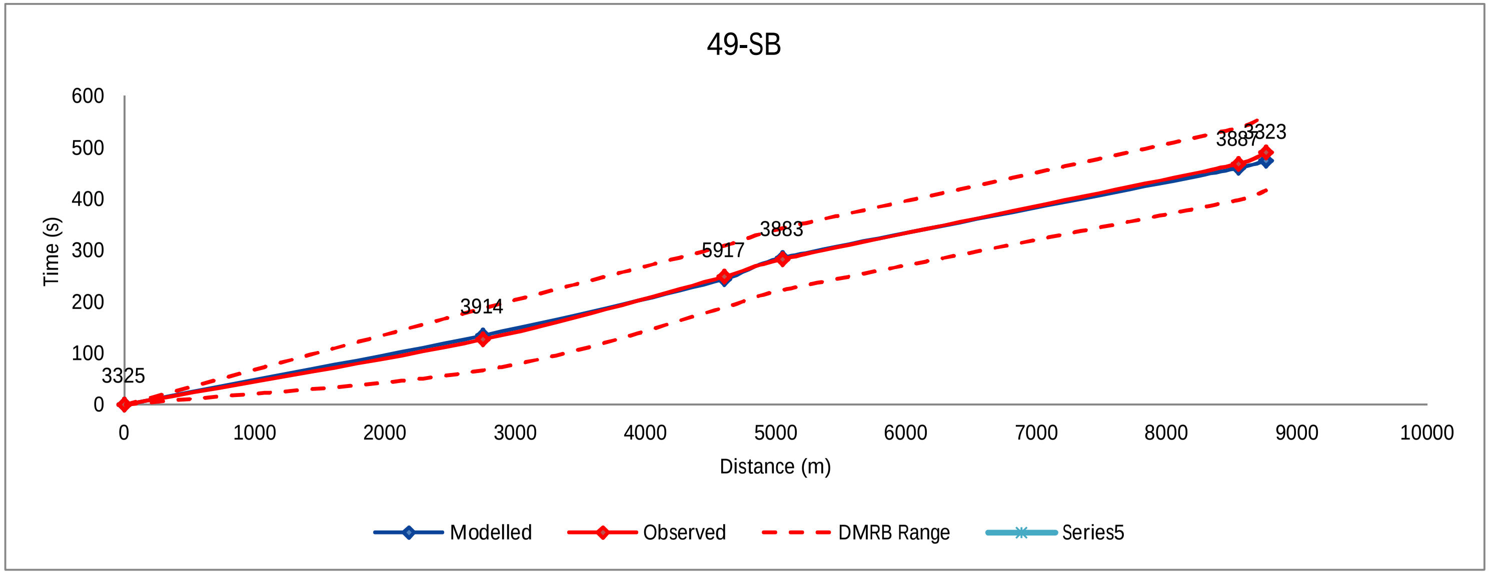


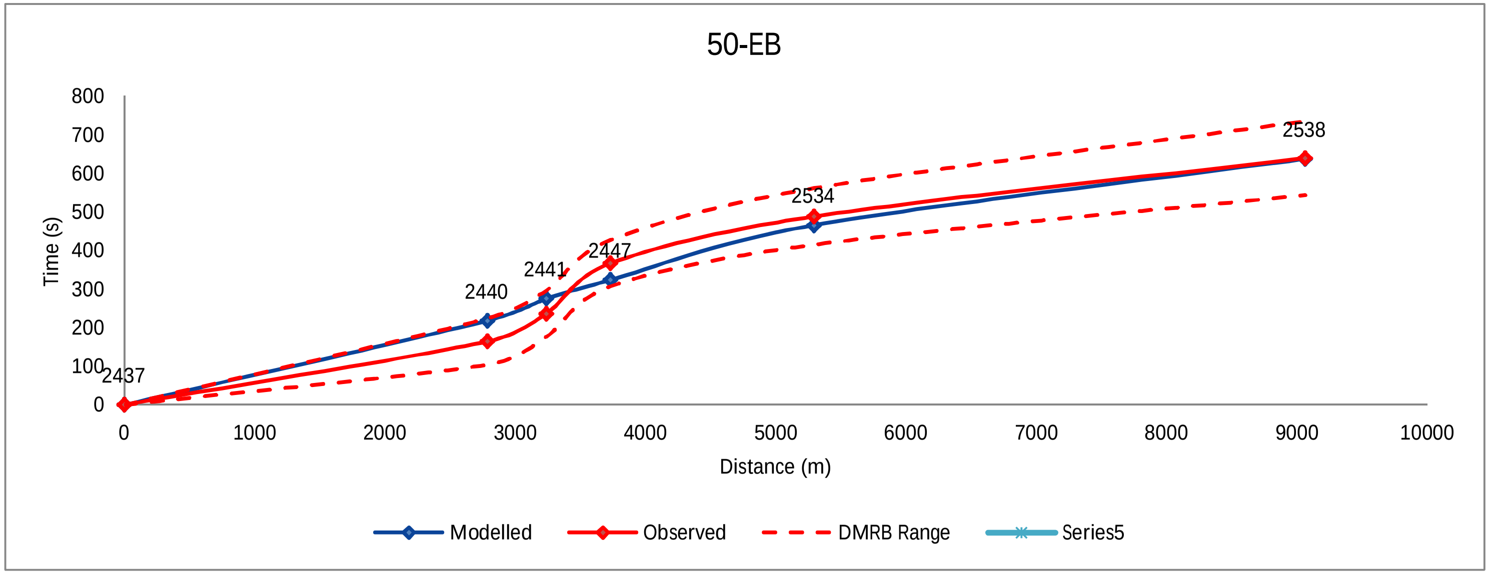
47-WB
Time (s)
Distance (m)
3215
5534
5910
5418
3214
3212
Modelled
Observed
DMRB Range
Series5

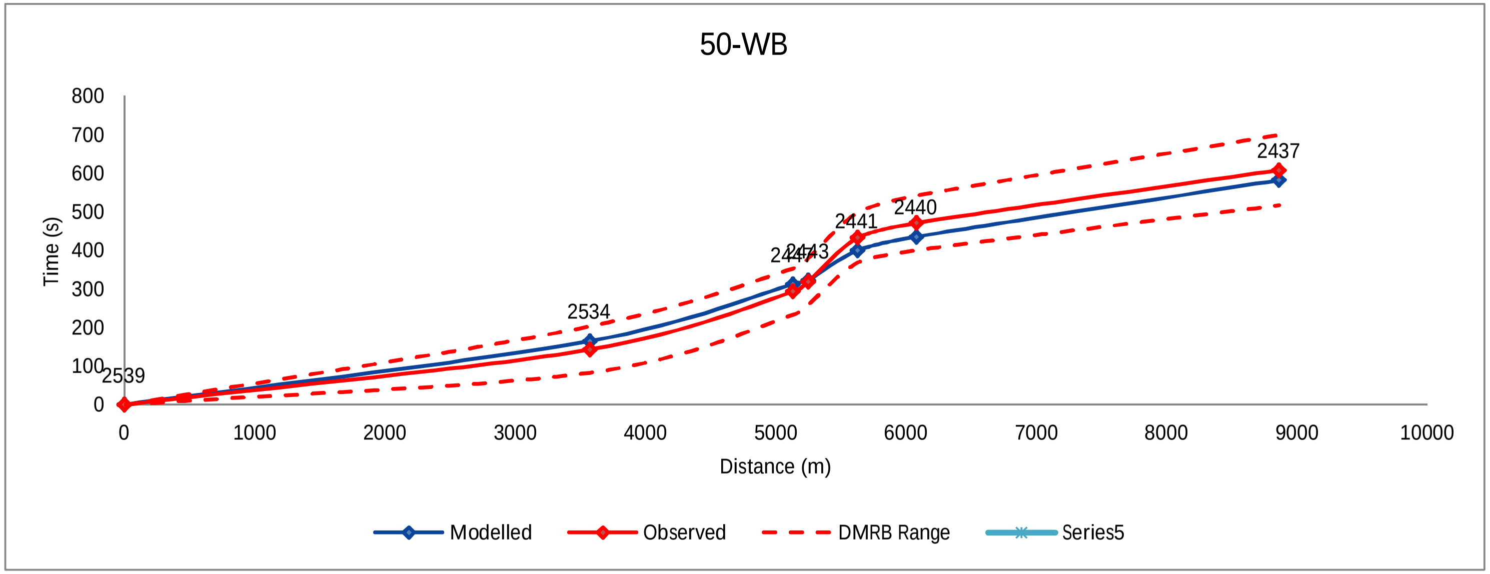

48-NB
Time (s)
1000
800
600
400
200
0
-200
-2000
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3264
3859
5921
3265
Modelled
Observed
DMRB Range
Series5

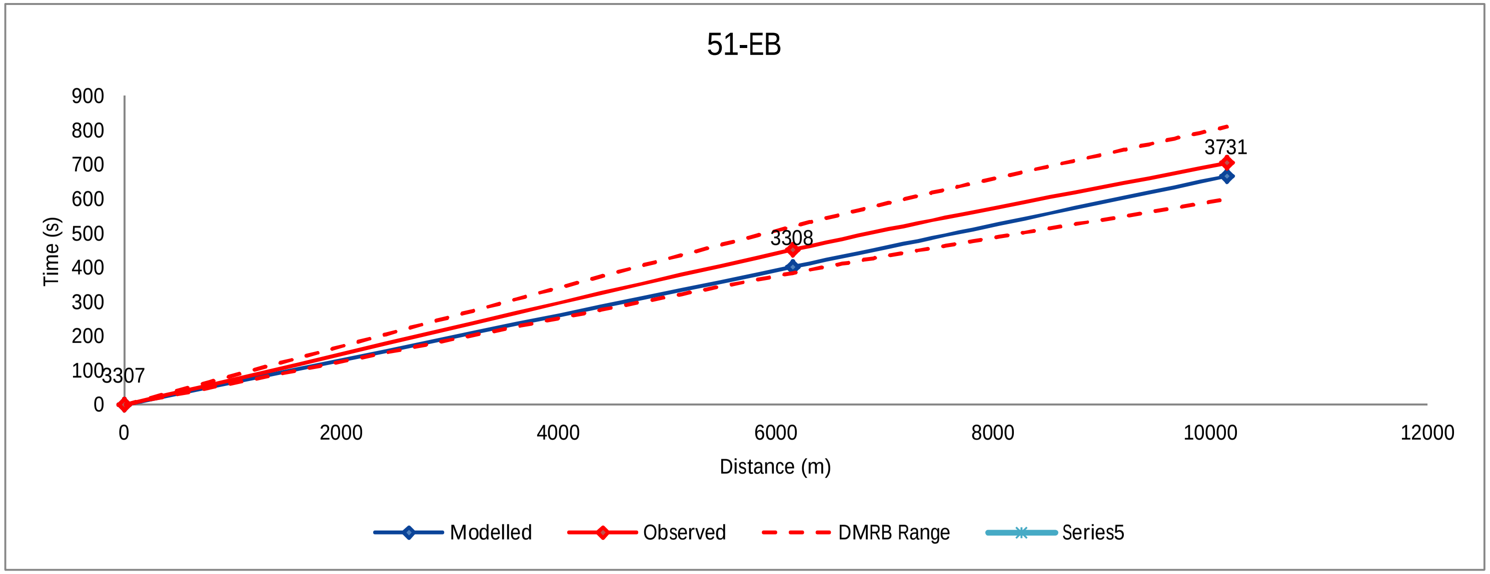

48-SB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3265
5921
3859
3264
Modelled
Observed
DMRB Range
Series5

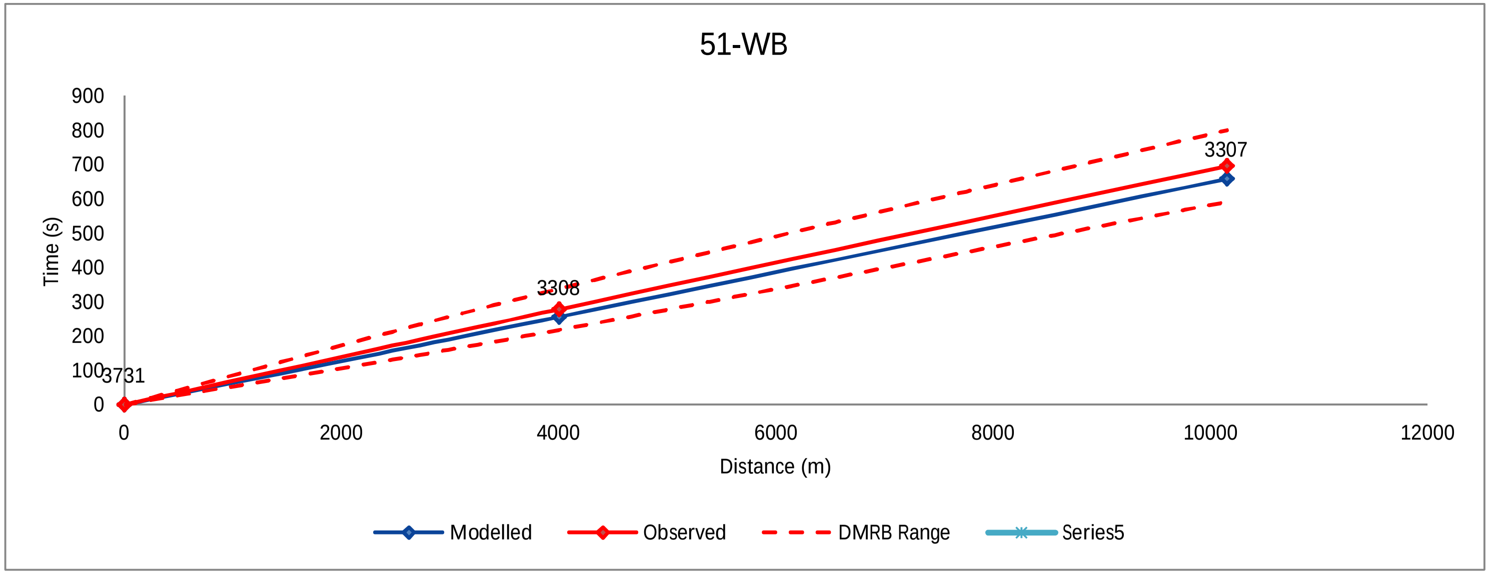

49-NB
Time (s)
700
600
500
400
300
200
100
0
-100
-1000
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
3887
3883
5917
3914
3325
Modelled
Observed
DMRB Range
Series5

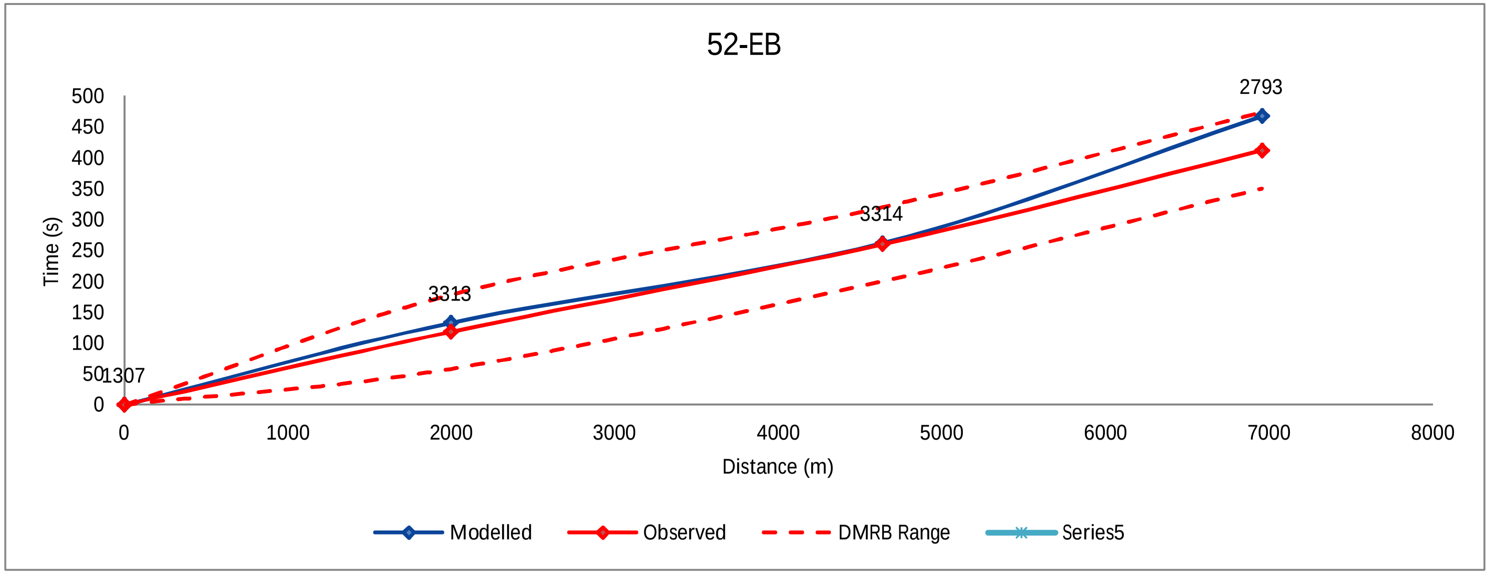

49-SB
Time (s)
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
3325
3914
5917
3883
3323
Modelled
Observed
DMRB Range
Series5

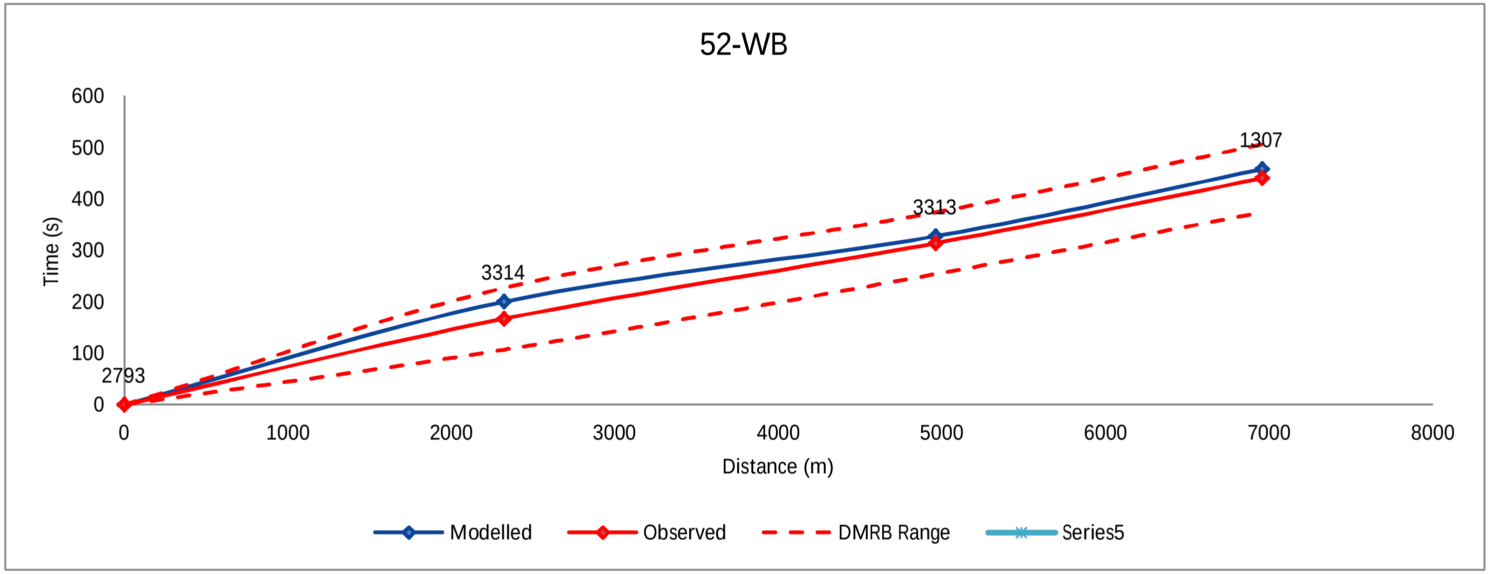

50-EB
Time (s)
800
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
2437
2440
2441
2447
2534
2538
Modelled
Observed
DMRB Range
Series5

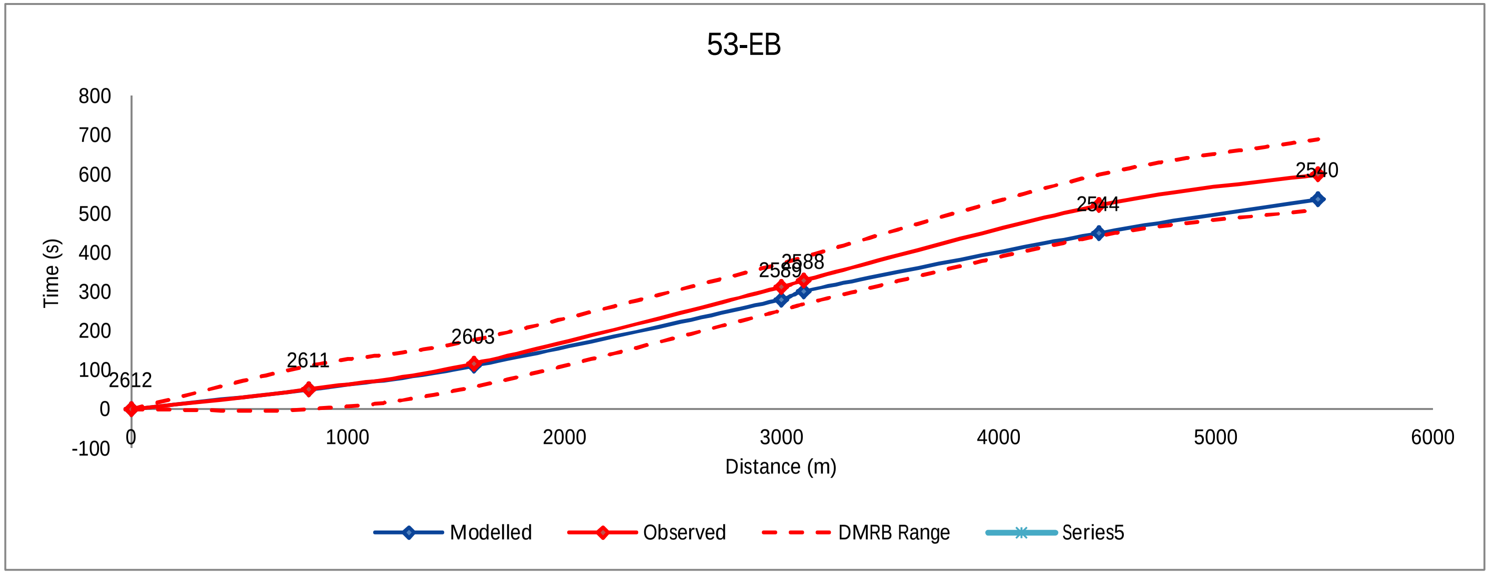

50-WB
Time (s)
800
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Distance (m)
2539
2534
2443
2441
2440
2437
Modelled
Observed
DMRB Range
Series5

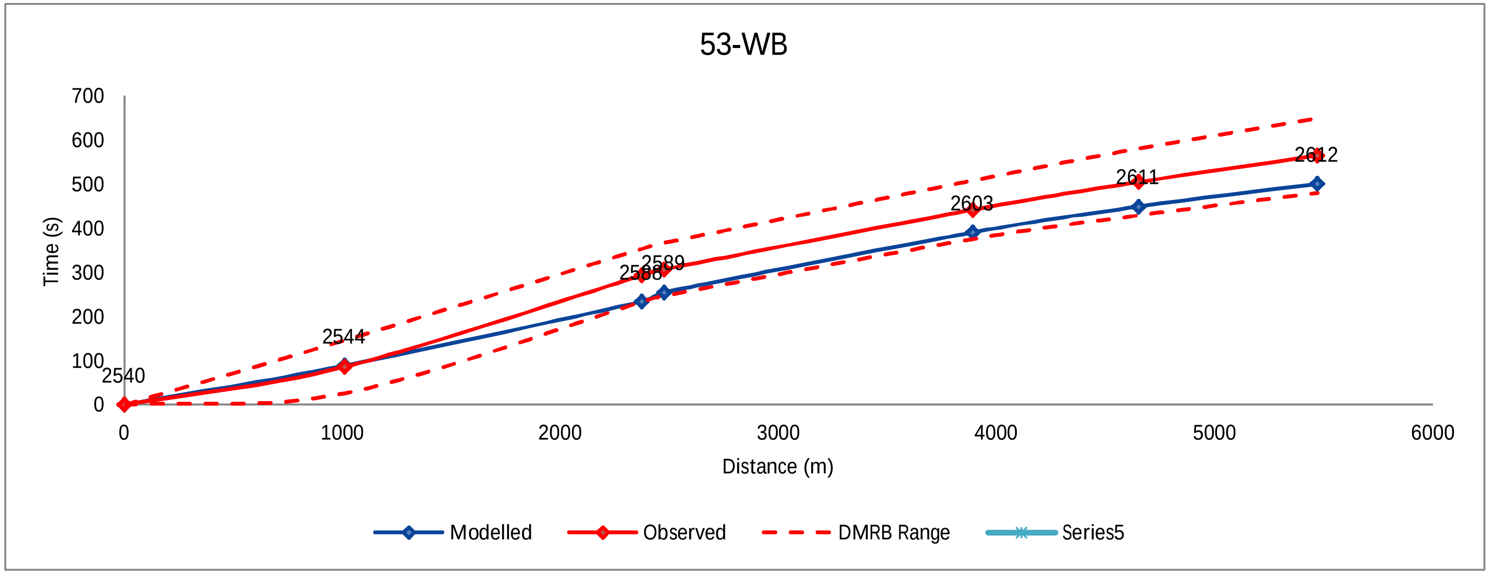

51-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
3307
3308
3731
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

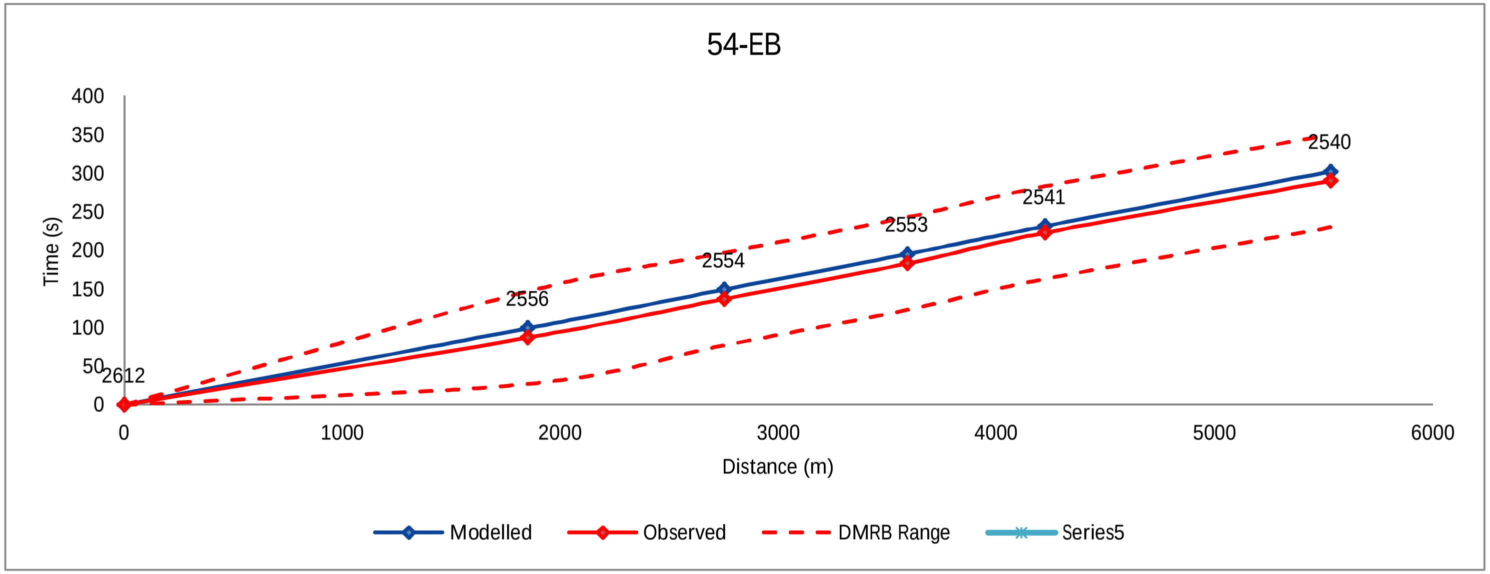

51-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
3731
3308
3307
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

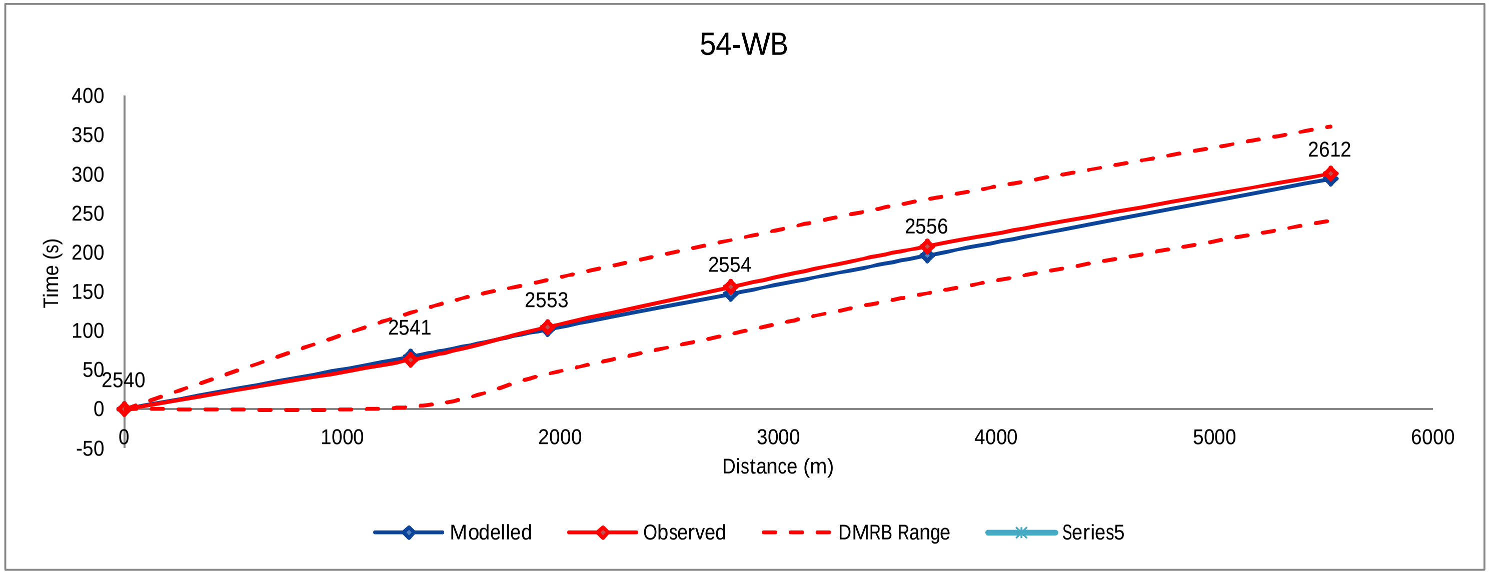

52-EB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
1307
3313
3314
2793
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
Modelled
Observed
DMRB Range
Series5

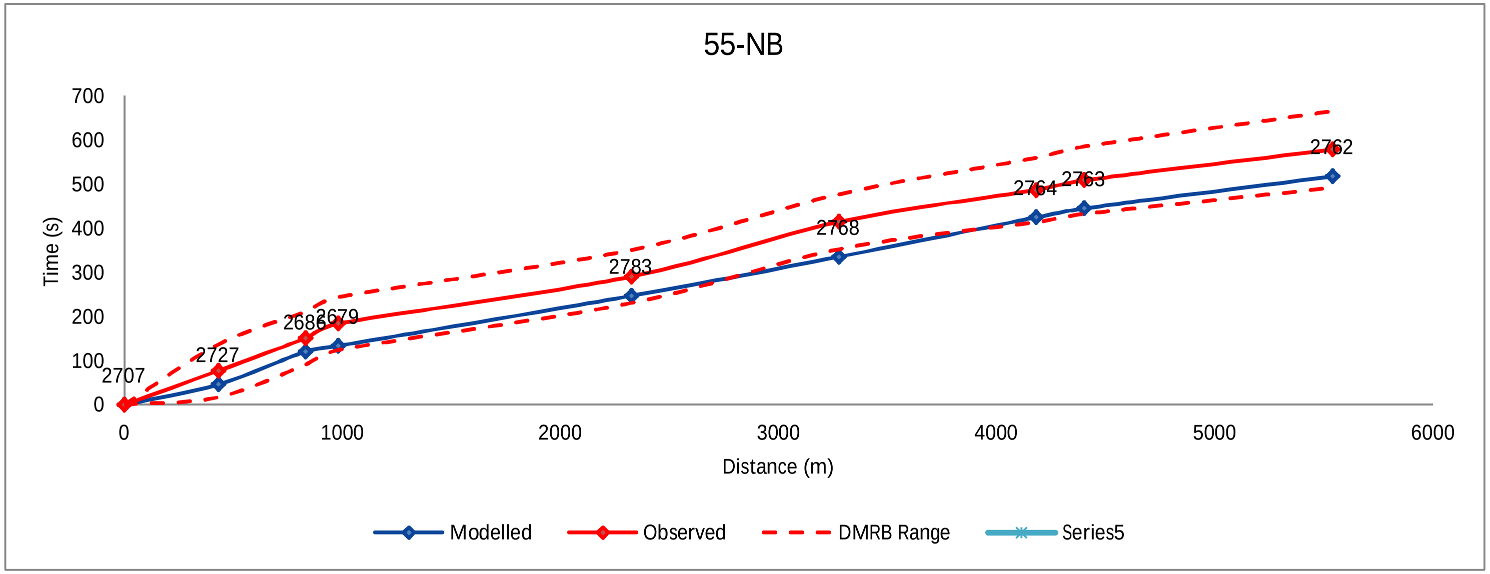

52-WB
Time (s)
600
500
400
300
200
100
0
2793
3314
3313
1307
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
Modelled
Observed
DMRB Range
Series5

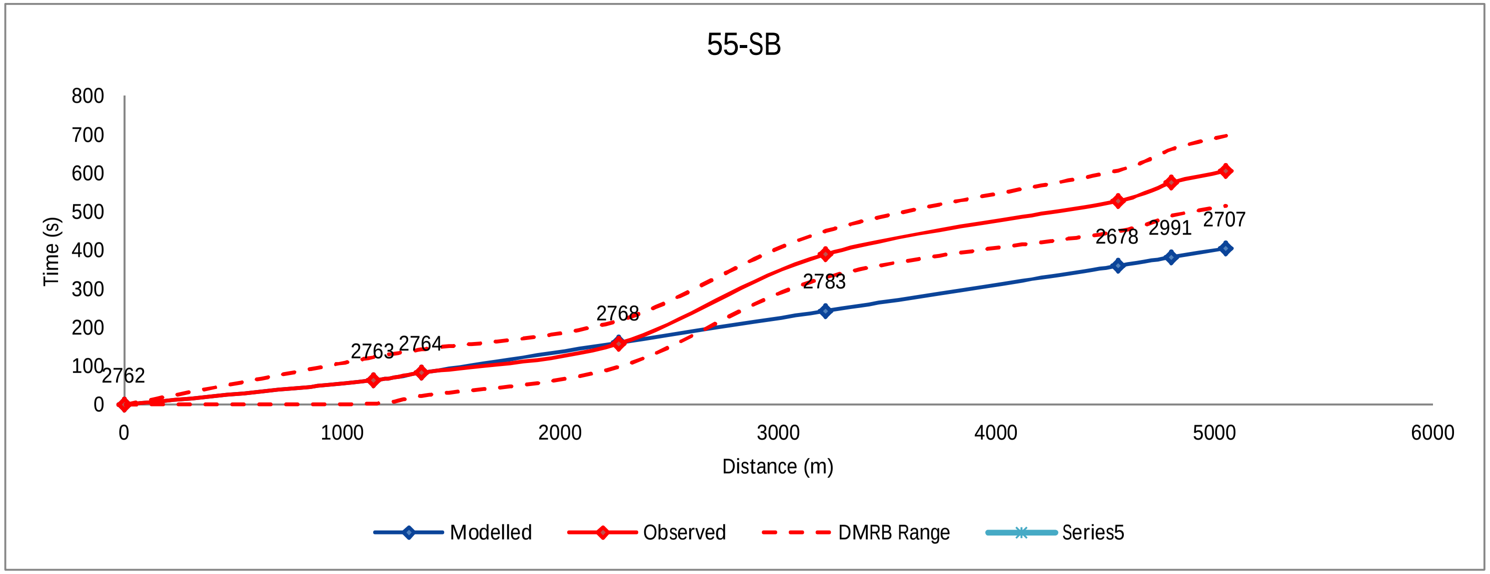

53-EB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
Distance (m)
2612
2611
2603
2589
2588
2544
2540
Modelled
Observed
DMRB Range
Series5

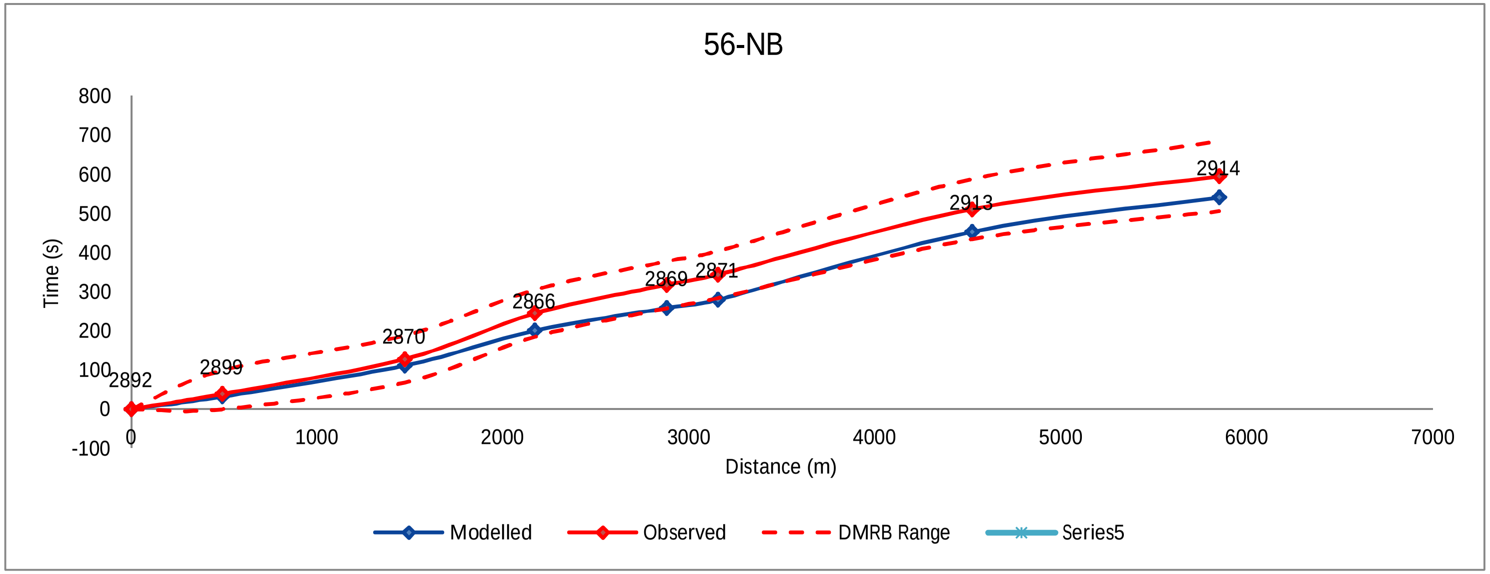

53-WB
Time (s)
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
Distance (m)
2540
2544
2588
2589
2603
2611
2612
Modelled
Observed
DMRB Range
Series5

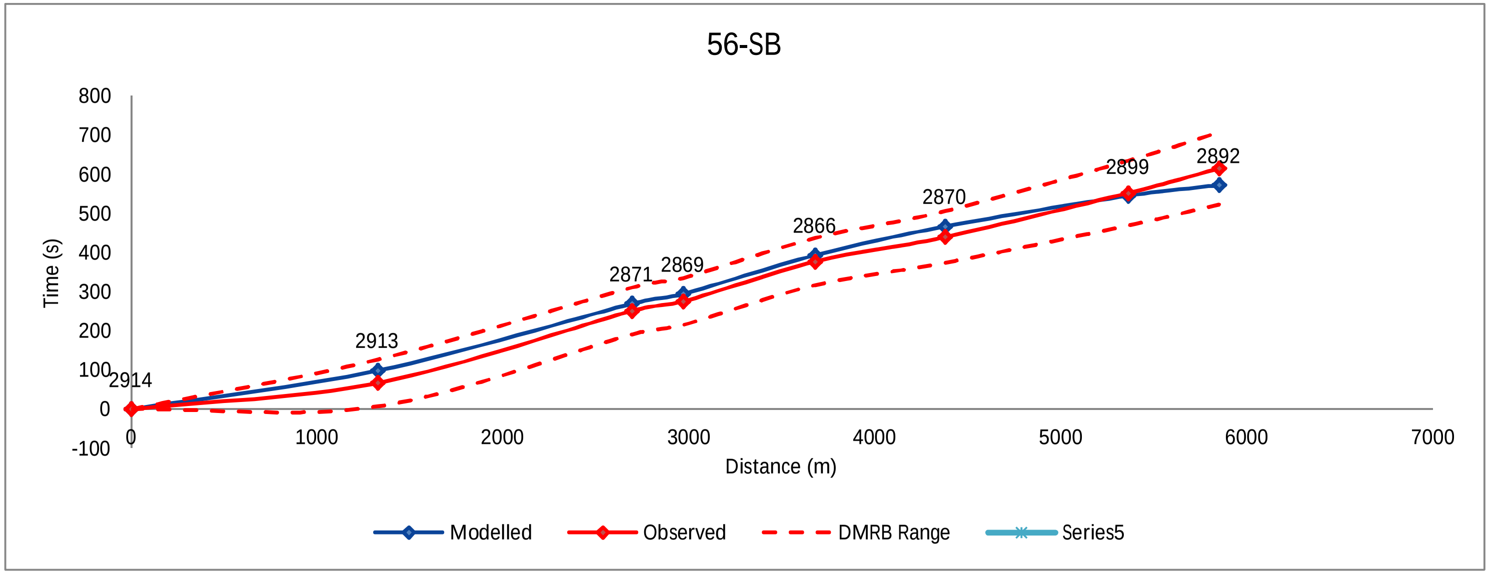

54-EB
Time (s)
400
350
300
250
200
150
100
50
0
2612
2556
2554
2553
2541
2540
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

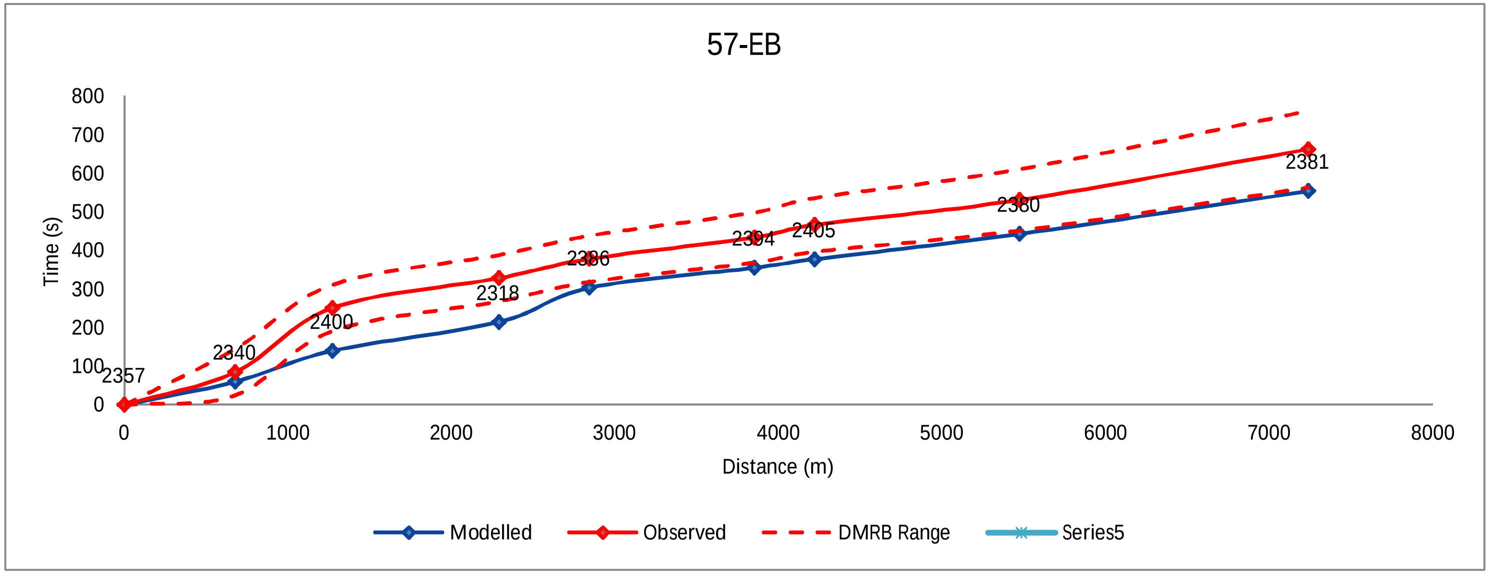

54-WB
Time (s)
400
350
300
250
200
150
100
50
0
-50
2540
2541
2553
2554
2556
2612
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

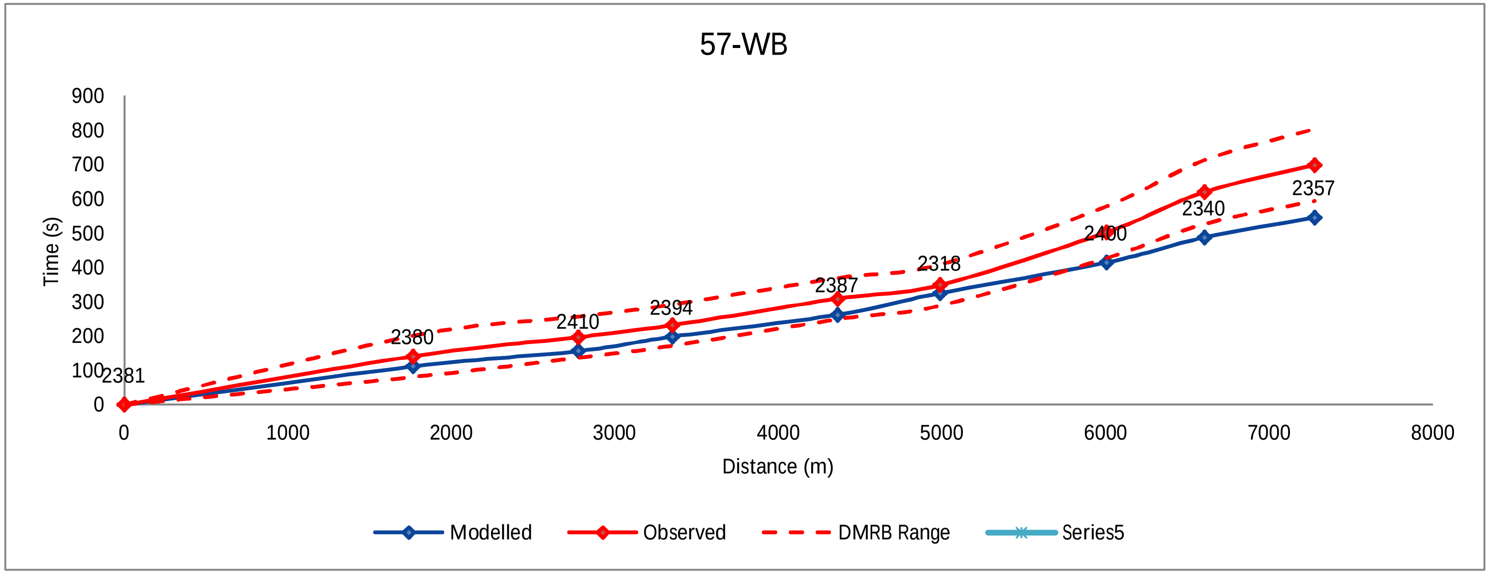

55-NB
Time (s)
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
Distance (m)
2707
2727
2686
2679
2783
2768
2764
2763
2762
Modelled
Observed
DMRB Range
Series5

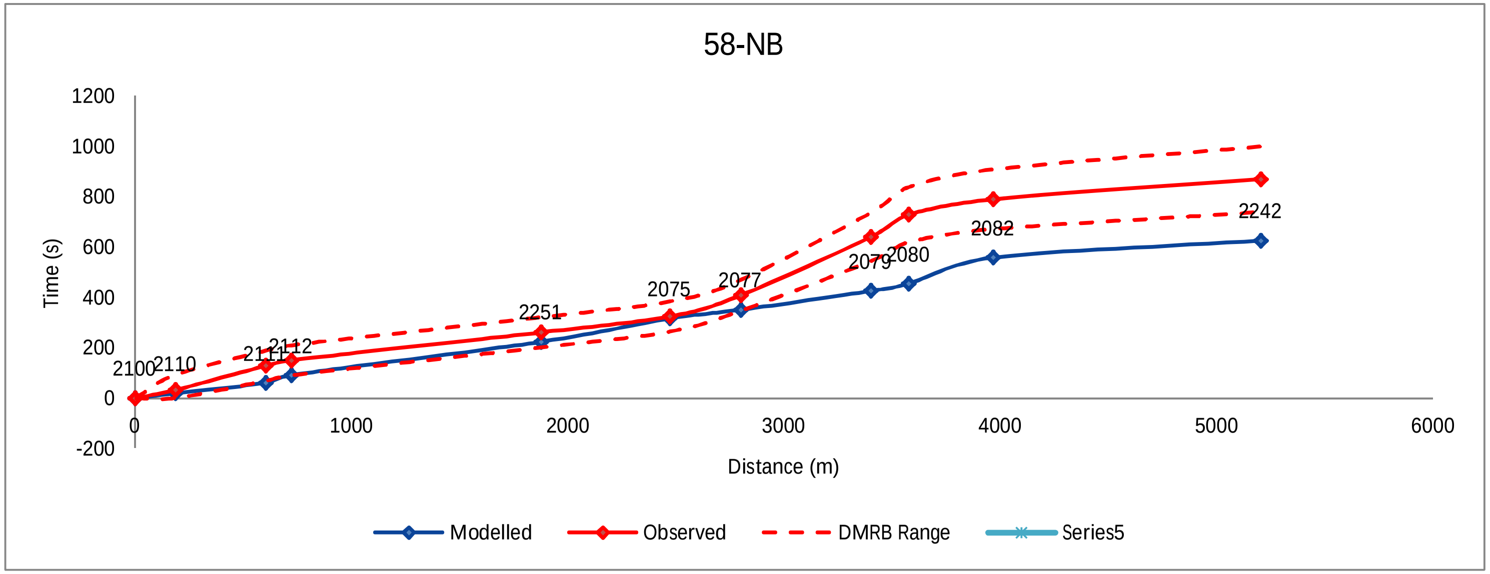

55-SB
Time (s)
800
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
Distance (m)
2762
2763
2764
2768
2783
2678
2991
2707
Modelled
Observed
DMRB Range
Series5

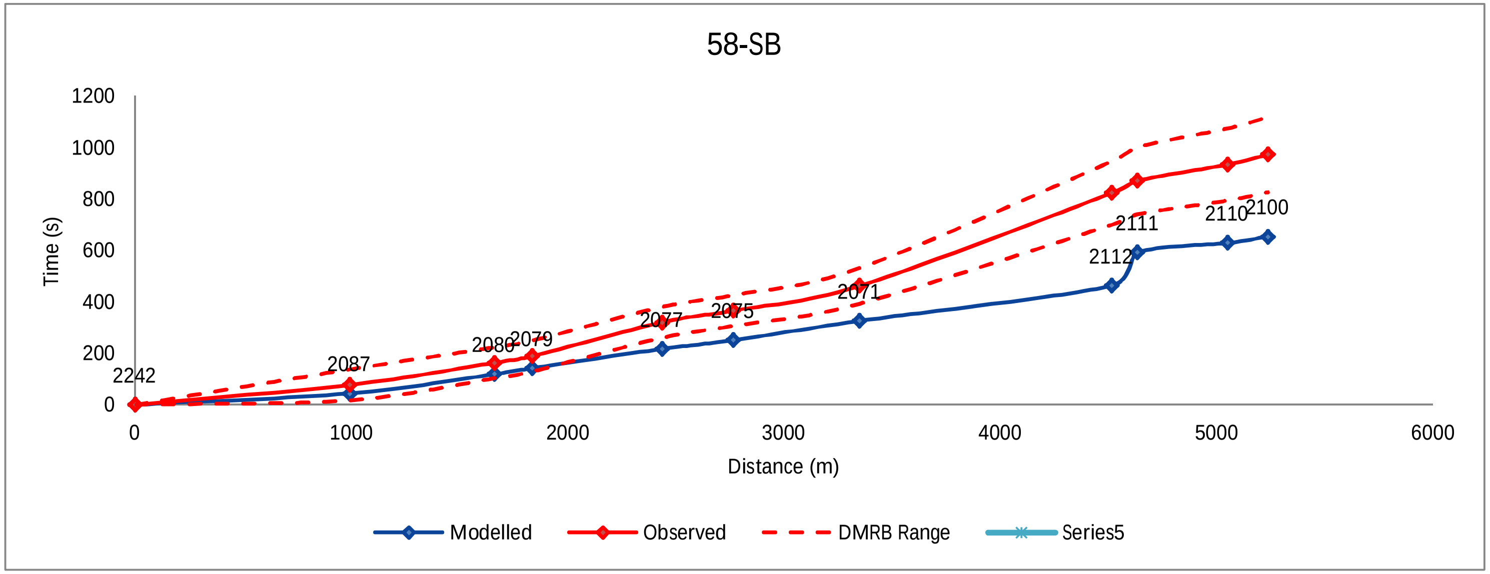

56-NB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
2892
2899
2870
2866
2869
2871
2913
2914
Modelled
Observed
DMRB Range
Series5

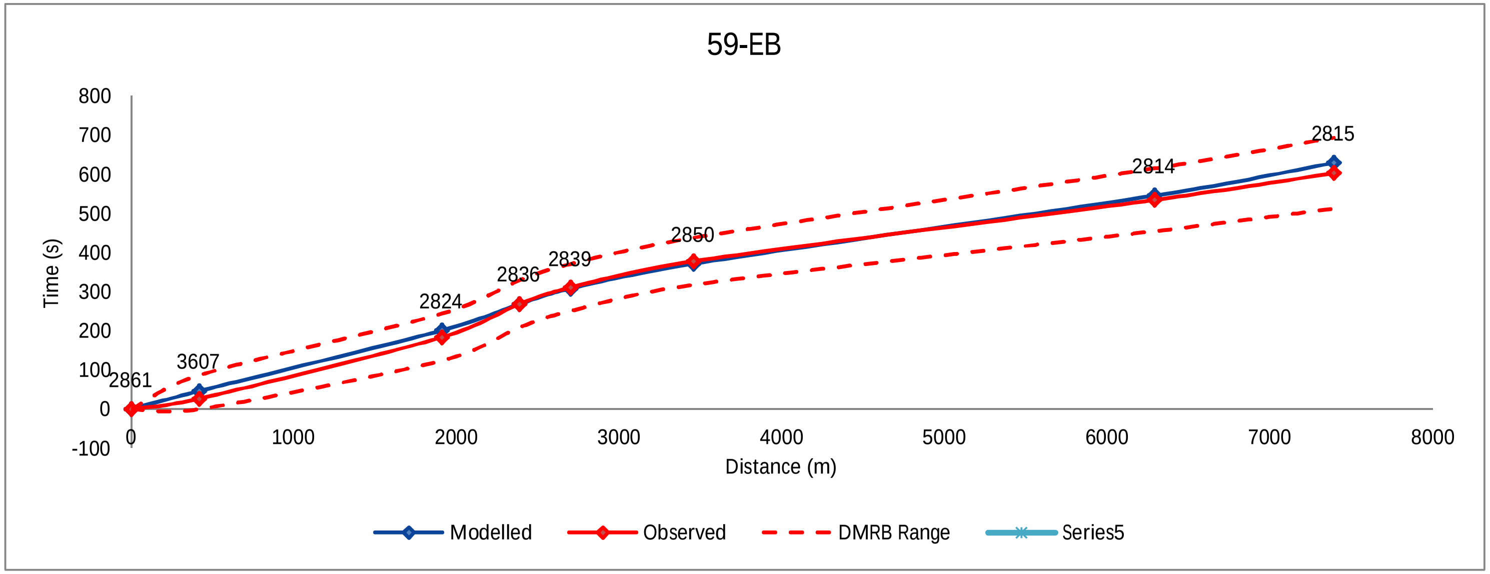

56-SB
Time (s)
800
700
600
500
400
300
200
100
0
-100
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
2914
2913
2871
2869
2866
2870
2899
2892
Modelled
Observed
DMRB Range
Series5

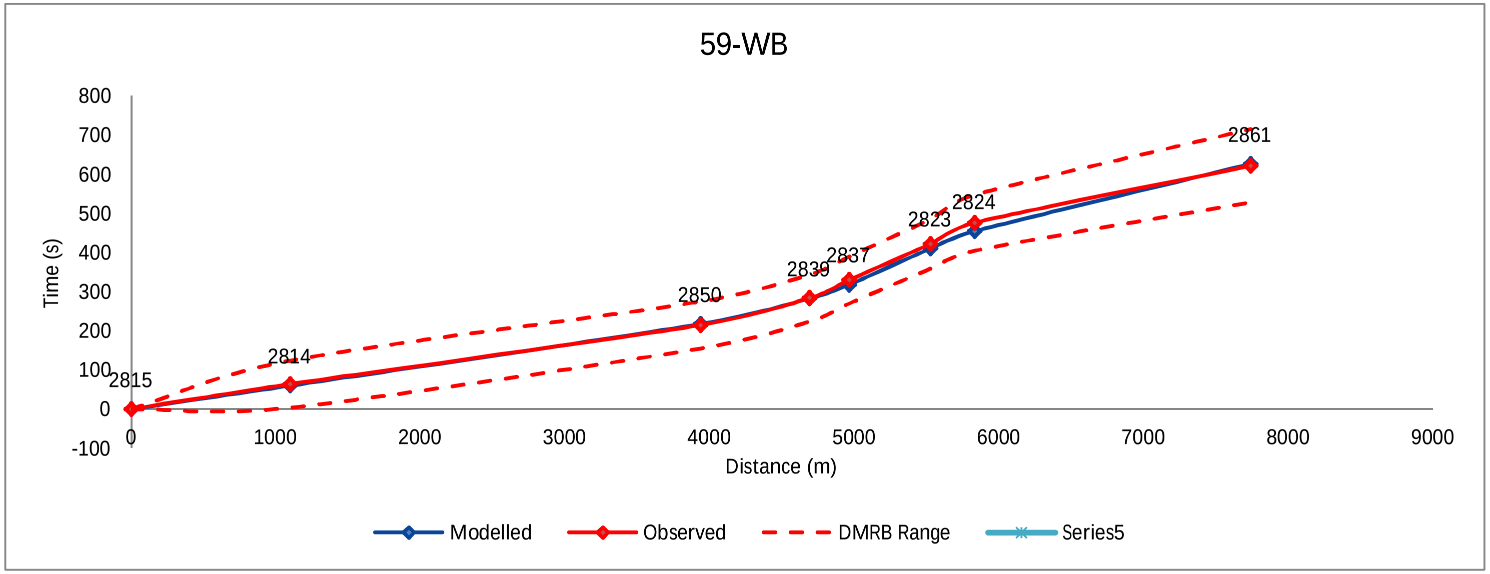

57-EB
Time (s)
800
700
600
500
400
300
200
100
0
2357
2340
2400
2318
2386
2394
2405
2380
2381
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
Modelled
Observed
DMRB Range
Series5

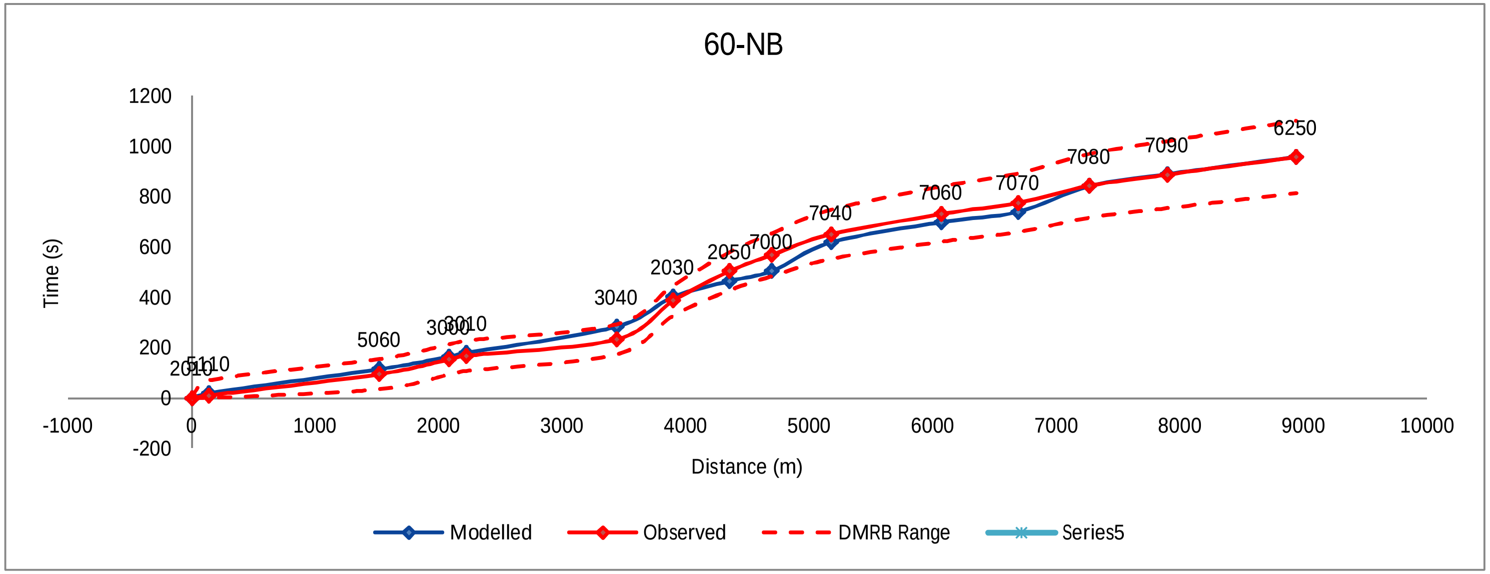

57-WB
Time (s)
900
800
700
600
500
400
300
200
100
0
2381
2380
2410
2394
2387
2318
2400
2340
2357
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
Modelled
Observed
DMRB Range
Series5

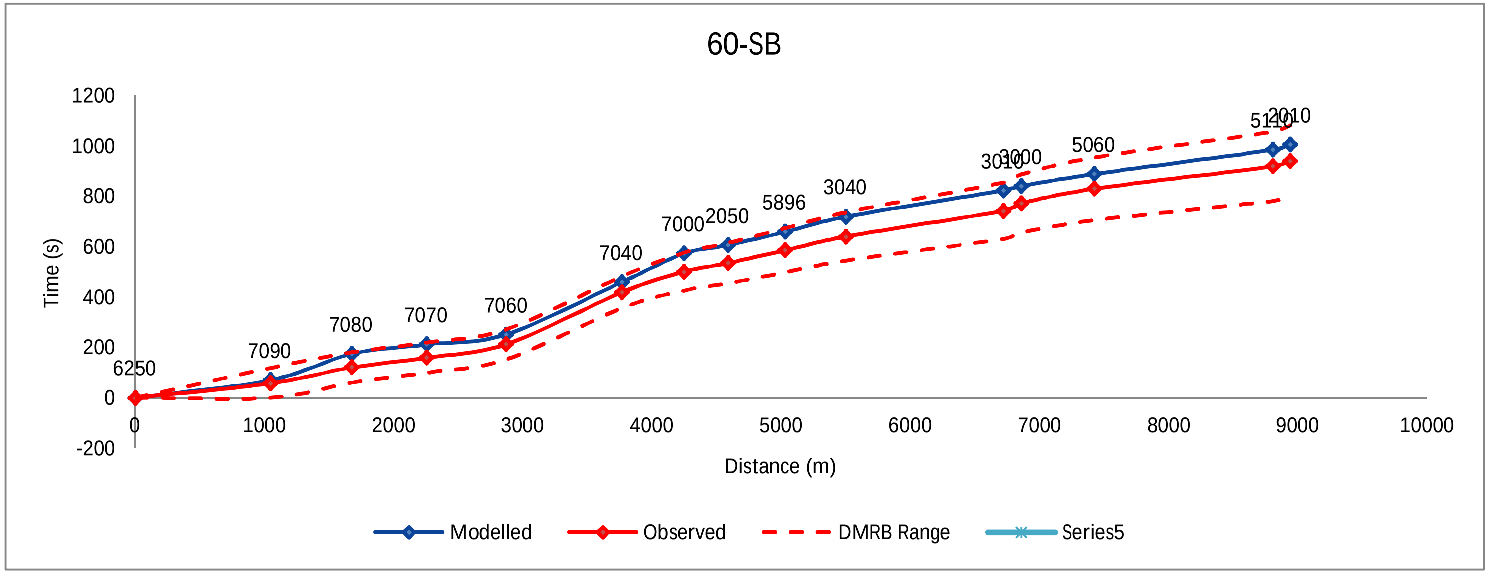

58-NB
Time (s)
1200
1000
800
600
400
200
0
-200
0
1000
2000
3000
4000
5000
6000
Distance (m)
2100
2110
2111
2112
2251
2075
2077
2079
2080
2082
2242
Modelled
Observed
DMRB Range
Series5

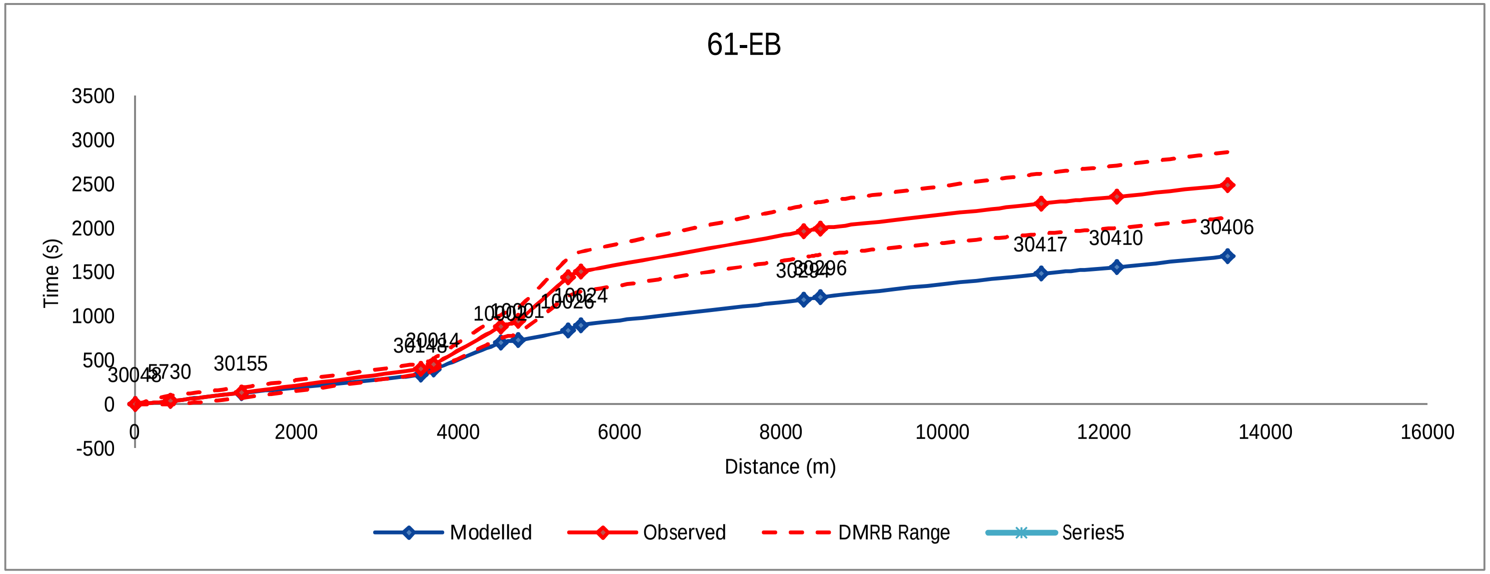

58-SB
Time (s)
1200
1000
800
600
400
200
0
0
1000
2000
3000
4000
5000
6000
Distance (m)
2242
2087
2080
2079
2077
2075
2071
2112
2111
2110
2100
Modelled
Observed
DMRB Range
Series5

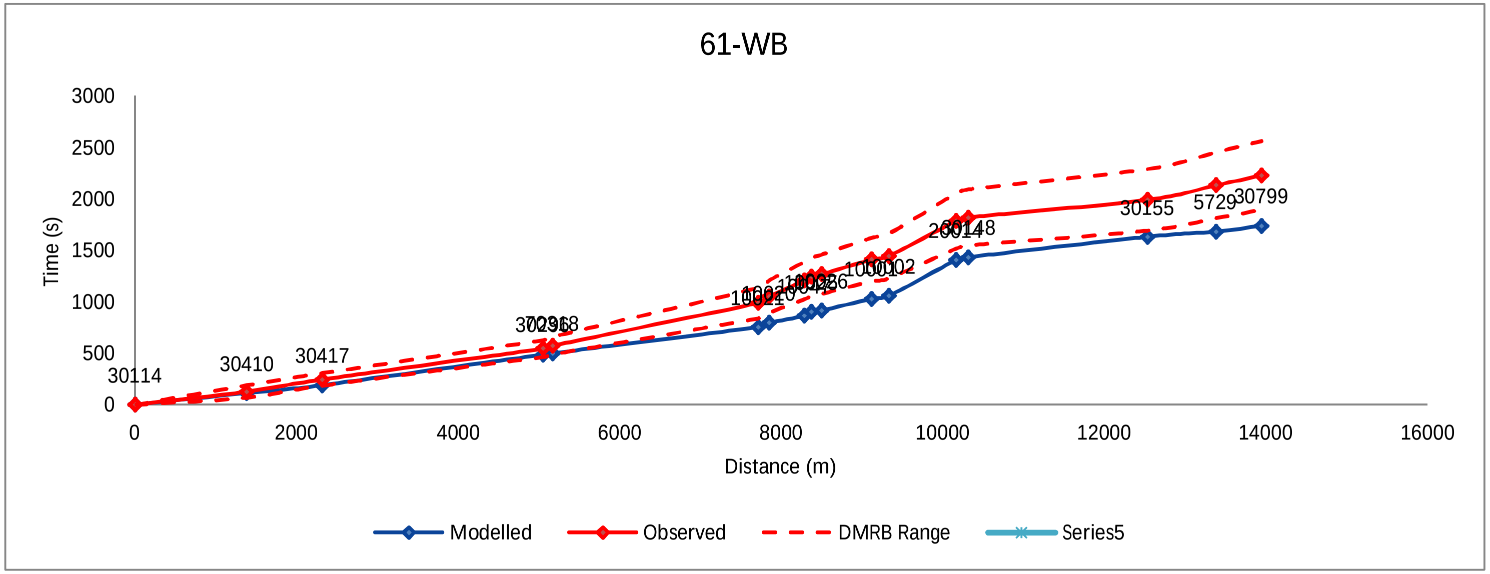

59-EB
Time (s)
800
700
600
500
400
300
200
100
0
-100
2861
3607
2824
2836
2839
2850
2814
2815
0
1000
2000
3000
4000
5000
6000
7000
8000
Distance (m)
Modelled
Observed
DMRB Range
Series5

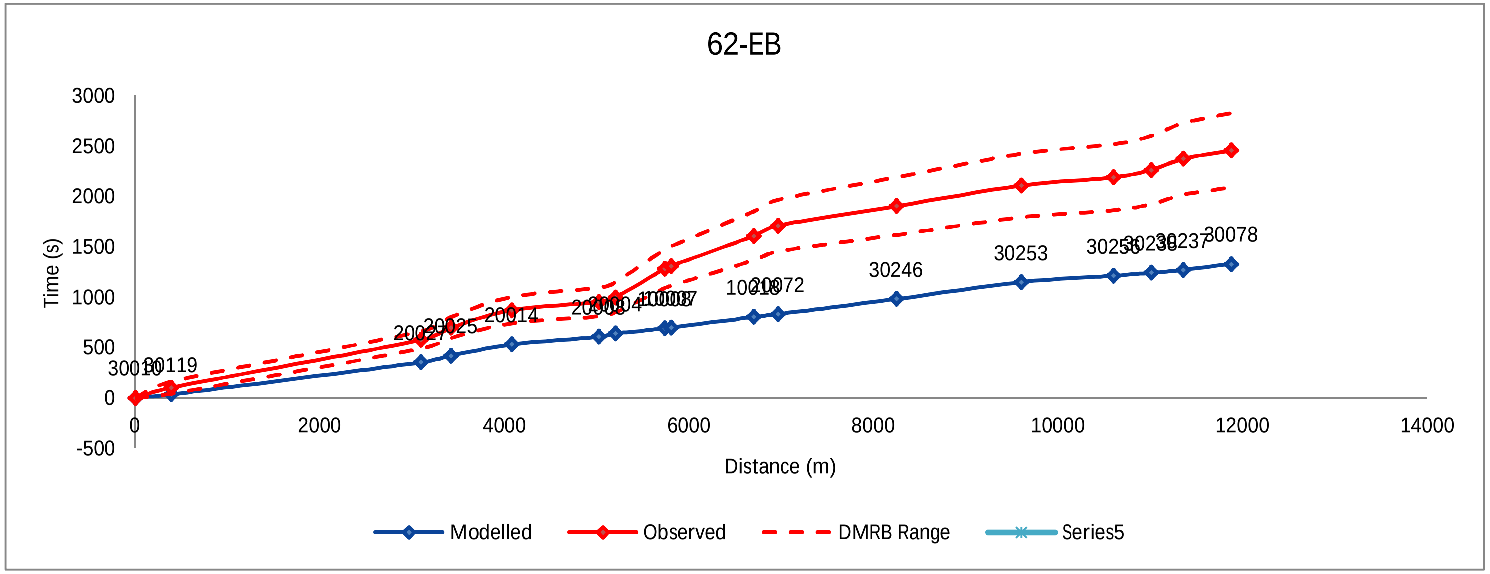

59-WB
Time (s)
800
700
600
500
400
300
200
100
0
-100
2815
2814
2850
2839
2837
2823
2824
2861
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

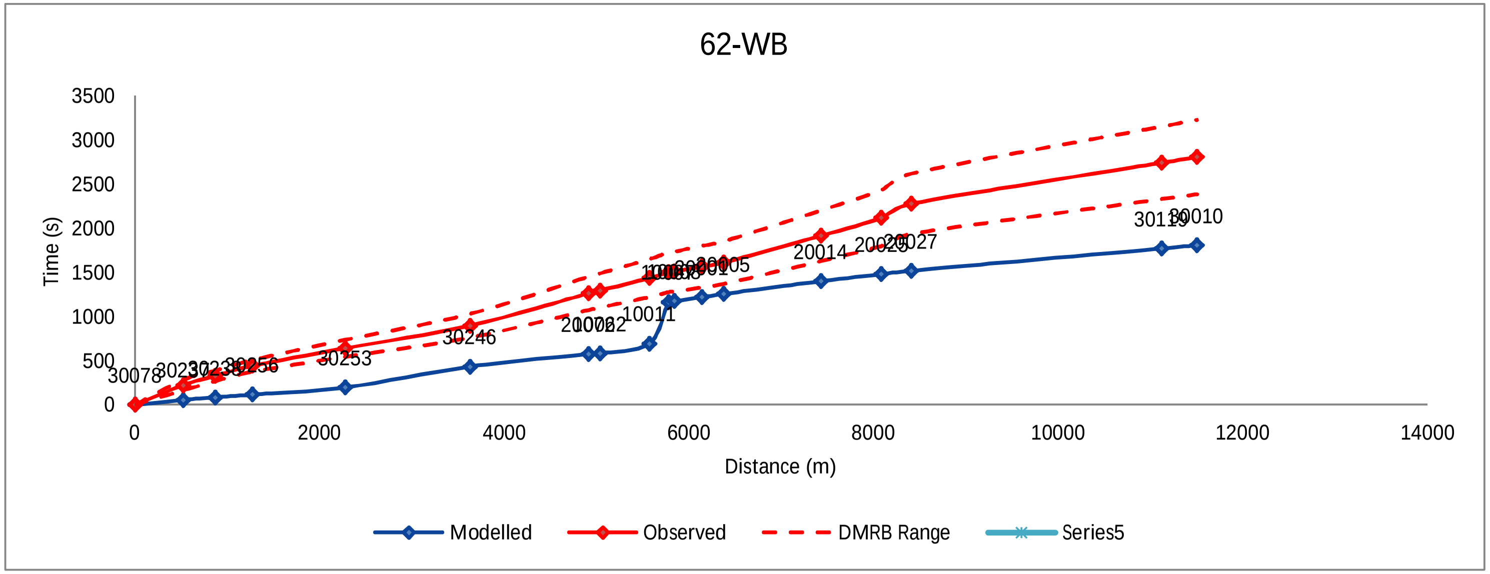

60-NB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5
2010
5110
5060
3000
3010
3040
2030
2050
7000
7040
7060
7070
7080
7090
6250

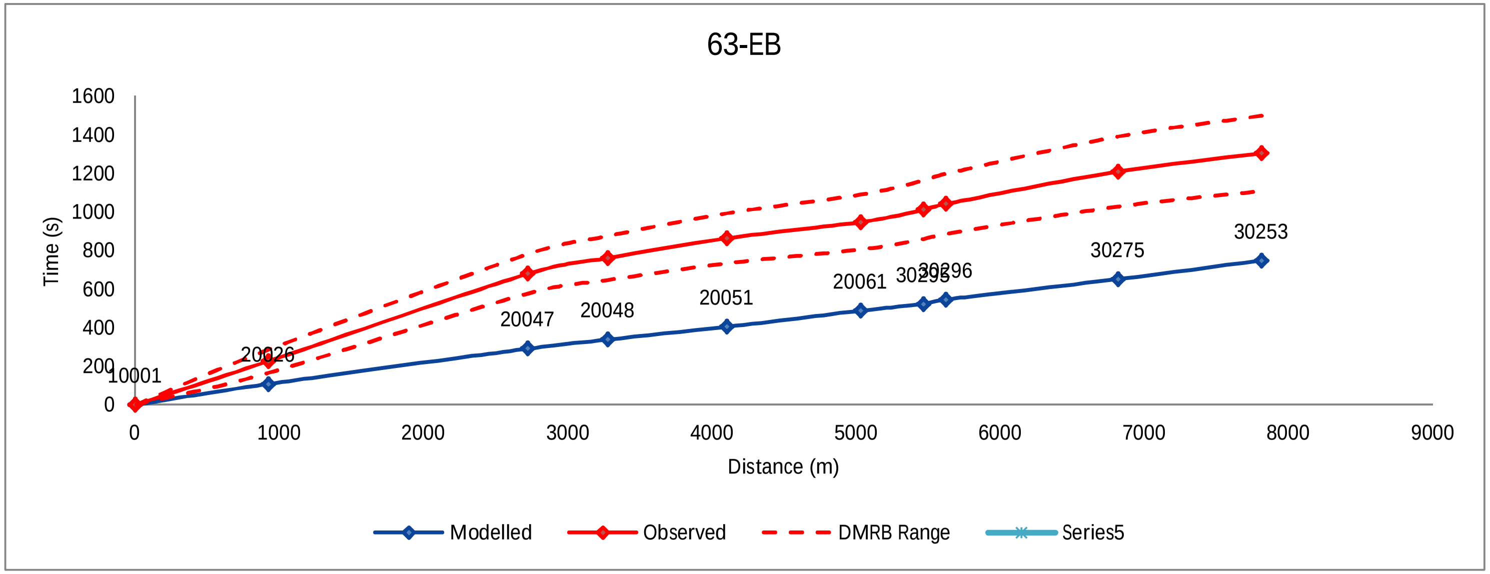

60-SB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5
6250
7090
7080
7070
7060
7040
7000
2050
5896
3040
3010
3000
5060
5110
2010

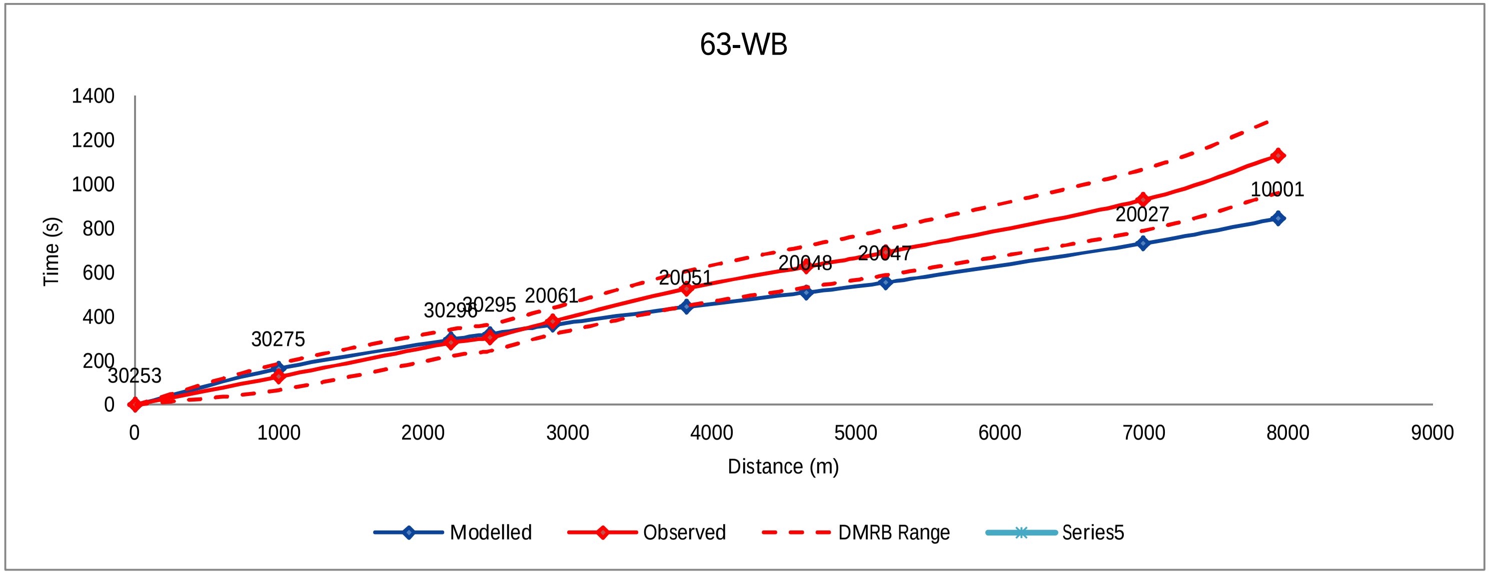

61-EB
Time (s)
Distance (m)
30048
5730
30155
30148
20014
10000
10001
10026
10024
30294
30296
30417
30410
30406
Modelled
Observed
DMRB Range
Series5

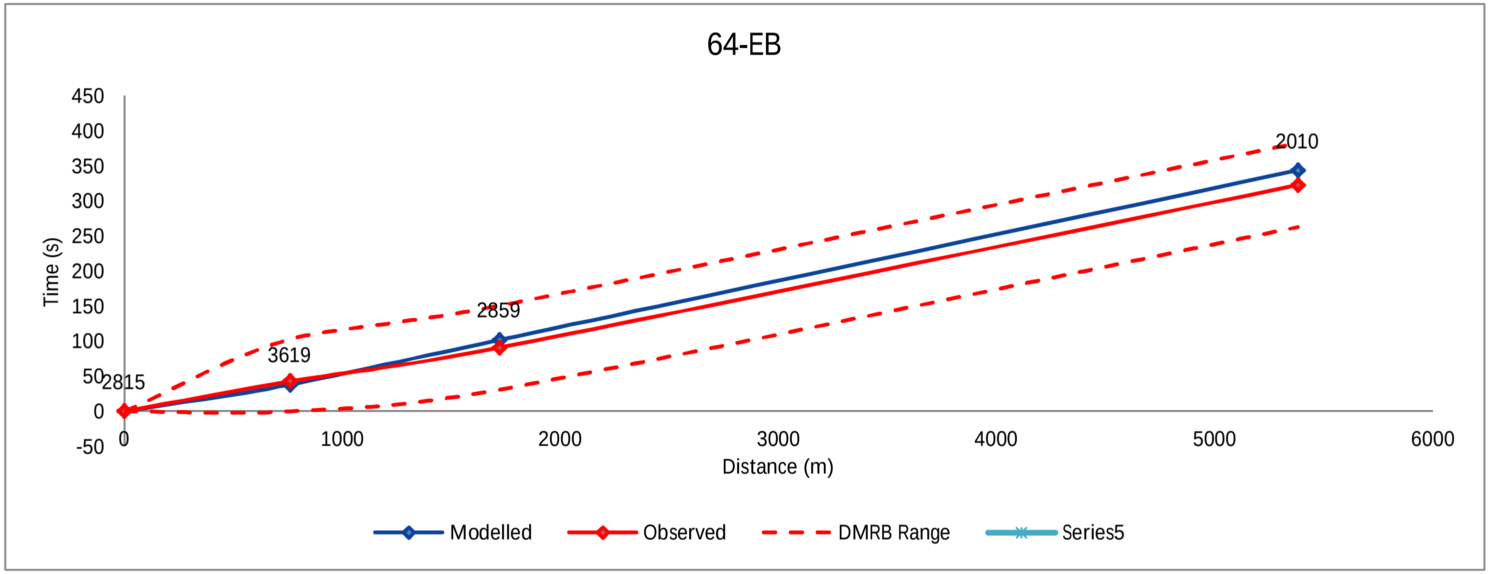

61-WB
Time (s)
Distance (m)
30114
30410
30417
30296
70218
10021
10010
10026
10002
20014
30148
30155
5729
30799
Modelled
Observed
DMRB Range
Series5

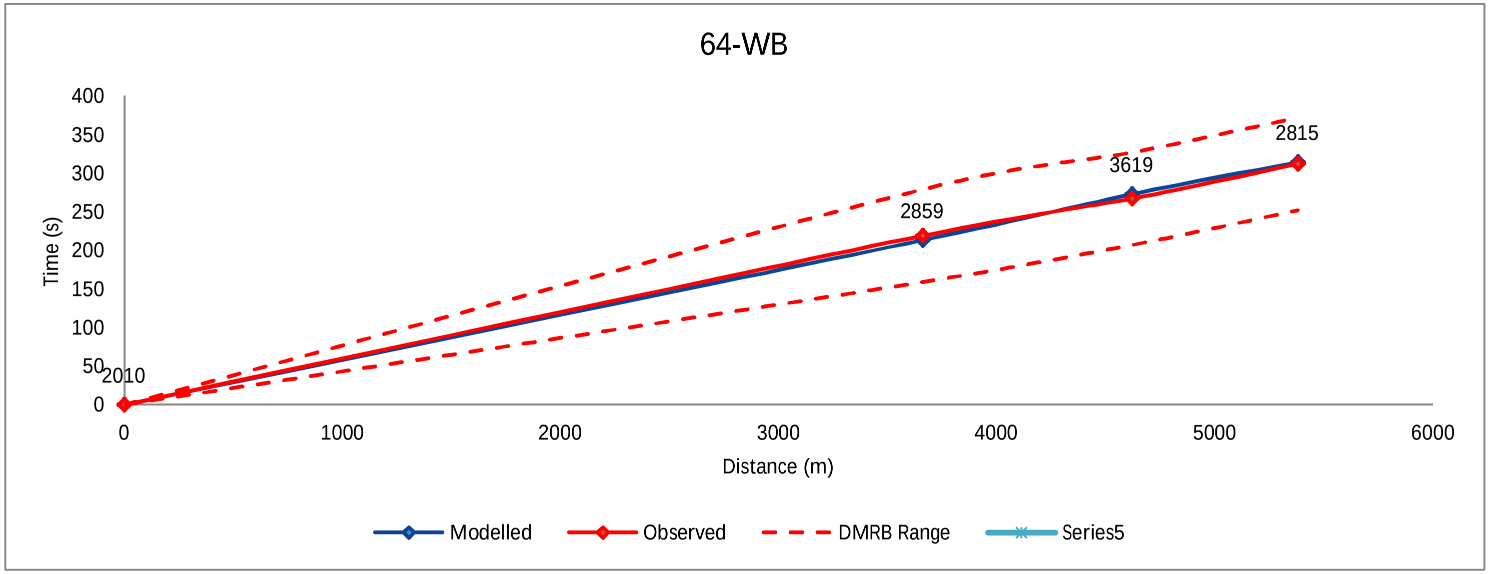

62-EB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5

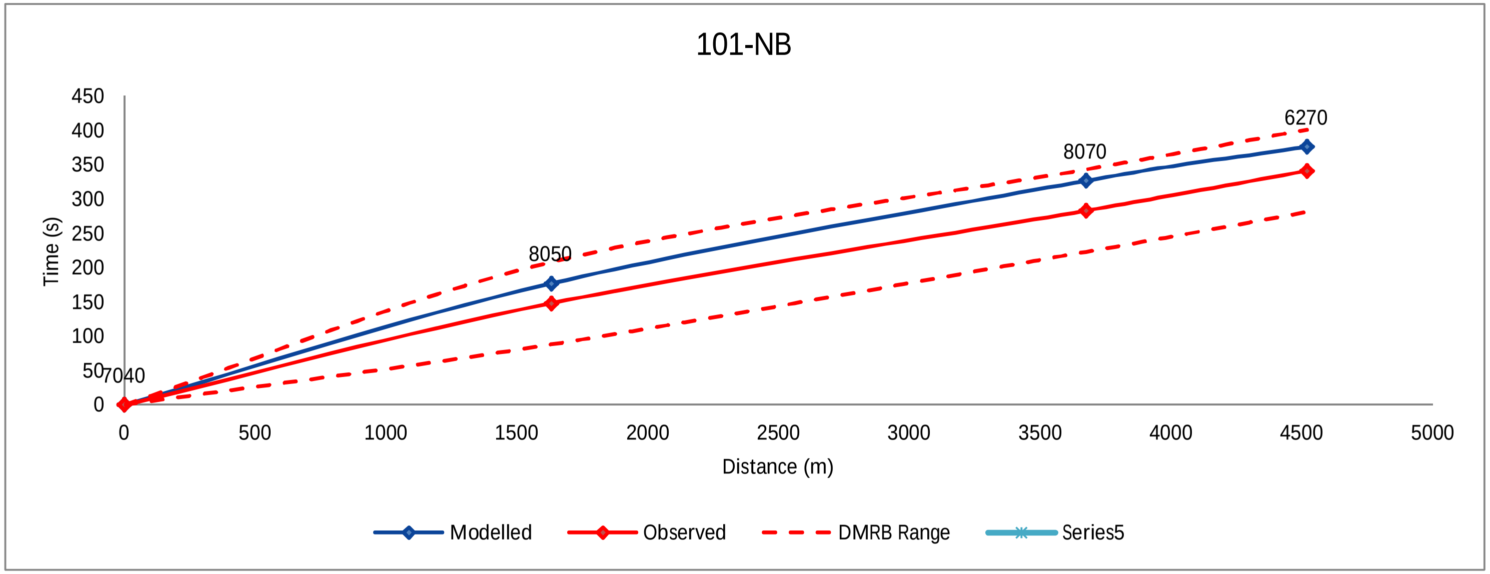

62-WB
Time (s)
Distance (m)
Modelled
Observed
DMRB Range
Series5

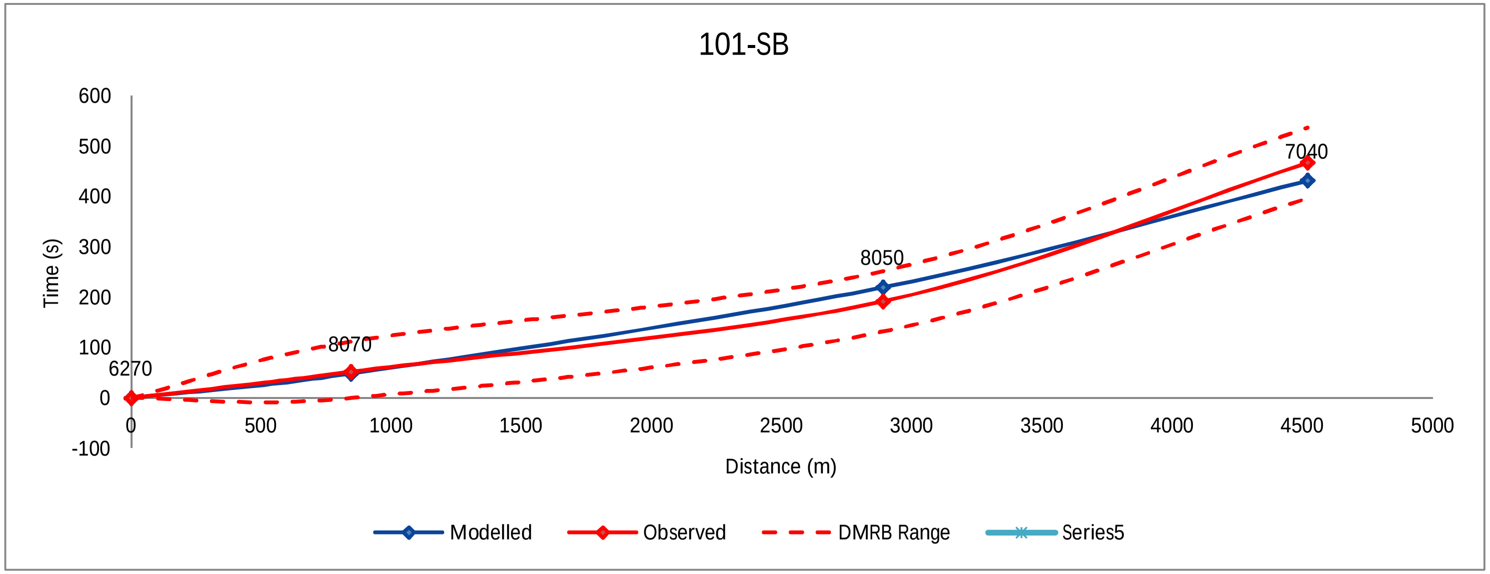

63-EB
1600
1400
1200
1000
800
600
400
200
0
Time (s)
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
10001
20026
20047
20048
20051
20061
30295
30296
30275
30253
Modelled
Observed
DMRB Range
Series5

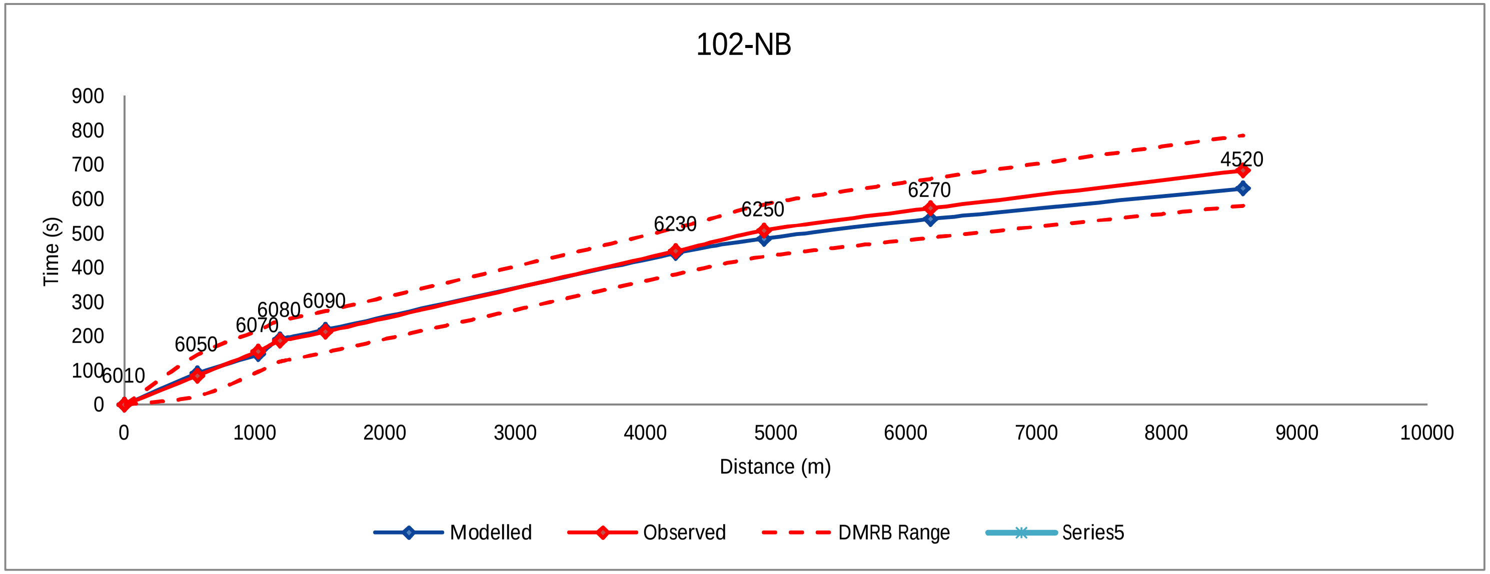

63-WB
1400
1200
1000
800
600
400
200
0
Time (s)
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
30253
30275
30296
30295
20061
20051
20048
20047
20027
10001
Modelled
Observed
DMRB Range
Series5

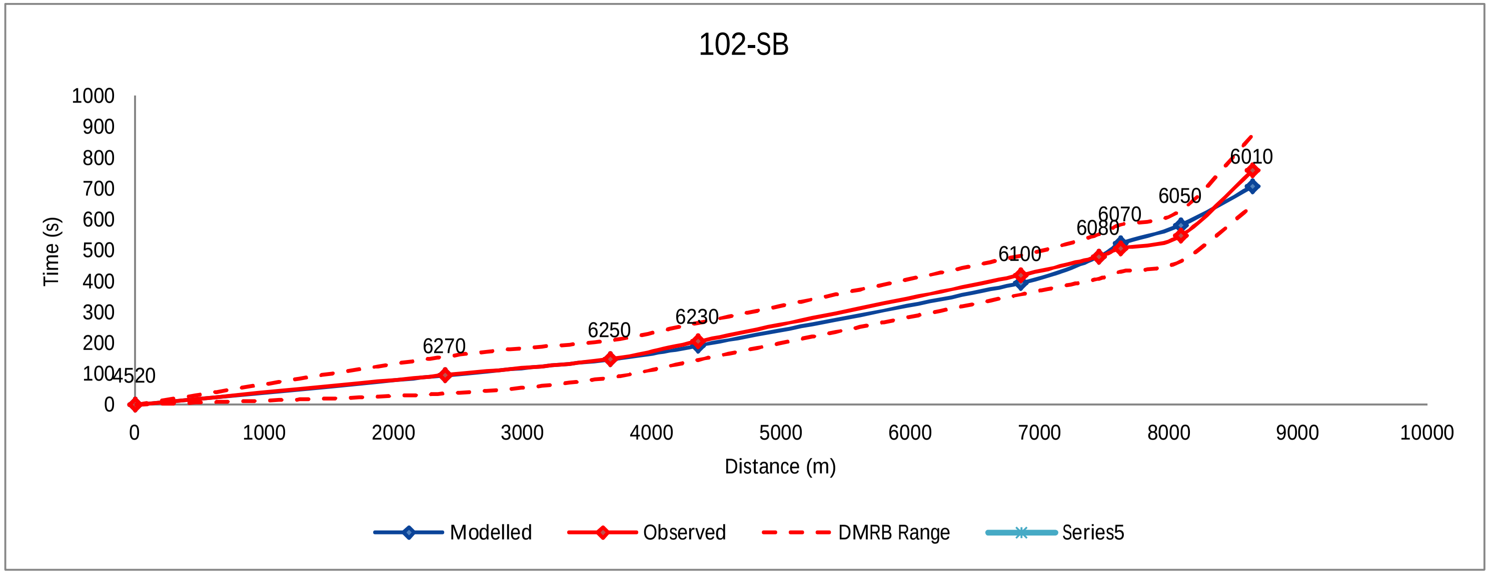

64-EB
Time (s)
450
400
350
300
250
200
150
100
50
0
-50
2815
3619
2859
2010
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

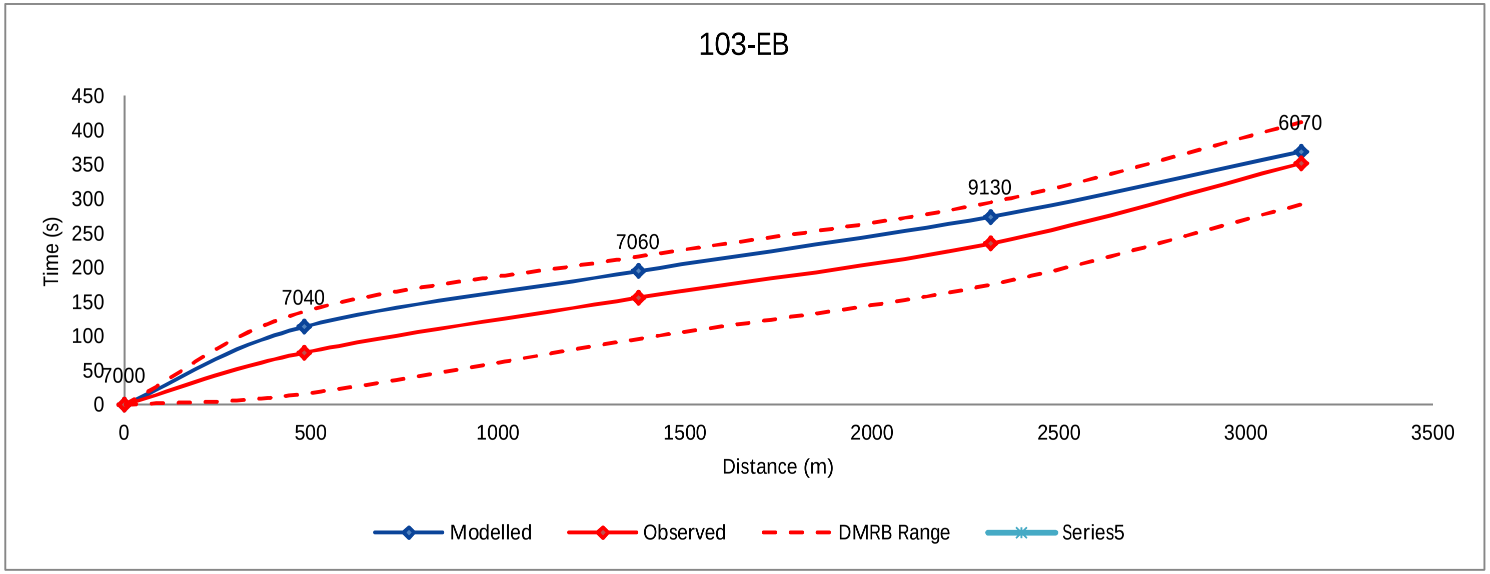

64-WB
Time (s)
400
350
300
250
200
150
100
50
0
2010
2859
3619
2815
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

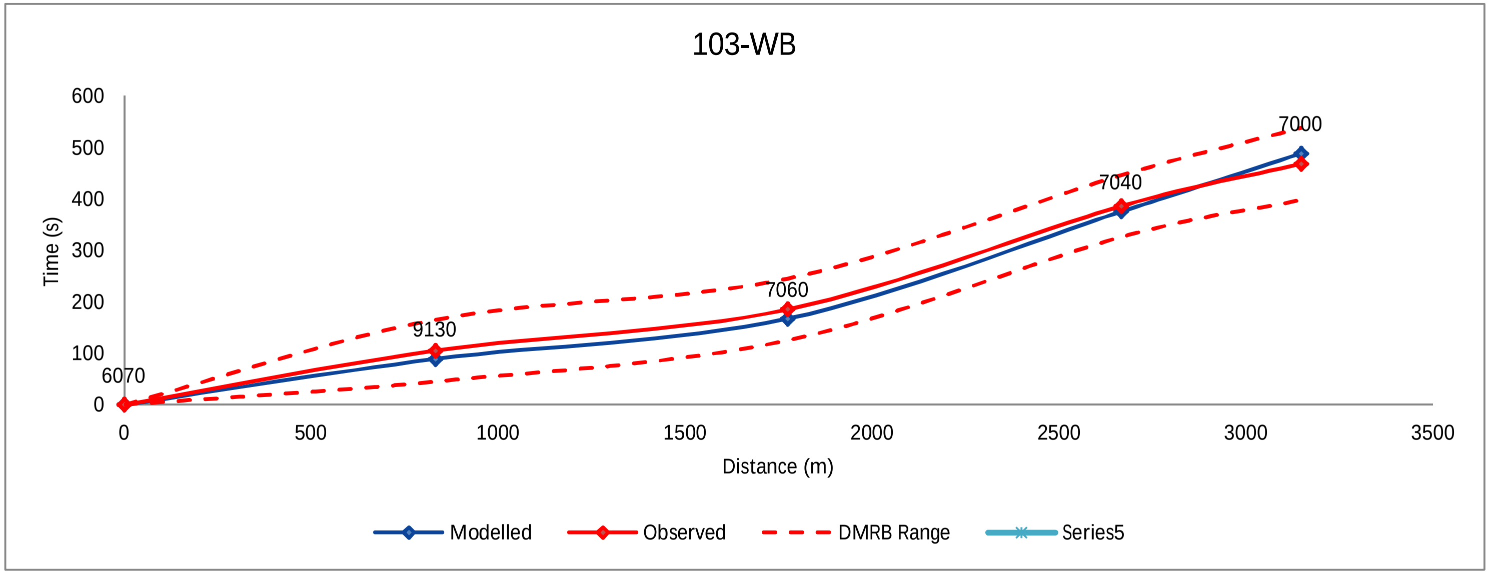

101-NB
Time (s)
450
400
350
300
250
200
150
100
50
0
7040
8050
8070
6270
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

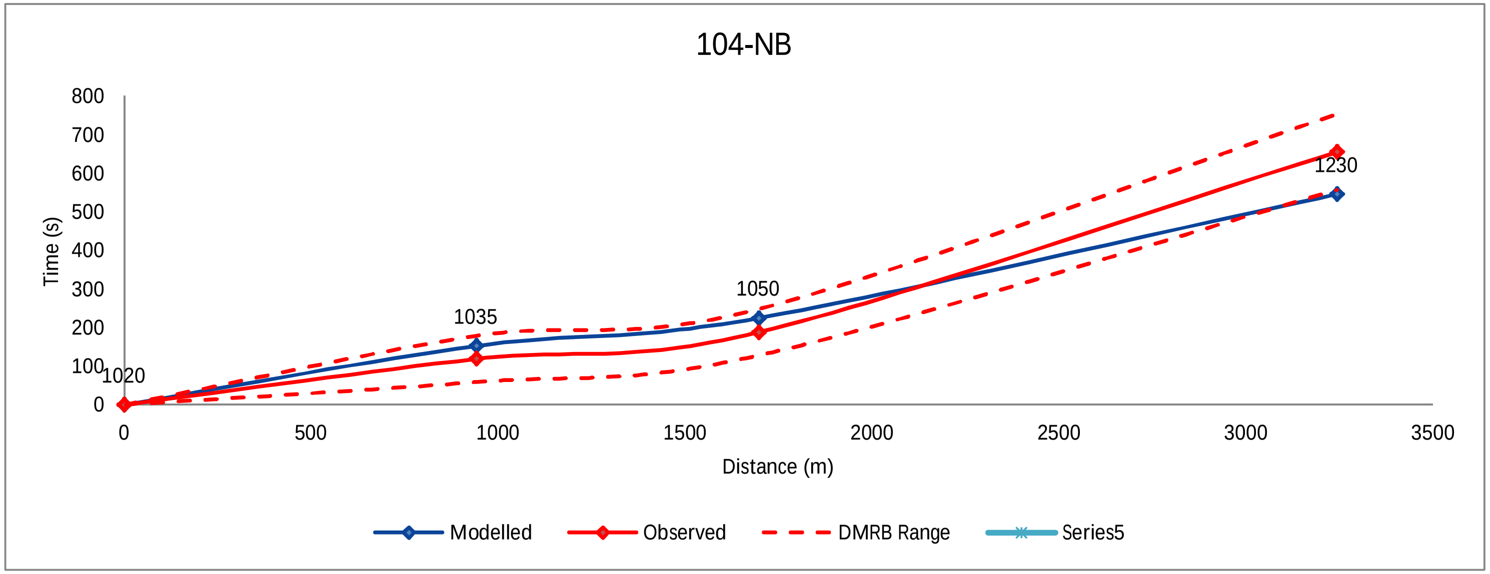

101-SB
Time (s)
600
500
400
300
200
100
0
-100
6270
8070
8050
7040
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5

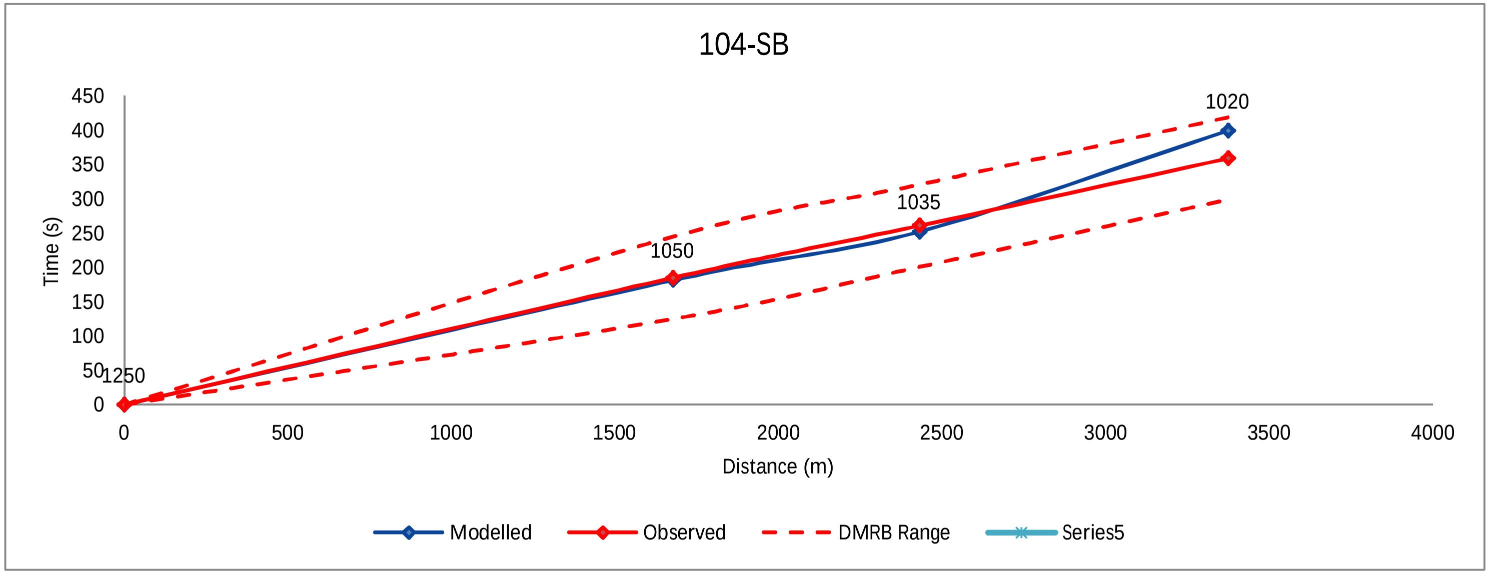

102-NB
Time (s)
Distance (m)
6010
6050
6070
6080
6090
6230
6250
6270
4520
Modelled
Observed
DMRB Range
Series5

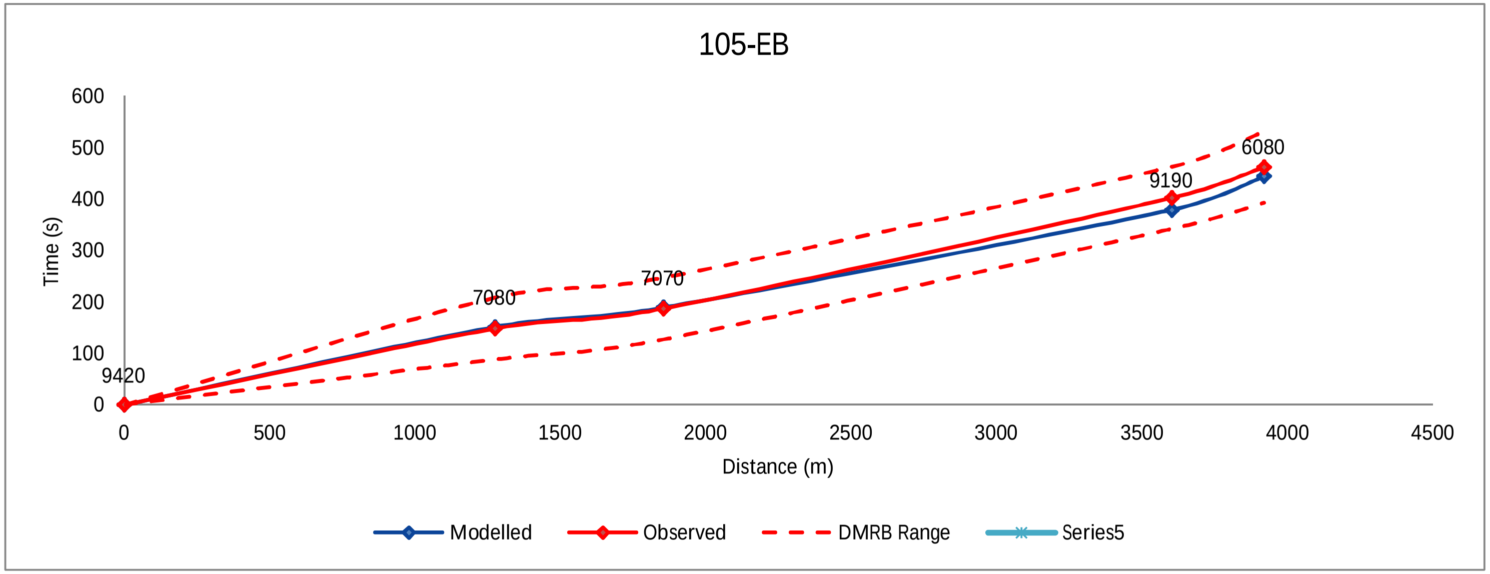

102-SB
Time (s)
Distance (m)
4520
6270
6250
6230
6100
6080
6070
6050
6010
Modelled
Observed
DMRB Range
Series5

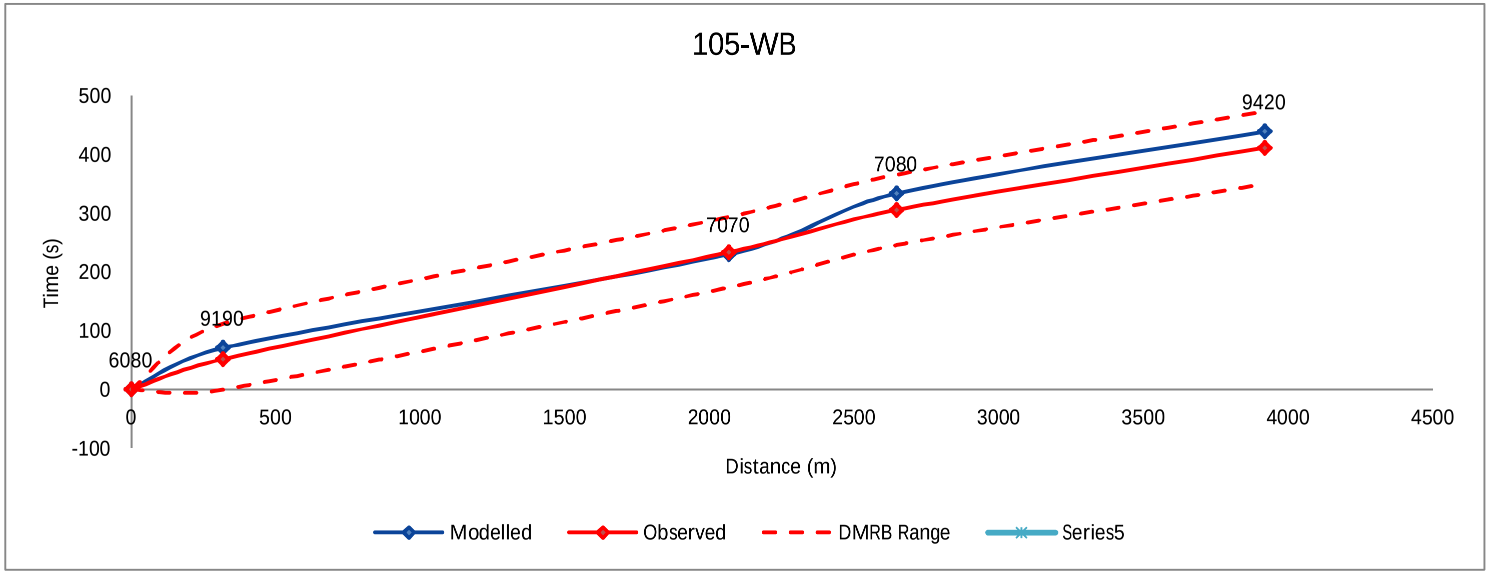

103-EB
Time (s)
450
400
350
300
250
200
150
100
50
0
7000
7040
7060
9130
6070
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5

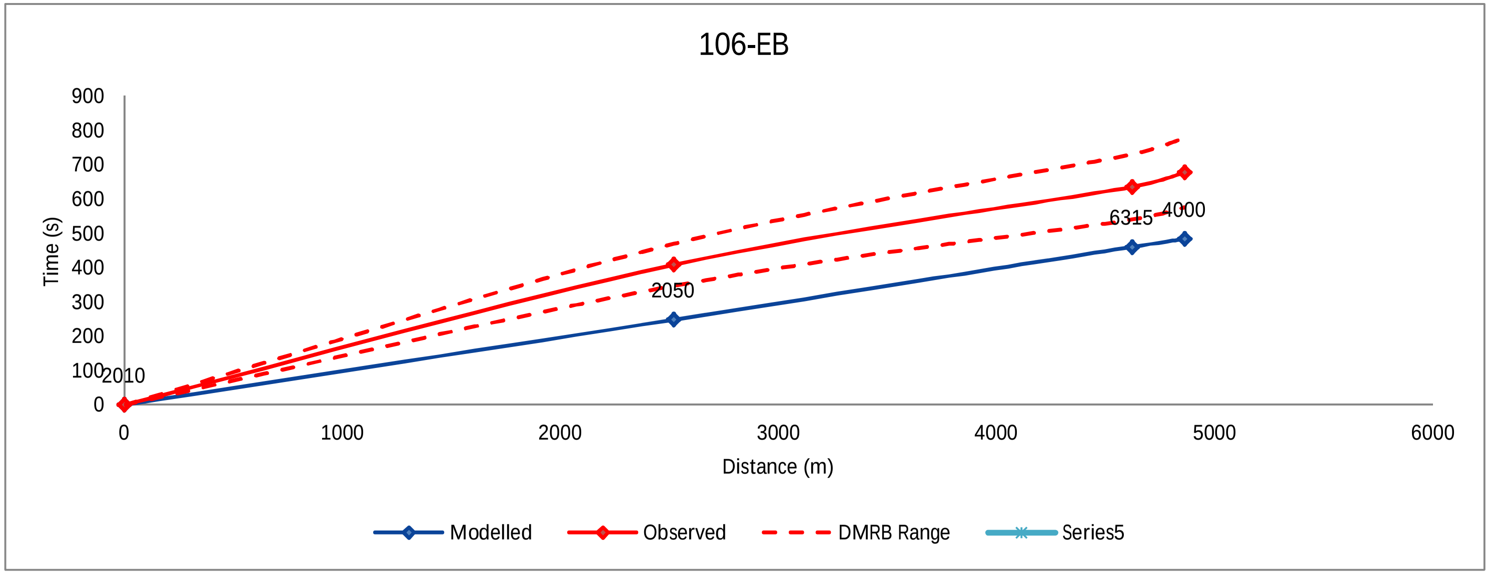

103-WB
Time (s)
600
500
400
300
200
100
0
6070
9130
7060
7040
7000
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5

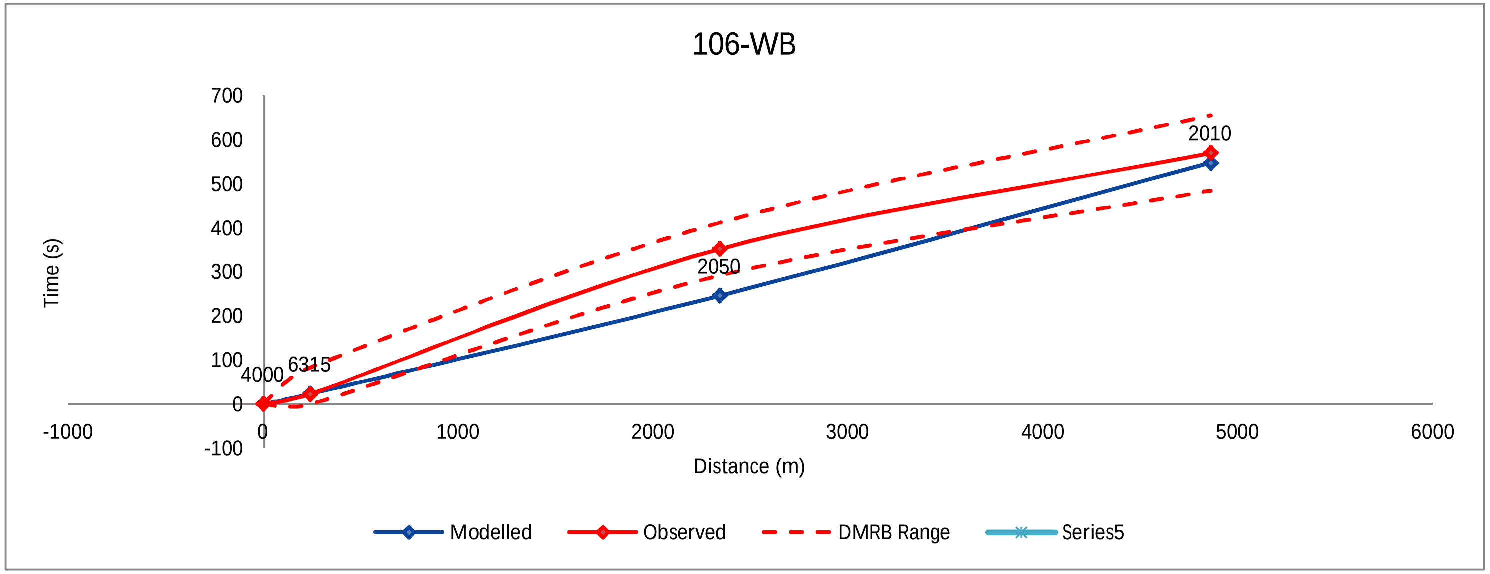

104-NB
Time (s)
800
700
600
500
400
300
200
100
0
1020
1035
1050
1230
0
500
1000
1500
2000
2500
3000
3500
Distance (m)
Modelled
Observed
DMRB Range
Series5

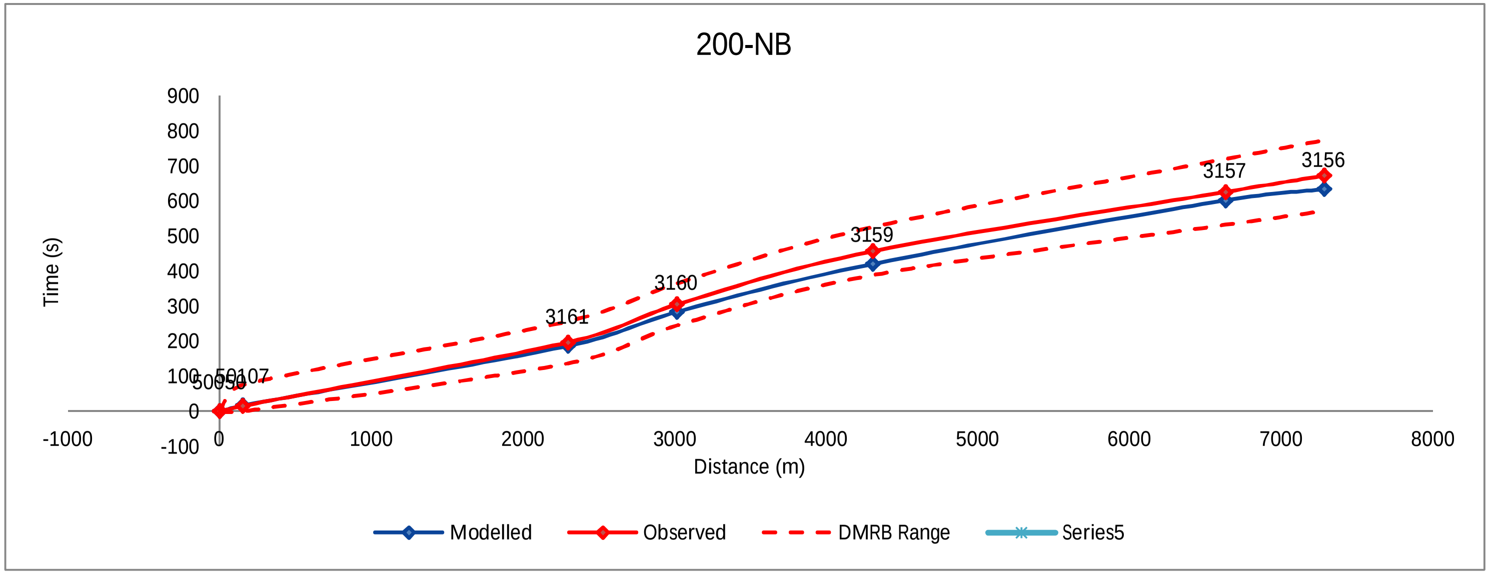

104-SB
Time (s)
450
400
350
300
250
200
150
100
50
0
1250
1050
1035
1020
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
Modelled
Observed
DMRB Range
Series5

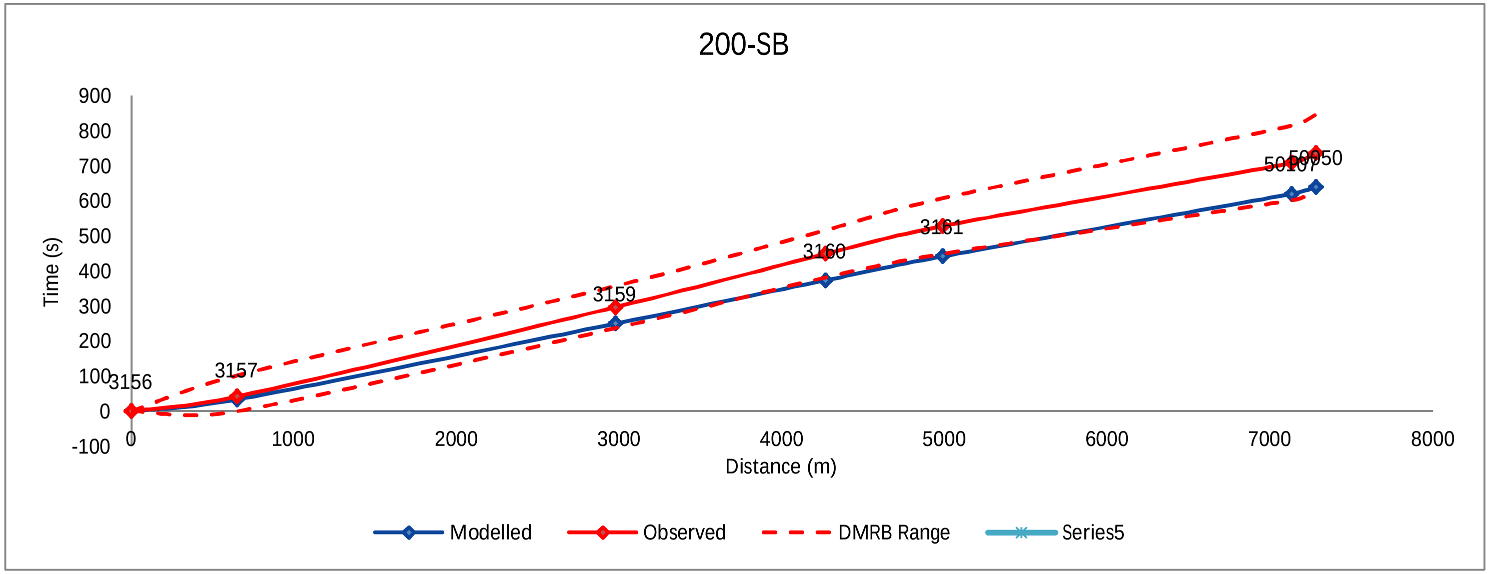

105-EB
Time (s)
600
500
400
300
200
100
0
9420
7080
7070
9190
6080
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Distance (m)
Modelled
Observed
DMRB Range
Series5

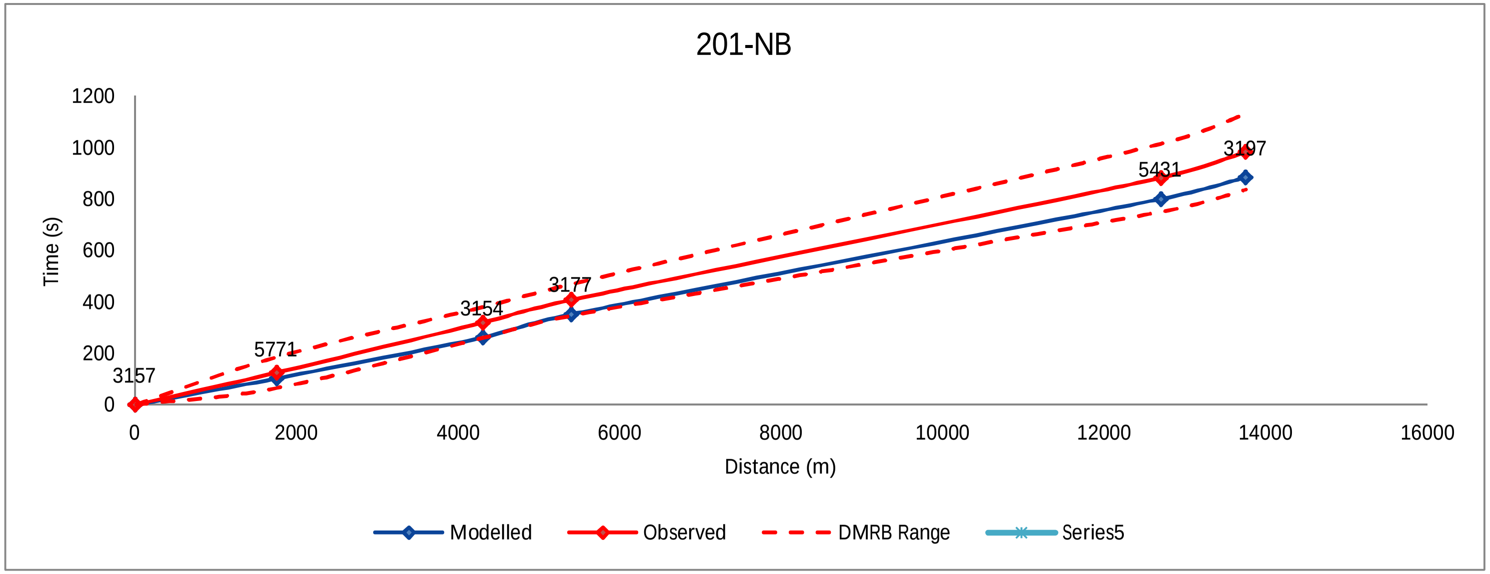

105-WB
Time (s)
500
400
300
200
100
0
-100
6080
9190
7070
7080
9420
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Distance (m)
Modelled
Observed
DMRB Range
Series5

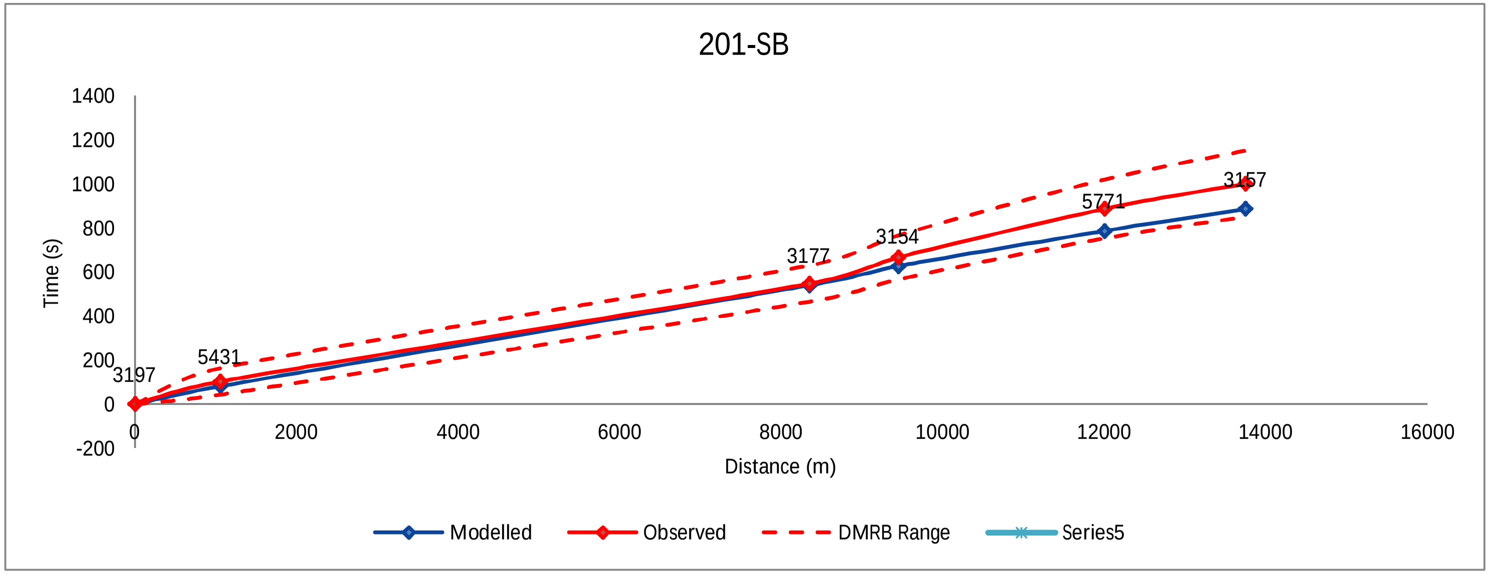

106-EB
Time (s)
900
800
700
600
500
400
300
200
100
0
2010
2050
6315
4000
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

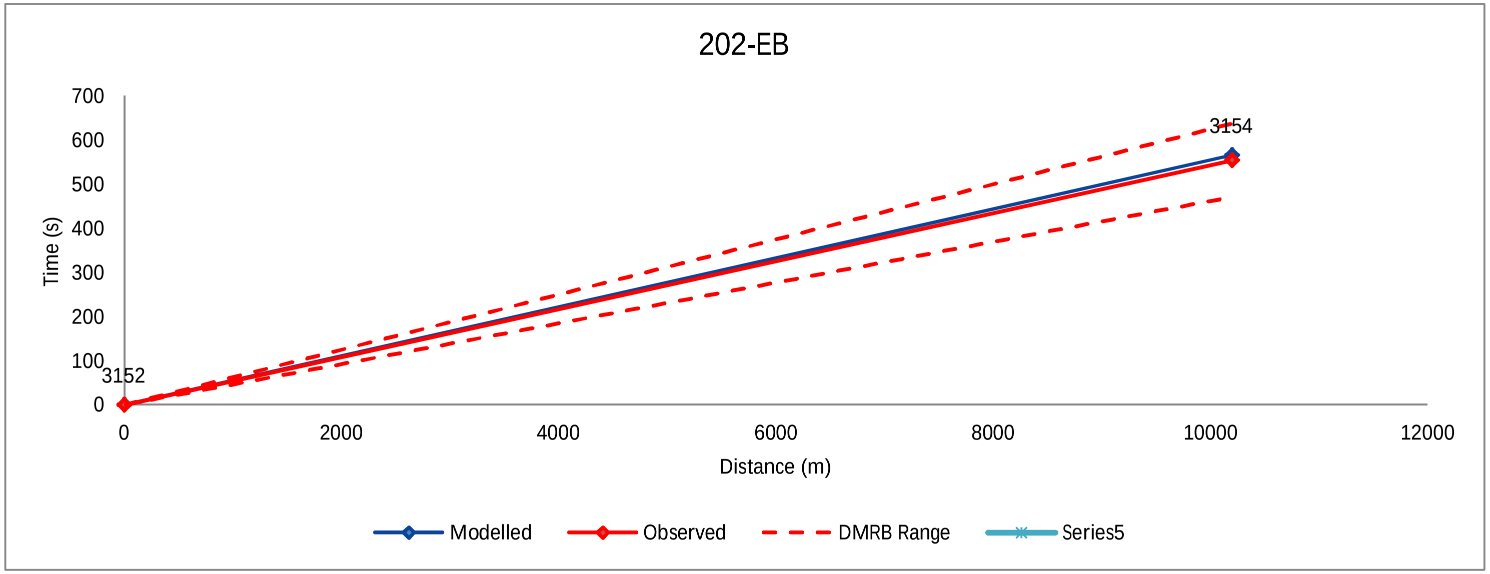

106-WB
Time (s)
700
600
500
400
300
200
100
0
-100
4000
6315
2050
2010
-1000
0
1000
2000
3000
4000
5000
6000
Distance (m)
Modelled
Observed
DMRB Range
Series5

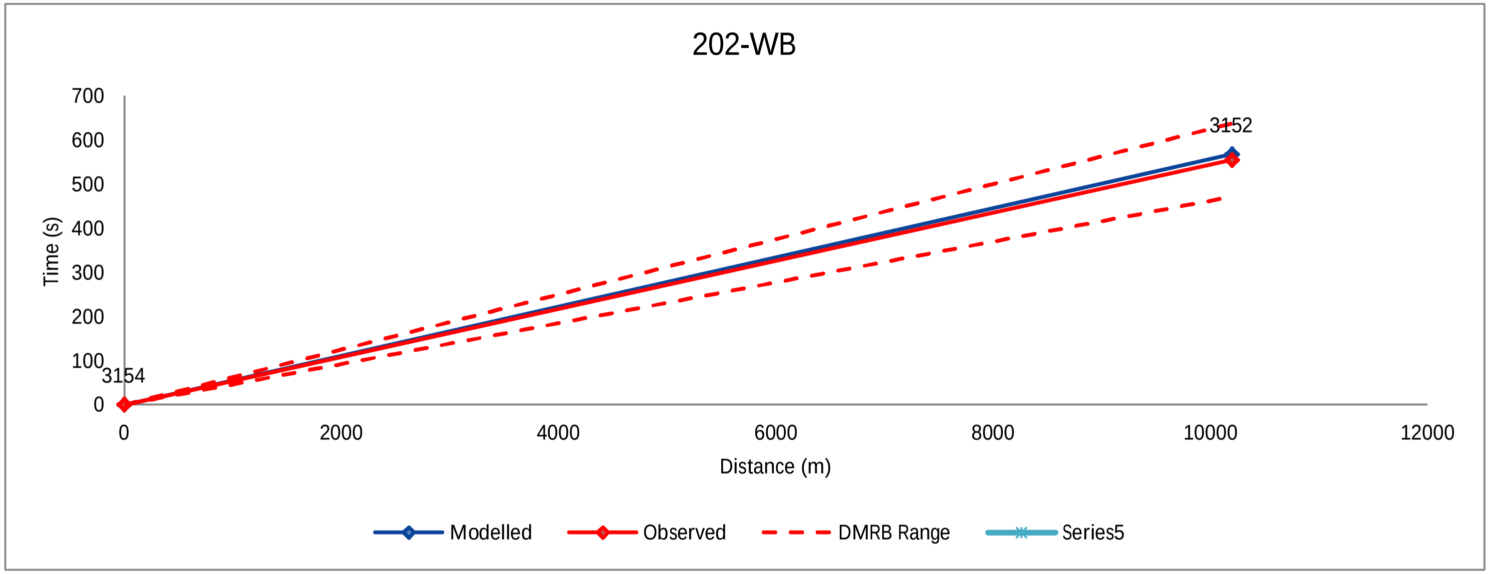

200-NB
Time (s)
Distance (m)
3156
3157
3159
3160
3161
50107
50050
Modelled
Observed
DMRB Range
Series5

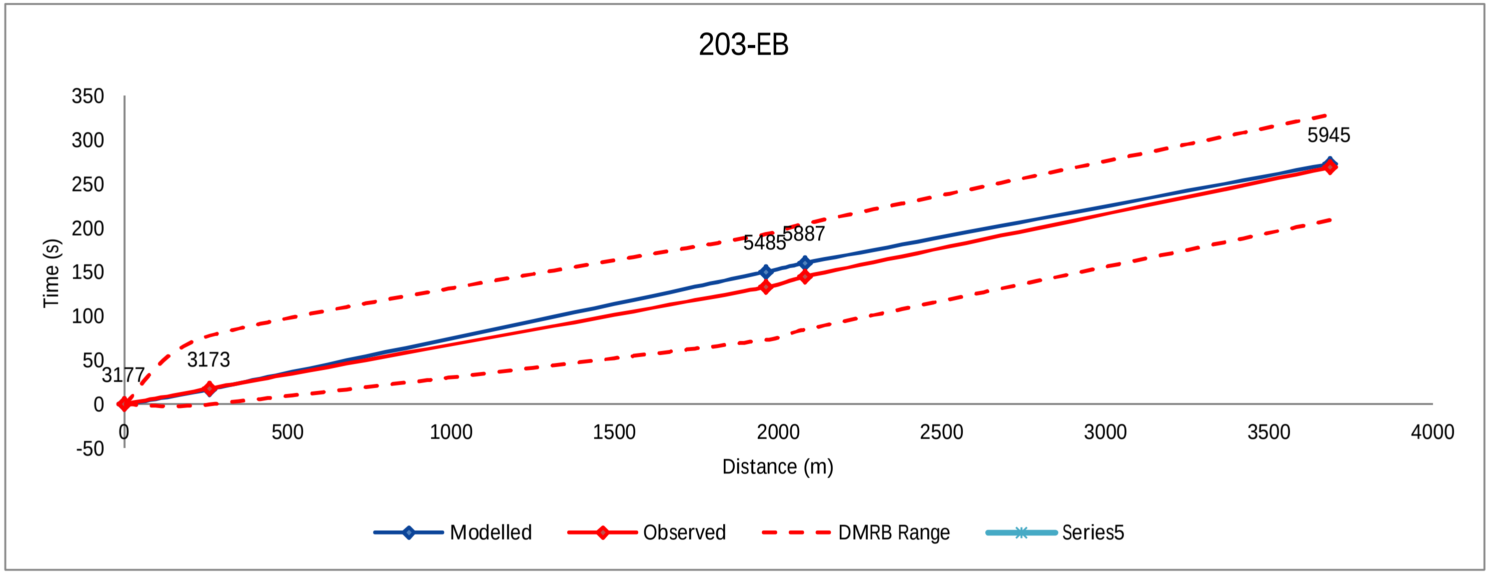

200-SB
Time (s)
Distance (m)
3156
3157
3159
3160
3161
50107
50050
Modelled
Observed
DMRB Range
Series5

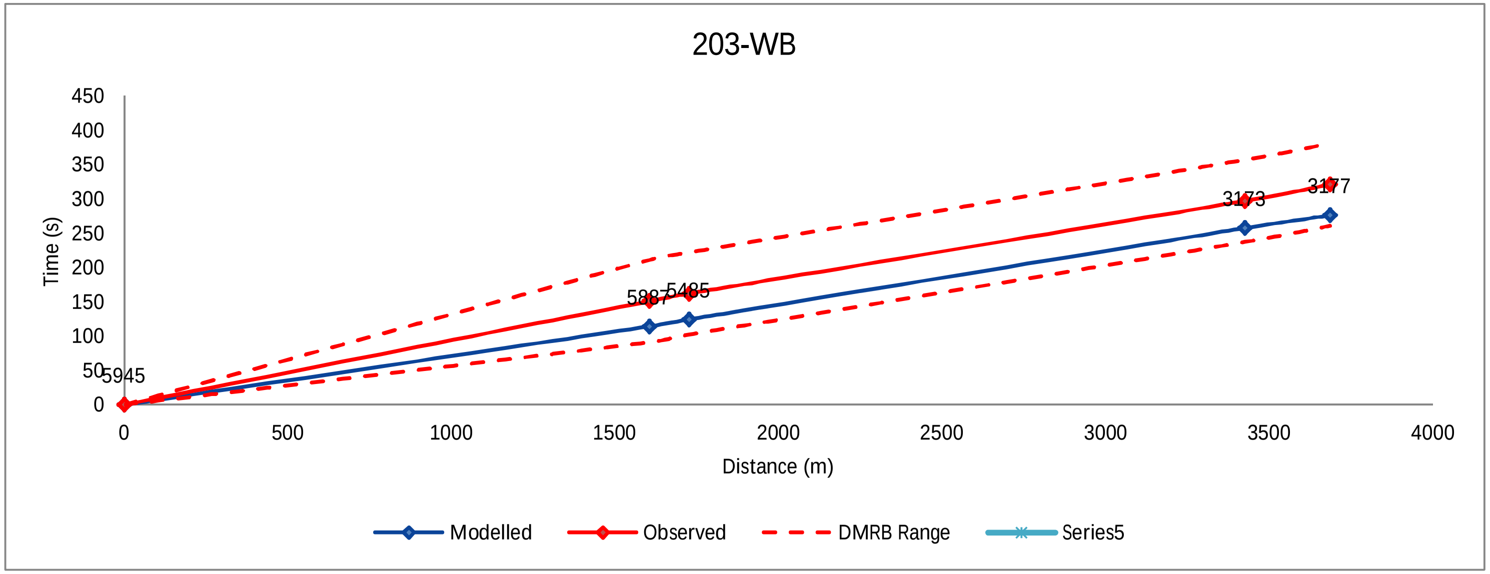

201-NB
Time (s)
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3157
5771
3154
3177
5431
3197
Modelled
Observed
DMRB Range
Series5

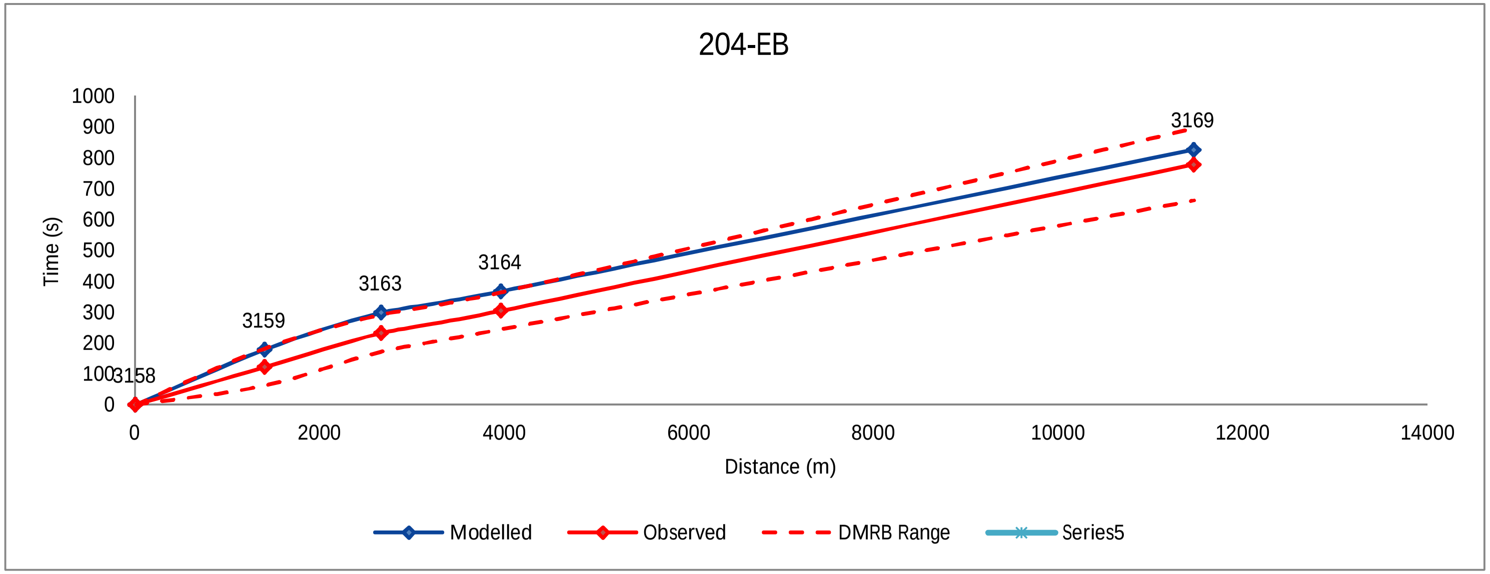

201-SB
Time (s)
1400
1200
1000
800
600
400
200
0
-200
0
2000
4000
6000
8000
10000
12000
14000
16000
Distance (m)
3197
5431
3177
3154
5771
3157
Modelled
Observed
DMRB Range
Series5

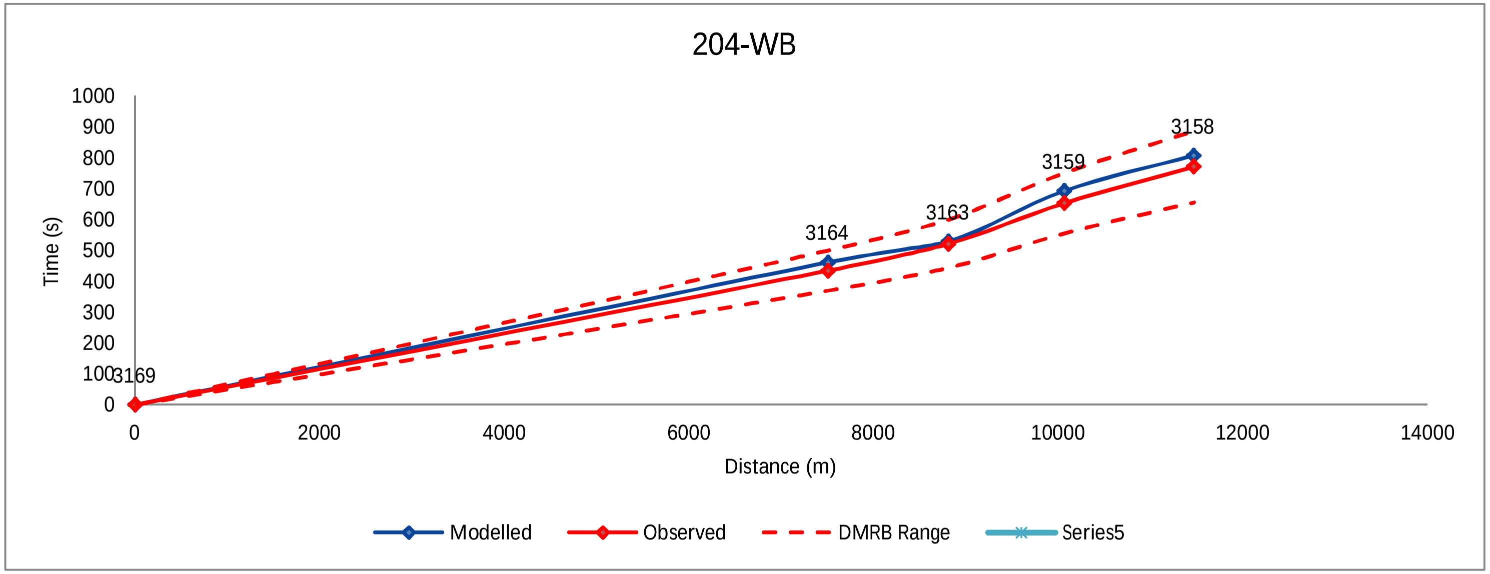

202-EB
Time (s)
700
600
500
400
300
200
100
0
3152
3154
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

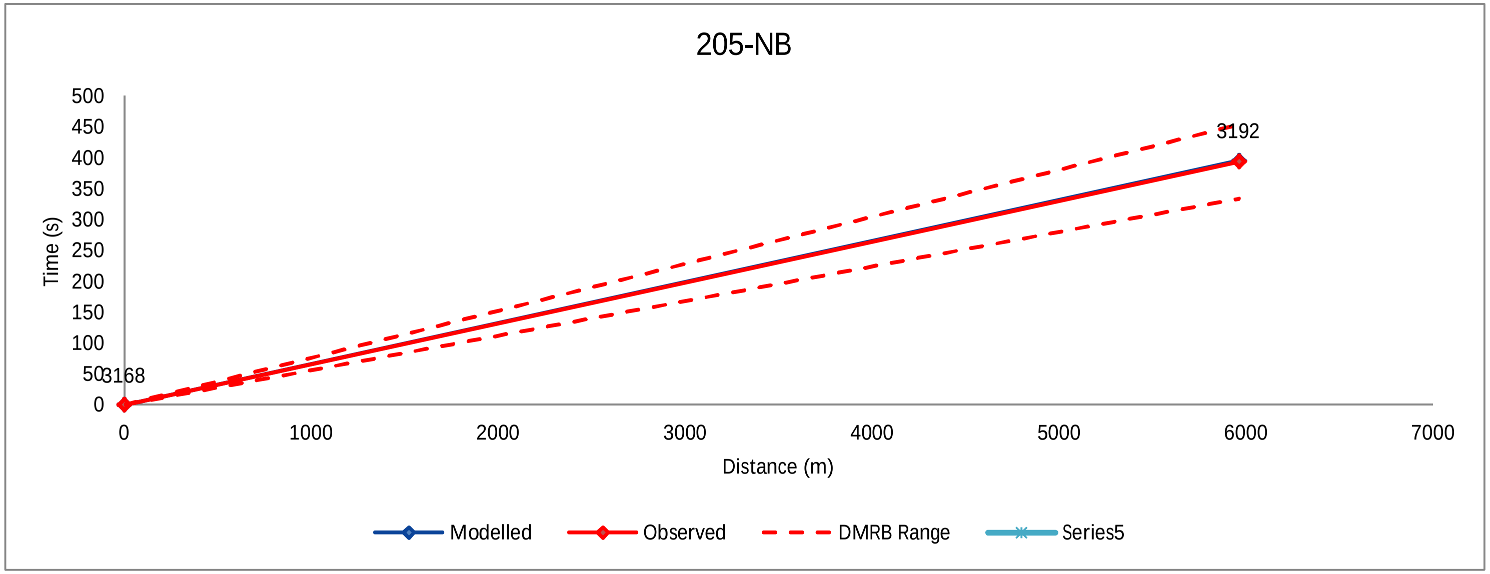

202-WB
Time (s)
700
600
500
400
300
200
100
0
3154
3152
0
2000
4000
6000
8000
10000
12000
Distance (m)
Modelled
Observed
DMRB Range
Series5

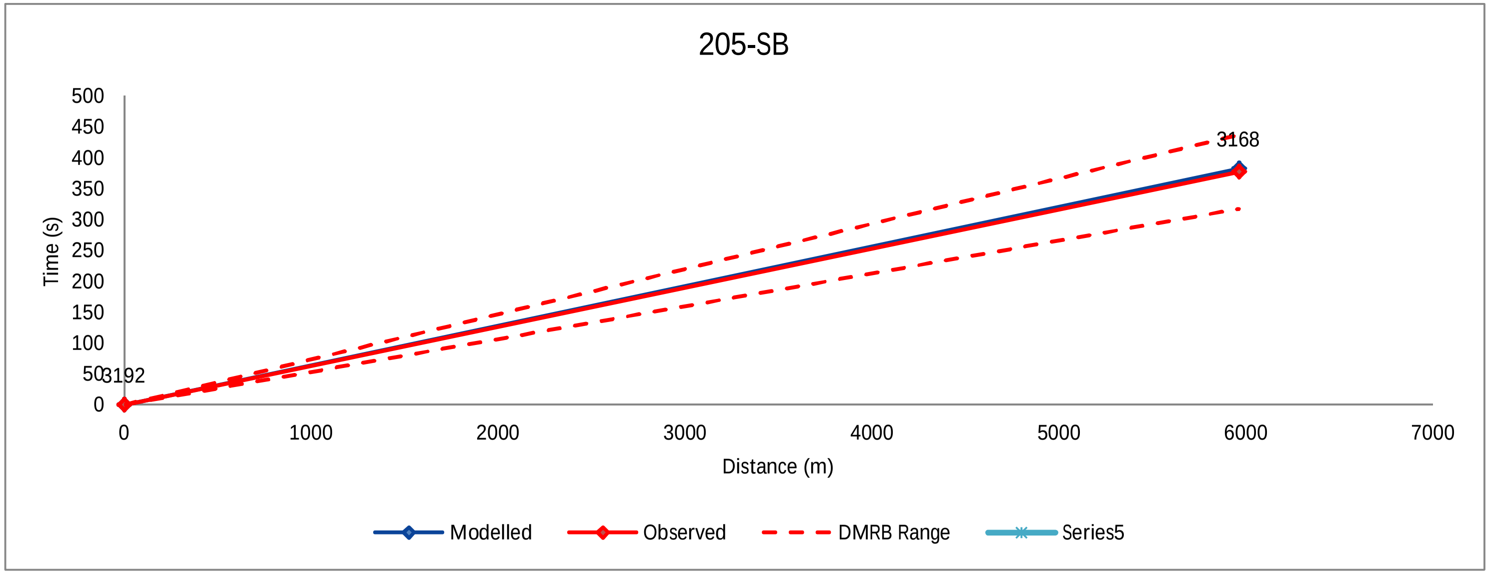

203-EB
Time (s)
350
300
250
200
150
100
50
0
-50
3177
3173
5485
5887
5945
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
Modelled
Observed
DMRB Range
Series5

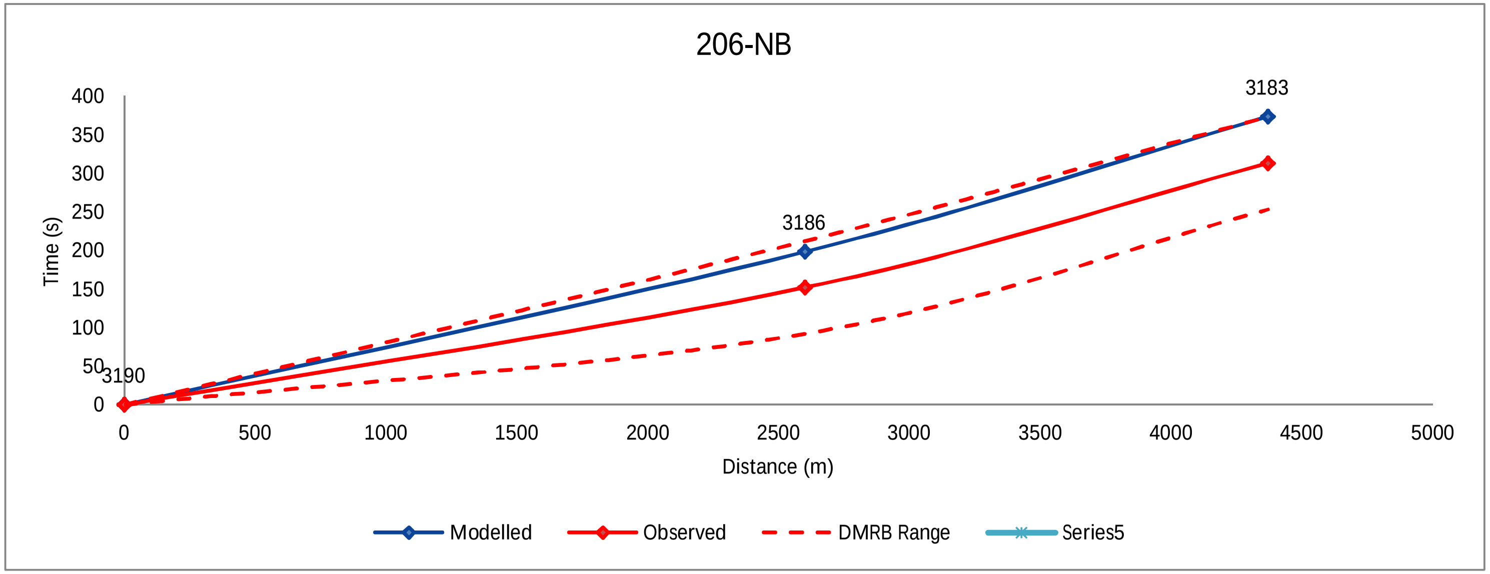

203-WB
Time (s)
450
400
350
300
250
200
150
100
50
0
5945
5887
5485
3173
3177
0
500
1000
1500
2000
2500
3000
3500
4000
Distance (m)
Modelled
Observed
DMRB Range
Series5

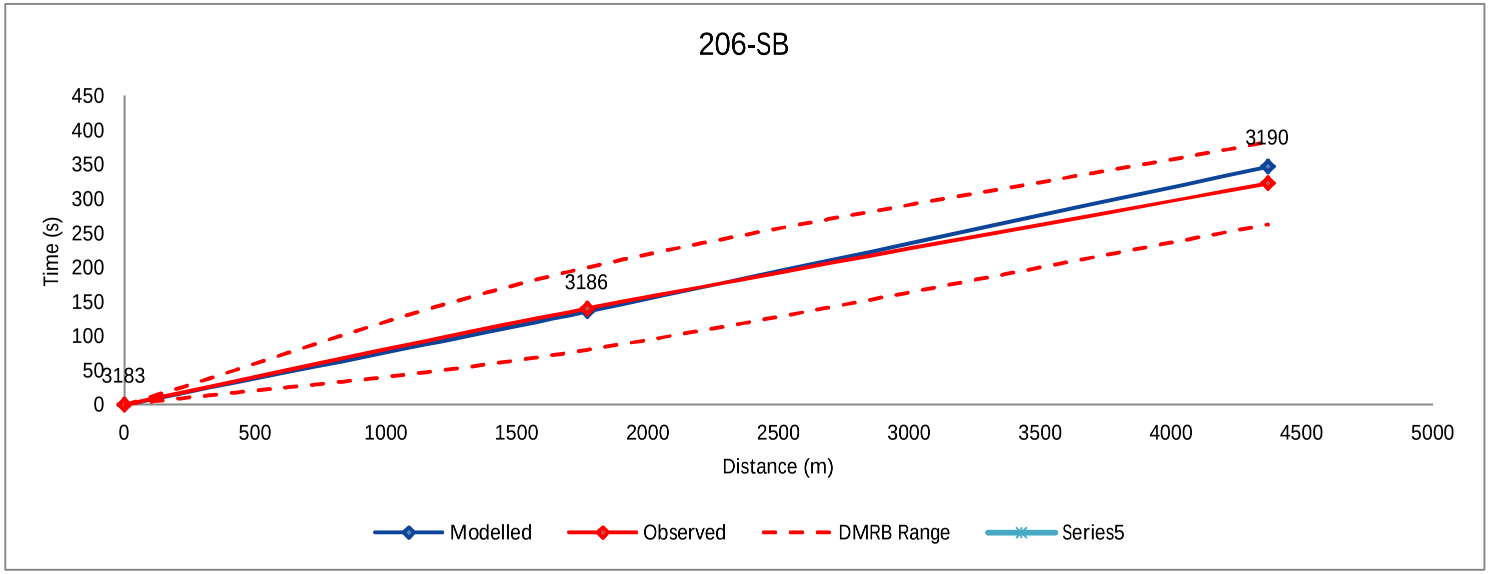

204-EB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3158
3159
3163
3164
3169
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

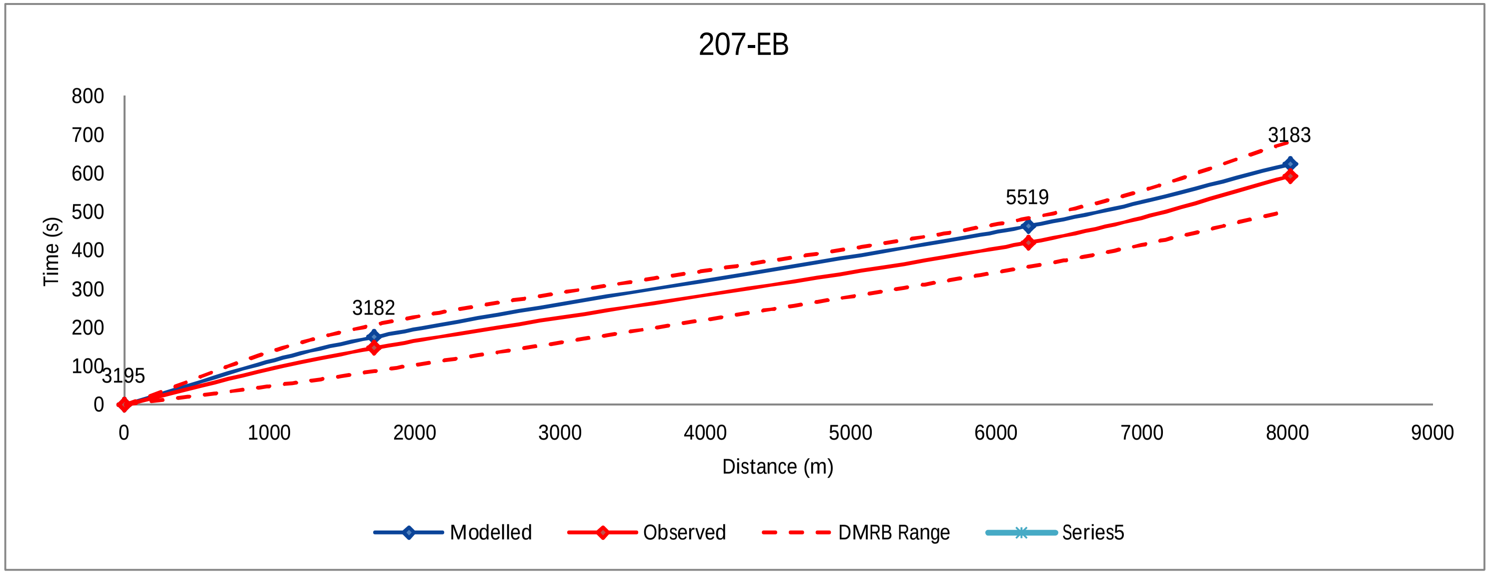

204-WB
Time (s)
1000
900
800
700
600
500
400
300
200
100
0
3169
3164
3163
3159
3158
0
2000
4000
6000
8000
10000
12000
14000
Distance (m)
Modelled
Observed
DMRB Range
Series5

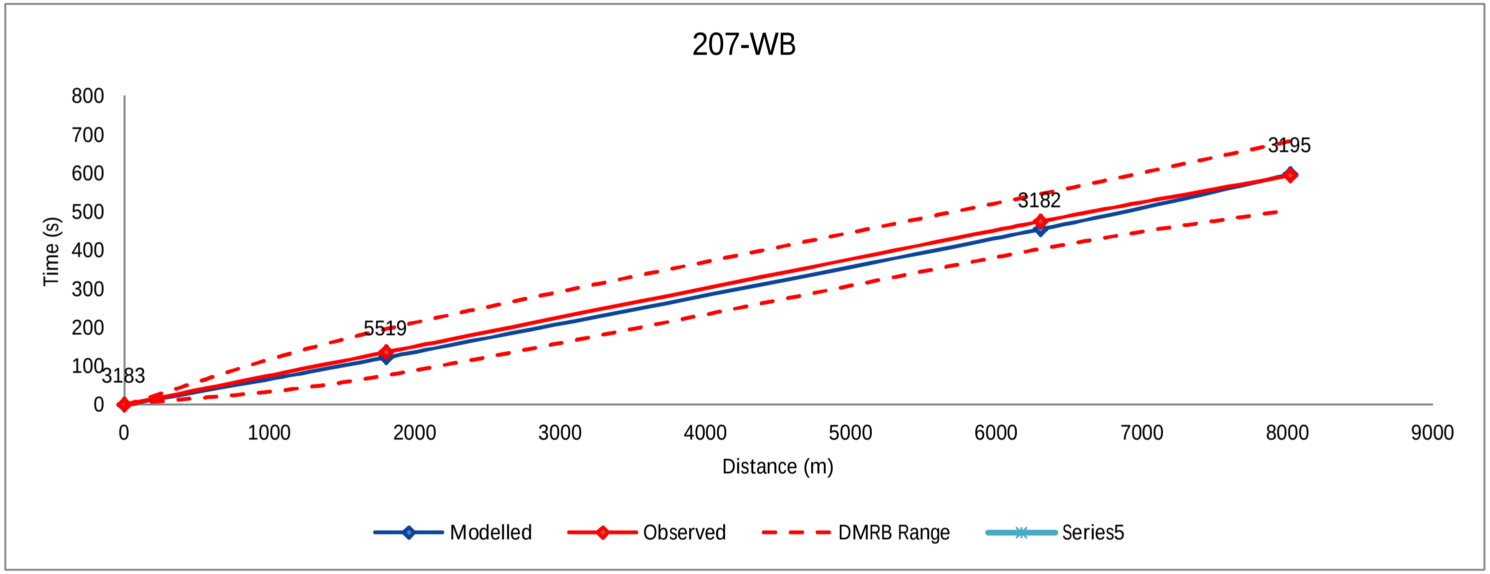

205-NB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
3168
3192
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range
Series5


205-SB
Time (s)
500
450
400
350
300
250
200
150
100
50
0
3192
3168
0
1000
2000
3000
4000
5000
6000
7000
Distance (m)
Modelled
Observed
DMRB Range
Series5


206-NB
Time (s)
400
350
300
250
200
150
100
50
0
3190
3186
3183
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5


206-SB
Time (s)
450
400
350
300
250
200
150
100
50
0
3183
3186
3190
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Distance (m)
Modelled
Observed
DMRB Range
Series5


207-EB
Time (s)
800
700
600
500
400
300
200
100
0
3195
3182
5519
3183
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5


207-WB
Time (s)
800
700
600
500
400
300
200
100
0
3183
5519
3182
3195
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Distance (m)
Modelled
Observed
DMRB Range
Series5

Appendix E

SIGNALISED JUNCTIONS

Appendix E

Signal Details			
Node Nr	Junction Name	Type	Controller Reference
3855	A134/Station St/The Street	Signalised Junction	BAJ1
2823	Blyburgate/Peddars Lane	Signalised Junction	BEJ1
2804	Ellough Rd/Ingate/Lowestoft Rd	Signalised Junction	BEJ3
2824	A145 London Rd/St Mary Rd	Signalised Junction	BEJ4
2837	Newgate/Smallgate/Market St/Station Rd	Signalised Junction	BEJ5
2836	Newgate/Smallgate/Market St/Station Rd	Signalised Junction	BEJ5
50025	B113 Bramford Road	Signalised Junction	BLJ1
5801	London Rd/High St	Signalised Junction	BDJ2
2267	Barton Rd/Ortwell Rd	Signalised Junction	BJ1
2311	Angel Hill/Northgate St/Mustow St	Signalised Junction	BJ4
2221	Tollgate Lane/Fordham Rd	Signalised Junction	BJ8
1308	A1302 Newmarket Rd	Signalised Junction	BJ10
2866	Beach Station Rd/Langer Rd	Signalised Junction	FJ1
2910	High Rd West/Garrison	Signalised Junction	FJ3
2922	Crescent Rd/Hamilton Rd/Cobbold Rd	Signalised Junction	FJ4
3577	High Rd West/Railway Approach	Signalised Junction	FJ5
30449	Bramford Rd/Riverside Rd	Signalised Junction	IJ1
30819	Bramford Rd/Towerhill Rd	Signalised Junction	IJ2
20025	Bramford Rd/Chevallier St	Signalised Junction	IJ3
30142	Bramford Rd/Sproughton Rd	Signalised Junction	IJ4
10030	Crown St/High St	Signalised Junction	IJ5
30758	Duke St/Pownall Rd	Signalised Junction	IJ6
10037	Queen St/Falcon Rd	Signalised Junction	IJ7
70151	Felixstowe Rd/Murray Rd	Signalised Junction	IJ8
30246	Felixstowe Rd/Derby Rd	Signalised Junction	IJ9
30250	Felixstowe Rd/Kingsway Rd	Signalised Junction	IJ10
20077	Foxhall Rd/Derby Rd	Signalised Junction	IJ12
10006	Grey Friars Rd/Wolsey Rd	Signalised Junction	IJ13
20069	Spring Rd/Grove Lane	Signalised Junction	IJ14
30235	Landseer Rd/Clapgate Lane	Signalised Junction	IJ17
20014	London Rd/Handford Rd	Signalised Junction	IJ18
30148	London Road / Ranelagh Road / Hadleigh Road	Signalised Junction	IJ19
20015	London Road / Handford Road (Lidl's)	Signalised Junction	IJ20
30158	London Road / Robin Drive	Signalised Junction	IJ21
30381	London Rd/Dickens Rd	Signalised Junction	IJ22
10048	St Helens St/Upper Orwell St	Signalised Junction	IJ23
30124	Norwich Rd/Old Norwich Rd	Signalised Junction	IJ27
20023	Norwich Rd/Bramford Rd	Signalised Junction	IJ28
30136	Norwich Rd/Ashcroft Rd	Signalised Junction	IJ29
30126	Norwich Rd/Meredith Rd	Signalised Junction	IJ30
20005	Princess St/Commercial Rd	Signalised Junction	IJ32
20004	Princess St/Grafton Way	Signalised Junction	IJ33
30168	Princess St/Burrell Rd/Ranliegh Rd/Railway Station	Signalised Junction	IJ34
30167	Ranelagh Rd/Ancaster	Signalised Junction	IJ36
20065	Spring Rd/Cauldwell Hall Rd	Signalised Junction	IJ37
10020	St Helens St/Argyle St	Signalised Junction	IJ38
10056	Star Lane/Slade St	Signalised Junction	IJ39
10018	Star Lane/Grimwade St	Signalised Junction	IJ40
30213	Stoke St/Burrel Rd	Signalised Junction	IJ41
30214	Stoke St/Vernon St/Stoke Bridge	Signalised Junction	IJ41
10090	Carr St/Upper brook St/Northgate St	Pedestrian Crossing	IJ42
10045	Tacket St/Dogs Head St	Signalised Junction	IJ43
20044	Valley Rd/Henly Rd	Signalised Junction	IJ44
70043	Wherstead Rd/Station St	Signalised Junction	IJ45
20057	Woodbridge Rd/Sidegate Lane	Signalised Junction	IJ46
30196	Stoke Park Drive/ASDA	Signalised Junction	IJ48
20072	Duke St/Fore Hamlet	Signalised Junction	IJ51
20016	Handford Rd/Portman Rd	Signalised Junction	IJ52
10004	Civic Drive/Princess St	Signalised Junction	IJ53
10049	St Helens St/Bond St	Signalised Junction	IJ55
30799	Copdock A14 / A12 roundabout	Signalised Junction	
30798	A14/A12/A1214 roundabout	Signalised Junction	
30797	A14/A12/A1214 roundabout	Signalised Junction	
30796	A14/A12/A1214 roundabout	Signalised Junction	

Signal Details

Node Nr	Junction Name	Type	Controller Reference
3183	Parkhill/Station Rd/Waterloo Ave/Main St	Signalised Junction	LEJ2
1110	A12 London Road South/Cliff Road/Ca	Signalised Junction	LJ2
1200	A12 London Road South/Mill Road	Signalised Junction	LJ4
7080	A1117 Oulton Road/Somerleyton Road	Signalised Junction	LTM OBC
4010	A146 Waveney Drive/Durban Road	Signalised Junction	LJ6/LTM OBC
6314	Tom Crisp Way / Blackheath Road	Signalised Junction	LJ7
6030	A12 Denmark Road/Katwijk Way	Signalised Junction	LTM OBC
6322	Station Square , Commercial Road	Signalised Junction	LJ102
6160	A12 Battery Green Road/Suffolk Road	Signalised Junction	LinSig
2030	A146/Cotmer Rd	Signalised Junction	
9190	St Peters Street/Boston Road	Signalised Junction	
6010	A12 Station Square/Waveney Road	Signalised Junction	
1230	A12 London Road South/A146 Belveder	Signalised Junction	
3159	Woods Lane/Melton Rd	Signalised Junction	MEJ1
2448	B1103 Fred Archer/Fordham Rd Stream 2	Signalised Junction	NJ3
2449	B1103 Fred Archer/Fordham Rd Stream 1	Signalised Junction	NJ3
2467	Fordham Rd/Snailwell Rd	Signalised Junction	NJ5
5730	A1214/Tesco	Signalised Junction	PWJ1
5732	A1214 Roundabout exit	Pedestrian Crossing	
3182	High St/Church St	Signalised Junction	SXJ1
30155	London Rd/Scrivener Drive	Signalised Junction	SPJ1
30150	A1071/C495 Hadleigh Rd	Signalised Junction	SPJ2
2336	Gipping Rd/Station Rd West	Signalised Junction	SJ1
2385	1120/A1308/B1113/Cedars Link Stream 2	Signalised Junction	SJ4
2386	A1120/A1308/B1113/Cedars Link Stream 3	Signalised Junction	SJ4
2387	A1120/A1308/B1113/Cedars Link Stream 1	Signalised Junction	SJ4
2400	Gipping Way/Navigation Approach	Signalised Junction	SJ5
2724	The Croft/Croft Rd/Gregory St	Signalised Junction	SUJ2
3540	Middleton Rd/Ballingdon St/Bulmer Rd	Signalised Junction	SUJ3
9190	St Peters Street / Boston Road	Signalised Junction	LJ8
2534	A1304 / B1506	Signalised Junction	NJ1
2462	B1103 / Elizabeth Avenue	Signalised Junction	NJ2
2441	High St / The Avenue	Signalised Junction	NJ4
2336	Gipping Way / Station Rd	Signalised Junction	SJ2
2686	Girling St / East St	Signalised Junction	SUJ1
2141	Horringer Rd / Out Westgate/ Vinery Rd	Signalised Junction	BJ5
5822	Petticoat Ln / Out Westgate/ Vinery Rd	Signalised Junction	BJ5
2073	Parkway / St Andrews St South	Signalised Junction	BJ6
5940	Hollow Rd/ Railway Bridge	Signalised Junction	BJ9
2881	Garrison Lane/ Mill Ln	Signalised Junction	FJ3
2893	Blofield Rd/ Trinity Ave	Signalised Junction	FJ6
2891	A14 Slip Rd/ Trinity Ave	Signalised Junction	FJ6
2601	Withersfield Rd/Howe Rd	Signalised Junction	HJ2
10024	St Margarets Street/Mulberry Tree	Signalised Junction	IJ24
10025	St Margarets Street/St Margarets Green	Signalised Junction	IJ58
30301	Woodbridge Rd/Beech Rd	Signalised Junction	KJ1
30303	A1214 Main Rd/Bell Lane	Signalised Junction	KJ2
5518	High St/Cross St/ Sizewell Rd	Signalised Junction	LEJ1
2030	Beccles Road / Cotmer Road	Signalised Junction	LJ1
30457	A1214 Park n Ride Bus Access	Signalised Junction	MAJ2
3810	Kingsway/ College Heath Rd	Signalised Junction	MHJ1
3160	Lime Kiln Quay/Thoroughfare/St Johns/Melton Hill	Signalised Junction	WOj2
30824	Ranelegh Road / McDonalds Ipswich	Signalised Junction	IJ35
30760	Fore Hamlet / Pownall Road	Signalised Junction	IJ50
2107	A14 / A134/ Bedingfield Way	Signalised Junction	BJ2
2101	A14 / A134/ Bedingfield Way	Signalised Junction	BJ2
2100	A14 / A134/ Bedingfield Way	Signalised Junction	BJ2
2098	A14 / A134/ Bedingfield Way	Signalised Junction	BJ2
5941	A14 / A134/ Bedingfield Way	Signalised Junction	BJ2
30418	Ropes Drive West/A1214 Woodbridge Rd	Signalised Junction	Kj3
30416	Ropes Drive West/A1214 Woodbridge Rd	Signalised Junction	Kj3

Signal Details

Node Nr	Junction Name	Type	Controller Reference
30419	Ropes Drive West/A1214 Woodbridge Rd	Signalised Junction	Kj3
30420	Ropes Drive West/A1214 Woodbridge Rd	Signalised Junction	Kj3
30114	A1214/ Martlesham Park n Ride Entrance/Exit Roundabout	Signalised Junction	MAJ1
30406	A1214/ Martlesham Park n Ride Entrance/Exit Roundabout	Signalised Junction	MAJ1
30407	A1214/ Martlesham Park n Ride Entrance/Exit Roundabout	Signalised Junction	MAJ1
30408	A1214/ Martlesham Park n Ride Entrance/Exit Roundabout	Signalised Junction	MAJ1
30822	Hadleigh Road / Sainsburys / Allenby Road Ipswich	Signalised Junction	IJ15
30240	Nacton Road / Maryon Road	Signalised Junction	IJ26
10031	St Matthew St / Crown Street / St Georges St	Pedestrian Crossing	
20252	Colchester Road near Sidegate Lane	Pedestrian Crossing	
70306	Crown Street / Crown Pools	Pedestrian Crossing	
70307	Crown Street / Fonnereau Rd	Pedestrian Crossing	
70309	Bixley Road / St Augustine Gardens	Pedestrian Crossing	
70310	Bixley Road near Foxhall Road	Pedestrian Crossing	
70311	Heath Road near Foxhall Road	Pedestrian Crossing	
70312	Heath Road near Ipswich Hospital	Pedestrian Crossing	
70313	St Margarets Street / Crown St	Pedestrian Crossing	
70316	Norwich Road / Old Norwich Road	Pedestrian Crossing	
70317	Woodbridge Road gyratory	Pedestrian Crossing	
70318	Woodbridge Road gyratory	Pedestrian Crossing	
70319	Grafton Way near Bridge Street	Pedestrian Crossing	
70320	Valley Road near Noriwch Road	Pedestrian Crossing	
70321	Woodbridge Road near Arthur Terrace	Pedestrian Crossing	
70322	A12 Belvedere Road	Pedestrian Crossing	
70323	A12 Belvedere Road	Pedestrian Crossing	
70324	Bridge Road Road	Pedestrian Crossing	
4040	A146 Victoria Road - railway crossing	Level Crossing	
1260	Eastern A12 Bascule Bridge - centre	Level Crossing	
7030	A1117 Bridge Road level crossing	Level Crossing	
10191	Harbour Road level crossing	Level Crossing	
5650	A146 level crossing	Level Crossing	
5651	Ingate level crossing	Level Crossing	
5652	London Rd level crossing	Level Crossing	
5653	Grove Rd level crossing	Level Crossing	
5861	A1065 level crossing	Level Crossing	
5859	Bridge Rd level crossing	Level Crossing	
5851	Station Road level crossing	Level Crossing	
5859	A154 level crossing	Level Crossing	
5858	Bramfield Rd level crossing	Level Crossing	
5862	B1112 level crossing	Level Crossing	
5860	Saxmundham level crossing	Level Crossing	
70269	The Street level crossing	Level Crossing	
5853	A137 level crossing	Level Crossing	
5854	Wilford Bridge Rd level crossing	Level Crossing	
5850	Dullingham Rd level crossing	Level Crossing	
5860	B1102 level crossing	Level Crossing	
5863	A1101 level crossing	Level Crossing	
5851	Station Rd level crossing	Level Crossing	
5852	Crown Street level crossing	Level Crossing	
5856	Yoxford Rd level crossing	Level Crossing	
5857	A12 level crossing	Level Crossing	
30333	Westerfield Rd level crossing	Level Crossing	