OPDC
OLD OAK AND
PARK ROYAL
DEVELOPMENT
CORPORATION

Park Royal Transport Strategy

Appendices

2017

MAYOR OF LONDON

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Park Royal Transport Strategy
HAM MAP.xlsx

Stage1a

Transport for London Planning Strategic Analysis - Sub-Regional Highway Assignment Model Application Model Auditing Process (HAM-MAP) - Stage 1a: Initial Model Review Project Name - Park Royal Transport Study HAM Used - WelHAMp3_HS2OOC	Consultant Responsible - Steer Davies Gleave
Model Base Year - 2012	Model Future Year - 2021, 2026, 2041
Periods Modelled AM PM	Periods Modelled AM PM

Base Year Model Review: Local Network Audit

Technical Note: Park Royal Transport Strategy - Modelling Report (Chapter 2)

Base Year Adequacy Assessment	**Satisfactory**	**Checking Engineer/ Planner**	**Checking Engineer/ Planner**	**Report Reference**
Local Network Density Checked Y/N	N	NDA	TSC	Paragraph 2.3 - 2.6
Check on Junction/ Link Coding Undertaken	N	NDA	TSC	Paragraph 2.7 - 2.9
Inspection for Convergence Issues	Y	NDA	TSC	Paragrpah 2.15
Realism Checks Made	Y	NDA	TSC	Chapter 2
Routing check between key OD pairs for Car/ HGV	Y	NDA	TSC	Appendix B
Network Improvements Identified	**Satisfactory**	**Checking Engineer/ Planner**	**Checking Engineer/ Planner**	**Report Reference**
Plot of Additional Links Provided	Y	NDA	TSC	Figure 2.3
Check on Coding Undertaken	Y	NDA	TSC	Paragraph 2.7 - 2.9
Local Area Zoning Checked	Y	NDA	TSC	Paragraph 2.11
Plot of Additional Zones Provided	N/A	NDA	TSC	N/A
Centroid Connectors Checked and Plotted	Y	NDA	TSC	Paragraph 2.12
Future Year Adequacy Assessment Satisfactory	**Satisfactory**	**Checking Engineer/ Planner**	**Checking Engineer/ Planner**	**Report Reference**
Local Area Network Adequacy	N/A	N/A	N/A	N/A
Local Area Zoning Adequacy	N/A	N/A	N/A	N/A
Local Model Validation Checks	**Satisfactory**	**Checking Engineer/ Planner**	**Checking Engineer/ Planner**	**Report Reference**
Local Area Flow Validation Checks Undertaken	N	NDA	TSC	Paragraph 2.32 - 2.37
Screenline and Cordon Performance Reported	N	NDA	TSC	Tables 2.4 and 2.6
Additional Local Counts Identified/ Collected	Y	NDA	TSC	Paragraph 2.19
Performance Against Local Counts Reported	N	NDA	TSC	Table 2.5 and 2.7
Local Journey Times Assessed	N	NDA	TSC	Table 2.8
Plots of Local Congestion Provided	Y	NDA	TSC	Appendix C
Requirement for Model Re-validation	Y	NDA	TSC	Paragraph 2.40

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		Natalia Duran	Tom Caulfield
	Signed		
	Date	27/01/2015	27/01/2015

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Stage 1b

Transport for London Planning Strategic Analysis - Sub-Regional Highway Assignment Model Application Model Auditing Process (HAM-MAP) - Stage 1a: Initial Model Review Project Name - Park Royal Transport Study HAM Used - WelHAMp3_HS2OOC	Consultant Responsible - Steer Davies Gleave
Model Base Year - 2012	Model Future Year - 2021, 2026, 2041
Periods Modelled AM PM	Periods Modelled AM PM

Base Year Model Review: Local Model Re-validation				
Model Validation Report Received: Park Royal Transport Strategy - Modelling Report				
Network Improvements Identified	**Satisfactory**	**Checking Engineer/ Planner**	**Model Audit Engineer/ Planner**	**Report Reference**
Plot of Additional Links Provided	Y	NDA	TSC	Figure 2.3
Check on Coding Undertaken	Y	NDA	TSC	Paragraph 2.7 - 2.9
Local Area Zoning Checked	Y	NDA	TSC	Paragraph 2.11
Plot of Additional Zones Provided	N/A	NDA	TSC	N/A
Centroid Connectors Checked and Plotted	Y	NDA	TSC	Paragraph 2.12
Model Calibration/ Matrix Estimation	**Satisfactory**	**Checking Engineer/ Planner**	**Model Audit Engineer/ Planner**	**Report Reference**
Estimation from Prior Matrices	Y	NDA	TSC	Paragraph 3.3-3.4
Additional Local Counts Identified/ Collected	Y	NDA	TSC	Paragraph 2.19
Counts used as Mini-screenlines	Y	NDA	TSC	Paragraph 3.3
Plot of Additional Counts Provided	Y	NDA	TSC	Figure 2.9
Screenline and Cordon Calibration Reported	Y	NDA	TSC	Table 3.1
Local Model Validation Checks	**Satisfactory**	**Checking Engineer/ Planner**	**Model Audit Engineer/ Planner**	**Report Reference**
Screenline and Cordon Calibration Reported	Y	NDA	TSC	Table 3.2 and 3.4
Performance Against Local Counts Reported	Y	NDA	TSC	Table 3.3 and 3.5
Local Screenline Comparisons WebTAG Compliant	Y	NDA	TSC	Paragraph 3.6 - 3.8
Local Individual Counts WebTAG Compliant	Y	NDA	TSC	Paragraph 3.6 - 3.8
Local Journey Times to 15%	Y	NDA	TSC	Table 3.6
Comparison of Journey Times for HAM JT Routes	Y	NDA	TSC	Table 3.1
Plots of Local Congestion Provided	Y	NDA	TSC	Appendix C
Routing check between key OD pairs for Car/ HGV Y/N	Y	NDA	TSC	Appendix B
Model Convergence Gap to WebTAG Standards	Y	NDA	TSC	Paragrpah 2.15
Acceptance: TfL make no warranties, express or implied, that acceptance of this model adheres to best practise nor is confirmation that the contractor has fully met their statutory requirements.		CE/P to confirm that this model conforms to HAM Guidance Stage 1a and the main areas above have been checked and are	MAE/P to confirm that this model conforms to HAM Guidance Stage 1b and the main areas above have Guidance Stage 1b and the main areas above have been checked and are correct.	
		Natalia Duran	Tom Caulfield	
	Signed			
	Date	27/01/2015	27/01/2015	

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Stage 2b

Transport for London Planning Strategic Analysis - Sub-Regional Highway Assignment Model Application Model Auditing Process (HAM-MAP) - Stage 1a: Initial Model Review Project Name - Park Royal Transport Study HAM Used - WelHAMp3_HS2OOC	Consultant Responsible - Steer Davies Gleave
Model Base Year - 2012	Model Future Year - 2021, 2026, 2041
Periods Modelled AM PM	Periods Modelled AM PM

Future Year Model Review: With Development Report				
Forecast Year Report Received				
Trip Generation and Distribution	**Satisfactory**	**Checking Engineer/ Planner**	**Model Audit Engineer/ Planner**	**Report Reference**
LTS Development Zone Trip-ends adjusted Y/N	Y	NDA	TSC	Paragraph 4.10 - 4.15
GIS Plot of Trip-end changes BY Minus/ Devt Y/N	Y	NDA	TSC	Appendix D
Car Trips vs Parking Check Y/N	N/A			
Development Zone Select Link Plots - B Minus/ Devt	N/A			
Comparison of LTS vs TRAVL/TRICS Y/N	Y	NDA	TSC	Appendix D
Sense Check of Trip Distribution and allocate development demand to the correct zones	Y	NDA	TSC	Appendix D
HAM Runs for with Development	**Satisfactory**	**Checking Engineer/ Planner**	**Model Audit Engineer/ Planner**	**Report Reference**
GIS Plot of OD changes BaseYear Minus vs Dev	Y	NDA	TSC	Appendix D
Plot of Junctions with Changed Coding	Y	NDA	TSC	Figure 4.4
Model Convergence Gap to WebTAG Standards Y/N	Y	NDA	TSC	Paragraph 4.18
Locations of Local Signal Optimization	N/A			
Impact of Local Signal Optimization (comparison)	N/A			
Plots of Local Congestion Hotspots	Y	NDA	TSC	Appendix E
Demand Flow Plots	Y	NDA	TSC	Appendix E
Actual Flow Plots	Y	NDA	TSC	Appendix E
Queue Length Plots	Y	NDA	TSC	Appendix E
GIS V/C (Red/amber/green) Plots	Y	NDA	TSC	Appendix E
Junction Impact Statistics	Y	NDA	TSC	Appendix E
Comparison against Base Journey Times	N/A			
Area Based Statistics	N/A			
Development Zone Select Link Plots - Devt	N/A			
Development Zone Select Link Plots - B Minus	N/A			
Gross Development Impact & Displacement Plots	N/A			
Matrix Cordon Based Analysis - Devt Demand	N/A			

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		Natalia Duran	Tom Caulfield
	Signed		
	Date	27/01/2015	27/01/2015

B

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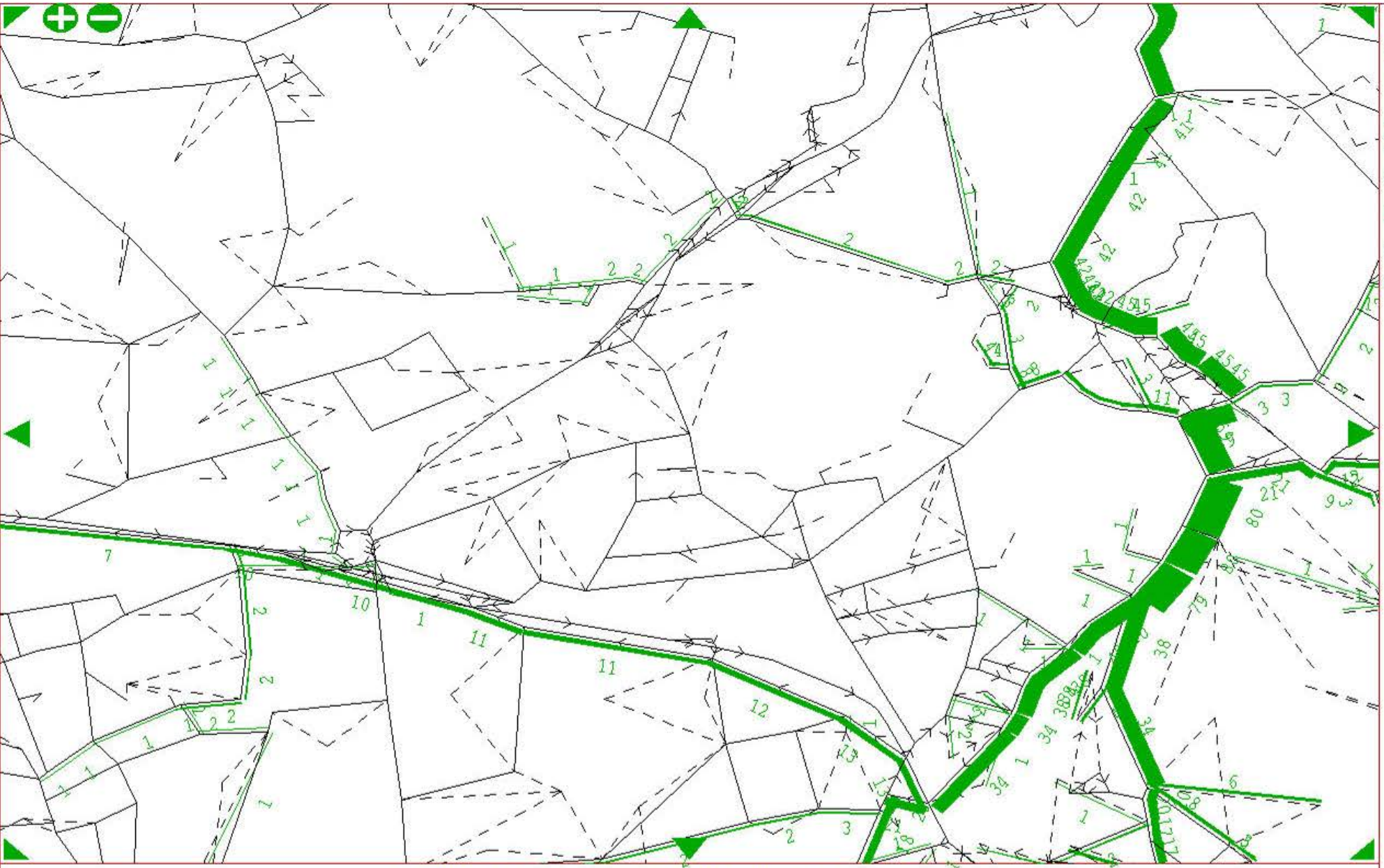
Park Royal Transport Strategy

Modelling Report

Appendix B – Select Link Analysis



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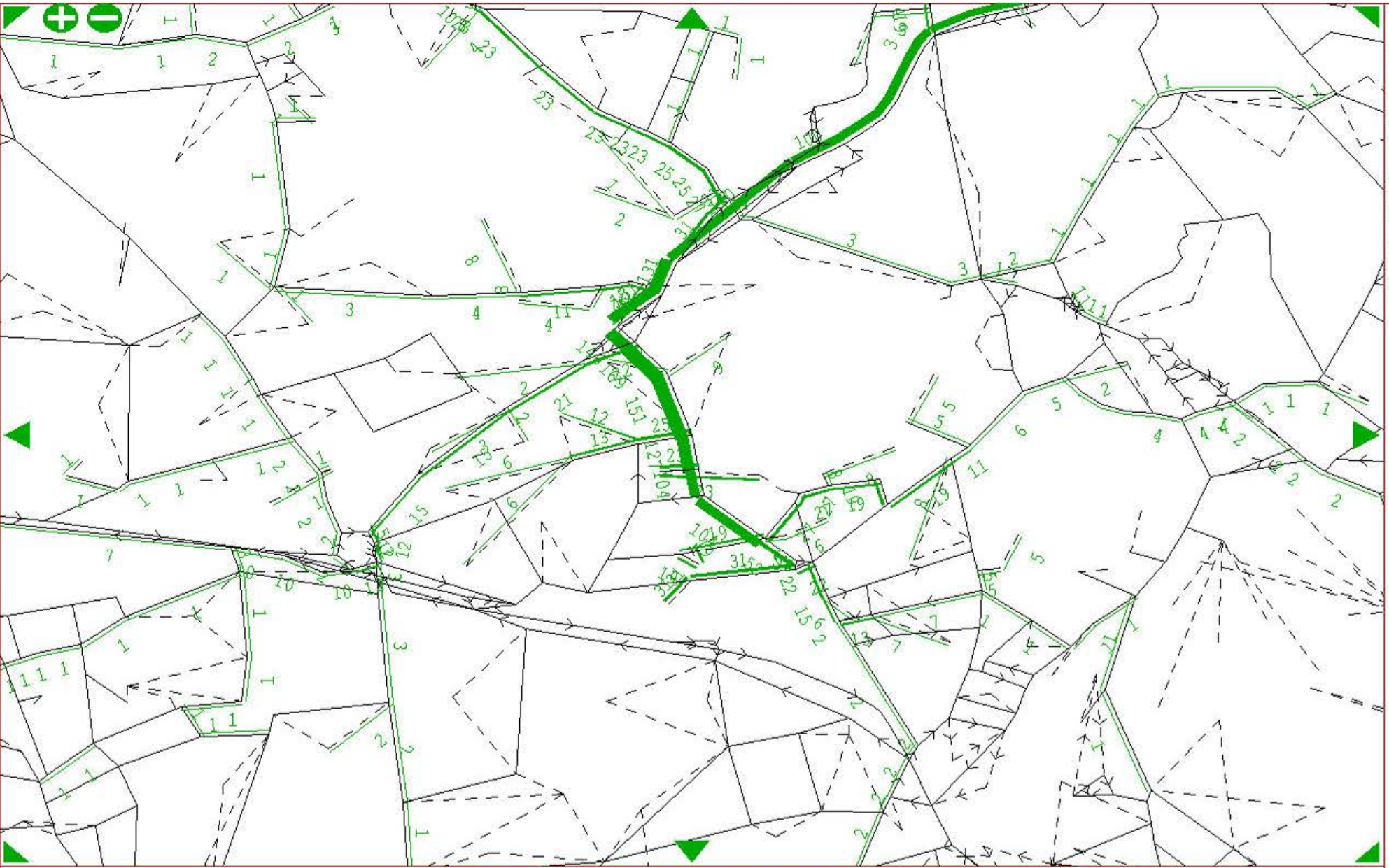

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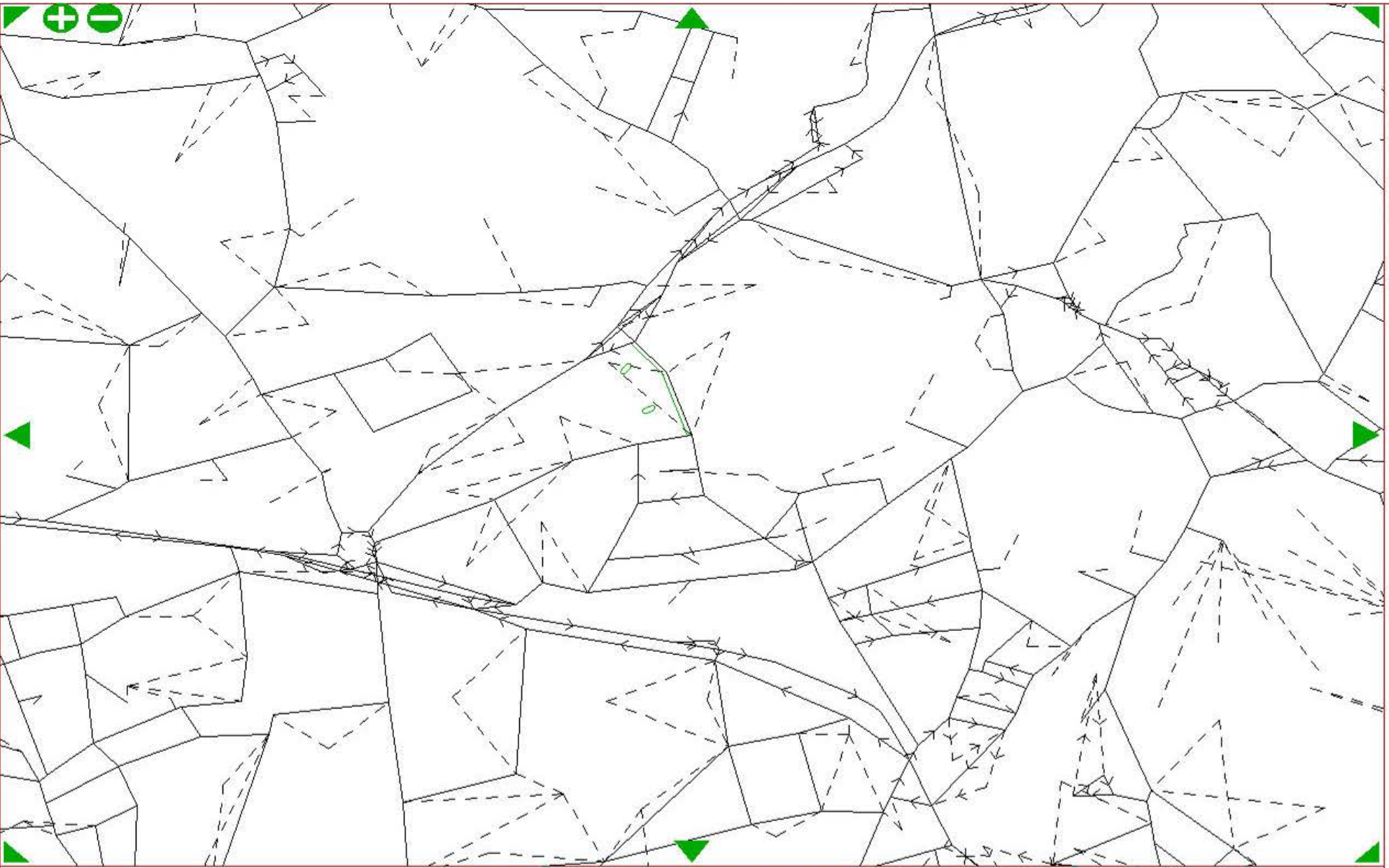

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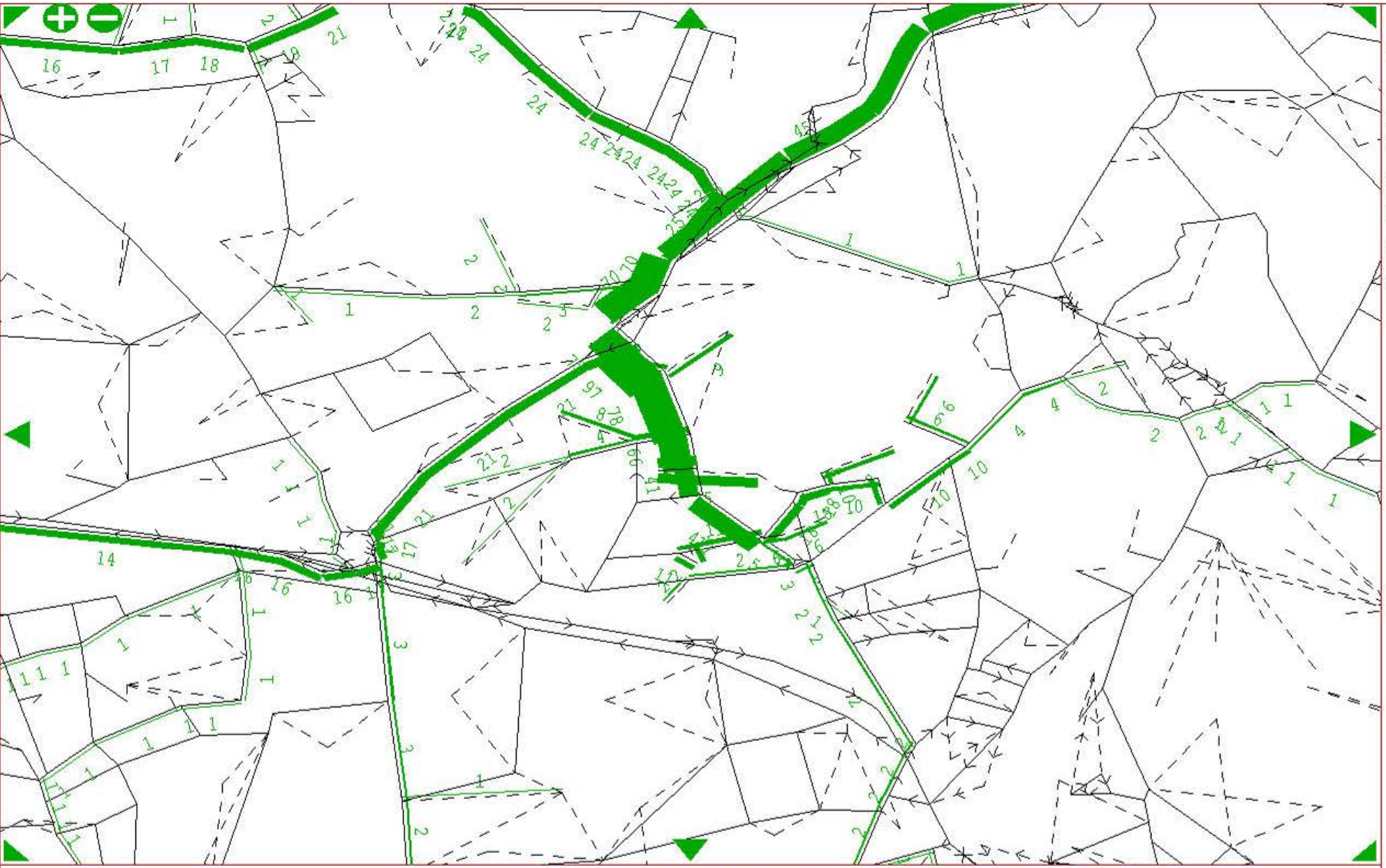

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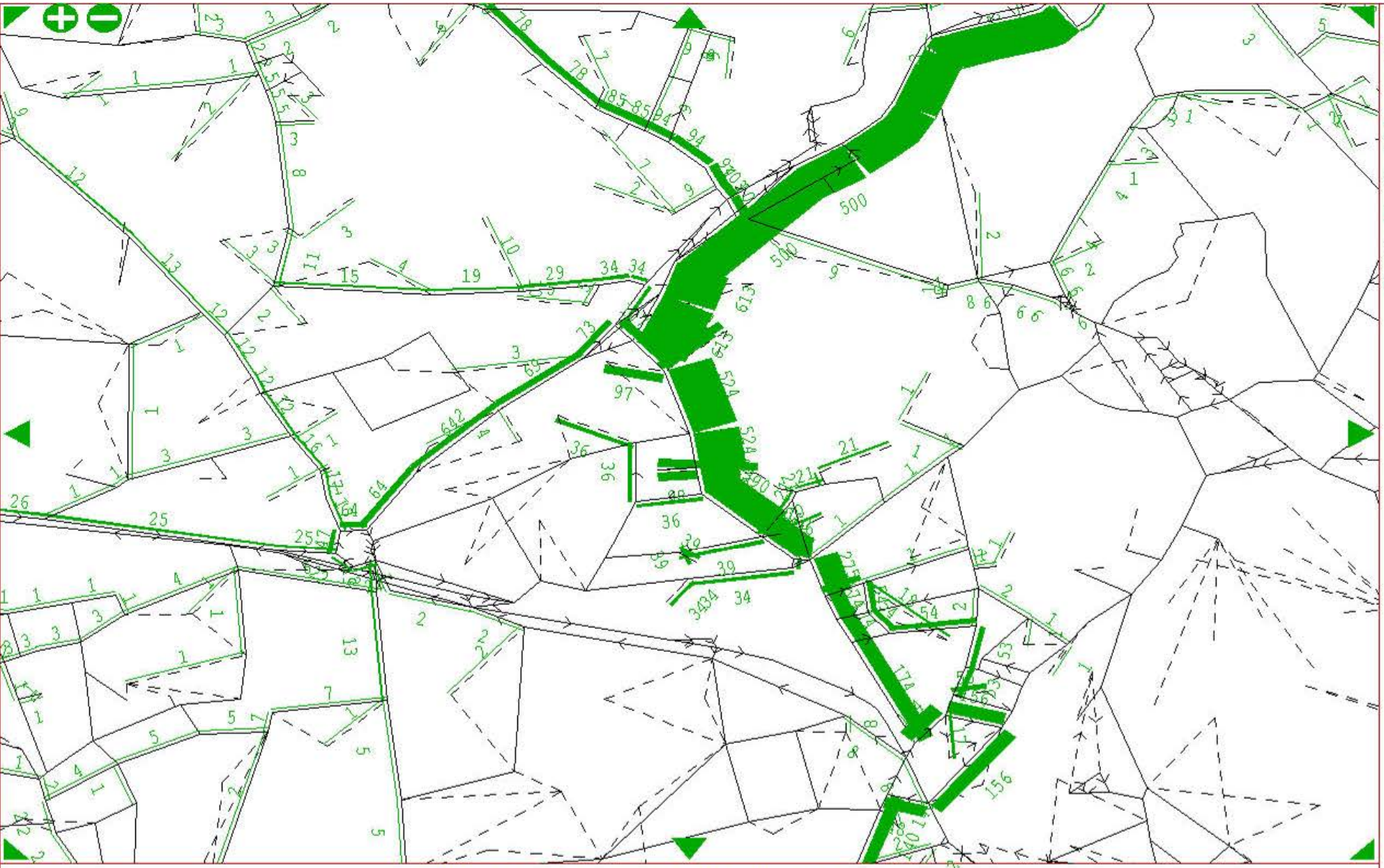

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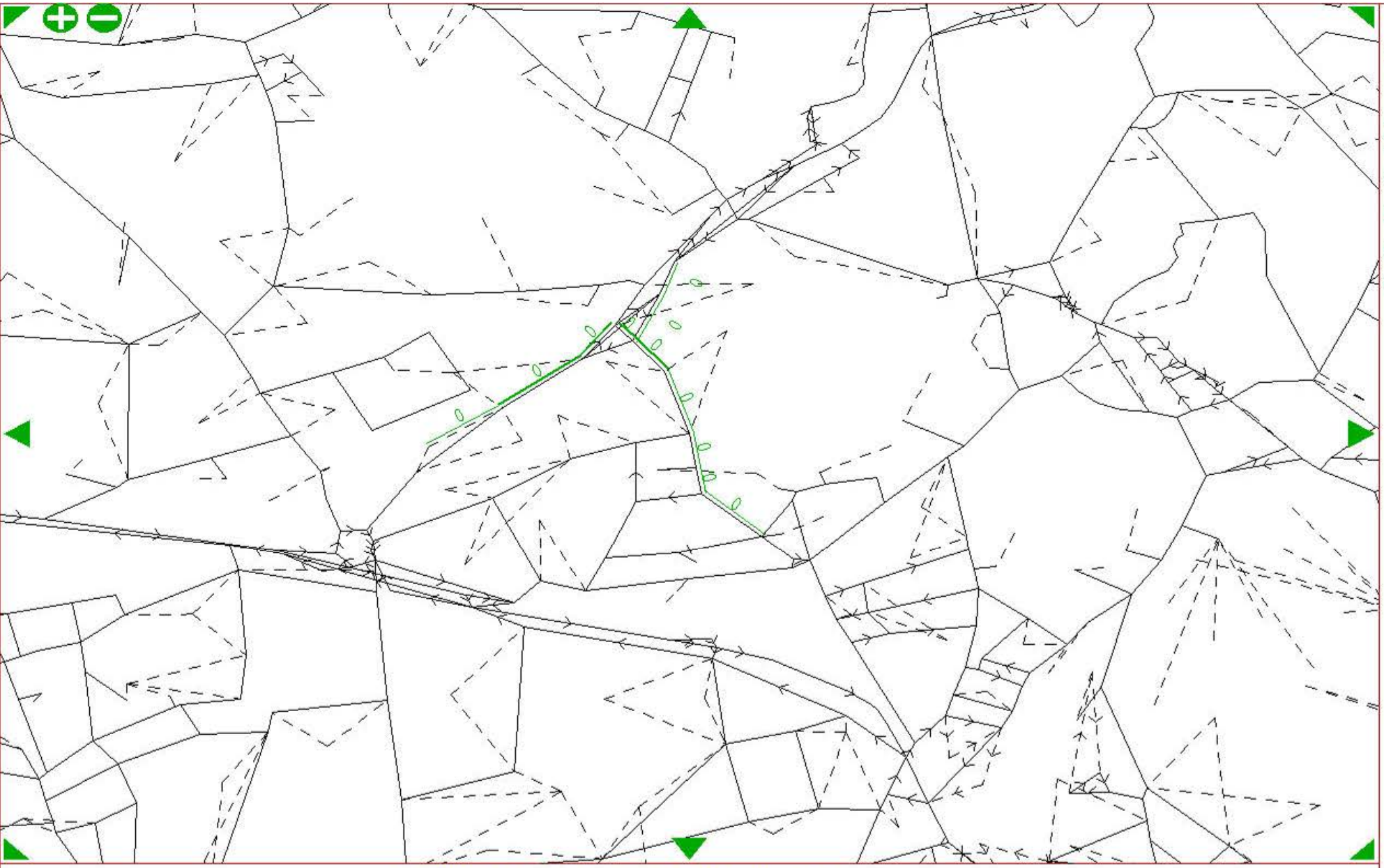

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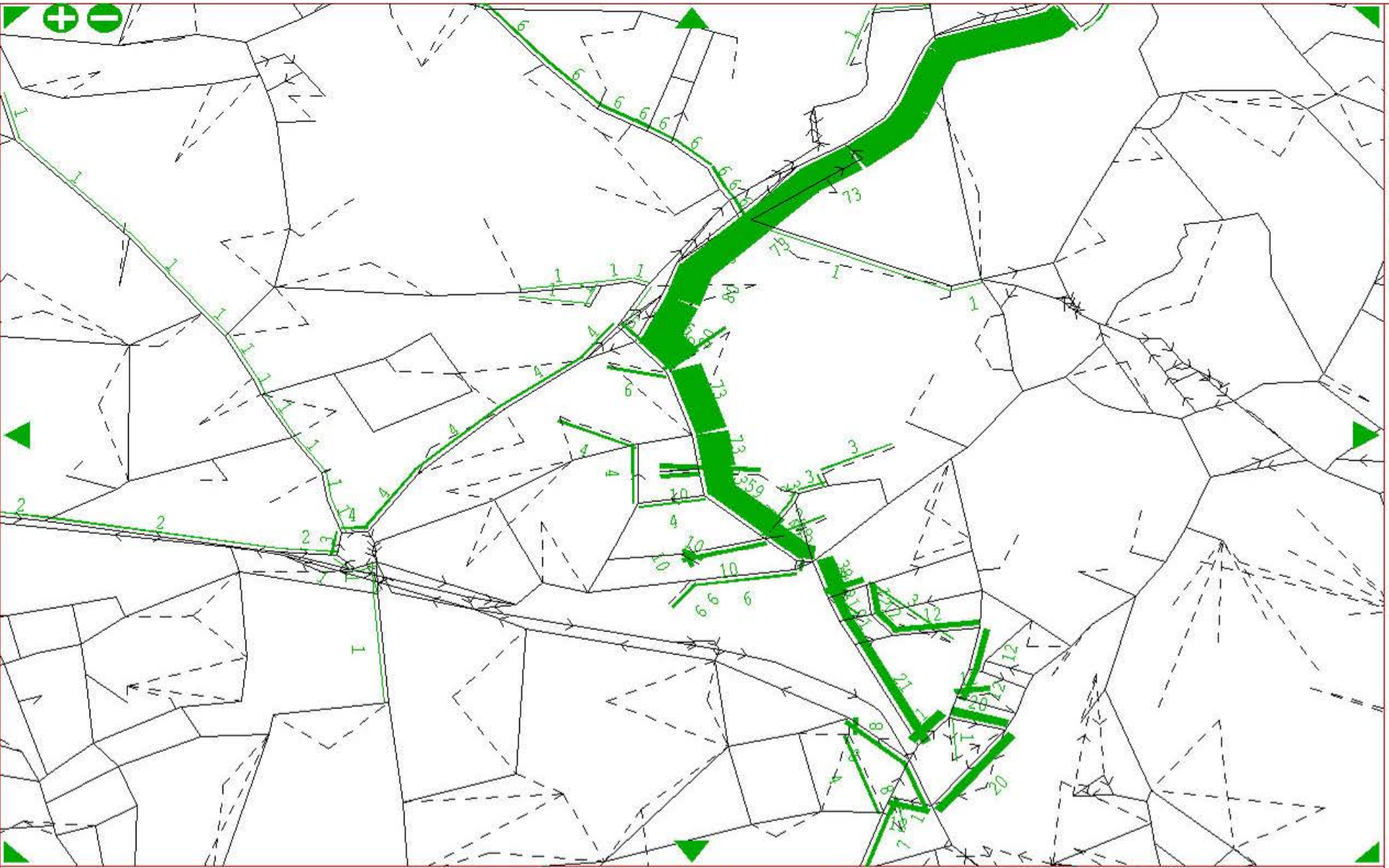

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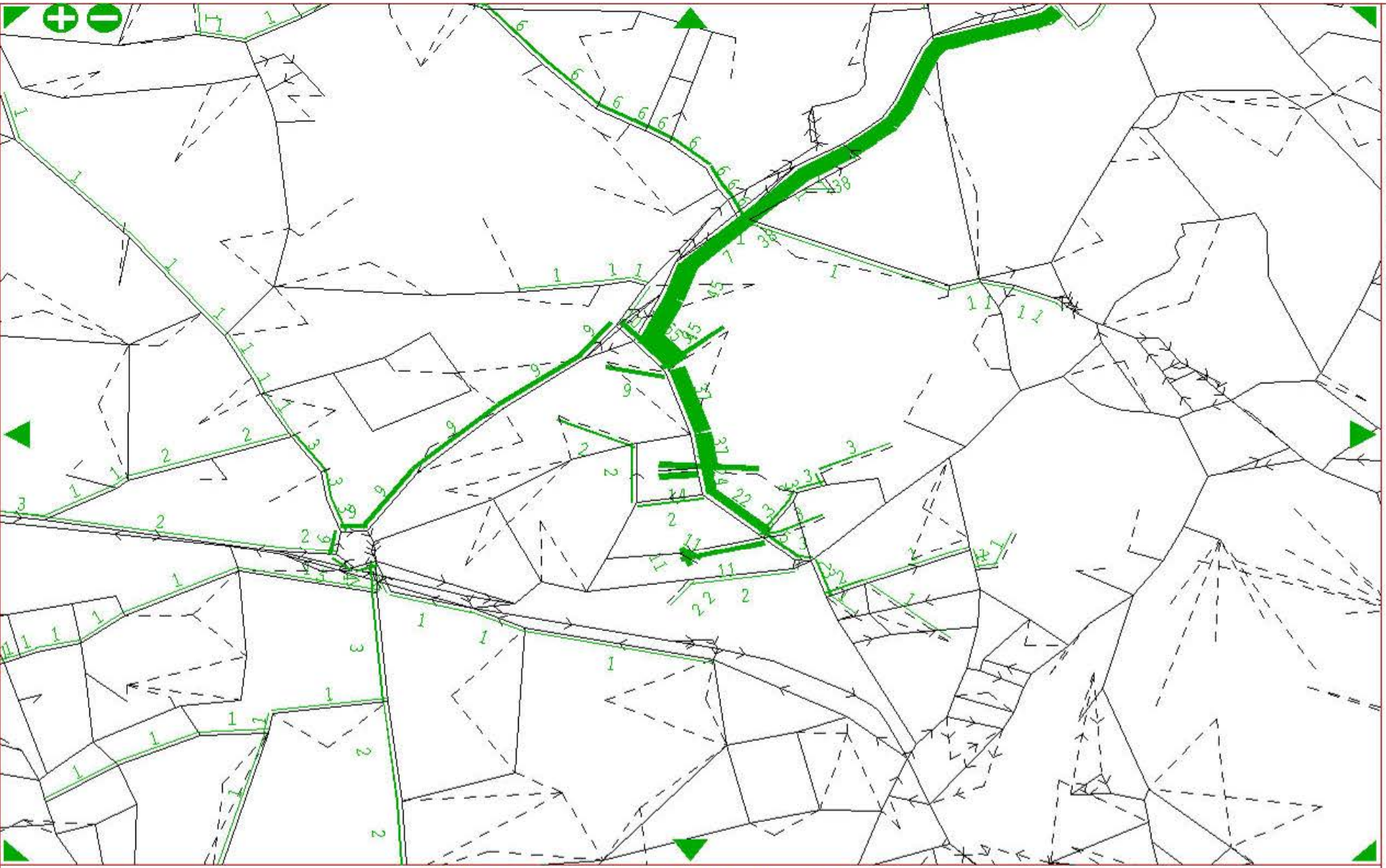

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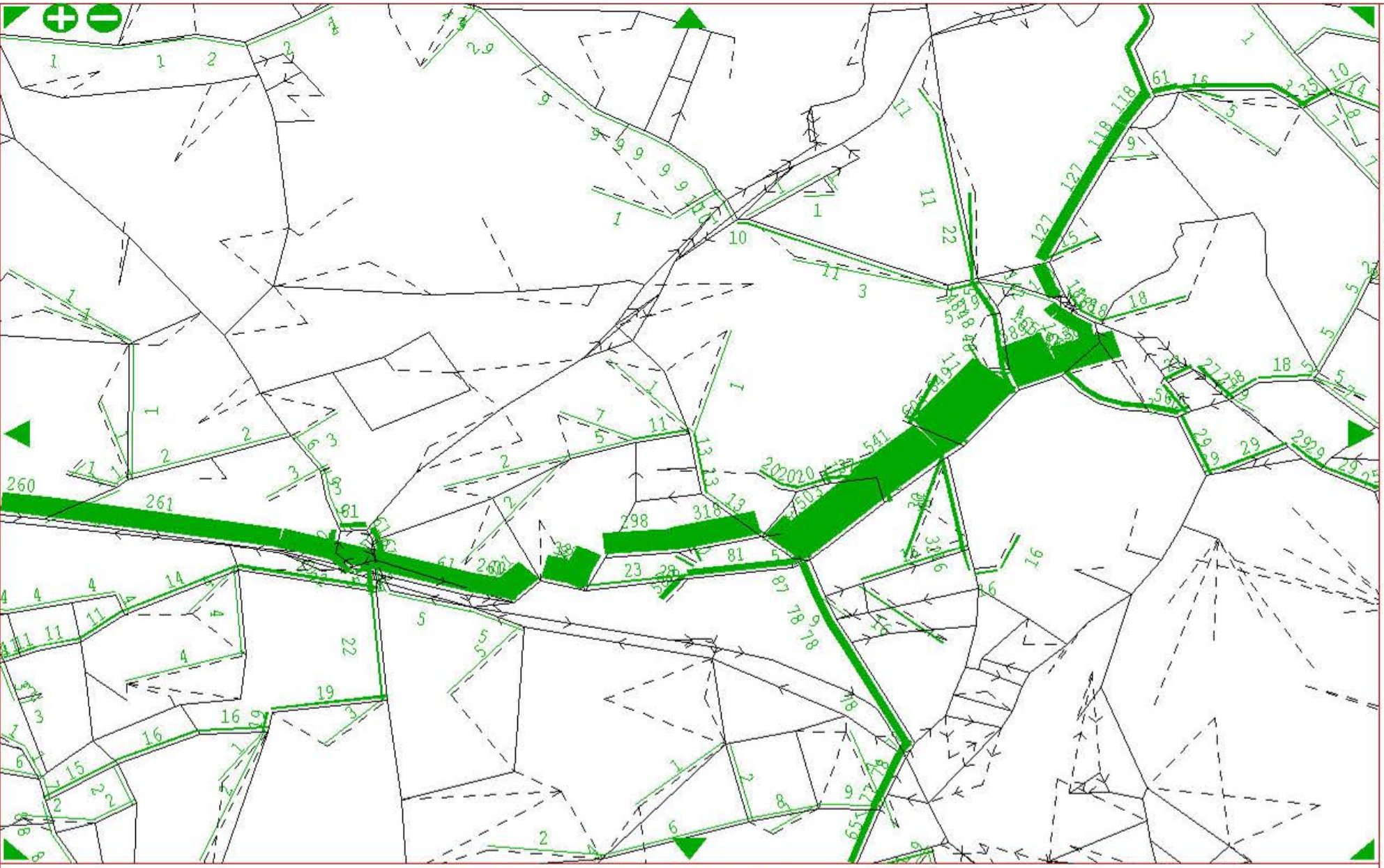

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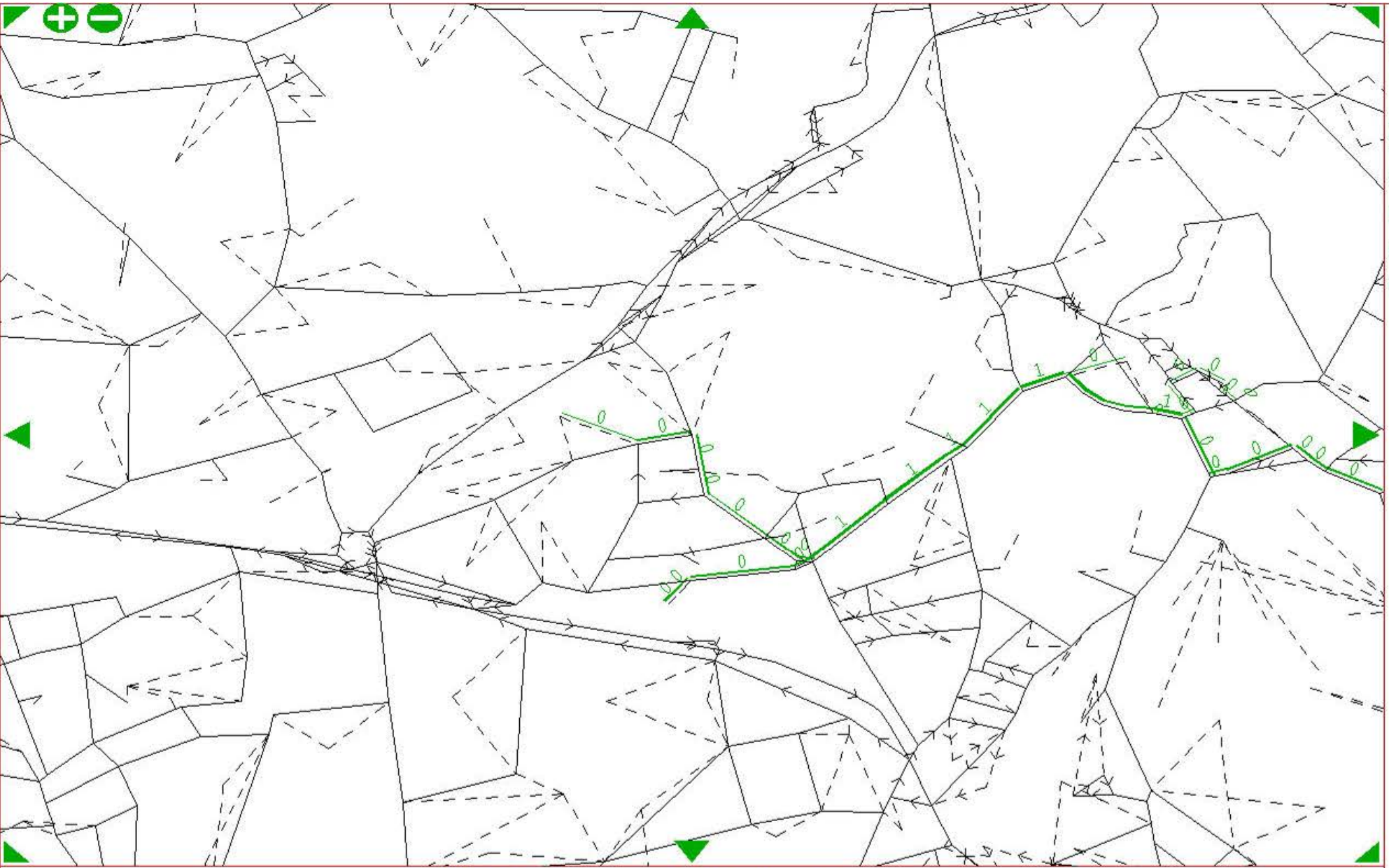

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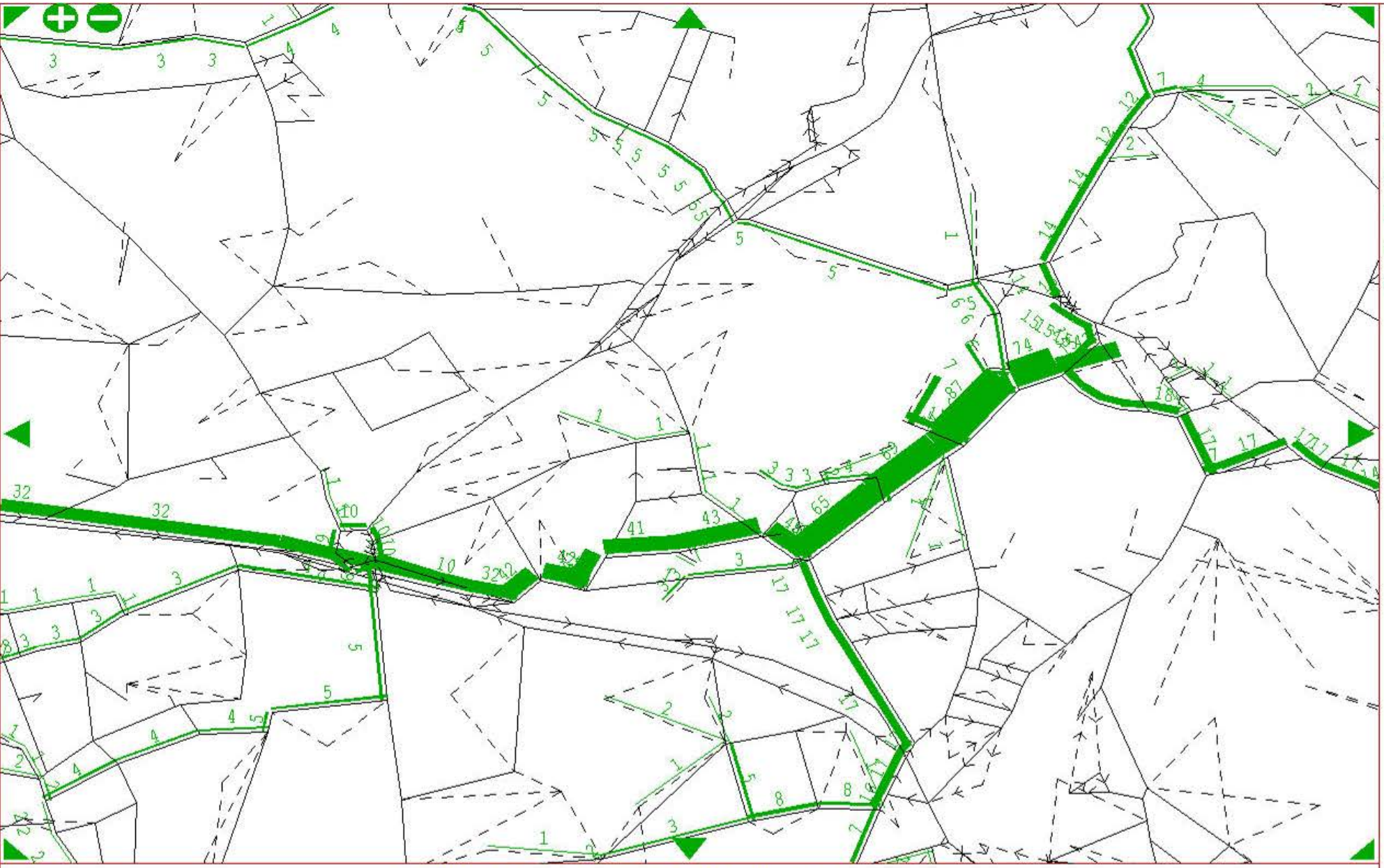

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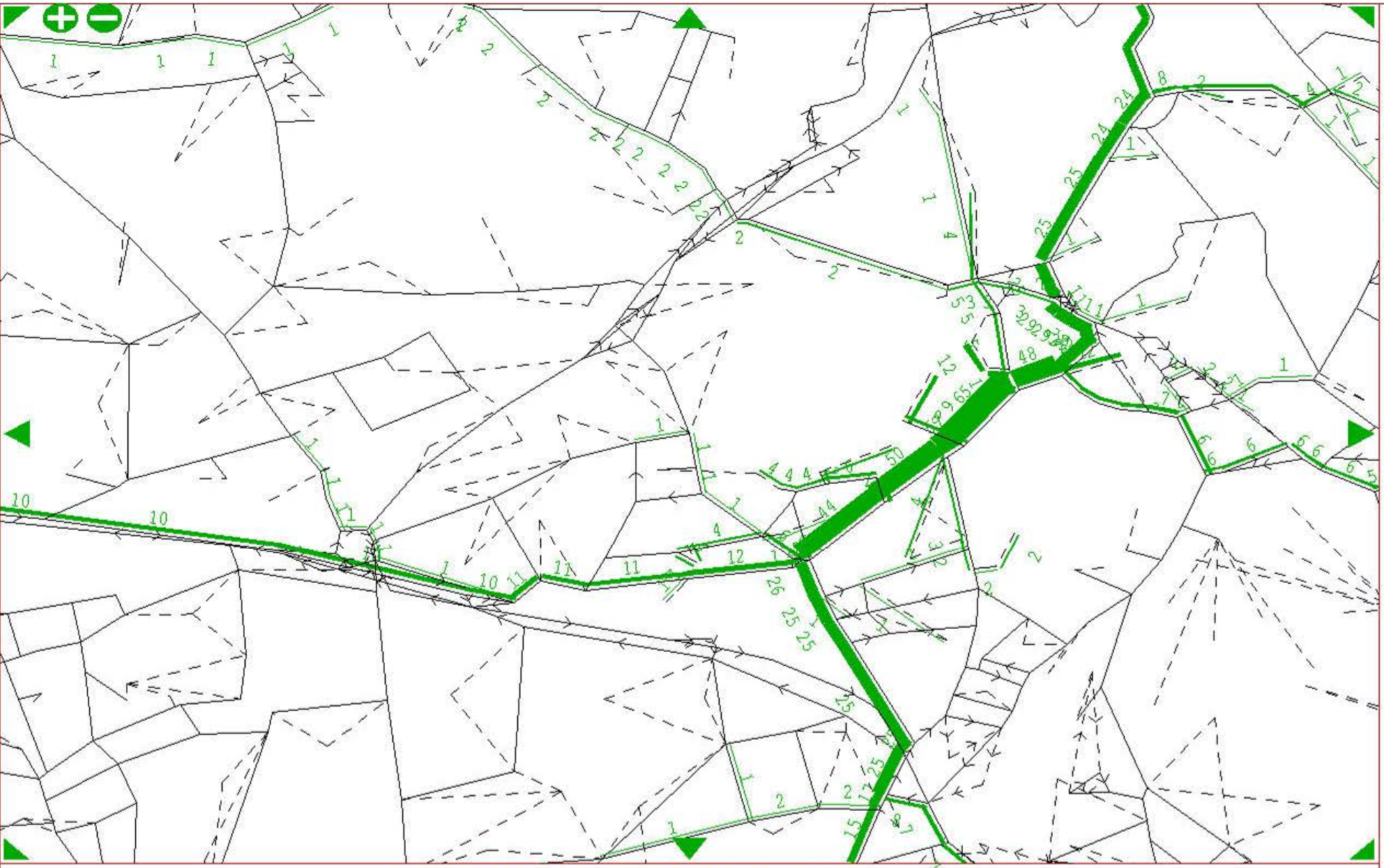

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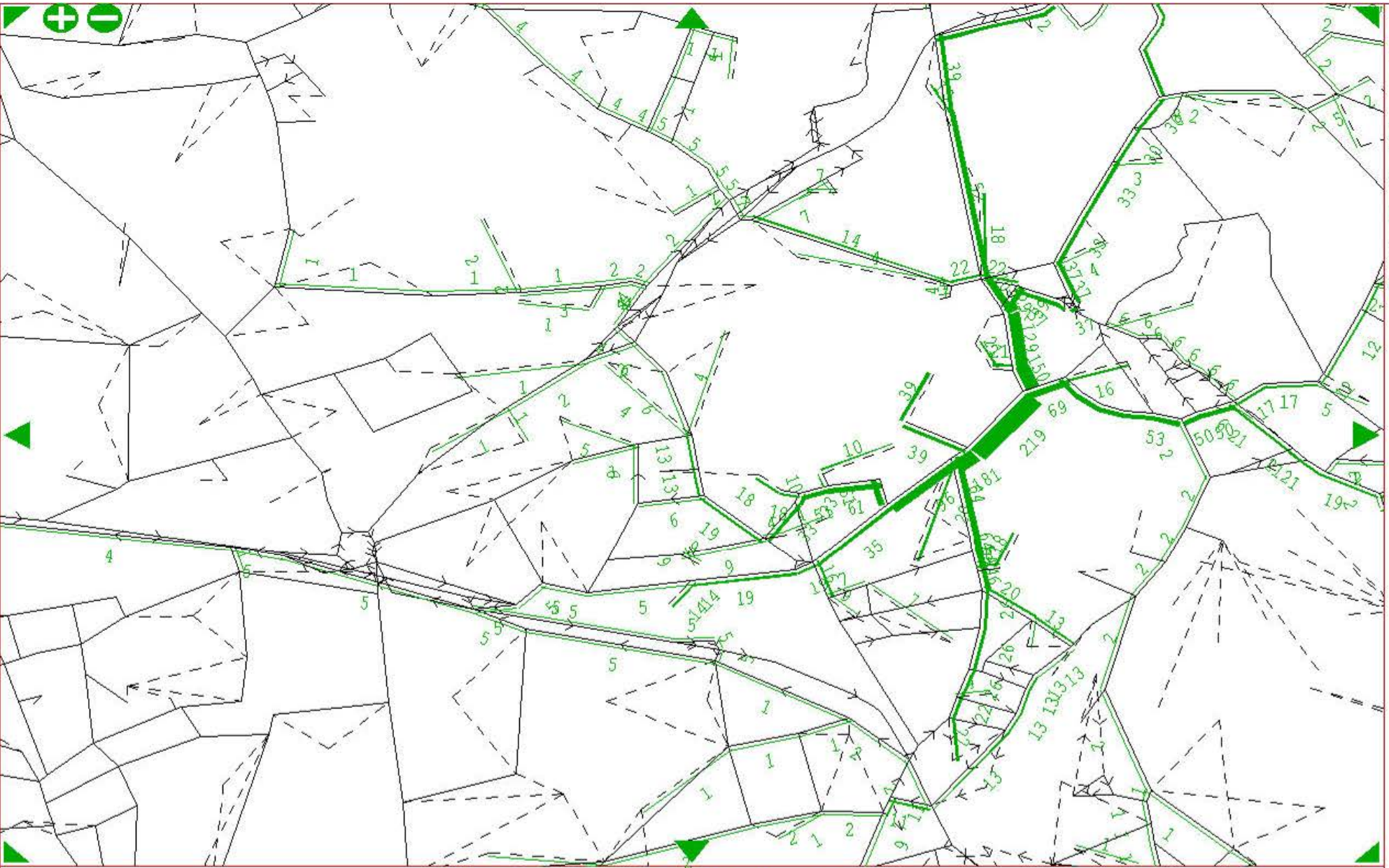

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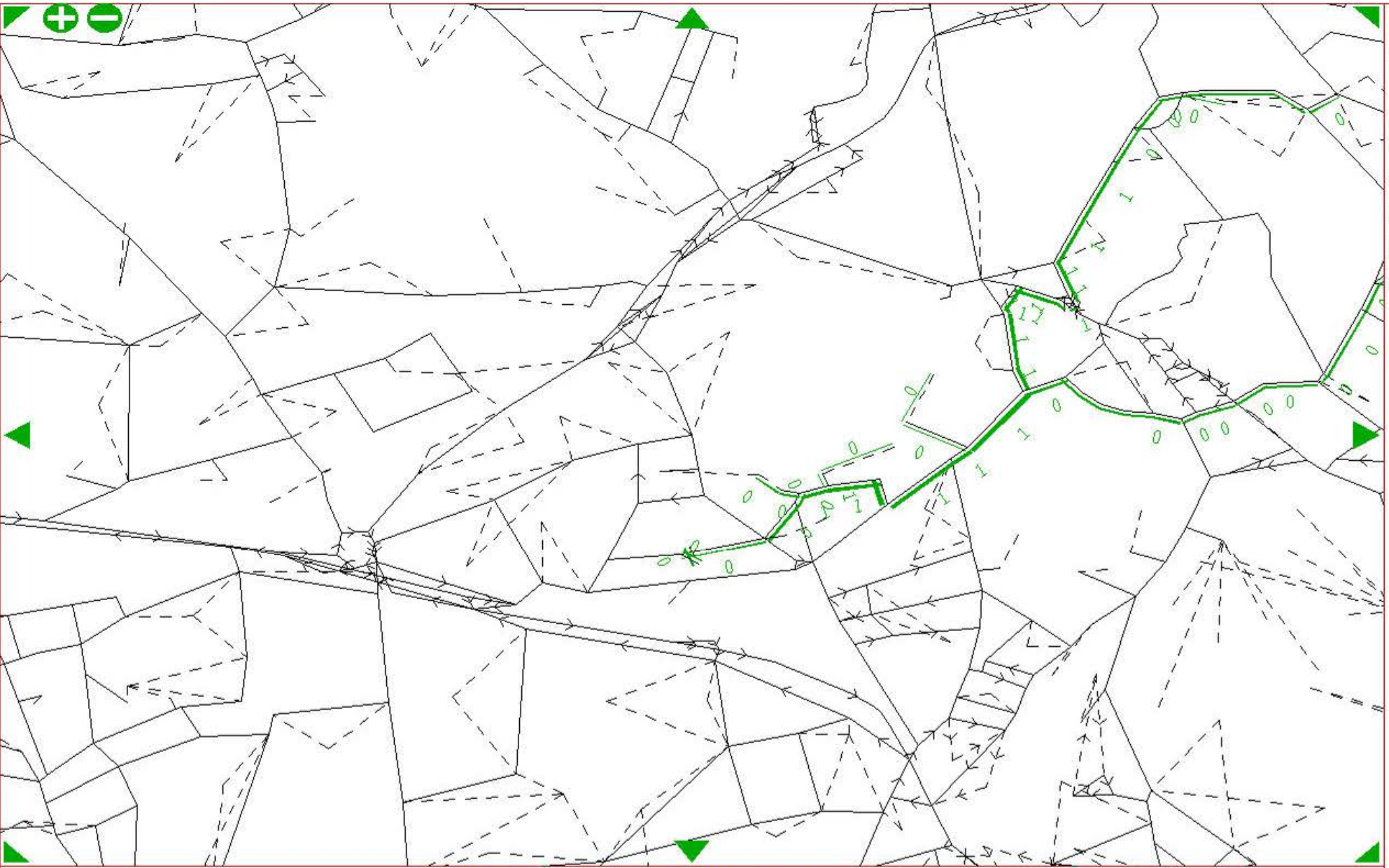

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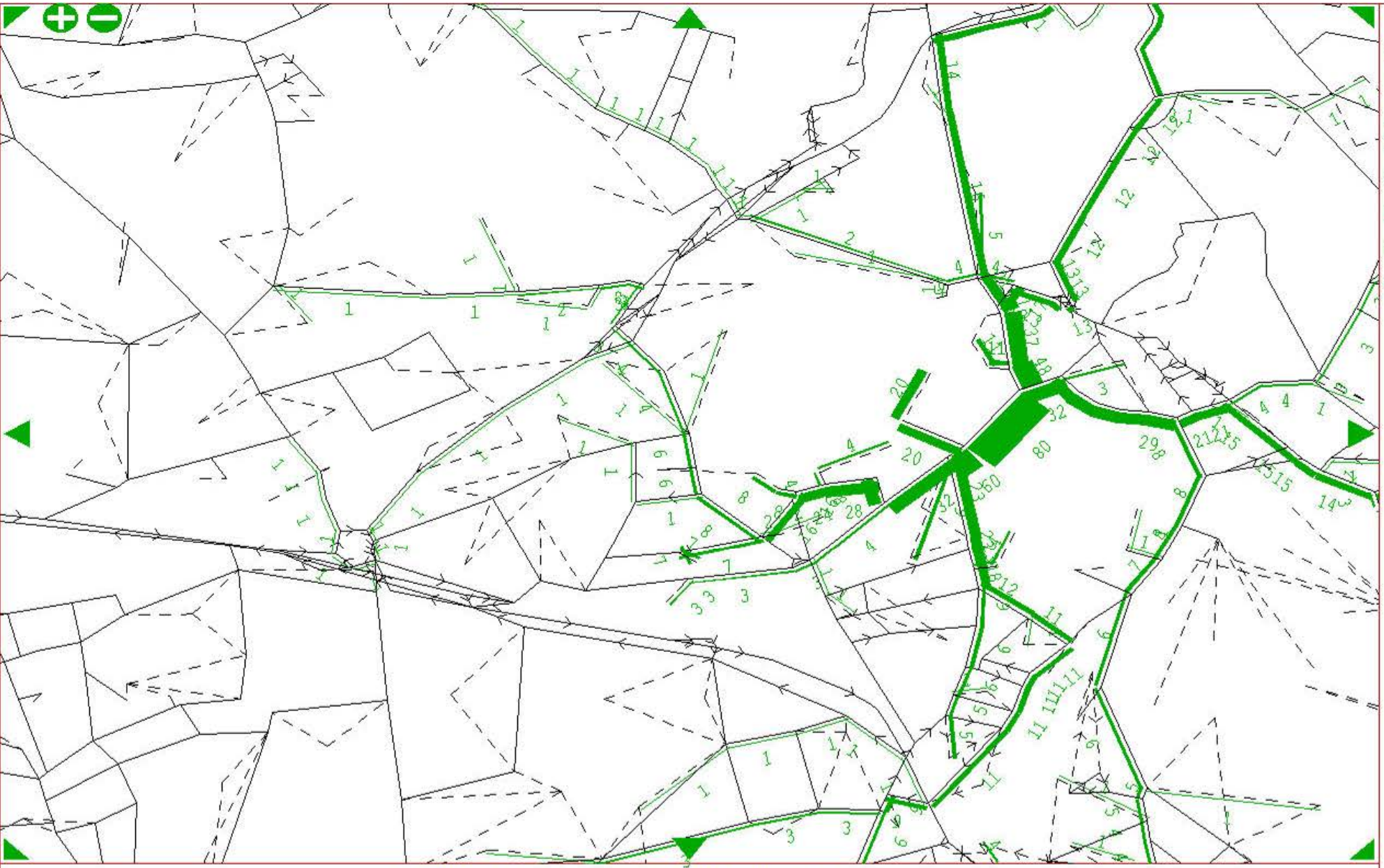

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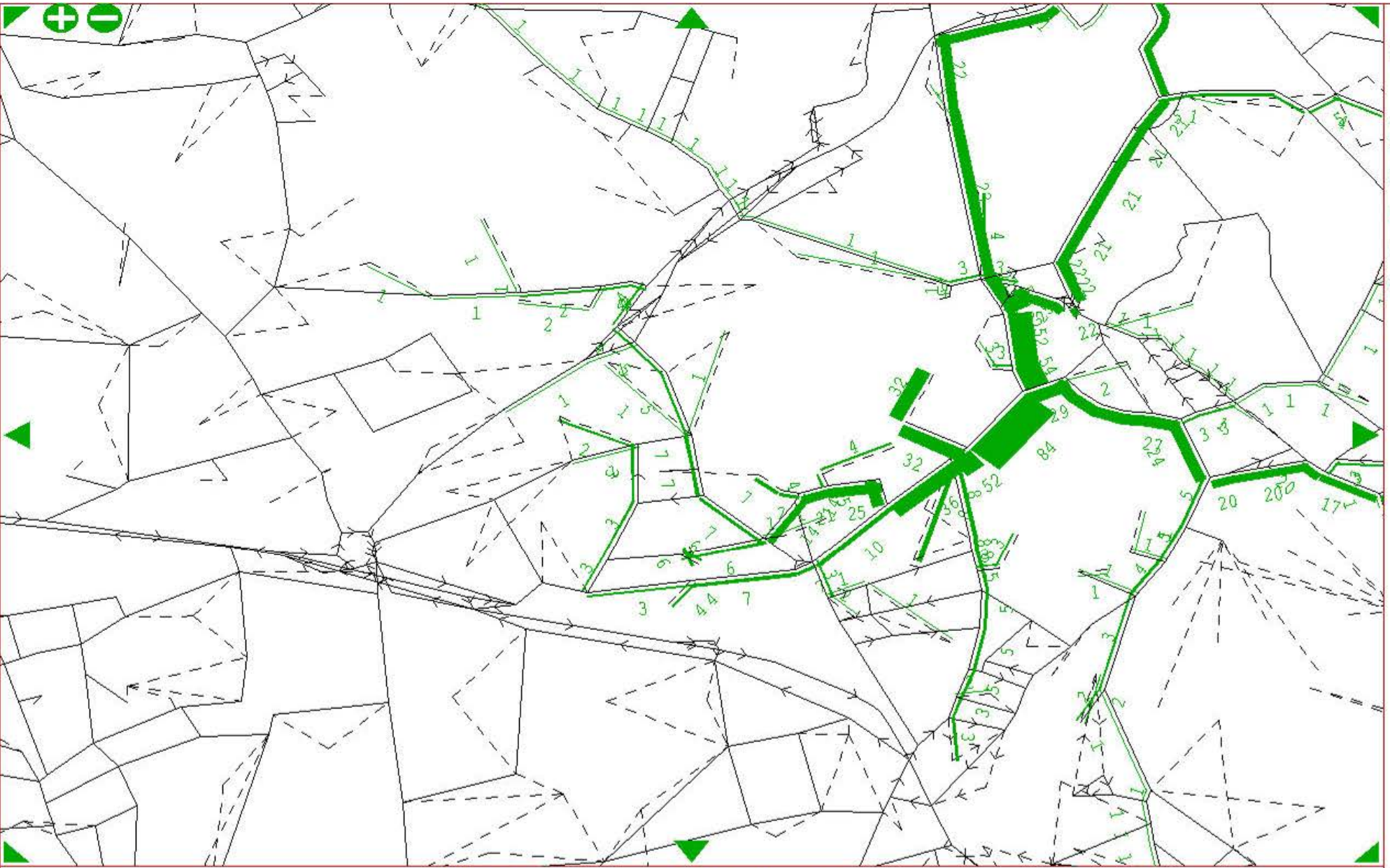

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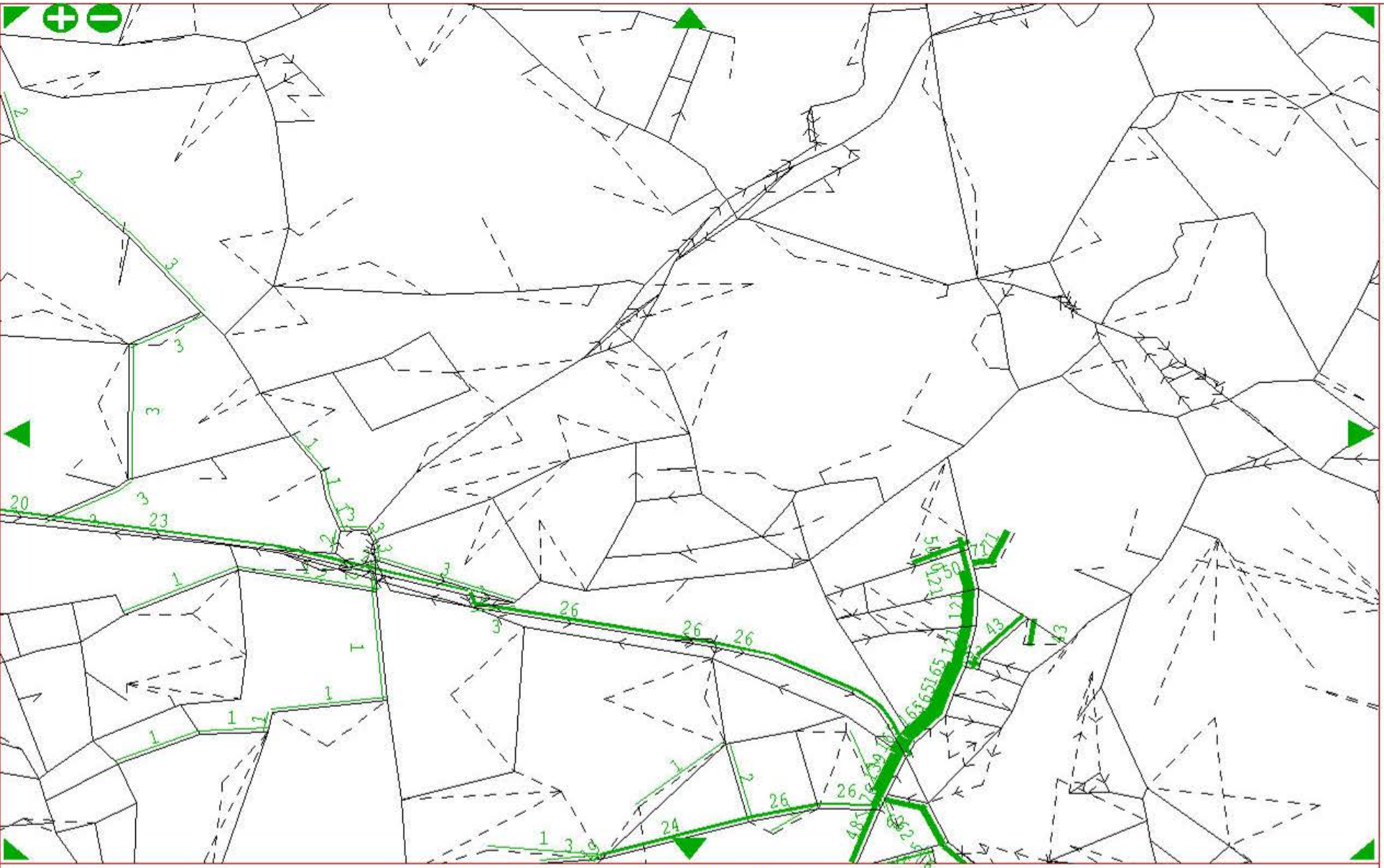

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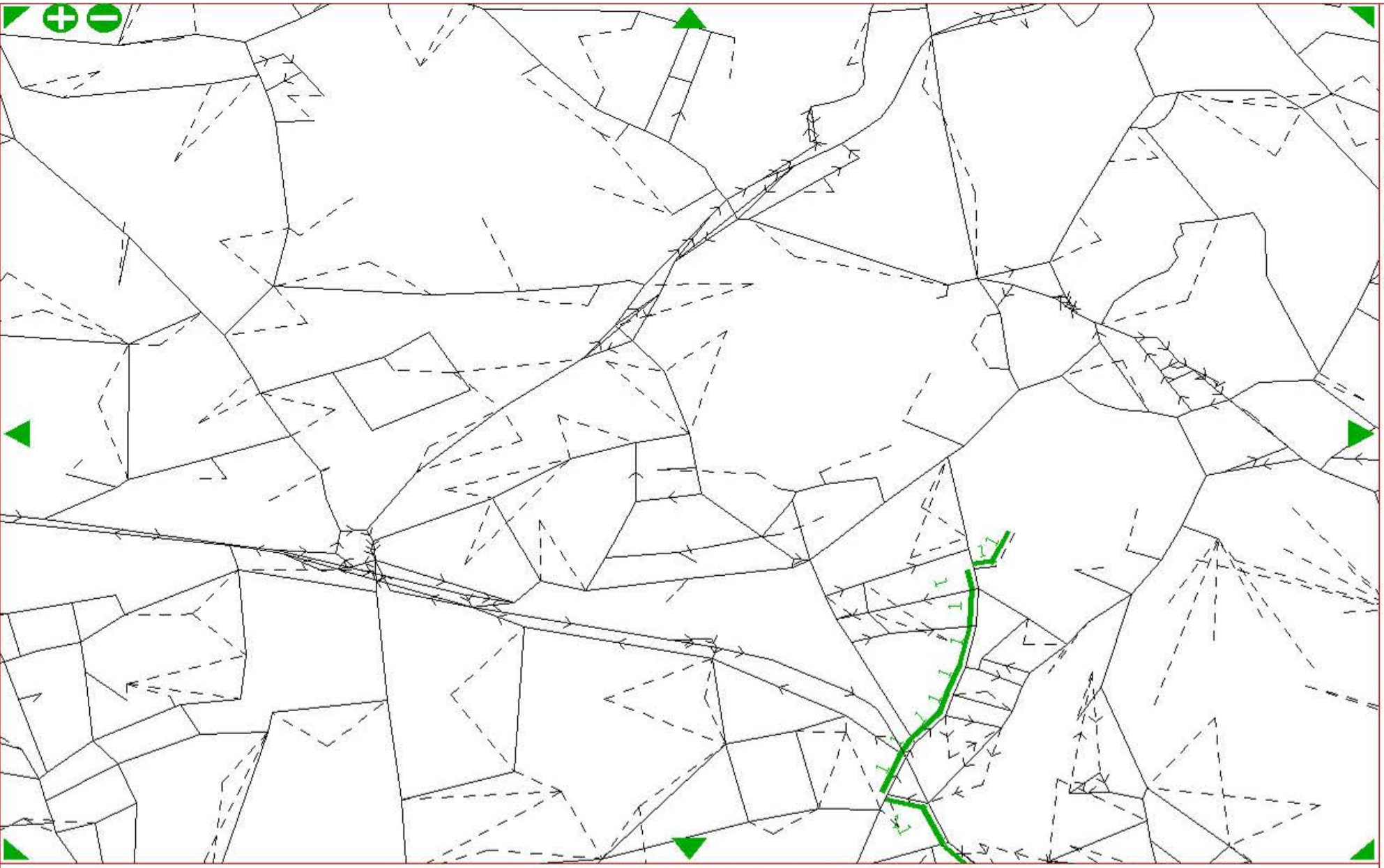

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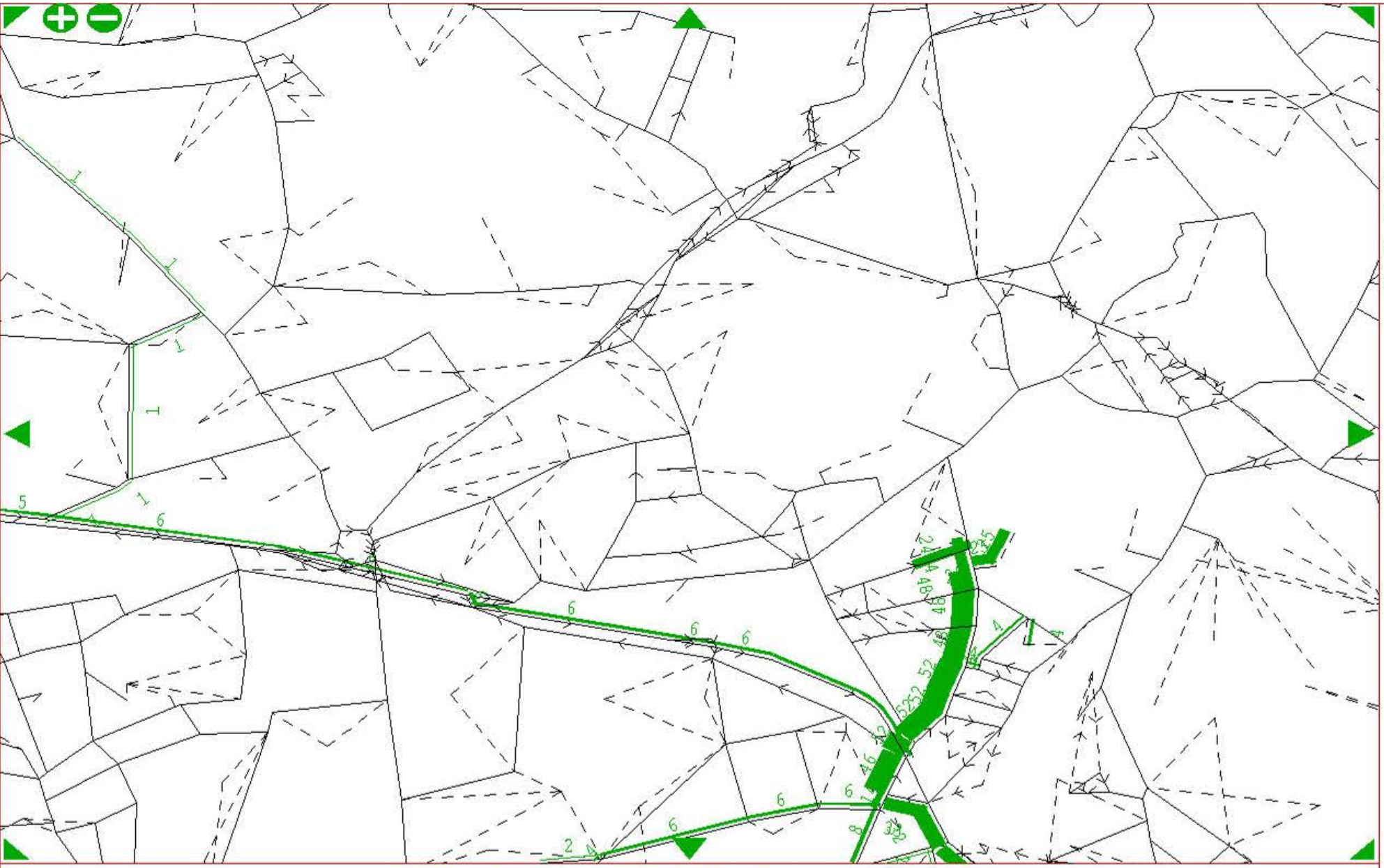

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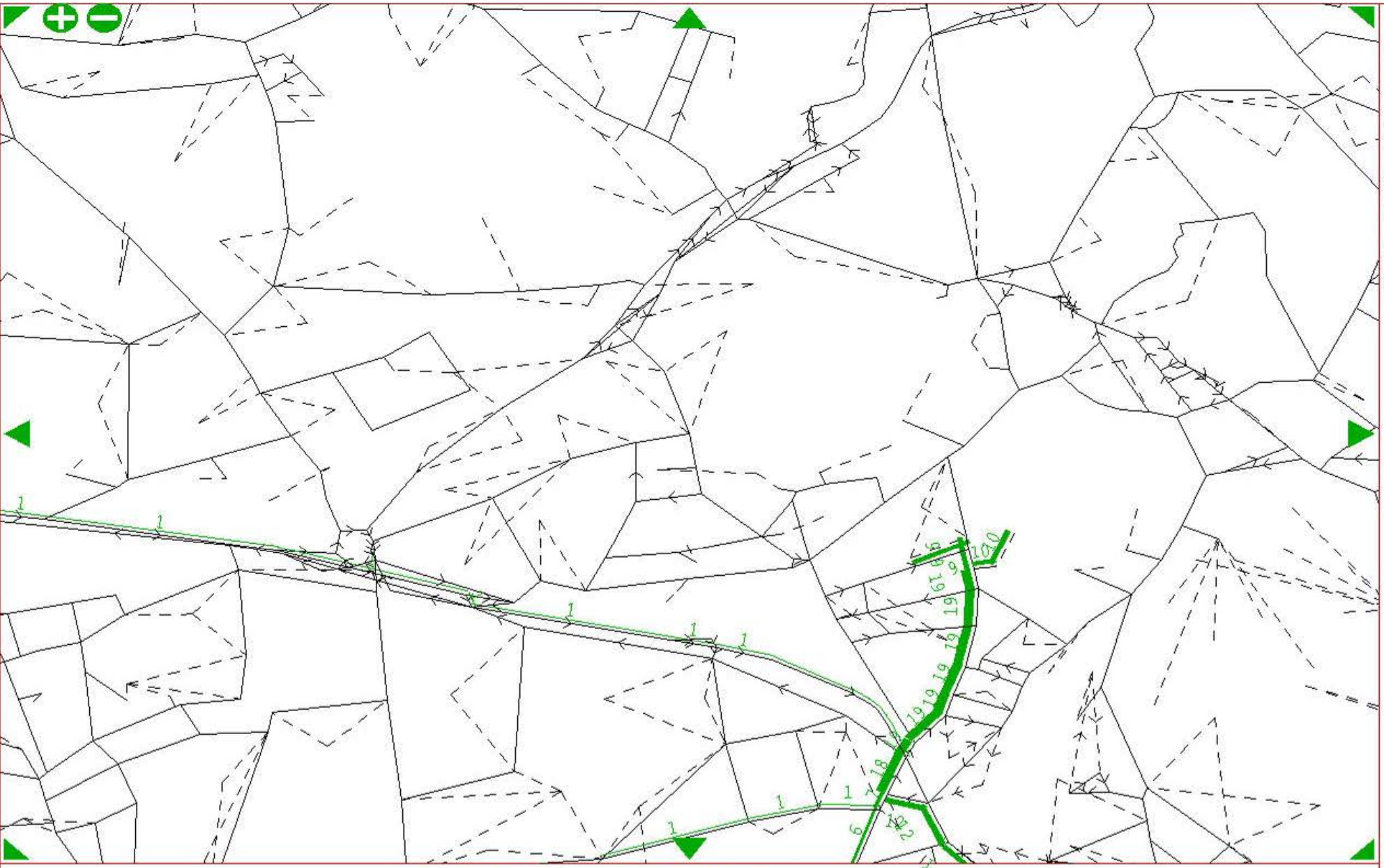

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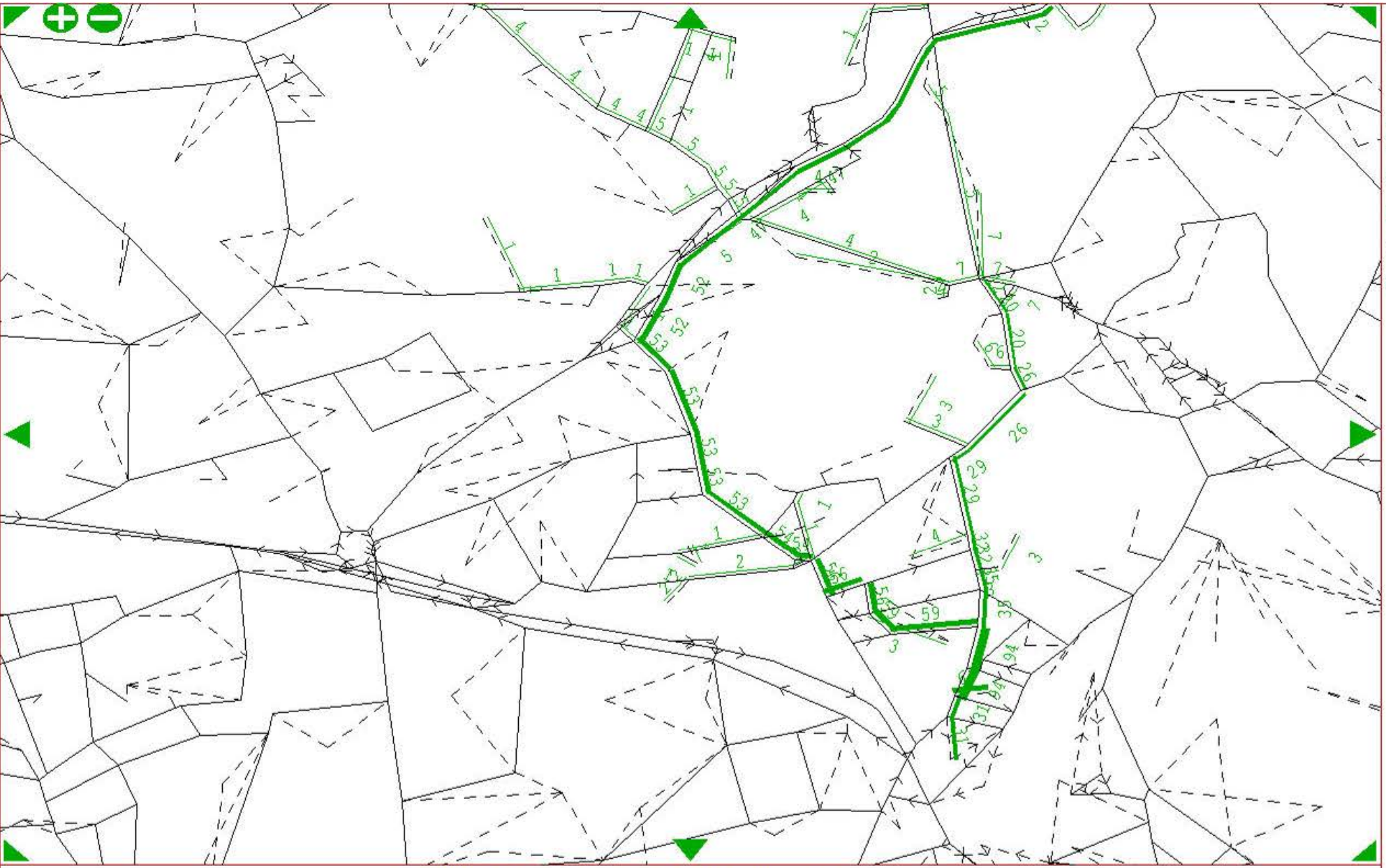

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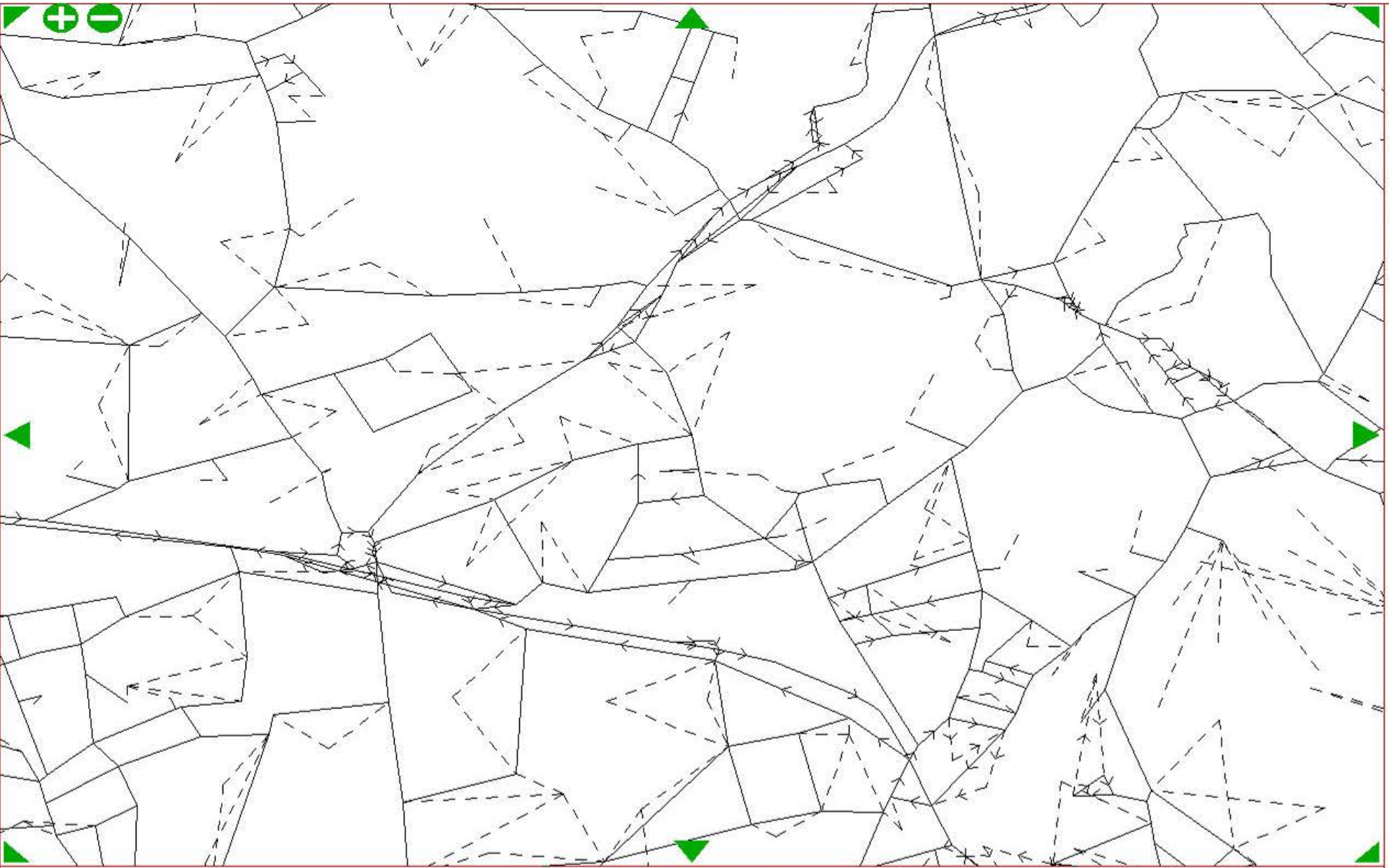

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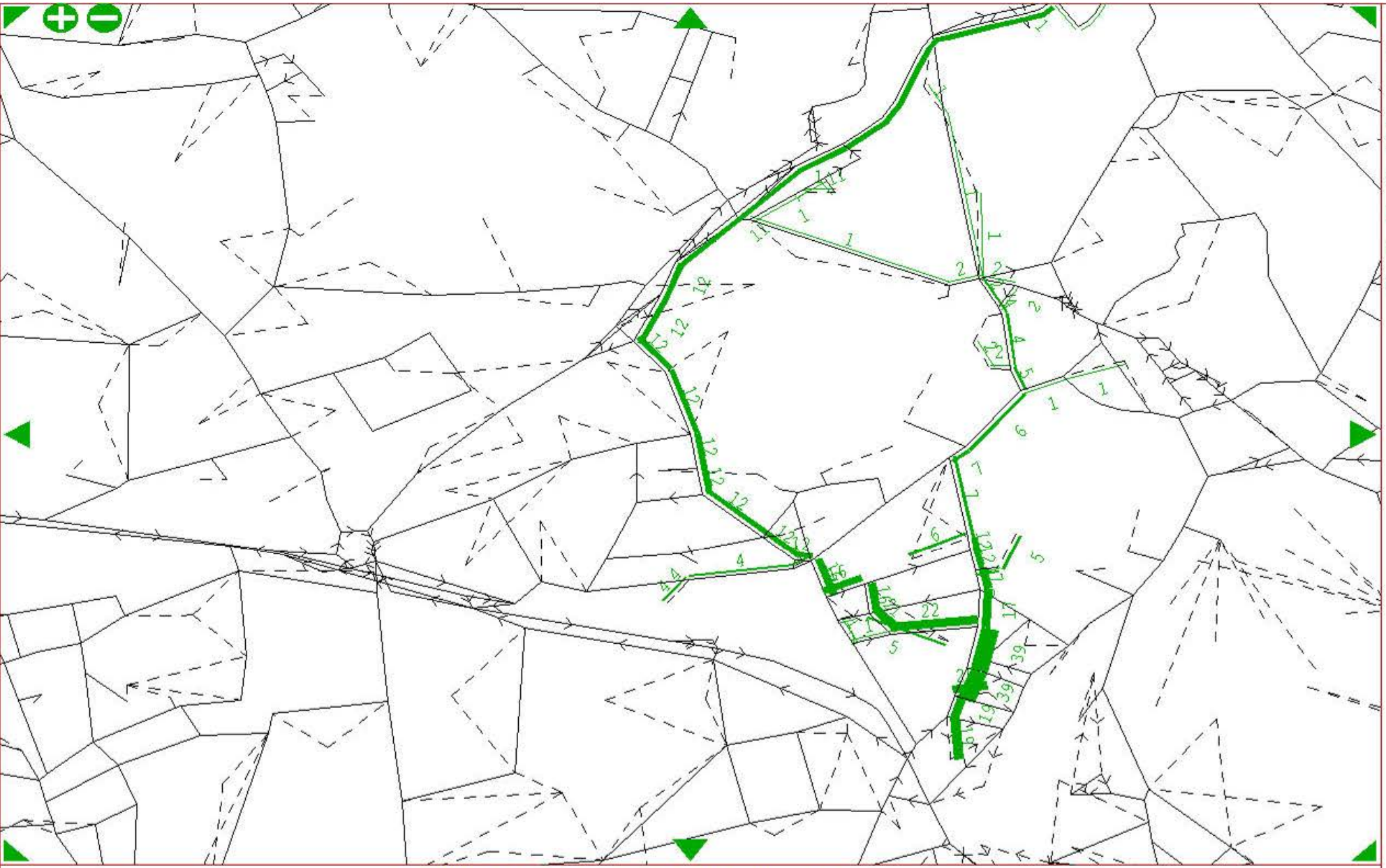

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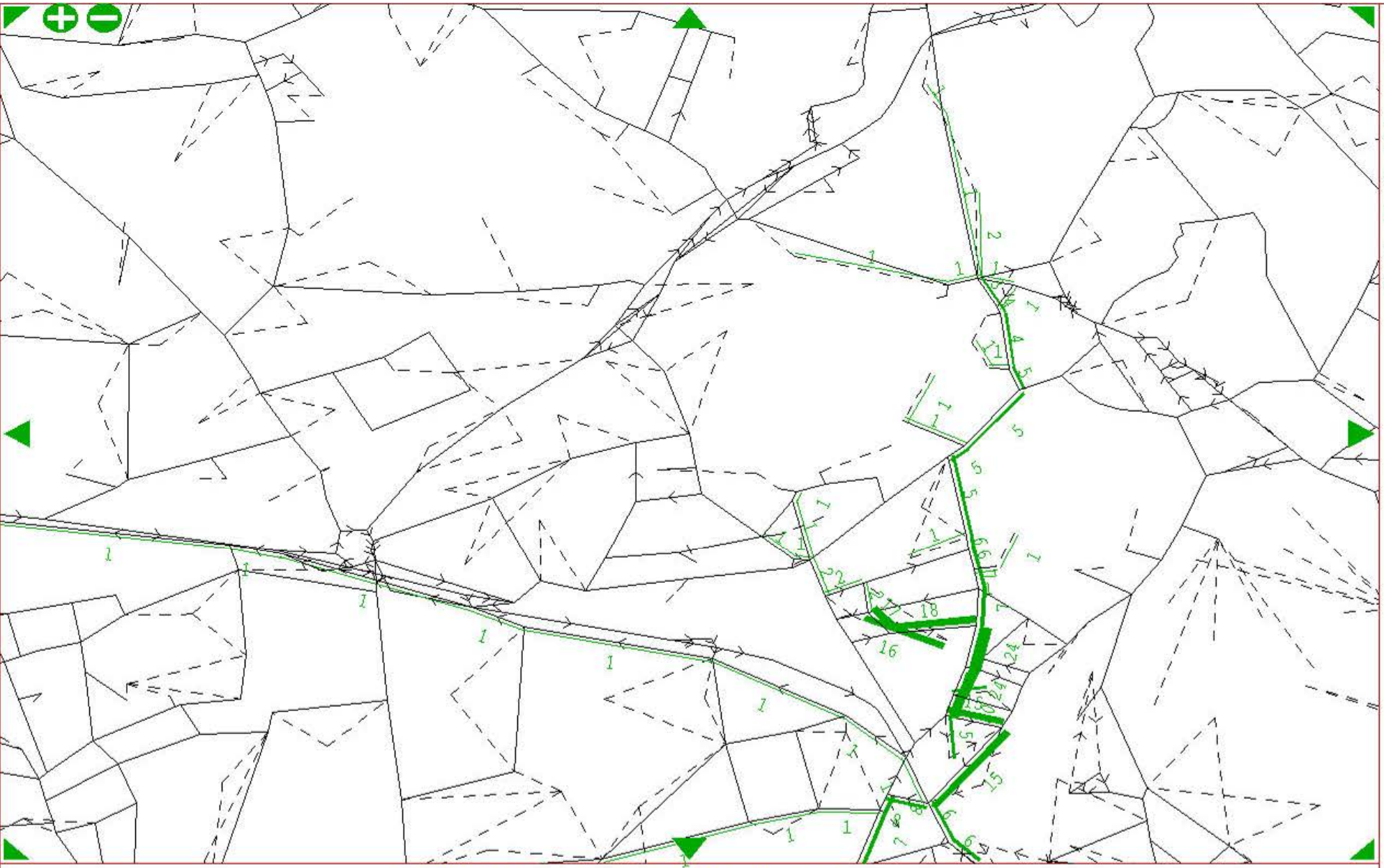

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Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

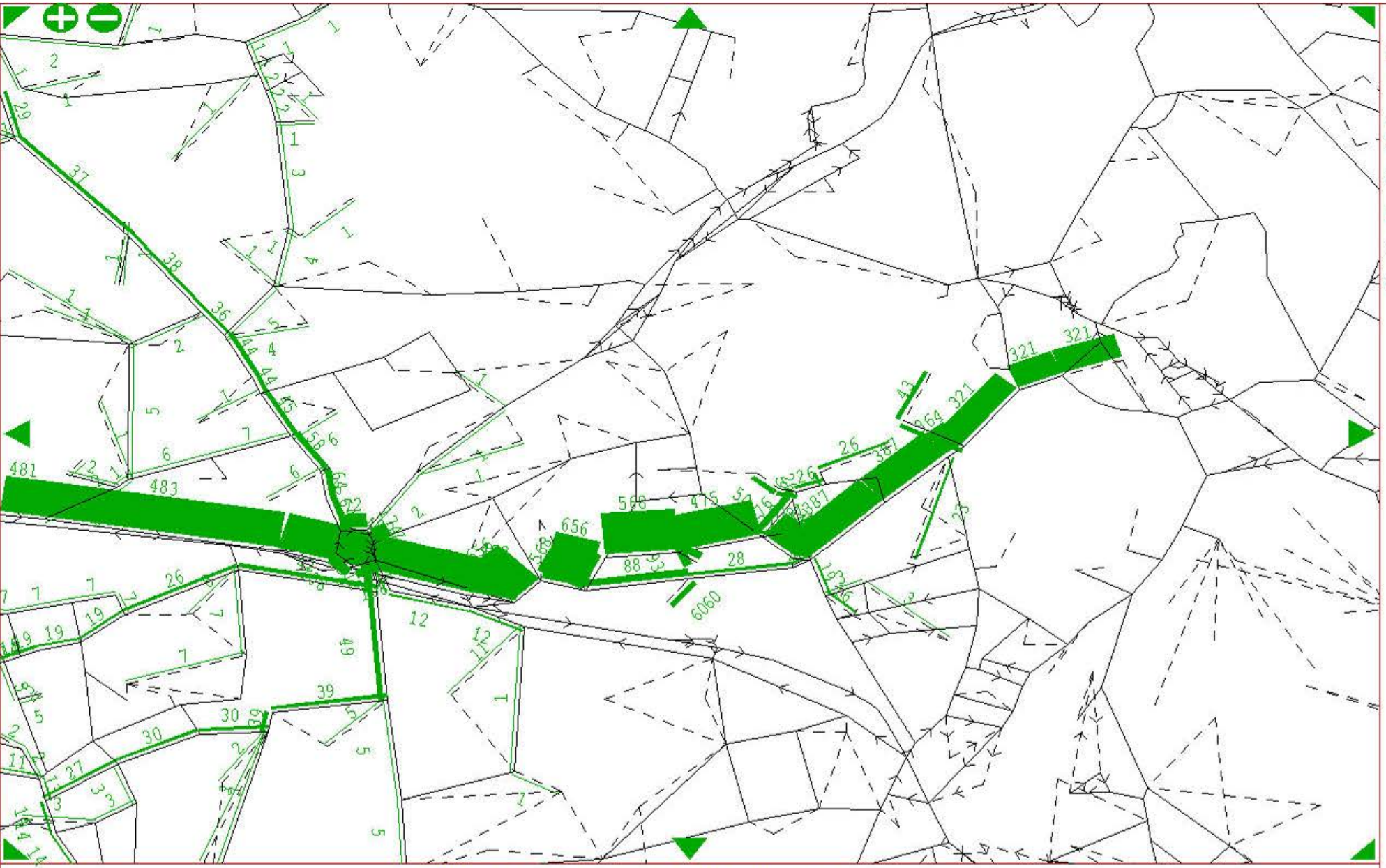
Link Annot:

U5

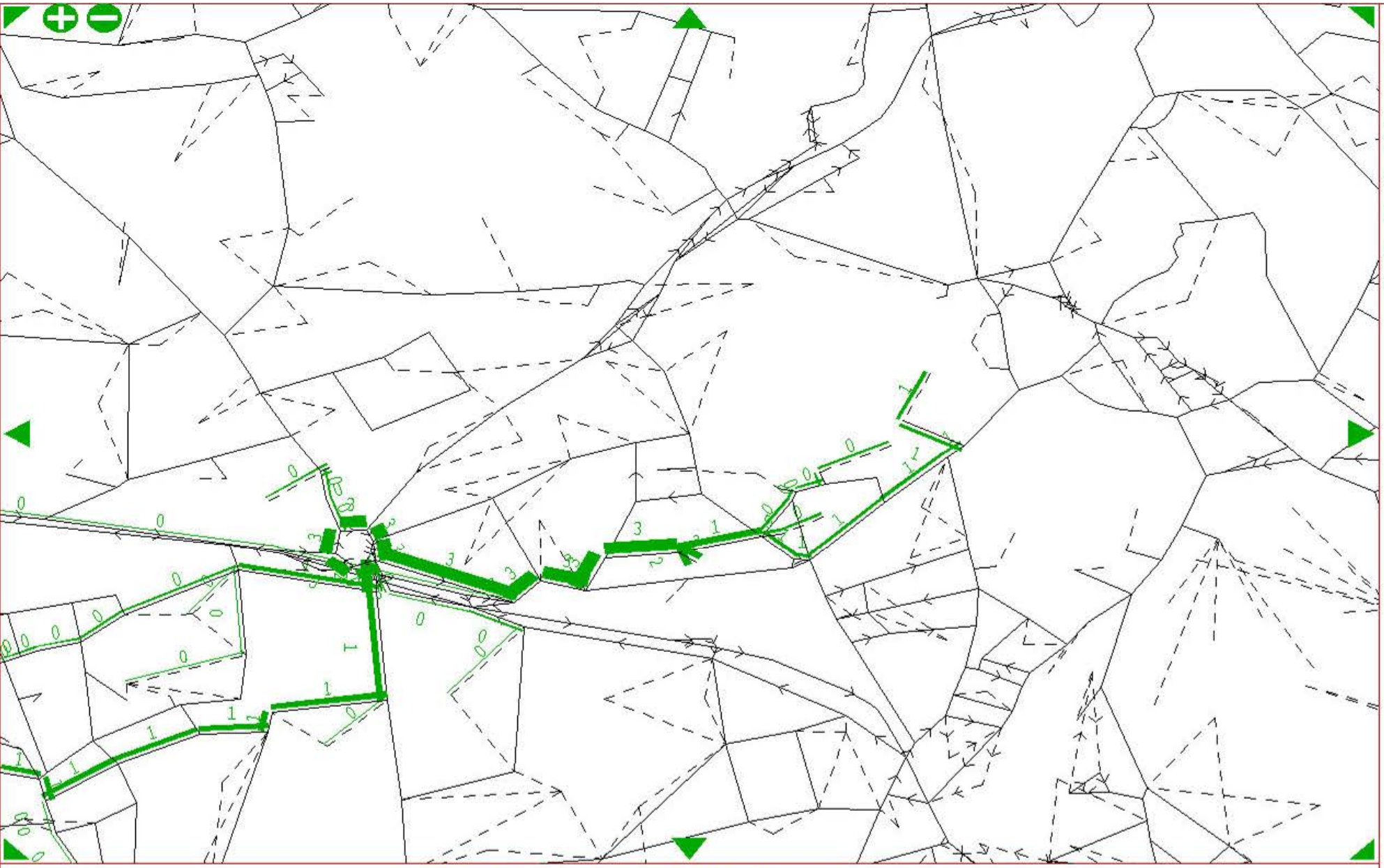
Bandwidths =
10./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
STEER DAVIES



LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

Link Annot:

U3

Bandwidths =
1./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
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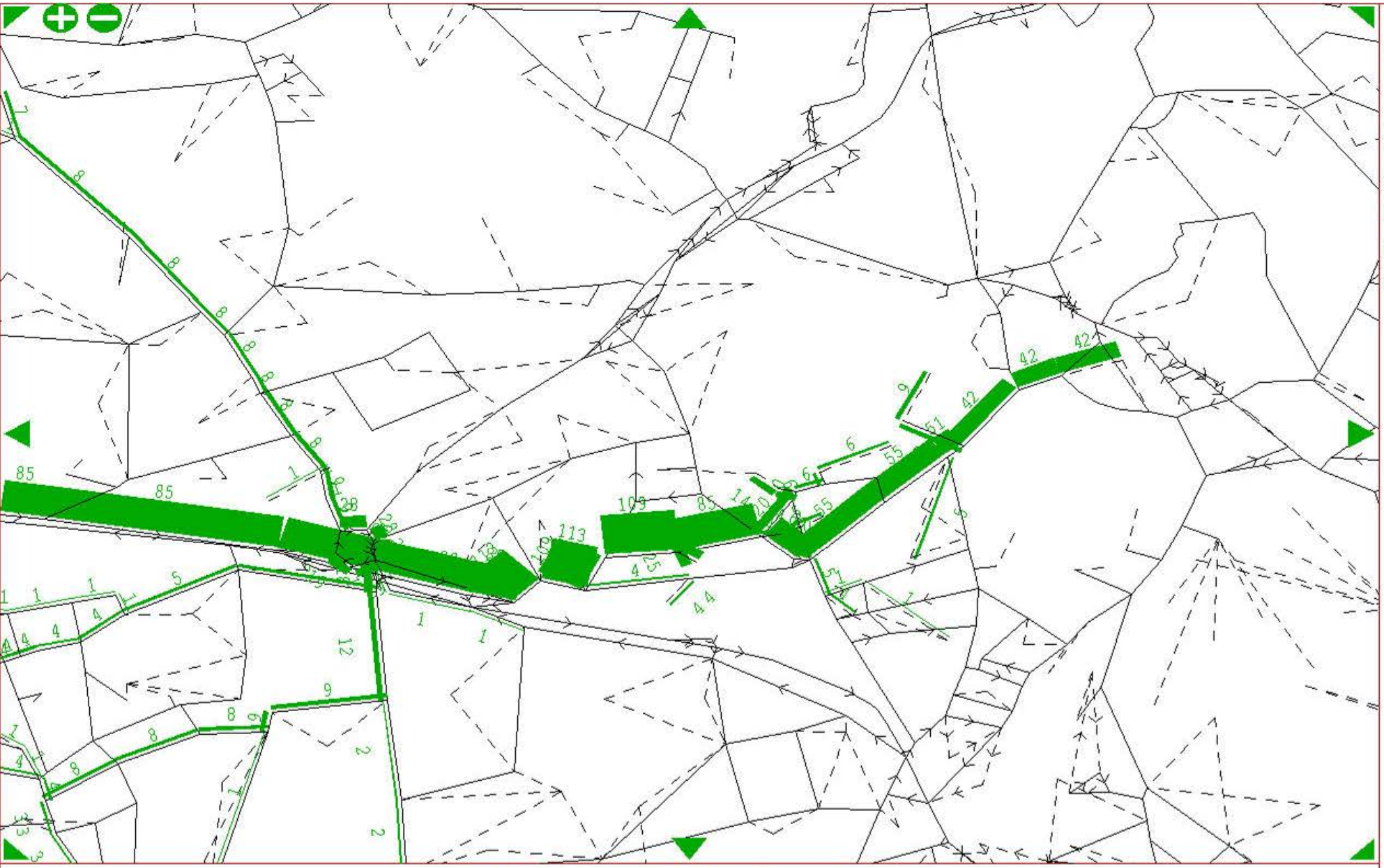

SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

Link Annot:

U4

Bandwidths =
10./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
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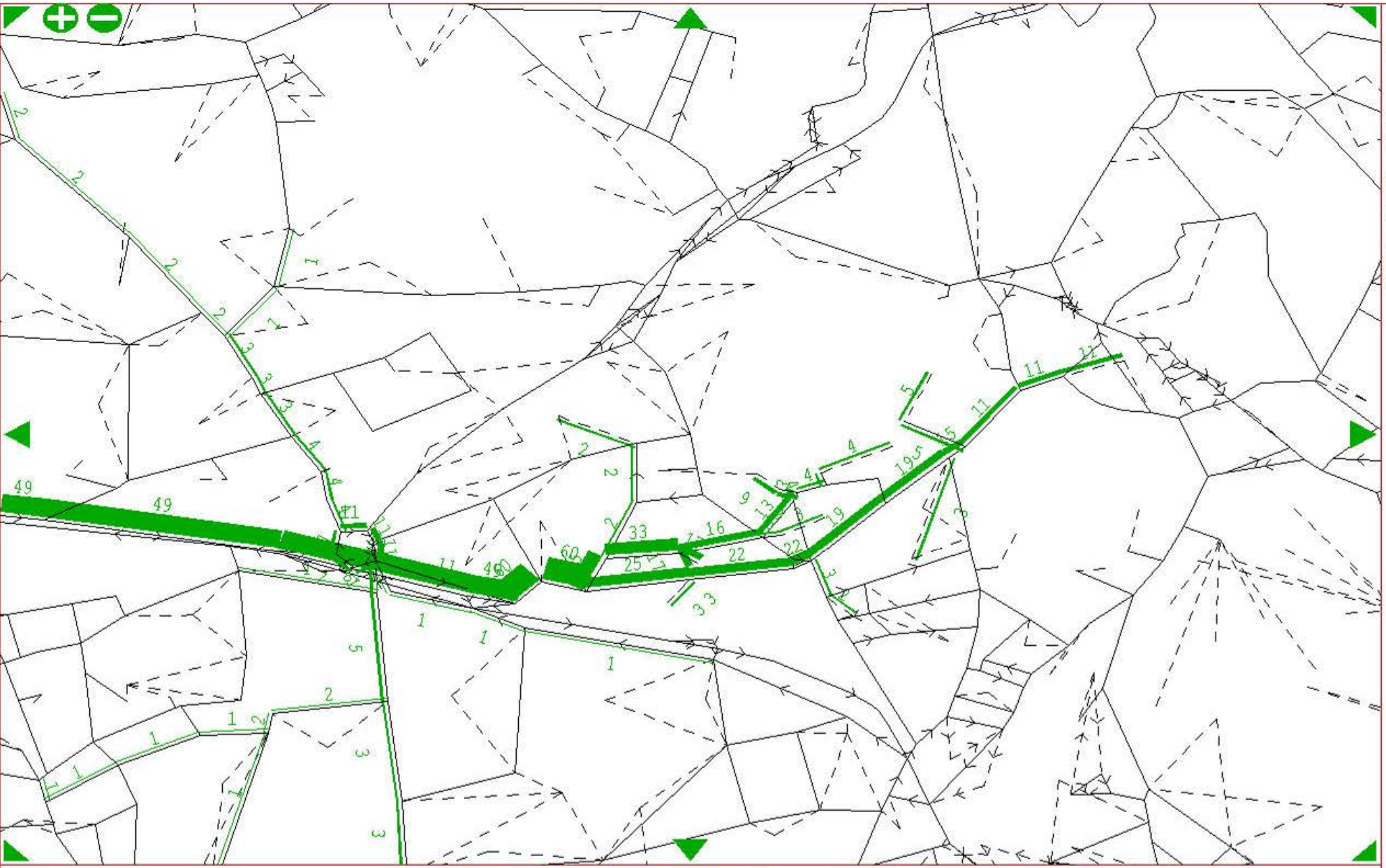

SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

Link Annot:

U5

Bandwidths =
10./mm

24- 9-15
STEER DAVIES

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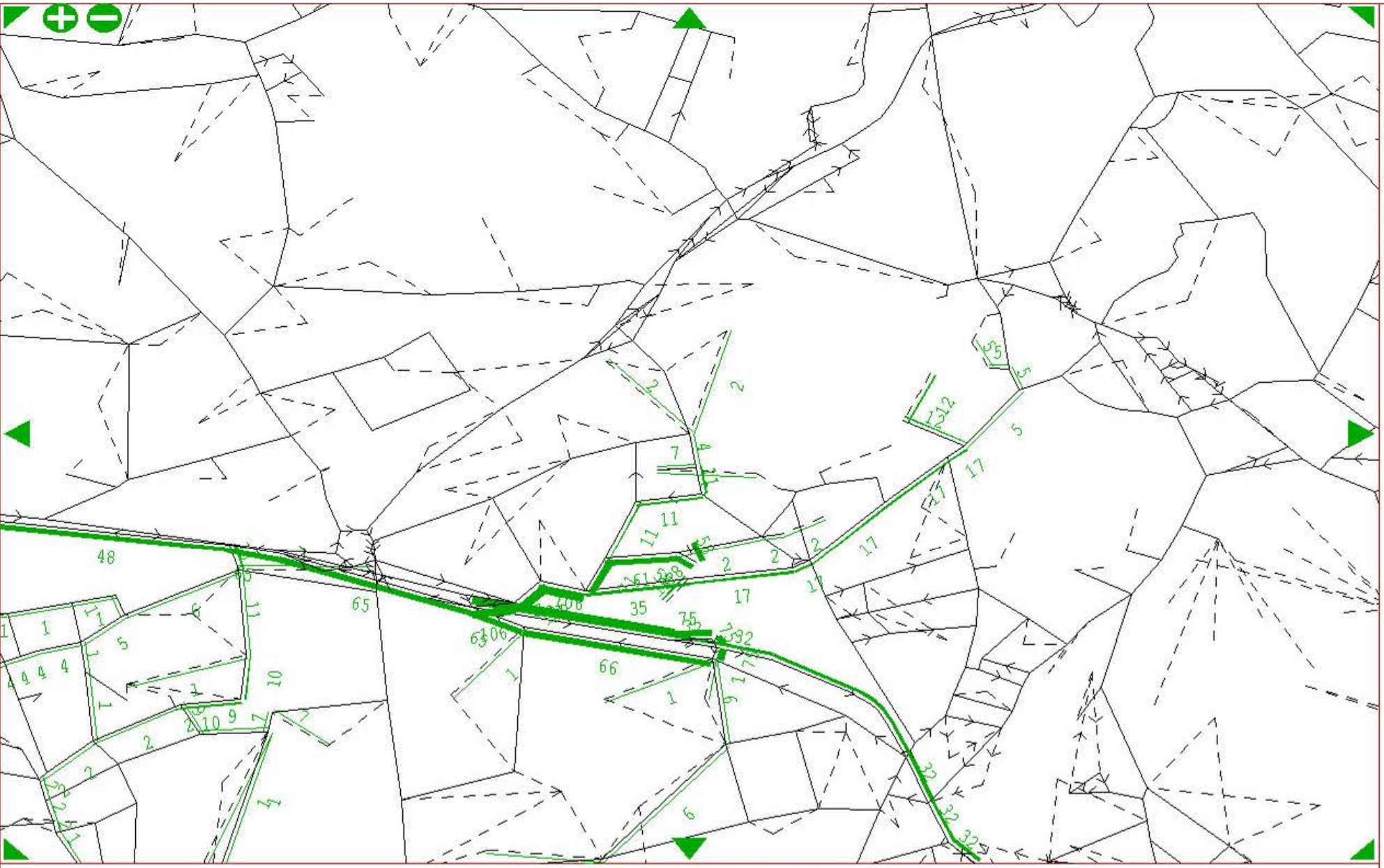

SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

Link Annot:

U1

Bandwidths =
50./mm

24- 9-15
STEER DAVIES

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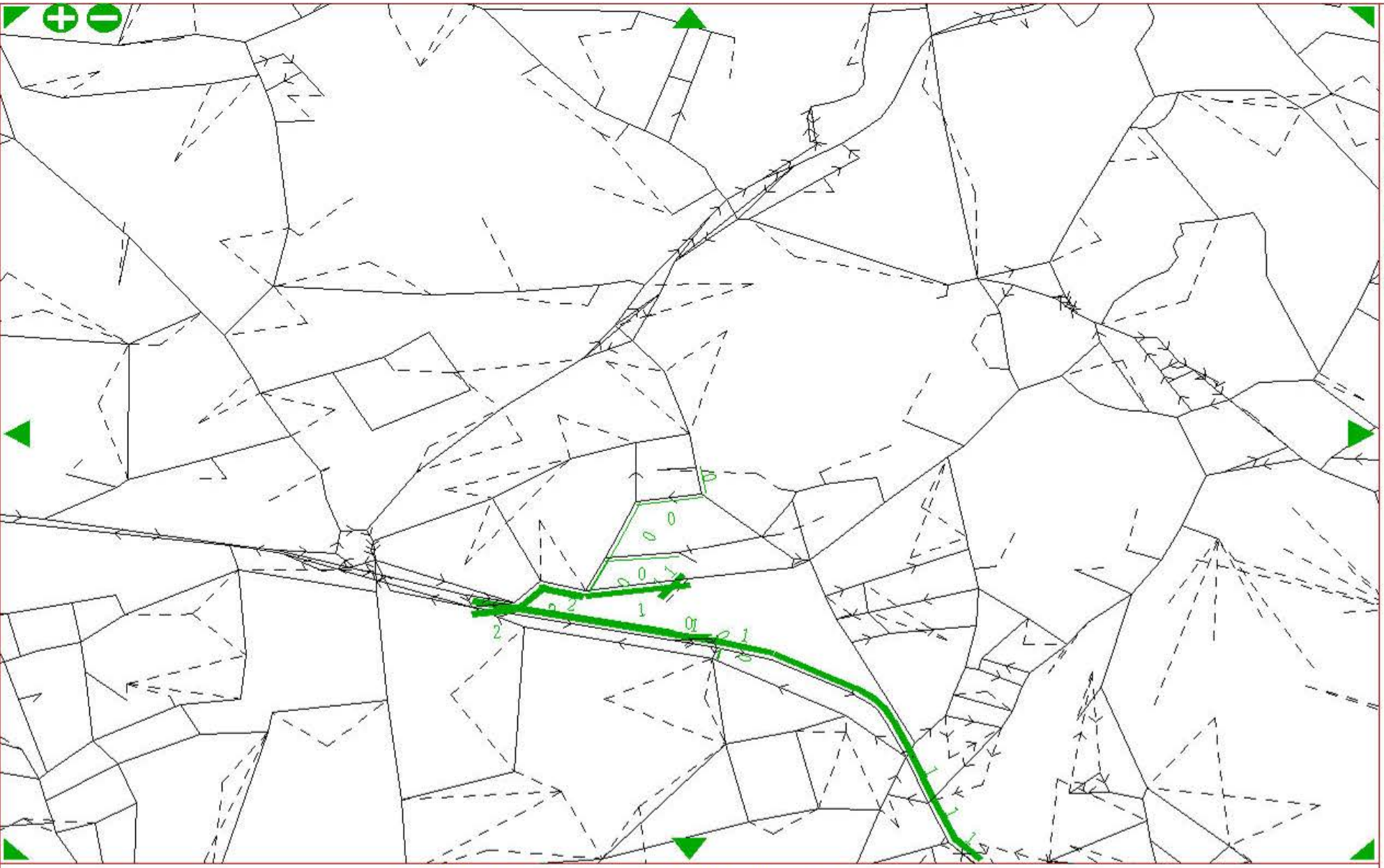


SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

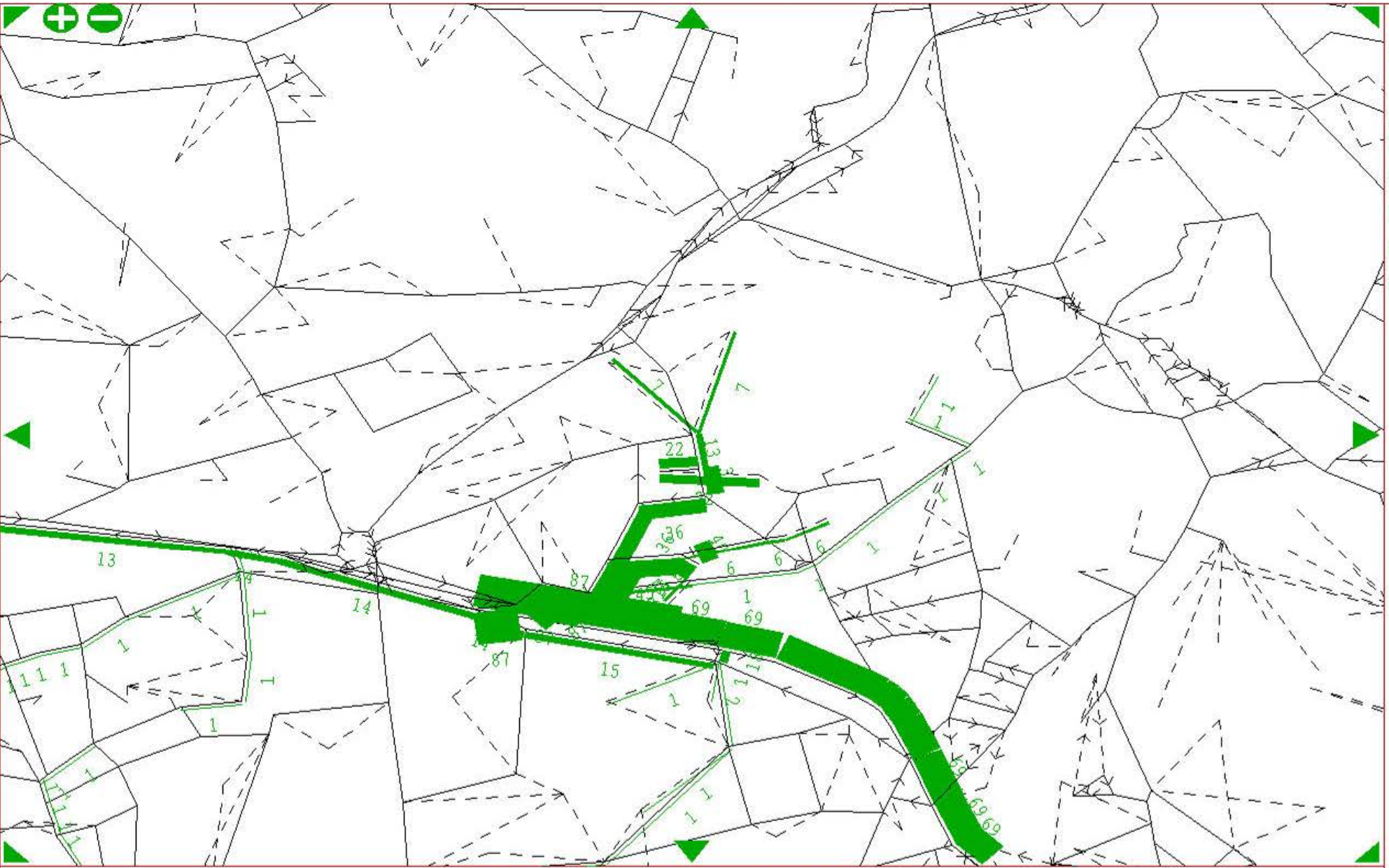
Link Annot:

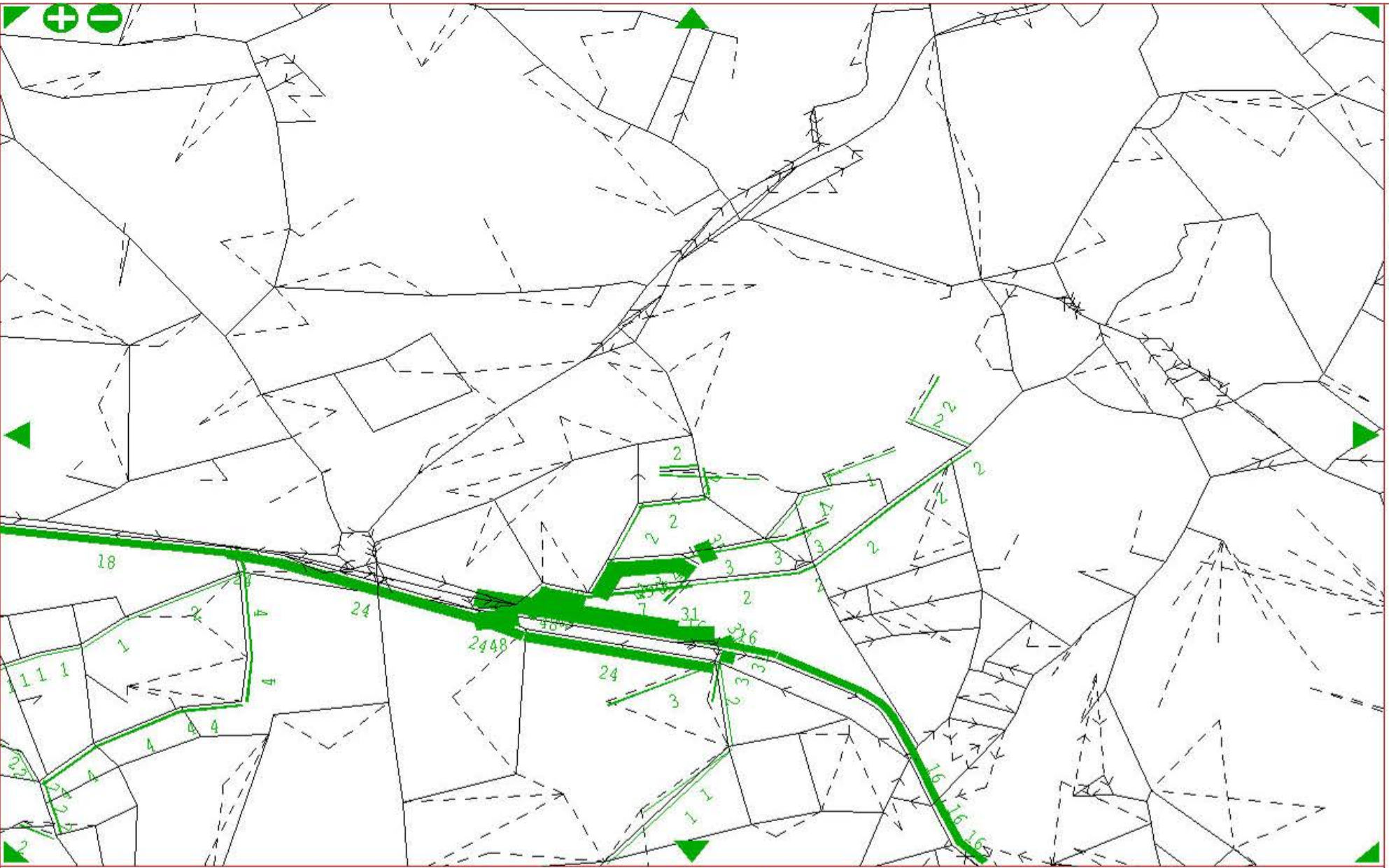
U3

Bandwidths =
1./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15


SATUR
Atkins Ltd
DVV / ITS
v88Net_R002
AM_OOC_F.UFS
Scale 16667
Link Annot:
U4
Bandwidths =
10./mm
24- 9-15
STEER DAVIES
LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

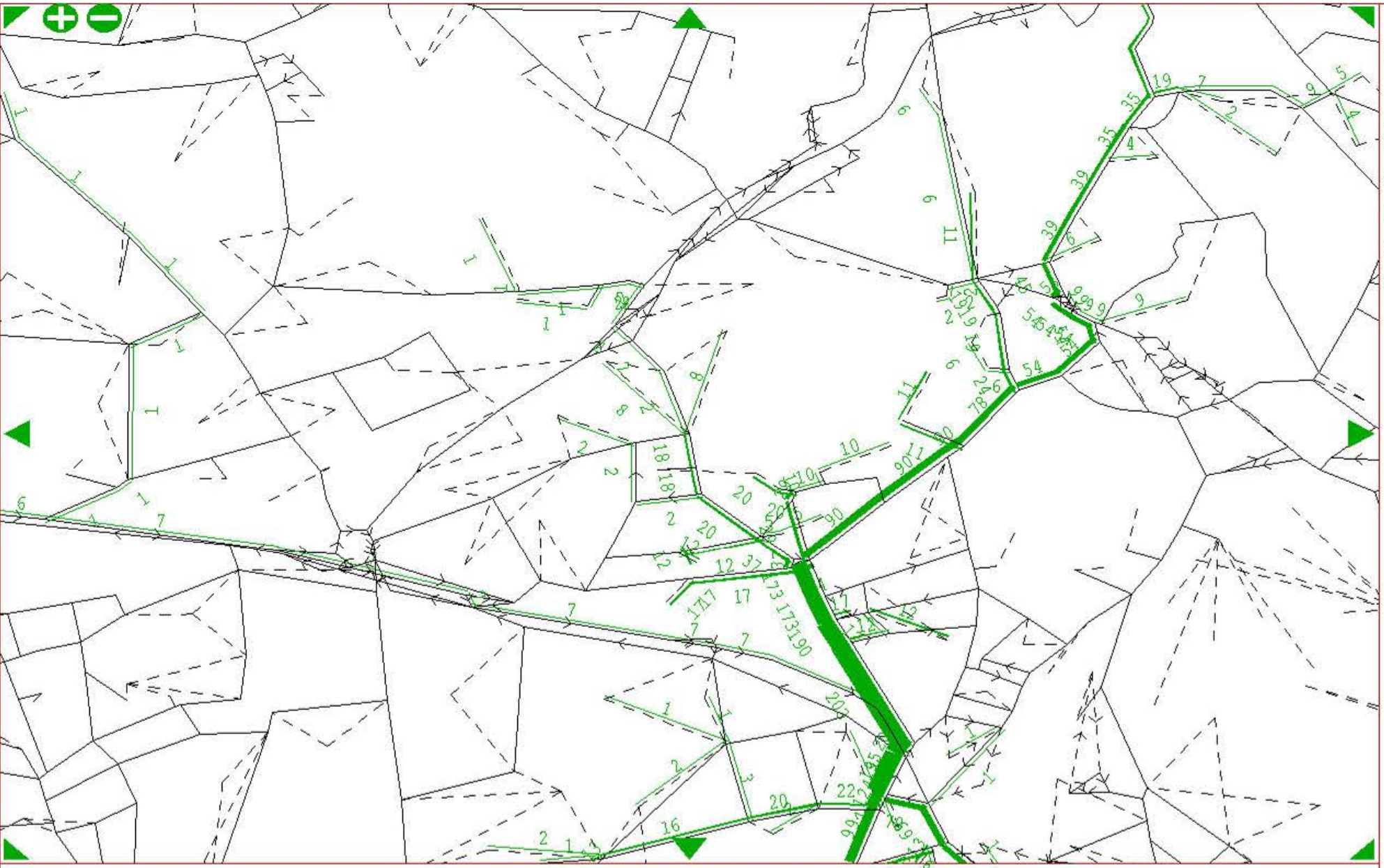
Link Annot:

U5

Bandwidths =
10./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
STEER DAVIES



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

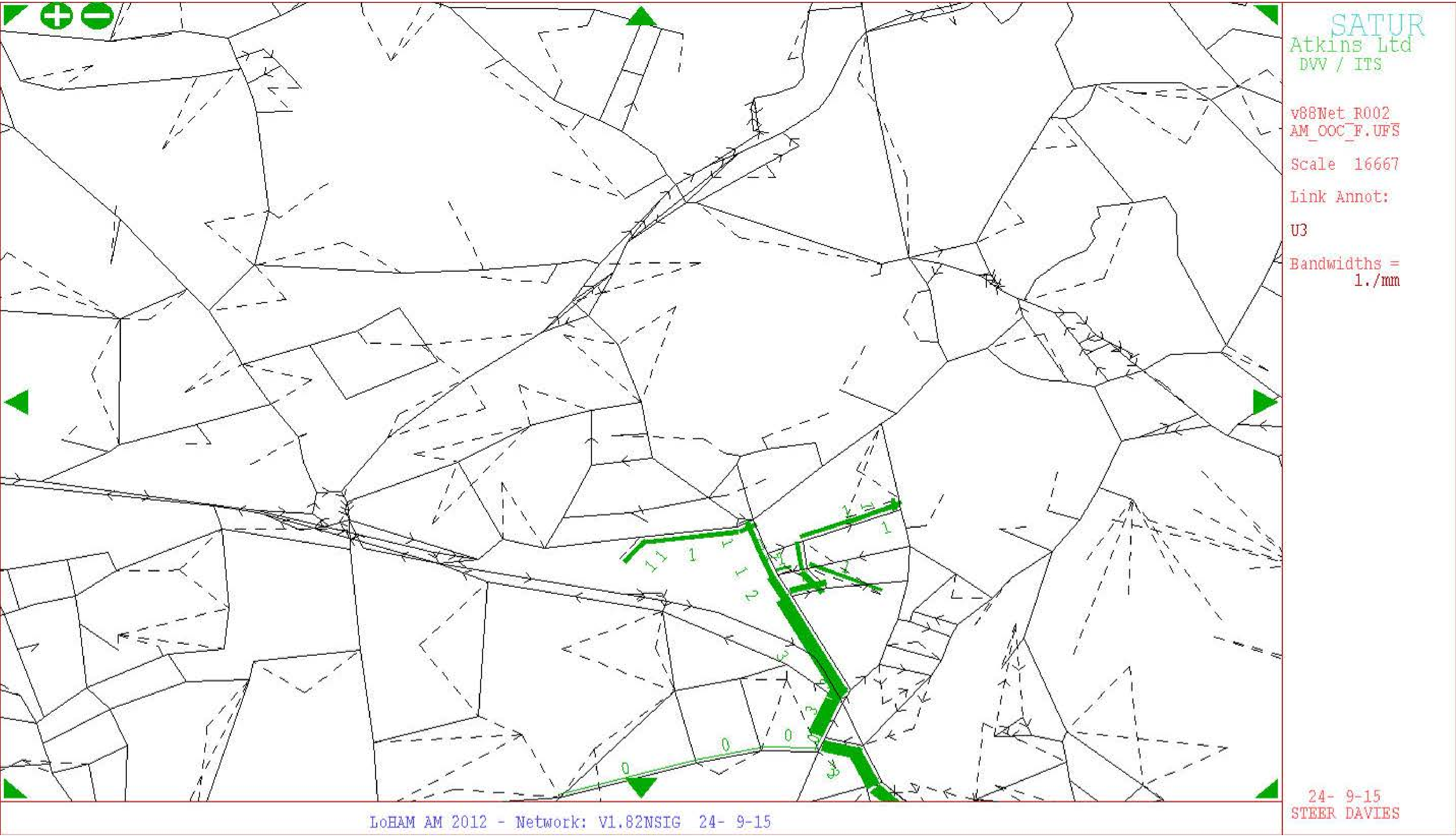
Link Annot:

U1

Bandwidths =
50./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15


SATUR
Atkins Ltd
DVV / ITS
v88Net_R002_
AM_OOC_F.UFS
Scale 16667
Link Annot:
U3
Bandwidths =
1./mm
24- 9-15
STEER DAVIES
LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

Link Annot:

U4

Bandwidths =
10./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
STEER DAVIES

SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

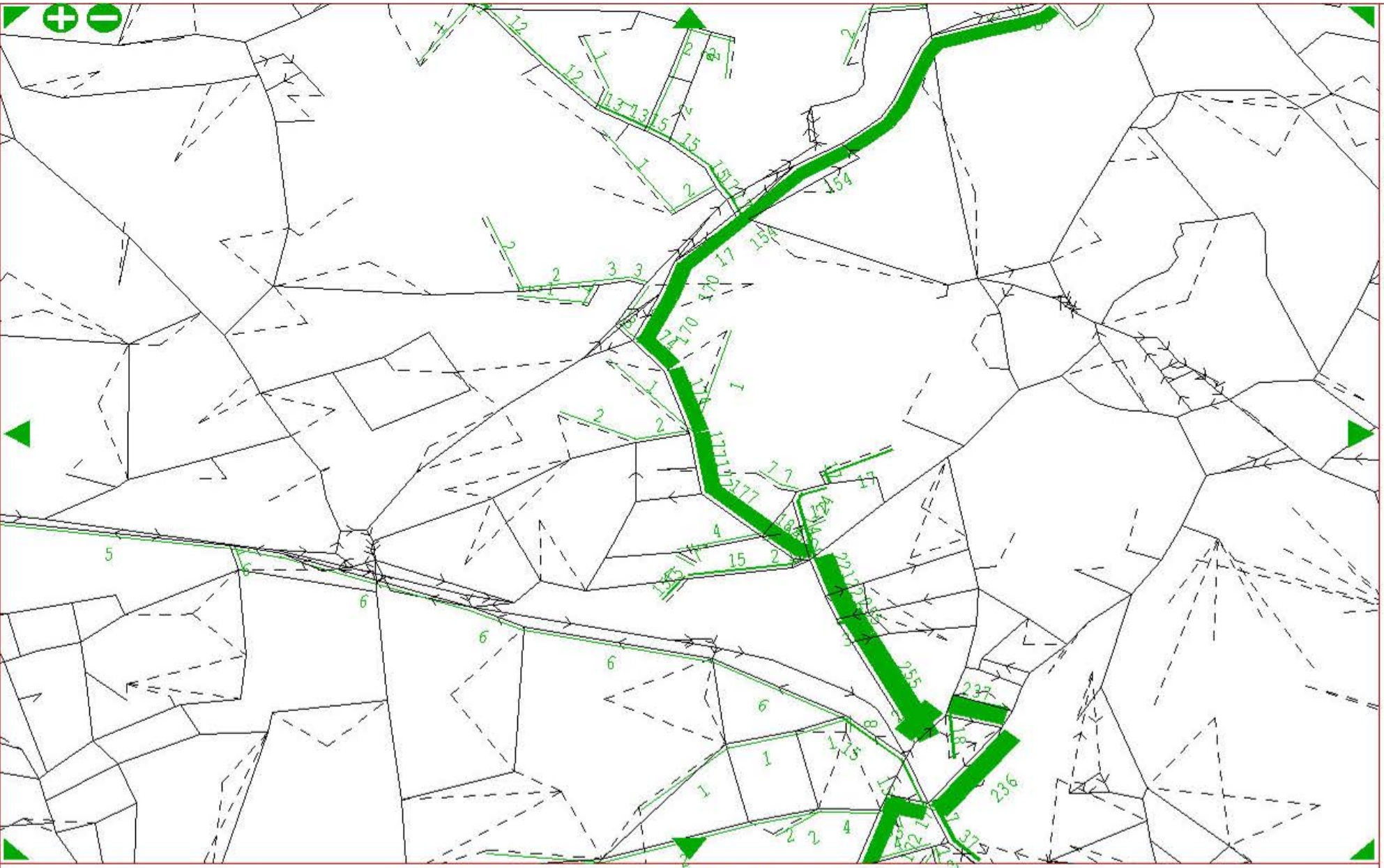
Link Annot:

U5

Bandwidths =
10./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
STEER DAVIES



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

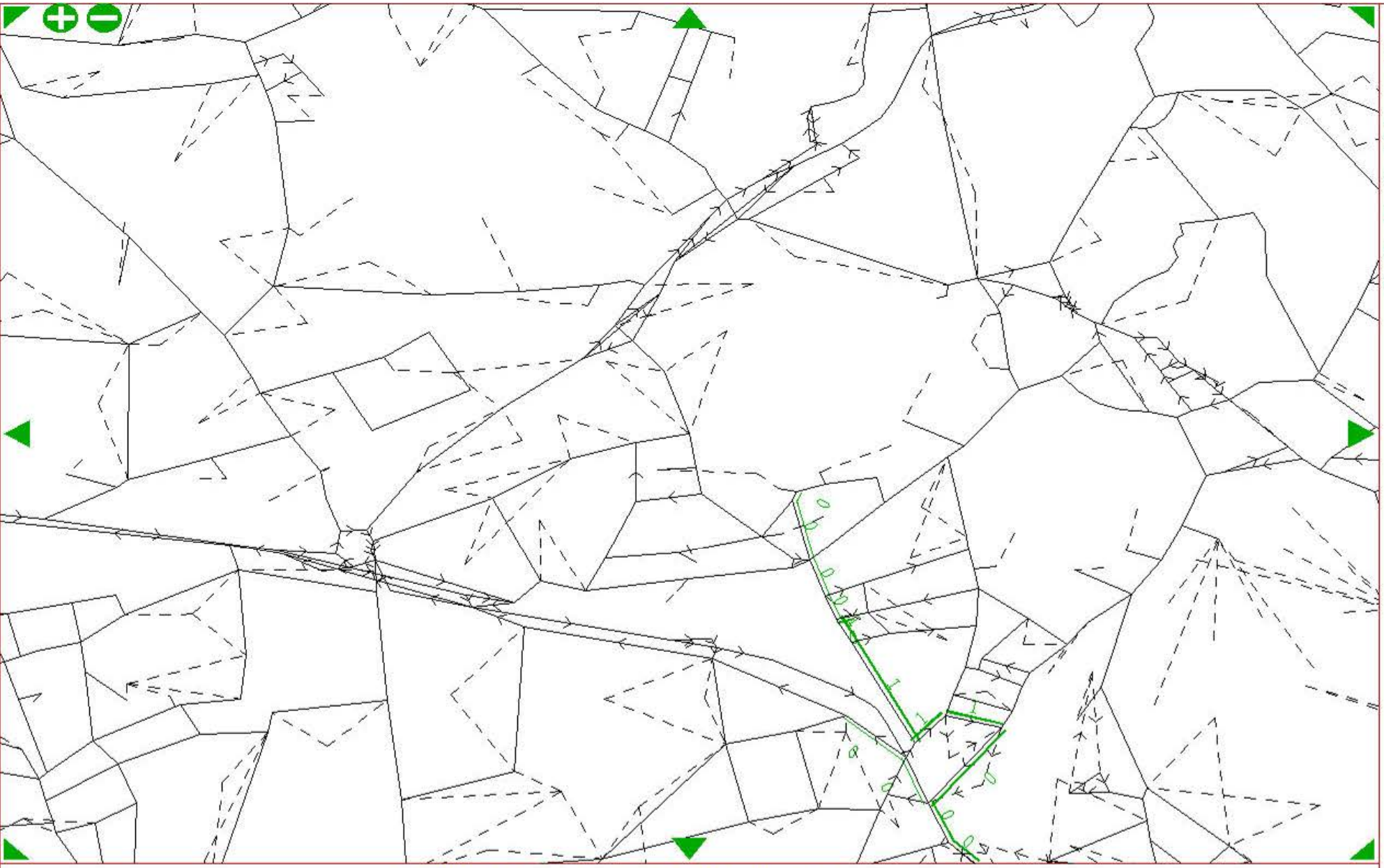
Link Annot:

U1

Bandwidths =
50./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

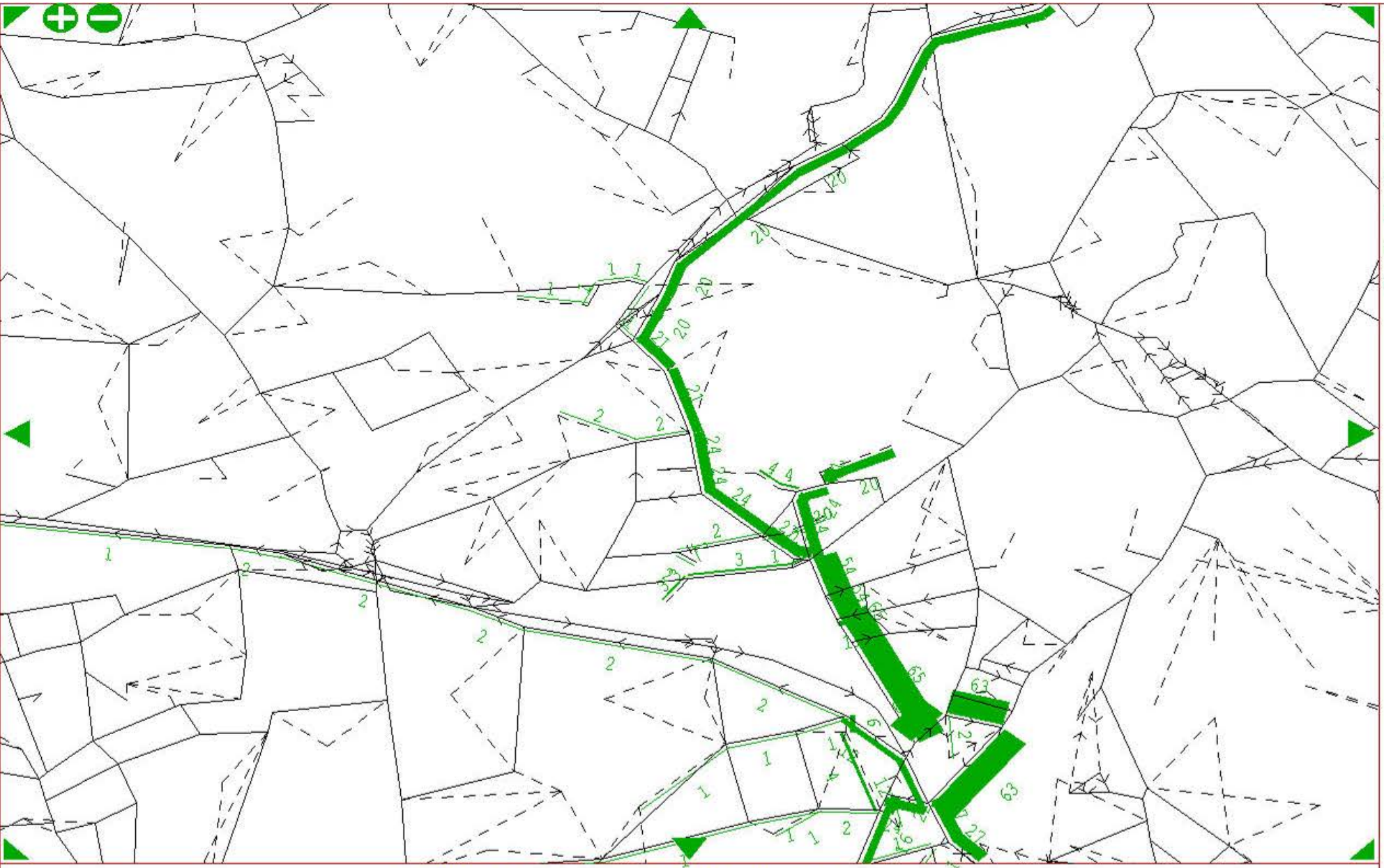
Link Annot:

U3

Bandwidths =
1./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
STEER DAVIES



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

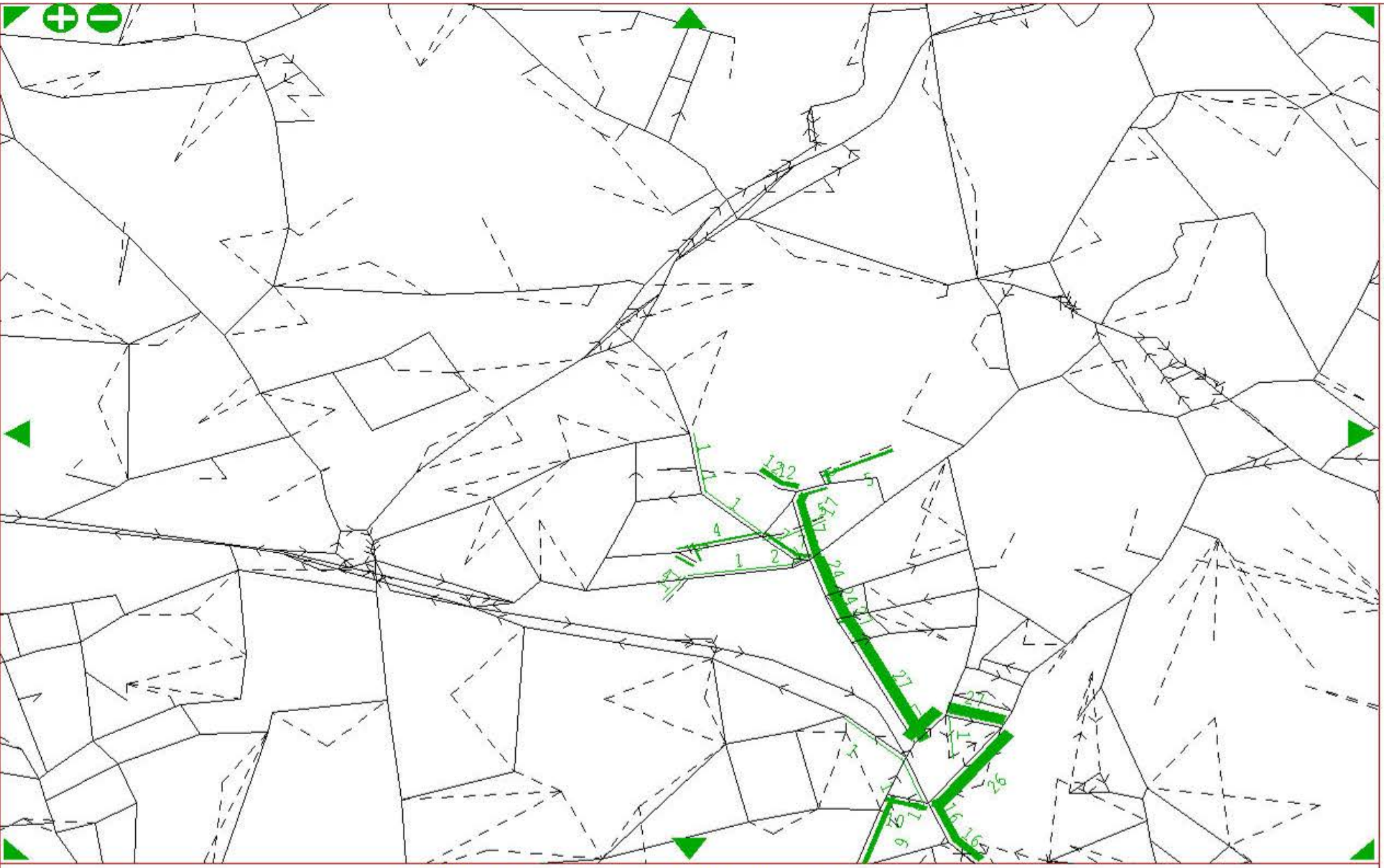
Link Annot:

U4

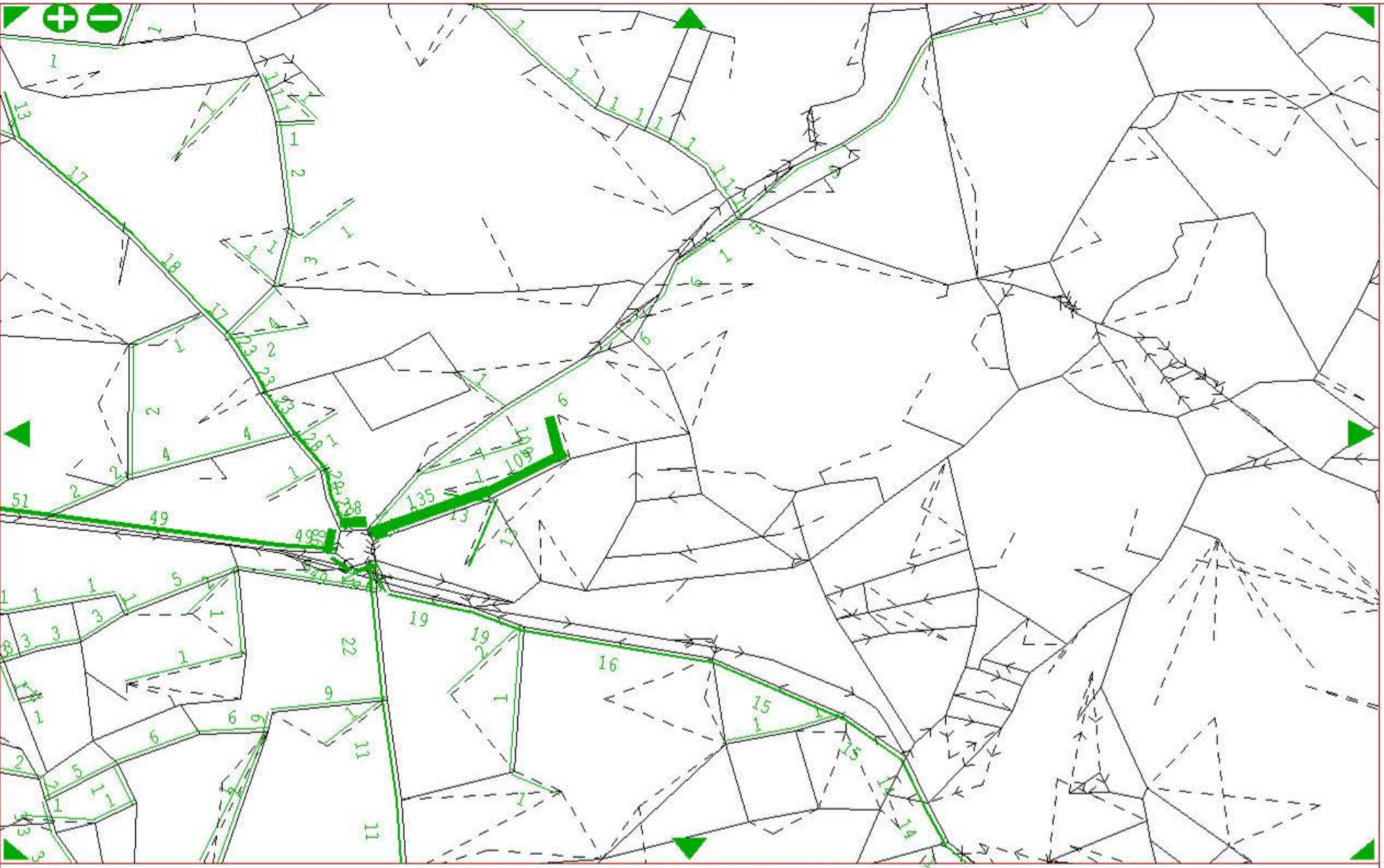
Bandwidths =
10./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
STEER DAVIES



LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

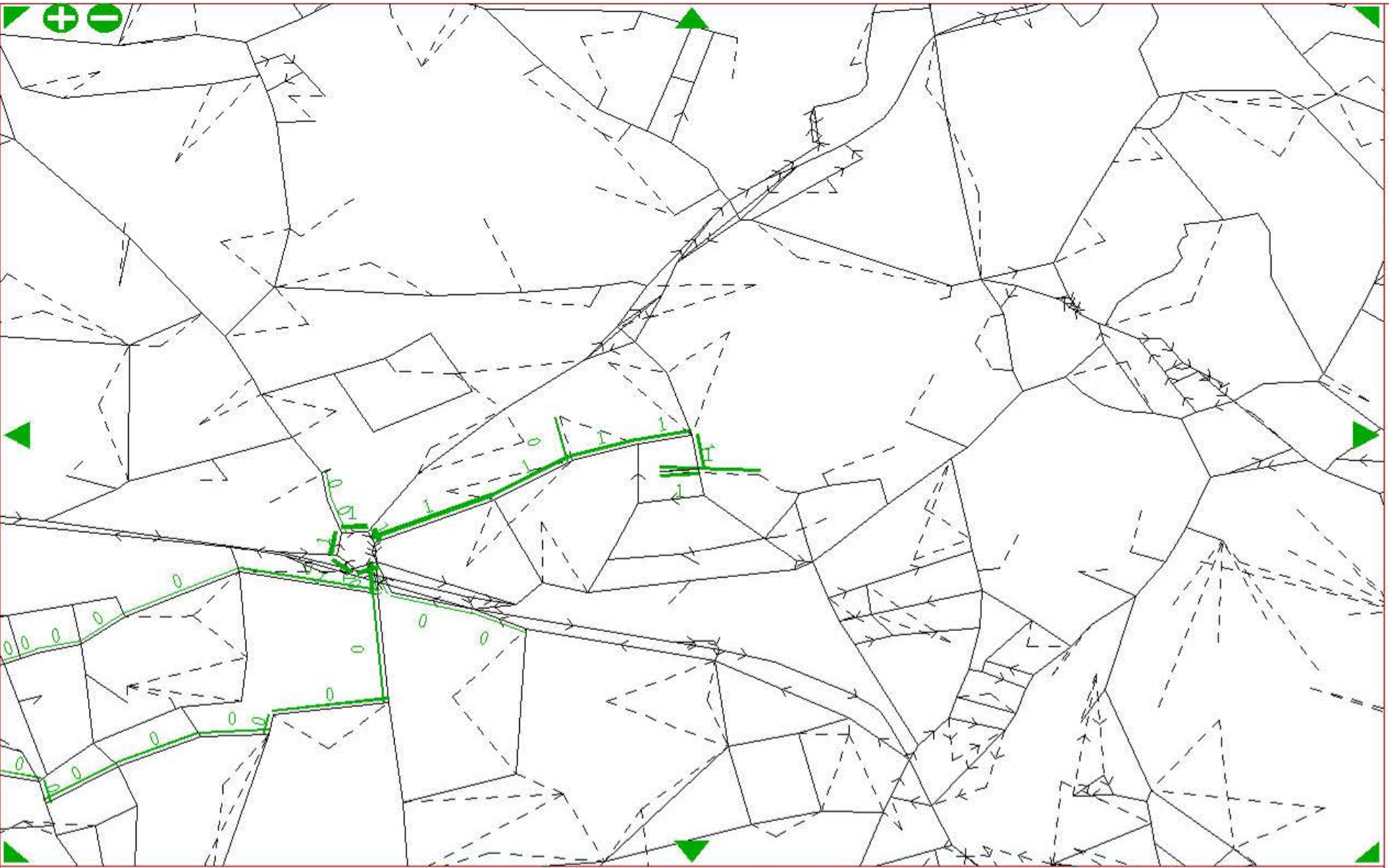
Link Annot:

U1

Bandwidths =
50./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

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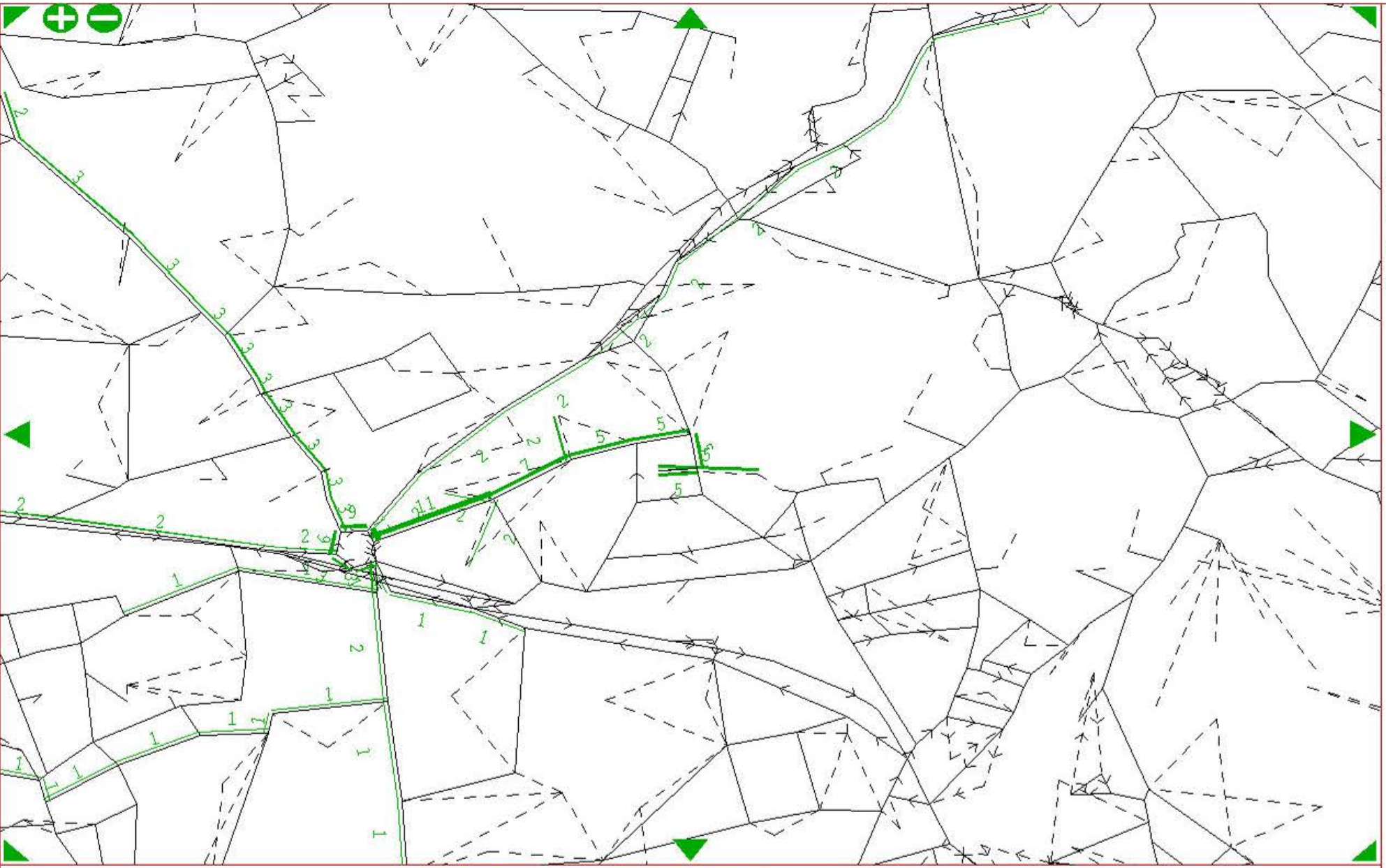
U3

Bandwidths =
1./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
STEER DAVIES



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

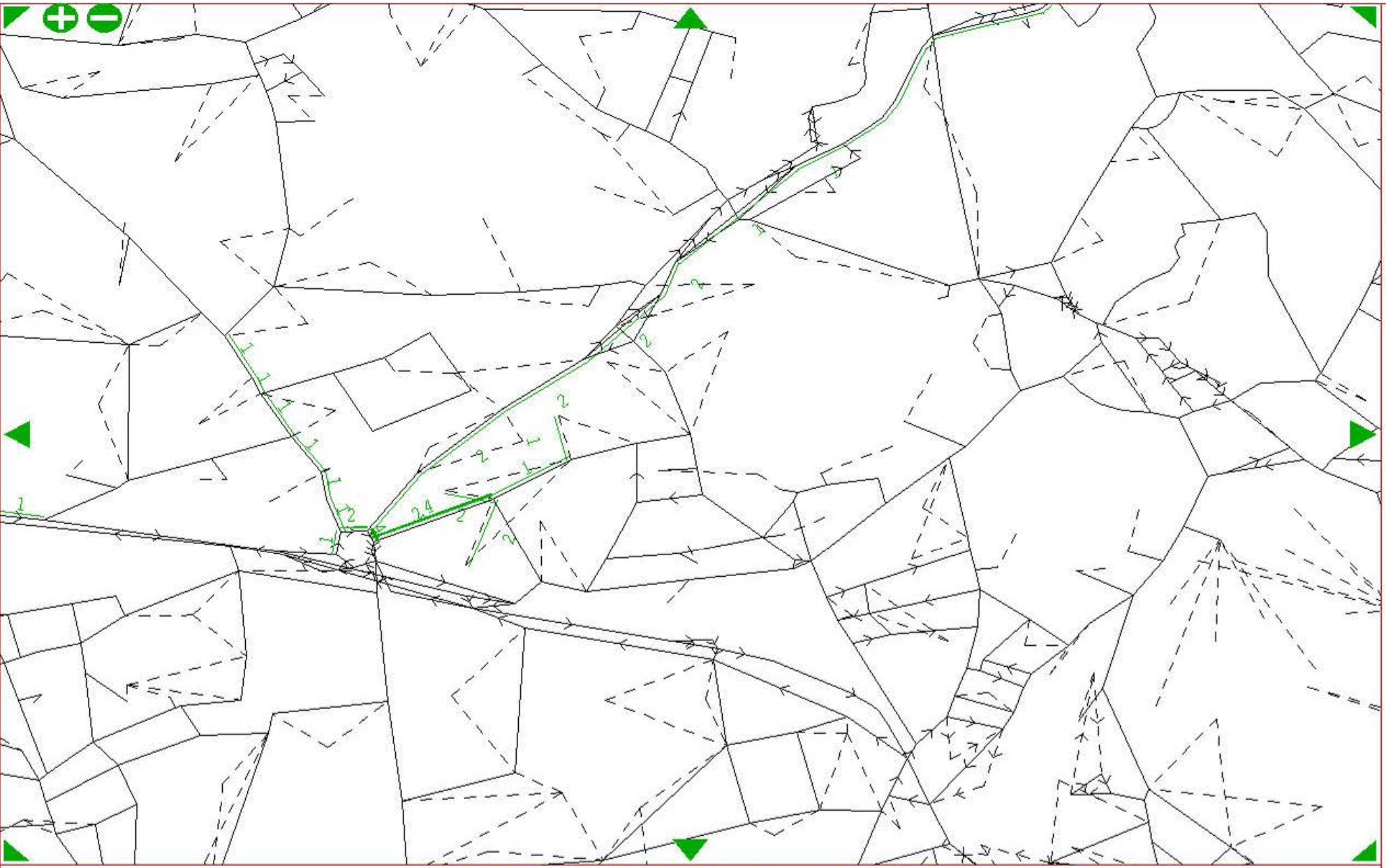
Link Annot:

U4

Bandwidths =
10./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

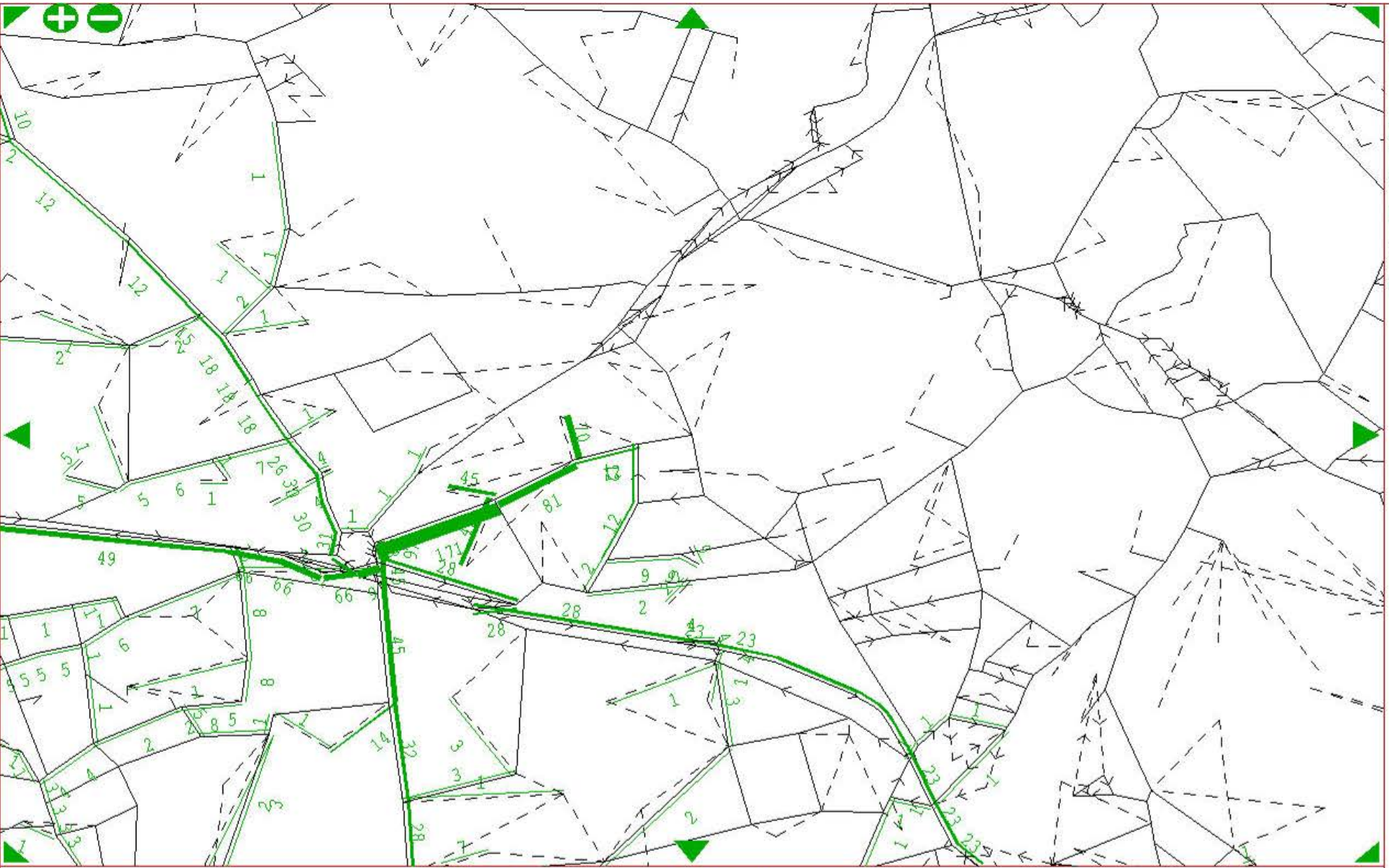
Link Annot:

U5

Bandwidths =
10./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

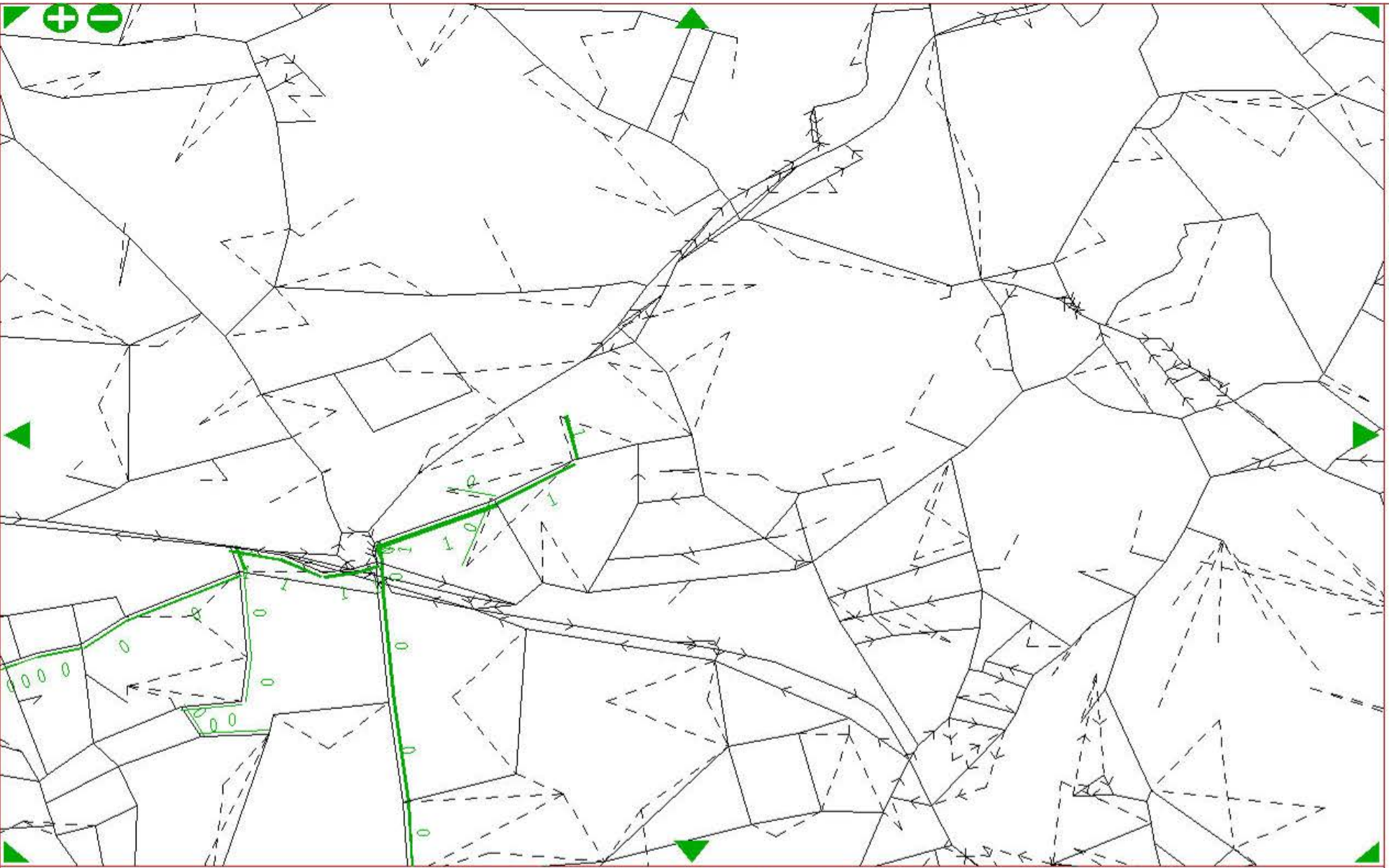
Link Annot:

U1

Bandwidths =
50./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

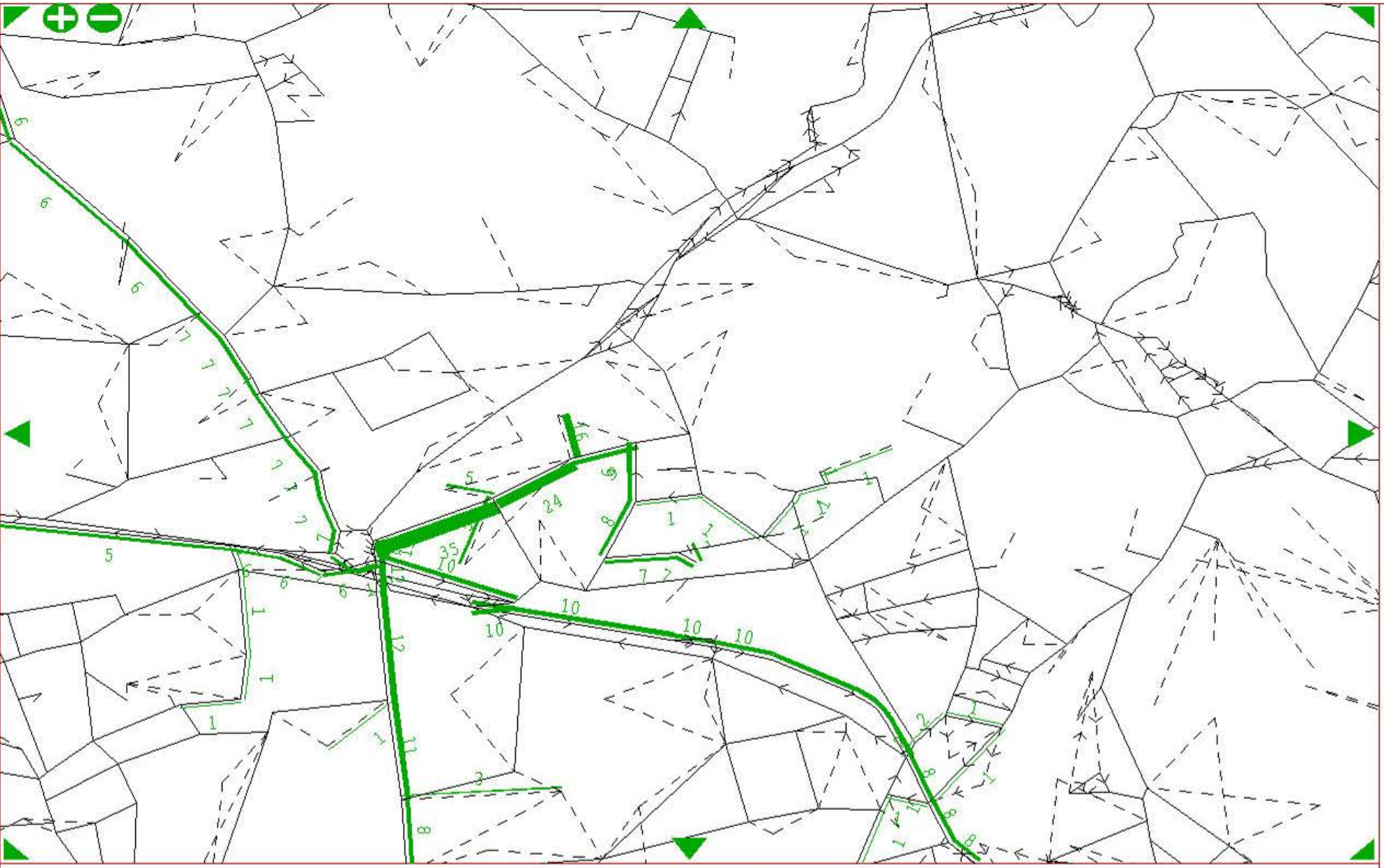
Link Annot:

U3

Bandwidths =
1./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

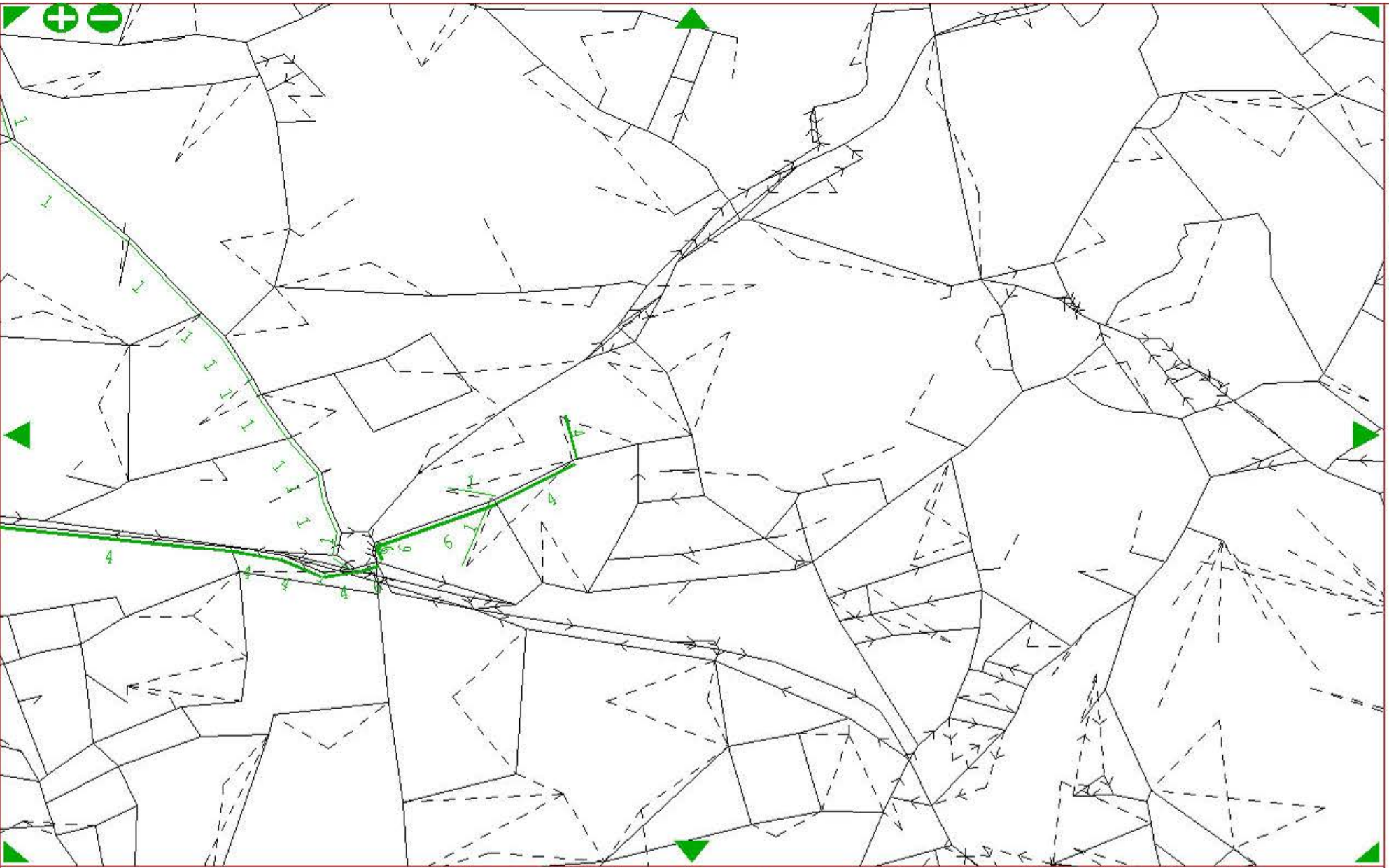
Link Annot:

U4

Bandwidths =
10./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

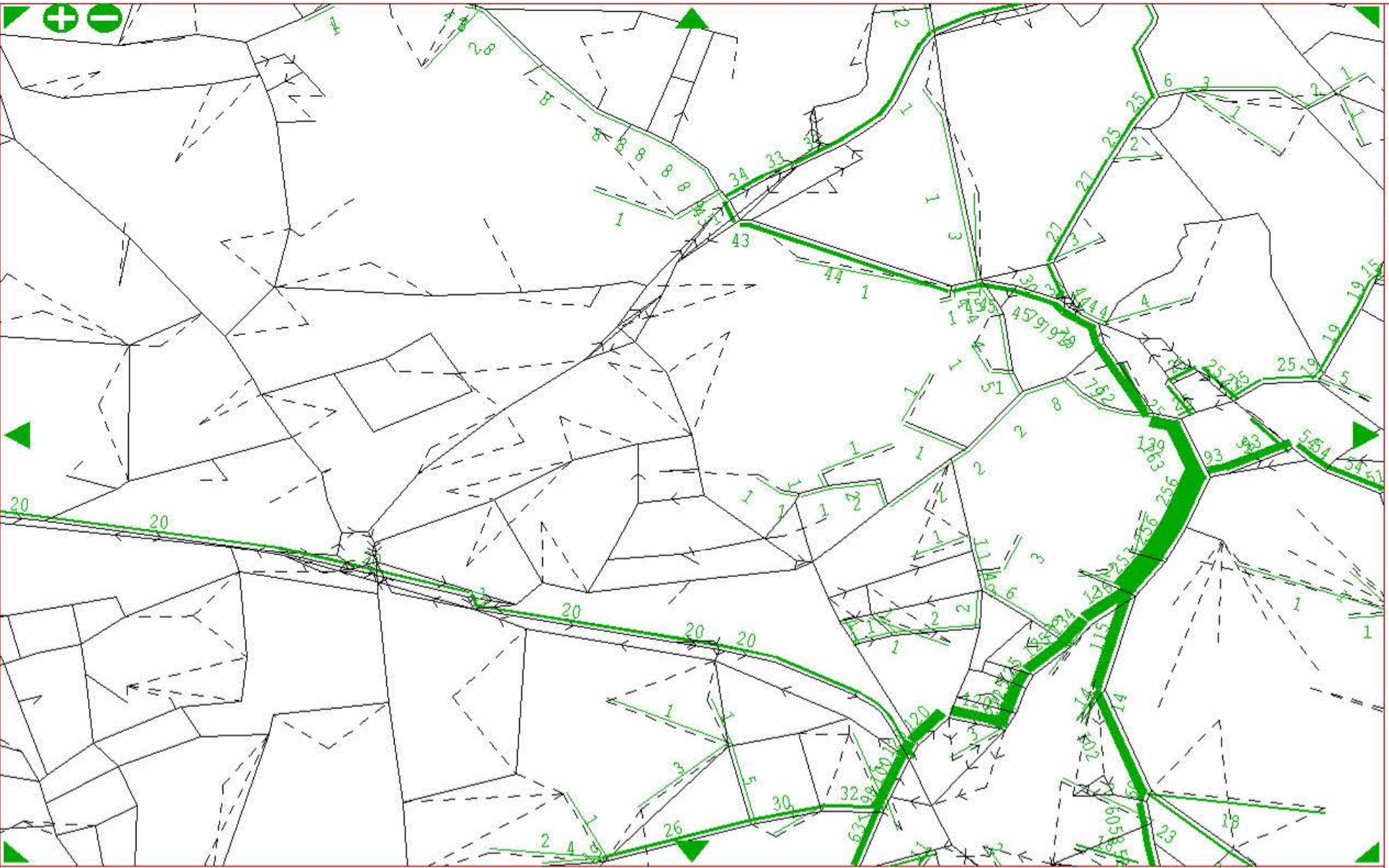
Link Annot:

U5

Bandwidths =
10./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

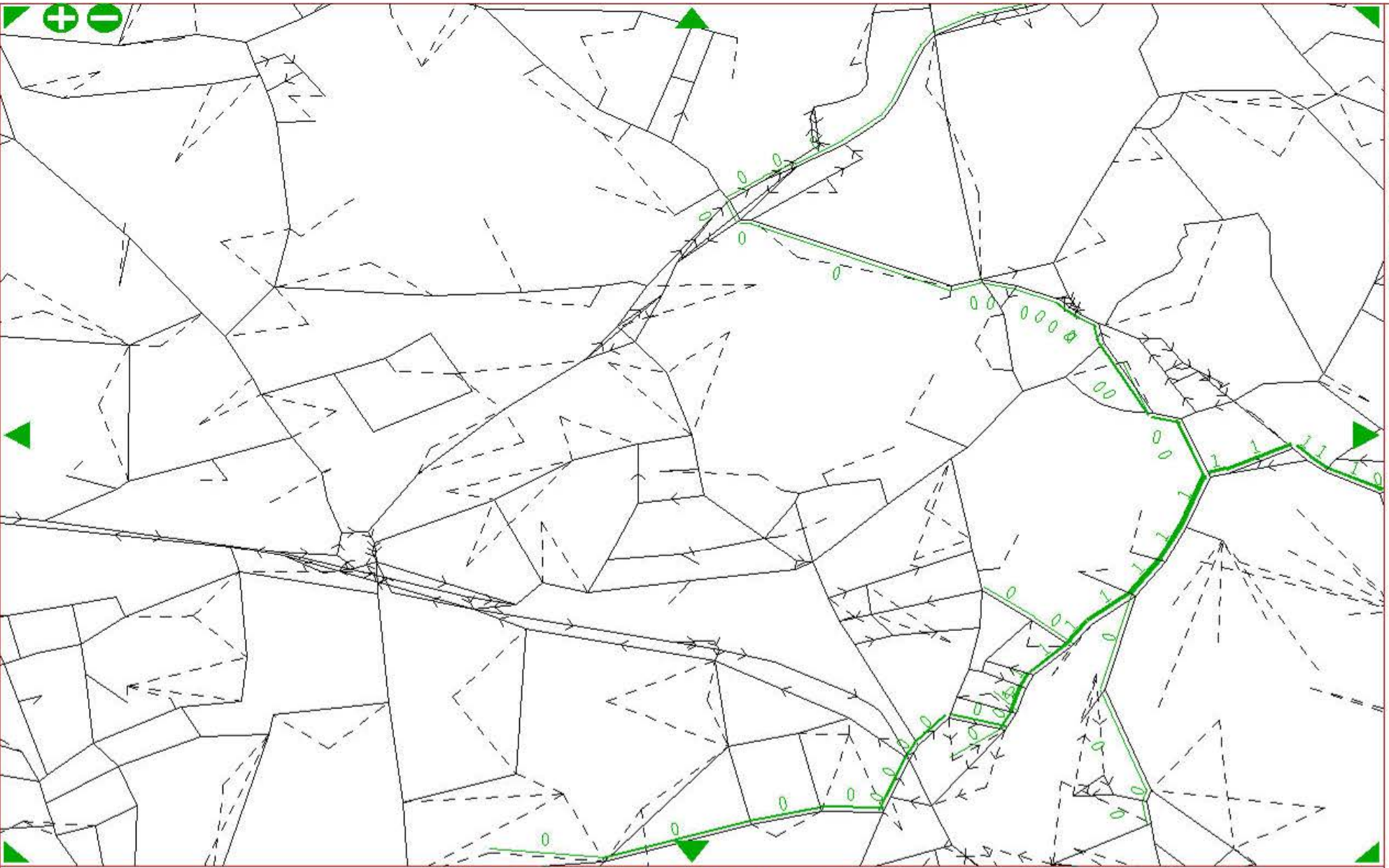
Link Annot:

U1

Bandwidths =
50./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

Link Annot:

U3

Bandwidths =
1./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
STEER DAVIES

SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

Link Annot:

U4

Bandwidths =
10./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

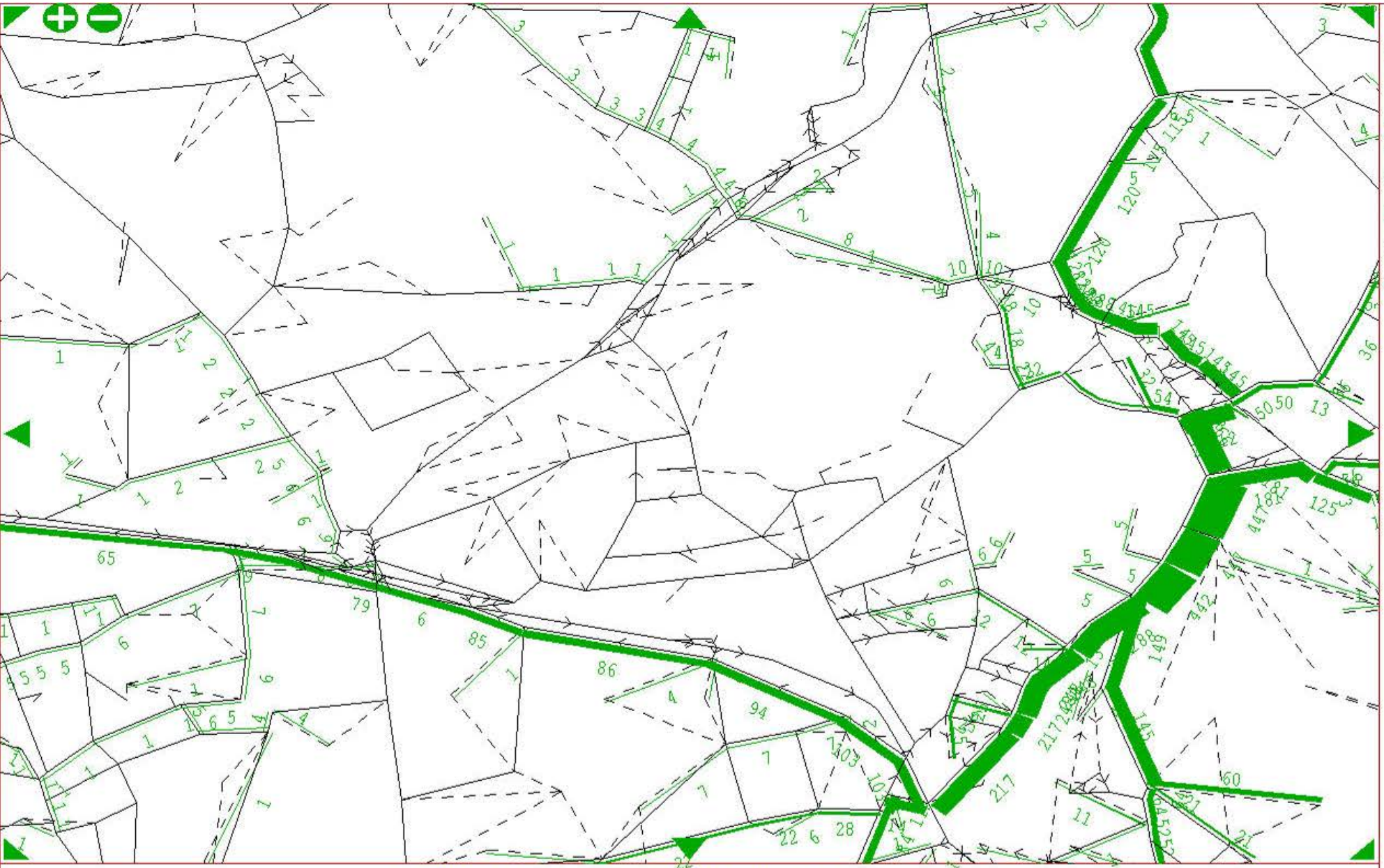
Link Annot:

U5

Bandwidths =
10./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
STEER DAVIES



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

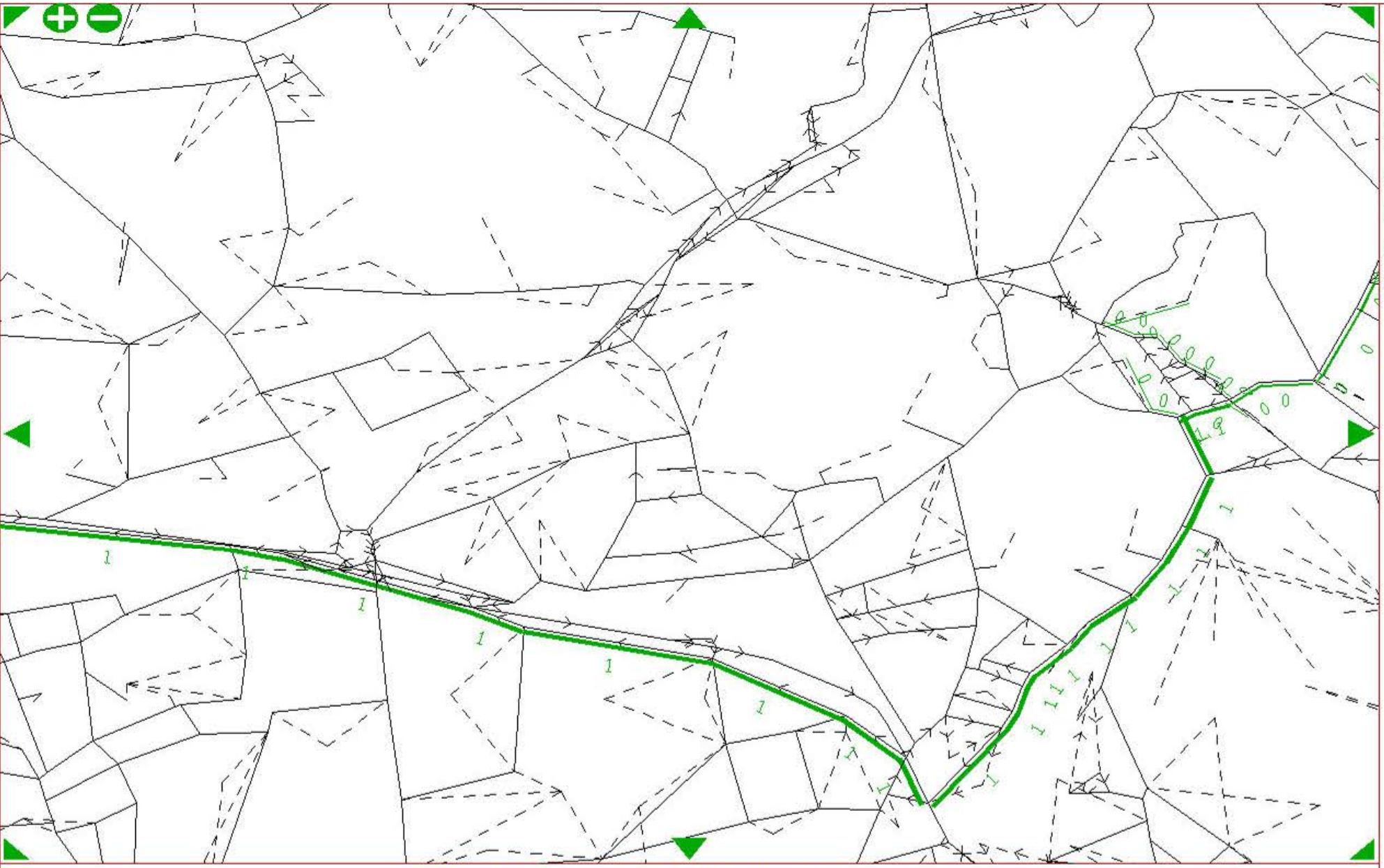
Link Annot:

U1

Bandwidths =
50./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
STEER DAVIES



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

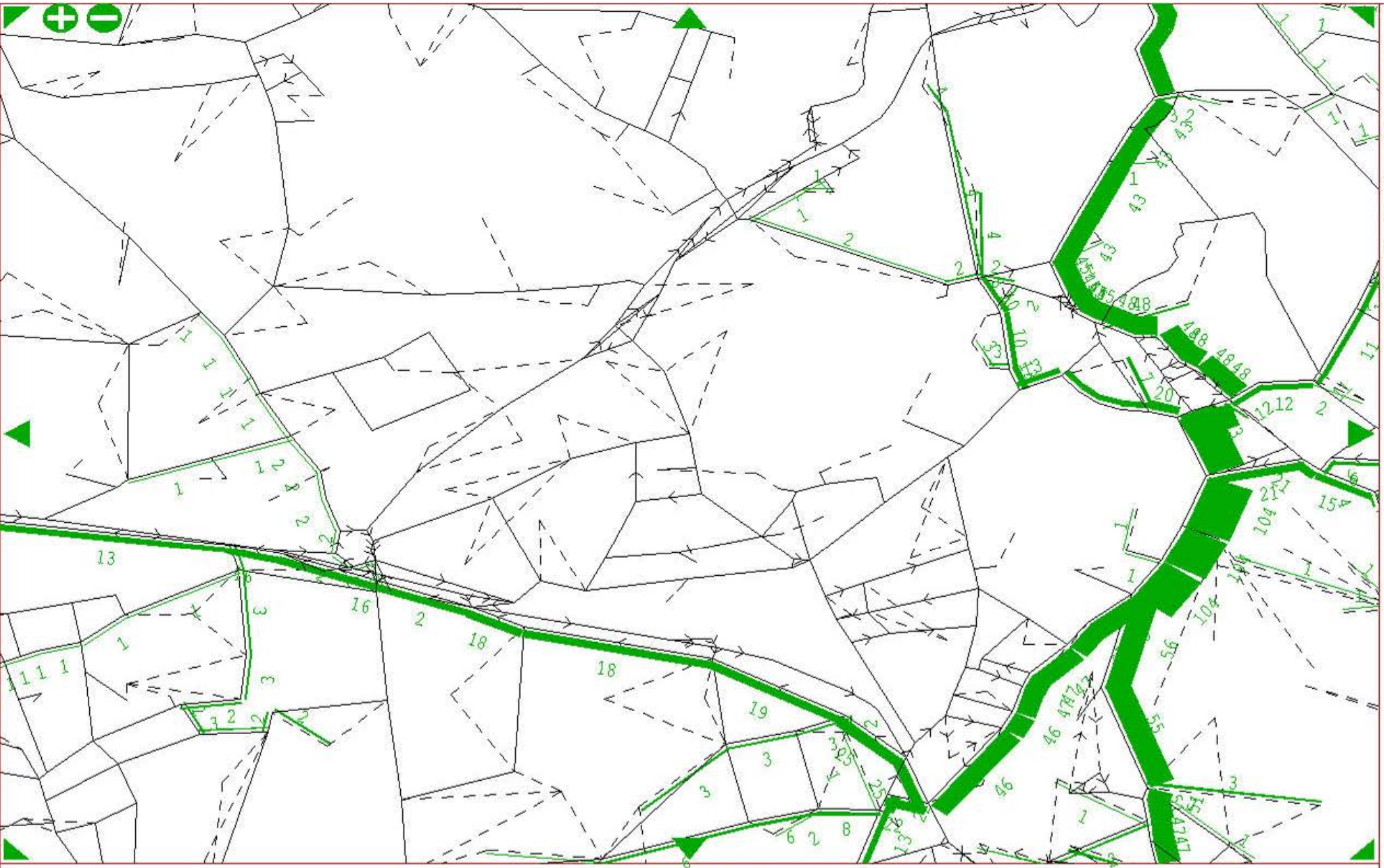
Link Annot:

U3

Bandwidths =
1./mm

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

24- 9-15
STEER DAVIES



SATUR
Atkins Ltd
DVV / ITS

v88Net_R002
AM_OOC_F.UFS

Scale 16667

Link Annot:

U4

Bandwidths =
10./mm

24- 9-15
STEER DAVIES

LoHAM AM 2012 - Network: V1.82NSIG 24- 9-15

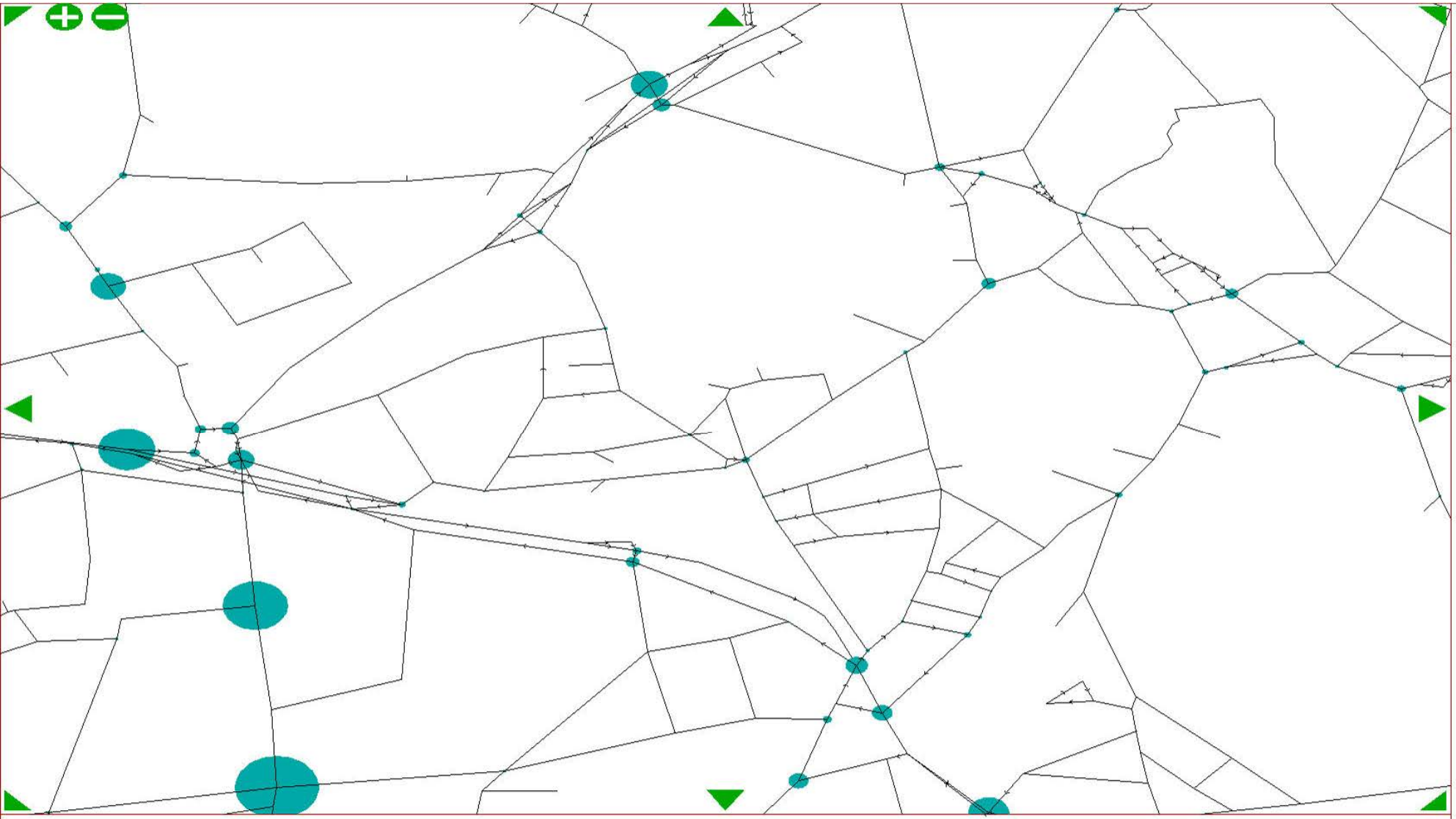
steer davies gleave

4

Park Royal Transport Strategy

Modelling Report

Appendix C – Base Modelling Junction Delay



SATUR
Atkins Ltd
DVV / ITS

V88NET_R002
AM_OOC_F.UFS

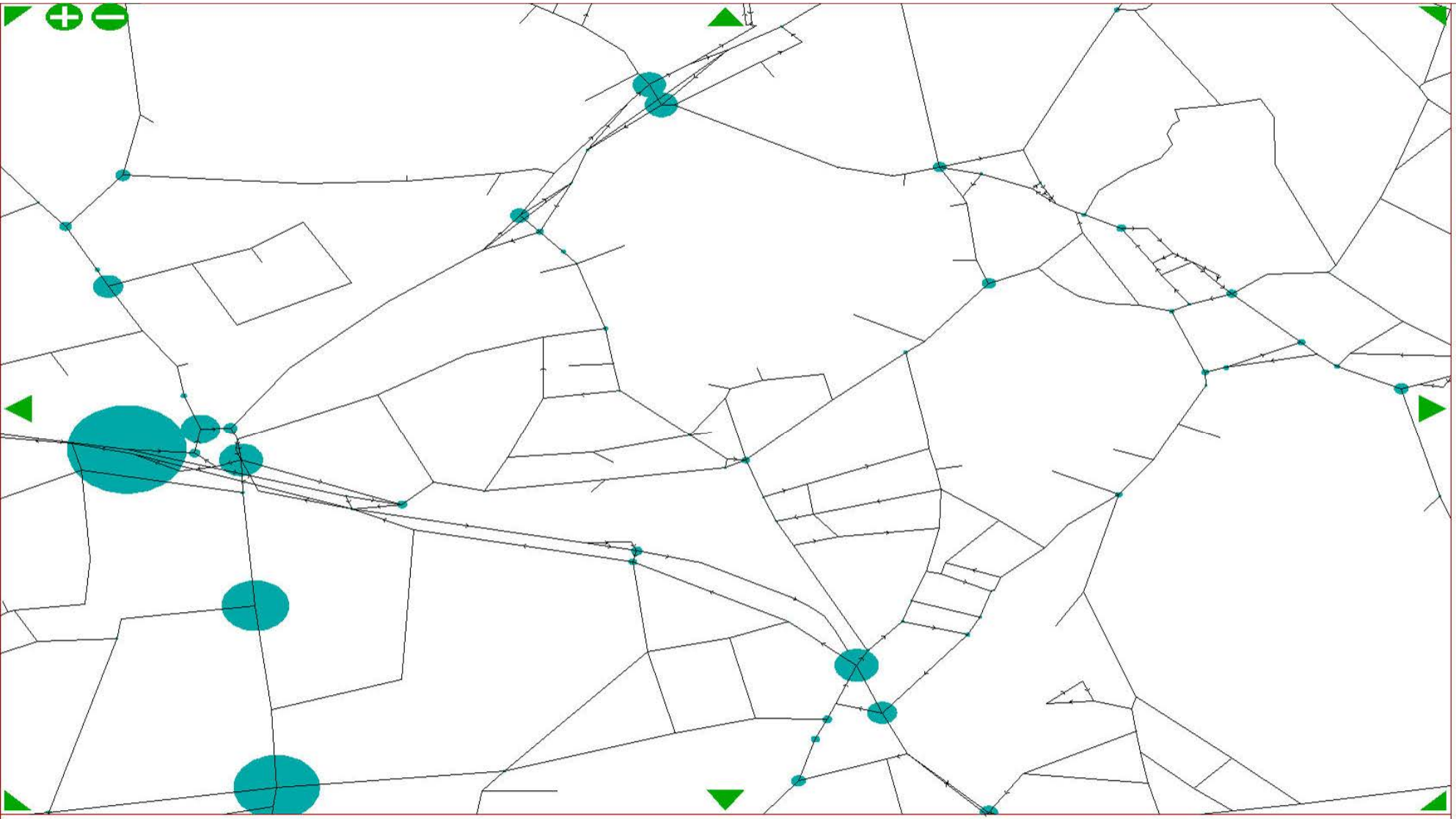
Scale 15098

Node data:
PCU Hr Delay

Bndwdh units
= 20.00/mm

19- 1-16
STEER DAVIES

AM Peak Initial Model - PCU Hour Delay



SATUR
Atkins Ltd
DVV / ITS

3 BY12 OAPF
NDA_AM_F.UFS

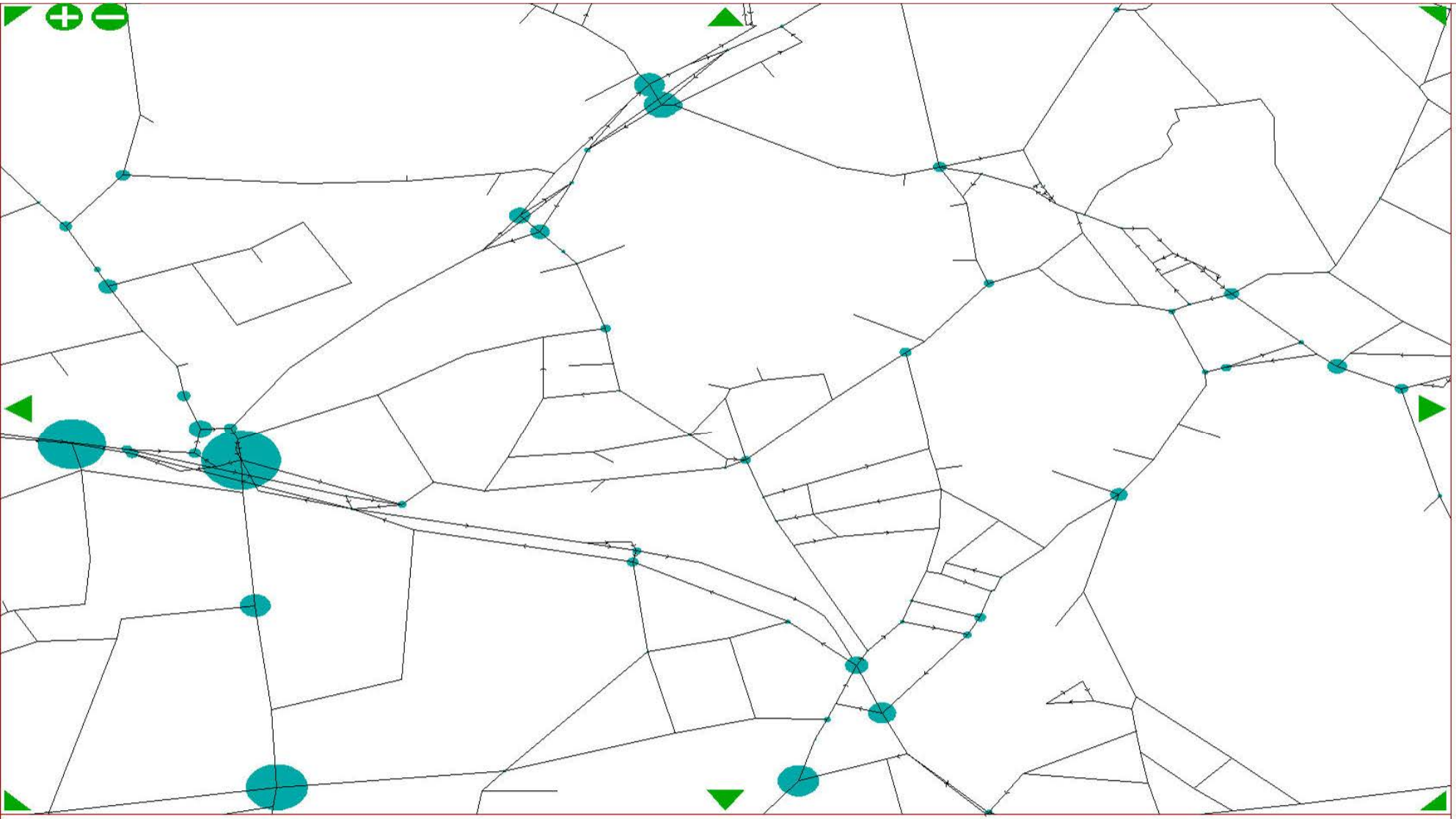
Scale 15098

Node data:
PCU Hr Delay

Bndwdh units
= 20.00/mm

AM Peak Final Model - PCU Hour Delay

19- 1-16
STEER DAVIES



SATUR
Atkins Ltd
DVV / ITS

3 BY12 OAPF
NDA_PM_F.UFS

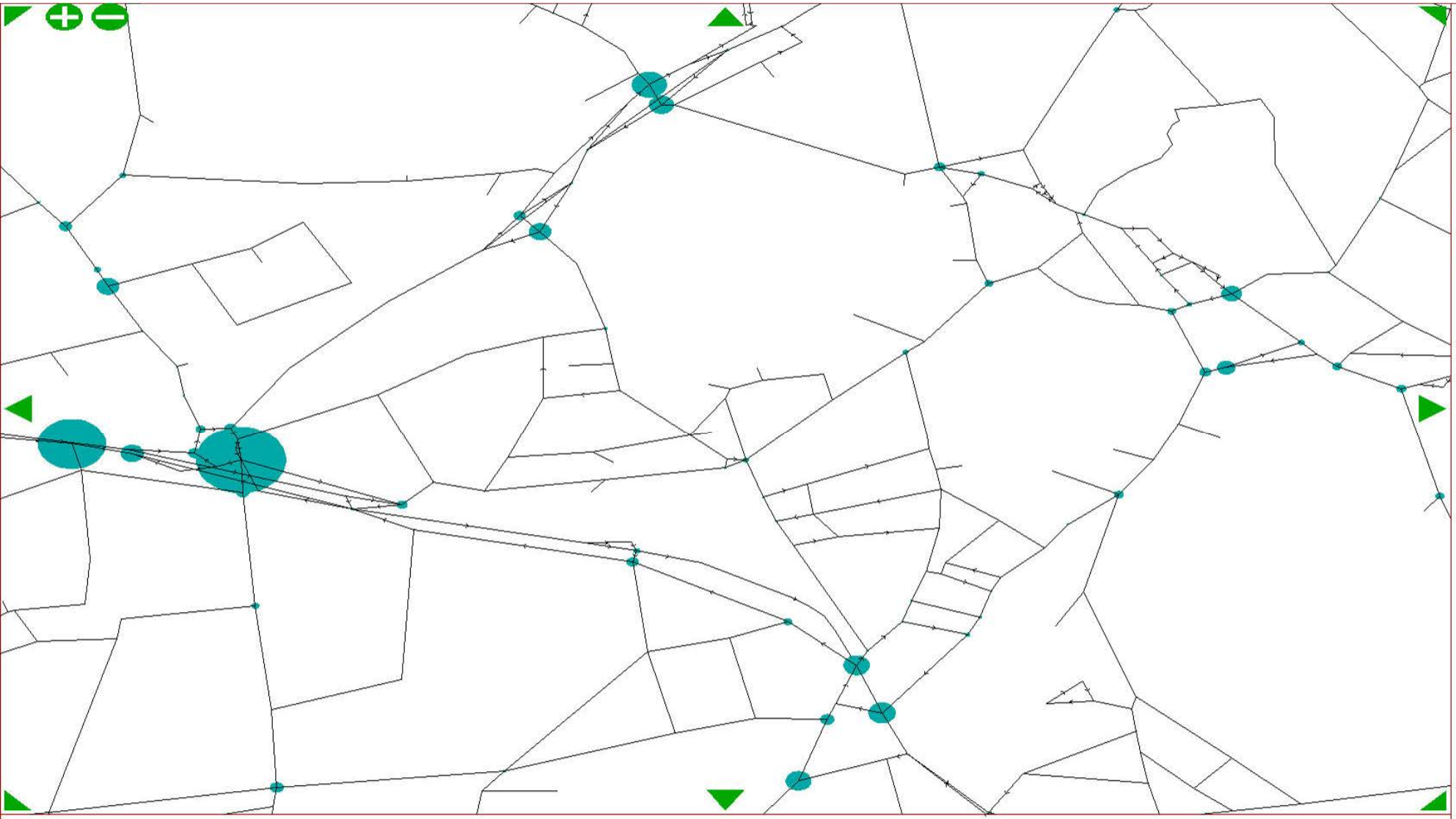
Scale 15098

Node data:
PCU Hr Delay

Bndwdh units
= 20.00/mm

PM Peak Final Model - PCU Hour Delay

19- 1-16
STEER DAVIES



SATUR
Atkins Ltd
DVV / ITS

ET_R002_PM_O
OC5_F_M4.UFS

Scale 15098

Node data:
PCU Hr Delay

Bndwdh units
= 20.00/mm

PM Peak Initial Model - PCU Hour Junction Delay

19- 1-16
STEER DAVIES

steer davies gleave

Park Royal Transport Strategy

Modelling Report

Appendix D – Demand Growth

Figure D1: AM Peak Development Growth Numbers

					AM Trips						2021 AM Peak								2026 AM Peak								2041 AM Peak							
					IN Destination			OUT Origin			IN Destination				Out Origin				IN Destination				Out Origin				IN Destination				Out Origin			
	HAM Zones	PRTS Name	Total Units	New Jobs	Car	LGV (Servicing)	HGV (servicing)	Car	LGV (Servicing)	HGV (servicing)	Car	Taxi	LGV	HGV	Car	Taxi	LGV	HGV	Car	Taxi	LGV	HGV	Car	Taxi	LGV	HGV	Car	Taxi	LGV	HGV	Car	Taxi	LGV	HGV
First Central	67483	First Central	N/A		428	129	19	392	129	19	428		65	10	118		65	10	428		65	10	392		65	10	428		65	10	392		65	10
	66201	255 Ealing Road (A3.2)	125		118			417			7				23				7				23				7				23			
	66201	243 Ealing Road (A3.1)	441		118			417			23				83				23				83				23				83			
	66031	Minavil House (A2)	136		118			417			7				26				7				26				7				26			
Alperton Housing	66201	Alperton House (A1)	188		118			417			10				35				10				35				10				35			
Zone	66031	Atlip (A4)	313		118			417			17				59				17				59				17				59			
	66031	Sunleigh Road (A5)	324		118			417			17				61				17				61				17				61			
	66031	Woodside Avenue (A6)	445		118			417			24				83				24				83				24				83			
	66054	Mount Pleasant (A7)	251		118			417			13				47				13				47				13				47			
Northfields	66054	Northfields	N/A		71			250			36				125				71				250				71				250			
HS2 Shield Site 2	64495	HS2 Shield Site 2		4160	246	216	24	8	216	24																	128		56	6	4		56	6
HS2 Shield Site 1	64496	HS2 Shield Site 1		3840	246	216	24	8	216	24																	118		52	6	4		52	6
Origin Bus Park	67481	Origin Bus Park	N/A	N/A	268	268	23	99	99	9	241		27	12	89		10	5	241		27	12	89		10	5	241		27	12	89		10	5

Figure D2: PM Peak Development Growth Numbers

					PM Trips						PM IN				PM Out				PM IN				PM Out				PM IN Destination				PM Out Origin			
					IN Destination			OUT Origin																											
	New Zone Name	PRTS Name	Total Units	New Jobs	Car	(Servicing)	HGV (servicing)	Car	(Servicing)	HGV (servicing)	Car	Taxi	LGV	HGV	Car	Taxi	LGV	HGV	Car	Taxi	LGV	HGV	Car	Taxi	LGV	HGV	Car	Taxi	LGV	HGV	Car	Taxi	LGV	HGV
First Central	67483	First Central			321	129	19	535	129	19	96		65	10	535		16	2	321		65	10	535		16	2	321		65	10	535		65	10
	66201	255 Ealing Road (A3.2)	125		293			205			16				12				16				12				16				12			
	66201	243 Ealing Road (A3.1)	441		293			205			58				41				58				41				58				41			
	66031	Minavil House (A2)	136		293			205			18				13				18				13				18				13			
Alperton Housing	66201	Alperton House (A1)	188		293			205			25				17				25				17				25				17			
Zone	66031	Atlip (A4)	313		293			205			41				29				41				29				41				29			
	66031	Sunleigh Road (A5)	324		293			205			43				30				43				30				43				30			
	66031	Woodside Avenue (A6)	445		293			205			59				41				59				41				59				41			
	66054	Mount Pleasant (A7)	251		293			205			33				23				33				23				33				23			
Northfields	66054	Northfields			175			123			88				62				175				123				175				123			
HS2 Shield Site 2	64495	HS2 Shield Site 2		4160	50			32	22	2																	26				17		6	0
HS2 Shield Site 1	64496	HS2 Shield Site 1		3840	50			32	22	2																	24				15		5	0
Origin Bus Park	67481	Origin Bus Park			67		6	248		21	34		3		31		3		34		3		31		3		34		3		124			11

Figure 1: AM 2021 Traffic Growth (PCUs) – Including Development Trips for Park Royal Study

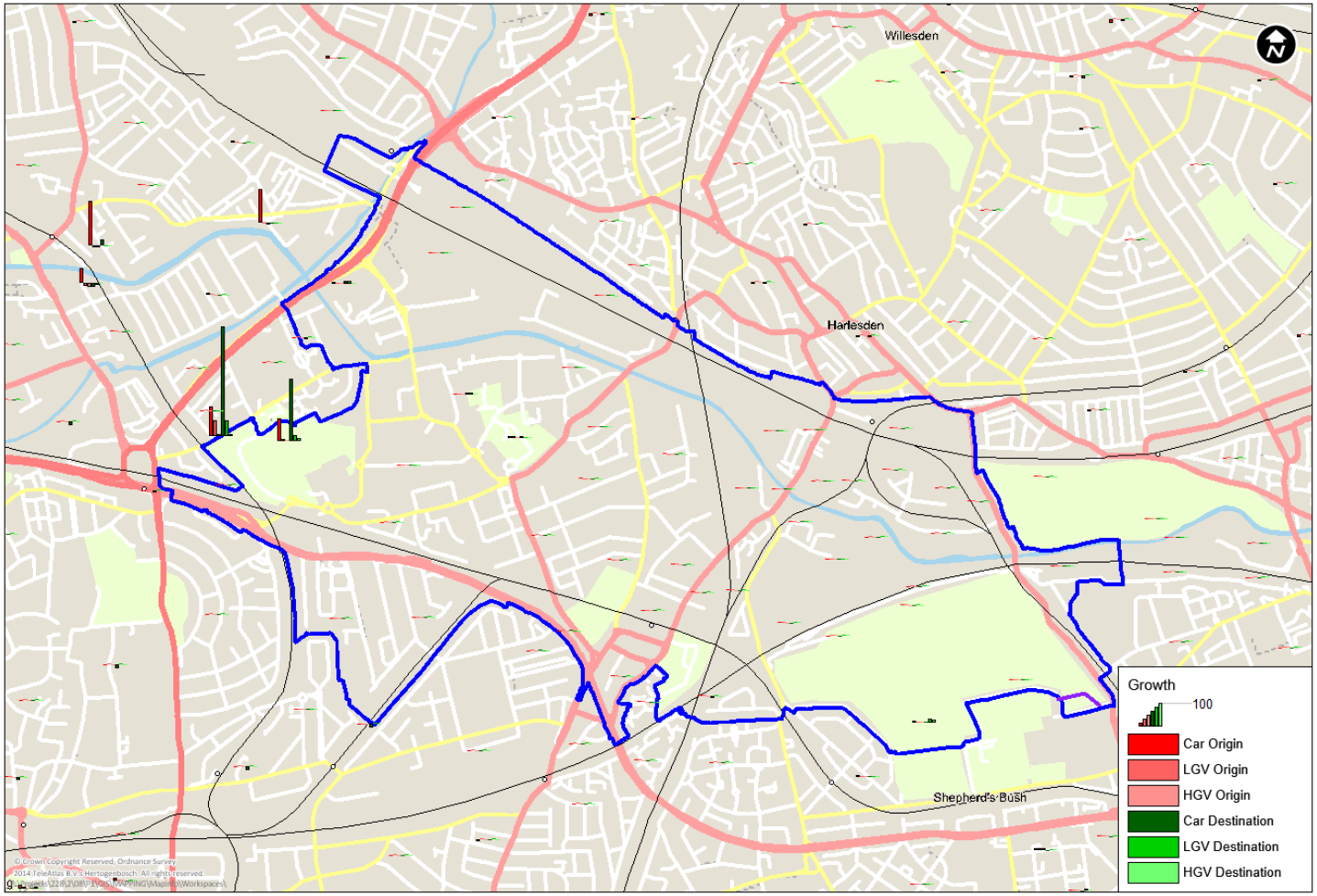


Figure 2: AM 2026 Traffic Growth (PCUs) – Including Development Trips for Park Royal Study

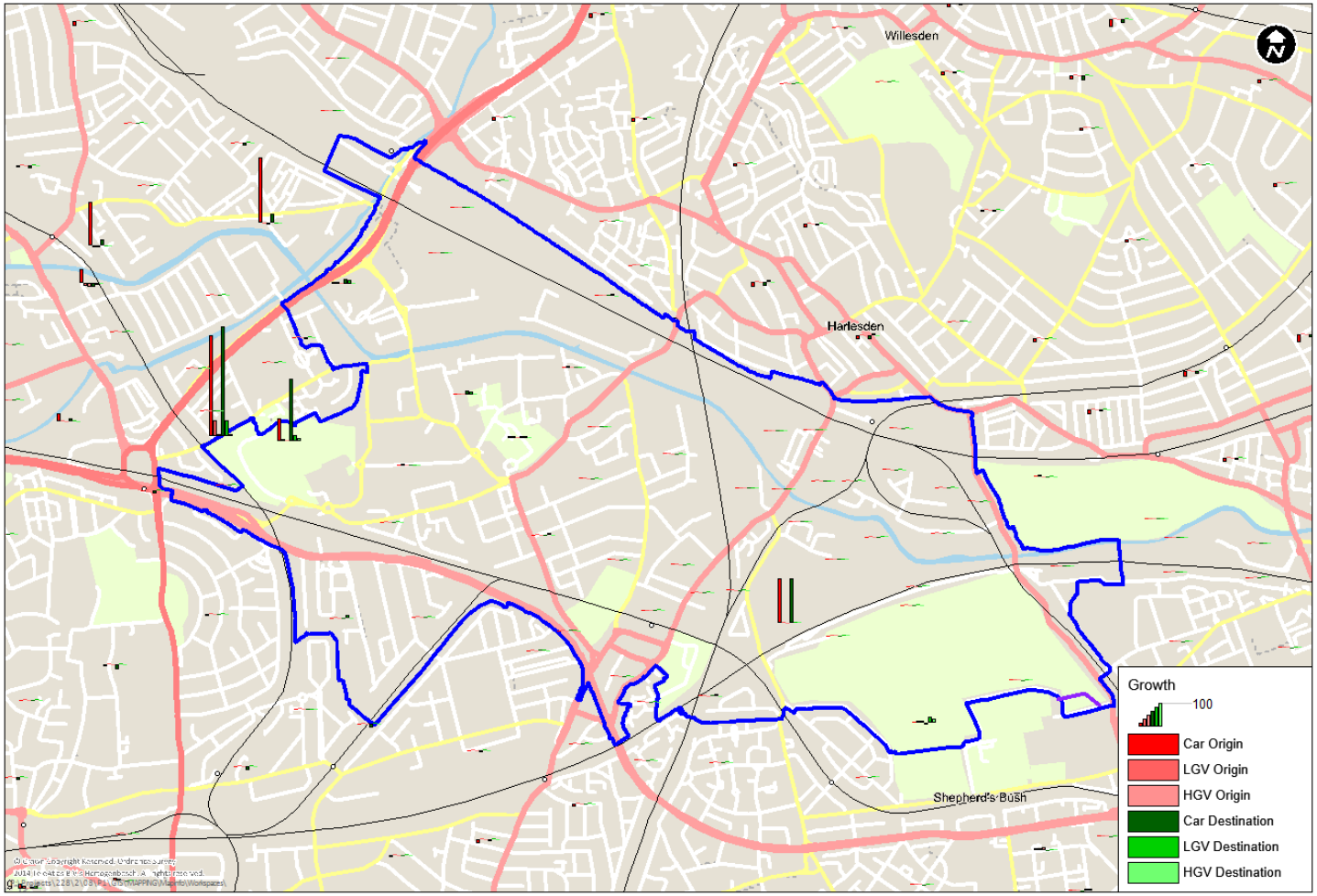


Figure 3: AM 2041 Traffic Growth (PCUs) – Including Development Trips for Park Royal Study

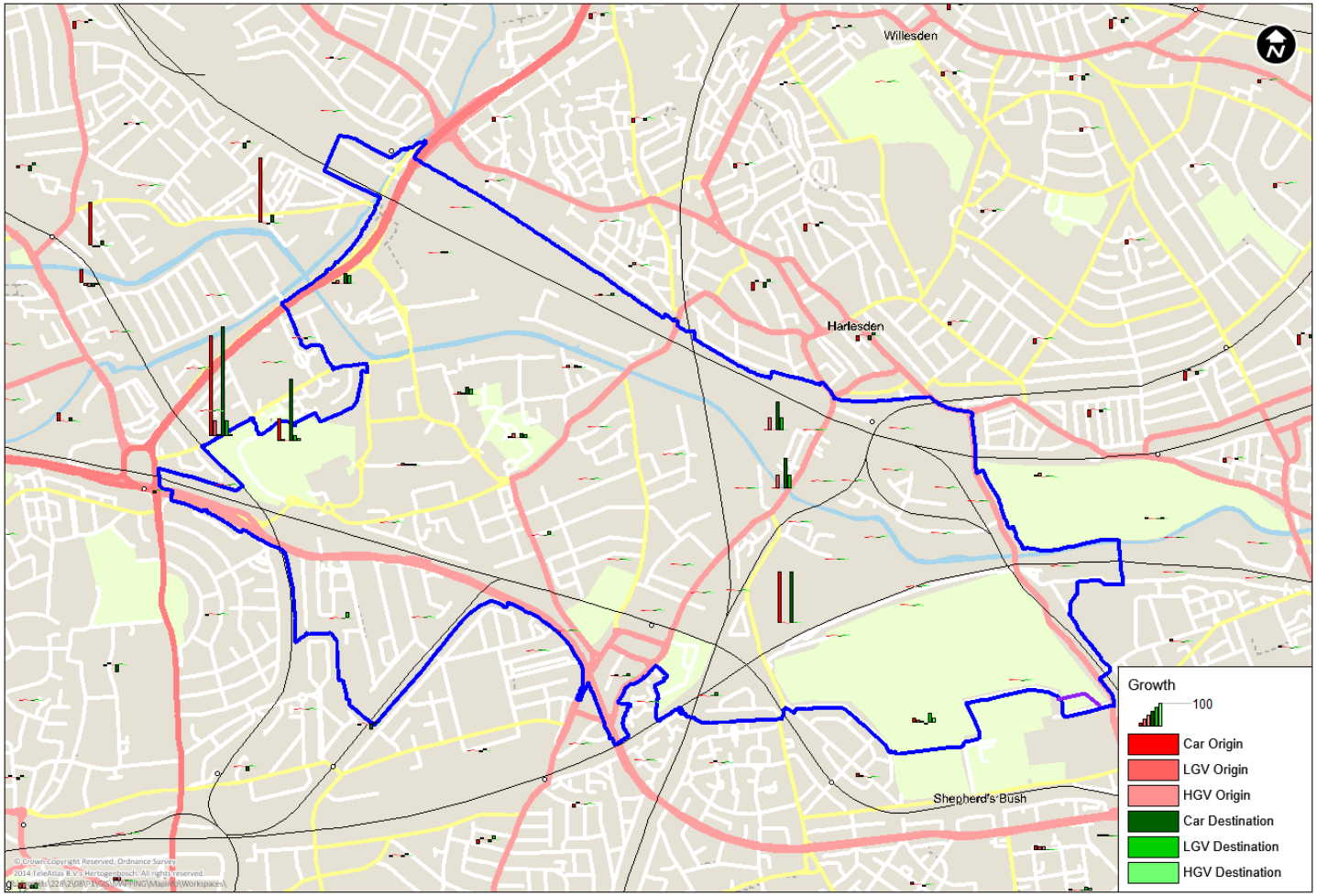


Figure 4: PM 2021 Traffic Growth (PCUs) – Including Development Trips for Park Royal Study

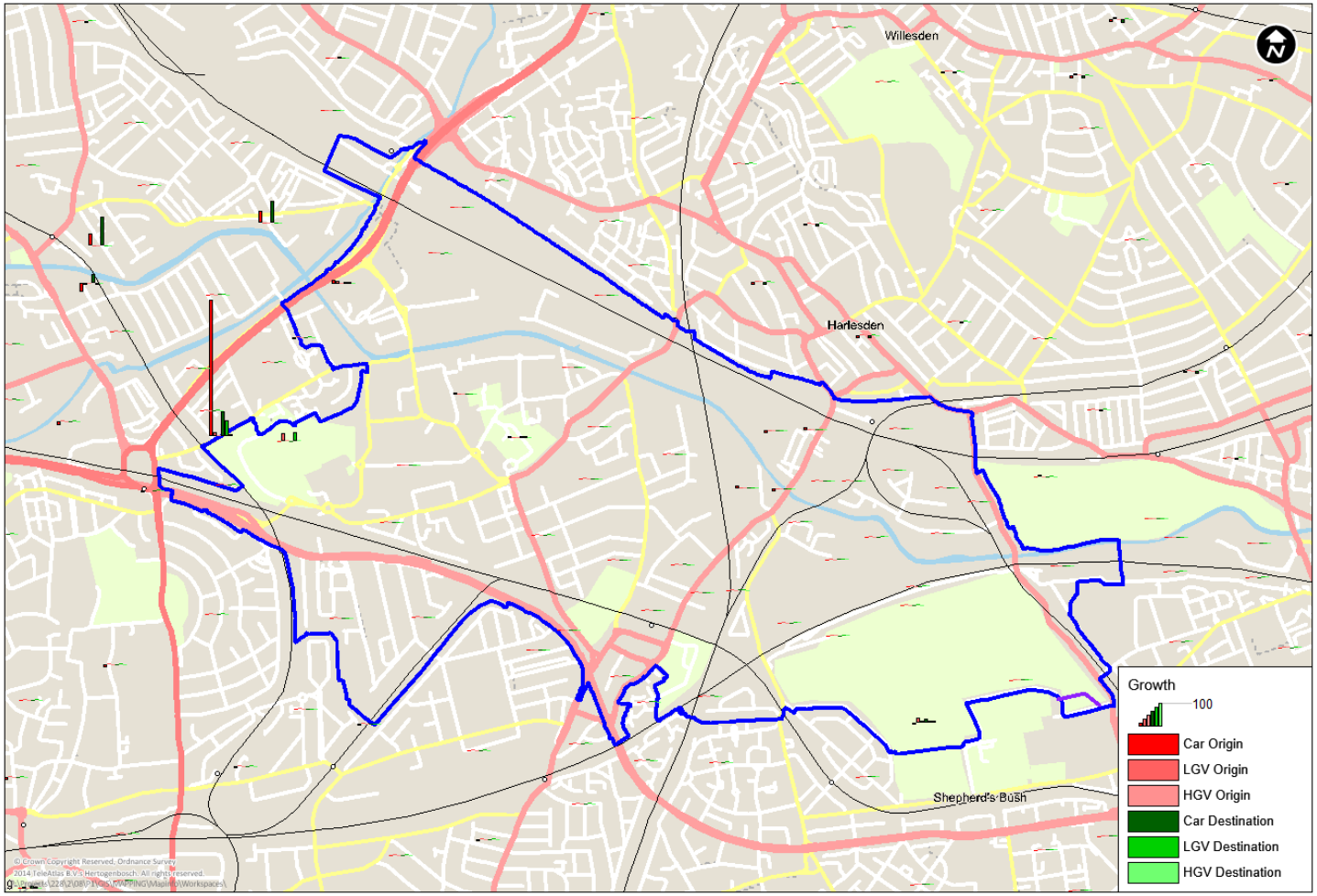


Figure 5: PM 2026 Traffic Growth (PCUs) – Including Development Trips for Park Royal Study

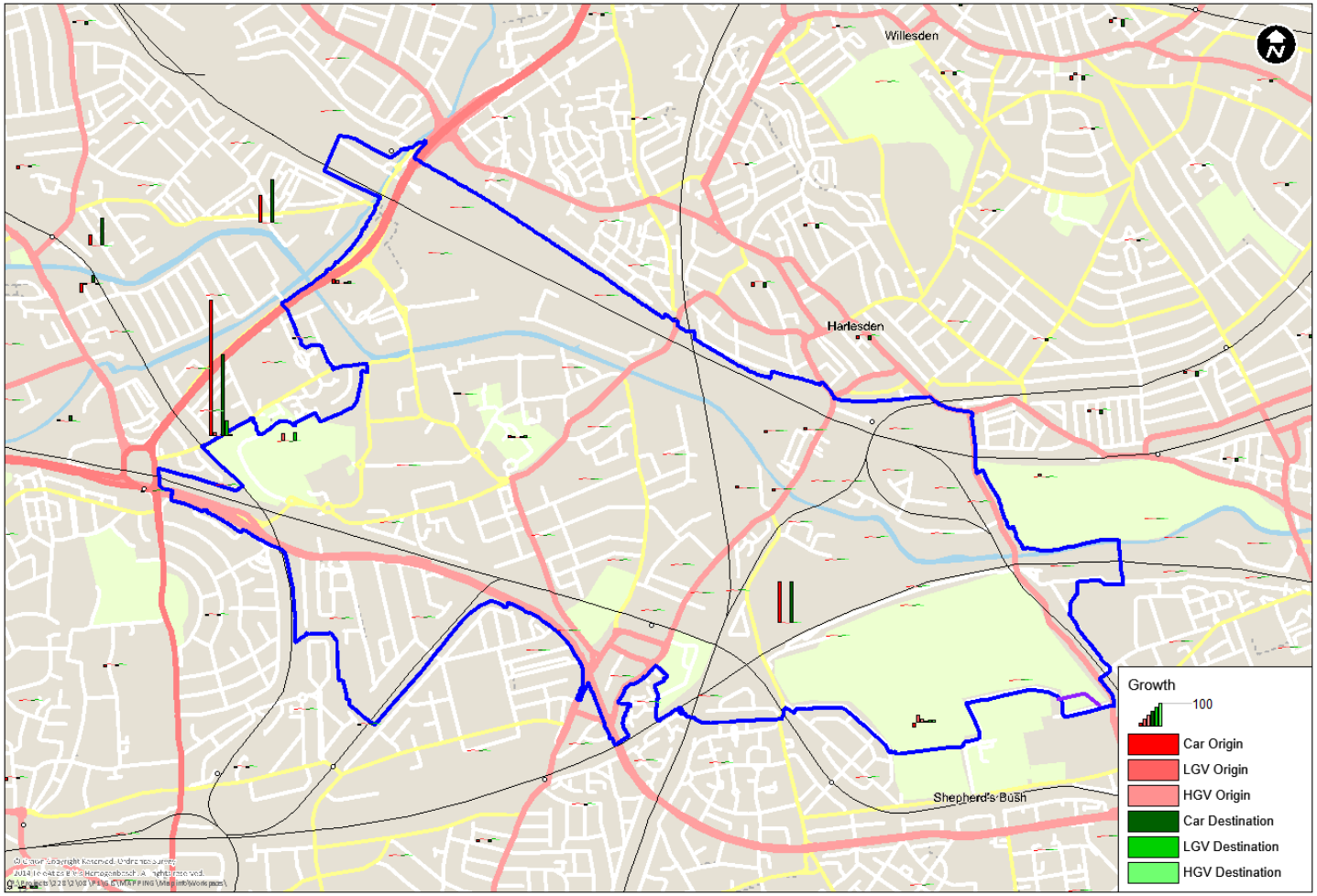


Figure 6: PM 2041 Traffic Growth (PCUs) – Including Development Trips for Park Royal Study

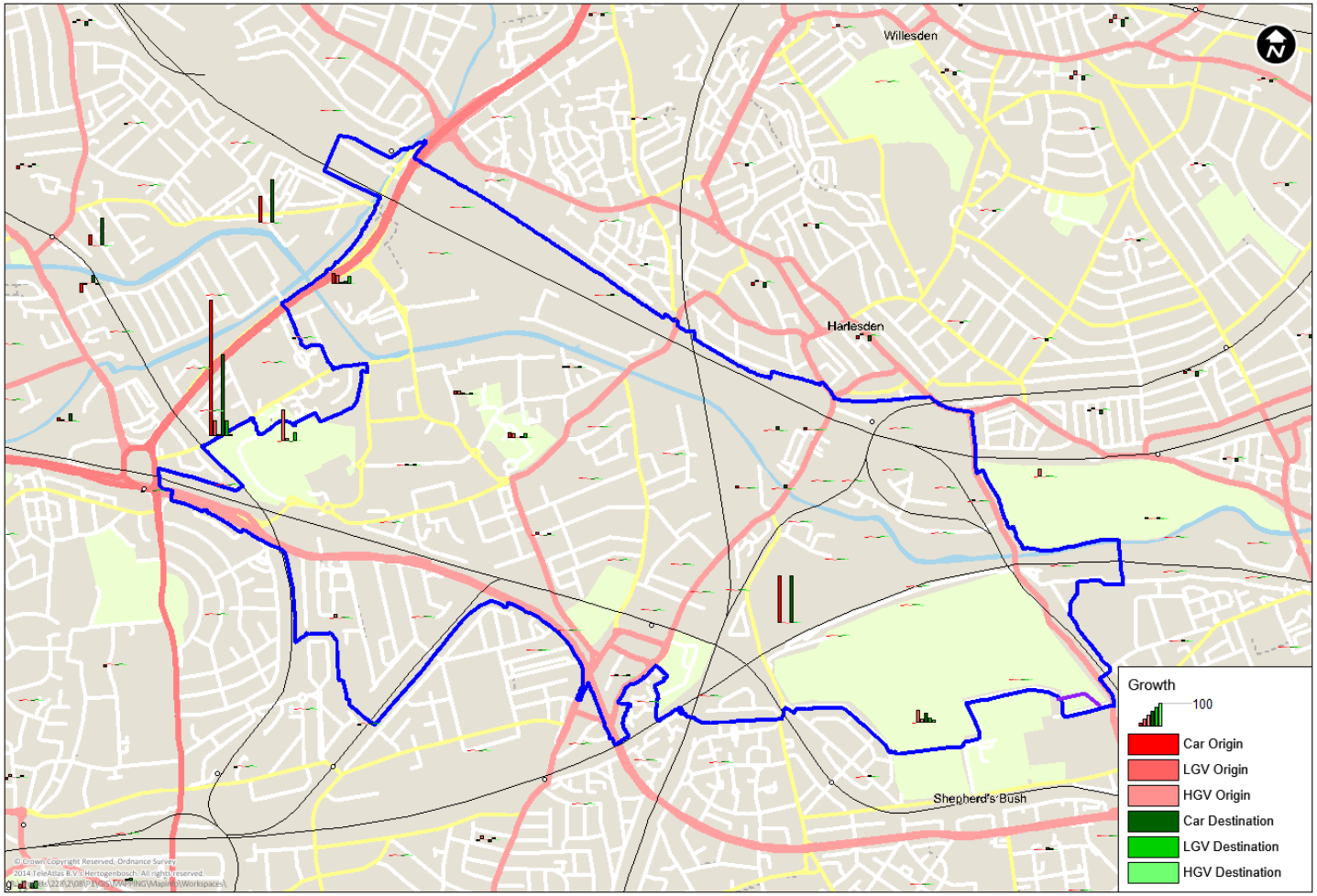


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Figure E.1: AM Peak 2012 Base Year Demand Flows in PCUs

Figure E.2: AM Peak 2012 Base Year Actual Flows in PCUs

Figure E.3: AM Peak 2012 Base Year Average Queue in PCUs

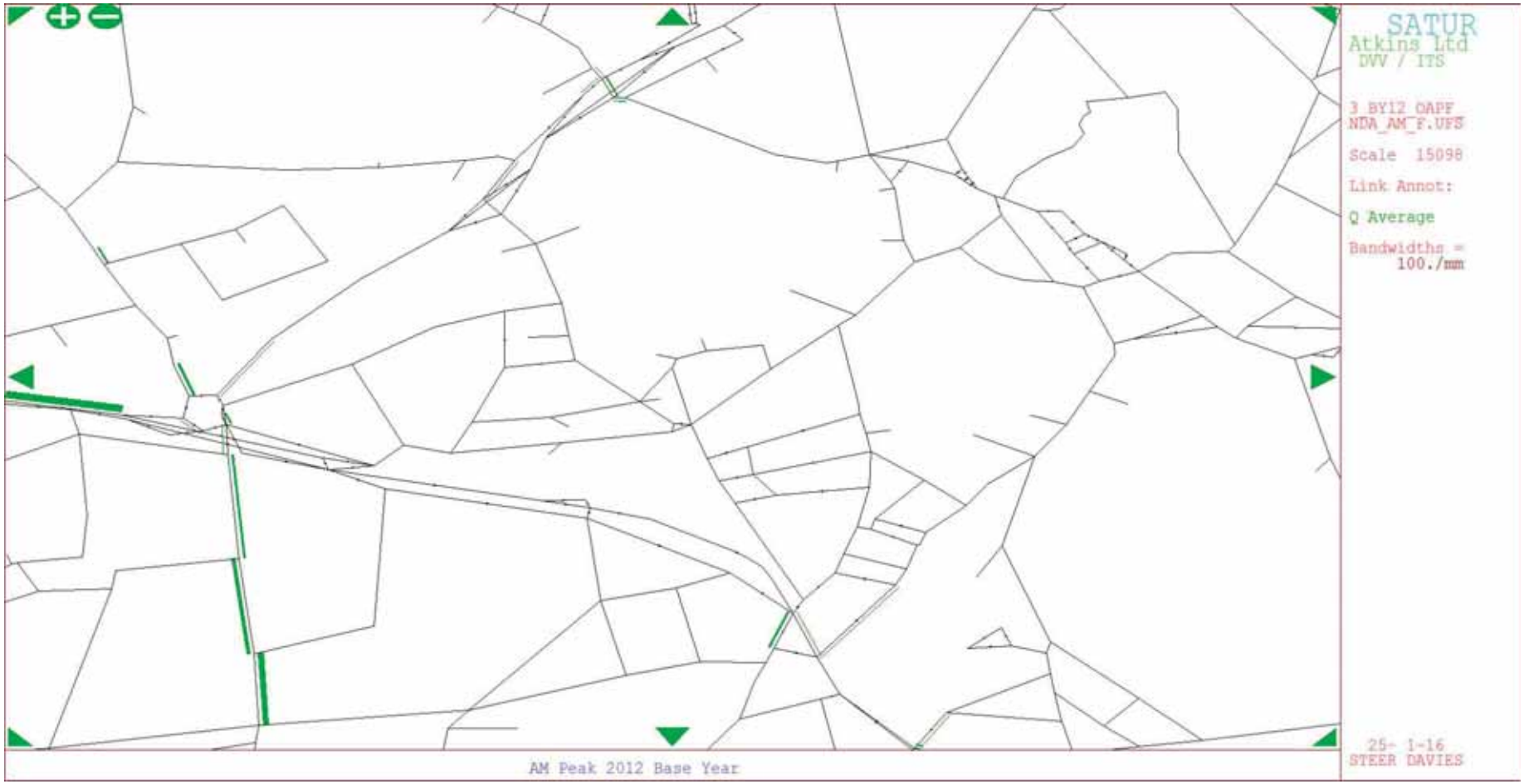


Figure E.4: AM Peak 2012 Base Year Average Delay in Seconds

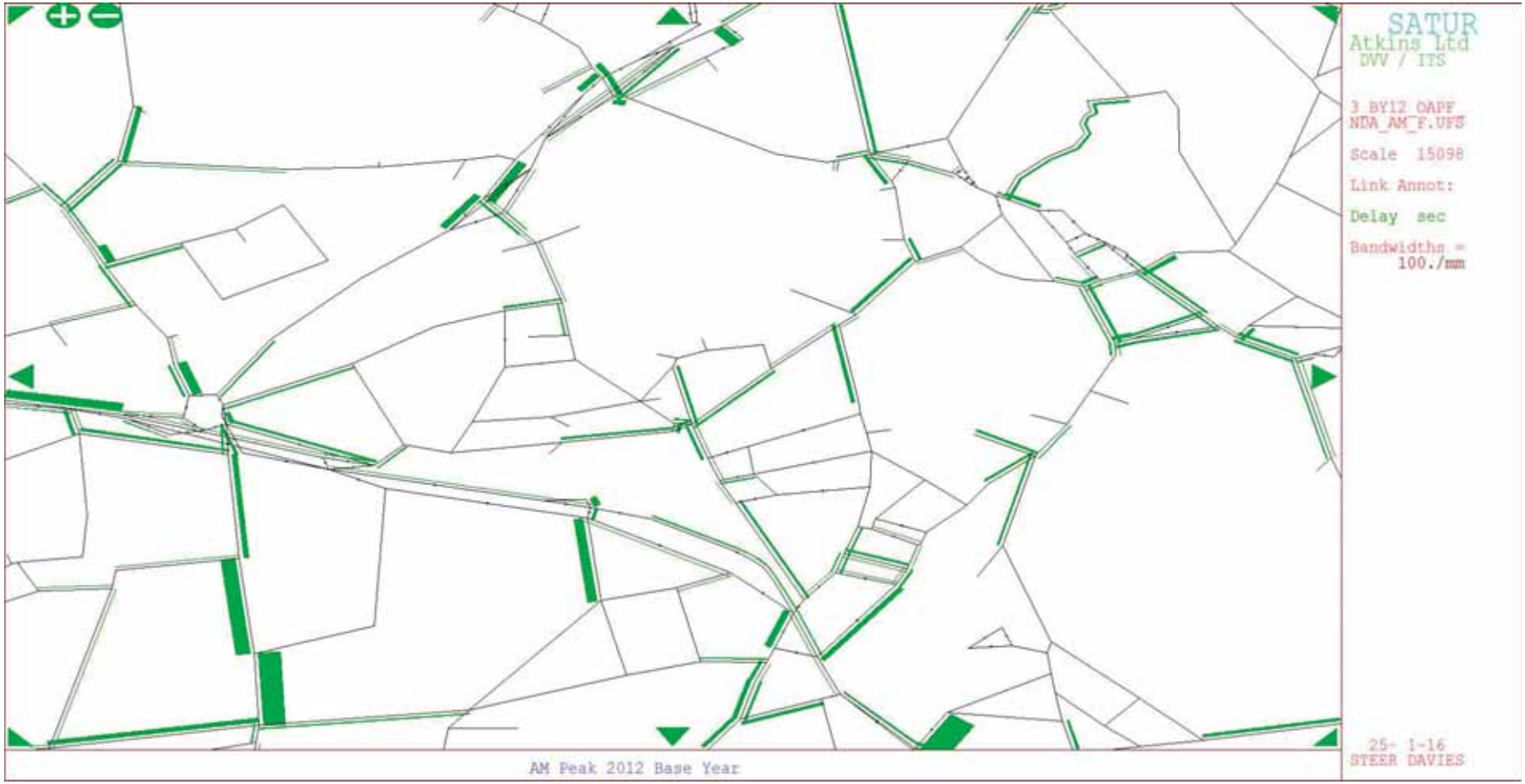


Figure E.5: AM Peak 2012 Base Year Volume Over Capacity %

Figure E.6: PM Peak 2012 Base Year Demand Flows in PCUs

Figure E.7: PM Peak 2012 Base Year Actual Flows in PCUs

Figure E.8: PM Peak 2012 Base Year Average Queues in PCUs

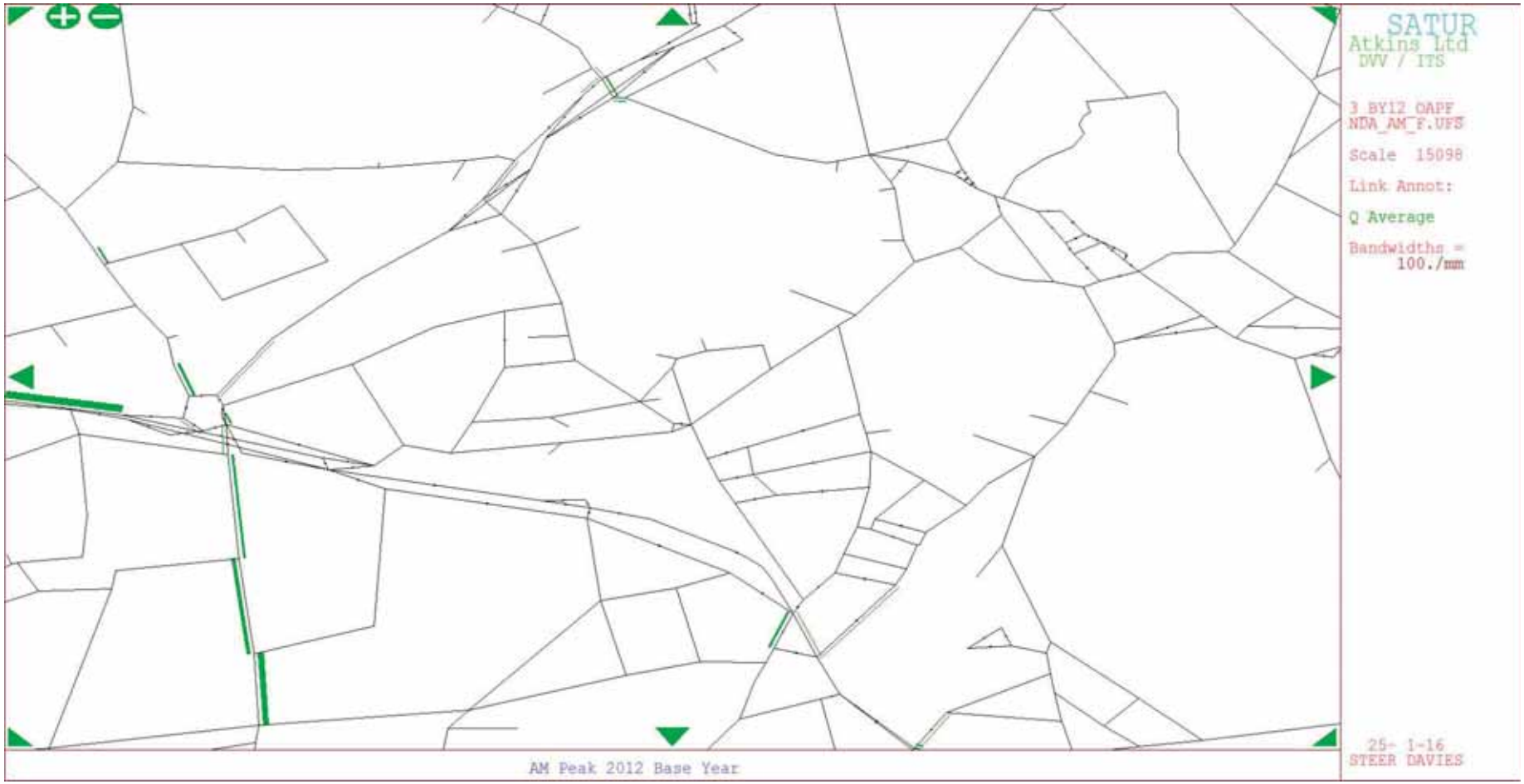


Figure E.9: PM Peak 2012 Base Year Average Delay in Seconds

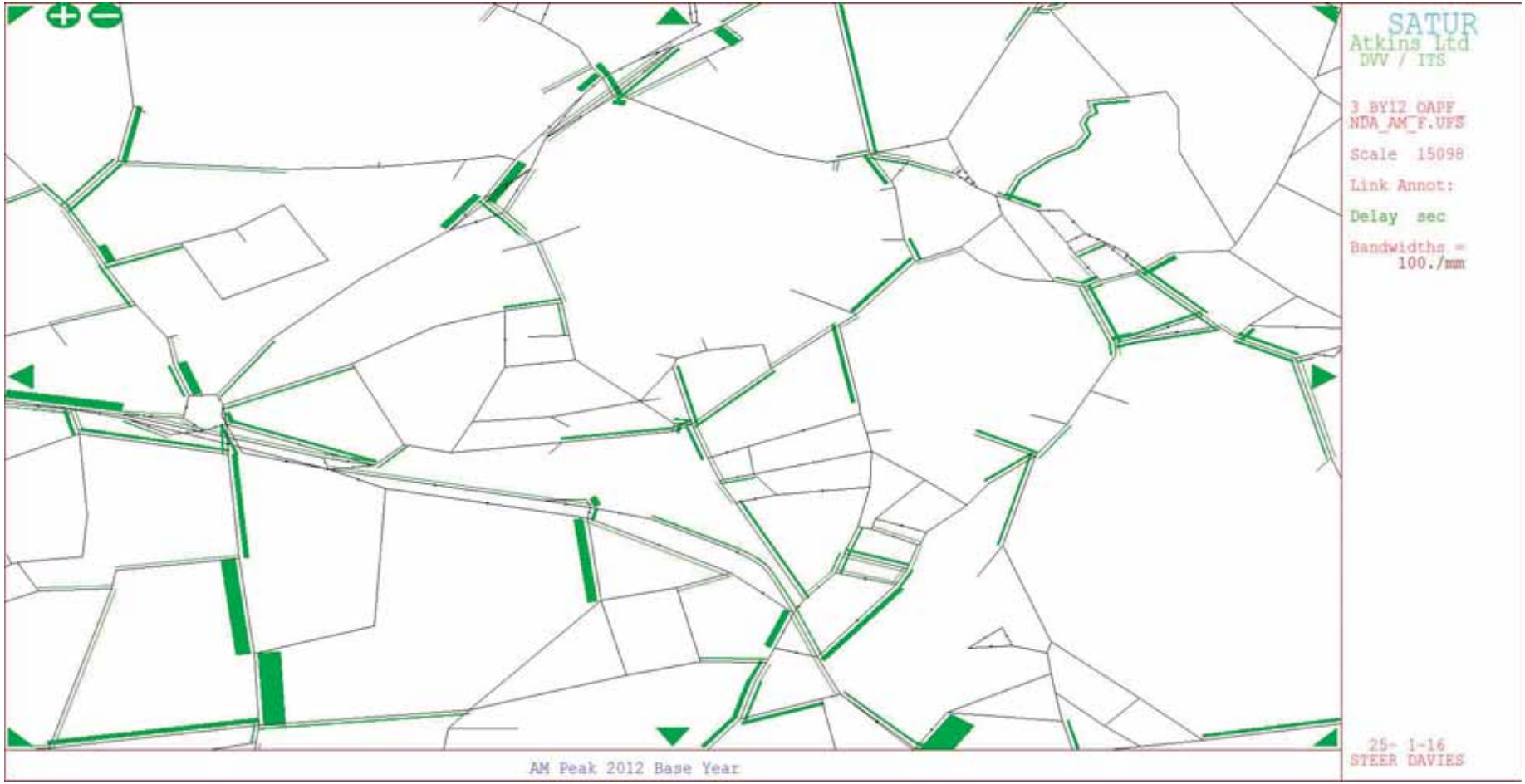


Figure E.10: AM Peak 2012 Base Year Volume Over Capacity %

Figure E.11: AM Peak 2021 Park Royal Demand Flows in PCUs

Figure E.12: AM Peak 2021 Park Royal Actual Flows in PCUs

Figure E.13: AM Peak 2021 Park Royal Average Queue in PCUs

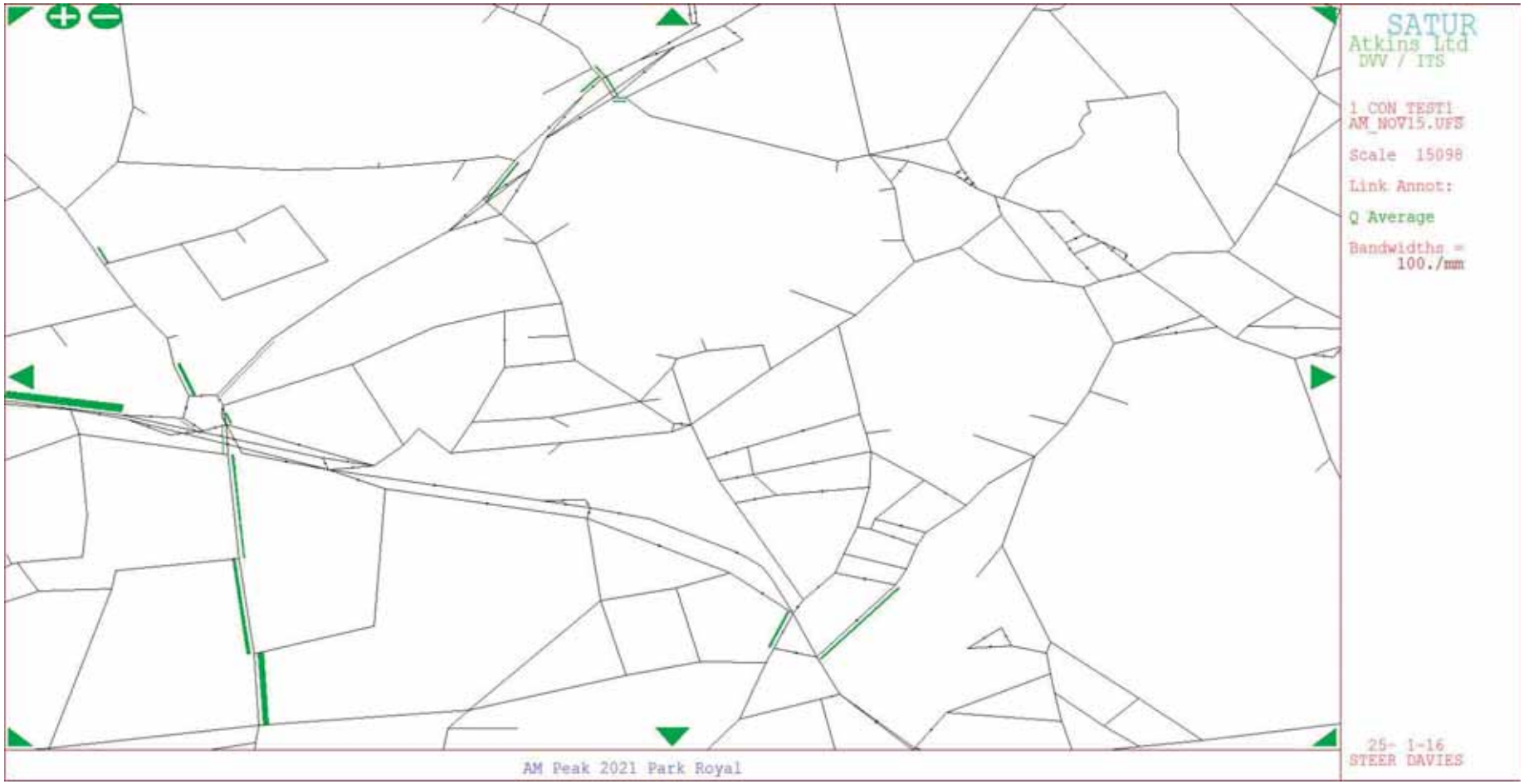


Figure E.14: AM Peak 2021 Park Royal Average Delay in Seconds

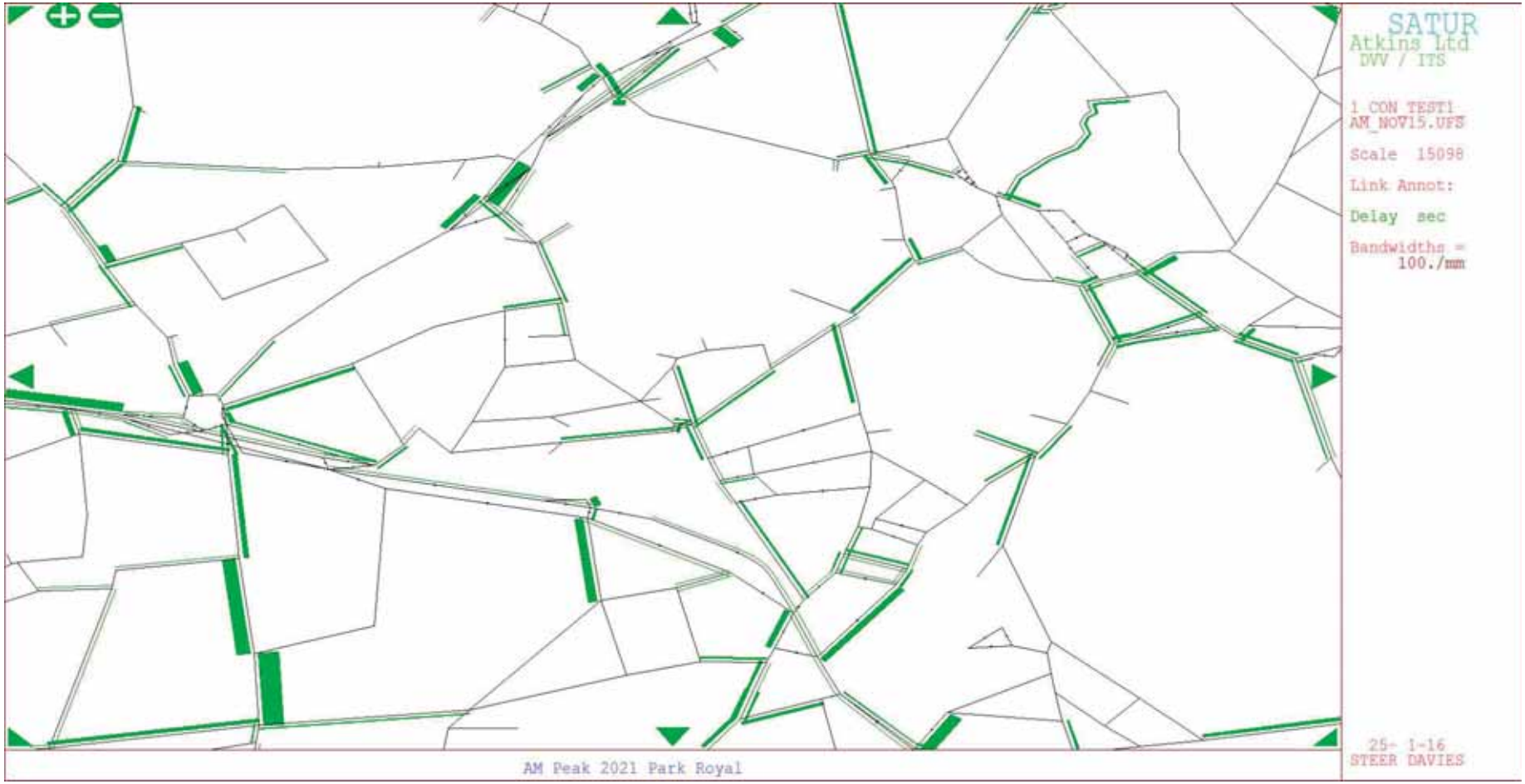


Figure E.15: AM Peak 2021 Park Royal Volume Over Capacity %

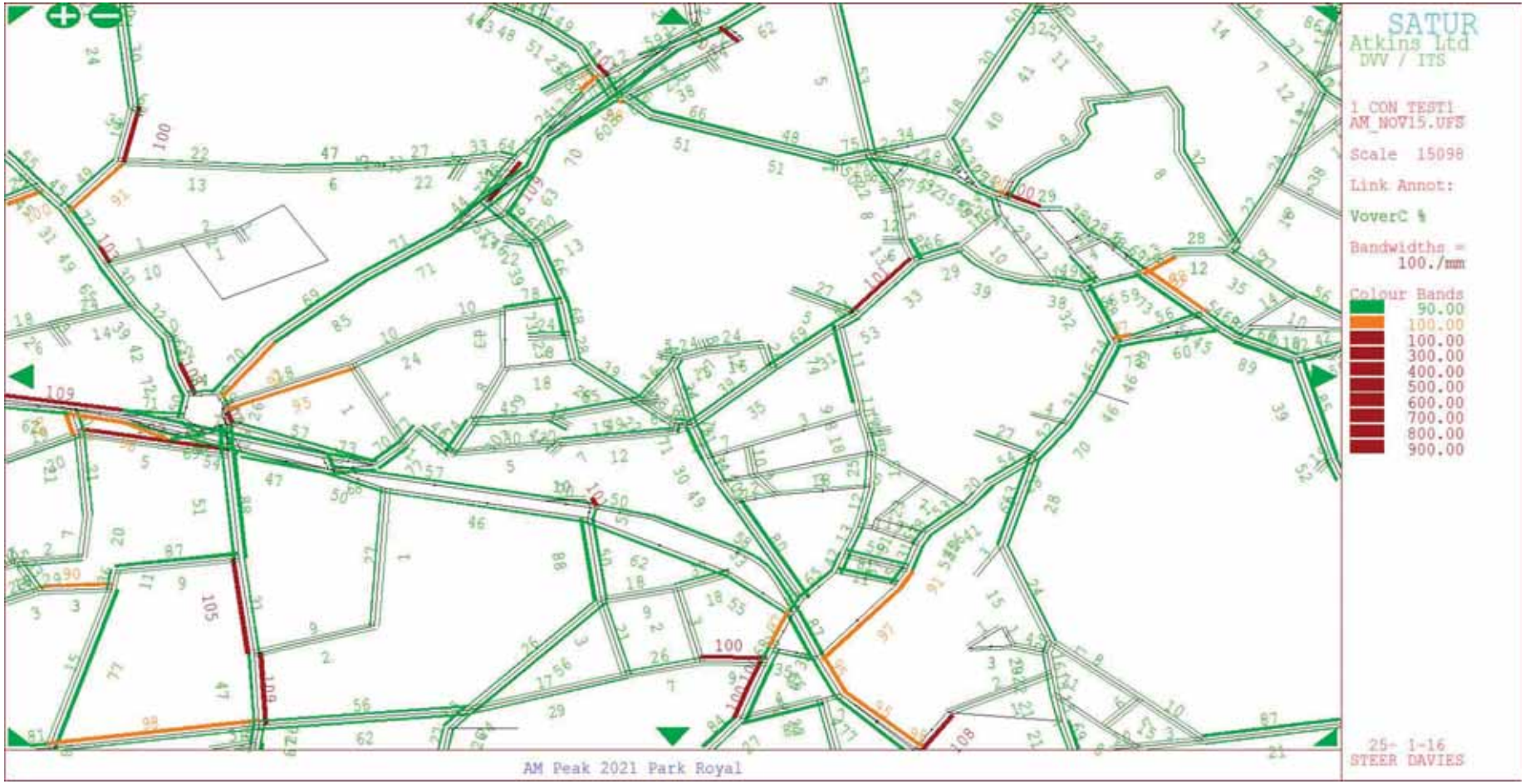


Figure E.16: AM Peak 2021 Park Royal PCU Hour Junction Delays

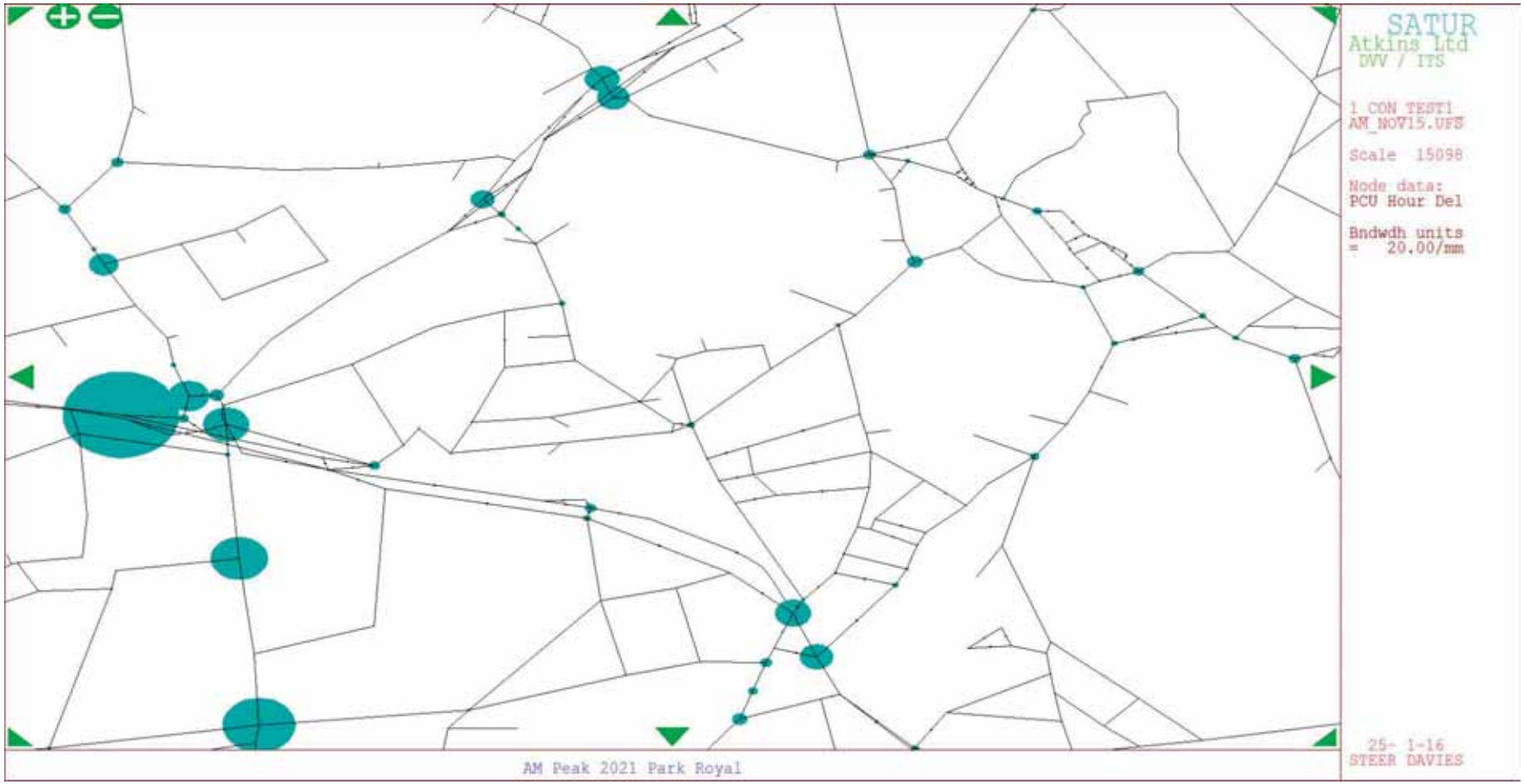


Figure E.17: AM Peak (Park Royal 2021- BY 2012) Demand Flow Differences in PCUs

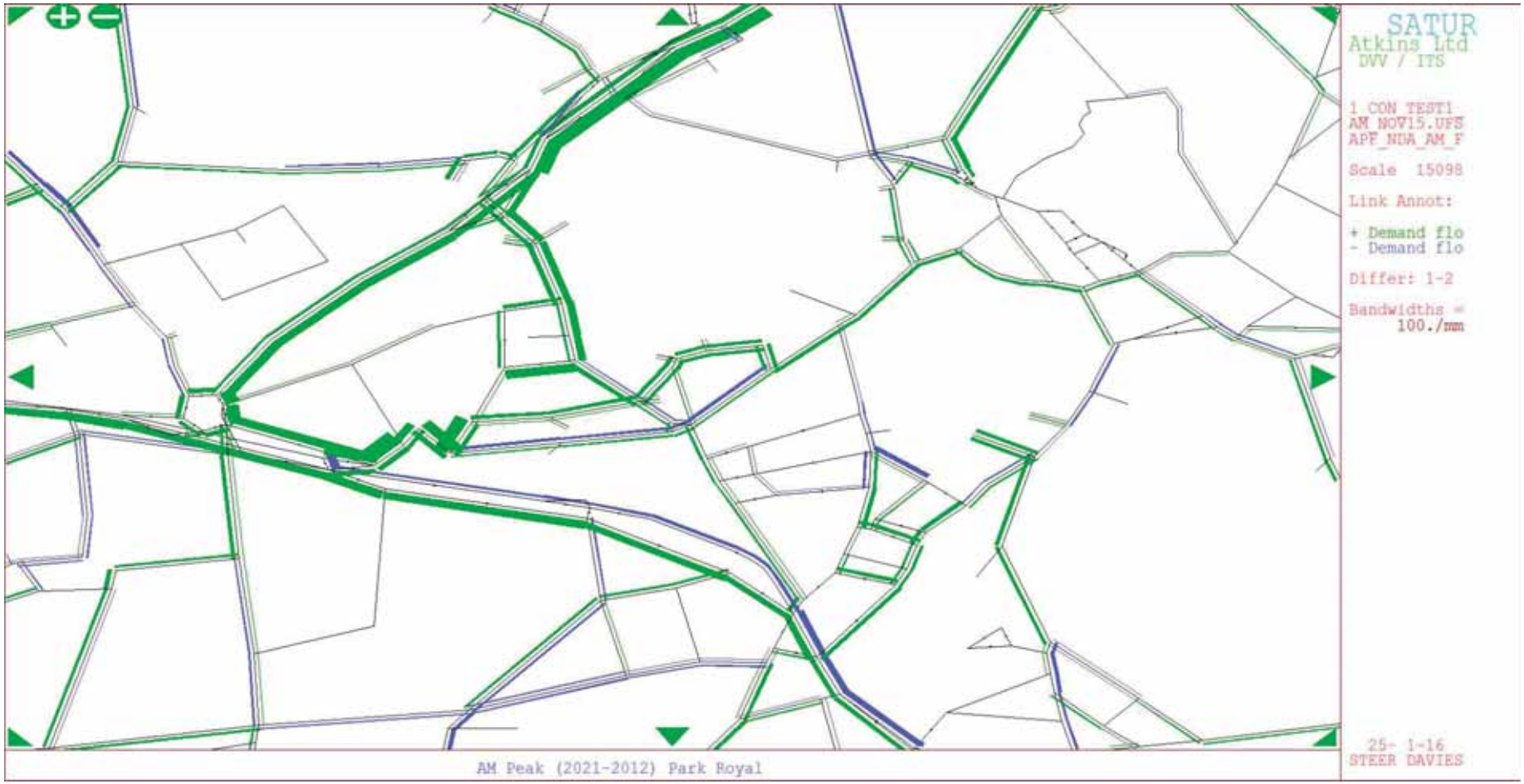


Figure E.18: AM Peak (Park Royal 2021- BY 2012) Actual Flow Differences in PCUs

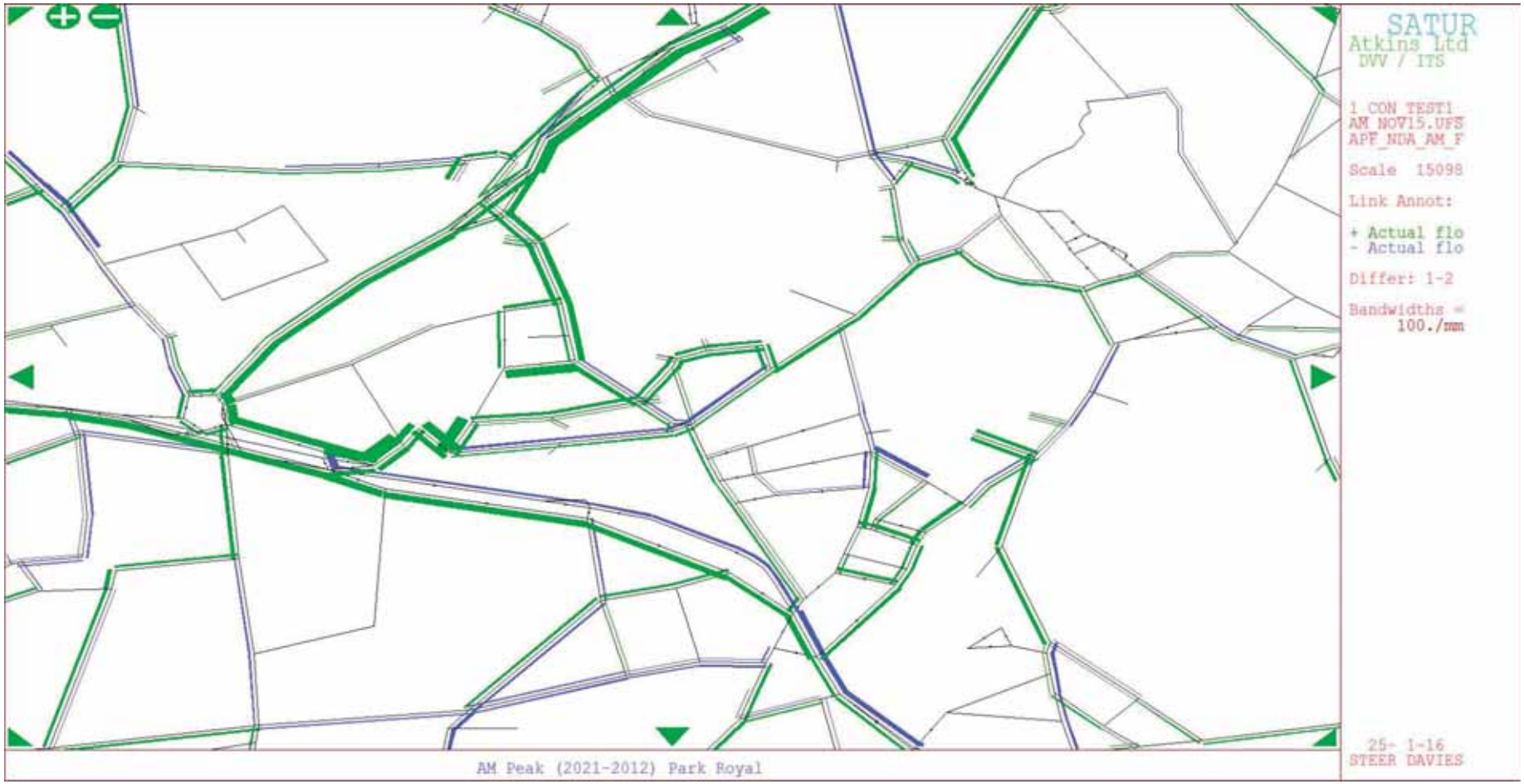


Figure E.19: AM Peak (Park Royal 2021- BY 2012) Average Queue Differences in PCUs

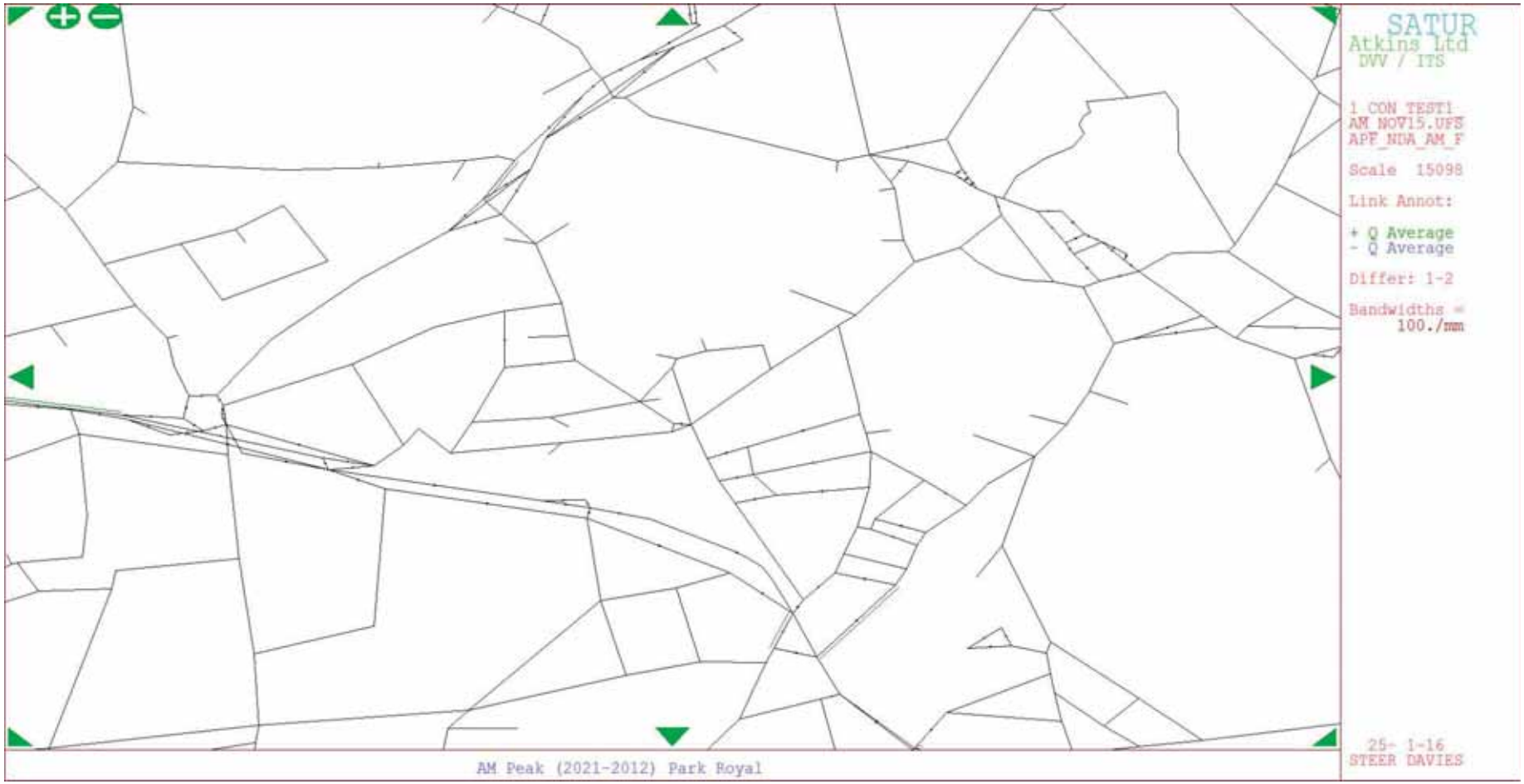


Figure E.20: AM Peak (Park Royal 2021 - BY 2012) Average Delay Differences in Seconds

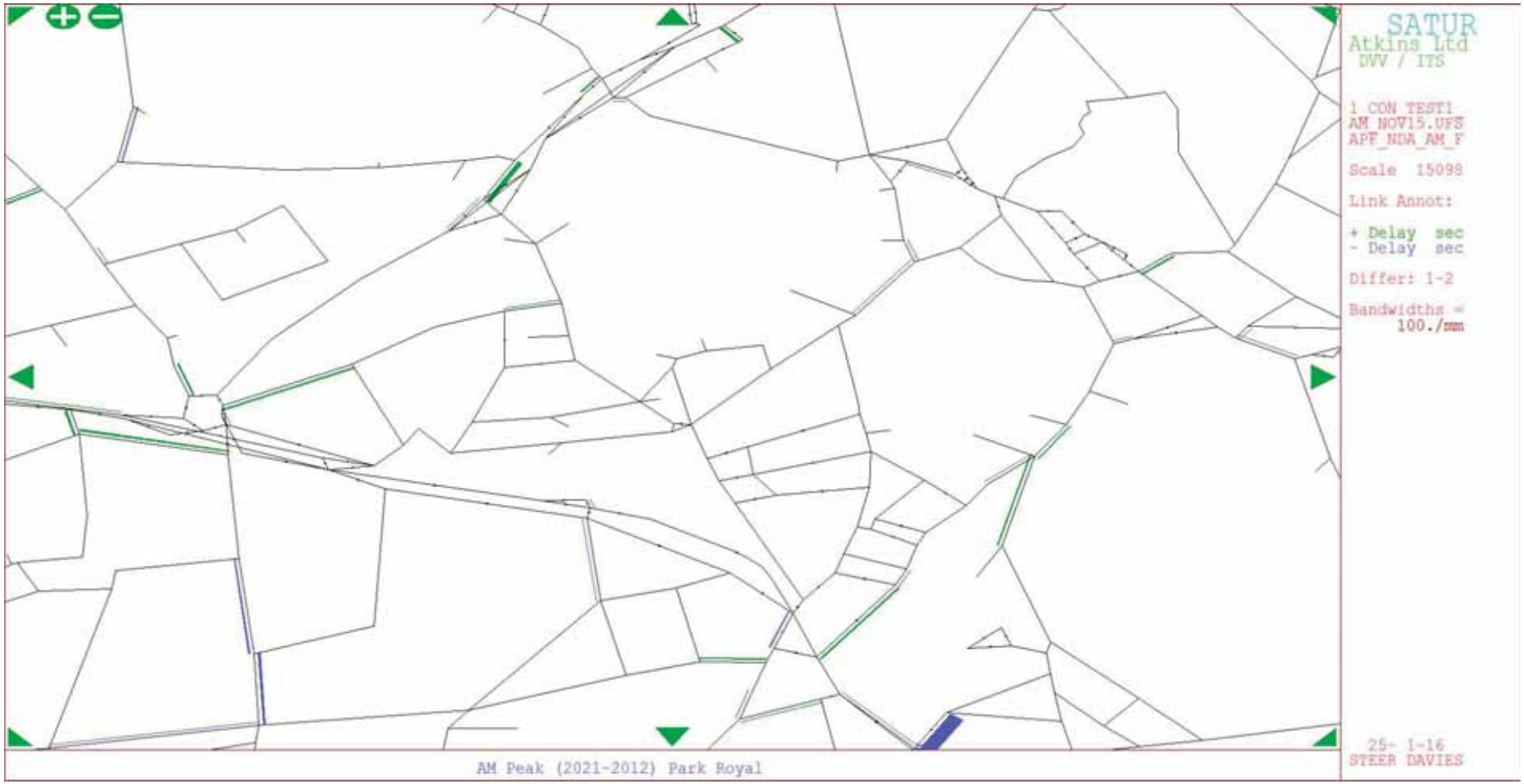


Figure E.21: AM Peak (Park Royal 2021- BY 2012) PCU Hour Junction Delay Differences

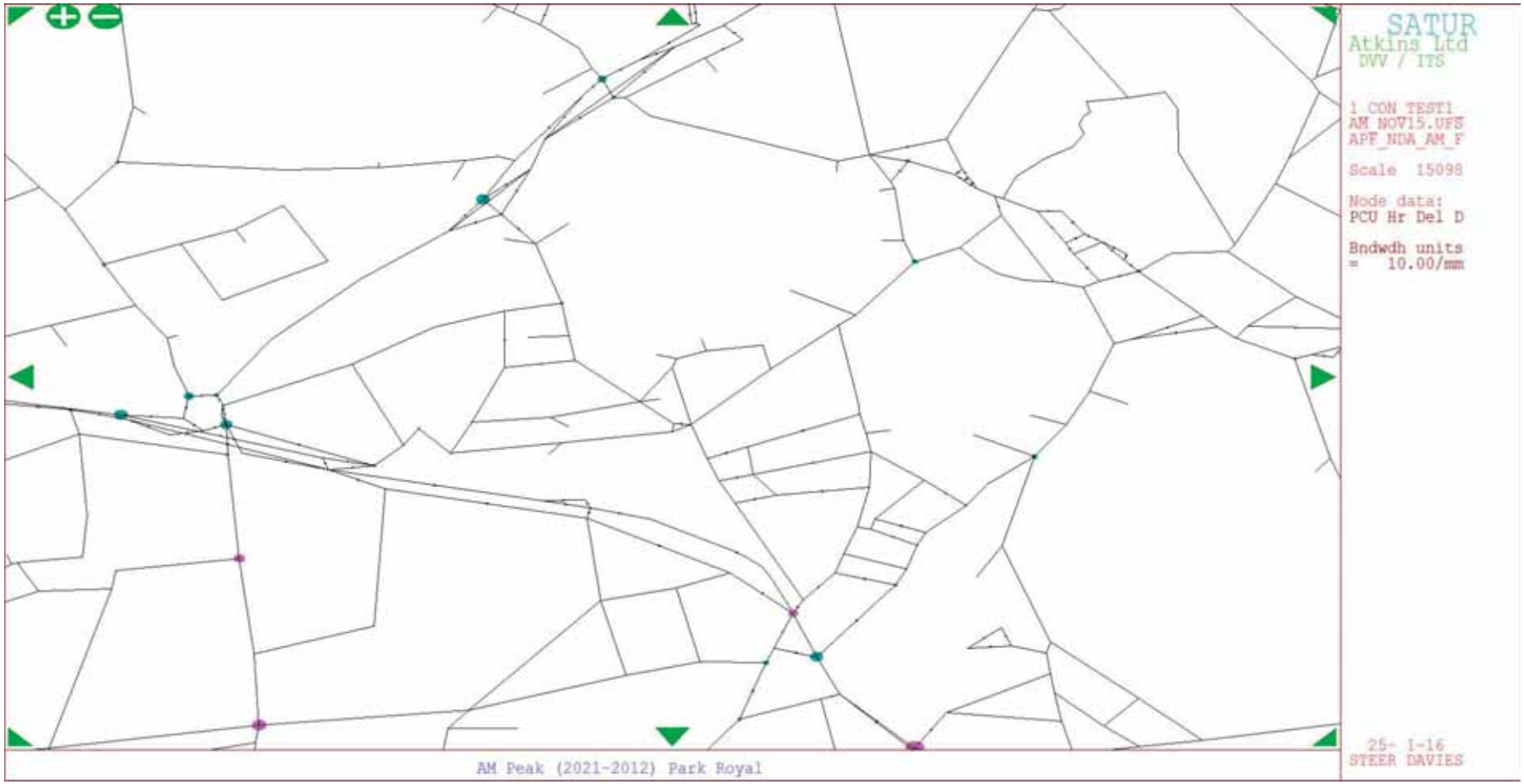


Figure E.22: PM Peak Park Royal 2021 Demand Flow in PCUs

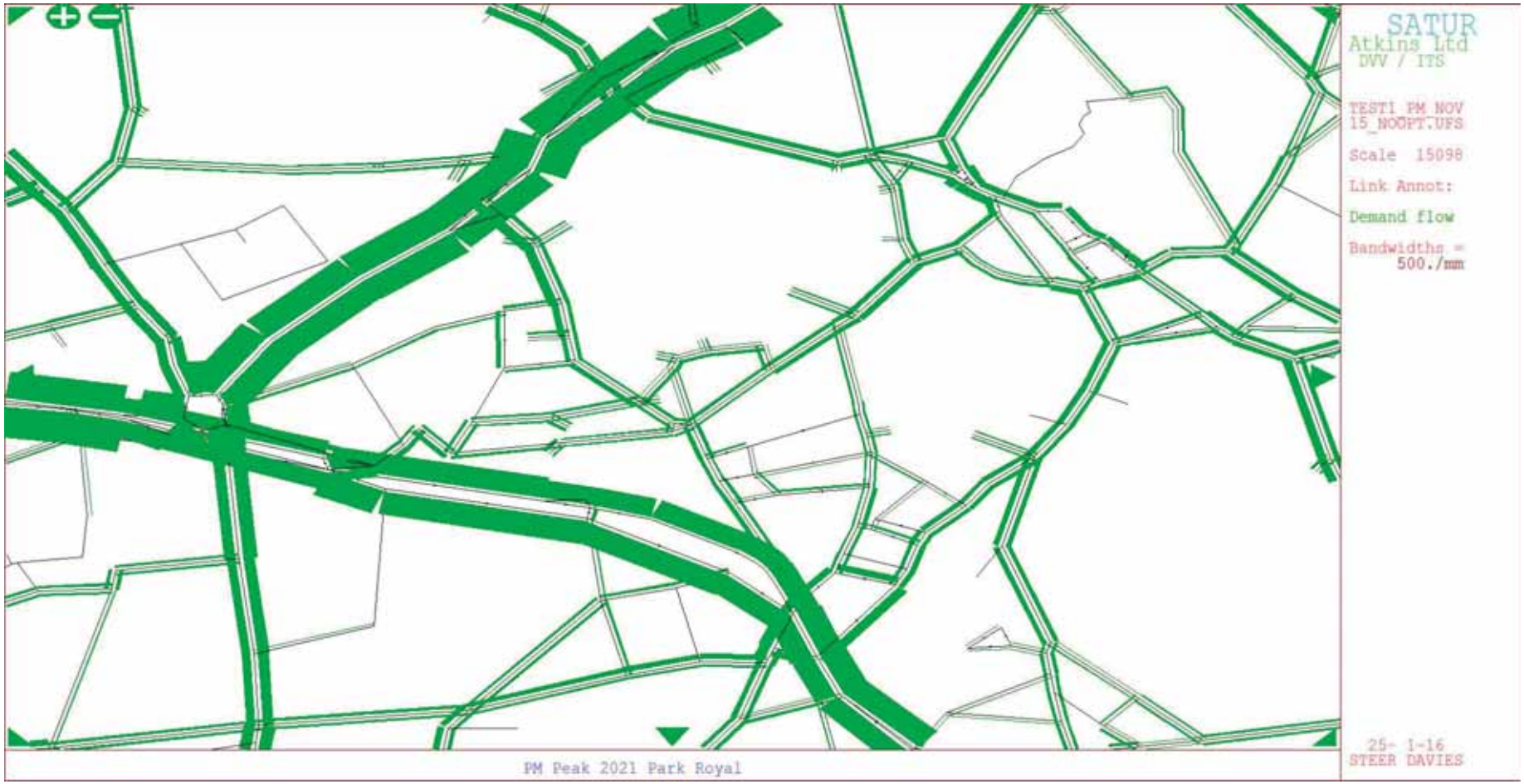


Figure E.23: PM Peak Park Royal 2021 Actual Flow in PCUs

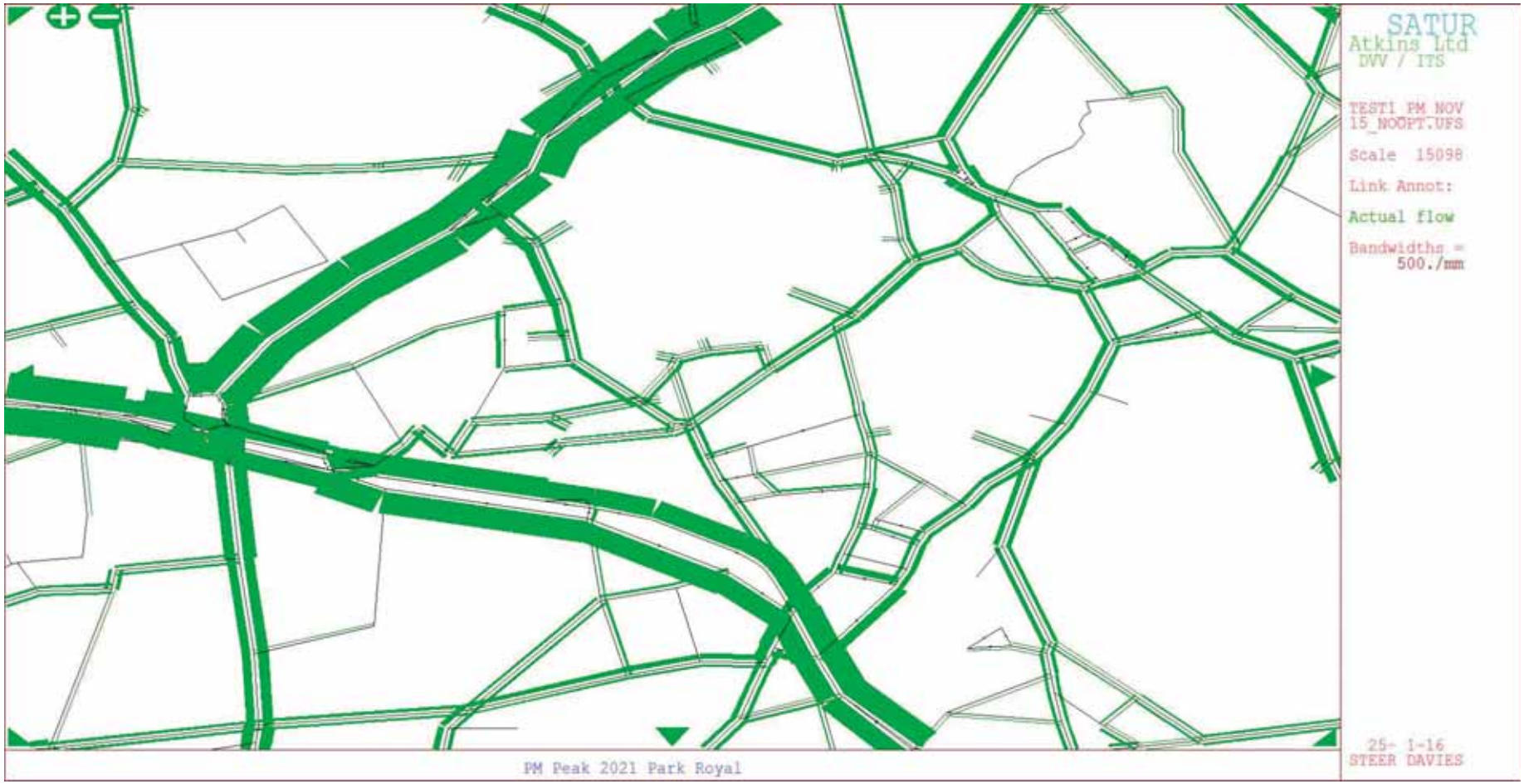


Figure E.24: PM Peak Park Royal 2021 Average Queue in PCUs

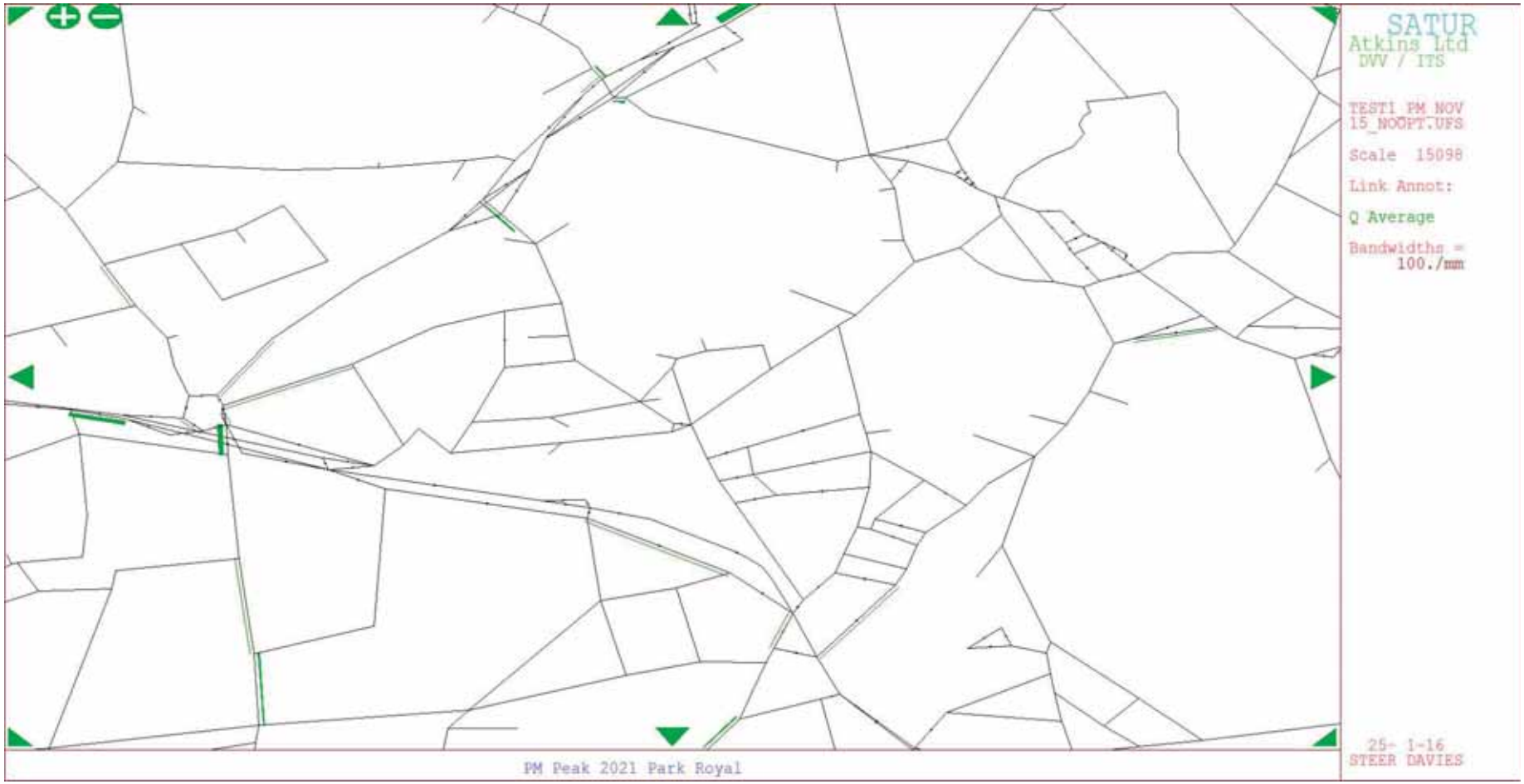


Figure E.25: PM Peak Park Royal 2021 Average Delay in Seconds

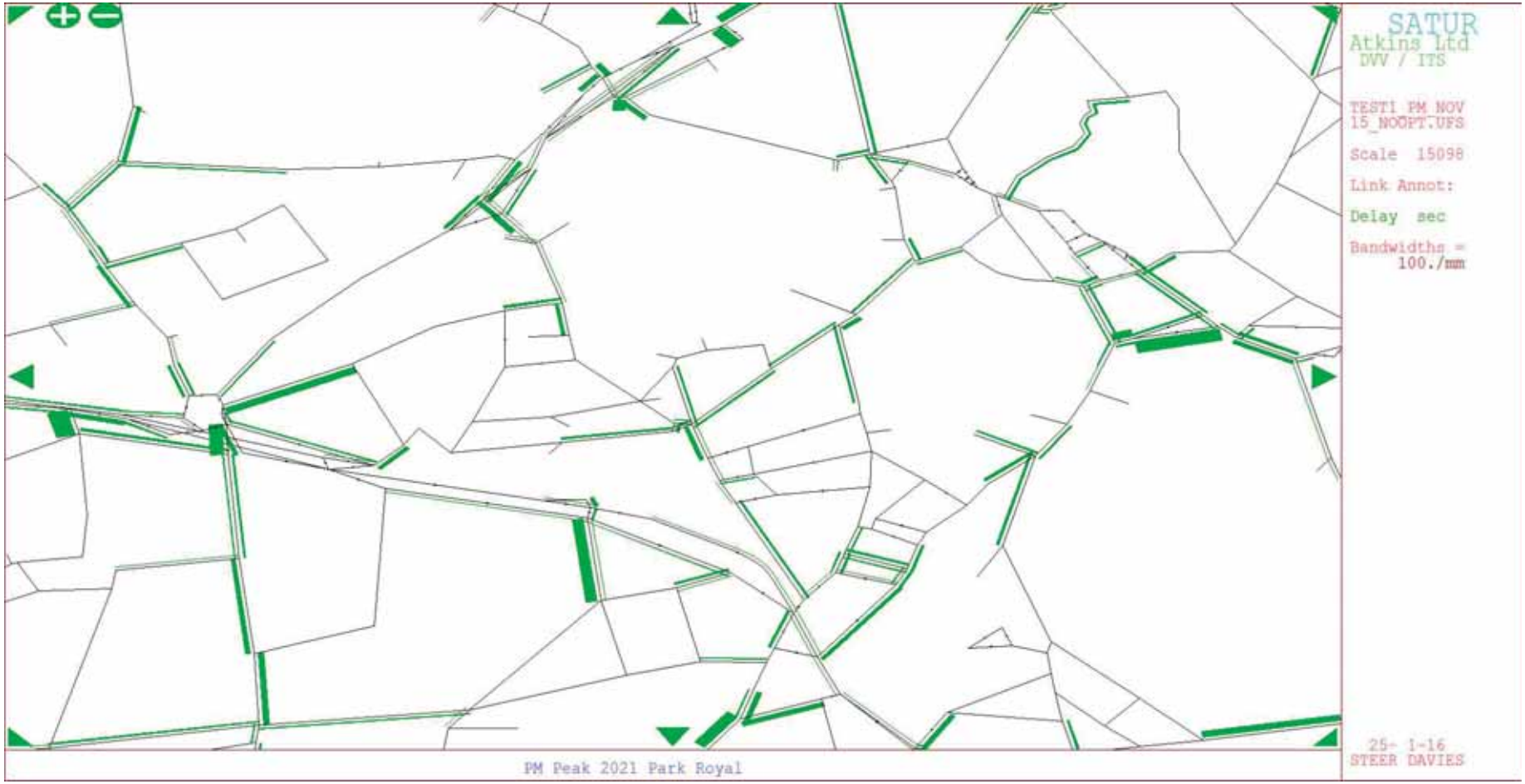


Figure E.26: PM Peak Park Royal 2021 Volume Over Capacity %

Figure E.27: PM Peak Park Royal 2021 Junction PCU Hour Junction Delay

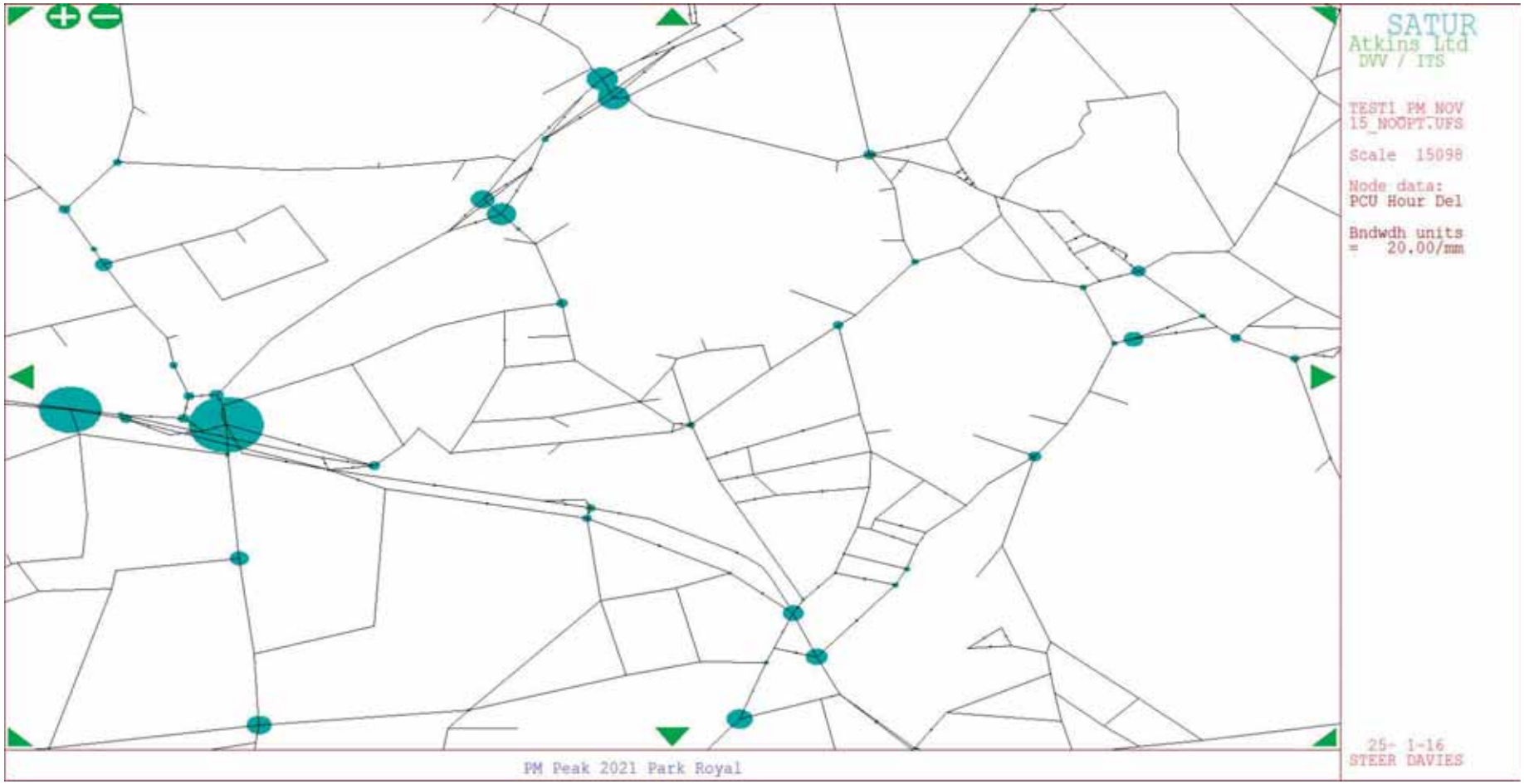


Figure E.28: PM Peak (Park Royal 2021 – BY 2012) Demand Flow Differences in PCUs

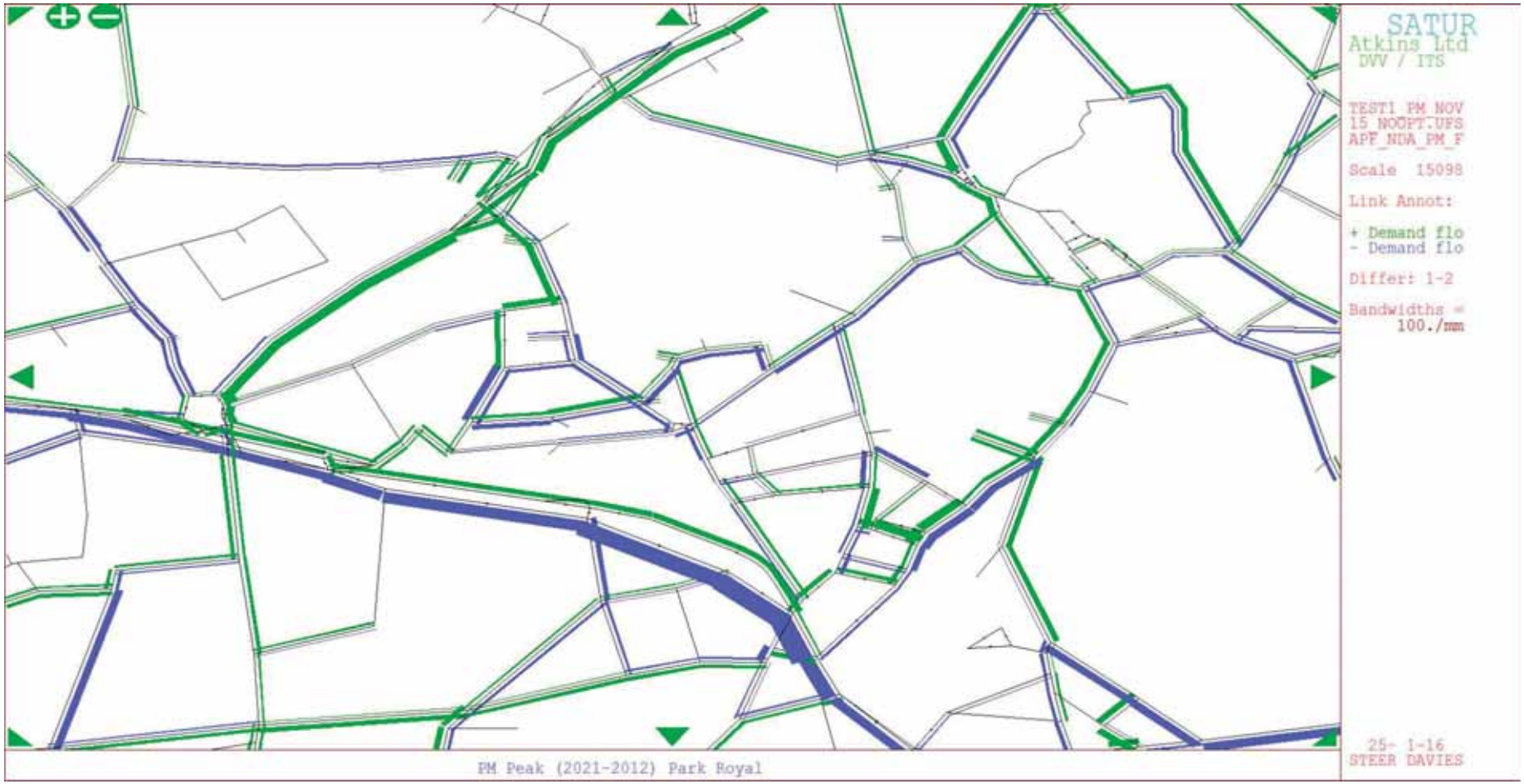


Figure E.29: PM Peak (Park Royal 2021 – BY 2012) Actual Flow Differences in PCUs

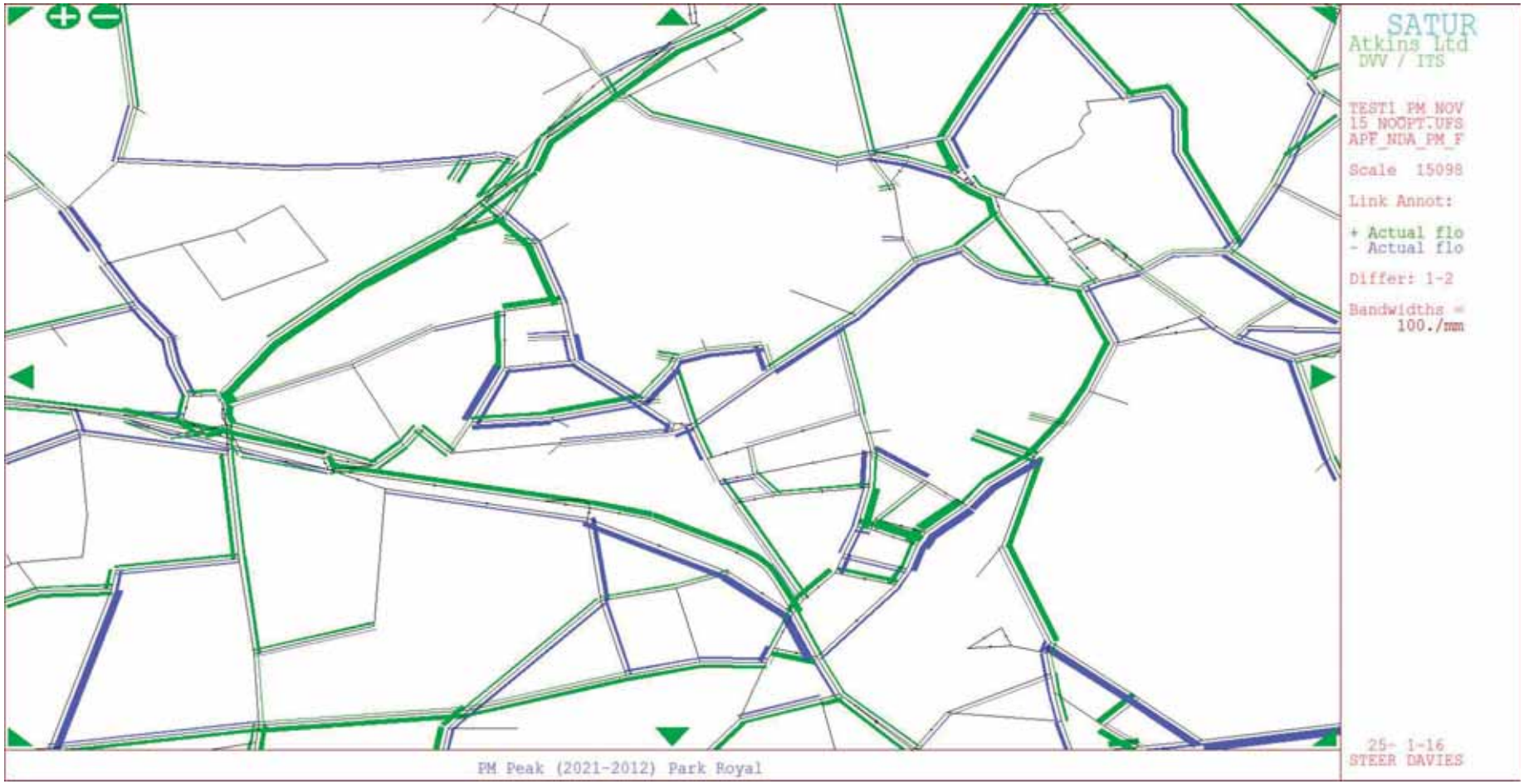


Figure E.30: PM Peak (Park Royal 2021 – BY 2012) Average Queue Differences in PCUs

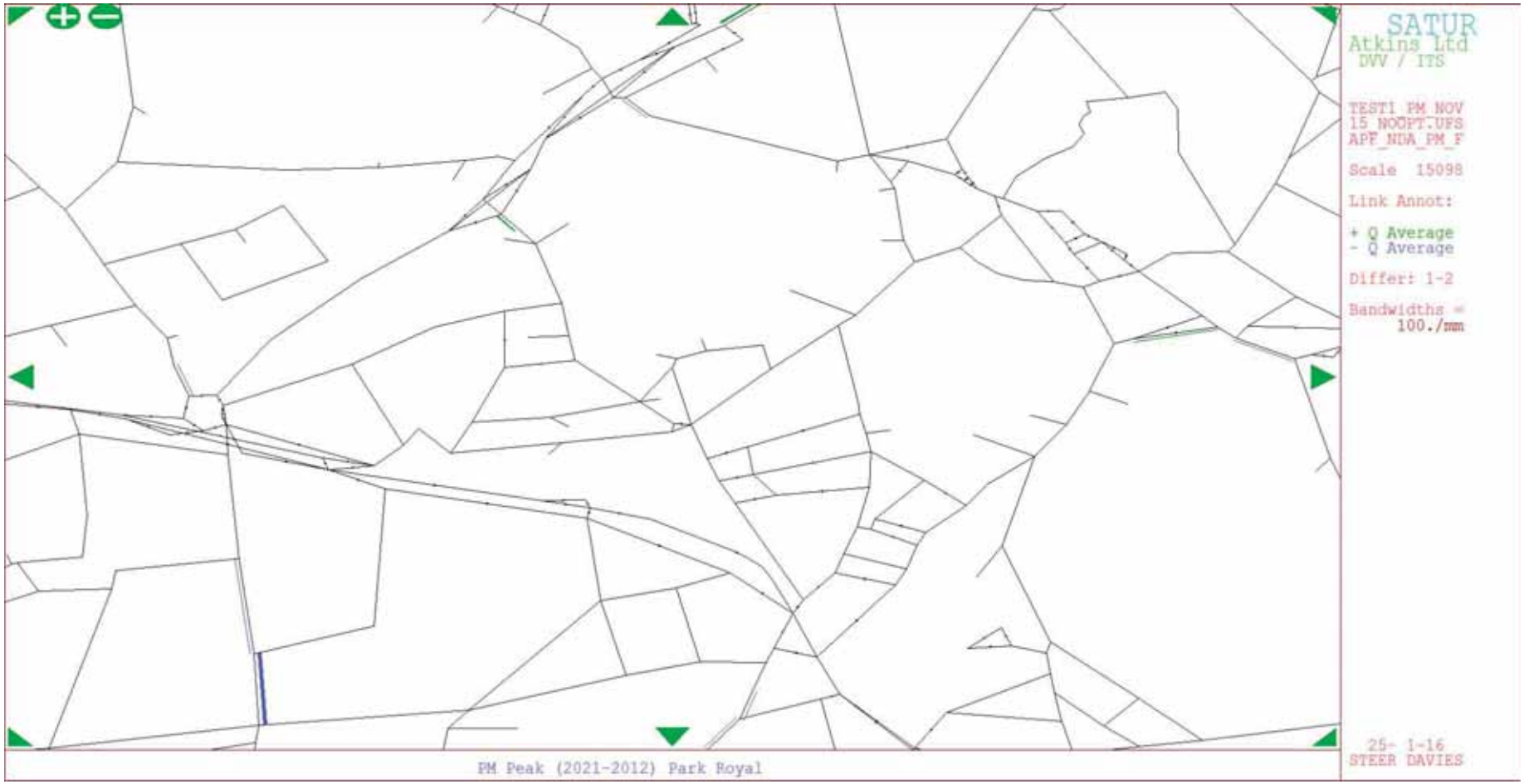


Figure E.31: PM Peak (Park Royal 2021 – BY 2012) Average Delay Differences in Seconds

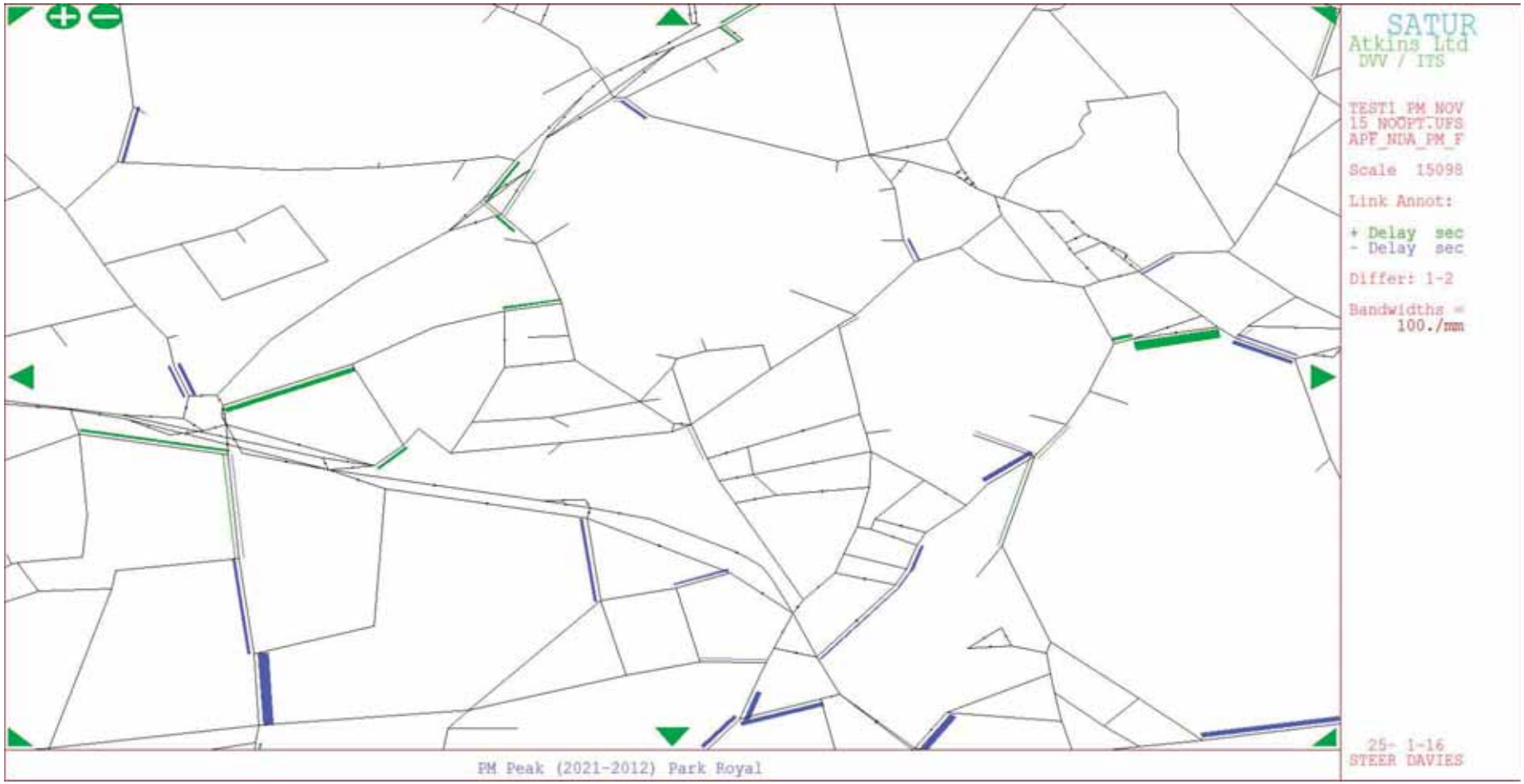


Figure E.32: PM Peak (Park Royal 2021 – BY 2012) PCU Hour Junction Delay Differences

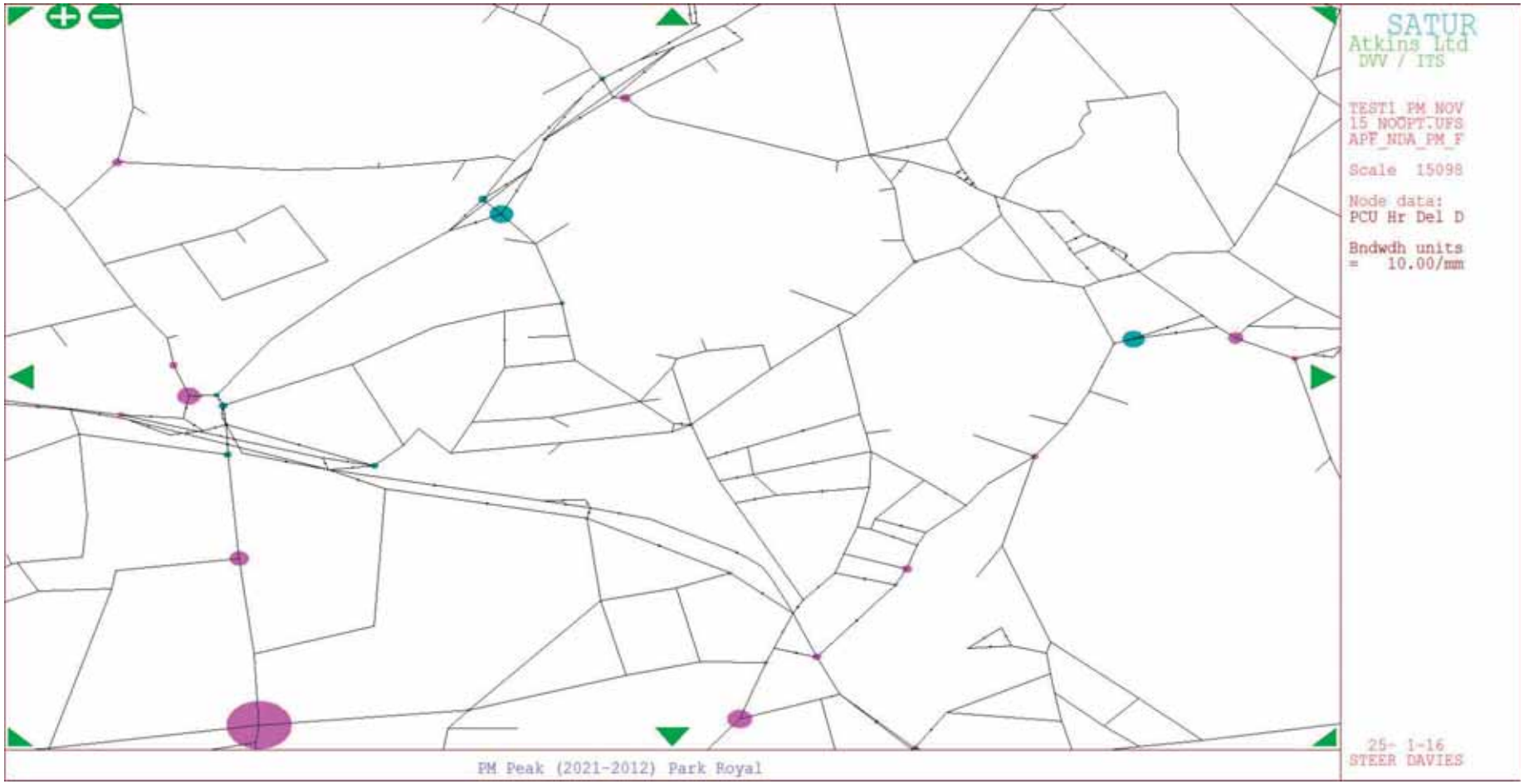


Figure E.33: AM Peak 2026 Park Royal Demand Flows in PCUs

Figure E.34: AM Peak 2026 Park Royal Actual Flows in PCUs

Figure E.35: AM Peak 2026 Park Royal Average Queue in PCUs

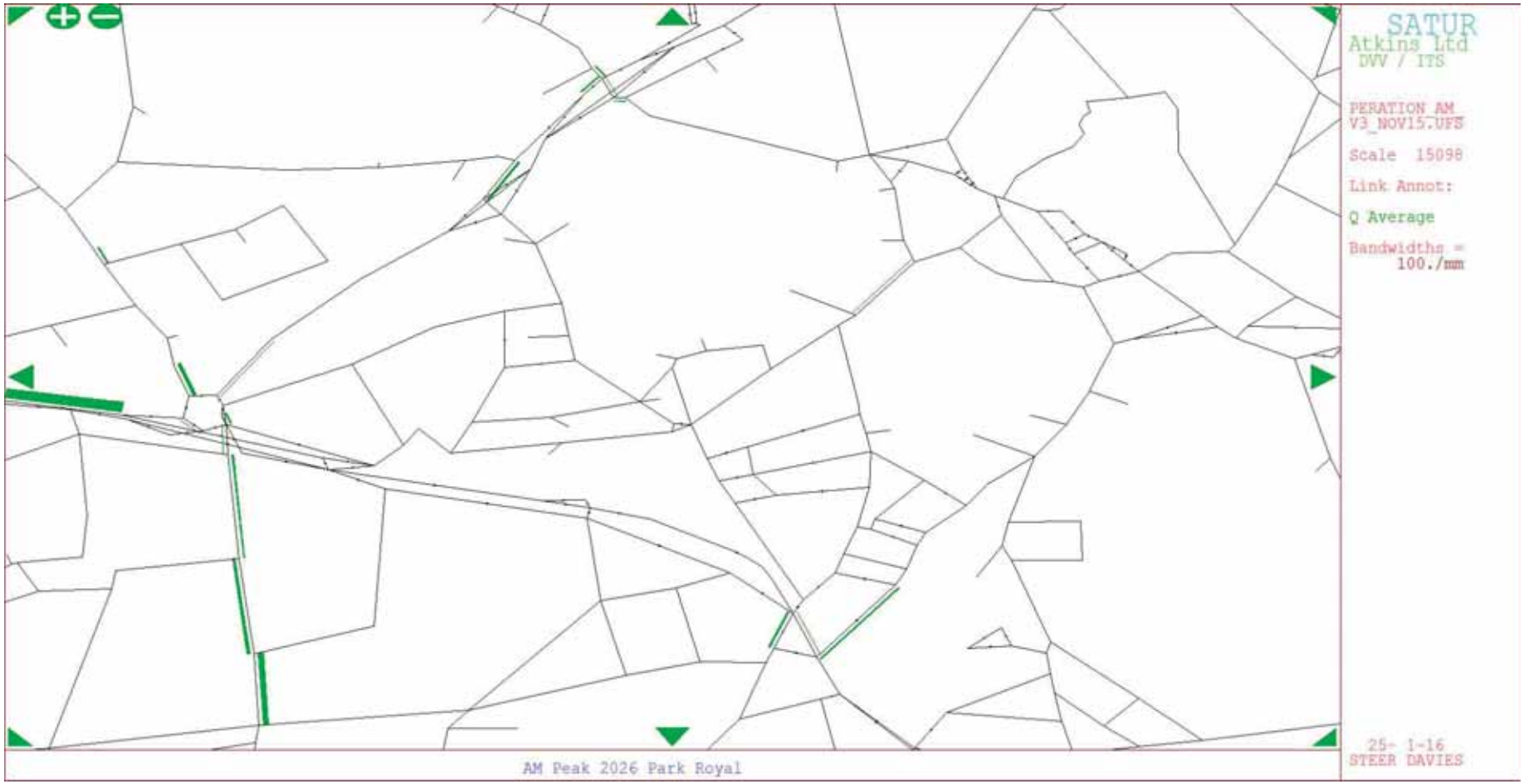


Figure E.36: AM Peak 2026 Park Royal Average Delay in Seconds

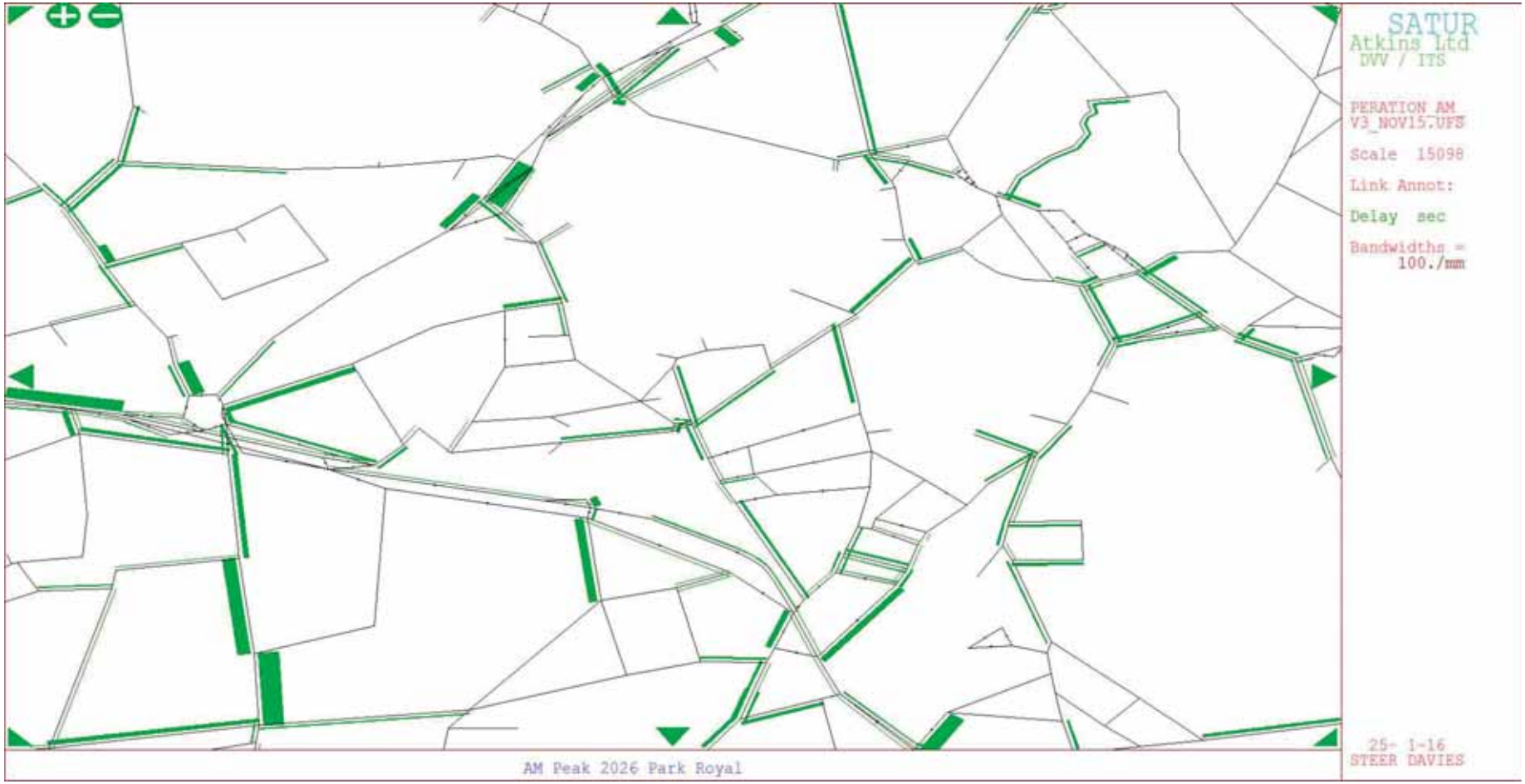


Figure E.37: AM Peak 2026 Park Royal Volume Over Capacity %

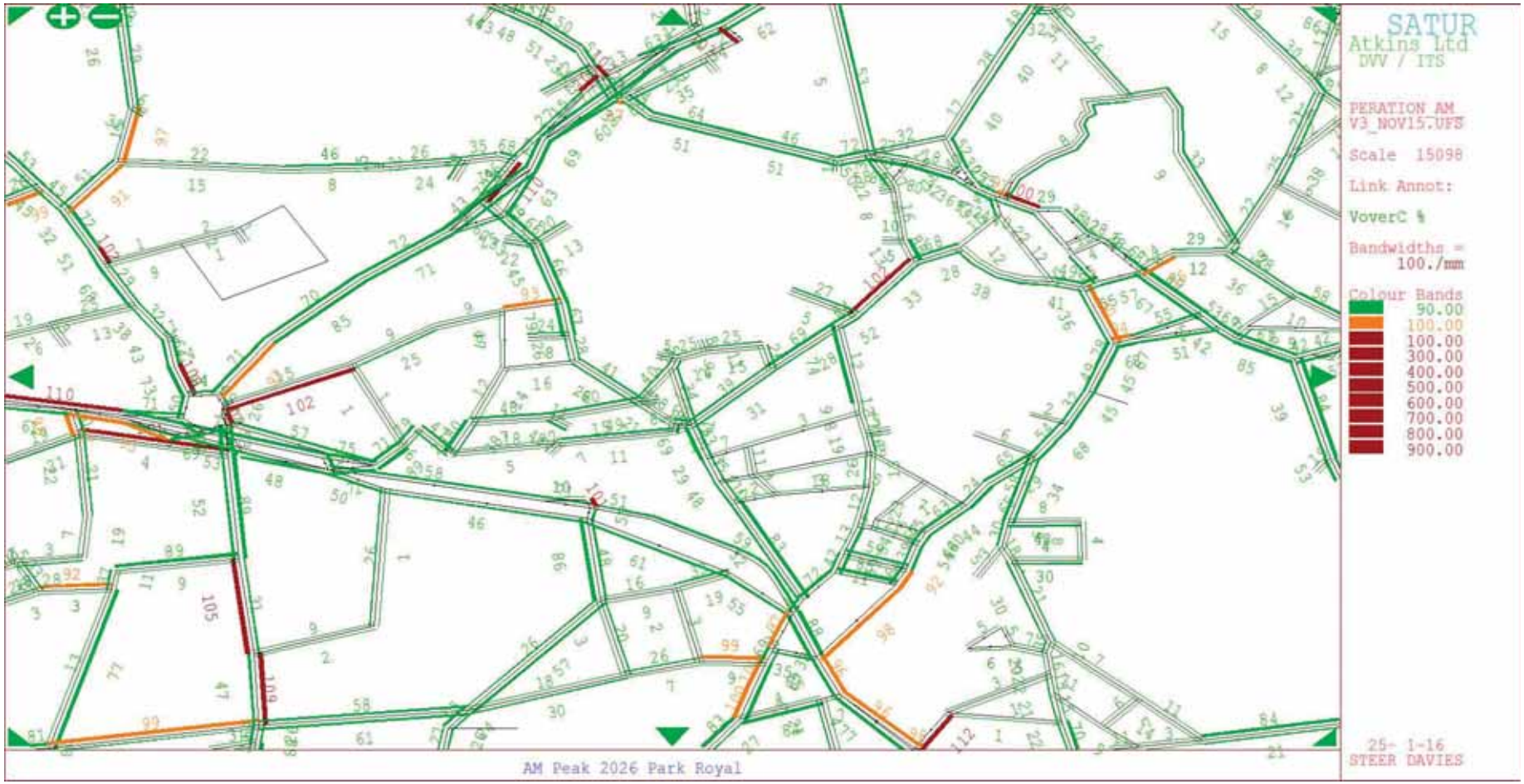


Figure E.38: AM Peak 2026 Park Royal PCU Hour Junction Delay

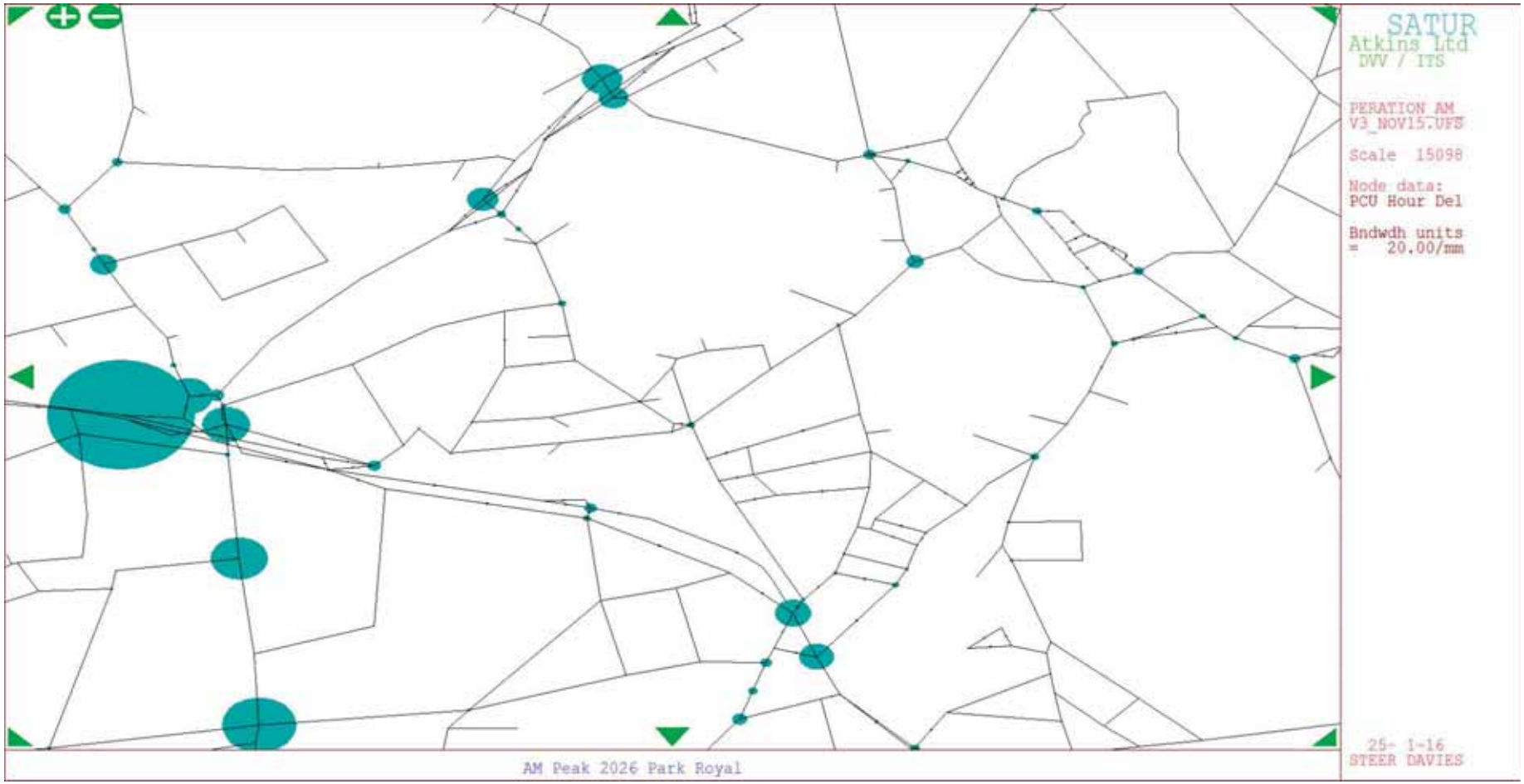


Figure E.39: AM Peak (Park Royal 2026 – BY 2012) Demand Flow Differences in PCUs

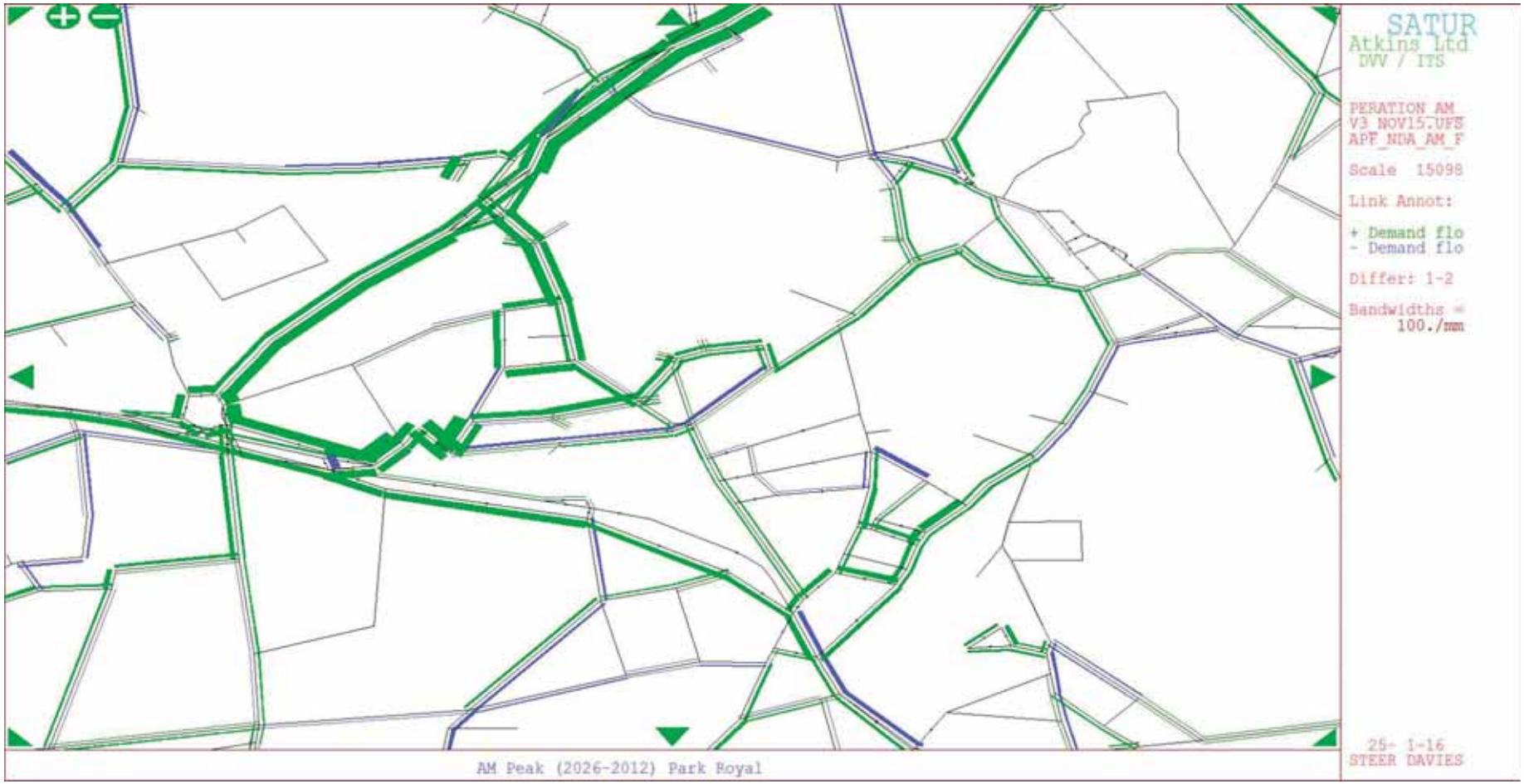


Figure E.40: AM Peak (Park Royal 2026 – BY 2012) Actual Flow Differences in PCUs

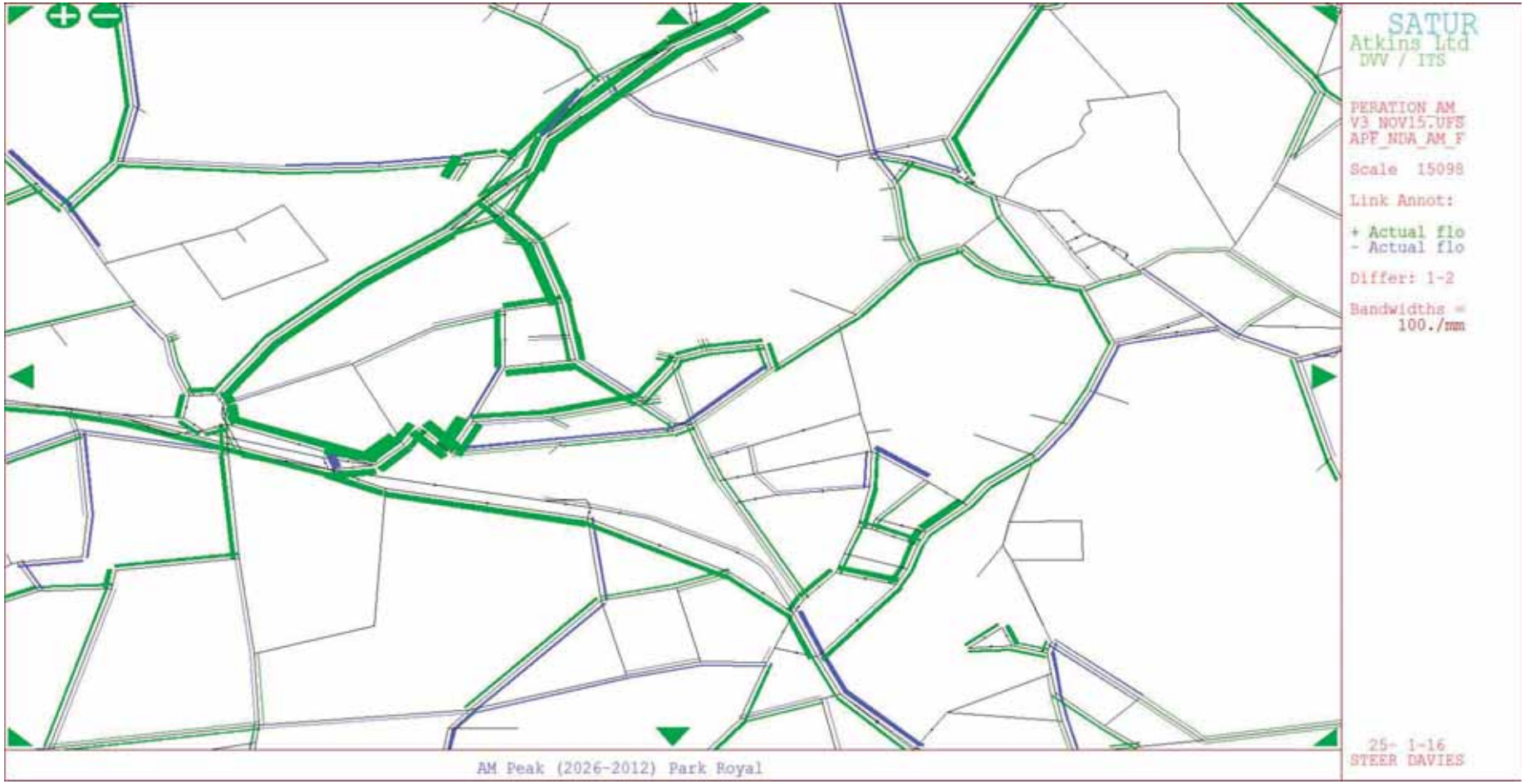


Figure E.41: AM Peak (Park Royal 2026 – BY 2012) Average Queue Differences in PCUs

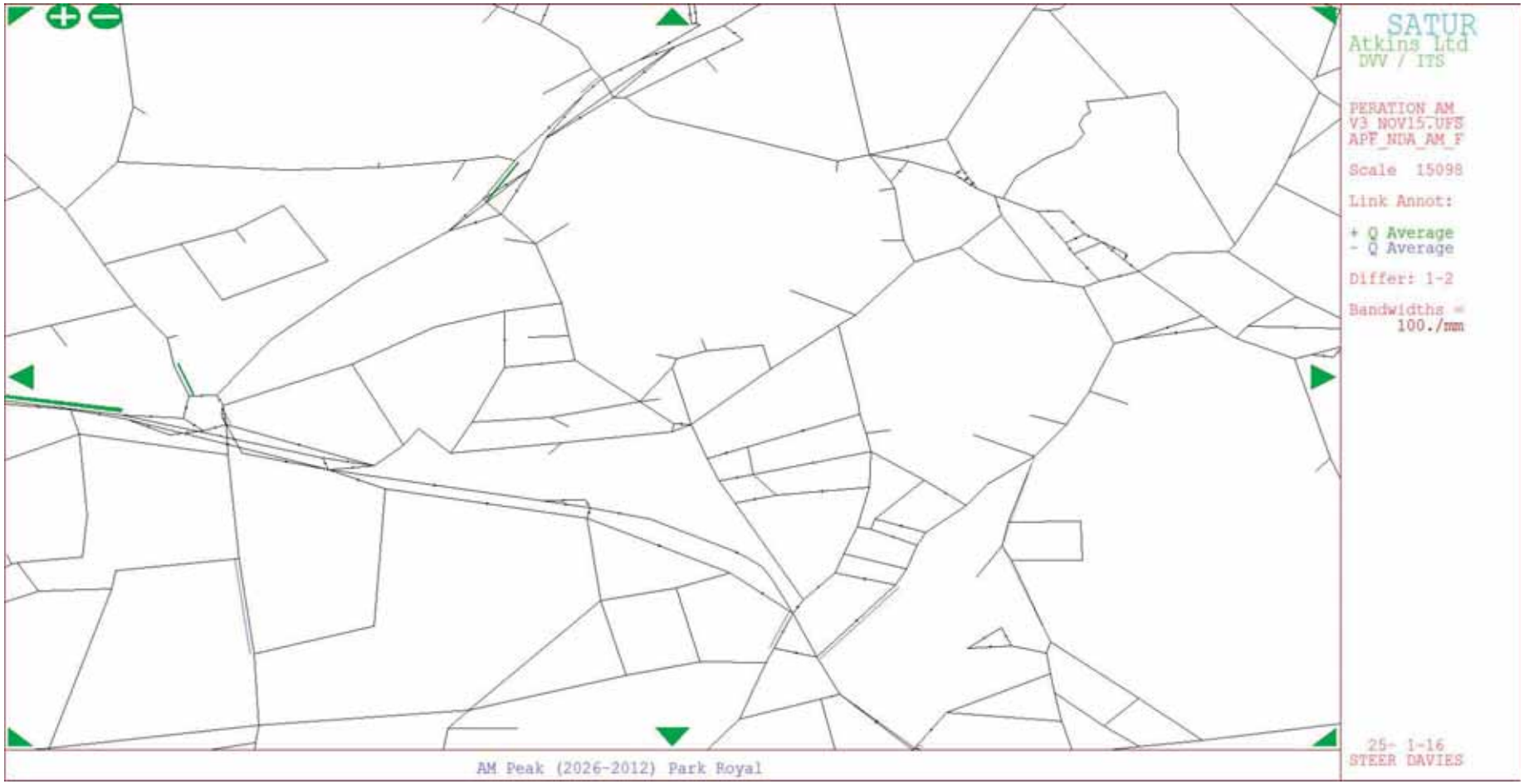


Figure E.42: AM Peak (Park Royal 2026 – BY 2012) Average Delay Differences in PCUs

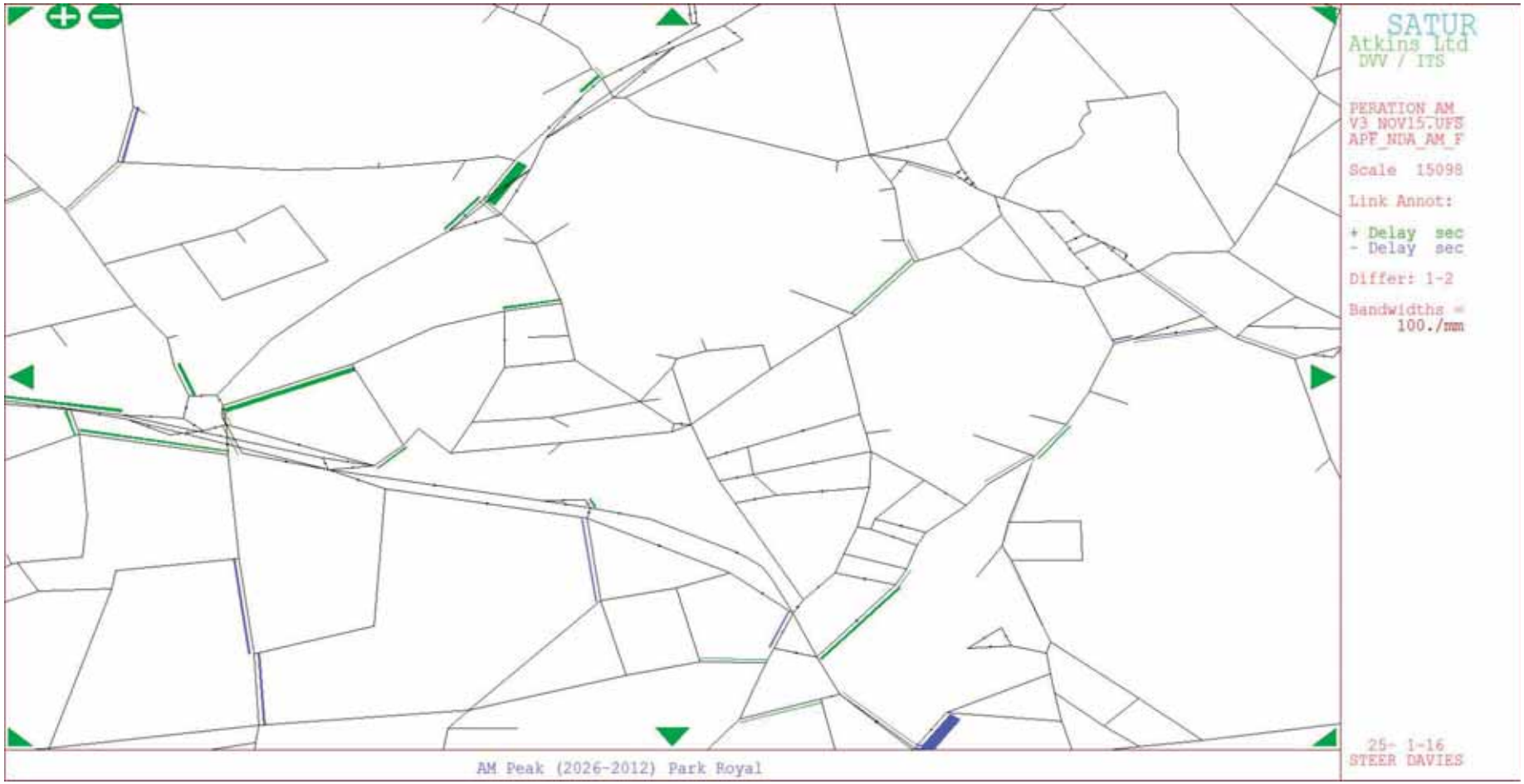


Figure E.43: AM Peak (Park Royal 2026 – BY 2012) PCU Hour Junction Delay Differences

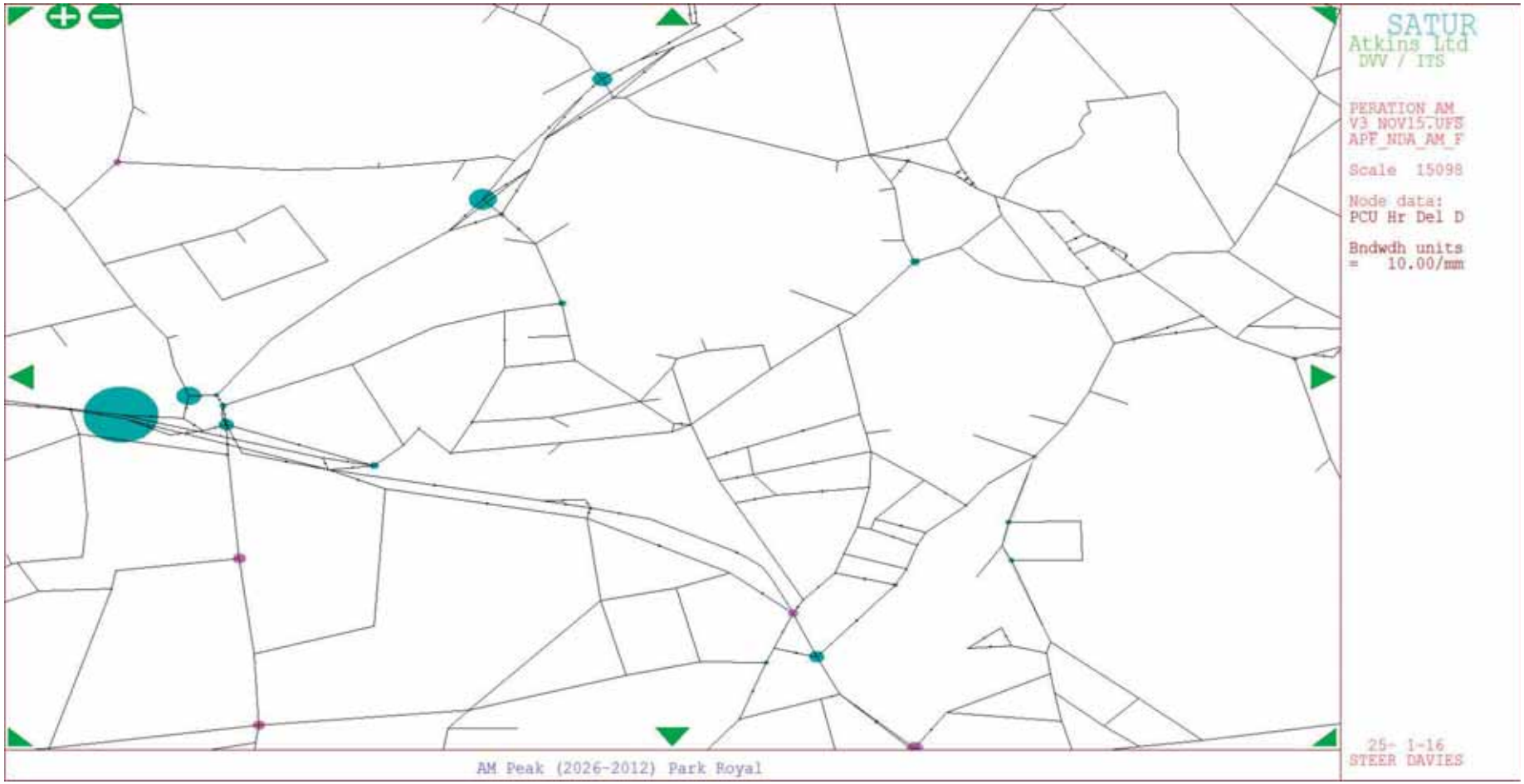


Figure E.44: PM Peak 2026 Park Royal Demand Flows in PCUs

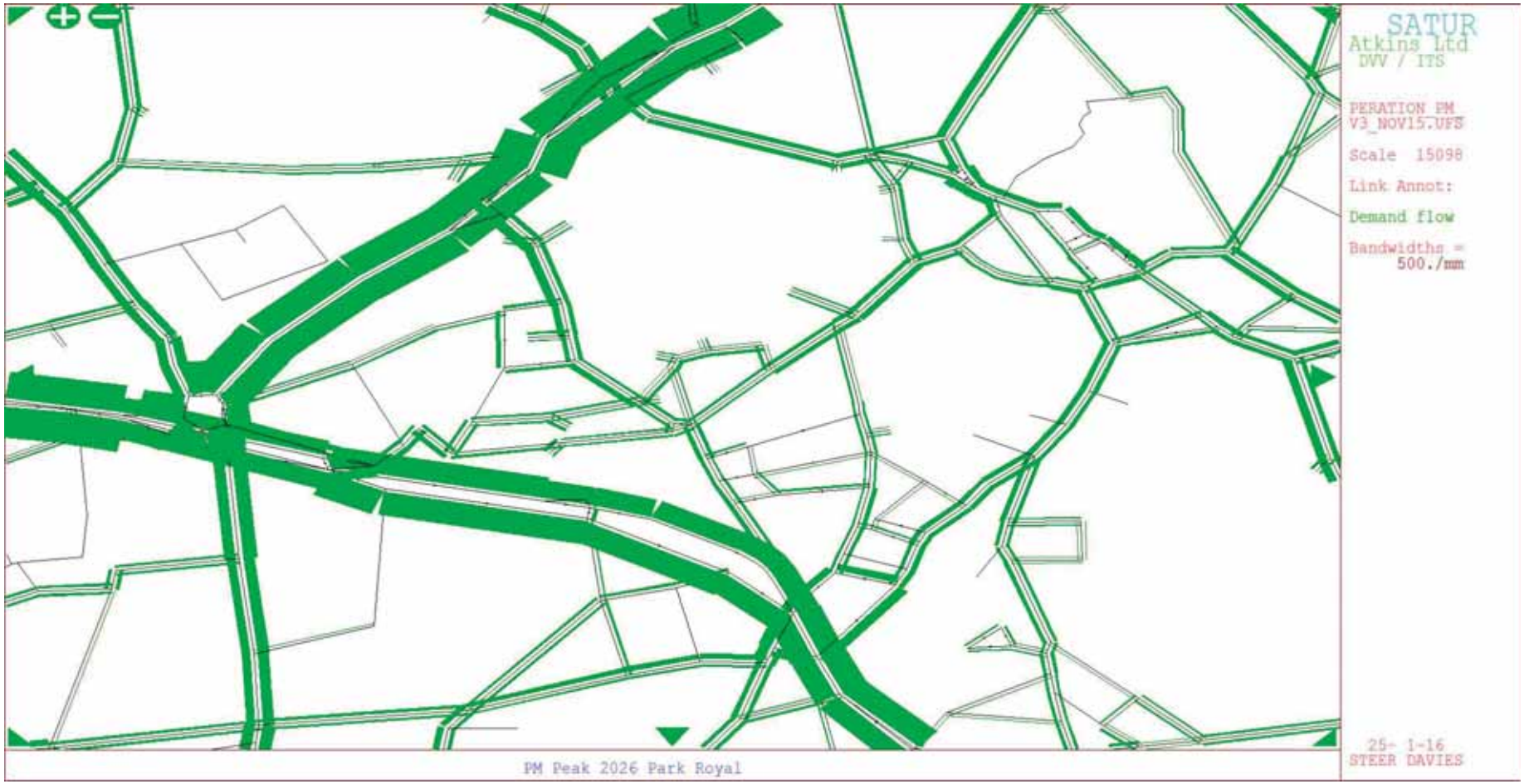


Figure E.45: PM Peak 2026 Park Royal Actual Flows in PCUs

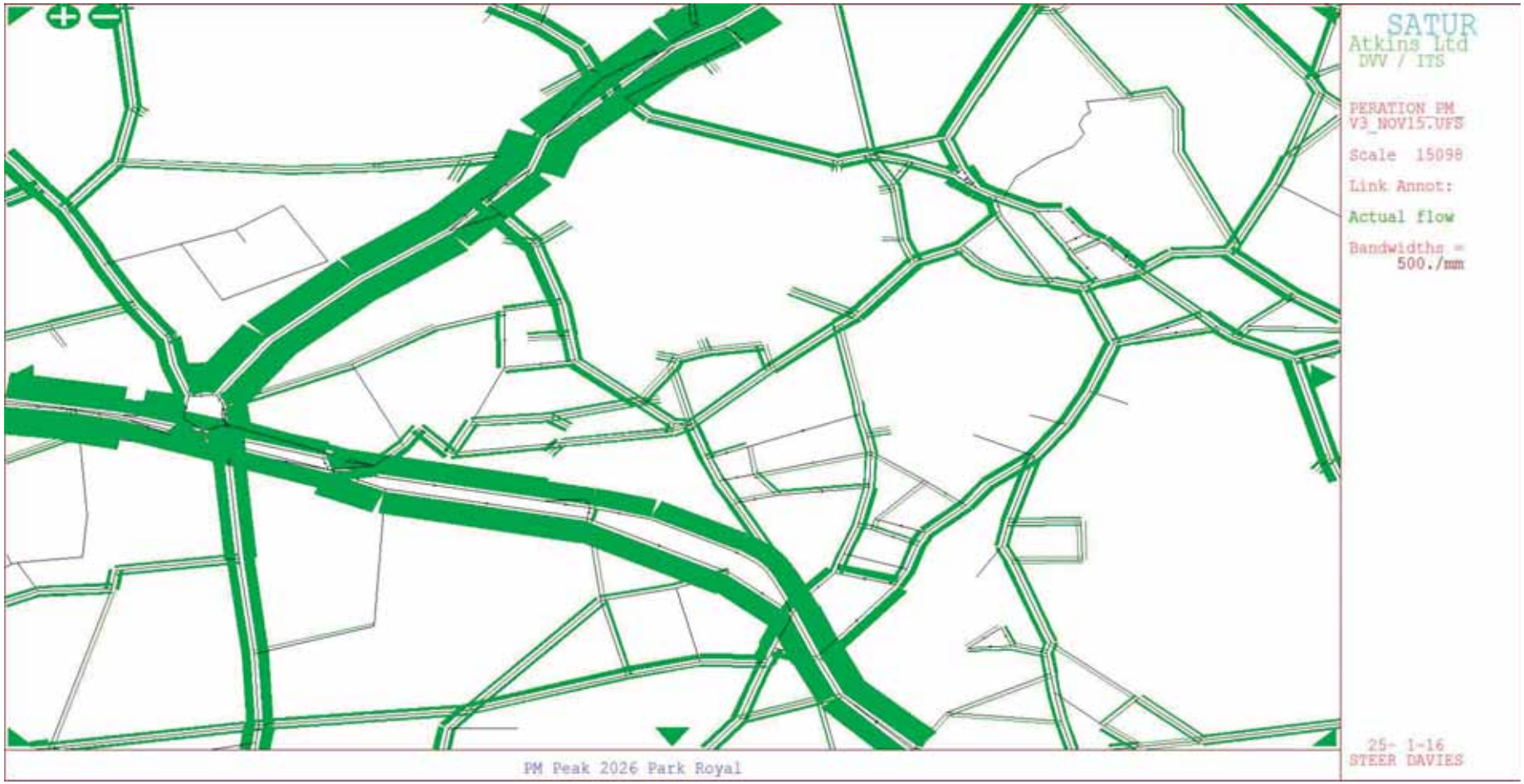


Figure E.46: PM Peak 2026 Park Royal Average Queue in PCUs

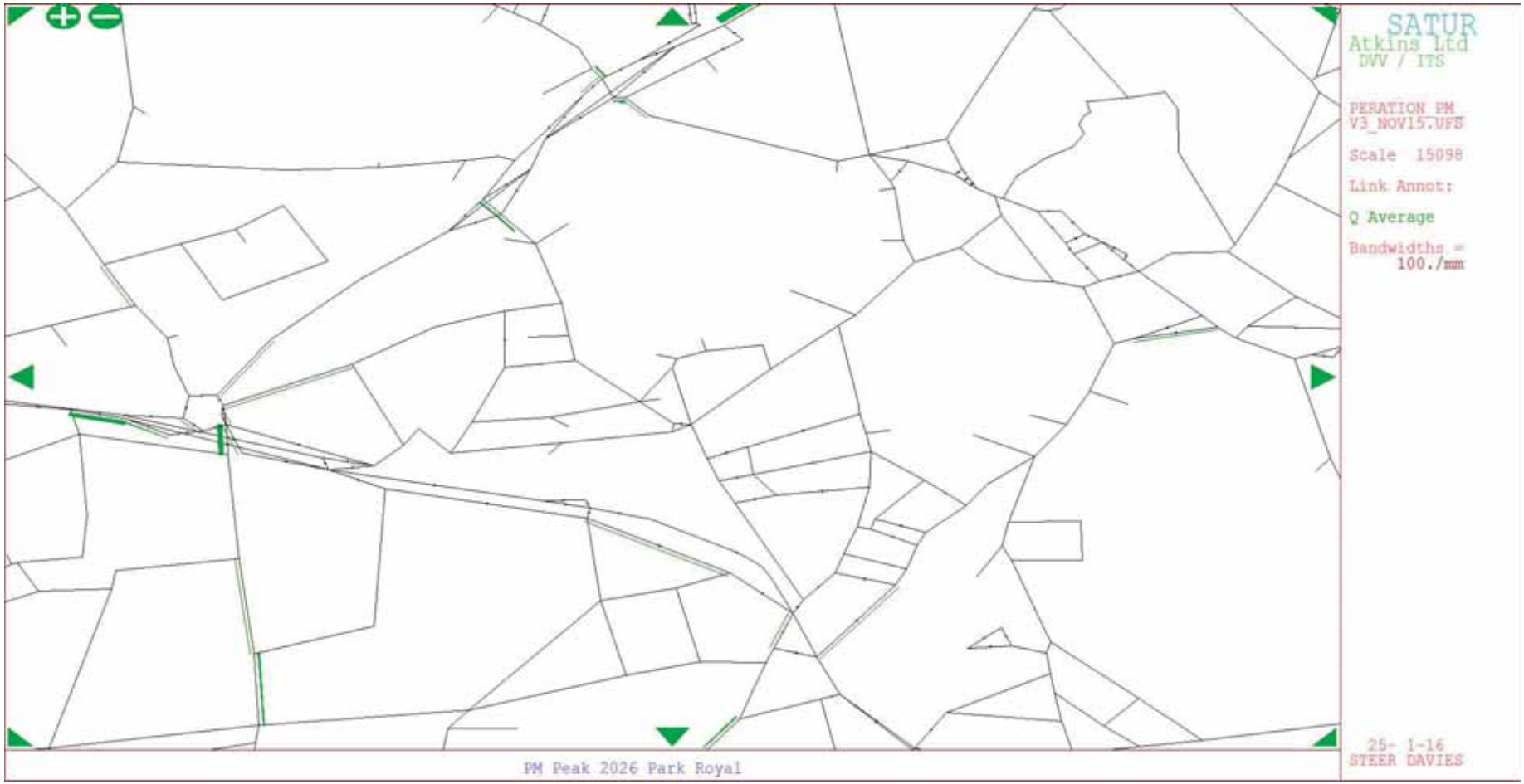


Figure E.47: PM Peak 2026 Park Royal Average Delay in Seconds

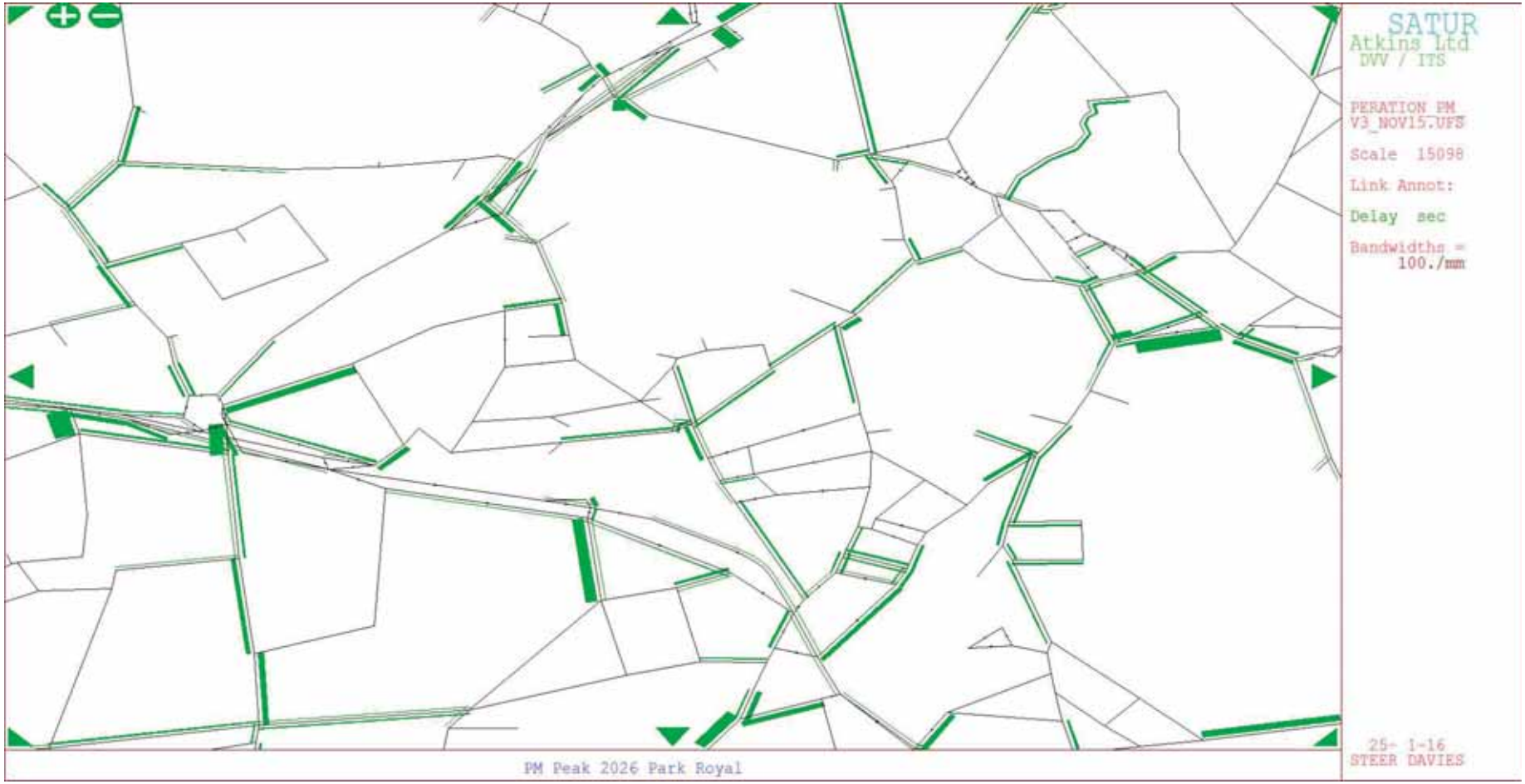


Figure E.48: PM Peak 2026 Park Royal Volume Over Capacity %

Figure E.49: PM Peak 2026 Park Royal PCU Hour Junction Delay

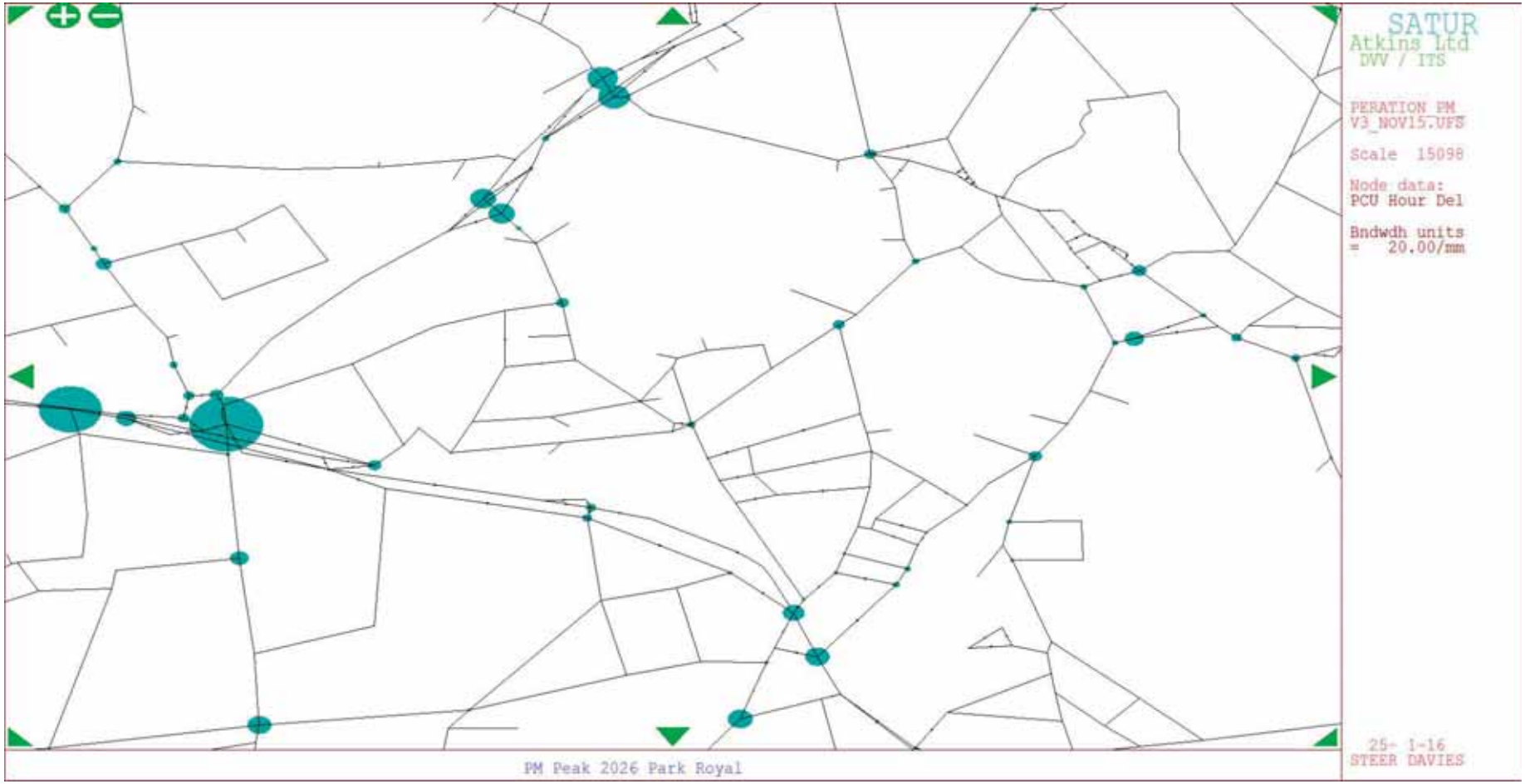


Figure E.50: PM Peak (Park Royal 2026 – BY 2012) Demand Flow Differences in PCUs

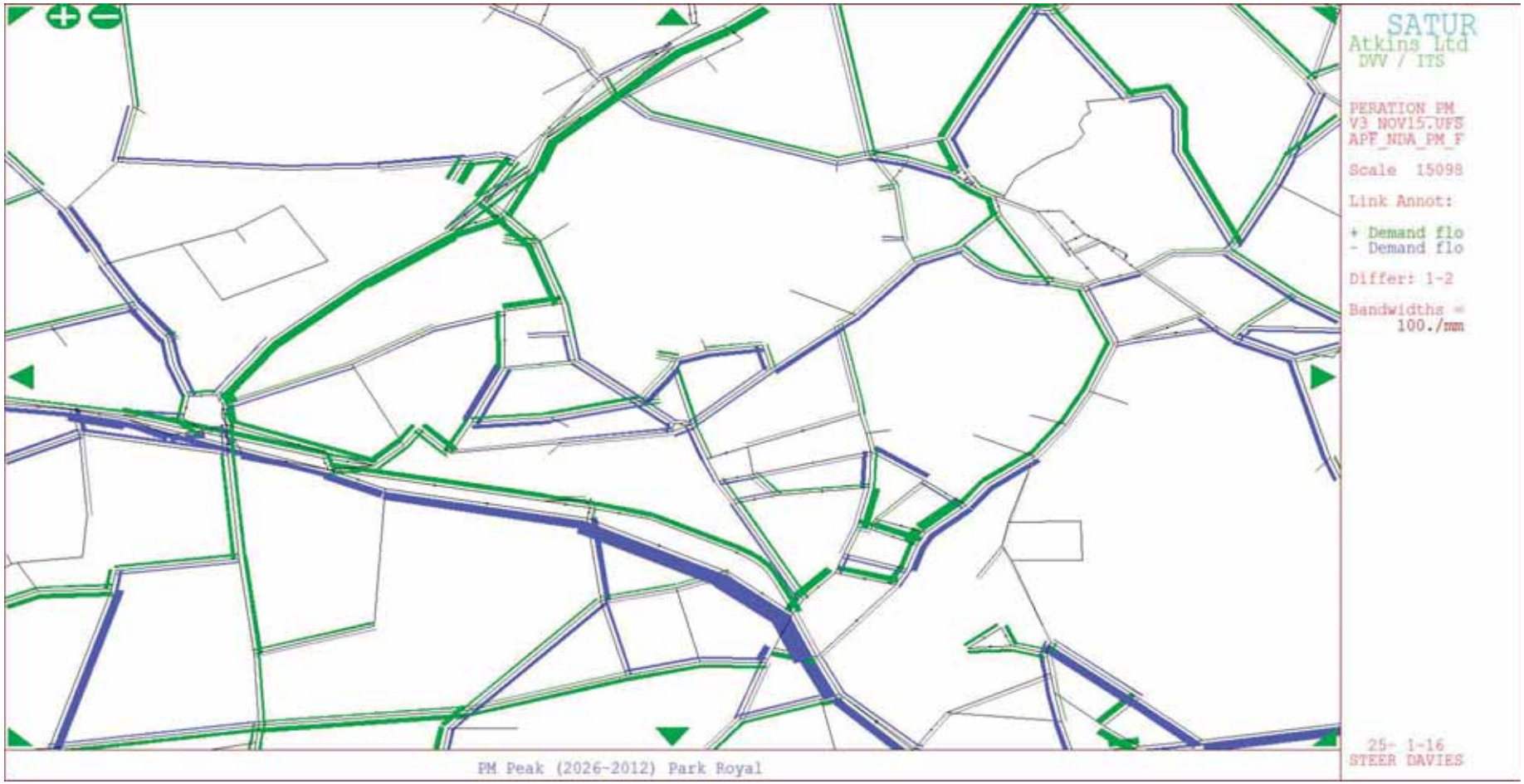


Figure E.51: PM Peak (Park Royal 2026 – BY 2012) Actual Flow Differences in PCUs

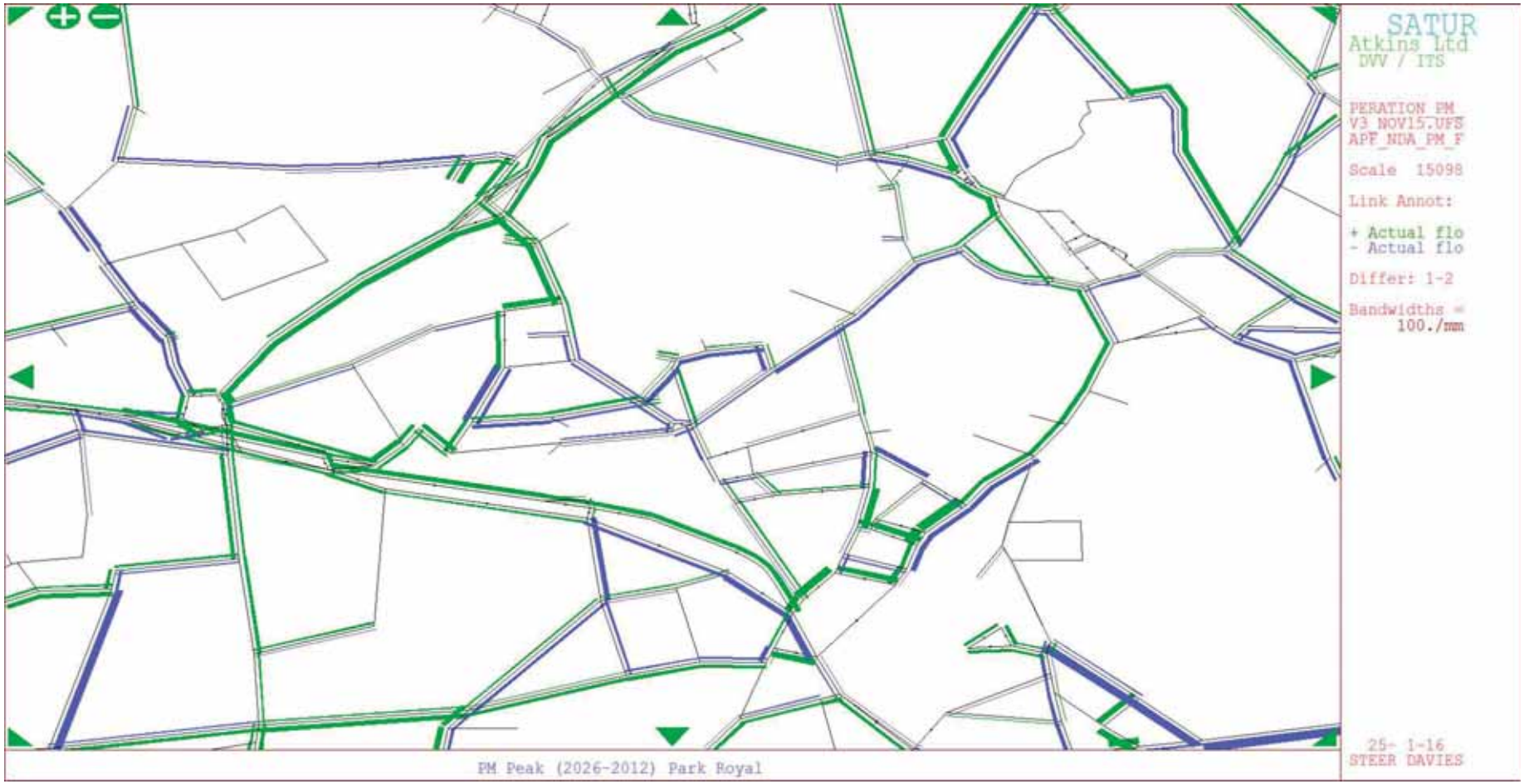


Figure E.52: PM Peak (Park Royal 2026 – BY 2012) Average Queue Differences in PCUs

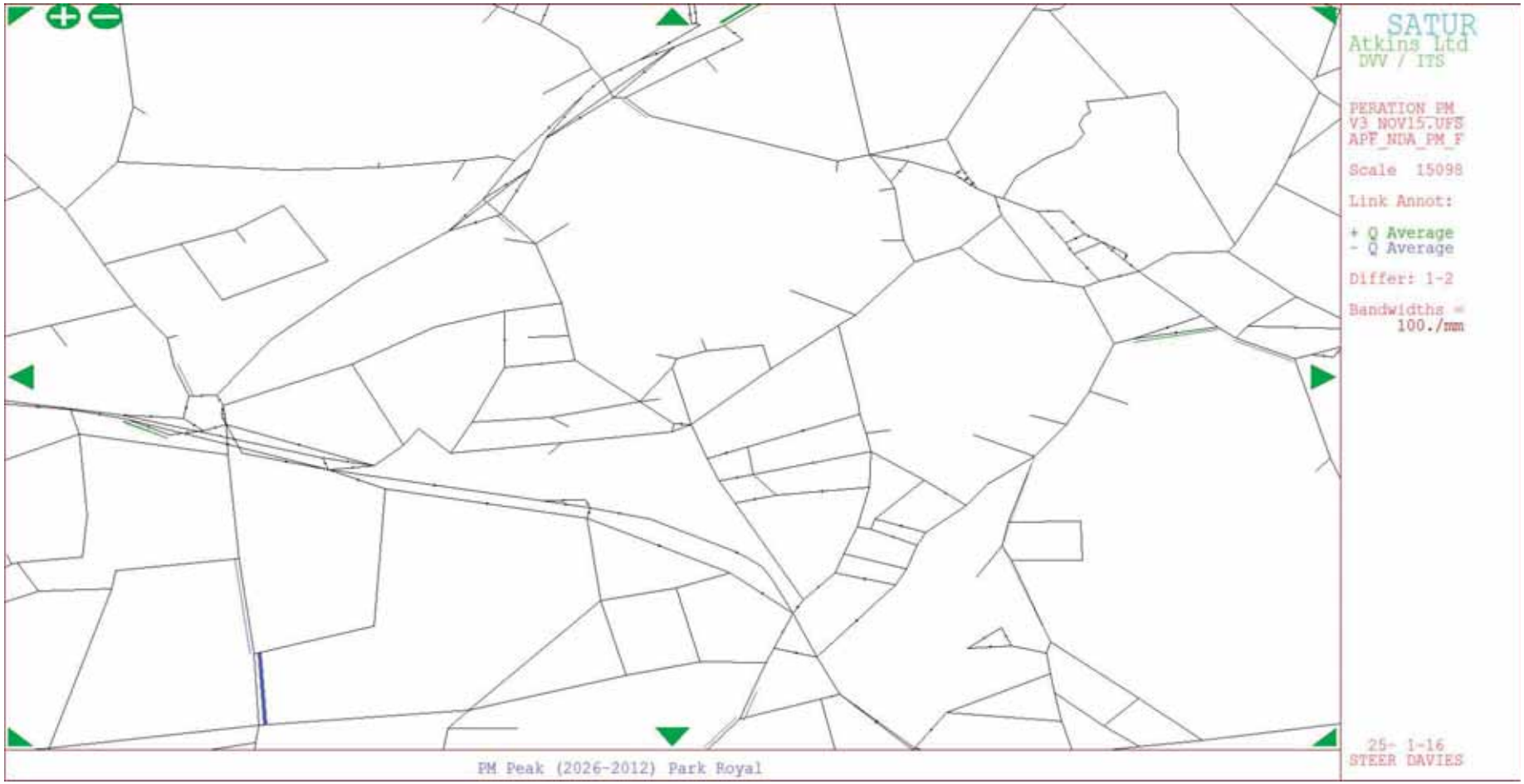


Figure E.53: PM Peak (Park Royal 2026 – BY 2012) Average Delay Differences in PCUs

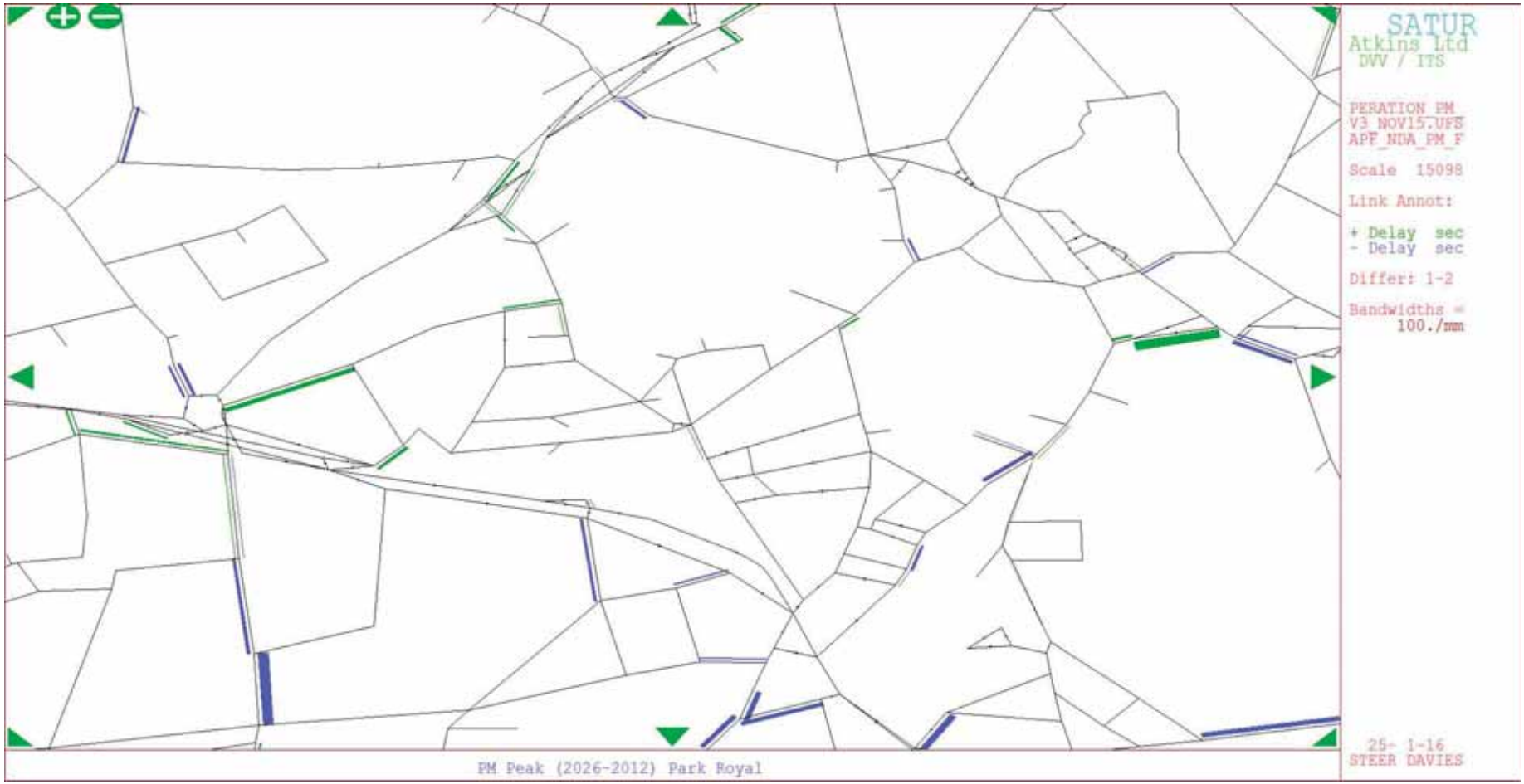


Figure E.54: PM Peak (Park Royal 2026 – BY 2012) PCU Hour Junction Delay Differences

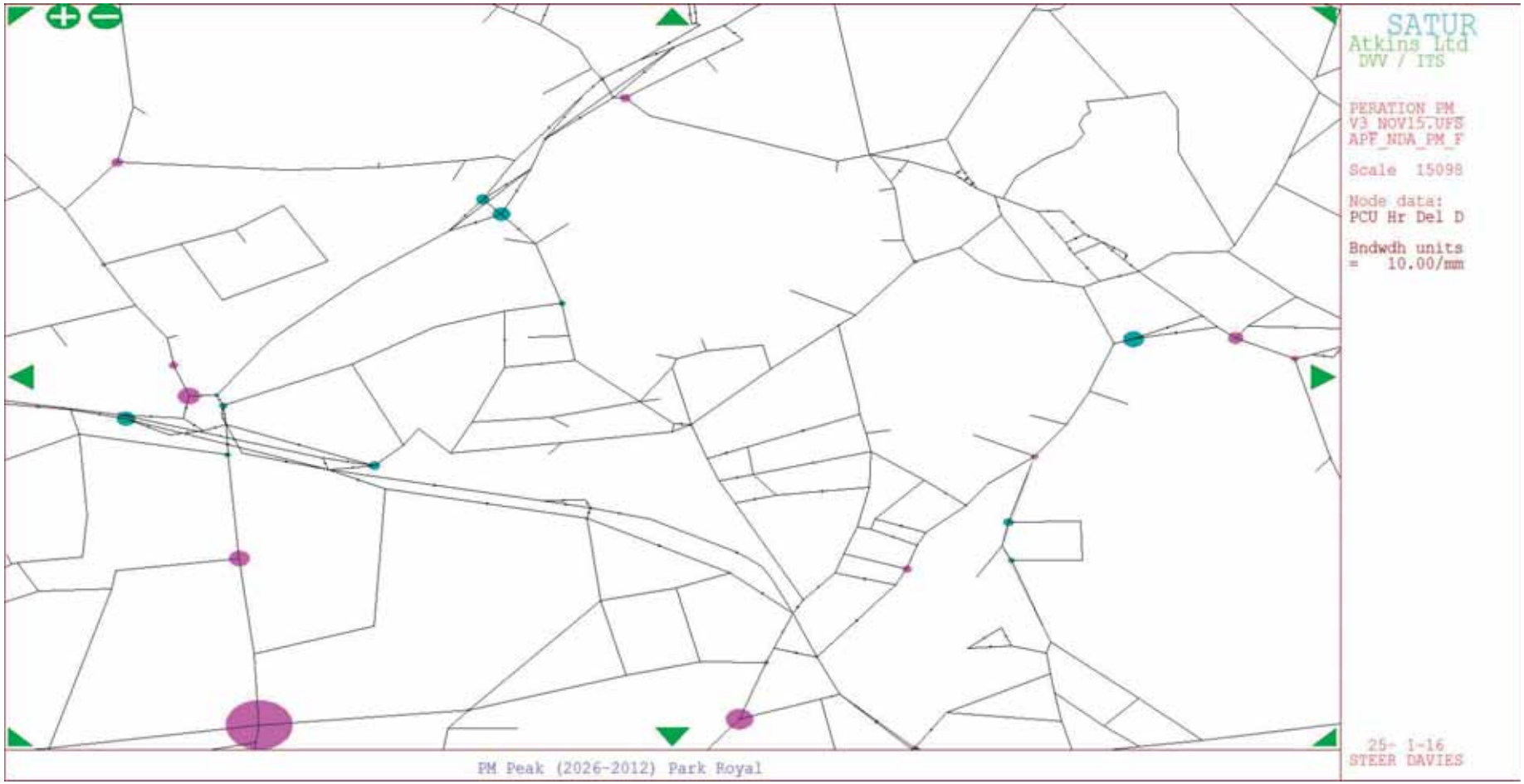


Figure E.55: AM Peak 2041 Park Royal Demand Flows in PCUs

Figure E.56: AM Peak 2041 Park Royal Actual Flows in PCUs

Figure E.57: AM Peak 2041 Park Royal Average Queue in PCUs

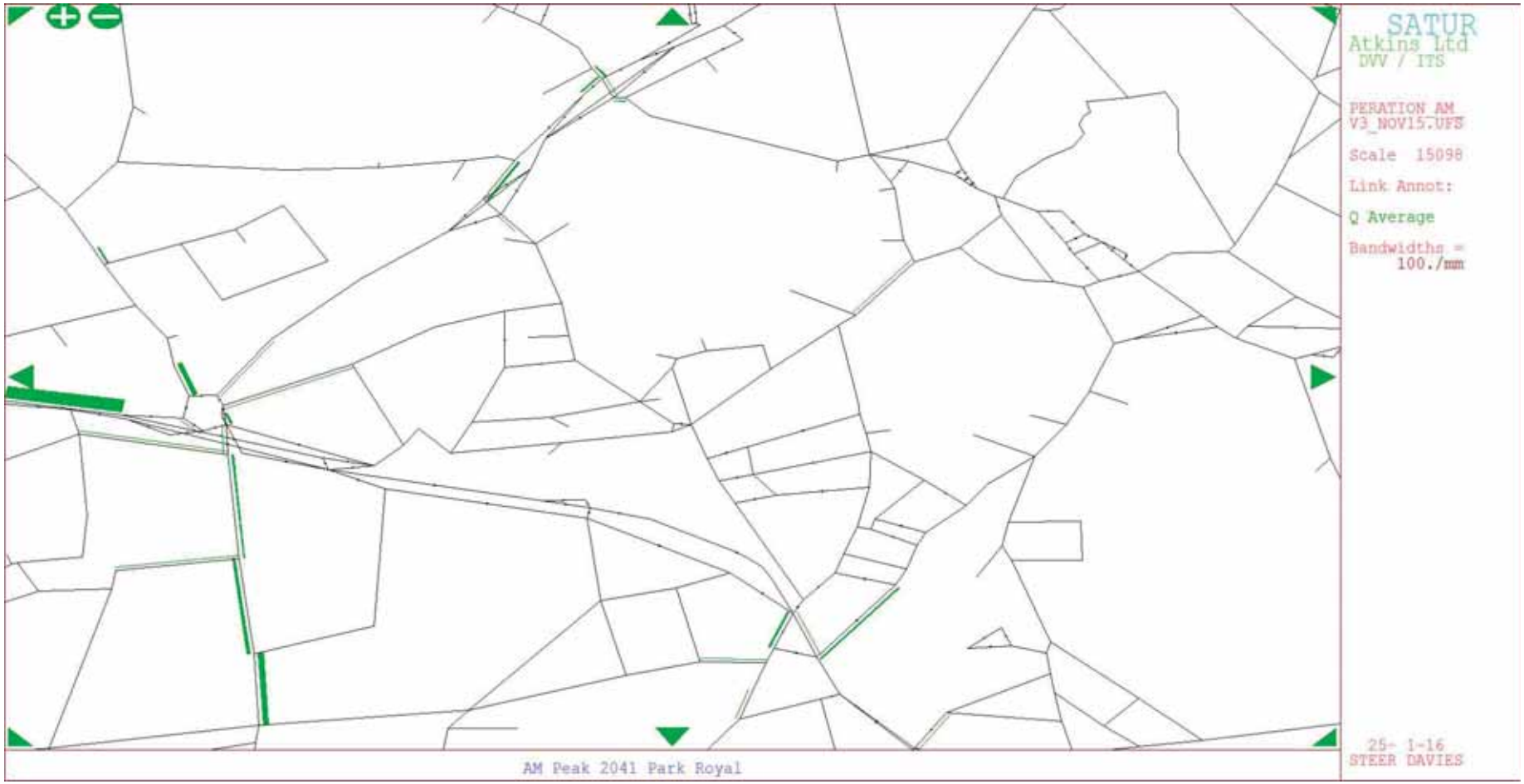


Figure E.58: AM Peak 2041 Park Royal Average Delay in Seconds

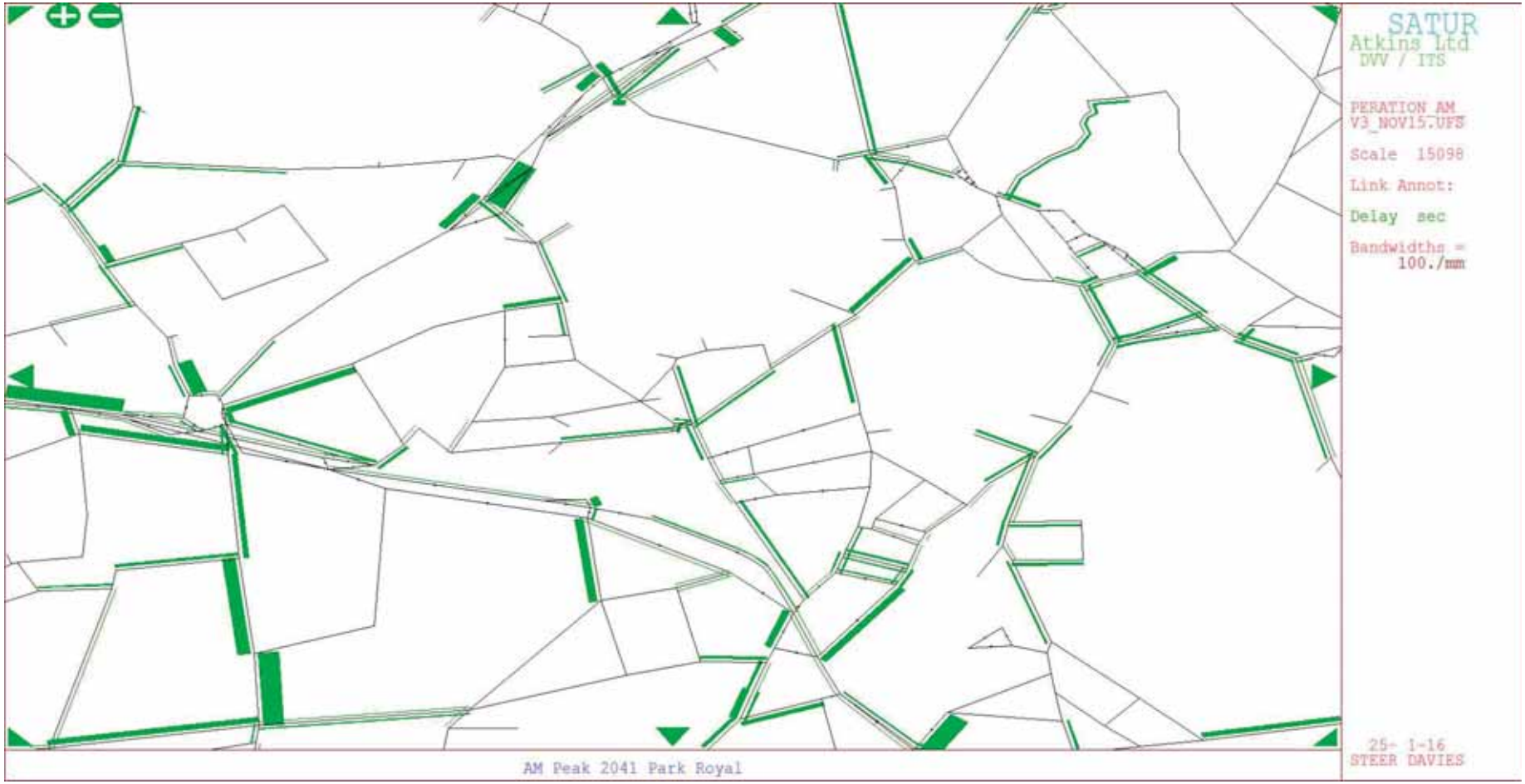


Figure E.59: AM Peak 2041 Park Royal Volume Over Capacity %

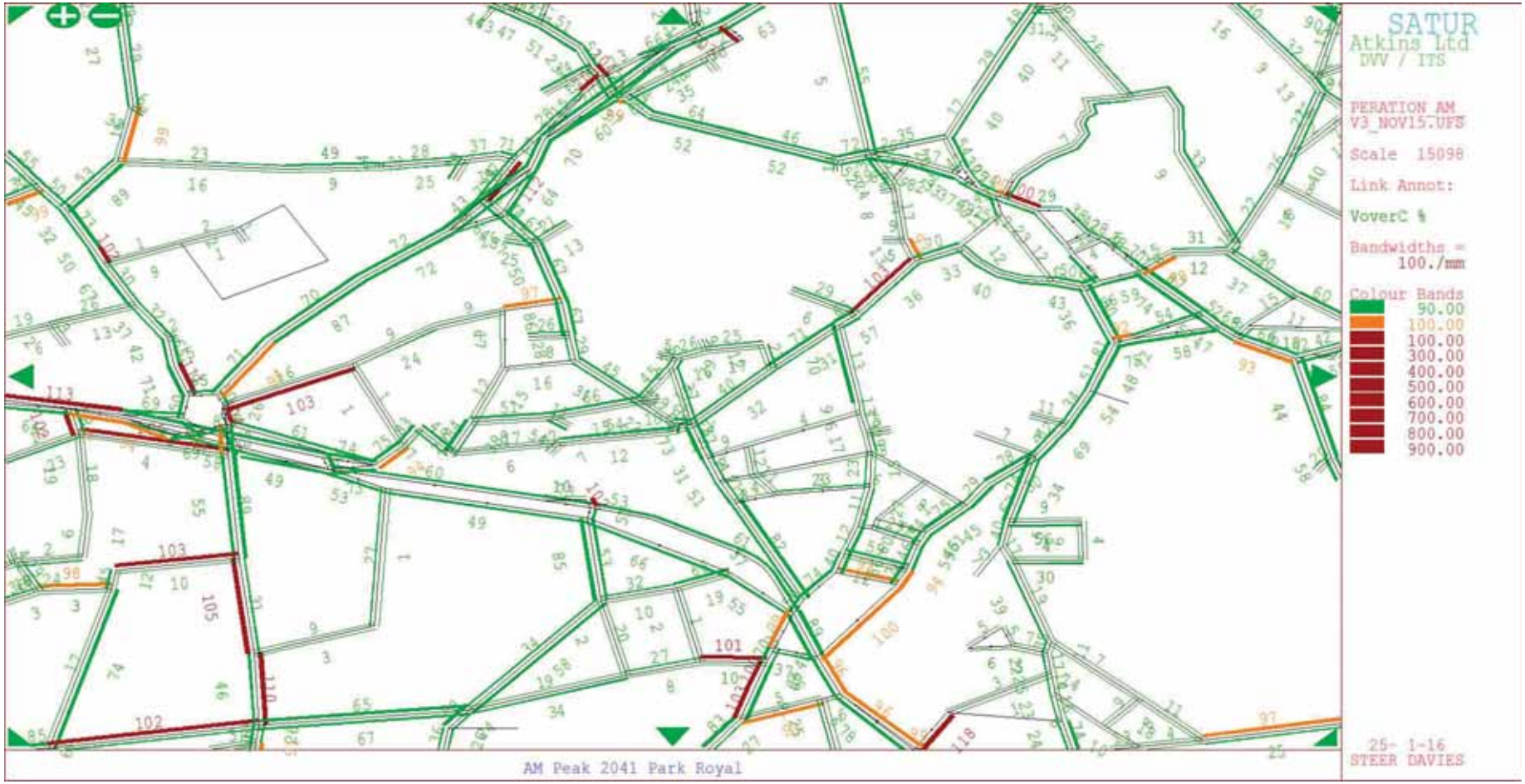


Figure E.60: AM Peak 2041 Park Royal PCU Hour Junction Delay

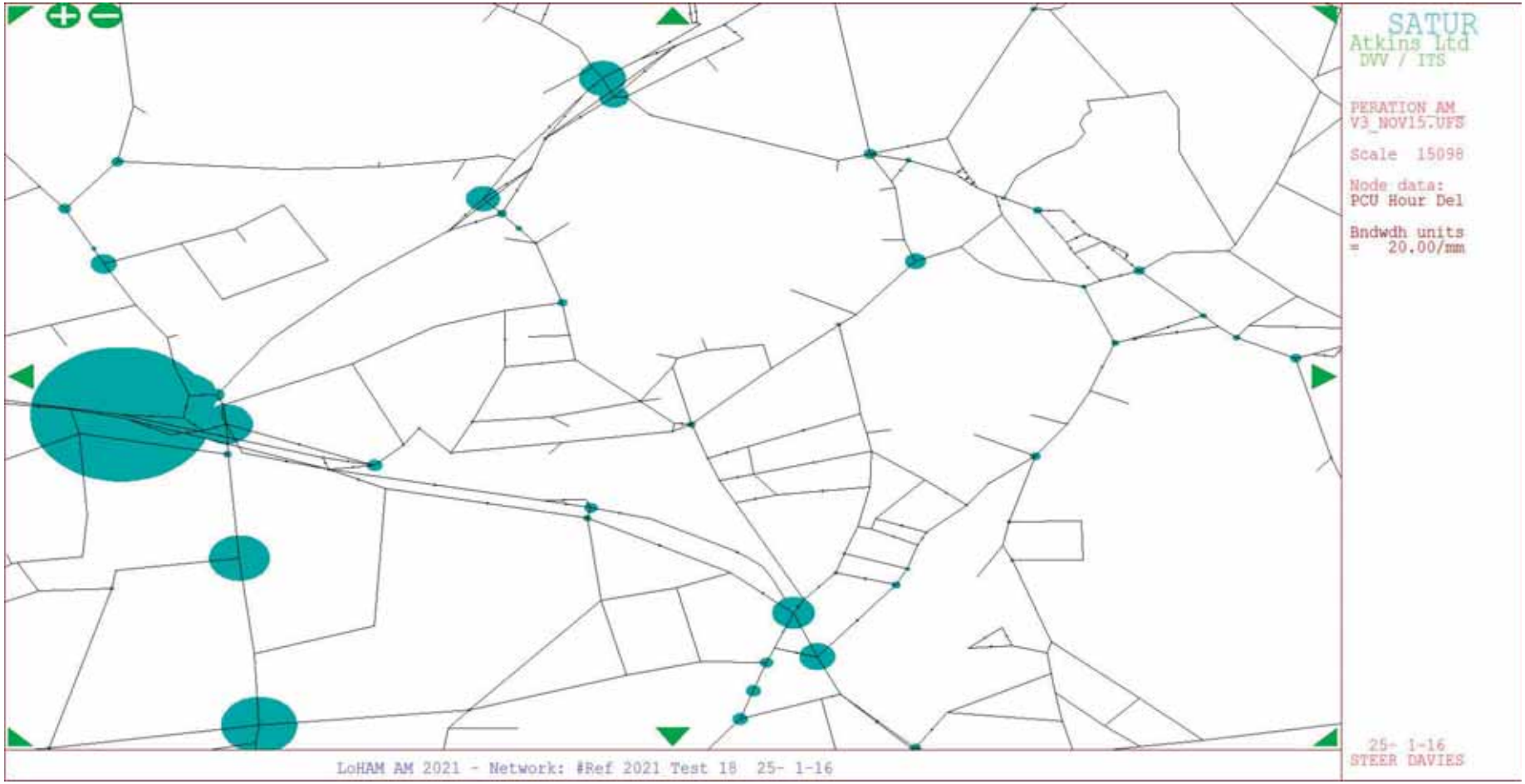


Figure E.61: AM Peak (Park Royal 2041 – BY 2012) Demand Flow Differences in PCUs

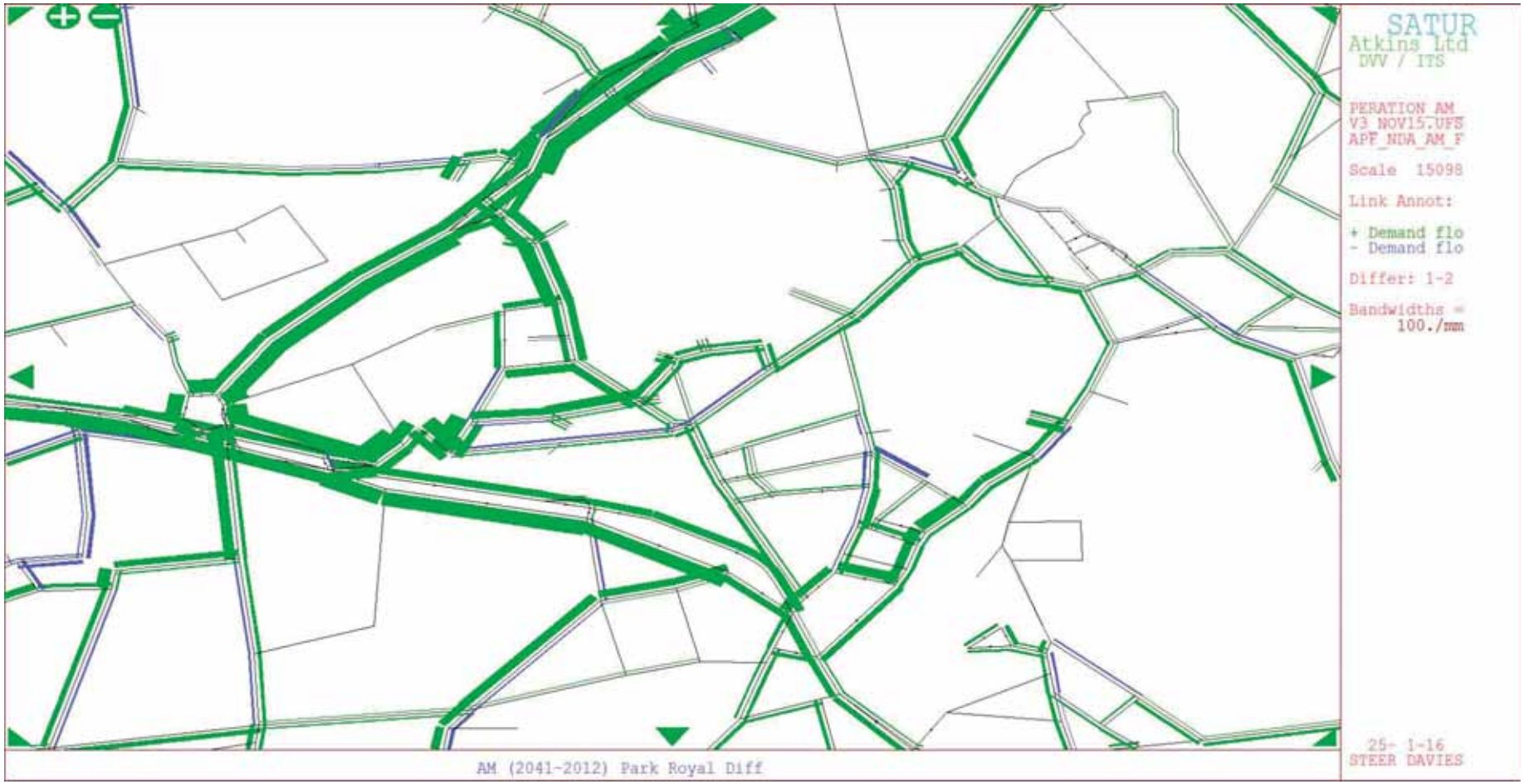


Figure E.62: AM Peak (Park Royal 2041 – BY 2012) Actual Flow Differences in PCUs

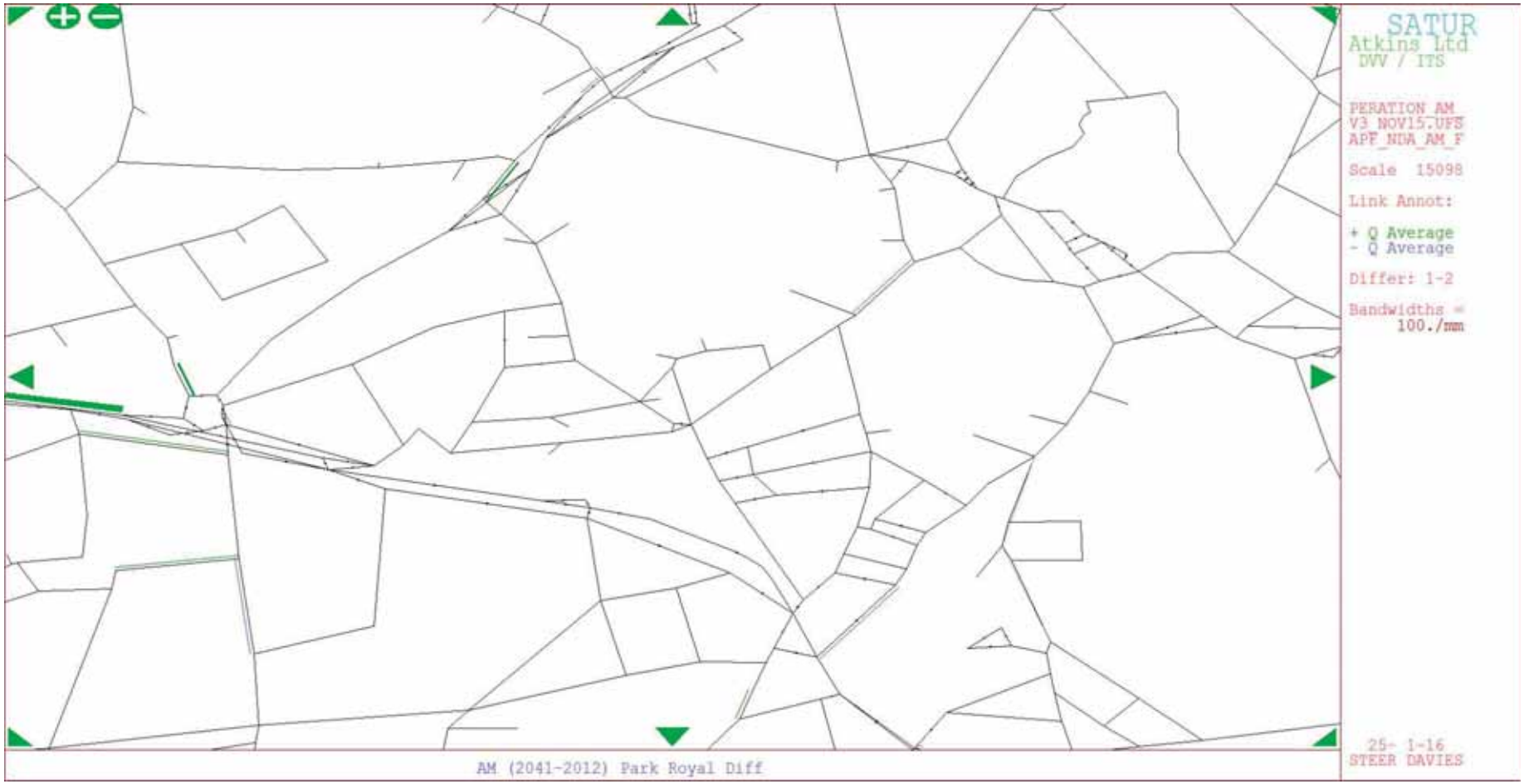


Figure E.63: AM Peak (Park Royal 2041 – BY 2012) Average Queue Differences in PCUs

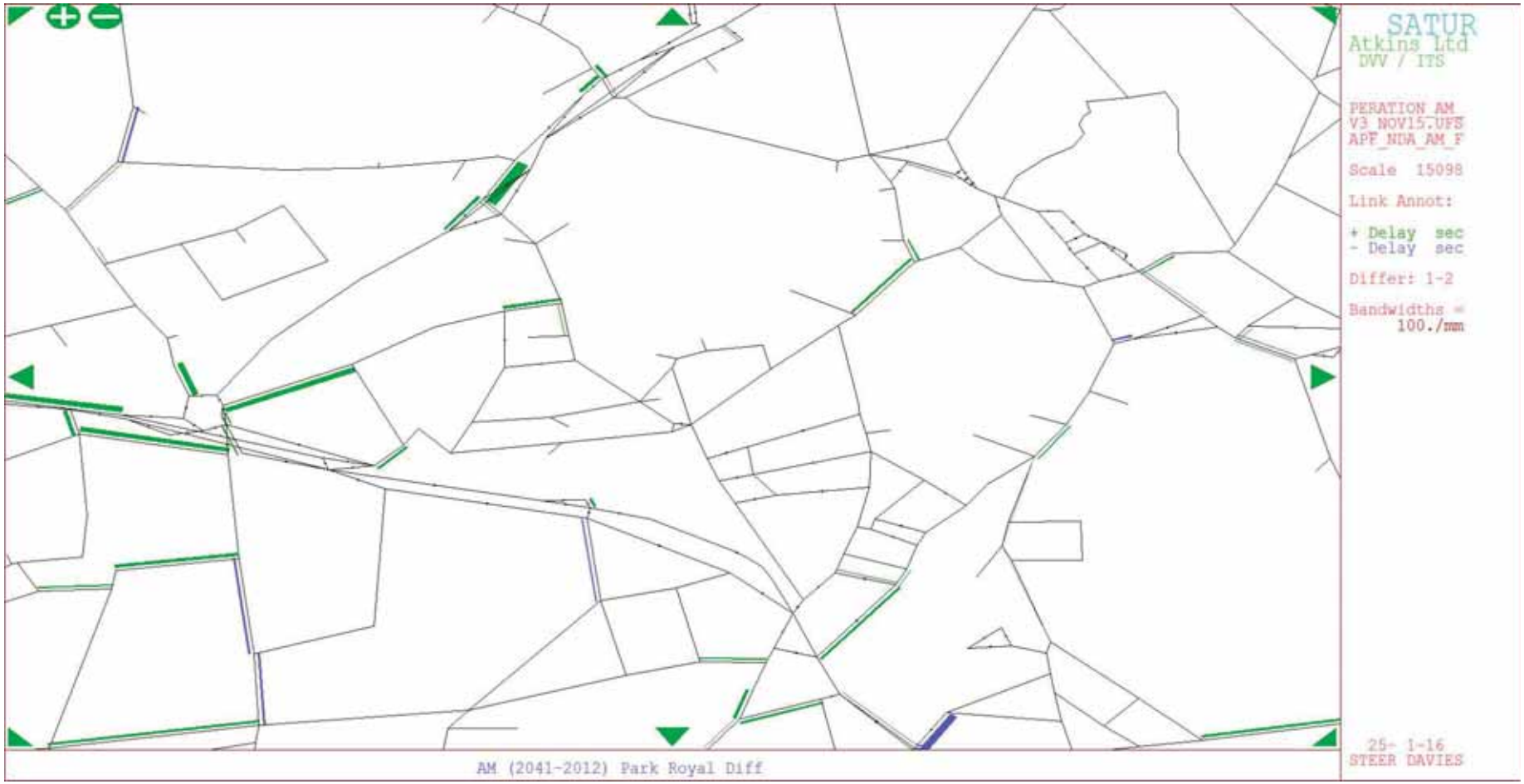


Figure E.64: AM Peak (Park Royal 2041 – BY 2012) Average Delay Differences in PCUs

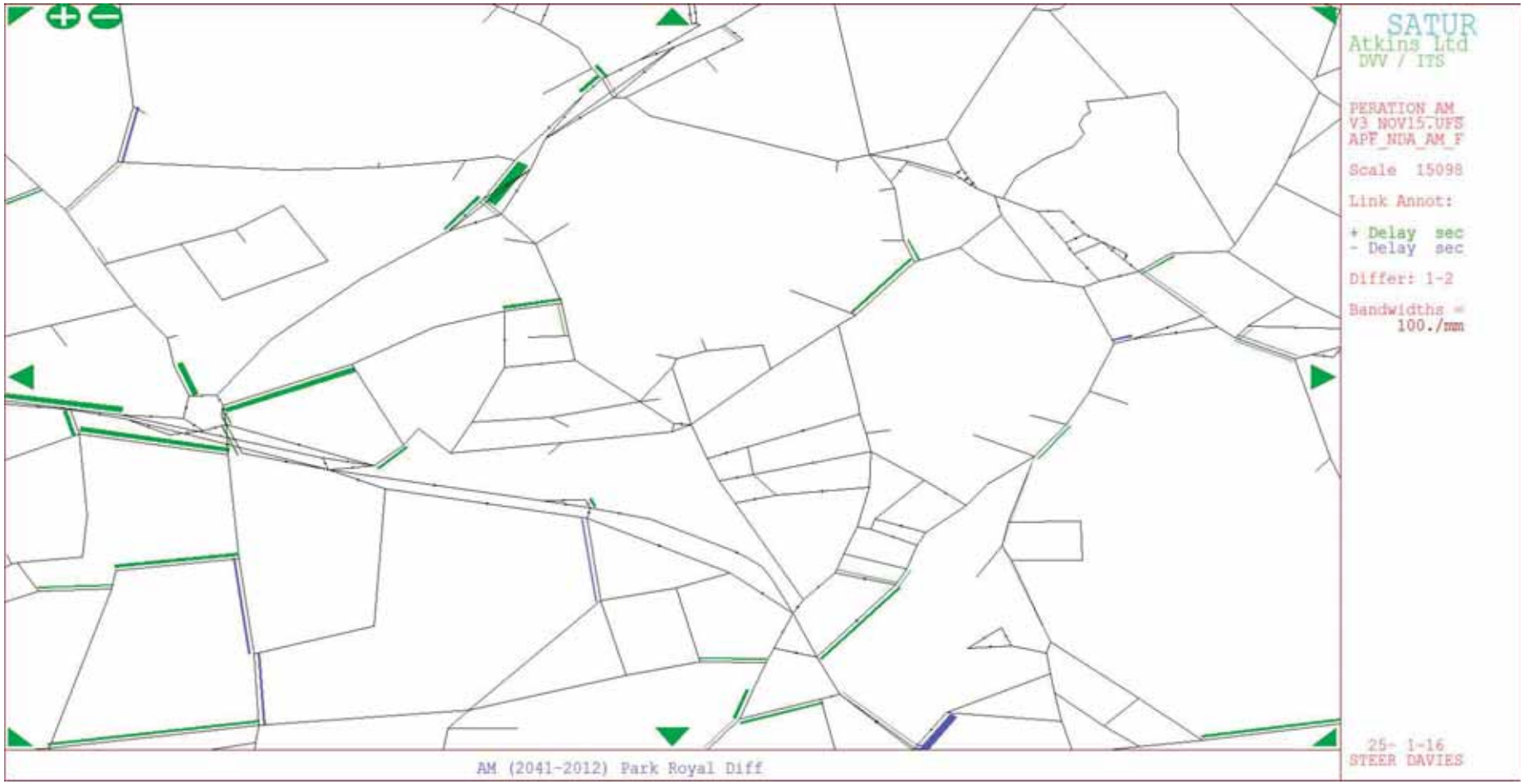


Figure E.65: AM Peak (Park Royal 2041 – BY 2012) PCU Hour Junction Delay Differences

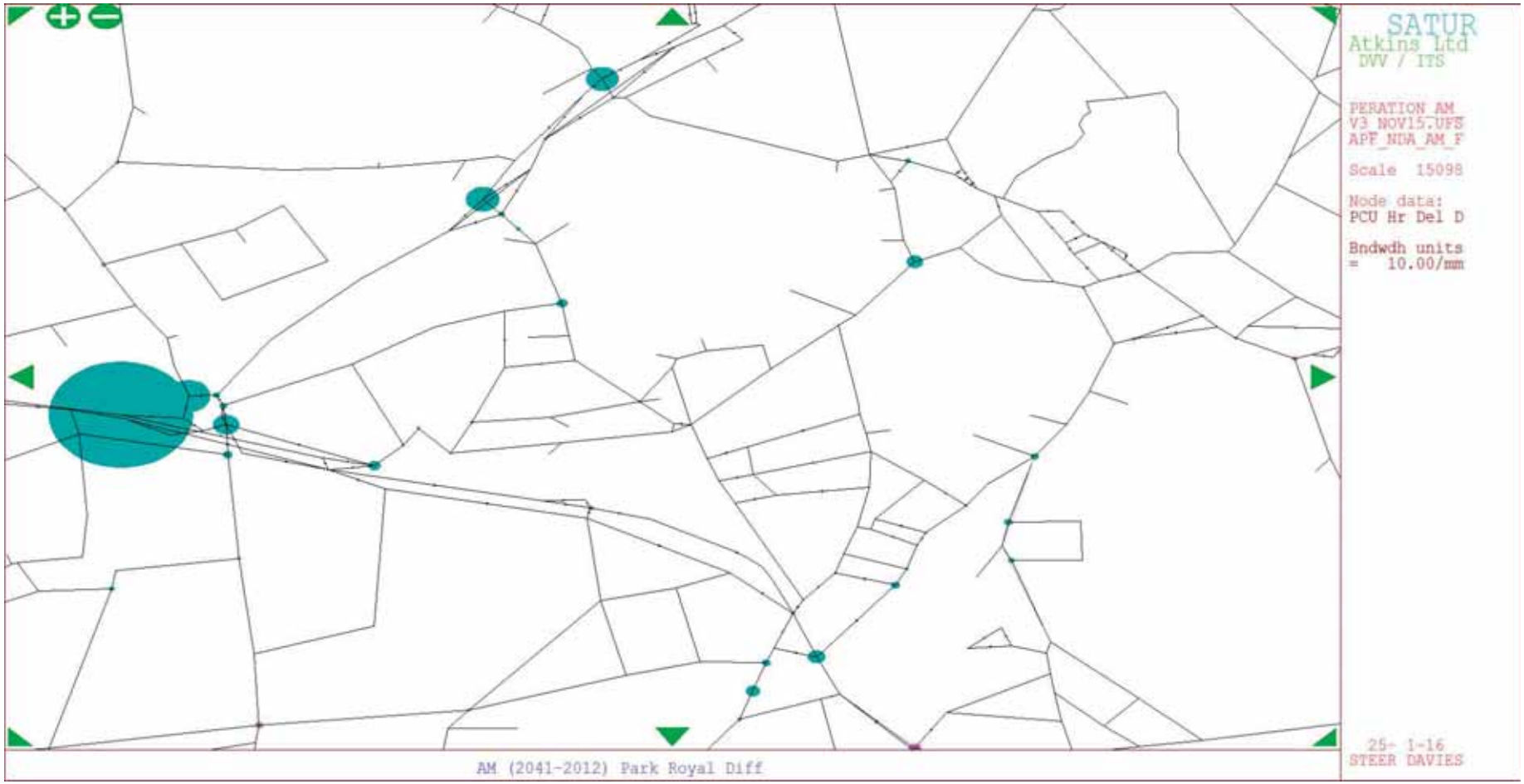


Figure E.66: PM Peak 2041 Park Royal Demand Flows in PCUs

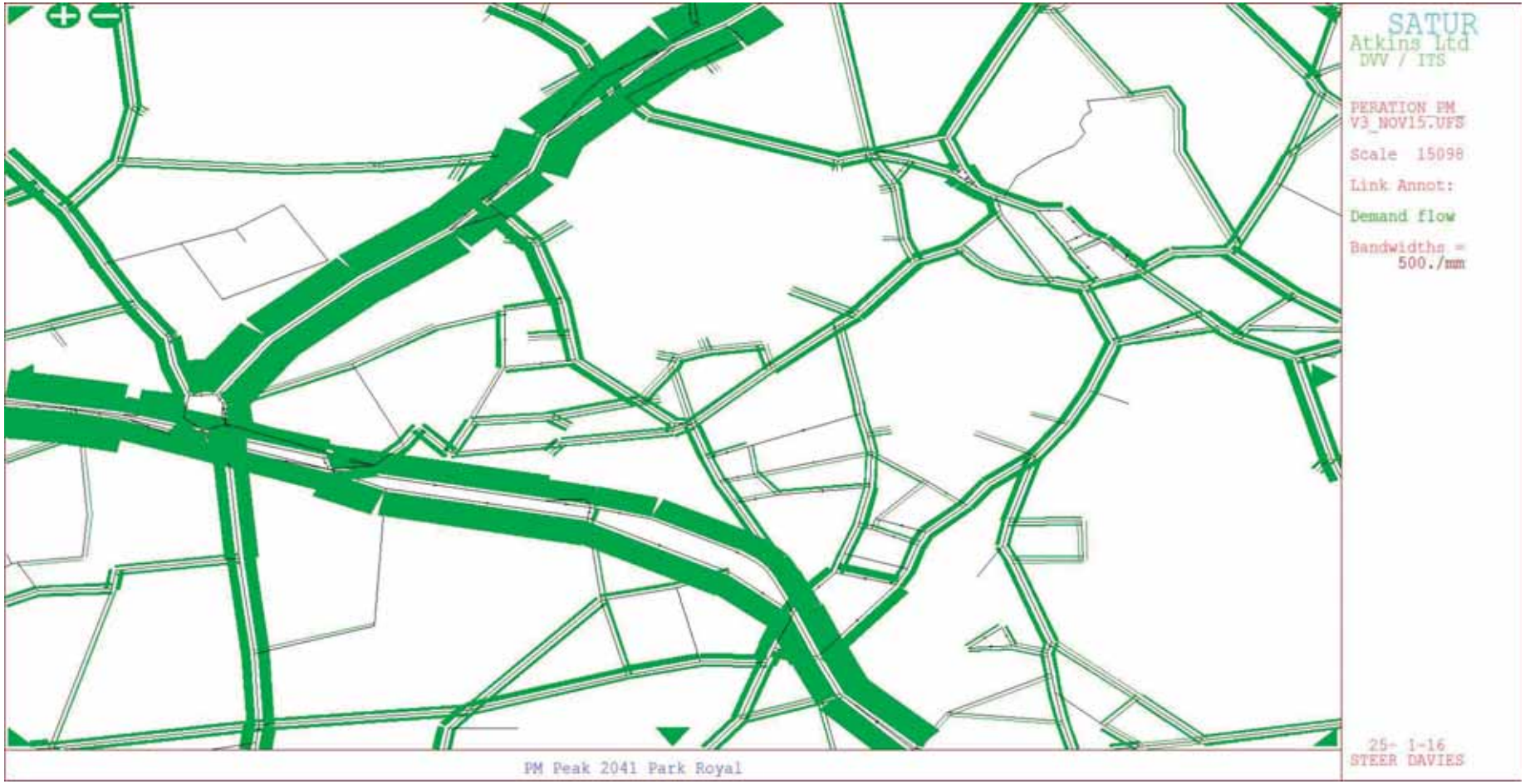


Figure E.67: PM Peak 2041 Park Royal Actual Flows in PCUs

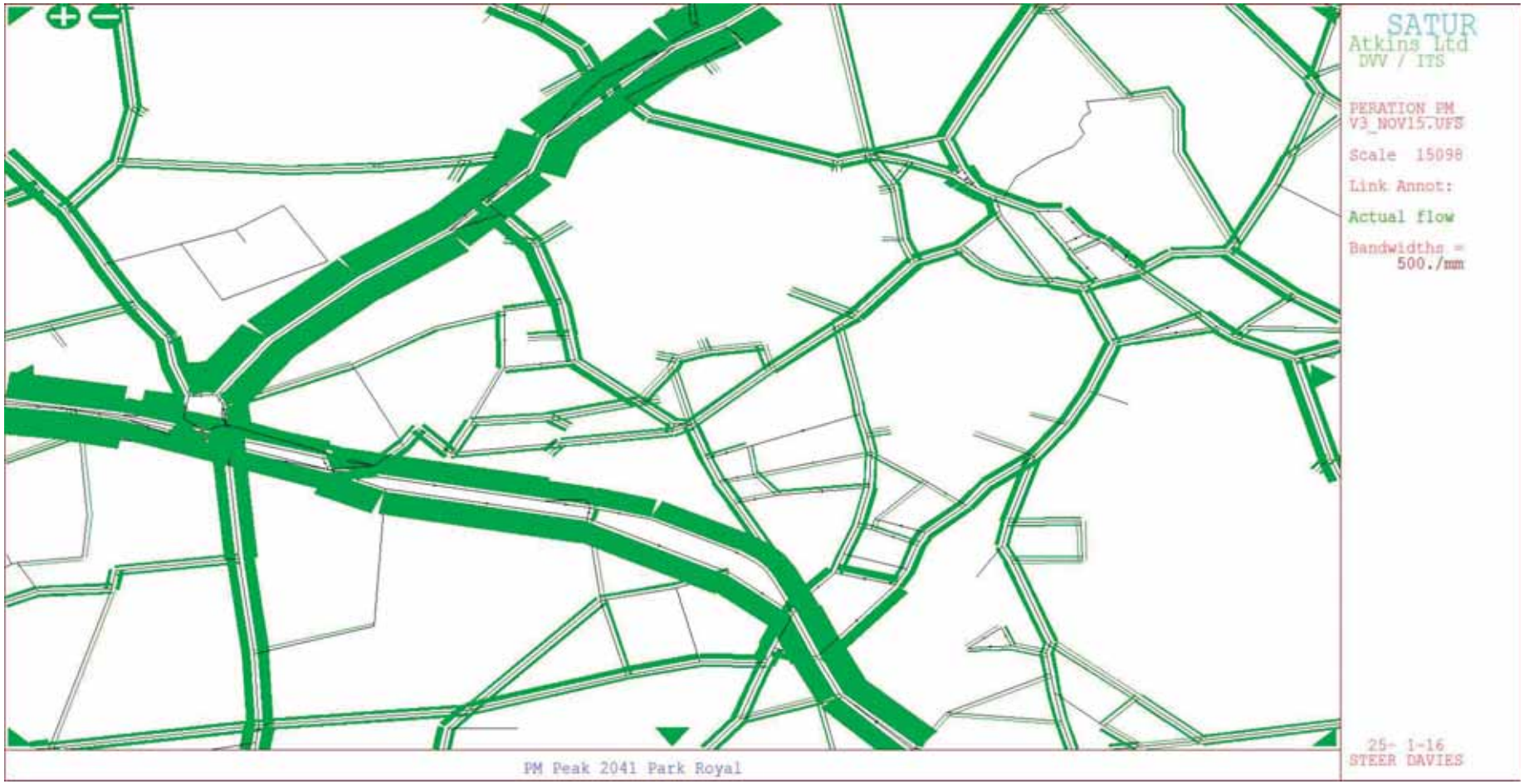


Figure E.68: PM Peak 2041 Park Royal Average Queue in PCUs

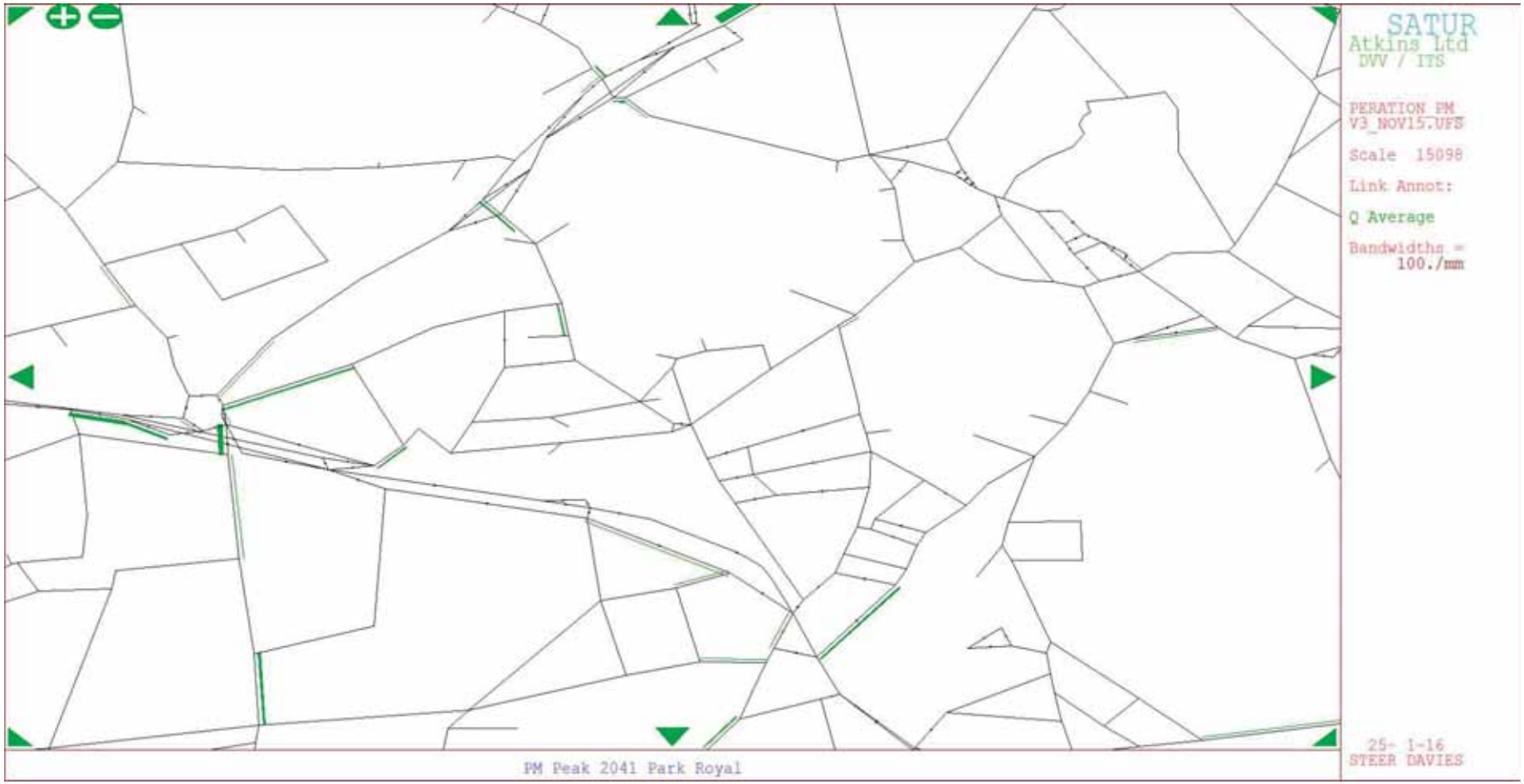


Figure E.69: PM Peak 2041 Park Royal Average Delay in Seconds

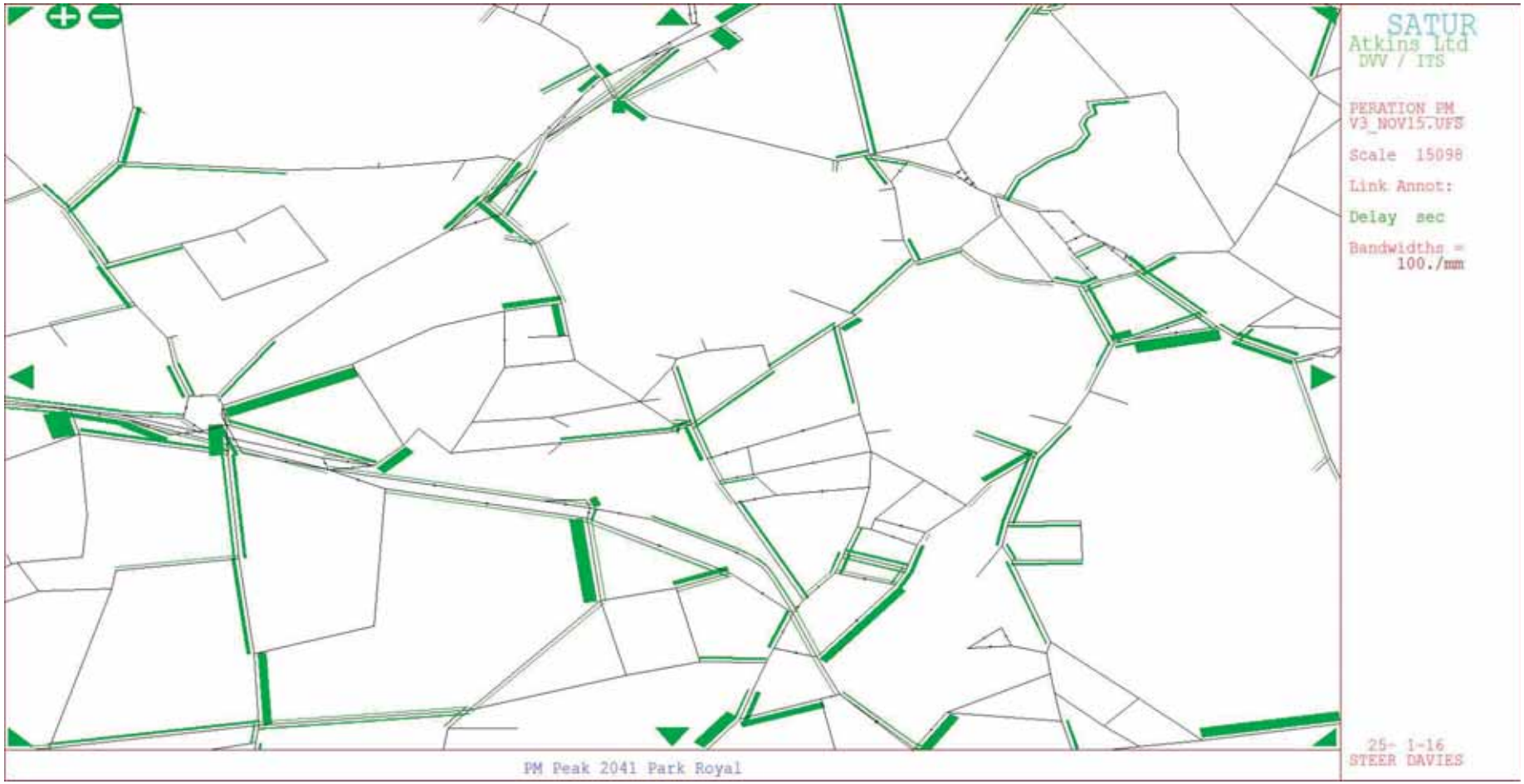


Figure E.70: PM Peak 2041 Park Royal Volume Over Capacity %

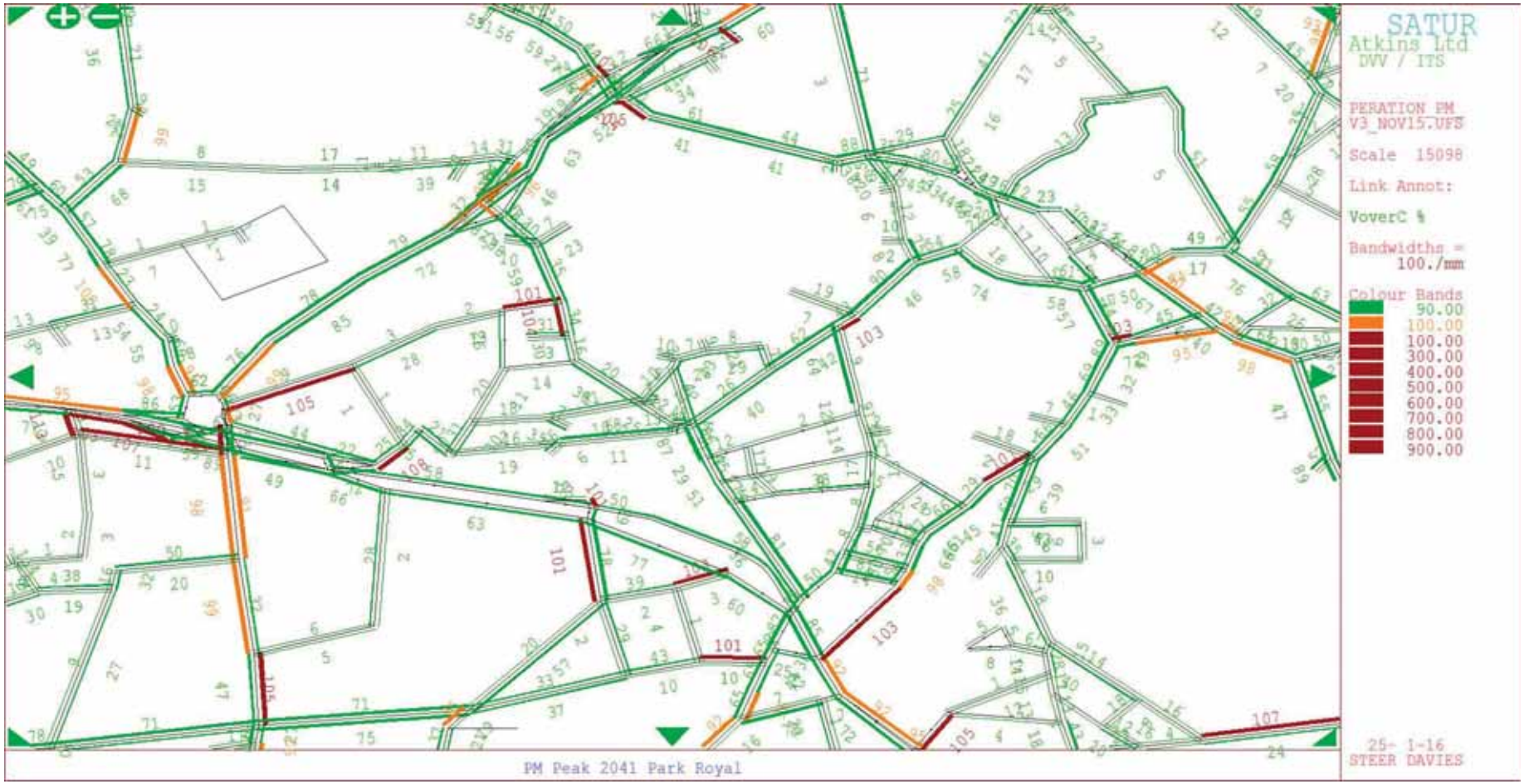


Figure E.71: PM Peak 2041 Park Royal PCU Hour Junction Delay

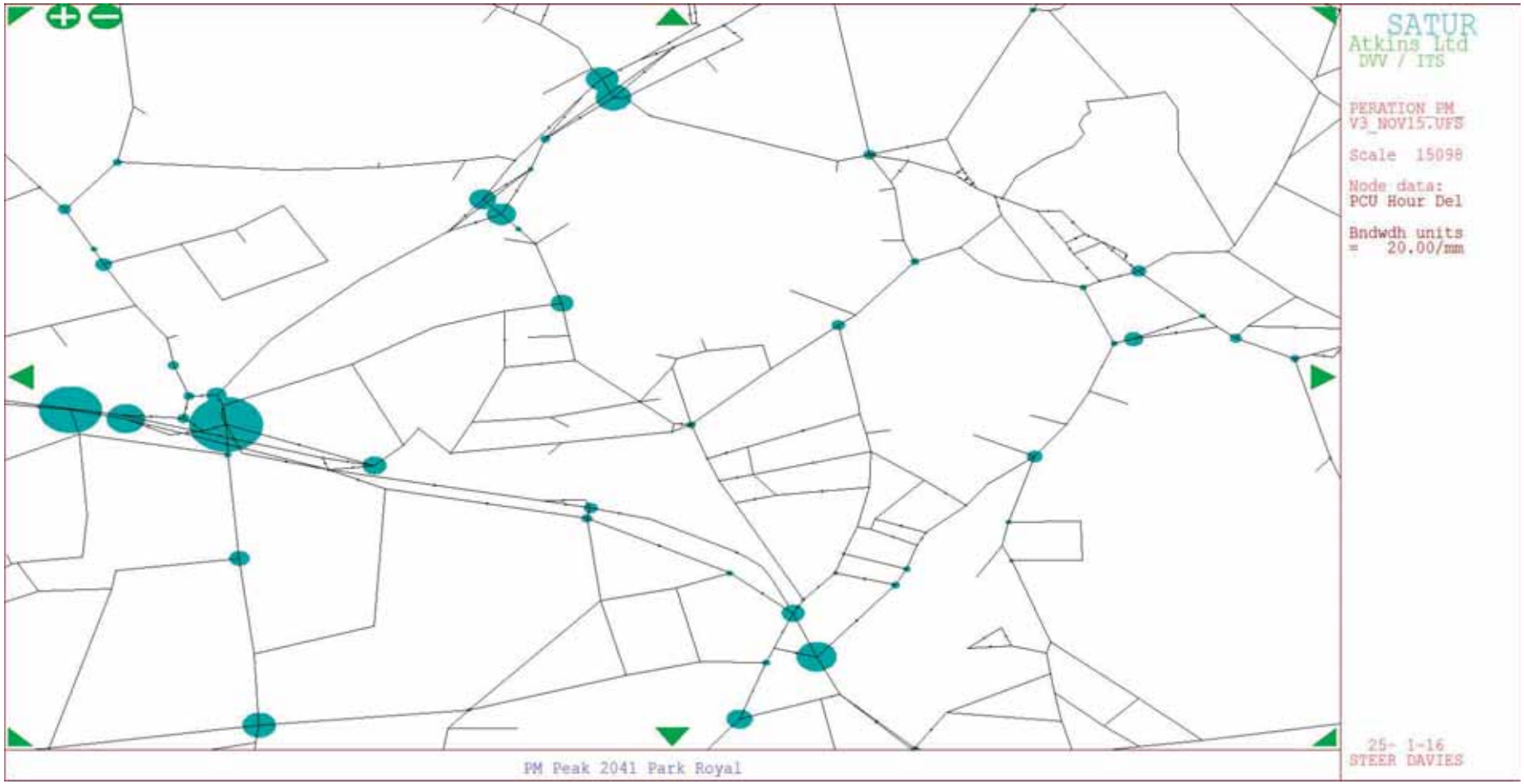


Figure E.72: PM Peak (Park Royal 2041 – BY 2012) Demand Flow Differences in PCUs

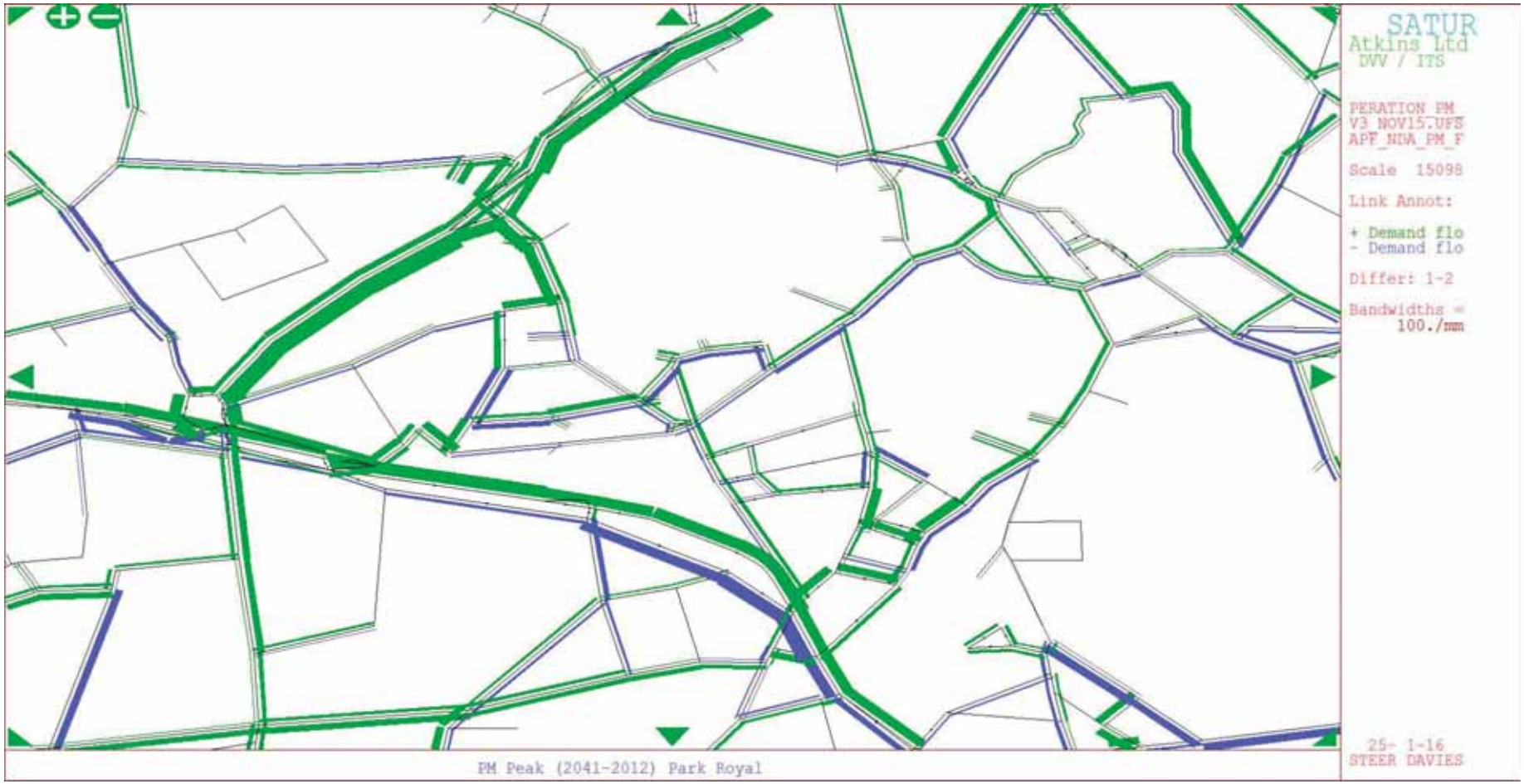


Figure E.73: PM Peak (Park Royal 2041 – BY 2012) Actual Flow Differences in PCUs

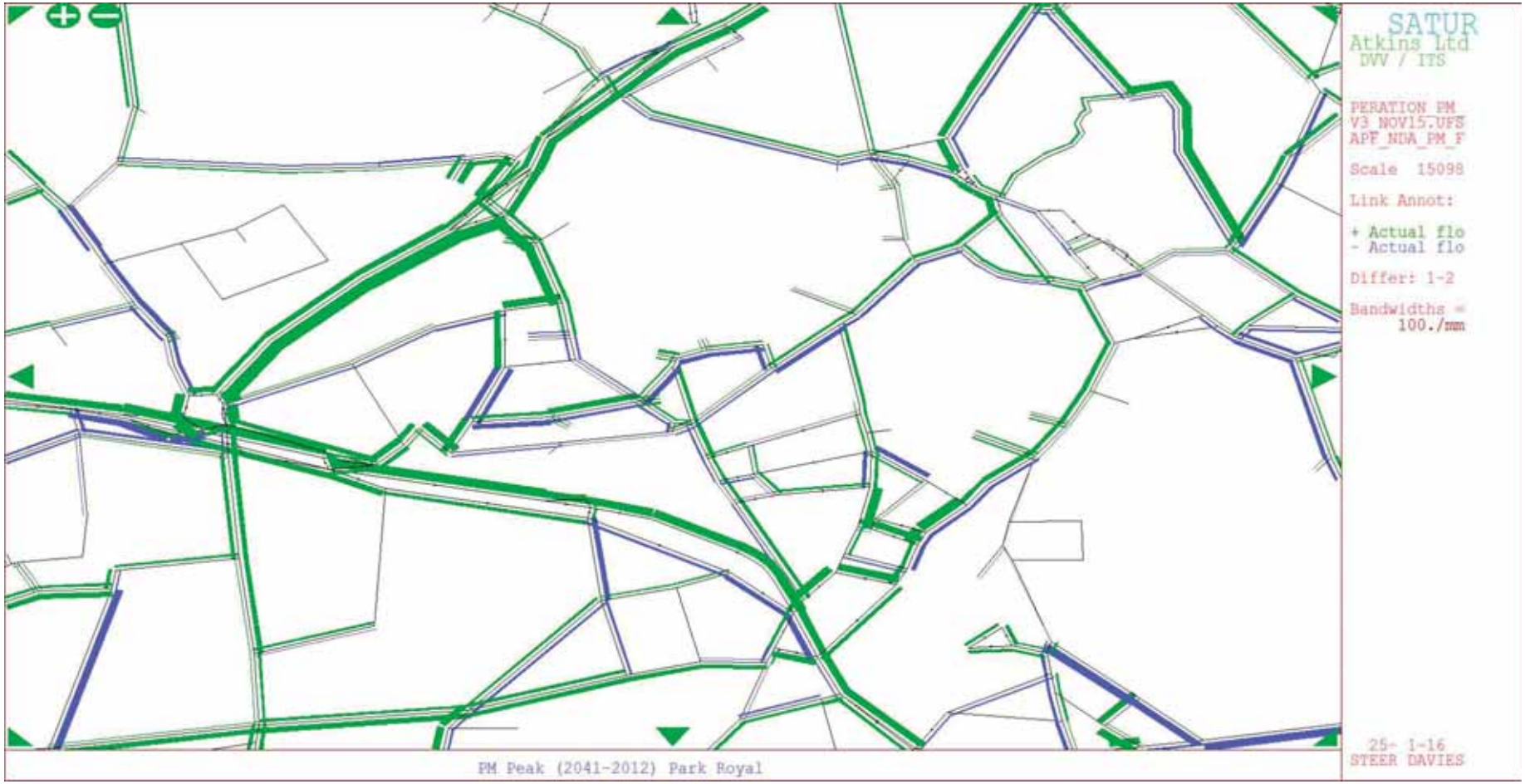


Figure E.74: PM Peak (Park Royal 2041 – BY 2012) Average Queue Differences in PCUs

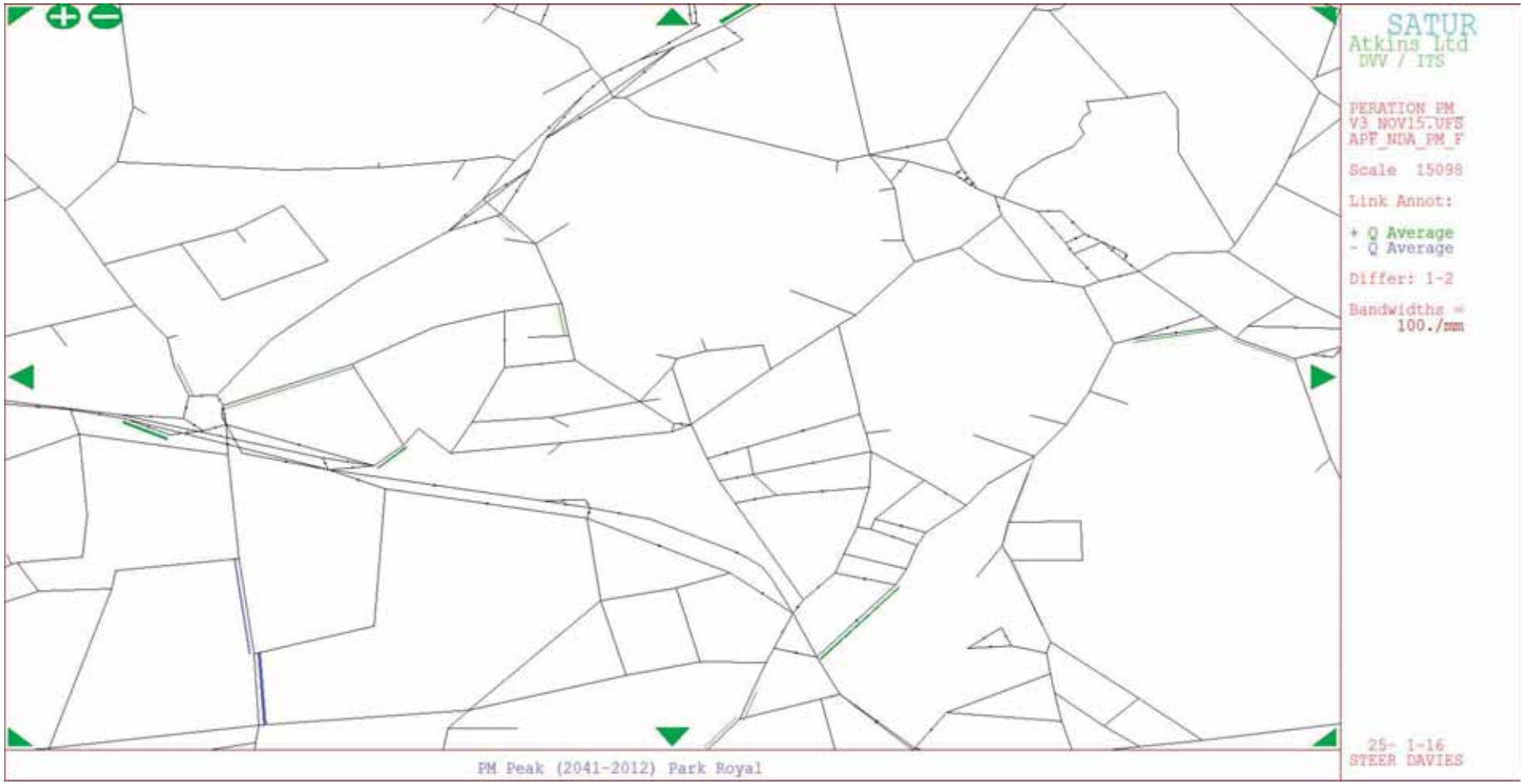


Figure E.75: PM Peak (Park Royal 2041 – BY 2012) Average Delay Differences in PCUs

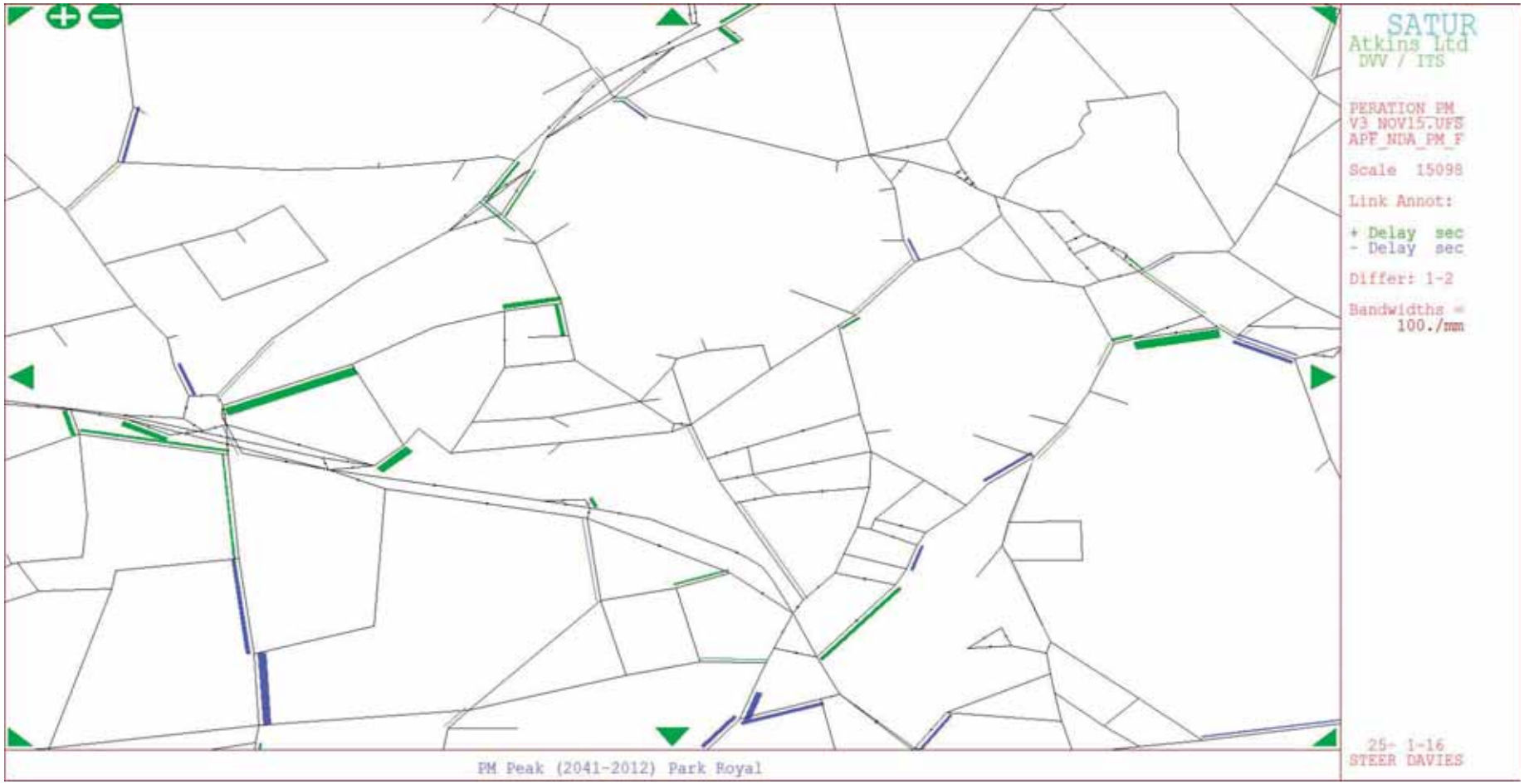
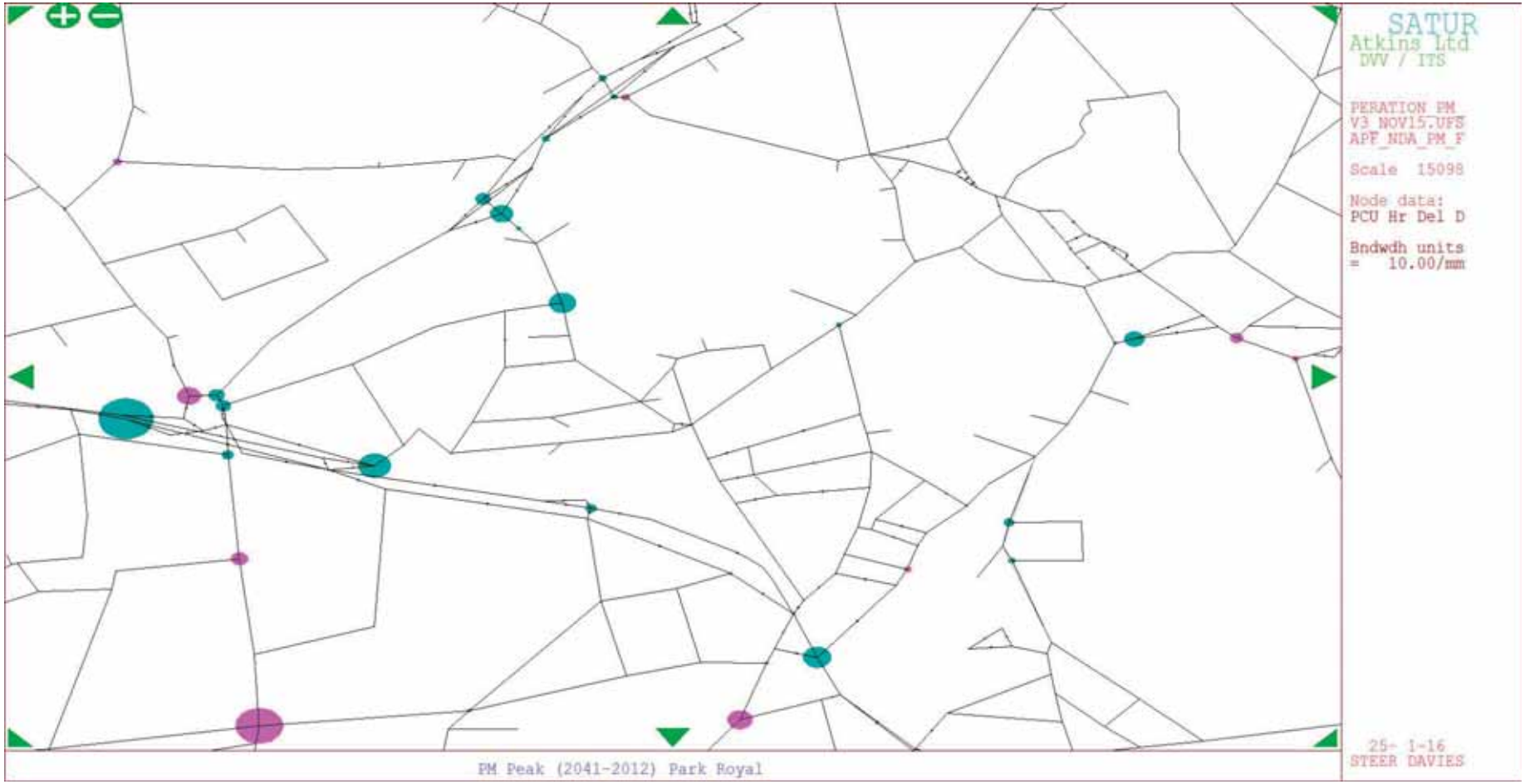


Figure E.76: PM Peak (Park Royal 2041 – BY 2012) PCU Hour Junction Delay Differences



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