

Tendring Local Plan Review Regulation 19 Transport Evidence - Appendices

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Tendring District Council

Tendring Local Plan Reg 19
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Tendring Local Plan Review Regulation 19 Transport Evidence - Appendices

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Appendix A. Method for assessing the acceptability of the transport impact of growth

Section 2.2 introduces a movement index for helping transport authorities consider the acceptability of transport impacts arising from local plan growth and supporting the identification of appropriate mitigation measures in line with the NPPF vision-led approach to transport planning and the county's LTP4. This appendix provides technical information on the transport assessment method, which has guided the findings and recommendations.

A.1 Strategic versus detailed

Traditional approaches to acceptability of local plan development often focus on using level of service (LoS), volume/capacity (V/C) and queue length indicators around junctions.

At the preferred options, plan making, Regulation 18 stage of local plan preparation there is risk that sole use of these indicators would tilt plans to highway schemes at the expense of the vision for sustainable transport; and put focus on specific problem locations while losing sight of the strategic tapestry of the transport network, and the cumulative impact of how people and goods move through the network using all modes.

At the Regulation 19 stage and in site-specific, developer-led transport assessments, LoS, V/C and queue length indicators have their role – ideally when used to test the effectiveness of mitigation measures to strike the right balance between pedestrian, cycle, bus, car and goods vehicle movements aligned with a sustainable transport vision. It is also appropriate that they are considered at key junctions such as found on the strategic road network managed by National Highways (NH).

However, at the Regulation 19 stage, a more strategic approach is recommended, aligned with the intent of the NPPF and the draft LTP4.

A.2 Assessment of keeping people and goods moving (theory and method)

The assessment of keeping people and goods moving is, arguably, the key criterion for which an objective judgement is required, to be informed by transport modelling. This section explains the theory and method.

Transport models can produce numerous indicators which are difficult to combine and interpret – it is metaphorically difficult to see the wood for the trees. In addition, strategic transport models are good at showing change between a reference case (without local plan growth and mitigations) and an assessment case (with local plan growth and with or without mitigations). However, strategic models are not as good at interpreting the level of problem in either of the cases.

We make an assumption that highway traffic indicators provide the most useful high level indicators since increases in flow, congestion and delay will likely impact all people and goods movements regardless of mode. Secondary analysis would then consider the impact on each mode informed by findings from the sustainable transport criterion and the traffic forecasts.

As illustrated in Section 2.2, the assessment of movement performance commences by identifying key areas of the network where there are problems or change is expected. Each area of interest is then subdivided into paths, which are routes through an area.

For example, one path may go straight ahead at a junction whereas another path may turn left or right. For each path the following indicators are extracted from the model.

- Relative queue (q) which shows blocking back of traffic on that path, i.e. traffic that doesn't get through in the modelled time period, which causes queues to form. This indicator only appears on the worst performing parts of the modelled network and is shown as the percentage of a link which is blocked. Relative queue ranges between 0 (no queue) to 100% (where the entire path link is blocked by the end of the modelled hour).
- The ratio between modelled speed and free flow speed along the path (s). This indicator reflects delay in situations where traffic is slow moving and is calculated by dividing modelled speed by free flow speed. Traffic can be slow moving without there being a relative queue. The ratio ranges from 0+ (very slow but never 0 since some traffic must have travelled along a path even if it ends up fully blocked with traffic unable to move at the end of the modelled hour) to 1 (where there is no delay whatsoever).
- The ratio between the demand for traffic to flow along a path and the actual modelled flow that is predicted to get through a path over the modelled hour (d). This indicator reflects issues where demand exceeds capacity. It is calculated by dividing demand flow by actual flow. It ranges from 1 (where all traffic can get through) to, potentially, a high number in an exceptionally congested network – though in reality the indicator will range between 1 and 2.

These indicators (q , s and d) have then been combined into a movement index (I) using the following formula:

$$I = \left(\frac{(1 + q)^2}{s} \right)^d$$

The index I ranges from 1 (with no queue and delay with all traffic demand passing through) to, in extreme situations, a high number. In practice it ranges from 1 to 4 for the majority of paths with some outliers ranging to 15.

There is an index score for each of the paths through each of the areas of interest. For each area of interest, a combined index score is then calculated. This is done by calculating a weighted average of the index scores of the paths through an area. The average is weighted by path length.

In order to interpret the severity of conditions represented by the index score, a seven point scale 1-15 has also been developed, shown in A.1. Since the function is non-linear the scale is also non-linear. To develop the scale, a technique borrowed from mathematical approximation theory has been used to identify the most efficient set of intervals to represent change.

A.1: Relationship between the movement scale and index values

Description	Movement scale	Index values
More or less free flow	1	$1.00 \leq I < 1.03$
	2	$1.03 \leq I < 1.10$
	3	$1.10 \leq I < 1.19$
Travelling slower	4	$1.19 \leq I < 1.31$
	5	$1.31 \leq I < 1.45$
	6	$1.45 \leq I < 1.63$
Moderate congestion	7	$1.63 \leq I < 1.83$
	8	$1.83 \leq I < 2.05$
	9	$2.05 \leq I < 2.29$
Substantial congestion	10	$2.29 \leq I < 2.54$
	11	$2.54 \leq I < 2.82$
	12	$2.82 \leq I < 3.10$
Extreme congestion	13	$3.10 \leq I < 3.40$
	14	$3.40 \leq I < 3.70$
	15	$I \geq 3.70$

Using the scale, the level of movement performance can be assessed in each area of interest. Also, problems on specific paths can be identified by looking at the indices on individual paths. The question then arises that if growth is added to the network, or mitigations made, whether performance is acceptable or not.

To answer this question, it is assumed that there will be two scenarios (reference and assessment scenarios) to be compared against each other. Depending on the changes between scenarios and the scale of problem, the matrix shown in A.2 shows how a judgement can be reached on whether the assessment scenario can be found broadly acceptable in terms of movement performance – noting that sustainable transport and safety impacts also need to be considered.

The main report illustrates how this method is being applied in praxis in the Tendring local plan evidence project. For example, see the assessment of the different scenarios as discussed in chapters 2, 4 and 5.

Depending on the change between the scenarios being compared, the change in the movement indices also help identify the level of concern to inform acceptability:

- passable ✓
- caution !
- unsatisfactory X

A.2: Acceptability matrix for initial assessment

Reference case level of problem	Assessment case level of problem														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	✓	✓	!	!	!	!	X	X	X	X	X	X	X	X	X
2	✓	✓	✓	!	!	!	X	X	X	X	X	X	X	X	X
3	✓	✓	✓	✓	!	!	X	X	X	X	X	X	X	X	X
4	✓	✓	✓	✓	!	!	!	!	X	X	X	X	X	X	X
5	✓	✓	✓	✓	✓	!	!	!	X	X	X	X	X	X	X
6	✓	✓	✓	✓	✓	✓	!	!	!	X	X	X	X	X	X
7	✓	✓	✓	✓	✓	✓	✓	!	!	X	X	X	X	X	X
8	✓	✓	✓	✓	✓	✓	✓	✓	!	!	X	X	X	X	X
9	✓	✓	✓	✓	✓	✓	✓	✓	!	!	X	X	X	X	X
10	✓	✓	✓	✓	✓	✓	✓	✓	✓	!	X	X	X	X	X
11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	!	X	X	X	X
12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	!	X	X	X
13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X
14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X
15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X

A.3 Reaching a view on acceptability

Information on movements of vehicles through the highway network is a good proxy for all movement, as buses, cyclists and pedestrians can be affected by general traffic delay, however, to reach a view on the acceptability of a local plan from the perspective of transport, additional interpretation is needed to assess also the impact on other modes and safety.

Appendix B. Reference Case Sites

B.1 Committed Residential Sites

B.1: Committed Residential Site Allocations

Site name	Planning Ref (where applicable)	Location	No. of Dwellings (2023 – 2043)
Hartley Gardens		Clacton-on-Sea	1700
Oakwood Park (Phase 1)		Clacton-on-Sea / Little Clacton	122
Oakwood Park (Phase 2)		Clacton-on-Sea / Little Clacton	900
Rouses Farm		Clacton-on-Sea	950
Low Road		Dovercourt	300
Lawford Green, Bromley Road		Manningtree	235
Thorpe Road (Land South Of)		Weeley	280
Bromley Road		Lawford / Ardleigh	99
West of The Street		Little Clacton	98
R/o 59 & 61 London Road		Little Clacton	30
Frinton Road/Lifehouse Drive		Thorpe-le-Soken	49
Brook Park West		Clacton-on-Sea	200
Sladbury's Lane		Clacton-on-Sea	132
St Helena Hospice, Tendring Centre		Clacton-on-Sea	10
3 Marine Parade East		Clacton-on-Sea	14
Waterworks Drive		Clacton-on-Sea	0
82 Jaywick Lane		Clacton-on-Sea	13
23-27 Brooklands		Jaywick Sands	15
32-37 Brooklands		Jaywick Sands	13
School Road East		Elmstead	52
Station Field		Great Bentley	125
Turpins Farm, Frinton		Kirby Cross	231
Finches Park, Kirby Cross		Kirby Cross	136
Station Yard/Avon Works		Walton-on-the-Naze	40
High Street (27-31)		Walton-on-the-Naze	10
Harwich Valley		Dovercourt / Harwich	297
SATO Site, Valley Road		Dovercourt / Harwich	42
Una Road (Land rear of)		Harwich	30
Land adjoining Harwich & Parkeston FC		Harwich	24
Cliff Hotel		Dovercourt / Harwich	20
Long Road/Clacton Road		Mistley / Lawford	484
Stourview Avenue		Mistley	72
Thorn Quay Warehouse		Mistley	0
Adj Great Oakley Primary School		Great Oakley	0
TDC Council Offices		Clacton-on-Sea	24
St Johns Plant Centre	21/01000/FUL	Clacton-on-Sea	180
Foots Farm	20/01130/FUL	Clacton-on-Sea	122
Chicken Farm, Thorpe Road	16/00421/FUL	Little Clacton	80
Coppins Court, Coppins Road	16/01916/FUL	Clacton-on-Sea	60
Crossways Garden Centre, Thorpe Road	19/01598/FUL	Little Clacton	21
South of Ramsey Road/East of Mayes Lane	19/00917/OUT	Ramsey	27
Fronks Road	23/01511/FUL	Harwich	14
Ferndale Road	11/00301/FUL	Harwich	13

Site name	Planning Ref (where applicable)	Location	No. of Dwellings (2023 – 2043)
Kirby Road, Great Holland	17/01988/FUL	Frinton-on-Sea	41
'River Reach', Harwich Road (Phase 2)	18/01994/OUT	Harwich	81
Honeycroft & 2 Waldegrave Way	23/00929/FUL	Lawford	13
Lower Farm, East End Green	19/00188/FUL	Brightlingsea	41
Lanswood Park	20/00239/FUL	Elmstead	65
Land to The East of Tye Road	20/01797/FUL	Elmstead	15
Hartford Green	22/01818/FUL	Great Bentley	154
Land at Moorlands Farm	21/02176/FUL	Great Bentley	26
24 The Street	16/00427/OUT	Little Clacton	10
Wellwick Field	11/00333/OUT	St Osyth	227
	24/00560/OUT		
Land East of Henderson Drive	21/01397/FUL	Thorpe-le-Soken	28
Hamilton Lodge, Great Bromley	20/00547/OUT	Great Bromley	79
Land North and South of A133 Clacton Road at Finches Lane, CO7 7FD	22/02076/FUL	Elmstead	126
Colchester Institute The Clacton Campus	24/01384/OUT	Clacton-on-Sea	60
Land to The rear of 173 – 203 Thorpe Road	23/01221/OUT	Kirby Cross	20
Land West of Clacton Road	24/01363/FUL	Elmstead	13
Land South of Holland Road, Little Clacton	24/00161/FUL	Little Clacton	50
Cockaynes Lane, Alresford	25/00374/OUT	Alresford	100
South of Weeley Road, Great Bentley	25/01066/OUT	Great Bentley	80
North of Avocet Place, Thorrington	25/01498/FUL	Thorrington	60
Tendring Colchester Borders GC		Ardleigh / Elmstead	4000

B.2 Committed Employment Sites

B. 2: Committed Employment Site Allocations

Site name	Planning Reference (where applicable)	Location	Employment Land Use	Employment Sqm (2023 – 2043)
Carless Extension, Harwich 1		Harwich	B1	898
Carless Extension, Harwich 2		Harwich	B2	898
Carless Extension, Harwich 3		Harwich	B8	898
Hartley Gardens, Clacton Gateway 1		Clacton-on-Sea	A1	441
Hartley Gardens, Clacton Gateway 2		Clacton-on-Sea	A3	43
Hartley Gardens, Clacton Gateway 3		Clacton-on-Sea	D2	120
Stanton Europark 1		Harwich	C1	366
Stanton Europark 2		Harwich	A3	159
Stanton Europark 3		Harwich	B2	843
Stanton Europark (Northern Site)		Harwich	B8	2459
Land South of Long Road, Mistley 1		Mistley	B1	745
Land South of Long Road, Mistley 2		Mistley	B2	745
Land South of Long Road, Mistley 3		Mistley	B8	745

Site name	Planning Reference (where applicable)	Location	Employ- ment Land Use	Employ- ment Sqm (2023 - 2043)
Oakwood Extension ('Dalau Site') 1		Clacton-on-Sea	B1	905
Oakwood Extension ('Dalau Site') 2		Clacton-on-Sea	B2	905
Oakwood Extension ('Dalau Site') 3		Clacton-on-Sea	B8	905
Mercedes Site, Bathside Bay 1		Harwich	B1	2757
Mercedes Site, Bathside Bay 2		Harwich	B2	2757
Mercedes Site, Bathside Bay 3		Harwich	B8	2757
Pond Hall Farm, Harwich 1		Harwich	B2	3521
Pond Hall Farm, Harwich 2		Harwich	B8	3521
Lanswoodpark, Elmstead Market 1		Elmstead	B1a/b	357
Lanswoodpark, Elmstead Market 1 (MGA)		Elmstead	D1	170
Land south of Thorpe Road 1		Weeley	B1	671
TCBGC - employment		Ardleigh/Elmstead	Eg	0
Extension to Gorse Lane, Clacton		Clacton-on-Sea	B1a/b	414
Extension to Gorse Lane, Clacton		Clacton-on-Sea	B1	414
Extension to Gorse Lane, Clacton		Clacton-on-Sea	B1	414
Extension to Gorse Lane, Clacton		Clacton-on-Sea	B2	1242
Extension to Gorse Lane, Clacton		Clacton-on-Sea	B8	1242
Crown Business Centre (phase 1)		Ardleigh	B1a/b	198
Crown Business Centre (phase 1)		Ardleigh	B1	198
Crown Business Centre (phase 1)		Ardleigh	B1	198
Crown Business Centre (phase 1)		Ardleigh	B2	594
Crown Business Centre (phase 1)		Ardleigh	B8	594
Crown Business Centre (phase 2)		Ardleigh	B1a/b	29
Crown Business Centre (phase 2)		Ardleigh	B1	29
Crown Business Centre (phase 2)		Ardleigh	B1	29
Crown Business Centre (phase 2)		Ardleigh	B2	87
Crown Business Centre (phase 2)		Ardleigh	B8	87
The Sunspot	21/00871/FUL	Jaywick Sands	B1a/b	158
Green Farm	18/00930/FUL	Manningtree	B8	121
Gorse Ln Industrial Estate	21/00486/FUL	Clacton-on-Sea	B1	157
Crossways Centre	21/00186/FUL	Frating	B8	263
Badley Hall	20/00704/FUL	Great Bromley	B8	77
Badley Hall	20/00704/FUL	Great Bromley	B1a/b	141
Badley Hall	20/00704/FUL	Great Bromley	B1	63
Hills Building Group	19/01140/DETAIL	Elmstead	B1a/b	78
Land adjacent to Church Farm Cottages, Church Road	18/00824/FUL	Little Bentley	B8	35
Gorse Ln Industrial Estate	21/00712/FUL	Clacton-on-Sea	B1a/b	58
Allens Farm	19/00544/FUL	Elmstead	B8	190
Gorse Lane Industrial Estate	21/01982/FUL	Clacton-on-Sea	B1a/b	456
Telford Business Park	21/01691/FUL	Clacton-on-Sea	B2	351
Telford Business Park	21/01691/FUL	Clacton-on-Sea	B8	351
Telford Business Park	21/01691/FUL	Clacton-on-Sea	B1a/b	117
Telford Business Park	21/01691/FUL	Clacton-on-Sea	B1	117
Telford Business Park	21/01691/FUL	Clacton-on-Sea	B1	117
Land south of Colchester Road	23/01699/OUT	Frating	B2	1127
Land south of Colchester Road	23/01699/OUT	Frating	B1a/b	483
Brand Art	21/01523/FUL	Little Bentley	B1	624

Site name	Planning Reference (where applicable)	Location	Employ- ment Land Use	Employ- ment Sqm (2023 - 2043)
Allens Farm	22/01782/FUL	Elmstead	B8	197
Surya Foods	20/00594/FUL	Ardleigh	B8	3619
Systematic Business Park	20/01783/FUL	Ardleigh	B1a/b	291
Land at Crown Quarry	19/01939/OUT	Ardleigh		0
Horsley Cross	22/01042/DETAIL	Horsley Cross	B2	1389
Horsley Cross	22/01042/DETAIL	Horsley Cross	B8	1389
Horsley Cross	22/01042/DETAIL	Horsley Cross	B1a/b	463
Horsley Cross	22/01042/DETAIL	Horsley Cross	B1	463
Horsley Cross	22/01042/DETAIL	Horsley Cross	B1	463
Horsley Cross	22/01047/FUL	Horsley Cross	B2	1090
Horsley Cross	22/01047/FUL	Horsley Cross	B8	1090
Stanton Europark	21/01240/FUL	Harwich	B2	562
Stanton Europark	21/01240/FUL	Harwich	B8	562
Hills Building Group	19/00432/DETAIL	Elmstead	B1a/b	123
Pump Farm	20/01393/FUL	Little Bentley	B8	46
Pond Barns	21/00582/FUL	Great Bromley	B8	89
Pump Farm	19/00282/FUL	Little Bentley	B8	45
Pump Farm	19/00282/FUL	Little Bentley	B1a/b	25
Gorse Lane Industrial Estate	20/01288/FUL	Clacton-on-Sea	B8	75
Martells Industrial Estate	23/01295/FUL	Ardleigh	B1	143
DTE Scaffolding	22/00121/FUL	Ardleigh	B2	33
DTE Scaffolding	22/00121/FUL	Ardleigh	B8	33
DTE Scaffolding	22/00121/FUL	Ardleigh	B1a/b	11
DTE Scaffolding	22/00121/FUL	Ardleigh	B1	11
DTE Scaffolding	22/00121/FUL	Ardleigh	B1	11
Kellys Farm	22/00468/FUL	Manningtree	B8	453
Gorse Lane Industrial Estate	24/00667/FUL	Clacton-on-Sea	B8	29
Philip Liverton Ltd	24/01075/FUL	Ardleigh	B1	82
Plough Road Centre	24/01121/FUL	Great Bentley	B8	23
Plough Road Centre	24/01121/FUL	Great Bentley	B1a/b	8
Plough Road Centre	24/01121/FUL	Great Bentley	B1	8
Plough Road Centre	24/01121/FUL	Great Bentley	B1	8
Plough Road Centre	24/01121/FUL	Great Bentley	B1	23
Land North West of The Ranch	24/01189/FUL	Ardleigh	B1	64
Red House Farm	24/01332/FUL	Little Bentley	B2	18
Land south of Long Road and west of Clacton Road	21/00197/DETAIL	Mistley		0
Land South of Thorpe Road	22/00979/DETAIL	Weeley	B1a/b	142
Land South of Thorpe Road	22/00979/DETAIL	Weeley	B1	142
Land South of Thorpe Road	22/00979/DETAIL	Weeley	B1	142
Bathside Bay	23/01594/FUL	Harwich	B8	23
Kellys Farm, Clacton Road	25/00688/FUL	Horsley Cross	B8	61
Titchmarsh Marina, CO14 8SL	25/00443/FUL	Walton on the Naze	B2	50
Plough Road Centre, CO7 8LG	25/01134/FUL	Great Bentley	B8	12
Plough Road Centre, CO7 8LG	25/01134/FUL	Great Bentley	B1a/b	4
Plough Road Centre, CO7 8LG	25/01134/FUL	Great Bentley	B1	4
Plough Road Centre, CO7 8LG	25/01134/FUL	Great Bentley	B1	4
Plough Road Centre, CO7 8LG	25/01134/FUL	Great Bentley	B1	12
Atlas Autos, CO11 1ND	25/01110/FUL	Mistley	B2	26

Site name	Planning Reference (where applicable)	Location	Employ- ment Land Use	Employ- ment Sqm (2023 - 2043)
Riverside Avenue West, CO11 1UN	25/00466/FUL	Manningtree	B8	113
Grange Farm, CO11 2ND	25/01734/FUL	Manningtree	B8	100
Red House Farm, CO7 8ST	25/01469/FUL	Little Bentley	B8	80
Red House Farm, CO7 8ST	25/01469/FUL	Little Bentley	B1a/b	32
Telegan Pressed Products	24/01344/FUL	Manningtree	B2	137
Telegan Pressed Products	24/01344/FUL	Manningtree	B8	137
Tendring Colchester Borders GC		Ardleigh / Elmstead	B1	14900
Tendring Colchester Borders GC		Ardleigh / Elmstead	B2	6600

Appendix C. New Local Plan Site Allocations

C.1 New Local Plan Residential Site Allocations

C. 1: New Local Plan Residential Site Allocations

Site name	Index in Local Plan	No. of Dwellings (2023 - 2043)
Land off Deane's Lane and Oakley Road, Dovercourt	SAMU5	1650
Weeley Green Garden Village	SAMU6	900
Saltings Quarter, Riverside Avenue, Manningtree	SAMU7	40
Hare Green Garden Village	SAMU8	1450
Horsley Cross Garden Village	SAMU9	1450
Land at Vicarage Farm, Dovercourt	SAH1	150
Land North of Thorpe Road, Kirby Cross	SAH2	450
Land east of Cockaynes Lane, Alresford	SAH6	100
Land east of Admirals Green and north of Weeley Road, Great Bentley	SAH7	120
Land East of Amerells Road, Little Clacton	SAH8	80
Land South of Clacton Road, St Osyth	SAH9	100
Land North of Lifehouse Spa & Hotel, Thorpe-le-Soken	SAH11	70
Durite Works, Valley Road	MSA1	82
Land adjacent Branscombe Close, Frinton	MSA2	40
Affinity Water, Mill Hill, Manningtree	MSA3	80
Crisp Malting, School Lane, Mistley	MSA4	50
Brightlingsea Telephone Exchange, 16 New Street, Brightlingsea	MSA5	15
Land at Pannell Place, Brightlingsea	MSA6	20
Land south-west of Colchester Main Road, Alresford	MSA7	40
Land adj Village Hall, Harwich Road, Beaumont	MSA8	12
Land west of Windmill Road, Bradfield	MSA9	20
Land South of Weeley Road, Great Bentley	MSA10	80
Land west of Parsons Hill, Great Bromley	MSA11	15
Land south of Hall Road, Great Bromley	MSA12	10
Land west of Main Road, Great Holland	MSA13	10
Land east of Kirby Road, Great Holland	MSA14	10
Land north-east of Wix Road, Great Oakley	MSA15	50
Land south of Orchard Close, Great Oakley	MSA16	50
Land north of Walton Road, Kirby-le-Soken	MSA17	10
Lane East of Heckfords Road, Great Bentley	MSA21	80
Land at Avocet Place, Thorrington	MSA23	60
Land east of Bentley Road, Weeley Heath	MSA24	60
Land south of Mill Lane, Weeley Heath	MSA25	17
Land south of Colchester Road, Wix	MSA26	20
Land at Abbey Bottom Farm, Harwich Road, Wix	MSA27	20
Land North of Rectory Road, Wrabness	MSA28	30
Land at Weeley Council Offices Thorpe Road	MSA29	24
Former Tendring Hundred Waterworks Site, Clacton	MSA30	90
Land adjoining Harwich & Parkeston Football Club, Main Road, Dovercourt	MSA31	24
Station Yard and Former Avon Works, off Station Road	MSA32	40

Site name	Index in Local Plan	No. of Dwellings (2023 - 2043)
Well House Site, Chestnut Way, Brightlingsea	MSA33	60
Vicarage Field, Church Road, Brightlingsea	MSA34	30
Land North of Robinson Road, Brightlingsea	MSA35	25
Land North of Wix Road, Bradfield	MSA36	25
Land East of The Street, Bradfield	MSA37	30
Land west of Manningtree Road, Little Bentley	MSA19	12
Land south of Shop Road, Little Bromley	MSA20	10
Haulage Depot, Heath Road, Tendring Heath	MSA22	10

C.2 New Local Plan Employment Site Allocations

C 2: New Local Plan Employment Site Allocations

Site name	Employment Land Use	Employment Sqm (2023 - 2043)
Horsley Garden Community, Land at Horsley Cross, CO11 2PH	B1a/b	6751
Horsley Garden Community, Land at Horsley Cross, CO11 2PH	B2	6751
Horsley Garden Community, Land at Horsley Cross, CO11 2PH	B8	6751
Groveswood Business Park, Collierswood Farm, Land North of the A120	B1a/b	30682
Groveswood Business Park, Collierswood Farm, Land North of the A120	B2	30682
Groveswood Business Park, Collierswood Farm, Land North of the A120	B8	30682
Tendring Central Garden Community, A120/A133 Junction	B1a/b	1925
Tendring Central Garden Community, A120/A133 Junction	B2	1925
Tendring Central Garden Community, A120/A133 Junction	B8	1925
Tendring Central Garden Community, A120/A133 Junction	B1a/b	14392
Tendring Central Garden Community, A120/A133 Junction	B2	14392
Tendring Central Garden Community, A120/A133 Junction	B8	14392
Tendring Central Garden Community, A120/A133 Junction	B1a/b	7667
Tendring Central Garden Community, A120/A133 Junction	B2	7667
Tendring Central Garden Community, A120/A133 Junction	B8	7667
Land North East of A133, Ravens Green, Colchester, Essex	B1a/b	5173
Land North East of A133, Ravens Green, Colchester, Essex	B2	5173
Land North East of A133, Ravens Green, Colchester, Essex	B8	5173
Land North East of A133, Ravens Green, Colchester, Essex	B1a/b	851
Land North East of A133, Ravens Green, Colchester, Essex	B2	851
Land North East of A133, Ravens Green, Colchester, Essex	B8	851
Land South of Colchester Road, Frating, Colchester, Essex.	B1a/b	5609
Land South of Colchester Road, Frating, Colchester, Essex.	B2	5609
Land South of Colchester Road, Frating, Colchester, Essex.	B8	5609
Tendring Business and Innovation Hub (North-Western), Horsley Cross CO11 2PH	B1a/b	2077
Tendring Business and Innovation Hub (North-Western), Horsley Cross CO11 2PH	B2	2077

Site name	Employment Land Use	Employment Sqm (2023 - 2043)
Tendring Business and Innovation Hub (North-Western), Horsley Cross CO11 2PH	B8	2077
Land North of Harwich Road, Great Bromley, CO7 8SZ	B1a/b	2443
Land North of Harwich Road, Great Bromley, CO7 8SZ	B2	2443
Land North of Harwich Road, Great Bromley, CO7 8SZ	B8	2443
Saltings Quarter - Manningtree Regeneration Area, Riverside Avenue East, Manningtree, CO11 1US	B1a/b	316
Saltings Quarter - Manningtree Regeneration Area, Riverside Avenue East, Manningtree, CO11 1US	B2	316
Saltings Quarter - Manningtree Regeneration Area, Riverside Avenue East, Manningtree, CO11 1US	B8	316
Saltings Quarter - Manningtree Regeneration Area, Riverside Avenue East, Manningtree, CO11 1US	A3	316
Saltings Quarter - Manningtree Regeneration Area, Riverside Avenue East, Manningtree, CO11 1US	D2	316
Land North of the A120 Harwich Road	B1a/b	2309
Land North of the A120 Harwich Road	B2	2309
Land North of the A120 Harwich Road	B8	3705
Weeley Car Boot	B1a/b	831
Weeley Car Boot	B2	831
Weeley Car Boot	A3	1039

Appendix D. Strategic Model Plots

Introduction

This appendix brings together flow difference, relative queue and speed plots from the 2043 NEMo reference and assessment case AM and PM models. They have been grouped by plot type and time period to facilitate comparison between scenarios. The key assumptions in the scenarios are summarised in Table 2.1:

- Scenario 1 – 2043 reference case demand with only committed mitigation
- Scenario 2 – 2043 assessment case without mitigation and with business as usual (BaU) demand
- Scenario 3 – 2043 assessment case with mitigation and BaU demand
- Scenario 4 – 2043 assessment case with mitigation and sustainable transport (ST) demand.

D.1 AM flow difference, speed and queue plots

D.1.1 Summary of impact in the AM

D 1: Summary of impact AM

AM peak impacts						
Sector	Location	2023 Base	2043 S1 RC	2043 S2 BAU	2043 S3 BAU Mit	2043 S4 BAU Mit ST
East Colchester	Greenstead Roundabout, Colne Causeway & Clingoe Hill	10	15	15	11	9
	A12 J29 / A120 (eastern)	7	12	14	9	9
North Tendring	A120 - Link Road Junction	3	4	4	5	4
	A120 – Horsley Cross to Harwich	3	4	5	4	4
	A120 - A133 to Horsley Cross	3	3	7	6	5
	A133 Colchester Rd Roundabout	9	10	10	10	10
	B1035 Horsley Cross	2	3	4	3	3
	Elmstead Market	3	4	4	4	4
	Frating	2	3	4	3	3
	Great Bromley - Hare Green	3	4	6	5	5
	Harwich	3	3	4	3	3
	Manningtree	8	10	10	9	9
	A137 - Between Ardleigh and Manningtree	4	5	6	5	5

AM peak impacts						
Sector	Location	2023 Base	2043 S1 RC	2043 S2 BAU	2043 S3 BAU Mit	2043 S4 BAU Mit ST
Overall assessment combining all areas		6	8	9	7	7

Key to movement scale and acceptability of change											
More of less free flow				Travelling slower		Moderate congestion			Substantial congestion		
1	2	3	4	5	6	7	8	9	10	11	12
Extreme congestion				Acceptability of Change							
13	14	15	Passable ✓			Caution !			Unsatisfactory ✖		

D.1.2 AM flow difference plots

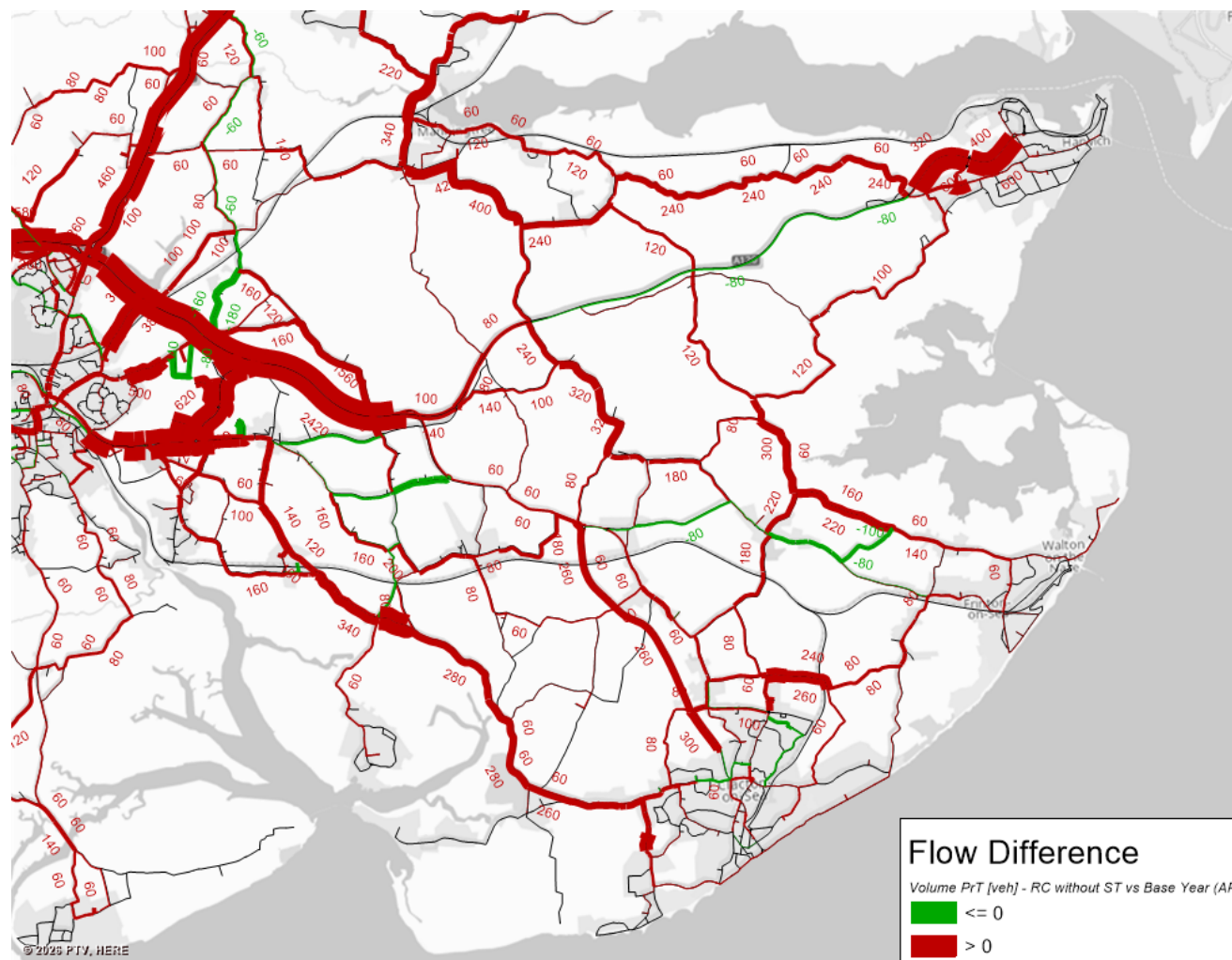


Figure D 1: AM flow difference – Scenario 1 2043 reference v 2023 base

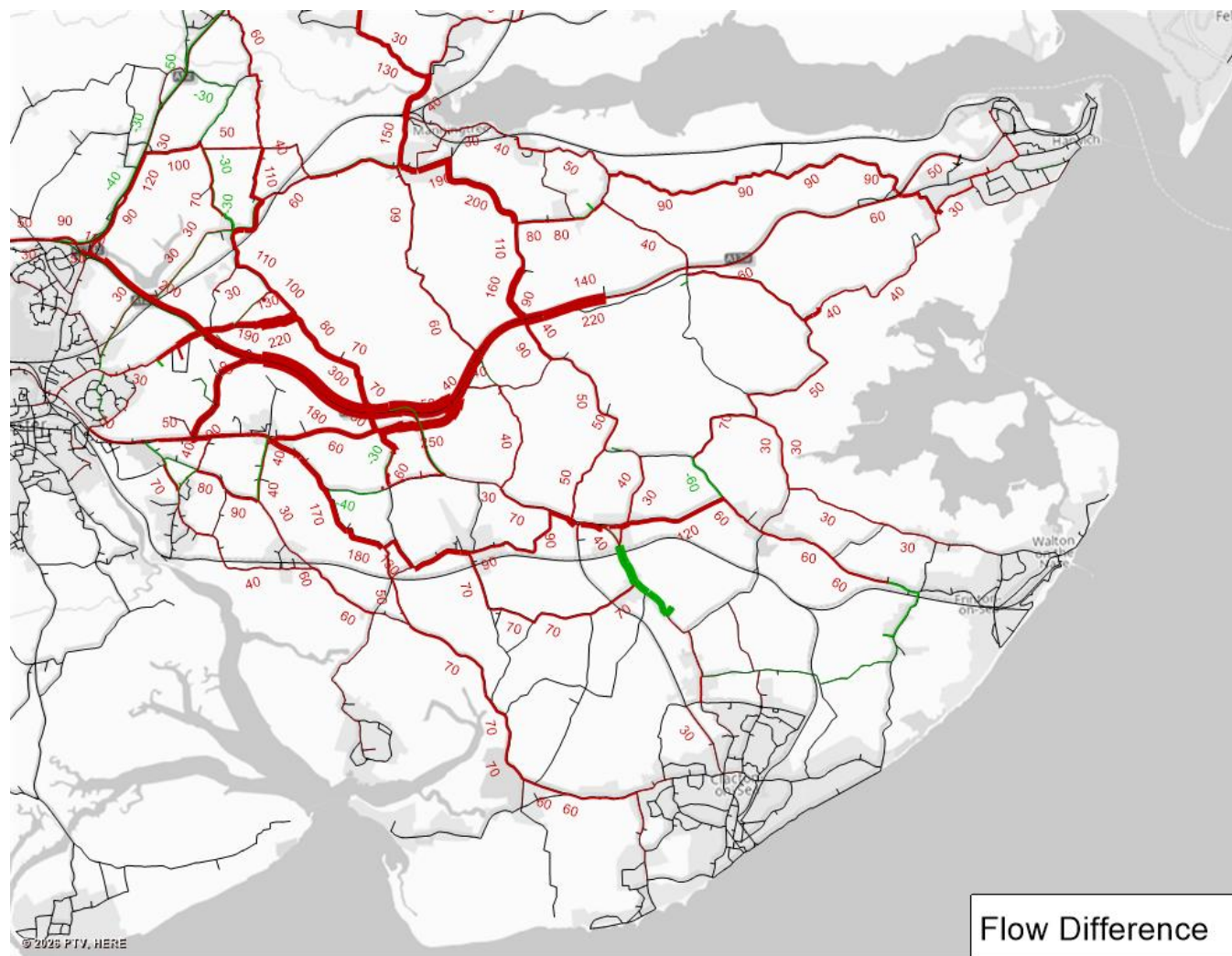


Figure D 2: AM flow difference – Scenario 2 2043 unmitigated assessment v Scenario 1 2043 reference

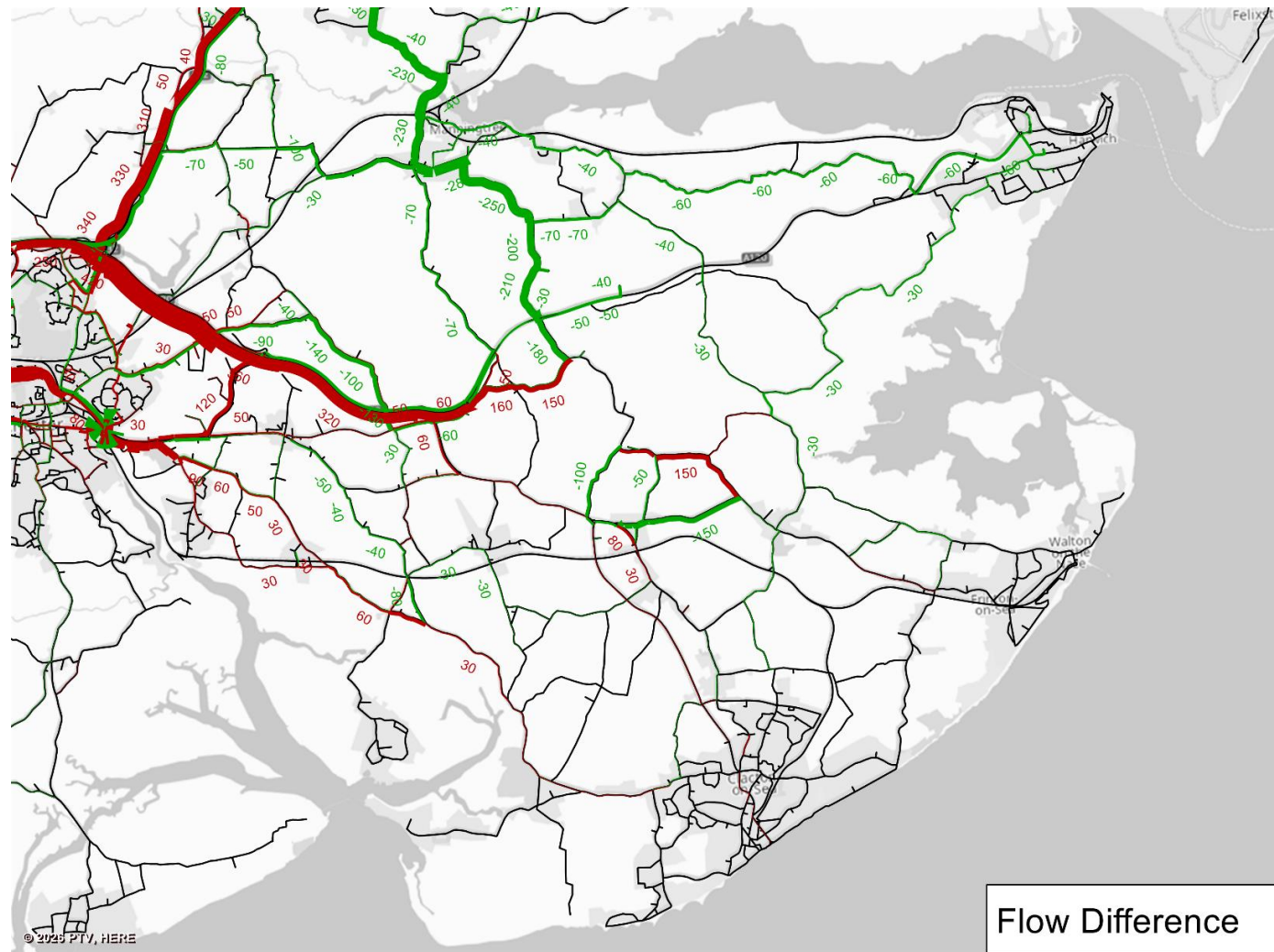


Figure D 3: AM flow difference - Scenario 3 2043 BaU mitigated assessment v Scenario 2 2043 unmitigated assessment

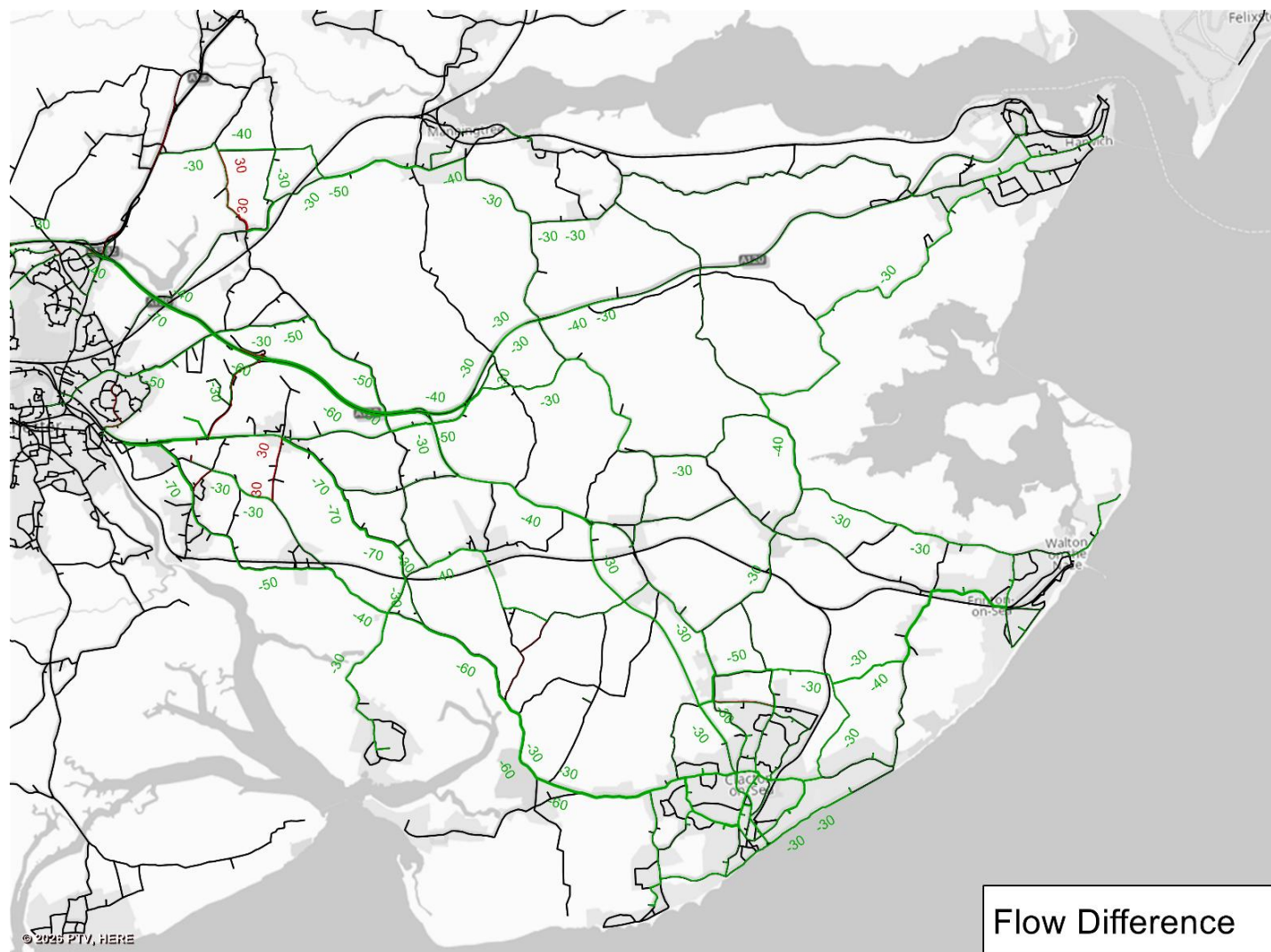


Figure D 4: AM flow difference - Scenario 4 2043 ST demand mitigated assessment v Scenario 3 BaU 2043 unmitigated assessment

D.1.3 AM speed ratio plots

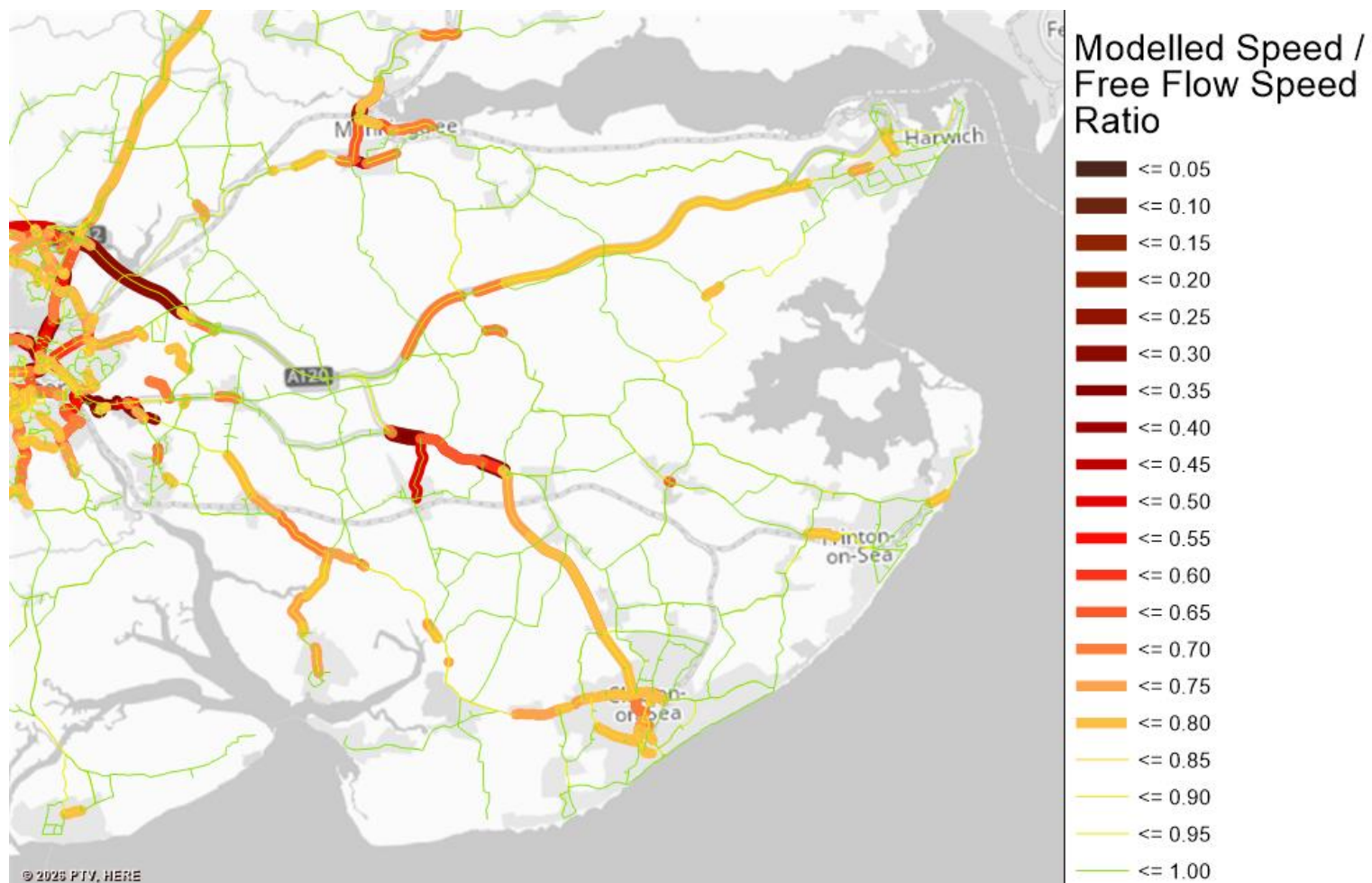


Figure D 5: AM speed ratio - Scenario 1 2043 reference

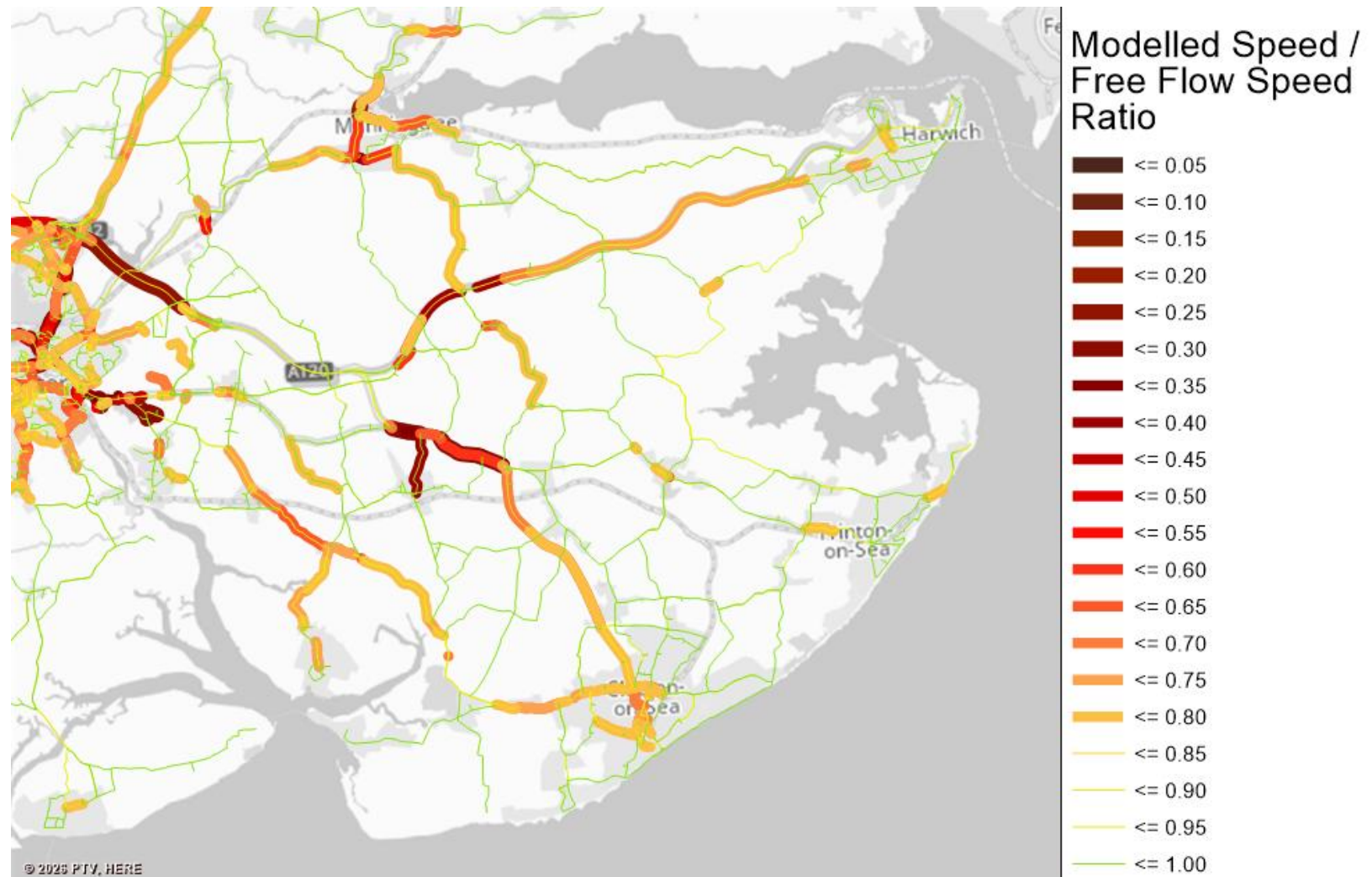


Figure D 6: AM speed ratio – Scenario 2 2043 unmitigated assessment

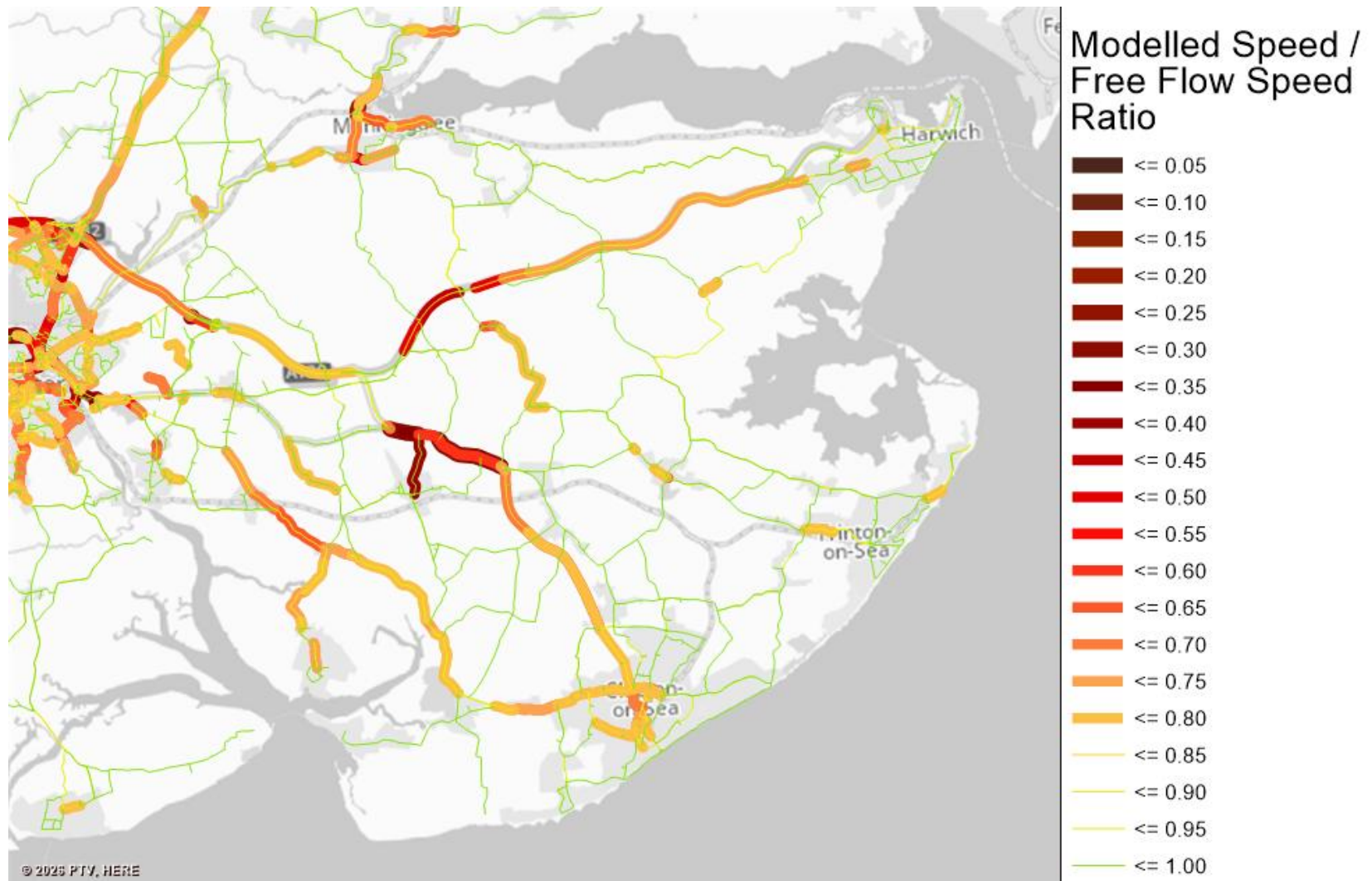


Figure D 7: AM speed ratio – Scenario 3 2043 BaU mitigated assessment

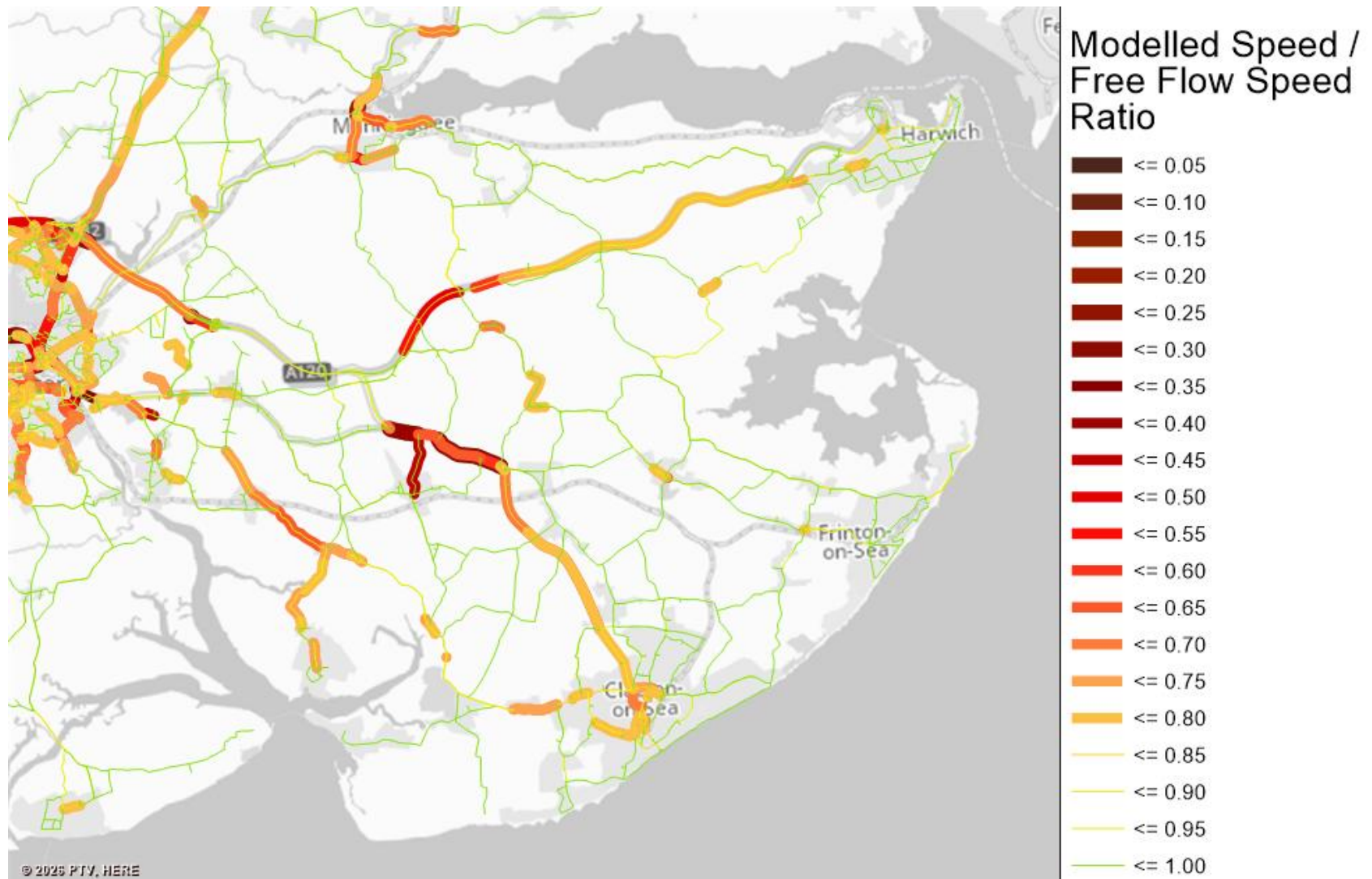


Figure D 8: AM speed ratio – Scenario 4 2043 ST mitigated assessment

D.1.4 AM relative queue plots (blocking back on road links in the model)

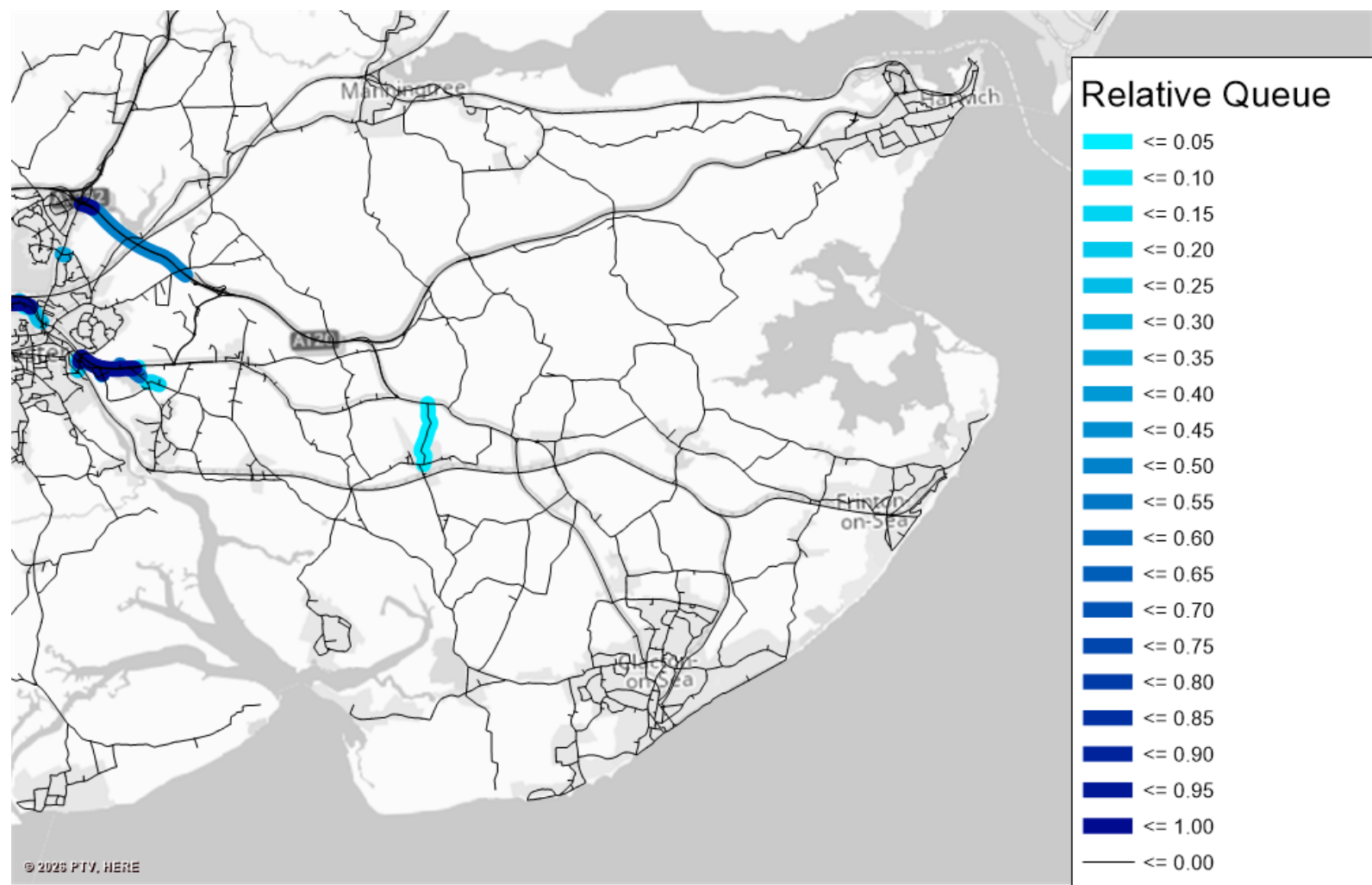


Figure D 9: AM relative queue – Scenario 1 2043 reference

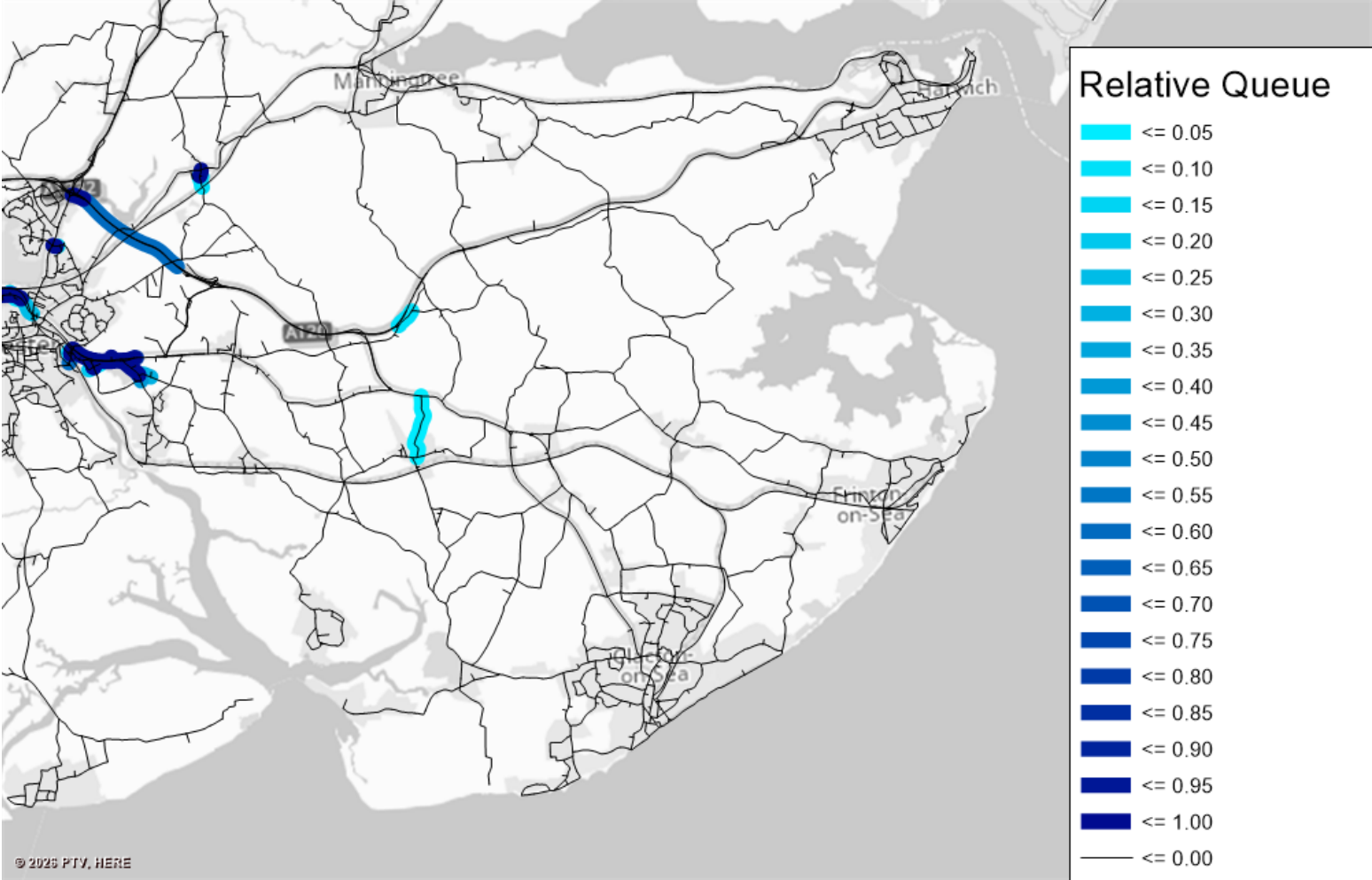


Figure D 10: AM relative queue – Scenario 2 2043 unmitigated assessment

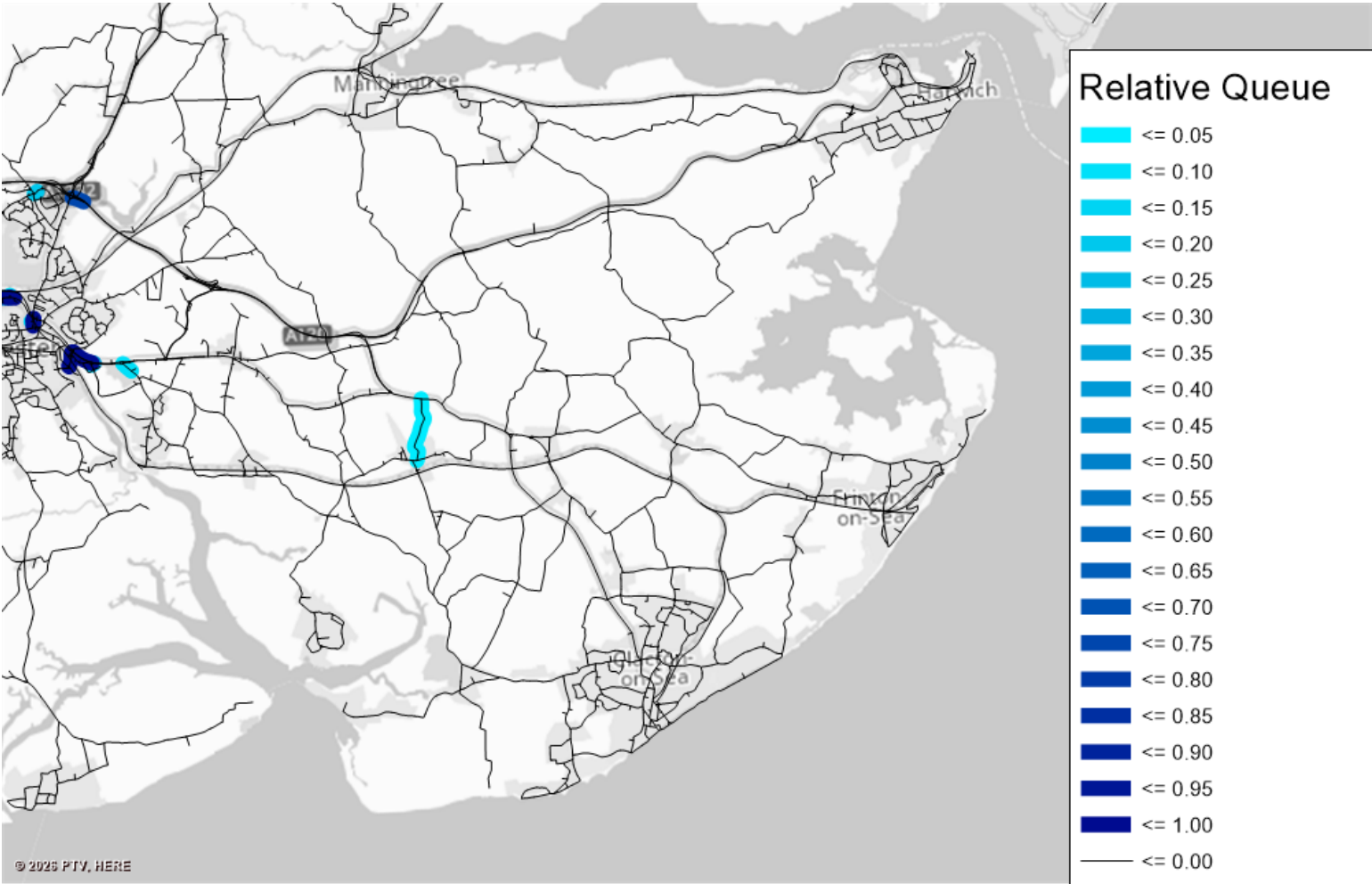


Figure D 11: AM relative queue – Scenario 3 2043 BaU mitigated assessment

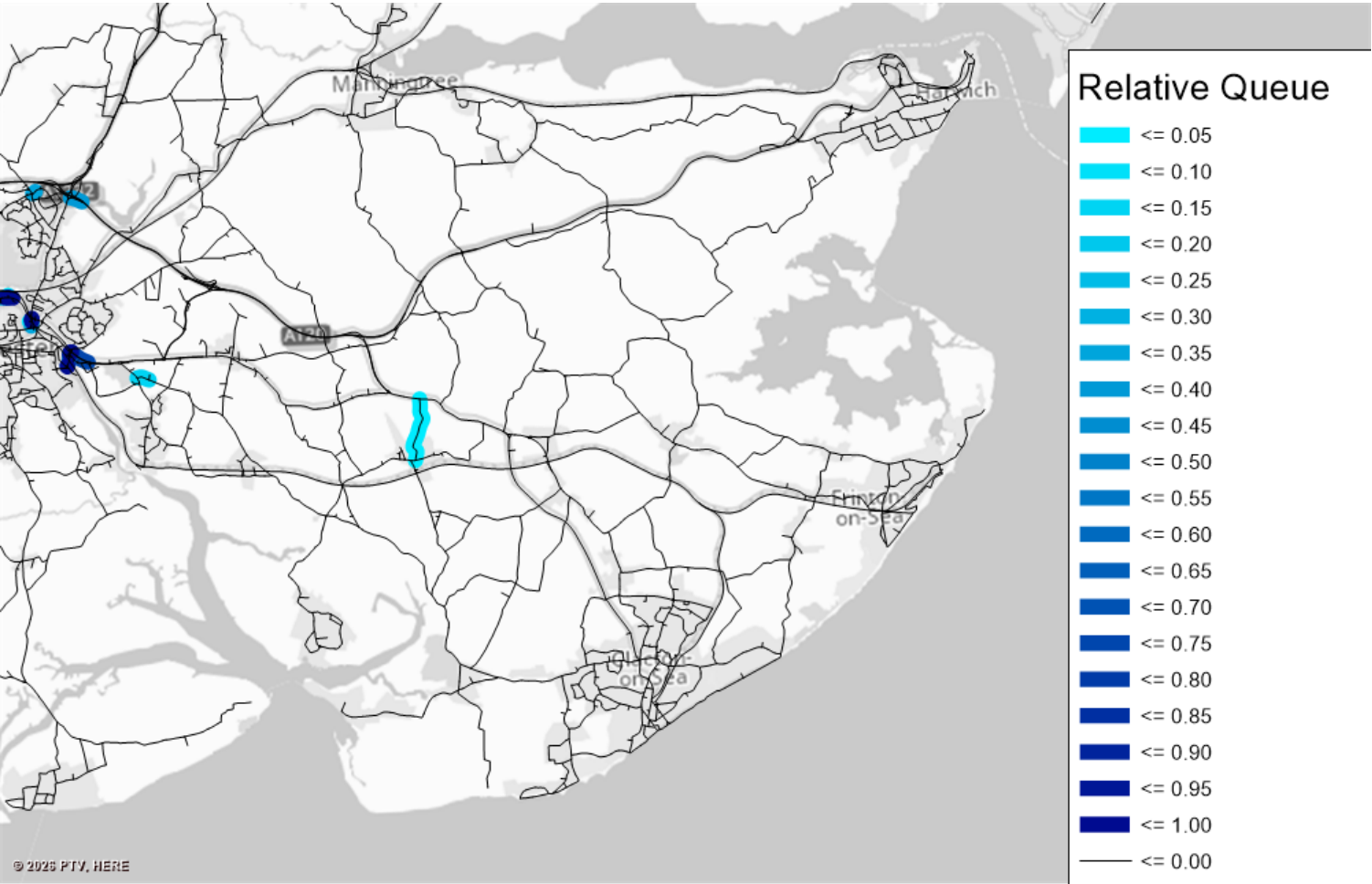


Figure D 12: AM relative queue – Scenario 4 2043 ST mitigated assessment

D.2 PM flow difference, speed and queue plots

D.2.1 Summary of impact in the PM

PM peak impacts						
Sector	Location	2023 Base	2043 S1 RC	2043 S2 BAU	2043 S3 BAU Mit	2043 S4 BAU Mit ST
East Colchester	Greenstead Roundabout, Colne Causeway & Clingoe Hill	12	14	15	10	9
	A12 J29 / A120 (eastern)	7	10	11	9	9
North Tendring	A120 - Link Road Junction	2	3	4	4	4
	A120 - Horsley Cross to Harwich	3	4	4	4	4
	A120 - A133 to Horsley Cross	2	3	4	4	3
	A133 Colchester Rd Roundabout	8	10	11	11	10
	B1035 Horsley Cross	2	2	3	3	3
	Elmstead Market	3	3	4	4	4
	Frating	1	1	1	1	1
	Great Bromley - Hare Green	3	5	7	6	6
	Harwich	2	3	3	3	3
	Manningtree	9	9	10	10	9
	A137 - Between Ardleigh and Manningtree	4	5	5	5	5
Overall assessment combining all areas		6	8	8	7	7

Key to movement scale and acceptability of change											
More of less free flow			Travelling slower			Moderate congestion			Substantial congestion		
1	2	3	4	5	6	7	8	9	10	11	12
Extreme congestion			Acceptability of Change								
13	14	15	Passable ✓			Caution !			Unsatisfactory ✗		

D.2.2 PM flow difference plots

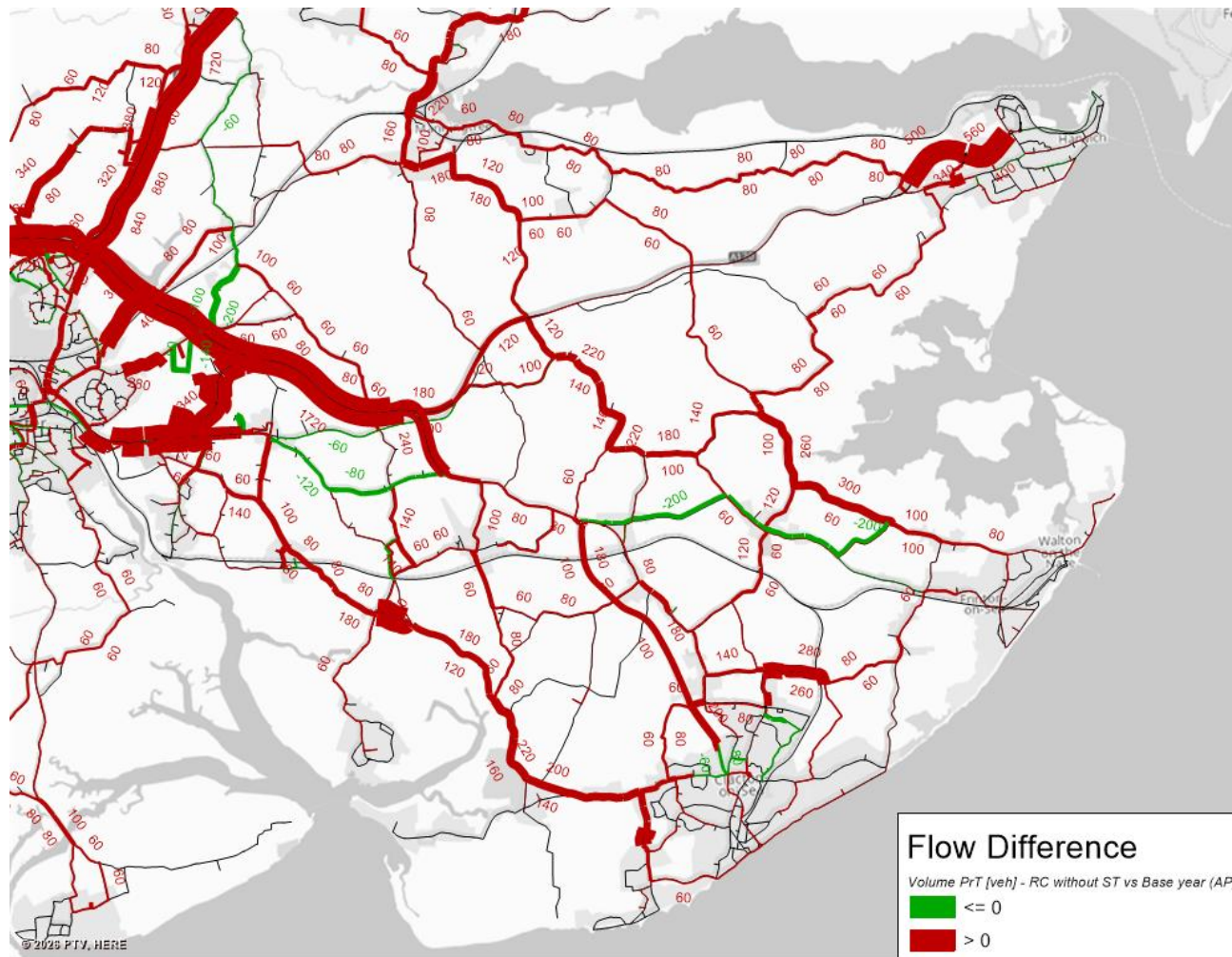


Figure D 13: PM flow difference – Scenario 1 2043 reference v 2023 base

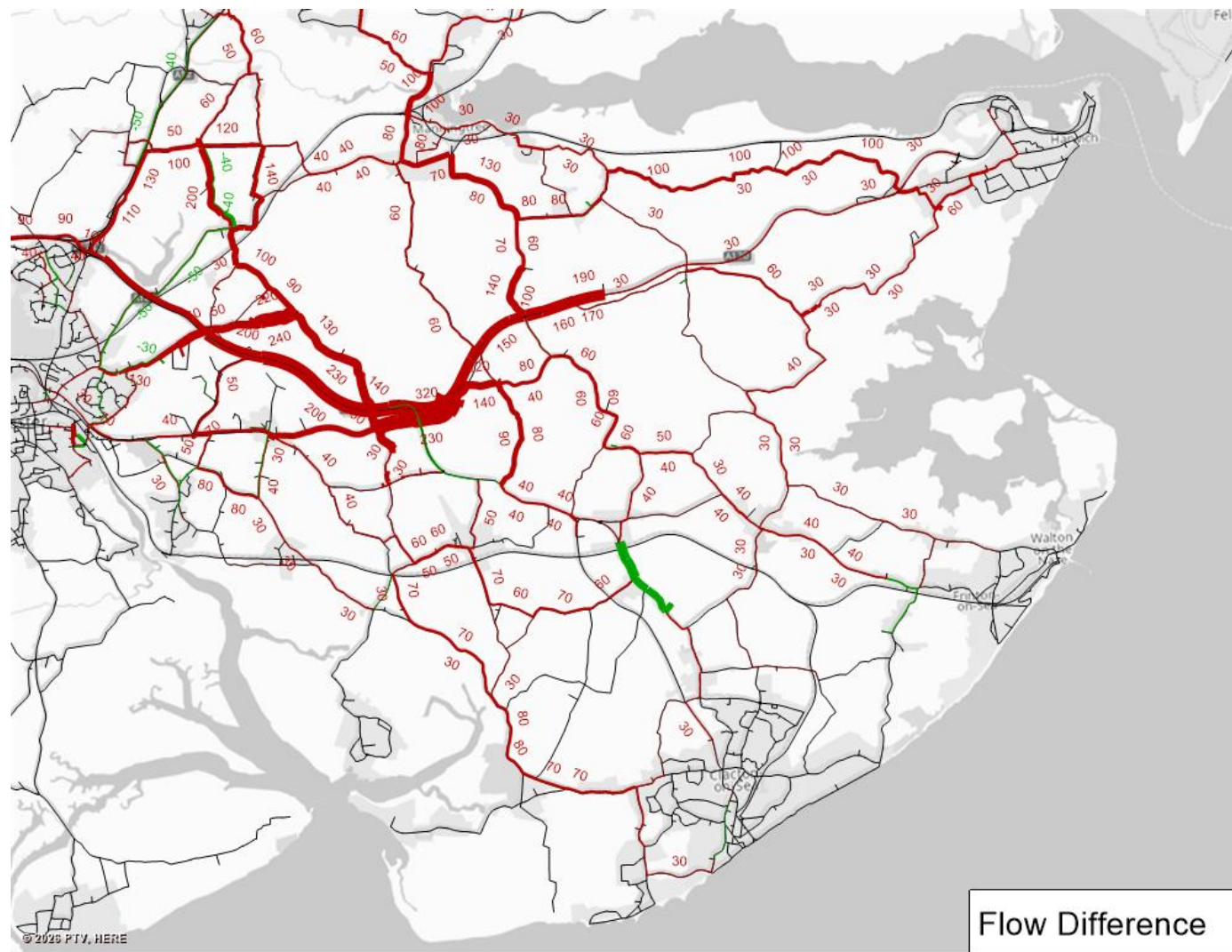


Figure D 14: PM flow difference – Scenario 2 2043 unmitigated assessment v Scenario 1 2043 reference

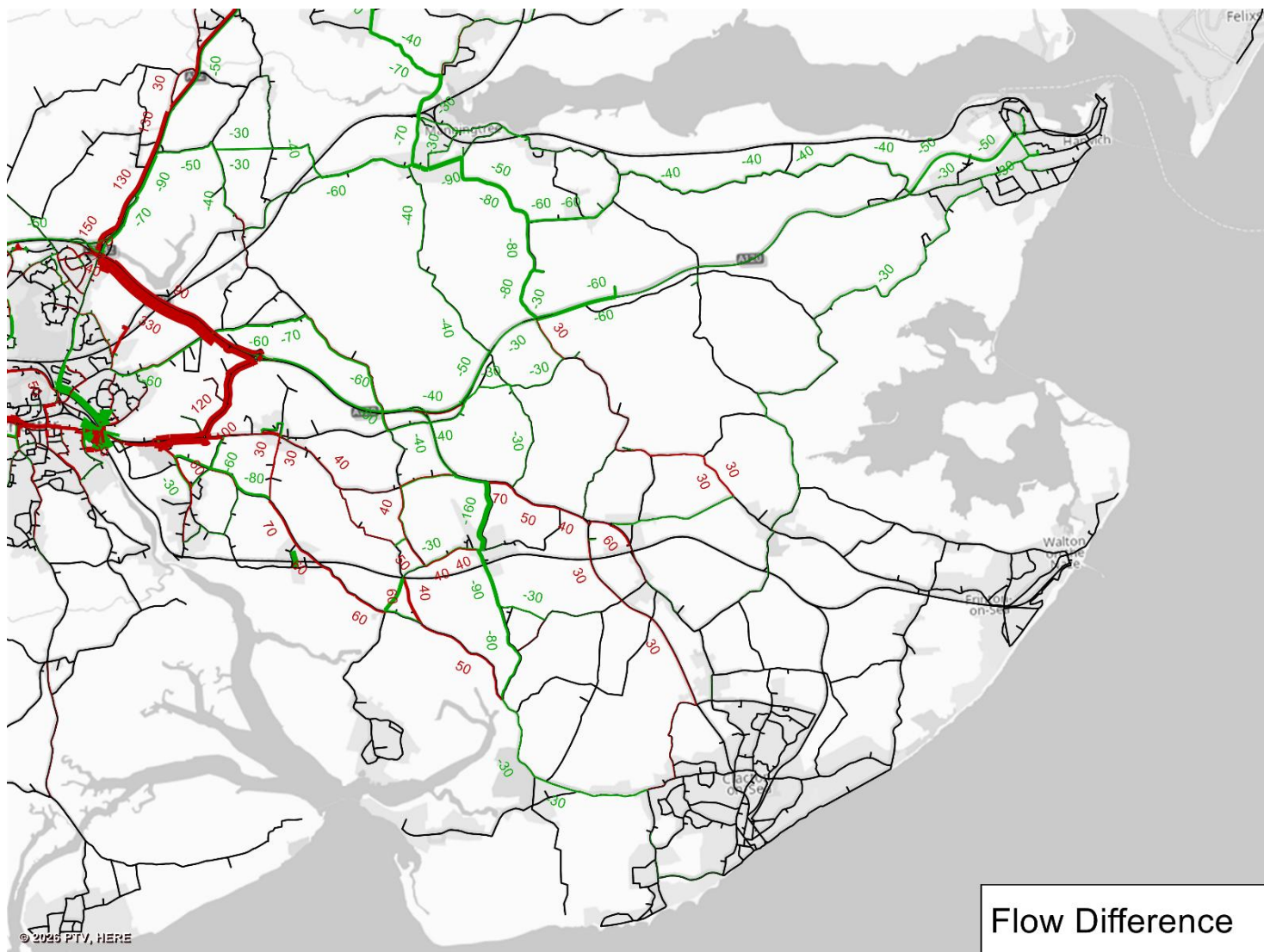


Figure D 15: PM flow difference – Scenario 3 2043 BaU mitigated assessment v Scenario 2 2043 unmitigated assessment

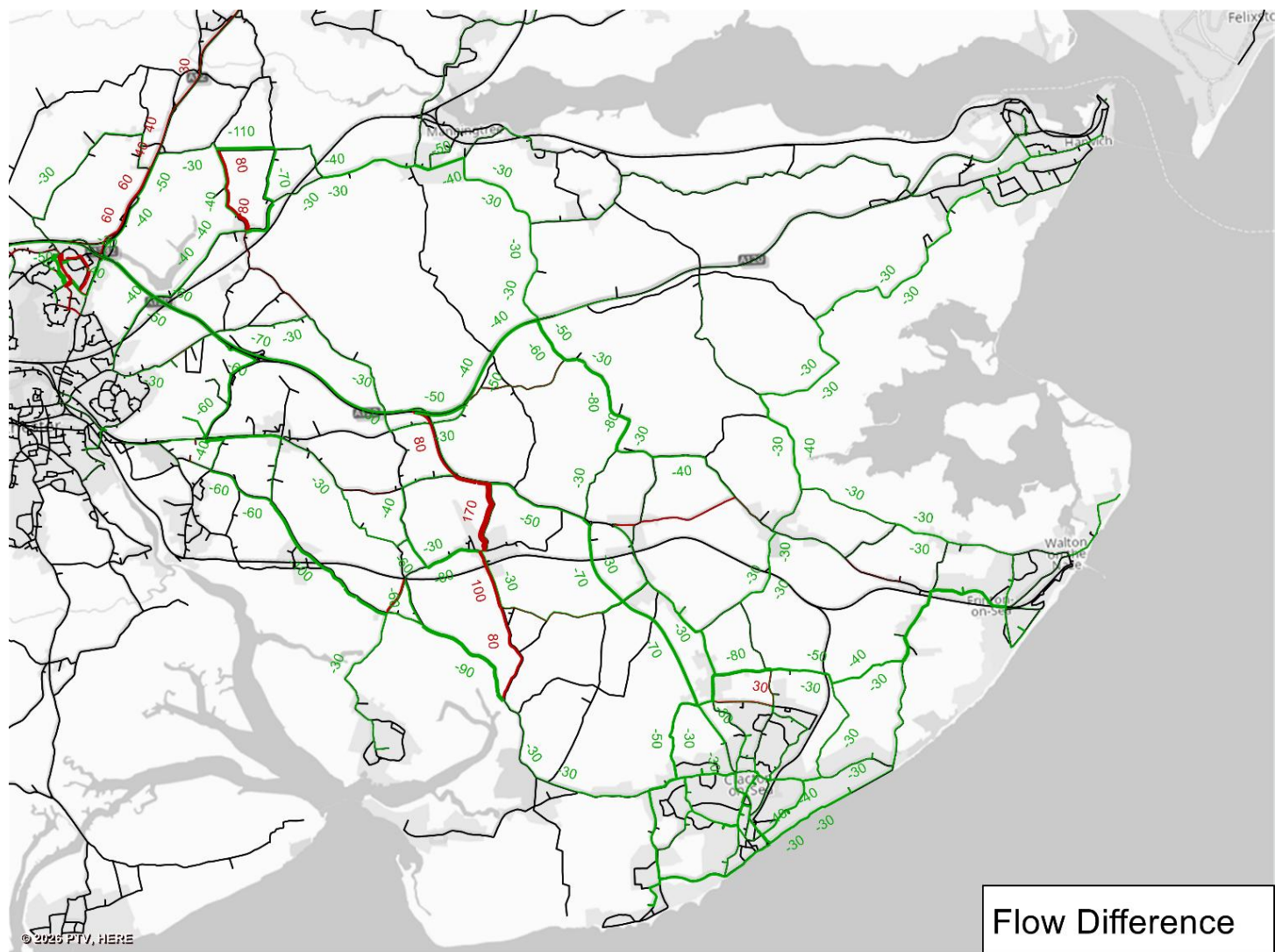


Figure D 16: PM flow difference – Scenario 4 2043 ST mitigated assessment v Scenario 3 2043 BaU mitigated assessment

D.2.3 PM speed plots (modelled speed / free flow speed)

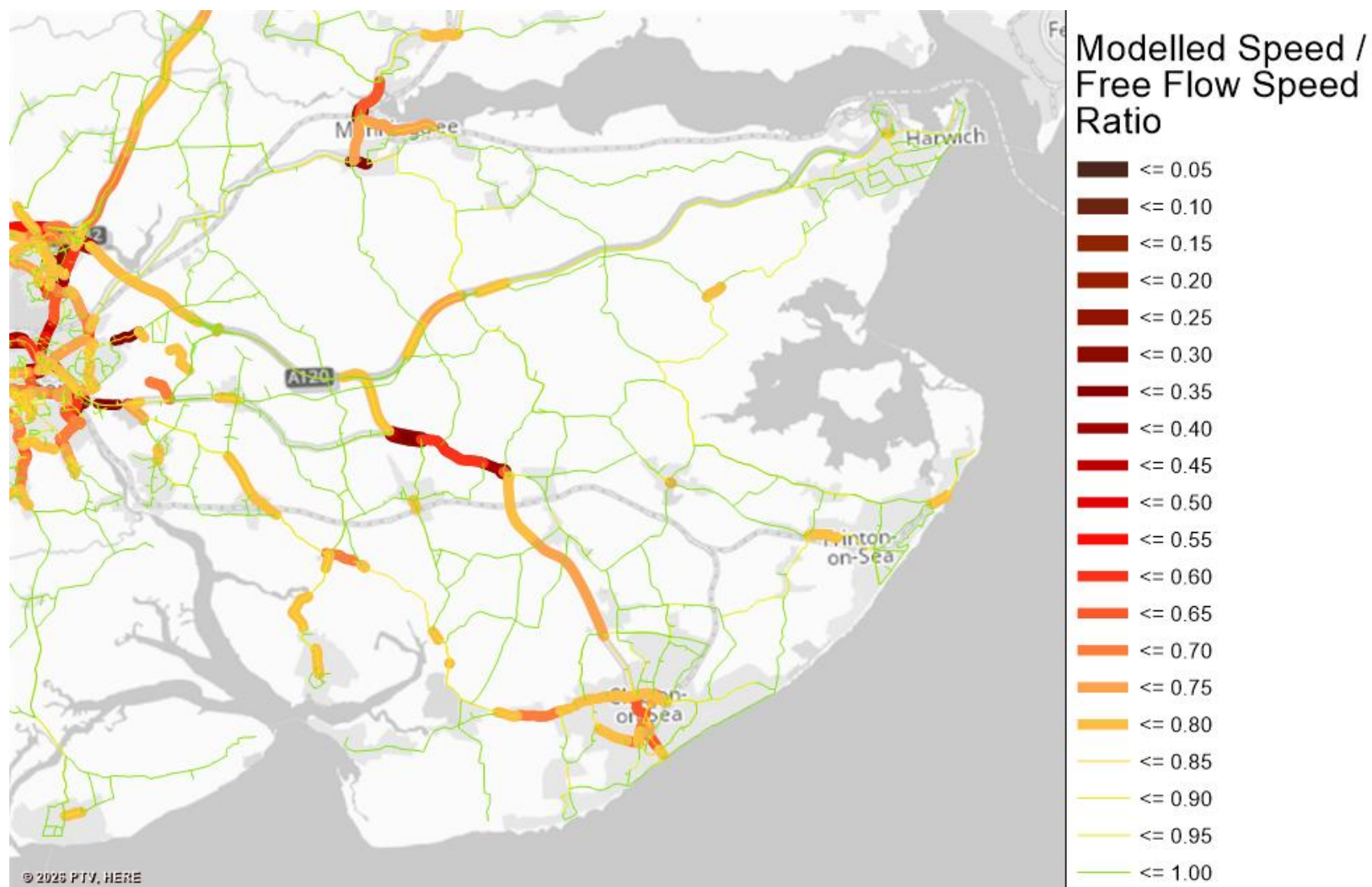


Figure D 17: PM speed ratio – Scenario 1 2043 reference

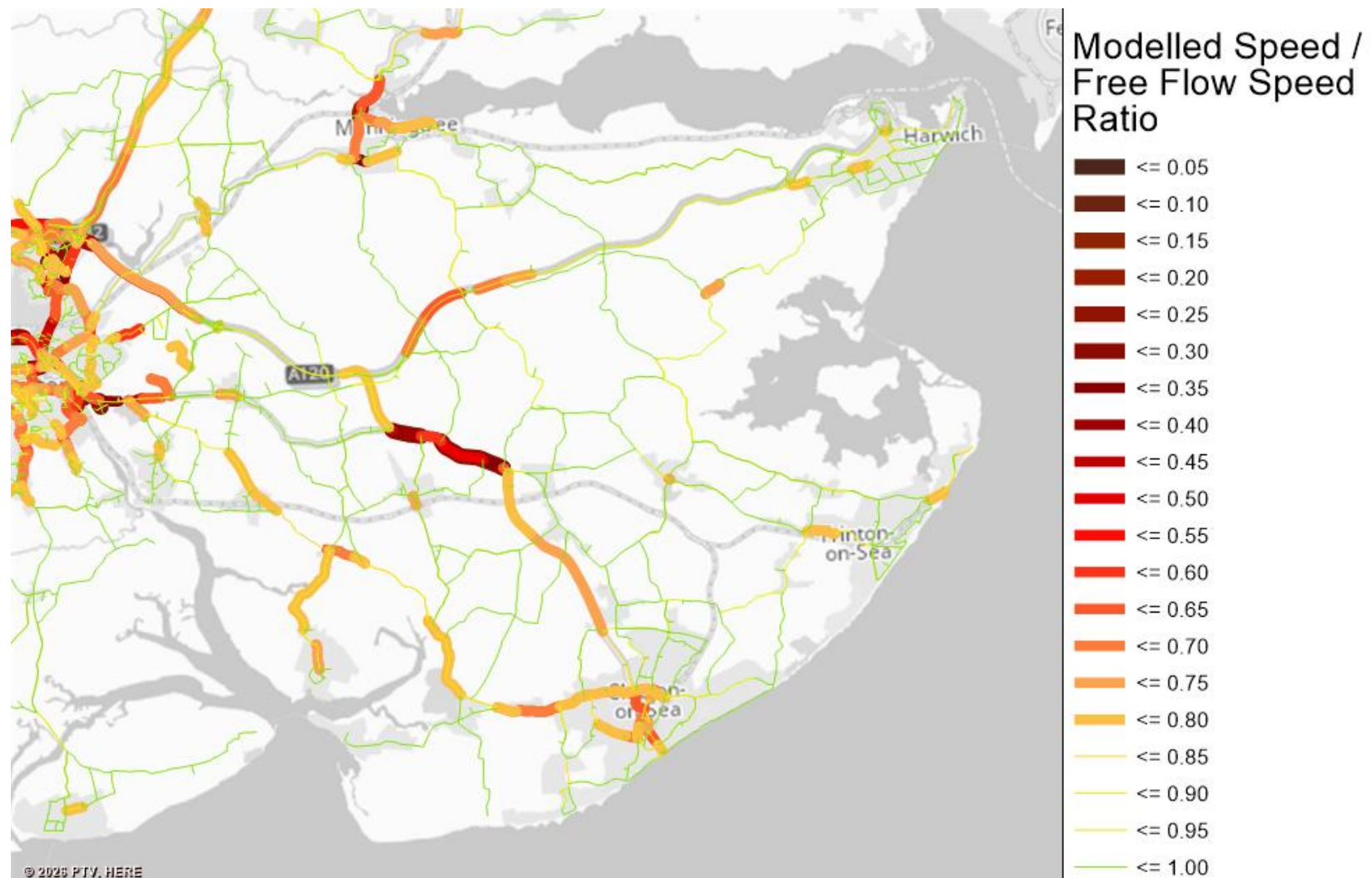


Figure D 18: PM speed ratio – Scenario 2 2043 unmitigated assessment

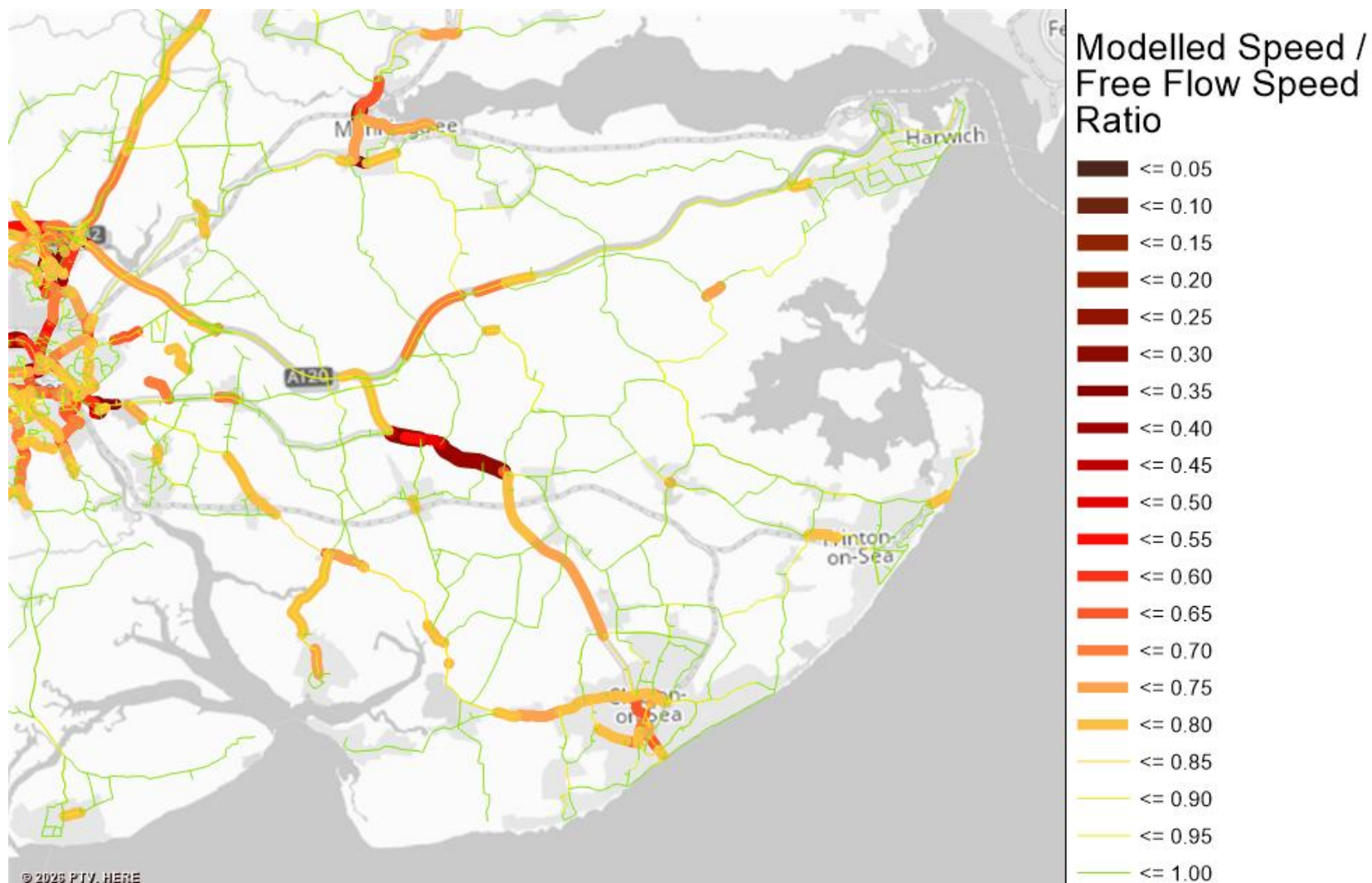


Figure D 19: PM speed ratio – Scenario 3 2043 BaU mitigated assessment

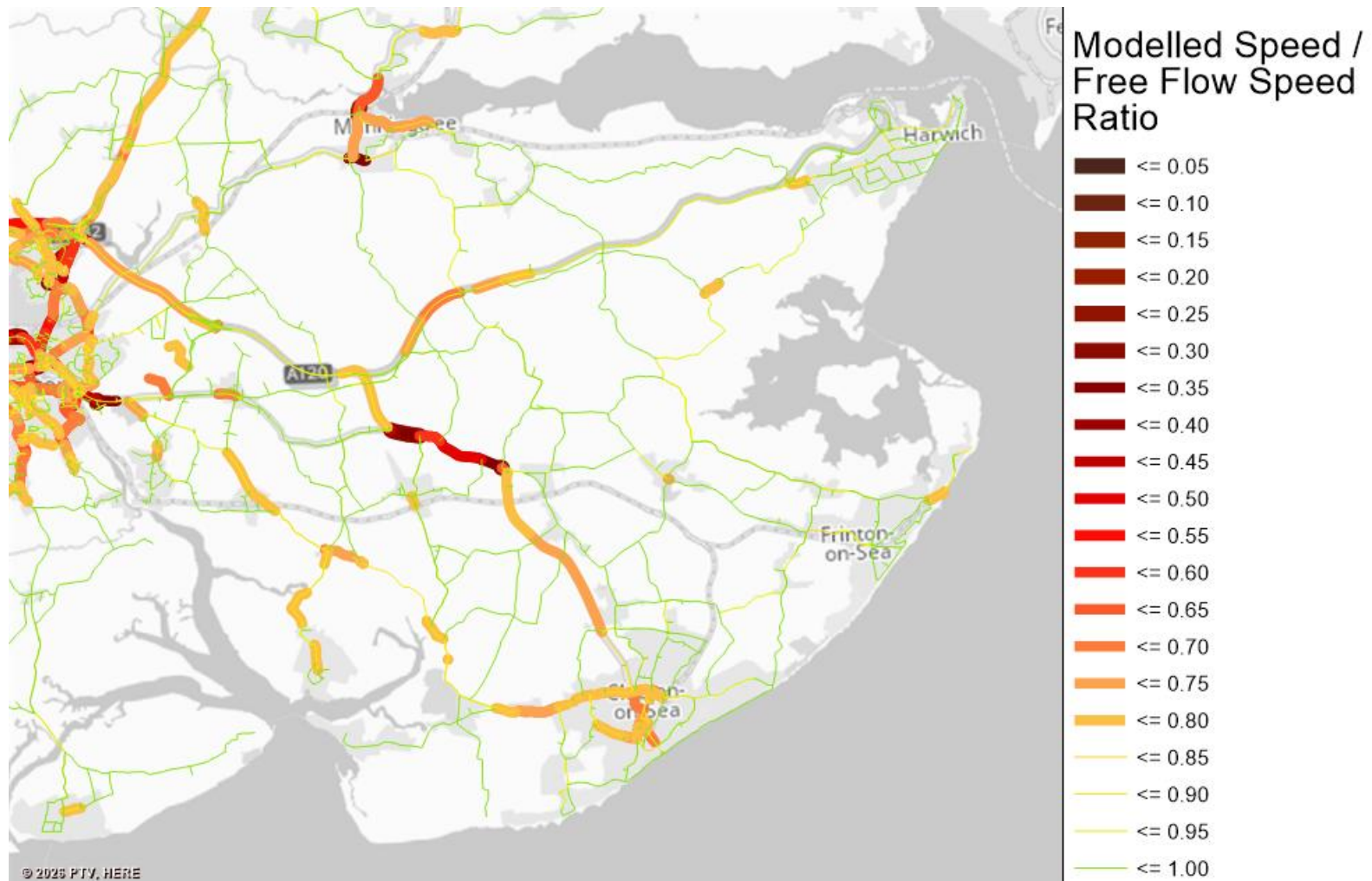


Figure D 20: PM speed ratio – Scenario 4 2043 ST mitigated assessment

D.2.4 PM relative queue plots (blocking back on road links in the model)

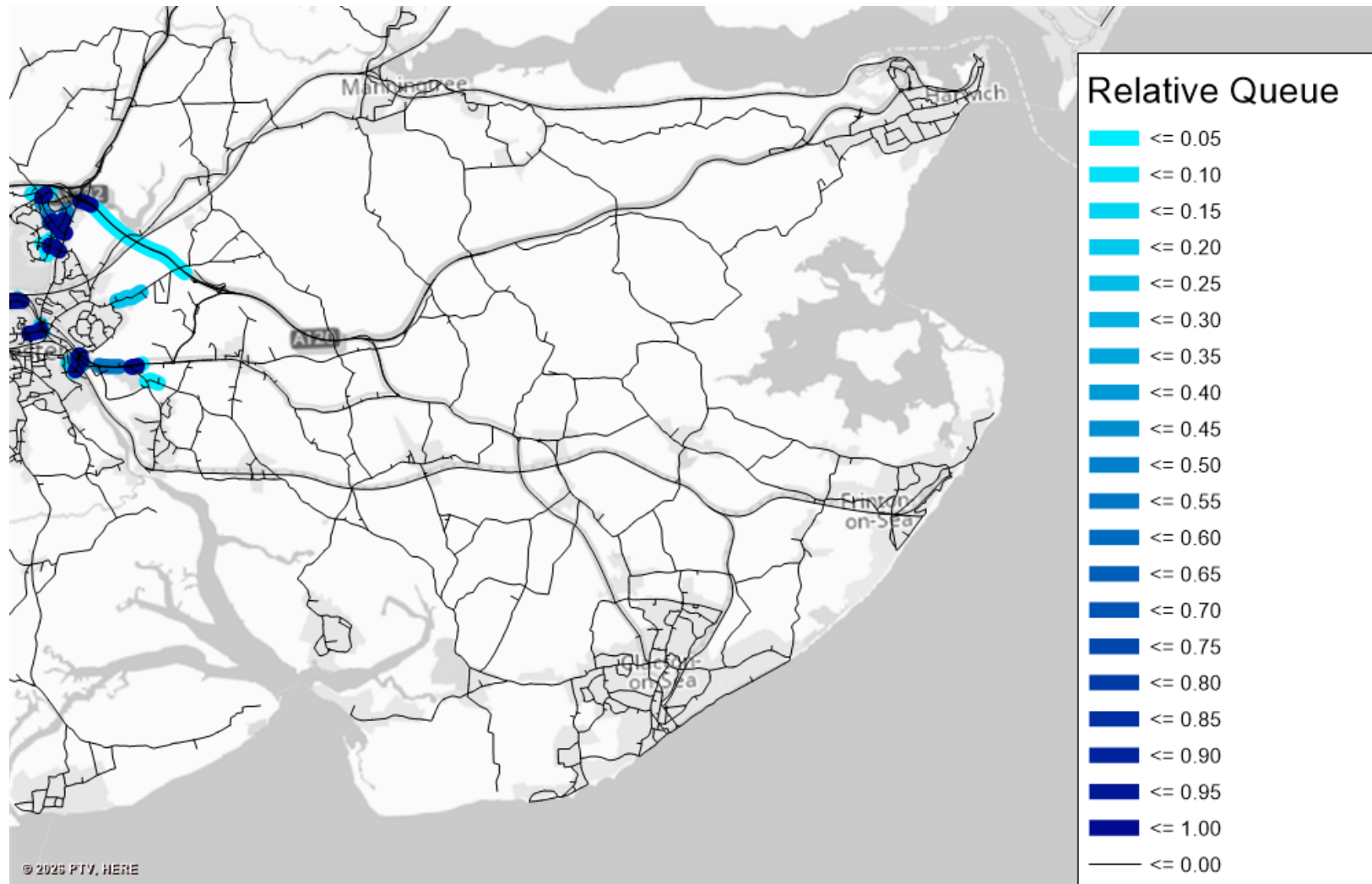


Figure D 21: PM relative queue – Scenario 1 2043 reference

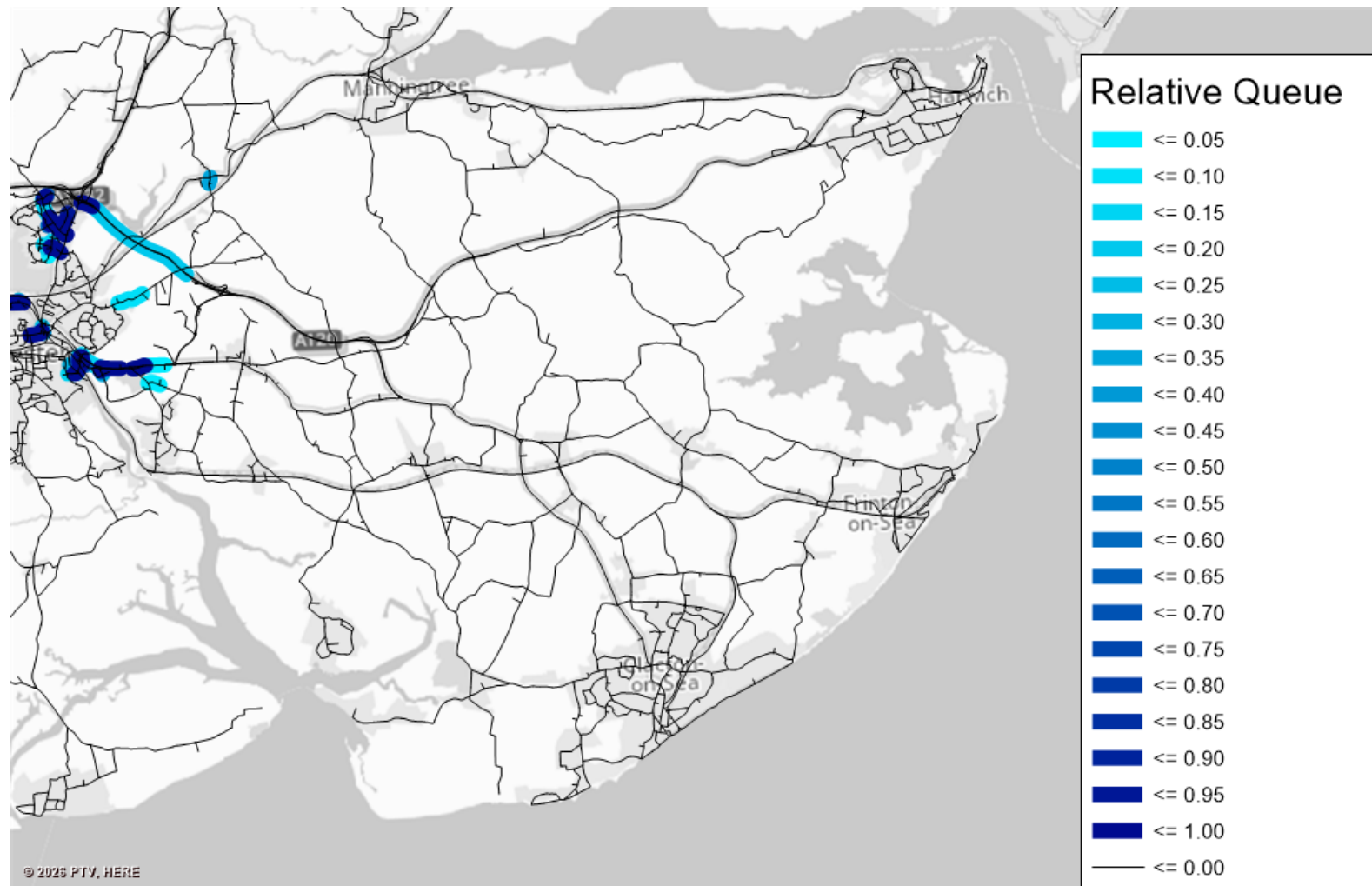


Figure D 22: PM relative queue – Scenario 2 2043 unmitigated assessment

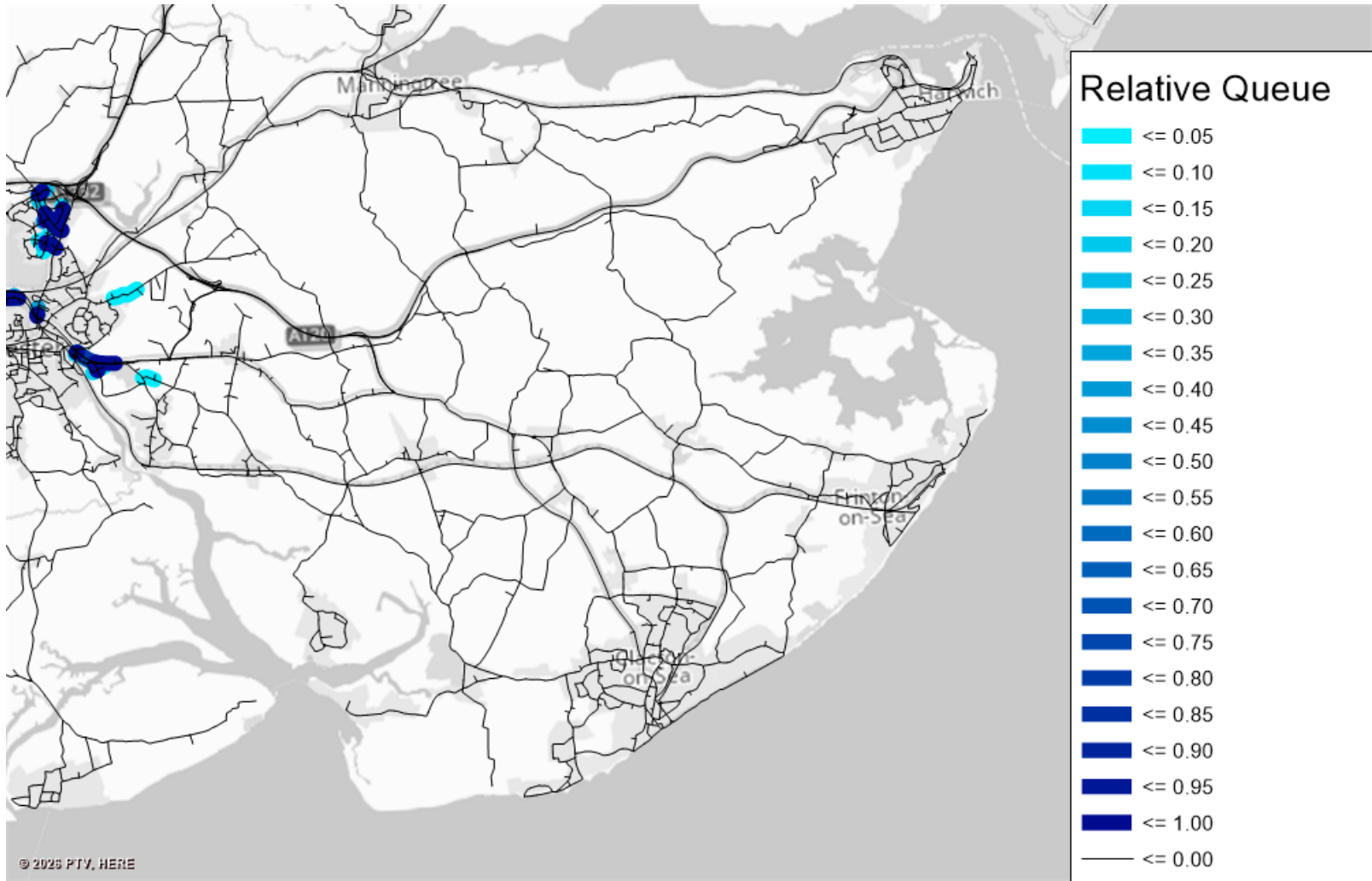


Figure D 23: PM relative queue – Scenario 3 2043 BaU mitigated assessment

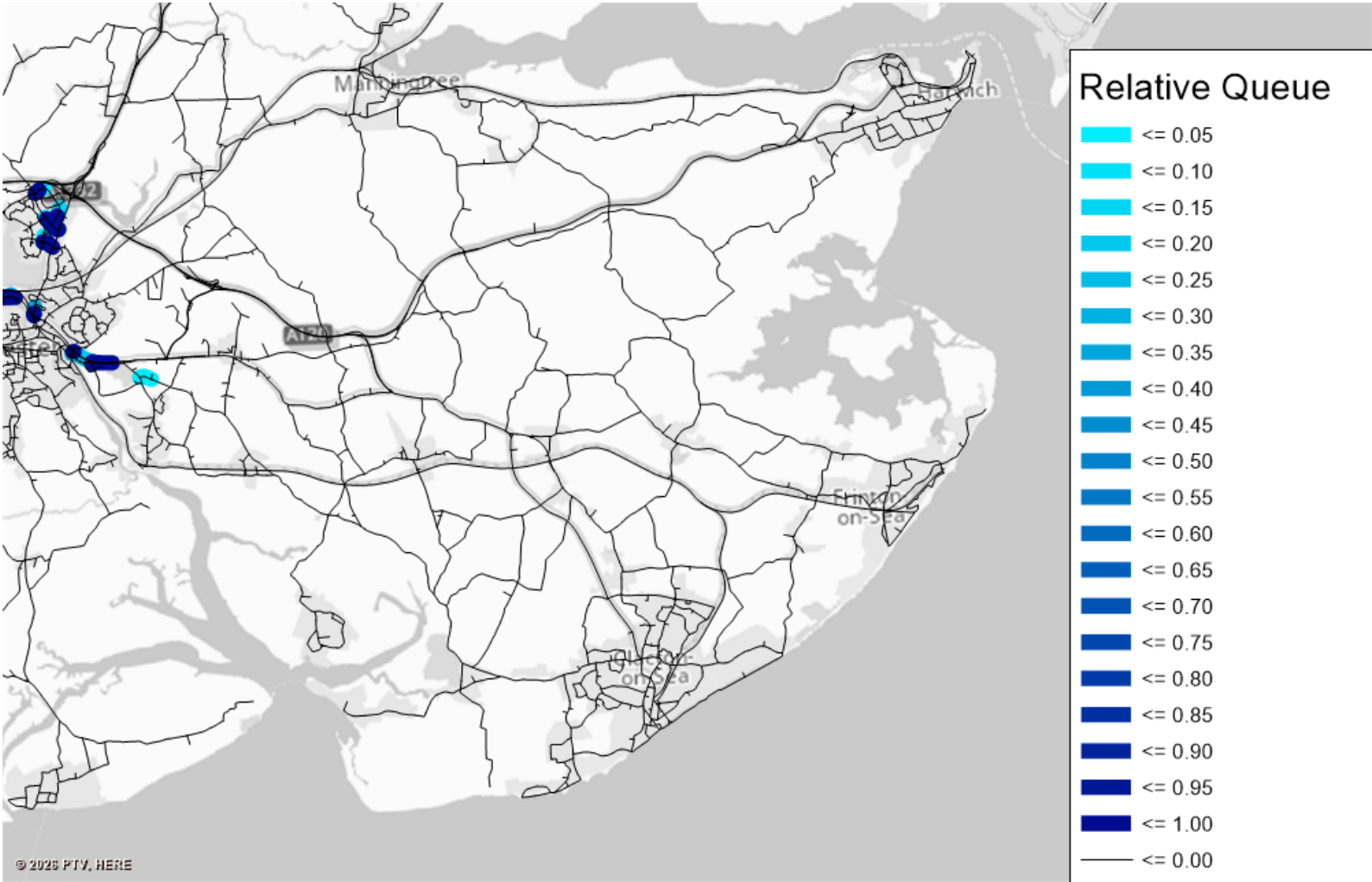


Figure D 24: PM relative queue – Scenario 4 2043 ST mitigated assessment

Appendix E. Vision-led Mitigation Measures

E.1 Introduction

This appendix sets out tables of proposed measures to mitigate the combined impact of reference case growth and new local plan growth. The measures are informing the Infrastructure Audit and Delivery Plan (IADP) for the Regulation 19 Local Plan. The cost of schemes are not shown in this report, however, the cost of each intervention has been estimated and input into the viability assessment

The main report explains that the requirement for mitigations arises from reference case growth – which comprises committed sites in the Tendring council area and possible growth in Braintree and Colchester proposed in their current local plan reviews – and proposed new local plan allocation in Tendring.

Accordingly, it is expected that the integrated transport and vision-based mitigations would need to be delivered in stages, with some of the largest schemes divided into phases aligned to specific sites or tranches of growth. Such phasing and incremental delivery would need to be worked out as growth comes forward as part of the planning process. It would be disproportionately complex to devise phasing at this strategic stage of plan making. Instead, it was considered more useful to show how the cumulative impact of all growth could be mitigated.

This appendix provides three lists of mitigation, which have been chosen to mitigate substantial impacts of growth and connect developments to public transport and active travel routes in line with policies and planning guidance. The three sets of measures are:

- highway measures – which support movement of all modes
- public transport measures
- active travel measures

There is an element of overlap between the sets of measures, as would be expected given the focus on integrated transport. However, it was considered useful to divide the measures into groups to illustrate how the measures are balancing the needs of all modes.

Each of the tables of measures indicates whether the need for the measures is caused by committed growth in Tendring, growth in other planning areas (principally Colchester), or new local plan growth in Tendring. The tables of measures provide an initial indication of which development groups contribute to which measures. It should be noted that this is subject to change as developments come forward and more detailed analysis is undertaken in transport assessments of planning applications.

The subsequent appendix, Appendix F, shows maps of each of the movement corridors on which measures are proposed. The maps combine highway, public transport and active travel measures, and show how they relate to nearby reference and new local plan developments in the Tendring council area. Some measures though are required due to cumulative growth further afield.

E.2 Highway related mitigation measures

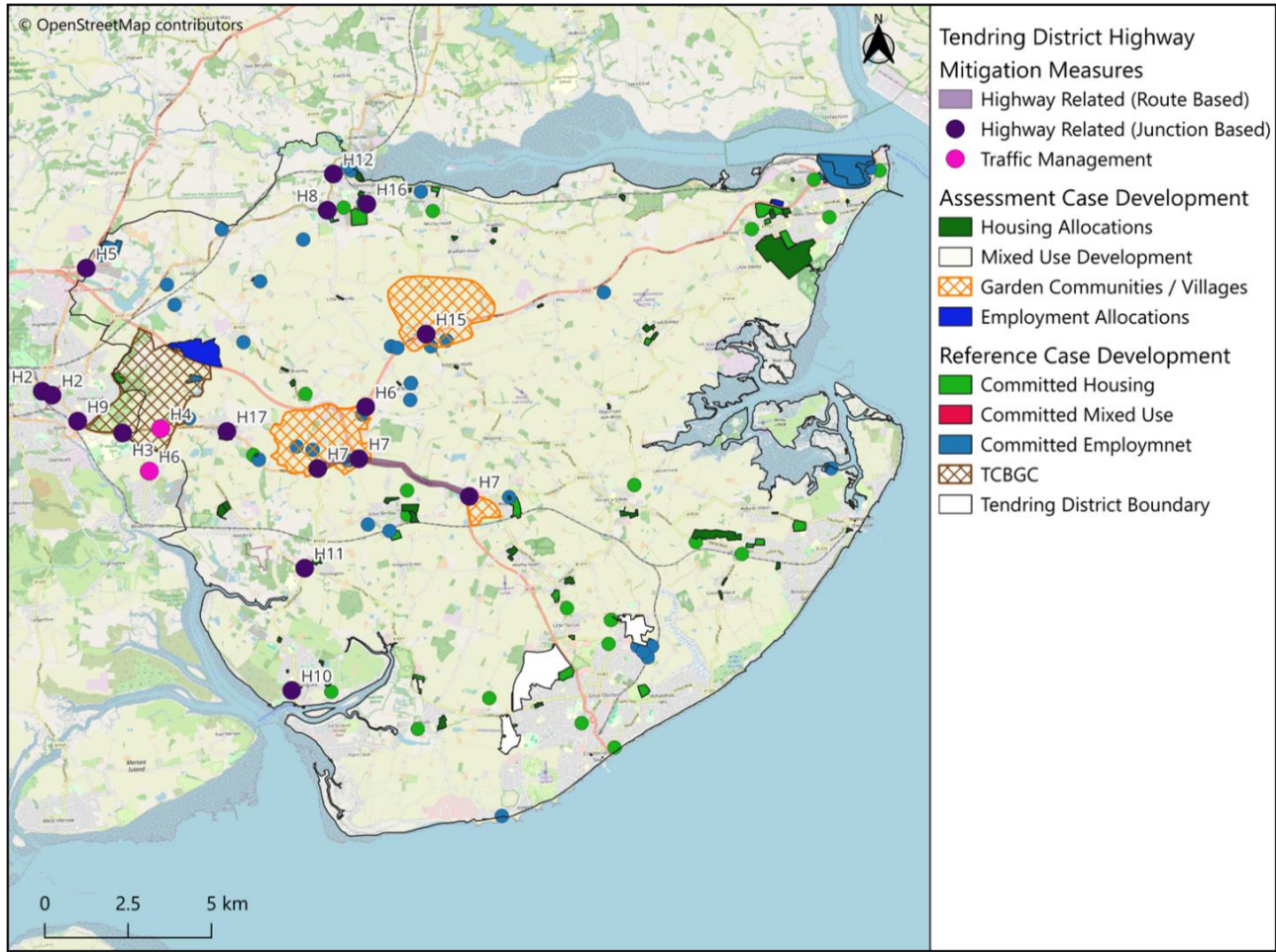


Figure E 1: Highway Related Mitigation Measures

Table E 1: Highway mitigations

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
H1	District wide	Traffic Management	Dynamic traffic management	In built up areas, the role of traffic management is increasingly important to balance movement needs arising from growth. Investment in new technologies which allow signal timings to be dynamically altered to respond to traffic conditions and incidents over a wider area. This also reduces the extent of new highway infrastructure schemes, resulting in cost and environmental benefits. While dynamic traffic management provides more benefits in urban areas, it is reasonable that all developments contribute to such systems since rural developments contribute to congestion in urban areas.	All	None	✓	✓	✓
H2	A133 Colchester	Highways Related	Lower Harwich Rd and Ipswich Roads	This route is essential for RTS reliability - with the extension of RTS into Tendring and the subsequent increase in RTS vehicles, there is a tangible impact from Tendring developments in this location for access to Colchester City Centre. The scheme is required to better balance movement of all modes along East Street, lower Ipswich Rd and lower Harwich Rd including junctions with St Andrews Av and Greenstead Rd. Solution expected to involve partial signalisation and signal co-ordination and the introduction of more priority for RTS	SAMU1	All developments and NE Colchester	✓	✓	✓

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
				and bus movements. Changes need to be co-ordinated with Greenstead roundabout improvements. Multiple developments contribute to congestion at this location including TCBGC and growth in NE Colchester and Tendring.					
H3	A133 East	Highways Related	Wivenhoe Park Corner roundabout including Colchester Road / Brightlingsea Road junction improvements	This junction is essential for vehicular access between Tendring and Colchester, to support development of TCBGC and future growth in Tendring, the Wivenhoe Park Corner junction requires re-design to a conventional roundabout geometry with RTS lanes forming hamburger arrangement to access P&C and ensure RTS reliability routing from Tendring. Includes pedestrian crossings and bus stop improvements.	SAMU1	All developments	✓	✓	✓
H4	A133 East	Traffic Management	Signalise LR roundabout	Signalising helps TCBGC traffic exit and is part of wider traffic management approach to the eastern approach to Colchester, avoiding excessive queue build up at single locations. It also supports road safety.	SAMU1	None	✓		
H5	A120/A12	Highways Related	A12 Junction 29	Full signalisation likely required to mitigate TCBGC impact. Local plan mitigation to widen slip to create more stacking capacity Pooling of contributions from developments across Tendring and Colchester council areas to be considered	SAMU1	SAMU8, SAMU9	✓		

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
				External contributions from NH should be explored					
H6	Harwich Road	Highways Related	Harwich Road approach to the A120	Minor adjustments to be explored - need for scheme established but exploring solutions	SAMU8		✓		
H7	A133 Colchester Road / Frating/ Harwich Road	Highways Related	A133 Highway Improvement s Package (Frating / Weeley)	Package of highway improvement schemes in the Frating and Weeley area including: - <u>A133 / Colchester Road</u> - Frating Rdbt - Redesign and signalisation expected - need for scheme established but exploring solutions. This route is an access route to the A133, A120 and into Colchester, it is directly associated with Garden Community development and RTS routing. It is flagged as an existing pinch point, particularly with seasonal traffic. The solution needs to consider the associated junctions just east of the roundabout: - junction with the road to Ravens Green - junction with the road to Gt Bentley (Heckford's Road) - <u>A133 Weeley Roundabout</u> - Uncertain if scheme will be needed but allowance in this draft - <u>A133 / B1029 Frating Crossroads (Gt Bentley Road / Bromley Road)</u> - Uncertain if scheme will be needed but allowance has been included in this draft. This route is an	SAMU6, SAMU3, SAMU2, SAMU8		✓		

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
				access route to the A133, A120 and into Colchester. It is directly associated with Garden Community Development and RTS routing Improvements to single carriageway between Frating Roundabout and Weeley Roundabout					
H8	B1352 Long Road/A137 Harwich Road	Highways Related	A137 Wignall St/ B1352 Long Road junction, Lawford	Proposed improved roundabout layout to alleviate traffic delay involving minimal alterations - need for scheme established but exploring solutions	Committed developments - Manningtree		✓		
H9	A133 Clingoe Hill	Highways Related	Greenstead roundabout (peninsularisation)	Significant alteration required - initial options peninsularises the SW side to prioritise key movements thus reducing extreme congestion. Full signalisation will be required along with complementary measures at the Colne Causeway / Elmstead Road roundabout. The scheme includes priority running for RTS and local buses.	SAMU1		✓		
H10	B1029 Brightlingsea	Highways Related	B1029 Brightlingsea	Uncertain if scheme will be needed but allowance included in this draft	Brightlingsea - 150 dwellings		✓		
H11	B1027/B1029 Brightlingsea	Highways Related	Thorrington B1027/B1029 staggered junction	Uncertain if scheme will be needed but allowance included in this draft	Brightlingsea - 150 dwellings		✓		

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
H12	B1352 Cox's Hill/A137 Harwich Road	Highways Related	A137 Cox's Hill Road/B1352 Station Road junction as part of package (see Manningtree study - likely need to increase cost)	Package of measures to improve access at A137 / Cox's Hill Road / Station Road junction to Manningtree Station. Measures could include: • New proposed roundabout layout (with minimal alterations) at A137 Cox's Hill Road / B1352 junction • Rail Station Access walking improvements between new Summers Park development and Cox's Hill / Station Road Rdbt • Relocation of bus stops on northern side of A137 / Cox's Hill Station roundabout to improve bus access to the station • Cox's hill route alteration (involving re-routing of service 92 to give Chester Grove and Summers Park Avenue a bus service which connects to the station and town centre). • Manningtree Level Crossing Replacement and Underpass	Committed developments - Manningtree		✓		
H15	A120	Highways Related	Horsley Cross Roundabout	Junction already under pressure - with development this will become increasingly pressurised. In the plan period targeted capacity improvements will be undertaken to enable access for the first tranche of development. Post-2043 a more significant scheme will be required involving junction reconstruction and increasing the length of the dualled section both sides of the	Horsley Cross development		✓	✓	

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
				roundabout. These post-2043 improvements are required to prevent delay for strategic A120 traffic.					
H16		Highways Related	B1352 Long Road/Trinity Road/New Rd/Clacton Rd – Manningtree				✓	✓	✓
H17		Highways Related	A133 Clacton Road/Bromley Road - Elmstead Market	Signals along the corridor require MOVA and upgrade.			✓	✓	✓

E.3 Public Transport Measures

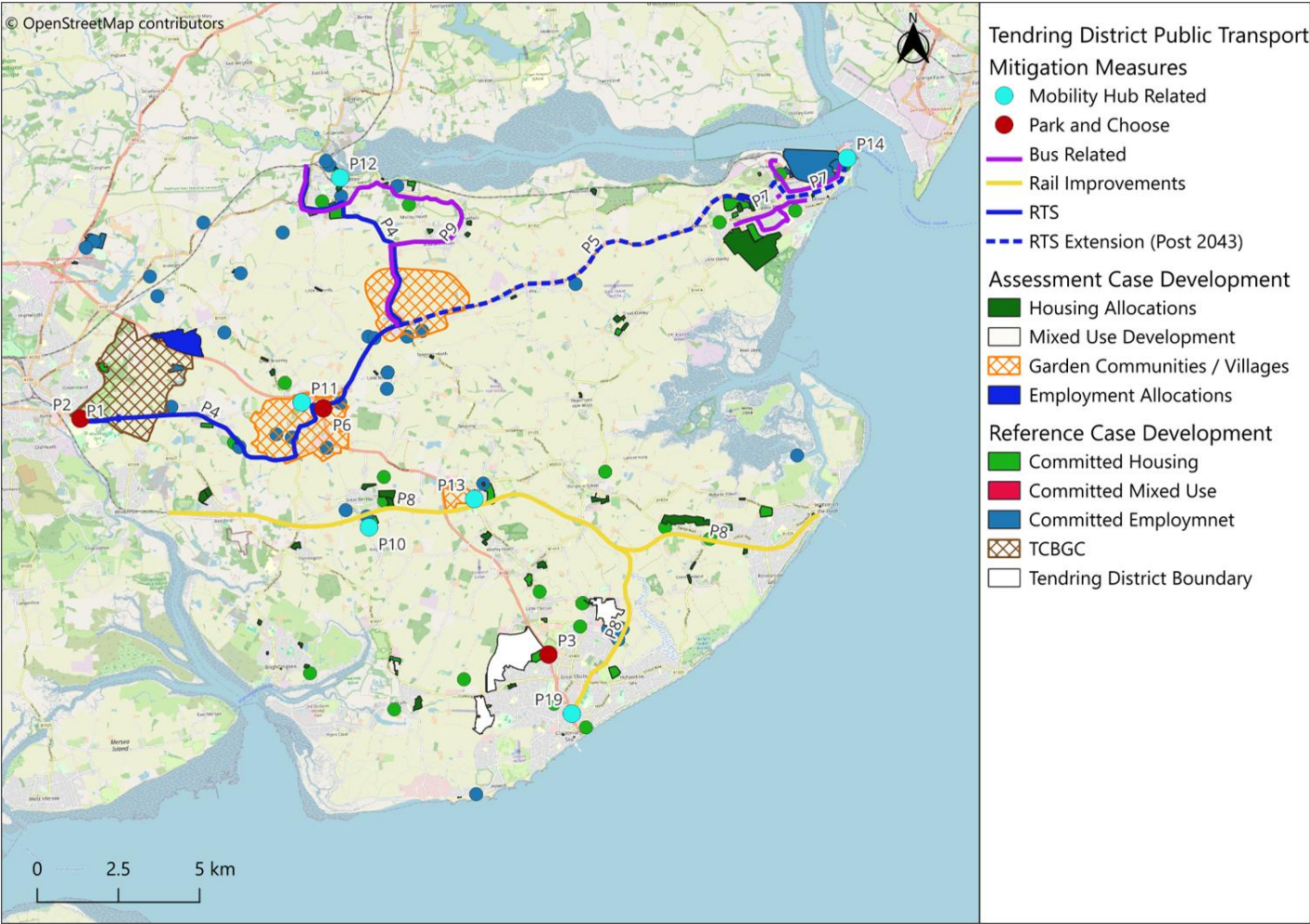


Figure E 2: Public Transport Related Mitigation Measures

Table E 2: Public Transport Measures

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Contributing areas		Expected causal links		
					Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
P1	A133 East	Bus Rapid Transit	Westbound RTS lane Wivenhoe Park Corner to Knowledge Gateway	This route is essential for RTS reliability and access into Tendring along the A133. The dedicated westbound RTS lane in central reservation will safeguard RTS journey times accessing Colchester.	SAMU1	All developments	✓	✓	
P2	A133	Highways Related	P&R/P&C facilities	Review of use of the proposed P&C East is advised. Depending on the amount use from Tendring, consideration should be given to extra facilities or enhancing access. While a study and monitoring is needed in this plan period, spend would be post-2043	SAMU8, SAMU9	None	✓	✓	
P3	A133 Clacton	P&C	Park and Choose – Clacton-on-Sea	Clacton sites SAMU2, 3 and 4 are adopted allocations in the existing Local Plan and are being carried forward into the new Local Plan. Therefore, it is appropriate that the IDP considers mitigation needs and recognises the seasonal impact of traffic due to tourism. Provision of P&R to Clacton is a practical option to - improve bus reliability by reducing traffic entering town centre	SAMU2, SAMU3, SAMU4		✓	✓	✓

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Contributing areas		Expected causal links		
					Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
				- support bus use in the town - support seasonal access					
P4	A133 West Central corridor to Colchester	RTS	RTS Colchester to Hare Green and Horsley Cross & Manningtree	High quality public transport service connecting Hare Green and Horsley Cross garden villages with Colchester and Manningtree. Total scheme length is 23km. Once the service passes the link road it can use infrastructure built in other schemes. Hence effective infrastructure length is 13km. Viability assessment required to understand whether RTS is able to operate between Colchester, Hare Green, Horsley Cross and Manningtree within the Local Plan period. Consideration should also be given to high quality public transport services to Harwich beyond the plan period.	SAMU8, SAMU9		✓	✓	✓
P5	A120 East	RTS	RTS extension Horsley Cross to Harwich	Extending RTS (15km) between Horsley Cross and Harwich strengthens public transport connectivity for the garden villages and facilitates access to employment opportunities in the freeport area. This could strengthen the viability of services. Viability assessment required to understand whether RTS is able to operate between Horsley Cross and	SAMU8, SAMU9		✓	✓	✓

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Contributing areas		Expected causal links		
					Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tending
				Colchester within the Local Plan period, or whether extension to Harwich is required.					
P6	A133 West Central corridor to Colchester	P&C	P&C facility at Hare Green Feasibility & Land Safeguarding	Given the site's strategic location on the proposed RTS corridor and its potential to serve multiple functions, an early feasibility study is recommended to assess access arrangements, land requirements, operational integration with P&C East, demand forecasts, environmental constraints, and delivery mechanisms. Undertaking this work at an early stage will provide the evidence base required to support the safeguarding of land for the scheme within local planning policy and garden community master planning. The study would also help define the scale and form of development required to accommodate future growth, ensuring that the site can contribute to the long-term transport vision for Tendring and Harwich Freeport as travel demands evolve. The Hare Green site would strengthen access to the RTS for residents and visitors travelling from southern	SAMU6, SAMU8	SAMU2, SAMU3, SAMU4	✓	✓	

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Contributing areas		Expected causal links		
					Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tending
				Tendring, extending the catchment of the rapid transit network. It would also provide greater flexibility for local bus network planning, enabling services to focus on higher-frequency connections between the P&C sites and Tendring's towns rather than longer inter-urban routes. In addition, the facility could support seasonal visitor demand and provide a strategically located overflow parking and holding area to support Harwich Freeport operations during periods of peak activity.					
P7	Harwich town	Bus Related	Harwich Town Bus Route & Harwich Port Shuttle	Supporting access to Harwich Freeport area Flexible and higher frequency bus routes serving a greater area of the town, with higher frequency bespoke operation	SAMU5			✓	
P8	A133 corridor	Rail	Sunshine Coast Rail Frequency Upgrade	Increasing frequency to two trains per hour along the rail route between Colchester and Clacton-on-Sea and Walton-on-the-Naze. -Competitive to long distance driving to Colchester -Greater opportunity for bus route timetables to align with rail services - Provide improved access to	SAMU2, SAMU3, SAMU4	SAH2, Frinton	✓	✓	✓

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Contributing areas		Expected causal links		
					Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
				employment and education opportunities for Clacton residents - Support wider economic activity in Clacton					
P9	Horsley Cross to Manningtree	Bus Related	North Tendring bus route (connect to RTS)	Scheme 23 Manningtree Transport Package (Manningtree/Mistley Town Route) extended to incorporate Horsley Cross, providing direct access to the East Coast Mainline at Manningtree, as well as supporting access to local and RTS services within Mistley and Manningtree as the Horsley Cross development is built out. Part of this scheme is likely to overlap with the RTS	SAMU9		✓	✓	✓
P10		Bus, Rail, Cycle, Car Share	Great Bentley Mobility Hub +_LEVEL 2	Enhancements at Great Bentley station, with additional hub within Great Bentley village, to support integrated transport access to both the station, bus routes and cycling links	Great Bentley		✓	✓	✓
P11		Bus, Cycle, Car Share	Hare Green Mobility Hub +_LEVEL 3	Location close to the A133/Bromley Road/B1029 junction to support integrated transport access to local bus and onwards cycling towards Great Bentley and Great Bentley rail station - incorporated with wider hub provision within the emerging Hare Green development (Scheme A5)	SAMU8		✓	✓	✓

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Contributing areas		Expected causal links		
					Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
P12		Bus, Rail, Cycle, Car Share	Manningtree Mobility Hub +_LEVEL 3	Two hubs to support access within and towards Manningtree from Horsely Cross development, to access Manningtree town centre and Manningtree rail station. Support integrated transport with local bus routes, cycle routes and Manningtree access to the RTS if required. Links closely with scheme A3, to provide connectivity.	Manning tree & Mistley		✓	✓	✓
P13		Bus, Rail, Cycle, Car Share	Weeley Mobility Hub +_LEVEL 2	Enhancements at Weeley station, with additional hub within Weeley village, to support integrated transport, access to both the station, bus routes and cycle links	Weeley		✓	✓	✓
P14		Bus, Rail Cycle, Car Share	Harwich Mobility Hub +_LEVEL 2	Support integrated transport, quality of interchanges and access to higher quality public transport services	SAMU5, SAH1, Dovercourt		✓	✓	✓
P15		Travel planning	Travel planning for residents	Allowance for travel planning at residential developments	All			✓	✓
P16		Travel planning	Travel planning for employment	Allowance for travel planning at employment developments (using estimated employment of 10,000 jobs)	All			✓	✓
P17		Bus subsidy	Bus subsidy for residents	Allowance for bus subsidy per new dwelling built to support bus	All			✓	✓

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Contributing areas		Expected causal links		
					Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
				connectivity and establishing new routes					
P18		Bus subsidy	Bus subsidy for employment	Allowance for bus subsidy for employment, based on floorspace to support bus connectivity and establishing new routes	All			✓	✓
P19		Bus, Rail, Cycle, Car Share	Clacton Mobility Hub_LEVEL 2	Enhancements at Clacton station, with additional hub within committed developments, to support integrated transport, access to both the station, bus routes and cycle links	Committed development - Clacton		✓	✓	✓

E.4 Active Travel Measures

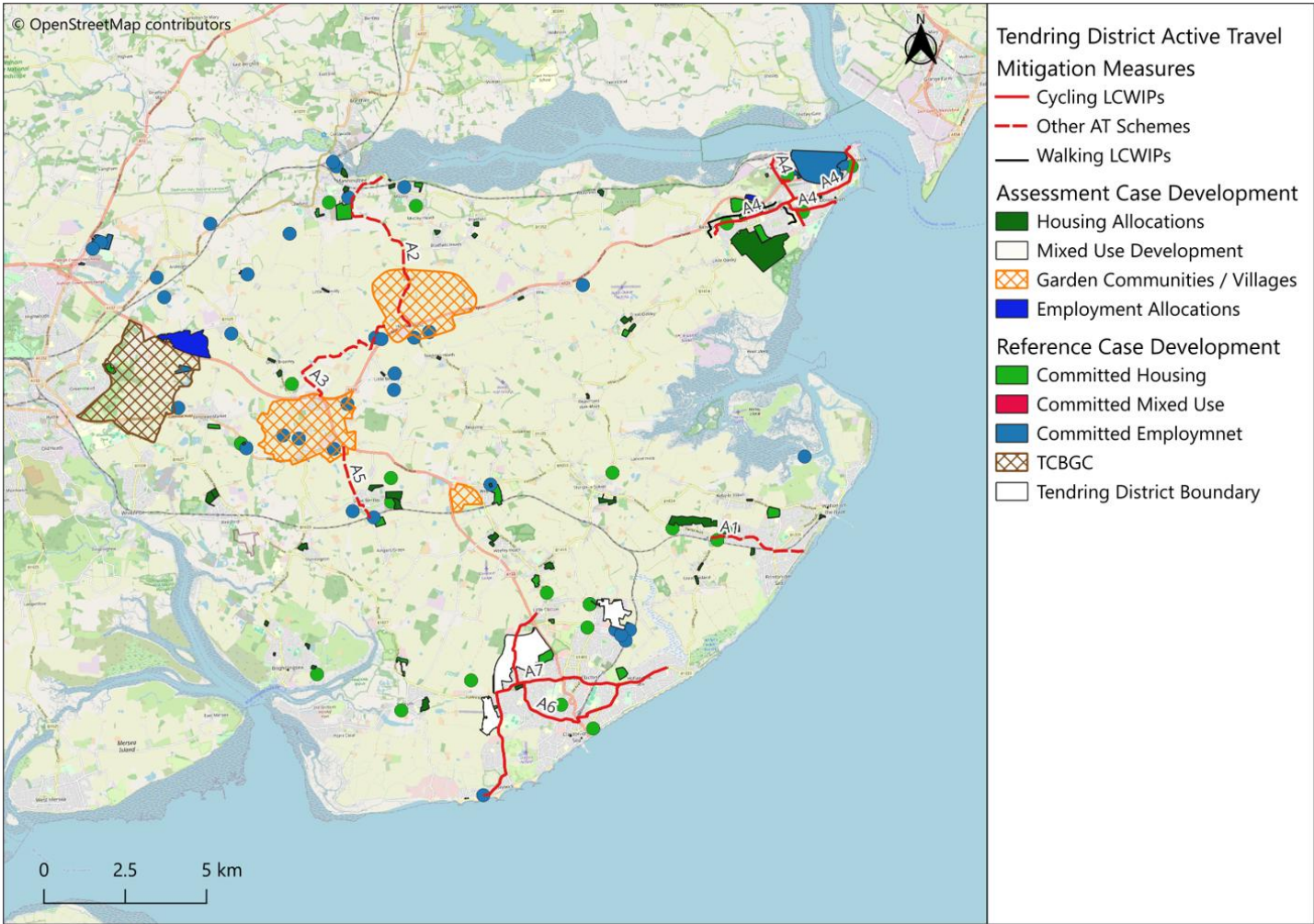


Figure E 3: Active Travel Related Mitigation Measures

Table E 3: Active Travel Measures

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Contributing areas		Expected causal links		
					Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
A1	Frinton Road local corridor	Cycling related	Kirby Cross Cycle Connectivity to the Coast	High quality access to the station from new and existing development Improved connection to amenities on the coast (10-15min cycle)	SAH2	Thorpe-le-Soken, Frinton	✓	✓	✓
A2	Horsley Cross to Manningtree	Cycling related	Horsley Cross - Manningtree Greenway	Connecting Horsley Cross with Manningtree & Manningtree Station Linking into potential future LCWIP North Tendring Part delivery of scheme 6 Manningtree Transport Package	SAMU9		✓	✓	✓
A3	Horsley Cross to Hare Green	Cycling related	Horsley Cross to Hare Green Greenway	Connection between Garden Communities Part delivery of scheme 6 Manningtree Transport Package – with refinement of routing	SAMU8, SAMU9		✓	✓	✓
A4	Harwich	Cycling related	Implement LCWIP Harwich & Dovercourt routes	High quality access to town centre attractors, station and seafront Reduce the need to use vehicles for short journeys Focus on Sustrans route from Little Oakley to Dovercourt, cycle routes 3, 4 and 5, walking routes 10 and 5 Inclusive of Bathside Bay Green Access Corridor	SAMU5		✓	✓	✓
A5		Cycling Related	Hare Green to Great	Connection between Garden Community and rail station	SAMU8		✓	✓	✓

Scheme ID	Movement Corridor	Type of Measure	Scheme Name	Scheme Description	Contributing areas		Expected causal links		
					Primary	Secondary	New Local Plan Site	Committed Sites	Growth beyond Tendring
			Bentley Station cycle route	Part delivery of scheme 6 Manningtree Transport Package Important to establish land ownership early on					
A6		Cycling related	LCWIP Cycle Route 3 Clacton	Little Clacton to Clacton rail station section - connecting development to the town centre and rail station	Committed development - Clacton		✓	✓	✓
A7		Cycling related	LCWIP Cycle Route 2 Clacton	St John's Road to Jaywick section - connecting development to Jaywick centre	Committed development - Clacton		✓	✓	✓

Appendix F. Maps of Vision-led Mitigation Measures

The previous appendix, Appendix E, listed proposed integrated transport and vision-based mitigation required to support reference case and proposed new local plan growth. The measures were divided, in an approximate manner, into highway, public transport and active travel schemes. The measures in each table were grouped by their location on movement corridors.

This appendix shows the location of highway, public transport and active travel measures together on each movement corridor. The maps also show how the measures relate to nearby reference and new local plan developments in the Tendring council area.

For completeness, a map for each of the movement corridors mentioned in the tables in Appendix E is provided. This means some maps are sparse. Sometimes this is because measures are required due to cumulative growth further afield, such as A12 J29. The measures provide a good indication of the range and scale of mitigation that would likely be required to mitigate and connect reference case and new local plan growth.

However, additional measures might be required as more detailed analysis is undertaken, which would support planning applications. Furthermore, each of the mitigation schemes could be divided into phases to align to individual developments or tranches of growth.

F.1 Schemes in Harwich and Dovercourt

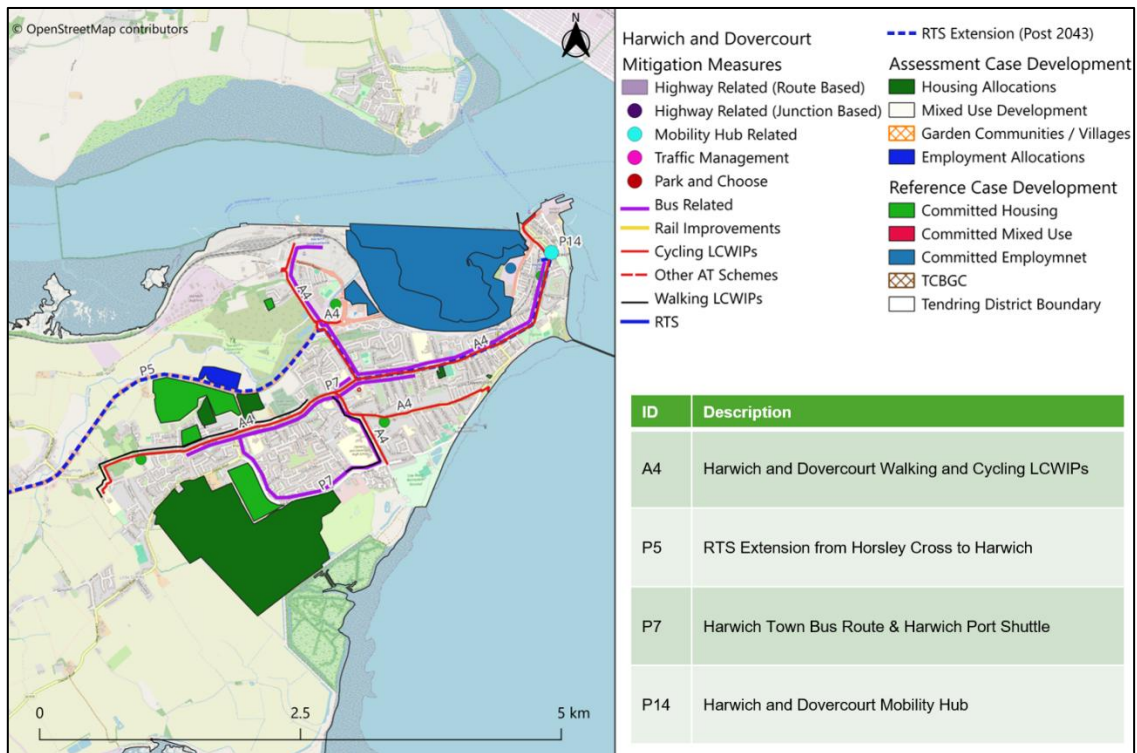


Figure F 1: Harwich and Dovercourt Measures

F.2 Schemes in Hare Green and Horsley Cross

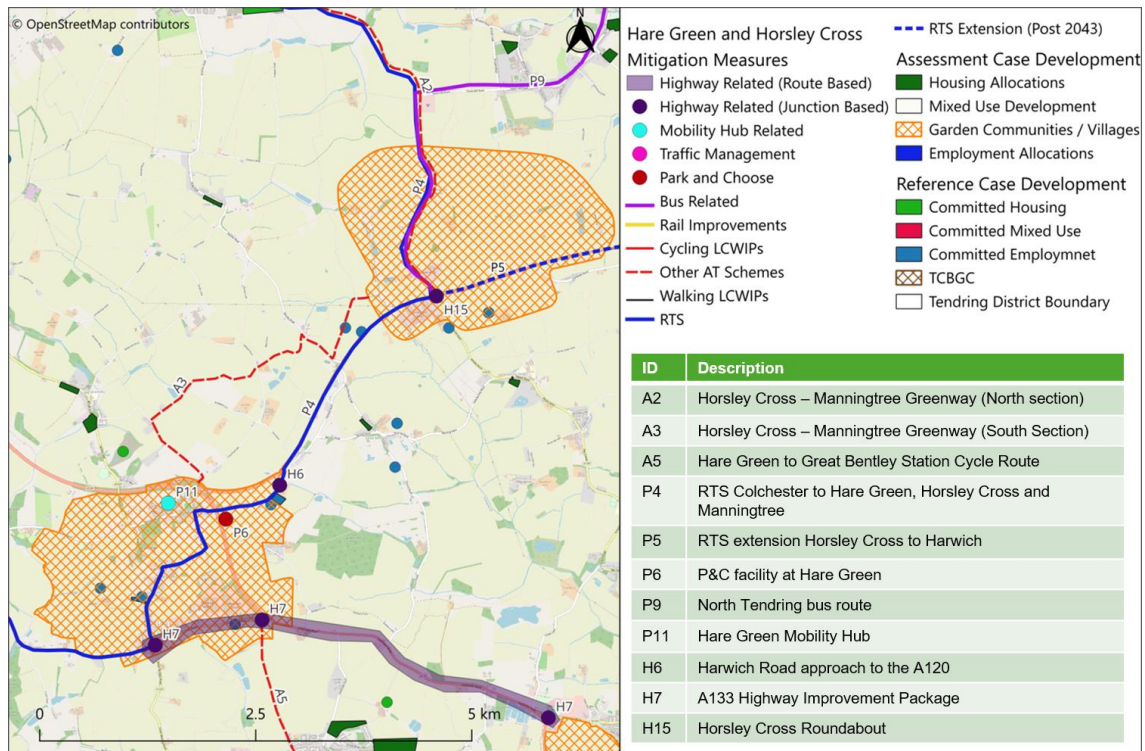


Figure F 2: Hare Green and Horsley Cross Measures

F.3 Schemes in Great Bentley and Weeley

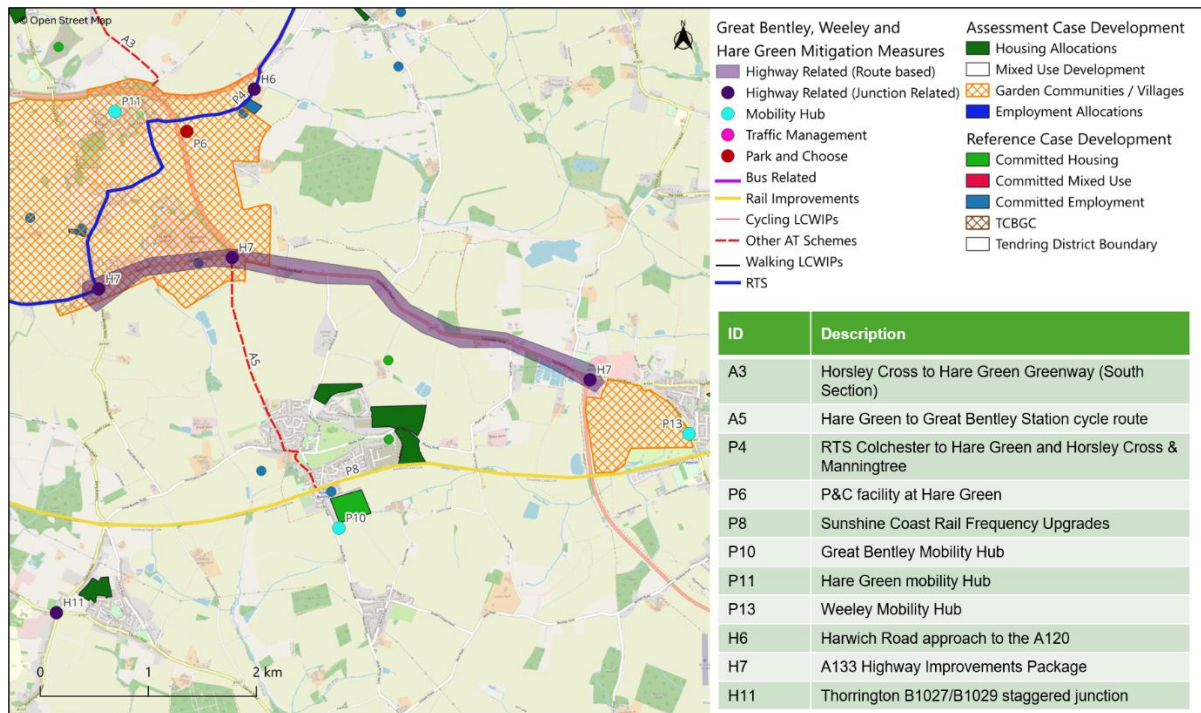


Figure F 3: Great Bentley and Weeley Measures

F.4 Schemes in Manningtree and Mistley

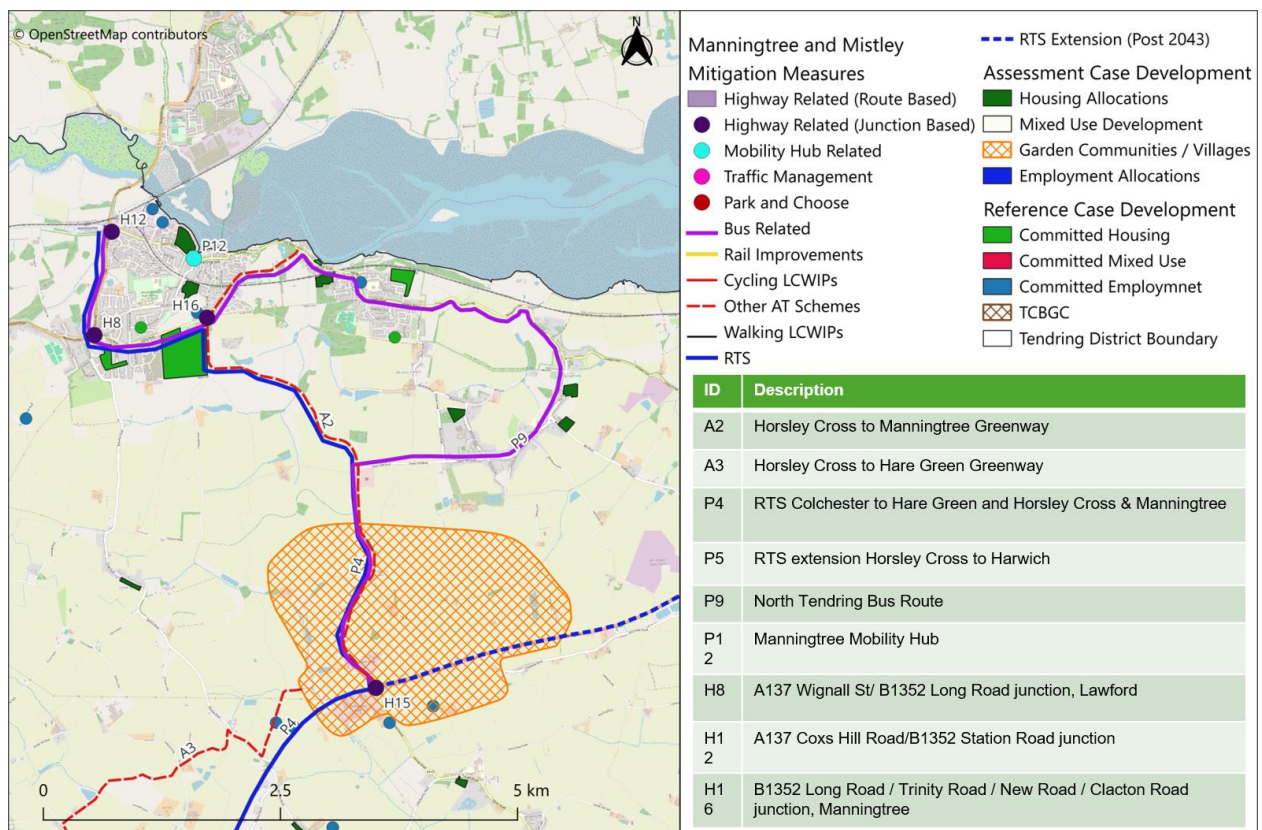


Figure F 4: Manningtree and Mistley Measures

F.5 Schemes in Clacton, Walton and Frinton

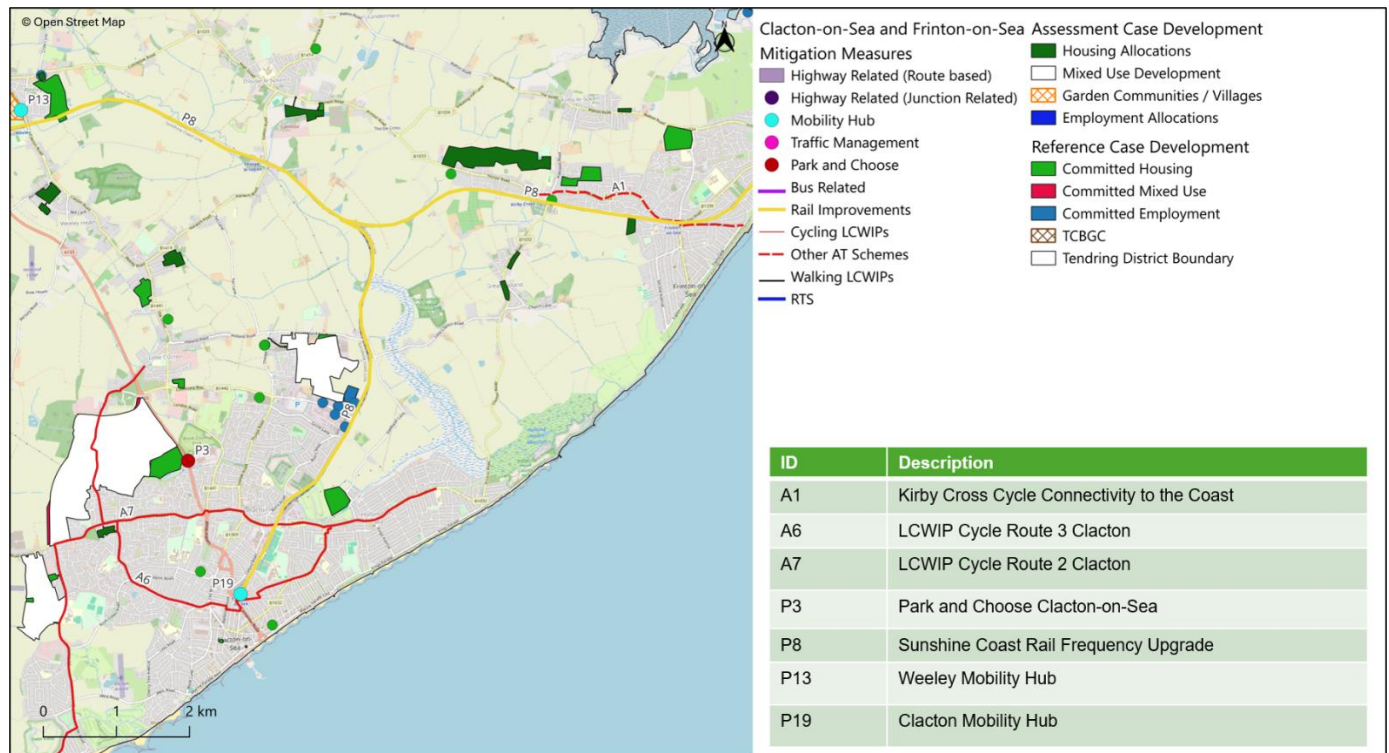


Figure F 5: Clacton, Walton and Frinton Measures

F.6 Schemes in Brightlingsea

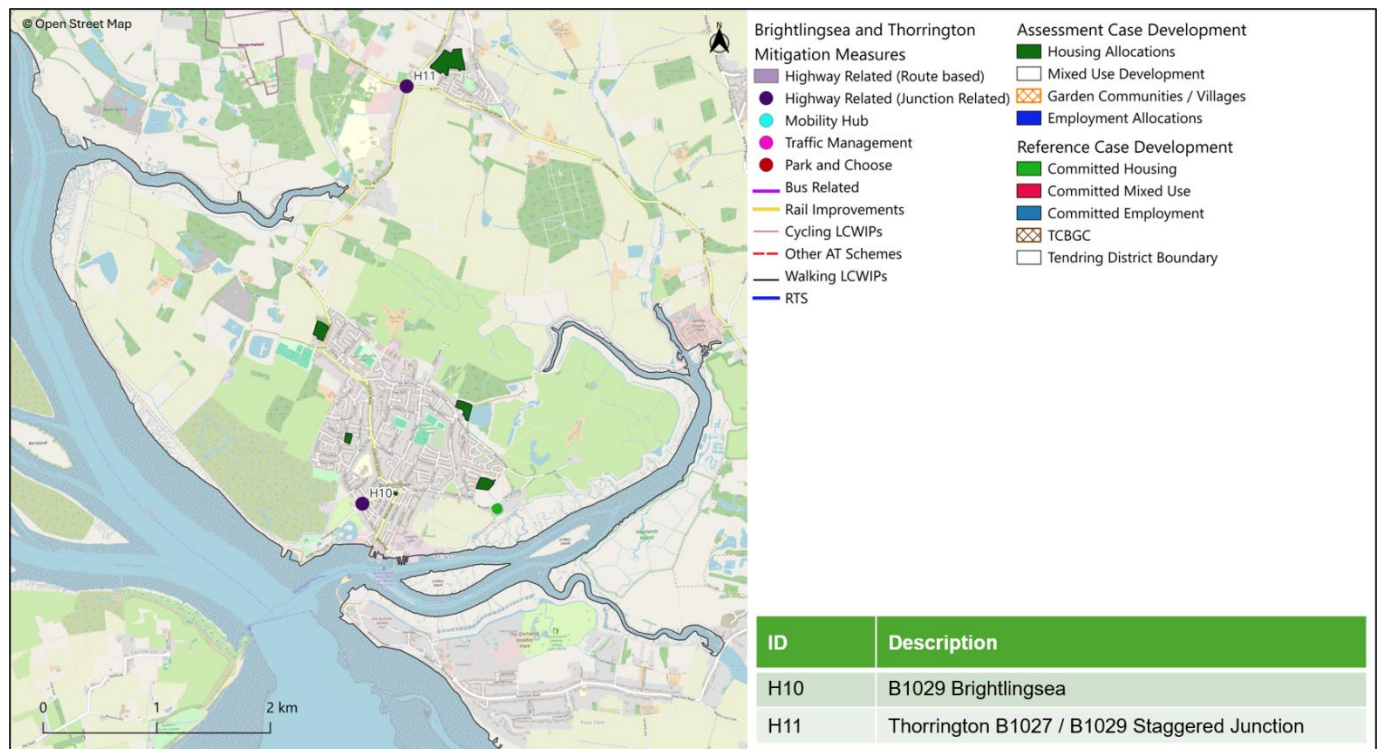


Figure F 6: Brightlingsea Measures

F.7 Cross-Border Schemes

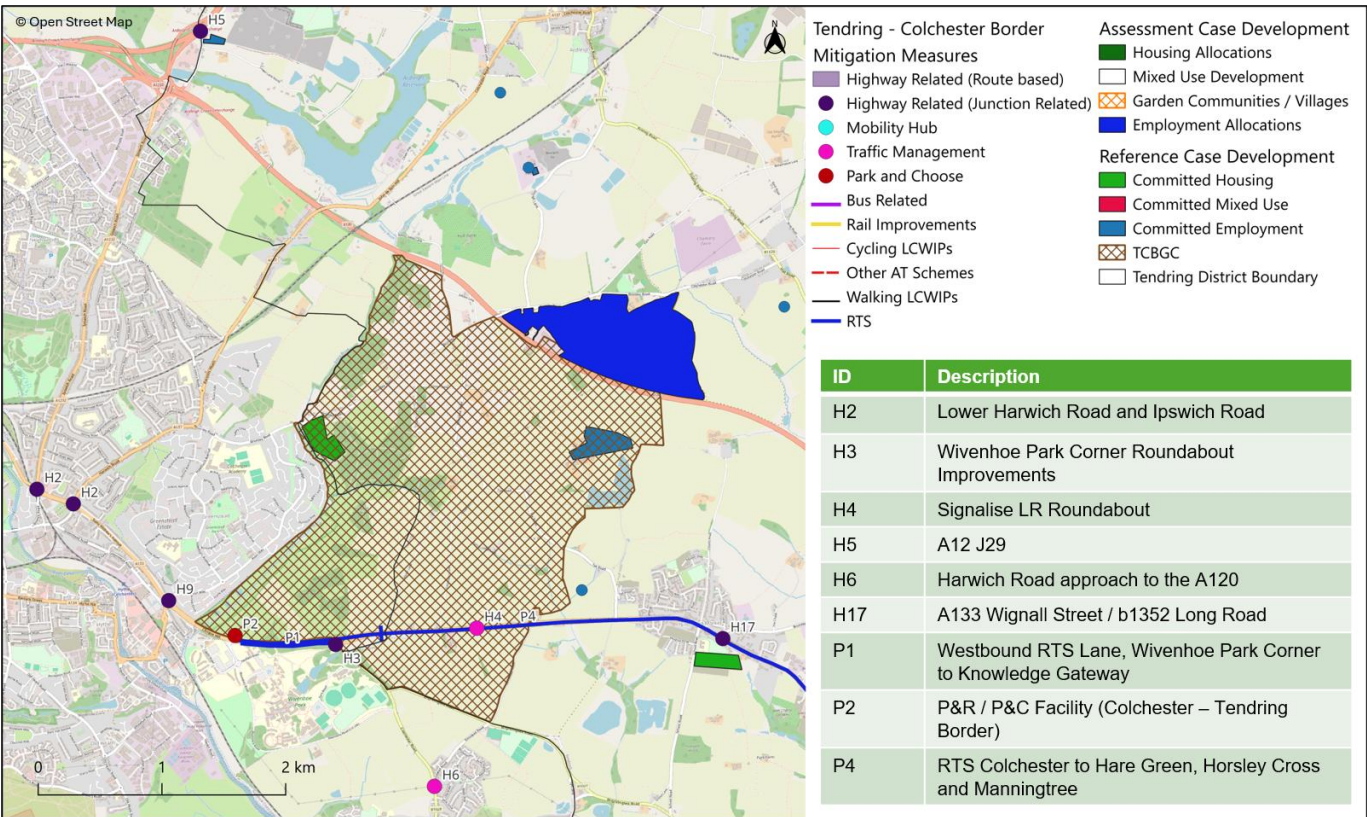


Figure F 7: Cross-Border Measures

Appendix G. Findings from Local Junction Models

AM Peak Level of Service (LoS)

Junction Name	Arm Name	Reference Case LoS	Assessment Case LoS	Suggested Mitigation	Assessment Case with Mitigation LoS
Harwich Road / A120 Roundabout	Harwich Road East	A	B	Entry flare on Harwich Road East approach	A
	Harwich Road South	A	B	Entry flare on Harwich Road South approach	A
	A120 West	A	A	None Required	A
	A120 Northeast	A	A	None Required	A
A133 / Colchester Road	A133 East	C	D	None Required	C
	A133 Colchester Rd West	F	F	Additional left hand lane for left hand turn only as well as entry width and flare length increased	E
	A133 NW	A	A	None Required	A
A137 Manningtree	A137 North	A	A	None Required	A
	Station Rd East	B	B	None Required	B

Junction Name	Arm Name	Reference Case LoS	Assessment Case LoS	Suggested Mitigation	Assessment Case with Mitigation LoS
	Colman Ave SE	A	A	None Required	A
	A137 Cox's Hill South	F	F	Increased entry width and flare length	B
Elmstead Road / A133	A133 East	A	A	None Required	A
	Elmstead Rd South	A	A	None Required	A
	A133 West	A	A	None Required	A
A133 Weeley Roundabout	Colchester Rd East	F	F	Increased entry width and flare length	A
	Services	A	A	None Required	B
	A133 South	A	A	None Required	A
	A133 Colchester Rd West	F	F	Increased entry width and flare length	A
A133 / B1029 Frating Crossroads	Great Bentley Road	B	B	Signal timing optimisation	A
	A133 East	A	A	Signal timing optimisation	A

Junction Name	Arm Name	Reference Case LoS	Assessment Case LoS	Suggested Mitigation	Assessment Case with Mitigation LoS
	A133 West	A	A	Signal timing optimisation	A
	B1029 North	A	B	Signal timing optimisation	B
B1029 Brightlingsea	Church Rd	A	A	None Required	A
	Ladysmith Ave	B	B	None Required	B
	Spring Chase	A	A	None Required	A
Thorrington B1027/B1029 Staggered Junction	Station Rd	A	A	None Required	A
	Clacton Rd	B	B	None Required	B
	Brightlingsea Rd	A	B	None Required	B

Junction Name	Arm Name	Reference Case LoS	Assessment Case LoS	Suggested Mitigation	Assessment Case with Mitigation LoS
	Tenpenny Hill	A	A	None Required	A
A120 Horsley Cross	Clacton Road	A	A	Two lane entry	A
	A120 (East)	A	A	None required	A
	B1035	C	F	Two lane entry and two lane exit on Clacton Road	B
	A120 (West)	A	A	None required	A
B1033 High Street, Thorpe-le-Soken	Landermere Rd	A	A	None Required	A
	Abbey Street	A	A	None Required	A
	High Street	B	B	None Required	B

PM Peak Level of Service (LoS)

Junction Name	Arm Name	Reference Case LoS	Assessment Case LoS	Suggested Mitigation	Assessment Case with Mitigation LoS
Harwich Road / A120 Roundabout	Harwich Road East	A	B	Entry flare on Harwich Road East approach	A
	Harwich Road South	A	B	Entry flare on Harwich Road South approach	A
	A120 West	A	A	None Required	A
	A120 Northeast	A	A	None Required	A
A133 / Colchester Road	A133 East	B	B	None Required	B
	A133 Colchester Rd West	C	C	Additional left hand lane for left hand turn only as well as entry width and flare length increased	B
	A133 NW	A	A	None Required	A
A137 Manningtree	A137 North	C	C	None Required	B
	Station Rd East	B	B	None Required	B
	Colman Ave SE	A	A	None Required	A

Junction Name	Arm Name	Reference Case LoS	Assessment Case LoS	Suggested Mitigation	Assessment Case with Mitigation LoS
	A137 Cox's Hill South	B	C	Increased entry width and flare length	A
Elmstead Road / A133	A133 East	A	A	None Required	A
	Elmstead Rd South	A	A	None Required	A
	A133 West	A	A	None Required	A
A133 Weeley Roundabout	Colchester Rd East	F	F	Increased entry width and flare length	A
	Services	A	A	None Required	A
	A133 South	A	A	None Required	A
	A133 Colchester Rd West	F	F	Increased entry width and flare length	C
A133 / B1029 Frating Crossroads	Great Bentley Road	B	B	Signal timing optimisation	A
	A133 East	A	A	Signal timing optimisation	A

Junction Name	Arm Name	Reference Case LoS	Assessment Case LoS	Suggested Mitigation	Assessment Case with Mitigation LoS
	A133 West	A	A	Signal timing optimisation	A
	B1029 North	A	B	Signal timing optimisation	B
B1029 Brightlingsea	Church Rd	A	A	None Required	A
	Ladysmith Ave	B	B	None Required	B
	Spring Chase	A	A	None Required	A
Thorrington B1027/B1029 Staggered Junction	Station Rd	A	A	None Required	A
	Clacton Rd	A	B	None Required	B
	Brightlingsea Rd	A	B	None Required	B

Junction Name	Arm Name	Reference Case LoS	Assessment Case LoS	Suggested Mitigation	Assessment Case with Mitigation LoS
	Tenpenny Hill	A	A	None Required	A
A120 Horsley Cross	Clacton Road	A	C	Two lane entry	A
	A120 (East)	A	A	None required	A
	B1035	A	A	Two lane entry and two lane exit on Clacton Road	A
	A120 (West)	A	A	None required	A
B1033 High Street, Thorpe-le-Soken	Landermere Rd	A	A	None Required	A
	Abbey Street	A	A	None Required	A
	High Street	B	B	None Required	B

Appendix H. Strategic Model Plots for Long Range Forecasts

Introduction

This appendix brings together flow difference, relative queue and speed plots from the 2058 NEMo reference and assessment case AM and PM models. They have been grouped by plot type and time period to facilitate comparison between scenarios. The key assumptions in the scenarios are summarised in Table 5.1:

- Scenario 5 – 2058 reference case, which includes committed growth at TCBGC, caps growth at 2043 levels at Hare Green and Horsley Cross, and grows elsewhere by the levels predicted by NTEM. The highway and public transport network is that used in 2043 mitigated new local plan scenario (Scenario 3). ST demand reductions as used in 2043 Scenario 4 have not been applied since Scenario 5 is run with VDM, which requires 24-hour trip demand.
- Scenario 6 – 2058 assessment case, which grows Hare Green and Horsley Cross proposed garden villages to 10,500 homes. Elsewhere the demand is as per Scenario 5. The highway and public transport network is also the same as Scenario 5.

Key to movement scale and acceptability of change											
More of less free flow			Travelling slower			Moderate congestion			Substantial congestion		
1	2	3	4	5	6	7	8	9	10	11	12
Extreme congestion			Acceptability of Change								
13	14	15	Passable ✓			Caution !			Unsatisfactory ✖		

H.1 AM flow difference, speed queue plots

H.1.1 Summary of impact in the AM

Table H. 1: AM movement index scores for 2023 base and Scenarios 1-6

Sector	Location	AM peak impacts						
		2023 Base	2043 S1 RC	2043 S2 BAU	2043 S3 BAU Mit	2043 S4 BAU Mit ST	2058 S5 RC	2058 S6 AC
East Colchester	Greenstead Roundabout, Colne Causeway & Clingoe Hill	10	15	15	11	9	15	15
	A12 J29 / A120 (eastern)	7	12	14	9	9	12	12
North Tendring	A120 - Link Road Junction	3	4	4	5	4	6	6
	A120 – Horsley Cross to Harwich	3	4	5	4	4	5	6
	A120 - A133 to Horsley Cross	3	3	7	6	5	7	8
	A133 Colchester Rd Roundabout	9	10	10	10	10	15	15
	B1035 Horsley Cross	2	3	4	3	3	3	4
	Elmstead Market	3	4	4	4	4	4	4
	Frating	2	3	4	3	3	4	4
	Great Bromley - Hare Green	3	4	6	5	5	5	6
	Harwich	3	3	4	3	3	4	4
	Manningtree	8	10	10	9	9	10	10
	A137 - Between Ardleigh and Manningtree	4	5	6	5	5	5	6
Overall assessment combining all areas		6	8	9	7	7	10	10

Key to movement scale and acceptability of change											
More of less free flow			Travelling slower			Moderate congestion			Substantial congestion		
1	2	3	4	5	6	7	8	9	10	11	12
Extreme congestion			Acceptability of Change								
13	14	15	Passable ✓			Caution !			Unsatisfactory ✗		

H.1.2 AM flow difference plots

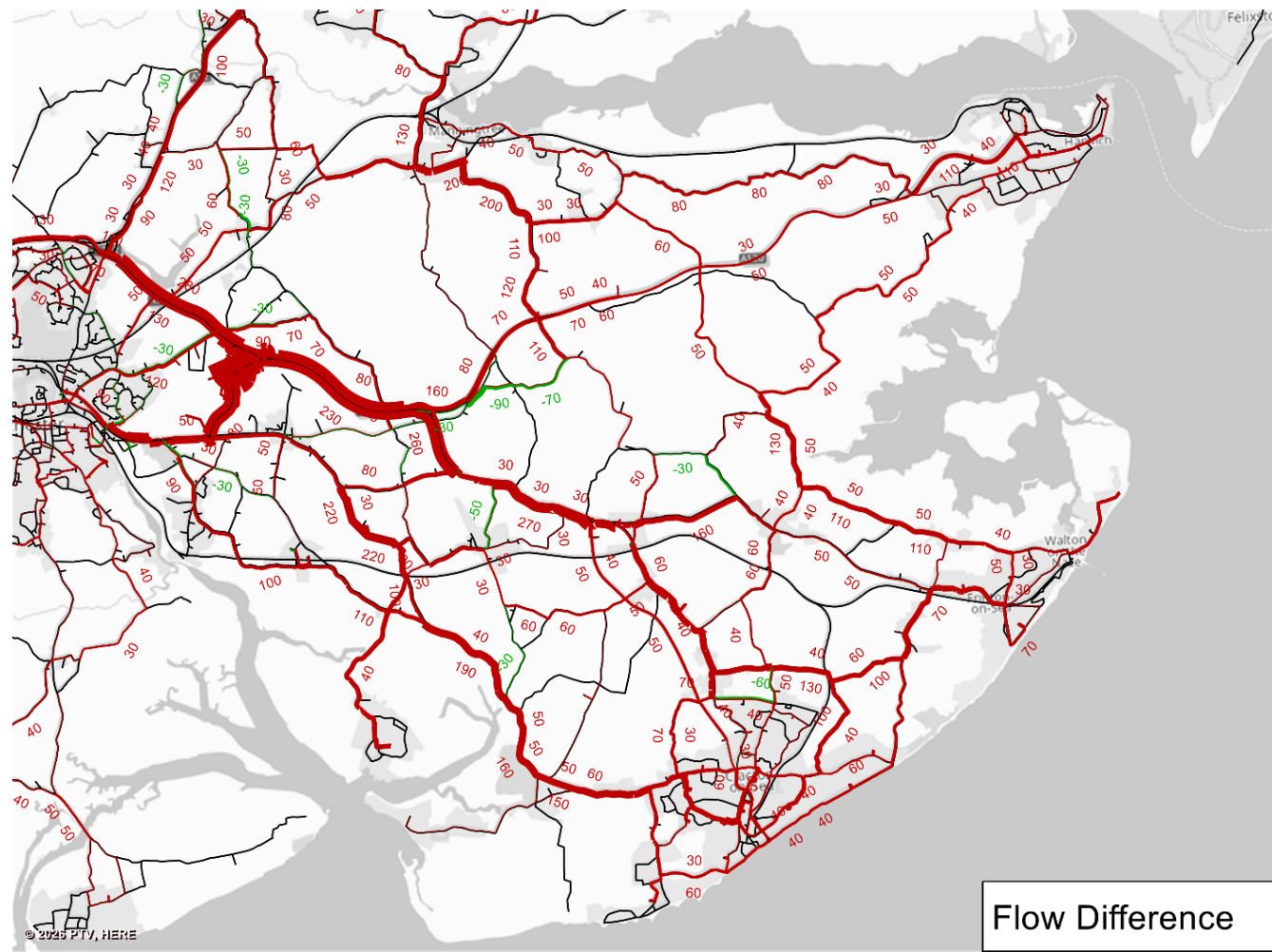


Figure H 1: AM flow difference - Scenario 5 2058 reference case with mitigation v Scenario 4 2043 ST mitigated assessment

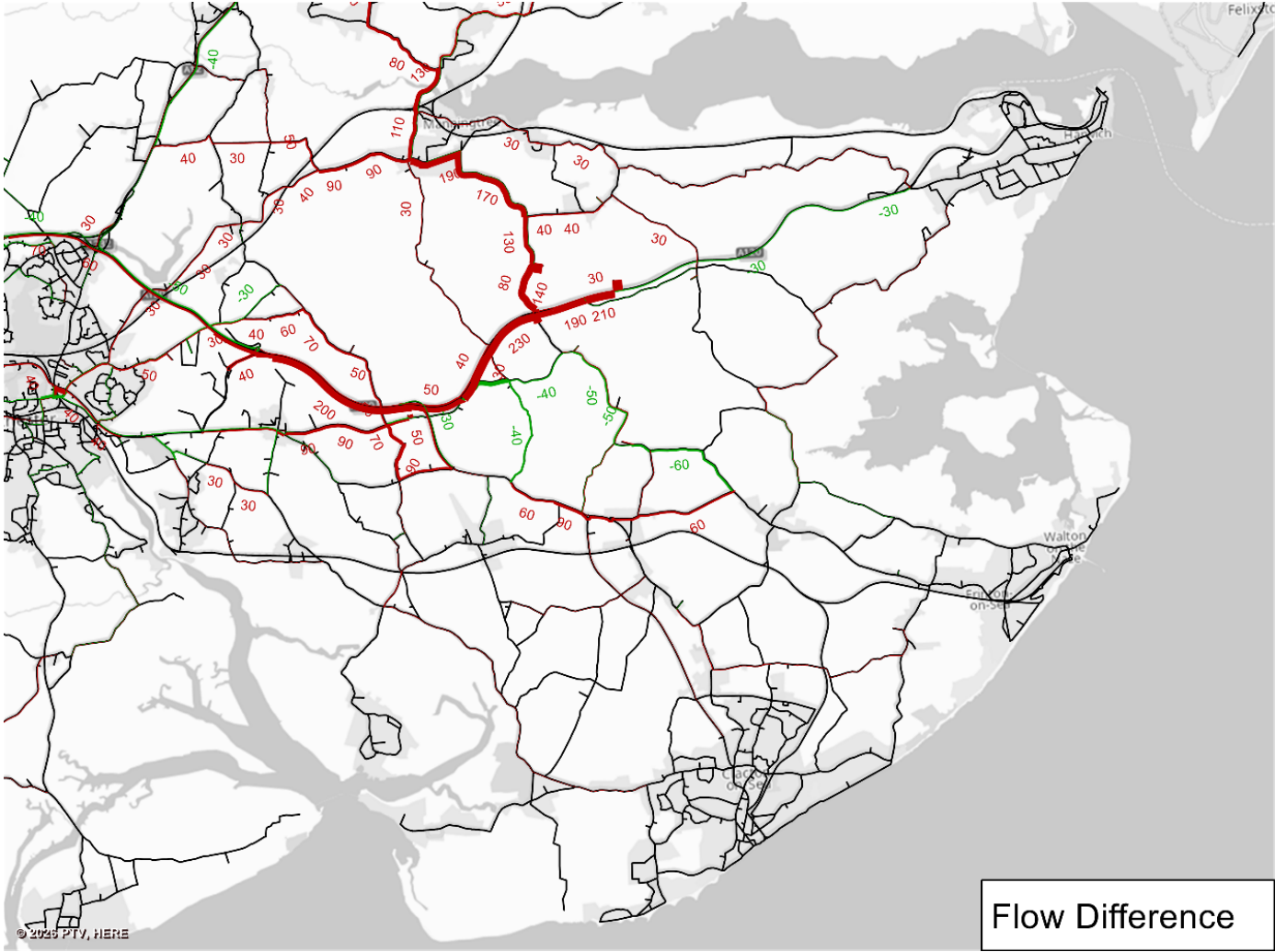


Figure H 2: AM flow difference - Scenario 6 2058 assessment case with mitigation and BaU demand v scenario 5 2058

H.1.3 AM speed Plots (Modelled speed / free flow speed)

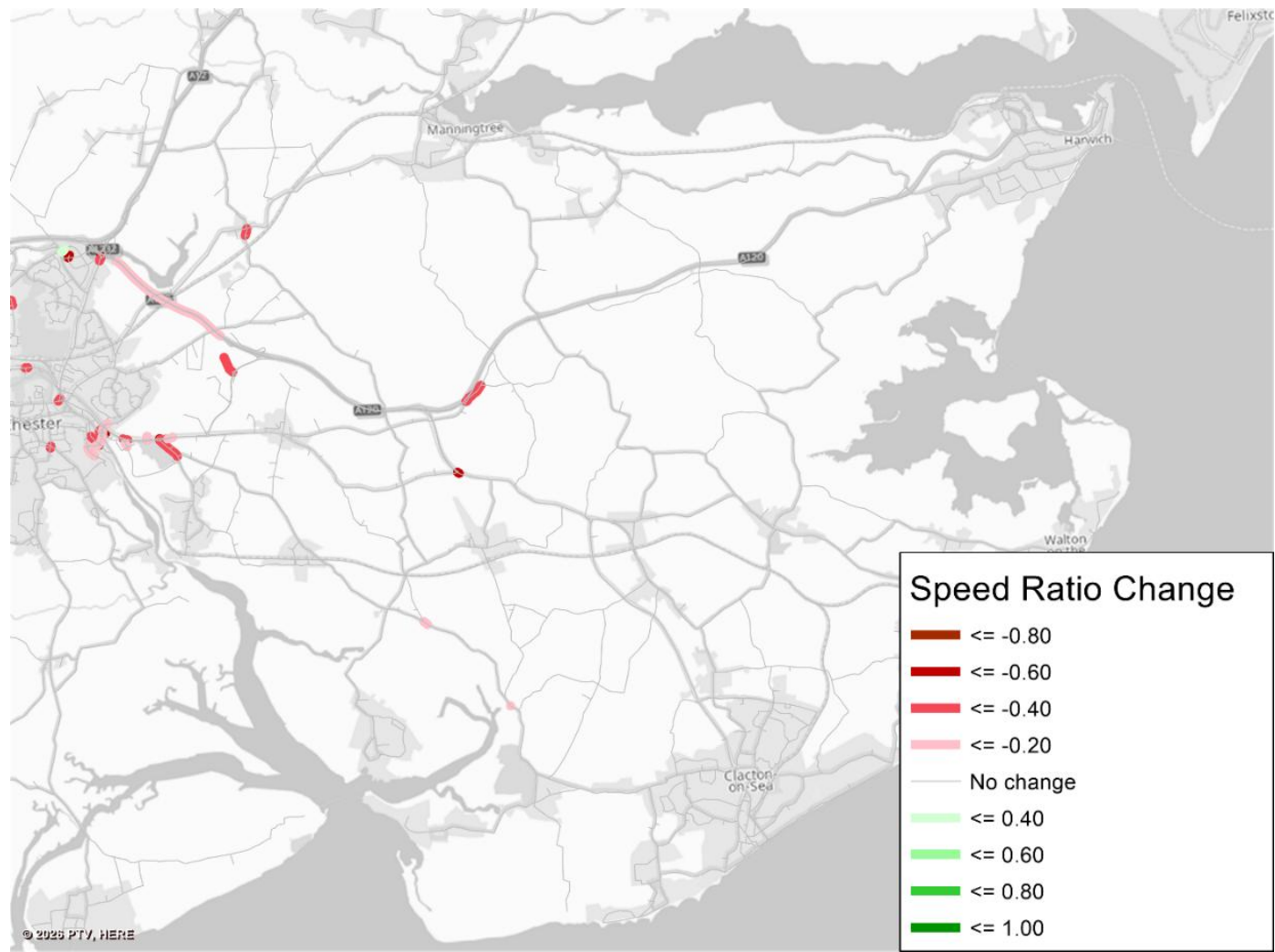


Figure H 3: AM Difference in traffic speed between Scenario 5 and Scenario 4

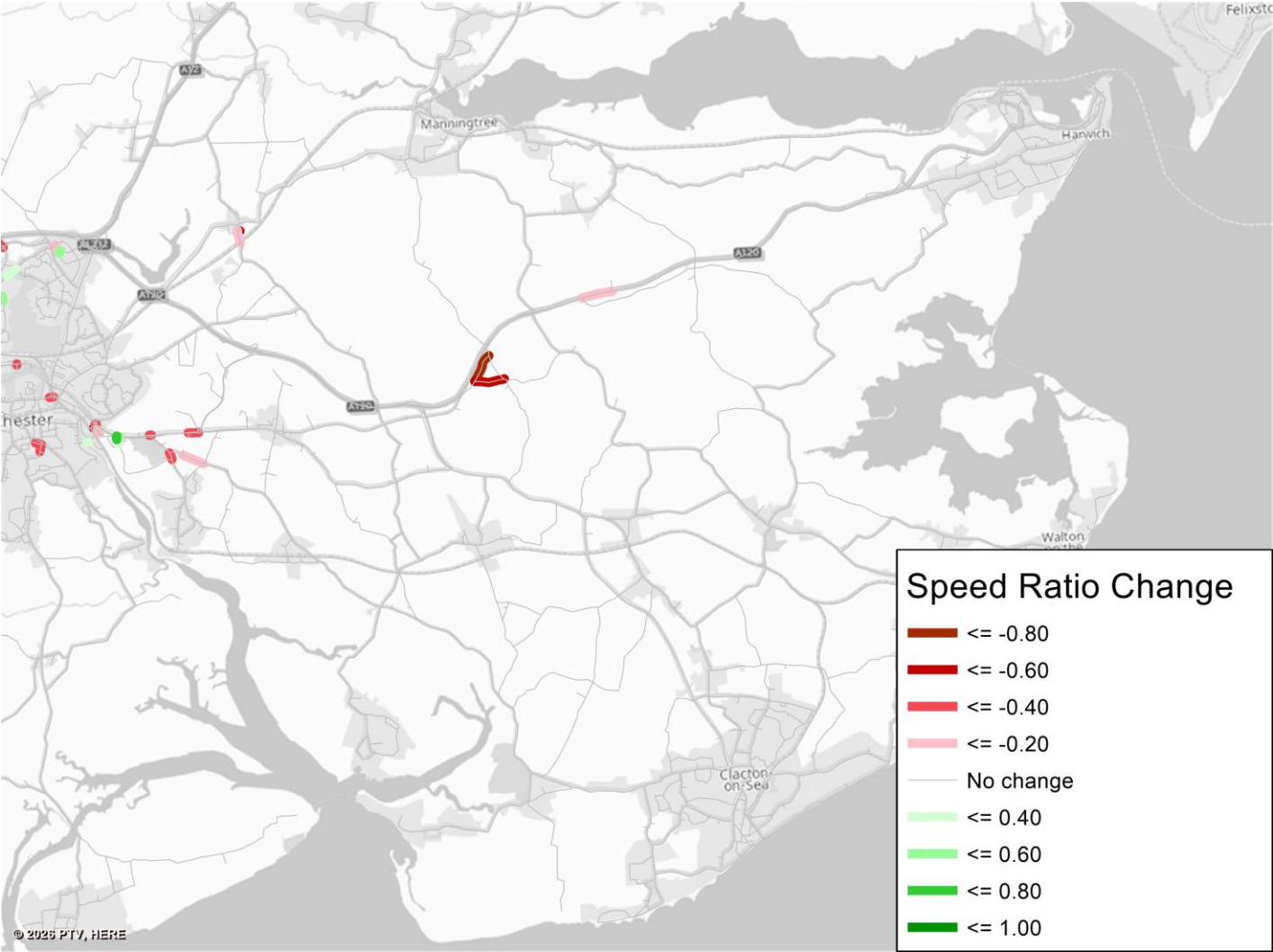


Figure H 4: AM Difference in traffic speed between Scenario 6 and Scenario 5

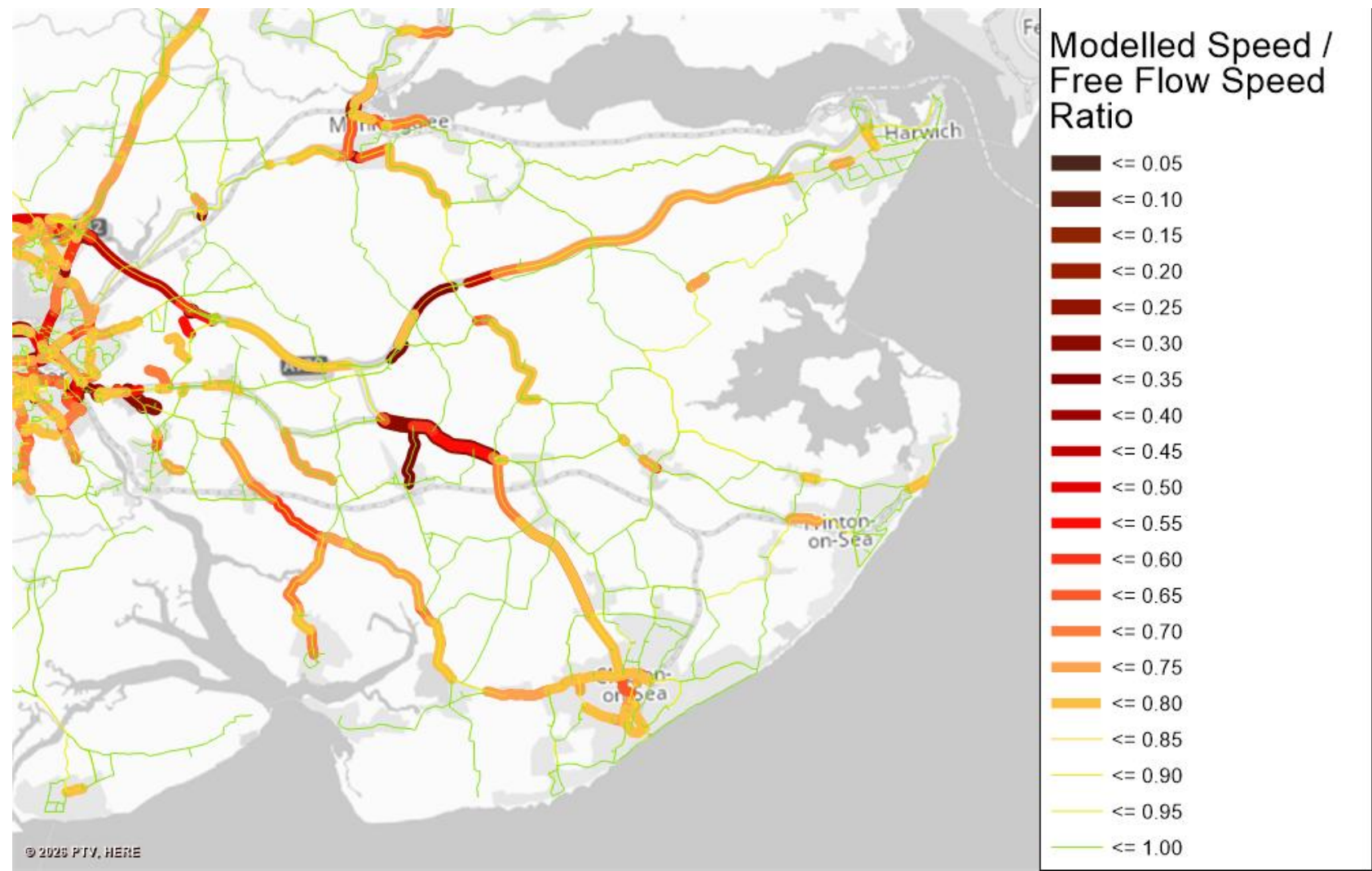


Figure H 5: AM Speed ratio - Scenario 5 2058 reference case with mitigation

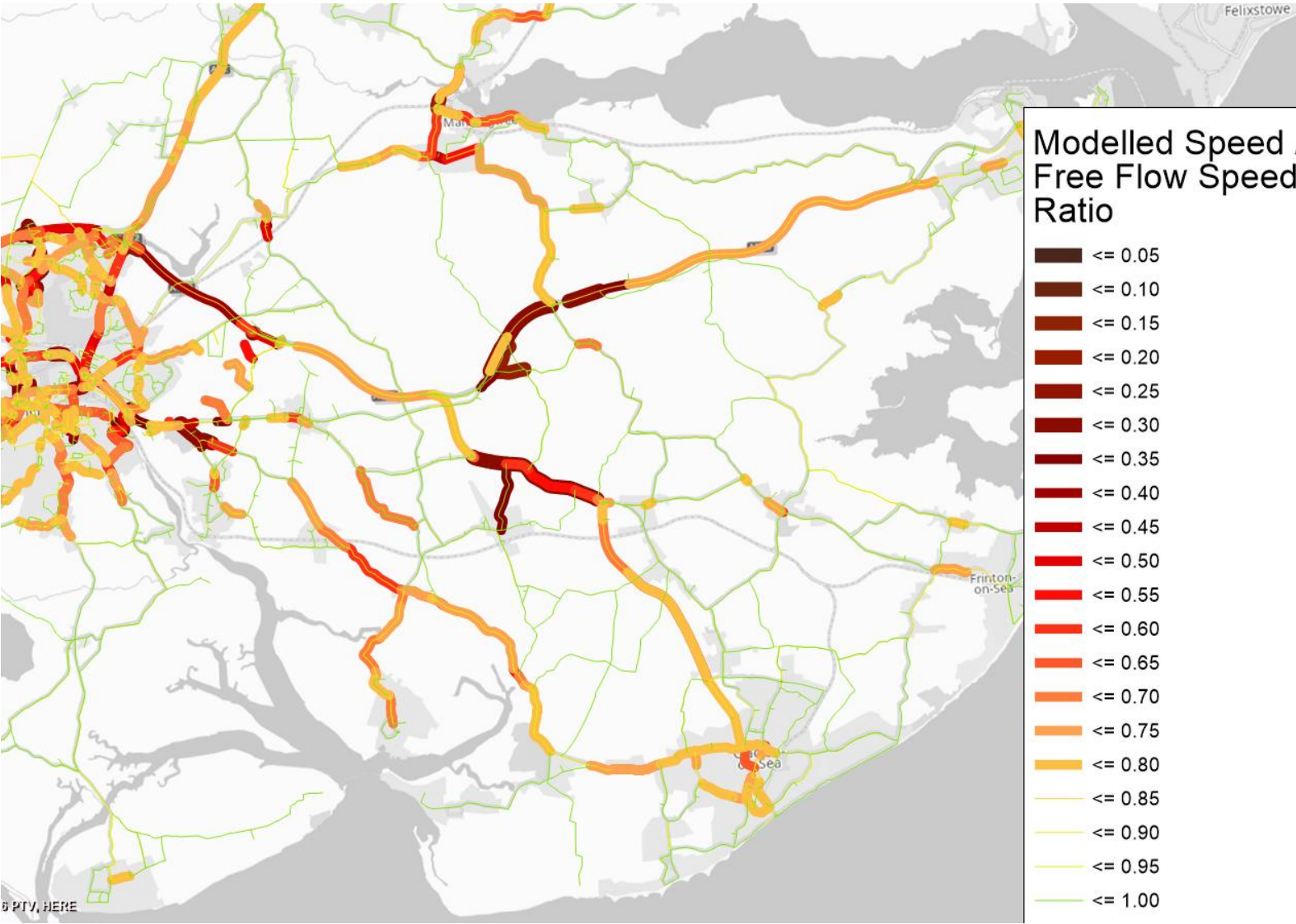


Figure H 6: AM speed ratio - Scenario 6 2058 assessment case with mitigation and BaU demand

H.1.4 AM relative queue plots (blocking back on road links in the model)

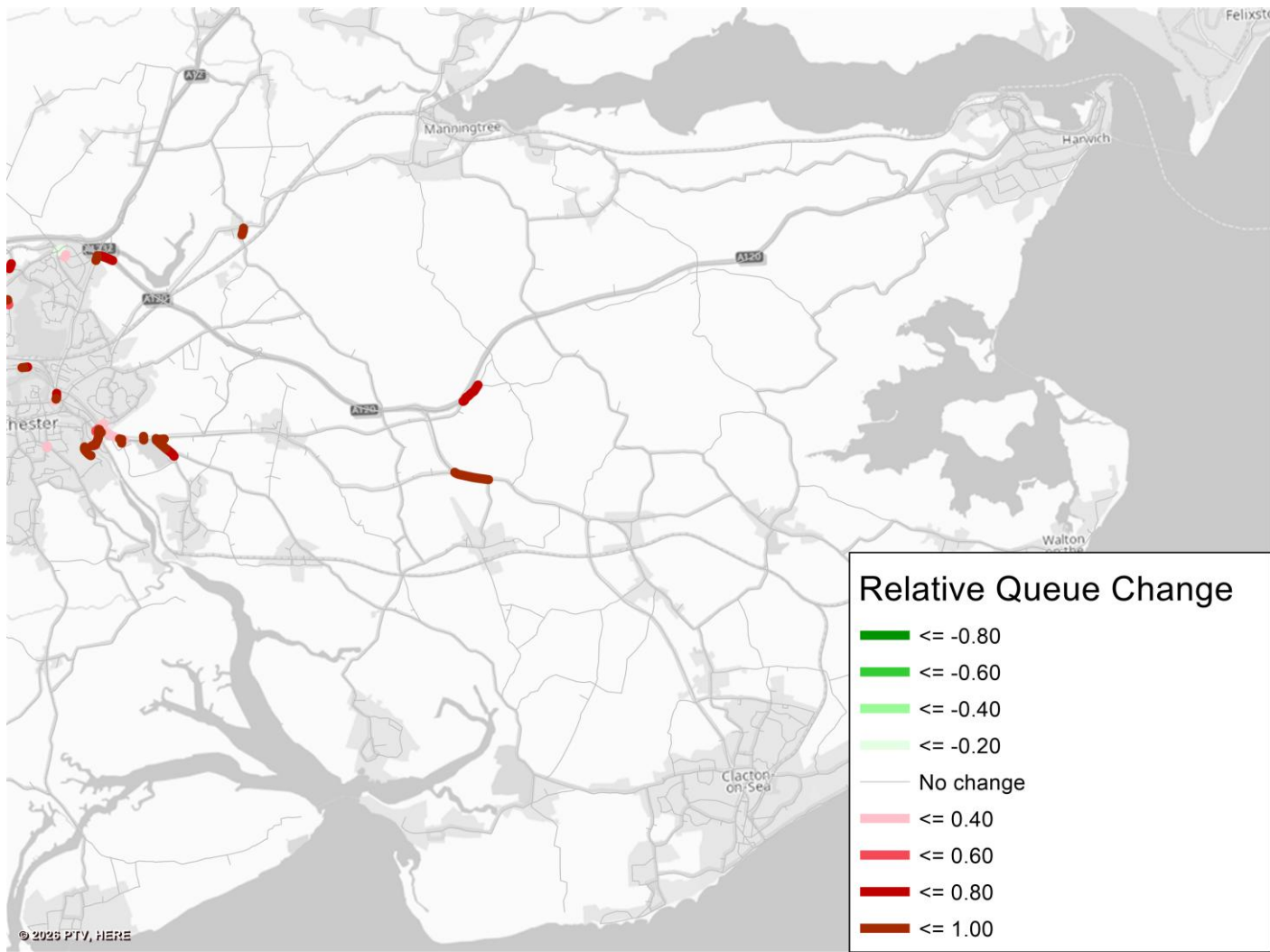


Figure H 7: AM Difference in blocking back (relative queues) between Scenario 5 and Scenario 4

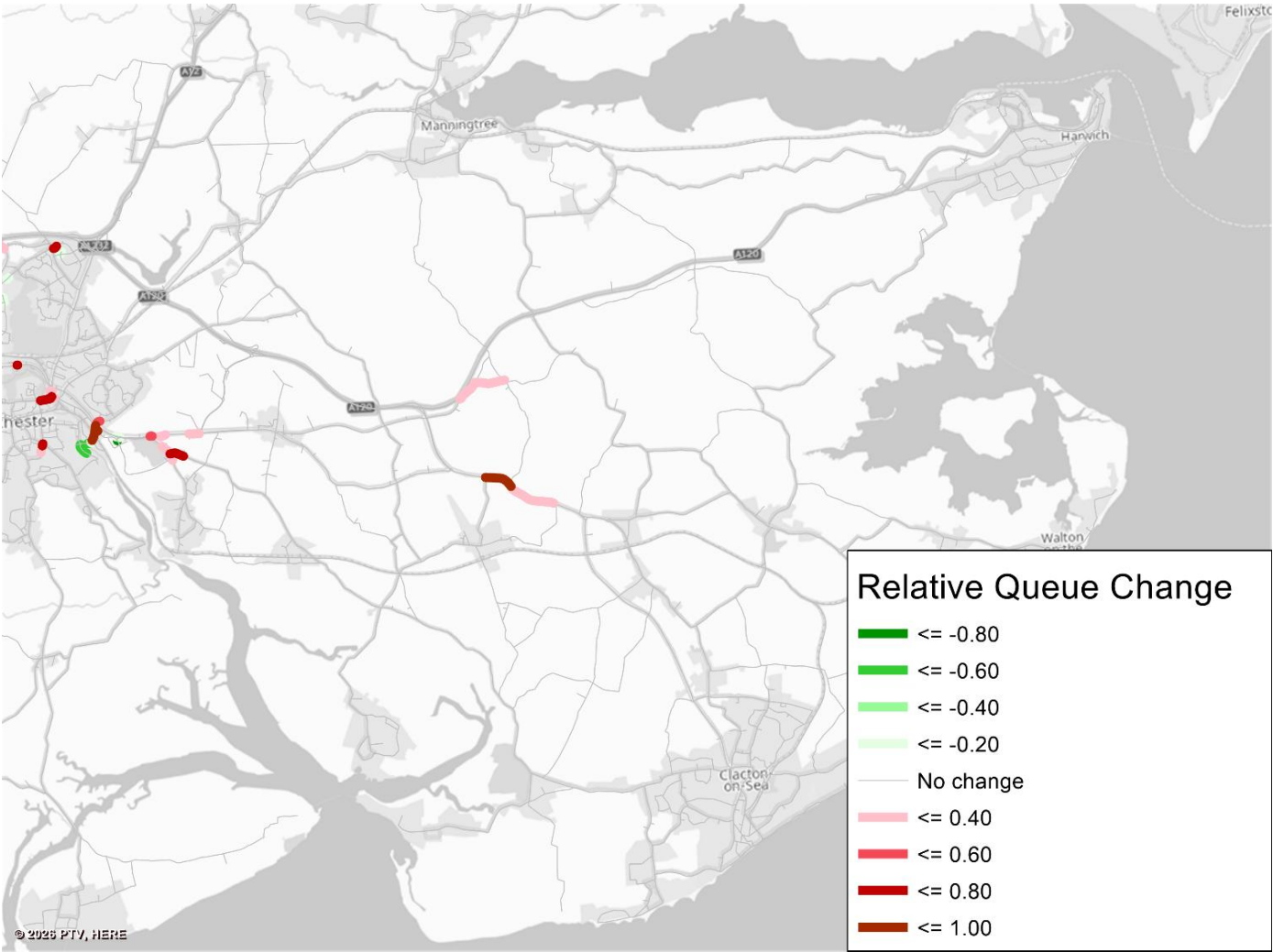


Figure H 8: AM Difference in blocking back (relative queues) between Scenario 6 and Scenario 5

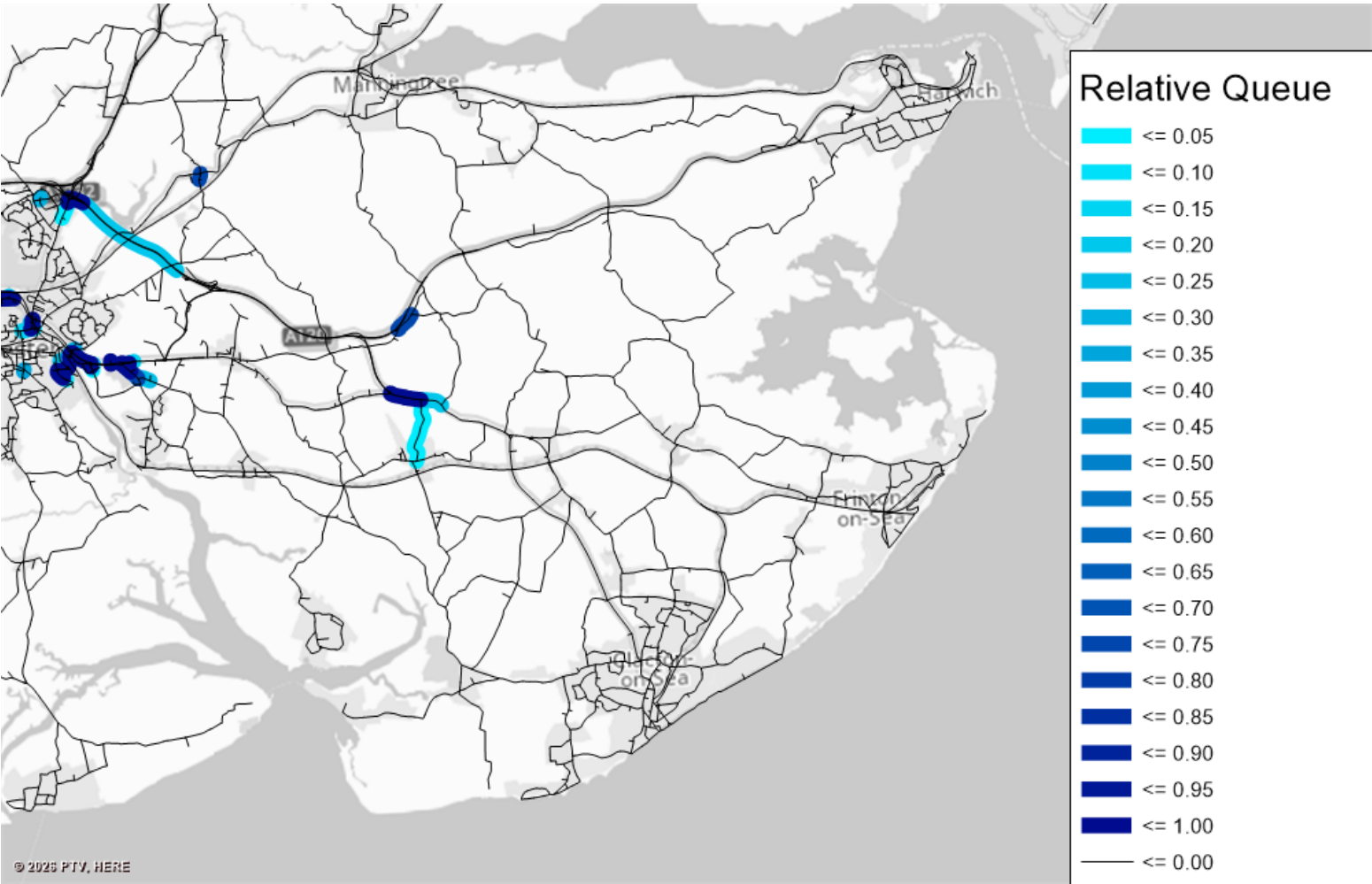


Figure H 9: AM relative queue - Scenario 5 2058 reference case with mitigation

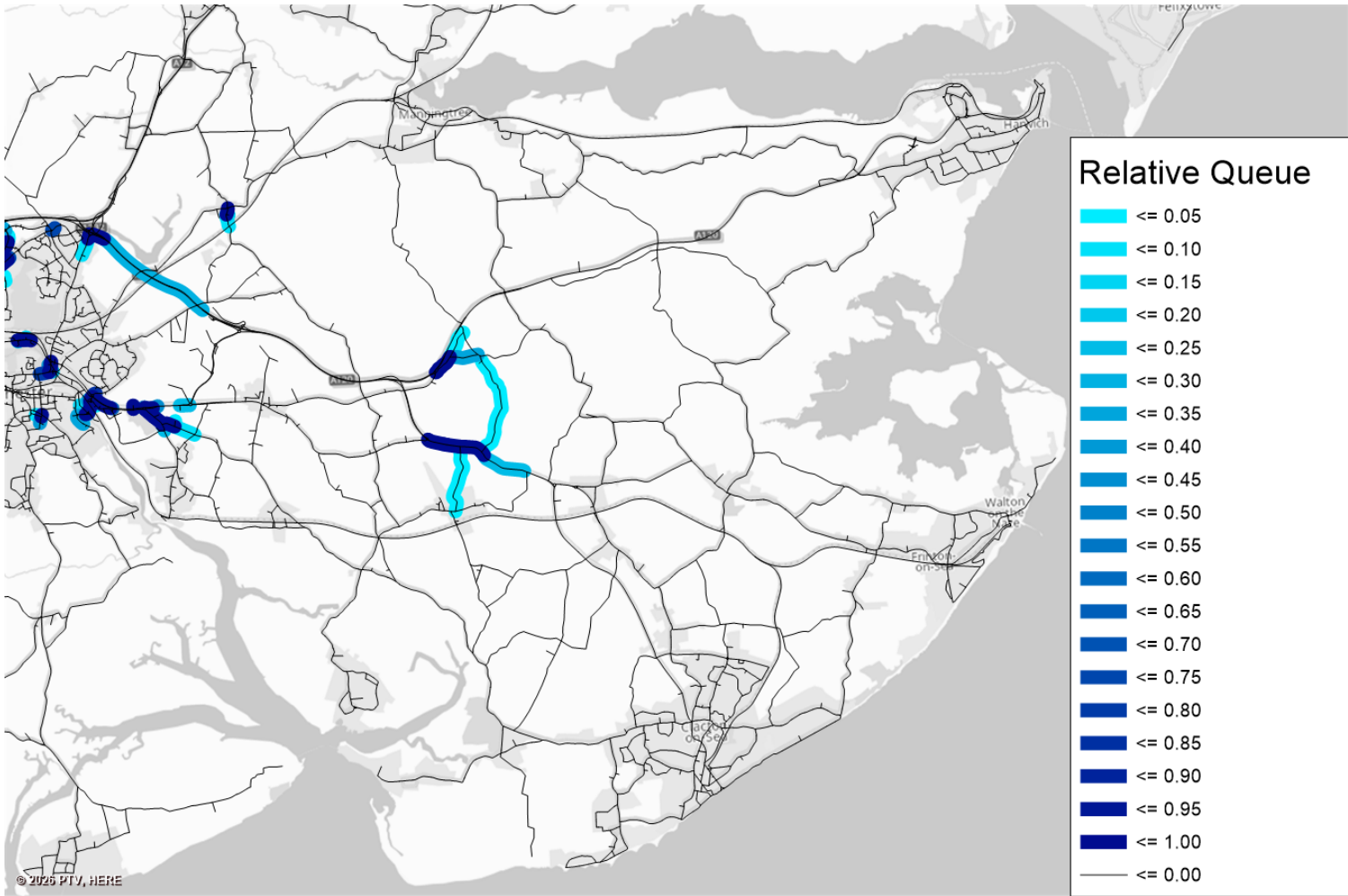


Figure H 10: AM relative queue - Scenario 6 2058 assessment case with mitigation and BaU demand

H.2 PM flow difference, speed and queue plots

H.2.1 Summary of impact in the PM

Table H. 2: PM Peak movement index scores for 2023 base and Scenarios 1-6

Sector	Location	PM peak impacts						
		2023 Base	2043 S1 RC	2043 S2 BAU	2043 S3 BAU Mit	2043 S4 BAU Mit ST	2058 S5 RC	2058 S6 AC
East Colchester	Greenstead Roundabout, Colne Causeway & Clingoe Hill	12	14	15	10	9	14	15
	A12 J29 / A120 (eastern)	7	10	11	9	9	10	10
North Tendring	A120 - Link Road Junction	2	3	4	4	4	5	5
	A120 - Horsley Cross to Harwich	3	4	4	4	4	4	4
	A120 - A133 to Horsley Cross	2	3	4	4	3	4	6
	A133 Colchester Rd Roundabout	8	10	11	11	10	11	12
	B1035 Horsley Cross	2	2	3	3	3	3	4
	Elmstead Market	3	3	4	4	4	4	4
	Frating	1	1	1	1	1	1	1
	Great Bromley - Hare Green	3	5	7	6	6	7	7
	Harwich	2	3	3	3	3	3	3
	Manningtree	9	9	10	10	9	10	10
	A137 - Between Ardleigh and Manningtree	4	5	5	5	5	5	5
	<i>Overall assessment combining all areas</i>	6	8	8	7	7	8	9

H.2.2 PM flow difference plots

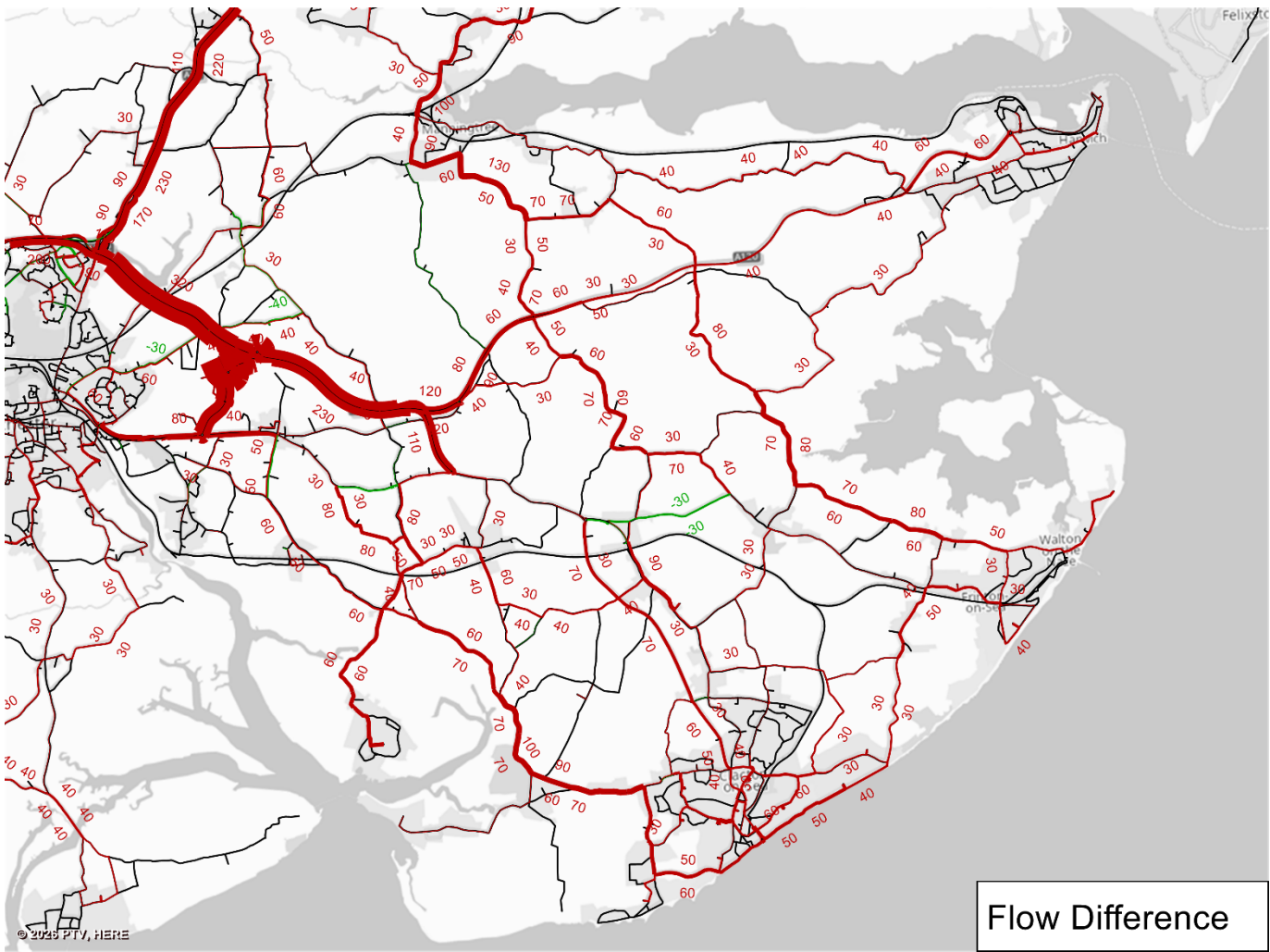


Figure H 11: PM flow difference - Scenario 5 2058 reference case with mitigation v Scenario 4 2043 ST mitigated assessment

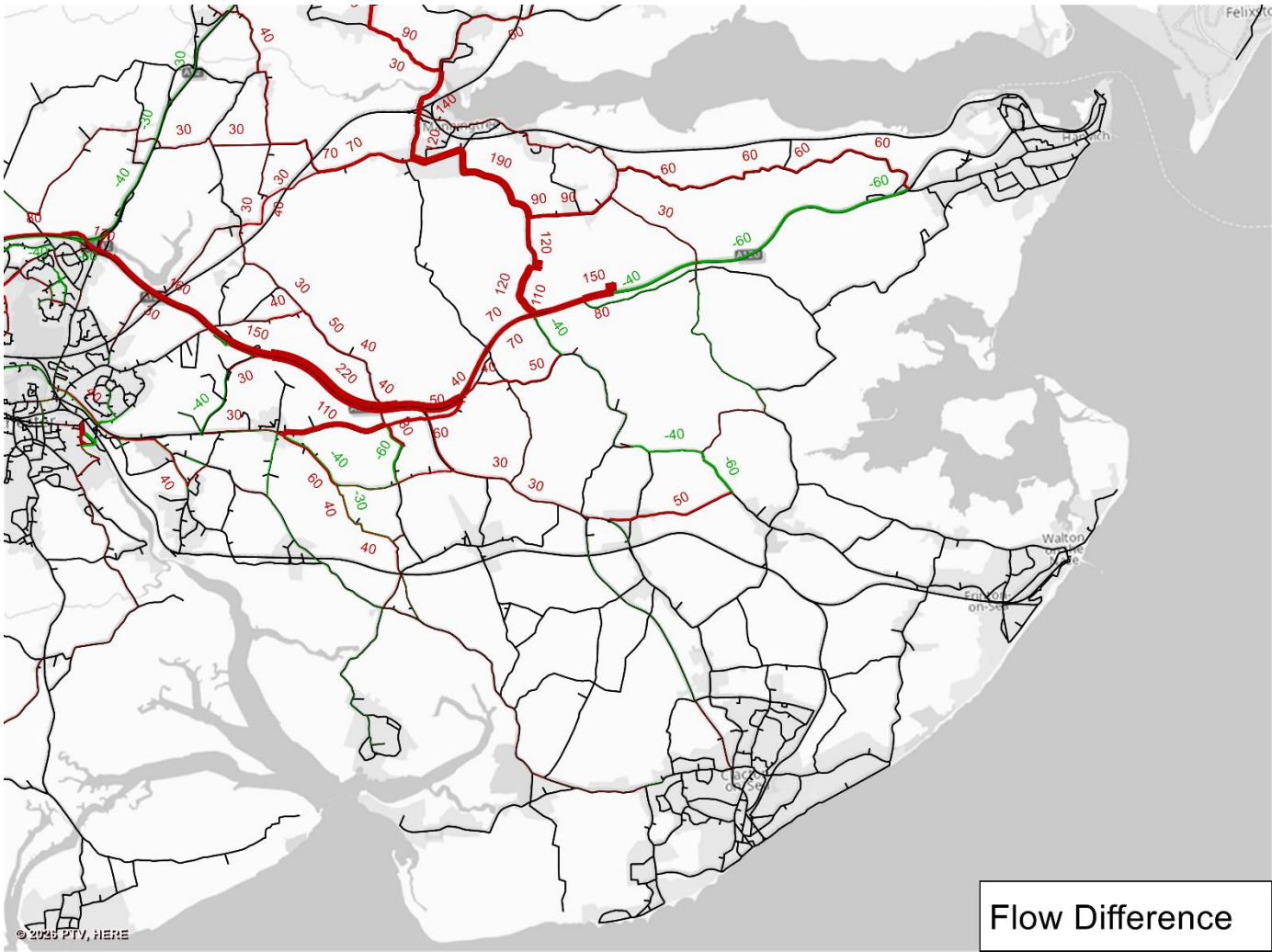


Figure H 12: PM flow difference - Scenario 6 2058 assessment case with mitigation and BaU demand v Scenario 5 2058 reference case with mitigation

H.2.3 PM speed plots (modelled speed / free flow speed)

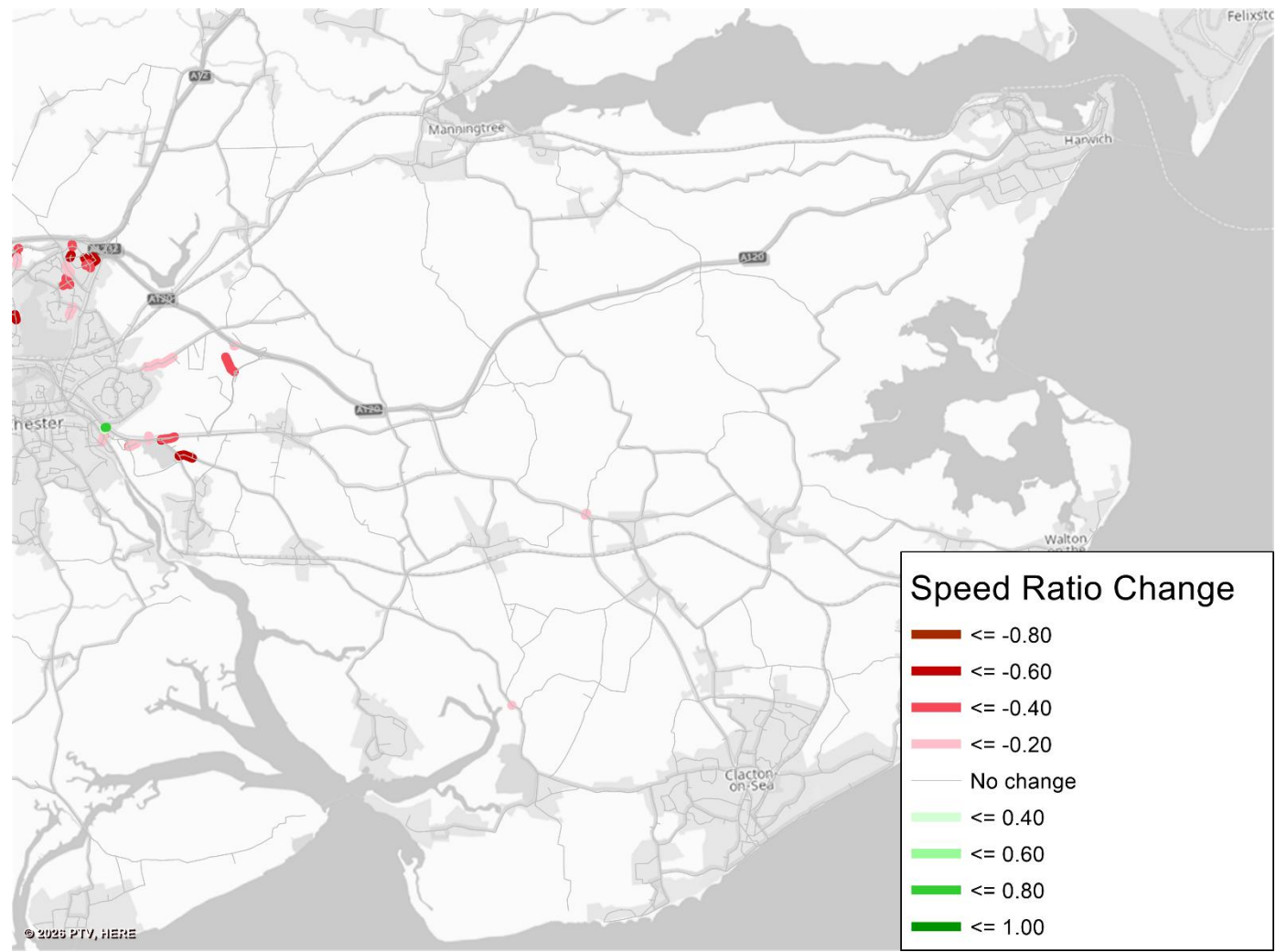


Figure H 13: PM Difference in traffic speed between Scenario 5 and Scenario 4

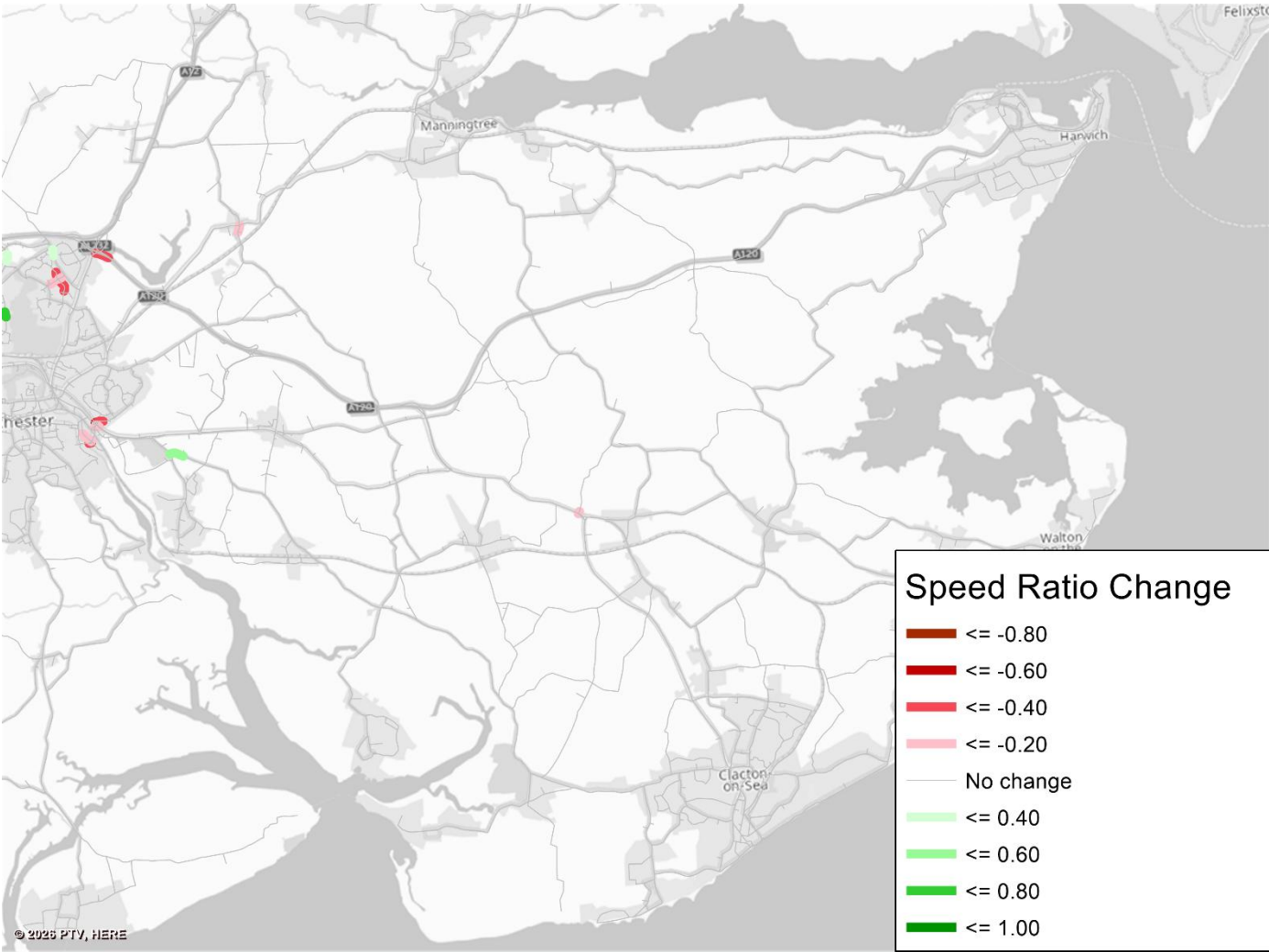


Figure H 14: PM Difference in traffic speed between Scenario 6 and Scenario 5

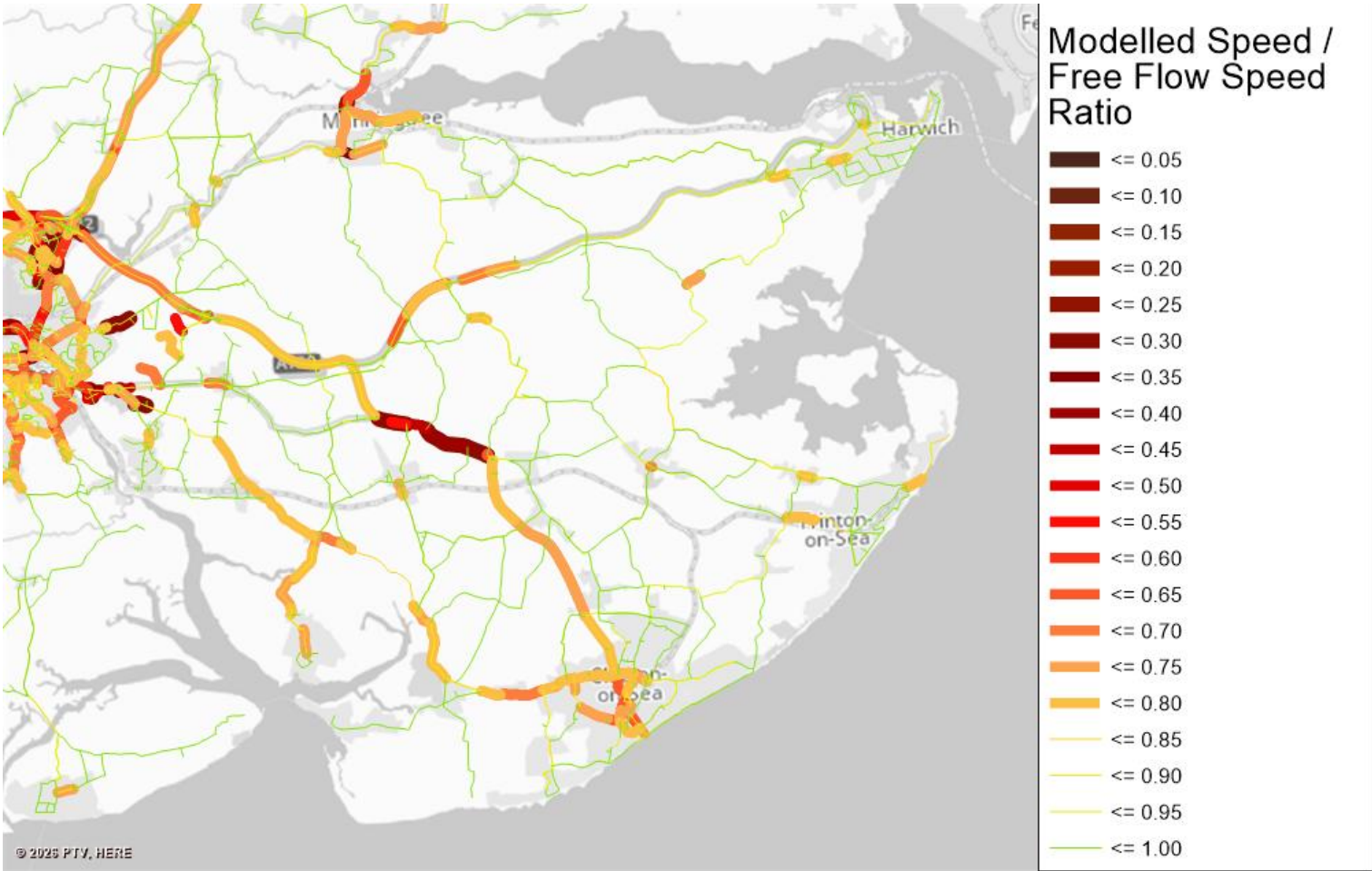


Figure H 15: PM speed ratio - Scenario 5 2058 reference case with mitigation

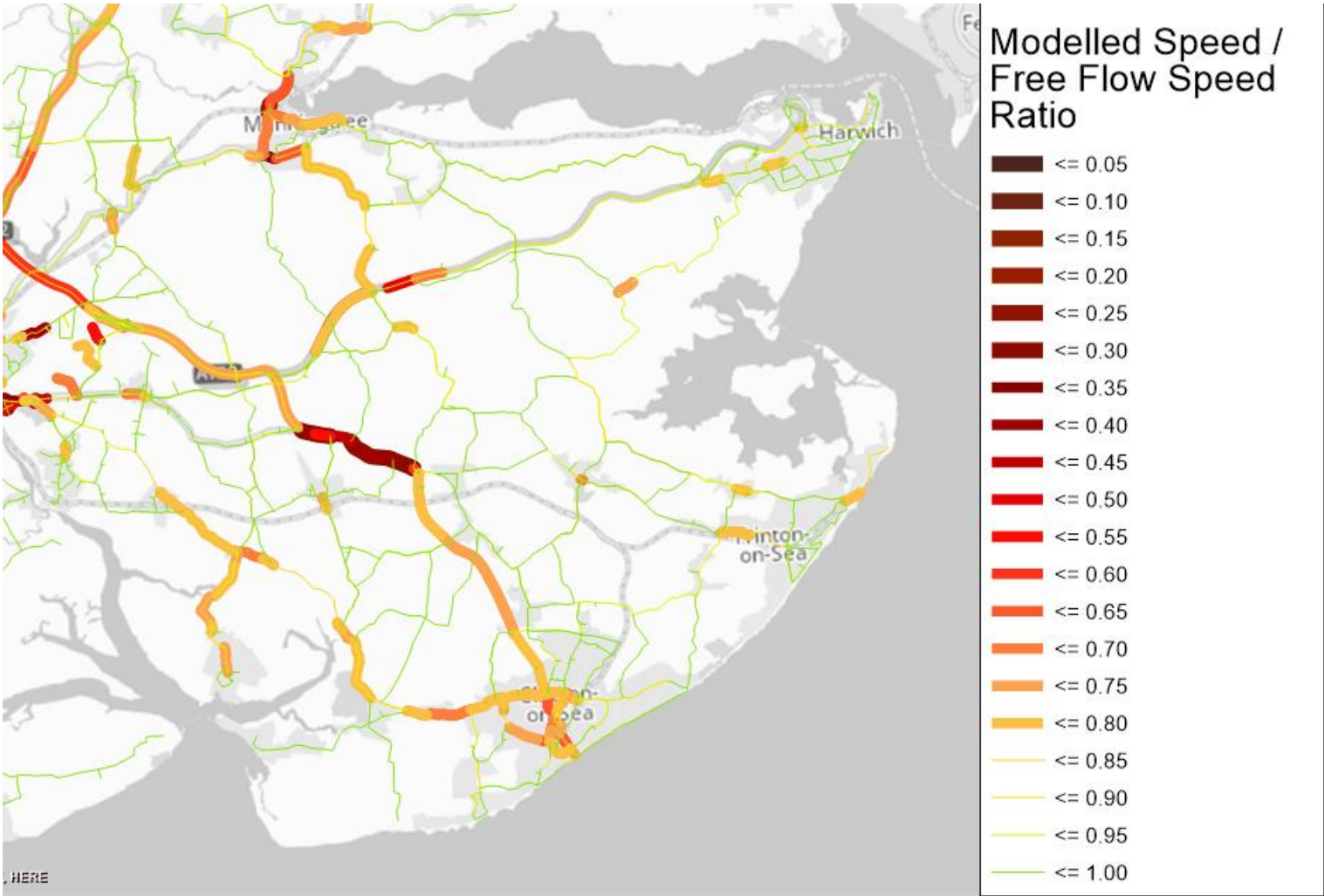


Figure H 16: PM speed ratio - Scenario 6 2058 assessment case with mitigation and BaU demand

H.2.4 PM relative queue plots (blocking back on road links in the model)

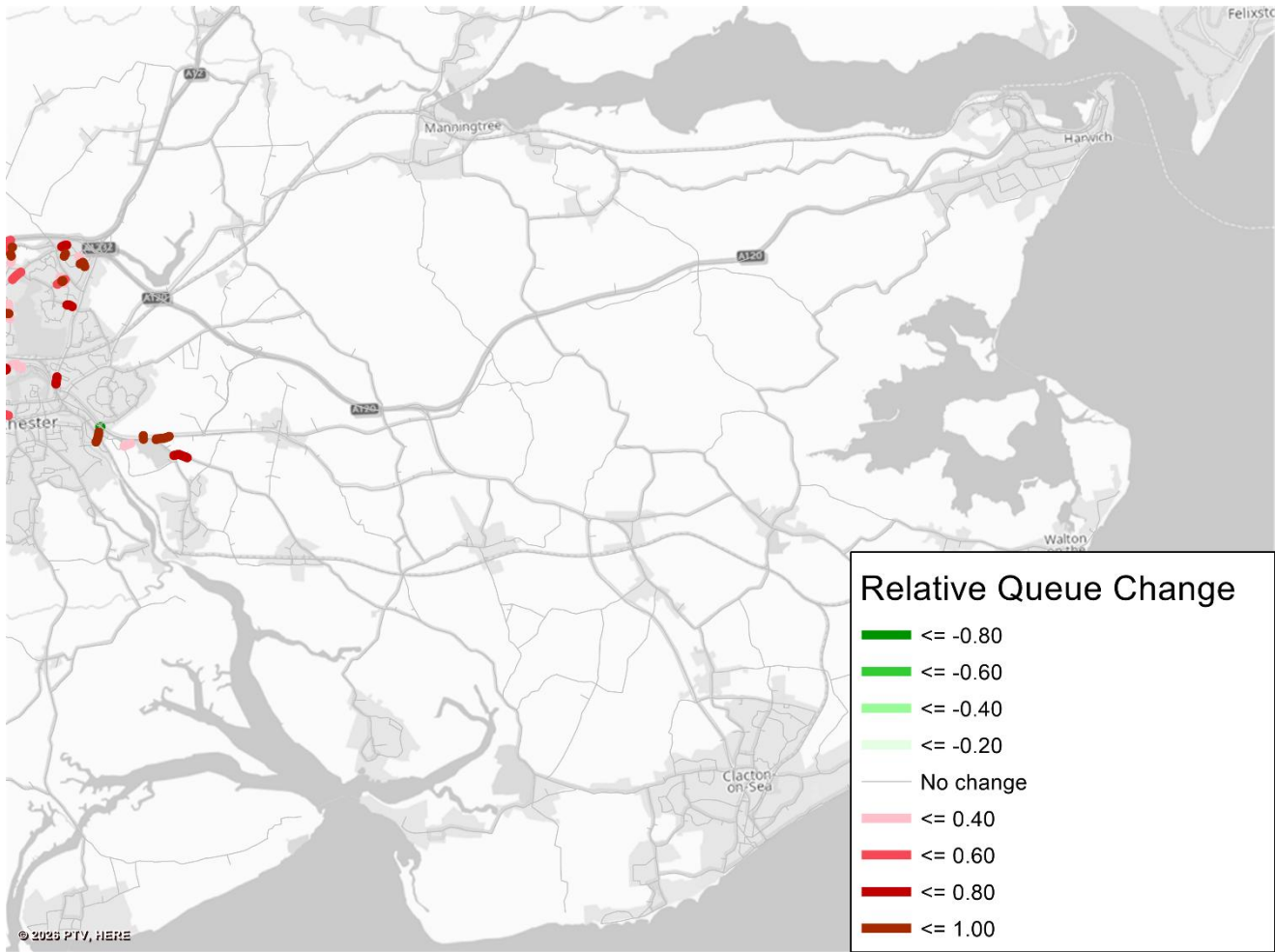


Figure H 17: PM Difference in blocking back (relative queues) between Scenario 5 and Scenario 4

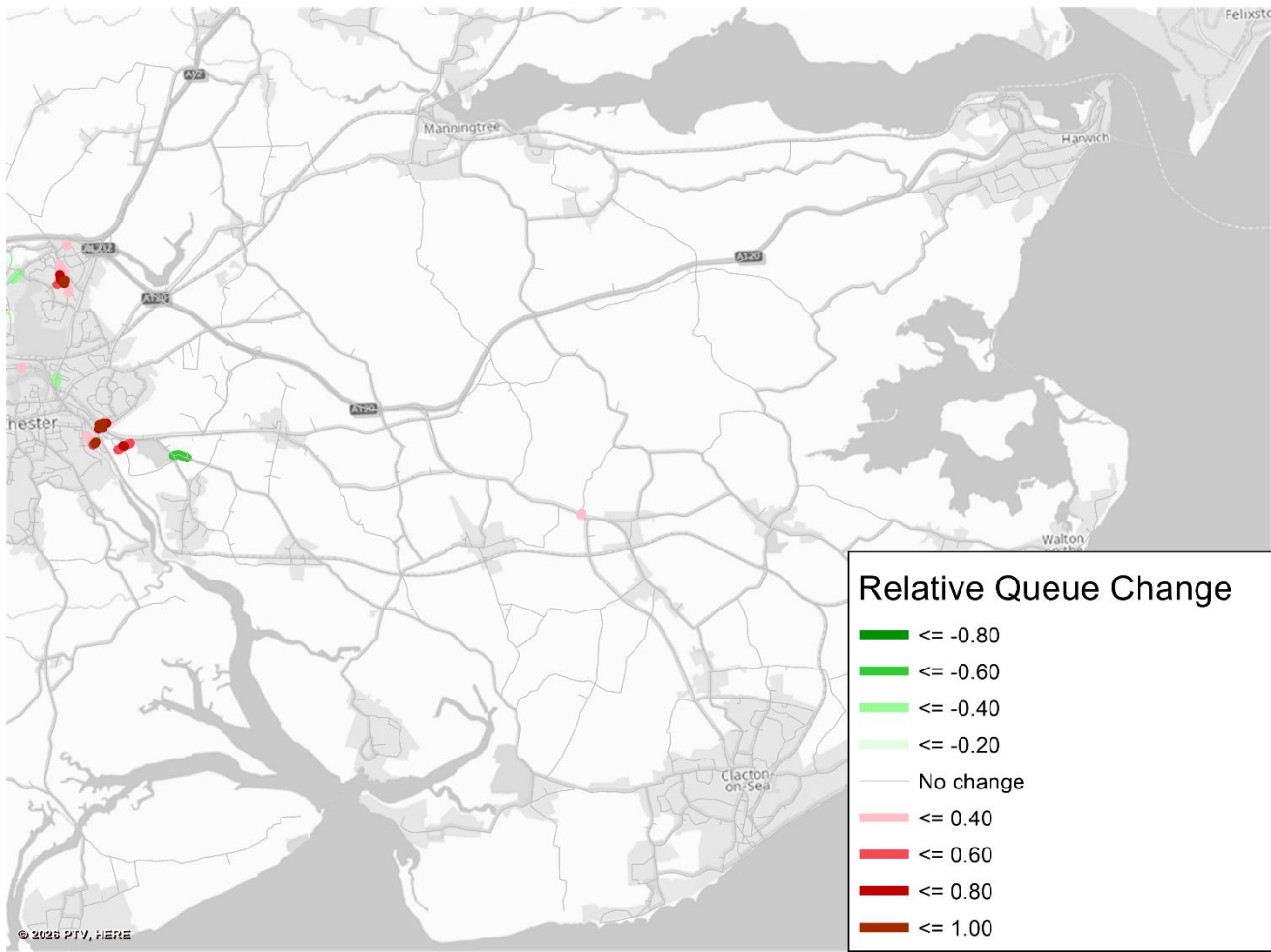


Figure H 18: PM Difference in blocking back (relative queues) between Scenario 6 and Scenario 5

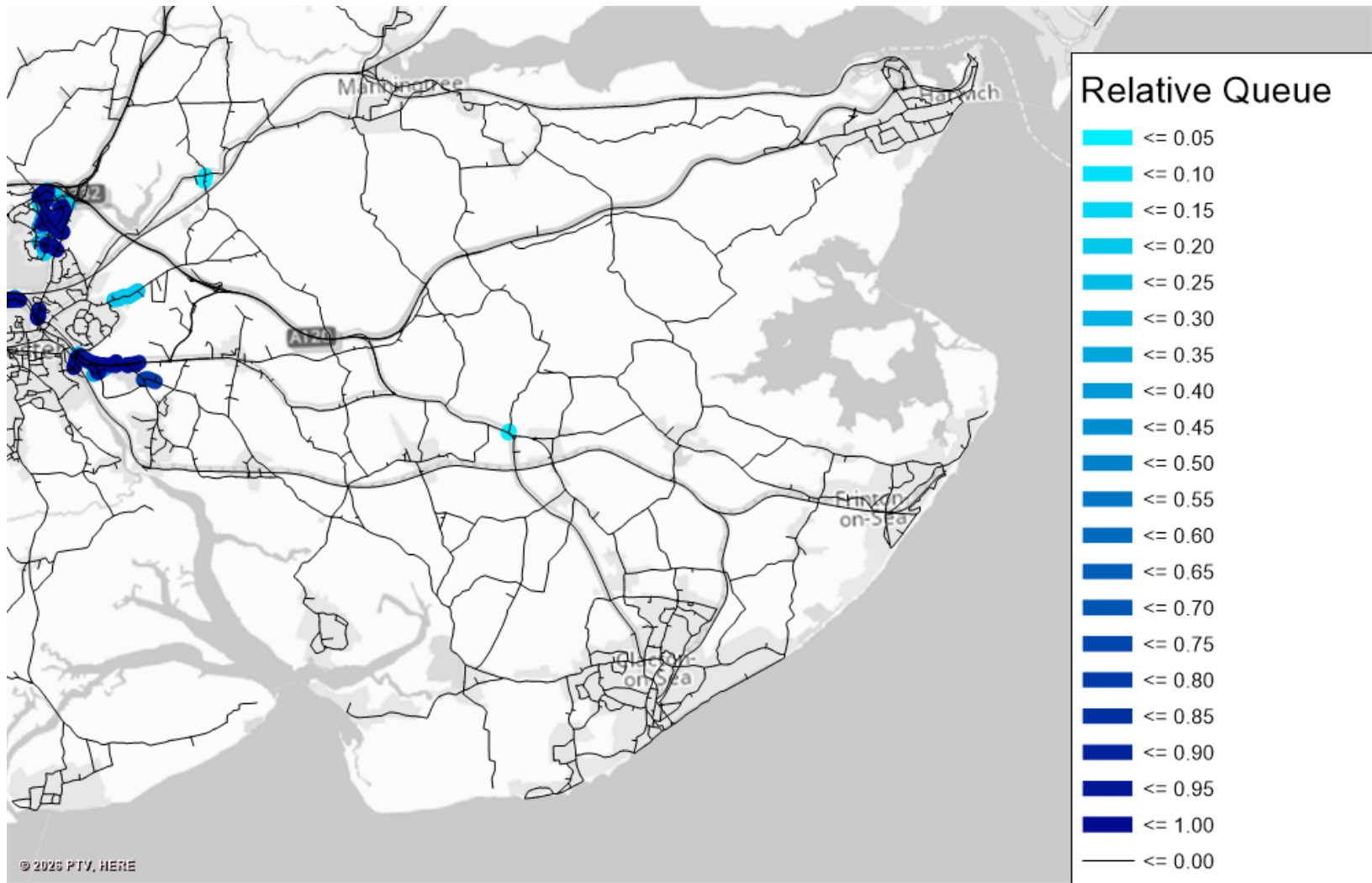


Figure H 19: PM relative queue - Scenario 5 2058 reference case with mitigation

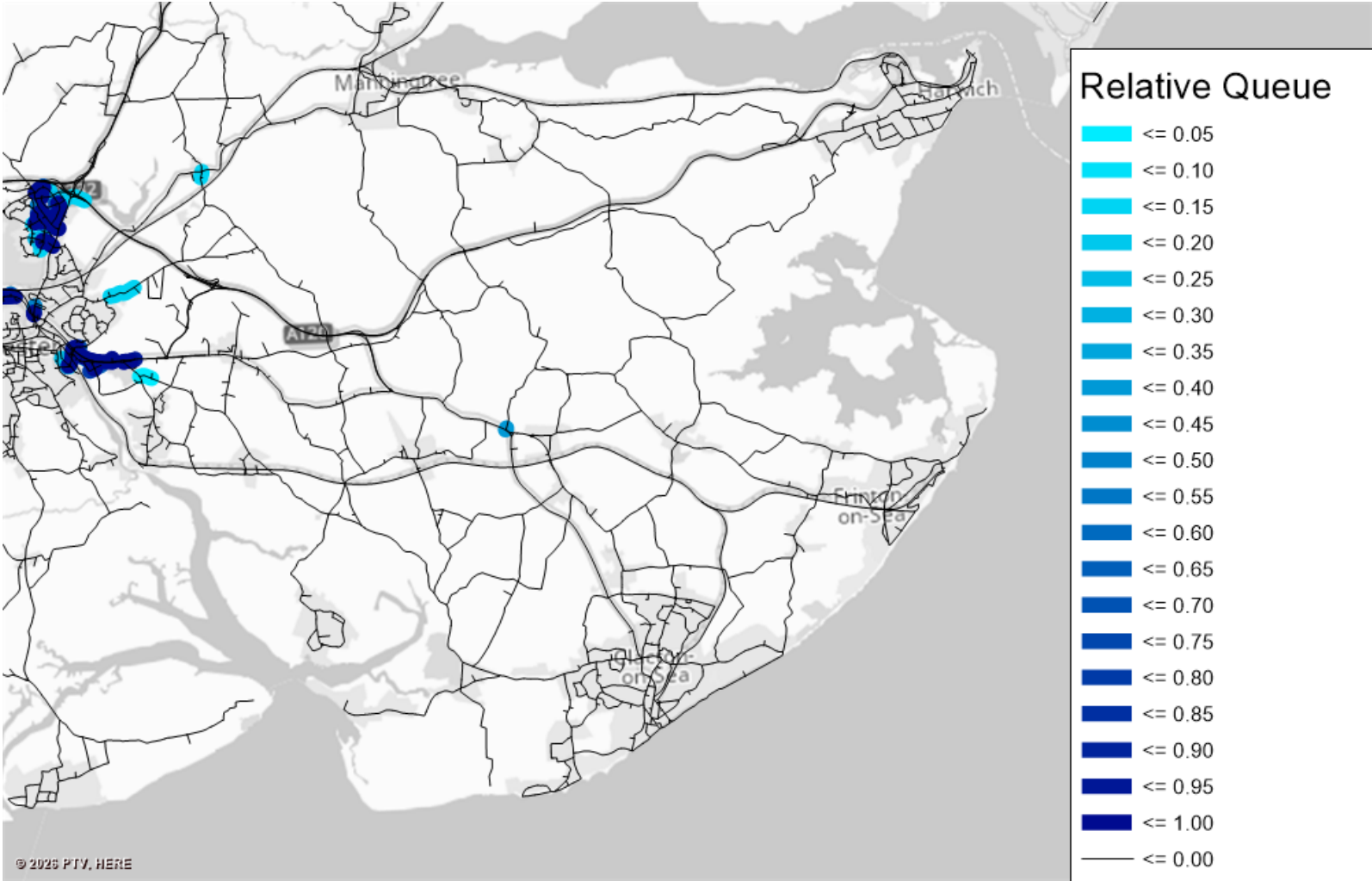


Figure H 20: PM relative queue - Scenario 6 2058 assessment case with mitigation and BaU demand