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AGENDA

CABINET MEETING

Date: Wednesday, 16 December 2020
Time: 7.00pm
Venue: Virtual Meeting Via Skype*

Membership:

Councillors Mike Baldock (Vice-Chairman), Monique Bonney, Angela Harrison, Ben J Martin, Richard Palmer, Roger Truelove (Chairman) and Tim Valentine.

Quorum = 3

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Pages

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1. Apologies for Absence

2. Minutes

   To approve the Minutes of the Meeting held on 28 October 2020 (Minute Nos. 207 - 219) as a correct record.

3. Declarations of Interest

   Councillors should not act or take decisions in order to gain financial or other material benefits for themselves or their spouse, civil partner or person with whom they are living with as a spouse or civil partner. They must declare and resolve any interests and relationships.

   The Chairman will ask Members if they have any interests to declare in respect of items on this agenda, under the following headings:

   (a) Disclosable Pecuniary Interests (DPI) under the Localism Act 2011. The nature as well as the existence of any such interest must be declared. After declaring a DPI, the Member must leave the meeting and not take part in the discussion or vote. This applies even if there is provision for public speaking.

   (b) Disclosable Non Pecuniary (DNPI) under the Code of Conduct adopted by the Council in May 2012. The nature as well as the existence of any such interest must be declared. After declaring a DNPI interest, the Member may stay, speak and vote on the matter.

   (c) Where it is possible that a fair-minded and informed observer, having considered the facts would conclude that there was a real possibility that the Member might be predetermined or biased the Member should declare their predetermination or bias and then leave the meeting while that item is considered.

   Advice to Members: If any Councillor has any doubt about the existence or nature of any DPI or DNPI which he/she may have in any item on this agenda, he/she should seek advice from the Monitoring Officer, the Head of Legal or from other Solicitors in Legal Services as early as possible, and in advance of the Meeting.

Part A Report for recommendation to Council

4. Medium Term Financial Plan and 2021/22 Budget 5 - 30

Part B Reports for Decision by Cabinet

Issued on Monday, 7 December 2020

The reports included in Part I of this agenda can be made available in **alternative formats**. For further information about this service, or to arrange for special facilities to be provided at the meeting, **please contact DEMOCRATIC SERVICES on 01795 417330**. To find out more about the work of the Cabinet, please visit www.swale.gov.uk

Chief Executive, Swale Borough Council,
Swale House, East Street, Sittingbourne, Kent, ME10 3HT

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Cabinet	
Meeting Date	16 December 2020
Report Title	Budget 2021/22 and Medium Term Financial Plan
Cabinet Member	Cllr Truelove, Leader and Cabinet Member for Finance
SMT Lead	Nick Vickers, Chief Financial Officer
Head of Service	Nick Vickers, Chief Financial Officer
Lead Officer	Phil Wilson, Financial Services Manager
Key Decision	Yes
Classification	Open
Forward Plan	Reference Number: 9
Recommendations	1. To endorse the draft 2021/22 revenue and capital budgets. 2. To endorse the Medium Term Financial Plan.

1. Purpose of Report and Executive Summary

1.1 This report sets out draft 2021/22 revenue and capital budgets and the draft Medium Term Financial Plan (MTFP).

1.2 The Council is facing its most serious challenges since its creation arising from the Covid 19 pandemic. Huge calls have been made upon the resources and ingenuity of the Council to help residents deal with the consequences of the pandemic. This crisis is about the health of residents, supporting the most disadvantaged and those hardest hit, such as the Clinically Extremely Vulnerable, and trying to ensure that a robust local economy survives the pandemic. This budget is focussed on how the Council can positively support the community over the next 18 months.

1.3 The Government announced a Spending Review on 25 November and the Local Government Finance Settlement has to be announced by 17 December and a verbal update will be given on the impact if known.

1.4 The contents of this report will form the basis of the formal scrutiny of the proposals on 20 January.

2. Background

Local Government Finance

2.1 The fundamental changes planned to the funding basis of councils have once again been deferred. The changes would have seen business rate localisation, a reset of each council's business rate base position and the implementation of the Fair Funding Review notionally reflecting resource needs in the allocation of funding. It does seem unlikely that these fundamental changes, which will result in many losers in funding, will be implemented in the foreseeable future.

2.2 This Council receives 25% less in Revenue Support Grant and Business Rates income than it did 10 years ago. With the significant price inflation in that time this shows just how severely funding for the Council has been reduced. The Government, in moving away from Revenue Support Grant, reflecting some element of need, to funding through Business Rates, is not properly funding high need areas. The Covid pandemic has focussed attention on just how stretched Council finances have become and the response from the Ministry for Housing, Communities and Local Government (MHCLG) has been quite exceptional. In light of the initial Council estimate of a funding pressure from Covid of £4.1m the following funding streams have been or will be received:

Funding	Amount £	Allocation basis
Tranche 1	75,560	March £1.6bn of which £1.46bn for Social care
Tranche 2	1,501,441	April £1.6bn with 35% allocation to districts
Tranche 3	317,585	July £500m with a Relative Needs Formula reflecting deprivation
Tranche 4	1,027,204	October £919m with a Relative Needs Formula reflecting deprivation
Sales, Fees and Charges	716,000	75% of defined losses on some Sales, Fees and Charges - initial submission made
Sub-total	**3,637,790**	
New Burdens Grant Revenues & Benefits	170,000	Banded allocation based upon number of hereditaments
Covid Enforcement	90,000	£30m allocation nationally
Contain Outbreak Funding	100,000	Via Kent County Council (KCC)
Total	**3,997,790**	

Note- this table excludes funding streams for specific purposes provided via KCC.

2.3 At this point in time there has been no further commitment from MHCLG to provide additional funding but it seems reasonable to assume that Government, having taken the steps it has to date, will not want to see large numbers of local authorities failing.

2.4 The Spending Review was on 25 November and the Chancellor of the Exchequer made announcements which are highly supportive of the strategy being put forward for balancing the Council's finances in 2021/22. The main features are:

- £1.55bn grant funding to cover COVID related expenditure costs for Quarter 1 2021/22. It is anticipated that this will be allocated on a needs basis as Tranche 4 funding was.

- Extension of the Sales Fee and Charges scheme for the first Quarter 1 of 2021/22 – 75% reimbursement with a 5% disregard (calculated on the first quarter only).

- £670m of additional grant funding to help local authorities support households that are least able to afford Council Tax payments.

- Maintain the existing New Homes Bonus (NHB) scheme for a further year with no new legacy payments. This is positive but we will have to await the detail in a MHCLG technical paper. The Council is forecasting an £881,000 reduction in NHB for 2021/22.

Coalition Priorities

2.5 Against this very difficult background the Council has to be able to meet the challenges from the Covid pandemic. The Recovery Plan agreed by Cabinet emphasises delivery of the priorities identified in May 2019 and now reflected in the new Corporate Plan as the key priorities for recovery. The 2021/22 budget therefore needs to support the delivery of the priorities in this Covid environment which means maintaining and where possible enhancing services to residents to assist them through the recovery.

2.6 The current circumstances are quite unprecedented for councils and this requires different thinking even if the legal framework which the Council has to operate within is unchanged. The budget proposals therefore reflect:

- Delivery of existing Coalition priorities has to be maintained. The next two years should see major steps forward based on the work undertaken to date.

- The organisation cannot support large scale reductions in staffing levels as would normally have to happen in this financial position.

- The Council has responded well to Covid and, with the pandemic by no means defeated, it is important that the Council can respond to new demands placed upon it. Government ministers have implied that they do not want to see councils slashing services at this time. But a balanced revenue budget position has to be achieved.

2.7 The Council in May 2019 had reserves of £23.9m, this reduced to £23.5m at 31 March 2020. The approach has been to use one off monies to support key Coalition priorities. So over the four years the £4m of Business Rates Volatility Reserve and £3.8m of shared Business Rates funds are committed to Coalition priorities. The projects supported from the Special Project Fund are reported separately to this meeting but show the extent of support provided across the borough to support specific projects.

Affordable Housing

2.8 There has been a significant increase in homelessness driven by the Covid 19 pandemic. This has resulted in a budget pressure of £500,000 for 2021/22.

2.9 It has been clear for a number of years that the real issue here is about increasing the supply of affordable homes. This is being approached in two main ways:

- Via the planning process. Currently it is projected that firm delivery sites over 5 years will be able to deliver 867 affordable dwellings.

- Through the creation of a housing company (Rainbow Homes). The business plan was agreed by Cabinet on 23 September and the first business case envisages 139 affordable homes being developed with Council funding of £23m.

2.10 Further business cases from Rainbow Homes will be considered as the company develops.

Use of Reserves

2.11 Reserves are central both to achieving the Coalition priorities and to achieving a balanced budget position. The Reserves position is healthy largely due to business rates growth since the partial localisation of Business Rates by the Coalition Government in 2013. Given the impact of Covid 19 it will be necessary to use Reserves to achieve a balanced position for 2021/22. It has to be recognised by all that the continued use of Reserves to achieve a balanced revenue budget position is not sustainable.

Capital Strategy

2.12 The capital strategy will be reported to Cabinet and Council in February. A draft capital budget is presented for Scrutiny to consider. New projects for the capital budget will be subject to individual business cases for decision by Cabinet.

Council Tax

2.13 The 2021/22 budget and the MTFP assume an increase of £4.95 per annum subject to confirmation in the Local Government Finance Settlement of the parameters for District Councils.

Contractual Price Inflation

2.14 The Council's major contracts are subject to price inflation (or deflation) provisions. The main contracts have the following provisions:

Contract	Inflation Provision
Refuse/ Street cleaning	Average Weighted Earnings (AWE) 40%, Consumer Price Index (CPI) 40%, and Diesel fuel index 20%
Grounds maintenance	Retail Price Index excluding mortgage interest payments (RPIX)
Leisure	Retail Price Index
Public Conveniences	AWE 55%, CPI 35%, and Diesel fuel index 10%.

Staff Pay

2.15 The budget currently reflects the fact that the staff pay increase, to which members' allowances increases are linked, is subject to negotiation locally. The current budget provision is for a 2% increase plus further salary costs including increments where applicable. In the Spending Review the Chancellor announced a widespread pay freeze across the public sector which we may apply to the Council. However, staff earning £24,000 or less will receive an increase of £250. We need to evaluate the impact of this, and it will be reported in the February Cabinet report.

Section 114 Local Government Finance Act 1988

2.16 When the pandemic hit in March 2020 there was much talk of the Section 114 powers. This has come back into prominence as a Section 114 notice was issued in the London Borough of Croydon in November 2020. This followed a Report in the Public Interest by external auditors, Grant Thornton, which makes very sanguine reading.

2.17 S114 imposes a specific duty on the S151 Officer to prepare and present a public report in certain circumstances of actual or possible financial misconduct and in circumstances where the S151 Officer believes it is not possible to maintain or achieve a balanced financial position.

2.18 The S151 Officer would be required to report to full Council within 21 days. The Council cannot enter into any agreements incurring expenditure until Council has considered the report.

2.19 To be clear, the S151 Officer would only take this route after all other options to achieve a balanced financial position had been unsuccessful. MHCLG officials in discussion with Kent Finance Officers have emphasized that they would want to be involved at an early stage if a Council felt that it was at risk of issuing a S114 notice.

2.20 To be absolutely clear there is no possibility of this happening in this Council.

3. Proposals

3.1 The updated Medium Term Financial Plan is attached in Appendix I. It currently shows a gap to be closed for a balanced position of £3,246,000. A gap of this magnitude on a net budget of £19m is unprecedented. The forecast includes an £881,000 reduction in New Homes Bonus income and for the first time since Business Rates were part localised in 2013 a forecast reduction in Business rates income, the latter reflecting the impact of Covid 19.

3.2 Variations from the 2020/21 base budget are set out in Appendix II. For convenience they are shown by Head of Service with the standard categories of Growth, Unavoidable Cost Pressures, Loss of Income, Service Savings and Additional Income.

3.3 The approach to bridging the £3.3m gap is based upon:

- Resisting pressures (£1.1m) - see paragraph 3.5;
- Assume that Government will not reduce funding (£1m);
- Balance from Reserves £1.2m.

3.4 If Government funding is not increased that would ultimately mean an additional £1m having to come from Reserves. This is a high risk approach which would not be recommended in “normal” circumstances but is driven by maintaining the Council’s Covid response. The Spending Review announcements are highly supportive of this strategy.

3.5 The table below shows the detail on resisting pressures:

Service Area	Issue	Amount £	Action
Environmental Health	Increase in charges from Tunbridge Wells Council	85,510	Not accepted/ under discussion
Parking	Increased charge from Maidstone Council	38,000	Fund from car parking income
Environmental & Community Services	Culture grants	10,000	Fund from other member funds
Environmental & Community Services	Members grants	53,800	Fund from Special Projects Fund (SPF) as planned
Planning	Local Land Charge income	76,000	Not accepted/ under discussion
Planning	Increased costs	30,000	Performance Fund
Planning	Planning fees reduced	180,850	Revise forecast/ staff savings
Leisure	Project surveyor	45,000	Fund from SPF as planned
Planning	Additional Heritage Officer	61,170	Fund from Heritage Reserve £250k
Licensing	Additional post	21,140	Fund from ring fenced income
Finance	Increased pension costs	181,640	Fund from reserves
Finance	Minimum Revenue Provision (MRP)	301,660	Fund from reserves
Revenues & Benefits	Reduction in benefits subsidy	52,280	Fund from Revenues & Benefits reserve
Total		**1,137,050**	

3.6 The draft capital budget is attached in Appendix III.

4. Alternative Options

4.1 Do nothing – This is not recommended as the Council is legally required to set a balanced budget. The Constitution also requires the Scrutiny Committee to have budget proposals one month in advance of their January meeting. Further budget report will be submitted to Cabinet and Council in February 2021.

5. Consultation Undertaken or Proposed

5.1 Formal consultation with the business community will be undertaken.

6. Implications

Issue	Implications
Corporate Plan	The budget proposals support the achievement of the Council's corporate priorities.
Financial, Resource and Property	The report sets out the Council's resourcing position.
Legal, Statutory and Procurement	The Council is required to set a Council tax and a balanced budget.
Crime and Disorder	Any potential implications will be addressed by service managers in their budget proposals.
Environment and Sustainability	The proposals support the Climate Change and Ecological motion agreed by Cabinet.
Health and Wellbeing	Funding is allocated for a dedicated Health post.
Risk Management and Health and Safety	Any potential implications will be addressed by service managers in their budget proposals.
Equality and Diversity	Any potential implications will be addressed by service managers in their budget proposals.
Privacy and Data Protection	Any potential implications will be addressed by service managers in their budget proposals.

7. Appendices

7.1 The following documents are to be published with this report and form part of the report:

- Appendix I: Medium Term Financial Plan
- Appendix II: Budget variations
- Appendix III: Capital budget

8. Background Papers

None

2021/22 Medium Term Financial Plan (MTFP)

	2020/21 £'000	2021/22 £'000	2022/23 £'000	2023/24 £'000
Base Budget	19,395	19,395	19,395	19,395
Growth items	0	68	70	71
Unavoidable cost pressures	0	972	1,065	1,225
Loss of income	0	386	523	518
Additional income	0	(95)	(95)	(96)
Committed price increases	0	191	430	754
Sittingbourne Town Centre (STC) Bourne Place & Retail Park	0	(129)	(447)	(445)
Lower Medway Internal Drainage Board	847	878	910	943
Pay Award (2%)	0	263	530	797
Other Pay Increases	0	78	125	150
Contribution to reserves	93	93	93	93
Contribution (from) Special Projects	(99)	0	0	0
Contribution (from) Performance Fund	(43)	0	0	0
Contribution (from) Communities Fund	(10)	0	0	0
Contribution (from) General Reserves	(541)	0	0	0
Contribution (from) Heritage Reserve	(61)	0	0	0
Contribution (from) Revenues Reserves	(52)	0	0	0
Sub Total Contribution (from) reserves	(806)	0	0	0
Revenue Support Grant	(115)	(101)	0	0
Business Rates *This does not reflect changes from Fair Funding Review, Baseline Reset and New Approach to Business Rates.*	(8,750)	(8,642)	(8,690)	(8,739)
Contribution from Business Rates Reserves	(250)	0	0	0
Levy account surplus	(173)	0	0	0
Council Tax	(8,623)	(8,949)	(9,282)	(9,620)
New Homes Bonus	(1,633)	(752)	(371)	0
Savings Required	**(15)**	**3,656**	**4,256**	**5,046**
Service savings	0	(410)	(409)	(388)
Requirement for balanced position	0	(3,246)	(3,847)	(4,658)
Committed savings	**0**	**(3,656)**	**(4,256)**	**(5,046)**
Contribution (to) General Fund	**(15)**	**0**	**0**	**0**
Council Tax	£179.37	£184.32	£189.27	£194.22
Tax Base	48,072.67	48,553.40	49,038.93	49,529.32
Council Tax increase %	2.84%	2.76%	2.69%	2.62%
Council Tax increase £	£4.95	£4.95	£4.95	£4.95
Tax Base increase %	1.5%	1.0%	1.0%	1.0%

Appendix II

Budget Variations

No.	Head of Service	Service Description	Type of Spend/ Income	2019/20 Actual £	Original Budget 2020/21 £	MTFP Category	Explanation of Budget Change	21/22 Increase Over & Above 20/21 £	22/23 Increase Over & Above 20/21 £	23/24 Increase Over & Above 20/21 £
1	Adams	Printing Section	Private Printing	-13,472	-12,000	Loss of income	External printing severely impacted due to Covid and uncertainty whether it will pick back up in 21/22.	6,000	6,000	6,000
2	Adams	Swale House - Structure	Rents	-21,986	-27,580	Loss of income	Swale FM not paying rent	5,180	5,180	5,180
3	Adams	Miscellaneous General Fund Properties	Rents	-351,055	-350,000	Loss of income	Will be reduced by £23,000 when Mormon Church site developed	0	23,000	23,000
4	**Adams**	**Sub Total**						**11,180**	**34,180**	**34,180**
5	Beattie	Kent & Medway Air Quality Data Mgt Network	Private Contractors	13,088	17,480	Unavoidable cost pressures	Contract management transferring to Tunbridge Wells in 2021/22	-17,480	-17,480	-17,480
6	Beattie	Kent & Medway Air Quality Data Mgt Network	Fees and Charges		-17,480	Unavoidable cost pressures	Contract management transferring to Tunbridge Wells in 2021/22	17,480	17,480	17,480
7	Beattie	Environmental Protection	Charges for Environmental Services		39,000	Service savings	Air Quality Project Officer for 2 years only (20/21 Budget Item 10 Special Projects Fund)	-39,000	-39,000	-39,000
8	Beattie	Contributions from Funds	Expenditure funded from Reserves		-39,000	Contribution from Reserves	End of reserve funding of Air Quality Project Officer (20/21 Budget Item 11 Special Projects Fund)	39,000	39,000	39,000

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Budget Variations

No.	Head of Service	Service Description	Type of Spend/ Income	2019/20 Actual £	Original Budget 2020/21 £	MTFP Category	Explanation of Budget Change	21/22 Increase Over & Above 20/21 £	22/23 Increase Over & Above 20/21 £	23/24 Increase Over & Above 20/21 £
9	Beattie	Various	Tunbridge Wells Council recharge for Environmental Services	496,390	526,160	Unavoidable cost pressures	Increase in cost of service and increase in Council's share of total costs	85,510	97,640	110,120
10	**Beattie**	**Sub Total**						**85,510**	**97,640**	**110,120**
11	Cassell	Head of Commissioning Economy and Community Services	Salary Savings	0	-60,000	Service savings	To confirm that these restructure 20/21 Budget savings will be achieved.	0	0	0
12	Cassell	Car Park Staff	Maidstone Council Charges for Car Parking	120,736	114,000	Unavoidable cost pressures	Revised resourcing	38,000	38,000	38,000
13	Cassell	Seafront	Undue Wear & Tear Rental Car	2,754	0	Unavoidable cost pressures	Trucks hire contract returnable standard	0	0	3,000
14	Cassell	Swale Community Leisure Trust Ltd	Contracts	228,319	112,150	Service savings	Contract anniversary in October 2021/22. Parking refunds of £90,000 not included.	-23,810	-38,570	-38,570
15	Cassell	Open Spaces - Swale	Commuted Sums - Contracts		-90,000	Loss of income	Change in policy of adopting open land has resulted in no additional new income	0	26,000	46,000

Appendix II

Budget Variations

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16	Cassell	Faversham Recreation Ground	Salaries			Growth items	Budget for 2 posts for 5 years	29,850	31,810	33,180
17	Cassell	Faversham Recreation Ground	Grants & Subscriptions	0	0	Growth items	Funding for 2 posts for 5 years on Faversham Recreation Project from Heritage Fund (Lottery) and s106.	-29,850	-31,810	-33,180
18	Cassell	Environmental Initiatives	Equipment Purchase	0	15,000	Unavoidable cost pressures	Move budget for grants to equipment.	-15,000	-15,000	-15,000
19	Cassell	Environmental Initiatives	Grants and subscriptions	19,763	0	Unavoidable cost pressures	Move budget for grants to equipment.	15,000	15,000	15,000
20	Cassell	Environmental Initiatives	Fixed Penalty Notice (Environmental Response)	-141,460	-152,360	Loss of income	Predicted that there will be lower level of issuing from new contractor based on industry research	12,360	12,360	12,360
21	Cassell	Public Conveniences	Rates	16,686	22,970	Service savings	Business rates multiplier	-6,070	-6,030	-5,940
22	Cassell	Wheeled Bins	Equipment Purchase	234,637	137,000	Unavoidable cost pressures	Additional bin purchases to be offset against additional income and use of remaining reserve.	50,000	0	0

Budget Variations

No.	Head of Service	Service Description	Type of Spend/ Income	2019/20 Actual £	Original Budget 2020/21 £	MTFP Category	Explanation of Budget Change	21/22 Increase Over & Above 20/21 £	22/23 Increase Over & Above 20/21 £	23/24 Increase Over & Above 20/21 £
23	Cassell	Recycling Campaign	Garden Waste Scheme-Brown Bins (not compost bins)	-580,898	-530,000	Additional income	Over achieved income in 2019-20. Small planned fee increase will probably balance drop in subscriptions following Covid effect.	-50,000	-50,000	-50,000
24	Cassell	Swale Car Parks	Rates	217,148	231,120	Service savings	Business rates multiplier	-11,920	-11,720	-10,620
25	Cassell	Swale Car Parks	Equipment Maintenance	20,320	15,000	Unavoidable cost pressures	Rebalanced budget and inflation	6,000	6,060	6,120
26	Cassell	Swale Car Parks	Fees - Licence	85,270	50,000	Unavoidable cost pressures	RingGo fees collected from customer for additional services and paid back to RingGo	35,620	35,980	36,340
27	Cassell	Swale Car Parks	Parking - Excess Charges	0	0	Unavoidable cost pressures	RingGo fees collected from customer for additional services and paid back to RingGo	-35,620	-35,980	-36,340
28	Cassell	S/B Multi-storey Car Park	Electricity	10,052	0	Unavoidable cost pressures	Operating costs of car park now known following opening 6 months last year.	12,000	12,000	12,000
29	Cassell	S/B Multi-storey Car Park	Fees and Services	2,137	0	Unavoidable cost pressures	Operating costs of car park software	10,000	10,000	10,000

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Budget Variations

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30	Cassell	S/B Multi-storey Car Park	Private Contractors	107,102	0	Unavoidable cost pressures	Full operational costs of managing the site.	28,120	32,350	36,670
31	Cassell	Civil Parking Enforcement	Computer Equipment & Materials	7,700	0	Unavoidable cost pressures	Shared software costs	7,700	7,700	7,700
32	Cassell	Contributions from Funds	Expenditure funded from Reserves		-45,000	Contribution from Reserves	End of reserve funding for Project Support Surveyor (permanent addition to establishment) (20/21 Budget item 32 Special Projects Fund)	45,000	45,000	45,000
33	**Cassell**	**Sub Total**						**117,380**	**83,150**	**111,720**
34	Clifford	Data Protection Resource	Salaries			Growth items	Information Governance (IG) officer post for one year fixed term	62,530	0	0
35	Clifford	Contributions from funds	Expenditure funded from Reserves			Growth items	IG officer post for one year fixed term funded from Performance Fund	-62,530	0	0
36	Clifford	Data Protection Resource	Salaries		57,560	Service savings	IG officer post due to end in 20/21 (20/21 Budget item 51)	-57,560	-57,560	-57,560
37	Clifford	Contributions from Funds	Expenditure funded from Reserves		-43,170	Contribution from Reserves	End of reserve funding for IG officer post due to end in 20/21(20/21 Budget item 52 Performance Fund)	43,170	43,170	43,170

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Budget Variations

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38	Clifford	Policy & Performance	Salary Savings	0	-20,000	Service savings	To confirm that these restructure 20/21 Budget savings will be achieved.	0	0	0
39	Clifford	Forums/Local Engagement Forums (LEF's)	Hire of Premises	0	0	Unavoidable cost pressures	Required to hold Area committees, initially remotely but 4 x quarterly meetings, 4 times a year - unless funded from Special Projects Fund?	6,000	8,000	10,000
40	Clifford	General Democratic Costs	Mid Kent Services (MKS) Director	42,077	42,030	Unavoidable cost pressures	Forecast 2020/21 plus 2% indexation	5,300	6,250	7,220
41	**Clifford**	**Sub Total**						**-3,090**	**-140**	**2,830**
42	Hudson	Head of Housing, Economy & Community Services	Salary Savings	0	-30,000	Service savings	To confirm that these 20/21 Budget savings will be achieved.	0	0	0
43	Hudson	Contributions from Funds	Expenditure funded from Reserves		-10,000	Contribution from Reserves	End of reserve funding for Culture Grants (20/21 Budget item 63 Communities Fund)	10,000	10,000	10,000
44	Hudson	Contributions from Funds	Expenditure funded from Reserves		-53,800	Contribution from Reserves	End of reserve funding for Members Localism Grants 20/21 Budget item 61 Special Projects Fund)	53,800	53,800	53,800

Appendix II

Budget Variations

No.	Head of Service	Service Description	Type of Spend/ Income	2019/20 Actual £	Original Budget 2020/21 £	MTFP Category	Explanation of Budget Change	21/22 Increase Over & Above 20/21 £	22/23 Increase Over & Above 20/21 £	23/24 Increase Over & Above 20/21 £
45	Hudson	Temporary Accommodation (TA) (Homelessness)	NL (Nightly Lets) - Homelessness Landlord Payments	1,611,919	1,700,000	Unavoidable cost pressures	Significant increase in TA and due to recession unlikely to improve position.	500,000	500,000	500,000
46	Hudson	Housing - Housing Options Team	Salaries		100,000	Service savings	End of reserve funding for Housing, Homelessness and Rough Sleepers Strategy (19/20 Budget item 59 General Reserves). Housing will be rolling forward grant monies to 21/22 to pay for staff. There will need to be a growth entered for 22/23 if no savings in staff.	-100,000	-100,000	-100,000
47	Hudson	Contributions from Funds	Expenditure funded from Reserves		-100,000	Contribution from Reserves	End of reserve funding for Housing, Homelessness and Rough Sleepers Strategy (19/20 Budget item 59 General Reserves). Housing will be rolling forward grant monies to 21/22 to pay for staff.	100,000	100,000	100,000
48	**Hudson**	**Sub Total**						**563,800**	**563,800**	**563,800**

Budget Variations

No.	Head of Service	Service Description	Type of Spend/ Income	2019/20 Actual £	Original Budget 2020/21 £	MTFP Category	Explanation of Budget Change	21/22 Increase Over & Above 20/21 £	22/23 Increase Over & Above 20/21 £	23/24 Increase Over & Above 20/21 £
49	Freeman	Planning Admin team	MKS charges for Planning	167,181	201,770	Unavoidable cost pressures	Forecast 2020/21 plus 2% indexation	19,760	24,190	28,710
50	Freeman	Local Land Charges	MKS Charges for Local Land Charges	57,122	75,060	Service savings	Forecast 2020/21 plus 2% indexation	-16,770	-15,600	-14,410
51	Freeman	Local Land Charges	Fees and Charges	-160,002	-236,000	Loss of income	The income budget has consistently been too high compared to actual income received.	76,000	76,000	76,000
52	Freeman	Building Control - Client Side	Contracts	62,972	59,240	Growth items	In accordance with shared service business plan	5,980	8,080	8,740
53	Freeman	Development Management	Fees and Charges	0	19,370	Growth items	This increase is based on trends in previous years.	30,000	30,000	30,000
54	Freeman	Development Management	Computer Equipment & Materials	0	0	Growth items	This is for the exacom software.	10,000	10,000	10,000
55	Freeman	Development Management	Planning Fees	-974,581	-1,180,850	Loss of income	This represents the forecast income from Planning Fees and does not include any adjustment for coronavirus.	180,850	180,850	180,850
56	Freeman	Development Management	Pre-application Planning advice	-59,479	-120,000	Additional income	Demand for this service is expected to increase.	-10,000	-10,000	-10,000

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Budget Variations

No.	Head of Service	Service Description	Type of Spend/ Income	2019/20 Actual £	Original Budget 2020/21 £	MTFP Category	Explanation of Budget Change	21/22 Increase Over & Above 20/21 £	22/23 Increase Over & Above 20/21 £	23/24 Increase Over & Above 20/21 £
57	Freeman	Local Plan	Fees and Services	166,293	151,540	Unavoidable cost pressures	The Local Plan Reserve currently absorbs any overspend on the revenue budget, but this reserve will be exhausted by March 2022, thereafter expenditure will have to be contained within this budget.	0	0	0
58	Freeman	Contributions from Funds	Expenditure funded from Reserves		-61,170	Contribution from Reserves	End of reserve funding for Heritage Conservation & Design (19/20 Budget item 52 £250k Heritage Strategy Reserve)	61,170	61,170	61,170
59	**Freeman**	**Sub Total**						**356,990**	**364,690**	**371,060**
60	Fackrell	Licensing	Salaries	95,195	113,860	Growth items	To restructure the team to enable an effective statutory service. Self-supporting service	21,140	21,140	21,140
61	Fackrell	Licences (Legal)	Licence Fees (Legal)	-128,788	-120,000	Additional income	To reflect anticipated higher income than originally forecast.	-5,000	-5,000	-5,000
62	Fackrell	Hackney Carriages + Private Hire	Hackney Carriage Licences	-97,899	-65,000	Additional income	Fees consistently received	-25,000	-25,000	-25,000
63	**Fackrell**	**Sub Total**						**-8,860**	**-8,860**	**-8,860**

Budget Variations

No.	Head of Service	Service Description	Type of Spend/ Income	2019/20 Actual £	Original Budget 2020/21 £	MTFP Category	Explanation of Budget Change	21/22 Increase Over & Above 20/21 £	22/23 Increase Over & Above 20/21 £	23/24 Increase Over & Above 20/21 £
64	Finance	Various	Pensions Future Funding	1,177,549	1,517,450	Unavoidable cost pressures	From last triennial valuation	65,590	97,250	129,540
65	Finance	Adjustments between accounting/funding basis - GF	Pensions Backfunding	0	1,200,000	Unavoidable cost pressures	From last triennial valuation	40,000	90,000	150,000
66	Finance	Contributions from Funds	Expenditure funded from Reserves		-88,370	Contribution from Reserves	End of reserve funding for pension commitments from last revaluation (19/20 Budget item 87 General Reserves)	88,370	88,370	88,370
67	Finance	Adjustments between accounting/funding basis - GF	Pension Enhancements	223,913	229,000	Service savings	Reduction in pension costs	-12,320	-12,320	-12,320
68	Finance	Chief Financial Officer	Salary Savings	0	-21,840	Service savings	To confirm that these Resources Directorate 20/21 Budget savings will be achieved.	0	0	0
69	Finance	Chief Financial Officer	Salary Savings	0	-30,000	Service savings	To confirm that these 20/21 Budget savings will be achieved.	0	0	0

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Budget Variations

No.	Head of Service	Service Description	Type of Spend/ Income	2019/20 Actual £	Original Budget 2020/21 £	MTFP Category	Explanation of Budget Change	21/22 Increase Over & Above 20/21 £	22/23 Increase Over & Above 20/21 £	23/24 Increase Over & Above 20/21 £
70	Finance	Adjustments between accounting/funding basis - GF	Minimum Revenue Provision (MRP) not for STC	286,231	292,530	Service savings	MRP costs not including Retail Park or Bourne Place	-55,170	-26,170	-25,170
71	Finance	Contributions from Funds	Expenditure funded from Reserves		-301,660	Contribution from Reserves	End of reserve funding for MRP for capital projects (19/20 Budget item 97 General Reserves)	301,660	301,660	301,660
72	**Finance**	**Sub Total**						**428,130**	**538,790**	**632,080**
73	Revenues	Housing Benefit	Recovery Via Academy	-452,467	-652,370	Loss of income	Income from the recovery of overpaid housing benefit set to continue to fall due to move to Universal Credit.	102,370	127,370	152,370
74	Revenues	Council Tax	Salaries			Growth items	2 posts within Council Tax are funded from the Council Tax Support Grant	57,000	0	0
75	Revenues	Contributions from Funds	Expenditure funded from Reserves			Growth items	2 posts within Council Tax are funded from the Council Tax Support Grant	-57,000	0	0
76	Revenues	Fraud Partnership	MKS Fraud Partnership Charges	18,328	33,660	Service savings	Based on 2019/20 outturn	-15,330	-15,330	-15,330

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Budget Variations

No.	Head of Service	Service Description	Type of Spend/ Income	2019/20 Actual £	Original Budget 2020/21 £	MTFP Category	Explanation of Budget Change	21/22 Increase Over & Above 20/21 £	22/23 Increase Over & Above 20/21 £	23/24 Increase Over & Above 20/21 £
77	Revenues	Council Tax Collection	Recovery of Costs	-462,884	-413,500	Loss of income	Reduction in income from court costs due to Covid for 21/22 is met from the Revenues reserves	113,500	63,500	13,500
78	Revenues	Contributions from Funds	Expenditure funded from Reserves	0	0	Loss of income	Assume reduction in income from court costs due to Covid and the economic environment but there will be some recovery 21/22 onwards met from Revenues reserves.	-113,500	0	0
79	Revenues	Housing Benefit & Council Tax Support - Administration	Benefit Subsidy	-399,813	-375,840	Unavoidable cost pressures	A year on year reduction in the Benefit Subsidy received is forecast.	-3,980	15,010	33,050
80	Revenues	Contributions from Funds	Expenditure funded from Reserves		-52,280	Contribution from Reserves	End of reserve funding for reduction in benefit subsidy (20/21 Budget item 105 Revenues and Benefits Reserve)	52,280	52,280	52,280
81	Revenues	Housing Benefit & C Tax Support - Administration	Council Tax Support Grant	-163,248	-158,630	Unavoidable cost pressures	A year on year reduction in the Council Tax Support Grant received is forecast.	7,940	15,470	22,630
82	**Revenues**	**Sub Total**						**143,280**	**258,300**	**258,500**

Budget Variations

No.	Head of Service	Service Description	Type of Spend/ Income	2019/20 Actual £	Original Budget 2020/21 £	MTFP Category	Explanation of Budget Change	21/22 Increase Over & Above 20/21 £	22/23 Increase Over & Above 20/21 £	23/24 Increase Over & Above 20/21 £
83	Clarke	Internal Audit	Mid Kent Services (MKS) - Audit Services	184,820	176,160	Unavoidable cost pressures	Forecast 2020/21 plus 2% indexation	13,480	17,270	21,140
84	**Clarke**	**Sub Total**						**13,480**	**17,270**	**21,140**
85	Narebor	Mid Kent Legal Services (MKLS)	Salary Savings	0		Service savings	Salary savings from restructure	-105,000	-129,000	-129,000
86	Narebor	Mid Kent Legal Services (MKLS)	MKLS income	-1,205,212	-1,152,120	Service savings	Income from the partner authorities will reduce as salary savings realised.	73,500	90,300	90,300
87	**Narebor**	**Sub Total**						**-31,500**	**-38,700**	**-38,700**
88	Sandher	Human Resources	Fees and Services	0	12,000	Service savings	The bHeard survey which is every 2 years. If survey is not carried out this year then the budget will be required for 2021/22.	0	-12,000	0
89	Sandher	Contributions from Funds	Expenditure funded from Reserves		-12,000	Contribution from Reserves	End of reserve funding for bHeard survey (20/21 Budget item 97 General Reserves)	12,000	12,000	12,000
90	Sandher	Human Resources	MKS Charges for HR Service	227,890	258,080	Service savings	Forecast 2020/21 plus 2% indexation	-15,420	-10,570	-5,620
91	**Sandher**	**Sub Total**						**-3,420**	**-10,570**	**6,380**
92	Woodward	ICT Development, Network & Support	MKS Charges for ICT	475,308	438,000	Unavoidable cost pressures	Forecast for 2020/21 plus 2% indexation.	56,580	66,470	76,560

Appendix II

Budget Variations

No.	Head of Service	Service Description	Type of Spend/ Income	2019/20 Actual £	Original Budget 2020/21 £	MTFP Category	Explanation of Budget Change	21/22 Increase Over & Above 20/21 £	22/23 Increase Over & Above 20/21 £	23/24 Increase Over & Above 20/21 £
93	Woodward	Swale House - Telephonists	Equipment Maintenance	0	15,130	Service savings	Saved on maintenance	-5,130	-5,130	-5,130
94	**Woodward**	**Sub Total**						**51,450**	**61,340**	**71,430**
95	Sittingbourne Town Centre (STC)	Princes Street Retail park	Fees and Services	10,730	23,600	Service savings	Management fee	-17,870	-17,700	-17,530
96	STC	Princes Street Retail park	Service Charges - Property	9,759	0	Unavoidable cost pressures	Service charges for Princes Street Retail Park	17,870	17,870	17,870
97	STC	Bourne Place	Fees and Services	0	10,000	Unavoidable cost pressures	Management Fee and Public Realm Costs	64,100	66,300	68,600
98	STC	Bourne Place	Rents	0	-584,290	Additional income	Assume full rent from April 2021	-286,400	-592,390	-592,390
99	STC	Interest Payable	Interest Payable	210,619	188,260	Service savings	£20m in borrowing	-119,360	-134,260	-134,260
100	STC	Minimum Revenue Provision (MRP)	MRP for STC Excluding Multi Storey Car Park	348,000	461,310	Unavoidable cost pressures	MRP costs to reflect completion of STC project	216,330	216,330	216,330
101	**STC**	**Sub Total**						**-125,330**	**-443,850**	**-441,380**
102	**Committed Price Increases**							**191,080**	**429,580**	**753,410**
103	**Minor Items**							**-580**	**-3,910**	**-2,610**
104	**Grand Total**							**1,789,500**	**1,942,710**	**2,445,100**

Capital Budget

	Funding SBC/ Partner-ship	2020/21 Original Budget	2020/21 Revised Budget	2021/22 Original Budget	2022/23 Original Budget	Budget Later Years
		£	£	£	£	£
Commissioning, Environment & Leisure - M. Cassell						
Barton's Point Coastal Park - replacement bridge - Capital Receipts	SBC	0	158,260	0	0	0
Beach Huts – Capital Receipts	SBC	60,000	60,000	0	0	0
Car Park Improvements/Enhancements – 8 Electric Charging Points – Swale House Car Park – Reserves	SBC	0	32,000	0	0	0
Car Park Improvements/Enhancements – Electric Charging Points – Rose Street Car Park – Reserves	SBC	0	29,900	0	0	0
Faversham Recreation Ground Improvements – Reserves	SBC	0	122,240	0	0	0
Faversham Recreation Ground Improvements – External Grants	P	104,080	42,731	0	0	0
Faversham Recreation Ground Improvements – S106	P	21,320	0	0	0	0
Footpath Contribution – High Street Sittingbourne – S106	P	0	18,915	0	0	0
Gunpowder Works Oare Faversham – S106	P	0	9,000	0	0	0
Leisure Centres – Internal / External Borrowing	SBC	0	293,847	0	0	0
Milton Creek Access Road – Reserves	SBC	0	40,000	0	0	0
Modular Toilet Kiosk – Minster Leas – Reserves	SBC	0	29,931	0	0	0
Modular Toilet Kiosk – Minster Leas – Special Projects Fund	SBC	0	93,000	0	0	0
New Play Area – Iwade Schemes – S106	P	0	45,000	0	0	0
Open Spaces Play Equipment – S106	P	130,000	356,000	100,000	0	0
Ospringe Brickworks Site, Western Link – S106	P	0	21,440	0	0	0
Play Improvements – Reserves	SBC	150,000	150,000	0	0	0
Play Improvements – Capital Receipts	SBC	0	0	50,000	0	0
Play Improvements – Diligent Drive – Reserves	SBC	0	18,000	0	0	0
Play Improvements – Minster Lees – Reserves	SBC	0	1,753	0	0	0
Play Improvements – Shellness Road – Reserves	SBC	0	2,250	0	0	0
Public Toilets - Forum Sittingbourne – Reserves	SBC	0	50,000	0	0	0

Capital Budget

	Funding SBC/ Partner-ship	2020/21 Original Budget	2020/21 Revised Budget	2021/22 Original Budget	2022/23 Original Budget	Budget Later Years
		£	£	£	£	£
Public Toilets - Central Car Park Faversham – Reserves	SBC	0	40,000	0	0	0
Public Toilets - Milton Creek Country Park – Reserves	SBC	0	150,000	0	0	0
Public Toilets - Barton Point – Reserves	SBC	0	100,000	0	0	0
Public Toilets - Spinney Leysdown – Reserves	SBC	0	40,000	0	0	0
Resurfacing Promenade, The Leas – External Grant	P	0	79,970	0	0	0
Swallows Leisure Centre Roof – Internal/External Borrowing	SBC	0	691,800	0	0	0
Swallows Leisure Centre Roof – Direct Revenue Funding	SBC	0	51,200	0	0	0
Wheeled Bins – Reserves	SBC	157,000	251,000	35,000	35,000	35,000
Total Commissioning, Environment & Leisure		**622,400**	**2,978,237**	**185,000**	**35,000**	**35,000**
Housing, Economy & Community Services - C. Hudson						
CCTV – Reserves	SBC	0	30,000	15,000	15,000	15,000
Faversham Creek Basin Regeneration Project (Swing Bridge) – Capital Receipts	SBC	0	200,000	0	0	0
Land Regeneration/Improvement Works at Dolphin Barge Museum & Skatepark – Reserves	SBC	0	0	37,920	0	0
Land Regeneration/Improvement Works at Dolphin Barge Museum & Skatepark – Capital Receipts	SBC	0	0	14,140	0	0
Local Housing Company – Internal/External Borrowing	SBC	0	0	11,500,000	11,500,000	0
Local Housing Company – Reserves	SBC	0	0	250,000	0	0
Murston Old Church – Reserves	SBC	0	100,000	0	0	0
Sheppey Hall Improvement – Reserves	SBC	0	0	40,000	0	0
Sittingbourne Town Centre –Internal/External Borrowing	SBC	44,250	5,386,559	0	0	0
Sheppey Improvement – Capital Receipts	SBC	0	0	250,000	0	0
Sheppey Capital Investments – Capital Receipts	SBC	0	0	850,000	0	0
Thistle Hill Community Centre – Solar PV Installation – Reserves	SBC	0	0	20,000	0	0

Capital Budget

	Funding SBC/ Partner-ship	2020/21 Original Budget	2020/21 Revised Budget	2021/22 Original Budget	2022/23 Original Budget	Budget Later Years
		£	£	£	£	£
Disabled Facilities Grant – External Grant	P	2,062,800	3,990,333	2,062,800	2,062,800	2,062,800
Queenborough & Rushenden Klondyke Land Improvement – External Grant	P	0	66,600	0	0	0
Total Housing, Economy & Community Services		**2,107,050**	**9,773,492**	**15,039,860**	**13,577,800**	**2,077,800**
Finance - N. Vickers						
Finance System Upgrade – Reserves	SBC	0	1,410	0	0	0
Leaky Lucy Minibus Replacement – Reserves	SBC	0	10,000	0	0	0
Total Finance		**0**	**11,410**	**0**	**0**	**0**
ICT - C. Woodward						
ICT Infrastructure & Equipment Replacement - Reserves	SBC	76,200	92,000	299,300	0	0
Total ICT		**76,200**	**92,000**	**299,300**	**0**	**0**
Planning – J. Freeman						
Land Charges – Online Submission Module – Capital Receipts	SBC	6,400	0	0	0	0
Total Planning		**6,400**	**0**	**0**	**0**	**0**
Property – A. Adams						
Swale House Refurbishment – Feasibility Studies	SBC	0	200,000	0	0	0
Swale House Refurbishment	SBC	0	0	3,000,000	0	0
Total Property		**0**	**200,000**	**3,000,000**	**0**	**0**
Total Capital Programme Funded by SBC	SBC	493,850	8,425,150	16,361,360	11,550,000	50,000
Total Capital Programme Funded by Partners	P	2,318,200	4,629,989	2,162,800	2,062,800	2,062,800
Total Capital Programme		**2,812,050**	**13,055,139**	**18,524,160**	**13,612,800**	**2,112,800**

Cabinet	Agenda Item: 5
Meeting Date	16 December 2020
Report Title	Financial Management Report – Second Quarter 2020/21
Cabinet Member	Cllr Roger Truelove, Leader and Cabinet Member for Finance
SMT Lead	Nick Vickers, Chief Financial Officer
Head of Service	Nick Vickers, Chief Financial Officer
Lead Officer	Phil Wilson, Financial Services Manager and Caroline Frampton, Principal Accountant
Key Decision	Yes
Classification	Open
Forward Plan	Reference number: 8
Recommendations	1. To note the total projected revenue overspend of £3,319,000 (£2,555,000 as at end of June 2020). 2. To agree to the settlement on litigation as set out in paragraph 3.16. 3. To agree to the use of reserve funds as set out in paragraph 3.15. 4. To approve the payments with regard to the loss of income claims for the leisure contract as set out in paragraph 3.18. 5. To note the projected capital overspend of £2,279,256 and expenditure of £5,676,723 as detailed in paragraph 3.23 and Table 10 Appendix I. 6. To note the additional Government funding received by the Council in response to the coronavirus. 7. To approve the capital variances and their funding as detailed in paragraph 3.21 and Table 10 Appendix I refers.

1. Purpose of Report and Executive Summary

1.1 This report sets out the revenue and capital projected outturn position for 2020/21 as at the end of September 2020. The report is based on service activity up to the end of September 2020 and is collated from monitoring returns from budget managers.

1.2 The headline figures are:

- projected total revenue overspend of £3,319,000 (£2,555,000 as at end of June 2020) - Table 2;
- the projected impact of the Coronavirus pandemic is £3.5m (£2,832,000 as at end of June 2020);
- projected capital overspend of £2,279,256 – Table 10 appendix I.

2. Background

2.1 The Council operates a budget monitoring process at Head of Service level, with regular reports to the Leader and Cabinet Member for Finance and the Strategic Management Team.

2.2 Financial monitoring reports are presented to Cabinet on a quarterly basis, as well as to Scrutiny Committee.

3. Proposals

Revenue Outturn

3.1 The last monitoring report to Cabinet was on 23 September covering April to June and the net revenue service expenditure was a forecast overspend of £2,555,000 and the equivalent outturn figure shown in Table 2 is a forecast overspend of £3,319,000, which represents a movement of £764,000 on a budget of £19.381 million. Table 1 below details the significant movements.

Table 1 – Net Revenue Service Expenditure - Movement from April to June Forecast to April to September Forecast

Movement from 1st Quarter to 2nd Quarter	**£'000**	**Notes**
1st Quarter Monitoring Report to Cabinet	**2,555**	
Homelessness – increase in numbers / Rough Sleeper Initiative	192	Includes £133k Rough Sleeper costs re Covid – may be possible to claim some of this back
Leisure Centre	170	Total estimated cost £570k re loss of income claim from Swale Community Leisure (SCL) Trust
Car Park Pay & Display – increased loss of income	156	
Faversham Pool Grant	75	One off grant
Interest Earnings & Cost of Borrowing – reduced income	70	Fall in interest rates and lower cash balances
Recovery of Council Tax costs	67	
Community Leisure Trust Grant	50	One off grant
Shared Service Costs	41	(HR, ICT and Planning)
Maidstone Council Parking Partnership – increased costs	38	Reflected in 21/22 budget proposals
Waste Contract Savings – reduced savings	35	
Car Park increased loss of income	30	
Bourne Place loss of income	18	
Mid Kent Services (MKS) Debt Recovery – based on further advice from Maidstone Borough Council (MBC)	(65)	Courts opening has been delayed and MBC anticipate to break-even.
Property Services – underspends	(41)	Vacant post (£20k) and reduced expenditure offset by reduced printing income (£6k)

Movement from 1st Quarter to 2nd Quarter	£'000	Notes
Sittingbourne Regeneration – revenue costs including staffing	(20)	Staffing costs that cannot be capitalised
Recovery of Council Tax Benefit Overpayments	(10)	
Net other movements (less than £10k)	(42)	
Sub Total – Movement	**764**	
2nd Quarter Monitoring Report to Cabinet	**3,319**	

Table 2 - Projected Variance by Service

Service	Service Manager	Working Budget £	Projected Outturn £	Projected Variance £
Chief Executive		330,270	202,270	(128,000)
Policy, Communications & Customer Services	D. Clifford	1,201,940	1,148,940	(53,000)
Democratic Services	D. Clifford	168,380	143,380	(25,000)
Electoral Services	D. Clifford	848,450	810,450	(38,000)
Director of Regeneration	E. Wiggins	198,110	198,110	0
Housing, Economy & Community	C. Hudson	3,545,670	4,267,670	722,000
Planning	J. Freeman	826,390	1,305,390	479,000
Commissioning, Environment & Leisure	M. Cassell	6,032,080	7,856,080	1,824,000
Finance	N. Vickers	0	(28,000)	(28,000)
Revenues & Benefits	Z. Kent	4,770	183,770	179,000
Property	A. Adams	1,928,250	1,887,250	(41,000)
Licensing & Resilience	D. Fackrell	60,780	43,780	(17,000)
Environmental Health	T. Beattie	567,190	580,190	13,000
Information Technology	C. Woodward	1,305,530	1,325,530	20,000
Internal Audit	R. Clarke	178,260	178,260	0
Human Resources	B. Sandher	446,410	452,410	6,000
Legal	P. Narebor	523,860	502,860	(21,000)
Sittingbourne Regeneration	N. Vickers	0	62,000	62,000
STC - Cinema/Hotel/Restaurants	N. Vickers	(574,290)	(372,290)	202,000
STC - Retail Park	N. Vickers	(471,400)	(471,400)	0
Contributions from Reserves for services shown above	N. Vickers	0	(8,000)	(8,000)
Corporate Items	N. Vickers	2,260,390	2,431,390	171,000
NET REVENUE SERVICE EXPENDITURE		**19,381,040**	**22,700,040**	**3,319,000**
Financed by:				
Revenue Support Grant		(115,000)	(115,000)	0
Business Rates		(9,000,000)	(9,000,000)	0
New Homes Bonus		(1,633,000)	(1,633,000)	0
Council Tax Requirement		(8,648,040)	(8,648,040)	0
TOTAL FINANCING		**(19,396,040)**	**(19,396,040)**	**0**
NET EXPENDITURE		**(15,000)**	**3,304,000**	**3,319,000**

Note: 2020/21 budget had a surplus of £15,000.

Forecast Budget Variance

3.2 Table 2 shows a variance of £3,304,000 which, with the £15,000 contribution to Reserves, gives a net overspend of £3,319,000.

3.3 The revenue overspend of £3,319,000 includes a number of contributions to/from reserves, which have been made in order to comply with statute and previous Cabinet decisions, which total £8,000 and they are detailed below:

Table 3 – Contributions to Reserves

Service	Description	£'000
Local Plan	The overspend as a result of legislative changes in August 2020 will be met from the ring-fenced local plan reserve.	(75)
Revenues and Benefits	The net saving will be transferred to the Revenues and Benefits reserve.	141
Parking Management	The 2020/21 deficit relating to on-street parking will be transferred to the surplus on the on-street parking reserve under Section 55 of the Road Traffic Act 1984.	(39)
Environmental Response Team	Section 96 of the Clean Neighbourhoods and Environment Act of 2005 advised that income must be spent on "qualifying functions". The 2020/21 deficit will be transferred to the surplus on the reserve.	(35)
Total		**(8)**

3.4 The forecast variance is for 2020/21 only. However, the impact of the coronavirus also affects forecast income from business rates and council tax. The Council is a billing authority which collects these taxes and then distributes them to other preceptors through the Collection Fund. Any surplus or deficit on the Collection Fund in 2020/21 will be allocated to preceptors in future years. Therefore, in order to show the full impact of the effect of the coronavirus on the Council's finances, these forecast deficits are shown in Table 4 below and the explanations for them are detailed in the next section of the report.

Table 4 – Forecast Variance

	Forecast Variance £'000
Forecast over/(under)spend 2020/21 (Table 2)	3,319
Forecast future impact of under-recovery of Business Rate income	250
Forecast future impact of under-recovery of Council Tax income	321
Total Forecast Overspend	**3,890**

3.5 The additional funding received by the Council, updated for funding allocated since the period end, is shown in the table below:

Table 5 – Government funding

Funding	Amount £	Allocation basis
Tranche 1	75,560	March £1.6bn of which £1.46bn for Social care
Tranche 2	1,501,441	April £1.6bn with 35% allocation to districts
Tranche 3	317,585	July £500m with a Relative Needs Formula reflecting deprivation
Tranche 4	1,027,204	October £919m with a Relative Needs Formula reflecting deprivation
Sales, Fees and Charges	716,000	75% of defined losses on some Sales, Fees and Charges - initial submission made
Sub-total	**3,637,790**	
New Burdens Grant Revenues & Benefits	170,000	Banded allocation based upon number of hereditaments
Covid Enforcement	90,000	£30m allocation nationally
Contain Outbreak Funding	100,000	Via Kent County Council (KCC)
Total	**3,997,790**	

3.6 At this stage, the forecast overspend is matched by an unprecedented level of additional Government funding. The cost forecasts are very sensitive to the impact of the new lockdown. These will be assessed in the January budget monitoring. We also await clarity of the level of support from Government for additional leisure costs. We are still awaiting information on how the additional £100m allocated nationally will be allocated.

Business Rates

3.7 The Council collects business rates and distributes them to preceptors including the Government, Kent County Council (KCC), the Fire Authority and the Council and this is accounted for in the Collection Fund. The original forecast for 2020/21 was that the Council would collect £53m in total in 2020/21. Later the Government announced new reliefs on business rates for retail, local newspapers and nurseries which would reduce the income from business rates by £14m, but this will be offset by Government grants.

3.8 The Council budgeted that its share of the total business rates collected for 2020/21 would be £8.75m plus £250k contribution from business rates reserves. There is a complicated system of levies and tariffs, and any deficit on the Collection Fund for 2020/21 will be allocated to each preceptor as a cost in future years. However, for the purposes of this report, the forecast Council share of the deficit for 2020/21 of £250,000 is reported here, even though it will be a cost in future years. Council policy is to pay for business rate collection fund deficits from reserves.

3.9 The Business Rates Collection Fund has set aside £10m for appeals, of which the Council's share is £4m.

Council Tax

3.10 The Council collects council tax and distributes it to preceptors including the KCC, the Fire Authority, the Police Authority, Parish and Town Councils and the Council and this is accounted for in the Collection Fund. The original forecast for 2020/21 was that the Council would collect £89m in total.

3.11 Any surplus or deficit on the Council Tax Collection Fund for 2020/21 will be allocated in future years. However, for the purposes of this report, the forecast for 2020/21 is a deficit on the Council Tax Collection Fund of £2.8m of which the Council's share is £321k.

3.12 The reasons for this reduction in income are:

- Increase in the single person discount due to the increase in the number of deaths resulting in a single person living in a property:
- Reduction in the number of new properties being completed and then being liable for Council Tax; and,
- Reduction in the recovery of overpayment of council tax support due to customers not moving into work since March.

Collection Fund

3.13 Any deficits from council tax and business rates arising in 2020/21 would normally be transferred from the collection fund in the following year (2021/22). The Government has proposed that these deficits will now be spread equally over three years (2021/22 to 2023/24) "to ease immediate pressures on budgets". The full terms of the arrangements are still not entirely clear.

Improvement and Regeneration Funds

3.14 Table 6 below details the movements on a number of reserve funds up to the end of September 2020. Further details regarding the funds committed in 2020/21 are detailed in Appendix I Table 9.

Table 6: Improvement and Regeneration Funds

	Balance as at 1 April 2020	Proposed Topping Up of Funds 2020/21	Fund Committed as at 1 April 2020	Funds committed after 1 April 2020 (Appendix I Table 9) 2020/21	Balance Unallocated
Funds:	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**
Special Projects	964	1,000	(553)	(972)	439
Performance	432	0	(233)	(29)	170
Communities	556	0	(173)	(15)	368
Pension & Redundancy	94	100	0	(103)	91
Regeneration	152	0	(152)	0	0
Local Loan Fund	175	0	0	0	175
TOTAL	**2,373**	**1,100**	**(1,111)**	**(1,119)**	**1,243**

3.15 The budget report to this meeting emphasises that the completely unprecedented circumstances that we are living in puts a huge onus on the Council to respond to the needs of our residents. The Leader and Cabinet Member for Finance has had a series of bilateral meetings with cabinet members to see what additional support can be provided. It is therefore proposed that:

- Business Volatility fund continues to support Project Fund on a £1 million per annum basis;
- £800,000 allocated to Town Centres from Business Pool;
- £1.7m North Kent Housing and Economic Growth Fund to Local Housing Company, for set up costs and future investment, including possible investment in Sheppey;
- £1.1m Malro capital receipt to Sheerness Improvement Fund at £250,000 and balance to other Sheppey capital investments; and
- £2.1m Business Pool money to be divided into "Improvement and Resilience Fund" of £1m. The balance to be retained for potential top ups and for new initiatives or pressures.

Litigation Settlement

3.16 The Council has legal responsibility for maintenance of closed churchyards. A business has a long-standing claim against the Council for the impact on their property from the failure to maintain the adjacent churchyard. Litigation has been going on since 2012. There was an agreement with the then owner in 2015 and we are now in a position to settle with the new owner. By agreeing to pay £86,950 inclusive of VAT we are no longer obliged, by the terms of the 2015 agreement, to carry out and pay for the reinstatement works ourselves with the potential for cost overruns and time delays as well as further claims should the reinstatement itself prove to be defective. Liability for all aspects of the reinstatement scheme is assumed by the current owner. The liability of the Council funded from the Property Reserve are:

- We cap the claim for diminution in the value of the land at £20,000;
- We cap any further liability for delay costs at £22,000;
- We cap our liability for legal costs at no more than £5,000 plus VAT; and,
- The settlement is inclusive of interest.

3.17 Legal officers have been involved throughout the process and the Head of Legal Services supports the settlement of the claim.

Leisure Contract

3.18 Over the last year the Council has been involved in protracted negotiations with Swale Community Leisure (SCL) and Serco over a range of issues where they are making claims for loss of income due to the actions of the Council. These are reported below as we reach a point of settlement. In an open report the details of these negotiations cannot be shared fully. The Head of Commissioning, Environmental & Leisure has been advised by Legal Services throughout the negotiations. The negotiations related to three claims:

- Loss of income claim 1 - this claim is for the extended closure of the pool hall due to additional roof works from the refurbishment of the Swallows. This claim will be settled at £249,000 dependent upon the outcome of loss of income claim 2. Serco already hold a sum of £28,750 towards this total and the Council already holds reserves of £110,770 for this. This leaves £109,480 to be approved.
- Loss of income 2 - this claim is storm damage to Swallows Leisure Centre roof. The income losses incurred by SCL/Serco are being covered by their insurance but the Council has to pay for the £50,000 insurance excess on the Serco insurance policy.

- Loss of income 3 - this related to losses incurred because of the Covid 19 pandemic which led to a Government enforced closure of the Swallows and Sheppey Leisure Centres on 20 March. Swale Community Leisure and Serco hold that, contractually, the Council is responsible for loss of income. There has been an ongoing dialogue with all parties and a Sport England funded consultant. It has to be said that this work has not yet produced a mutually acceptable solution. The position is compounded by the Government providing no financial support to date for the additional costs which councils are incurring with their outsourced leisure providers. It was announced in October that £100m of funding has been provided for the Department for Culture, Media and Sport to meet additional costs and we await further details on the criteria. For this report Cabinet is asked to agree a payment of £165,000 for the period April-July 2020.

Capital Expenditure

3.19 This section of the report details actual capital expenditure to end of September 2020 and highlights any projected variations between the revised 2020/21 capital budget and the projected outturn.

3.20 The revised budget includes the following approvals: -

- capital rollovers from 2019/20 of £5,263,936;
- roof replacement for the Swallows Leisure Centre of £743,000 approved by the July Cabinet;
- Replacement of Bartons Point footbridge - Cabinet in July approved the capital contract at an additional cost of £22,000 to be met from capital receipts;
- Car park improvements / Enhancements – Electric Charging Points – Rose Street Car Park - funded from car park reserve £29,900;
- Car park improvements / Enhancements – Electric Charging Points – Swale House Car Park – funded from Special Projects Fund £32,000;
- The Community Fund approved a grant of £10,000 for the Leaky Lucy Minibus Replacement;
- The Community Fund approved a grant of £100,000 for Murston Church;
- Adjustment to the funding of the Modular Toilet Kiosk – Minster Leas – £80,000 of the project was originally to be funded from capital receipts but this has been replaced with funding from the Special Projects Fund;
- £380,000 of capital receipts funding has been replaced with Special Project Funding (public toilets).

3.21 The following projects require approval for funding in 2020/21: -

- Bartons Point Coastal Park – replacement footbridge - due to detailed investigations of the foundations, foundation costs are expected to be in the region of £40k more than the award price. There are also additional hiring costs depending on when the works can be completed of £5k. To be funded from capital receipts;

- Sittingbourne Town Centre (STC) – as the leisure development completes there will be a reconciliation of total spend against budget. There are additional costs associated with the Light cinema and bowling developments;

- Queenborough & Rushenden Klondyke Land Improvement £6m in total – this is fully funded via external grant from Homes England;

- Ospringe Brickworks Site, Western Link £21,440 – this is fully funded from S106 receipts;

- Swallows Leisure Centre – additional funding from revenue £51,200;

- Faversham Recreation Ground – to reflect actual expenditure and allocation from Lottery Fund.

3.22 Actual expenditure to end of September 2020 was £5,676,000. This represents 53% of the revised budget. Further details are set out in Table 10 of appendix I.

3.23 Table 7 below summarises the projected capital overspend of £2,279,000.

Table 7: Capital Programme Expenditure

	2020/21 Revised Budget	**2020/21 Actual to Date**	**2020/21 Projected Variance**
	£'000	**£'000**	**£'000**
Housing, Economy & Community Services	7,496	5,329	2,277
Commissioning, Environment & Leisure	2,946	266	32
Finance	12	11	0
Property	200	2	0
Planning	6	0	(6)
Information Technology	116	68	(24)
Total Capital Programme	**10,776**	**5,676**	**2,279**
Total funded by the Council	**6,077**	**5,045**	**2,348**
Total Partnership funded	**4,699**	**631**	**(69)**
% Spent to date compared to Revised Budget		**53%**	

Payment of Creditors

3.24 For April to September 2020, 99% of invoices from suppliers were paid within 30 days of receipt of invoice, against the target of 97%.

Sundry Debtors

3.25 Tables 11.1 and 11.2 in appendix I analyse the sundry debt outstanding.

4. Alternative Options

4.1 None identified – this report is largely for information.

5. Consultation Undertaken or Proposed

5.1 Heads of Service and Strategic Management Team have been consulted in preparing this report.

6. Implications

Issue	Implications
Corporate Plan	Good financial management is key to supporting the Corporate Plan objectives.
Financial, Resource and Property	As detailed in the report
Legal and Statutory	The outturn report is not a statutory requirement, but it is a requirement of the Council's Financial Regulations.
Crime and Disorder	None identified at this stage.
Environmental Sustainability	The report identifies a wide range of expenditure headings which support the Council's Climate and Emergency Action Plan.
Health & Wellbeing	None identified at this stage.
Risk Management and Health and Safety	The Council's overall financial position is a key risk in the Council's Corporate Risk Register.
Equality and Diversity	None identified at this stage.
Privacy and Data Protection	None identified at this stage.

7. Appendices

7.1 The following documents are published with this report and form part of the report:

- Appendix I: Finance Report 2020/21

8. Background Papers

Cabinet Medium Term Financial Plan and Budget 2020/21

Table 8 – Significant Variances APPENDIX I

Service – Cabinet Member (Head of Service)	£'000
CHIEF EXECUTIVE – Cllr R Truelove	
Other Variances:	
Salary underspend	(133)
Recruitment costs	25
Special Projects & Swale Stars	(14)
Other net savings	(6)
TOTAL	**(128)**
POLICY, DEMOCRATIC SERVICES, COMMUNICATIONS AND CUSTOMER SERVICES – Cllr R Truelove (David Clifford)	
Policy, Communications & Customer Services:	
Other Variances:	
Salary underspend – Policy	(11)
Salary underspend – Customer Service Centre	(34)
Other variances	(8)
Democratic Services:	
Other Variances:	
Salary underspend – Mayoral	(17)
Mayor & Ceremonial – other	(8)
Electoral Services:	
Other Variances:	
Net underspend on Electoral Registration	(38)
TOTAL	**(116)**
HOUSING, ECONOMY AND COMMUNITY SERVICES – Cllr B Martin, Cllr T Valentine, Cllr R Palmer, Cllr M Bonney, Cllr A Harrison (Charlotte Hudson)	
Economy & Community Services:	
Coronavirus Related Variances:	
Salary overspend – Economy & Communities budget savings requirement delayed due to restructure being paused due to coronavirus.	38
Income under-recovery – Markets' rents not received. Markets did not trade during quarter one and will be in recovery stage for the remainder of the year. Trading commenced in July.	9
Sub-total	**47**
Housing:	
Coronavirus Related Variances:	
Temporary accommodation overspend – additional pressure on service during coronavirus.	656
Rough Sleeper Initiative – Government "everyone in" during coronavirus cost £50k. It is assumed that this will be fully reimbursed by the Government.	0

Table 8 – Significant Variances APPENDIX I

Service – Cabinet Member (Head of Service)	£'000
Other Variances:	
Salary overspend – Housing Private Sector vacancy allowance will not be achieved and new staff recruitment may involve post regrading.	8
Stay-Put scheme grants – net variations	11
Sub-total	**675**
TOTAL	**722**
PLANNING - Cllr M Baldock (James Freeman)	
Coronavirus Related Variances:	
Planning fees income – shortfall as a result of economic uncertainty which has caused the decline in the housing market and a significant drop in planning applications and major applications to the Council.	250
Local Land Charges income – shortfall as a result of economic uncertainty which has caused the decline in the housing market and a significant drop in the income from land searches fees to the Council.	60
Building Control – the South Thames Gateway (STG) Building Control Partnership is not a separate entity and the forecast loss in fees and charges is being reported within Medway's submission to Ministry of Housing, Communities and Local Government (MHCLG) and included as part of their compensation claim to the Government. The remaining deficit is being met from partnership reserves for 2020/21 only.	0
Other Variances:	
Development Control / Services – salaries underspend	0
Planning Shared Service – overspend	15
Legal fees / Planning consultation advice	60
Local Plan overspend as a result of legislative changes in August 2020	75
Conservation, Design and Heritage staff - overspend	19
TOTAL	**479**
Note: Not included in the above are the potential costs for the major planning appeal for Barton Hill Drive estimated at £203k including the £170k costs of a court claim against the Council which is subject to a High Court challenge.	
COMMISSIONING, ENVIRONMENT AND LEISURE – Cllr A Harrison, Cllr T Valentine (Martyn Cassell)	
Coronavirus Related Variances:	
Car Parks pay and display – income shortfall	825
Parking Penalty Charge Notices (PCN's) – income shortfall	50
Multi-Storey Car Park – income shortfall	80
Parking season tickets – income shortfall	22
Environmental Response – Fixed Penalty Notices – net loss of income – deficit is transferred to the ring-fenced Environmental Initiatives account.	35
Parking Enforcement – deficit relating to on-street parking is transferred to the ring-fenced street parking account under Section 55 of the Road Traffic Act 1984.	39

Table 8 – Significant Variances APPENDIX I

Service – Cabinet Member (Head of Service)	£'000
Leisure & Sports Centres – additional expenditure. Additional costs re contract variation.	570
Street Cleansing and Refuse Collection – significant additional COVID-19 costs to be factored in for additional cleansing in town centres and contract pressures during peak of pandemic.	125
Swale Community Leisure Trust Ltd – additional grant	50
Faversham Pool - additional grant	75
Community Halls – loss of bookings income	5
Parking Management – reduced cash security costs	(20)
Other Variances:	
Leisure & Sports Centres – additional expenditure – consultancy costs and concessionary use.	5
Garden Waste collections – additional income.	(150)
Wheeled Bins purchase – additional expenditure. Increase in garden waste subscriptions.	115
Wheeled Bins sales – reduced income – including income from new developments requesting waste receptacles (anticipated to be slightly below last year's levels).	10
Street Cleansing and Refuse Collection – contract costs savings. Indexation anticipated to be lower than expected but yet to be finalised. Annual uplift figures not yet been agreed.	(145)
Public Conveniences – cost savings on premises expenses.	0
Parks, Sports and other 'open air' facilities – net additional expenditure on Sports Facilities premises expenses.	13
Seafront and Flood Prevention net additional contract and contractor costs.	15
Multi-Storey Car Park additional private contractor costs and security costs increased due to longer opening hours.	30
Multi-Storey Car Park additional other costs, including £12k electricity.	18
Parking Management – additional licence costs	19
Parking Partnership – additional costs with Maidstone Borough Council.	38
TOTAL	**1,824**
FINANCE – Cllr R Truelove (Nick Vickers)	
Other Variances:	
Salary Underspend – vacant post and agency staff savings.	(28)
TOTAL	**(28)**
REVENUES & BENEFITS – Cllr R Truelove (Nick Vickers)	
Coronavirus Related Variances:	
Reduced income – recovery of council tax court costs due to the courts being shut for April to September.	250
Reduced income – recovery of overpayments of housing benefits due to reduction in recovery action.	172

Table 8 – Significant Variances APPENDIX I

Service – Cabinet Member (Head of Service)	£'000
Reduced income – Mid Kent debt recovery.	15
Other Variances:	
Department of Works and Pensions (DWP) net additional housing benefit subsidy grant.	(107)
DWP additional housing benefit grants.	(111)
DWP housing benefit admin subsidy grant increase.	(30)
Recovery of Council Tax Benefit Overpayments.	(10)
TOTAL	**179**
PROPERTY SERVICES – Cllr M Bonney (Anne Adams)	
Coronavirus Related Variances:	
External Printing reduced income.	6
Other Variances:	
Property salary underspend due to vacant post	(20)
Premises expenditure	(32)
Admin Buildings – rent – additional costs.	5
TOTAL	**(41)**
LICENSING & RESILIENCE PLANNING – Cllr R Palmer (Della Fackrell)	
Other Variances:	
Licensing salary underspend due to vacant post	(7)
Hackney Carriage additional income forecast	(15)
Gambling Licence fees additional income forecast	(4)
Emergency response overtime (Eastchurch Cliff fall)	9
General Licence Fees reduced income forecast	0
TOTAL	**(17)**
ENVIRONMENTAL HEALTH – Cllr T Valentine (Tracey Beattie)	
Other Variances:	
Shared Service costs	13
TOTAL	**13**
INFORMATION TECHNOLOGY – Cllr R Truelove (Chris Woodward)	
Other Variances:	
Shared Service costs	20
TOTAL	**20**
INTERNAL AUDIT – Cllr R Truelove (Rich Clarke)	
Other Variances:	
Nil variance	0
TOTAL	**0**

Table 8 – Significant Variances APPENDIX I

Service – Cabinet Member (Head of Service)	£'000
HUMAN RESOURCES – Cllr R Truelove (Bal Sandher)	
Other Variances:	
Shared Service costs	6
TOTAL	**6**
LEGAL – Cllr R Truelove (Patricia Narebor)	
Other Variances:	
Legal shared service – underspend	(25)
S106 additional income	(25)
External legal fees	29
TOTAL	**(21)**
SITTINGBOURNE REGENERATION	
Other Variances:	
Salary costs	12
Fees & services – anticipated consultancy and legal costs	50
TOTAL	**62**
CINEMA/HOTEL/RESTAURANTS	
Coronavirus Related Variances:	
Loss of rental income	202
TOTAL	**202**
CONTRIBUTIONS TO/FROM (-) RESERVES FROM SERVICES SHOWN ABOVE	
Local Plan	(75)
Revenue Services	141
On-street Parking	(39)
Environmental Response Team	(35)
TOTAL	**(8)**
CORPORATE ITEMS	
Coronavirus Related Variances:	
Coronavirus Communities overspend – grants issued.	28
Coronavirus Communities overspend – salary costs.	26
Coronavirus Communities overspend – PPE equipment for staff.	14
Coronavirus Communities overspend – other costs.	38
Opening High Street Safely Project overspend – private contractors.	0
Other Variances:	
Staff costs including pension costs reflecting the recent three-year revaluation which are higher than the estimated contributions provided as part of that revaluation, offset by net corporate staff savings.	26
Salary underspend – secretarial support	(31)
Net interest earnings.	59

Table 8 – Significant Variances APPENDIX I

Service – Cabinet Member (Head of Service)	£'000
Insurance – additional properties and increase in cost of public liability cover.	26
Other savings.	(15)
TOTAL	**171**
NET EXPENDITURE (Overspend)	**3,319**

The forecast salary variances identified above are collated in the table below and total £155k underspend on the total salary/ agency budget of £13.6m.

Service	£'000
Salary underspend - Chief Executive	(133)
Salary underspend – Policy	(11)
Salary underspend – Customer Service Centre	(34)
Salary underspend – Mayoral	(17)
Salary underspend – secretarial support - Regeneration	(31)
Salary overspend – Economy & Communities budget savings requirement delayed due to restructure being paused due to coronavirus.	38
Salary overspend – Housing Private Sector	0
Development Control / Services – salaries underspend	0
Conservation, Design and Heritage agency staff	19
Salary underspend – Finance due to vacancy and reduced agency costs.	(28)
Salary underspend – Licensing due to vacancy	(7)
Salary underspend – Property due to vacancy	(20)
Salary costs – Sittingbourne Regeneration	12
Salary costs – overtime – Eastchurch landslide	9
Coronavirus Communities overspend – salary costs.	22
Staff costs including pension costs reflecting the recent three-year revaluation which are higher than the estimated contributions provided as part of that revaluation, offset by net corporate staff savings	26
Total	**(155)**

Table 9 – 2020/21 Allocations from Funds APPENDIX I

	£'000
Special Project Fund	
Members' grants	54
Area Committees - grant funding	188
Park improvements	150
Fuel poverty	48
Climate project officer	27
Social inclusion - officer and one off spend	55
Air Quality Officer	50
Clean Air Zone consultancy	50
Project Surveyor	55
Green Space Activity Coordinator	35
Biffa deep cleans	50
Play equipment	100
West Faversham Community Centre - support for expansion	25
Air Quality - additional monitoring St Paul's Street	22
Provision of heating for Faversham Strike Force Football Club	6
Thistle Hill Community Centre - solar PV installation	20
Leysdown Village Hall kitchen refurbishment	27
Oak Road bus lane bollards	10
Total Special Project Fund Approved as at 30 September 2020	**972**
Performance Fund	
Sittingbourne Town Centre (STC) Away Day	4
Member IT	25
Total Performance Fund Approved as at 30 September 2020	**29**
Communities Fund	
Old Forge Museum	8
Raybel Restoration Project	7
Total Communities Fund Approved as at 30 September 2020	**15**
Pension & Redundancy Fund	
Pension and Redundancy costs	103
Total Pension & Redundancy Fund Approved as at 30 September 2020	**103**

Table 10 – Capital Programme 2020/21

APPENDIX I

Capital Scheme	Funding SBC/ Partnership (P)	2020/21 Original Budget	2020/21 Revised Budget	2020/21 Actual to Date	2020/21 Projected Variance	Notes
		£	£	£	£	
Commissioning, Environment & Leisure - M. Cassell						
Gunpowder Works Oare, Faversham - S106	P	0	9,000	0	0	
New Play Area - Iwade Scheme	P	0	45,000	0	0	
Minster Leas Promenade Resurfacing	P	0	79,970	0	0	
Modular Toilet Kiosk - Minster Leas	SBC	0	122,931	0	0	(a)
Milton Creek Country Park Access Road	SBC	0	40,000	0	0	
Barton's Point Coastal Park – Replacement Bridge	SBC	0	113,260	9,364	45,000	(b)
Faversham Recreation Ground Improvement - S106	P	125,400	199,534	42,731	(156,803)	(c)
Faversham Recreation Ground Improvement – Reserves	SBC	0	0	118,762	122,240	(c)
Open Space Project - Minster Leas (outdoor gym equipment)	SBC	0	1,753	0	0	
Open Spaces Project - Shellness Road (refurbishment existing Play Area at Leysdown Coastal Park, Shellness Road)	SBC	0	2,250	0	0	
Car Park Improvement/Enhancement - Electric Charging Points – Swale House Car Park (Reserves)	SBC	0	32,000	0	0	(d)
Car Park Improvement/Enhancement – Electric Charging Points – Rose Street Car Park (Reserves)	SBC	0	29,900	29,870	0	(d)

Capital Scheme	Funding SBC/ Partnership (P)	2020/21 Original Budget	2020/21 Revised Budget	2020/21 Actual to Date	2020/21 Projected Variance	Notes
Footpath contribution - High Street Sittingbourne - S106	P	0	18,915	11,300	0	
Open Spaces S106 Play Equipment (Budget Only)	P	130,000	356,000	0	0	
Ospringe Brickworks Site, Western Link – S106	P	0	0	0	21,440	(e)
Leisure Centres – Budget Only	SBC	0	293,847	0	0	
Swallows Leisure Centre - Capital Works	SBC	0	0	(22,090)	0	
Sheppey Leisure Centre (Not Pool) - Capital Works	SBC	0	0	(2,310)	0	
Sheppey Swimming Pool	SBC	0	0	(4,030)	0	
Play Area Improvements - Reserves	SBC	150,000	150,000	0	0	
Play Area Improvements - Diligent Drive	SBC	0	18,000	0	0	
Public Toilets Refurbishment - Forum, Sittingbourne	SBC	0	50,000	0	0	
Public Toilets Refurbishment - Central Car Park, Faversham	SBC	0	40,000	0	0	
Modular Toilet Kiosk - Milton Creek Country Park	SBC	0	150,000	73	0	
Public Toilets and Showers - Bartons Point, Sheppey	SBC	0	100,000	0	0	
Public Toilets - The Spinney Leysdown	SBC	0	40,000	15,000	0	
Wheeled Bins	SBC	157,000	251,000	0	0	
Beach Huts	SBC	60,000	60,000	0	0	
Swallows Leisure Centre Roof – internal/external	SBC	0	743,000	67,102	(51,200)	(f)
Swallows Leisure Centre Roof – Revenue	SBC	0	0	0	51,200	(f)
Total Commissioning, Environment & Leisure		**622,400**	**2,946,360**	**265,772**	**31,877**	

Capital Scheme	Funding SBC/ Partner-ship (P)	2020/21 Original Budget	2020/21 Revised Budget	2020/21 Actual to Date	2020/21 Forecast Variance	Notes
		£	£	£	£	
Housing, Economy & Communities Services - C. Hudson						
Disabled Facilities Grants Mandatory Grants	P	2,062,800	2,062,800	396,393	0	
Disabled Facilities Grants Discretionary Grants	P	0	1,927,533	0	0	
Queenborough & Rushenden Klondyke Land	P	0	0	66,600	66,600	(g)
Housing Repair Grants Over 60	SBC	0	0	0	0	
CCTV - Repairs & Renewals	SBC	0	30,000	0	0	
CCTV Monitoring Control Centre at Multi-Story Car Park	SBC	0	0	(24,112)	0	
Decent Home Loans Owner Occupier (loans)	SBC	0	0	7,400	0	
Murston Old Church	SBC	0	100,000	100,000	0	(h)
STC Site 4, Cinema/Restaurants	SBC	0	3,131,302	4,511,432	2,211,007	(i)
STC Site 5, Multi-Storey Car Park	SBC	0	0	0	0	
STC - Other Assets	SBC	44,250	44,250	276,588	0	(i)
The Mill Project, Sittingbourne Skate Park	P	0	0	(4,860)	0	
Faversham Creek Basin Regeneration Project (swing bridge)	SBC	0	200,000	0	0	
Total Housing, Economy & Communities Services		**2,107,050**	**7,495,885**	**5,329,441**	**2,277,607**	

Table 10 – Capital Programme 2020/21

APPENDIX I

Capital Scheme	Funding SBC/ Partner-ship (P)	2020/21 Original Budget	2020/21 Revised Budget	2020/21 Actual to Date	2020/21 Forecast Variance	Notes
		£	£	£	£	
ICT - C. Woodward						
ICT infrastructure – firewall and equipment replacement	SBC	76,200	115,828	68,390	(23,828)	
Total ICT		**76,200**	**115,828**	**68,390**	**(23,828)**	
Finance - N. Vickers						
Finance System Upgrade	SBC	0	1,410	950	0	
Leaky Lucy Minibus Replacement	SBC	0	10,000	10,000	0	(j)
Total Finance		**0**	**11,410**	**10,950**	**0**	
Property – A. Adams						
Swale House Refurbishment	SBC	0	200,000	2,170	0	
Total Property Services		**0**	**200,000**	**2,170**	**0**	
Planning - J. Freeman						
Land Charges Shared Service - Online Submission Module	SBC	6,400	6,400	0	(6,400)	(k)
Total Planning		**6,400**	**6,400**	**0**	**(6,400)**	
Total Capital Programme Funded by the Council	**SBC**	**493,850**	**6,077,131**	**5,164,559**	**2,348,019**	
Total Capital Programme Funded by Partners	**P**	**2,318,200**	**4,698,752**	**512,164**	**(68,763)**	
Total Capital Programme		**2,812,050**	**10,775,883**	**5,676,723**	**2,279,256**	

Notes

(a) Revised Budget includes Special Project Funding (SPF22).

(b) Cabinet on 8 July 2020 approved additional funding of £22,000 against the original budget of £120,000 as a result of a contract award for the Bartons Point Coastal Park footbridge. This will be met from capital receipts. In addition, due to detailed investigations of the foundations, foundation costs are expected to be in the region of £40k more than the award price. There are also additional hiring costs depending on when the works can be completed of £5k.

(c) Budget virement between allocation of funding to reflect actual expenditure.

(d) Funded from reserves – special project funding and car parking equipment reserve.

(e) Funded from S106 monies.

(f) Expenditure is to be met from borrowing. Anticipated to be £743k. This is to meet the uninsured losses regarding the roof replacement at the Swallows Leisure Centre. Agreed by Cabinet 8 July 2020. In addition, £51,200 is to be funded from direct revenue funding.

(g) Externally funded project Homes England.

(h) Community Fund Bid (CFB54).

(i) As the leisure development completes there will be a reconciliation of total spend against budget. There are additional costs associated with the Light cinema and bowling developments.

(j) Community Fund Bid (CFB55) approved in 2019/20.

(k) Project has been cancelled.

Table 11.1 – Sundry Debt Outstanding (including not due) by due date

	September 2020 £'000	September 2019 £'000
Not due (less than 1 month)	315	301
1–2 months	4	41
2–6 months	160	269
6–12 months	104	93
1–2 years	205	32
2–3 years	20	21
3–4 years	17	10
4–5 years	9	27
5–6 years	24	5
6 years +	34	33
Total	**892**	**832**
Total due (over 1 month)	**577**	**531**
% Total over 1 month	**65**	**64**

Notes:

2 – 6 months includes £71k relating to two debtors.

6 – 12 months includes £57k relating to one debtor.

1 – 2 years includes £10k relating to charges on property and £170k relating to two debtors.

2 – 3 years includes £2k relating to charges on property.

5 – 6 years includes £4k relating to charges on property.

6 years + includes £21k relating to charges on property. The balance are rent deposit debts which are being paid off via payment plans.

These tables include debts raised for all our grants receivable from Kent County Council, the NHS, etc.

Table 11.2 – Sundry Debt Outstanding (including not due) by Service

	September 2020 £'000	September 2019 £'000
Property	251	143
Commissioning, Environment & Leisure	56	43
Housing, Economy & Communities	290	278
Legal	0	0
Environmental Health	6	0
Planning	28	4
Communications	1	5
Other	260	359
Total	**892**	**832**

Notes:

‘Property’ includes outstanding £137,000 quarterly rent relating to one debtor.

‘Housing, Economy & Communities’ September 2020 includes £147k for one debtor, £98k Rent Deposit Schemes etc. and £31k charges on property.

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Cabinet Meeting	
Meeting Date	16th December 2020
Report Title	Queenborough & Rushenden Project Management Contract Appointment Value Increase
Cabinet Member	Cllr Monique Bonney, Cabinet Member for Economy and Property
SMT Lead	Emma Wiggins, Director of Regeneration
Head of Service	Charlotte Hudson, Head of Housing, Economy & Community Services
Lead Officer	Debbie Townrow, Economic Development Officer
Key Decision	Yes
Classification	**Open**
Recommendations	1. That the Cabinet approves the contract variation of Campbell Reith increasing the contract value from £98,000 to £151,644.

1 Purpose of Report and Executive Summary

1.1 In September 2019, a Contract Standing Orders Waiver was approved for the appointment of Campbell Reith to produce the tender specification documents and manage the subsequent procurement for the scheme contractor required to deliver phase 4 of the Queenborough & Rushenden regeneration scheme funded by the Homes England Housing Infrastructure Funding (HIF) grant received.

2 Background

2.1 In September 2019, a Contract Standing Orders Waiver was approved for the appointment of Campbell Reith to produce the tender specification documents and manage the subsequent procurement for the scheme contractor required to deliver phase 4 of the Queenborough & Rushenden regeneration scheme funded by the Homes England Housing Infrastructure Funding (HIF) grant received.

2.2 Swale required an appropriately qualified and experienced organisation to produce the tender specification documents for this specialist work, to manage the procurement process and to then project manage the contractors onsite for the duration of the contacts. Campbell Reith were selected as they had already completed almost identical works for the prior phases of the project effectively. They had also completed previous tender exercises conducted by Homes England to secure the contracts relating to the scheme – on both occasions being the only organisation to submit a bid.

2.3 There are two separate contract variations that are totalling the overall contract value increase. The first is the unanticipated extended contract duration for the land raising contractor on the Klondyke site contributing £23,000 and the second is the need to procure a separate contract for the construction of the new surface water pump station within the Twyford site costing an additional £30,644.

2.4 At the time of submitting the waiver document, it was assumed that negotiations would have concluded with remaining occupiers and the site vacant to enable immediate possession. This has not proved to be the case and whilst the contractor was appointed at the end of September 2020, they are not practically able to take possession of the site until February 2021. As well as delaying the start of the physical works, the contractor now must undertake several months of reptile translocation before the principle works can begin. This has the effect of extending the overall programme thus requiring an elongated contract management period that was not previously included within the contract provisions.

2.5 The fee proposal submitted by Campbell Reith assumed that the construction of the new surface water pump station would be included within the contract for the same contractor completing the land raising works and so based their fees on procuring and managing one contract. As discussions between the project team continued, and following some market testing it became apparent that it made sense to have two separate contracts for these work elements in order to avoid a general contractor adding a management fee of up to 15% onto the specialist works required to complete the pump station works. Whilst this results in additional contract administration and management services from Campbell Reith, the cost of these is significantly less than the management fee would be.

2.6 Both elements of this contract variation will be paid for in full by the funds being received via the HIF grant and there is a sufficient contingency allowance within that to enable that to go ahead without requiring any additional approvals.

2.7 These contract variations are being made in line with the Local Government National Procurement Strategy which states, *"A modification up to 50% of the original contract value can also be made in circumstances which a 'diligent contracting authority could not have foreseen' provided that the changes do not alter the overall nature of the contract."* and subsequently, "*The 50% limit applies to each change that is made (not cumulatively), provided that the changes are not aimed at avoiding the regulations."*.

2.8 Two separate contract variation requests will be submitted to Legal for processing in line with these requirements.

3 Proposals

3.1 It is proposed that the existing contract with Campbell Reith be varied in accordance with the legal provisions within the contract to include these additional works; resulting in a revised contract value of £151,644. The contract variation will be fully reviewed and approved by Swale's legal representatives.

4 Alternative Options

4.1 An alternative option would be to carry out a full tender exercise for these additional services. This is not considered to be a suitable alternative for several reasons. Campbell Reith have accrued extensive detailed project knowledge and information that other organisations would not have, and this would give them a considerable competitive advantage against other organisations if a competitive tender was to be carried out. This advantage if further exacerbated by the fact they are currently working on the project site completing works for both Homes England and Swale Borough Council. It is therefore not considered that a fair and meaningful competitive competition could be carried out in this instance. The timing of this contract variation is also imperative in order for ensure the scheme can deliver the outcomes contractually required within the Grant Determination Agreement for the HIF grant.

4.2 There is an alternative option to not commission these additional works. This is not considered to be a suitable alternative as without these works being completed, we would not commit and spend sufficient funds to meet the contractual obligations as set out in the Grant Determination Agreement for the HIF grant. Any failure to adequately spend the awarded funds and/or fail to meet the contractual obligations could have a negative impact on Swale's future ability to secure grant funding from Homes England.

5 Consultation Undertaken or Proposed

5.1 Internal consultation has taken place with relevant colleagues in Legal, Procurement and Senior Management Team. There has also been ongoing dialogue with Homes England.

5.2 Legal and Procurement colleagues will be required to approve all process and documentation prior to any agreements being signed or contracts issued.

6 Implications

Issue	Implications
Corporate Plan	The Queenborough and Rushenden Regeneration scheme is a key element of Delivering Regeneration within the current Corporate Plan and contributes to the delivery of major regeneration projects in the Borough to improve the appearance and facilities of our towns and villages.
Financial, Resource and	Failing to vary this contract and deliver these additional works would elongate the development timescales and delay the delivery

Property	of homes, within phase 4 of the scheme. This would then mean Swale does not meet the contractual obligations contained with the HIF Grant Determination Agreement.
Legal, Statutory and Procurement	Procurement and Legal have reviewed the proposals and have indicated that they are acceptable and in line with contract standing orders and regulatory requirements The standard contract variation clause within the contract will be executed and administered by Legal for each of the contract variations.
Crime and Disorder	None identified at this stage.
Environment and Sustainability	None identified at this stage.
Health and Wellbeing	None identified at this stage.
Risk Management and Health and Safety	Failing to deliver this grant funding would put the future of the Queenborough and Rushenden Regeneration scheme at risk of failure through elongating the development timescales.
Equality and Diversity	None identified at this stage.
Privacy and Data Protection	All regulatory and legislative requirements associated with privacy and data protection are accounted for and met by utilising the council's procurement portal, Pro-Contract.

7 Appendices

None.

8 Background Papers

None.

Cabinet Meeting	
Meeting Date	16 December 2020
Report Title	Swale House refurbishment project – progress report
Cabinet Member	Cllr Monique Bonney, Cabinet Member for Property and Economy
SMT Lead	Nick Vickers, Chief Financial Officer
Head of Service	Anne Adams, Head of Property Services
Lead Officer	Anne Adams, Head of Property Services
Key Decision	No
Classification	**Open**
Recommendations	Cabinet is recommended to: 1. Note the progress made on the design and feasibility stages of the project, and 2. Delegate authority to the Head of Property Services in consultation with the Cabinet Member for Property and Economy, subject to a successful grant application, to carry out certain carbon reduction works fully funded from grant funding in advance of the decision to allocate capital funding to the project.

1 Purpose of Report and Executive Summary

1.1 The purpose of this report is to update members on the progress made so far with the design and feasibility work for the proposed Swale House refurbishment project and to seek delegated authority to carry out certain works fully funded by grant money in advance of the decision to allocate capital funding to the project.

2 Background

2.1 Swale Borough Council has declared a climate change emergency and as part of the Borough's Climate and Ecological Emergency Action Plan, our intention is to carry out a low carbon refurbishment of Swale House together with an internal refurbishment to create greater scope for renting space to third party occupiers. From work carried out by the Carbon Trust on behalf of Swale Borough Council in 2019, Swale House was estimated in their report to account for 12% of the CO_2 emissions within the Borough's assets and services for which the Council themselves have control over. According to the Climate and Ecological Emergency Action Plan the carbon reduction target for Swale House needs to be or in excess of 186 tCO_2e/annum and the works need to be complete by 2025.

2.2 The project will also support the Council's Economic Improvement and Recovery Plan by providing opportunities for businesses to locate at Swale house. This will result in a positive economic impact on the town centre.

2.3 The government has recently announced the Public Sector Decarbonisation Grant fund which is accessible to potentially part-fund the project. The timescale for submitting a grant application is very short and certain actions have already been carried out and are being proposed to maximise the chances of a successful bid. The deadline for submitting the application is 11 January 2021.

2.4 At the Cabinet meeting on 18 March 2020 members approved a capital budget of £250,000 to fund the initial feasibility and design work for the project. This was approved on the basis that a full business case would be provided in due course.

3 Proposals

3.1 This report is a progress update report. It is proposed to provide a more detailed report to Cabinet on 10 February 2021. That report will provide the business case for the project and will recommend that members approve a capital allocation to deliver the project.

3.2 The scope of the project and amount of funding to be recommended will be dependent upon whether the grant application has been successful. It is anticipated that a decision on the application will have been made by the time of the next report and this will inform the recommendation.

3.3 As well as a short timescale for submission of the application, the grant scheme also places a deadline of the completion of the low-carbon works. In order to be able to meet the deadline imposed, it is proposed to carry out certain works in advance of the main project works. This would only happen in the event that the grant application is successful and the procurement of any works would comply with the Council's standing orders.

3.4 The following is a summary of progress to date and proposed next steps:

Appointment of project/consultancy team

3.5 *Quartz Project Services* – this company has been appointed as Project Managers and Quantity Surveyors. They will be responsible for ensuring that the project is delivered to the required specification and quality, on time and within the approved budget. They are also responsible for managing the rest of the consultancy team.

3.6 *Spacelab Ltd* – this company is the appointed architects and they are responsible for designing the carbon reduction works and the internal refurbishment. This includes the workplace planning process to support the Council in assessing its office accommodation requirements, taking into account any long-term changes to working practices arising as a result of Covid-19.

3.7 *Elementa Ltd* – this company is the appointed sustainability/MEP consultants and they are responsible for designing the electrical and mechanical installations and measuring the environmental impacts of the proposed carbon reduction measures.

3.8 Other consultants such as structural engineers will be appointed as and when required as the project develops.

BREEAM accreditation

3.9 Whilst there are a number of ways of measuring environmental efficiency in buildings, it is recommended that BREEAM is used as it is a widely recognised accreditation scheme which allows comparisons to be made against other buildings. The intention is to aim for the BREEAM Excellent rating although it is recognised that budgetary constraints may prevent this being achieved, in which case the BREEAM Very Good rating will be the target.

3.10 The BREEAM accreditation is a comprehensive measure of a building's performance and includes management, health and wellbeing, energy, transport, water, materials, waste, land use and ecology, pollution and innovation.

Workplace appraisal

3.11 As mentioned above, Spacelab have been appointed to support the Council in assessing and designing its workplace requirements. Spacelab's Engagement Plan will involve an initial visioning workshop in November followed by one to one interviews with senior managers and an all-staff survey to establish the views of staff. An example of the Engagement Plan is attached as Appendix I.

3.12 Factors to be taken into account in establishing the long-term office space requirements will include:

- Current and future organisational structure,
- Benefits in changing working practices,
- Creating space for third party occupiers,
- Visitor/customer needs,
- Use of common spaces,
- Meetings,
- Storage requirements,
- Waste and recycling strategy, and
- Building security.

Business Case

3.13 It is proposed to present a business case to members in the report to be presented to the February Cabinet meeting. This will contain a detailed budget estimate of the estimated costs associated with achieving the objective of a BREEAM Excellent or Very Good rating together with the internal refurbishment and alterations required to achieve the required office space.

3.14 In the event that the estimated costs exceed the available budget, members will be asked to prioritise the work to ensure that the budget is spent on the most important areas and that the benefits achieved are maximised. The amount that can be achieved from the project will depend to a significant extent on the success of the grant application.

4 Alternative Options

4.1 *Not to carry out any refurbishment works*: This is not recommended because the building would continue to be environmentally inefficient and any scope to increase rental income from third party occupiers would not be realised.

5 Consultation Undertaken or Proposed

5.1 The Cabinet Member for Property and Economy and the Deputy Cabinet Member for Property and Economy are members of the project steering group and fully support this project.

5.2 The Chief Financial Officer is a member of the project steering group and fully supports this project.

5.3 SMT has been consulted and fully supports this project.

6 Implications

Issue	**Implications**
Corporate Plan	This project meets the corporate priority to address the climate and ecological emergency by reducing carbon emissions from Swale House. It also meets the priority to reduce dependence on government-controlled funding sources by increasing the amount of space available for renting out to third party occupiers.
Financial, Resource and Property	This report does not have any direct financial implications as this will be the subject of a future report. Any works carried out to the building prior to the approval of a capital budget will be fully funded by grant funding.
Legal, Statutory and Procurement	Due to the tight timescales imposed by the grant application, a number of different approaches have been adopted in relation to the procurement of the project team. Where it has not been possible to meet contract standing orders, a waiver has been obtained.

Crime and Disorder	None identified at this stage.
Environment and Climate/Ecological Emergency	The environmental implications are set out in the report.
Health and Wellbeing	This will be addressed in the next report and will discuss the implications on staff's wellbeing arising from a revised flexible and home working policy.
Risk Management and Health and Safety	None identified at this stage.
Equality and Diversity	None identified at this stage.
Privacy and Data Protection	None identified at this stage.

7 Appendices

7.1 Appendix I: Spacelab – Engagement Plan

8 Background Papers

None.

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Swale Council Engagement Plan

Executive visioning workshop_ (25.11.2020)

A group session facilitated by Spacelab - to understand the Executive vision for the Council going forward, and to set the project within that context. This will set the 'road map' for the project and establish key objectives and measures of success.

Introduction
Introductions to Spacelab_ and our scope / process.

Future vision for the council
What is your vision for the future of the council?
Are you planning on making any strategic or operational changes, and what are the timescales for these?

Future vision for the building and ways of working
What is your vision for the future of the building, including provision of council services / interface with the community?
(How will your vision for the future of the council manifest spatially?)
Is there an appetite to open up the space to other (related) third parties and/or generate revenue from the space?
How do you envisage staff will work in future?

Key benefits / measure of success
Overall, what are the key benefits you are hoping to deliver through changing the workplace and ways of working?
What would be your measures of success?

Staff requirements
What do you think staff want from their future workplace?

Visitors and clients
What sort of experience do you want visitors and clients to have of the future office, and how much of the space do you want them to have access to?

Summary
Key 'must haves'.
Any other comments.

SMT visioning workshop_ (01.12.2020)

A group session facilitated by Spacelab - to understand the SMT vision for the Council going forward, and to set the project within that context. This will help set the 'road map' for the project and establish key objectives and measures of success.

Introduction
Introductions to Spacelab_ and our scope / process.

Future vision for the council
What is your vision for the future of the council?

Future vision for the building and ways of working
What is your vision for the future of the building, including provision of council services / interface with the community?
(How will your vision for the future of the council manifest spatially?)
How do you feel about opening up the space to commercial tenants to generate revenue, and/or other third-sector parties?
How do you envisage staff will work in future?

Key benefits / measure of success
Overall, what are the key benefits you are hoping to deliver through changing the workplace and ways of working?
What would be your measures of success?

Staff requirements
What do you think staff want from their future workplace?

Visitors
What sort of experience do you want visitors to have of the future building, and how much of the space do you want them to have access to?

Summary
Key 'must haves'.
Any other comments.

1:1 interviews_ (January 2021 - TBC)

A series of 1:1 sessions (up to 1 hour each) with representatives from across the organisation - to understand the different departments and to define the needs and amenity requirements for each.

What does your department do and how do they do it?
(Including main roles and headcounts, and a typical 'day in the life'.)

Do you provide a service / direct contact with residents?
(Including the nature / frequency of contact, how this has traditionally been delivered, and how it has been done through COVID-19.)

Do you see any of this changing in future?
(Including having learned from the experience of working from home through COVID-19.)

What were the key issues / challenges of working from Swale House, and the issues / challenges of working from home?
(At both the individual and team-wide level.)

What spatial settings / changes could resolve or enhance the way you work?
(Including working from elsewhere.)

Which teams do you work most closely with (now and in an ideal future), and would you like to be physically proximal to in a future workplace?
(List teams)

Online staff survey_ (December 2020 / January 2021 - TBC)

A series of 1:1 sessions (up to 1 hour each) with representatives from across the organisation - to understand the different departments and to define the needs and amenity requirements for each.

1. Rank what you are enjoying most about working from home.
The ability to focus and concentrate
Not having to commute
More quality time to spend with my family or housemates
The flexibility to work in a way that suits me
A more balanced lifestyle
Other / any comments [text box]

2. Rank what you are missing most about not being in the office.
Not socialising with my colleagues
Not having face-to-face collaboration with my colleagues
A structure to my working day
My commute into work
The separation between my work life and my home life
Other [text box]

3. What is the biggest challenge you have faced whilst WFH?
No dedicated space to do my work
Poor ergonomics of my home working set-up
My computer set-up
My wifi connection
Collaboration with colleagues
General distraction from others in my home
Other / any comments [text box]

4. Do you feel more productive WFH than being in the office?
Yes
No
About the same

5. Do you feel happier WFH than being in the office?
Yes
No
About the same

6. Pre-lockdown, on average how often did you work from home?
Never
Occasionally
1 day per week
2 days per week
3 days per week
4 days per week
5 days per week

7. In future, on average how often would you ideally like to work from the office?
1 day per week
2 days per week
3 days per week
4 days per week
5 days per week

8. Describe your ideal workplace and way of working, including any facilities and amenities that would be important to you.
[Free text]

[See example survey here - https://spacelab.co.uk/future-of-work-survey/]

9. In future, where would you ideally carry out the following activities?

Activity	I will mostly do this in the office	I will do this both in the office and at home	I will mostly do this from home
Collaborative working			
1:1 meetings			
Team meetings			
External or client meetings			
Independent deep work			
Independent routine work			
Taking VC calls			
Social interactions			
Other (please specify)			

spacelab_

great space. imagined.

—

the lab_
urbanlab_
sense_
the lab foundation_
energylab_

—

+44 (0)20 7033 3450
info@spacelab.co.uk

18 Wenlock Road
London N1 7TA

Cabinet Meeting	
Meeting Date	16 December 2020
Report Title	Clean Air Zone Feasibility Study
Cabinet Member	Cllr Tim Valentine, Cabinet Member for Environment
SMT Lead	Nick Vickers, Chief Financial Officer
Head of Service	Tracey Beattie, Mid Kent Environmental Health Manager
Lead Officer	Julie Oates, Environment Protection Team Leader
Key Decision	Non-Key
Classification	**Open**
Recommendations	1. To note the contents of the Clean Air Feasibility (CAZ) study report and its conclusions and recommendations 2. To pursue the recommended option from the CAZ Feasibility Study of working in partnership with KCC to review the measures explored and develop in more detail a package of measures to reduce traffic, improve flow and improve the vehicle fleet along the A2. This could be promoted as a local Low Emission Zone or similar. 3. To report back to Cabinet at a later date following engagement and discussion with KCC on any options or measures that are supported by KCC to be taken forwards.

1 Purpose of Report and Executive Summary

1.1 The priorities in the Swale Borough Council Strategic Air Quality Action Plan (AQAP) are to identify and develop measures which will deliver compliance with Air Quality Objectives (AQO) through a combination of strategic and local focused Air Quality Management Area measures. One of the key strategic measures is the introduction of a Clean Air Zone (CAZ) along the length of the A2 in the borough. A feasibility study to assess the costs and air quality benefits of a CAZ has been undertaken by independent consultants Ricardo. The purpose of this report is to present the findings and recommendations of the CAZ Feasibility Study which is provided as Appendix A to this report.

1.2 The feasibility study followed Defra's Joint Air Quality Unit (JAQU) guidance and included baseline air quality modelling, the development of potential mitigation options and appraisal of these options using an indicative cost benefit analysis. Six key mitigation options plus two packages of options were shortlisted for cost benefit analysis appraisal. Of these, two were a charging CAZ and four were non-charging measures. The first packaged option was a group of non charging

measures and the second was a combination of a charging CAZ plus non charging measures

1.3 The air quality modelling was undertaken for an 'end' year of 2022. This year was chosen as it aligns with most CAZ studies in England in terms of compliance with Regulations etc. To extend further into the future could result in potential large modelling inaccuracies. The option giving the highest air quality improvement across all monitoring sites (18%) was a chargeable CAZ (CAZ D which covers all vehicle types). The second chargeable CAZ (CAZ B which covers HGVs, buses and taxis) only provided a 1.7% reduction. Both chargeable CAZ have high implementation costs of about £2.2 million. Key costs of setting up and installing a CAZ include signs/advance warning, road markings, and cameras – hence costs are the same for both types of CAZ. Costs could be reduced by utilising mobile cameras. There are other economic or compliance costs which also need to be taken into consideration. The most significant of these is the cost to businesses and the public in changing or upgrading their vehicles to be compliant, for CAZ B this is estimated at £17 million and CAZ D at £142 million.

1.4 Of the non-charging measures (mode shift package, freight package (delivery/servicing plans and a freight consolidation centre), support for electric vehicles and removal of pinch point parking), the mode shift package which includes school and business travel plans, investments in walking/cycling infrastructure and cycle parking, pilots with e-bikes/scooters and establishing car clubs in Faversham and Sittingbourne offered the highest air quality improvement of 2.1%. This was also the most expensive as significant investment in walking and cycling infrastructure along the A2 would be required (an estimate of £15 million).

1.5 However, with all measures, the wider costs to the community and businesses are very important and need to be considered alongside the implementation costs. All costs and offsetting air quality benefits (which were given a monetary value calculated by the reduction in emissions) were reviewed in the Feasibility Study by looking at the total Net Present Value (NPV). This takes into account all costs (implementation and wider costs) and the monetary value of the air quality benefit associated with the measure, to provide an overall NPV for that measure. Those measures having a negative NPV being less attractive in terms of cost benefit analysis to those with a positive NPV. The highest negative NPV was CAZ D - £118 million, with the highest positive being Pinch Point Parking at +£0.4million. However, although far less costly, this measure also offers up the least benefit in terms of air quality improvements.

1.6 The air quality along the A2 is expected to improve by 2022 in a normal 'business as usual' situation due to lower emissions as new vehicles replace older models. However, due to modelling uncertainty and the economic impact of the Covid-19 pandemic, there is a risk that improvements will not be as high as anticipated and exceedances of the AQOs will still occur. In this respect, the risk needs to be addressed so traffic emission reduction measures are likely to still be needed.

1.7 However, the introduction of a charging CAZ may be a disproportionate and expensive response to dealing with the situation along the A2 and non-charging measures may be more appropriate for the Swale Borough.

1.8 The introduction of any formal charging Class of CAZ must adhere to legislation (Transport Act 2000 Part III) which provides a legal framework and basis for the introduction of a charging CAZ in order to promote consistency across the country. This is inline with the Ultra Low Emission Zone ULEZ in London. However, a form of CAZ can be considered on a local case by case basis by the Government and there can be flexibility on charges, compliance levels and criteria. In these circumstances, the area can't be called a CAZ, but can be called something similar – Low Emission Area, Zero Emission Area, Clean Car Road etc. This option could be feasible for SBC – incorporating a lower level of compliance in terms of Euro Standards, flexibility in terms of enforcement (mobile cameras instead of fixed) and wider notification of the scheme through signage. The additional non-charging measures such as mode shift could also be incorporated into this.

1.9 Kent County Council as the Highways Authority would be responsible for the implementations of the majority of either a charging CAZ (or similar) or the non-charging measures. The Feasibility Study recommends that SBC work with KCC to develop in more detail a package of measures which will reduce traffic, improve flow and improve the vehicle fleet along the A2. This will work towards an overall improvement in air quality along the A2 and compliance with the Air Quality Objectives.

2 Background

2.1 Under the Environment Act 1995 and the Local Air Quality Management framework, Swale Borough Council has a statutory duty to review and assess air quality within its borough and take the necessary actions to improve areas of poor air quality. If Air Quality Objectives (AQO) for key pollutants are exceeded, an Air Quality Management Area (AQMA) must be declared. To date Swale Borough Council has declared six AQMA's for exceedances of the annual average AQO for nitrogen dioxide (NO_2) and one AQMA has recently been amended to include particulate matter (PM_{10}):

AQMA 1: Newington, (A2/High St)) declared 2009;
AQMA 2: Ospringe Street, Faversham (A2/Ospringe) declared in June 2011 and revised (as AQMA 6) to the Mount in May 2016. AQMA 2 has now been revoked and renamed and consolidated into one as AQMA 6;
AQMA 3: East Street, Sittingbourne (A2/Canterbury Road) declared January 2013;
AQMA 4: St Pauls Street, Milton, Sittingbourne (B2006) declared January 2013; amended 22nd October 2020 to include Particulate Matter (PM_{10})
AQMA 5: Teynham (A2 /London Rd) declared December 2015;
AQMA 6: See details in AQMA 2 above.
AQMA 7: Keycol Hill declared 22nd October 2020.

2.2 The 2019 Strategic AQAP outlines actions and measures that will be delivered in order to improve air quality particularly within the declared AQMA areas which, apart from one, are all located on the A2. The A2 suffers very heavy traffic loading through these AQMA areas and also at other points along the road. A key priority for consideration in the AQAP is investigating the feasibility of a CAZ – either a charging CAZ or non-charging measures.

2.3 Ricardo was commissioned earlier this year to undertake the CAZ Feasibility study on behalf of SBC. The approach taken follows the guidance provided by the Government's Joint Air Quality Unit (JAQU) for Clean Air Zone feasibility studies and followed these steps:

- Baseline air quality modelling – this covered the whole of the A2 and AQMA and some connecting roads (including St Paul's Street AQMA). The main focus was NO_2 concentrations as until very recently this has been our main pollutant of concern. The modelling was carried out for the baseline year of 2019 and a future year of 2022. This year was chosen as it aligns with most CAZ studies in England in terms of compliance with Regulations etc. To extend further into the future could result in potential large modelling inaccuracies. The modelling results provided an estimation of the improvement in NO_2 levels needed to achieve compliance with the annual NO_2 Air Quality Objective.
- Development of potential mitigation options - existing plans and policies were reviewed and through liaison with officers and local stakeholders (including KCC), a long list of potential CAZ options was drawn up. Two stakeholder engagement workshops took place in the summer and following discussion and feedback from these, the list was reduced.
- Appraisal of the mitigation options – The short-listed options were then assessed further in terms of air quality benefits and indicative cost. Using the baseline air quality model, each of the options was assessed in relation to 2022 to estimate its air quality impact. Indicative cost benefit analysis (CBA) was also undertaken to allow a comparison of the measures on both an air quality and cost effectiveness basis.

2.4 In terms of air quality modelling, a recognised and appropriate dispersion model was used and the results verified and adjusted against the actual 2019 monitoring data. The baseline modelled results for 2019 compared well to the actual measured results for 2019, with exceedances being found at Keycol Hill and in the St Paul's Street and East Street AQMAs. In the future modelled year of 2022, compliance with the AQO was generally seen in most parts of the A2. However, St Paul's Street, Keycol Hill and possibly East Street are still predicted to be at risk of exceeding the AQO. As a result of the Covid-19 pandemic, a sensitivity test was undertaken. The pandemic is likely to result in a number of economic impacts which could lead to a slower replacement of the vehicle fleet with the less polluting Euro standard vehicles. This could result in there still being exceedances of the AQO in St Pauls St and East Street AQMA's.

2.5 Initially a long list of 25 potential measures grouped into 4 themes was drawn up:

- Options based on a formal charging CAZ
- Low emission vehicle measures
- Promoting mode shift and free flow of vehicles through traffic and travel management measures
- Longer term development policy.

2.6 Following two stakeholder engagement workshops, this long list was reduced to a shortlist of six key mitigation options plus two combined packages to be taken forwards for an appraisal on their impact on air quality and an indicative cost benefit analysis:

Option	Description
Charging CAZ B (A2 from A249 to A299, including St Paul's AQMA)	Covers HGV's, Buses and Taxis. Vehicles not meeting a Euro 6/VI standard for diesel vehicles or Euro 4 for petrol vehicles will be charged. Proposed exemption for 3 years for buses and taxis – support upgrade to compliant vehicles
Charging CAZ D (A2 from A249 to A299, including St Paul's AQMA)	Covers HGV's, Buses, Taxis, LGVs and cars. Vehicles not meeting a Euro 6/VI standard for diesel or Euro 4 for petrol vehicles will be charged. Proposed exemption for 3 years for buses and taxis – support upgrade to compliant vehicles
Mode shift package (Targeting whole SBC area but focus on A2)	Package including : - Travel plans – schools and businesses - Work with KCC in investment in walking and cycling infrastructure - Invest in secure cycle parking - Pilots/loans/trials with e-bikes/scooters - Car club in Sittingbourne and Faversham
Freight package (covering the main swale towns but with focus along A2)	Package focused on freight including: - Delivery and servicing plans, link to travel plans - Consolidation centre servicing Sittingbourne and Faversham
Electric vehicle support package	Package to promote electric cars and vans across Swale including: - Parking charge incentives - Charging infrastructure in Council car parks also working with businesses - Promotion – link to travel plans - E-car clubs linked to car clubs
Pinch point parking removal	Remove pinch point parking on the A2 to allow better vehicle flow
Non charging Package	Bundle of mode shift, freight, electric vehicles and pinch point removal
CAZ B plus non charging package	Looking at the benefits of the CAZ B and the non-charging package combined.

2.7 The table below shows the results of the options appraisal on the impact on air quality and also an indicative cost benefit analysis. The cost benefit analysis has been summarised as a Net Present Value (NPV). As mentioned previously, this quantifies the costs (implementation and wider costs) and the monetary value of the air quality benefit to provide an overall NPV for that measure. In terms of costs, indicative implementation costs have been shown separately to the Net Present Value (NPV).

Category	Ref Case	CAZ B	CAZ D	EV	Freight	Mode Shift	Pinch Point	All non-charging	CAZ B + non-charging
Average reduction concentration across all monitoring sites %									
Reduction	0	1.7	18.4	1.2	0.6	2.1	0.3	3.0	4.7
Number of monitoring sites exceeding or at risk (global adjustment)									
Exceeding	0	0	0	0	0	0	0	0	0
At risk	2	2	0	2	2	2	2	2	2
Number of monitoring sites exceeding or at risk (site specific adjustment)									
Exceeding	1	1	0	1	1	1	1	0	0
At risk	1	1	0	1	1	1	1	2	2
Summary cost benefit analysis results (Million £)									
Total NPV	N/A	-15.0	-118.1	-1.9	0.3	- 13.3	0.4	-15.6	-30.6
Implement-action only	N/A	2.26	2.26	0.14	0.29	15.17	<0.01	15.61	17.86

2.8 In terms of air quality improvements, the CAZ D (all vehicles) provides the greatest benefit giving an 18% improvement which will result in no sites exceeding or at risk of exceeding the Air Quality Objective (AQO). CAZ B (targeting HGVs) provides a far lower improvement at only a 1.7% reduction in concentrations. In terms of cost, both CAZ options have similar implementation costs (£2.26 million), but the NPV is far greater at £118 million over 10 years for CAZ D compared to £15 million for CAZ B. These costs include the compliance costs to local businesses and residents in upgrading their vehicles which is significant.

2.9 Two measures present a positive NPV (freight and pinch point parking), but these offer a very small overall impact in terms of air quality benefit. In addition, it has been impossible to estimate the costs involved with providing additional residential parking for those no longer able to park on street. Of the non-charging options, Mode Shift offers the highest reduction (2.1%) which is a higher reduction than CAZ B. The lowest air quality impact was the removal of the pinch point parking at 0.3%. As this measure would only be applicable to certain areas of the A2 rather then the entire length, this is to be expected. As specific details of these non-charging measures were not available, the costs were estimated. Mode shift being the costliest with likely implementation costs of c £15 million to cover cycle and walking infrastructure. However, this estimation does cover the introduction of new cycle way along the entire length of the A2 though the borough and it is unlikely that level of investment will be possible. In terms of NPV, this option does perform better than both CAZs with an NPV of £13.3 million.

2.10 As a non-charging package, the 4 measures together generate a 3% improvement to air quality which is higher than CAZ B alone. This will result in no areas exceeding the AQO, with 2 areas at risk of exceedance (which is no different to most of the other options). In terms of overall costs, it is about the same as a CAZ B at £15 million but the air quality improvements are far greater. A package of CAZ B combined with all the non-charging options was also examined by combining the individual costs and benefits. As expected, the combination of the CAZ be and non-charging measures, gives a higher air quality improvement (4.7%) than the options alone and will result in no exceedances of the AQO. Costs are estimated at £17million for implementation and £30 million overall. This combination package is obviously far less in terms of overall cost that the CAZ D option. It should be noted that this combination option was simply estimated by summing the costs and benefits of the CAZ B and non charging measures package.

2.11 As CAZ D (all vehicles) provides the greatest benefit in terms of air quality and enables compliance with the AQO in all AQMAs by 2022, a Low Emission Zone (LEZ) requiring lower levels of Euro standard compliance (such as Euro 4) will still provide sufficient air quality benefits, if a form of charging CAZ is a preferred option. This would deal with the older, more polluting vehicles but have a lesser impact on the wider community and businesses in terms of the cost of vehicle replacements. Residents and businesses will still have the ability to drive vehicles up to 14 years old and still be complaint with a Euro 4/IV based LEZ scheme.

This form of LEZ would provide more flexibility to implement the zone and any other supporting measures in a more cost effective manner. For example, mobile ANPR cameras could be used along the A2 as an alternative to fixed cameras which are expensive to purchase and maintain. Our consultants have estimated that set up and running costs for a mobile ANPR system would be in the region of £1-1.5 million. Of this approximately 75% are upfront capital expenditure costs with the rest being operational expenditure (estimated over a 10 year period). In comparison, the implementation costs for a formal CAZ D have been estimated at £2.26 million on the assumption that eight sets of fixed cameras will be installed. Again, a similar 75% to 25% split for upfront and operational expenditure applies. It must be remembered that with any charging scheme there will also be back office costs in setting up the system to collect information, issue and process any fines.

2.11 Modelling has shown that by 2022, air quality along the A2 is expected to improve as vehicle fleets are renewed and the number of vehicles with higher Euro emission standards increases. However, there is always uncertainty in modelling and with the economic impact of the Covid-19 pandemic, there is a risk that vehicle fleet turnover will be slower than anticipated and improvements will not be as high. This could result in continued exceedances of the AQOs. In this respect, measures are likely to still be needed to reduce traffic related emission along the A2 to address this risk.

2.12 Although there is a risk of exceedances of the AQOs in some of the AQMAs in 2022, the exceedances are not significant in comparison to other areas or cites such as London, Birmingham etc. As a result, a charging CAZ may therefore be considered to be a disproportionate and expensive response to dealing with the situation along the A2. A package of non-charging measures may be more appropriate for the Swale Borough. In addition with a package or measures, these could be implemented using a phased approach across the district as financial resources allow. This process could be implemented over a number of years with the initial focus or priority being given to supporting schemes and measures in the areas of the AQMAs and the A2 (as these areas are the most polluted).

2.13 Kent County Council as the Highways Authority for this area would be responsible for the implementation of the majority of either a charging CAZ or the non-charging measures. The Feasibility Study recommends that SBC work in partnership with KCC to develop in more detail, a package of measures which will reduce traffic, improve flow and improve the vehicle fleet along the A2. This will work towards an overall improvement in air quality along the A2 and compliance with the AQOs. As the Highways Authority, KCC would be also primarily be responsible for funding these non-charging measures. However, there are a number of additional funding options open to SBC that could be utilised to finance measure or provide match funding:

- Section 106 contributions arising from Air Quality Damage Costs Assessments or other traffic and transport assessment. Work is currently under way looking at the option of pooled developer contributions in the form of a Sustainable Transport, Facilities and Incentives contribution. These pooled contributions could be used to fund larger schemes that would benefit a wider population and areas in terms of air quality benefits than a measure focussed on a particular development.
- Defra Air Quality Grants – applications for grant monies can be made to Defra on an annual basis. Applications are submitted in the autumn with determination in the following spring. If a scheme of measures is drawn up for SBC and approved, funding could be sought via this route.
- Housing Infrastructure Fund (HIF) – monies from the Swale Transport Infrastructure scheme set up to support infrastructure improvements linked to long term housing delivery in northwest Sittingbourne, could be utilised for some measures or schemes.

2.14 KCC Highways have been involved in the Feasibility Study process so are aware of the options that have been considered and modelled. It is also anticipated that mode shift measures in particular will be an important aspect in the emerging SBC Local Transport Plan. In this respect, it is hoped that the CAZ Feasibility Study will be well received by KCC.

3 Proposals

3.1 To note the contents and recommendations of the CAZ Feasibility Study.

3.2 To pursue the recommended option from the CAZ Feasibility Study of working in partnership with KCC to review the measures explored and develop in more detail a package of measures to reduce traffic, improve flow and improve the vehicle fleet along the A2. This could be promoted as a local Low Emission Zone or similar.

3.3 To report back to Cabinet at a later date following engagement and discussion with KCC on any options or measures that are supported by KCC to be taken forwards.

4 Alternative Options

4.1 Not to act on the recommendation of the CAZ Feasibility Study to liaise with KCC to develop further measures to reduce pollution along the A2. This would be on the basis that the modelling indicates that there will be a natural downward trend in pollution levels by 2022, with no exceedances of the AQO, so no additional measures to improve air quality are required. This could result in continued exceedances of the AQOs if the anticipated vehicle fleet improvements do not happen.

5 Consultation Undertaken or Proposed

5.1 Public consultation has not been undertaken at this stage. However, two stakeholder engagement workshops involving SBC members and officers, relevant KCC departments, parish councils and public transport sectors were held to discuss a shortlist of measures to be assessed further.

5.2 Public consultation was undertaken as part of the AQAP process and feedback indicated there was an appetite for a CAZ locally. It may be considered appropriate that further public consultation be undertake exercise to ascertain more up to date public opinion regarding the possible options.

6 Implications

Issue	Implications
Corporate Plan	The proposals support Priority 2: Investing in our environment and responding positively to global challenges in the emerging Corporate Plan 2020-2023 ‘Working together for a better borough’.
Financial, Resource and Property	The Feasibility Study was funded from the Special Project Fund. The Council has limited funding available to fund the implementation of specific projects identified so we need to explore other funding sources from KCC, Central Government and S106 contributions.

Legal, Statutory and Procurement	The Transport Act 2000 Part III provided a legal framework and basis for the introduction of charging CAZ. Any form of CAZ will require approval by Defra. The SBC Strategic AQAP approved by Defra contains a key strategic measure to reduce emission and smooth traffic flows on the A2 and also encourages alternative modes of transport to reduce congestion and pollution by the introduction of a CAZ. We are required to report annually to Defra on progress with AQAP measures.
Crime and Disorder	None identified
Environment and Sustainability	The CAZ feasibility study is a key action in the Strategic Air Quality Action Plan and also forms part of the Climate and Ecological Emergency Action Plan drawn up in fulfilment of the declaration by Council of a Climate and Ecological Emergency.
Health and Wellbeing	Actions or measures resulting in reductions in vehicle emissions and improvements to air quality are beneficial to the health of residents, especially vulnerable people who suffer from respiratory conditions, and young children
Risk Management and Health and Safety	None identified.
Equality and Diversity	None identified at this time. Equalities Impact Assessment not required at this time.
Privacy and Data Protection	None identified

7 Appendices

7.1 The following documents are to be published with this report and form part of the report:

- Appendix I: Clean Air Zone (CAZ) Feasibility Study – Final Report

8 Background Papers

Swale Borough Council Strategic Air Quality Action Plan – https://services.swale.gov.uk/assets/Air-Quality/AQAP_SwaleBC_2018%20final.pdf

Clean Air Zone (CAZ) Feasibility Study – Swale Borough

Final Report for Swale Borough Council

Customer:

Swale Borough Council

Customer reference:

Swale CAZ Feasibility Study

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Executive Summary

The A2 corridor through Swale Borough suffers from heavy traffic and congestion which has led to the declaration of 4 Air Quality Management Areas (AQMAs) along the A2 itself and one related AQMA in the St Paul's Street area of Sittingbourne. All the AQMAs have been declared on basis of exceedance of the Nitrogen Dioxide (NO_2) limit value of 40µgm^{-3} annual average. The annual average value relates to the average concentration over the year and there will times when the actual concentrations could be higher than this. There are also concerns in relation to particulate matter (PM) in the St Paul's Street AQMA. Since the commissioning of this work Keycol Hill has also been declared an AQMA but is not shown explicitly on the maps as an AQMA.

An interim Air Quality Action Plan (AQAP) was developed in 2017 to reduce pollution across all 5 AQMAs. Further work was then done in 2018 to provide a wider evidence base for the AQAP covering a modelling and source apportionment study and an assessment of initial options. This provided the basis for the full AQAP in 2019 which was approved by DEFRA. The revised AQAP took a more holistic AQAP combining AQMA specific actions and measures, plus provide a wider strategic approach to improving air quality across the Borough. A key plank of the proposed actions in the AQAP was the assessment and development of a Clean Air Zone, both a formal charging zone and non-charging additional measures targeting the AQMAs along the A2.

The report sets out an assessment of a range of potential measures to address air quality both locally and more strategically across the Borough including a specific assessment and feasibility of a Charging Clean Air Zone (CCAZ). The approach taken to the study builds on the guidance provided by the Government's Joint Air Quality Unit (JAQU) for Clean Air Zone feasibility studies to provide a robust assessment approach for Swale and the A2 corridor. The key steps of the assessment process undertaken were:

- *Baseline air quality modelling* – covering the whole A2, related roads and the AQMAs and focused on NO_2 concentrations. This was carried out for the base year in 2019 and a future year in 2022. This builds on the existing source apportionment work and related data sources to confirm the compliance gap to be addressed.
- *Development of potential mitigation options* - this task reviewed existing plans and policies, and worked with local stakeholders, to develop a long list of potential CAZ options. This was then reduced to through a stakeholder engagement workshop and simplified multi criteria assessment (MCA).
- *Appraisal of the mitigation options* – using the baseline model each of the options was assessed in the future year to estimate its air quality impact. This was complemented by an indicative cost benefit analysis (CBA) allowing comparison of the measures on both an air quality and cost effectiveness basis.

Current and forecast air quality along the A2

Air quality along the A2 was modelled using traffic data from the existing regional traffic model, fleet composition data collected from the previous source apportionment study, that latest emissions factors from DEFRA's Emission Factor Toolkit and our in-house dispersion model RapidAir®. The model was then verified and adjusted against 2019 monitoring data.

The modelling provides detailed results expressed in 2 ways to provide an assessment of air quality along the A2 and related AQMAs:

- Compliance data in relation to the air quality limit values for all roads in the modelled area – this extracts results at 4m from the roadside and presents the highest concentration along each road link.
- Monitoring point location results – which have been extracted both with the overall model adjustment factor (global) and adjusted to match the actual monitored value (site-specific) in

2019. These latter site-specific adjusted results are intended to reflect any specific conditions around the diffusion tube location that could be influencing the results.

The baseline compliance air quality results in 2019 indicated a number of areas where the NO_2 limit value is being exceeded principally in Sittingbourne at Keycol Hill, and in the St Paul's Street and East Street AQMAs. There is also a slight exceedance in Ospringe. In relation to the monitoring locations, 9 of the locations are showing exceedances of the 40 ugm^{-3} limit value.

Moving forward to 2022 the results show a significant improvement based on business as usual conditions, generated primarily by improvement to the vehicle fleet as vehicles renew and become cleaner. Road link based compliance results showed that no roads were expected to exceed the limit value although there are roads in Sittingbourne, again within the St Paul's Street and East Street AQMAs that are at risk of exceedance being above 35 ugm^{-3} which is within model error estimated from the model verification. The monitoring location results with the global adjustment reflect the same picture showing no monitoring sites expected to exceed in 2022. However, when using the local adjustment factor one monitoring site in St Paul's Street AQMA (SW82) is showing an exceedance and one location at Keycol Hill (SW124) is very close.

For the 2022 year a sensitivity test was also carried out to assess the impact of a slower fleet turnover potentially from an economic slow-down related to COVID 19. This sensitivity suggested that there could potentially be exceedances remaining in Sittingbourne in the St Paul's Street and East Street AQMAs.

This analysis suggested that although a standard business as usual assessment in 2022 indicated that there would be no exceedances, sensitivity assessment using site-specific adjustment at monitoring locations and slower fleet turnover could well result in exceedances in Sittingbourne. The highest level of NO_2 under these tests was 44 ugm^{-3} estimated at monitoring location SW82 in the St Paul's Street AQMA. So, the aim of any mitigation measures should to reduce the risk of these potential exceedances occurring, especially in St Paul's Street AQMA.

Developing the mitigation options

The starting point for the long list of options was a review of existing plans from Swale Borough Council (SBC), Kent County Council (KCC) and Transport for the South East (TfSE) as the key bodies responsible for transport in the area. The documents were evaluated looking at: air quality action plans, development plans, transportation strategy (incl. rail, active travel, taxi, parking) and sustainable growth, including any progress reports in these areas.

From these documents an initial long list of measures was generated by collating similar and overlapping measures into key themes. These themes were then reviewed to identify any potential gaps building on experience from measures being implemented in other CAZ cities or through the concept of Low Emission Strategies such as those developed in Southampton, Leicester and York. This initial long list defined 25 key groups in 4 themes:

1. A formal charging CAZ and options on this;
2. Low emission vehicle measures to promote and support the uptake of low emission vehicles;
3. Traffic and travel management to promote mode shift and the efficient flow of vehicles;
4. Longer term development policy.

The long list of measures was refined into a shortlist of measures through two stakeholder engagement workshops. The key stakeholders included in the workshops were:

- Relevant KCC departments i.e. KCC Highways; Transport Innovations; Public Transport; Transport and Development Planners
- Medway Council - Departments – Planning and Environmental protection
- All parish councils

- Swale Officers - Planning and Policy, Economy and Community Services, Environmental Protection, Environmental Services, Parking Services
- Relevant Swale Management Officers and Councillors
- All public transport sector operators (buses and trains)

The outcome of the shortlisting process was the generation of 6 key options to assess plus two packages of options as summaries below in Table ES1.

Table ES1 - Summary of short listed mitigation options

Option	Description
Charging CAZ B	CAZ B (covering HGV's, Buses and Taxis) charging vehicles that do not meet a Euro 6/VI standard for diesel vehicles operating along the A2 from A249 to A299, including St Paul's AQMA. Proposed exemption for 3 years for buses and taxis while supporting then upgrade to compliant vehicles
Charging CAZ D	CAZ D (covering HGV's, Buses, Taxis, LGVs and cars) charging vehicles that do not meet a Euro 6/VI standard for diesel or Euro 4 standard for petrol vehicles operating along the A2 from A249 to A299, including St Paul's AQMA. Proposed exemption for 3 years for buses and taxis while supporting then upgrade to compliant vehicles
Mode shift package	Mode shift package targeting Swale in general but focusing along the A2 including: - Travel plans – schools and businesses - Work with KCC in investment in walking and cycling infrastructure - Invest in secure cycle parking - Pilots/loans/trials with e-bikes/scooters - Car club in Sittingbourne and Faversham
Freight package	Package focused on freight, again covering the main Swale towns but with focus along A2, including: - Delivery and servicing plans, link to travel plans - Consolidation centre servicing Sittingbourne and Faversham
Electric vehicle support package	Package to promote electric cars and vans across Swale including: - Parking charge incentives - Charging infrastructure in Council car parks also working with businesses - Promotion – link to travel plans - E-car clubs linked to car clubs (could just shift car clubs here)
Pinch point parking removal	Remove pinch point parking on A2
Non charging Package	Bundle of mode shift, freight, electric vehicles and pinch point removal
CAZ B plus non charging package	This was a simple addition of the benefits of the CAZ B and the non-charging package. This was only carried out for the monitoring site results.

Appraisal of the mitigation options

The 6 shorted listed options and the two packages were appraised for their potential impact on air quality and with an indicative costs benefit analysis (CBA). A summary of the key air quality and cost benefit results associated with the modelled options is set out in the table below and discussed in the following sections.

Table ES2 - Summary results for the mitigation options

Category	Reference Case	CAZ B	CAZ D	EV	Freight	Mode Shift	Pinch Point	All non-charging	CAZ B + non-charging
Average reduction concentration reduction across all monitoring sites									
Reduction	0%	1.7%	18.4%	1.2%	0.6%	2.1%	0.3%	3.0%	4.7%
Number of monitoring sites exceeding or at risk (global adjustment)									
Exceeding	0	0	0	0	0	0	0	0	0
At risk	2	2	0	2	2	2	2	2	2
Number of monitoring sites exceeding or at risk (site-specific adjustment)									
Exceeding	1	1	0	1	1	1	1	0	0
At risk	1	1	0	1	1	1	1	2	2
Summary cost benefit analysis results (Million £)									
Total NPV	N/A	-15.0	-118.1	-1.9	0.3	-13.3	0.4	-15.6	-30.6
Implementation only	N/A	2.26	2.26	0.14	0.29	15.17	<0.01	15.61	17.86

Charging Clean Air Zones

Two formal CAZ options were assessed in terms of a full CAZ D covering all vehicle types and a CAZ B targeted at HGV's. These would both be enforced in the same way with a set of fixed ANPR cameras along the A2 and hence would have similar direct implementation costs to the Council estimated at about £2.2 million.

Clearly the CAZ D would generate the greatest air quality benefit as more vehicles are being targeted. On average it would reduce concentrations by some 18% resulting in no areas with exceedances of the annual NO_2 limit value or even being at risk of exceeding. The CAZ B has a much smaller impact as it is only targeting HGVs, many of which already meet the CAZ standard, and reduced concentrations on average by about 2%. However, this will still remove all exceedances with the possible exception of monitoring location SW82 in the St Paul's Street AQMA.

On the face of it this might indicate that the CAZ D would provide the greatest benefit for a similar cost. However, just implementation costs ignore the wider costs to vehicle owners for upgrading their vehicles. Taking these costs into account the CAZ D would cost local businesses and residents some £142 million in compliance costs to upgrade vehicles and have an overall negative net present value (NPV) from the CBA of £118 million over 10 years. This compares to the CAZ B which would have some £17 million in compliance costs borne by freight companies and an overall negative NPV of £15 million.

So both are costly measures to society as a whole but the CAZ B has a significantly lower cost while still largely mitigating any air quality limit value exceedance risk.

Non-charging measures

Four non-charging measures were assessed: a mode shift package, a freight package, support for electric vehicles and removal of pinch point parking. Of these the mode shift package was estimated to have the largest impact on air quality reducing concentrations by an average of 2.1% which is in fact a greater impact than the CAZ B. The EV measures had the next largest impact at a 1.2% average reduction in concentrations, followed by the freight measures at only a 0.6% average reduction. The smallest average impact was from the removal of pinch point parking, as might be expected, as the benefits of this measure are greatest at these specific points.

The costing of these measures was carried out in a fairly generic way as the specific details of what would be included was not developed and so the CBA can only be considered indicative. The mode

shift package was the costliest as it assumed a significant investment in walking and cycling infrastructure of some £15 million. However, this provides a better, though still negative, overall NPV than a CAZ B of £13 million. This suggests it would be a better option for society in general than the CAZ B though it has higher direct costs to the public sector (in this case the County Council). It should also be noted that the mode shift CBA does not include the assessment of any wider health or congestion benefits.

The EV measure is the next most costly with a negative NPV of some £1 million overall, but with a potential implementation cost to the Borough and County Councils in terms of supporting charging infrastructure of some £137,000. The freight measures could potentially cost the councils some £300,000 but this would be outweighed by the air quality benefit to give a positive NPV for the measure. The pinch point parking removal is likely to fairly low cost, if no additional provision is made for parking elsewhere, and has air quality benefits that again outweigh the costs to give a positive NPV.

All the non-charging measures have a better overall NPV than either of the CAZ measures with two being positive. The mode shift measure also has a greater air quality impact than the CAZ B though not the CAZ D. The other measures all have lower, but still positive impacts on air quality.

A package approach

Two packages of measures were also considered: a combination of all the non-charging measures, and the CAZ B combined with the all of the non-charging measures. The impact of the latter package was not formally modelled but estimated by simply adding the impacts (and costs and benefits) of the CAZ B and package of non-charging measures.

The package of non-charging measures generated an average reduction in NO_2 concentrations of some 3%, about twice that of the CAZ B on its own. It also removes all exceedances of the limit value even the site-specific adjusted monitoring locations in St Paul's Street AQMA (though only just). The CBA indicates that it has a negative NPV of around £15 million which is the same as the CAZ B but with about twice the benefit to air quality.

Combining CAZ B with the package of non-charging measures gives an estimated reduction in concentrations of some 4.7% which is clearly better than either on their own, but less than the CAZ D. This combined package also removes all exceedances even for the site-specific adjusted monitoring location in St Pauls Street AQMA at monitoring location SW82. It has a negative NPV of some £30 million (basically twice that of the CAZ B and Non-charging package individually), but this is an order of magnitude less than the cost of the CAZ D.

Recommendations

Air quality along the A2 is expected to improve significantly over the next 3 years out to 2022 as the vehicle fleet renews and the proportion of vehicles of the latest Euro emission standard increases significantly. As such by 2022 a standard reference forecast suggests the annual average NO_2 limit values will be achieved. However, there is clearly uncertainly in the modelling and exploring this through site-specific adjustment at monitoring locations and a sensitivity test with a slower fleet turn over indicates that there is a risk of remaining exceedances especially in the St Pauls Street AQMA. As such there is still a need to take further action to reduce transport related emissions and concentrations along the A2.

The implementation of a Charging Clean Air Zone would reduce concentrations and manage the risk of further exceedances. However, the overall economic cost of these measures would be high (£30 million for a CAZ B and £118 million for a CAZ D) and likely to be politically challenging to implement. As such given the scale of the air quality challenge, largely around managing risk rather than tackling significant exceedances, these would appear to be a disproportionate response.

This suggests that a more appropriate approach is to implement a package of non-charging measures which have been shown to have about twice the benefit of the CAZ B, in terms of air quality, but at a

similar economic cost. It is also clear that there would be further benefits for example in terms of health from active travel that have not been accounted for here.

Moving forward we would recommend that the Swale Borough Council work with the Kent County Council, who are the highways authority and so largely responsible for implementing transport measures, to develop in more detail a package of measures to reduce traffic, improve flow and improve the vehicle fleet operating along the A2 comprising:

- The removal of key pinch point parking areas – which is likely to be low cost (dependant on whether alternative parking locations are required), have both air quality and traffic flow benefits and is already being explored by the County Council.

- Assessment of the feasibility of a freight consolidation centre serving Sittingbourne (and potentially other areas) along with developing Delivery and Servicing Plans (DSPs) with local business to reduce freight movements in the area.

- Further work on the development of EV charging infrastructure and other incentives to accelerate the uptake of EVs in the area.

- Significant investment in walking and cycling schemes, travel plans and other information campaigns, as well as exploring micro-mobility options to manage traffic growth and congestion. This could also be an important element of economic recovery following the COVID 19 pandemic and would support wider public health in the area.

Table of contents

Glossary

Abbreviation	Description
ANPR	Automatic Number Plate Recognition
AQAP	Air Quality Action Plan
AQD	Air Quality Directive
AQMA	Air Quality Management Area
BEIS	Department for Business, Energy, and Industrial Strategy
CAZ	Clean Air Zone
CBA	Cost Benefit Analysis
CNG	Compressed Natural Gas
CAPEX	Capital expenditure
CO2	Carbon dioxide
Defra	Department for Environment, Food, and Rural Affairs
DfT	Department for Transport
EFT	Emissions Factor Toolkit
EV	Electric vehicle
FPN	Fixed Penalty Notice
GHG	Greenhouse gas
HGV	Heavy goods vehicle
JAQU	Joint Air Quality Unit of the UK government
KCC	Kent County Council
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LGV	Light goods vehicle
MCA	Multi-criteria assessment to determine short list of CAZ options
NO2	Nitrogen dioxide
NOX	Oxides of nitrogen
NPV	Net present value
OPEX	Operating expenditure
PM	Particulate matter
RMSE	Root mean square error
SBC	Swale Borough Council
SCRT	Selective Catalytic Reduction and particle Trap
SHM	Swale Highway Model, a traffic model developed by Sweco
TfL	Transport for London
TfSE	Transport for South East
TRO	Traffic Regulation Orders
ULEV	Ultra low emission vehicle
ULEZ	Ultra low emission zone
USEPA	US Environmental Protection Agency

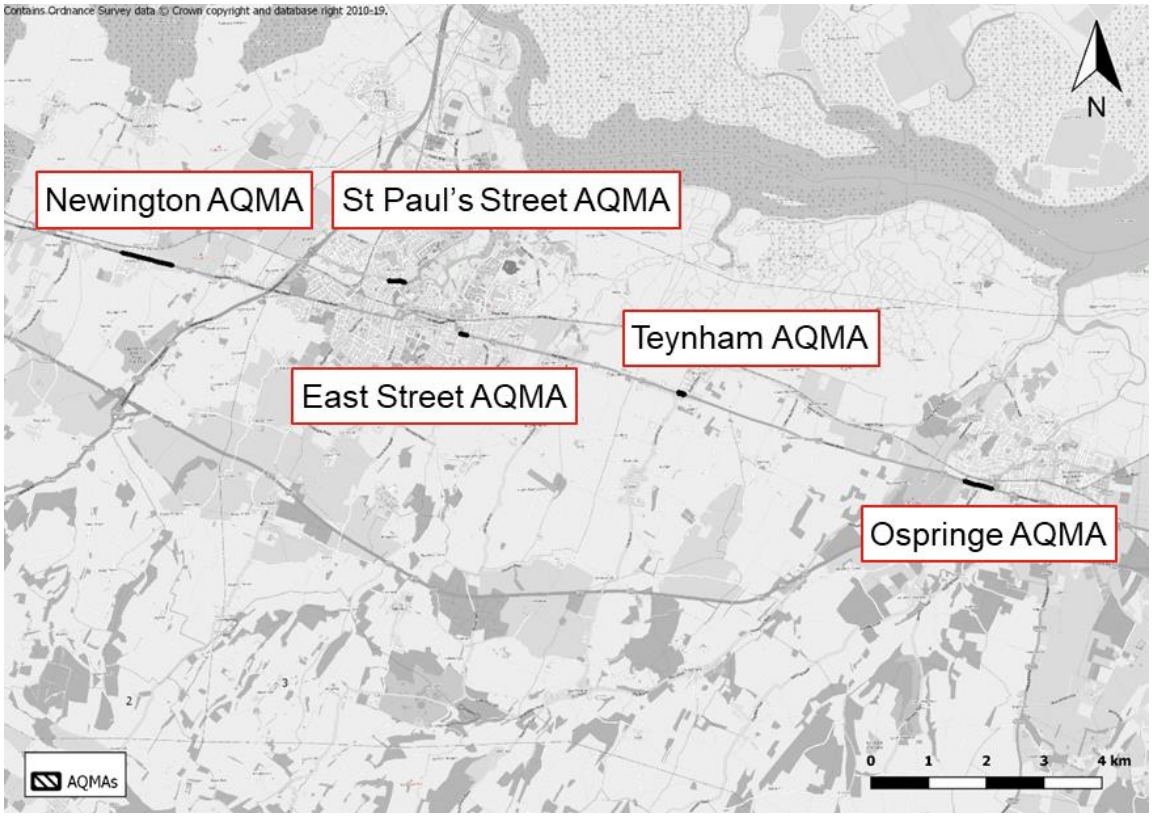
1 Introduction and scope of feasibility study

Swale Borough Council (SBC) has commission Ricardo to assess the impact and feasibility of a range of measures to address air quality issues, specifically Nitrogen Dioxide (NO_2) concentrations, along the A2 route through the Borough. The study has reviewed potential measures to address air quality both locally and more strategically across the Borough including a specific assessment and feasibility of a Charging Clean Air Zone (CCAZ). The study has carried out an air quality impact assessment of the measures along with a simple cost benefit analysis and sets out recommendations for progressing measures to improve air quality along the A2 corridor.

1.1 Background

The A2 corridor through the Borough suffers from heavy traffic and congestion which has led to the declaration of 4 Air Quality Management Areas (AQMAs) along the A2 itself and one related AQMA in the St Paul's Street area of Sittingbourne, as illustrated in Figure 1-1 below. All the AQMAs have been declared on basis of exceedance of the Nitrogen Dioxide (NO_2) limit value, but there are also concerns in relation to particulate matter (PM) in the St Paul's Street AQMA. Since the commissioning of this work Keycol Hill has also been declared an AQMA but is not shown explicitly on the maps as an AQMA.

Figure 1-1 Air Quality Management Areas in Swale Borough



Note: Keycoll Hill was declared an AQMA on 23/10/2020 towards the end of this study and as such is not shown on the maps.

An interim Air Quality Action Plan (AQAP) was developed in 2017 to reduce pollution across all 5 AQMAs. Further work was then done in 2018 to provide a wider evidence base for the AQAP covering a modelling and source apportionment study and an assessment if initial options[1][2]. This provided the basis for the full AQAP in 2019 which was approved by DEFRA[3]. The revised AQAP took a more holistic AQAP combining AQMA specific actions and measures, plus provide a wider strategic approach to improving air quality across the borough. A key plank of the proposed actions in the AQAP was the assessment and development of a Clean Air Zone, both a formal charging zone and non-charging additional measures targeting the AQMAs along the A2.

Ricardo was commissioned to carry out the feasibility study for the CAZ, building on their work with a number of UK CAZ projects, and this report summaries the outcome of that study.

1.2 Overview of assessment approach

The approach taken to the feasibility study builds on the approach taken for other CAZ studies across the UK and guidance provided by the Government's Joint Air Quality Unit (JAQU) to support these studies to provide a robust assessment approach for Swale and the A2 corridor. The key steps of the assessment process undertaken were:

- Baseline air quality modelling – covering the whole A2, related roads and the AQMAs and focused on NO_2 concentrations. This was carried out for the base year in 2019 and a future year in 2022. This builds on the existing source apportionment work and related data sources to confirm the compliance gap to be addressed.

- Long list of options–this task reviewed existing plans and policies, and worked with local stakeholders, to develop a long list of potential CAZ options.

- Short list of options – a qualitative assessment of the options through a stakeholder workshop and simplified multi criteria assessment (MCA) was carried out to reduce the long list of a short list for detailed assessment. As part of this short-listing process the project team also worked with the borough and county council to define the assumptions to be used for the assessment.

- Air quality modelling of the options – using the baseline model each of the options was assessed in the future year, using the assumptions agreed above.

- Cost benefit analysis – a basic assessment of costs and benefits of the options was carried out allowing comparison of the measures on both the impact on air quality and cost effectiveness.

The details of each of these steps and the resulting outcomes in terms of the short list of measures, their impacts on air quality and the cost benefit analysis are set out in the following sections. The final section pulls together all of these results to provide a set of recommendations for tackling air quality along the A2.

[1] Swale Strategic AQAP 2018 – 2022, Report 1: Source Apportionment and Options Assessment. October 2018, Phlorum

[2] Swale Strategic AQAP 2018 – 2022, Report 2: AQMA options assessment, October 2018, Plorum

[3] Swale Borough Council, Air Quality Action Plan (2018 – 2022), 2019

2 Baseline air quality modelling

2.1 Study methodology

Baseline conditions in 2019 and the impact of future 2022 scenarios have been assessed using atmospheric dispersion modelling to predict the concentrations of NO_2. The general approach taken was:

- Collect and analyse recent traffic, pollutant monitoring, meteorological and background pollutant concentration data for use in a dispersion modelling study.
- Model Baseline road traffic emissions in 2019 using the RapidAir atmospheric dispersion model and refine/verify the model to gain good agreement with nearby NO_2 monitoring data.
- Use the verified dispersion model to predict annual mean pollutant concentrations at NO_2 monitoring locations within the study area for the following three scenarios:
- Current/most recent year where pollutant measurements are available (2019) Baseline. This represents 2019 traffic conditions within Swale and provides an indication of current air quality conditions.
- Future year Baseline (2022) without intervention.
- Future year (2022) with a shortlist of individual interventions.
- Describe the predicted impacts of the shortlisted options on air quality within the AQMAs in Swale, referring to modelled concentrations at NO_2 monitoring sites and contour maps of NO_2 concentrations across the study area.

The modelling methods outlined in the Defra Technical Guidance LAQM.TG(16) were used throughout the study.

2.2 Study area

2.2.1 Model domain

To assess the transport and air quality impacts of the scheme, a model domain is required that covers the potential scheme options and relevant AQMAs. The model domain used is shown in Figure 2-1 and Figure 2-2 and has been chosen to cover the following:

- The full extent of the A2 through Swale and adjoining roads which is the main air quality concern in the borough;
- All of the AQMAs in Swale;
- Areas of concern identified from measurement data.

Concentrations were calculated across a grid covering this area at 3m resolution.

2.2.2 Baseline air quality

Swale Borough Council operates a wide network of monitoring locations comprising both automatic monitoring stations and passive diffusion tube samplers. All available locations where NO_2 monitoring data were measured during 2019 were specified as receptors in the model; and where appropriate, used for model verification and calculating model performance statistics including the Root Mean Square Error (RMSE). A map of the monitoring locations is presented in Figure 2-1 and Figure 2-2.

Figure 2-1: Monitoring sites operated in 2019 (west)

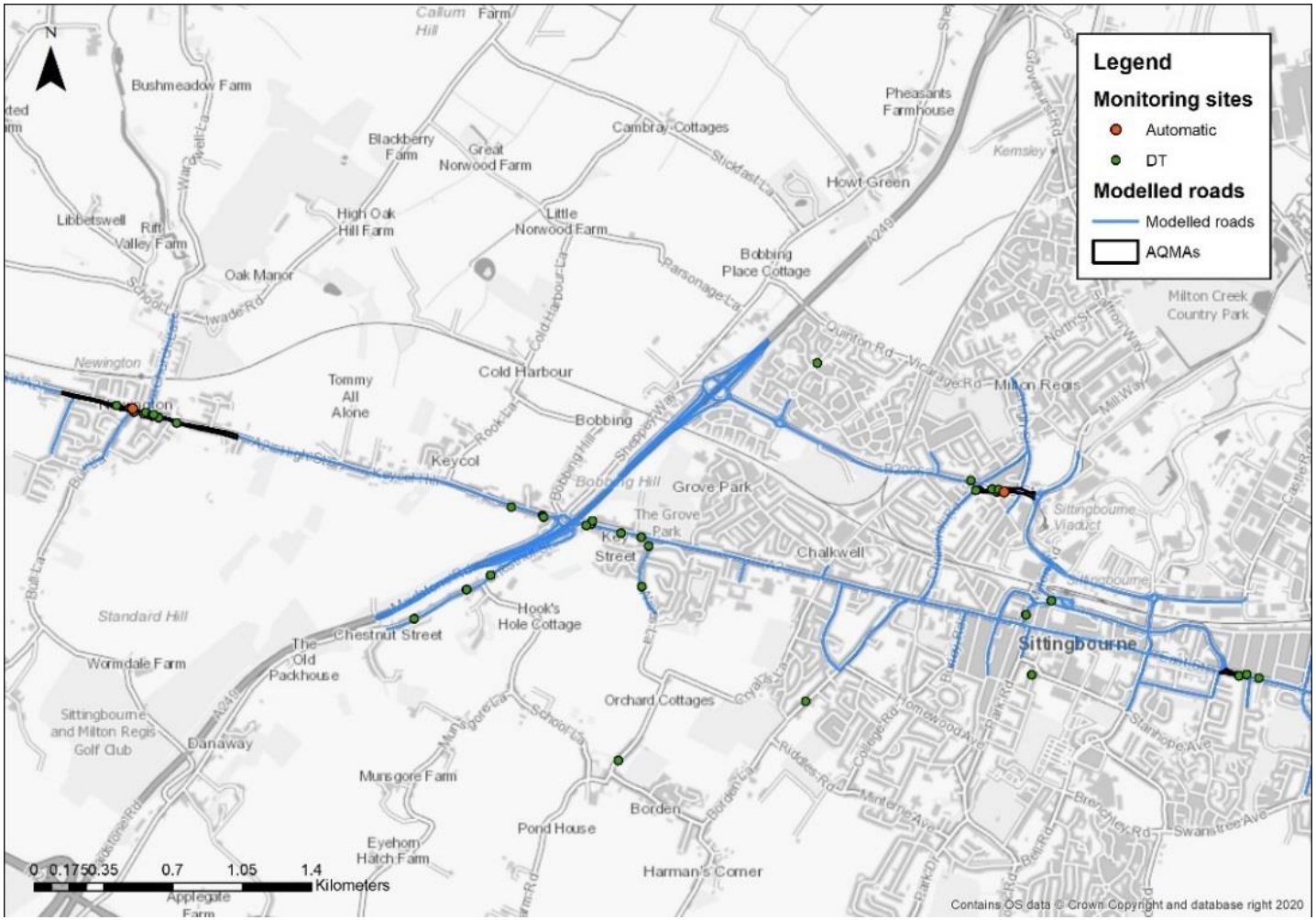
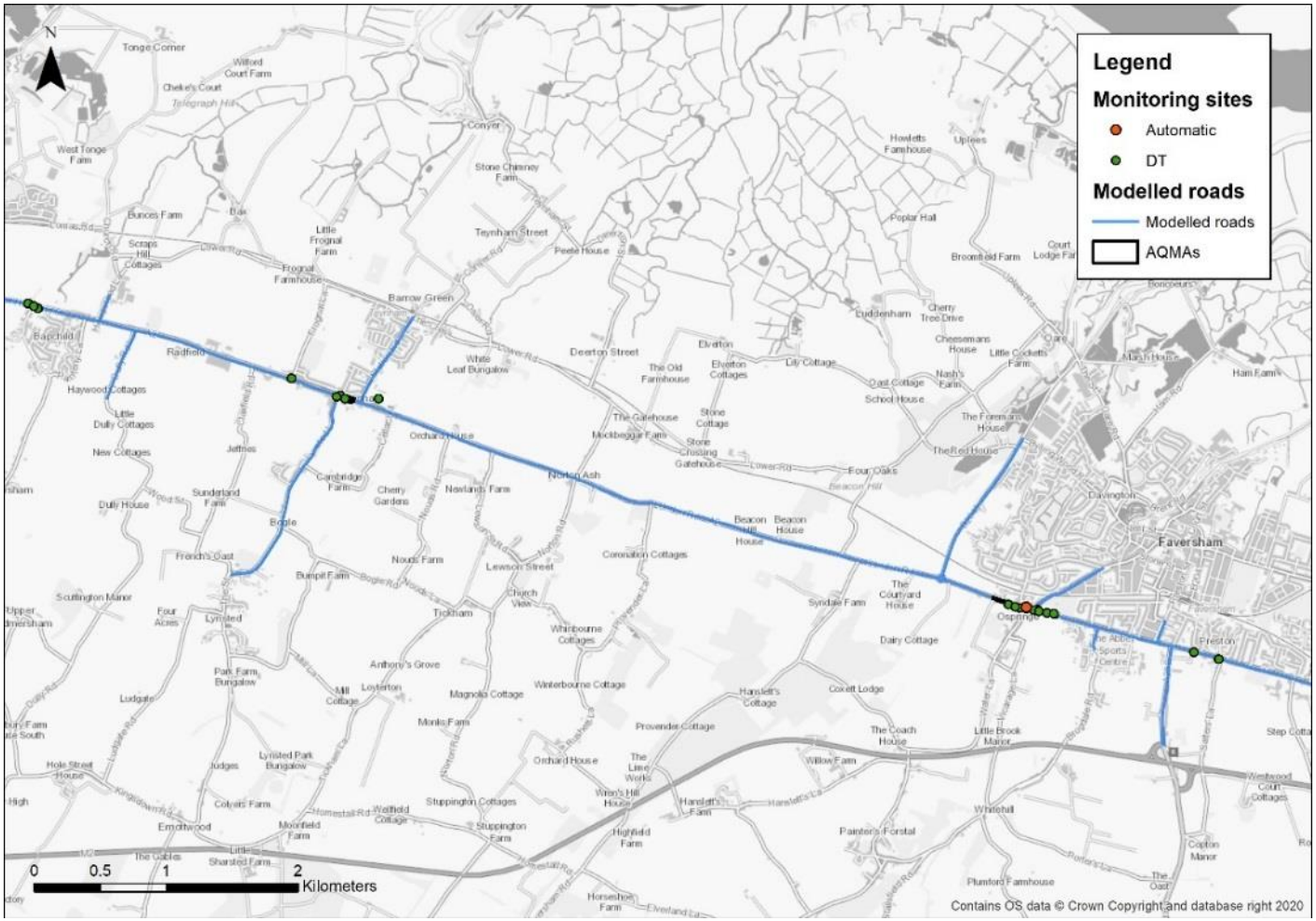


Figure 2-2: Monitoring sites operated in 2019 (east)



2.3 Model description and setup

2.3.1 Model description

The RapidAir© dispersion modelling system was used for the study. This is Ricardo Energy & Environment's proprietary modelling system developed for urban air pollution assessment.

The model calculates pollutant concentrations through convolution of an emissions grid with dispersion kernels derived from the USEPA AERMOD[4] model. The physical parameterisation (release height, initial plume depth and area source configuration) closely follows guidance provided by the USEPA in their statutory road transport dispersion modelling guidance[5]. AERMOD provides the algorithms which govern the dispersion of the emissions and is an accepted international model for road traffic studies (it is one of only two mandated models in the US and is widely used overseas for this application). The combination of an internationally recognised model code and careful parameterisation matching international best practice makes RapidAir demonstrably fit for purpose for this study.

The model produces high resolution concentration fields at the city scale (1 to 3m scale) so is ideal for spatially detailed compliance modelling. A validation study has been conducted in London using the same datasets as the 2011 Defra inter-comparison study[6]. Using the LAEI 2008 data and the measurements for the same time period the model performance is consistent (and across some metrics performs better) than other modelling solutions currently in use in the UK. A RapidAIR model validation paper has also recently been published with our partners at Strathclyde University in the well-known Environmental Modelling and Software journal[7].

2.3.2 Chemistry, meteorology and topology

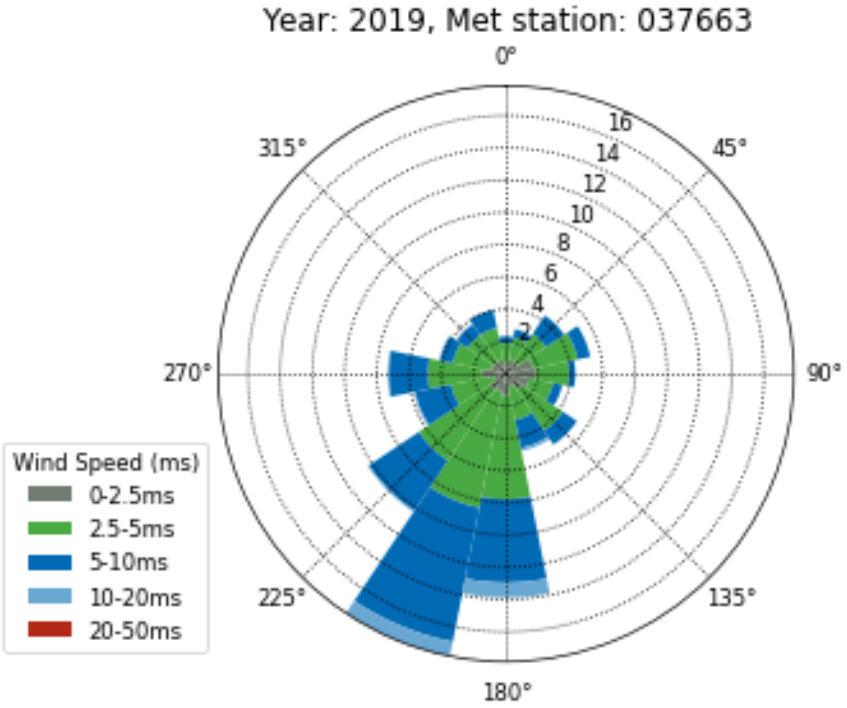
NOx to NO_2 chemistry was modelled using the Defra NOx/NO_2 calculator (v7.1). Modelled annual mean road NOx concentrations were combined with background NOx and a receptor-specific f-NO_2 fraction to calculate NO_2 annual mean concentrations. The receptor-specific f-NO_2 fraction was calculated by dividing the modelled road primary NO_2 contribution by the modelled road NOx contribution at each receptor.

2.3.3 Meteorology

Modelling was conducted using the 2019 annual surface meteorological dataset measured at Biggin Hill weather station (see the 2019 wind rose in Figure 2-3). The dataset was processed in house using our own meteorological data gathering and processing system. We used freely available overseas meteorological databases which hold the same observations as supplied by UK meteorological data vendors. Our RapidAir model also takes account of upper air data which is used to determine the strength of turbulent mixing in the lower atmosphere; this was obtained from the closest radiosonde site and processed with the surface data in the USEPA AERMET model. We have utilised data filling where necessary following USEPA guidance which sets out the preferred hierarchy of routines to account for gaps (persistence, interpolation, substitution). AERMET processing was conducted following the USEPA guidance. To account for differences between the meteorological site and the dispersion site, surface parameters at the meteorological site were included as recommended in the guidance and the urban option specified for the dispersion site.

[4] https://www3.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod
[5] https://www.epa.gov/state-and-local-transportation/project-level-conformity-and-hot-spot-analyses
[6] https://uk-air.defra.gov.uk/research/air-quality-modelling?view=intercomparison
[7] Masey, Hamilton, Beverland (2018) Development and evaluation of the RapidAir® dispersion model, including the use of geospatial surrogates to represent street canyon effects

Figure 2-3 Biggin Hill wind rose in 2019



2.3.4 Non-road transport modelling and background concentrations

Emissions from non-road sources were considered in the study by using spatially varying background maps. This study uses the 2017 base year LAQM background maps published by Defra. The contributions from local road transport source sectors that were modelled explicitly were subtracted from the background maps. Defra's 2022 background map was also downloaded and processed as described to use for the future year reference case.

2.3.5 Roadside receptors and grid

RapidAir was used to model concentrations at 3m grid resolution. As RapidAir produces concentration grids (in raster format), modelled NO_2 concentrations can be extracted at receptor locations anywhere on the 3m resolution model output grid. For assessment of compliance with the Air Quality Directive, annual mean concentrations at a distance of 4m from the kerb and at 2m height were extracted from the RapidAir model outputs at 10m intervals along each road. This provides an assessment of compliance at relevant roadside locations where there may be public access as specified in the Air Quality Directive (AQD) requirements Annex III A, B, and C3.

Annex III of the AQD specifies that microscale sampling should be at least 25m from the edge of major junctions. Therefore, when reporting model results relevant to compliance with the AQD, locations up to 25m from the edge of major junctions in the model domain were excluded.

2.3.6 Road geometry

Road geometry information was derived from the Ordnance Survey OpenMap Local dataset. Road widths were estimated using aerial imagery in Google Maps.

2.3.7 Canyon modelling

The presence of buildings either side of a road can introduce 'street canyon' effects which result in pollutants becoming trapped, leading to increased pollutant concentrations. Several clusters of buildings in the model domain produce street canyons, which contribute to air quality issues.

Street canyon impacts were modelled using the AEOLIUS model, which is included in RapidAir. Street canyons were identified using building height data sourced from Ordnance Survey (OS) Mastermap data provided by the Council.[8] These canyon locations were checked using Google Street View and local knowledge. The locations of modelled street canyons are shown in Figure 2-4.

2.3.8 Gradients, tunnels and flyovers

Gradient effects were included for relevant road links during emissions calculations. LIDAR Composite Digital Terrain Model (DTM) datasets at 1m resolution are available over the model domain[9]. Link gradients across the model domain were calculated by extracting start and end node elevations for road links from the LIDAR DTM datasets.

The Emissions Factor Toolkit (EFT) v9.0, includes gradient effects in its emissions calculations, and was used in this assessment. The adjustment in the EFT applies to roads with gradients of 2.5% or greater. Figure 2-5 shows the roads where gradient effects were included during emission calculations.

No modelling of tunnels or flyovers is included in the modelling, in order to provide a worst-case estimation of air quality impacts at a height of 2m.

[8] https://www.ordnancesurvey.co.uk/business-and-government/products/mastermap-products.html
[9] http://environment.data.gov.uk/ds/survey/#/survey

Figure 2-4: Modelled street canyons

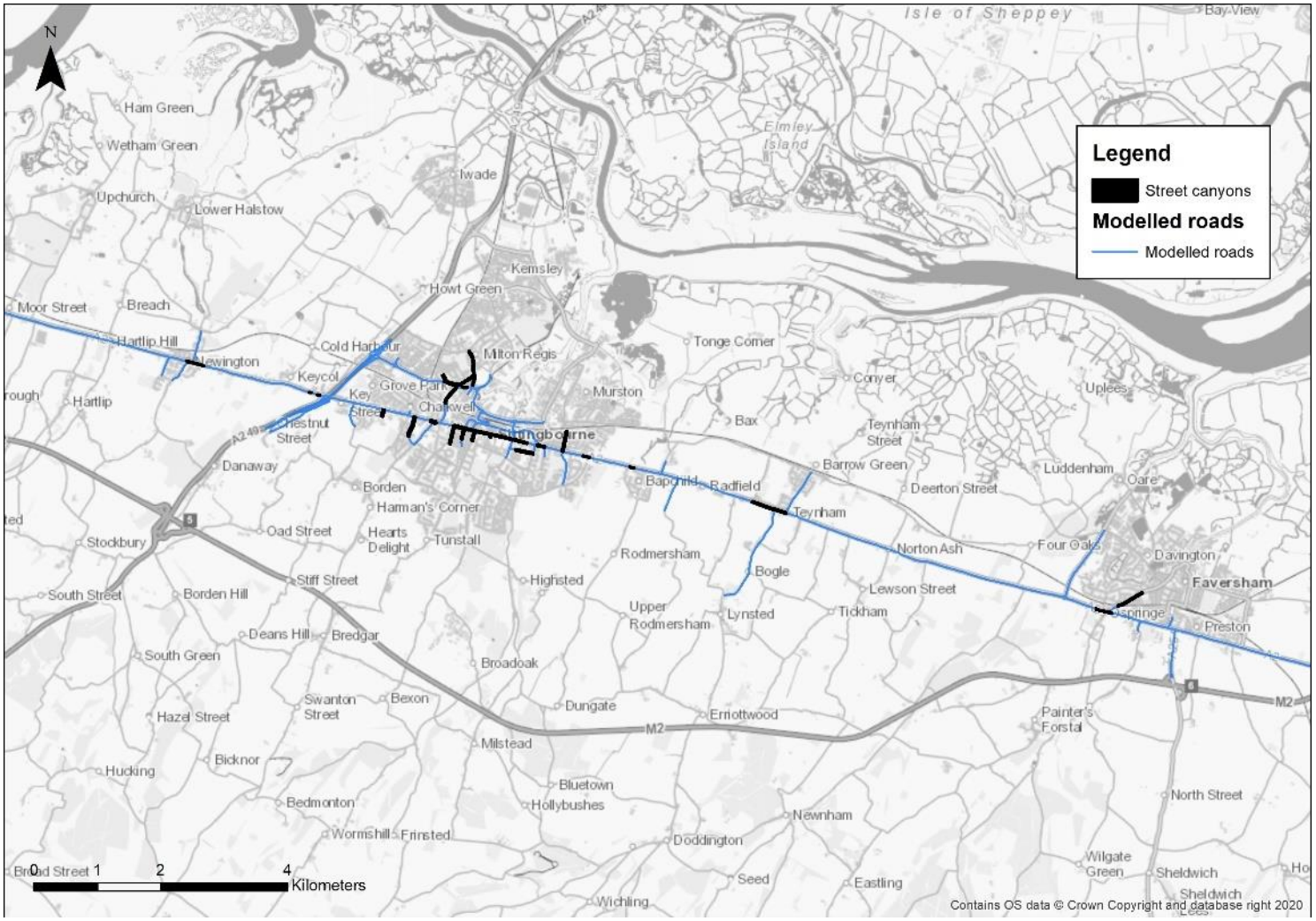
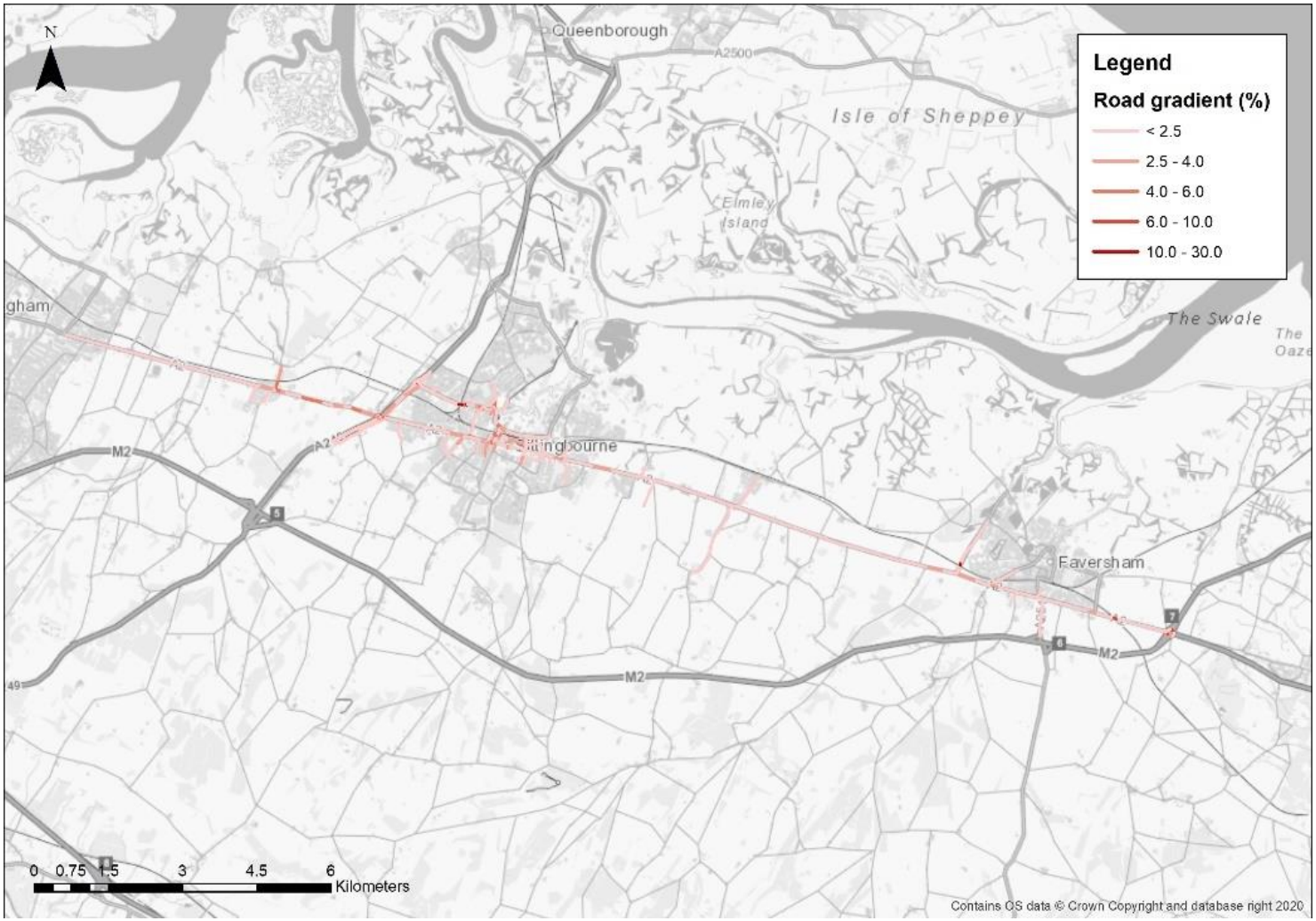


Figure 2-5: Modelled gradients



2.4 Road traffic modelling

The development of the emission inventories was carried out through the following process:

1. Collation of traffic activity data;
2. Traffic flow and fleet data were combined with emission factors from the most recent version of the Emission Factor Toolkit (EFT), version 9.1b[10] to provide total annual emissions for the modelled road links.

Each step is described below.

2.4.1 Emission factors

Emissions from all modelled road traffic sources were calculated using speed-dependent vehicle emission factors for NO_X and primary NO_2 from the latest version of the Emission Factor Toolkit (EFT), version 9.1b. The emission factors for NO_X are derived from COPERT, while the emission factors for primary NO_2 are derived from the National Atmospheric Emissions Inventory. COPERT is a European database of emission factors which is recommended for the quantification of road-transport emissions. These factors provide emission factors categorised by vehicle size, age, and Euro classification, taking into account average vehicle mileage and engine degradation.

The EFT uses these factors to calculate emissions along road links given traffic flow, vehicle split, speed, and gradient information.

2.4.2 Traffic flows and speeds

Traffic data for the study area was taken from the Swale Highway Model (SHM)[11]. This model was developed by Sweco on behalf of Kent County Council (KCC) in order to test the traffic impacts of both new developments and transport infrastructure across the area. The transport model results include traffic flows for the following periods for the years 2017 and 2027:

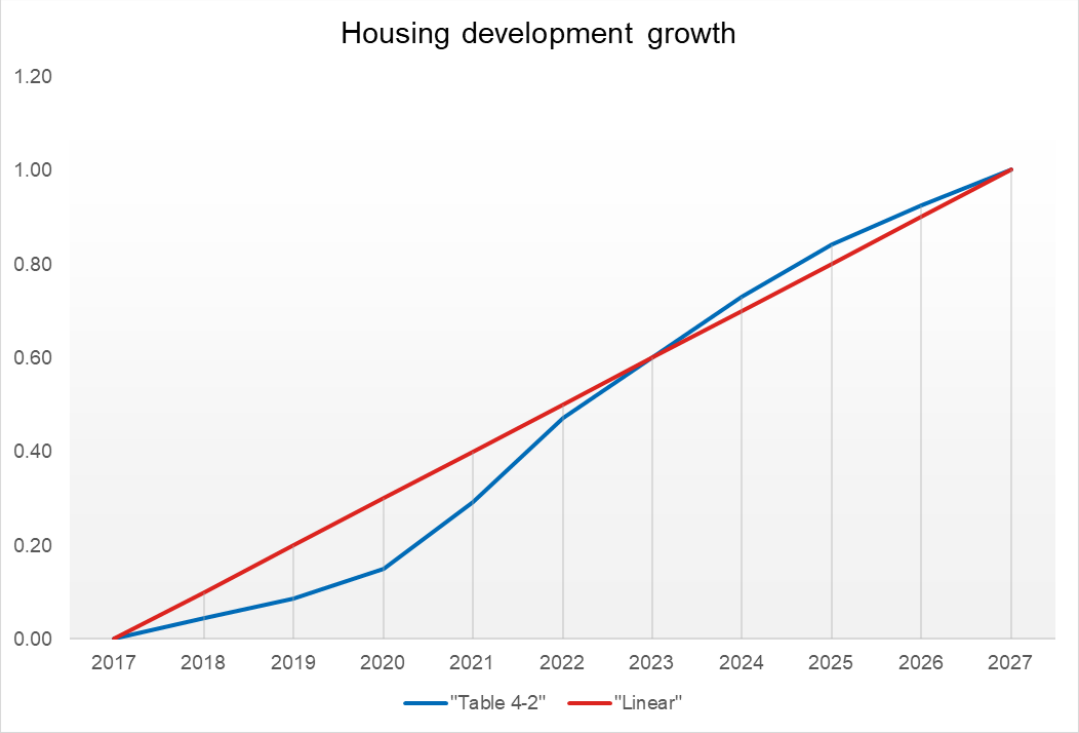
- AM peak (07:00 to 10:00);
- Interpeak (10:00 to 16:00);
- PM peak (16:00 to 19:00);
- Outside peak (19:00 to 07:00).

The 2017 transport model output was adjusted to represent the baseline year of 2019 and a CAZ implementation year of 2022. The housing development growth ratio from the Swale Highway Model, as illustrated Figure 2-6, was used to project traffic flows and speed for 2019 (ratio=0.09) and 2022 (ratio=0.47) from the 2017 traffic flows.

[10] https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html

[11] Sweco (2019), Swale Highway Model: Reference Case Forecasting Report

Figure 2-6 – Swale housing development growth from Swale Highway Model



2.4.3 Vehicle fleet composition

Results from an ANPR survey provided by Swale Borough Council were used to derive the vehicle fleet composition for 2019; the fleet projection tool in the Emissions Factors Toolkit published by Defra was then used to project this fleet to the 2022 future baseline year. This project is based on national assumptions to local fleet turnover may not necessarily be the same as this, but this is the best available approach to estimating future fleet composition.

Information on the baseline Euro standard mix (traffic composition & age) was collected in ANPR surveys at three locations along the A2 (London Road, Key Street, and Ospringe Street).

The Euro fleet composition for cars, LGVs, and HGVs were derived from the ANPR surveys, as sufficient data was available to derive a robust local fleet. For other vehicle types, the national average fleet split was used. Table 2-1 shows the Euro fleet distribution for cars, LGVs, and HGVs derived from the ANPR surveys. The projected 2022 fleet is presented in Table 2-2.

Table 2-1: Fleet age splits, ANPR

Vehicle type	Pre-Euro 1/I	Euro 1/I	Euro 2 / II	Euro 3 / III	Euro 4 / IV	Euro 5 / V	Euro 6 / VI	Euro 6c	Euro 6d
Petrol Car	-	0.2%	0.5%	4.5%	20.1%	46.8%	9.1%	18.8%	-
Diesel Car	-	0.2%	0.5%	4.5%	20.1%	46.8%	9.1%	18.8%	-
LGV	-	0.6%	0.5%	8.0%	18.1%	50.7%	22.1%	-	-
HGV	-	0.5%	0.6%	7.4%	7.5%	18.5%	65.5%	-	-

Table 2-2: Fleet age split projections, 2022

Vehicle type	Pre-Euro 1/I	Euro 1/I	Euro 2 / II	Euro 3 / III	Euro 4 / IV	Euro 5 / V	Euro 6 / VI	Euro 6c	Euro 6d
Petrol Car	-	-	-	0.9%	5.6%	19.2%	12.7%	61.6%	-
Diesel Car	-	-	-	0.6%	5.8%	27.7%	17.4%	24.2%	24.3%
LGV	-	-	-	0.8%	5.3%	19.2%	13.1%	28.5%	33.1%
Rigid HGV	-	-	-	1.4%	1.6%	9.1%	87.9%	-	-
Artic HGV	-	-	-	0.2%	0.3%	3.8%	95.8%	-	-

2.5 Model uncertainty, verification and adjustment

2.5.1 Model uncertainty

There were key uncertainties in the traffic data that could affect model results:

- The results of a transport model for traffic flows and speeds were used and projected to the relevant years, rather than using observed traffic data on the modelled road links in 2019.
- ANPR surveys were only available at three locations within the modelling domain and did not include taxis or buses. Details of fuel use were also not available, so national average statistics were used that may not be fully representative of the vehicle fleet in Swale.
- The impact of COVID-19 on traffic levels in the coming years is uncertain.

In light of this uncertainty, two approaches were taken to identifying locations at risk of exceedance:

- Concentrations at monitoring sites have been calculated using a site-specific adjustment factor, in order to ensure that maximum concentrations are captured;
- Any concentrations that are within 5.2 $\mu g.m^{-3}$ of the Air Quality Objective (the RMSE) are considered to be 'at risk' of exceeding due to uncertainty in the model, for example in the event that fleet turnover in the Swale area does not match the rapid turnover which is predicted to occur naturally.

The impact of Covid-19 on future air quality is difficult to quantify, and is a significant cause of additional uncertainty in the results of this study. In order to quantify the uncertainty associated with Covid-19, a simple sensitivity was carried out following guidance provided by the Joint Air Quality Unit (JAQU). JAQU recommend that sensitivity should be assessed by modelling the assumption that Covid-19 will delay fleet turnover by a year, i.e. that vehicle owners and businesses hold on to their existing vehicles for a year longer. This approach has been used in a number of other CAZ studies.

2.5.2 Model verification and adjustment

Verification of the model involves comparison of the modelled results with any local monitoring data at relevant locations; this helps to identify how the model is performing and if any adjustments should be applied. The verification process involves checking and refining the model input data to try and reduce uncertainties and produce model outputs that are in better agreement with the monitoring results. This can be followed by adjustment of the modelled results if required. The LAQM.TG(16) guidance recommends making the adjustment to the road contribution of the pollutant only and not the background concentration these are combined with.

The approach outlined in LAQM.TG(16) section 7.508 – 7.534 (also in Box 7.14 and 7.15) has been used in this case. All roadside automatic and diffusion tube NO_2 measurement sites near modelled roads in Swale have been used for model verification with sufficient (> 75 %) data capture in 2019 (n = 51).

It is appropriate to verify the performance of the RapidAir© model in terms of primary pollutant emissions of nitrogen oxides (NOx = NO + NO_2). To verify the model, the predicted annual mean Road NOx concentrations were compared with concentrations measured at the various monitoring sites during 2019.

The model output of Road NOx (the total NOx originating from road traffic) was compared with measured Road NOx, where the measured Road NOx contribution is calculated as the difference between the total NOx and the background NOx value. Total measured NOx for each diffusion tube was calculated from the measured NO_2 concentration using the latest version of the Defra NOx/NO_2 calculator (v7.1).

The initial comparison of the modelled vs measured Road NOx identified that the model was under-predicting the Road NOx contribution at most locations. Refinements were subsequently made to the model inputs to improve model performance where possible.

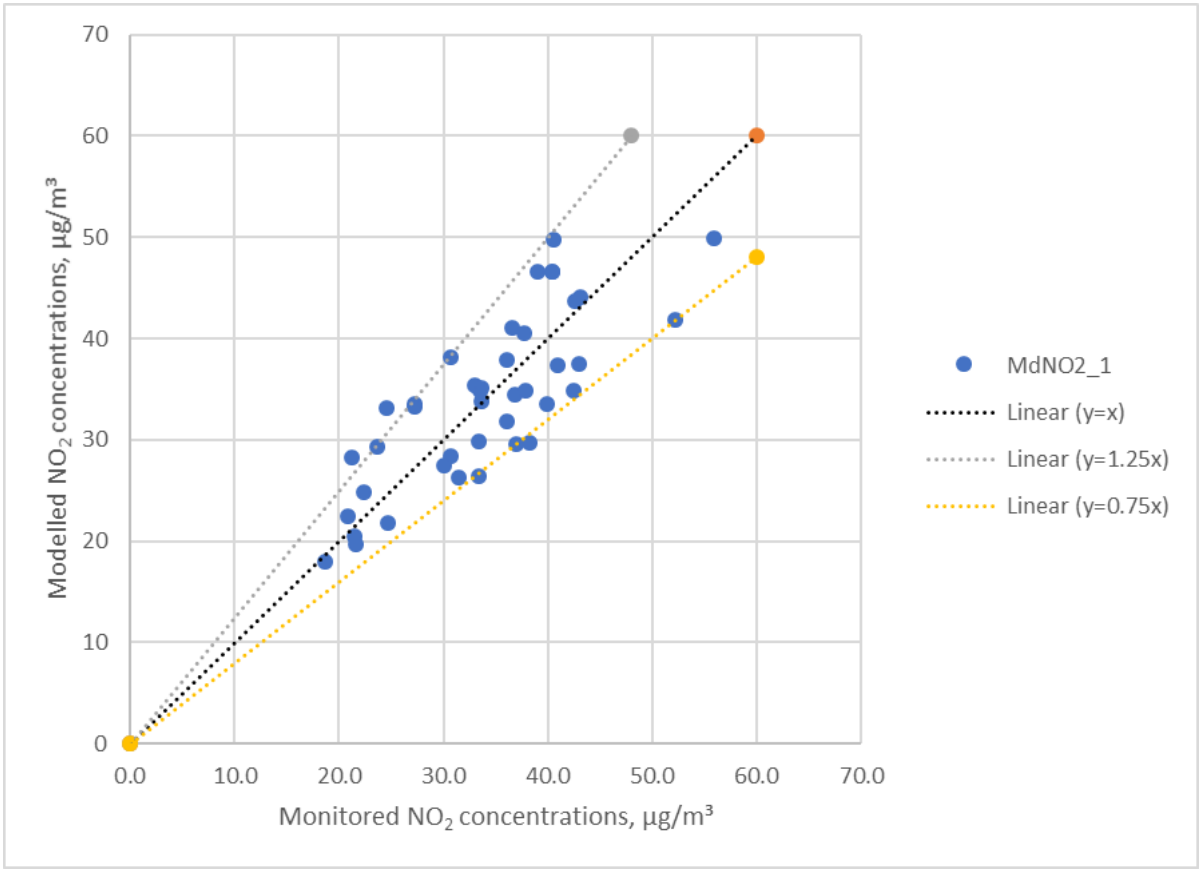
The gradient of the best fit line for the modelled Road NOx contribution vs. measured Road NOx contribution was then determined using linear regression and used as a global/domain wide Road NOx adjustment factor. This factor was then applied to the modelled Road NOx concentration at each discretely modelled receptor point to provide adjusted modelled Road NOx concentrations. The total annual mean NO_2 concentrations were then determined using the NOx/NO_2 calculator to combine background and adjusted road contribution concentrations.

Some clear outliers were apparent during the model verification process, whereby we were unable to refine the model inputs sufficiently to achieve acceptable model performance at these locations. There are a number of reasons why this could be the case e.g.

- A site located next to a large car park, bus stop, or additional emission source that has not been explicitly modelled due to unknown activity data.
- Sites located underneath trees or vegetation i.e. unsuitable locations for diffusion tubes to measure NO_2 concentrations effectively.
- No traffic model road link included where the NO_2 sampler is located, not all road links included e.g. at a junction, or insufficiently resolved traffic information at the junction e.g. resolution of speed information.

A number of sites were not used for verification because they were either outside of the modelling area or had poor data capture or missing data. In addition, 4 out of remaining 45 monitoring sites were considered as outliers and were therefore excluded from the verification process. Appendix 1 contains a table of outliers and reasons for exclusion. A primary NOx adjustment factor (PAdj) of 2.4882 was derived and applied to all modelled Road NOx data prior to calculating an NO_2 annual mean. Adjusted modelled and measured NO_2 concentrations are presented in Figure 2-7.

Figure 2-7 – Monitored vs. modelled NO_2 concentrations (µg m^{-3})



To evaluate the model performance and uncertainty, the Root Mean Square Error (RMSE) for the observed vs predicted NO_2 annual mean concentrations was calculated, as detailed in Technical Guidance LAQM.TG(16). These calculations are presented in Appendix 1. The RMSE is 5.2 µg.m^{-3} after the exclusion of outliers.

2.6 Baseline results

The modelling provides detailed NO_2 concentration data on a 1m x 1m grid over the study area and so allows the extraction of results for all relevant receptor location. In this case results have been extracted in 2 ways to provide an assessment of air quality along the A2 and related AQMAs:

- Compliance data in relation to the Air Quality Directive for all roads in the modelled area – this extracts results at a distance of 4m from the kerb and at 2m height were extracted at 10m intervals along each road and presents the highest concentration along each road link.

- Monitoring point location results – which provide relevant exposure for Local Air Quality Management purposes which is often closer to the kerb than the 4m criteria used above. These have been extracted both with the overall model adjustment factor (global) and adjusted to match the actual monitored value (site-specific) in 2019. These latter site-specific adjusted results are intended to reflect any specific conditions around the diffusion location that could be influencing the results.

The results in relation to road link compliance and monitoring sites are set out in the following sections.

2.6.1 Compliance results along road links

The road link based results are illustrated in Figure 2-8 through Figure 2-15 and present the maximum modelled concentrations at 4m from the kerb along each link in the study area, for comparison with the Air Quality Objective. These are all modelled results and cannot be compared directly with results at monitoring locations which may be nearer or further away from the road. However, they do provide a prediction of air quality compliance for all roads across the study area. Roads in red exceed the Objective; amber roads are classified as being 'at risk' of exceeding, given model uncertainty. For the 2022 reference and sensitivity results maps are not presented for the Faversham and Newington areas, as concentrations along all links in these regions are predicted to be below 35 µg.m^{-3}.

2019 base year

The base year data shows exceedances in the main AQMAs in Sittingbourne in St Paul's Street and East Street as would be expected. It also identifies the exceedance in Keycol Hill running up to the A249 which has now been declared an AQMA. However, the modelling also indicates other exceedances along a number of sections of the A2 in Sittingbourne, where no monitoring currently takes place, particularly around busy junctions along Key Street, London Road and Canterbury Road.

A single small section of the A2 in Faversham at the Ospringe Street/Ospringe Road junction is predicted to exceed the Objective. However, no exceedances are predicted to occur in the Teynham and Newington AQMA and more generally in Ospringe AQMA, and predicted concentrations in these areas are generally low. Most monitoring sites in these areas did not measure exceedances in 2019.

Exceedances are also predicted to occur along the majority of the A249. However, as this road is part of the Strategic Road Network and is managed by Highways England, concentrations along this road have not been considered further in this study.

2022 business as usual

Moving forward to 2022 the results show a significant improvement based on business as usual conditions, generated primarily by improvement to the vehicle fleet as vehicles renew and become cleaner. Road link based compliance results show that no roads were expected to exceed the objective value although there are roads in Sittingbourne, within the St Pauls Street and East Street AQMA's that are at risk of exceedance being above 35 µg.m^{-3} which is within model error estimated from the model verification

However, there is level of uncertainty in the results particularly in relation to projected traffic flows and the turnover of the fleet, hence a sensitivity test was developed.

2022 COVID sensitivity

As described in Section 2.5.1 a sensitivity test was developed with a slower fleet turn over to represent what might be the impact of an economic slow down as a result of the COVID 19 situation. This assumes that fleet turnover is delayed by 1 year. These results indicate that under these conditions exceedances would remain in the St Paul's Street and East Street AQMAs. Also small exceedances are predicted to occur along the A2 near the two junctions between West Street/St. Michael's Road and London Road/Hawthorne Road, as the result of congestion and low traffic speeds associated with the junctions.

Figure 2-8: Modelled annual mean NO_2 concentrations, 2019

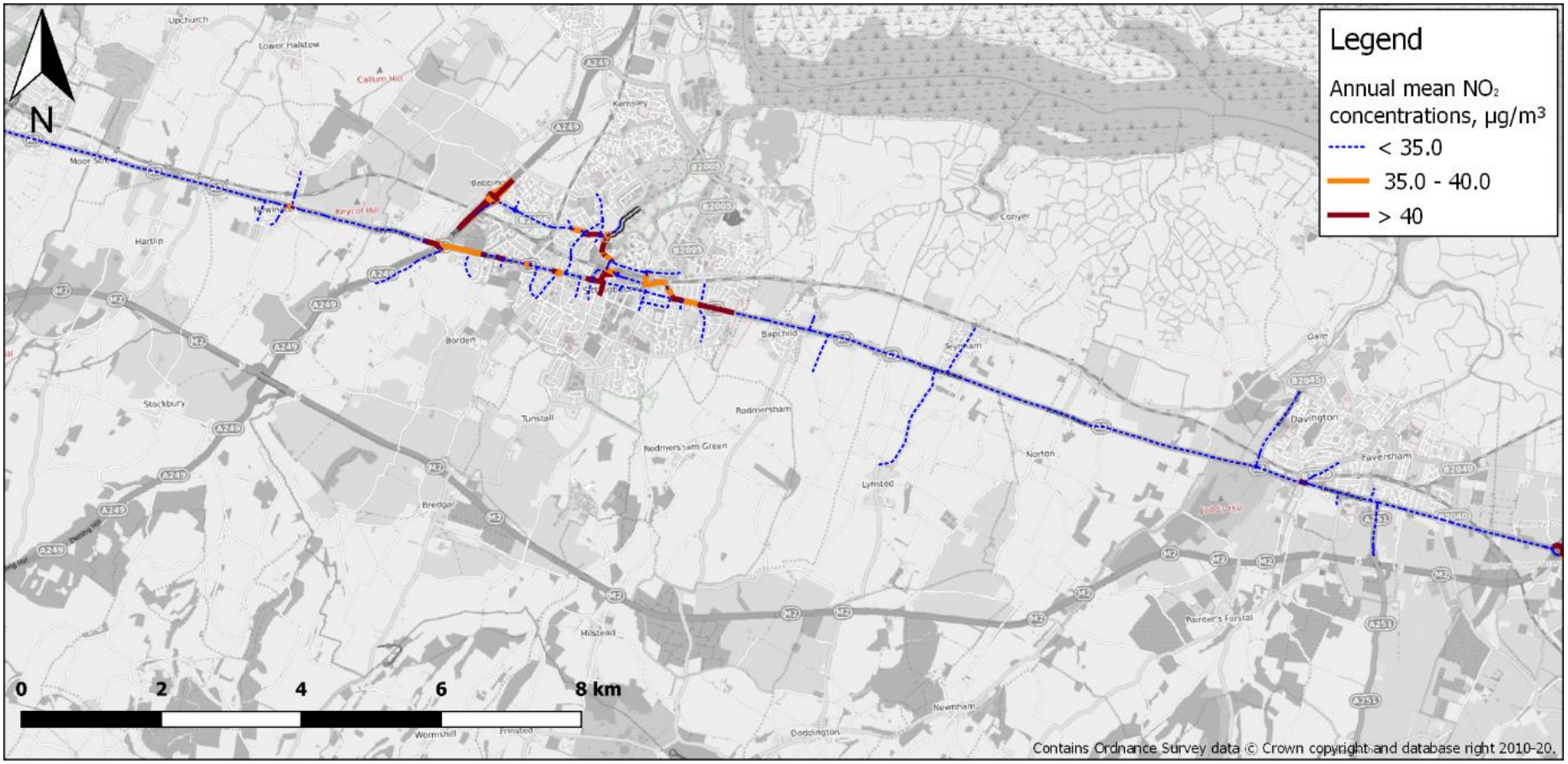


Figure 2-9: Modelled annual mean NO_2 concentrations, 2019, Sittingbourne

Figure 2-10: Modelled annual mean NO_2 concentrations, 2019, Faversham

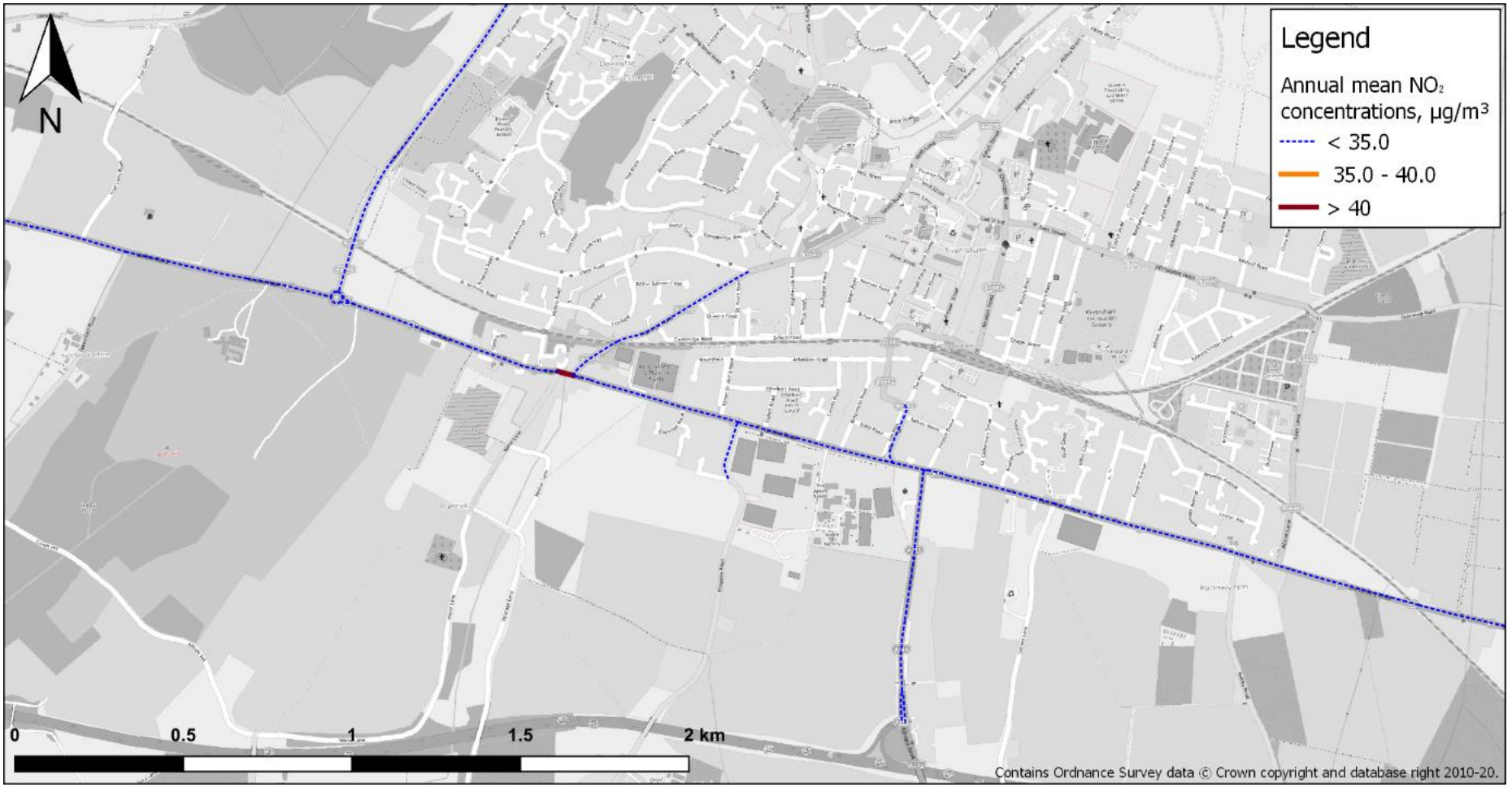


Figure 2-11: Modelled annual mean NO_2 concentrations, 2019, Newington

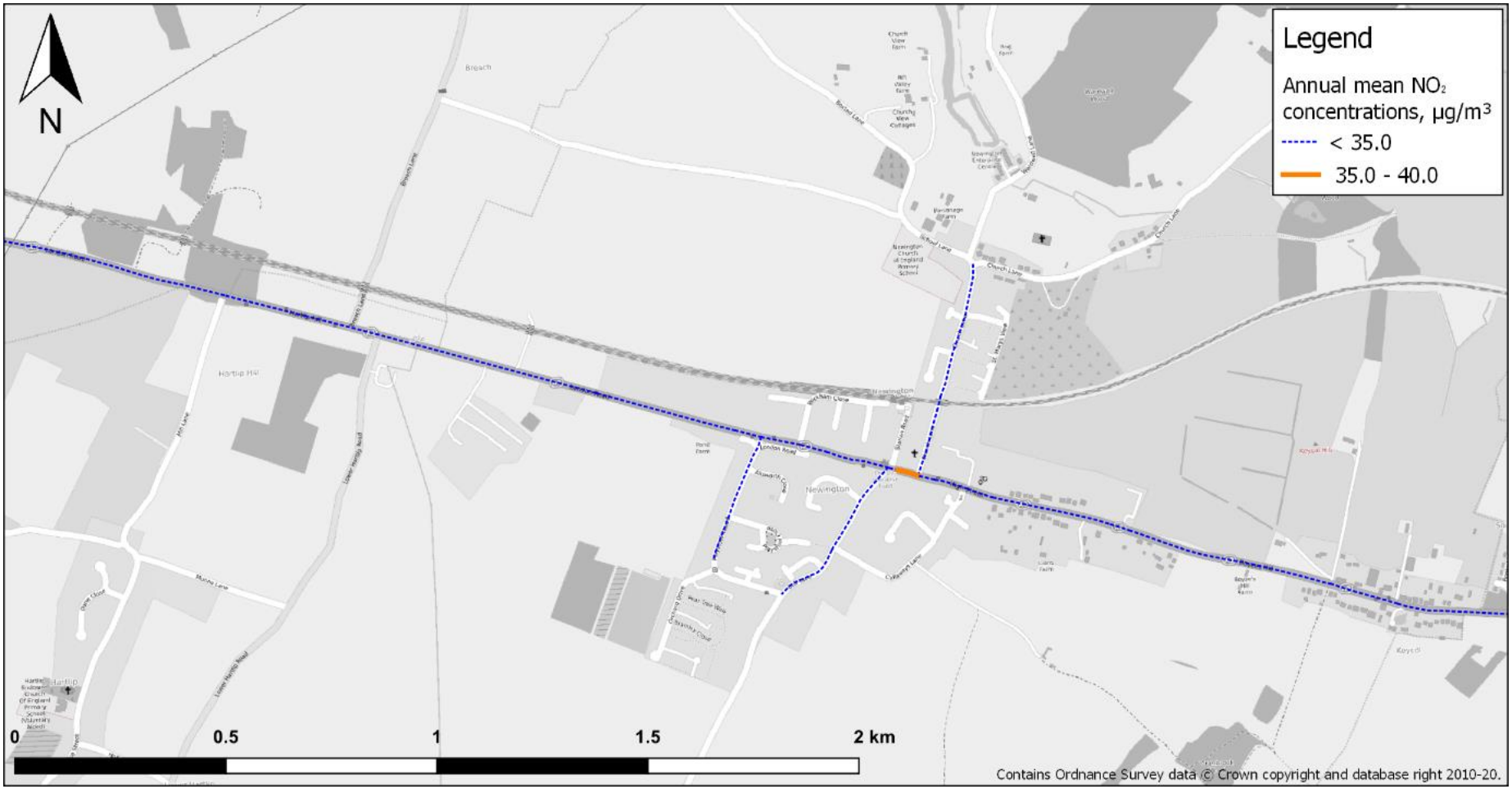


Figure 2-12: Modelled annual mean NO_2 concentrations, 2022 Reference case

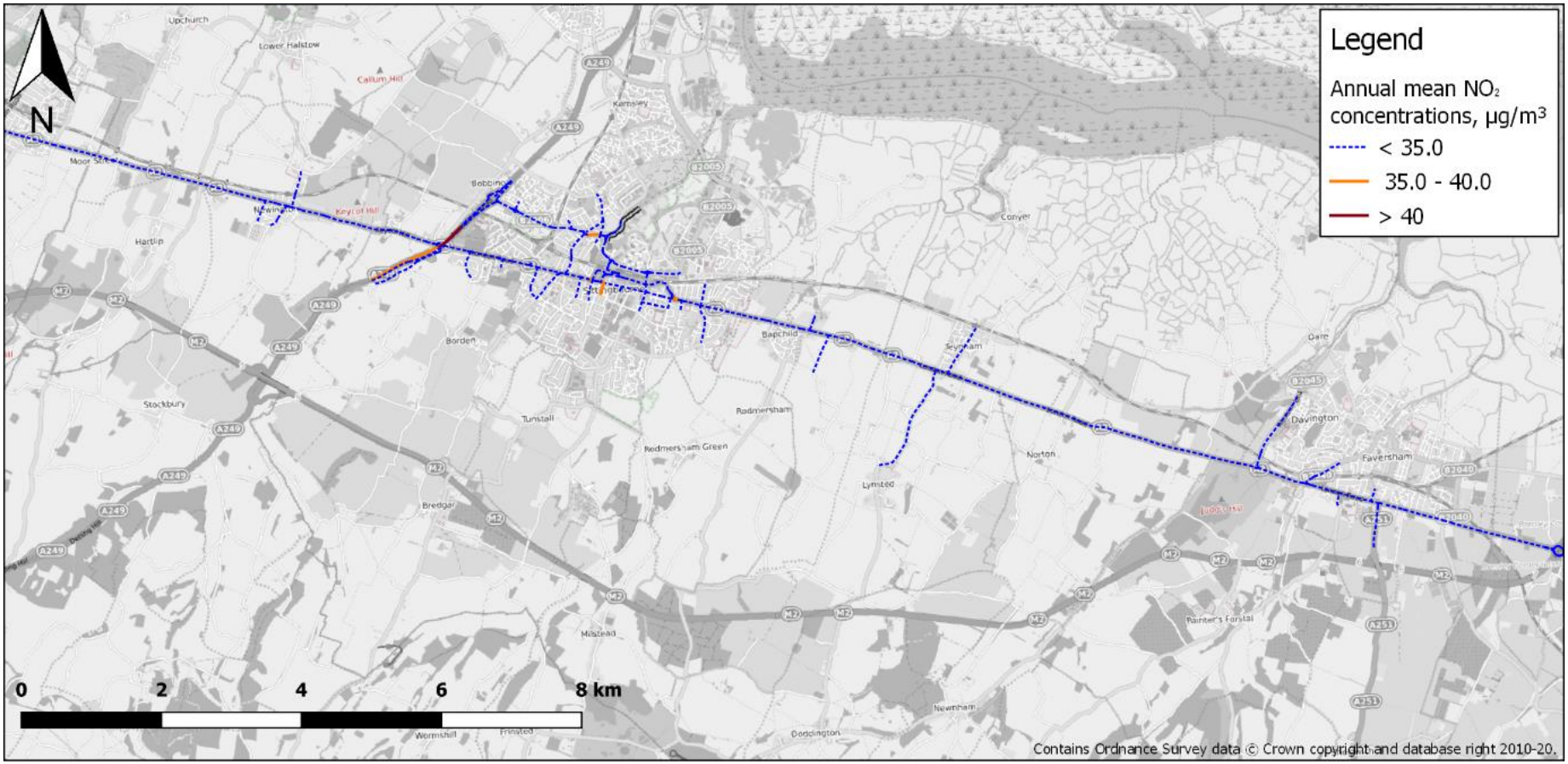


Figure 2-13: Modelled annual mean NO_2 concentrations, Sittingbourne area, 2022 Reference case

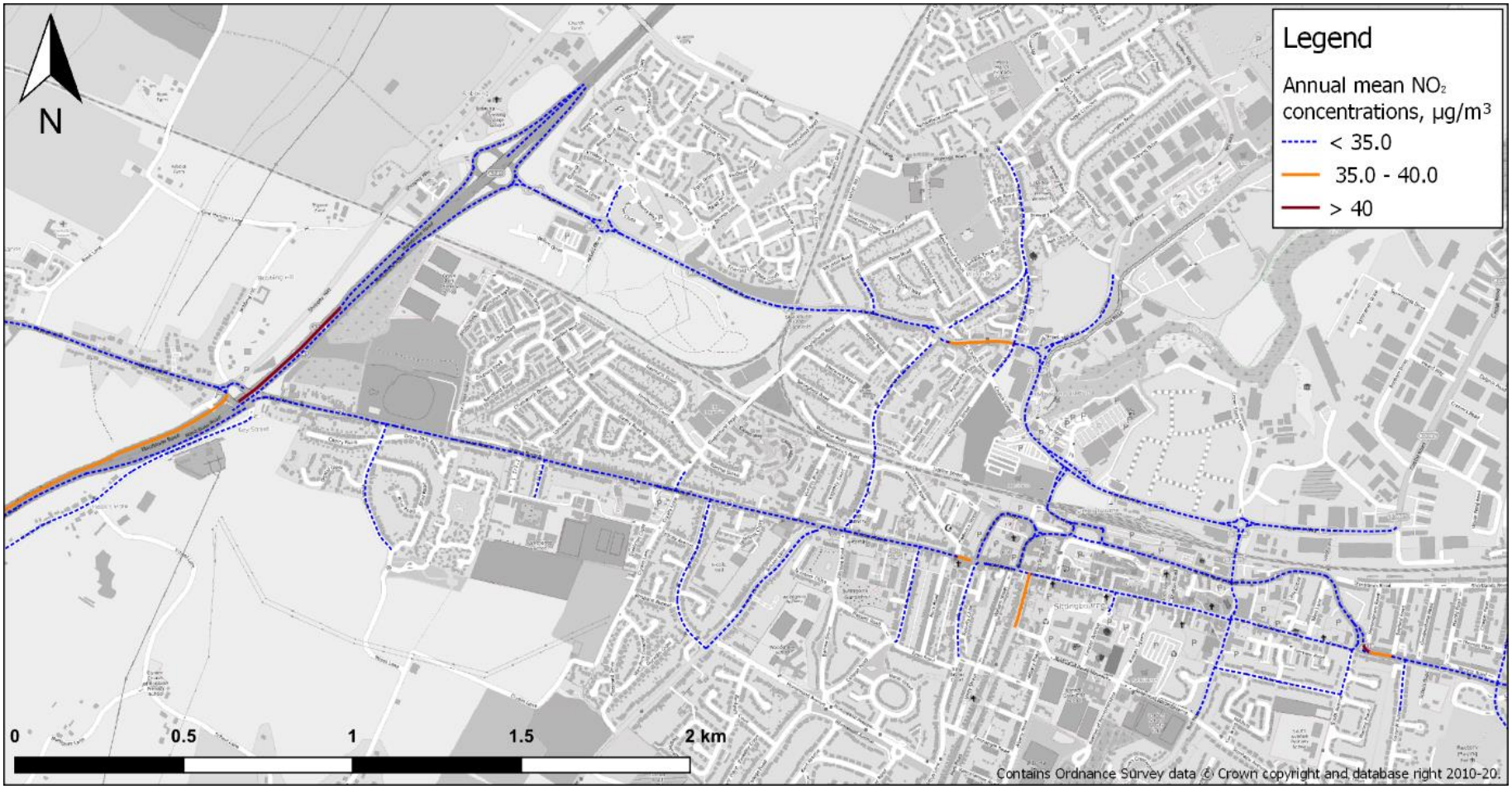


Figure 2-14: Modelled annual mean NO_2 concentrations, 2022, including Covid-19 sensitivity

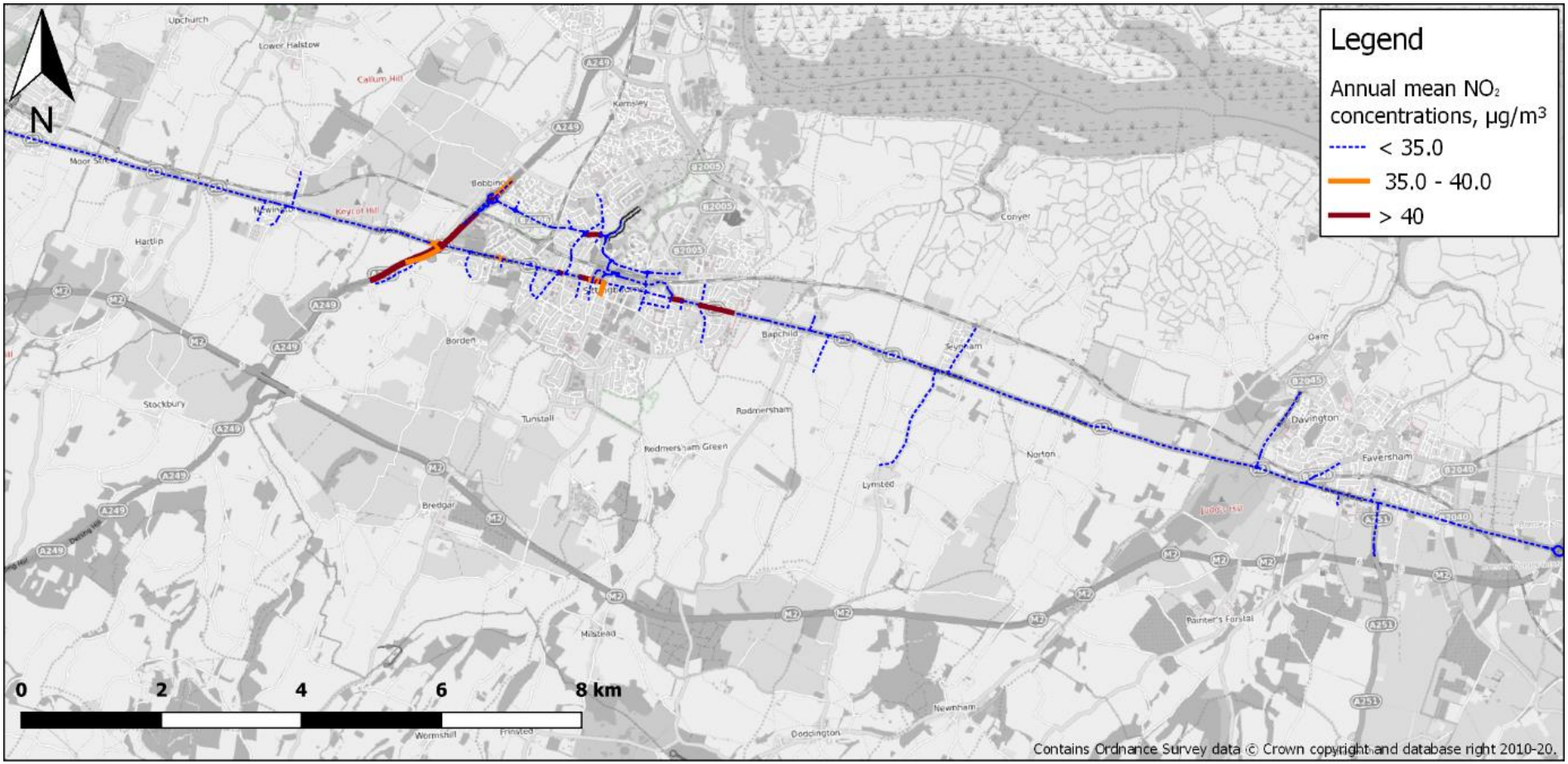
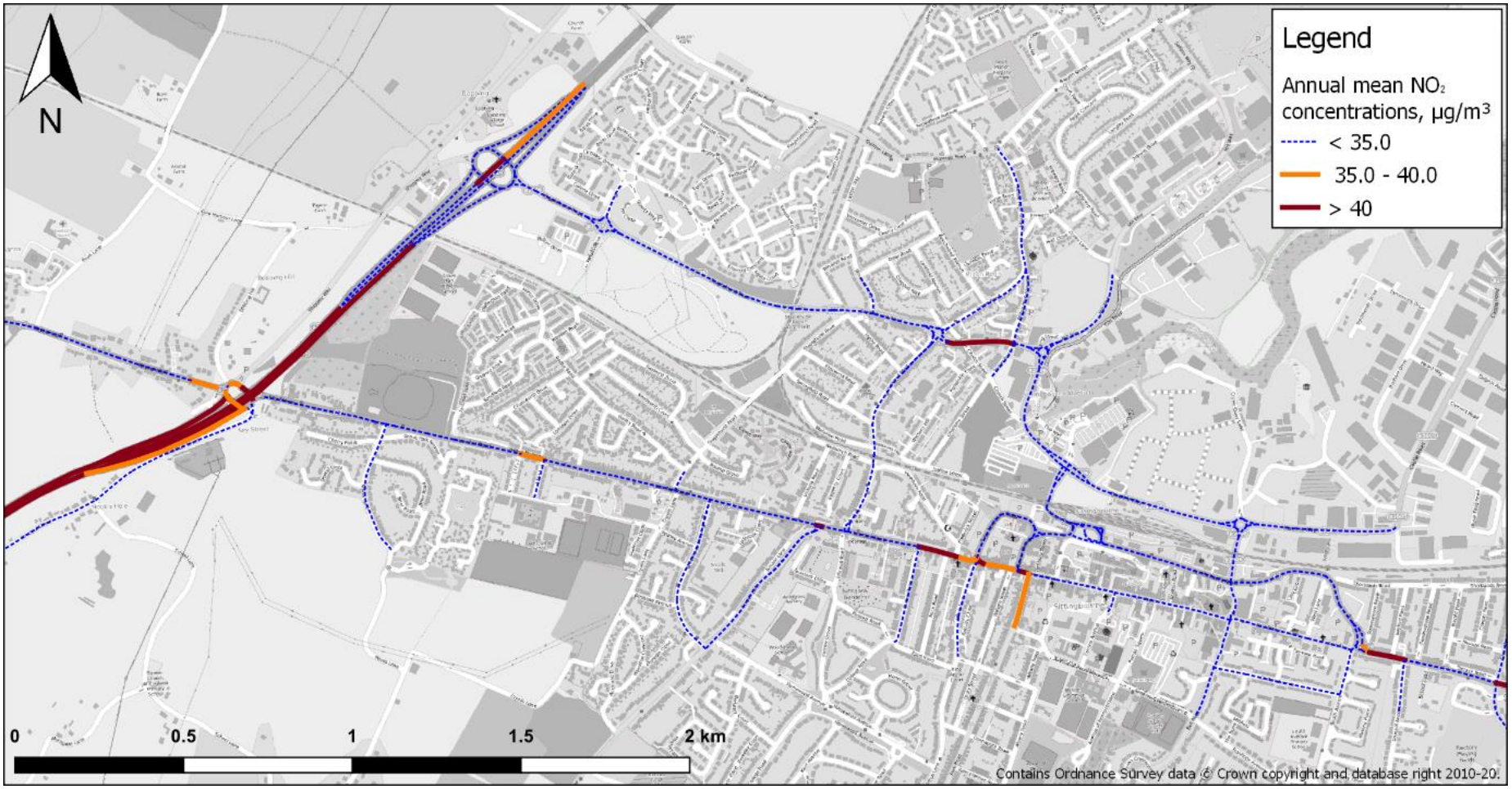


Figure 2-15: Modelled annual mean NO_2 concentrations, 2022, including Covid-19 sensitivity, Sittingbourne



2.6.2 Concentrations at monitoring locations

The modelled concentrations at monitoring site locations are shown in Table 2-3 for 2019, 2022, and the 2022 Covid-19 sensitivity test. The results are shown with both the global and local adjustment factors. The 2019 results are the actual monitored data, whereas 2022 results are modelled using both the site-specific and global adjustment factors. Red values indicate that the concentration exceeds the Air Quality Objective of 40 µg.m^{-3}; amber values indicate that location is classified as 'at risk' of exceeding within the model uncertainty. For the purposes of this study, at risk locations were defined as having a predicted concentration greater than 35 µg.m^{-3}, i.e. one RMSE from exceedance. The total number of monitoring locations exceeding or at risk in each of the three modelling baseline scenarios is also presented.

2019 baseline results

There are 9 exceedances of the Air Quality Objective of 40 µg.m^{-3} for annual mean NO_2 concentrations at monitoring stations in Swale in 2019. These exceedances primarily occur along the A2 and the B2006 in the Sittingbourne area. Exceedances occur at the East Street, St. Paul's Street and Newington AQMAs. An additional exceedance is shown on Keycol Hill, where gradients and congestion near the junction with the A249 give rise to elevated emissions.

2022 reference case

No exceedances of the air quality objective are predicted to occur at monitoring sites when using the global adjustment factor. However, these predictions are subject to significant uncertainty and as such site-specific adjustment factors have been used at monitoring sites in order to account for local effects that may not be captured in the model. Using site-specific adjustment factors, one location is predicted to exceed the objective in 2022 without intervention; SW82, located in the St. Paul's Street AQMA.

The East Street and St. Paul's Street AQMAs are both predicted to remain at risk of exceeding in 2022 without intervention.

2022 Covid-19 sensitivity

The Covid-19 sensitivity test indicates that the impacts will lead to increased concentrations across all the monitoring locations. When using the global adjustment this does not result in any exceedances, but with the site-specific adjustment factor two exceedances are predicted one at SW82 in the St Paul's Street AQMA and SW124 in Keycol Hill.

Table 2-3: Modelled annual mean NO_2 concentrations at monitoring locations in the study area, $\mu g.m^{-3}$

Site	Road Name	Monitored data	Site-specific adjustment		Global adjustment	
		2019	2022	2022 (Covid-19 sensitivity)	2022	2022 (Covid-19 sensitivity)
ZW6	Newington 3	26.8	20.6	21.8	25.9	27.4
ZW8	St Paul's Street	39.1	29.2	31.1	34.9	37.2
ZW3	Ospringe Roadside	31.4	24	25.3	20.1	21.2
SW66	96/94High Street, Newington	33.7	25.6	27.1	25.7	27.2
SW45	64 High Street, Newington	36.1	27.5	29	24.2	25.6
SW35	60 High Street, Newington	42.5	32.2	34.1	26.4	28
SW42	High Street, Opp Church Lane	44.2	32.9	35.1	32.8	34.9
SW19	Newington Social Club	36.8	27.8	29.5	26	27.5
SW20	Newington Co Op	26.1	20.1	21.2	25.8	27.3
SW36	49 High Street, Newington	32.9	24.8	26.3	26.6	28.2
SW82	Conservative Club, St Paul's Street	55.9	41.6	44.4	37.1	39.6
SW51	14/16 St Paul's Street	40.5	30.2	32.2	37	39.5
SW89	St Paul's Air Quality Station	40.3	30.2	32.2	34.9	37.2
SW71	o/s 8 Staple Close, Staplehurst Road, Sittingbourne	36.1	27.4	29.3	28.8	30.8
SW73	14 Chalkwell Road, Sittingbourne	30.7	23.7	25.9	21.9	23.9
SW56	126 East Street, Sittingbourne	37.7	29.1	30.7	31.3	33
SW87	Canterbury Road AQ Station	30.7	24.2	25.2	30	31.3
SW99	A2 Frognal Lane, Teynham	24.7	20.1	21.2	21.5	22.7
SW91	Adj to 72 London Road, Teynham	33.4	25.5	26.9	20.2	21.3
SW101	A2 Lynsted Lane, Jct	22.4	18.2	19.2	20.2	21.3
SW28	Mayors Arms, Ospringe	43	31.9	34	27.9	29.7
SW30	ZW3 Ospringe Street	30.1	22.9	24.2	20.9	22.1
SW31	Site 7, 4 Ospringe Street	37.9	28	29.8	25.8	27.4
SW32	11 Ospringe Street, Ospringe	36.9	27.6	29.3	22.1	23.4
SW96	Maison Dieu, Ospringe Street	36.6	27	28.9	30.3	32.4
SW29	Opp Lions Yard, Ospringe Street	40.9	30.4	32.4	27.8	29.6
SW120	103 Ospringe Street, Ospringe, Faversham	39.9	29.6	31.4	24.9	26.4
SW117	Land Adj Orchard, Canterbury Road, Faversham	28.5	22.2	23.2	16.5	17.2

Site	Road Name	Monitored data	Site-specific adjustment		Global adjustment	
		2019	2022	2022 (Covid-19 sensitivity)	2022	2022 (Covid-19 sensitivity)
SW62	Key Street, Sittingbourne	33.7	24.9	26.4	25.9	27.6
SW110	2 Cherryfields, Sittingbourne	18.7	15	15.5	14.3	14.9
SW111	76A Key Street, Sittingbourne	38.2	28.9	30.6	22.4	23.7
SW112	56 Key Street, Sittingbourne	33.4	25.2	26.7	22.5	23.8
SW114	2 Florence Cottages, Chestnut Street	20.9	15.9	16.7	17.1	18
SW115	Cherry Tree Cottage, Chestnut Street	21.6	16.6	17.4	15.1	15.8
SW116	Bankside, Chestnut Street	21.5	16.4	17.2	15.6	16.4
SW124	31/33 Keycol Hill Sittingbourne Highest Point	52.3	39.2	41.7	31.4	33.4
SW121	Façade Squirrel Cottage, Keycol Hill	42.7	32.5	34.6	33.3	35.5
SW122	Façade 13 Key Street, Sittingbourne	21.2	15.8	16.8	21.1	22.3
SW123	12 Key Street, Sittingbourne	27.3	20.2	21.4	24.6	26.1
SW76	155 Canterbury Road, Sittingbourne	33.5	25.9	27.4	27	28.5
SW119	Flats, The Mount, Ospringe	24.7	19.2	20.2	17	17.8
SW83	Pembury Court, Dover Street	24.6	19	19.9	25.6	26.8
SW125	16/18 The Street, Bapchild	23.7	18.5	19.6	23	24.3

Note: Red cells are exceedances and yellow/amber cells are at risk sites

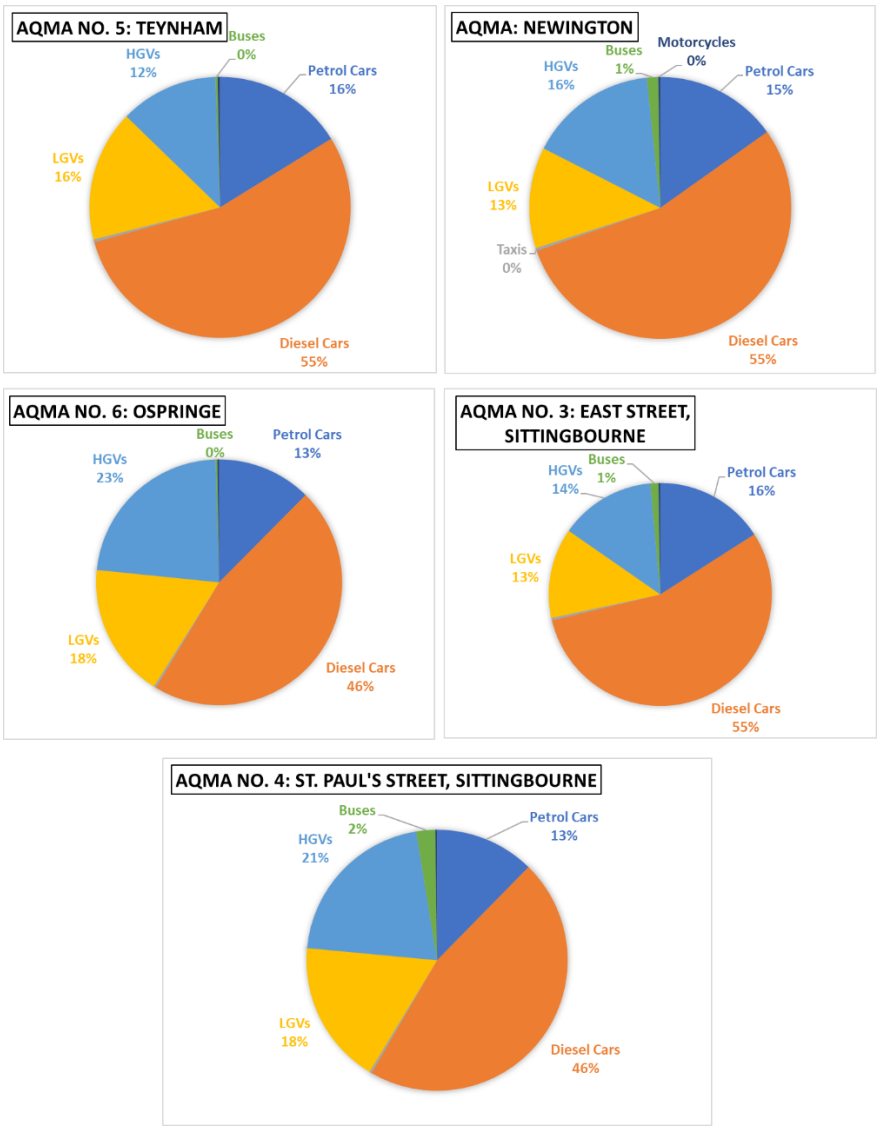
2.7 Source apportionment

A source apportionment analysis was carried out for roads in the five AQMAs in 2019 and 2022, in order to identify the primary contributors of air pollution hotspots in the city and inform potential policy development.

2.7.1 2019

The most important source of NO_X emissions in the AQMAs is diesel cars; this is a common trend seen across the United Kingdom, as cars comprise the majority of vehicle trips in the UK, and diesel cars have significantly higher NO_X emissions compared with petrol cars. In 2019, diesel cars were the largest contributors to NOx emissions in each of the AQMAs, ranging from 37-50%. The second most important source of NO_X emissions is HGVs, which contribute 22-36% of NOx emissions. LGVs contribute 13-19% of emissions, and petrol cars contribute 9-12%. The contributions of buses, motorcycles, and taxis are very low (<2%), which may reflect the limitations of the traffic data available for the project as described in Section 2.5. Figure 2-16 shows the source apportionment for all vehicle types in each AQMA.

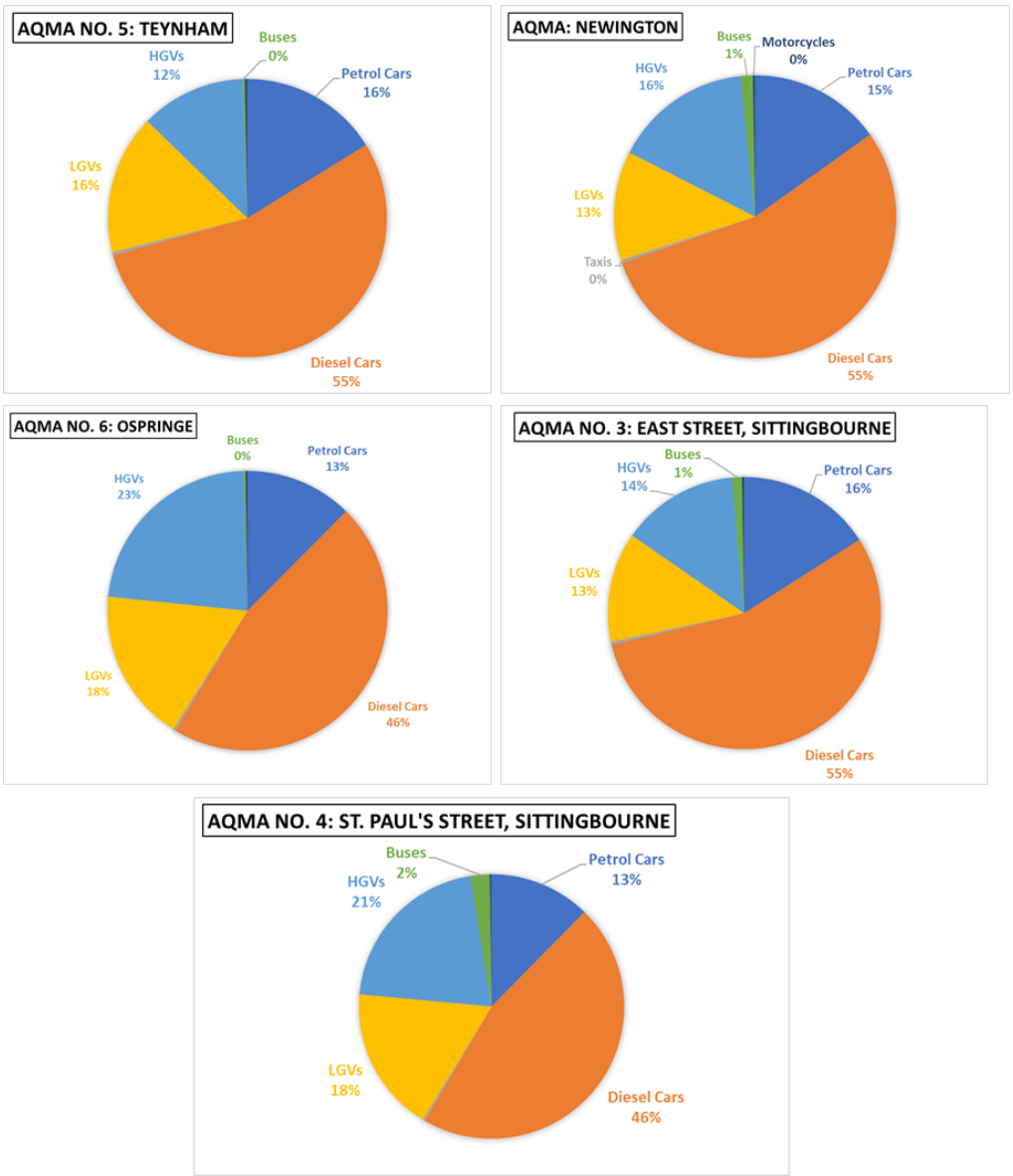
Figure 2-16 – Source apportionment in AQMAs in 2019



2.7.2 2022

In 2022, diesel cars are projected to be the largest contributor to NOx emissions in each AQMA, ranging from 46-55%. Compared to 2019, the contributions of HGVs decrease to 12-23% in each AQMA in 2022, while the contributions of both diesel and petrol cars increase in each AQMA. The contributions of LGVs remains approximately consistent compared to 2019. Figure 2-17shows the source apportionment for all vehicle types in each AQMA in 2022, and lists the percentages from both years.

Figure 2-17 – Source apportionment in AQMAs in 2022



3 Developing the mitigation options

There are a number of different mitigation options that could be applied that would have different impacts on both pollutant emissions and concentrations. In developing an initial list of options, we have considered both:

- Regulatory measures – primarily a charging Clean Air Zone, that requires people to action to reduce their emissions;
- Non-regulatory measures – where people are encourages or incentives to change behaviours to reduce emissions, for example supporting active travel to reduce car use

Alongside the impact on air quality it is also necessary to consider the costs of scheme implementation and the cost to the public. Generally, regulatory measures come with a high cost of enforcement, compliance and have lower public acceptability. Non-regulatory can have a range of costs to the local authority but are generally more accepted by the public and have lower costs to the public. Because of this, formal schemes such as a Charging CAZ are often considered only as a last resort or where the pollution problems are significant. Often a package of multiple softer non-regulatory measures is chosen in preference to the regulatory scheme, if the package of measures can provide the required emission reductions to result in acceptable concentrations.

For this project a long list of measures was created to identify potential solutions to the elevated NO_2 concentrations. From this long list, key themes were extracted and discussed with key stakeholders through engagement. Through this engagement a shortlist was created, as the long list was revised and refined to focus on the most appropriate measures for the Swale context. The shortlist of measures was refined further to create a final set of options that were taken through to the detailed air quality modelling and cost benefit analysis.

3.1 Option identification and longlist

The starting point for the long list was a review of existing plans and policies to identify existing and planned measures that would help to address the problem and then identify potential gaps where further action could be taken. To do this a thorough review of documents that could have any impact on emissions in Swale were assessed.

The review covered strategies and policies not just from Swale Borough Council (SBC) but also Kent County Council (KCC) and Transport for the South East (TfSE) as the key bodies responsible for transport in the area. The documents were evaluated looking at: air quality action plans, development plans, transportation strategy (incl. rail, active travel, taxi, parking) and sustainable growth, including any progress reports in these areas. The documents reviewed are listed in Table 3-1 below.

Table 3-1. List of documents reviewed to identify measures.

Document	Body
Swale Strategic AQAP 2018 - 2022	SBC
Swale Strategic AQAP 2018 – 2022, Report 1: Source Apportionment and Options Assessment. October 2018	Phlorum
Swale Strategic AQAP 2018 – 2022, Report 2: AQMA options assessment, October 2018	Phlorum
Swale - Cycling and walking Guidance Statement 2018-2022	SBC
2019 Air Quality Annual Status Report	SBC
Swale Borough Council - Parking Standards	SBC
Realising our ambitions for Swale - Partnership priorities for the borough to 2031	SBC
SWALE BOROUGH COUNCIL - PROCUREMENT STRATEGY (2013 – 2016)	SBC

Housing Strategy 2010-2015	SBC
HACKNEY CARRIAGE AND PRIVATE HIRE LICENSING POLICY 2018-2021	SBC
Air Quality Action Plan (2018 – 2022)	SBC
Swale Transportation Strategy 2014-2031 (Draft)	SBC
SWALE BOROUGH COUNCIL FREIGHT MANAGEMENT PLAN	SBC
Bearing Fruits 2031	SBC
The Swale Borough Local Plan	SBC
Digital Strategy	SBC
Housing Strategy 2010-2015	SBC
Kent County Council's Strategic Statement 2015-2020 (Annual Report 2019 County Council)	KCC
Rail Action Plan for Kent	KCC
SEA Environmental Report -LTP4 Strategic Environmental Assessment	KCC
Strategic Environmental Assessment – Non-Technical Summary [Local Transport Plan 4 (LTP4)]	KCC
SEA Adoption Statement - LTP4 Strategic Environmental Assessment	KCC
Local Transport Plan 4: Delivering Growth without Gridlock 2016–2031	KCC
KENT ENVIRONMENT STRATEGY INDICATORS JANUARY 2020	KCC
Kent ENVIRONMENT Strategy - A strategy for environment, health and economy - Impact Report 2018	KCC
KENT ENVIRONMENT STRATEGY IMPLEMENTATION PLAN - Year 2 activity monitoring report - August 2017 – July 2018	KCC
Kent County Council - Environment policy	KCC
KENT COUNTY COUNCIL HIGHWAYS TRACKER 2017 WRITTEN REPORT	KCC
KENT AND MEDWAY GROWTH AND INFRASTRUCTURE FRAMEWORK | 2018 UPDATE	KCC
Transport Strategy for the South East - Consultation Draft - October 2019	TfSE
TRANSPORT FOR THE South East - Draft Transport Strategy - October 2019 [Strategic Policy Context]	TfSE
TRANSPORT FOR THE South East - Priority scheme summaries	TfSE
TRANSPORT FOR THE South East - Future transport technology	TfSE
TRANSPORT FOR THE South East - Draft Transport Strategy - October 2019 [Freight, logistics and gateway review]	TfSE
Economic Connectivity Review	TfSE

From these documents an initial long list of measures was generated by collating similar and overlapping measures into key themes. These themes were then reviewed to identify any potential gaps building on experience from measures being implemented in other CAZ cities or through the concept of Low Emission Strategies such as those developed in Southampton, Leicester and York. This initial long list defined 25 key groups in 4 themes:

1. A formal charging CAZ and options on this;
2. Low emission vehicle measures to promote and support the uptake of low emission vehicles;
3. Traffic and travel management to promote mode shift and the efficient flow of vehicles;
4. Longer term development policy.

These measures are listed in Table 3-2 and described briefly below.

3.1.1 Charging CAZ

A charging CAZ is a measure that creates a financial incentive to change the emissions of a vehicle. Vehicles that enter the charging zone are required to pay a charge to enter if they do not meet a specific emission standard defined as Euro4 for petrol vehicles and Euro 6/VI for diesel vehicles. By charging vehicles not meeting these standards it is possible to provide a strong price signal to upgrade a vehicle.

The legal basis for a charging Clean Air Zone is road user charging powers as set out in the Transport Act 2000. Part III of the Act empowers local authorities (as "charging authorities") to make a local charging scheme in respect of the use or keeping of motor vehicles on roads. DEFRA and DfT has also provided a clear framework[12] on the design of CAZ scheme so that there is a consistent approach taken across the country.

This measure can be targeted at specific types of vehicles, with the DEFRA guidance defining 4 categories or 'Classes' of CAZ:

- Class A – covering buses and taxis;
- Class B – covering buses, taxis and HGVs;
- Class C – covering buses, taxis, HGVs and LGVs;
- Class D – covering all vehicles types.

In addition, it is necessary to consider:

- the CAZ boundary – does it cover the whole A2 corridor, the whole of Swale or just the AQMAS;
- The charging price – the starting point for this would be the levels used for the London ULEZ.

In theory the DEFRA/DfT framework is guidance only and the legislation would allow different approaches to a charging scheme, but to avoid confusion this would not be expected to be called a CAZ. An example of this is the developing Zero Emission Zone in Oxford that is using the same legislation to promote zero emission vehicle usage in the centre of the city.

3.1.2 Low emission vehicle measures

Taxi licencing

The current taxi licencing regulations are stipulated in Hackney Carriage and Private Hire Licensing Policy (2018-2021):

- **2.5.1** Vehicles licensed with 4 to 6 passengers, on first registration, will be less than 8 years old on the first date of the application and can be licensed up to 10 years old.
- **2.5.2** Vehicles licensed with 7 to 8 passengers, with wheelchair accessibility will be less than 12 years old on the first date of application and can be licensed for up to 15 years old.

There is potential to tighten the restrictions on the emissions from taxis. Taxis that are 10 years old are likely to be Euro V and taxis that are 15 years old are likely to be Euro IV. Although the current licencing rules stipulate age of taxis, it might make more sense to stipulate emission standards rather

[12] 'Clean Air Zone Framework, Principles for setting up Clean Air Zones in England', DEFRA/DfT, May 2017

than age in the licencing method. Through licencing in this way it is also possible to encourage taxis to become ULEV and hybrid vehicles.

Creating more stringent taxi licencing regulations will only be successful with the co-operation of adjoining boroughs. If licencing is more stringent in Swale then taxi drivers would licence in adjoining boroughs but continue to operate within Swale.

Taxi incentives

A taxi licencing scheme can also be complemented by grants or incentives as being developed in other authorities such as grant schemes for upgrades, loan schemes and try before you buy schemes.

It is also possible to use Traffic Regulation Orders (TROs) to set emission standards for vehicles using taxi ranks. This can help support licencing, provide an incentive to upgrade to use priority ranks and help with taxi coming in from other areas.

Eco Stars scheme for freight vehicles

The Kent Freight Action Plan highlights the Eco-Star scheme where large operators within SBC are provided with community recognition for high levels of environmental performance. The scheme provides support for operators in better fuel management and driver training. The result of the scheme is to help improve efficiency, reduce fuel consumption and reduce negative impact on local air quality.

According to the Energy Saving Trust, by taking Eco-driving training, an improvement of up to 15% MPG would be possible. However, the average improvement is close to 8% and this can tail off over time.

Low emission loading bays

To complement the Eco Stars and as an alternative to a CAZ charging scheme it would be possible to use TROs to set emission standards for vehicles using loading areas along the A2 and especially in the AQMAs. This would require deliveries to have vehicles that meet the given standards.

Improving bus fleet through a retrofit programme

This measure looks to reduce emissions from buses. As a modal shift away from private vehicles occurs, the need for clean buses further increases.

Reduced bus emissions can occur from retrofitting Selective Catalytic Reduction and particle Trap (SCRT) exhaust treatment old buses and provide thermal management for Euro V buses. Another option is to explore a change in vehicle power moving towards Compressed Natural Gas (CNG) or electric.

ULEV parking charges

This measure provides preferential parking charges for ULEVs. By providing better or cheaper parking for ULEV this measure will encourage the uptake of ULEVs. This measure can act either on residential parking permits or council owned public parking.

A recent trial in Winchester has seen some drivers of EVs being able to park for free in any local authority parking bays. In addition, a discount on parking charges is provided to those owner vehicles who have low CO_2 levels (according to vehicle excise duty band).

Two other examples of such schemes are in Richmond and Edinburgh. These were applied to the pricing of residents parking permits, but other authorities such as York have consider adjusting

charges in in public car parks. In most cases the main assessment has been on impact of parking revenues with the current fleet rather than the likely change to that fleet. Clearly the impact will depend on the scale of the charges or indeed if only vehicles of a certain emission criteria can use the parking, but it seems likely to be small. In assessing a scheme of this nature some simple assumptions will need to be made on its likely impact on vehicle emission standards.

EV cars and vans - charging infrastructure

A key obstacle to overcome in the uptake of EVs is the provision of charging infrastructure. The perception of a lack of infrastructure stops people from making the leap to electric vehicles.

The range of modern electric vehicles are now well over 100 miles. Therefore, the majority of charging is usually done overnight for local commuting travel. It is therefore important that electric charging is available at home. This may be easier for people who have the ability to park off-road but more challenging for those who park on the road. There are potential health and safety issues with running cables across pavements. In these circumstances, provision of electric charging infrastructure built into the road would allow charging at the roadside.

Charging infrastructure can also be provided at places of work, where vehicles will typically sit for the duration of the day. Fleet vehicles are an area where EV uptake is expected to be high. Provision of EV infrastructure for fleet vehicles is important.

EV cars and vans – grants

This measure provides financial support to those who wish to make a change in vehicle from combustion to electric vehicle. Through car leasing or salary sacrifice it is possible to increase the uptake in electric vehicles. EV cars that are financed in this way would then gain some of the other benefits discussed in this list in relation to priority provision for EVs.

EV cars and vans - car clubs

The basic idea of a car club is that people can have access to a car in their neighbourhood without having to own it. With Electric car clubs, the idea is identical with the proviso being that only EVs are available for users.

Typically, car club members pay an annual membership fee to an operator (in the order of £100-£200) who provides and maintains a range of vehicles in their neighbourhood. Members then pay by the hour and mile when they use a vehicle. Some operators prefer to charge a higher hourly rate and do not ask for a membership or mileage fee.

The combined costs of membership and use are intended to be cheaper than personal car ownership, for car owners who do not do a high mileage, and to encourage the adoption of relatively diverse personal transport strategies.

Anti-idling

This measure looks to highlight the unnecessary emissions that are created during engine idling. There are two types of schemes, one which raises awareness and others which issue fixed penalty notices (FPN) in order to increase local authority revenue as well as improve air quality. The Council has already adopted and approved this action for use in the Borough.

Anti-idling campaigns are one approach to reduce vehicle emissions and fuel consumption, and improve air quality. They typically advise drivers to switch their engine off whenever it is likely to be idling for more than one minute. One of the key benefits of this measure is that it will be possible to target the pollution hot spots and areas of high exposure. Targeting bus drivers and taxis at train stations or parents at schools will greatly reduce exposure to large populations.

3.1.3 Traffic and travel management

Improve walking infrastructure

Improving walking infrastructure can increase the numbers of people walking. There are a number of key issues that need to be addressed:

- Safety
- Access
- Journey times

Additional safety can be provided to pedestrians via barriers alongside major roads and junctions. These provide a physical barrier which can increase the perception of safety. Separation from the traffic can also be provided by creating additional distance from the main carriageway. Where the pavements are wide enough, creation of a cycle path next to the road, and a walkway further away provides an additional buffer from the flow of traffic. Another safety element comes through the provision of lights to allow for walking at night and the feeling of safety.

To encourage walking it is important that at least one side of a carriageway has sufficient space to get a wheelchair or pram along the pavement. In locations where cars park mounted on the curb this is not always the case. Wide pavements allow for improved access allowing wheelchairs or pram users to pass one another with ease.

A key benefit that can be realised for walking is increased journey times over road users for short journeys. Due to the decreased space required to put a path in versus a road, it is possible to create walking cut throughs which will allow pedestrians to take more direct routes. This also has the added benefit of removing pedestrians from walking alongside roads. Another way to improve journey times is through priority signalling. This is where the traffic light signalling has been optimised in favour of pedestrians rather than cars.

Improve cycle infrastructure

Improving cycle infrastructure can improve the rates of cycling. Rates of cycling in Swale are low compared to the national average. Investment in cycle infrastructure can increase the appeal of cycling and therefore increase its uptake.

Key cycle infrastructure can be in relation to:

- Cycle routes
- Cycle safety
- Bicycle storage
- Post cycle facilities
- Journey times
- Bicycle rental schemes
- Training

An effective cycle network requires cycle routes which interlink and are direct between key destinations. For the more experienced cyclists cycling on main roads does not phase them, but this can be quite daunting for less experience cyclists. Provision of cycle routes that are off the main roads can be a great way to increase the numbers of cyclists. By providing routes that have low numbers of cars there is increased security for cyclists. Reducing the number of cars on cycle routes can be achieved via cycle cut throughs that cars cannot use. This can be achieved via something as simple as filtered permeability (where bollards across a restrict cars but bicycles can still get through).

Cycle safety can be achieved through a number of methods but safety of cyclists is a key barrier to new cyclists. Provision of visible cycle infrastructure can be a great way to encourage cyclists. This

can be via road markings (e.g. cycle lanes and cycle boxes at lights) or via hard infrastructure (separating cyclist from the main carriageway).

Cycling requires physical effort and therefore the shortest routes are the best routes, with little slowing and accelerating for lights. It may be possible to tweak the road network to give priority at signals to cyclists and to create green-wave for lights so that cyclists can retain their momentum.

Another key to increase cycle numbers is the provision of cycle storage. At the end of a journey by bicycle it is important that the user can lock up their bike without the fear of it being stolen. At places of work and schools this is provision of storage facilities that are not accessible to the general public. In public locations this is provision of cycle storage in well light areas preferably with CCTV surveillance.

For those commuting longer distance by bicycle then they will likely require changing and shower facilities. Provision of these facilities will encourage a modal shift towards cycling. Following this, there is also need for cycle equipment storage (e.g. helmet). Provision of lockers can overcome this issue.

Many people do not feel comfortable cycling and are nervous about trying to cycle. There are a number of different schemes that are available to help overcome this. The KCC Adult Cycle Training provided training to 381 across 174 sessions in 2017/18. In Camden in London, to encourage cycling at the end of training sessions, the trainer agrees to cycle attendees' routes from home to work with them to help them gain confidence on the route they will take. Other schemes in Kent include Ride Social and Breeze Rides which provide residents to ride with cycle leaders and can be a good way to increase cycle confidence.

Short-term cycle hire schemes are now commonplace in many cities using either a docked or free-standing system. In the London Borough of Hackney, the council provide bicycles on loan for a month to help users determine whether or not cycling is the right option for them. There is also growing use of e-bikes and other micro-mobility solution as alternatives to the car for some longer journeys.

Pinch-point parking alternatives

Pinch-point parking is a measure that does not allow parking along key routes, especially where roads narrow. By removing parking along these routes, it is possible to improve the flow of traffic as parked cars do not create obstacles which can often lead to congestion, low-speeds and high acceleration passed the obstacle. By removing obstacles it will also improve active travel experience, especially cycling.

Through the removal of parking spaces to improve vehicular flow, it will be important to provide additional parking options to gain the support of the public.

Improve bus services for key routes

All key centres should be accessed by public transport. There are a number of potential bus routes which do not exist that could exist:

- Sittingbourne to Ashford
- Faversham to Maidstone

During rush hour, it is possible to run express bus services which make less stops and travel more directly from one economic hub to another. This type of service further improves reliability and reduces travel times.

Improve public transport scheduling

To create a modal shift away from cars to public transport, it is important that the journey times do not differ too much. If a journey is required to be multi-modal, long wait times can severely increase the overall journey time.

A key way of reducing overall journey times is to improve public transport scheduling. By providing public transport that allows for quick transitions from one form of public transport to another then it is possible to make public transport more appealing and create modal shift. Since train schedules are often fixed due to other users of the same trainlines, it will be the bus schedules which may need to change to optimise the public transport schedules.

It is also important to provide public transport that works to the schedules of workers. It is important to provide public transport services that get people to work or school before when they need to arrive, but not by too much.

Improve public transport infrastructure

It is possible to increase public transport ridership through the provision of improved infrastructure. Infrastructure could be in relation to: multi-modal journeys, bus lanes, better bus-stops, quick and easy journey payments.

Bus lanes are an excellent way to improve the reliability of bus services and therefore make bus travel more desirable. As a result of assigning space on the roads to buses, it increases congestion for private vehicles. This can increase journey times and encourage a modal shift. However, until the modal shift occurs, there is likely to be a spike in emissions.

Good bus stops can be a key factor in improving their ridership. By covered bus stops with up-to-date information makes bus travel a more pleasant experience. Bus stops that are in lay-bys allow for the flow of other traffic to continue whilst the bus is stopped and therefore this reduces any potential congestion that could occur in these locations. Provision of good services for multi-modal travel are also important (e.g. bike stands).

Kent connected Smartcard is the first step from KCC towards smart ticketing. Quick payment for journeys improves journey times and reduces the need for fiddly coins in payment.

School and business travel plans

Creating cohesive travel plans for schools and business may highlight key areas for improvements. Understanding the journeys that members of your organisation take it is possible to put into place actions to improve transportation.

Secondary schools in Swale have a below average active travel percentage, at 1.6% cycling to school rate compared to the national average of 2.2%[13]. A key question therefore should be why? Where pupils are too far to travel by active travel, it may be possible to reduce the number of vehicles by combining school journeys with others that live near-by.

For business it may be possible to reduce the number of car journeys by having colleagues come into work together or by improving at work bicycle facilities (e.g. shower, changing and bicycle storage).

[13] Swale cycling rate was provided by SBC in an unpublished rpeort, the national average is from the National Travel Survey published by DfT.

20 mph zones

Reduced speed zones are primarily designed as a safety measure - reducing the speed of vehicles, increases the safety of cyclist and pedestrians. This in itself can encourage more walking and cycling. Also, by reducing the speed limit to 20 mph reduce vehicle accelerations and so decrease emissions, but this is not always the case. However, another effect of reducing speeds on key road segments can be to cause changes to route selection for vehicles potentially taking longer route and therefore increase emissions. So the overall effect on these on emission is complicated and not always positive.

Freight management – consolidation centre

This measure aims to reduce the number of goods vehicles making deliveries into the town centre. A consolidation centre is usually a warehouse on the outskirts of town where LGVs deliver to and subsequently smaller goods vehicles do the final drop into the centre of town. This methodology reduces congestion and also provides an opportunity to make the final deliveries in low emission vehicles or EVs.

These can have a significant impact on the number of vehicles delivering to retail premises involved in the scheme, reducing them by some 60-70%. However, only a proportion of retailers will use the scheme (perhaps 20-30%), hence we might expect a 15% reduction in activity of freight vehicles servicing the area targeted by the consolidation centre.

Freight management – Delivery and servicing plans

Delivery and service plans - manage and co-ordinate deliveries to a given site. TfL in London has been working strongly on these and has seen delivery trips reduced by 15-20% for a given site when this approach has been implemented.

Improvement to current road network

These measures look to improve the flow of traffic across the road network. By improving the flow of traffic, it is possible to reduce the number of slow-moving, high-emitting vehicles.

There are a number of major road infrastructure projects that have been discussed both by Swale and Kent councils. The major road infrastructure projects are:

- A249 corridor capacity enhancements to support growth
- Sittingbourne town centre regeneration
- Improvements to Key Street junction
- Improvements to M2 Junction 5 – funding committed by Highways England
- A249/Grovehurst Road junction
- Improvements to M2 Junction 7 (Brenley Corner)

Major road infrastructure projects are extremely expensive but can be an effective measure to move vehicles from areas of high human exposure and improve the flow of the overall road network.

3.1.4 Development policy

Sustainable new development

This measure ensures that new developments, both residential and commercial do not negatively impact the environment. Through planning guidance documents developers are led towards technologies that are best for Swale. This can include:

- Energy efficiency
- Car parking spaces and type

- Provision of cycle storage
- Public transport provision
- Local amenities.

Through carefully planned new developments it is possible to develop in such a manner that is unlikely to have a negative impact on the environment and community.

Citizens of Swale seem to have reservations about new developments and their likely impacts on the roads in Swale. An increase in population does not need to have a negative impact on the roads of Swale but this requires provision of other transportation services. Provision of active travel and public transport will be required to increase the population of Swale without increasing congestion. A key factor is the location of new developments and the amenities provided in the development to reduce the need for travel.

High quality telecommunication service provision

This measure looks to capitalise on improve telecommunications software which increases individual's ability to work from home. By working from home it is possible to reduce journey and therefore the number of vehicles on the roads. Lots of families prefer the flexibility provided by the ability to work from home and with the COVID-19 pandemic it has proven to be successful for many people.

3.2 Initial review and consultation

The consultation and engagement was carried out in two stages:

- Initial review and discussion of the long list with SBC officers to focus down the long list to a draft short list for wider engagement;
- Two stakeholder engagement workshops to review and discuss the draft short list.

3.2.1 Initial review

The aim of stage in the process was to reduce the long list of measures for stakeholder engagement discussions. To refine the list of measures, discussions with SBC on each of the measures allowed for better understanding of the issues in Swale and the likely effectiveness of these measures. The long list of measures is presented in Table 3-2.

Table 3-2It should be also noted that a number of measures that potentially could have effective may have been removed from the list of measures to carry into the next stage for a number of other reasons, including:

- Measure would have been effective, but the impacts would only be felt outside the timeframe of this study e.g. sustainable new developments, high speed internet;
- Deemed to be outside the scope of the project e.g. improvements to road network
- They would only impact on a small source of emissions e.g. improvements to the buses or taxis;
- The impact of the measure could not be assessed in the model for example vehicle idling for which is not accounted for in the model, or traffic management schemes, such as 20 mph zones which would not affect average traffic speeds.

Table 3-2 indicates how the long list of 25 measures was reduced following these initial review discussions into a short list for wider stakeholder engagement.

Table 3-2. Long list of measures for initial review with SBC

Measure	Measure type	Initial review conclusions (green taken further; red excluded)
Charging CAZ		
Charging CAZ (Class B - HGVs, Bus and Taxi)	Clean air zone	Include
Charging CAZ (Class C - LGVs, HGVs, Bus and Taxi)	Clean air zone	Include
Charging CAZ (Class D - Cars, HGVs, LGVs, Bus and Taxi)	Clean air zone	Include
ULEV		
ULEV parking charges - residential	Low emission vehicle measures	Include as part of Non-Charging CAZ
ULEV parking charges - public	Low emission vehicle measures	Include as part of Non-Charging CAZ
EV cars and vans - infrastructure	Low emission vehicle measures	Charging infrastructure to be led by KCC
EV cars and vans - grants	Low emission vehicle measures	Include as part of Non-Charging CAZ
EV cars and vans - car clubs	Low emission vehicle measures	Include as part of Non-Charging CAZ
Freight		
Eco Stars scheme	Low emission vehicle measures	Currently in place for existing members, but stopped for new members. Has been hard to quantify improvements
Low emission freight bays	Low emission vehicle measures	Minimal locations for this measure (except Sittingbourne)
Freight management - consolidation centre	Traffic and travel management	Include as part of Non-Charging CAZ
Freight management - delivery service plans	Traffic and travel management	HGV drop offs are often determined by the route required by the company
Active travel		
Improve walking infrastructure	Traffic and travel management	Include as part of Non-Charging CAZ
Improve cycle infrastructure	Traffic and travel management	Include as part of Non-Charging CAZ
Taxi/Public transport		
Improve public transport services	Traffic and travel management	Include as part of Non-Charging CAZ
Improving bus fleet	Low emission vehicle measures	High financial burden to bus operating companies which may reduce services
Taxi licencing	Low emission vehicle measures	Minor source
Taxi incentives	Low emission vehicle measures	Minor source
Local emission reductions		
Anti-idling (Bus and Taxis)	Traffic and travel management	Local emission reductions hard to model
Improve traffic flow		
School and business travel plans	Traffic and travel management	Include as part of Non-Charging CAZ
20 mph zones	Traffic and travel management	Average road speeds in the model were already at 20 mph or blow in

		many places so measure difficult to assess arcuately.
Improvement to current road network	Traffic and travel management	Out of scope – would require additional transport modelling
Pinch-point parking alternatives	Traffic and travel management	Include as part of Non-Charging CAZ
Development		
Sustainable new development	Development policy	Reductions will occur over too long a time frame
High quality telecommunication service provision	Development policy	Reductions will occur over too long a time frame

3.2.2 Stakeholder engagement

The long list of measures was refined into a shortlist of measures for the stakeholder engagement. Stakeholder engagement was performed over the course of two separate workshops delivered as webinars. The presentations differed slightly between the two webinars, but the majority of content remained the same. The slides from the second workshop are provided in Appendix 2.

For the first consultation invitations were provided to Swale Cabinet and Deputy Members and KCC Highways Authority. The second consultation invitations included key internal and external stakeholder groups:

- All public transport sector (buses and trains)
- Relevant KCC departments i.e. KCC Highways; Transport Innovations; Public Transport; Transport and Development Planners
- Medway Council - Departments – Planning and Environmental protection
- All parish councils
- Swale Officers - Planning and Policy, Economy and Community Services, Environmental Protection, Environmental Services, Parking Services
- Relevant Swale Management Officers and Councillors

During the webinar a presentation of the baseline modelling results was followed by a presentation and discussion of the measures. During these discussions the relative strengths and weaknesses of each measure was discussed with particular focus on potential feasibility and political acceptance. The short list of measures discussed during stakeholder engagement is shown in Table 3-3 with the summarised feedback from the webinars.

Table 3-3. Short list of measures for engagement workshop

Measure	Measure type	Summary
Charging CAZ		
Charging CAZ (Class B - HGVs, Bus and Taxi)	Clean air zone	If a CAZ, Class B is most likely - to be modelled
Charging CAZ (Class C - LGVs, HGVs, Bus and Taxi)	Clean air zone	-
Charging CAZ (Class D - Cars, HGVs, LGVs, Bus and Taxi)	Clean air zone	Reference case as likely most impactful measure - to be modelled
Mode shift		
Improve walking infrastructure	Active travel	Great opportunity
Improve cycle infrastructure	Active travel	Great opportunity

Improve public transport services	Public transport	Significant improvements required
School and business travel plans	Traffic and travel management	Potential to do more
ULEV		
ULEV parking charges - residential	Low emission vehicle measures	Supported
ULEV parking charges - public	Low emission vehicle measures	Supported
EV cars and vans - grants	Low emission vehicle measures	Is there the demand? Can grid cope?
Freight		
Freight management - consolidation centre	Traffic and travel management	Generally positive
Freight management - delivery service plans	Traffic and travel management	Generally positive
Improve traffic flow		
Pinch-point parking alternatives	Traffic and travel management	Politically acceptable despite residential resistance
Car Clubs	Traffic and travel management	Supported

A couple of measures were mentioned in the webinars that did not make the short list of measures. One was the 20 mph zone measure which had a lot of interest and is being carried out in Faversham. This measure is typically a safety measure with focus on reducing the speed differential between active travel and cars. A 20 mph zone would however not show up in the modelling due to the low speeds in the model. However, it could work in conjunction with a Charging CAZ by increasing the journey times of taking back roads in an attempt to avoid the charge. The 20 mph zone concept also supports wider uptake of walking and cycling which will impact on air quality and this mode shift approach was taken through into the final modelling. The other measure raised but not taken forwards was to increase rail freight in an attempt to reduce road freight, but this measure had insufficient data to be modelled.

As a result of these discussions, the short list of measures was further refined into a selection of different modelling scenarios. The modelled scenarios are collections of measures that target specific sectors and the scenarios (including rationale) were:

1. **CAZ B** – This was determined to be the most likely charging CAZ option to be pursued. It was also proposed that buses and taxis should exempt for 3 years from the scheme as they were only a small source of emissions and it was felt it would be an unnecessary burden to this sector when trying to promote alternatives to the car. Also during (and before) this exemption period it would be the intention to work with the bus and taxi industry to support them in upgrading their vehicles to meet the CAZ standard.
2. **CAZ D** – It was agreed to be carried out as a reference CAZ as the likely to be the most impactful measures, but it was noted that the political acceptability would be very low. As with the CAZ B buses and taxis would be exempt for 3 years.
3. **Mode shift package** – This was a package of measures that look to target moving people out of private vehicles and included: travel plans, walking and cycling infrastructure, cycle parking, pilots/loans/trials with e-bikes/scooters and car clubs. It was felt, that in the current pandemic that an increase in personal mobility as people increase the amount they are working from home may make reductions in the need for personal car journeys with the right support.
4. **Freight measures package** – Eurolink causes high percentages of goods vehicles so a consolidation centre and delivery service plans could reduce the number of goods vehicles on the road.

5. **Electric vehicle incentives** – To encourage the uptake of electric vehicles, a package of actions were considered to create the incentives and knowledge to increase the electric vehicle percentage in the fleet. This could be to include parking charges that are cheaper for EVs, the use of car clubs (which would be electric vehicles) and informational measures promoting their use (especially in travel plans).
6. **Pinch point parking removal** – By removing obstacles from the road it is possible to increase speeds. Low modelled speeds along parts of the A2 is a sign of queueing traffic which have relatively high emissions, removing pinch point parking allows for traffic to flow freely in both directions, reducing emissions.
7. **Non-charging CAZ package** – This measure is a combination of the non-CAZ measures as a package to show the impact if all sectors were tackled without the use of a formal CAZ.

The assumptions used to model each of these scenarios are described in the following section.

4 Air quality modelling of short-listed measures

Air quality modelling was carried out for each of the shortlisted options outlined in Section 3, in order to allow the effectiveness of each option in improving air quality to be assessed. The assumptions used to represent the shortlisted options are described in this chapter, and predicted pollutant concentrations in each scenario are presented.

4.1 Modelling assumptions for options

Traffic flows and fleet data in the 2022 baseline model were adjusted to reflect each of the shortlisted options using the best available approach for each measure. Where official guidance was available which provides assumptions for a particular measure, this information was used; in the absence of guidance, suitable proxies from other studies were sought. Appropriate, expert judgement was used to assess the best way to model the measures. Table 4-1 presents the modelling assumptions followed for each of the short-listed measures, together with the data source for each assumption.

Table 4-1: Modelling assumptions for short-listed measures

Option	Description	Modelling assumptions	Data source for assumptions
Charging CAZ B HGVs Buses Taxis	CAZ B covering A2 from A249 to A299, including St Paul's Street AQMA. - Buses and taxis with proposed exemption for 3 years, so are unaffected by the CAZ in 2022.	JAQU behavioural response assumptions	JAQU assumptions Grant and exemption assumptions
Charging CAZ D HGVs Buses Taxis LGVs Cars	CAZ D covering A2 from A249 to A299, including St Paul's Street AQMA. - Buses and taxis with proposed exemption for 3 years, so are unaffected by the CAZ in 2022.	JAQU behavioural response assumptions	JAQU assumptions Grant and exemption assumptions
Mode shift	Mode shift package targeting Swale in general but focusing along the A2 including: - Travel plans – schools and businesses - Work with KCC in investment in walking and cycling infrastructure - Invest in secure cycle parking - Pilots/loans/trials with e-bikes/scooters - Car club in Sittingbourne and Faversham	3.5% reduction in traffic	Cardiff CAZ modelling from Motts - 3.5% reduction in car traffic for travel plan and cycle scheme based on previous pilot evaluation DfT Sustainable travel towns study investment of 4p per km removed
Freight	Package focused on freight, again covering the main swale towns but with focus along A2, including: - Delivery and servicing plans, link to travel plans - Consolidation centre servicing Sittingbourne and Faversham	3% reduction in freight traffic	Southampton LES/CAZ study, 7.5% reduction for DSP and consolidation centre based on 15% reduction for 50% of premises. Assume only 20% uptake as final CAZ was much lower gives 3% freight reduction.
EV	Package to promote electric cars and vans across Swale including: - Parking charge incentives - Charging infrastructure in Council car parks also working with businesses - Promotion – link to travel plans - E-car clubs linked to car clubs (could just shift car clubs here)	2% cars and vans EV	Derby EV strategy, 2% EV's in fleet by 2022. Check current EfT projections. Should be greater than these. Derby LES and EV strategy has costing info to use.

Option	Description	Modelling assumptions	Data source for assumptions
Pinch point	Remove pinch point parking on A2	Speed data adjusted upwards to link average at pinch points	Expert judgement
Non charging package	Bundle of mode shift, freight, electric vehicles and pinch point removal	All non-charging assumptions combined	
CAZ B plus non charging package	This was a simple addition of the benefits of the CAZ B and the non-charging package. This was only carried out for the monitoring site results.	Simple addition of benefits	

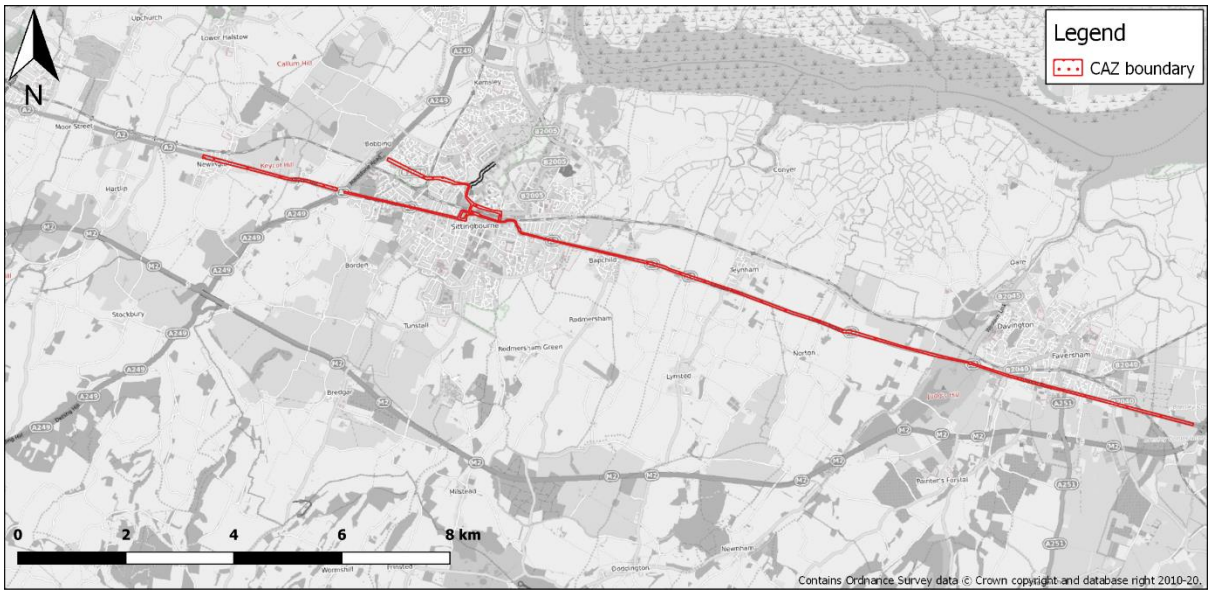
Driver response behaviour to the implementation of a charging Clean Air Zone was taken from the Third Wave Evidence Package document published by JAQU for use in Clean Air Zone studies. These statistics represent behavioural responses from the implementation of the ULEZ in London, and are therefore considered appropriate for this study. The behavioural responses are summarised in Table 4-2.

Table 4-2: Response behaviour assumptions to a charging CAZ (taken from Third Wave Evidence Package document from JAQU)

Response	Cars	LGV	HGV
Upgrade vehicle	64%	64%	83%
Cancel trip	7%	6%	4%
Change mode	11%	2%	0%
Avoid zone	11%	8%	4%
Pay charge	7%	20%	9%

Figure 4-1 presents the proposed charging CAZ boundary used in the modelling. This boundary encompasses the A2 running through Swale, and sections of roads with measured exceedances of the Air Quality Objective.

Figure 4-1: Proposed charging CAZ boundary



4.2 Air quality results for short-listed options

4.2.1 Summary of results

A summary of the results considering road link compliance and monitoring sites (both globally and locally adjusted) are shown in Table 4-3 below. This table shows the number of road links exceeding or at risk for each scenario, the average reduction in concentration resulting at monitoring sites across the study area, and the total number of monitoring sites predicted to exceed the objective or 'at risk' of exceeding the objective in 2022.

Table 4-3: Summary of air quality results for short listed options

Category	Reference Case	CAZ B	CAZ D	EV	Freight	Mode Shift	Pinch Point	All non-charging	CAZ B + non-charging
Average reduction concentration reduction across all monitoring sites									
Reduction	0%	1.7%	18.4%	1.2%	0.6%	2.1%	0.3%	3.0%	4.7%
Number of monitoring sites exceeding or at risk (global adjustment)									
Exceeding	0	0	0	0	0	0	0	0	0
At risk	2	2	0	2	2	2	2	2	2
Number of monitoring sites exceeding or at risk (site-specific adjustment)									
Exceeding	1	1	0	1	1	1	1	0	0
At risk	1	1	0	1	1	1	1	2	2

The charging class D CAZ is highly effective in reducing annual mean NO_2 concentrations in across all monitoring sites in Swale, reducing concentrations by 18.4% on average. Concentrations are reduced along all roads in the study area as the result of the expected fleet upgrades in response to the CAZ. This is to be expected, as the class D CAZ is the only charging measure to affect diesel cars, which account for the majority of NOx emissions in the area. The CAZ D is predicted to eliminate all exceedances including in the St. Paul's Street AQMA, and reduces concentrations along all road links to below 'at risk'.

As the charging class B CAZ is only designed to affect HGVs, the overall impact on predicted pollution levels is small compared to the class D CAZ; an average reduction of 1.7% is seen across monitoring sites, less than a tenth of the change from implementing the class D CAZ. This change is not sufficient to eliminate the exceedance in the St. Paul's Street AQMA when considering local adjustment.

Of the non-charging interventions the modal shift intervention delivers the largest average change in annual mean NO_2 concentrations across the study area, leading to a 2% reduction in concentrations. This corresponds to a 0.9 $\mu g.m^{-3}$ reduction in annual mean NO_2 concentrations at receptors 4m from the St. Paul's Street and East Street AQMAs. This measure just reduces the locally adjusted concentration in St Pauls to the limit value and so is technically in compliance.

Pinch point effects are highly localised, and as such the average effect across all roads in the study area is small; however, significant reductions are achieved along short sections of the A2. However, as the St. Paul's Street AQMA is not affected by the proposed changes, this exceedance is not affected by the measure.

The implementation of a package to promote electric cars and LGVs in the area and reduction in freight traffic lead to additional small reductions in NO_2 concentrations. However, these measures are not sufficiently effective to address air quality issues in the borough on their own.

Bundling all four non-charging measures together with the CAZ B leads to a 4.7% reduction in average predicted concentrations, and is predicted to address the potential air quality exceedance on St. Paul's Street. This road is therefore classified as 'at risk' in this scenario.

Maps showing modelled concentrations at receptors relevant to compliance of the Air Quality Directive along each road are presented in Section 4.3. These extract the highest concentration along each road link estimated at 4 m from the roadside. These plots give a fuller view of air quality across the study area beyond just the monitoring locations.

Predicted concentrations for all the shortlisted options at monitoring sites in the study area are presented in Section 4.4. Table 4-4 shows concentrations that have been adjusted to match the measurements at these locations, i.e. using local adjustment factors rather than the global adjustment factor described in section 2.6. Results using the global adjustment factor are provided in Table 4-5

4.3 Maps of results

4.3.1 Charging CAZ B

Figure 4-2 – The reduction in NO_2 concentrations along the A2 for the CAZ B option

Figure 4-3 – The reduction in NO_2 concentrations around Faversham for the CAZ B option

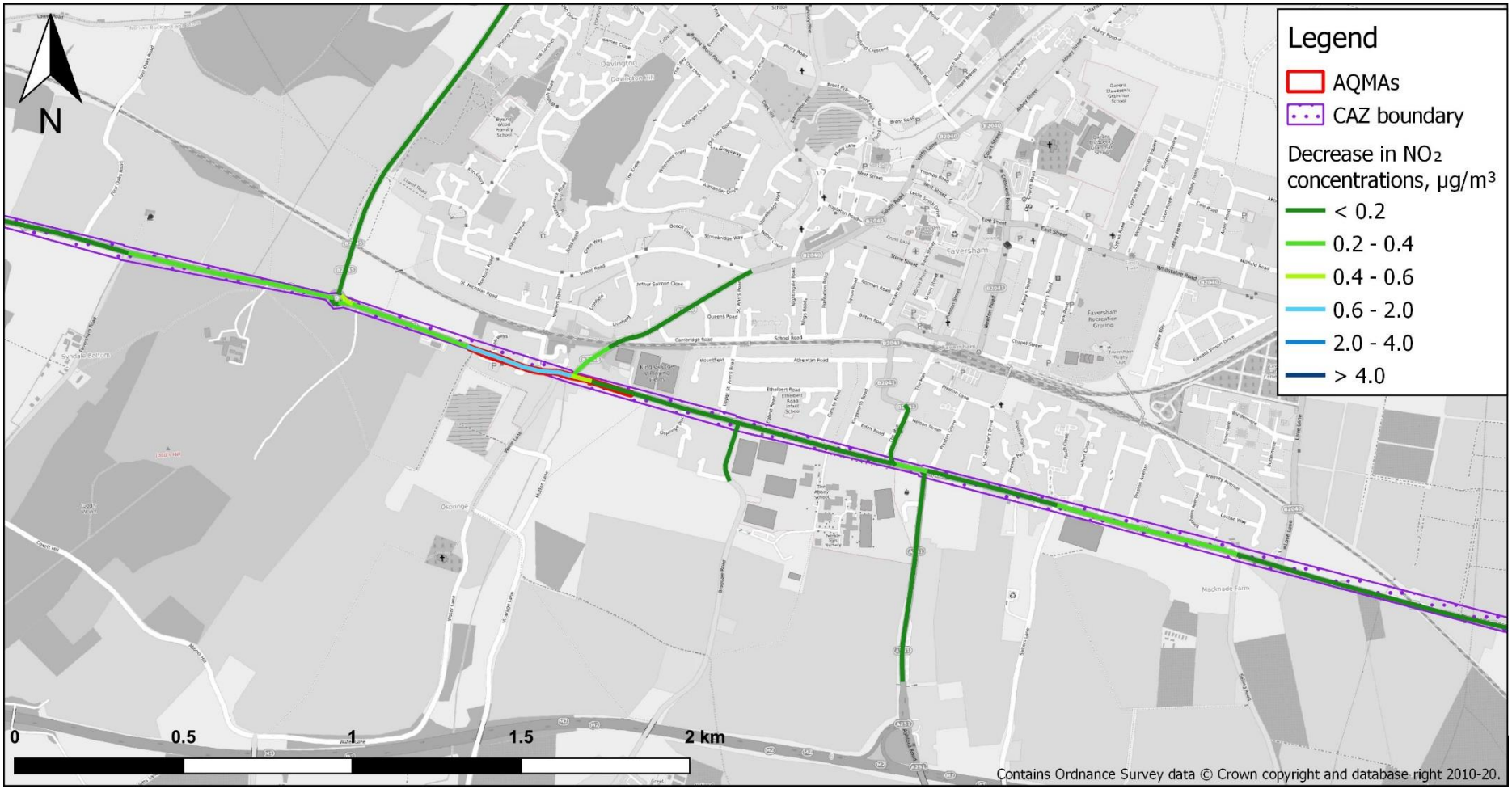
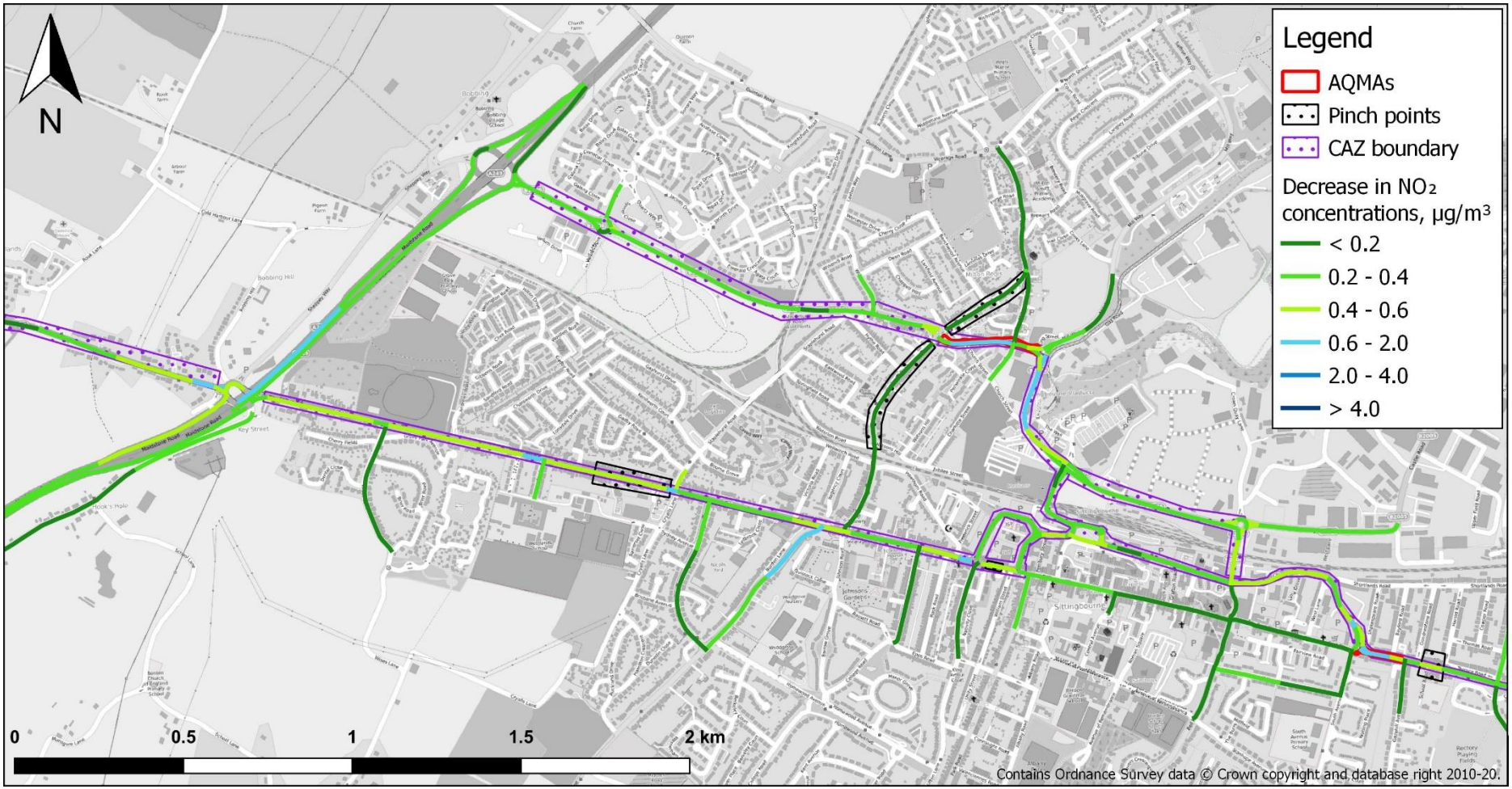


Figure 4-4 – The reduction in NO_2 concentrations around Newington for the CAZ B option

Figure 4-5 – The reduction in NO_2 concentrations around Sittingbourne for the CAZ B option



4.3.2 Charging CAZ D

Figure 4-6 – The reduction in NO_2 concentrations along the A2 for the CAZ D option

Figure 4-7 – The reduction in NO_2 concentrations around Faversham for the CAZ D option

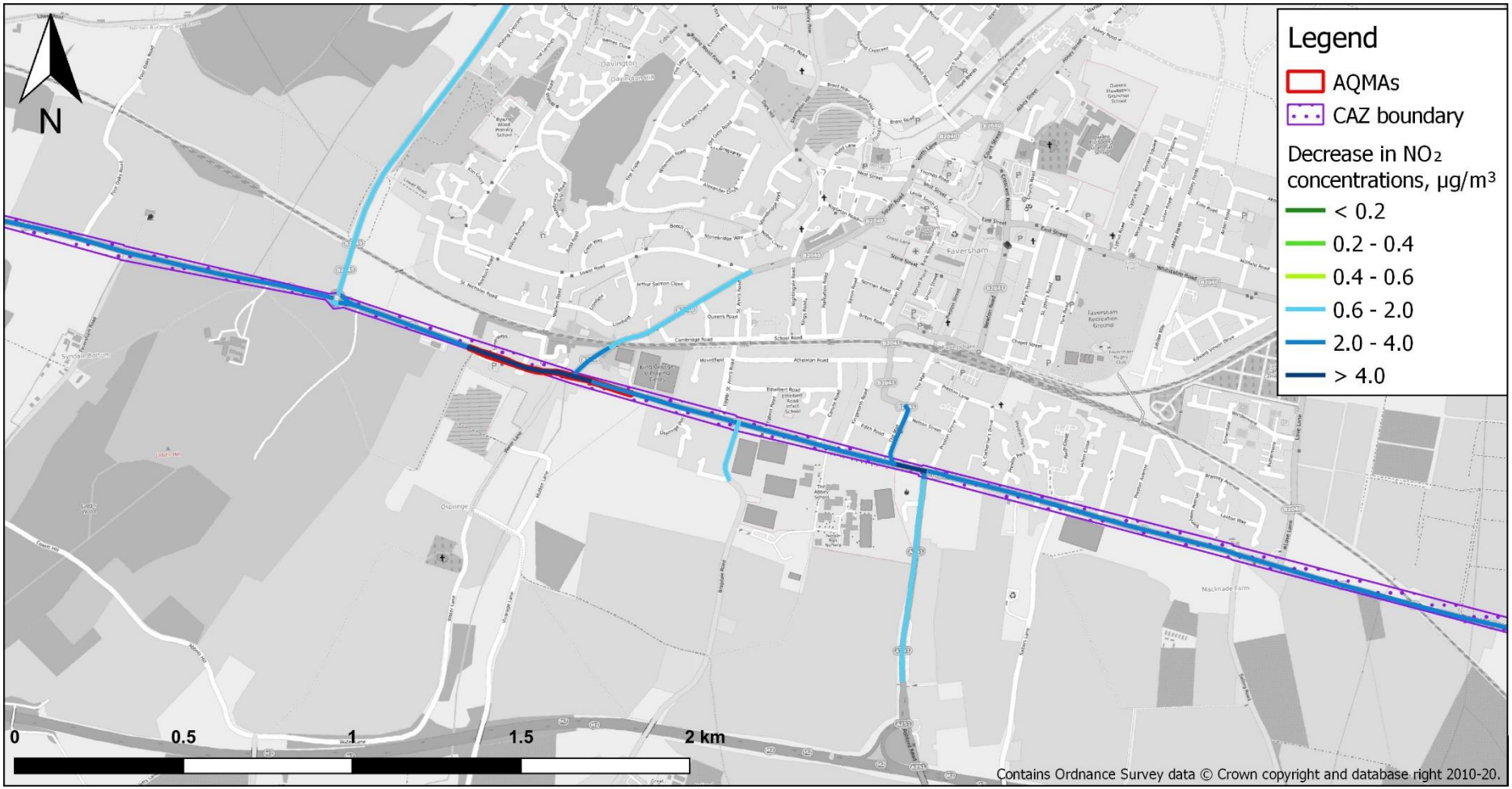


Figure 4-8 – The reduction in NO_2 concentrations around Newington for the CAZ D option

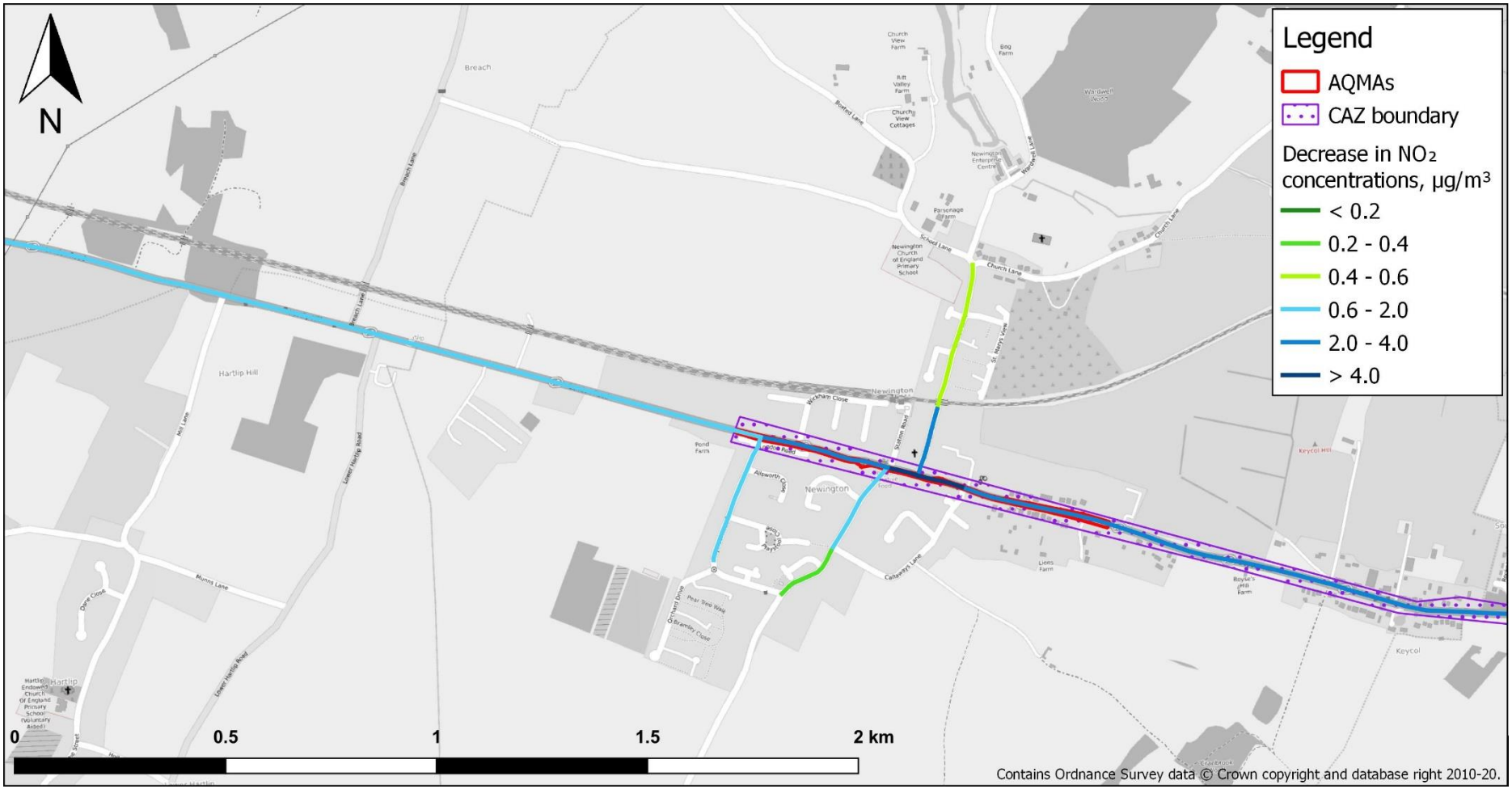
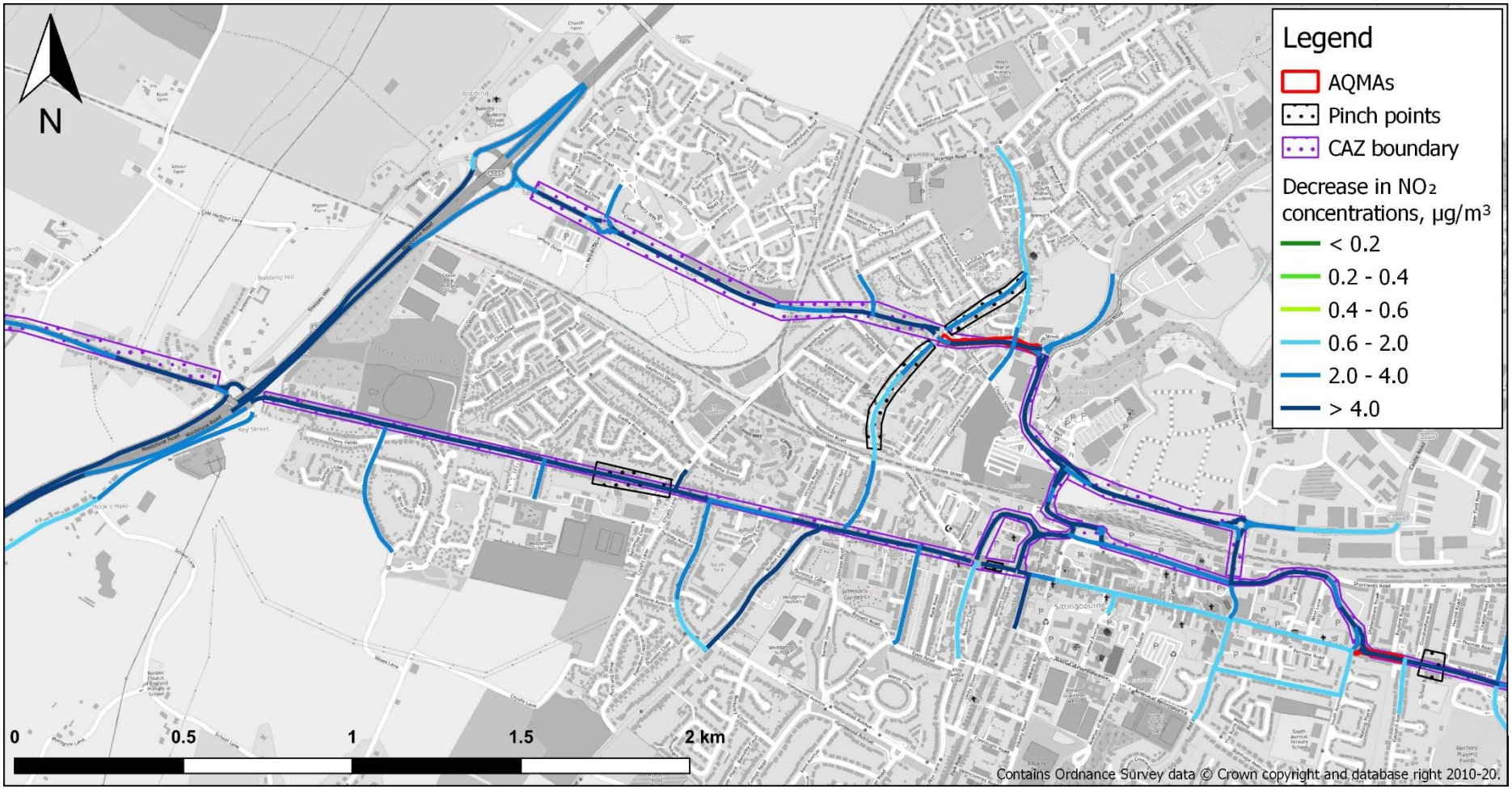


Figure 4-9 – The reduction in NO_2 concentrations around Sittingbourne for the CAZ D option



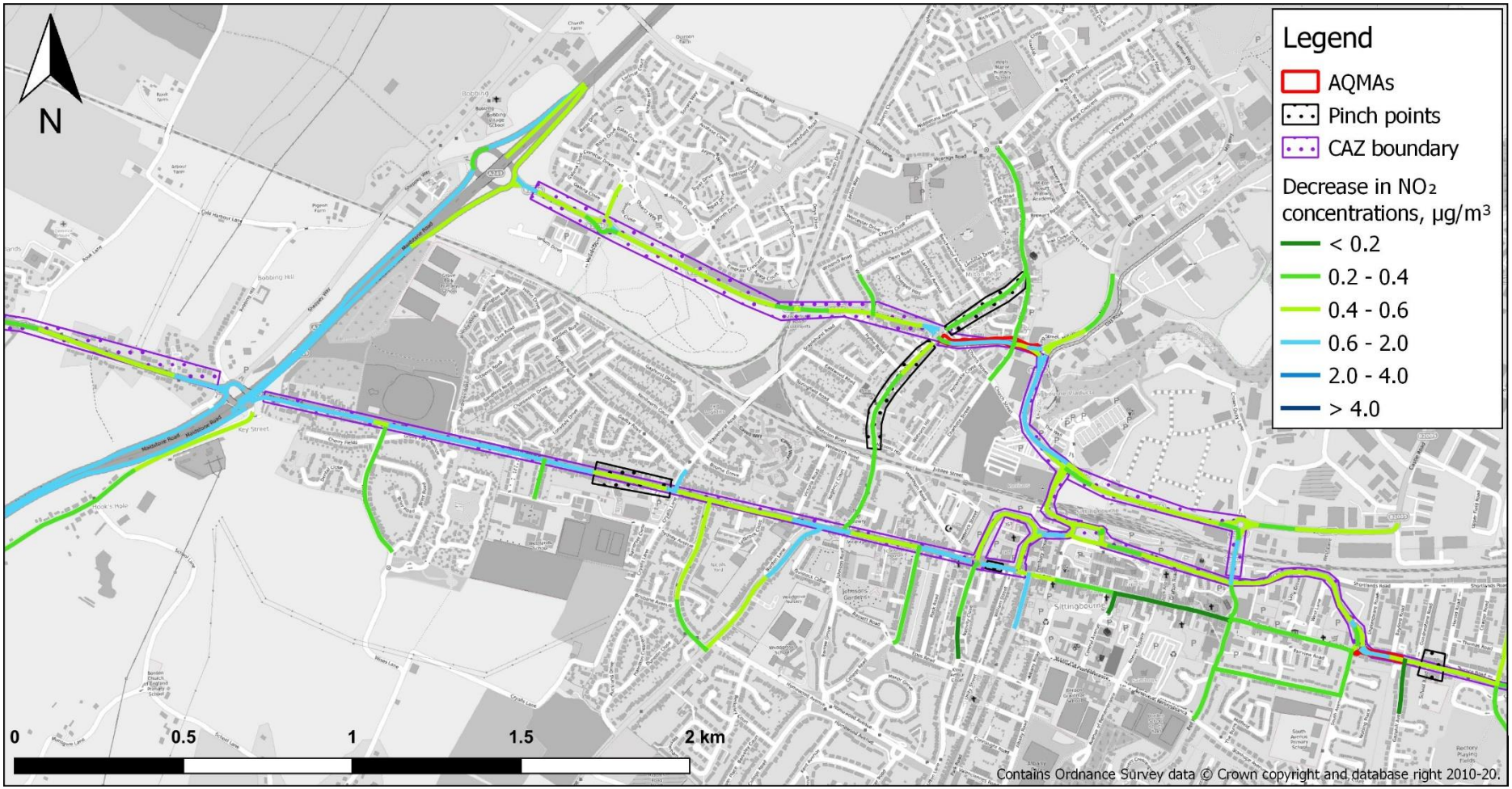
4.3.3 Mode shift

Figure 4-10 – The reduction in NO_2 concentrations along the A2 for the mode shift option

Figure 4-11 – The reduction in NO_2 concentrations around Faversham for the mode shift option

Figure 4-12 – The reduction in NO_2 concentrations around Newington for the mode shift option

Figure 4-13 – The reduction in NO_2 concentrations around Sittingbourne for the mode shift option



4.3.4 Freight

Figure 4-14 – The reduction in NO_2 concentrations along the A2 for the freight option

Figure 4-15 – The reduction in NO_2 concentrations around Faversham for the freight option

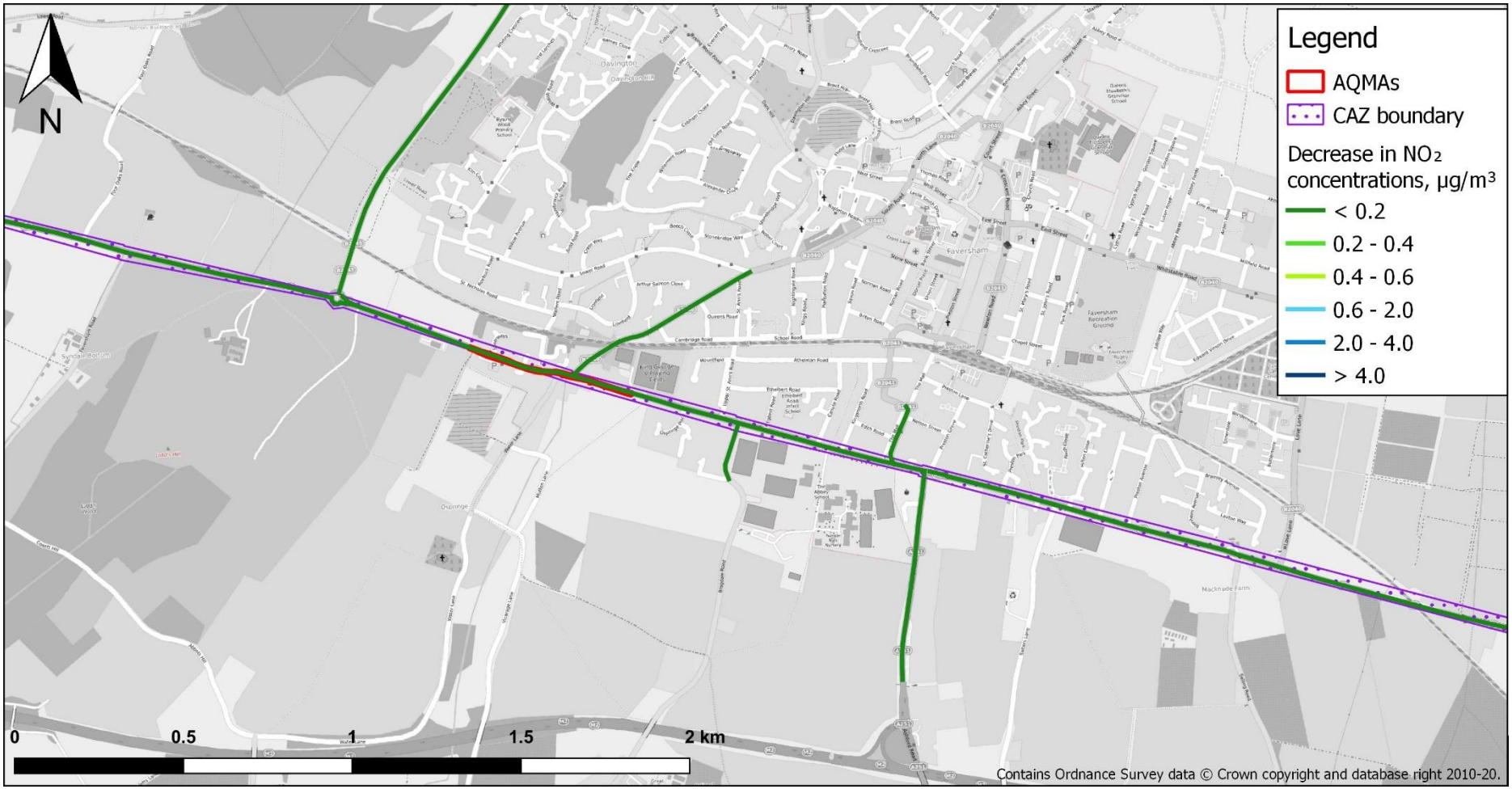
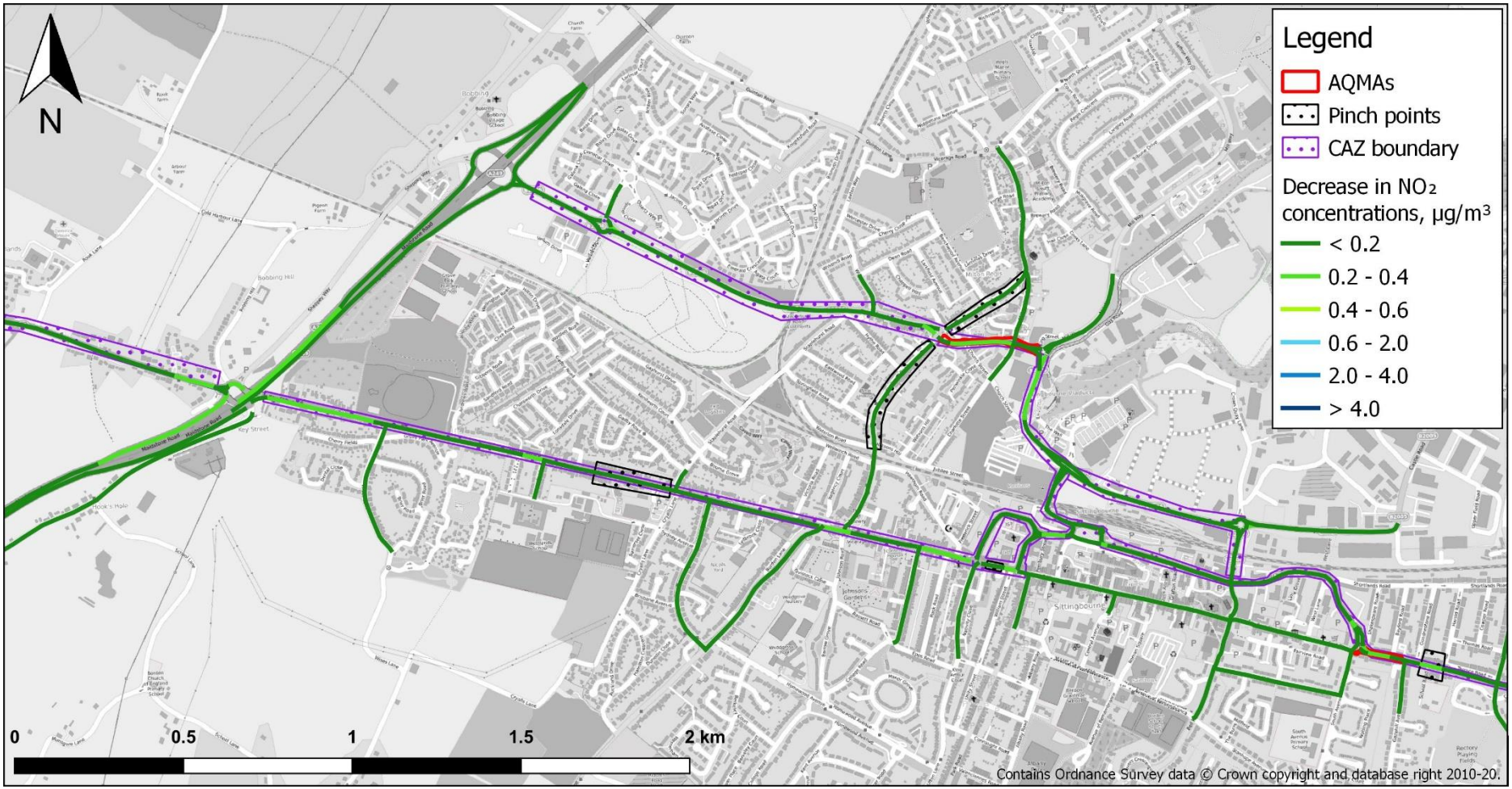


Figure 4-16 – The reduction in NO_2 concentrations around Newington for the freight option

Figure 4-17 – The reduction in NO_2 concentrations around Sittingbourne for the freight option



4.3.5 EV

Figure 4-18 – The reduction in NO_2 concentrations along the A2 for the EV option

Figure 4-19 – The reduction in NO_2 concentrations around Faversham for the EV option

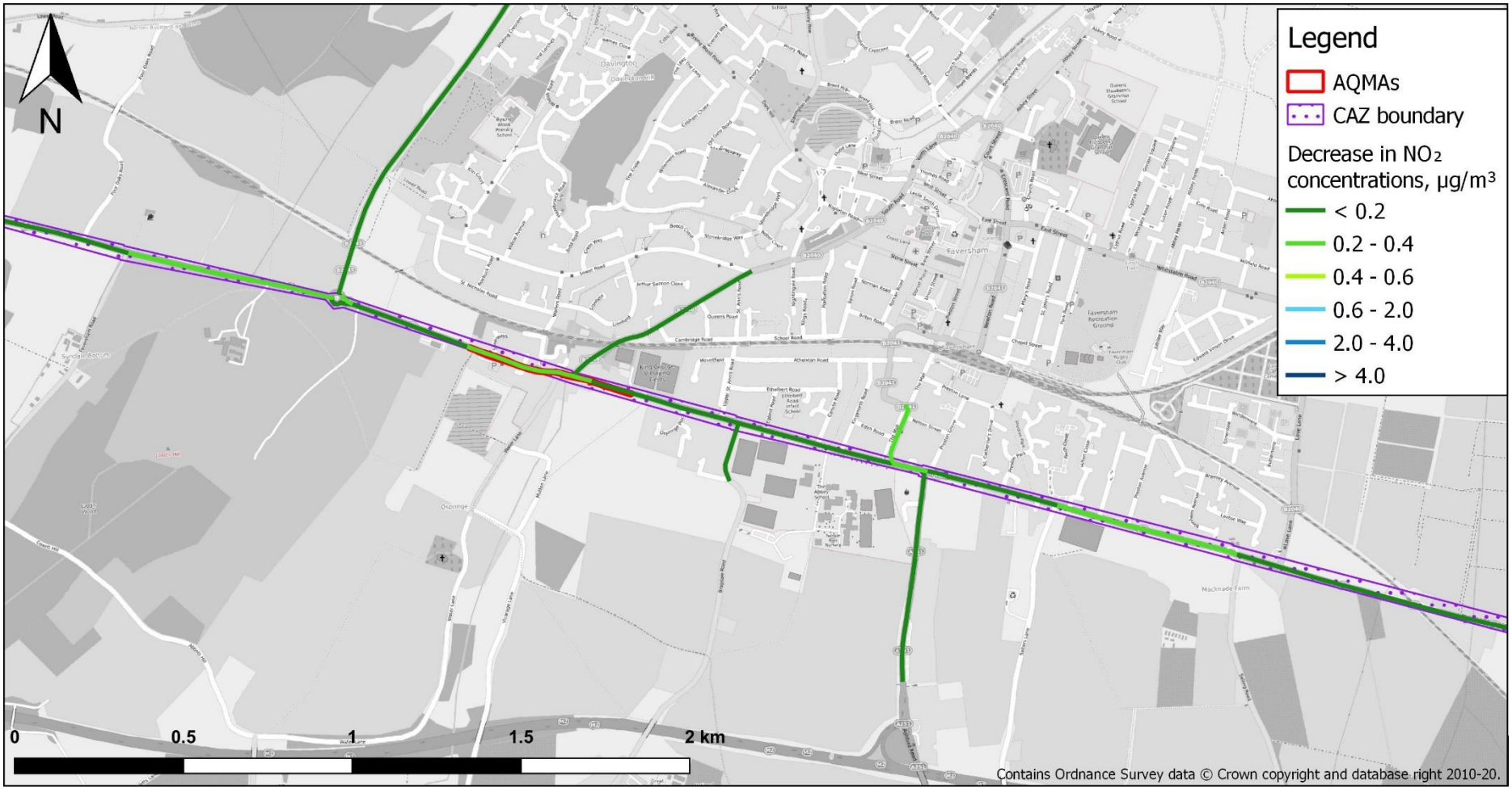
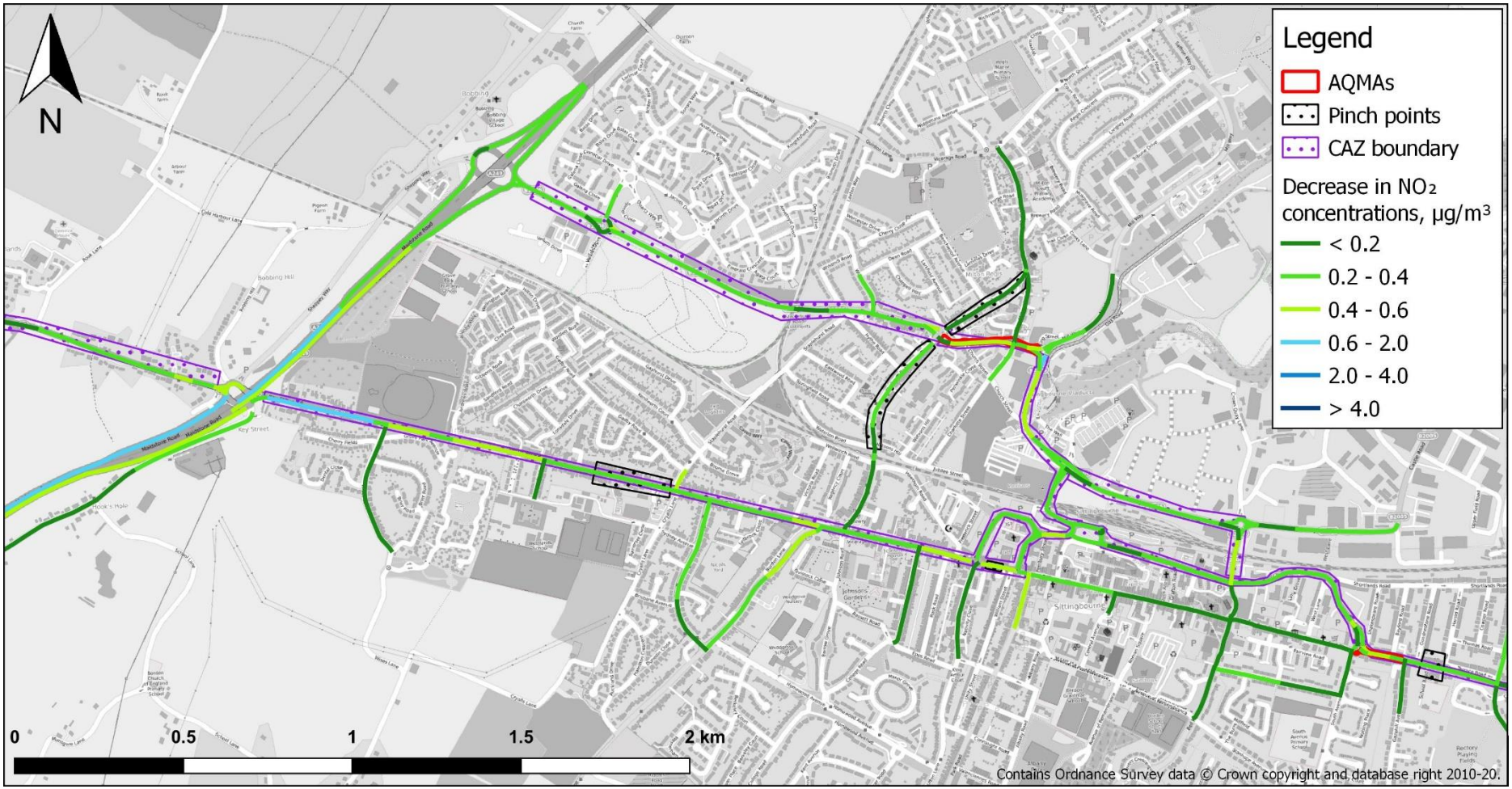


Figure 4-20 – The reduction in NO_2 concentrations around Newington for the EV option

Figure 4-21 – The reduction in NO_2 concentrations around Sittingbourne for the EV option



4.3.6 Pinch point

Figure 4-22 – The reduction in NO_2 concentrations along the A2 for the pinch point option

Figure 4-23 – The reduction in NO_2 concentrations around Faversham for the pinch point option

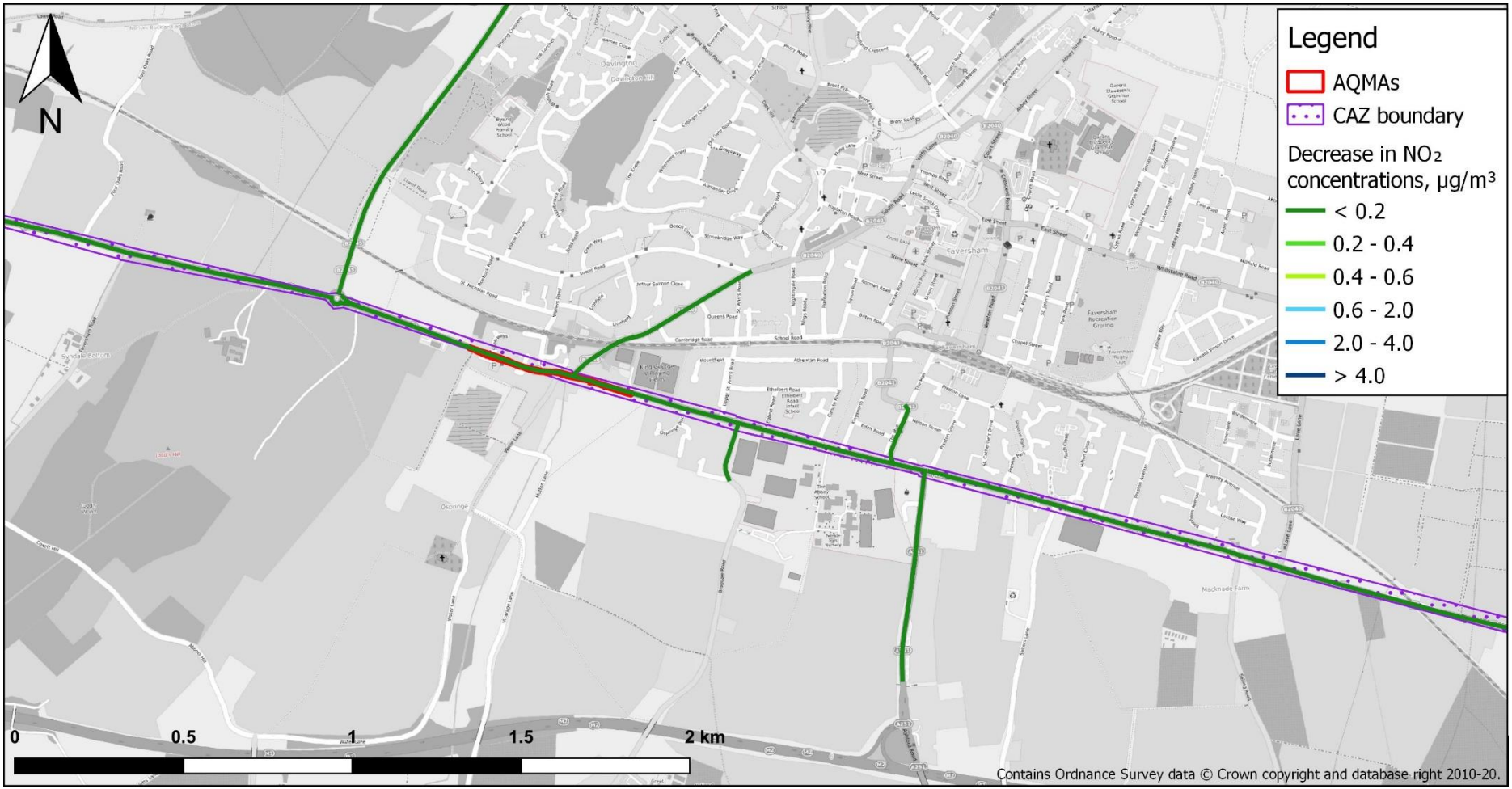
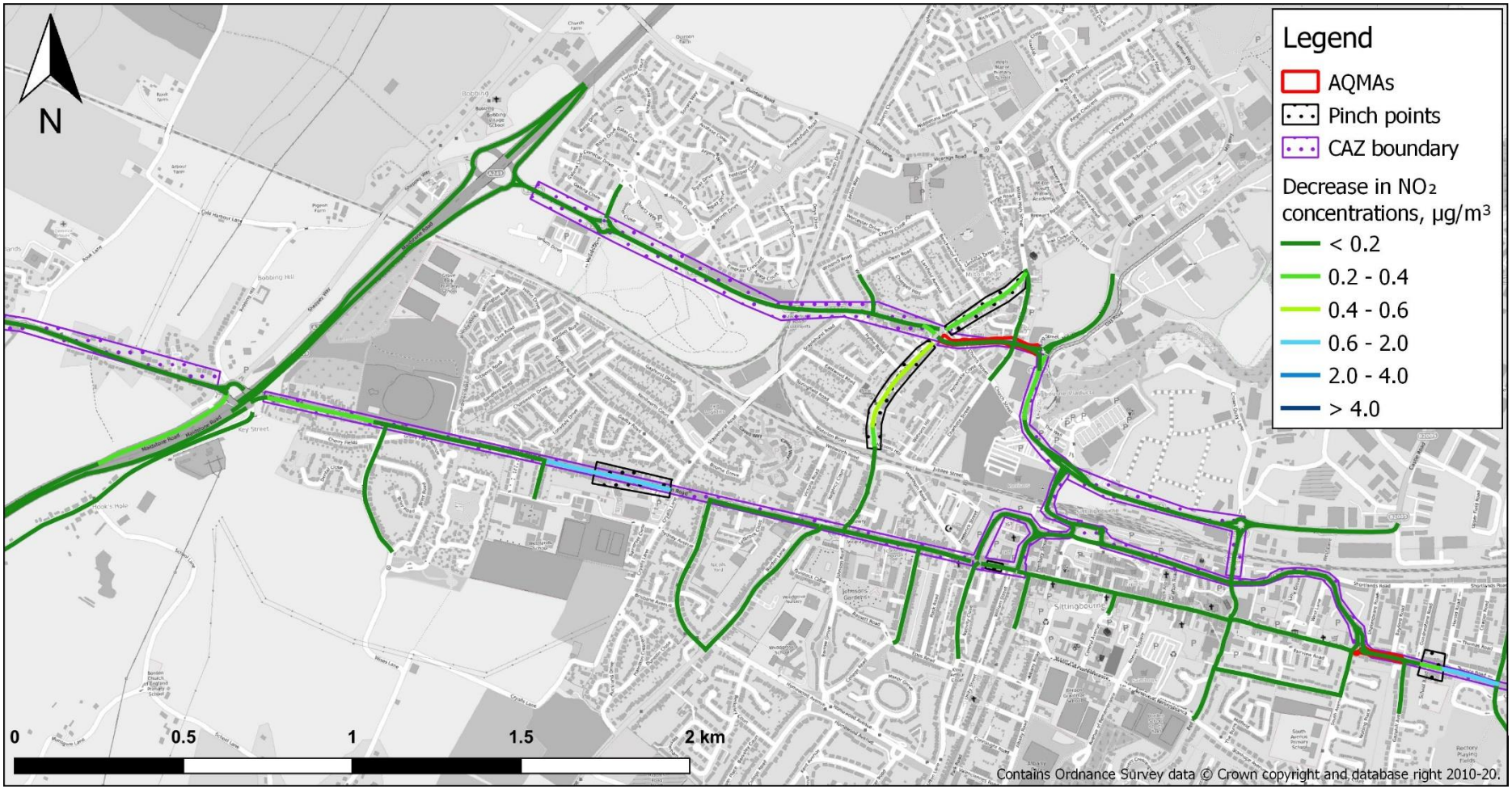


Figure 4-24 – The reduction in NO_2 concentrations around Newington for the pinch point option

Figure 4-25 – The reduction in NO_2 concentrations around Sittingbourne for the pinch point option



4.3.7 All non-charging measures combined

Figure 4-26 – The reduction in NO_2 concentrations along the A2 for the bundle combining all non-charging measures

Figure 4-27 – The reduction in NO_2 concentrations around Faversham for the bundle combining all non-charging measures

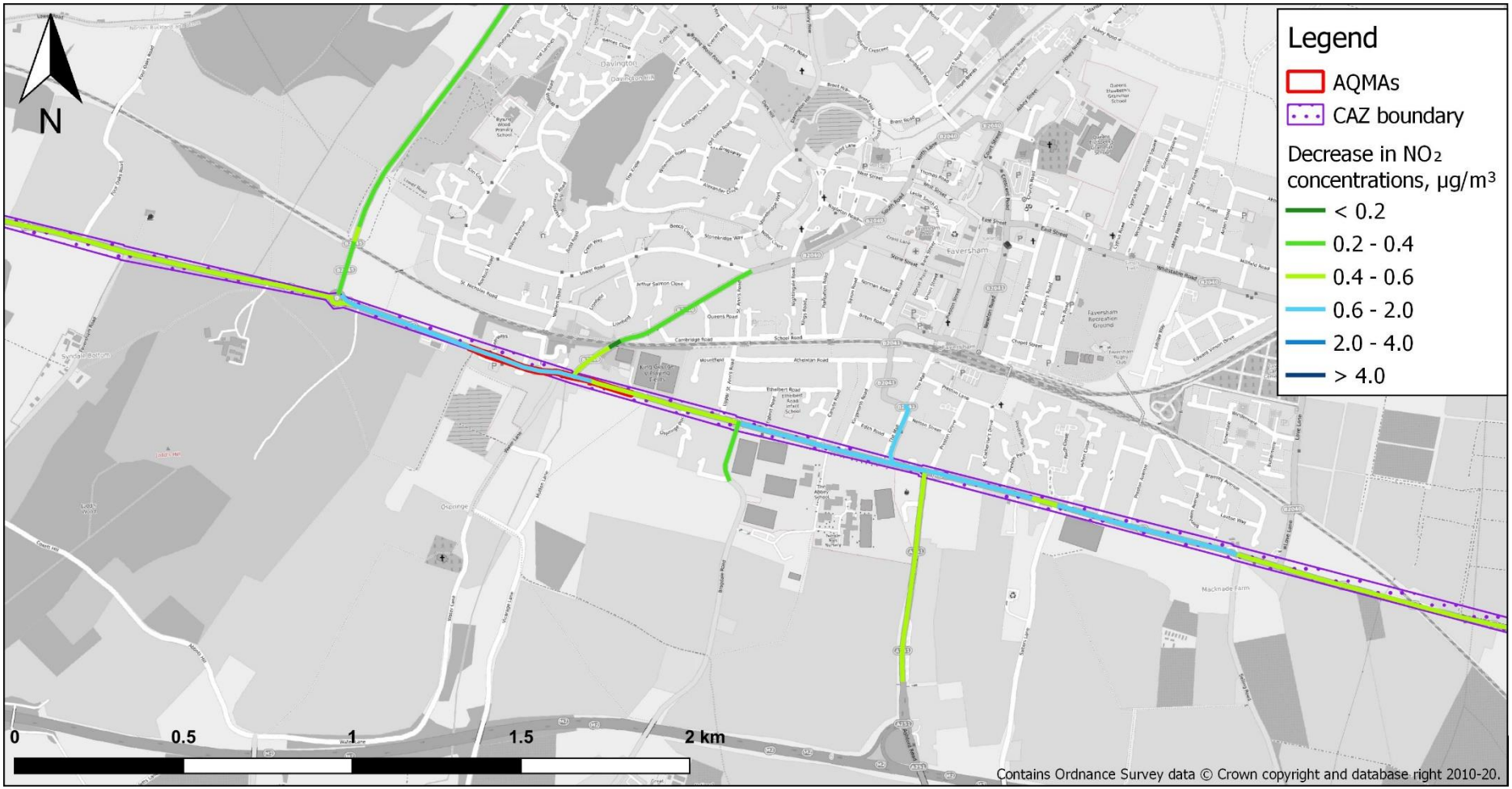
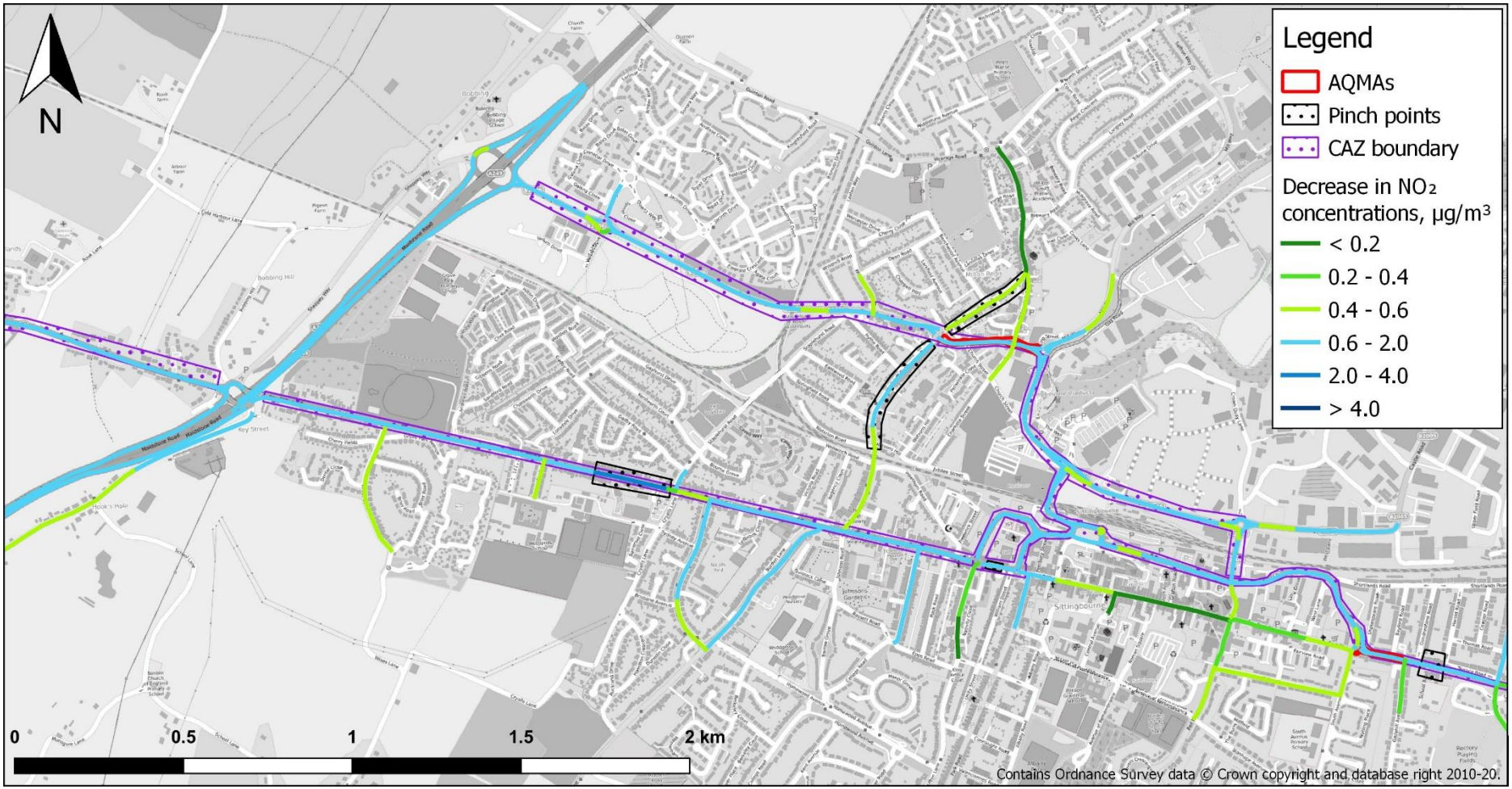


Figure 4-28 – The reduction in NO_2 concentrations around Newington for the bundle combining all non-charging measures

Figure 4-29 – The reduction in NO_2 concentrations around Sittingbourne for the bundle combining all non-charging measures



4.4 Results at monitoring locations

Table 4-4: Modelled annual mean NO_2 concentrations for the 2022 reference case and shortlisted options, local adjustment applied, µg.m^{-3}

Site	Road Name	Modelled annual mean NO_2 concentrations, 2022, µg.m^{-3}								
		Reference Case	CAZ B	CAZ D	EV	Freight	Mode Shift	Pinch Point	All non-charging	CAZ B + all non-charging
ZW6	Newington 3	20.6	20.3	16.7	20.4	20.5	20.2	20.6	20.0	19.8
ZW8	St Paul's Street	29.2	28.7	24.0	28.9	29.1	28.7	29.2	28.4	27.8
ZW3	Ospringe Roadside	24.0	23.5	19.2	23.7	23.8	23.5	24.0	23.2	22.7
SW66	96/94High Street, Newington	25.6	25.2	20.4	25.3	25.5	25.1	25.6	24.9	24.5
SW45	64 High Street, Newington	27.5	27.1	22.2	27.2	27.4	27.0	27.5	26.7	26.3
SW35	60 High Street, Newington	32.2	31.6	25.7	31.8	32.0	31.6	32.1	31.2	30.6
SW42	High Street, Opp Church Lane	32.9	32.2	25.2	32.4	32.7	32.1	32.8	31.8	31.1
SW19	Newington Social Club	27.8	27.3	22.0	27.4	27.6	27.2	27.7	27.0	26.4
SW20	Newington Co Op	20.1	19.8	16.2	19.8	19.9	19.7	20.0	19.5	19.2
SW36	49 High Street, Newington	24.8	24.3	19.6	24.5	24.6	24.3	24.7	24.0	23.6
SW82	Conservative Club, St Paul's Street	41.6	40.8	33.8	41.1	41.3	40.7	41.5	40.3	39.5
SW51	14/16 St Paul's Street	30.2	29.6	24.5	29.8	30.0	29.5	30.1	29.2	28.6
SW89	St Paul's Street Air Quality Station	30.2	29.7	24.8	29.9	30.1	29.7	30.2	29.4	28.8
SW71	o/s 8 Staple Close, Staplehurst Road, Sittingbourne	27.4	27.1	22.4	27.1	27.3	26.8	27.3	26.6	26.2
SW73	14 Chalkwell Road, Sittingbourne	23.7	23.4	20.3	23.4	23.6	23.2	23.5	22.9	22.6
SW56	126 East Street, Sittingbourne	29.1	28.7	23.9	28.8	29.0	28.6	29.1	28.4	27.9

Site	Road Name	Modelled annual mean NO_2 concentrations, 2022, $\mu g.m^{-3}$								
		Reference Case	CAZ B	CAZ D	EV	Freight	Mode Shift	Pinch Point	All non-charging	CAZ B + all non-charging
SW87	Canterbury Road AQ Station	24.2	23.8	19.8	23.9	24.0	23.7	24.1	23.5	23.2
SW99	A2 Frognal Lane, Teynham	20.1	19.8	16.0	19.8	20.0	19.7	20.0	19.5	19.2
SW91	Adj to 72 London Road, Teynham	25.5	25.2	20.4	25.2	25.4	25.0	25.4	24.7	24.4
SW101	A2 Lynsted Lane, Jct	18.2	18.0	14.6	18.0	18.1	17.9	18.2	17.7	17.4
SW28	Mayors Arms, Ospringe	31.9	31.1	25.5	31.6	31.7	31.3	31.9	30.9	30.1
SW30	ZW3 Ospringe Street	22.9	22.4	18.2	22.6	22.8	22.4	22.9	22.1	21.6
SW31	Site 7, 4 Ospringe Street	28.0	27.5	22.5	27.6	27.8	27.4	27.9	27.1	26.6
SW32	11 Ospringe Street, Ospringe	27.6	27.2	22.8	27.3	27.5	27.1	27.6	26.9	26.4
SW96	Maison Dieu, Ospringe Street	27.0	26.3	21.3	26.7	26.8	26.4	27.0	26.1	25.4
SW29	Opp Lions Yard, Ospringe Street	30.4	29.7	24.4	30.1	30.2	29.8	30.4	29.5	28.7
SW120	103 Ospringe Street, Ospringe, Faversham	29.6	29.1	23.9	29.2	29.4	29.0	29.5	28.7	28.2
SW117	Land Adj Orchard, Canterbury Road, Faversham	22.2	22.0	18.7	21.9	22.1	21.8	22.1	21.6	21.4
SW62	Key Street, Sittingbourne	24.9	24.5	19.8	24.5	24.7	24.2	24.7	23.9	23.6
SW110	2 Cherryfields, Sittingbourne	15.0	14.8	13.4	14.8	14.9	14.8	14.9	14.6	14.5
SW111	76A Key Street, Sittingbourne	28.9	28.5	22.8	28.5	28.7	28.2	28.8	27.9	27.5
SW112	56 Key Street, Sittingbourne	25.2	24.8	19.9	24.8	25.0	24.6	25.1	24.3	24.0
SW114	2 Florence Cottages, Chestnut Street	15.9	15.8	14.3	15.7	15.8	15.6	15.9	15.5	15.3
SW115	Cherry Tree Cottage, Chestnut Street	16.6	16.5	15.0	16.4	16.5	16.3	16.5	16.2	16.1

Site	Road Name	Modelled annual mean NO_2 concentrations, 2022, $\mu g.m^{-3}$								
		Reference Case	CAZ B	CAZ D	EV	Freight	Mode Shift	Pinch Point	All non-charging	CAZ B + all non-charging
SW116	Bankside, Chestnut Street	16.4	16.3	14.9	16.2	16.3	16.1	16.3	16.0	15.9
SW124	31/33 Keycol Hill Sittingbourne Highest Point	39.2	38.4	31.2	38.7	38.9	38.3	39.2	37.9	37.1
SW121	Façade Squirrel Cottage, Keycol Hill	32.5	31.8	26.3	32.1	32.3	31.8	32.5	31.4	30.6
SW122	Façade 13 Key Street, Sittingbourne	15.8	15.6	13.2	15.6	15.8	15.5	15.8	15.3	15.1
SW123	12 Key Street, Sittingbourne	20.2	19.9	16.5	19.9	20.1	19.7	20.1	19.5	19.2
SW76	155 Canterbury Road, Sittingbourne	25.9	25.4	20.8	25.6	25.8	25.4	25.9	25.2	24.7
SW119	Flats, The Mount, Ospringe	19.2	18.9	15.9	19.0	19.1	18.8	19.2	18.7	18.4
SW83	Pembury Court, Dover Street	19.0	18.7	15.5	18.8	18.9	18.6	18.9	18.4	18.2
SW125	16/18 The Street, Bapchild	18.5	18.2	14.9	18.3	18.5	18.2	18.5	18.0	17.7

Table 4-5: Modelled annual mean NO_2 concentrations for the 2022 reference case and shortlisted options, no local adjustment applied, µg.m^{-3}

Site	Road Name	Modelled annual mean NO_2 concentrations, 2022, µg.m^{-3}								
		Reference Case	CAZ B	CAZ D	EV	Freight	Mode Shift	Pinch Point	All non-charging	CAZ B + all non-charging
ZW6	Newington 3	25.9	25.6	21.0	25.6	25.8	25.4	25.9	25.2	24.8
ZW8	St Paul's Street	34.9	34.2	28.7	34.5	34.7	34.2	34.8	33.9	33.2
ZW3	Ospringe Roadside	20.1	19.6	16.1	19.8	19.9	19.6	20.0	19.4	18.9
SW66	96/94High Street, Newington	25.7	25.3	20.5	25.4	25.6	25.2	25.7	24.9	24.5
SW45	64 High Street, Newington	24.2	23.9	19.6	24.0	24.1	23.8	24.2	23.5	23.2
SW35	60 High Street, Newington	26.4	25.9	21.1	26.1	26.3	25.9	26.4	25.6	25.1
SW42	High Street, Opp Church Lane	32.8	32.1	25.1	32.3	32.5	32.0	32.7	31.6	30.9
SW19	Newington Social Club	26.0	25.5	20.6	25.6	25.8	25.4	25.9	25.2	24.7
SW20	Newington Co Op	25.8	25.5	20.9	25.5	25.7	25.3	25.8	25.1	24.8
SW36	49 High Street, Newington	26.6	26.1	21.0	26.3	26.4	26.1	26.5	25.8	25.3
SW82	Conservative Club, St Paul's Street	37.1	36.4	30.1	36.7	36.9	36.3	37.0	35.9	35.2
SW51	14/16 St Paul's Street	37.0	36.3	30.1	36.6	36.8	36.2	36.9	35.9	35.1
SW89	St Paul's Street Air Quality Station	34.9	34.2	28.7	34.5	34.7	34.2	34.8	33.9	33.2
SW71	o/s 8 Staple Close, Staplehurst Road, Sittingbourne	28.8	28.4	23.5	28.4	28.6	28.2	28.7	27.9	27.5
SW73	14 Chalkwell Road, Sittingbourne	21.9	21.6	18.7	21.6	21.7	21.4	21.7	21.2	20.9
SW56	126 East Street, Sittingbourne	31.3	30.9	25.7	31.0	31.2	30.8	31.3	30.5	30.1
SW87	Canterbury Road AQ Station	30.0	29.5	24.5	29.6	29.8	29.4	29.9	29.2	28.7

SW99	A2 Frognal Lane, Teynham	21.5	21.2	17.2	21.2	21.4	21.1	21.4	20.9	20.6
SW91	Adj to 72 London Road, Teynham	20.2	19.9	16.1	19.9	20.1	19.8	20.1	19.6	19.3
SW101	A2 Lynsted Lane, Jct	20.2	19.9	16.2	19.9	20.1	19.8	20.1	19.6	19.3
SW28	Mayors Arms, Ospringe	27.9	27.2	22.3	27.6	27.7	27.3	27.9	27.0	26.3
SW30	ZW3 Ospringe Street	20.9	20.5	16.6	20.7	20.8	20.5	20.9	20.2	19.7
SW31	Site 7, 4 Ospringe Street	25.8	25.3	20.7	25.5	25.6	25.2	25.7	25.0	24.5
SW32	11 Ospringe Street, Ospringe	22.1	21.7	18.3	21.9	22.0	21.7	22.1	21.5	21.1
SW96	Maison Dieu, Ospringe Street	30.3	29.5	23.9	30.0	30.1	29.6	30.3	29.3	28.5
SW29	Opp Lions Yard, Ospringe Street	27.8	27.1	22.3	27.5	27.6	27.2	27.8	27.0	26.2
SW120	103 Ospringe Street, Ospringe, Faversham	24.9	24.4	20.1	24.6	24.7	24.4	24.8	24.1	23.7
SW117	Land Adj Orchard, Canterbury Road, Faversham	16.5	16.3	13.9	16.3	16.4	16.2	16.4	16.0	15.9
SW62	Key Street, Sittingbourne	25.9	25.5	20.6	25.5	25.7	25.3	25.8	24.9	24.6
SW110	2 Cherryfields, Sittingbourne	14.3	14.2	12.8	14.2	14.3	14.1	14.3	14.0	13.9
SW111	76A Key Street, Sittingbourne	22.4	22.1	17.7	22.1	22.3	21.9	22.3	21.7	21.3
SW112	56 Key Street, Sittingbourne	22.5	22.2	17.8	22.2	22.4	22.0	22.4	21.7	21.4
SW114	2 Florence Cottages, Chestnut Street	17.1	17.0	15.3	16.9	17.0	16.8	17.0	16.6	16.5
SW115	Cherry Tree Cottage, Chestnut Street	15.1	15.0	13.7	15.0	15.1	14.9	15.1	14.8	14.6
SW116	Bankside, Chestnut Street	15.6	15.5	14.2	15.5	15.6	15.4	15.6	15.2	15.1
SW124	31/33 Keycol Hill Sittingbourne Highest Point	31.4	30.8	25.0	31.0	31.2	30.7	31.4	30.3	29.7
SW121	Façade Squirrel Cottage, Keycol Hill	33.3	32.6	27.0	32.9	33.1	32.6	33.3	32.2	31.4

SW122	Façade 13 Key Street, Sittingbourne	21.1	20.9	17.6	20.9	21.0	20.7	21.1	20.4	20.2
SW123	12 Key Street, Sittingbourne	24.6	24.3	20.1	24.2	24.4	24.0	24.5	23.7	23.4
SW76	155 Canterbury Road, Sittingbourne	27.0	26.4	21.7	26.7	26.8	26.5	27.0	26.3	25.7
SW119	Flats, The Mount, Ospringe	17.0	16.7	14.0	16.8	16.9	16.6	16.9	16.5	16.2
SW83	Pembury Court, Dover Street	25.6	25.2	20.9	25.3	25.4	25.1	25.5	24.8	24.5
SW125	16/18 The Street, Bapchild	23.0	22.6	18.5	22.8	22.9	22.6	23.0	22.4	22.0

5 Cost Benefit Analysis

5.1 Introduction

The cost-benefit analysis comprises a high-level assessment of the key costs and benefits that can accrue to transport policies that impact air pollution. These are:

- Costs to vehicle users that are required to upgrade their vehicle
- Changes in operational expenditure to drivers with newer vehicles.
- Fuel costs from the change in vehicle fleet
- CO_2 savings from the change in fuel use
- Health benefits from the reduction in exhaust pollution
- The cost of implementing the different policies

Not all the costs set out here apply to all the measures assessed in this report. Principally, two Clean Air Zones that charge non-compliant vehicles to enter a designated area will encourage people to purchase new (cleaner) vehicles. The other policies assessed will have no impact on the overall makeup of the fleet, although they may reduce the number of vehicles entering the appraisal area.

5.1.1 Scope

The analysis includes all types of vehicles expected to be on the road, cars, taxis, private hire vehicles, LGVs, HGVs, buses and coaches. The nature of the ANPR data (automatic number plate registration) used in this analysis means that taxis and private hire vehicles are included in the 'car' analysis and buses and coaches are included in the 'HGV' analysis.

5.2 Assumptions

Several key assumptions were made as part of the cost benefit analysis conducted here. Firstly, it is assumed that all policies are implemented in 2022 and assessed over a 10 year appraisal period from 2022-2032. Any impacts that occur in the future are discounted to 2022 with a discount rate of 3.5%[14]. Moreover, all costs are calculated in a 2019 price year.

Several additional assumptions have been made to simplify the analysis undertaken.

1. A 3.5% discount rate has been used;
2. An 'urban medium' damage cost value has been used to value the air quality benefit[15];
3. For the CAZ B and D, vehicles will upgrade to a compliant vehicle of the same fuel type[16];
4. A 36% optimism bias has been added to capital expenditure (CAPEX) implementation costs[17];
5. Several assumptions about what the final measures in the 'modal shift' package will look like have been made to assess the implementation costs (these are presented in the section on implementation costs)[18];

[14] The 3.5% discount rate is determined by the UK Green Book Guidance. An analysis of how this discount rate is derived can be found in Annex 6 of the Green Book
[15] Pollutant damage costs are provided by DEFRA and vary depending on the population density of the appraisal area. Here an 'urban medium' setting was used to describe the appraisal area.
[16] This was assumed for simplicity of modelling.
[17] The requirement for optimism bias to be applied is set out by JAQU, however the exact level of optimism bias is not specified. 36% was used to be consistent with other scheme which in turn used WebTag guidance to determine the optimism bias.

6. Where possible damage costs and CO_2 costs have been based on webtag guidance and developed by DEFRA. Vehicle and related costs are primarily based on a Ricardo (2014) report[19];
7. The CAZ B and D do not capture the potential upgrades of non-compliant taxis or buses after the 3 year exemption period[20];
8. First order behavioural responses to the CAZ (upgrade assumption) are provided by JAQU[21].

5.3 Methodology

The methodology follows that set out in the webtag guidance[22]. Given the relatively small size and scope of the project some changes have been implemented to streamline the analysis and conduct individual assessment for a group of individual policy options (such as the mode shift package).

5.3.1 Vehicle upgrades

A vehicle owner upgrading to cleaner vehicles and the resultant impact on air quality is the key output of each charging CAZ scheme. The costs associated with this decision is a critical impact category. Our approach to estimating upgrade costs has been tested in a number of cities considering charging schemes and has been applied in Swale when considering the Charging Scheme and Fleet upgrades.

The approach starts by calculating the number of vehicles to be upgraded. For the CAZ this is defined by applying behavioural responses to the non-compliant vehicles in the baseline. It is assumed that the oldest vehicles are the first to upgrade. The number of vehicles upgrading is based on JAQU data and presented in Table 5-1

Table 5-1: Response behaviour assumptions to a charging CAZ (taken from Third Wave Evidence Package document from JAQU)

Response	Cars	LGV	HGV
Upgrade vehicle	64%	64%	83%
Cancel trip	7%	6%	4%
Change mode	11%	2%	0%
Avoid zone	11%	8%	4%
Pay charge	7%	20%	9%

The cost to an owner of a change in vehicle is then estimated through consideration of the following:

- The lost residual value from scrapped vehicles or the resale value of an unwanted vehicle based on the depreciated value of vehicle in 2022
- New or used vehicle purchase costs in 2022

These input values are combined to give the net cost. Resale costs (if applicable) are netted off the purchase costs and lost residual value associated with each upgrade.

Upgrades will also occur in the baseline and our approach to estimating these costs is very similar to what has been applied when considering the policy scenario. The general assumption in the baseline

[18] Given the early stage, the measures had not been finalised and therefore an indicative analysis of what the cost could look like given some potential modal shift measures has been conducted. The example measures are based off similar measures modelled or introduced in other UK cities.
[19] Ricardo study for TfL (2014): 'Environmental Support to the Development of a London Low Emission Vehicle Roadmap' (unpublished).
[20] This is due to a lack of ANPR data on taxis and buses in the area.
[21] See **Error! Reference source not found.**
[22] https://www.gov.uk/guidance/transport-analysis-guidance-tag

is that the same upgrade decision will be undertaken as in the measure but at a later date (defined by useful lives and ownership profiles). This future net cost is discounted (according to how far in the future it occurs) to 2022 to allow comparison with option costs.

The upgrade costs are calculated taking the difference in aggregate upgrade costs for the option and baseline scenarios. The cost of upgrade is hence calculated as the marginal impact of people upgrading earlier than they would do if a CAZ was not in place. This is to say that a person would upgrade in the future anyway, what is the economic impact of the person upgrading in the implementation year relative to the cost in the future year.

5.3.2 Vehicle costs

Ricardo's model takes into account changes in fuel consumption (related to OPEX and GHG impacts)[23] associated with the upgraded fleet that has resulted from the option.

The estimation of operating costs and greenhouse gas emissions focused on capturing the effect of upgrading vehicles, which switches the distance travelled (measure in vehicle-km - vkm) from one Euro class of vehicles to another. The following approach was taken:

1. Take numbers of vehicles upgraded from fleet upgrade calculations
2. Combine numbers of vehicles upgraded by different vehicle type and Euro standards with data around the average annual fuel consumption and average annual operating costs per vehicle type and age[24]
    a. By applying average OPEX and fuel consumption over the full year and average vkm travelled per annum, this illustrative modelling will likely capture an even wider domain of impacts – i.e. will include the impacts where upgraded vehicles travel outside the AQ modelling domain.
3. Changes in fuel consumption are combined with changes in fuel prices.
4. Changes in fuel consumption are combined with emissions factors from BEIS' Green Book Supplementary Guidance to calculate changes in GHG emissions (tCO_2e)[25]
5. Changes in GHG emissions in each year are combined with carbon values from BEIS' Green Book Supplementary Guidance: Non-traded, Central[26].

Note: due to limitation in the model, only a single year analysis has been conducted. Typically analysis is conducted over the entire appraisal period and reflects the relative difference between the policy and baseline scenario. This has not been possible in this analysis and therefore an extrapolation factor has been applied. This assumes that benefits captured in the modelled implementation year decrease over time (in a linear fashion) as older vehicles are replaced with newer vehicles in the baseline scenario[27].

[23] Annual fuel consumption and opex source: Ricardo study for TfL (2014): 'Environmental Support to the Development of a London Low Emission Vehicle Roadmap' (unpublished)
[24] Consumption and OPEX for general vehicle types came from: Ricardo study for TfL (2014): 'Environmental Support to the Development of a London Low Emission Vehicle Roadmap' (unpublished). Data for hybrid vehicles came from: Ricardo Energy & Environment (forthcoming). Car Choice Model (CCM) summary report.
[25] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/602657/5._Data_tables_1-19_supporting_the_toolkit_and_the_guidance_2016.xlsx
[26] BEIS supplementary Green Book Guidance https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/602657/5._Data_tables_1-19_supporting_the_toolkit_and_the_guidance_2016.xlsx Tables 3: Carbon Prices and sensitivities Price Year 2016. Prices have been adjusted to 2019. Average carbon price for appraisal period: £76.81/tCO2e.
[27] The extrapolation factor was used to be consistent with the air quality analysis and is derived from JAQU data.
Given some limitation is the baseline scenario modelled this method may presented a more realistic approach to vehicle replacement as typically not all owners will wait until the end of the vehicle life to replace the vehicle.

5.3.3 Air pollutant emissions

The key objective of these policy options is to reduce the emission (and subsequently concentrations) of air pollutant emissions from road transport sources. Reducing air pollutant emissions will have a range of subsequent benefits on human and environmental health, productivity and amenity.

The following approach to valuing the impacts associated with reductions in emissions is as follows:

1. Take quantities (tonnes) of emissions from underlying air quality modelling undertaken by Ricardo for all option scenarios and do minimum baseline
2. Calculate total emissions impact relative to baseline
3. Value impact applying damage costs provided by JAQU
    a. The damage cost 'Urban medium' is applied to all emissions reductions

The change in the total output of emission in the implementation year is given by the air quality model which calculated the total emission (of NO_x $PM_{2.5}$ and PM_{10}) under a business as usual and the CAZ scenarios. The difference in emissions for each scenario is then determined.

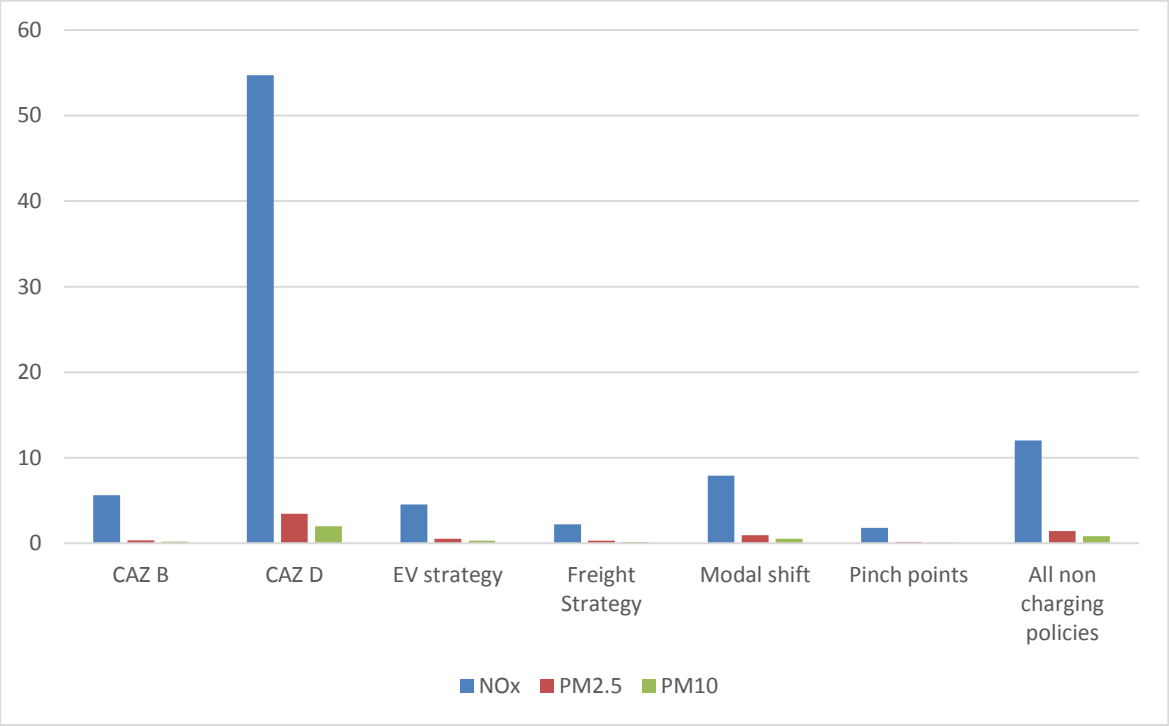
Damage cost values (based on recent Defra Guidance for Air Quality Damage Costs) are applied to calculate the monetary benefit of the change in emissions. It is assumed that the benefit reduces over time as the baseline scenario naturally catches up to the CAZ measure using an extrapolation factor based on JAQU data.

The results of the analysis for the implementation year 2022 are shown in Table 5-2 and the relative change in 2022 between the baseline and the various modelled policy options are shown graphically in Figure 5-1. It should be noted that these are only impacts for each single year, and there is no application of extrapolation factors.

Table 5-2: Air pollutant (NOx, PM2.5 and PM10) impacts of the measures in 2022 (tonnes)

	Net emission (tonnes)			Relative change (with baseline – tonnes)		
	NOx	PM2.5	PM10	NOx	PM2.5	PM10
Baseline	186.66	22.73	13.04			
CAZ B	181.02	22.38	12.85	5.63	0.34	0.19
CAZ D	131.95	19.25	11.04	54.71	3.47	2.00
EV strategy	182.11	22.18	12.73	4.55	0.54	0.31
Freight Strategy	184.43	22.43	12.87	2.23	0.30	0.17
Modal shift	178.76	21.76	12.49	7.90	0.97	0.55
Pinch points	184.85	22.55	12.94	1.80	0.18	0.11
All non charging policies	174.64	21.29	12.21	12.02	1.44	0.83

Figure 5-1: Relative change in emissions between the policies and baseline in 2022 (tonnes)



5.3.4 Implementation costs

The varied nature of the policy options considered in this analysis means that no consistent methodology has been developed for deriving the implementation costs. For each policy option we have referred to previous Clean Air Zones that have considered similar policies to benchmark the implementation costs and scaled them to reflect the size and traffic conditions in the Swale Borough area.

A 36% optimism bias is applied to all capital expenditures.

Clean Air Charging Zones (CAZ B and D)

Key costs of setting up and installing a charging area include signs, road markings, cameras and advanced warning. It is assumed that 8 sets of cameras will be use to capture vehicles assessing the CAZ area at key junctions. The majority of the cost is assumed to be capital expenditure (purchase of cameras etc) with some ongoing maintenance costs also required. The costs per camera have been used in a number of previous CAZ analyses and have been agreed with JAQU.

Mode shift (increasing active travel and reducing the use of private cars)

This policy includes a variety of different plans to reduce the amount of private vehicle use. The policies and costs are estimated below:

Table 5-3: Breakdown of mode shift policies modelled implementation costs (without optimism bias applied)

Policy	Cost	Rationale
Creation of travel plans	-	Travel plans will be created by schools and local communities and not require any financial investment
Investment in walking and cycling infrastructure	£11.12 million	This is the estimated cost of the creation of a cycle highway along the A2 between Newington and Faversham the cost per km is based on two estimates provided in DfT (2017) report[28]
Secure cycle parking	£10,000	Based on estimates of additional funding provided by TfL scaled down to estimate the installation of 20 bike storage units.
Car club	£ 5,000	Estimate – minimal costs expected.
Trial of e-bikes and scooters	£ 20,000	Estimations of a trial of 10 e-bikes, based on a similar trial in Leeds
Total	£11.5 million	

Note: as the exact form of several of these measures has not been agreed upon (such as the investment in walking and cycling infrastructure) indicative estimates have been used based off a potential final form. A more detailed assessment of the analysis will be required when these plans have been finalised. Moreover, the final implementation costs will be highly variable and location specific. The results presented here show the indicative scale of each plan rather than an opposed cost.

Freight consolidation plans

Previous analysis conducted for a port city provided an estimated cost for a freight consolidation centre, the size and cost has been scaled down to reflect the local environment in line with traffic modelling.

Increased use of electric vehicles

Based on electric vehicle strategies in different cities, we have estimated that an investment of £100,000 over the 10 year appraisal period is required to install the necessary infrastructure (charging and otherwise) to achieve the desired uptake in electric vehicles.

Removal of pinch points

The only cost to the council is understood to be a Traffic Regulation Order, required to change the layout of a road. A briefing paper produced by the House of Commons estimated the cost of a TRO to be between £1,000 and £3,000[29].

The cost is estimated to be £2,000 per annum, an average of the upper and lower boundary.

5.4 Results

Figure 5-2 and Table 5-4 provide a breakdown of the various costs and benefits we have assessed for the 6 different policy options included in the appraisal. We have also included an 'all non-charging' policy package which includes the 4 non-CAZ based policies which could be implemented together, and a package combining the CAZ B and all 'non-charging' measures.

[28] Department for Transport (2017) *Typical costs of cycling intervention* Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/742451/typical-costings-for-ambitious-cycling-schemes.pdf [Accessed October 2020)

[29] House of Commons Library (2020) *Traffic Regulation Orders (TROs) – Briefing Paper* No: CBP 6013 p.12

The results can broadly be assessed as falling in to 3 categories: a net cost due to the requirement for new vehicles to be purchased, a net cost due to high implementation costs[30] and policies with a net benefit. These last two, the freight policy and the removal of several pinch points[31], have a positive net present value (NPV)[32] but a very small overall impact. The nature of the policies means that while they have the benefit of reducing air pollution of several current exceeding locales, their overall impact is relatively small.

The policy with the largest impact is the CAZ D. This policy would require all non-compliant vehicles using the CAZ area to pay a charge. Given the inclusion of passenger cars in this charging measure there is an expected significant upgrade cost for the majority of non-compliant vehicles that will now upgrade. There is also a corresponding increase in fuel and CO_2 savings from the inclusion of passenger cars, however this does not negate the significant cost of requiring private vehicles to upgrade. Finally, its worth reiterating that the cost calculations for the CAZ B and D do not include the cost that non-compliant vehicles that choose to pay the charge will face, this is seen as a net transfer between the passenger and the local council and are therefore not considered a cost.

The costs presented here should be understood in relation to the Air Quality analysis presented previously and should not be used as the sole decision-making tool. While emission reductions are captured, the cost benefit analysis (CBA) does not take in to account if the pollution concentrations are sufficiently reduced in targeted area, nor does it capture any distributional elements of the policies, for example, which demographics would be impacted by the various options. The CBA presents one piece of evidence, amongst many, to support the introduction of new clean air policies.

[30] Note that the only policy here is the modal shift which has a very high implementation cost due to the inclusion of a cycle superhighway. If this was not included, it would likely have a net positive result

[31] Its worth reiterating that while this has a positive NPV in its current form. The costs here no not include the need to create additional parking space which would likely increase the overall cost of the policy. The cost could be significant if off-street parking needs to be produced.

[32] The NPV represents the total costs and benefits across the 10 year appraisal period, discounted to 2022 and summed.

Figure 5-2: Policy appraisal CBA results

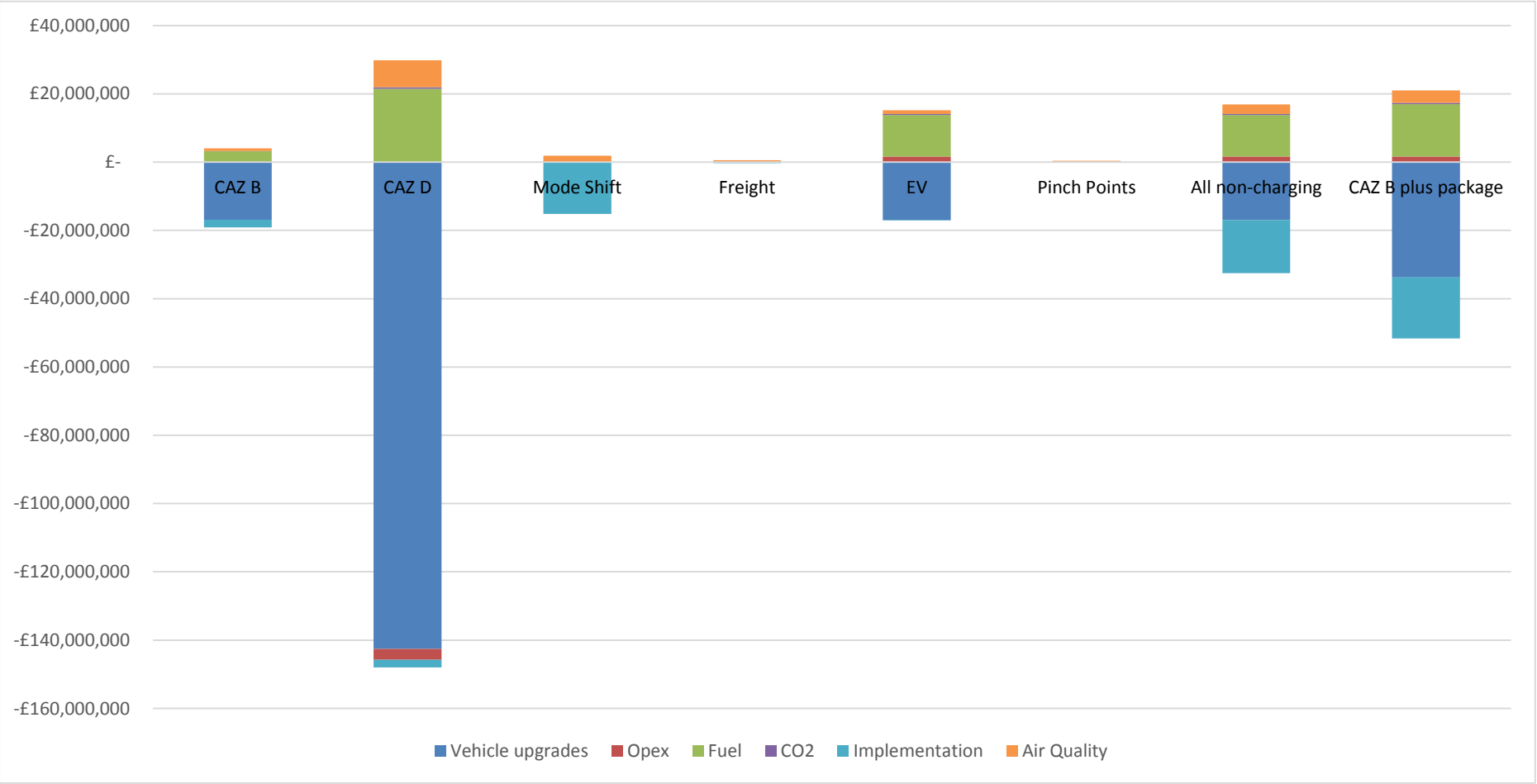


Table 5-4: Indicative breakdown of costs and benefits for all policy options

	CAZ B	CAZ D	Mode Shift	Freight policy	EV	Pinch Points	All non-charging	CAZ B plus all non-charging
Vehicle upgrades	- £16,857,000	- £142,584,000	£ -	£ -	- £16,929,000	£ -	- £16,929,000	- £33,785,000
Opex	£14,000	- £3,145,000	£ -	£ -	£1,616,000	£ -	£1,616,000	£1,631,000
Fuel	£3,184,000	£21,472,000	£ -	£-	£12,166,000	£ -	£12,166,000	£15,350,000
CO2	£82,000	£492,000	£ -	£-	£324,000	£-	£324,000	£407,000
Implementation	- £2,256,000	- £2,256,000	- £15,171,000	- £295,000	- £141,000	- £3,000	- £15,609,000	- £17,865,000
Air Quality	£783,000	£7,891,000	£1,867,000	£571,00	£1,053,000	£366,000	£2,797,000	£3,580,000
Total	**- £15,050,000**	**- £118,130,000**	**- £13,303,000**	**£276,000**	**- £1,909,000**	**£364,000**	**- £15,633,000**	**- £30,683,000**

Note: the CAZ B plus all non-charging has been estimated as a simple sum of the costs and benefits of these 2 scenarios
Numbers may not sum exactly due to rounding errors

5.4.1 CAZ B

The CAZ B is a relatively un-invasive charging policy that would only impact HGVs (with buses and taxis being initial except). Nevertheless, given the price of HGVs, there is a significant cost associated with requiring them to upgrade (totalling over £15 million). Moreover, JAQU assumptions state that 83% of non-compliant HGVs will choose to upgrade (although this may not reflect the actual behaviour response to the scheme in Swale). While there are additional benefits accrued as part of the policy (fuel savings, emission reduction) to policy results in a total NPV of -£15,259,113

5.4.2 CAZ D

As discussed above, a CAZ D is the most expansive and all-encompassing policy proposal as it requires all non-compliant vehicles, including private passenger cars to pay to enter the CAZ area. As demonstrated in Table 5-4 the most significant impact would be the requirement for a large number of non-compliant vehicle users to upgrade to a compliant vehicle, to the net cost of over £140 million. While this policy also results in significant savings (we see the largest pollution reduction and a significant fuel saving) these benefits are dwarfed by the upgrade costs. Overall we would see a net cost of over £116 million over the appraisal period.

5.4.3 Mode shift strategy

The mode shift strategy presents the most varied policy approach to reducing the number of private vehicles on the road and includes a number of different 'sub-measures' to achieve this. These include:

- The creation of travel plans for schools and businesses
- Additional investment in walking and cycling infrastructure
- Investment in secure cycle parking
- A pilot scheme for e-bikes and scooters
- A car club in Sittingbourne and Faversham.

As set out in the methodology, several assumptions have been made about what a modal shift strategy could look like, including potential investment for cycling infrastructure and a pilot scheme for e-bikes. This policy has the largest implementation cost of all the policies assessed including the two CAZs. This is primarily due to the estimated cost of creating a new cycle way along the A2.

The policy also results in the largest pollution reduction of all the non-charging mechanism, recognising the success of the modal shift policy.

5.4.4 Freight policy

The freight policy aims to remove a significant proportion of the HGV traffic entering the towns in the area under consideration, particularly in Sittingbourne. The policy will likely have a targeted impact on the commercial area of Sittingbourne and have limited wider impact. Moreover, as no fleet upgrades are expected to result from the policy, the overall impact is expected to be minimal.

While this policy has a larger impact on pollutant reductions than the pinch point policy it also has greater implementation costs therefore having the smallest magnitude impact of all the policies assessed. The total net benefit over the 10 year appraisal period is £282,163.

5.4.5 EV Strategy

The EV strategy assumes that 2% of all passenger cars and LGVs will upgrade to electric vehicles through the introduction of more EV charging and other supporting infrastructure. The measure has the potential for significant savings, particularly from the reduced fuel use and subsequent CO_2

savings, however the cost of 2% of vehicles upgrading to electric is also significant. The impacts captured here may slightly overestimate the true economic impact as it currently assumes that all new EV's will be purchased in 2022. More likely, the increase in EV uptake will happen gradually over the appraisal period.

The total modelled impact of NPV of -£1,909,262

5.4.6 Pinch points

The removal of several pinch points in and around Sittingbourne will improve the air quality in these immediate areas and have a small impact on driver speeds however it will have very limited overall economic effect.

While it will improve air quality in the immediate area around the current pinch points it will have the small impact of all options assessed on the total reduction of emissions (tonnes). There will also be a small cost to the council associated with removing the current parking spaces which will take place through the introduction of new TROs.

This does not include the creation of alternative parking to offset the removal on pinch point parking as specified previously. Additional work is required to assess the type of new parking required and the associated cost. This cost could be substantial if it is decided that new off-street parking is required to replace the parking spaced lost via the removal of these pinch points.

Overall, the modelled net benefit is £352,960

5.4.7 All non-charging measures

The package of non-charging measures has a greater air quality benefit than the CAZ B, driven mainly by the mode shift policy but increased by the other measures, but is less impactful that the CAZ D. The net cost of the package is about same as the CAZ B at £15,289,174 for greater impact, but an order of magnitude less than the CAZ D.

5.4.8 CAZ B plus all non-charging measures

This package simply summed the costs and benefits of the CAZ B and the all non-charging measures package. This combination is obviously more impactful then either on its own, but less than the CAZ D. It has a net cost of just over £30 million which is still significantly less than the CAZ D.

5.5 Conclusion

The policies appraised in this analysis form a wider spectrum of approaches to reducing air pollution. Moreover, while the cost-benefit analysis is a useful tool in understanding some of the impacts of each policy it provides no insight into the key metric of the policy, reducing air pollution concentration in current areas of exceedance.

Nevertheless, there is significant variation in the scope and economic impact of the policies assessed. The freight policy has the smallest NPV while the removal of key pinch points has the smallest overall impact. By far the most impactful policy would be the introduction of the CAZ D. While it would have a significant impact on improving air pollution in the local area, these benefits are dwarfed by the upgrade costs associated.

Each policy offers its own pros and cons to implementing and the NPV alone should not be used to decide the 'best' policy. Regardless, they offer a useful insight into understanding the impacts of each policy option.

6 Conclusions and recommendations

This study has set out to assess the feasibility and practicality of implementing a formal Charging Clean Air Zone to mitigate air quality issues along the A2. In addition, further non-charging measuring measures have been considered as an alternative or as a complement to a formal CAZ. The study initially established current air pollution levels along the A2 for a base year in 2019 and a future year in 2022 to assess the level of challenge that needed to be addressed. The improvements in air quality that could be gained from a set of CAZ and non-charging measures were assessed along with an indicative cost benefit analysis of implementing these measures. This final section combines these analyses to set out our recommendations for a practical approach to improving air quality along the A2 and associated AQMAs.

6.1 Current air quality along the A2

Air quality along the A2 was modelled using traffic data from the existing regional traffic model, fleet composition data collected from the previous source apportionment study, that latest emissions factors from DEFRA's Emission Factor Toolkit and our in-house dispersion model RapidAir®. The model was then verified and adjusted against 2019 monitoring data.

The modelling provides detailed NO_2 concentration data on a 1m x 1m grid over the study area and so allows the extraction of results for all relevant receptor location. In this case results have been extracted in 2 ways to provide an assessment of air quality along the A2 and related AQMAs:

- Compliance data in relation to the air quality limit values for all roads in the modelled area – this extracts results at 4m from the roadside and presents the highest concentration along each road link.

- Monitoring point location results – which have been extracted both with the overall model adjustment factor (global) and adjusted to match the actual monitored value (site-specific) in 2019. These latter site-specific adjusted results are intended to reflect any specific conditions around the diffusion tube location that could be influencing the results.

The baseline compliance air quality results in 2019 indicated a number of areas where the NO_2 limit value is being exceeded principally in Sittingbourne at Keycol Hill (this area has now been formally declared as an AQMA on 23rd October 2020) and in the St Paul's Street and East Street AQMAs. There is also a slight exceedance in Ospringe. In relation to the monitoring locations, 9 of the locations are showing exceedances of the 40 μgm^{-3} limit value.

Moving forward to 2022 the results show a significant improvement based on business as usual conditions, generated primarily by improvement to the vehicle fleet as vehicles renew and become cleaner. Road link based compliance results showed that no roads were expected to exceed the limit value although there are roads in Sittingbourne, again within the St Paul's Street and East Street AQMAs that are at risk of exceedance being above 35 μgm^{-3} which is within model error estimated from the model verification. The monitoring location results with the global adjustment reflect the same picture showing no monitoring sites expected to exceed in 2022. However, when using the local adjustment factor one monitoring site in St Paul's Street AQMA (SW82) is showing an exceedance and one location at Keycol Hill (SW124) is very close to exceedance.

For the 2022 year a sensitivity test was also carried out to assess the impact of a slower fleet turnover potentially from an economic slow-down related to COVID 19. This sensitivity suggested that there could potentially be exceedances remaining in Sittingbourne in the St Paul's Street and East Street AQMAs.

This analysis suggested that although a standard business as usual assessment in 2022 indicated that there would be no exceedances, sensitivity assessment using site-specific adjustment at

monitoring locations and slower fleet turnover could well result in exceedances in Sittingbourne. The highest level of NO_2 under these tests was 44 μgm^{-3} estimated at monitoring location SW82 in the St Paul's Street AQMA. So, the aim of any mitigation measures should to reduce the risk of these potential exceedances occurring, especially in St Paul's Street AQMA.

6.2 Clean Air Zone mitigation measures

The earlier AQAP assessment work carried out in 2019 by Phlorum recommended the assessment of a Clean Air Zone as a potential measure to manage air pollution along the A2. The charging CAZ option was assessed in this study along with 'softer' non-charging measures as an alternative or complement to a charging CAZ. A summary of the key air quality and cost benefit results associated with the modelled options is set out in Table 6-1 below and discussed in the following sections

Table 6-1: Summary results for the mitigation options

Category	Reference Case	CAZ B	CAZ D	EV	Freight	Mode Shift	Pinch Point	All non-charging	CAZ B + non-charging
Average reduction concentration reduction across all monitoring sites									
Reduction	0%	1.7%	18.4%	1.2%	0.6%	2.1%	0.3%	3.0%	4.7%
Number of monitoring sites exceeding or at risk (global adjustment)									
Exceeding	0	0	0	0	0	0	0	0	0
At risk	2	2	0	2	2	2	2	2	2
Number of monitoring sites exceeding or at risk (site-specific adjustment)									
Exceeding	1	1	0	1	1	1	1	0	0
At risk	1	1	0	1	1	1	1	2	2
Summary cost benefit analysis results (Million £)									
Total NPV	N/A	-15.0	-118.1	-1.9	0.3	-13.3	0.4	-15.6	-30.6
Implementation only	N/A	2.26	2.26	0.14	0.29	15.17	<0.01	15.63	17.86

6.2.1 Charging Clean Air Zones

Two formal CAZ options were assessed in terms of a full CAZ D covering all vehicle types and a CAZ B targeted at HGV's as described in section 3. These would both be enforced in the same way with a set of ANPR cameras along the A2 and hence would have similar direct implementation costs to the Council estimated at about £2.2 million.

Clearly the CAZ D would generate the greatest air quality benefit as more vehicles are being targeted. On average it would reduce concentrations by some 18% resulting in no areas with exceedances of the NO_2 limit value or even at risk of exceeding. The CAZ B has a much smaller impact as it is only targeting HGVs. Many of which already meet the standard, and reduced concentrations on average by about 2%. However, this will still remove all exceedances with the possible exception of monitoring location SW82 in the St Paul's Street AQMA.

On the face of it this might indicate that the CAZ D would provide the greatest benefit for a similar cost. However, just implementation costs ignore the wider costs to vehicle owners for upgrading their vehicles. Taking these costs into account the CAZ D would cost local businesses and residents some £142 million in compliance costs to upgrade vehicles and have an overall negative net present value (NPV) from the CBA of £118 million over 10 years. This compares to the CAZ B which would have some £17 million in compliance costs borne by freight companies and an overall negative NPV of £15 million.

So both are costly measures to society as a whole but the CAZ B has a significantly lower cost while still largely mitigating any air quality limit value exceedance risk.

6.2.2 Non-charging measures

Four non-charging measures were assessed: a mode shift package, a freight package, support for electric vehicles and removal of pinch point parking. Of these the mode shift package was estimated to have the largest impact on air quality reducing concentrations by an average of 2.1% which is in fact a greater impact than the CAZ B. The EV measures had the next largest impact at a 1.2% average reduction in concentrations, followed by the freight measures at only a 0.6% average reduction. The smallest average impact was from the removal of pinch point parking, as might be expected, as the benefits of this measure are greatest at these specific points.

The costing of these measures was carried out in a fairly generic way as the specific details of what would be included was not developed and so the CBA can only be considered indicative. The mode shift package was the costliest as it assumed a significant investment in walking and cycling infrastructure of some £15 million. However, this provides a better, though still negative, overall NPV than a CAZ B of £13 million. This suggests it would be a better option for society in general than the CAZ B though it has higher direct costs to the public sector (in this case the County Council). It should also be noted that the mode shift CBA does not include the assessment of any wider health or congestion benefits.

The EV measure is the next most costly with a negative NPV of some £1 million overall, but with a potential implementation cost to the borough and county councils in terms of supporting charging infrastructure of some £137,000. The freight measures could potentially cost the councils some £300,000 but this would be outweighed by the air quality benefit to give a positive NPV for the measure. The pinch point parking removal is likely to fairly low cost and have air quality benefits that again outweigh the costs to give a positive NPV.

All the non-charging measures have a better overall NPV than either of the CAZ measures with two being positive. The mode shift measure also has a greater air quality impact than the CAZ B though not the CAZ D. The other measures all have lower, but still positive impacts on air quality.

6.2.3 A package approach

Two packages of measures were also considered: a combination of all the non-charging measures, and the CAZ B combined with the all of the non-charging measures. The impact of the latter package was not formally modelled but estimated by simply adding the impacts (and costs and benefits) of the CAZ B and package of non-charging measures.

The package of non-charging measures generated an average reduction in NO_2 concentrations of some 3%, about twice that of the CAZ B on its own. It also removes all exceedances of the limit value even the site-specific adjusted monitoring locations in St Paul's Street AQMA (though only just). The CBA indicates that it has a negative NPV of around £15million which is the same of the CAZ B but with about twice the benefit to air quality.

Combining CAZ B with the package of non-charging measures gives an estimated reduction in concentrations of some 4.7% which is clearly better than either on their own, but less than the CAZ D. This combined package also removes all exceedances even for the site-specific adjusted monitoring location in St Pauls Street AQMA at SW82. It has a negative NPV of some £30 million (basically twice that of the CAZ B and Non-charging package individually), but this is an order of magnitude less than the cost of the CAZ D.

6.3 Recomendations

Air quality along the A2 is expected to improve significantly over the next 3 years out to 2022 as the vehicle fleet renews and the proportion of vehicles of the latest Euro emission standard increases significantly. As such by 2022 a standard reference forecast suggests the NO_2 limit values will be achieved. However, there is clearly uncertainly in the modelling and exploring this through site-specific adjustment at monitoring locations and a sensitivity test with a slower fleet turn over indicates that there is a risk of remaining exceedances especially in the St Pauls Street AQMA. As such there is still a need to take further action to reduce transport related emissions and concentrations along the A2.

The implementation of a Charging Clean Air Zone would reduce concentrations and manage the risk of further exceedances. However, the overall economic cost of these measures would be high (£30 million for a CAZ B and £118 million for a CAZ D) and likely to be politically challenging to implement. As such given the scale of the air quality challenge, largely around managing risk rather than tackling significant exceedances, these would appear to be a disproportionate response.

This suggests that a more appropriate approach is to implement a package of non-charging measures which have been shown to have about twice the benefit of the CAZ B, in terms of air quality, but at a similar economic cost. It is also clear that there would be further benefits for example in terms of health from active travel that have not been accounted for here.

Moving forward we would recommend that the Swale Borough Council work with the Kent County Council, who are the highways authority and so largely responsible for implementing transport measures, to develop in more detail a package of measures to reduce traffic, improve flow and improve the vehicle fleet operating along the A2 comprising:

- The removal of key pinch point parking areas – which is likely to be low cost (dependant on whether alternative parking locations are required), have both air quality and traffic flow benefits and is already being explored by the County Council.

- Assessment of the feasibility of a freight consolidation centre serving Sittingbourne (and potentially other areas) along with developing Delivery and Servicing Plans (DSPs) with local business to reduce freight movements in the area.

- Further work on the development of EV charging infrastructure and other incentives to accelerate the uptake of EVs in the area.

- Significant investment in walking and cycling schemes, travel plans and other information campaigns, as well as exploring micro-mobility options to manage traffic growth and congestion. This could also be an important element of economic recovery following the COVID 19 pandemic and would support wider public health in the area.

Appendix 1 – Air quality model verification and adjustment

A1.1 Exclusion of monitoring sites

Several diffusion tubes were excluded from the model verification and adjustment process because they were outside of the modelling domain or had insufficient data capture in 2019 (missing data from one or more months). These diffusion tubes are listed in Table A1.1.

Table A1.1 – Monitoring sites excluded from model

Site	Site Name	Reason for exclusion
SW37	32 High Street, Newington	Missing data for one or more months
SW38	15a High Street, Newington	Missing data for one or more months
SW78	55057 High Street, Newington	Low data capture 67%
SW129	55/57 High Street, Newington EOB	Low data capture 33%
SW52	20/22 St Paul's Street	Missing data for one or more months
SW90	Junction of Canterbury Road Goodnestone Road	Missing data for one or more months
SW133	159 High Street, Sheerness Lampost	Outside of modelling domain
SW134	12/14 High Street Sheerness Post	Outside of modelling domain
SW127	Halfway Road (14) Halfway, Sheerness	Outside of modelling domain
SW128	Queenborough Road (12/14) Halfway, Sheerness	Outside of modelling domain
SW85	Sheerness College 2, Bridge Road, Sheerness	Outside of modelling domain
SW86	Swale Foyer, Bridge Road, Sheerness	Outside of modelling domain
SW80	A2 Teynham, 107 London Road	Missing data for one or more months
SW92	FJ Williams, London Road	Located at bus stop
SW30	ZW3 Ospringe Street	Missing data for one or more months
SW95	The Mount, London Road, Ospringe	Low data capture 67%
SW22	35 Ospringe Street, Ospringe	Missing data for one or more months
SW98	Canterbury Road, Preston, Faversham	Missing data for one or more months
SW107	110 Borden Lane, Sittingbourne	Outside of modelling domain
SW108	1 Oak House, Wises Lane	Outside of modelling domain
SW109	39 Wises Lane, Sittingbourne	Outside of modelling domain
SW130	31/33 Keycol Hill Sittingbourne Mid Point	Low data capture 50%
SW131	31/33 Keycol Hill Sittingbourne Lowest Point	Low data capture 50%
SW132	Fountain Street, Sittingbourne	Low data capture 42%
SW53	114 East Street, Sittingbourne	Outside of modelling domain
SW77	Kemsley Fields, Swale Way, Sittingbourne	Outside of modelling domain
SW88	Sonara Way, Sonara Fields, Sittingbourne	Outside of modelling domain
SW118	Opp Fruit Stall, 9 Fox Hill, Bapchild	Missing data for one or more months, located next to car park and bus stop
SW58	Dover Street	Outside of modelling domain
SW126	Fox & Goose, The Street, Bapchild	Missing data for one or more months
SW34	Hernhill Village Hall, Hernhill	Outside of modelling domain
SW07	Capel Hill Farm, Harty	Outside of modelling domain

Some clear outliers were also apparent during the model verification process, whereby we unable to refine the model inputs sufficiently to achieve acceptable model performance at these locations. There are a number of reasons why this could be the case e.g.

- A site located next to a large car park, bus stop, petrol station, or taxi rank that has not been explicitly modelled due to unknown activity data.
- Sites located underneath trees or vegetation i.e. unsuitable locations for diffusion tubes to measure NO_2 concentrations effectively
- No traffic model road link included where the NO_2 sampler is located, or not all road links included e.g. at a junction.
- Uncertainties in the traffic model outputs.
- Uncertainties in the background maps, and the uncertainties introduced by modelling background concentrations over such a wide area at 1km resolution i.e. the mapped background concentrations change very suddenly at the edges of each 1km background map square. In reality annual average background concentrations would change gradually over an urban area. A possible solution to this issue would be to interpolate the 1km background maps to a finer resolution e.g. 200m; this would have the effect of smoothing out the sudden changes in background concentrations at the 1km square edges of the background maps

Table A1.2 lists the monitoring locations that were excluded as outliers from the verification process. For monitoring locations that contained multiple diffusion tubes, only one measurement was used in verification.

Table A1.2 – Monitoring sites excluded from verification

Site	Site name	Reason for exclusion
ZW6	Newington 3	Monitoring site is located in a passageway, which limits dispersion.
SW99	A2 Frognal Lane, Teynham	Monitoring site is adjacent to a car park which is not included in the model.
SW117	Land Adj Orchard, Canterbury Road, Faversham	Monitoring site is located at the entrance of a building site, and this road is not included in the model.
SW113	Squirrel Cottage, Keycol Hill	Overgrown vegetation is present at the monitoring site.

A1.2 Verification and adjustment results

Verification of the model involves comparison of the modelled results with any local monitoring data at relevant locations; this helps to identify how the model is performing and if any adjustments should be applied. The verification process involves checking and refining the model input data to try and reduce uncertainties and produce model outputs that are in better agreement with the monitoring results. This can be followed by adjustment of the modelled results if required. The LAQM.TG(16) guidance recommends making the adjustment to the road contribution of the pollutant only and not the background concentration these are combined with.

The approach outlined in LAQM.TG(16) section 7.508 – 7.534 (also in Box 7.14 and 7.15) has been used in this case. All roadside automatic and diffusion tube NO_2 measurement sites near modelled roads in Swale have been used for model verification with sufficient (> 75 %) data capture in 2019. It is appropriate to verify the performance of the RapidAir© model in terms of primary pollutant emissions of nitrogen oxides (NOx = NO + NO_2). To verify the model, the predicted annual mean Road NOx concentrations were compared with concentrations measured at the various monitoring sites during 2019.

The model output of Road NOx (the total NOx originating from road traffic) was compared with measured Road NOx, where the measured Road NOx contribution is calculated as the difference between the total NOx and the background NOx value. Total measured NOx for each diffusion tube

was calculated from the measured NO_2 concentration using the latest version of the Defra NOx/NO_2 calculator (v7.1).

The initial comparison of the modelled vs measured Road NOx identified that the model was under-predicting the Road NOx contribution at most locations. Refinements were subsequently made to the model inputs to improve model performance where possible.

The gradient of the best fit line for the modelled Road NOx contribution vs. measured Road NOx contribution was then determined using linear regression and used as a global/domain wide Road NOx adjustment factor. This factor was then applied to the modelled Road NOx concentration at each discretely modelled receptor point to provide adjusted modelled Road NOx concentrations. A linear regression plot comparing modelled and monitored Road NOx concentrations before and after adjustment is presented in Figure A1.1.

The total annual mean NO_2 concentrations were then determined using the NOx/NO_2 calculator to combine background and adjusted road contribution concentrations.

A primary NOx adjustment factor (PAdj) of 2.4882 based on model verification (Figure A1.1) using the remaining 2018 NO_2 measurements was derived and applied to all modelled Road NOx data prior to calculating an NO_2 annual mean. Adjusted modelled and measured NO_2 concentrations are presented in Figure A1.2.

Figure A1.1- Monitored vs. modelled NOx concentrations (µg m^{-3})

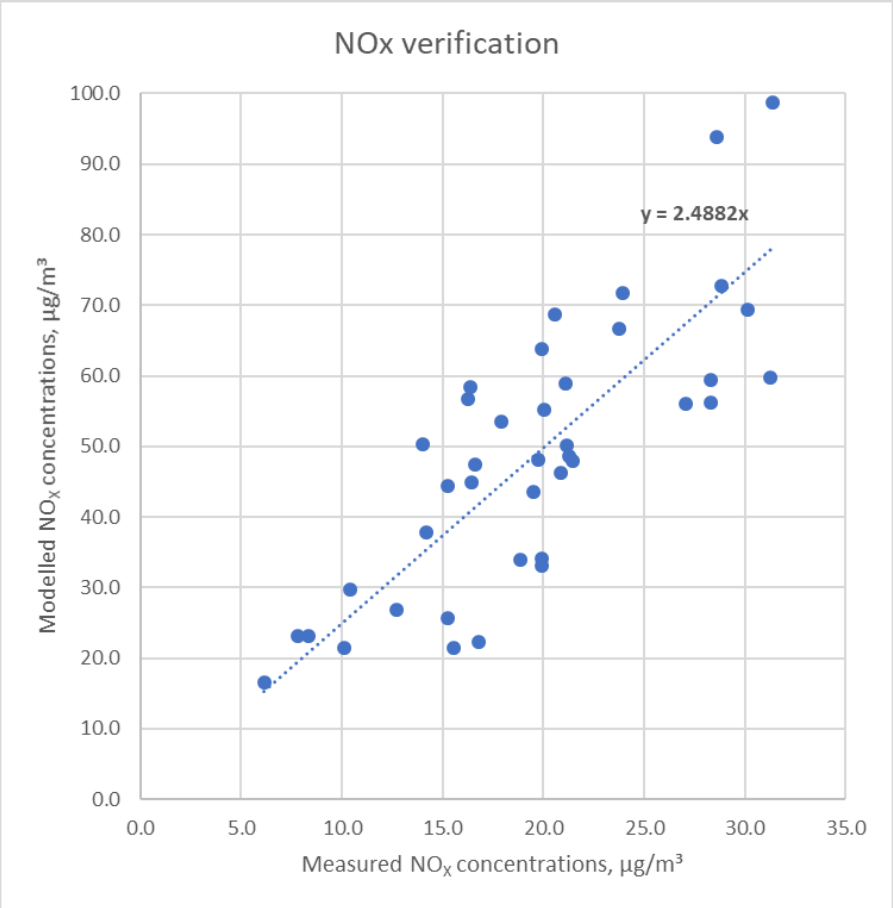
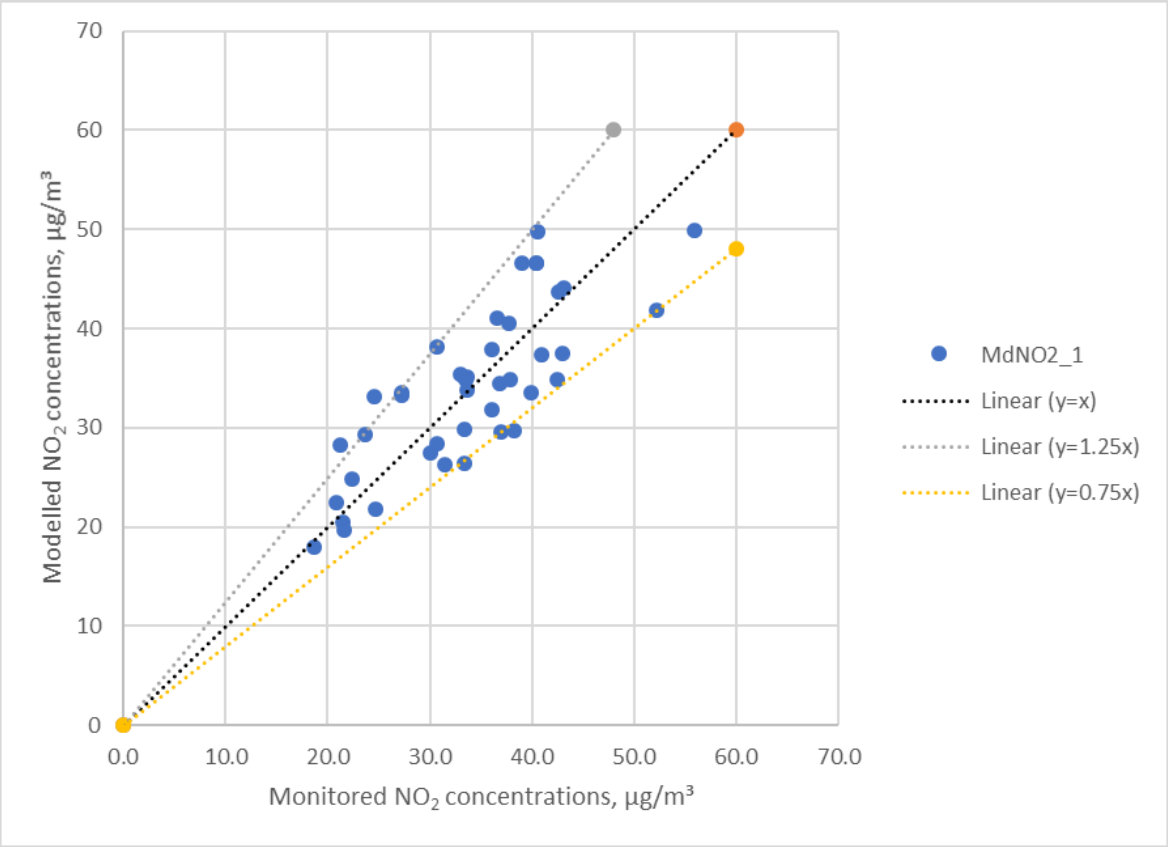


Figure A1.2- Monitored vs. modelled NO2 concentrations (µg m^{-3})



To evaluate the model performance and uncertainty, the Root Mean Square Error (RMSE) for the observed vs predicted NO_2 annual mean concentrations was calculated, as detailed in Technical Guidance LAQM.TG(16). The calculated RMSE is presented in Table A1.1. In this case the RMSE when outliers were excluded was calculated at 5.2 µg.m^{-3}.

Table A1.1 – Measured and modelled NO2 concentrations (µg.m^{-3})

Site	Site Name	Monitoring Type	Measured NO_2 annual mean concentration 2019	Modelled NO_2 annual mean concentration 2019	Difference measured – modelled
ZW8	St Paul's Street	Auto	39	47	-7.6
ZW3	Ospringe Roadside	Auto	31	26	5.2
SW66	96/94High Street, Newington	DT	34	34	-0.1
SW45	64 High Street, Newington	DT	36	32	4.3
SW35	60 High Street, Newington	DT	43	35	7.6
SW42	High Street, Opp Church Lane	DT	43	44	-0.9
SW19	Newington Social Club	DT	37	34	2.4
SW20	Newington Co Op	DT	27	34	-6.4
SW36	49 High Street, Newington	DT	33	35	-2.4
SW82	Conservative Club, St Paul's Street	DT	56	50	6.1
SW51	14/16 St Paul's Street	DT	41	50	-9.2
SW89	St Paul's Street Air Quality Station	DT	40	47	-6.2
SW71	o/s 8 Staple Close, Staplehurst Road, Sittingbourne	DT	36	38	-1.8
SW73	14 Chalkwell Road, Sittingbourne	DT	31	28	2.4
SW56	126 East Street, Sittingbourne	DT	38	41	-2.8
SW87	Canterbury Road AQ Station	DT	31	38	-7.4
SW91	Adj to 72 London Road, Teynham	DT	33	26	7
SW101	A2 Lynsted Lane, Jct	DT	22	25	-2.4
SW28	Mayors Arms, Ospringe	DT	43	38	5.4
SW30	ZW3 Ospringe Street	DT	30	28	2.6
SW31	Site 7, 4 Ospringe Street	DT	38	35	3
SW32	11 Ospringe Street, Ospringe	DT	37	30	7.4
SW96	Maison Dieu, Ospringe Street	DT	37	41	-4.4
SW29	Opp Lions Yard, Ospringe Street	DT	41	37	3.5
SW120	103 Ospringe Street, Ospringe, Faversham	DT	40	34	6.3

Site	Site Name	Monitoring Type	Measured NO_2 annual mean concentration 2019	Modelled NO_2 annual mean concentration 2019	Difference measured – modelled
SW62	Key Street, Sittingbourne	DT	34	35	-1.4
SW110	2 Cherryfields, Sittingbourne	DT	19	18	0.8
SW111	76A Key Street, Sittingbourne	DT	38	30	8.5
SW112	56 Key Street, Sittingbourne	DT	33	30	3.5
SW114	2 Florence Cottages, Chestnut Street	DT	21	22	-1.6
SW115	Cherry Tree Cottage, Chestnut Street	DT	22	20	1.9
SW116	Bankside, Chestnut Street	DT	21	20	1
SW124	31/33 Keycol Hill Sittingbourne Highest Point	DT	52	42	10.4
SW121	Façade Squirrel Cottage, Keycol Hill	DT	43	44	-1
SW122	Façade 13 Key Street, Sittingbourne	DT	21	28	-7.1
SW123	12 Key Street, Sittingbourne	DT	27	33	-6
SW76	155 Canterbury Road, Sittingbourne	DT	33	35	-1.4
SW119	Flats, The Mount, Ospringe	DT	25	22	2.9
SW83	Pembury Court, Dover Street	DT	25	33	-8.5
SW125	16/18 The Street, Bapchild	DT	24	29	-5.7
RMSE (excluding clear outliers)					**5.2**

Appendix 2 – RapidAir street canyon equations

AEOLIUS/OSPM

There are three principal contributions in the AEOLIUS model, a direct contribution from the source to the receptor, a recirculating component within a vertex caused by winds flowing across the top of the canyon, and the urban background. The RapidAir model only take the recirculating component from the canyon and sums this with the kernel derived concentrations.

The RapidAir implementation of AEOLIUS is written in python 2.7 and uses the same equations described in the referenced Met Office papers.

During the coding of the canyon model we tested the outputs of our code with calibration data provided with the FORTRAN version of AEOLIUS. Our implementation agrees almost perfectly (R^2 = 0.97) with the version supplied by the Met Office (which is in any case now out of circulation).

The AEOLIUS model is more complex than the STREET model. Concentrations are calculated for the windward and leeward sides of the road using the equations detailed below (based on equations from the Met Office). The leeward and windward concentrations described below are only calculated for streets that are perpendicular to the direction of the wind. Concentrations are calculated in ppb, and for NOx/NO_2 models are converted to µg/m^3 by multiplication by 1.91. The system of equations in Rapid Air's implementation of the AEOLIUS model are shown below.

Inputs:

Emission rates (Q, µg/m/s); traffic speeds (v_t, mph), traffic density (f, vehicles per hour), % of cars and heavy good vehicles (f_c and f_h respectively), wind speed at roof level (u_r, m/s), street canyon width (w, m), street canyon height (h, m), and angle of street (θ).

Leeward concentrations:

The leeward concentrations = sum(C_{dlee} + C_{rec}) where C_{dlee} is the direct contribution from vehicles and C_{rec} is the pollution associated with recirculation.

Direct contribution (C_{dlee}):

$$Recirculation\ zone\ (l_r) = \min(w, l_v * \sin(\theta)) \quad \text{(meters)}$$

Where:

$$vortex\ length\ (l_v) = 2 * r * h \quad \text{(meters)}$$

And r = wind speed dependence factor = 1 if u_r > 2 m/s and = u_r/2 otherwise.

If the recirculation zone is greater than the width of the canyon:

$$C_{dlee} = \sqrt{\frac{2}{\pi} * \frac{Q}{(w * \sigma_w)} * \ln\left[\left(\frac{\sigma_w * w}{h_o * u_s}\right) + 1\right]}$$

Where:

σ_w = mechanical turbulence from wind and traffic (m/s) = $\sqrt{(\lambda * u_s)^2 + {\sigma_{wo}}^2}$

λ = constant for removal at the top of the canyon = 0.1

σ_{wo} = traffic-created turbulence (m/s) = $b * \sqrt{\frac{v_t * f_c * s_c + v_t * f_h * s_h}{w}}$

where s_c = mean surface area of cars (4 m^2), s_h = mean surface area of heavy vehicles (16 m^2) and b = aerodynamic constant (0.18)

u_s = wind speed at street level (m/s) = $u_r \left(\frac{\ln\left(\frac{h_o}{z_o}\right)}{\ln\left(\frac{h}{zo}\right)}\right)(1 - d * \sin(\theta))$

h_o = effective height of emissions (2 m)

z_o = effective roughness length (0.6 m)

d = model dependence (0.45)

If the recirculation zone is less than the width of the canyon:

$$C_{dlee} = \sqrt{\frac{2}{\pi}\frac{Q}{(w * \sigma_w)}}\left[ln\left[\left(\frac{\sigma_w * d_1}{h_o * u_s}\right) + 1\right] + R * \ln\left(\frac{h_o + \sigma_w * \frac{d_6}{u_s}}{\frac{\sigma_w * l_r}{u_s} + h_o}\right) + \frac{\sigma_w}{\omega_t}\left[1 - e^{\left(\frac{-\omega_t d_7}{u_s h}\right)}\right]\right]$$

Where:

d_1 (m) = min(w, l_r)

R = max(0, C_{ang})

C_{ang} = cos(2*r* θ)

d_6 (m)= min(max(l_{max}, l_r), x_1)

l_{max} = w/sin(θ)

x_1 = vertical distance (m) at which pollutants can escape canyon = $\frac{u_s(h - h_o)}{\sigma_w}$

ω_t = removal at top of the canyon (m/s) = $\sqrt{(\lambda * u_r)^2 + 0.4(\sigma_{wo})^2}$

d_7 (m) = max(l_{max}, x_1)-x_1

Recirculation contribution (C_{rec}):

$$C_{lee} = \frac{\left[\left(\frac{Q}{w}\right)d_1\right]}{\omega_t * d_2 + \omega_s * d_3}$$

Where

d_2 (m) = min(w, 0.5*l_r)

d_3 (m) = $l_s\left(\max(0, \frac{2w}{l_r} - 1\right)$

l_s (m) = $\sqrt{(0.5 * l_r)^2 + h^2}$

ω_s = removal speed at the side of the canyon (m/s) = $\sqrt{{u_s}^2 + {\sigma_{wo}}^2}$

Windward concentrations (C_{dwind}):

Final windward concentrations = $C_{dwind} + C_{rec}$. $C_{dwind} = 0$ if $l_r \geq w$, else:

$$C_{dwind} = \sqrt{\frac{2}{\pi}} \frac{Q}{w * \sigma_w} \left[ln\left(\frac{\sigma_w + d_4}{u_s + h_o} + 1\right) + \frac{\sigma_w}{\omega_t}\left[1 - e^{\left(\frac{-\omega_t d_5}{u_s h}\right)}\right]\right]$$

d_4 (m) = min[(w – l_r), x_1]

d_5 (m) = [max[(w – l_r),x_1]]-x_1

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Cabinet Meeting	
Meeting Date	16 December 2020
Report Title	Kent and Medway Energy and Low Emissions Strategy
Cabinet Member	Cllr Tim Valentine, Cabinet Member for the Environment
SMT Lead	Nick Vickers, Chief Financial Officer
Head of Service	Nick Vickers, Chief Financial Officer
Lead Officer	Janet Hill, Climate Change Officer
Key Decision	Yes
Classification	**Open**
Recommendations	1. That Cabinet notes the Kent and Medway Energy and Low Emissions Strategy. 2. That Swale Borough Council works with KCC to deliver this strategy where appropriate.

1 Purpose of Report and Executive Summary

1.1 This report is to introduce the Kent and Medway Energy and Low Emissions Strategy and to recommend that Cabinet notes it and works with KCC where appropriate.

1.2 The purpose of the Kent and Medway Energy and Low Emissions Strategy is to identify an evidence-based pathway to deliver clean growth, and specifically, strategies and actions to eliminate poor air quality, reduce fuel poverty and deliver an affordable, clean and secure energy supply for Kent and Medway. The Strategy includes the commitment to meet the UK Government's target to achieve net-zero emissions by 2050 for the country.

2 Background

2.1 In 2020 most councils in Kent declared a climate emergency with varying net zero target dates.

2.2 Swale Borough Council set the most ambitious targets in Kent with a borough wide target of net zero by 2030.

2.3 KCC, despite lobbying by various LAs and other partners, has retained the government target of 2050 but with significant reductions by 2030.

2.4 The objective of the Kent and Medway Energy and Low Emissions Strategy is to outline the Kent and Medway approach to achieving a reduction in carbon

emissions and improvements in air quality, with an agreed Kent and Medway target of net-zero emissions by 2050. The aims of the strategy are:

EVIDENCE: Provide an ongoing evidence and intelligence base; linking data sets to identify hot spots and opportunities, and to build the business case for action across Kent and Medway.
POLICY AND STRATEGY: Facilitate the development of evidence-based policy and strategy to future proof growth, tackle emerging issues and realise opportunities.
LEADERSHIP: Support the public sector across Kent and Medway to play a strong leadership role with regards to challenges and opportunities.
ACTION: Facilitate increased and accelerated action and implementation across Kent and Medway.

2.5 The Strategy is a key element of the County Council's and Kent and Medway public sector partners' approach to tackling the climate emergency. It provides evidence-based pathways to deliver clean growth, and additionally, specific strategies and actions to eliminate poor air quality, reduce fuel poverty and deliver an affordable, clean and secure energy supply for Kent and Medway. The Strategy was reviewed and amended to take account of COVID-19 in May 2020.

2.6 The 10 priority actions link directly to a detailed implementation plan which is being finalised and adjusted in light of COVID-19. The Strategy and implementation plan will be made available on the KCC web pages in order that members of the public and external organisations can understand how the Strategy's Vision is being realised. A summary of the 10 actions, and Swale's position is given in Table 1 below. The full set of priority actions can be found on pages 15 to 28 of the Strategy.(Appendix1)

Table 1: Kent and Medway Energy and Low Emissions Strategy 10 Priority Actions
PRIORITY 1: EMISSION REDUCTION PATHWAYS TO 2050 Set area and organisational five-year carbon budgets and emission reduction pathways to 2050, with significant reduction by 2030**.** **Swale: Net Zero by 2030.**
PRIORITY 2: PUBLIC SECTOR DECISION MAKING Develop a consistent approach across Kent and Medway, to assess, manage and mitigate environmental impacts (both positive and negative), resulting from public sector policies, strategies, service delivery, commissioning and procurement**.** **Swale: Timescales more advanced than KCC.**

PRIORITY 3: PLANNING AND DEVELOPMENT Ensure climate change, energy, air quality and environmental considerations are integrated into Local Plans, policies and developments, by developing a clean growth strategic planning policy and guidance framework for Kent and Medway, to drive down emissions and mainstream climate resilience. **Swale: Local Plan under review.**
PRIORITY 4: CLIMATE EMERGENCY INVESTMENT FUND Establish a trusted Kent and Medway 'Climate Emergency' carbon sequestration, offset and renewable energy investment scheme and fund. **Swale: Being developed as part of Local Plan policies on Sustainable Construction and Air Quality.**
PRIORITY 5: BUILDING RETROFIT PROGRAMME Set up a Kent and Medway net-zero buildings retrofit plan and programme for public sector, domestic and businesses. **Swale: Swale House retrofit process started. Nothing developed yet for domestic and businesses, economies of scale could favour joint working.**
PRIORITY 6: TRANSPORT, TRAVEL AND DIGITAL CONNECTIVITY Set up a smart connectivity and mobility modal shift programme – linking sustainable transport, transport innovations, active travel, virtual working, broadband, digital services, artificial intelligence and behaviour change. **Swale: Some joint working under way.**
PRIORITY 7: RENEWABLE ENERGY GENERATION Set up an opportunities and investment programme for renewable electricity and heat energy generation. **Swale: Already have the highest level of renewable generation in Kent, but would welcome appropriate opportunities and investment.**
PRIORITY 8: GREEN INFRASTRUCTURE Develop a multi-functional, natural capital opportunity and investment programme – focusing on environmental projects that store carbon, increase climate change resilience, improve air quality and increase biodiversity. **Swale: investigating tree planting and other natural solutions.**
PRIORITY 9: SUPPORTING LOW CARBON BUSINESS Develop a support programme for Kent and Medway's Low Carbon Environmental Goods and Services sector **Swale: Already supporting businesses but would welcome a joint programme.**
PRIORITY 10: COMMUNICATIONS Develop a comprehensive communications, engagement and behaviour change programme targeted at residents, employees, businesses and visitors. **Swale: Working on this including via the fuel and water advice outreach service. We have already worked jointly to promote Solar Together but would welcome more joint communications where appropriate.**

3 Proposals

3.1 It is proposed that we note this strategy and that where appropriate we work with KCC to deliver its objectives.

3.2 However because our own targets are more ambitious and we are ahead on delivering some of the priorities it is important that we do not always wait for KCC's lead.

3.3 Officers who are members of the Kent Climate Change Network have a long established good working relationship with their counterparts at KCC and across all Kent LAs. In the past we have been the "go to" authority for partnership working – in particular the Coastal Communities 2150 project and Sustainable Sheppey. We do not wish to erode this relationship.

4 Alternative Options

4.1 Adopt the strategy – this would undermine our own targets and Action Plan.

4.2 Ignore the strategy – there are times when joint working is necessary.

4.3 Note the strategy and work jointly when appropriate – this way we can take action independently and ahead of KCC and other Kent LAs but jointly when it will facilitate our progress.

5 Consultation Undertaken or Proposed

5.1 The strategy has been through several rounds of consultation and workshops.

5.2 Officers, in particular the Climate Change Officer, the Air Quality Officer and colleagues from Planning Policy, and councillors have taken part and submitted comments.

5.3 A presentation was made to informal Cabinet in March 2020 by the then Head of Sustainable Business & Communities from KCC.

5.4 Internally the Cabinet member, deputy, the Head of Financial Services and other officers have discussed the merits of adoption versus noting.

6 Implications

Issue	Implications
Corporate Plan	The strategy supports Priority 2: Investing in our environment and responding positively to global challenges
Financial,	Some of the possible joint actions will become projects and will

Resource and Property	necessarily have financial, resource or property implications. These will be considered on a case by case basis before each project commences
Legal, Statutory and Procurement	None identified at this stage
Crime and Disorder	None identified at this stage
Environment and Climate/Ecological Emergency	The ELES in part supports our own declaration and action plan
Health and Wellbeing	There will be health benefits from reducing emissions and improving air quality
Risk Management and Health and Safety	None identified at this stage
Equality and Diversity	An Equalities Impact Assessment has been undertaken for the Kent and Medway Energy and Low Emissions Strategy, which has been updated as a result of the public consultation. There are no significant negative impacts. As this Strategy is aimed at improving health outcomes, there are likely to be more positive equality impacts than negative, particularly for Age, Maternity, Carers and Disability.
Privacy and Data Protection	None identified at this stage

7 Appendices

7.1 The following documents are to be published with this report and form part of the report:

- Appendix I: Kent and Medway Energy and Low Emissions Strategy

8 Background Papers

Declaration of a Climate and Ecological Emergency June 2019
https://services.swale.gov.uk/meetings/documents/g2156/Public%20reports%20pack%2026th-Jun-2019%2019.00%20Council.pdf?T=10

Swale Climate and Emergency Action Plan April 2020
https://services.swale.gov.uk/assets/Climate-Change-and-Ecological-Emergency/SBC%20CEE%20Action%20Plan%20Final%20with%20illustrations.pdf

KENT AND MEDWAY ENERGY AND LOW EMISSIONS STRATEGY

MEETING THE CLIMATE CHANGE CHALLENGE

JUNE 2020

SUPPORTING THE KENT ENVIRONMENT STRATEGY

CONTENTS

FOREWORD

We've only got one world. Just one. And it's changing.

Some will say **"It's always changed"** but this time around humans are responsible. The decisions we make today set the course for our planet's future. We must do the right thing.

Our Energy and Low Emissions Strategy is a big document with a single, simple goal - to ensure that every resident, neighbourhood and business in the county takes some simple steps to care for this beautiful, productive yet fragile part of the world – the bit we call Kent.

It is part of Kent's wider Environment Strategy and offers you an invitation - an invitation to come with us and find something you can do for your world. Get involved. Join in.

The first step is to recognise this climate emergency and the second is to commit to the change we need to rescue and sustain our world. There is huge pressure for growth in our county and we need to find new ways to ensure it is GOOD growth. It matters to our environment, our economy and our health. As the gateway to Europe we are well placed to take a lead on energy and emissions and our contribution could have positive impacts far beyond our county boundaries.

The call to action is all around us. We see a growing number of severe weather events and nature's response of flooding and then water shortages, icy winters and then rising temperatures. Kent is a wonderful county full of opportunity, but the truth is that some of our people live in places where air quality is low or where fuel poverty is high.

We can all make better choices - when we travel, when we invest, where and when developers plan new homes, when we choose a vehicle or when we insulate our homes. Those decisions are better when advice and learning is shared and when private and public sectors work together.

Please take a look at this Strategy and commit yourself to be part of it.

It means the world to us.

Roger Gough
Leader of Kent County Council

Alan Jarrett
Leader of Medway Council

VISION

By 2050 the county of Kent has reduced emissions to net-zero and is benefiting from a competitive, innovative and resilient low carbon economy, where no deaths are associated with poor air quality.

INTRODUCTION

The **coronavirus pandemic has changed the world,** but presents an opportunity to rebuild the county stronger, cleaner and more resilient. At the same time, **our climate is changing** and the effects are already being felt in Kent and Medway. Limiting our contribution to global warming and driving low carbon economic recovery will undoubtedly be the most urgent issues of this decade.

In recognition of the UK **environment and climate emergency**, all 14 local authorities in Kent and Medway have committed to ambitious targets to reduce greenhouse gas emissions to net-zero by 2050 at the latest. Our joint action has already seen carbon dioxide emissions in the area fall by 37% since 2005, but fully decarbonising our economy over the coming years will require momentous effort and rely on action taken in partnership.

The coronavirus pandemic will severely restrict growth in the short term, but as we emerge from this crisis the longer-term trajectory will be a **return to growth,** and this growth must be low carbon. By 2031 it is anticipated that there will be almost 180,000 new homes and nearly 400,000 extra people, a 24% increase from 2011 levels. The local economy is also expected to expand, creating an additional 170,300 jobs by 2031 a 21% increase from 2011 levels, in line with forecast population growth.

Economic recovery presents an opportunity to invest in new jobs and low carbon infrastructure; support innovation, re-skilling and retraining to expand the low carbon and environmental goods and services sector; and drive a shift in social norms and behaviour change that will benefit health and reduce emissions. A green, clean economic recovery will help protect the climate, air, land and water on which future generations depend.

Kent and Medway are already experiencing significant environmental issues and constraints.

Trees, hedgerows, grasslands, wetlands and saltmarsh all provide **natural carbon storage** that can provide a significant contribution to our net-zero targets; as well as other environmental and health benefits. However, these important habitats are

[1] Calculated using all age, all cause deaths.

at risk from land use pressures, lack of appropriate management, climate change and diseases such as Ash Dieback *(Hymenoscyphus fraxineus),* which threatens Kent's most widespread tree species.

Although air quality is generally improving in line with national trends, there are still **43 Air Quality Management Areas** across Kent and Medway and significant pockets of poor air quality along the county's major road networks. It is estimated that in 2017, there were 922 deaths associated with particulate matter (PM2.5) exposure across Kent and Medway. [1]

Pollution from road vehicles is the main cause of poor air quality across Kent and Medway and is also the largest source of carbon emissions. In addition, congestion continues to be a problem, with average journey times on A-roads increasing 6% since 2015. Keeping the county moving is a high priority, as congestion negatively impacts productivity levels and air quality.

Actions to improve and promote public transport and encourage walking and cycling for short journeys, will have the dual benefit of reducing harmful emissions and tackling congestion. Supporting the switch away from petrol and diesel to clean, alternatively fuelled vehicles will also be essential. Over 4,845 ultra-low emission vehicles are already registered in Kent.

The cost of energy is rising. The average annual domestic combined gas and electricity bill increased by 8.8% between 2017 and 2019 and now costs £1,360.[2] Government data shows that in 2017, 9.6% of Kent and Medway residents were living in **fuel poverty.**

Many Kent and Medway homes, often those of the most vulnerable residents, are cold and poorly insulated. 34% of homes that have an Energy Performance Certificate have the lowest energy efficiency ratings (E, F and G); usually due to inadequate insulation and inefficient heating systems, which can result in higher energy bills.

In industry, approximately 75% of the energy used is to produce heat, much of which is wasted. This is also true across Kent and Medway. The Government expects **business and industry** to improve energy efficiency by at least 20% by 2030,[3] this includes a focus on industrial heat recovery.

Ensuring an **affordable energy supply** for all and continuing to promote energy efficiency, forms a significant element of our Strategy. Supporting new forms of renewable low carbon energy supply will be an important part of the mix, and an opportunity to grow new low carbon sectors. The county has already seen an increase in renewable energy generation of 726% since 2012 (230MW to 1900MW). We must be bold and encourage new developments to create their own decentralised energy.

However, low carbon technologies such as electric vehicles and local renewable energy generation pose a challenge to the electricity grid network in Kent and Medway which is already significantly constrained, and which could inhibit future growth. Therefore, we must work with the energy utility companies to create a more resilient, **smart and innovative local energy system** to ensure we have the energy we need, when we need it, at the right price and without any negative environmental impacts.

Economic recovery, if clean, is a significant opportunity for Kent and Medway. Measures to tackle poor air quality and lower greenhouse gas emissions will have multiple benefits. For instance, promoting walking and cycling for short journeys improves health and reduces congestion; increasing tree and hedgerow coverage can help improve air quality, manage flood risk and support biodiversity; and supporting a switch to more efficient, low carbon energy use creates jobs and new market opportunities.

By tackling poor air quality, energy and carbon constraints in parallel, and by working closely across the public sector, business and communities to scale up action, we can protect health, the environment and be a significant player in the low carbon environmental goods and services sector (LCEGS) both in the UK and internationally.

[1] Calculated using all age, all cause deaths

[2] Provisional estimated average bill, Department for Business, Energy and Industrial Strategy (December 2019).

[3] Department for Business, Energy & Industrial Strategy, "Helping businesses to improve the way they use energy: call for evidence," 18th July 2018 [online]

PURPOSE OF THIS STRATEGY

The Kent and Medway Energy and Low Emissions Strategy sets out how we will respond to the UK climate emergency and drive clean, resilient economic recovery across Kent and Medway. Taking an evidence-based approach, it identifies a pathway to reduce greenhouse gas emissions, eliminate poor air quality, reduce fuel poverty, and promote the development of an affordable, clean and secure energy supply for this county. It is informed by and delivers, but does not duplicate, the priorities and actions from other strategies related to energy and the environment. The strategy also builds on the strengths and activities of other partner organisations.

The Strategy has four strategic aims:

1. **EVIDENCE:** Provide an ongoing evidence and intelligence base; linking data sets to identify hot spots and opportunities, and to build the business case for action across Kent and Medway
2. **POLICY AND STRATEGY:** Facilitate the development of evidence-based policy and strategy to future-proof economic recovery, tackle emerging issues and realise opportunities
3. **LEADERSHIP:** Support the public sector across Kent and Medway to play a strong leadership role with regards to challenges and opportunities
4. **ACTION:** Facilitate increased and accelerated action and implementation across Kent and Medway

The priority actions to deliver these four aims over the next five years are described on pages 15-27. Further information on the detailed actions, timescales and outputs are provided in the technical implementation plan, which is published alongside this strategy.

SUPPORTING DELIVERY OF THE KENT ENVIRONMENT STRATEGY

The Kent and Medway Energy and Low Emissions Strategy sits within the framework of the Kent Environment Strategy, which was published in 2016.

The Kent Environment Strategy provides the basis for closer cross-sector partnership working between environment, health and economic agendas. It identifies the high-level priorities to support sustainable economic growth whilst protecting and enhancing the natural and historic environment, and sustaining vibrant, healthy and resilient communities.

The Kent and Medway Energy and Low Emissions Strategy delivers across all three themes of the Kent Environment Strategy:

THEME 1: BUILDING THE FOUNDATIONS FOR DELIVERY – aims to ensure decision makers have an evidence-based understanding of the risks and opportunities relating to energy and emissions and are incorporating them into strategies, plans and actions.

THEME 2: MAKING THE BEST USE OF EXISTING RESOURCES, AVOIDING OR MINIMISING NEGATIVE IMPACTS – aims to ensure existing infrastructure, assets and resources across the public, private and domestic sector are managed to reduce emissions and build a clean future energy supply.

THEME 3: TOWARDS A SUSTAINABLE FUTURE – aims to ensure Kent and Medway's communities, businesses and public sector have embraced clean growth and are working towards developing a clean, affordable and secure local energy future.

POLICY CONTEXT

Climate change, energy and air quality issues are high on the national agenda. The Government has set a clear policy direction by revising the Climate Change Act 2008 to legislate for net-zero by 2050. Net-zero means reducing greenhouse gas emissions to almost zero and balancing any remaining emissions with schemes to remove carbon dioxide from the atmosphere, such as tree planting or technology.

Further policy is set out in the Home Energy Conservation Act 1995, the 25 Year Environment Plan (2018), the Clean Growth Strategy (2017), the Clean Air Strategy (2019) and Clean Maritime Plan (2019), which aim to protect and enhance the environment, mitigate climate change, support clean, low carbon economic growth and address the negative impacts on health from a poor environment.

Local action will play a significant role in achieving these ambitions and therefore local policy must reflect these priorities. The key strategies that have influenced the development of the Energy and Low Emissions Strategy are summarised in Figure 1. Further detail on the policies driving action are outlined in the ***Kent and Medway Energy and Low Emissions Strategy Evidence Base,*** which is published alongside this strategy.

CHALLENGES

25 YEAR ENVIRONMENT PLAN

Aims to deliver cleaner air and water; thriving plants and animals; connect people with the environment; and secure the environment for future generations.

CLEAN AIR STRATEGY

Focuses on reducing industrial and transport emissions. It also aims to reduce particulate matter emissions from solid fuel used in homes. It also aims to tackle rising agricultural emissions.

THE ROAD TO ZERO

Aims to ensure almost every car and van is zero emission by 2050. It supports delivery of both the Industrial and Clean Growth Strategies.

LOCAL TRANSPORT PLAN 4: DELIVERING GROWTH WITHOUT GRIDLOCK (2016-2031)

SUSTAINABLE DEVELOPMENT GOALS

Adopted by all United Nations Member States, the goals provide a shared blueprint for peace and prosperity for people and the planet, now and into the future.

INDUSTRIAL STRATEGY

Aims to boost productivity, create good jobs and position the UK as a leader in low cost, low carbon innovation.

THE CLEAN GROWTH STRATEGY

Aims to achieve nearly zero emissions from buildings and transport by 2050.

LOCAL ENERGY STRATEGY: ENERGY SOUTH 2 EAST

Provides an analysis of the opportunities and challenges across heat, transport and power in South East England.

OPPORTUNITIES

FIGURE 1: Key national and regional strategies influencing the development of the Kent and Medway Energy and Low Emissions Strategy.

EXAMPLES OF ACTIVITY AND ACHIEVEMENTS IN KENT AND MEDWAY

Carbon dioxide emissions in Kent and Medway fell 37% between 2005 and 2017, hitting our 2020 Kent Environment Strategy target two years early.

Low Carbon Across the South East (LoCASE) has been identified in the Tri-LEP Energy Strategy as an exemplar project for replication across the south-east region. Supported by European funding, LoCASE provides free support to help businesses become more competitive and profitable while protecting the environment and encouraging low carbon solutions. Since LoCASE began in 2016, £3.5m has been awarded to 425 Kent and Medway businesses.

The installed capacity of solar, wind, waste and Combined Heat and Power (CHP) increased by 726% in five years, from 230MW in 2012 to 1,900MW in 2017.

Kent and Medway's non-domestic gas consumption decreased by 57% between 2005 and 2018, whilst domestic gas consumption fell by 20% over the same period.

The number of days of moderate or high air pollution in Kent and Medway fell between 2012 and 2016 and there have been improvements in most Air Quality Management Areas.

Since the Warm Homes Scheme began in 2014, over 2,400 energy efficiency measures have been installed in over 2,300 homes in Kent and Medway.

89% of newly built homes in Kent and Medway had an Energy Performance Certificate rating of A or B in 2017, meaning they have the highest energy performance, up from 62% in 2011.

Average household electricity use in Kent and Medway continues to fall; down from 4,117 kWh in 2015, to 3,894 kWh in 2018. A 5% reduction in three years.

4,845 ultra-low emission vehicles (ULEVs) are registered in Kent (September 2019). In February 2019, Kent County Council was awarded £180,000 from the Government's Office of Low Emission Vehicles to install 8 rapid chargers for use by taxis in 6 Kent Districts.

In a 2018 survey of Kent residents, 85% reported that they have fitted energy efficiency measures, such as loft or cavity wall insulation, and 40% have fitted energy monitoring equipment.

There has been a 42% increase in people using train stations in Kent in the past ten years. In 2016/17, 1.8 million people used Ebbsfleet International Station.

KENT AND MEDWAY KEY FACTS AND FIGURES

54%
of total fuel consumption is from gas and electricity

Heat networks[4] currently provide 2% of the UK heat demand, but this is estimated to rise to 43% by 2050.

EFG RATING
23% of homes and 19% of public buildings are E, F, or G rated, meaning they have the worst energy performance, highest energy running costs and make a bigger contribution to emissions.

11% of residents have reported that they struggle to pay their energy bills. 41% of those, live in rented accommodation. [5]

14.3% increase in the number of vehicles on major roads in Kent between 2006 and 2016

9.2M
vehicle movements at Port of Dover and Channel Tunnel every year

73,000
households in fuel poverty (2017)

Only a 4.5% fall in carbon emissions from transport since 2005.

43 AIR QUALITY
Air Quality Management Areas, where air pollutants have been known to exceed government objectives.

Kent's rate of Excess Winter Mortality was the same as the South East and English averages in 2017/18.

Kent's rate of Excess Winter Mortality was the same as the South East and English averages in 2017/18.

Kent and Medway's mortality rate associated with poor air quality is worse than the national average.

BY 2031 KENT AND MEDWAY ARE EXPECTING TO SEE[6]

178,600
additional homes **(24% growth)**

396,300
additional people **(23% growth)**

170,300
additional jobs **(21% growth)**

This predicted population and economic growth will require a higher demand for energy. It is likely that domestic gas and electricity sales will rise by 23% and 19% respectively from 2014/15 to 2030/31.

[4] Heat networks supply heat from a central source to consumers.
[5] Kent Environment Strategy resident survey, July 2018
[6] Figures identified by the Growth and Infrastructure Framework for Kent and Medway

OUR CHALLENGES

Despite the many successes and opportunities, Kent continues to face some significant challenges. These will need to be addressed in the short to medium-term if the environmental condition of the county is not to see considerable deterioration. The Kent and Medway Energy and Low Emissions Strategy Evidence Base identifies the key issues, which are summarised here:

SECURING A CLEAN, GREEN ECONOMIC RECOVERY

Supporting economic recovery from the coronavirus pandemic and accommodating the significant levels of housing growth currently required by government will be a major challenge for the county and is an influencing factor in all the key issues identified. This means not only creating new jobs and supporting low carbon innovation, but also advancing climate action in ways that make Kent and Medway more resilient and attractive places for low carbon companies to invest. Principles of Clean Growth (growing our economy whilst reducing greenhouse gas emissions), must be factored into all planning and development polices and decisions, whilst not becoming a barrier to new development.

REDUCING GREENHOUSE GAS EMISSIONS TO NET-ZERO

All local authorities in Kent and Medway have committed to reducing greenhouse gas emissions to net-zero. Our current progress is a 37% reduction in carbon dioxide emissions since 2005 but achieving our target will require a substantial step up in action, both in terms of scale and speed.

Whilst emissions from the industry and commercial sector and domestic sector have fallen significantly over the period (falling 57% and 35% respectively), emissions from the transport sector have only reduced by 4.5% (see Figure 2). The transport sector is now the largest source of emissions in Kent and Medway.

To date, much of the reduction in emissions has been due to a national decrease in the use of coal for electricity generation and the closure of a small number of energy-intensive industrial plants. However, in order to achieve net-zero, all

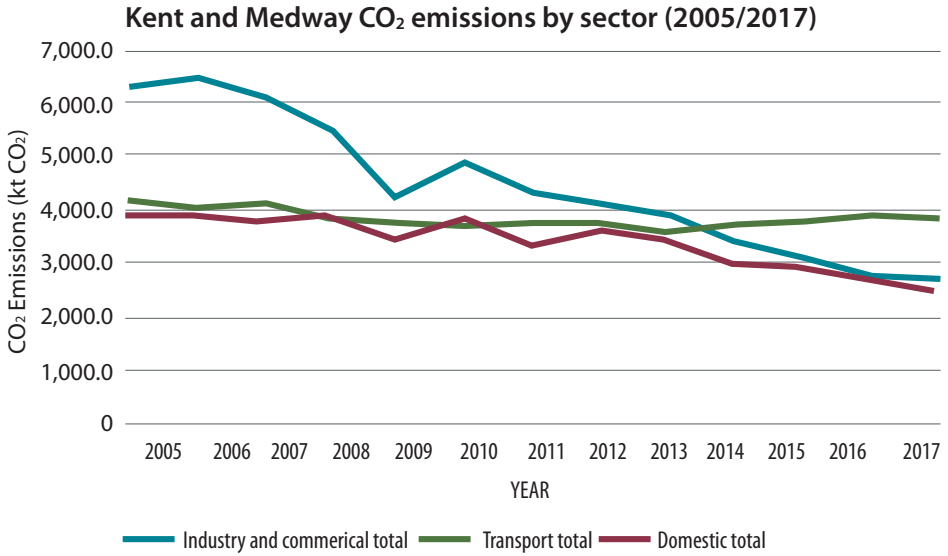


FIGURE 2: CO_2 emissions profile for Kent and Medway; this data includes estimated emissions for the industrial and commercial, transport and domestic sectors. Note: kt refers to kilotons

sectors will need to use resources much more efficiently and switch to low-carbon fuels for electricity, heating and transport.

We will also need to increase the amount of carbon stored in the natural environment; this is known as carbon sequestration. Soil and vegetation such as trees, hedges, wetlands and kelp all store carbon, so improving land management practices and increasing vegetation coverage will be essential if we are to achieve our net-zero target. These measures can also provide other benefits, such as reducing air and water pollution, reducing flood risk, improving biodiversity and providing health, cultural and leisure opportunities for local communities.

TACKLING HOT-SPOTS OF POOR AIR QUALITY

Poor air quality is a major health challenge for the UK causing both short and long-term effects on health. Long-term exposure to air pollution can impact on all stages of life; from asthma in children, to emerging evidence linking fine particulate matter (PM2.5) to the progression of Alzheimer's and Parkinson's.

Public Health England estimates that the cumulative health and social care costs of air pollution (PM2.5 and NO_2) in England could reach £18.6 billion by 2035. Poor air quality also has adverse impacts on the natural environment through damage to vegetation, soils, rivers and lakes.

Although air quality in the county is generally improving in line with national trends, there are still 43 Air Quality Management Areas and significant pockets of poor air quality along the major road networks. Kent and Medway's position between London and the continent brings air quality challenges associated with cross-channel traffic, including a disproportionately large number of HGVs, with their associated diesel emissions. Around the coast and ports, shipping brings additional impacts from the use of marine diesel. Even air pollution sources from outside Kent and Medway impact the population; with easterly winds bringing pollution from continental sources and westerly winds bringing urban pollution from London.

PROTECTING THE VULNERABLE

It is often the most vulnerable and deprived that suffer the most from poor air quality, cold homes and fuel poverty. Whilst air pollution is harmful to everyone, some people are at greater risk due to

- living in areas with high levels of air pollution
- learning or working near busy roads
- age; in the womb, infancy, early childhood and the elderly
- existing medical conditions, such as lung and heart disease and asthma.

These vulnerabilities are heightened among those living in the most deprived communities. This is due to poor housing and indoor air quality, the stress of living on a low income, unhealthy diet, smoking and limited access to green spaces.

Eliminating poor air quality and fuel poverty and achieving net-zero emissions will require changes to the way we travel, access services and use energy. We must therefore ensure that all residents in Kent and Medway are supported to make and benefit from these changes. For example, providing funding to help those in fuel poverty improve the energy efficiency of their home and ensuring superfast broadband, public transport and refuelling points for low carbon vehicles are widely available.

GROWTH WITHOUT GRIDLOCK – ENABLING INTEGRATED AND CONNECTED TRANSPORT, TRAVEL AND DIGITAL CONNECTIVITY

A convenient, affordable and reliable transport network is vital for providing access to facilities and services, connecting businesses and communities and reducing social isolation. However, transport contributes over 40% of the county's carbon emissions and pollutants from road vehicles have a negative impact on air quality and human health.

Kent is already experiencing increased congestion on its road and rail network. The average delay on Kent's A-roads has increased almost 7% since 2015 and average speed has dropped 1% over the same period. With severe congestion on the highway network, particularly in major town centres, growth across the county will be constrained without investment.

Achieving safe and effective transport networks that support clean economic recovery is a significant challenge. Our action must not only focus on low carbon road transport such as electric and hydrogen vehicles, but also promote smarter driving and traffic management; improve infrastructure for walking and cycling (active travel); ensure convenient connections to clean public transport; and support new transport models such as car clubs, car sharing and automated vehicles through the use of smart technology.

Promoting and supporting active travel will be an essential element of the strategy, which will not just help to reduce emissions, but also bring numerous health benefits.

At the same time, we need to support smarter working practices. The coronavirus pandemic forced many organisations and businesses to adapt to home working

overnight. As restrictions are lifted and the economy recovers, we must utilise and learn from this experience, whilst continuing to improve broadband services and enhance access to digital services to ensure demand for travel reduces permanently. Over 95% of Kent and Medway's homes and businesses now have access to superfast broadband, but there are still significant challenges to get 100% consistent coverage and service across the county and ensure the full benefits of digitalisation are realised.

ENSURING ENERGY SUPPLIES ARE LOW-CARBON, SECURE, AFFORDABLE AND LOCAL WHERE POSSIBLE

Energy prices are increasing again. Government data estimates that the average annual domestic combined gas and electricity bill increased by 8.8% between 2017 and 2019 and now costs £1,360. Higher energy prices can have an impact on business recovery and residents' wellbeing. Although fuel poverty levels vary across the county; from 12.3% in Thanet, to 7.7% in Dartford, eight council areas recorded fuel poverty rates higher than the South East average of 8.7% in 2017.

Continued housing growth means that our energy consumption is set to rise. A study commissioned by Kent County Council revealed that between 2014/15 and 2030/31, domestic gas demand in Kent and Medway is expected to increase by 23% and domestic electricity demand is expected to increase by 19%.

Demand for energy is exacerbated by the fact that large amounts are wasted. The UK has some of the least energy efficient housing stock in Europe and much of the industrial heat produced in South East England is released into the atmosphere, despite the fact it could be reused. There is a huge opportunity to utilise more efficient technology to reduce energy demand and achieve cost savings for residents and businesses alike.

Demand for heat and electricity, together with generation and supply is intrinsically linked to carbon dioxide emissions, due to our current reliance on fossil fuels. It is therefore essential to understand how much energy is used, by whom, how and for what, and how this might change in the future. This will allow us to identify the most appropriate and cost-effective interventions to support the transition to a secure, affordable, low or zero carbon energy system.

The challenge of decarbonising energy at the local level will be threefold:

- Increase the supply of local, low carbon energy generation, at or near the point of use, whether domestic or industrial.
- Significantly cut consumption of energy derived from fossil fuels, for example, facilitating low-carbon energy connections for properties that are not connected to the gas network and still heated by coal or oil.
- Eliminate wasted energy through greater energy efficiency, targeting industrial processes, commercial buildings and homes.

OVERCOMING ENERGY GRID CONSTRAINTS

Energy security is vital to the development and growth of Kent and Medway in the coming years. However, the energy system in the UK and Kent is changing. Two-thirds of the UK's existing coal, gas and nuclear power stations are set to close by 2030 and any future power stations must be largely decarbonised, if the UK is to achieve its legally binding target of cutting carbon emissions to net-zero by 2050.

Much of the county is already subject to electricity grid network constraints, which is making new connections increasingly difficult, particularly for new energy generation projects. Electricity demand is also expected to grow significantly by 2050, driven by the growth in electric vehicles and increased electrification of heating, which could see up to 60% of homes using heat pumps. A drive towards locally generated renewable energy, often from smaller, more dispersed sources, will further ramp up pressure on an already constrained electricity grid network.

Changing supply and demand, though an enormous opportunity, also presents significant challenges to our existing system nationally and locally. It will require large amounts of investment in infrastructure and the transmission and distribution networks. It will be essential to map existing electricity and gas grid constraints against future development, to identify potential issues early and to identify any opportunities for local generation solutions, such as district heating systems.

HOW WE DEVELOPED THIS STRATEGY

Underpinning this Strategy is the *Kent and Medway Energy and Low Emissions Strategy Evidence Base*, which is drawn from a wide range of sources:

- Government strategies, plans, reports and national data sets.
- The Tri-LEP Energy Strategy and Evidence Base.
- The Kent and Medway State of the Environment Report and annual monitoring report.
- AECOM Renewable Energy for Kent 2017 Update.
- Public health indicators and evidence covering national and local area data.
- Home energy conservation and fuel poverty action plans and reports.
- Air quality monitoring plans and reports from Kent District and Borough Councils and Medway Council.
- Public and private sector research and current activity on the topics of energy, fuel poverty, transport, air quality, growth and planning and the impacts on public health.
- The 2018 Kent Environment Strategy Public Perception Survey.

Central to the development of this strategy has been stakeholder engagement, through a dedicated cross-sector working group, workshops and consultations. Organisations and partners involved in the development of the strategy include, amongst others, all Local Authorities in Kent and Medway, Joint Chief Executives, Joint Kent Leaders, NHS, Kent Fire and Rescue Service, South East Local Enterprise Partnership, Kent and Medway Economic Partnership, Public Health, Kent Housing Group, Kent and Medway Air Quality Partnership, Kent and Medway Sustainable Energy Partnership, Kent Energy Efficiency Partnership, Kent Planning Officers Group and Kent Health and Wellbeing Board. A summary of the review process is shown in Figure 3.

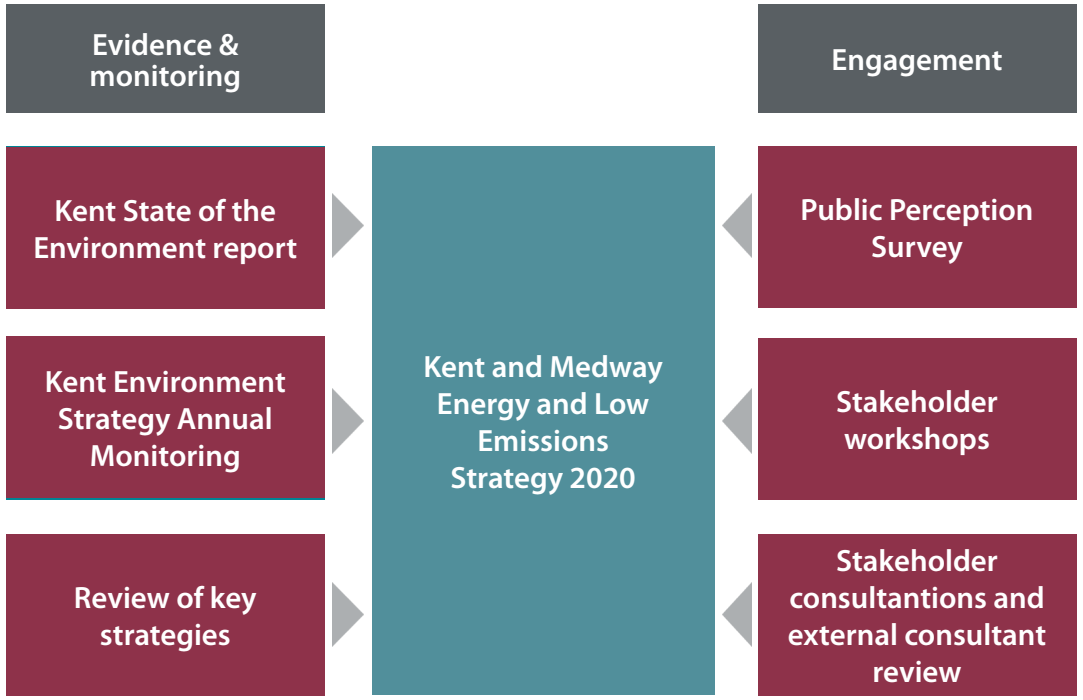


Figure 3: Summary of the review process used to develop the Kent and Medway Low Emissions Strategy

ENERGY SOUTH TO EAST: TOWARDS A LOW CARBON ECONOMY - THE TRI-LEP ENERGY STRATEGY

The Government's Department for Business, Energy and Industrial Strategy (BEIS) has requested and provided the funding to all Local Enterprise Partnerships (LEPs) to produce regional Local Energy Opportunities Strategies, which should provide a clear analysis of the local opportunities and challenges across heat, transport and power.

In response to this request, the South East Local Enterprise Partnership (SELEP) has partnered with Coast to Capital and Enterprise M3, to develop an ambitious regional Local Energy Strategy, which aims to reduce emissions from energy and transport and support clean growth.

The strategy has identified five themes and 18 potential technological project model interventions, which are shown in Figure 4. These interventions will be scalable across the geography to increase impact and investment and develop partnership working across Local Enterprise Partnerships, including Kent and Medway. Where project models are relevant for Kent and Medway, suitable actions will be reflected in the Kent and Medway Low Emissions Strategy.

The full strategy can be found at www.southeastlep.com/our-strategy/energy-south2east.

FIVE PRIORITY THEMES	PROJECT MODELS
LOW CARBON HEATING	#1 District Heat Networks rollout #2 Off-gas grid homes #3 Hydrogen injection into the Natural Gas grid #16 New-build homes on hydrogen grid
ENERGY SAVING AND EFFICIENCY	#2 Off-gas grid homes #9 Energy Efficiency in homes #10 SME Support Programme
RENEWABLE GENERATION	#4 Offshore wind development #5 Solar and microgrid on landfill sites #6 Biomass fuel supply chain development #7 Solar energy for Network Rail #8 Car parks - solar potential #17 Biofuel evolution
SMART ENERGY SYSTEM	#5 Solar and microgrid on landfill sites #11 Housing and community microgrids #12 EV charging & hydrogen-fuelling infrastructure #15 Setup of ESCO / MUSCO infrastructure #18 Support developments in CO2 capture
TRANSPORT REVOLUTION	#12 EV charging & hydrogen-fuelling infrastructure #13 CNG fleet fuelling #14 Ports - modernisation of energy infrastructures

Figure 4: The 5 themes and 18 project models in the Energy South2East Action Plan.

OUR TEN PRIORITIES

Achieving our vision will require significant, coordinated action across all sectors for the next thirty years. The following pages describe the ten areas that have been identified as a priority for collaboration and the immediate, short- and longer-term actions required.

The priorities are not listed in order of importance and will be implemented concurrently. No regrets actions that should be undertaken immediately have also been included to ensure significant action takes place as soon as possible.

A technical implementation plan accompanies this strategy and provides detailed information on the specific actions that will be taken, action owners, timescales and outputs.

PRIORITY 1:
EMISSION REDUCTION PATHWAYS TO 2050

Set five-year carbon budgets and emission reduction pathways to 2050 for Kent and Medway, with significant reduction by 2030.

RATIONALE

Carbon budgets will set quotas for the amount of greenhouse gases that can be emitted in five-year periods. These can then be used to identify the actions (or pathways), that will allow us to stay within our carbon budgets. Such evidence-based pathways will ensure we prioritise the most cost-effective activities and will support more collaborative working with partners across the county, region and nationally. It will also highlight where appropriate engagement is needed to influence aspects outside local authorities' control.

OUTCOME

Everyone in Kent and Medway can see the scale of action required to achieve net-zero emission by 2050, with significant reductions in emissions by 2030. Decision makers understand where action and resources should be targeted. Progress is monitored and reported.

HIGH LEVEL ACTIVITIES

DO NOW	Agree evidence and current baseline for five-year carbon budgets.
	Set local authority carbon budgets with emission reduction pathways to net zero by 2050, with significant reduction by 2030.
SHORT TERM (BY 2023)	Set costed and jointly owned area-based carbon budgets for Kent and Medway.
	Set detailed, area-based emission reduction pathways to net zero by 2050, with significant reduction by 2030. Pathways to cover all public and private organisations and communities.
	Monitor and report progress publicly.
FOR LONGER TERM CONSIDERATION (BY 2030)	Develop a full carbon footprint for Kent and Medway based on consumption (not territorial or organisational boundaries), with consumption targets and reduction measures integrated into existing carbon budgets.

PRIORITY 2:
PUBLIC SECTOR DECISION MAKING

Develop a consistent approach across Kent and Medway, to assess, manage and mitigate environmental impacts (both positive and negative), resulting from public sector policies, strategies, service delivery, commissioning and procurement.

RATIONALE

The decisions made by Kent and Medway's public sector affect the environment and everyone living and working in the area. Kent County Council alone spends over £1.5 billon each year providing a range of essential services to the people of Kent. Developing a simple way to assess, manage and mitigate these impacts will ensure public sector policies, services and spending support our environmental targets. In addition, the public sector's influence and spending power will help drive demand and support innovation in the local clean growth sector.

OUTCOME

Public sector decisions and spending are consistent with our net-zero and clean growth targets and are utilising opportunities to drive market change and support expansion in the clean growth sector.

HIGH LEVEL ACTIVITIES

DO NOW	Develop a simple checklist to identify where significant environmental issues and opportunities may arise, for use on imminent key decisions, major commissions and procurements.
	Revisit existing social value commitments within contracts and align to climate change and net-zero ambitions where possible.
	Stronger emphasis on reducing carbon miles and on buying local goods and services where possible.
SHORT TERM (BY 2023)	Develop a full net-zero and climate change impact assessment and social value framework aligned with Kent and Medway targets, to include: specific policies such as requiring the supply chain to match net-zero commitments; simple checklists; guidance and tool kits; training and technical support.
	Develop a supply chain support programme to enable small and medium sized enterprises (SMEs), within large supply chains to effect change and reduce costs; adopt new lower impact processes and win new business.
FOR LONGER TERM CONSIDERATION (BY 2030)	Consider expanding to include a full carbon and ecological footprint, based on consumption and lifetime costs in strategy, policy, commissioning and procurement.

PRIORITY 3:
PLANNING AND DEVELOPMENT

Ensure climate change, energy, air quality and environmental considerations are integrated into Local Plans, policies and developments, by developing a clean growth strategic planning policy and guidance framework for Kent and Medway, to drive down emissions and incorporate climate resilience.

RATIONALE

Almost 180,000 new homes will have been built in Kent and Medway by 2031 and will still be in use after 2050. To ensure the buildings and infrastructure we construct today are fit for the zero-carbon future, we need to ensure planning policies and decisions embrace clean growth, support good quality sustainable design and promote low carbon travel, transport and digital connectivity. A joint evidence base and planning resource, together with shared position statements, guidance and polices will help inform planning decisions and future-proof new developments.

OUTCOME

New developments in the county are sustainable, carbon neutral and climate resilient. Kent and Medway's development and construction industry is supported to be cutting edge to enable a quicker economic recovery for the sector.

HIGH LEVEL ACTIVITIES

DO NOW	Secure agreement for a joint Kent and Medway clean growth and climate change evidence base and planning resource, to ensure that planning decisions are fully informed by the latest evidence and advice.
	Refresh the Kent Design Guide to reflect clean growth, net-zero and climate change mitigation and adaptation.
SHORT TERM (BY 2023)	Develop a jointly owned, clean growth and climate change evidence base for planning policy and development control.
	Develop a clean growth and climate change strategic planning framework for Local Plans and development, by identifying common guidance, position statements, policies and targets.
	Set stretching net-zero targets for any new development over 100 houses.
FOR LONGER TERM CONSIDERATION (BY 2030)	Fully integrate clean growth and climate change into Local Plans and planning policies.
	Aim for "energy positive" new developments and communities (communities producing more energy than they are using).

PRIORITY 4:
CLIMATE EMERGENCY INVESTMENT FUND

Establish a trusted Kent and Medway 'climate emergency' carbon offset scheme and renewable energy investment fund

RATIONALE

Before the coronavirus pandemic, funding for climate emergency actions came from many disparate sources including; developer contributions, business rates, public sector funding, charitable donations from residents and businesses, and external grants and funding. There is likely to be significantly less funding available for environmental projects in the short to medium term, so ensuring money is invested in projects that have the greatest impact and bring multiple benefits will become increasingly important.

A climate emergency investment fund for Kent and Medway will pool the funding available and match it to the most cost effective and biggest impact schemes. The fund will be informed by renewable energy and natural capital opportunities studies.

OUTCOME

Developers, businesses, public sector and residents can offset their carbon emissions by investing in meaningful 'climate emergency' projects in Kent and Medway, such as tree and hedge planting, habitat improvement, renewable energy generation and building retrofit. The fund not only generates additional resources for delivering our climate emergency targets, but also brings environmental and social benefits.

HIGH LEVEL ACTIVITIES

DO NOW	Review existing funding streams and see how they can be tweaked to provide additional resource.
	Package up quick wins and 'oven-ready' projects suitable for external funding such as crowd funding or business sponsorship
	Review external funding expertise and opportunities and look at increasing access to finance through collaboration and development of a central resource.
SHORT TERM (BY 2023)	Develop and promote a Kent and Medway offset scheme and permanent crowd funding space to support new and existing local environmental projects and groups.
FOR LONGER TERM CONSIDERATION (BY 2030)	Further develop a cross-sector, multi-agency sequestration, offset and low carbon investment fund for Kent and Medway that can be used by the public, community and private sector.

CASE STUDY: WORKING WITH SCHOOLS TO TACKLE AIR POLLUTION

In 2018, Maidstone Borough Council and Tunbridge Wells Borough Council environmental health teams worked with local schools to tackle local air pollution. Schools who signed up to the Clean Air for Schools Scheme were helped to undertake an engaging class experiment. Schools were provided with two free air monitoring tubes per month, along with a teaching pack and guidance on how to record data and report the results back to the council.

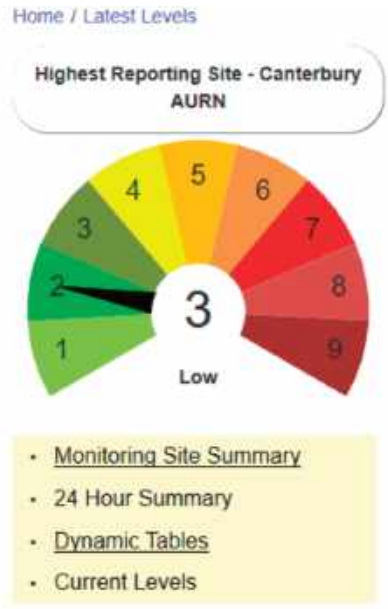
This hands-on approach allowed students to analyse the direct relationship between the volume of traffic outside their school and its impact on air pollution within the school grounds. The objective was to encourage a reduction in car journeys made by parents and to highlight the effects of leaving engines idling while dropping off and collecting children.

The project was launched in conjunction with the KM Charity Team's Green Champions and is sponsored by the Mid-Kent Environmental Health Team, with no funding required from the schools. For more information, or to register, visit: www.maidstone.gov.uk/cleanairforschools. Similar schemes are now also run by Medway Council and Swale Borough Council, in partnership with the KM Charity Team.

CASE STUDY: KENT AIR WEBSITE

The Kent and Medway Air Quality Monitoring Network is funded by the district and borough councils within the county, Medway Council and Kent County Council. The network aims to promote the improvement of air quality within the region, to help local authorities to meet their obligations under environmental regulations and to maintain an accessible database of robust measurements for public reporting, research and development.

The Kent Air website has been developed by the network to provide easy public access to live air quality levels, historic data measured from automatic monitoring and NO2 diffusion tubes, and published data and reports for Medway and all district and borough councils except for Dartford and Sevenoaks (whose data is hosted on the London Air Quality Network website: www.londonair.org.uk). The website also provides information about the health impacts of air pollution and recommended health advice for the forecast level of pollution.



PRIORITY 5: BUILDING RETROFIT PROGRAMME

Develop Kent and Medway net-zero buildings retrofit plans and programmes for public sector, domestic and business.

RATIONALE

Over the next 30 years, most of the emissions from the built environment will be from buildings or communities that are already in existence today. In addition, some of our most vulnerable residents are living in cold, energy inefficient homes which are expensive to run; worsening health problems and causing fuel poverty. Funding for building improvements is fragmented and complicated by property ownership issues, and projects often need to be done at scale to attract the investment needed.

In the short term, our activities will focus on expanding and accelerating existing domestic energy efficiency and fuel poverty initiatives and supporting energy efficiency and low carbon heat generation in non-domestic buildings. These programmes will then need to be expanded to ensure retrofit is seen from the perspective of a 'place', linking public buildings and the public realm, schools, businesses and homes, both rented and owned.

OUTCOME

Greenhouse gas emissions from Kent and Medway's existing buildings are significantly reduced and the housing stock no longer exacerbates levels of fuel poverty. High volume retrofit programmes for homes, businesses and public sector buildings maximise external funding and finance, supporting the local retrofit industry to be cutting edge.

HIGH LEVEL ACTIVITIES

DO NOW	Undertake 'quick-wins' in public and commercial premises such as converting lighting to LEDs, installing energy and water efficiency measures and controls and training building managers. Utilise and promote existing funding pots: • Kent and Medway Warm Homes Programme and other domestic energy efficiency and fuel poverty projects through the Kent Energy Efficiency Partnership (KEEP). • LOCASE (Low Carbon Across the South East) grant support programme to improve efficiency of local businesses.
SHORT TERM (BY 2023)	Establish a public sector building retrofit programme, identifying joint initiatives that maximise economies of scale including shared buildings and facilities, EV charging and micro energy generation. Look to scale up housing retrofit by maximising government funding and developing innovative funding mechanisms with a focus on fuel poor; difficult to treat properties such as park homes; off-gas properties; private rented sector; and 'Able to Pay'. Scope cross-sector place-based approach, identifying quick wins and how we can work with private investors to scale up retrofit across Kent and Medway.
FOR LONGER TERM CONSIDERATION (BY 2030)	Develop a large scale, cross-sector, area-based retrofit programme. The programme will focus on place and public realm, including business and communities, to create net-zero and "energy positive" communities.

PRIORITY 6: TRANSPORT, TRAVEL AND DIGITAL CONNECTIVITY

Set up a smart connectivity and mobility modal shift programme – linking sustainable transport, transport innovations, active travel, virtual working, broadband, digital services, artificial intelligence and behaviour change.

RATIONALE

Tackling poor air quality and achieving safe and effective transport networks that support low carbon economic recovery have been highlighted as key challenges for Kent and Medway. Furthermore, greenhouse gas emissions from transport have remained stubbornly high, but the coronavirus pandemic triggered a change in digital and travel behaviours that could be utilised to ensure emissions from transport are reduced permanently.

Tackling these issues and opportunities will require a combination of measures that improve infrastructure and facilities to encourage low carbon travel and drive behaviour change. We must also continue to tackle poor air quality hotspots, through the implementation of Air Quality Management Plans.

OUTCOME

Greenhouse gas emissions from transport and travel are significantly reduced and air quality is improved.

HIGH LEVEL ACTIVITIES

DO NOW	Set a challenging 2030 business miles reduction target for the public sector. Work collaboratively with the public and private sector to roll out EV charging points and infrastructure for walking and cycling. Support public transport providers, including school transport providers, to use lower emission vehicles. Tackle poor air quality hotspots through the implementation of Air Quality Management Plans.
SHORT TERM (BY 2023)	Develop and expand sustainable travel policies that reduce car use and business miles, through a hierarchy of travel options to reduce the need to travel, encourage modal shift to walking, cycling and public transport or increase car sharing. Implementation of low-carbon mobility hubs for electric cars, electric bikes and push bikes, to include battery storage and solar panels where possible.
FOR LONGER TERM CONSIDERATION (BY 2030)	Review and develop approaches that consider: • locating services nearer to public transport or within walking distance of communities • reallocation of road space in favour of more sustainable travel modes • increased control, regulation and charging for public parking in favour of electric vehicles and public transport • increased involvement in regulation of public transport and taxis to tackle poor air quality and lower greenhouse gas emissions • testing and roll-out of new technologies to enable the transition to low carbon transport and travel.

CASE STUDY: PARK AND PEDAL IN CANTERBURY

In June 2018, Canterbury City Council launched its Park and Pedal scheme at Wincheap Park and Ride. Over 1,200 journeys were recorded between July 2018 and January 2019. Of these journeys, 87% were by customers who were not regular users of the Wincheap Park and Ride and would normally have driven into the city centre.

Cyclists who sign-up to the scheme pay a £15 deposit for a key card that allows them to leave their bike in a high security compound. They are then able to drive to the car park each morning and park for free, before grabbing their bike and heading into the city, helping to cut the queues and improving air quality in the town centre.

The scheme was largely funded by a £21,300 grant from Kent County Council. The Park and Pedal map can be viewed on Canterbury City Council website and shows bike routes from Wincheap Park and Ride into the city, cycle racks and places to refill your water bottle.

CASE STUDY: MAKING KENT HOMES WARMER

Through a combination of schemes and initiatives, local authorities in Kent and Medway have been able to maximise funding and signpost residents to initiatives that make homes warmer, reduce health inequalities and lower carbon emissions.

Since 2013, Dartford, Dover, Gravesham, Tonbridge and Malling and Tunbridge Wells Councils have offered a Collective Energy Switching scheme, called Energy Deal. Residents can register for free to take part in energy auctions (held 3 times a year), to identify lower energy tariffs without any obligation to switch. Since 2013, the Energy Deal has helped residents save £804,632 on their energy bills collectively.

Kent and Medway partners are also working together to promote the Warm Homes scheme that helps residents identify energy efficiency measures that will help lower their energy bills and make their homes feel warmer. Since the Warm Homes scheme began in 2014, over 2,400 energy efficiency measures have been installed in over 2,300 homes. In total, the measures are expected to save an estimated 39,000 tonnes of carbon and save residents £8.8 million over the course of the measures' life.

For more information visit www.energydealswitch.com and www.kent.gov.uk/warmhomes

PRIORITY 7:
RENEWABLE ENERGY GENERATION

Set up an opportunities and investment programme for renewable electricity and heat energy generation.

RATIONALE

Securing a low carbon, sustainable economic recovery will require us to transform the way we generate energy. Whilst some of this will be done at the national level, we must also support new low-carbon energy infrastructure opportunities, such as those presented in the Tri-LEP Energy Strategy. We will focus on supporting opportunities that allow more of our energy to be produced locally and from renewable sources and increasing the number of new developments supplied by local energy centres and district heating schemes.

OUTCOME

The county is an exemplar for renewable energy generation; producing more low carbon energy than it consumes and stimulating enhanced renewable energy supply chain opportunities that will support a green recovery.

HIGH LEVEL ACTIVITIES

DO NOW	Install roof-top solar panels on all suitable public sector buildings. Support residents and small businesses to install roof-top solar panels, by offering a group purchasing scheme such as Solar Together Kent.
SHORT TERM (BY 2023)	Undertake a renewable electricity and heat energy generation opportunities study for Kent and Medway. The study will build on existing knowledge and focus on all existing and emerging technologies including solar, wind, nuclear, heat pumps, district heating and green gas such as hydrogen.
FOR LONGER TERM CONSIDERATION (BY 2030)	Develop a joint Future Energy Investment Programme for Kent and Medway looking at: • hydrogen • green gas • decentralised energy in new developments • community energy generation • other emerging energy technologies.

PRIORITY 8:
GREEN INFRASTRUCTURE

Develop a multi-functional, natural capital opportunity and investment programme – focusing on environmental projects that store carbon, increase climate change resilience, improve air quality and soil health and increase biodiversity.

RATIONALE

Soil, trees, hedgerows, grassland, wetlands and maritime habitats all store carbon, so improving land management practices and increasing coverage of these habitats will be essential if we are to achieve our net-zero target. In addition, our actions to increase carbon storage can also support our efforts to respond to the ecological emergency, support the Kent Biodiversity Strategy and increase resilience to climate change. The development of an opportunity and investment programme will ensure resources can be targeted at the most appropriate projects, capable of generating the most benefits.

OUTCOME

There is increased capacity for Kent and Medway's natural environment to store carbon and offset the county's greenhouse gas emissions: bringing additional benefits such as reduced air and water pollution, increased flood storage capacity, improved biodiversity and providing health, cultural and leisure opportunities for local communities.

HIGH LEVEL ACTIVITIES

DO NOW	Identify natural environment 'quick-wins' and areas where tree establishment is needed, especially in relation to Ash Dieback. Produce tree planting guidance to ensure the right tree species are planted in the most appropriate places.
SHORT TERM (BY 2023)	Assess the carbon and resilience value of natural capital in Kent and Medway, together with other potential functions. Scope develop and implement a multi-functional, natural capital opportunity and investment programme.
FOR LONGER TERM CONSIDERATION (BY 2030)	Expand the natural capital opportunity and investment programme to include all sectors.

PRIORITY 9: SUPPORTING LOW CARBON BUSINESS

Develop and implement a Kent and Medway business recovery and support programme to cut costs and win new business.

RATIONALE

The coronavirus pandemic has had a significant impact on local businesses and many will need support to recover. In addition, whilst many local businesses have already taken action to save money and reduce their impact on the environment, our evidence shows that this activity needs to be expanded and rapidly accelerated if we are to achieve our low carbon vision. A dual pronged approach to local business support, which utilises the considerable purchasing power of Kent and Medway's public sector and supports businesses to reduce their environmental impact will help drive a low carbon economic recovery.

OUTCOME

Greenhouse gas emissions from local small and medium sized enterprises are reduced and businesses are supported to make the most of the economic opportunities that arise as we transition to a low carbon economy.

HIGH LEVEL ACTIVITIES

DO NOW	Support public sector suppliers to complete Steps to Environmental Management (STEM) training (or equivalent), in order to identify supply chain emissions and drive efficiencies where possible.[7] Promote and refer businesses and supply chain to LOCASE, for support and access to grant funding to reduce their costs and access new markets.
SHORT TERM (BY 2023)	Conduct public sector supply chain assessments, focusing on the largest suppliers. Undertake a supply chain analysis of the economic opportunities from the low carbon sector across Kent and Medway (funded through SELEP). Require public sector suppliers to undertake STEM or a similar scheme. Working in partnership with local authorities and the Kent and Medway Economic Partnership, develop a targeted business support supply chain programme for the Kent and Medway public sector, building on LOCASE.
FOR LONGER TERM CONSIDERATION (BY 2030)	Develop local supply chain, low carbon clusters or opportunities (dependent on supply chain analysis).

[7] The STEM accreditation scheme was developed through Low Carbon Across the South East (LOCASE) and is free to members of the Low Carbon Kent business network. It helps businesses improve their environmental performance through a series of assessments and certificates (blue, silver and gold), which correspond to National Standard BS 8555.

PRIORITY 10: COMMUNICATIONS

Develop a comprehensive communications, engagement and behaviour change programme targeted at residents, employees, businesses and visitors.

RATIONALE

We will not tackle the climate emergency through technology alone: our net-zero future will only be achieved if we successfully change perceptions, behaviour and social norms. Despite a recent surge in public interest in climate change there remain many psychological, social and cultural barriers to behaviour change, alongside a lack of physical capability or opportunity. These barriers are compounded by many competing voices seeking to advance their own part of the environmental agenda. We will need to work closely with our partners to develop simple, tailored and targeted communications that raise awareness and encourage a change in perceptions and behaviour.

OUTCOME

Residents, employees, businesses and visitors to Kent and Medway understand how their actions impact the environment; are aware of the risks of climate change and poor air quality; appreciate the value of the natural environment; and are sufficiently well informed and motivated to adopt more sustainable and low carbon behaviours. This increased awareness and engagement increases the impact of the other programmes developed through this Strategy.

HIGH LEVEL ACTIVITIES

DO NOW	Link up existing stakeholder communications and agree shared messages on topics such as air quality, fuel poverty, active travel and energy efficiency. Use the Kent Environment Strategy Conference as a mechanism to raise the profile of local authority collective action.
SHORT TERM (BY 2023)	Develop a joint communications, engagement and behaviour change strategy and programme for residents, public sector staff and businesses.
	Monitor effectiveness of campaigns and develop into targeted behaviour change programmes.

CASE STUDY: **ELECTRIC BUS TRIAL**

In March 2018, Kent took part in an eight-week electric bus demonstrator trial commissioned by Volvo Bus UK and ABB UK. The trial aimed to demonstrate to Kent County Council, Prologis and Arriva (the bus operators), that electric buses can be operational without disrupting current schedules, whilst also improving air quality, energy efficiency, noise and passenger comfort, as well as providing financial benefits. The trial was conducted along the 23.6km-long 'Fastrack Route A', operating 20 hours daily between Dartford and Bluewater.

Data gathered from the trial showed that an energy saving of 69.3% could be realised on the Fastrack Route A (based on the annual energy use of current diesel buses; 2,063MW, versus the energy used by the bus on the trial; 634MW). Feedback from Arriva was positive, with the electric bus outperforming expectations and the drivers reporting that they preferred the electric vehicles. The public were also complimentary, with 70% of Twitter comments being neutral or positive.

The demonstration proved that the vehicle operated within Fastrack's operational requirements. It also helped promote the drive towards zero emissions technology and whilst the vehicle itself drew attention, the visual element of the charging infrastructure proved to be much more effective and thought provoking for the general public and stakeholders alike.

CASE STUDY: **LOW CARBON ACROSS THE SOUTH EAST**

The Low Carbon Across the South East (LoCASE) project provides free support to help businesses become more competitive and profitable, by reducing environmental impacts through resource efficiencies and encouraging low carbon innovation. It does this through a three-pronged approach of stimulating demand, supporting supply and transferring knowledge. The scheme is administered by Kent County Council and supports businesses in Kent and Medway, Essex, Thurrock, Southend-on-Sea and East Sussex.

So far the project has seen nearly £3.5 million of EU grant funding approved for 425 Kent and Medway Small and Medium Sized Enterprises (SMEs), towards a huge range of purposes. This investment is set to deliver over 4,000 tonnes of carbon dioxide equivalent of savings through 250 energy and resource efficiency projects; from simple lighting, heating and insulation works, to investing in more effective and sustainable business practices. To date this support has helped create 160 jobs, launch 45 new products or services and support 31 business start-ups in Kent and Medway's burgeoning Low Carbon Environmental Goods and Services sector.

It was due to this success that LoCASE was identified as an exemplar project for replication across the south east in the Energy South2East regional local energy strategy. It was also selected as a runner-up by the President of the Association of Directors of Environment, Economy, Planning and Transport (ADEPT) Awards in 2018.

The project will continue to administer additional funding up to a value of £49 million to support businesses in the South East, in addition to expanding delivery into the neighbouring Local Economic Partnership (LEP) areas of Coast to Capital, Enterprise M3 and the Solent. This will open up access to LoCASE support to any SME based in Kent, Medway, Essex, Surrey, Hampshire and the Solent.

HOW WE WILL DELIVER THIS STRATEGY

The Kent and Medway Energy and Low Emissions Strategy sets out how we will respond to the UK climate emergency and ensure our recovery from the coronavirus pandemic drives clean and resilient economic growth, eliminates poor air quality, reduces fuel poverty, and promotes the development of an affordable, clean and secure energy supply across Kent andMedway. Building on the strengths and activities of local authorities and their partners, the strategy identifies ten high level priorities for action now and in the short- and long-term.

The strategy is owned by all 14 Kent and Medway local authorities, but the actions will need to be taken in partnership with other public and private sector partners, academic and charitable organisations. In addition, the strategy will develop programmes that will require the support of local businesses, community groups and residents if they are to be successful.

A technical implementation plan accompanies this strategy and provides detailed information on the specific actions that will be taken to achieve each priority, the partners involved, timescales and outputs. Progress, risks and issues will be regularly reviewed by Kent Leaders, Kent Chief Executives and appropriate partnerships. Progress reports and the latest indicators will be published online at www.kent.gov.uk/environment.

The Energy and Low Emissions Strategy is a sub-strategy of the Kent Environment Strategy and is intrinsically linked to several other strategic documents and policies across Kent. These are shown in Figure 4.

Regional	Energy South to East: Local Industrial Strategy
	Local Economic Plan and Strategic Economic Statement
	Transport Strategy for the South East
County wide	Environment Strategy
	Growth and Infrastructure Framework
	Biodiversity Strategy
	Local Transport Plan
	Active Travel Strategy (excluding Medway)
	Health and Wellbeing Strategy
	Joint Strategic Needs Assessment
	Fuel Poverty Strategy
	Housing Strategy
	Enterprise and Productivity Strategy (in development)
	Sustainability and Transformation Plan
Local	Local Plans
	Covid-19 recovery plans
	Green Infrastructure Strategies
	Sustainable School Travel Strategy (Medway only)
	Walking and Cycling Strategies
	Air Quality Management Area Strategies

Figure 4: Key strategies linked to the Kent and Medway Energy and Low Emissions Strategy

MEASURING PROGRESS – OUR INDICATORS

To ensure our activities remain effective, it is essential that we monitor and evaluate progress against our priorities regularly. To do this we will establish and monitor the following key indicators; ensuring that they remain measurable over the lifetime of this strategy. These indicators will be monitored quarterly (as they are updated) and published online.

THEME	INDICATOR	BASELINE
Carbon dioxide emissions	Total carbon dioxide (CO_2) emissions	8,958.2 kilo tonnes of CO_2 (2017). Total CO_2 emissions have fallen by 37% since 2005.
	Per capita carbon dioxide (CO_2) emissions	4.9 tonnes per person (2017).
Air quality	Annual exceedance of key air pollutants	2 site failures for NO_x and 2 site failure for O_3 (2018).
	Number of days of moderate or higher air pollution	78 days (21.3% of the year), where at least one pollutant recorded levels of moderate or higher air pollution (2018).
	Deaths associated with particulate matter (PM2.5)	922 deaths associated with particulate matter (2017).
	Number of air quality management areas	43 air quality management areas (2019).
Green infrastructure	Tree canopy coverage	To be developed
	Carbon storage value of habitats	To be developed
Energy	Annual energy consumption of local authority estate (all 14 councils)	To be developed
	Average domestic energy consumption (gas and electricity) per customer	16,781 kilowatt hours (2017).
	Carbon emissions from gas and electricity consumption	4.87 Mega tonnes CO_2 (2017).
	Renewable electricity generation	1,751 Mega Watts (2018).

Transport	Carbon emissions from the transport sector	3,953.7 kilo tonnes of CO_2 (2017).
	Active travel to school (walking, cycling, scooting)	64.2% of primary school children. 36.6% of secondary school children (2018).
	Active travel to work (census data – updated every 10 years)	In 2011, 32% of people that work within 5km of their home actively travelled to work in Kent.
	Journey delays on local A-roads (excluding Medway)	35.4 seconds per vehicle per mile (2018).
	Journey delays on local A-roads (Medway only)	46.9 seconds per vehicle per mile (2018).
	Electric Vehicle Registrations	4,845 electric vehicle registrations (December 2019).
	Road transport fuel consumption	1,182,943 tons of oil equivalent.
	Number of car share / car clubs in operation	To be developed
	Kilometres of footpath/cycle lane improved	To be developed
Housing and health	Households in fuel poverty	73,010 (9.6%) households in fuel poverty (2017).
	Excess winter deaths	1,610 excess winter deaths 29.6% averaged excess winter mortality (2017/18).
	Carbon emissions from the domestic sector	2,585.9 kilo tonnes of CO_2 (2017).
	Household water consumption	To be developed
	Energy Performance Certificate (EPC) rating of homes	83% of new builds had an EPC rating of A or B (2018). 16% of all domestic EPC lodgements were rated A or B for energy efficiency (2018).
	Number of energy efficiency measures installed in homes	To be developed

GLOSSARY

Active travel - Travel and transport by physically active modes of transport such as cycling, walking or scooting.

Air quality - The composition of the air in terms of how much pollution it contains.

Air Quality Management Areas (AQMAs) – Where Local Authorities have found that air pollution objectives have been exceeded or are not likely to be achieved, an Air Quality Management Area must be declared. The size of these areas is not predefined and can vary.

Department for Business, Energy and Industrial Strategy (BEIS) – Formed in 2016 The Department for Business, Energy and Industrial strategy is a government department responsible for business, industrial strategy, science and innovation and energy and climate change policy.

Car club – Car clubs allow you to rent a car by the hour. Car clubs offer the benefits of using a car without the expense or inconvenience of maintaining and running your own car.

Clean energy – Energy that is not produced from fossil fuels (coal, oil or natural gas)

Clean growth – set out in the Government's Clean Growth Strategy, the concept aims to lower carbon emissions, protecting the environment and meeting our climate change obligations, whilst stimulating growth and prosperity, increasing earning power and creating and supporting thousands of jobs.

Combined Heat and Power (CHP) - When electricity is generated, up to 60% of the energy can be wasted as lost heat. Combined Heat and Power schemes are designed to recover most of this waste heat and use it to power a turbine and generate more electricity.

Department for Environment, Farming and Rural Affairs (DEFRA) – Formed in 2001, the Department for Environment, Food and Rural Affairs is the government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in England.

District heating - A district heating system is a network of insulated pipes, which delivers heat (or chilled water) from a centralised energy centre to multiple end users [see also Heat Network].

Energy Performance Certificate (EPC) - EPCs are intended to inform potential buyers or tenants about the energy performance of a building, so they can consider energy efficiency as part of their investment or business decision. The scale is from A-G, A being the most efficient.

Energy switching – a process carried out by consumers aiming to reduce their energy bills by changing their energy provider.

Excess Winter Deaths – is defined as the difference between the number of deaths which occurred in winter (December to March) and the average number of deaths during the preceding months (August to November) and the subsequent four months (April to July).

Flexible working - Flexible working is a way of working that suits an employee's needs, for example having flexible start and finish times, or working from home.

Fuel poverty - Fuel poverty in England is measured by the Low Income High Costs definition, which considers a household to be in fuel poverty if they have fuel costs that are above average (the national median level) and where if they were to spend that amount, they would be left with a residual income below the official poverty line.

Geographic Information Systems (GIS) – A computer system that allows analysis of spatial data by organising layers of information into visual maps and 3D scenes. Commonly used GIS applications are ArcGIS and MapInfo.

Greenhouse gases - As defined under the Kyoto Protocol, these include:

Carbon dioxide (CO2) Methane (CH4) Nitrous oxide (N2O)

Hydrofluorocarbons (HFCs) Perfluorocarbons (PFCs) Sulphur hexafluoride (SF6)

Green infrastructure - Green infrastructure is a network of multi-functional green space, both new and existing, both rural and urban, which supports the natural and ecological processes and is integral to the health and quality of life of sustainable communities.

Growth and Infrastructure Framework – prepared by Kent County Council to provide a view of emerging development and infrastructure requirements to support growth across Kent and Medway. It provides a strategic framework across the County, for identifying and prioritising investment across a range of infrastructure, for planned growth up to 2031.

Hard-to-treat homes – homes that cannot accommodate routine, cost-effective energy efficiency measures. Homes considered hard-to-treat are often not connected to the gas network or are built with solid walls (without a cavity); this includes older properties and park homes.

Heat networks - A heat network, sometimes called district heating, is a distribution system of insulated pipes that takes heat from a central source and delivers it to a number of domestic or non-domestic buildings. The heat source might be a facility that provides a dedicated supply to the heat network, such as a combined heat and power plant; or heat recovered from industry and urban infrastructure, canals and rivers, or energy from waste plants.

Local Enterprise Partnership (LEP) – LEPs are locally owned partnerships between local authorities and businesses They play a central role in determining local economic priorities and undertaking activities to drive economic growth and the creation of local jobs.

Low Carbon Across the South East (LoCASE) – An EU funded project set up to help businesses tackle and adapt to climate change, by aiming to reduce costs by cutting emissions and promoting the opportunities of the low carbon and environmental goods and services market.

Low carbon economy - An economy which has a minimal output of greenhouse gas emissions.

Mega Watt (MW) - a measure of power, one million watts.

Net-zero – Achieving net-zero carbon emissions by deeply cutting emissions, with remaining emissions offset by removal from the atmosphere (eg. by trees or technology).

Renewable energy - Energy produced using naturally replenishing resources. This includes solar power, wind, wave, tide and hydroelectricity. Wood, straw and waste are often called solid renewable energy, while landfill gas and sewerage gas can be described as gaseous renewables.

Small and Medium Sized Enterprises (SMEs) - Micro, small and medium-sized enterprises who employ fewer than 250 people and which have an annual turnover of less than £25 million.

Superfast broadband - In the UK, 'superfast' broadband is defined as a connection with download speeds of 24Mb or above.

Sustainable development - Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It is central to the economic, environmental and social success of the country and is the core principle underpinning the National Planning Policy Framework.

Tri-LEP – A term used to describe collaboration between the South East, Coast to Capital and Enterprise M3 Local Economic Partnerships. The Tri-LEP area covers much of south east England including Kent, Sussex, Surrey, Hampshire and Essex.

Ultra-Low Emission Vehicles (ULEVs) – Ultra low emission vehicles (ULEVs), also known as plug-in vehicles, emit extremely low levels of motor vehicle emissions compared to traditional petrol or diesel vehicles.

Vulnerable resident – A term for an individual who is at risk of harm due to life circumstances such as being homeless, frail or elderly or has a mental or physical illness.

KENT AND MEDWAY ENERGY AND LOW EMISSIONS STRATEGY

WWW.KENT.GOV.UK/ENVIRONMENT

This document is available in alternative formats and can be explained in a range of languages. Please contact alternativeformats@kent.gov.uk

Cabinet	Agenda Item: 10
Meeting Date	16 December 2020
Report Title	Overarching enforcement policy
Lead Member	Councillor Roger Truelove - Council Leader
SMT Lead	David Clifford - Head of Policy, Communications and Customer Services
Head of Service	
Lead Officer	Bob Pullen - Policy and Performance Officer
Key Decision	No
Classification	**Open**
Forward Plan	**Reference number:**
Recommendations	1. Adopt the overarching enforcement policy at Appendix I.

1. Purpose of Report and Executive Summary

1.1. The Council's existing enforcement policy was published many years ago and is now out of date and needs to be replaced. A new overarching enforcement policy has been developed and the purpose of this report is to seek Cabinet endorsement of the new policy.

2. Background

2.1. The Council discharges a range of functions that involve enforcement activity including:

- Community safety;
- Environmental health;
- Environmental response;
- Housing;
- Licensing;
- Parking; and
- Planning.

2.2 It is good practice for the Council to have a single overarching policy in place that helps to promote efficient and effective approaches to regulatory inspection and enforcement as a means of improving regulatory outcomes without imposing unnecessary burdens. Councils are encouraged to comply with the Regulators' Code.

2.3 The policy sets out the principles of good regulation (consistent, targeted, transparent, accountable, proportionate and helpful) which will be applied to all of the Council's enforcement activity.

3. Proposals

3.1 The policy is intended as an umbrella policy and applies to all service areas of the Council with enforcement responsibilities.

3.2 The policy sits above all of the service-specific policies which the Council is responsible for discharging. The policy therefore sets out a short and succinct statement of what those who are on the receiving end of enforcement action should expect from the Council in how it discharges its responsibilities.

4. Alternative Options

4.1. The alternative options are to leave the existing policy in place or to simply not have an overarching enforcement policy. The former was discounted as the Council would not be compliant with the Regulators' Code. The latter was also ruled out for the same reason, plus each individual service-based policy would need to replicate the same wording requiring them all to be reviewed, revised and approved, even where the policies were up to date.

5. Consultation undertaken or proposed

5.1 Heads of Service and the team leaders responsible for discharging enforcement functions were consulted a number of times during the development of the revised policy. Mid Kent Legal Services played an active role in the drafting of the policy.

5.2 The policy was considered by Policy Development and Review Committee on 26 November. In addition, the policy has been written to be compliant with the Regulators' Code April 2014.

5.4 The policy relates to a number of Cabinet members responsibilities and so is very much in the 'cross-portfolio' category which falls to the Council Leader. He and the other Cabinet members with responsibilities in this area were consulted on the revised policy before it is formally submitted to Cabinet for approval.

6. Implications

Issue	Implications
Corporate Plan	The policy aligns with several objectives in the adopted corporate plan 2020-2023
Financial, resource and property	None identified at this stage.
Legal, statutory and procurement	The policy is intended to ensure that regulatory inspection and enforcement is carried out in a fair, practical and consistent manner. It is good practice to have this in line with the Regulators' Code, which sits under the Legislative and Regulatory Reform Act 2006. Mid Kent Legal Services have been instrumental in the development and drafting of the new policy.
Crime and disorder	The policy makes clear that enforcement activity is targeted on those whose activities give rise to the most serious offences.
Climate and ecological emergency	Environmental response is one of the Council's key means of keeping the borough clean and enforcement activity is a primary means of achieving this.
Health and wellbeing	None identified at this stage.
Risk management and health and safety	None identified at this stage.
Equality and diversity	None identified at this stage.
Privacy and data protection	None identified at this stage.

7. Appendices

7.1. The following documents are to be published with this report and form part of the report:

- Appendix I: Overarching enforcement policy

8. Background Papers

8.1 The Regulators' Code: https://www.gov.uk/government/publications/regulators-code.

Swale Borough Council Overarching Enforcement Policy

1 - Introduction

1.1 This overarching enforcement policy is an umbrella policy and applies to all service areas. Extra requirements can apply to specific enforcement activities such as health and safety, licensing, planning and parking services.

1.2 Detailed service-specific policies and procedures, where needed, are held, updated and reviewed by the relevant service. Information about these may be obtained directly from that service.

1.3 This policy helps to make sure that regulatory inspection and enforcement is carried out in a fair, practical and consistent manner.

1.4 This policy has been written in accordance with the Regulators' Code April 2014 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/300126/14-705-regulators-code.pdf. In certain circumstances we may conclude that a provision in the Code is either not relevant or is outweighed by another provision. We will ensure that any decision to depart from the Code will be properly reasoned and based on evidence.

2 - Council aim and vision

2.1 Swale Borough Council has set out its strategic aims and vision in the Corporate Plan and the enforcement services of the Council carry out their duties in support of these. The specific aims that relate to enforcement services are found in service plans together with the core enforcement activities of the service.

2.2 Good regulation and enforcement helps to support the local economy and a safer and more enjoyable environment for residents.

3 - Principles of good regulation

Proportionality

3.1 The principle of proportionality is that enforcement action taken against a person, organisation or business is suitable and appropriate in the circumstances. It should also justify the level of resources to be implemented taking into account factors such as interests, resources and objectives.

3.2 To achieve proportionality, Swale Borough Council will carefully consider all the issues relevant to an enforcement matter. This could include issues such as the seriousness of the offence, the offender's circumstances, the interests and safety of the public and environment.

3.3 In all cases, Swale Borough Council will follow the relevant guidance to deliver best practice.

Consistency

3.4 Swale borough council will carry out enforcement action in a fair and consistent manner in accordance with its policies and procedures. Similar approaches will be taken in similar circumstances to achieve similar ends, although each case will be assessed on its own merits. The willingness to comply and co-operation of the person, organisation or business subject to enforcement action may also be taken into account in deciding how and what enforcement action should be taken.

Targeted

3.5 Targeting means making sure that enforcement activity is targeted on those whose activities that give rise to the most serious offences. It also means that any enforcement action is focused on those with a duty imposed on them by Statute and where as a result of their breach of duty any offences committed by others are likely to be facilitated.

3.6 Any enforcement action will be targeted against the person, organisation or business who is under a duty, such as employers, employees, owners of premises, householders, self-employed persons, or individual members of the public.

Transparency

3.7 Transparency is important in maintaining public confidence in our capability. We will help those being regulated to understand what they need to do and how they can achieve compliance. In all matters the various enforcement teams will also clearly identify themselves and their role.

3.8 Swale enforcement officers will explain carefully (if necessary in writing) why the action is necessary, who must carry it out, and by what date it must be carried out.

3.9 Where appropriate, Swale Borough Council will give reasonable opportunity for discussion before formal enforcement action is taken. Where it is appropriate but not possible, we will give a written explanation of our reasons for taking immediate action and this will be done as soon as practicable.

3.10 Information and advice will be provided in language or in a format which is easy to understand.

Accountability

3.11 Swale Borough Council is accountable to the public for its actions. This means we must have policies and standards which are easily accessible and understood, and effective and easily accessible mechanisms for dealing with comments and handling complaints.

3.12 Swale Borough Council has an internal procedure for dealing with complaints against its services. Details are available on the Council's website https://www.swale.gov.uk/compliments-and-complaints/. In addition to Swale Borough Council's own complaints procedures, the Local Government Ombudsman hears complaints regarding local government maladministration, and details of this service are also available from the council.

3.13 Where a right of appeal is applicable we will give out information on how to do this with the statutory notices or warnings served by us.

Helpfulness

3.14 Our staff will deal courteously and efficiently with all people, organisations and businesses they come into contact with. Staff will, in the usual course of events, identify themselves by name, and contact numbers will be made available as soon as practicable after the event. We will communicate by email where this is possible and preferable.

Recommendations for approval

Extraordinary Local Plan Panel – 29 October 2020

Minute No. 222 – Local Green Spaces

(1) That the contents of the report and the site which have been submitted as proposed Local Green Spaces be noted.

(2) That all Members be asked to review the existing sites and those which have been submitted in their Wards and provide any comments on the manner in which they consider them to meet (or not) the assessment criteria.

(3) That delegation be given to the Head of Planning Services in consultation with the Cabinet Member for Planning and the Deputy Cabinet Member for Planning to agree on the assessment of the proposed Local Green Spaces for inclusion in the Draft Local Plan to be presented to Cabinet at their meeting on Wednesday 16 December 2020.

Minute No. 223 – Local Plan Review Site Selection

(1) That the South East Faversham site be endorsed and the remaining three strategic sites options be rejected as they did not support the delivery of the LPR development strategy as agreed as 'option c' at the Local Plan Panel meeting on 30 July 2020.

(2) That the provision of 200 dwellings within Sheerness town and the allocation of Rushenden South (18/113 as amended) for 850 dwellings be endorsed.

(3) That the approach to secure Park Homes accommodation in suitable and sustainable locations be endorsed.

(4) That the allocation of approximately 200 dwellings within the boundary of Faversham town itself to be identified through the Faversham Neighbourhood Plan be supported.

(5) That the provision of circa 3,300 dwellings at Land north of Graveney Road (18/135), Land east of Faversham (18/091) and land at south east Faversham (18/226) and at Preston Fields (18/178) and that the policy and design framework should support an integrated design approach that is required for access and movement be endorsed.

(6) That the provision of 850 dwellings in Sittingbourne town centre and settlement boundary be endorsed.

(7) That the provision of 200 dwellings at site 18/021 Chilton Manor Farm, Highstead Road be endorsed.

(8) That the provision of circa 90 dwellings at sites 18/093 and 18/096 (land south of Selling Road) and 18/094 (land at Monica Close) through a

comprehensive policy be endorsed subject to provision of an off-road link from Monica Close to the village of Selling.

(9) That sites in Newington should not be progressed for inclusion as allocations in the LPR.

(10) That the provision of circa 1,000 dwellings at Teynham (sites 18/025, 18/123, 18/122, 18/116, 18/153 and part of 18/106) through the identification of an 'area of opportunity' and that the policy and design framework should support an integrated design approach that is required for access and movement and infrastructure and includes a southern link road be endorsed.

(11) That an important local countryside gap be designated to the west of Teynham to prevent coalescence with Bapchild and Sittingbourne.

(12) That the potential allocation of the Lamberhurst Farm site for additional employment use be supported, and that it be noted that a potential mixed-use development be considered beyond the LPR.

(13) That sites in Bobbing/Sheppey Way should not be progressed for inclusion as allocations in the LPR.

(14) That the broad approach to employment land as set-out in the report be endorsed.

(15) That the approach to Gypsy and Traveller accommodation and Travelling Show People accommodation, as set out in the report, be endorsed.