Faversham Town Centre Road Closures, Option Assessment – Reference: 007901-PCL-HGN-ZZ-RP-CH-0002

Project	**Faversham Town Centre Closures**	**Job No**	**1000007901**
Subject	**Options Assessment**	**Issue**	**01**
Prepared by	**Jon East**	**Date**	**25/07/22**
Approved by	**Nishil Parmar**	**Date**	**25/07/22**

1.1 Purpose of the Technical Note

1.1.1 The Purpose of the Technical Note is to detail the Options Assessment process undertaken for the Faversham Town Centre Road Closures recommend a preferred option to be taken forward for consultation with stakeholders and progression of the traffic order.

1.1.2 This technical note follows on from the Options Sifting process which recommended the following options were progressed for the options assessment.

- Option 1a – Court Street Closure 10:00 to 16:00 with Exemptions for permit holders
- Option 2b – Full Closure 10:00 to 16:00 with exemptions for permit holders and Disabled access for East St & Preston St only
- Option 2c – Full Closure 09:00 to 18:00 with exemptions for permit holders and Disabled access for East St & Preston St only

1.2 Options Assessment

1.2.1 The following have been investigated as part of the options assessment:

- Air Quality Assessment
- Cost
- Economic Benefits – AMAT Assessment

1.3 Air Quality Assessment

1.3.1 An air quality assessment has been undertaken on the road closure options which forms Appendix A to this report.

1.3.2 The air quality assessment concluded that all the options would have a negligible impact on air quality when compared to National Air Quality Standards.

1.3.3 As all options would have a negligible impact, air quality is not a distinguishing criterion for the options.

1.4 Cost Budget Estimates

1.4.1 Option 1a – Construction Costs

- 1 x Enforcement Camera (Priced based on mounting on existing lighting column) - £25k
- Signage Works - £2k
- Total Budget Estimate: £35k (inc. risk and inflation)

1.4.2 Option 2b & 2c – Construction Costs

- 2 x Enforcement Camera (Priced based on mounting on existing lighting column) - £50k
- Signage Works – £5k
- Total – £70k (inc. risk and inflation)

1.4.3 Ongoing maintenance costs for the cameras have not been included as it has been assumed that KCC will carry out the maintenance.

1.5 Economic Assessment (AMAT)

1.5.1 For all options the Active Mode Appraisal Toolkit (AMAT) has been used to give an assessment of Benefit Cost Ratio of the closure:

1.5.2 AMATs for both options are producing unrealistically high BCR values, as the assessment tool is not tailored to assessing such schemes.

1.5.3 As we have very low maintenance costs (included in the investment costs, as per the guidance for transport schemes) there is no reduction to the BCR.

1.5.4 The overall investments costs for both schemes are also reasonably low, in comparison to schemes this tool is usually used for. Therefore, the tool is calculating benefits much higher than those predicted on site, once the scheme measures have been implemented.

1.5.5 **Option 1a BCR - 29**

1.5.6 **Option 2b & 2c BCR - 44**

1.6 Recommended Option

1.6.1 Although options 2b and 2c will have a higher capital cost to implement, the AMAT assessment shows that the Benefit Cost Ratio (BCR) is higher.

1.6.2 During the informal consultation of the closure from 21st May to 14th June 2021 the highest proportion of respondents wanted the closure to be implemented between 10am and 4pm.

1.6.3 Based on this assessment It is recommended that Option 2b – Full Closure 10:00 to 16:00 with exemptions for permit holders and Disabled access for East St & Preston St only is progressed for implementation

1.7 Next Steps

1.7.1 Following agreement of the option to be progressed, the design drawings will be updated and a Stage 1/2 road safety audit will be progressed as well as an Equality Quality Impact Assessment. Design drawings will be finalised, ready for a final package submission.

1.7.2 Traffic Order amendments will not be made until formal SBC sign off is confirmed.

Air Quality Assessment

Faversham Town Centre Road Closure

July 2022

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Air Quality Assessment

Faversham Town Centre Road Closure

July 2022

Project Centre

On behalf of Swale Borough Council

Document Control:

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Executive Summary

Phlorum were commissioned by Project Centre, on behalf of Swale Borough Council, to assess the air quality impacts of the proposed options for the closure of roads within Faversham's Town Centre.

Air quality modelling was undertaken to assess the potential impact of three proposed Town Centre Road Closure options by assessing the change in pollutant concentrations as a result of the scheme's implementation. The assessment followed relevant methodologies prescribed for the assessment of air quality by Defra and the Institute of Air Quality Management. The scheme was assessed for changes in nitrogen dioxide and particulate matter.

An Air Quality Management Area has been declared along on the A2 Ospringe Street, following monitored exceedances of the annual mean air quality objective for nitrogen dioxide. However, modelled concentrations across Faversham's Town Centre suggest air quality is much better here, with no anticipated exceedances of any relevant air quality standards.

Overall, the modelling assessment predicted that the three road closure options caused decreases in annual mean pollutant concentrations near to the scheme initiative, with increased concentrations tending to occur on other traffic routes, likely displaced following the implemented closure.

With the magnitudes of change being small for each of three closure options, relative to the relevant national air quality objectives, and with air quality across the local area also being comfortably below these objectives, all three options are considered to have an insignificant effect on local air quality, overall.

1. Introduction

Client

1.1 Phlorum were commissioned by Project Centre, on behalf of Swale Borough Council, to assess the air quality impacts of the proposed options for the closure of roads within Faversham's Town Centre.

Project Objective

1.2 The objective of the Air Quality Assessment (AQA) is to compare the potential impact on local air quality inside and surrounding the location of the proposed road closure area, due to its implementation.

Project Specification

1.3 During the COVID-19 pandemic, Kent County Council (KCC) arranged a Temporary Traffic Regulation Order to assist with social distancing measures. Following a review of how this affected that Town Centre, consideration is being given to the introduction of a more permanent road closure scheme.

1.4 The key objectives of the scheme are to improve the high street economy as well as providing a better environment for walking & cycling, in terms of safety, air pollution and noise pollution.

1.5 The three road closure options currently being considered are as follows:

- Option 1a – Court Street Closure 10:00 – 16:00 (Permit Holders exempt)

  Court Street, Middle Row, Market Place and Market Street all closed.

- Option 2b – Full Town Centre Closure 10:00 – 16:00 (Permit Holders and Disabled Users exempt)

  Court Street, Middle Row, Market Place, Market Street, East Street and Preston Street all closed.

- Option 2c – Full Town Centre Closure 09:00 – 18:00 (Permit Holders and Disabled Users exempt)

  Court Street, Middle Row, Market Place, Market Street, East Street and Preston Street all closed.

Modelling Assessment

1.6 This assessment compares the baseline ("without scheme") air quality, that reflect conditions with no scheme in place, with air quality when the schemes are in place ("with scheme").

1.7 The assessment will compare the predicted changes in annual average concentrations of pollutants using a detailed air pollutant dispersion model to demonstrate the potential impact of the road closure options if it were to operate continuously.

1.8 The results are predicted using detailed air pollutant dispersion modelling and are based on the year 2022.

Air Pollutants

1.9 Vehicle emissions will arise from the combustion of fossil fuels in vehicle engines and their subsequent release to atmosphere via tailpipe exhausts. The most significant pollutants released by cars and other vehicles are oxides of nitrogen (NO_2/NO_x) and particulate matter (PM_{10} and $PM_{2.5}$). Releases of carbon monoxide (CO) and some volatile hydrocarbons (e.g. benzene and 1,3-butadiene) are of less significance and are not assessed further in this report.

1.10 The assessment of impacts will focus on the key pollutant of concern from road traffic; nitrogen dioxide (NO_2). Particulate matter (PM_{10} and $PM_{2.5}$) has also been assessed, acknowledging national ambitions to reduce particulate matter concentrations.

2. Methodology

Air Quality Standards and Objectives

2.1 The assessment refers to the UK Air Quality Strategy[1] air quality standards (AQSs) and air quality objectives (AQOs) as presented in Appendix A.

Guidance

2.2 Defra's Local Air Quality Management Technical Guidance (LAQM.TG (16))[2] has been followed in this assessment.

2.3 Guidance from the Institute for Air Quality Management (IAQM)[3] and Environmental Protection UK (EPUK) was referred to, to provide a description of impacts at each modelled receptor. The criteria used to determine these impacts are included in Appendix B.

Modelling Assessment

Model specification

2.4 This assessment uses the latest Cambridge Environmental Research Consultants (CERC) version of ADMS-Roads (version 5.0.1.3) air quality dispersion model. The programme has been validated and approved by Defra for use as an assessment tool for calculating the dispersion of pollutants from traffic on UK roads. Defra's latest Emissions Factors Toolkit (EFT (v11.0))[4] for road transport was used to provide emissions factors for NO_x, PM_{10} and $PM_{2.5}$ in this assessment.

2.5 The modelling utilises Defra's UK-AIR[5] predicted 2019 background concentration ($1km^2$ x $1km^2$) grid squares. At the time of writing, the most recent background maps were from August 2020 and based on monitoring data from 2018. 2019 background concentrations were used for conservative purposes, acknowledging the traffic-related uncertainties associated with the COVID-19 pandemic.

1 Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2) July 2007.
2 Defra. 2021. Part IV of the Environment Act 1995, Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management, Technical Guidance LAQM. TG (16). London: Defra.
3 IAQM/EPUK, 2017: Land-Use Planning & Development Control: Planning for Air Quality (2017) https://iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf
4 Defra Emissions Factor Toolkit: (v11) https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html
5 Defra UK-AIR maps https://uk-air.defra.gov.uk/data/laqm-background-home (Accessed June 2022)

Meteorological Data

2.6 Detailed, hourly sequential, meteorological data are used by the model to determine pollutant transportation and levels of dilution by the wind and vertical air movements.

2.7 Meteorological data used in the model was obtained from Manston Airport in Ramsgate, as it was considered to provide the most representative data of similar conditions to the site. The meteorological data used for this assessment was from 2019, for which air quality monitoring and traffic data was also available. The surface roughness applied to the model for the site was 0.7m. A factor of 0.1m was applied to the meteorological site.

Model Verification

2.8 It is recommended, following guidance set out in LAQM.TG(16)[2], that the model results be compared with measured data to determine whether they need adjusting to reflect local air quality more accurately. This process is known as verification and reduces the uncertainty associated with local effects on pollution dispersion and allows the model results to be more site-specific.

2.9 A verification study has been undertaken using local authority monitoring data from 2019 across the relevant modelling domain. Full details of this process are provided in Appendix C. The model was found to be generally under-predicting concentrations, which is not unusual and is likely the result of the local dispersion environment; an adjustment factor of **2.02** was, therefore, applied to the model results, for conservative purposes.

2.10 Root Mean Square Error (RMSE) is used to define the average error or uncertainty of the model. According to LAQM.TG(16), the RMSE should ideally be within 10% of the relevant air quality standard, but is acceptable where it is within 25% of the AQS. The model verification process calculated a post-adjusted RMSE of **2.3 µg.m^{-3}**, which equates to 5.75% of the annual mean AQS for NO_2 and is therefore considered to be ideal.

Sensitive receptors

2.11 Key sensitive receptors were selected within and surrounding the assessed road closure schemes. The sensitive receptors were modelled at 1.5m height above ground, which by convention is the average receptor height for human health assessments for air quality.

2.12 Receptor locations were selected where people are reasonably expected to spend significant periods of time, such as residential properties, hospitals, and care facilities. Modelled locations are set at the nearest building façades to the roadside, for conservative purposes. Even where receptor locations are located at 1st floor heights, they were modelled at 1.5m above ground for conservative purposes.

2.13 A total of 17 receptors were modelled across the model domain. Details of sensitive receptor locations are displayed in Figure 2.1 and are included in Table 2.1, below.

Table 2.1: Modelled Receptors

Receptor		Height (m)	UK Grid Reference	
ID	Road Link/ Location		X	Y
R1	B2040 South Road (Residence)	1.5	600891.0	161140.7
R2	B2040 South Road (Residence)	1.5	601253.8	161266.6
R3	Stone Street (Residence)	1.5	601267.0	161234.3
R4	Stone Street (Faversham Cottage Hospital)	1.5	601399.7	161200.2
R5	Preston Street (Residence)	1.5	601514.0	161016.9
R6	Preston Street (Residence)	1.5	601567.3	161128.9
R7	Preston Street (Residence)	1.5	601595.8	161241.4
R8	Market Street (Residence)	1.5	601597.0	161343.9
R9	Court Street (Residence)	1.5	601612.6	161454.1
R10	B2040 Crescent Road (Residence)	1.5	601626.6	161501.6
R11	B2041 Newton Road (Residence)	1.5	601633.9	160976.3
R12	B2041 Newton Road (Residence)	1.5	601666.1	161150.8
R13	B2041 Newton Road (Residence)	1.5	601706.6	161297.9
R14	B2040 East Street (Residence)	1.5	601717.8	161311.2
R15	B2040 Crescent Road (Care Facility)	1.5	601689.3	161377.7
R16	B2040 East Street (Care Facility)	1.5	601799.7	161299.7
R17	B2040 East Street (Residence)	1.5	602480.9	161074.0

Note: Grid references are indicative as the model layout is based on Ordnance Survey based mapping which does not accurately portray the width or position of roads.

Figure 2.1: Modelled Receptors

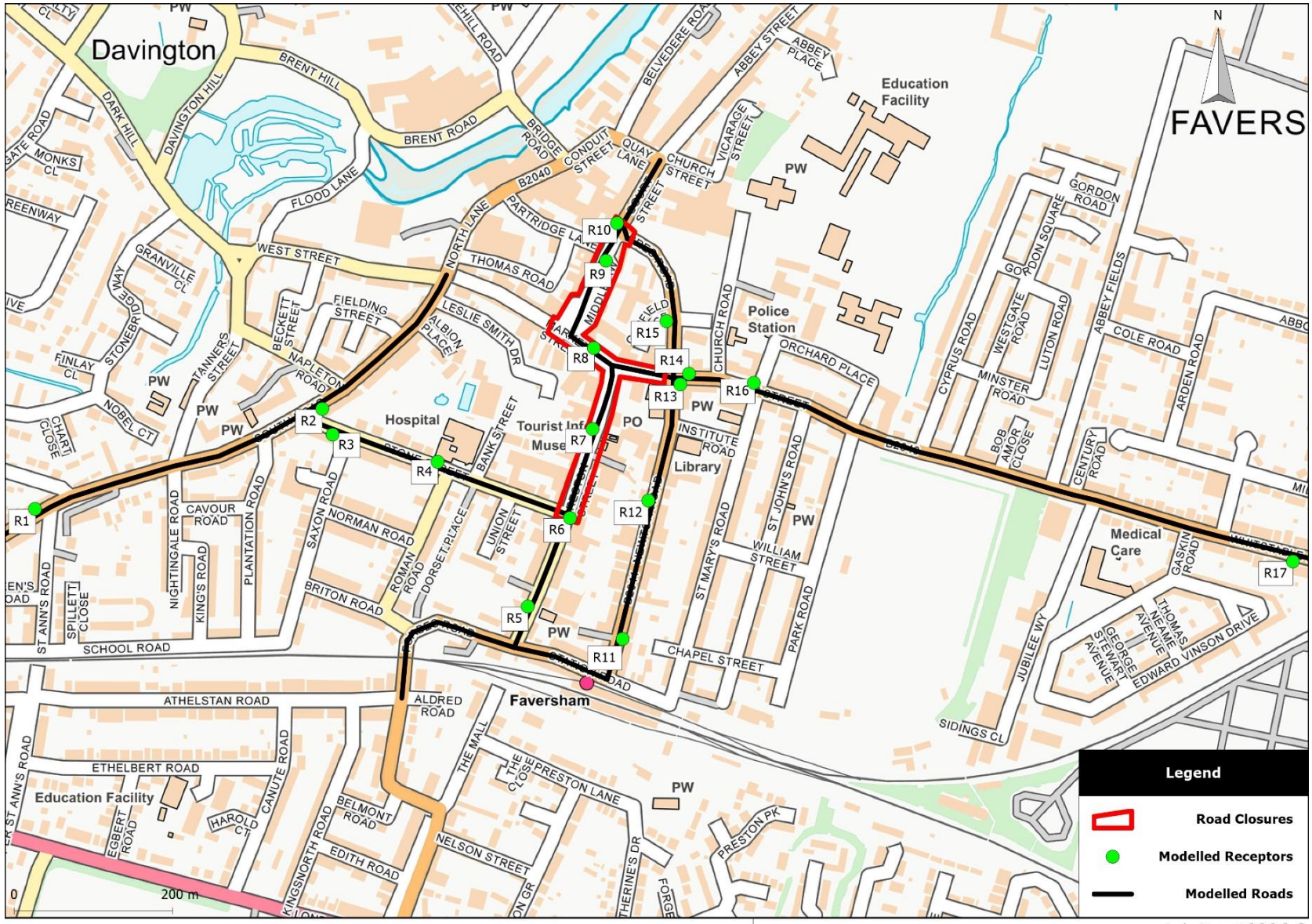

Figure 2.1: Modelled Receptors

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Traffic Data

2.14 All traffic data used in the assessment was provided by Project Centre. Baseline traffic data (i.e. "without scheme") were taken from weekly Automatic Traffic Count (ATC) surveys carried out in December 2021. The datasets were used to provide annual average daily traffic (AADT) flows of the local road network.

Results and Impact Descriptors

2.15 To provide context for the change in concentration, and the potential impact of changes in concentrations of pollutants, due to the introduction of the road closures, the assessment provides results for:

- "Without" scheme (pre-scheme) annual mean concentrations ($\mu g.m^{-3}$);
- "With" scheme annual mean concentrations ($\mu g.m^{-3}$);
- "With" – "Without" scheme concentration change ($\mu g.m^{-3}$);
- Percentage (%) change relative to the annual mean AQS; and
- Impact of change, according to EPUK & IAQM Impact Descriptors.

2.16 The "*Percentage (%) change relative to the AQS"* provides context to how much of a change is predicted to occur, relative the pollutant's UK AQS (see Appendix A).

2.17 The Environmental Protection UK (EPUK) & IAQM guidance on *'Planning for Air Quality*[3] impact descriptors were used to describe the potential "*Impact of change*" at the individual receptor locations. These impact descriptors consider the amount (or magnitude) of change relative to the AQS, as well as existing air quality concentration and are described in Table B.1 in Appendix B.

Model Uncertainty

2.18 There are a number of inherent uncertainties associated with the modelling process, including:

- Model uncertainty – due to model formulations;
- Data uncertainty – due to inaccuracies in input data, including emissions estimates, background estimates and meteorology; and
- Variability – randomness of measurements used.

2.19 Using a validated air quality model such as ADMS Roads combined with performing model verification accounts for much of this uncertainty. In addition, the most detailed available input data is used and reviewed to ensure accuracy.

2.20 The latest version of Defra's EFT (v11.0) was released in November 2021 and is expected to provide a more reasonable match for real world emissions in the current UK fleet than previous versions; however, it should be noted that there remains uncertainty regarding future emissions from the vehicle fleet.

2.21 To adequately account for this uncertainty when predicting future pollutant concentrations, UK-AIR background concentrations were predicted to stay the same beyond 2019. Additionally, no improvement in vehicle fleet emissions was assumed beyond 2019, the year used for model verification. This is considered to be appropriately conservative to account for uncertainties associated with the impact of COVID-19 on vehicle fleet renewal.

2.22 Furthermore, modelled receptors were positioned at the ground-level façades of the buildings closest to the roadside. As such, this assessment offers a wholly conservative approach.

3. Assessment of Road Closures

Current Local Air Quality Conditions

3.1 Swale Borough Council (SBC) operate a comprehensive air pollution monitoring network across the borough. The network comprises both automatic monitoring stations and passive diffusion tubes.

3.2 In Faversham, all monitoring locations are adjacent to the A2 major road, approximately 0.8km to the south of the Town Centre. SBC has declared an Air Quality Management Area (AQMA) on the A2 Ospringe Street due to recorded exceedances of the annual mean AQS for NO_2. Due consideration is given to impacts on this AQMA within this assessment.

3.3 Currently, SBC's pollutant monitoring network does not extend into Faversham Town Centre. As such, this dispersion modelling assessment provides an insight into anticipated pollutant concentrations here. Figure 3.1, overleaf, shows the predicted concentrations of NO_2 at modelled receptor locations in the absence of the proposed road closure scheme.

3.4 Results show that no modelled receptor location within the Town Centre is expected to be in exceedance of the annual mean AQS for NO_2. Appendix D shows that no modelled receptor location is expected to be in exceedance of the annual mean AQS for PM_{10} or $PM_{2.5}$, either.

Figure 3.1: Current annual mean NO_2 concentrations without road closures (µg.m^{-3})

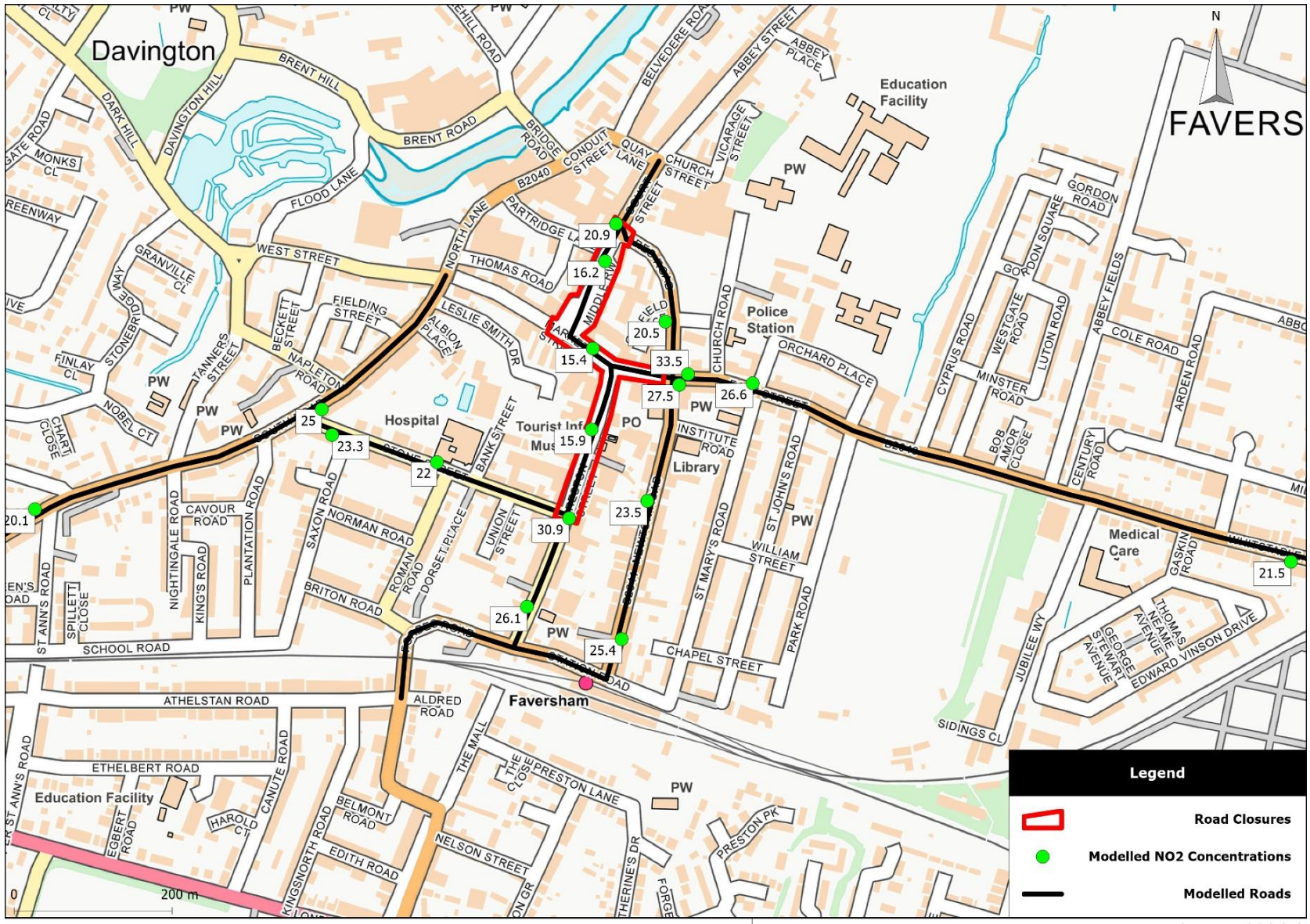

Figure 3.1: Modelled NO2 Concentrations without Road Closures

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Impacts of Road Closure Option 1a

3.5 The pollutant dispersion modelling assessment results for Option 1a are presented in the following section. To reiterate, Option 1a is for the closure of Court Street, Middle Row, Market Place, and Market Street between 10:00 and 16:00.

3.6 The results are presented as changes in concentrations of NO_2 in Figure 3.2, with the full NO_2 results and annual mean concentrations presented in Table 3.1. Results for PM_{10} and $PM_{2.5}$ are presented in Appendix D.

3.7 The modelled annual mean NO_2 concentrations are shown in Table 3.1, below.

Table 3.1: Modelled annual mean NO_2 concentrations with Option 1a

Receptor		Annual Mean Concentration of NO_2 ($\mu g.m^{-3}$)		Change due to Option 1a ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without Option 1a	With Option 1a			
R1	B2040 South Road	20.1	20.1	0.0	0.0	Negligible
R2	B2040 South Road	25.0	25.0	0.0	-0.1	Negligible
R3	Stone Street	23.3	23.3	0.0	0.0	Negligible
R4	Stone Street	22.0	22.0	0.0	0.0	Negligible
R5	Preston Street	26.1	26.1	0.0	0.0	Negligible
R6	Preston Street	30.9	30.9	0.0	0.0	Negligible
R7	Preston Street	15.9	15.6	-0.3	-0.7	Negligible
R8	Market Street	15.4	15.1	-0.2	-0.6	Negligible
R9	Court Street	16.2	15.9	-0.3	-0.6	Negligible
R10	B2040 Crescent Road	20.9	20.8	-0.1	-0.2	Negligible
R11	B2041 Newton Road	25.4	25.5	0.1	0.1	Negligible
R12	B2041 Newton Road	23.5	23.6	0.1	0.1	Negligible
R13	B2041 Newton Road	27.5	27.5	0.0	0.1	Negligible
R14	B2040 East Street	33.5	33.5	0.0	0.0	Negligible
R15	B2040 Crescent Road	20.5	20.6	0.0	0.1	Negligible
R16	B2040 East Street	26.6	26.6	0.0	0.0	Negligible

Receptor		Annual Mean Concentration of NO_2 ($\mu g.m^{-3}$)		Change due to Option 1a ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without Option 1a	With Option 1a			
R17	B2040 East Street	21.5	21.5	0.0	0.0	Negligible

Note: Any discrepancies are due to rounding.

3.8 Table 3.1 shows that all receptor locations surrounding the Town Centre are not anticipated to be impacted by the introduction of the proposed road closure (Option 1a). In total, 5 receptor locations show a decrease in annual mean concentrations, with a further 4 showing increases.

3.9 The highest recorded annual mean NO_2 concentration at any receptor location, in any scenario, was 33.5 $\mu g.m^{-3}$, at Receptor 14, near the junction between East Street and Newton Road. Annual mean concentrations of NO_2 at this receptor were not predicted to change as a result of the scheme.

3.10 All modelled concentrations were anticipated to be below the annual mean AQS for NO_2 by at least 16%. In fact, 15 of the 17 receptors were modelled to be well below the annual mean AQS, by at least 25%, in the 'With Road Closure' scenario.

3.11 The largest modelled increase as a result of the LTN was at Receptors 11 and 12, on Newton Road. The receptor shows an increase of 0.1 $\mu g.m^{-3}$, which is predicted to cause a *Negligible* (incremental) air quality impact, according to EPUK & IAQM descriptors.

3.12 The largest modelled decrease as a result of the LTN was at Receptor 7, on Preston Street. The receptor shows a decrease of 0.3 $\mu g.m^{-3}$, which is predicted to cause a *Negligible* (incremental) air quality impact, according to EPUK & IAQM impact descriptors.

3.13 Figure 3.2, overleaf, illustrates the modelled changes in NO_2 concentrations across the Town Centre, between the pre-scheme data and with-scheme data. The colour changes have no reflection on the modelled impact of NO_2 changes – for example, "red" diamonds do not indicate statistically 'adverse' impacts, nor do "blue" diamonds indicate statistically 'beneficial' impacts. The colours purely provide a visual aid for discussion.

PM_{10} and $PM_{2.5}$ Results

3.14 PM_{10} and $PM_{2.5}$ results are displayed fully in Appendix D. To summarise, all concentrations were well below their respective annual mean National AQSs and all impacts, relative to the National AQSs, were modelled to be of *Negligible* impact, according to EPUK & IAQM descriptors.

Figure 3.2: Mapped Change in NO_2 Concentrations for Option 1a ($\mu g.m^{-3}$)

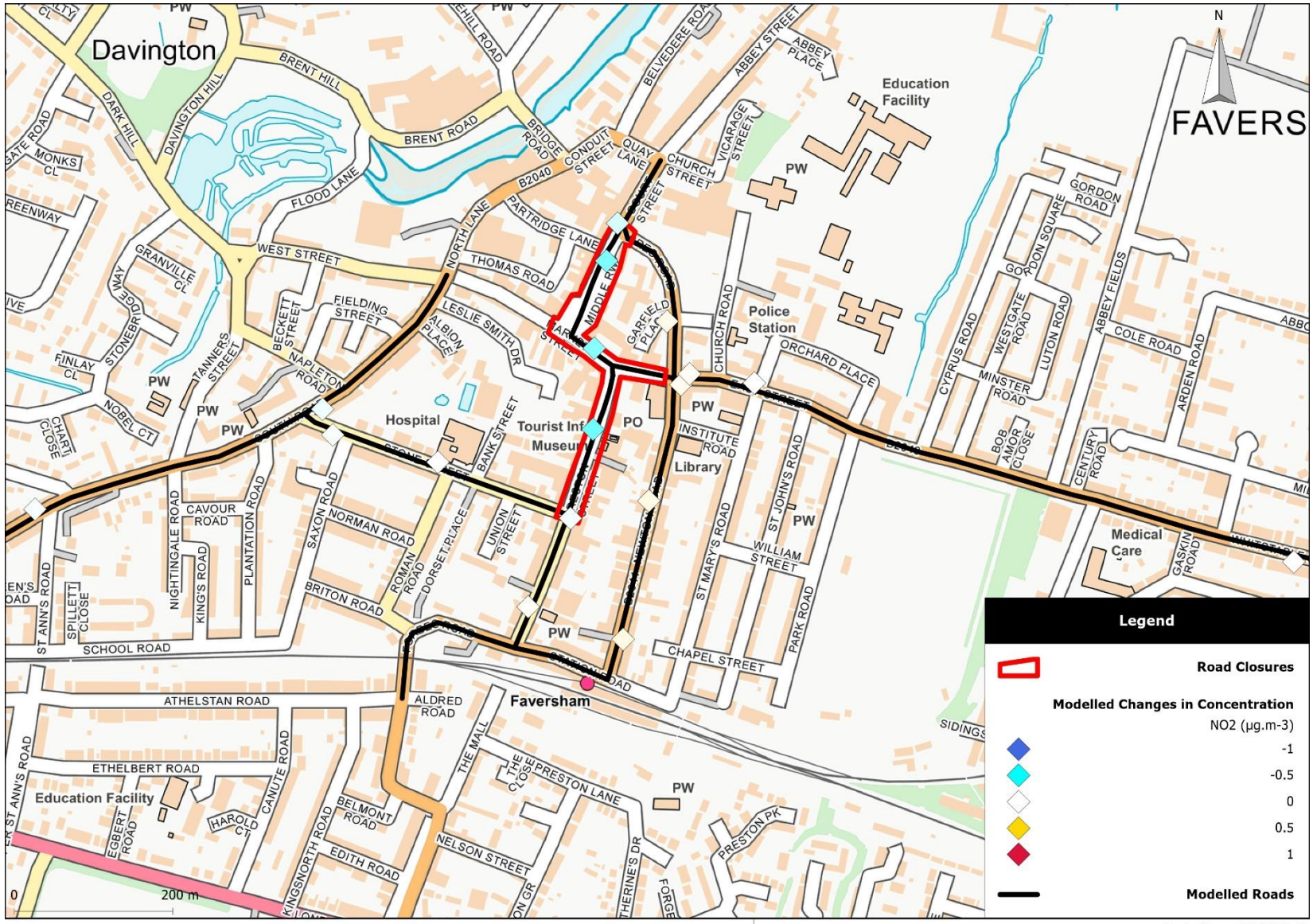

Figure 3.2: Change in NO2 concentrations for Option 1a

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Impacts of Road Closure Option 2b

3.15 The pollutant dispersion modelling assessment results for Option 2b are presented in the following section. To reiterate, Option 2b is for the closure of Court Street, Middle Row, Market Place, Market Street, East Street, and Preston Street between 10:00 and 16:00.

3.16 The results are presented as changes in concentrations of NO_2 in Figure 3.3, with the full NO_2 results and annual mean concentrations presented in Table 3.2. Results for PM_{10} and $PM_{2.5}$ are presented in Appendix D.

3.17 The modelled annual mean NO_2 concentrations are shown in Table 3.2, below.

Table 3.2: Modelled annual mean NO_2 concentrations with Option 2b

Receptor		Annual Mean Concentration of NO_2 ($\mu g.m^{-3}$)		Change due to Option 2b ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without Option 2b	With Option 2b			
R1	B2040 South Road	20.1	20.1	0.0	0.0	Negligible
R2	B2040 South Road	25.0	25.0	0.0	0.0	Negligible
R3	Stone Street	23.3	23.3	0.0	0.0	Negligible
R4	Stone Street	22.0	22.0	0.0	0.0	Negligible
R5	Preston Street	26.1	26.2	0.1	0.2	Negligible
R6	Preston Street	30.9	30.9	0.0	0.0	Negligible
R7	Preston Street	15.9	15.6	-0.3	-0.6	Negligible
R8	Market Street	15.4	15.1	-0.2	-0.5	Negligible
R9	Court Street	16.2	15.9	-0.2	-0.6	Negligible
R10	B2040 Crescent Road	20.9	20.8	-0.1	-0.2	Negligible
R11	B2041 Newton Road	25.4	25.9	0.5	1.3	Negligible
R12	B2041 Newton Road	23.5	23.9	0.4	1.1	Negligible
R13	B2041 Newton Road	27.5	27.7	0.3	0.6	Negligible
R14	B2040 East Street	33.5	33.6	0.1	0.2	Negligible
R15	B2040 Crescent Road	20.5	20.6	0.1	0.2	Negligible

Receptor		Annual Mean Concentration of NO_2 ($\mu g.m^{-3}$)		Change due to Option 2b ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without Option 2b	With Option 2b			
R16	B2040 East Street	26.6	26.7	0.0	0.1	Negligible
R17	B2040 East Street	21.5	21.5	0.0	0.0	Negligible

Note: Any discrepancies are due to rounding.

3.18 Table 3.2 shows that all receptor locations surrounding the Town Centre are not anticipated to be impacted by the introduction of the proposed road closure (Option 2b). In total, 4 receptor locations show a decrease in annual mean concentrations, with a further 7 showing increases.

3.19 The highest recorded annual mean NO_2 concentration at any receptor location, in any scenario, was 33.6 $\mu g.m^{-3}$, at Receptor 14, near the junction between East Street and Newton Road. Annual mean concentrations of NO_2 at this receptor were not predicted to change as a result of the scheme.

3.20 All modelled concentrations were anticipated to be below the annual mean AQS for NO_2 by at least 16%. In fact, 15 of the 17 receptors were modelled to be well below the annual mean AQS, by at least 25%, in this 'With Road Closure' scenario.

3.21 The largest modelled increase as a result of the LTN was at Receptor 11, on Newton Road. The receptor shows an increase of 0.5 $\mu g.m^{-3}$, which is predicted to cause a *Negligible* (incremental) air quality impact, according to EPUK & IAQM descriptors.

3.22 The largest modelled decrease as a result of the LTN was at Receptor 7, on Preston Street. The receptor shows a decrease of 0.3 $\mu g.m^{-3}$, which is predicted to cause a *Negligible* (incremental) air quality impact, according to EPUK & IAQM impact descriptors.

3.23 Figure 3.3, overleaf, illustrates the modelled changes in NO_2 concentrations across the Town Centre, between the pre-scheme data and with-scheme data. The colour changes have no reflection on the modelled impact of NO_2 changes – for example, "red" diamonds do not indicate statistically 'adverse' impacts, nor do "blue" diamonds indicate statistically 'beneficial' impacts. The colours purely provide a visual aid for discussion.

PM_{10} and $PM_{2.5}$ Results

3.24 PM_{10} and $PM_{2.5}$ results are displayed fully in Appendix D. To summarise, all concentrations were well below their respective annual mean National AQSs and all impacts, relative to the National AQSs, were modelled to be of *Negligible* impact, according to EPUK & IAQM descriptors.

Figure 3.3: Mapped Change in NO_2 Concentrations for Option 2b (µg.m^{-3})

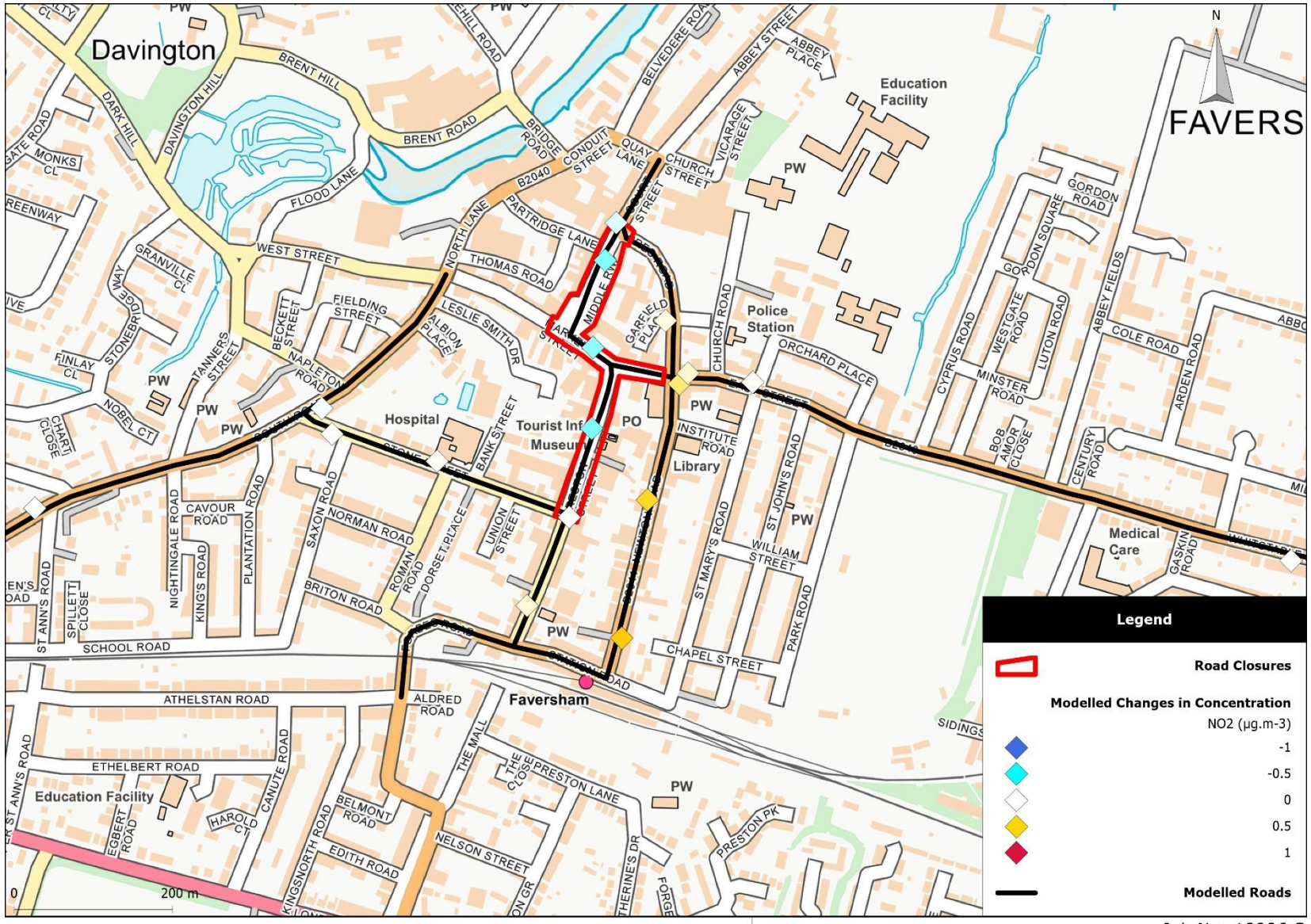

Figure 3.3: Change in NO2 concentrations for Option 2b

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Impacts of Road Closure Option 2c

3.25 The pollutant dispersion modelling assessment results for Option 2c are presented in the following section. To reiterate, Option 2c is for the closure of Court Street, Middle Row, Market Place, and Market Street between 09:00 and 18:00.

3.26 The results are presented as changes in concentrations of NO_2 in Figure 3.4, with the full NO_2 results and annual mean concentrations presented in Table 3.3. Results for PM_{10} and $PM_{2.5}$ are presented in Appendix D.

3.27 The modelled annual mean NO_2 concentrations are shown in Table 3.3, below.

Table 3.3: Modelled annual mean NO_2 concentrations with Option 2c

Receptor		Annual Mean Concentration of NO_2 ($\mu g.m^{-3}$)		Change due to Option 1a ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without Option 1a	With Option 1a			
R1	B2040 South Road	20.1	20.1	0.0	0.0	Negligible
R2	B2040 South Road	25.0	25.0	0.0	0.0	Negligible
R3	Stone Street	23.3	23.3	0.0	0.0	Negligible
R4	Stone Street	22.0	22.0	0.0	0.0	Negligible
R5	Preston Street	26.1	26.2	0.1	0.3	Negligible
R6	Preston Street	30.9	30.9	0.0	0.0	Negligible
R7	Preston Street	15.9	15.2	-0.6	-1.6	Negligible
R8	Market Street	15.4	14.8	-0.5	-1.3	Negligible
R9	Court Street	16.2	15.6	-0.6	-1.4	Negligible
R10	B2040 Crescent Road	20.9	20.8	-0.1	-0.2	Negligible
R11	B2041 Newton Road	25.4	26.3	0.9	2.2	Negligible
R12	B2041 Newton Road	23.5	24.2	0.7	1.8	Negligible
R13	B2041 Newton Road	27.5	27.9	0.5	1.2	Negligible
R14	B2040 East Street	33.5	33.6	0.2	0.4	Negligible
R15	B2040 Crescent Road	20.5	20.7	0.2	0.5	Negligible
R16	B2040 East Street	26.6	26.7	0.0	0.1	Negligible

Receptor		Annual Mean Concentration of NO_2 ($\mu g.m^{-3}$)		Change due to Option 1a ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without Option 1a	With Option 1a			
R17	B2040 East Street	21.5	21.5	0.0	0.0	Negligible

Note: Any discrepancies are due to rounding.

3.28 Table 3.3 shows that all receptor locations surrounding the Town Centre are not anticipated to be impacted by the introduction of the proposed road closure (Option 2c). In total, 4 receptor locations show a decrease in annual mean concentrations, with a further 7 showing increases.

3.29 The highest recorded annual mean NO_2 concentration at any receptor location, in any scenario, was 33.6 $\mu g.m^{-3}$, at Receptor 14, near the junction between East Street and Newton Road. Annual mean concentrations of NO_2 at this receptor were not predicted to change as a result of the scheme.

3.30 All modelled concentrations were anticipated to be below the annual mean AQS for NO_2 by at least 16%. In fact, 15 of the 17 receptors were modelled to be well below the annual mean AQS, by at least 25%, in this 'With Road Closure' scenario.

3.31 The largest modelled increase as a result of the LTN was at Receptor 11, on Newton Road. The receptor shows an increase of 0.9 $\mu g.m^{-3}$, which is predicted to cause a *Negligible* (incremental) air quality impact, according to EPUK & IAQM descriptors.

3.32 The largest modelled decrease as a result of the LTN was at Receptor 7, on Preston Street. The receptor shows a decrease of 0.6 $\mu g.m^{-3}$, which is predicted to cause a *Negligible* (incremental) air quality impact, according to EPUK & IAQM impact descriptors.

3.33 Figure 3.4, overleaf, illustrates the modelled changes in NO_2 concentrations across the Town Centre, between the pre-scheme data and with-scheme data. The colour changes have no reflection on the modelled impact of NO_2 changes – for example, "red" diamonds do not indicate statistically 'adverse' impacts, nor do "blue" diamonds indicate statistically 'beneficial' impacts. The colours purely provide a visual aid for discussion.

PM_{10} and $PM_{2.5}$ Results

3.34 PM_{10} and $PM_{2.5}$ results are displayed fully in Appendix D. To summarise, all concentrations were well below their respective annual mean National AQSs and all impacts, relative to the National AQSs, were modelled to be of *Negligible* impact, according to EPUK & IAQM descriptors.

Figure 3.4: Mapped Change in NO_2 Concentrations for Option 2c (µg.m^{-3})

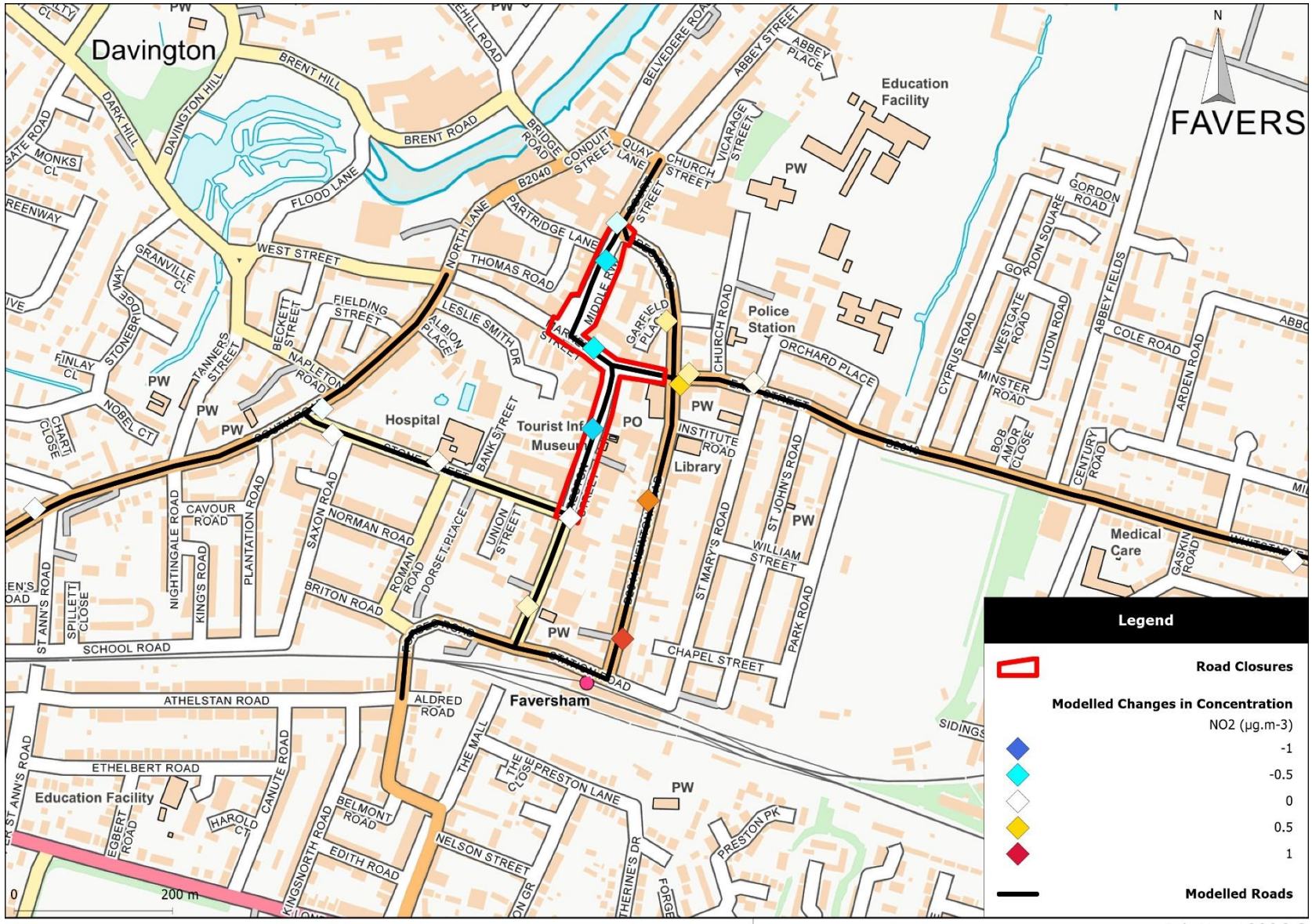

Figure 3.4: Change in NO2 concentrations for Option 2c

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4. Discussion

Summary of Results

4.1 The road closure modelling results showed improvements in air quality within the roads where closures were proposed, and a worsening of air quality due to the subsequent displacement of traffic onto roads outside of the Town Centre.

4.2 The smallest magnitude of change in air pollutant concentrations was caused by Road Closure Option 1a, with the largest magnitude of change caused by Option 2c. All predicted changes in pollutant concentrations were small enough to be considered to have a *Negligible* impact on local air quality.

4.3 Additionally, no modelled receptor locations are anticipated to be in exceedance of any relevant AQS for NO_2, PM_{10} or $PM_{2.5}$. It should be noted that none of the proposed options are anticipated to displace any traffic onto the A2 Ospringe Street AQMA, where existing air quality is known to be poor and in exceedance of the annual mean AQS for NO_2.

Significance of Results

4.4 Based on the above, it is considered that irrelevant of which of the three road closure options are proposed, the scheme would be expected to have an overall negligible impact on air quality. This effect is not considered to be significant.

5. Conclusions

5.1 Phlorum were commissioned by Project Centre, on behalf of Swale Borough Council, to assess the air quality impacts of proposed road closure options in Faversham's Town Centre.

5.2 Air quality modelling was undertaken to assess the potential impact of the road closures by assessing the change in pollutant concentrations before and during the scheme's implementation.

5.3 The results showed a change in concentrations both within and outside of the town centre, due to the displacement of traffic from the former to the latter. All air quality changes were predicted to be of *Negligible* impact for all modelled road closure options, when compared to the National Air Quality Standards.

5.4 Overall, and when compared to the national air quality standards these air quality impacts are not considered to be significant.

5.5 The introduction of the road closure schemes are, therefore, considered to be acceptable, in air quality terms, with regards to all relevant local and national planning policy and guidance. As such, air quality does not necessarily need to have a material influence on the refining of road closure options.

Appendices

Appendix A: Air Quality Standards and Objectives

National Air Quality Standards and Objectives

The UK Air Quality Strategy (UKAQS) sets air quality standard (AQS) concentrations for a number of key pollutants that are to be achieved at sensitive receptor locations across the UK by corresponding "objective" dates (AQO's). The sensitive locations at which the standards and objectives apply are those where the population are reasonably expected to be exposed to said pollutants over the particular averaging period.

For those objectives to which an annual mean standard applies, the most common sensitive receptor locations used to compare concentrations against the standards are areas of residential housing. It is reasonable to expect that people living in their homes could be exposed to pollutants over such a period of time.

Schools and children's playgrounds are also often used as sensitive locations for comparison with annual mean objectives due to the increased sensitivity of young people to the effects of pollution (regardless of whether or not their exposure to the pollution could be over an annual period). For shorter averaging periods of between 15 minutes, 1 hour or 1 day, the sensitive receptor location can be anywhere where the public could be exposed to the pollutant over these shorter periods of time. A summary of the AQS relevant to this assessment are included in the table below.

Table A.1: UK Air Quality Standards and Objectives

Pollutant	Averaging Period	Air quality standard (AQS) ($\mu g.m^{-3}$)	Air quality objective (AQO)
Nitrogen dioxide (NO_2)	1-hour	200	200 $\mu g.m^{-3}$ not to be exceeded more than 18 times a year
	Annual	40	40 $\mu g.m^{-3}$
Particulate Matter (PM_{10})	24-hour	50	50 $\mu g.m^{-3}$ not to be exceeded more than 35 times a year
	Annual	40	40 $\mu g.m^{-3}$
Particulate Matter ($PM_{2.5}$)	Annual	20	20 $\mu g.m^{-3}$

Appendix B: Impact Descriptors

Table B.1: EPUK/IAQM Impact descriptors for individual receptors

Long term average concentration at receptor in assessment year	% Change in concentration relative to AQAL			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Substantial
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Notes:

1. AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.
2. The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5%, will be described as Negligible.
3. The Table is only designed to be used with annual mean concentrations.
4. Descriptors for individual receptors only; the overall significance is determined using professional judgement , for example, a 'moderate' adverse impact at one receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.
5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme' concentration for an increase.

Appendix C: Model Verification Study

Model Verification

Model verification studies are undertaken in order to check the performance of dispersion models and, where modelled concentrations are significantly different to monitored concentrations, a factor can be established by which the modelled results can be adjusted in order to improve their reliability. The model verification process is detailed in LAQM.TG(16).

According to LAQM.TG(16), no adjustment factor is necessary where the results of the model all lie within 25% of the monitored concentrations.

Model verification can only be undertaken where there is sufficient roadside monitoring data in the vicinity of the subject scheme being assessed. LAQM.TG(16) recommends that a combination of automatic and diffusion tube monitoring data is used; although this may be limited by data availability. 9 monitoring locations with appropriate traffic data collated by the Department for Transport were selected for this study.

Table C.1 compares monitored and modelled NO_2 concentrations at the monitoring locations.

Table C.1: Monitored and Modelled Road Contributions of NO_2 at Roadside Monitoring Sites

Monitor ID	Type	Concentrations ($\mu g.m^{-3}$)		
		Monitored	Modelled	% Difference
ZW3	A	31.4	22.7	-27.6%
SW28	DT	43.0	27.9	-35.1%
SW29	DT	40.9	26.2	-36.0%
SW96	DT	36.6	22.8	-37.8%
SW32	DT	36.9	26.5	-28.3%
SW31	DT	37.9	27.1	-28.6%
SW120	DT	39.9	27.0	-32.4%
SW117	DT	28.5	19.5	-31.7%
SW98	DT	33.5	22.0	-34.5%

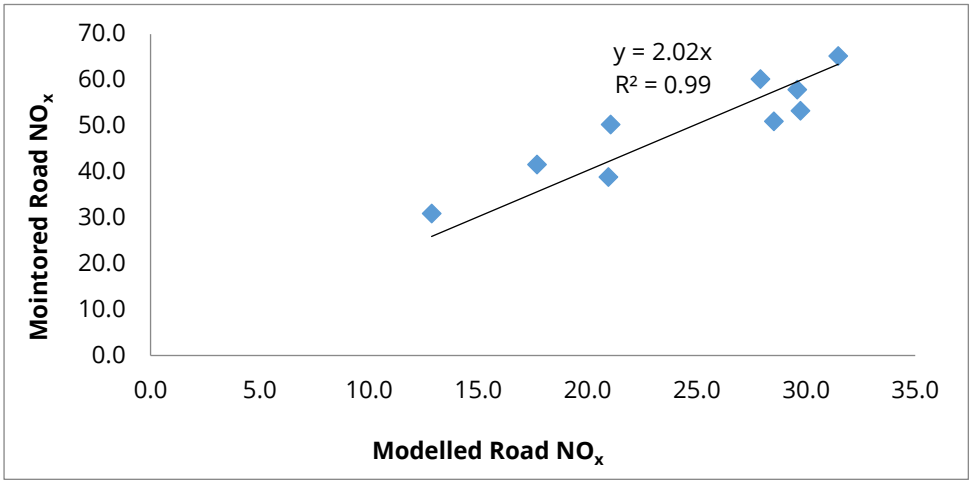
Note: A = Automatic Monitor; DT = Diffusion Tube

The data in Table C.1 shows that the model is under-predicting concentrations at most locations to a varying degree. This is a pattern frequently seen in model verification studies, and is likely to be the result of local dispersion characteristics. As such, and for conservative purposes, it was decided to proceed with adjustment as the model was under predicting most NO_2 concentrations.

As it is primary NO_x, rather than secondary NO_2, emissions that are modelled, an adjustment factor must be derived for the road contribution of NO_x.

Plots of modelled versus monitored NO_x concentrations on a graph shows a positive correlation. The graph is included in Figure C.1 below.

Figure C.1 Monitored vs Modelled Road NO_x



By plotting a trend line through the points on the graph, a factor of **2.02** was derived. Table C.2 shows total monitored versus modelled NO_2 following the adjustment of the road contribution of NO_x by this factor. It shows that, following this adjustment, all modelled concentrations of NO_2 are within 10% of monitored concentrations at these locations. As a result, the adjustment factors were considered appropriate for the adjustment of modelled road contributions of NO_x for the LTN.

Table C.2: Monitored and Adjusted Modelled Total NO_2 at Roadside Monitoring Sites

Monitor ID	Type	Concentrations (µg.m^{-3})		
		Monitored	Modelled	% Difference
ZW3	A	31.4	33.0	5.1%
SW28	DT	43.0	42.3	-1.6%
SW29	DT	40.9	39.3	-4.0%
SW96	DT	36.6	33.1	-9.6%

Monitor ID	Type	Concentrations (µg.m^{-3})		
		Monitored	Modelled	% Difference
SW32	DT	36.9	39.8	7.8%
SW31	DT	37.9	40.8	7.7%
SW120	DT	39.9	40.7	2.0%
SW117	DT	28.5	26.1	-8.5%
SW98	DT	33.5	30.8	-8.1%

Note: A= Automatic Monitor; DT = Diffusion Tube

As there is no suitable PM_{10} or $PM_{2.5}$ monitoring data in the study area, it was not possible to perform model verification for these pollutants. As such, the NO_2 adjustment factor has also been applied to PM_{10} and $PM_{2.5}$ model results, in accordance with LAQM.TG(16).

Root Mean Square Error

Root Mean Square Error (RMSE) is used to define the average error or uncertainty of the model. According to LAQM.TG(16), the RMSE should ideally be within 10% of the relevant air quality standard, but is acceptable where it is within 25% of the AQS. The model verification process calculated a post-adjusted RMSE of 2.3 µg.m^{-3}, which equates to 5.8% of the annual mean AQS for NO_2 and is therefore considered to be acceptable.

Appendix D: Modelled PM_{10} and $PM_{2.5}$ results

Table D.1: Annual mean predicted PM_{10} concentrations with Option 1a

Receptor		Annual Mean Concentration of PM_{10} ($\mu g.m^{-3}$)		Change due to LTN ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without LTN	With LTN			
R1	B2040 South Road	17.0	17.0	0.0	0.0	Negligible
R2	B2040 South Road	17.6	17.6	0.0	0.0	Negligible
R3	Stone Street	17.3	17.3	0.0	0.0	Negligible
R4	Stone Street	17.1	17.1	0.0	0.0	Negligible
R5	Preston Street	17.7	17.7	0.0	0.0	Negligible
R6	Preston Street	18.0	17.9	0.0	0.0	Negligible
R7	Preston Street	16.3	16.2	0.0	-0.1	Negligible
R8	Market Street	16.2	16.2	0.0	-0.1	Negligible
R9	Court Street	16.3	16.3	0.0	-0.1	Negligible
R10	B2040 Crescent Road	17.0	17.0	0.0	0.0	Negligible
R11	B2041 Newton Road	17.5	17.5	0.0	0.0	Negligible
R12	B2041 Newton Road	17.4	17.4	0.0	0.0	Negligible
R13	B2041 Newton Road	17.8	17.8	0.0	0.0	Negligible
R14	B2040 East Street	18.8	18.8	0.0	0.0	Negligible
R15	B2040 Crescent Road	16.9	16.9	0.0	0.0	Negligible
R16	B2040 East Street	17.9	17.9	0.0	0.0	Negligible
R17	B2040 East Street	16.5	16.5	0.0	0.0	Negligible

Table D.2: Annual mean predicted $PM_{2.5}$ concentrations with Option 1a

Receptor		Annual Mean Concentration of PM_{10} ($\mu g.m^{-3}$)		Change due to LTN ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without LTN	With LTN			
R1	B2040 South Road	11.2	11.2	0.0	0.0	Negligible
R2	B2040 South Road	11.9	11.9	0.0	0.0	Negligible
R3	Stone Street	11.7	11.7	0.0	0.0	Negligible
R4	Stone Street	11.6	11.6	0.0	0.0	Negligible
R5	Preston Street	12.0	12.0	0.0	0.0	Negligible
R6	Preston Street	12.1	12.1	0.0	0.0	Negligible
R7	Preston Street	11.1	11.1	0.0	-0.1	Negligible
R8	Market Street	11.1	11.0	0.0	-0.1	Negligible
R9	Court Street	11.1	11.1	0.0	-0.1	Negligible
R10	B2040 Crescent Road	11.5	11.5	0.0	0.0	Negligible
R11	B2041 Newton Road	11.4	11.4	0.0	0.0	Negligible
R12	B2041 Newton Road	11.8	11.8	0.0	0.0	Negligible
R13	B2041 Newton Road	12.0	12.0	0.0	0.0	Negligible
R14	B2040 East Street	12.6	12.6	0.0	0.0	Negligible
R15	B2040 Crescent Road	11.5	11.5	0.0	0.0	Negligible
R16	B2040 East Street	12.1	12.1	0.0	0.0	Negligible
R17	B2040 East Street	10.9	10.9	0.0	0.0	Negligible

Table D.3: Annual mean predicted PM_{10} concentrations with Option 2b

Receptor		Annual Mean Concentration of PM_{10} ($\mu g.m^{-3}$)		Change due to LTN ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without LTN	With LTN			
R1	B2040 South Road	17.0	17.0	0.0	0.0	Negligible
R2	B2040 South Road	17.6	17.6	0.0	0.0	Negligible
R3	Stone Street	17.3	17.3	0.0	0.0	Negligible
R4	Stone Street	17.1	17.1	0.0	0.0	Negligible
R5	Preston Street	17.7	17.7	0.0	0.0	Negligible
R6	Preston Street	18.0	18.0	0.0	0.0	Negligible
R7	Preston Street	16.3	16.2	0.0	-0.1	Negligible
R8	Market Street	16.2	16.2	0.0	-0.1	Negligible
R9	Court Street	16.3	16.3	0.0	-0.1	Negligible
R10	B2040 Crescent Road	17.0	17.0	0.0	0.0	Negligible
R11	B2041 Newton Road	17.5	17.6	0.1	0.2	Negligible
R12	B2041 Newton Road	17.4	17.4	0.1	0.2	Negligible
R13	B2041 Newton Road	17.8	17.8	0.0	0.1	Negligible
R14	B2040 East Street	18.8	18.8	0.0	0.0	Negligible
R15	B2040 Crescent Road	16.9	16.9	0.0	0.0	Negligible
R16	B2040 East Street	17.9	17.9	0.0	0.0	Negligible
R17	B2040 East Street	16.5	16.5	0.0	0.0	Negligible

Table D.4: Annual mean predicted $PM_{2.5}$ concentrations with Option 2b

Receptor		Annual Mean Concentration of PM_{10} ($\mu g.m^{-3}$)		Change due to LTN ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without LTN	With LTN			
R1	B2040 South Road	11.2	11.2	0.0	0.0	Negligible
R2	B2040 South Road	11.9	11.9	0.0	0.0	Negligible
R3	Stone Street	11.7	11.7	0.0	0.0	Negligible
R4	Stone Street	11.6	11.6	0.0	0.0	Negligible
R5	Preston Street	12.0	12.0	0.0	0.0	Negligible
R6	Preston Street	12.1	12.1	0.0	0.0	Negligible
R7	Preston Street	11.1	11.1	0.0	-0.1	Negligible
R8	Market Street	11.1	11.0	0.0	-0.1	Negligible
R9	Court Street	11.1	11.1	0.0	-0.1	Negligible
R10	B2040 Crescent Road	11.5	11.5	0.0	0.0	Negligible
R11	B2041 Newton Road	11.4	11.5	0.0	0.2	Negligible
R12	B2041 Newton Road	11.8	11.8	0.0	0.1	Negligible
R13	B2041 Newton Road	12.0	12.0	0.0	0.1	Negligible
R14	B2040 East Street	12.6	12.6	0.0	0.0	Negligible
R15	B2040 Crescent Road	11.5	11.5	0.0	0.0	Negligible
R16	B2040 East Street	12.1	12.1	0.0	0.0	Negligible
R17	B2040 East Street	10.9	10.9	0.0	0.0	Negligible

Table D.5: Annual mean predicted PM_{10} concentrations with Option 2c

Receptor		Annual Mean Concentration of PM_{10} ($\mu g.m^{-3}$)		Change due to LTN ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without LTN	With LTN			
R1	B2040 South Road	17.0	17.0	0.0	0.0	Negligible
R2	B2040 South Road	17.6	17.6	0.0	0.0	Negligible
R3	Stone Street	17.3	17.3	0.0	0.0	Negligible
R4	Stone Street	17.1	17.1	0.0	0.0	Negligible
R5	Preston Street	17.7	17.7	0.0	0.0	Negligible
R6	Preston Street	18.0	18.0	0.0	0.0	Negligible
R7	Preston Street	16.3	16.2	-0.1	-0.2	Negligible
R8	Market Street	16.2	16.1	-0.1	-0.2	Negligible
R9	Court Street	16.3	16.3	-0.1	-0.2	Negligible
R10	B2040 Crescent Road	17.0	17.0	0.0	0.0	Negligible
R11	B2041 Newton Road	17.5	17.6	0.1	0.3	Negligible
R12	B2041 Newton Road	17.4	17.5	0.1	0.3	Negligible
R13	B2041 Newton Road	17.8	17.9	0.1	0.2	Negligible
R14	B2040 East Street	18.8	18.8	0.0	0.1	Negligible
R15	B2040 Crescent Road	16.9	16.9	0.0	0.1	Negligible
R16	B2040 East Street	17.9	17.9	0.0	0.0	Negligible
R17	B2040 East Street	16.5	16.5	0.0	0.0	Negligible

Table D.6: Annual mean predicted $PM_{2.5}$ concentrations with Option 2c

Receptor		Annual Mean Concentration of PM_{10} ($\mu g.m^{-3}$)		Change due to LTN ($\mu g.m^{-3}$)	Change as a % of the AQS	EPUK & IAQM Impact Descriptor
ID	Road Link	Without LTN	With LTN			
R1	B2040 South Road	11.2	11.2	0.0	0.0	Negligible
R2	B2040 South Road	11.9	11.9	0.0	0.0	Negligible
R3	Stone Street	11.7	11.7	0.0	0.0	Negligible
R4	Stone Street	11.6	11.6	0.0	0.0	Negligible
R5	Preston Street	12.0	12.0	0.0	0.0	Negligible
R6	Preston Street	12.1	12.1	0.0	0.0	Negligible
R7	Preston Street	11.1	11.1	-0.1	-0.2	Negligible
R8	Market Street	11.1	11.0	0.0	-0.2	Negligible
R9	Court Street	11.1	11.1	0.0	-0.2	Negligible
R10	B2040 Crescent Road	11.5	11.5	0.0	0.0	Negligible
R11	B2041 Newton Road	11.4	11.5	0.1	0.3	Negligible
R12	B2041 Newton Road	11.8	11.8	0.1	0.3	Negligible
R13	B2041 Newton Road	12.0	12.1	0.0	0.2	Negligible
R14	B2040 East Street	12.6	12.6	0.0	0.1	Negligible
R15	B2040 Crescent Road	11.5	11.5	0.0	0.1	Negligible
R16	B2040 East Street	12.1	12.1	0.0	0.0	Negligible
R17	B2040 East Street	10.9	10.9	0.0	0.0	Negligible

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