M M MOTT MACDONALD

Fact Sheet

Air quality information, with a focus on Foxton

This note supports the figures prepared by Mott MacDonald using existing available data to report on the current air quality situation in Foxton.

No additional monitoring has been undertaken by GCP; the information presented here is based only on data currently available from local authorities and DEFRA.

Air quality monitoring

- The national air quality[1] objective for Annual Mean concentrations of Nitrogen dioxide (NO_2) is for levels of NO_2 to be lower than 40µg/m³ at sensitive locations such as people's homes, schools and hospitals.
- NO_2 is the main pollutant of concern from road traffic. The highest pollutant concentrations associated with road traffic can be found in busy urban areas. NO_2 concentrations on busy roads in cities such as Cambridge are generally higher than in surrounding areas.
- It is recognised that where concentrations of NO_2 are low and road traffic is the primary source of emissions, such as in Foxton, the concentration of particulate matter (PM_{10}/$PM_{2.5}$) would be within the air quality objectives for PM_{10}/$PM_{2.5}$. Therefore, in such situations, local authorities do not tend to monitor particulate matter PM_{10}/$PM_{2.5}$[2] in as many locations as NO_2.
- Currently available air quality monitoring undertaken by Cambridge City Council and South Cambridgeshire District Council is available on their websites.
- Local authorities only tend to monitor in areas where they have concerns about pollutant concentrations.

Foxton

There is no air quality monitoring currently undertaken by South Cambridgeshire District Council in Foxton demonstrating that the council believes air quality is good in the area. The closest air quality monitoring is a diffusion tube (which is a passive air quality monitoring device) at 47 High Street in Harston which has been used to measure roadside annual mean NO_2 concentrations since 2006. While not confirmed, it is possible the reason why air quality monitoring started in Harston is due to the village being situated around a primary road (A10) that connects Cambridge to the south and has a direct junction with the M11. Although Harston is located approximately 3km north of Foxton, the air quality is expected to be broadly similar as receptors are adjacent to the same section of the A10 and traffic flows in the two areas would be similar.

Defra's Local Air Quality Management Technical Guidance (2016) provides a list of rail lines where emissions associated with diesel trains should be taken into account for air quality assessment purposes. The rail line crossing through Foxton is not included in this list, likely due to its electrification. In addition, on rail lines with heavy traffic of diesel trains, emissions from trains only need to be considered where background NO_2 is greater than 25µg/m³. As shown on the accompanying figures, background NO_2 concentrations in Foxton are less than 8µg/m³. As the rail line is electrified, not heavily trafficked by diesel trains and background NO_2 concentrations in Foxton are low, the effect of trains using the rail line have negligible effect on NO_2 concentrations in Foxton.

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[1] DEFRA. UK and EU Air Quality Limits. National air quality objectives and European Directive limit and target values for the protection of human health. Available online at: https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update.pdf

[2] PM = particulate matter, 2.5 and 10 refer to the size of the particulates in micrometers.

Table 1 presents the annual NO_2 concentration measured in Harston since 2006 which is considered to be a useful proxy for concentrations in Foxton. The data and associated figures prepared with this data show that the annual NO_2 concentrations have remained below the air quality objective over this period.

Table 1: NO_2 monitoring data at 47 High Street, Harston

Year	Annual NO_2 concentration ($\mu g/m^3$)
2006	26.6
2007	26.1
2008	27.0
2009	28.1
2010	29.6
2011	23.7
2012	25.6
2013	25.7
2014	28.0
2015	28.4
2016	28.6
2017	27.3

Source: South Cambridgeshire District Council Review and Assessment Documents

Additional information has been collated on regional modelled NO_2, $PM_{2.5}$ and PM_{10}[3] levels and from site specific monitoring locations in the Cambridge area for the same parameters. Figures have been prepared by Mott MacDonald using existing available data.
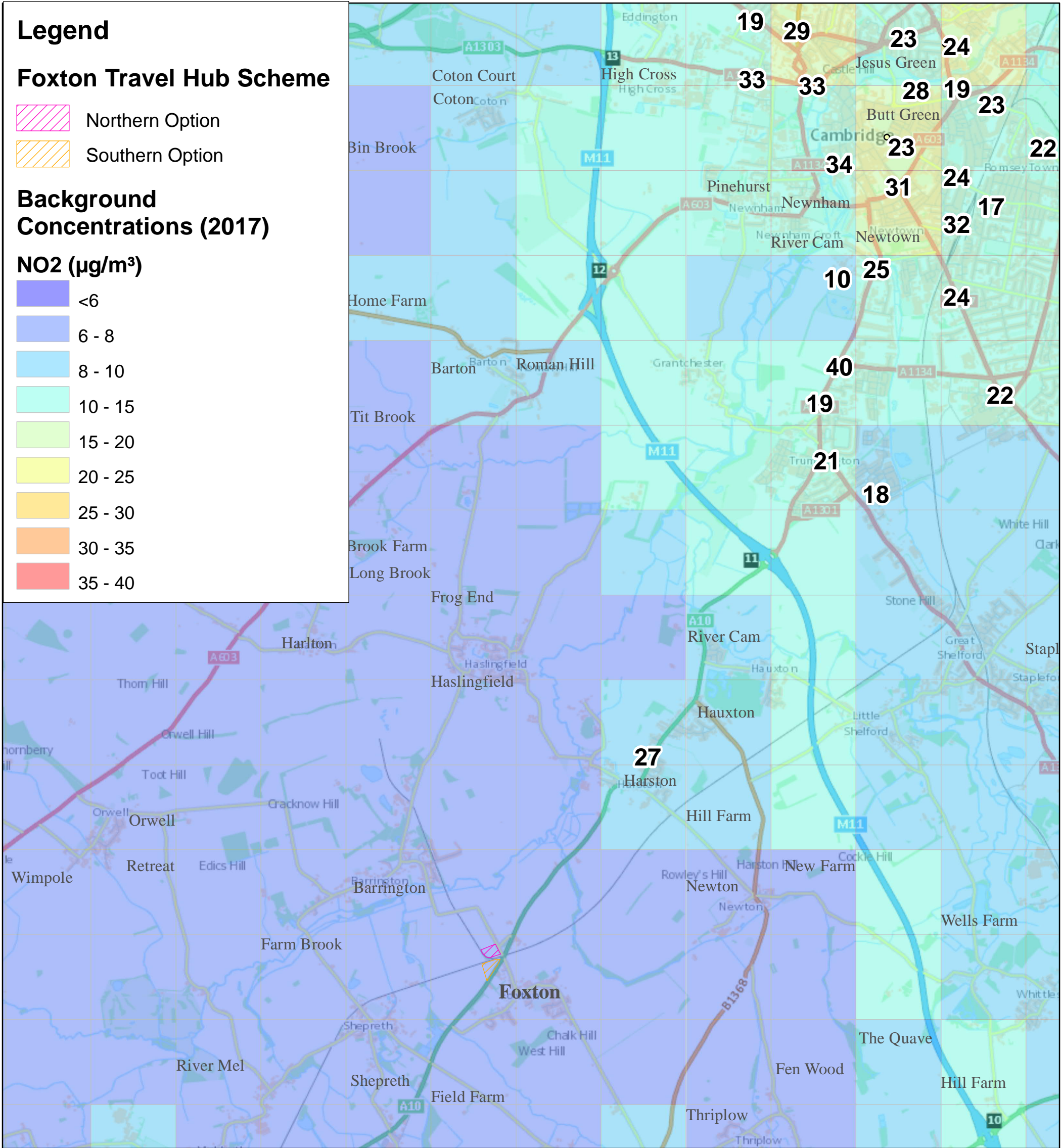
On the proposed scheme and next steps

- There will be growth in traffic along the A10 in response to committed developments in Cambridge as increasing numbers of people commute to and from work in the city, or simply visit the city.

- The effects of road traffic on air quality are worst within a few metres of the roadside, and rapidly decline to the point where beyond 200m there is generally negligible effect on air quality.

- The Foxton Travel Hub Scheme does not propose to change the frequency of train movements.

- As the proposed options for a new Travel Hub are located within 200m from sensitive receptors (i.e. residential properties along Barrington Road and along the A10)[4], both locations would potentially have some effects on receptors from vehicle traffic movements at the site.

- The proposed Travel Hub is intended to alleviate congestion along the A10 arising from this growth in traffic. With growth in traffic it is possible that air quality would decline. However, there are likely to be significant ongoing improvements in vehicle engine technology which will result in reductions in vehicle emissions with a consequential benefit to air quality. To predict changes in air quality in the future requires detailed modelling of traffic projections and the results to be used in an air quality model that accounts for improvement in vehicle technology to calculate likely future air quality conditions.

- The next step for this project is to prepare the Outline Business Case, which will consider two site options for the proposed Travel Hub. No air quality monitoring specific to this proposed scheme is currently planned for this scheme.

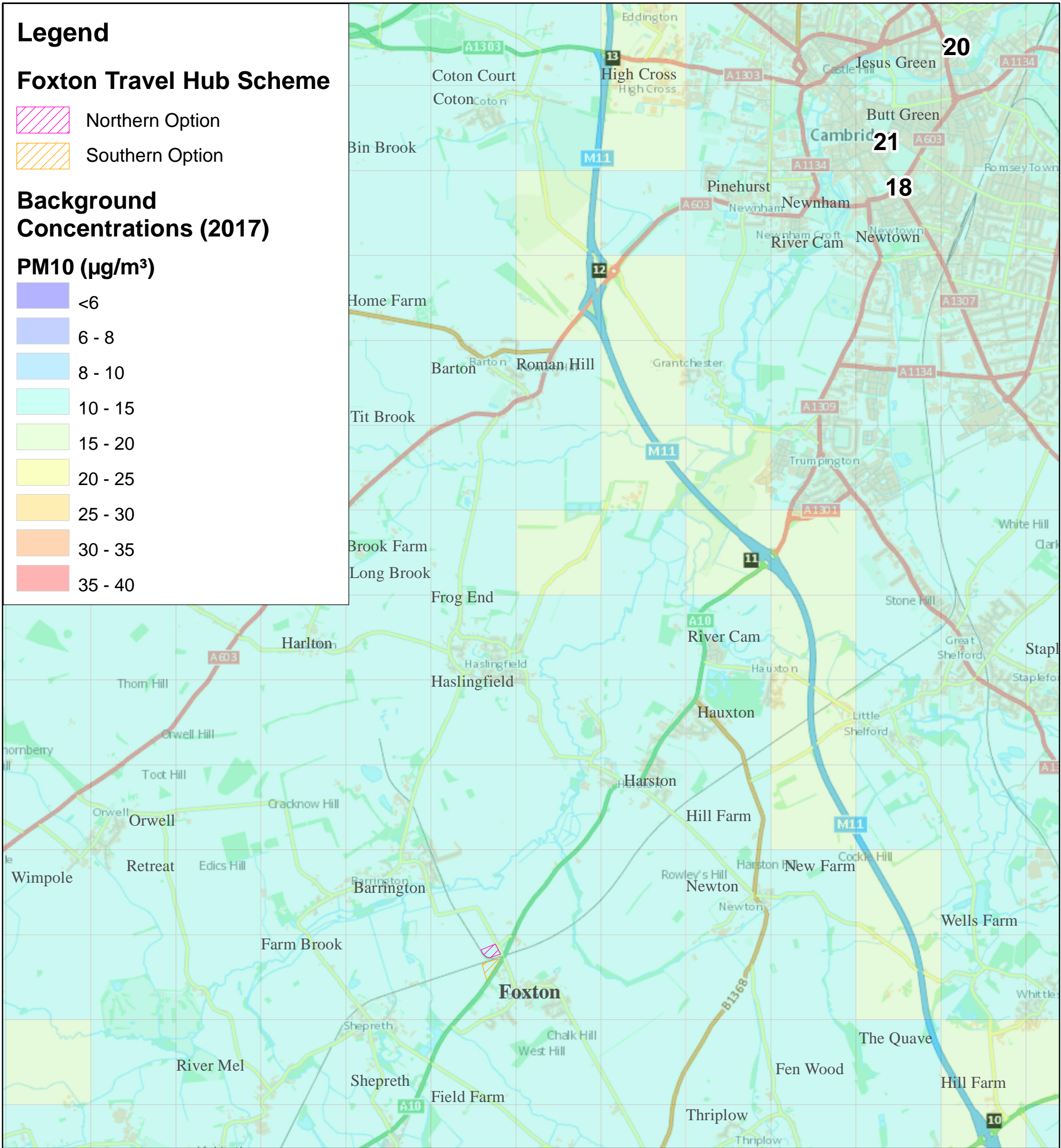[3] PM = particulate matter, 2.5 and 10 refer to the size of the particulates in micrometers.
[4] Example of common sensitive receptors are residential properties, schools and hospitals.

- If a decision is made to take the proposed scheme to the next stage, the preferred option will be subject to further environmental assessments during which the level of effect on air quality and receptors will be investigated in more detail.

Legend

Foxton Travel Hub Scheme

Northern Option

Southern Option

Background Concentrations (2017)

NO2 (µg/m³)

<6
6 - 8
8 - 10
10 - 15
15 - 20
20 - 25
25 - 30
30 - 35
35 - 40

Numbers on the map present the concentration in micrograms per metre cubed (µg/m³) of nitrogen dioxide (NO2) measured by Cambridgeshire City Council and South Cambridgeshire District Council in 2017. These are different from the coloured squares as they represent the concentration at a specific location e.g. the concentration along a particular road rather than across the whole coloured 1km grid square. The air quality objective for NO2 is 40µg/m³ which applies at sensitive locations such as peoples homes, schools and hospitals.

The coloured tiles on the map present modelled background pollutant concentrations for 1km grid squares provided Defra. These are different from the numbers on the map as they are an average of the concentration across the entire square. The modelled background concentrations take account of emission sources both within and outside the grid square and are representative of pollutant concentrations away from emissions sources. For example, emissions from a road would not be distinguishable from background concentrations beyond 200m of the roadside.

Legend

Foxton Travel Hub Scheme

Northern Option

Southern Option

Background Concentrations (2017)

PM10 (µg/m³)

	<6
	6 - 8
	8 - 10
	10 - 15
	15 - 20
	20 - 25
	25 - 30
	30 - 35
	35 - 40

Numbers on the map present the concentration in micrograms per metre cubed (µg/m³) of particulate matter less than 10 microns in diameter (PM10) measured by Cambridgeshire City Council and South Cambridgeshire District Council in 2017. These are different from the coloured squares as they represent the concentration at a specific location e.g. the concentration along a particular road rather than across the whole coloured 1km grid square. The air quality objective for PM10 is 40µg/m³ which applies at sensitive locations such as peoples homes,

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Legend

Foxton Travel Hub Scheme

Northern Option

Southern Option

Background Concentrations (2017)

PM2.5 (µg/m³)

	<8
	8 - 9
	9 - 10
	10 - 12
	12 - 15
	15 - 18
	18 - 20
	20 - 25

Numbers on the map present the concentration in micrograms per metre cubed (µg/m³) of particulate matter less than 2.5 microns in diameter (PM2.5) measured by Cambridgeshire City Council and South Cambridgeshire District Council in 2017. These are different from the coloured squares as they represent the concentration at a specific location e.g. the concentration along a particular road rather than across the whole coloured 1km grid square. The air quality objective for PM2.5 is 25µg/m³ which applies at sensitive locations such as peoples homes,

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