

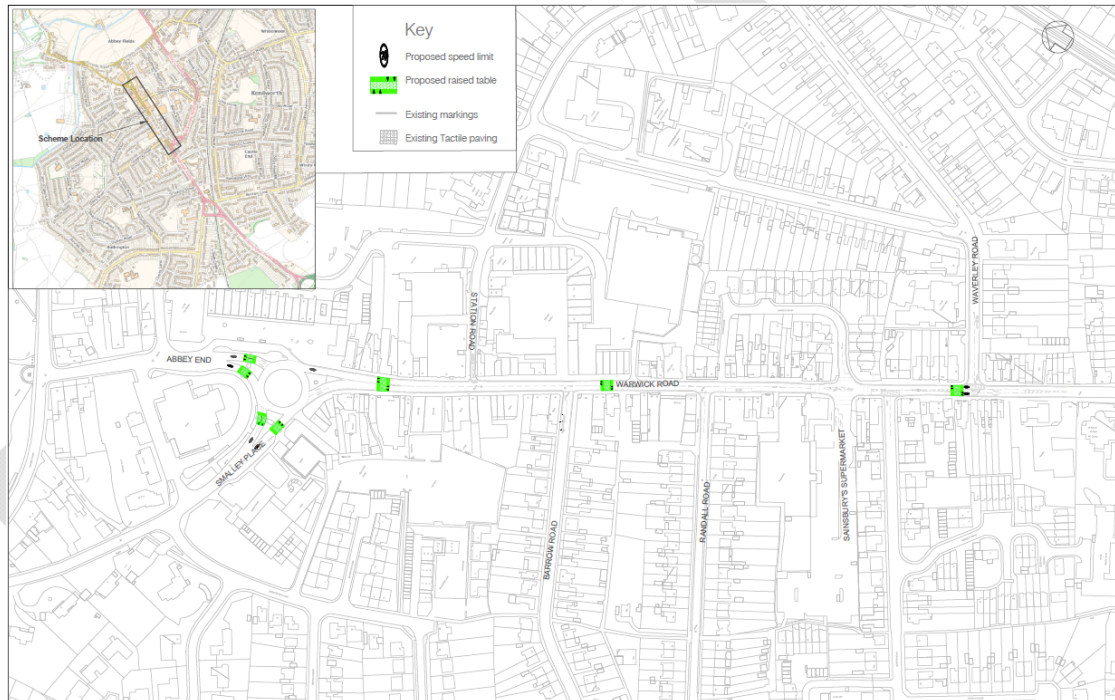
Warwick Road Scheme: Air Quality Modelling Assessment Results

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Introduction

1. Vectos Microsim (VM) has been commissioned by Warwickshire County Council (WCC) to assess the impact on tail pipe emissions of the proposed Warwick Road scheme. The testing has been undertaken using WCC's Kenilworth and Stoneleigh Wide Area (KSWA) model.
2. The proposed Warwick Road Scheme is intended to reduce the speed limit and introduce raised tables to manage traffic. The scheme is presented in Figure 1 below.

Figure 1: Warwick Road Scheme



Model Scenarios

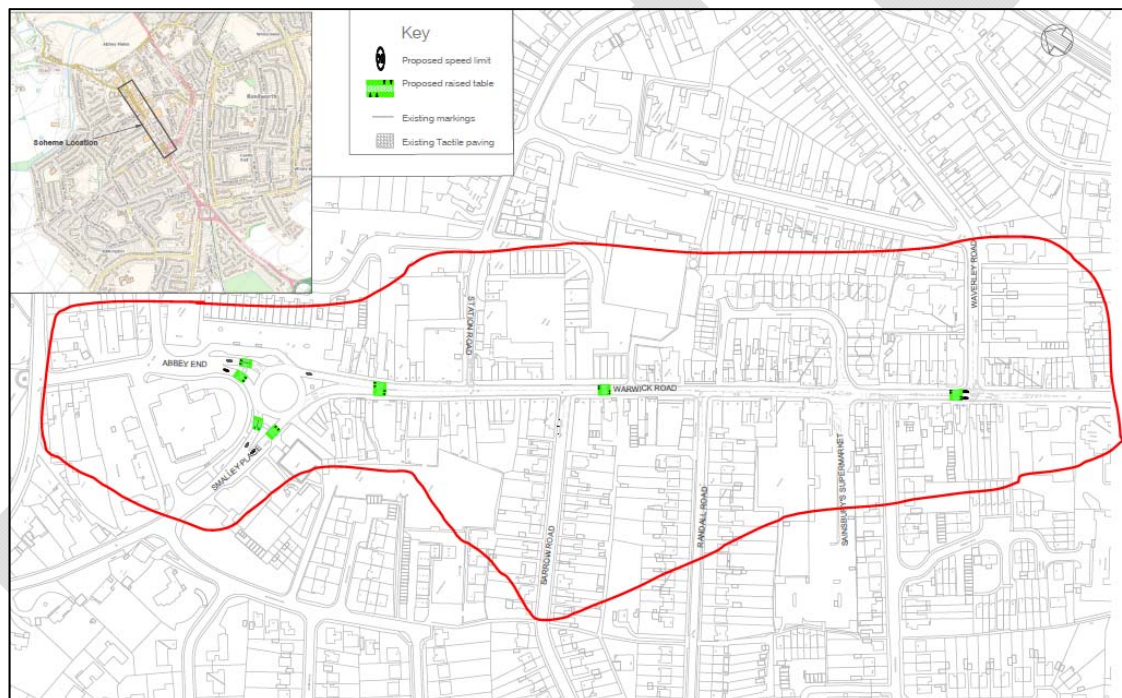
3. The following scenarios have been used to inform the assessment summarised in this Note.
 - M001 – KSWA 2021 Reference model
 - M002 – KSWA 2021 Reference model + Scheme
 - M003 – KSWA 2029 Local Plan model
 - M004 – KSWA 2029 Local Plan model + Scheme

4. A comparative Air Quality Assessment has been carried using the above scenarios, which is focussed on the emissions recorded within the two model scenarios. A comparison of a with and without Scheme position has been completed in the 2021 Reference model and the 2029 Local Plan model.
5. The results from the assessments are presented in the following sections.

Air Quality Assessment

6. The following section presents the air quality outputs that have been extracted from the KSWA scenarios and processed through the Analysis of Instantaneous Road Emissions (AIRE) programme, which was developed to work with the outputs from Paramics models.
7. The study area within the KSWA network has been defined using a filter (carposdefs file) that lists the links contained within the area outlined in the Figure below:

Figure 2: Air Quality Study Area



AIRE (Analysis of Instantaneous Road Emissions)

8. AIRE is an ancillary program specifically designed to process the outputs from traffic microsimulation models and calculate vehicle emissions. AIRE incorporates over 3,000 Instantaneous Emissions Modelling (IEM) tables, which are used to estimate tailpipe emissions from individual simulated road vehicles.
9. The IEM tables were derived from PHEM (Passenger car and Heavy duty Emissions Model), which was developed by the Technical University of Graz. PHEM is a vehicle dynamics model with engine maps, enabling emissions to be output for various engine speeds and engine loads.

10. AIRE produces estimates of the oxides of nitrogen, particulate matter and total carbon that result from the combustion of fuel throughout each simulated vehicle's journey. The estimates are produced on a simulated time step by time step basis, so the detail and quality of the resulting output emissions estimates are directly related to the adopted simulation's fidelity and robustness.
11. The estimates produced by AIRE are for tailpipe emissions and do not include the impact of dispersion within the atmosphere, ambient factors, such as weather and temperature, or the local built environment.

Results

12. Completion of the AIRE assessment has enabled a comparison of the level of the following outputs to be made between each scenario, at each of the AQMAs being assessed:

- Nitrogen
- Particulate Matter (PM10)
- Carbon

13. The outputs have been collected and compared between the four scenarios:

- M001 – KSWA 2021 Reference model
- M002 – KSWA 2021 Reference model + Scheme
- M003 – KSWA 2029 Local Plan model
- M004 – KSWA 2029 Local Plan model + Scheme

14. The results are presented below.

2021 Reference Assessment

15. The Air Quality outputs for the 2021 Reference assessment are presented in Table 1 below.

Table 1: 2021 Reference Results

Output	Period	2021	2021 + Scheme	Diff
Nitrogen Emissions (g)	AM	70191505	70332523	0.20%
	PM	63429822	64066996	0.99%
PM10 Emissions (g)	AM	1936652	1939142	0.13%
	PM	1789005	1803647	0.81%
Carbon Emissions (g)	AM	11698326184	11720556657	0.19%
	PM	11047676693	11026908817	-0.19%

16. The impact of the schemes on tailpipe emissions within the study are is shown to minimal, with changes in the emission particles being less than 1% in all cases.
17. From this assessment, it is fair to conclude that the inclusion of the proposed scheme on Warwick road has a negligible impact on tail pipe emissions along this corridor.

2029 Local Plan Assessment

18. The Air Quality outputs for the 2029 Local Plan assessment are presented in Table 2 below.

Table 2: 2029 Local Plan Results

Output		2029	2029 + Scheme	Diff
Nitrogen Emissions (g)	AM	68879553	69387587	0.73%
	PM	63342642	62765312	-0.92%
PM10 Emissions (g)	AM	1932673	1943457	0.55%
	PM	1793498.674	1778087	-0.87%
Carbon Emissions (g)	AM	11833744887	11794457288	-0.33%
	PM	11164736671	11106899233	-0.52%

19. As was shown in the 2021 Reference assessment, the impact on the tail pipe emissions following the inclusion of the Scheme is negligible and in all cases changes by less than 1%. It is, however, worth note that the majority of changes are highlighting reductions in the particle emissions, albeit by marginal levels.

Air Quality Summary

20. The air quality assessment above presents results from the 2021 KSWA Reference model and the 2029 Local Plan model, with and without the Warwick Road scheme in place.
21. Air quality assessments have been undertaken using the Paramics air quality analysis tool, AIRE.
22. The assessment has revealed that the scheme does not trigger a significant change in the emissions recorded on Warwick Road in Kenilworth.