

UK Plan for tackling roadside nitrogen dioxide levels

An aerial photograph of a suburban area. A multi-lane road runs horizontally across the upper half of the image. To the left of the road is a residential street with houses and a parking lot. To the right of the road is a railway line with several tracks. A large, dense green tree stands in the center of the image, partially obscuring the railway. In the foreground, there is a green lawn and a paved path. The text 'Fareham / HCC Progress Final Plan / Measures Update 27 June 2019' is overlaid in white on the image.

**Fareham / HCC Progress
Final Plan / Measures
Update
27 June 2019**

Air Quality

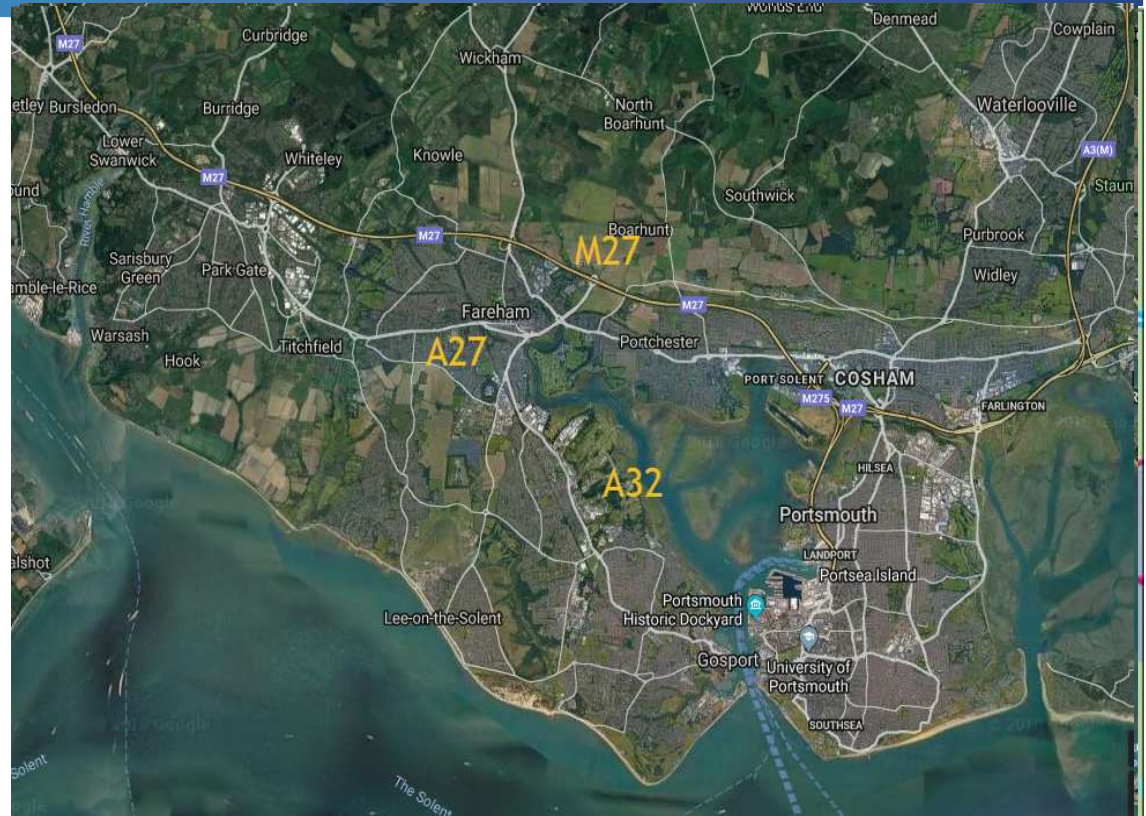
1. Project Update
2. Financial Position / Funding
3. Measures delivery
4. evaluation

A27 / A32 NO₂ exposure overview and strategic context

The A32 provides the primary route on and off of the Gosport peninsula, this intersects with the A27 which runs East-West across Fareham, linking the A32 to Junction 11 of the M27.

Under the UK Plan, projections for concentrations of nitrogen dioxide (NO₂) and oxides of nitrogen (NO_x) across the UK in the years 2017 - 2030 inclusive were calculated as part of the Pollution Climate Mapping (PCM) model.

PCM Projects 2021 NO₂ concentrations of 40.1 µg/m³ on the A27. (EU limit 40 µg/m³)



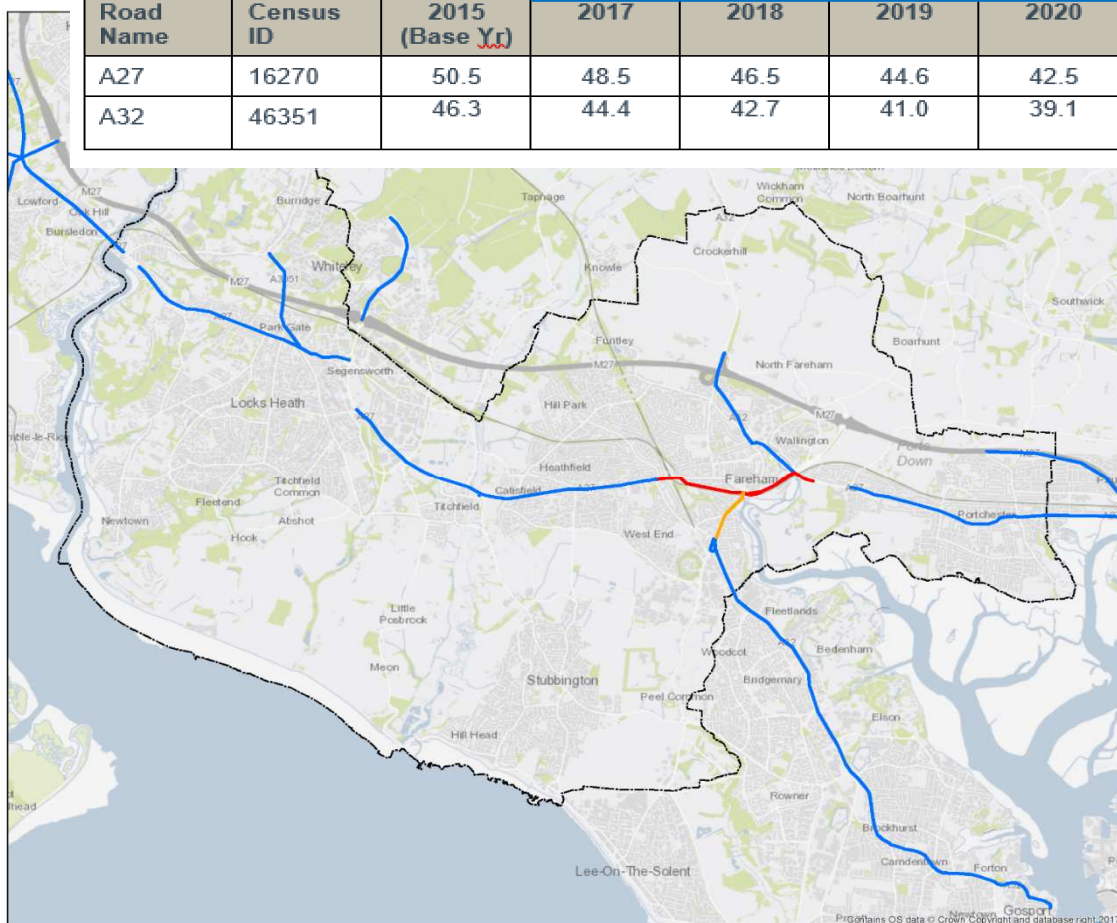
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National Modelling – A27/A32

Baseline roadside concentrations for projected year ($\mu\text{g}/\text{m}^3$)

| Road Name | Census ID | 2015 (Base Yr) | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|-----------|-----------|----------------|------|------|------|------|------|------|
| A27 | 16270 | 50.5 | 48.5 | 46.5 | 44.6 | 42.5 | 40.1 | 37.9 |
| A32 | 46351 | 46.3 | 44.4 | 42.7 | 41.0 | 39.1 | 37.0 | 35.0 |

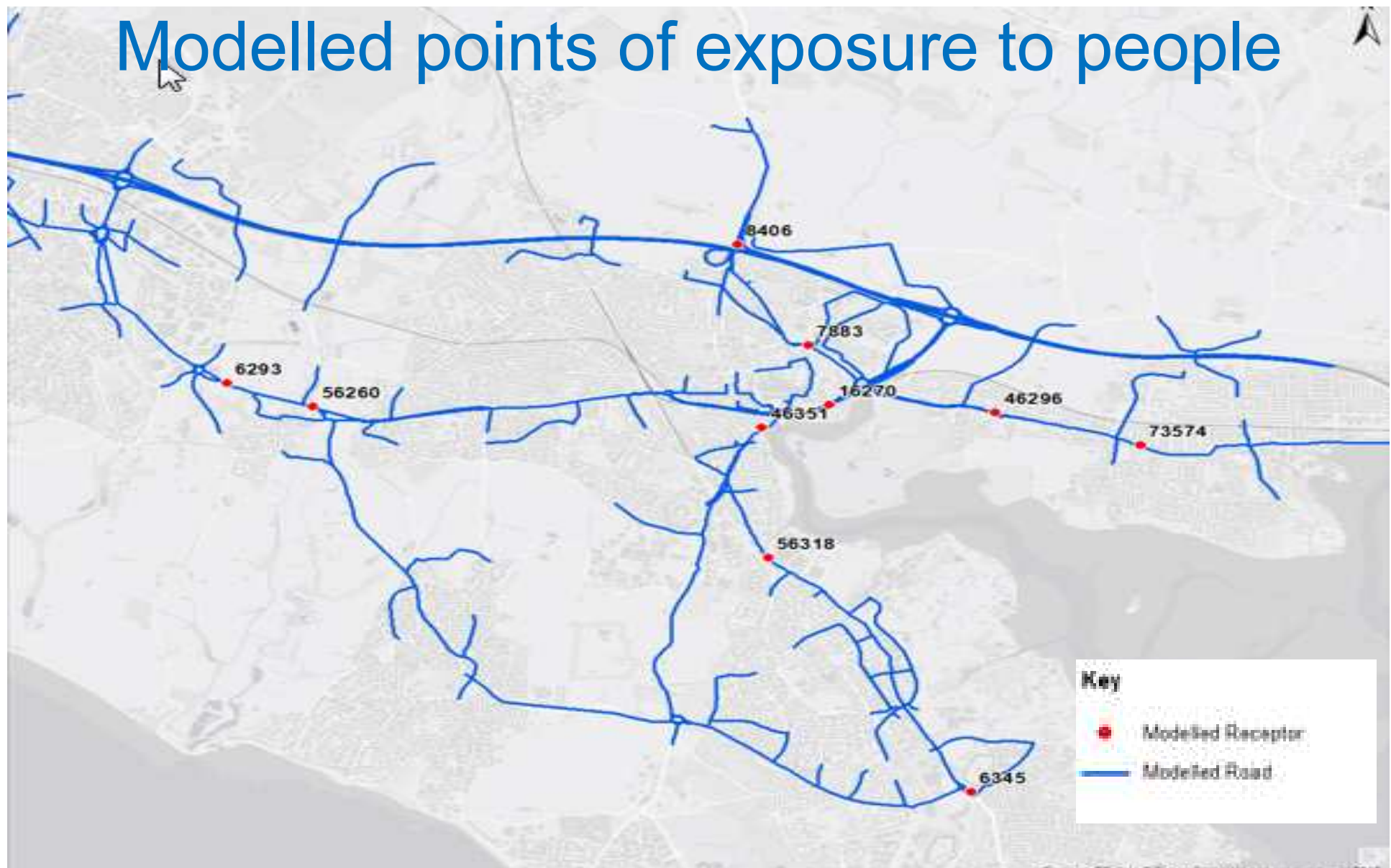


Defra Pollution Climate Mapping (PCM) model used to assess compliance with EU Limit Values

Projects 2021 NO_2 concentrations of $40.1 \mu\text{g}/\text{m}^3$ on the A27

Projects compliance by 2022 without further action

Modelled points of exposure to people

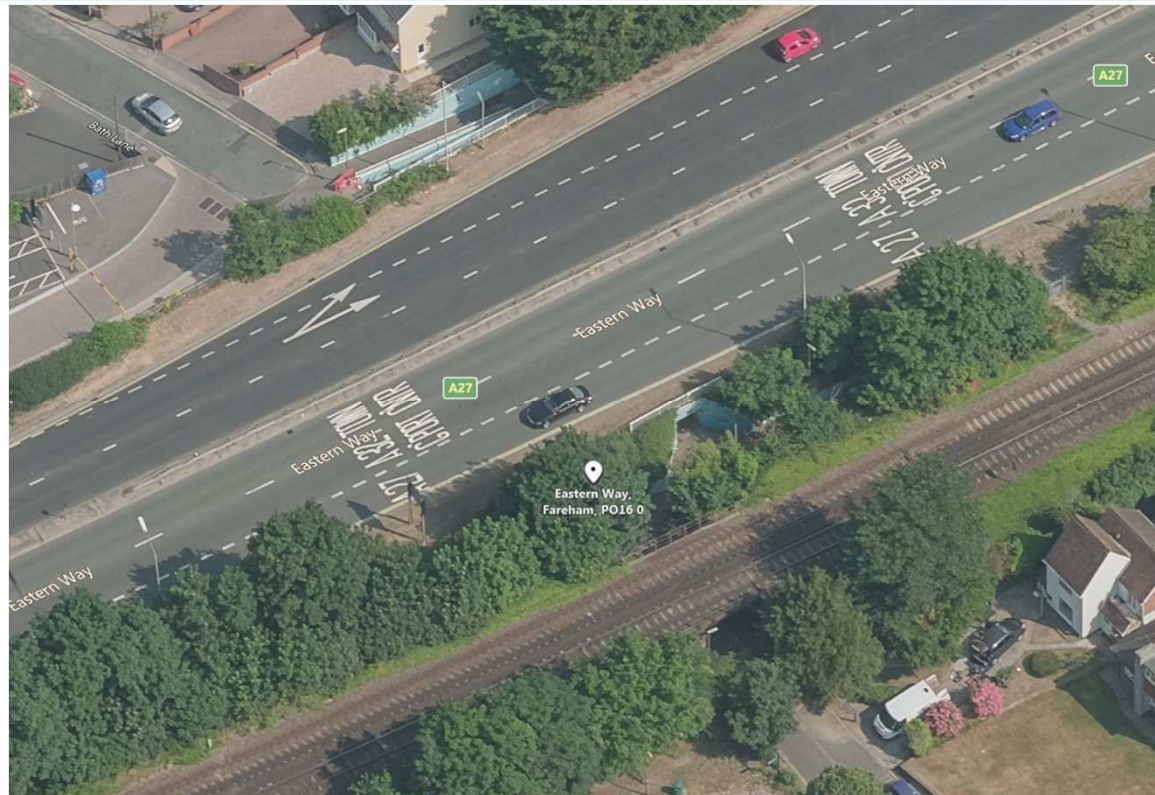


Air Quality Modelling Results

| Census ID | Modelled Roadside Annual Mean NO ₂ Concentration (µg/m ³) | | | | |
|-----------|--|--------------|--------------|--------------|-------|
| | 2017 | 2018 | 2019 | 2020 | 2021 |
| 6293 | 42.12 | 40.98 | 39.82 | 38.58 | 37.03 |
| 6345 | 38.02 | 36.45 | 34.83 | 33.11 | 31.61 |
| 7883 | 27.39 | 26.34 | 25.28 | 24.16 | 23.19 |
| 8406 | 38.40 | 37.34 | 36.27 | 35.13 | 33.52 |
| 16270 | 44.52 | 43.25 | 41.94 | 40.55 | 38.58 |
| 46296 | 30.98 | 29.78 | 28.55 | 27.24 | 25.96 |
| 46351 | 43.46 | 41.78 | 40.02 | 38.15 | 36.28 |
| 56260 | 42.57 | 41.75 | 40.94 | 40.07 | 38.15 |
| 56318 | 40.14 | 38.55 | 36.93 | 35.19 | 33.55 |
| 73574 | 26.27 | 25.36 | 24.44 | 23.46 | 22.59 |

Note: Values in **bold** denote exceedances of annual mean NO₂ EU limit value¹

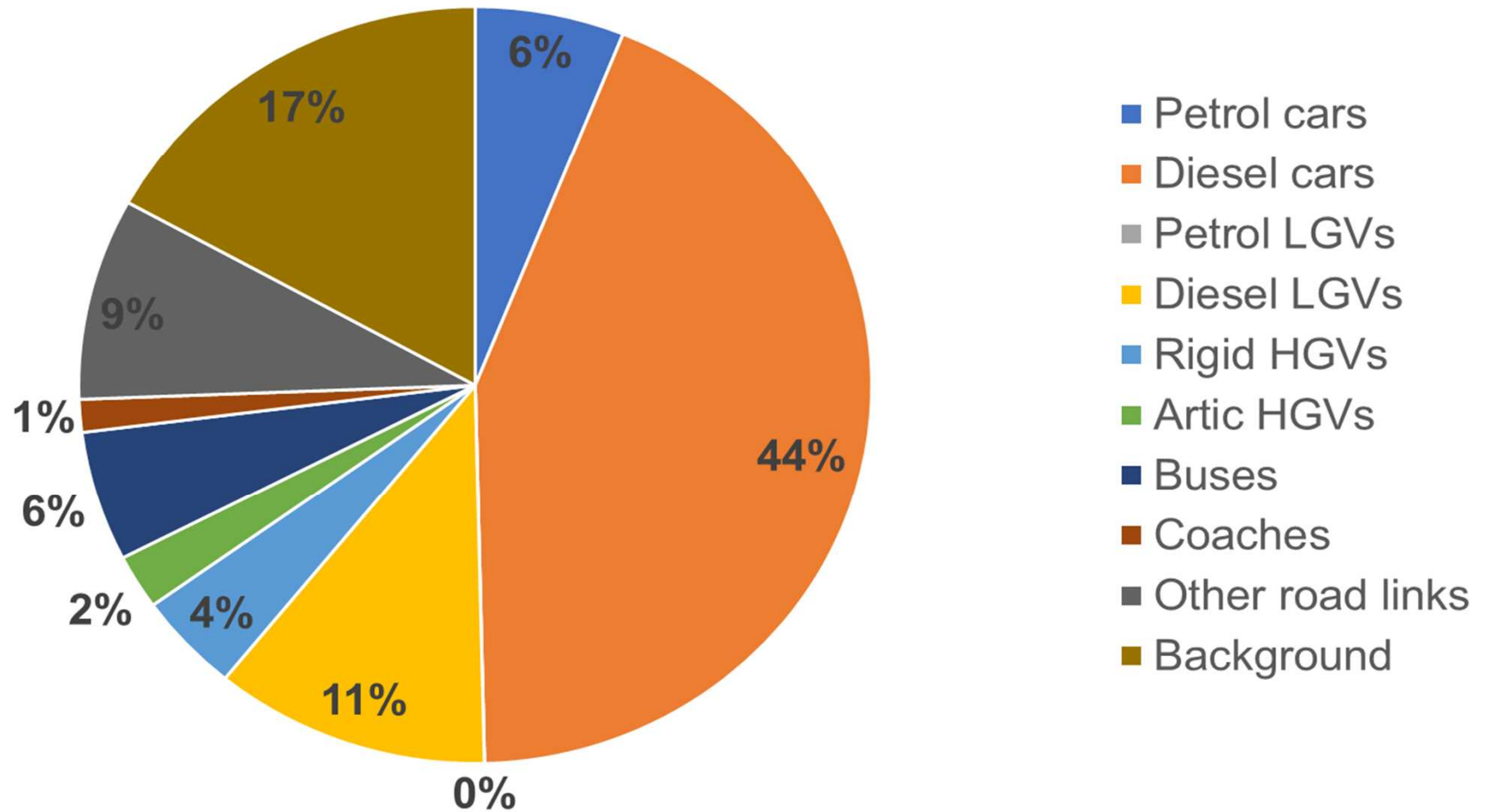
Point (16720) of modelled exceedance – Bath Lane



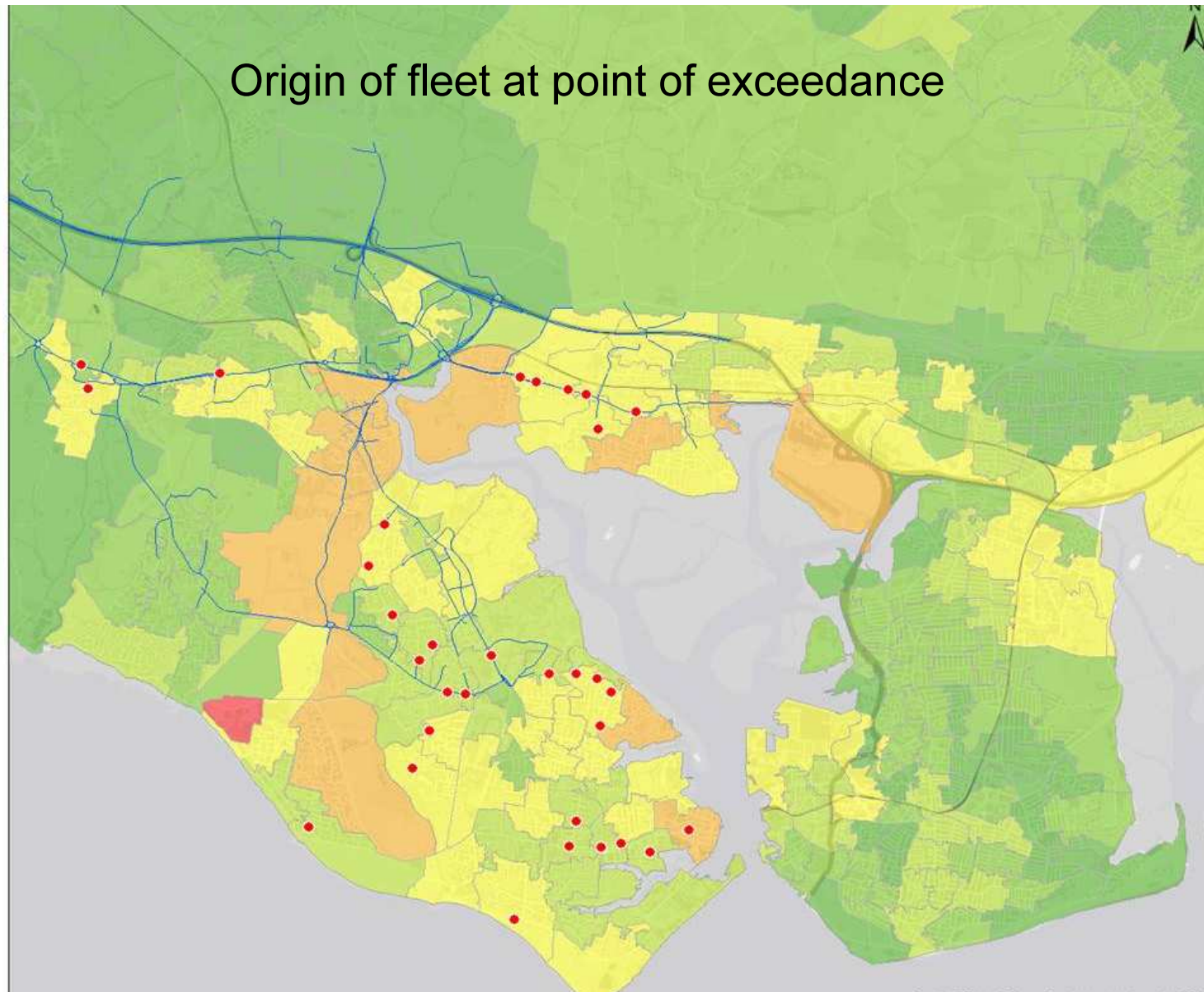
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Fleet at Bath Lane point of modelled exceedance



Origin of fleet at point of exceedance



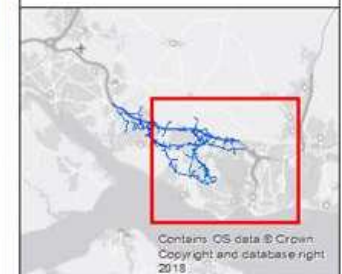
Select Link Analysis for
'Problem Link' to show
Car Movements by Origin
during peak periods
(2021)

Key

- Proposed RTPI
- Modelled Road Network

2021 Car Movements (by origin)

- < 25
- 25 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1,000
- > 1,000



Data sources: Ordnance Survey

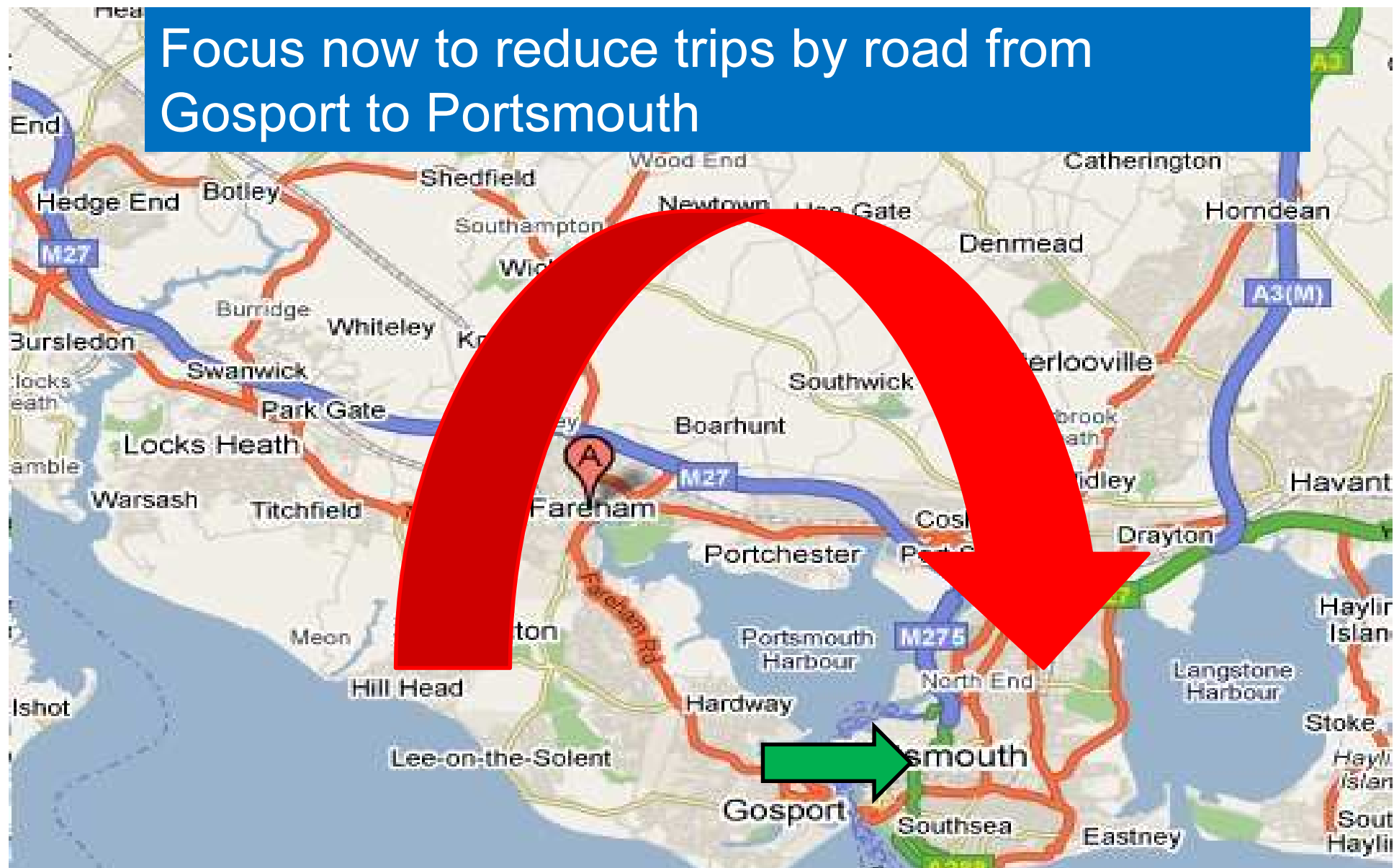
0 0.5 1 2 Km
Scale (at A3): 1:50,000

SNC-LAVALIN

ATKINS
Member of the SNC-Lavalin Group

| Status: | Purpose of Issue: | Rev: | Model File Identifier: |
|------------|-------------------|----------|------------------------|
| S1 | Draft | A | N/A |
| Reference: | Drawn: | Checked: | Authorised: |

Focus now to reduce trips by road from
Gosport to Portsmouth



Shortlist of measures submitted at Strategic Outline Case

- 1: Taxi Incentive – Subject of 'Early Measures' grant, enhancements being developed
- 2: Bus Retrofitting
- 3: Cycle Infrastructure
- 4: AQ Business Engagement Officer
- 5: ITS Review
- 6: Integrated Bus & Ferry Season Ticket w/ discount
- 7: Bus Stop RTI
- 8: Travel Plan reviews
- 9: Fleet Recognition Scheme
- 10: EVCPs
- 11: Additional Bus Services
- 12: Class A Charging CAZ

Final modelling 40.55ug/m³ in 2020 (Nov 2018)

A - Tackling taxi emissions at source

~~B - Tackling bus emissions at source~~

C - Walking and cycling Infrastructure & marketing

~~D - Air Quality Business Engagement Officer~~

E - ITS Corridor Strategy Review

~~F - Bus & ferry marketing, ticket discounts / app~~

G - Bus stop info & RTI

~~H - Local Travel Plan reviews~~

~~I - Fleet recognition scheme~~

~~J - EVCPs~~

~~K - Bus services~~

~~L - Class A CAZ - (Benchmark)~~

State aid / out of time to progress

Out of time to achieve behavioural change

Issues with match funding/ state aid / time

Out of time to achieve behavioural change

Out of time to achieve behavioural change

Out of time to achieve behavioural change

Issues with match funding/ state aid

Out of time to implement

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Preferred option

This Final Plan therefore seeks approval to invest £1,409,253.06 in Fareham & Gosport to tackle roadside emissions of Nitrogen Dioxide (NO₂) for the benefit of human health and bring forward compliance with the legal limit to 2020.

This investment will deliver four measures in 2019:

- A taxi upgrade incentive scheme (Fareham Borough Council)
- Cycle infrastructure schemes (Hampshire County Council)
- Real Time Information provision at local bus stops (Hampshire County Council)
- Optimisation of the signalised Quay Street junction (Hampshire County Council)

Implementation of this whole package of measures makes compliance with the legal limit in 2020 likely, bringing forward legal compliance one year from the 'Business as Usual' scenario achieving compliance in 2021.

Preferred option

The preferred option is a package of measures that are deliverable within 2019 and cumulatively have the greatest potential to improve air quality on the non-compliant link and in the wider area:

130

- Incentive to encourage the upgrade of pre-Euro 6 diesel taxis to Euro 6; ★
- Cycling measures to bring modest improvements to four key routes within Gosport, including one which serves Fareham station (near to the non-compliant link to the west);
- RTPI at 55 selected bus stops which do not currently have information to improve the attraction of public transport, bringing benefits to public transport users and encouraging some mode shift to bus; and
- SCOOT signalling at the Quay Street roundabout (to the west of the non-compliant link on the A27)

Measures – Taxi Incentive Scheme

Licencing data shows there are currently 225 pre-Euro 6 taxis and private hire vehicles in the Fareham fleet. Modelling on the link of concern has shown that if these were converted to Euro VI, this would remove the marginal exceedance of the EU Limit value adjacent to the target link of the A27 / Gosport Road between the Quay Street & Delme junction (Census ID 16270) in 2020 and reduce annual mean NO₂ concentrations at all modelled receptors (by up to 0.23 µg/m³). However, this is a grant activity and is dependant on voluntary up-take by local taxi drivers.

If all 225 vehicles took up the scheme at £2,425 each, that would require an additional funding of £388,000 to be awarded. However, Fareham are requesting only an additional £150K at this time which, when combined with the existing grant of £150K, should provide enough funding for approximately 130 taxis to be upgraded. Uptake would be periodically reported to JAQU

A proportion of the replaced vehicles could be resold within Fareham or Gosport, however as normal family cars they would be doing at least 18,000 miles per annum less than when they were taxis.

Measures – Walking and Cycling

The 19 cycle infrastructure schemes have been subject to an appraisal by WSP, to ascertain potential growth of cycling mode share shifting from private car trips against government targets. The result of this process predicts a significant reduction in local car trips can be expected as a result of encouraging modal shift to cycling through network improvements.

It should be noted that this is an upper estimate based on the delivery of the four complete routes, which have had to have elements prioritised for 2019 delivery, targeting achieving compliance in 2020. Also, this is essentially a voluntary measure that requires individuals to opt to change their travel habits based on an improved cycle network, for which uptake cannot be guaranteed. The other infrastructure gaps not eligible for funding under these terms are required to maximise potential uptake and deliver the predicted modal shift that has been modelled. These other schemes will likely form the basis of future bids, beyond the constraints of this process.

Considering the above, Hampshire County Council as the local transport authority have undertaken a risk assessment review of the process and tools. Whilst reviewers concluded maximum realisation of the modelled scenario was possible, a lower likely impact is considered a more robust and therefore likely outcome.

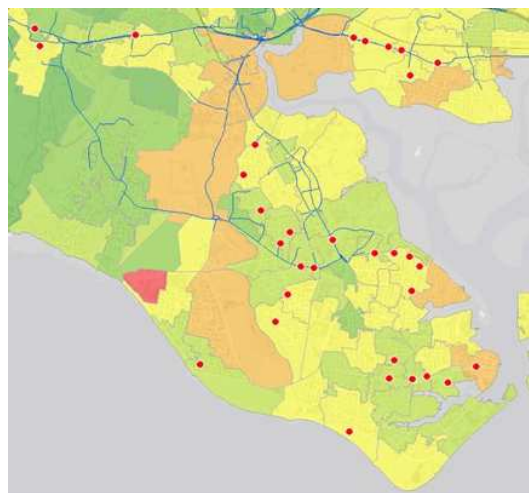
Should less significant modal shift manifest, it would still be likely to reduce the number of local car trips. As a comparison, if only 10%-20% of the upper level modelling being were to be realised, it could be expected to deliver an associated NO₂ impact comparable with that modelled for maximum up-take of the Enhanced Taxi Incentive. However, high up-take of the taxi incentive requires fewer individuals to change their behaviour than the cycle measure would, to be as effective. These nuances reinforce the need for implementing all four measures that can be implemented in 2019 for 2020 benefit.

The 19 cycle infrastructure improvement schemes along the four route corridors have an estimated cost of £560,000 including detailed design, works, fees and supervision.

Measures – Real time passenger information (RTPI)

Bus Stop RTI & QR Codes

55 bus stops across the local area have been identified that do not currently have Real Time Information (RTI). RTI provision is acknowledged as an enabler of increasing public transport uptake, providing greater journey time reliability and information.



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Measures - SCOOT

ITS at Quay Street (SCOOT Implementation)

It is proposed to implement SCOOT traffic signal optimisation at the Quay Street junction of the A27 & A32. Since SCOOT optimisation relies upon variable signal stages that respond to vehicular demand, it is not possible to replicate the benefits of this approach in the strategic transport model (SRTM) that relies upon fixed cycle signal operation.

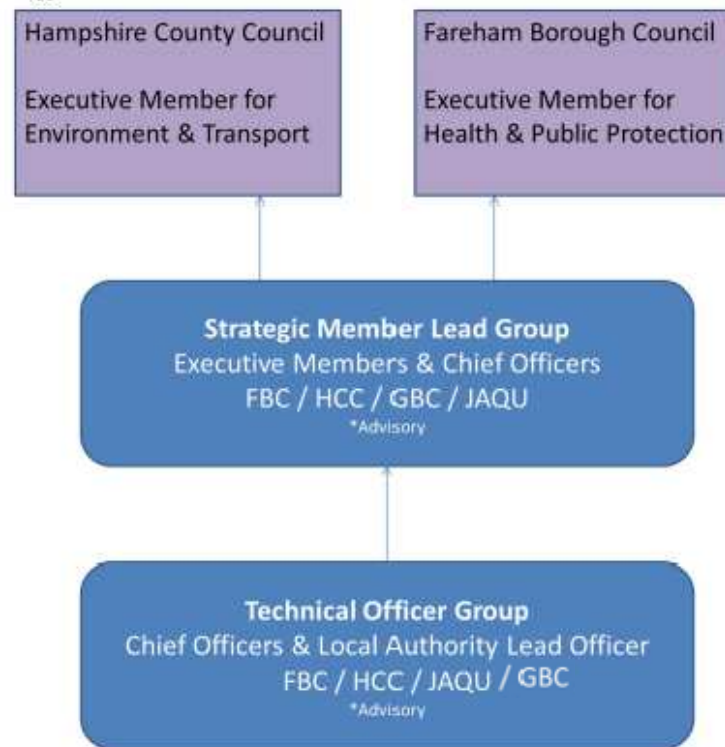
A feasibility study undertaken by Hampshire County Council concludes that the application of SCOOT would reduce congestion. The results from SRTM however show that whilst it reduces congestion at approaches to the roundabout, it would be less likely to influence average vehicle speeds on the A27 / Gosport Road between the Quay Street and Delme junctions (Census ID 16270) and would have a negligible influence on traffic flows. However, it may impact on background NO₂ emissions on this link, which contributes 17% of NO₂ at this location. The impact of this measure on annual mean NO₂ concentrations and user impacts has therefore not been quantified, although as stated it is considered likely it would have a consequential beneficial effect in the area of concern.

Effect of Measures

| Census ID | Modelled 2020 Roadside Annual Mean NO ₂ Concentration (µg/m ³) | | | |
|-----------|---|------------------------|-------------------------------------|--|
| | Do-Min | Taxi Upgrade Incentive | Cycling Infrastructure ^a | Cumulative (Taxi and Cycling) ^a |
| 6293 | 38.58 | 38.35 | 38.45 | 38.22 |
| 6345 | 33.11 | 33.00 | 32.48 | 32.37 |
| 7883 | 24.16 | 24.13 | 24.04 | 24.01 |
| 8406 | 35.13 | 35.02 | 34.93 | 34.83 |
| 16270 | 40.55 | 40.46 | 40.08 | 39.99 |
| 46296 | 27.24 | 27.19 | 27.04 | 26.99 |
| 46351 | 38.15 | 38.04 | 37.68 | 37.57 |
| 56260 | 40.07 | 39.83 | 39.90 | 39.66 |
| 56318 | 35.19 | 35.10 | 35.05 | 34.96 |
| 73574 | 23.46 | 23.42 | 23.31 | 23.27 |

^a Based on a likely upper estimate of the impact of the proposed cycling measure on traffic flows within the study area, which is subject to some uncertainty.

Governance



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Risks

- Funding
- Time delay
- Uptake
- Other projects e.g. SMART motorway
- Third parties e.g. cycle measure
- Construction difficulties
- Suppliers

Next Steps

- Comply with latest Ministerial Direction
 - Deliver Measures
- Deliver measures by 31/12/19
- Monitoring and evaluation 2020/2021
- Achieve compliance 2020?