

POLLUTION THREATS ARISING FROM HIGHSTED PARK AND WEST TEYNHAM APPLICATIONS

[Ref. No: 21/503906/EIOUT & 21/503914/EIOUT]

Summary

Primarily, this paper seeks to identify the key drivers leading to increases in the most harmful pollutant (PM2.5) associated with increases in vehicle numbers driven by these two proposals.

Swale Borough Council approval of these two applications will inflict the greatest health harms from friction products (PM2.5) in existing communities in the 'closed system' of the A2 between Faversham and Sittingbourne (Bapchild, Teynham, and Ospringe).

In a "rural town and fringe" setting, each household adds, on average, 1.33 cars. So 8,400 additional households from these developments equates to an addition of 11,172 vehicles [NTS9902 Data Set]ⁱ In addition, there will be increases in commercial traffic generated within these developments and from servicing the new households. This suggests additional traffic movements in excess of 22,000. "Appendix 8.2.1 - Traffic Data used in Modelling" argues that only 5,357 traffic movements would find their way through Teynham AQMA5.

National and European policies on vehicle design and power-generation have driven down NOx emissions nationally and will continue to do so. But PM2.5 will continue to be generated by friction products.

The only policy lever available to Swale Borough Council (SBC) to manage harms from PM2.5 is through local planning policy and decisions.

In a rational world, planning decisions and the Local Plan (under Review) can and should be directed at controlling the size and position of housing developments in the Borough to reduce cumulative harms to residents. Local Authority responsibility is defined in NPPF.

SBC approval of the opportunistic Highsted Park and West Teynham proposals would amount to a policy of **inflicting PM2.5 harms 'by design'**. The impact on all communities between Sittingbourne and Faversham would lead to a massive pollution burden into the closed system of the A2.

SBC approval would inflict an irreversible impact with repercussions beyond 2038. Such a decision would fly in the face of HMG mandatory targets of 10 micrograms of PM2.5 per cubic metre ($\mu\text{g}/\text{m}^3$) by 2040. Imperial College modelling (published by COPI) shows that Teynham and surrounding communities are already breaching that target.

Department for Transport modelling forecasts a national increase in vehicles of 22% on the national stage by 2060. That will add further pressure on traffic flows through Greenstreet/Teynham.

For these reasons, Lynsted with Kingsdown Parish Council considers that the proposals for Highsted Park and West Teynham are dangerously harmful to the health of our residents, visitors and workers. In the real world, there can be no meaningful 'mitigation' of PM2.5 pollution as it is experienced at the kerbside. Proximity to the sources of PM2.5 makes the threat very direct.

KEY POINTS

THE CONTEXT OF GOVERNMENT POLICY COMMITMENTS ON PM2.5 TARGETS

- Mandatory Government targets have been set for PM2.5. All authorities now accept that PM2.5 is the most harmful and persistent pollutant associated with traffic movements. The UK is aligning its targets with the World Health Organisation (WHO). “A legal target to require a maximum annual mean concentration of **10 micrograms** of PM2.5 per cubic metre ($\mu\text{g}/\text{m}^3$) by **2040**, with a new interim target of **12 $\mu\text{g}/\text{m}^3$** by the end of January **2028**.”ⁱⁱ
- It is widely understood there are no “safe” levels for PM2.5 pollutants. However, National and International policies focus on ‘degrees of harm’ represented by thresholds (Low/Moderate/High/Very High) that describe direct likely impacts on human health from concentration of traffic-generated pollutants.

IMPERIAL COLLEGE/COPI POLLUTION MODELLING

Levels of PM2.5 (and other pollutants) in Greenstreet (A2) already breach Government commitments. Those breaches extend to the whole of Lynsted with Kingsdown Parish to the south. We have benefitted from modelling data for all addresses in the Parish and both sides of Greenstreet based on modelling by Imperial College, London, published by Central Office of Public Interest (COPI) - attached. The figures for 2021 increased over the same exercise for 2020. This is even before the realisation of housing developments approved under “Bearing Fruits”, and any new commitments through the Local Plan Review. Injection of any new significant developments and the associated traffic volumes between Faversham and Sittingbourne will increase the pollution burden contrary to HMG Policy. That worsening pollution burden will be further increased if the ill-advised so-called Teynham Area of Opportunity is resuscitated.ⁱⁱⁱ

- Real world versus annualised data. Generalised annualised data misrepresent how pollution levels are experienced in real world conditions. The roadside is where the greatest concentrations of pollutants are generated, recirculated and experienced by pedestrians, residents and all road-users, hourly and daily.
- Citizen Science corroboration. Serious exceedances for PM2.5 and other pollutants have been recorded at the roadside (Greenstreet) on an hourly and daily basis, confirming the postcode data derived by COPI/Imperial College.
- Citizen Science mobile monitoring has demonstrated that levels of harmful pollutant measured at the roadside spread up to at least one kilometre away from the A2, depending on wind strength and direction.^{iv}

THE NOx TRAP - QUINN RELIANCE ON SBC POLLUTION MEASUREMENTS

Leading to:

- Reliance on poor quality pollution data associated with AQMA5.
 - Until this year, SBC Officials have resisted continuous monitoring of any pollutants.
 - SBC NOx monitoring uses single dispersion tubes, which are the crudest means of measuring NOx.
 - Inconsistent data location points. The number of tubes used by SBC and their locations have changed from year to year. The most recent measurements are derived from only two sites, one of which is outside a low building, which is not typical of the topography of Greenstreet. Greenstreet is generally characterised as

an East-West 'canyon' that concentrates and recirculates particulate matter in places throughout its length.

This approach in AQMA5 fails to address the most harmful pollutant – PM2.5. A new 12-month continuous monitoring project for PM2.5 has been introduced to AQMA5 under pressure from Ward Councillor Julien Speed.

FUTURE TRAFFIC LEVELS AND ASSOCIATED PM2.5 POLLUTION BURDEN IN GREENSTREET

At the kerbside, large increases in vehicle numbers will result in large increases in harmful friction-products - Particulate Matter (PM2.5).

Those higher PM2.5 concentrations are generated by:

- a) Increasing volumes of traffic.
- b) Increasing size and weight of domestic vehicles flowing from the increased popularity of larger car models/SUVs as a proportion of the overall fleet.^v
- c) "Service Rate" of the A2(KCC) in narrowing built-up areas Newington, Teynham/Lynsted, Ospringle. Larger vehicles also erode the safety of cyclists in narrowed parts of the A2.
- d) Associated topography causing braking and acceleration and congestion in peak periods – variable road-widths, obstacles (parked cars and delivery vehicles), and junctions/roundabouts;
- e) Competition from opposing traffic and vehicles negotiating junctions/roundabouts (entering and leaving the A2 at Station Road, Teynham, Lynsted Lane towards/from Lynsted, Doddington and Newnham and the new roundabout at the bottom of Claxfield Road where traffic on A2 travelling west will need to give way). This issue becomes increasingly problematic as car sizes increase; and
- f) Adverse impact of introducing a Northern and Southern Relief Road as a magnet for up to 40% more traffic.

Quinn's Traffic Figures – "Appendix 8.2.1- Traffic Data used in Modelling":

- a. 2019 daily vehicle count given for Greenstreet of 15,560.
- b. By 2038, "Bearing Fruits" committed developments will raise this figure to 17,609. That equates to 1,959 new vehicle movements.
- c. By 2038, Quinn states that their developments would increase the total traffic burden through Greenstreet to 22,986. That equates to 5,377 new vehicle movements driven by their proposals.

This equates to an uplift attributed to Highsted Park and West Teynham developments of 30.5% above the figures they quote for existing "commitments" under Bearing Fruits.

On this analysis, the period from 2019 to 2038, would see a total increase in daily traffic through Greenstreet of 48% (15,560 to 22,986). However, Department for Transport's manual count for 2019 was 14,001. From this starting point, this equates to an uplift of 64% over the period 2019 to 2038.

If we accept the end-point figure of 22,986 by 2038, 23% of the increase between 2019 and 2038 will come from these two developments alone.

Omissions from Quinn data

Quinn figures omit:

- a. Development 'drift' to increase 'committed' (Bearing Fruits) housing numbers.
For example, 106 homes 'committed' for Tonge ("Bearing Fruits") was subsequently tripled to 380 homes [22/502834/EIOUT] that bring excessive traffic through very rural roads connecting to the A2 at Bapchild. Arguably opening-up a 'rat run' to and from the Industrial Centre of north Sittingbourne onto the A2 unless physical barriers are introduced to prevent new traffic flow through very rural lanes.
- b. Pressures from the Local Plan Review (intended completion in 2025) with the likely direct input of new traffic into the 'closed system' between Sittingbourne and Faversham. The earlier Local Plan Review was abandoned, in part, because of the misconceived Teynham "Area of Opportunity" (TAO).
That proposal argued for 1,100 new homes [with a further 1,284 homes introduced at Reg19 Stage to the south of the A2].
Grand total for TAO of 2,384 homes. Equating to 4,000 vehicles or more than 9,000 journeys through Greenstreet daily (all vehicles).
- c. The Department for Transport's national core forecast – gives an increase of 22% in vehicles in the UK between 2025 and 2060. ^{vi}
- d. Cumulative impacts from major developments under consideration outside "Bearing Fruits" framework - especially, Bobbing and Duchy/Faversham proposals.

NEGATIVE IMPACTS ON TRAFFIC FLOW ARISING FROM THE CREATION OF A NORTHERN AND SOUTHERN RELIEF ROAD.

These proposals argue that traffic flow through Teynham/Greenstreet originating from these two developments will increase by 5,377 vehicle movements. However, this fails to recognise the traffic generated simply by the creation of a Northern and Southern Relief Road to the M2.

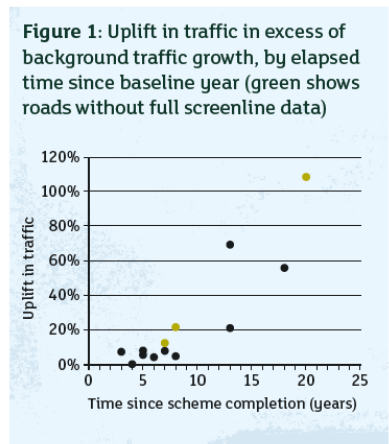
Empirical data from CPRE (2017) ^{vii} suggests there are real risks of long-term uplift in traffic flows within a road network of 40% (or more). That increase arises solely from building a new road that drivers perceive as a 'faster' route – even without a single house being built.

It is likely that drivers from developments in and to the west of central Faversham will adopt the "Relief roads" as a preferred route onto the new M2 junction (for London) as well as the A249 towards Maidstone and the M20. Thus, avoiding Ospringe and increased traffic from major developments to the south and east of Faversham.

Threats to the parishes of **Doddington** and **Newnham** will be two-fold – poorer access to limited services in Teynham and burden of 'rat runs' as residents from the Quinn developments take measures to avoid congestion along the A2 in the direction of Faversham.

Table 1: Generated traffic across road schemes studied

Road scheme	Number of years since scheme completion	Year of 'post-scheme' data	Uplift in traffic ² (%)
A1 Bramham – Wetherby	3	2010	7
M1 J25-28 Widening	4	2011	0.1
A500 Basford, Hough & Shavington Bypass	5	2008	8
A5 Weeford – Fazeley	5	2010	6
A10 Wadesmill – Colliers End Bypass	6	2009	4
A66 Stainburn and Gt Clifton Bypass	7	2009	8
M25 J12-15	7	2010	13
A1 Willowburn – Denwick	8	2008	22
A30 Bodmin – Indian Queens	8	2012	5
A46 Newark – Lincoln	13	2015	21
A120 Stansted – Braintree	13	2015	70
A34 Newbury Bypass	18	2015	56
M65 Blackburn Southern Bypass	20	2015	109
Short run average (3-7 years)			+7% (Average of 7 schemes)
Long run average (8-20 years)			+47% (Average of 6 schemes)



This CPRE research echoes empirical data supporting the Braess Paradox^{viii}. Simply put, Braess Paradox observes that introducing newer and faster roads into a network leads to persistent decisions by individual drivers to benefit from the perceived ‘improvement’ to their driving experience. Arguably, the greater risk is to AQMA3 as Sittingbourne residents and businesses seek to avoid the awful road conditions of the A2 through to the A249 Keycol roundabout.

Braess' Paradox observes that, counterintuitively, adding a new road to an existing road network can impede flow (e.g. the travel time of each driver) expressed, in our case, as a greater risk of worsening congestion through AQMA5. It can be shown that, in a random network, the addition of an 'edge' or perceived advantage causes Braess' paradox with probability roughly 50%, which is surprisingly high.

THE “MITIGATION LIE” IN THE REAL WORLD

Major developers point to “mitigation” of the harms caused by increasing traffic and congestion through tree-planting and parkland. A function served much better by not building over the most effective carbon-sinks provided by cultivation of the rare Best Most Versatile (Grade 1) acres found along both sides of the A2 between Sittingbourne and Faversham.

These “mitigations” cannot impact how pollution is experienced in the real world at the kerbside. The reality is that concentrated PM2.5 (friction from brakes, tyres and road wear) in A2 communities is created and recirculated immediately next to pedestrians, cyclists, other road users, residents, visitors and workers.

The invisible killer stalks us directly, without the opportunity for ‘greenwashing’ the traffic by reference to remote and irrelevant planting schemes.

The generalised environmental benefits of planting schemes beyond the A2 corridor are also out of phase with the harms created at the kerbside. Trees take many decades to make an appreciable difference to carbon and PM2.5 levels.

So, “mitigation” is a failed policy for those living daily with the concentration of harmful products adjacent to the A2.

CONCLUSION

If permitted, Highsted Park and West Teynham developments create a grim picture for the health of those living in beleaguered rural communities along the A2 and those communities with links to the A2. For example, Kingsdown, Doddington, Newnham.

As argued, above, there are many omissions and a gross misrepresentation of the likely real-world impacts at the kerbside of the most dangerous pollutant – PM2.5.

BACKGROUND DOCUMENTS

NPPF 2023 Latest edition

Importance of joined-up planning to traffic, pollution, and sustainable communities.

9. Promoting sustainable transport

108. Transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

- a) the potential impacts of development on **transport networks** can be addressed;
- b) opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;
- c) opportunities to promote walking, cycling and public transport use are identified and pursued;
- d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and
- e) patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places.

109. The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.

Air Pollution in the UK 2022 – DEFRA- September 2023- Released 30th April 2024

3.1 Pollutants of Concern

“The latest estimate is that long-term exposure to the air pollution mixture in the UK has an annual effect equivalent to 29,000 to 43,000 deaths for adults aged 30 and over (UK Health Security Agency, 2022a).”

3.1.1. Oxides of Nitrogen

There are several oxides of nitrogen. The ones of most interest, for air quality, are nitric oxide (NO) and nitrogen dioxide (NO₂). Together, they are often referred to as NO_x. Nitrogen oxides are emitted from combustion processes. Combustion in **industry, passenger cars and other transport** are the most important UK sources (National Atmospheric Emissions Inventory, 2022).

"**Peak hourly mean NO₂ concentrations in the UK** rarely exceed applicable limit values, **except at some congested urban roadside sites**. Prior to 2020, annual mean limit values were frequently exceeded at roadside sites in the UK, and in many other countries. The extent of these exceedances was substantially reduced in 2020, and in subsequent years have remained low in comparison with pre-2020 years (see Sections 4 and 6 for details)."

Environmental Improvement Plan 2023 – April 2024

<https://assets.publishing.service.gov.uk/media/64a6d9c1c531eb000c64fffa/environmental-improvement-plan-2023.pdf>

Primary Objectives

P72: Review and improve how the government communicates air quality information to make sure the public know the impacts of air quality and how to protect themselves.

P73: Air quality in the UK has improved significantly in recent decades. We have seen a decrease in all five major air pollutants: for instance, emissions of fine particulate matter (PM2.5), the most damaging pollutant to human health, decreased by 18% between 2010 and 2020. Reductions in these pollutants have produced significant benefits for our health and environment.

In recent years we have broadly maintained this trajectory. However, air pollution continues to be the biggest environmental risk to human health, with particular hotspots in some urban areas.

Therefore, to make further progress we are setting out an ambitious plan which tackles both overall concentrations and specific hotspots. In particular, we are taking further action on PM2.5, as the pollutant which is most harmful to humans.

P74: We have the following targets and commitments:

- A legal target to reduce population exposure to PM2.5 by 35% in 2040 compared to 2018 levels, with a new interim target to reduce by 22% by the end of January 2028.
- Legal concentration limits for a number of other key pollutants. We already meet the majority of these limits including for sulphur dioxide and coarse particulate matter. We are working towards meeting compliance with a 40µg/m³ limit for nitrogen dioxide.
- **A legal target to require a maximum annual mean concentration of 10 micrograms of PM2.5 per cubic metre (µg/m³) by 2040, with a new interim target of 12 µg/m³ by the end of January 2028.**
- Reduce emissions of nitrogen oxides by 73%.
- Legal emission reduction targets for five damaging pollutants by 2030 relative to 2005 levels:
 - Reduce emissions of sulphur dioxide by 88%.
 - Reduce emission of PM2.5 by 46%.
 - Reduce emissions of ammonia by 16%.
 - Reduce emissions of non-methane volatile organic compounds by 39%.

ⁱ <https://www.gov.uk/government/statistical-data-sets/nts99-travel-by-region-and-area-type-of-residence>

ⁱⁱ **Environmental Improvement Plan 2023 – published April 2024**

<https://assets.publishing.service.gov.uk/media/64a6d9c1c531eb000c64fffa/environmental-improvement-plan-2023.pdf>

ⁱⁱⁱ **Validation of Postcode Modelling undertaken by Imperial College and published by COPI:**

<https://www.copi.org.uk/> - "In the summer of 2022 [COPI] received United Nations accreditation becoming a UNESCO Green Citizens project. It has now landed front page national news 3 times, been featured in more than 570 pieces of national and international press, whilst changing the property sector for good, turning home owners and estate agents into budding environmentalists. Like Asbestos, every property owner now wants rid of this invisible killer."

^{iv} http://aqma5.co.uk/Pollution_Diary.html - 2019-2020 and 2020-2021

^v <https://www.bbc.com/future/article/20240207-are-cars-getting-too-big-for-the-road> (8th February 2024) and <https://www.transportenvironment.org/discover/cars-are-getting-too-big-for-british-roads-new-research-shows/> (23rd January 2024).

^{vi} Department for Transport "National Road Traffic Projections 2022", Para 4.9 (p31) <https://assets.publishing.service.gov.uk/media/63975bcfd3bf7f3f7d1cf440/national-road-traffic-projections-2022.pdf> - "...total traffic is projected to increase by 22% between 2025 and 2060, with the traffic growth between each forecast year declining over time."

^{vii} <https://www.cpre.org.uk/resources/the-end-of-the-road-challenging-the-road-building-consensus/> - This CPRE Research (2017) confirms the adverse impacts from adding new roads. A conclusion that is supported by the empirical data underlying the Braess Paradox.

^{viii} Braess Paradox simplified - <https://brilliant.org/wiki/braess-paradox/>. More detailed description - https://en.wikipedia.org/wiki/Braess%27s_paradox