

Meeting:	Executive Member for Transport
Meeting date:	05/12/2024
Report of:	Director of Environment, Transport & Planning
Portfolio of:	Cllr Ravilious Executive Member for Transport

Decision Report: Gillygate Signal Trial

Subject of Report

1. This report considers two approaches to delivering a traffic signal trial on Gillygate aimed at improving air quality in the Air Quality Management Area (AQMA).
2. Poor air quality can lead to significant negative health impacts for residents of the city alongside a poor experience for those visiting. York's fourth Air Quality Management Plan (AQAP4) and the Local Transport Strategy both contain specific reference to exploring traffic management options for areas like Gillygate.

Benefits and Challenges

3. Queueing motor vehicle traffic emits gases such as nitrogen oxides and particulate matter that negatively affect air quality and in turn negatively impact the health of residents and visitors in those areas. Narrow streets with buildings on either side create a canyon effect, where pollution from queuing vehicle traffic becomes trapped, leading to poor air quality. Gillygate suffers from this canyon effect and has the worst air quality of any road in York. Reducing queuing traffic on Gillygate should improve air quality on the street.
4. There are three key questions where specific empirical data on traffic and air quality is lacking in the Gillygate area;
 - a) How much will air quality on Gillygate improve as a result of reduced motor vehicle emissions?

- b) Would the transfer of queues to adjacent streets, and particularly Lord Mayor's Walk and Clarence St, cause problems which more than offset the benefits in Gillygate?
 - c) Would those transferred queues result in traffic being displaced to other parts of the network, and if so, what would the consequences be?
5. Undertaking a trial traffic signal plan designed to minimise queuing traffic on Gillygate will help to answer these questions. In time, this trial will also inform updates to traffic management policy targeting other locations across York experiencing poor air quality or disruption as a result of queueing traffic.
 6. The core challenge, due to funding constraints, is how to fully evaluate all of the impacts. The Council has a significant number of diffusion tubes across the city. Diffusion tubes provide an indication of longer-term average NO_x levels at a spot location. Diffusion tube measurements across a calendar year will provide a good indication of the air quality impact associated with the proposed trial but cannot do so over a short period. This is because nitrogen dioxide diffusion tube data needs to be 'bias corrected' to provide a reliable estimate of concentrations for comparison with the health-based UK Annual Mean Air Quality Objective. This objective considers long-term exposure to air pollution over a period of 12 months. Bias correction factors are calculated by co-locating diffusion tubes with CYC's highly accurate continuous monitoring sites. In line with statutory reporting to DEFRA, bias correction factors are derived on a calendar year basis.
 7. CYC monitors particulate matter (PM_{10} and $\text{PM}_{2.5}$) at a small number of fixed locations in York. Whilst $\text{PM}_{2.5}$ is monitored on Gillygate, short term trends and annual variation in particulate matter do not generally reflect those seen with other traffic-borne pollutants such as nitrogen dioxide (NO_2). This is because while transport in York produces between 50-70% of total NO_x emissions (which become NO_2), it is only responsible for around 15% and 17% of PM_{10} and $\text{PM}_{2.5}$ emissions respectively, with the remainder from background sources and other sources such as domestic and commercial heating, nature, waste and agriculture.
 8. Assessing the transport impacts in detail across a period of time, such as delay levels at junctions in the Gillygate area, numbers of queuing vehicles and any driver behaviour impacts is more difficult and requires additional resource, both in terms of staff time and

funding. The Council has access to datasets such as live bus journey times and TomTom vehicle journey times. These datasets can be used to understand impacts on bus routes and point to point vehicle journey times. CCTV can also be used occasionally to measure queue lengths but is more time consuming and would divert staff away from their existing roles.

Policy Basis for Decision

9. The trial aims to contribute towards the three of the seven priorities in the Council Plan:
10. Health & Wellbeing. The proposed trial will reduce the number of queuing vehicles in Gillygate which is anticipated to improve air quality and thereby provide an improvement in the health and wellbeing of residents and those working in and passing through Gillygate.
11. Sustainability. A reduction in congestion on Gillygate should help enable sustainable modes of transport and create a safer environment for pedestrians, wheelchair users and cyclists. Gillygate is an important street for shopping, eating out, accessing school and passing through on the way to the City Centre. Current levels of queuing traffic do not encourage walking, wheelchair use, wheeling and cycling on Gillygate.
12. Economic. A safer environment for pedestrians, wheelchair users and cyclists would help to increase footfall on Gillygate, bringing benefit for businesses along the street.

Financial Strategy Implications

13. Option 1 (recommended) involves reassigning existing resources along with support from partner organisations including The Gillygate Air Quality Group and the York Civic Trust to undertake a simple trial. Although this option does use existing resources, these resources are currently assigned to other activities. This option therefore represents a reprioritisation of resources to the trial for approximately 15 days through 2025.
14. Option 2 involves seeking additional funding to implement a more comprehensive trial and therefore would have no financial impact.

The trial would not commence until suitable funding has been identified and secured.

Recommendation and Reasons

15. **Recommendation:** Implement Option 1. Undertake a trial of traffic signal gating on Gillygate for 12 months with air quality and basic transport impact monitoring.
16. **Reason:** To understand the impacts of traffic signal gating on Gillygate and surrounding areas in order to inform future air quality and traffic management policies.

Background

17. Local residents, business representative and other groups in York are concerned about air quality and the street environment, resulting in poor health conditions and a poorer quality of life. Particularly so on Gillygate. York's AQAP4 and Local Transport Plan both reference the need to consider traffic management on Gillygate.
18. Gillygate has the worst air quality of any street in York (Annex A) with an annual mean NO₂ concentration of 43µg/m³ exceeding the National Air Quality Standards¹ limit of 40µg/m³. The World Health Organisation guideline level is 10µg/m³.
19. The transport sector is the largest contributor to total oxides of nitrogen (NO_x) levels in York at 57% with the contribution from cars in areas of poor air quality ranging from 64% to 87%. Therefore, measures specifically targeting transport emissions in AQMA's are likely to deliver more benefit than targeting other sectors.
20. In January 2020, CYC launched a voluntary Clean Air Zone (CAZ) for buses to improve air quality. The CAZ is enforced by the Traffic Commissioner using Traffic Regulation Conditions (TRC) applied to bus operator licences. The CAZ includes the Inner Ring Road (IRR) and area contained within. Buses making 5 or more entrances to the city centre CAZ per day (including Gillygate) are required to be low emission (minimum Euro VI diesel or electric).

¹ https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update_20230403.pdf

21. Whilst the bus-based CAZ area is restricted to the city centre / Inner Ring Road, the majority of local service buses use this area for part of their route, therefore the CAZ also has a beneficial impact of reducing air pollution and carbon emissions across the wider area of York. The CAZ currently captures 97% of bus movements to the city centre per day, with 65% of these journeys operated by fully electric vehicles and the majority of the remainder being operated by Euro VI diesel buses (or buses retrofitted to Euro VI equivalent standard).
22. Bus Services 1,5 and 6 are the most frequent bus routes operating on Gillygate. All are operated using electric buses. Service 40 and Tour Buses also run on Gillygate and use vehicles to EURO VI emissions standards. The Ghost Bus does not meet EURO VI emissions standards but operates on Gillygate infrequently; approximately once per day.
23. Recent survey work has shown that petrol and diesel vehicles still represent the majority of the car fleet, with around 6% of cars being either electric-hybrid or fully electric.
24. Traffic signal gating, also known as perimeter flow control or metering, is a method of controlling traffic flow by using traffic signals to limit the number of vehicles entering a protected network. Signals at the Bootham/St. Leonard's Place/Gillygate junction and the Gillygate/Clarence Street/Lord Mayor's Walk junction will form the focus of the trial. Other signalised junctions impacting on the flow of vehicles towards Gillygate will also be considered when confirming the exact timings to be used.
25. A trial of these principles was implemented in 2006, resulting in queues in Gillygate being roughly halved. However, changes in signal technology since that time necessitate a different approach. A mild form of signal gating is currently employed by 'capacity matching' each end of the street, using vehicle-actuated mode 'max sets', rather than fixed time Urban Traffic Control plans. This balances the number of vehicles entering and leaving Gillygate to reduce blocking back through adjacent junctions.
26. An initial two-week trial took place in October 2023. Different traffic signal timings were tested. The 2023 trial was successful in

significantly reducing queuing traffic on Gillygate. Queues were largely eliminated during the second week with traffic 'platooned' through the corridor to minimise stopping on Gillygate itself. The gating strategy led to queue relocation primarily onto Lord Mayor's Walk and to a far smaller extent, Clarence Street. The signal timing information from the October 2023 trial will be used to derive the signal timings to be used as part of the proposed traffic signal gating trial for the duration of 2025.

27. The Council has access to two main 'live' data sources that help inform on journey delays and vehicle speed. These are;
 - TomTom journey time data for the area – can be used to identify point to point journey time over a given period, such as Bootham to York Hospital. Comparisons with days, weeks or months in 2024 will provide an indication as to the general journey time impact of the trial.
 - Horizon bus journey – bus performance data can accurately map whether there will have been delays or improvements to bus journey times as a result of the trial.
28. Volunteer count data is extremely helpful and can provide details on queue length and traffic flows, but only for limited periods. Robust data across a full year period would require the siting of cameras to do full counts.

Consultation Analysis

29. The Gillygate Air Quality group which consists of local residents, business owners and interested parties has met regularly with Council officers and members of the Executive. This proposal has been formed as direct outcome of the engagement with the Gillygate Air Quality group.

Options Analysis and Evidential Basis

30. **Option 1** (Recommended) – Undertake a trial of traffic signal gating on Gillygate for 12 months with air quality and basic transport impact monitoring.
31. Across options 1 and 2 some potential outcomes of the trial may include;
 - Reduced vehicle queuing on Gillygate

- Improved air quality on Gillygate and therefore an improvement in public health
 - An improved environment for walking, wheelchair use and cycling on Gillygate resulting in an increase in active travel in the area, and increased footfall to the businesses on Gillygate.
 - Increased queueing on Lord Mayors Walk and Clarence Street.
 - The potential, if traffic queues extend to upstream junctions, for some diversion to other areas of the network including Burton Stone Lane.
 - A longer wait time for pedestrians at the Lord Mayor's Walk/Gillygate/Clarence Street crossing point, depending on the changes made to signal timings at this junction.
 - A potential for increased vehicle journey times if additional traffic flows on surrounding roads arise and become significant.
A potential for reduced air quality on surrounding roads if additional traffic queues emerge and become significant.
32. Air quality will be measured using diffusion tubes and a permanent monitoring station situated on Gillygate across both trial options. This will remain consistent and will provide information on NO₂ and particulate levels across 2025.
33. Transport impact monitoring will comprise TomTom journey time data comparisons against data from previous years and analysis of bus journey time data. This will provide a good indication of the time taken to travel through Gillygate and any connecting streets. It will not provide data on queue lengths, pedestrian or cycling impacts or behavioural changes from drivers or other road users. Some small-scale queue length surveys will be undertaken by Council Officers using CCTV. Volunteers would monitor traffic queue lengths on Lord Mayor's Walk, Clarence Street (and any upstream queuing into Monkgate and Wigginton Road) and traffic flows through the Lord Mayor's Walk/Gillygate/Clarence Street junction for limited periods.
34. Estimated council officer time to deliver this option would be approximately 15 days across 2025. Volunteers have offered to assist with wider queue length monitoring using CCTV. Officers would need to establish appropriate GDPR procedures to facilitate this.
35. Resource will also be required to complete a report on the trial. Volunteers have offered to assist in this. Appropriate governance procedures to allow volunteers to have access to Council data for

the purpose would need to be established to enable this to happen.

36. **Option 2** – Defer a trial of signal gating on Gillygate to 2026 and seek funding to deliver comprehensive monitoring and evaluation of air quality and transport impacts.
37. This option would provide far more robust data to understand transport impacts, such as queue lengths, pedestrian and cycling impacts and behavioural changes. Officers have sought a quote to deliver this across a 12-month period and the cost is likely to be in the order of £100k. More robust base (current) scenario data could be collected.
38. £100k would deliver air quality modelling, extensive transport impact data collection and transport modelling, stakeholder engagement and reporting. There is no guarantee that the funding would be found to deliver the comprehensive monitoring.
39. **Option 3** – Do not undertake a traffic signal gating trial. This option is not recommended as it is not consistent with AQAP4 or the Local Transport Strategy. There would remain air quality issues in Gillygate and solutions to the problem would have to come from future, as yet undefined, projects or policy.
40. Any option variation that does not cover a calendar year in full is not recommended due to the need to correct air quality monitoring data with an annual bias factor as outlined in paragraph 6.

Organisational Impact and Implications

41. The report has the following impacts and implications:

Financial Monitoring and implementing the trial as outlined in option 1 can be delivered using existing resources.

Human Resources (HR) There are no Human Resources implications arising from the recommendations in this report.

Legal

The Council is under a duty contained in section 16 of the Traffic Management Act 2004 to manage its road network with a view to securing the expeditious movement of traffic on that network, so far as may be reasonably practicable while having regard to their other obligations, policies and objectives. This is called the network management duty and includes any actions the Council may take in performing that duty which contribute for securing the more efficient use of their road network or for the avoidance, elimination or reduction of road congestion (or other disruption to the movement of traffic) on their road network. It may involve the exercise of any power to regulate or coordinate the uses made of any road (or part of a road) in its road network.

In exercising functions under the Road Traffic Regulation Act 1984, the Council must consider the criteria within Section 122 of that Act 1984 and, in particular, the duty to make decisions in accordance with s.122 so far as practicable having regard to the matters in s.122(2) to “secure the expeditious, convenient and safe movement of vehicular and other traffic (including pedestrians) and the provision of suitable and adequate parking facilities on and off the highway. The matters set out in s.122(2) are:

- a) a) the desirability of securing and maintaining reasonable access to premises;
- b) b) the effect on the amenities of any locality affected and the importance of regulating and restricting the use of roads by heavy commercial vehicles, so as to preserve or improve the amenities of the areas through which the roads run;
- c) bb) the strategy prepared under section 80 of the Environment Act 1995 (national air quality strategy);
- d) c) the importance of facilitating the passage of public service vehicles and of securing the safety and convenience of persons using or desiring to use such vehicles; and
- e) d) any other matters appearing to the local authority to be relevant.

Procurement Should option 2 be progressed. All services requiring procurement must be procured via a compliant, and fair process in accordance with the council’s Contract Procedure Rules and where applicable, the Public Contract Regulations 2015 (soon to be Procurement Act 2023). Further advice regarding the procurement process and development of procurement strategies must be sought from the Commercial Procurement team.

Health and Wellbeing. Public Health support the ambitions outlined in the report, reducing traffic idling is beneficial for air quality and in turn this can have a positive impact on those who breath that air, potentially improving respiratory health and general wellbeing of residents.

Lower Emissions of Pollutants, Fuel Efficiency, Health Benefits reducing idling in these areas directly lowers exposure to harmful pollutants for pedestrians and nearby residents. Impact on Urban Air Quality Traffic idling significantly contributes to localized air quality issues in congested urban areas. Minimizing it can reduce "hotspots" of pollution.

As outlined in the report public health share the concern that displacing idling cars to another location may increase the impact of poorer air quality in a different location, this is particularly of concern if this is displaced into more dense residential areas or a more deprived area of the city where we already know negative health impacts are felt more severely.

Environment and Climate action The recommendation in the report is directly focused on making changes to improve the environment on Gillygate particularly in terms of air quality.

Affordability No impacts identified

Equalities and Human Rights

The Council recognises its Public Sector Equality Duty under Section 149 of the Equality Act 2010 (to have due regard to the need to eliminate discrimination, harassment, victimisation and any other prohibited conduct; advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it and foster good relations between persons who share a relevant protected characteristic and persons who do not share it in the exercise of a public authority's functions). The impact of the recommendation on protected characteristics has been considered as follows:

- Age – Neutral;
- Disability – Neutral
- Gender – Neutral;
- Gender reassignment – Neutral;
- Marriage and civil partnership– Neutral;
- Pregnancy and maternity - Neutral;
- Race – Neutral;

- Religion and belief – Neutral;
- Sexual orientation – Neutral;
- Other socio-economic groups including :
 - Carer - Neutral;
 - Low income groups – Neutral;
- Veterans, Armed Forces Community– Neutral

Data Protection and Privacy. The data protection impact assessment (DPIAs) screening questions were completed for the recommendations and options in this report and as there is no personal, special categories or criminal offence data being processed to set these out, there is no requirement to complete a DPIA at this time. However, this will be reviewed following the approved recommendations and options from this report and a DPIA completed if required.

Communications. Communications will support any decision on the proposals with a robust communications plan that focuses on proactive messaging, whilst being agile in responding to any reactive enquiries.

Risks and Mitigations

42. There are a number of potential risks associated with the trial, these include;
43. Drivers may feel an increased level of frustration if they are held at a red light with a clear road ahead of them which then could potentially result in an increase of moving traffic offences. This safety concern could be mitigated by installing automatic numberplate recognition cameras at the junctions and taking appropriate action on drivers who commit moving traffic offences, but would require a budget.
44. Gating traffic further back along the network may result in stationary queues through junctions that do not currently occur. Whilst queuing back through junctions does already occur in the baseline situation, this trial is likely to increase the frequency of this event. Queueing back through junctions is a safety concern due to the impact it has on pedestrians and cyclists attempting to navigate the junction. This can be mitigated to a certain extent by adjusting signals across the wider network to help accommodate

the new configuration on Gillygate. It is also likely to ease over time. A study by the International Transport Forum in 2021, drawing on evidence from several countries, demonstrated that drivers rapidly adjust to changes in traffic capacity in urban road networks, and that any adverse impacts are typically short-lived.

45. Risk of reduction in air quality in surrounding areas. The areas likely to experience higher levels of queuing as a result of the gating trial will be Lord Mayor's Walk and to a lesser extent, Clarence Street.
46. There is also a Potential negative of increased pedestrian wait times at the Gillygate/Lord Mayors Walk/Clarence Street junction if an acceptable signal plan with two pedestrian stages cannot be delivered. Every effort will be made to design a junction with two pedestrian stages, but this will need to be balanced against the Councils Network Management Duty.
47. To manage the safety implications of the trial, conditions under which the trial would be aborted (and default traffic signals restored) or modified will be defined. This approach is to be confirmed after discussion with the CYC Road Safety Team.
48. Should bus and general vehicle traffic journey times increase substantially as a result of the proposed changes to signal operation then there will likely be public and stakeholder opposition to the trial. A key concept of undertaking a trial is to monitor the impacts; if significant issues are identified then the traffic signal plans can be modified in response to information from key stakeholders.
49. There are substantial risks with not doing the trial or deferring to 2026. Principally, the Council would not be meeting its air quality obligations or adhering to AQAP4. As stated in the report, Gillygate is currently exceeding the National Air Quality Standards level of NO₂. A method of addressing the primary contributor, traffic, to this exceedance has been identified. To defer or not undertake a trial risks legal action from residents and businesses suffering negative health implications as a result of the poor air quality and Council inaction on addressing an evidenced problem. There is no identified mitigation to this risk; the signal gate is the only tool available in the short term, within funding constraints that can be

implemented quickly to directly reduce transport related NO₂ levels in Gillygate.

Wards Impacted

Guildhall

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Background papers

City of York Council Fourth Air Quality Action Plan (AQAP4)
Local Transport Strategy

Annexes

Annex A: Air Quality Trends in York.