Department
for Environment
Food & Rural Affairs

Department
for Transport

Adrian Phillips
Birmingham City Council
54 Highfield Road
Birmingham
B8 3QU

Ref: BIRM IEKM 3176

20 December 2017

Dear Adrian,

Implementation of Early Measures

I am writing to confirm I have received clearance to make a capital grant payment of £727,500 to Birmingham City Council under Section 31 of the Local Government Act 2003. I attach a signed Grant Determination Form.

This funding is to support the work you are doing to improve air quality in your local area and your requirement to develop a local plan to ensure the UK achieves compliance with legal limits for nitrogen dioxide in the shortest possible time. This capital grant payment will support the implementation of early measures and deliver Birmingham's local plan. Your projects, which have been approved by our Assurance Panel, are listed in Annex B.

This funding and project delivery will be monitored with the feasibility Project Delivery and Budget Tracker tool and your team has already been provided with this to complete for the feasibility study project. You should set out clear milestones, timelines and work undertaken including performance indicators so that you can evaluate whether the project was effective, achieved its objectives and what the impact of the project was on the local area. JAQU can work with you to develop these indicators and these will be reviewed through the project as part of regular project management meetings.

Should you require to change any element of the project this must be discussed with JAQU as soon as possible, any substantial change may require a variation. Your acceptance of the award of this grant payment will be made by signing the below. No other form of acknowledgement will be accepted. By signing the below you confirm this capital funding

support is additional to existing Local Transport Plan Funding and will not displace any future Local Transport Plan funding. Please remember to quote the reference number in any future communications relating to this grant.

I would strongly encourage you to take advantage of the further funding for Early Measures that is available to you as part of the 17/18 Early Measure Funding opportunity. This has been discussed with your team and additional guidance sent to them on Friday 15 December on huddle.

If you have any questions regarding this letter, please do not hesitate to contact me.

Yours sincerely

Susanna May

Susanna May

Head of the Joint Air Quality Unit

Grant Determination Form

Title: Clean Air Zones: No. 31/3176

The Secretary of State at the Department for Transport, in exercise of the powers conferred by section 31 of the Local Government Act 2003, makes the following determination:

Citation

1) This determination may be cited as Clean Air Zones: No. 31/3176

Purpose of the grant

2) The purpose of the grant is to provide support to local authorities in England towards the Clean Air Zones implementation support, which is being conducted in five cities in England (Birmingham, Derby, Leeds, Nottingham, and Southampton).

Determination

3) The Minister determines as the authority to which the grant is to be paid, and the amount of grant to be paid, the authority and the amount set out in Annex A.

Treasury consent

4) Before making this determination in relation to the local authorities in England, the Minister obtained the consent of the Treasury.

Signed by authority of the Secretary of State for Transport

Richard Bruce
Director of Energy, Technology and Innovation
Department of Transport

December 2017

ANNEX A: Capital allocation for the 2017/18 financial year

Authority to which grant is to be paid	Amount of grant to be paid
Birmingham City Council	£727,500

Signed for on behalf of Birmingham City Council

Name	
Title	
Signature	
Date	

Signed for on behalf of the Joint Air Quality Unit

Name	Susanna May
Title	Deputy Director
Signature	Susanna May
Date	20/12/17

Annex B: Grant Application

Following Assurance Panel Review and the additional information Birmingham City Council have provided to JAQU including the below:

Signing and Routing Strategy

Birmingham Connected set out the need to change the way we use our roads. The city centre is dissected by the A38, which is used as a through route for bypassing traffic. This contributes to air quality issues and impacts on the vibrancy of the city centre. The Council want to focus on the major arterial routes to/from the city centre, to direct bypass traffic away from the centre and around, to make better use of the A4540 Ring Road. Our approach will be to use Variable Message Signs (VMS) and implement a new signage strategy.

VMS

The ANPR data collection from November 2016, confirms our need to re-direct traffic to appropriate routes. Over 55,000 trips each weekday travel straight through the city centre. These are predominately diesel vehicles and use the city centre as a route to travel through contributing to air pollution and congestion in the city centre. These movements account for 45 per cent of the total traffic in the city centre.

The use of Variable Message Signs (VMS) at decision points on key route approaches to the city centre, will inform drivers to use the Ring Road as the most convenient route to continue their journey if bypassing the city centre. VMS will be delivered within 3 months to manage to the existing movement patterns and influence driver route choice. Provision of VMS on the key arterials to/from the city will enable drivers to be informed that the city centre should be avoided as a through route, and directing use of the Ring Road. The placement of VMS will be informed by the ANPR data, which highlights the major city centre through movements to/from the following arterials:

- A38 Bristol Road
- A34 New Town Row
- A41 Soho Road

Signage Strategy

A change to our existing signage strategy for key destinations and tourist locations in the Southern Gateway (Digbeth) and Snow Hill District (business) will be required so that people travel in and out from specific points on the Ring Road, instead of travelling through the city core to reach a destination. This is particularly important as we expect significant construction works in the city centre (and these areas) over the next 10 years, with the arrival of HS2 and other major developments (i.e. Arena Central, metro extension, Birmingham Smithfield). To ensure the VMS is implemented effectively, a signage review will be undertaken to complement the proposed traffic management measures (package 2) and long-term development of the city centre. Following the review, a new signage strategy will be implemented within 6 months, which complements the VMS and package 2 measures to achieve our aim to reduce the proportion (and negative impact) of through traffic and unnecessary routing in the city centre.

The VMS strategy and the new signing and rerouting strategy will be based on the outputs from the ANPR surveys and the traffic modelling that is being undertaken to develop strategies to minimise the impact of displacing traffic and prevent creating air quality problems on other roads within the city centre/wider city. The development process will consider existing traffic movements and changes being made to the transport network in the shorter term over the next few years. It will take into

consideration any potential re-routing and VMS routing options. The ANPR surveys undertaken to support the CAZ feasibility study have shown that some 45% of traffic on the A38 is through traffic – measures to help encourage traffic to use alternative routes coupled with smarter routing for those accessing the city centre will help to reduce the traffic on this link.

As noted the proposal also aligns to the National Productivity Investiment Fund bid being developed by Birmingham City Council which which consists of a package of traffic signal technology upgrades, electronic signing and average speed enforcement measures to assist with reducing congestion and consequent air quality issues along the A38 corridor, and assist with tackling high journey time variability affecting public transport on the corridor. As part of the NPIF scheme development further work was undertaken to try and estimate the impact of the wider signing strategy and estimated average network speed data was collected for the period of 08/05/2016 – 30/04/2017 from the city council's UTMS system.

Statistical analysis was undertaken to establish the expected normal network speeds, when discounting trends and weekly variations. From this analysis, unexpected variances in daily average traffic speeds were identified, for days where traffic speeds were lower than the expected average. It has been estimated that on those days where the average daily traffic speed is over 2.5% slower than the expected speed, a conservative assumption that around a 25% saving in this delay could occur on the corridors on which the VMS system is implemented has been assumed. The existing delay has been estimated based on Trafficmaster data, and savings applied to inbound traffic only in the peak periods. These are conservative assumptions, and the actual benefits realised could be more substantial.

In the longer terms as the preferred CAZ scheme option will shape the wider signing and rerouting strategy – taking account of the scheme boundaries and any further infrastructure changes which may be required. The signing and rerouting strategy for the final CAZ scheme are likely to be of a far more strategic nature and will need to be focused on routes to the city centre much further in advance of the city centre ring road.

The timescales for the elements are subject to refinement but are anticipated to be:

Mobilisation / Procurement – Summer 2017
Study and identification of measures (aligned to emerging CAZ preferred scheme, emerging traffic management programme and other measures e.g. through NPIF funding) – Autumn 2017
Full Business Case – Early 2018
Implementation – Spring 2018

Traffic Management and Bus Priority Enhancements

In collaboration with our transport partners at Transport for West Midlands (TfWM) and the major bus operator in the city, National Express West Midlands (NXWM) (which operates 95 per cent of the bus service kilometres in the city centre) a long-list of 25 potential traffic management and bus priority enhancements were identified. This long-list of measures was prioritised using a 13 criterion multi-criteria analysis (MCA) 5-point assessment framework against strategic, economic, financial, commercial and management objectives:

- Strategic
    - Supports Areas of Transformation
    - Level of Patronage / Bus Demand
    - Bus Delay / Potential Impact

    - Alignment with Transport Strategy
- Economic
    - Value for Money
- Financial
    - Capital Costs
    - Revenue Costs
    - Cost Risks
- Commercial
    - Initial Implementation
    - Permanent Implementation
- Management
    - Evidence of similar schemes
    - Approvals / Stakeholder Management
    - Deliverability Risks

The long-list and MCA framework outcome provides more detail on the justification for the various measures proposed for the selected locations, summaries are provided in Appendix 1 and further information is included as an Annex to this proposal. The result of the MCA was 12 prioritised physical traffic management measures to restrict private vehicle access and/or provide dedicated bus priority. The measures are focused on linking gaps in the core bus network to ensure improved journey time reliability. The city centre has sections of bus priority and bus lanes but gaps in this network results in unnecessary delays and reliability issues for buses.

A. Digbeth (145 buses per hour)

a. Upper Dean St – Bus Gate eastbound (id 6)
b. Moat Lane Gyratory – Bus Gate at southern arm (7)
c. B4100 Digbeth High St / Rea St – Bus only right turn onto Rea St (8)
d. Moor St Car Park – No straight on movement allowed onto bus mall (9)
e. Moor St Queensway – Yellow Box Junctions (14)
f. Moor St Queensway – Bus only straight on lane eastbound to Jennens Road (15)

B. Great Charles St Queensway (60 buses per hour)

a. Ludgate Hill – Close left turn onto Great Charles St Queensway for private vehicles / bus gate (1)
b. A4400 Great Charles St Queensway – northbound and southbound bus lanes (Paradise Circus - St Chads Queensway) (3)

C. Ring Road (6 buses per hour)

a. Lister St / Great Lister St – Bus Gate across the Ring Road (10)

D. City Centre Arterials (36 buses per hour)

a. Harborne Road – Extend bus lane to Vicarage Road and PM peak period operation (20)
b. Calthorpe Road – Bus lane Fiveways to Westbourne Road (AM and PM peak periods) (21)

E. City Centre Routes (65 buses per hour)

a. Smallbrook Queensway – northbound and southbound bus lanes (Holloway Circus – St Martins Queensway) (5)

Impacts

The combined impacts of these measures have been tested in the PM peak (worse-case) using the city centre SATURN traffic model (2015 base). Traffic rerouting impact is shown in Appendix 2 as demand flows comparison plot, where green represents an increase and blue represents a decrease in vehicle demands as a result of the improvement. The comparison plot indicates a decrease of 150 vehicles on Great Charles Street Queensway, a decrease of 250 vehicles in the Jewellery Quarter to the north-west of Great Charles Street and a reduction of 300 vehicles in Digbeth area. As a result of rerouting, more vehicles choose to use the Ring Road and Queensway Tunnel with increase of 300 vehicles (NE Ring Road), 200 vehicles using Tunnels and 150 more vehicles using SE Ring Road.

This has highlighted an improvement in vehicle speeds and bus speeds of 3 per cent and 10 per cent respectively, a reduction in traffic in the scheme areas with re-routing to more appropriate routes. This demonstrates the likely overall benefit of these measures in areas of NO2 exceedance in the city centre area.

Average vehicle speed existing network – 17kph

- Average vehicle speed with CAZ improvements – 17.5kph
- Average bus speed existing network – 17.3kph
- Average vehicle speed with CAZ improvements – 18.9kph

The modelling has limitations as it is not able to model modal shift, which could be expected from improvements in bus journey time reliability. Observed benefits from existing traffic management trials have seen an average bus journey time improvement of 3 minutes, with a 25 minute reduction in the daily journey time variability compared to the before situation. This has improved bus reliability, which is likely to yield patronage increase; however given the short period of operation, patronage changes cannot be robustly assessed. However, applying the 1 minute improvement / 1 per cent increase in patronage rationale could be expected to patronage increases of between 3 to 25 per cent, which would yield air quality benefits from reduced traffic. The journey time savings for bus has resulted in direct air quality benefits, as emissions will be reduced from less idling and stationary traffic.

Implementation

We will seek to implement the measures, initially as temporary works under a Temporary Traffic Regulation Order (TTRO). This will allow monitoring of real-time observed impacts, whilst making adjustments to the permanent design where required. This is a tried and tested approach that has been successful for the delivery of three current traffic management trials in the city centre. This approach will allow implementation within 2 months, to get the scheme operational and the benefits realised, whilst retaining the flexibility to remove or modify a scheme, if it has adverse impacts. Whilst the schemes are operational (albeit in temporary form) the detailed permanent or semi-permanent designs will be developed. The detailed designs will be able to capture any amendments required as a result of the temporary schemes. This could include impacts on other junctions or roads which will require mitigation and would not have been foreseen without implementation. It will also allow for the necessary statutory consultations to be undertaken, costs refined, TROs gained and contracts for delivery developed.

Semi-permanent designs may be delivered to retain resilience in our network. This is particularly important as many of the city centre roads are closed throughout the year to allow major events like our Irish Day Parade, Birmingham Marathon and 10k, Lord Mayors Parade, cycle events and the

Christmas Markets. Semi-permanent designs also allow flexibility in delivery as the risk from any major works is removed.

The permanent/semi-permanent designs will be implemented within a 6 to 9 month timeframe following the temporary works. During this period, the scheme benefits will continue to be realised as the temporary works are operational. If there are unforeseen issues with any design, the temporary works will be continued, as a TTRO can be in place for up to 18 months. The scalable nature of our proposal will allow the project to be delivered ahead of the CAZ to facilitate and embed change and allow for long-term air quality monitoring.

Project delivery

We have put forward a scalable package of measures that can be delivered within a 12 month timeframe. Our approach is practical in its implementation and focused on delivery of the works. We will seek to implement the initial traffic management package 2, as temporary works, which will allow us to monitor real-time, observed impacts, whilst making adjustments to the permanent design where required.

This is a flexible approach that has been successful for the delivery of three current traffic management trials in the city centre. It allows quick implementation to get a scheme operational and the benefits realised, whilst retaining the flexibility to remove or modify a scheme, if it has adverse impacts. The scalable nature of our proposal will allow the project to be delivered ahead of the CAZ to facilitate and embed change and allow for long-term air quality monitoring.

Project plan:

July 2017:	Governance Structure & Procurement Framework and Approvals
August 2017:	Procurement of services and resources
Autumn 2017:	Design and implement trial works
Spring 2017:	Trial Monitoring / Scheme Development
Summer 2018:	Permanent Scheme Implementation

Consultation has been undertaken with our transport partners TfWM, NXWM and Amey in the development of the package of works. Consultation has been undertaken with the City Council's Cabinet member for Transport and Roads. This will facilitate the expedient progress of the project through the Council's governance process.

Resources and procurement:

The City Council will need to bring in external partner support and external consultant resources to deliver the project. We have a close working relationship with our transport partners at TfWM and NXWM, through existing schemes and the different working groups set up in the city centre (i.e. Bus User Liaison Group, City Centre Traffic Management Coordination, Bus Alliance and Statutory Quality Partnership Meetings).

Procurement of external consultant support will be through two frameworks. The frameworks enable a competitive bidding process but also allow quick engagement and appointment of necessary resources.

- West Midlands Transportation Professional Services Framework (WMPSF)
  - Multi-Disciplinary Services
  - Transport Planning

- Traffic Management Technology 2 (TMT2), Crown Commercial Service
  - Supply of traffic and roadside technology goods and services for use by UK public sector organisations

The WMPSF has two lots, with six consultants on each lot. These consultants are well–versed in working with the City Council to deliver transport projects and schemes across the city. Several of the consultants have staff seconded to the City Council to assist with the delivery of works, which improves our close collaborative working practices. Collaborative working will be encouraged through the delivery of the project to ensure resources are maximised and available through the project programme. Governance of the project and consultants will be managed by Council officers. An agile governance structure will be set up, to allow delegation from senior management and a streamlined approval process for timely decision-making. The Council has legal, finance and project delivery capabilities for the delivery of major project works.

Value for money:
VfM will be ensured through a competitive tender process. Schemes have been selected against an initial framework including VfM consideration to ensure the biggest impact for the investment. The implementation of works as temporary trials initially, will allow scheme benefits to be monitored before permanent designs are committed.

Project management and evaluation
As outlined, we have designed a scalable package of measures that can be delivered within a 12 month timeframe. An overall Project Manager has been identified to oversee the implementation and deployment of the works in collaboration with Growth & Transportation, Environmental Services (Air Quality) and Highways Team (Traffic Management).

Project management will be at 2 levels.

1. A BCC project manager with associated resource support to oversee a procured service that project manages the implementation and focused delivery of the works as well as the co-ordination of the BCC internal communication, systems, procedures in line with the Council's governance processes.

2. Procured provider project managing, implementation and deployment of the works including a Stakeholder and required statutory consultation and engagement processes (supported through BCC project Manager and BCC processes).

An evaluation framework, to monitor progress and impact, will be developed to support the operational delivery of the initial traffic management package 2, to be delivered as temporary works, which will allow BCC Project Manager and procured provider project management through the technology already integrated within the equipment to monitor real-time, observed impacts, whilst making adjustments to the permanent design where required. Working alongside BCC air quality monitoring team, measurement of impact, which will align with the target air quality to be achieved and how we go beyond this will be set as part of the evaluation framework. Measurement and monitoring will be ongoing, utilising air quality monitoring stations, diffusion tube analysis, and smart app technology.

Main risks are around the installation of technology and equipment which will require construction work, as well as public & stakeholder engagement. Risks and opportunities shall be managed in line

with Birmingham City Council Risk Management Methodology 2010. As with any capital works, there are revenue risks associated with the long-term maintenance and monitoring required for the project works. Birmingham has a 20-year PFI agreement in place with Amey for our highway maintenance. The impacts on revenue will need to be better understood as schemes are developed and risks to funding mitigated. This project will support the wider Air Quality and CAZ programme- there will be running alongside a communication campaign which will focus on raising public and business awareness, which will be supported through the signing and re-routing developments. Alongside this, other mitigating actions will include ongoing project management, communication management, technical reporting monitoring and evaluation.

Traffic Signals Technology Pilot

The Birmingham scheme would be designed to deliver the optimal emission reductions and air quality improvements on those links which are most critical to demonstrating compliance with the EU Limit Values. The outputs of the CAZ modelling will assist with understanding which links are in exceedance and future scalability if the pilot scheme yields benefits which deliver value for money. The locations of these key road links will be reviewed, and consideration given to how any UTC scenario might affect traffic routing, with the intention of ensuring the alternative routes are not worsened excessively, or have sufficient "NO2 headroom" to accommodate additional emissions as a result of any intervention. The sensor network would then be deployed to cover the worst case links, plus other worsened routes, so that the overall beneficial and adverse impacts of the UTC can be measured, analysed and refined iteratively based on ongoing real-world operations.

The DST will be further developed to react to air quality alerts generated from roadside air quality sensors located at traffic signal junctions. This additional functionality will enable the development and deployment of traffic management strategies that react in real time to air quality issues detected within the city centre. The proposal is to target three key junctions that have been identified as being in exceedance using JAQU's latest PCM model. On selection of these two locations e-mote sensors will be installed at each junction and monitor air quality exceedances.

Project Outputs

The key signalised junctions in the identified project areas will be equipped with e-mote sensors. The usual methodology will be to ensure that each arm of the junction has significant coverage to give a clear picture of overall air quality conditions in the locations. Air quality information will be routed back to the traffic control centre via the existing backhaul network to allow the control room to have a clear picture of the air quality situations. This information will be stored in the UTMC common database.

Traffic management strategies will be created for each junction which can be invoked when air quality conditions are poor. These strategies will focus on queue relocation which effectively hold traffic back at junctions outside of the area of interest, so that less pollution is emitted at sensitive locations. Initially, air quality alerts will be generated and sent to traffic operators, who will be able to make a manual decision as to whether to invoke the strategies. It is envisaged that this could become an automated function of the UTMC common database, once an agreed methodology is implemented.

Data from the common database is automatically made available as open data and will therefore be accessible to third parties who are interested in air quality. The information gathered and patterns at

these junctions will assist with on-going benefits monitoring when a CAZ is implemented, and measure the level of change. This dual output will be valuable in helping to control areas currently in exceedance of EU limits.

Project Benefits

The impact we can gain from this technology is being evaluated as the current delivery programme comes on line but typically we expect to deliver a 12% reduction, based on current out-dated signal settings in traffic delay, a proportional; improvement in journey time reliability and a reduction in queuing or stationary vehicles. In the event that the UTC scenarios lead to material improvements in NO_2 concentrations, then these benefits may be sufficient to incorporate into the CAZ scheme assessment reporting & design, or mean that lower levels of "additional measures" may need to be employed.

To test this, the traffic model could be run with some anticipated UTC control options, and the traffic data used for subsequent AQ modelling. This would help to indicate the typical number of hours (or set of meteorological conditions) a UTC scenario might need to be live to deliver a quantum of NO2 reduction. It should be noted that AQ dispersion models do not tend to perform as robustly for short term outputs vs annual mean predictions, that the real-world monitoring would contain its own uncertainty, and traffic and emissions responses would also be expected to be sensitive to many parameters which are poorly represented in the modelling process.

Project Implementation

We are confident that this can be delivered this within a 12 months period as this is a pilot scheme with focus on three key locations. What is being proposed is essentially a variation on existing implementations in Ashford and Newcastle. In developing the proposal we have not framed the use of the sensors as monitoring air quality as their primary purpose because they are indicative sensors and there is still much debate about their accuracy or rather variability/reliability under changing conditions, and therefore, usefulness for that purpose particularly when it comes to things such as input into the AQAP Review and Assessment process for example.

However, their performance is improving all the time and we have used them successfully to measure the impact traffic state/patterns has on urban air quality to develop understanding of the complexities of AQ, weather and other factors in urban spaces, and monitor the impact the implementation of traffic management strategies, interventions, or events such as roadworks and collisions has on local air quality.The lifespan of the air quality monitoring sensors is typically up to 5 years depending on the device used and the level of support and maintenance. All new capital transport projects by nature attract additional ongoing costs in respect of maintaining new highway assets.. Revenue maintenance commitments will be covered through the existing PFI contract and this will need to be confirmed via the councils governance processes.

To achieve this level of functionality the following tasks will be undertaken:

Deployment of localised air quality monitoring devices to city centre locations and associated strategic routes. This is to provide spatially and temporarily dense measurement of the changes in levels of air quality in order to associate levels with changing traffic patterns and in particular changes in congestion. This data will feed into:

- an AQ analytics platform that will help prediction of congestion related emissions in other parts of the network, broadening the AQ prediction capability (see note on MOVA and AQM below)
- New MOVA algorithms (see below also)
- All data will be backhauled to the existing Argonaut UTMC system, and potentially the Birmingham open data platform, to provide baseline data to develop traffic management strategies that can be deployed to mitigate air quality issues by:
- Keeping traffic moving – minimise queues and idling time
- Provide progressive traffic gating measures to control vehicle flow into the CAZ – potentially out to the city boundaries

The AQ sensor network locations will be on or near junctions on the A38:

- Co-location of several sensors with at least one reference quality/AURN site.
- A road corridor that contains a number of SCOOT and/or MOVA and UTC connected junctions where co-location between traffic count sites and sensors can occur.
- At least one location which is, at least in part, an urban street canyon.

The air quality analytics platform uses traffic data from systems such as UTC/SCOOT to predict emissions using a congestion-sensitive model that is scientifically rigorous and based on years of research and provides a broader coverage of air quality and emissions across the road network (beyond where the physical sensors are installed). Further, it is used to aggregate raw sensor data from pervasive air quality sensors, precision pollution monitoring sites and weather stations are also used to deliver time aligned air quality and noise related information to systems such as UTMC in real time, where in turn they can be made available to the DST, MOVA or other CAZ stakeholders*.

The Expert Module and DST will be used to process real time data being recorded by all available data sources that will be processed and used to affect the control of the local traffic system or indeed the wider strategic network. This data will be fed back into a wider AQM management system so that downstream junctions can pre-empt issues or indeed upstream nodes can be gated. This would allow the use of more aggressive AQM reduction measures locally due to the associated signal junctions being highly adaptive and responsive.

To enable this level of control and efficiency all of the associated traffic signals will be upgraded to enable joint SCOOT/MOVA adaptive control that allows us to:

- Exploit functionality within SCOOT that supports air quality control
- Exploit potential air quality related functionality in MOVA V.8 (currently V.7)
- Deploy Greenwave methodology to avoid unnecessary stop/start scenarios for Buses and Freight vehicles

The traffic management strategies will not be confined to purely driving traffic signal operations but will also encompass the capability to disseminates information that:

- Supports the use of a Smartphone App as a delivery mechanism
- Links real time information dissemination as a component of traffic management strategies i.e. use of VMS signs (linked to Package 1) and media broadcasting

The exploitation of the existing adaptive traffic control systems is particularly important for the project to achieve its objectives and we intend to use the very latest optimisation technology to achieve our aims. A good example of this is the use of the latest version of MOVA (V.8) as this has some improvements that lend themselves well to improving local (junction) air quality. MOVA has a very good stop and delay optimiser built in to it and there have been improvements made in version 8 that this optimiser can be weighted by external influence.

For example, a local AQM input (from the local sensor or data derived from it) can be used to provide an input to MOVA that would weight the stop and delay parameters for an approach or individual vehicle. This can make it more likely an approach would maintain green for approaching vehicles, therefore reducing stop/start and standing vehicles on a busy approach. This parameter can be controlled by priority function so it could be targeted specifically at buses or freight vehicles in the first instance and then extended to all vehicles should pollution levels persist in being higher than a set threshold. In support of this methodology we are already using SVD detection and allowing for clearance of Buses and HGV's at junctions through the Journey Time Reliability for Growth project and the improvements made in MOVA 8 expand and improve on this to make it more useable in an urban environment when there are other sites and issues to consider.

Throughout this project we will develop the ability to automate the system as much as possible to reduce reliance on day to day manual interventions by operational staff whilst delivering an overall control hierarchy that maintains manual intervention as the highest priority. This approach will enable faster reaction times to DST alerts and allow a library of strategies to be built and developed that can adapt to the impact on the network from areas of transformation.

Project Costs

The system cost is envisaged to be [redacted]. The cost for each junction to be fitted with emote sensors will be [redacted]. The system will require some maintenance. E-motes will have a maintenance period of 2 years, after which the city council will pick up the ongoing maintenance costs as part of the existing PFI maintenance contract.