Department
for Environment
Food & Rural Affairs

Department
for Transport

Dr Adrian Phillips
Director of Public Health
Birmingham City Council
PO Box 16732
Birmingham
B2 2GF

Ref: BIR IEKM 3288
22 March 2018

Dear Adrian,

Implementation of Early Measures

I am writing to confirm I have received clearance to make a capital grant payment of £2,043,680 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 you to deliver measures that will contribute to reaching legal nitrogen dioxide compliance in the shortest possible time. This capital grant payment will support the implementation of early measures to support the delivery of Birmingham's local plan. The projects that are supported are listed in Annex B.

The conditions of the grant and the monitoring and reporting expectations are also outlined in Annex B. The first reporting submission is expected by 31st May 2018, with subsequent monthly submissions. The Secretary of State may require the repayment of any part of the grant monies paid, if the evidence for funding that has been spent cannot be demonstrated or spend has not been as intended as outlined in Annex B.

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. Please remember to quote the reference number in any future communications relating to this grant. 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

Annex A - Title: NO_2 Plan Early Measures Fund: No.31/3288

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 NO_2 Plan Early Measures Fund: No.31/3288

Purpose of the grant

2) The purpose of the grant is to provide support to local authorities in England towards delivering measures that will contribute to reaching legal nitrogen dioxide compliance in the shortest possible time.

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 below.

Grant conditions

4) Pursuant to section 31(3) and 31(4) of the Local Government Act 2003, the Minister of State determines that the grant will be paid subject to the conditions in Annex B.

Treasury consent

5) 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

March 2018

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	£2,043,680

Signed for on behalf of Birmingham City Council

Name	
Title	
Signature	
Date	

Signed for on behalf of the Joint Air Quality Unit

Name	JENNY WARD
Title	DEPUTY HEAD OF JAQU
Signature	
Date	22/03/18

Annex B: Grant Project and Conditions

Grant Conditions

1. Grant paid to a local authority under this determination may be used only for the purposes that a capital receipt may be used for in accordance with regulations made under section 11 of the Local Government Act 2003.

2. The Chief Executive and Chief Internal Auditor of each of the recipient authorities are required to sign and return to the team leader of JAQU of the Department for Transport a declaration, to be received no later than by 31st March 2019, in the following terms:

"To the best of our knowledge and belief, and having carried out appropriate investigations and checks, in our opinion, in all significant respects, the conditions attached to NO_2 Plan Early Measures Fund: No.31/3288 have been complied with".

3. If an authority fails to comply with any of the conditions and requirements of paragraphs 1 and 2, the Minister of State may reduce, suspend or withhold grant; or by notification in writing to the authority, require the repayment of the whole or any part of the grant.

4. Any sum notified by the Minister of State under paragraph 3(o) shall immediately become repayable to the Minister.

5. The grant will be monitored in the Project Delivery and Budget Tracker tool with a first submission by 31st May 2018 and subsequent monthly submissions. JAQU can work with you to develop the reporting to track progress and to evaluate whether the project was effective, achieved its objectives and what the impact of the project was on the local area. Evidence may be requested to support use of funding, such as contracts, contractor reports, invoices and timesheets.

6. 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.

Grant Projects

Delivering mode shift on the bus network Package

Highway Scheme Theme

The previous early measures submission (January 2017) incorporated a total of 25 potential schemes, which, following multi-criteria analysis, was prioritised to 12 physical bus-based highway traffic management interventions, which have since been awarded funding.
The measures were predominantly identified through consultation with National Express West Midlands (which operates 95 per cent of the bus service kilometres in the city centre) with a benefits assessment completed using the City Council's SATURN strategic transportation model.

Since the submission, the City Council, in partnership with TfWM, commissioned a study to review and assess options for the roll-out further bus priority measures across the city core. This has taken a different approach to scheme identification, focussing on:

- building-upon measures already approved through successful NPIF's bids and the first round of early measures funding; and,
- plugging gaps in existing city centre bus priority.

The study allowed a more targeted approach, focussed on corridor based investment to ultimately boost benefit realisation to the bus network. The study identified 10 traffic management measures which had the potential to maximise benefits to existing schemes / bus priority. Journey time savings/speed uplifts where calculated using real time data from bus GPS systems, where the relative change between peak hour and out of peak journey times/speeds was compared.

This list of potential interventions has been prioritised based on three key metrics; strategic fit, deliverability and value for money, taking account of forecast bus user benefits, annual passenger (pax) journey and forecast costings.

Given the compressed timescales in formulating a bid, there has been insufficient time to complete any detailed traffic modelling of the interventions nor a more scientific economic assessment using Treasury green book principles. Undertaking detailed transport modelling would be particularly helpful in demonstrating the wider benefits of the scheme; i.e. the extent to which they boost the benefit of existing bus priority infrastructure and the level of modal shift which could be derived.

The above notwithstanding, there is clear evidence that increases in bus speeds increases patronage and mode-share[1]. The scheme developed for this proposal have been subject to robust and methodical analyses using on-board real journey time data. There is, therefore, a very high degree of confidence in forecast benefit realisation.

A summary of the prioritised proposed interventions is set-out within the table below.

[1] TRL593

Priority	Location	Link to corridor	Intervention	Peak bus p/h	Pax p/a	Forecast journey time saving	Forecast speed uplift
1	Moor Street Q'way	Bus mall	Convert existing loading bay to bus stop allowing services to bypass Park St	40	11m	>270 secs AM & PM peak	N/A
2	B4127 Bath Row / Holloway Head	A441	Provide bus lane between Granville Street and Holloway Circus	14	5m	AM – 30 secs / PM – 180 secs	AM – 12kph / PM – 18.7kph
3	Pershore Road / Belgrave Midway 1	A441	Provide new road markings Pershore Rd/Belgrave Middleway R/bout	11	5m	AM – 5 secs / PM - 20 secs	AM –12.1kph PM – 22.4kph
4	A5127 Lichfield Road	A38	A5127 Lichfield Rd I/B – approach to Dartmouth Circus – extend existing bus lane	12	4.8m	AM – 119 secs /PM 131 - secs	AM – 22.5kph /PM – 24.1kph
5	Coventry Rd / Bordesley Circus	A45	Reassign links between junction – 3x e/bound lanes along the approach to Bordesley Circus with an associated reduction of the westbound link	24	9m	AM – 30 secs / PM - 255 secs	AM – 6.4kph / PM – 16.1kph
6	Pershore Road / Belgrave Midway 2	A441	Plug gap in existing bus lane on approach to Belgrave Middleway and increase flare length onto gyratory	11	5m	AM – 185 secs / PM - 40 secs	AM – 22.4kph / PM – 12.1kph
7	Hockley Hill	A41	Provide new bus lanes on the approach to St. Chads	28	12m	AM – 120 secs/ PM - 120 secs	AM – 9.4kph/ PM – 8.1kph
8	Bristol Street / Thorp Street	A38	Widen existing bus lane	15	4m	AM – 30 secs /PM - 25 secs	AM – 6kph/ PM – 5kph
9	Sherlock Street / Pershore Road	A441	Provide bus lane at Sherlock Street from Gooch Street to Ring Road. Additional flare on Sherlock Street approach to roundabout	11	5m	AM Peak – 30 secs /PM - 240 secs	AM – 6.7kph/ PM – 18.7kph

10	Longmore Street	A441	Extend length of bus lane on approach to Belgrave Middleway	11	2.4m	AM – 120 secs / PM - 15 secs	AM – 9.7kph / PM – 7kph

Bus stop infrastructure Theme
To complement the 10 prioritised highway interventions, will be a complementary package of up to 34 bus stop upgrades. These will be delivered along the highway intervention priority routes, where the highway schemes are being delivered.

- Sherlock Street / Pershore Road – 5 bus-stop enhancements
- B4127 Bath Row / Holloway Head – 4 bus-stop enhancements
- Longmore Street – 4 bus-stop enhancements
- Pershore Road / Belgrave Midlway 1 – 2 bus-stop enhancements
- Pershore Road / Belgrave Midway 2 – 0 bus-stop enhancements
- Bristol Street / Thorp Street – 5 bus-stop enhancements
- A5127 Lichfield Road – 0 bus-stop enhancements
- Hockley Hill – 4 bus-stop enhancements
- Moor Street Q'way – 0 bus-stop enhancements
- Coventry Rd / Bordesley Circus – 9 bus-stop enhancements

This will see enhanced passenger comfort through new, upgraded and refurbished shelters and better passenger information, including at-stop information includes printed vinyls, signs, timetables and posters, as well as audio and electronic 'next-bus' and real-time information (RTI).

Improving the off-board bus experience
It is proposed to improve the branding of the bus market, through the West Midlands Bus Alliance, so the public knows the buses are greener, quicker and a reliable means of travel. The infrastructure improvements will be coupled with a targeted marketing campaign to promote improved journey times and reliability, network branding, better travel information and promotion of the green credentials of our buses to existing and new bus users.

Improving the on-board bus experience Theme
Linked to the network branding improvements to public transport, this will provide targeted marketing on the bus routes that have been upgraded by the other complementary measures outlined in this submission. We will explore and seek contributions from our Alliance partners (including operators) to fund this element of the package, to complement the other investment being made off-board through the funding. This will maximise the investment made and enhance the benefit of the packages.

Traffic Signal Technology Package

It is proposed to implement new control strategies at four key intersections within the City Core which are closely related to key air quality locations. This will mean that all junctions will have a choice of SCOOT (which optimises on the network level), MOVA (which optimises at the junction level) and fixed time (fall back scenario). On top of this, green extensions and recalls will be provided at off peak times for priority vehicles, such as buses and freight. This will be to reduce the level of stop-start required for the highest polluting vehicles and will be complementary to the bus priority measures. Traffic loops will also be upgraded with technology that classifies vehicle according to their type. This will have 2 purposes:-

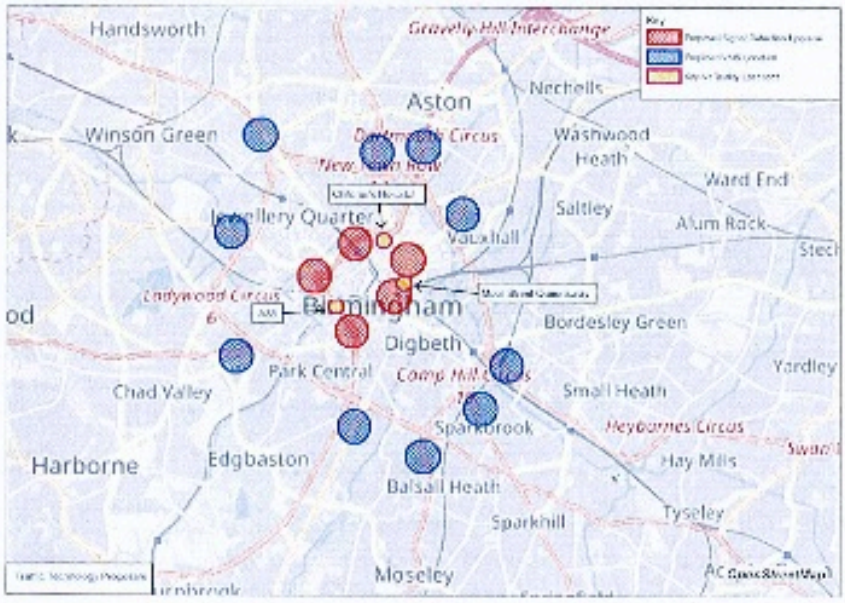
- To allow the above bus and/ or freight priority to be provided

- To enable real-time calculations of air quality to be made

We will implement a Decision Support Tool (DST) that monitors traffic levels using information from the classified loop information and the existing journey time monitoring system. When certain threshold levels of air quality are identified, the system will automatically implement the most favourable control strategy. These will be network based and will involve trying to reduce congestion

at the junctions most sensitive to air quality issues. When carrying out the rerouting the DST will also take advantage of ongoing changes to the network from disruption in relation to the construction of HS2 and other construction in the city centre. In many cases, the solution will be to redirect traffic around the ring road to enter the city from a different direction.

Alongside the upgrade of key intersections, it is proposed to provide a supporting network on Variable Message Signing (VMS) on the approach to the City Centre along the ten key radial corridors leading onto the A4540 ring road as outlined in the figure below. The VMS will strengthen the locations for VMS for which funding has already been secured as part of the first round of early measures whilst additionally plugging further gaps in the network, ensuring a comprehensive network of VMS on all approaches to Birmingham City Centre. Moreover, the VMS will form a key mechanism for the routing strategy agreed as part of the first round of early measures. By upgrading where static routing signs are strengthened by dynamic VMS support planned and unplanned incidents on the network thereby smoothing traffic flow and reducing emissions.



VMS Locations

1. A34 Stratford Road
2. A45 Coventry Road
3. A441 Pershore Road
4. A456 Hagley Road
5. A457 Spring Hill
6. A41 Soho Road
7. A34 Walsall Road
8. A38 Gravelley Hill
9. A38 Bristol Road
10. A47 Washwood Heath Road

Signal Upgrades

1. Bristol Street/Holloway Head
2. Paradise Circus
3. St Chads Gyratory
4. Park Street/Priory Queensway
5. Digbeth Gyratory

The VMS would provide dynamic, real time information relayed by the City's UTMC centre, enabling traffic patterns to be influenced, by informing drivers approaching the city centre of congestion or unexpected events, at a point on their journey where they could reasonably be anticipated to use an alternative arterial route.

For the purposes of the economic assessment, ten major arterial routes have been assumed. This deployment is complementary to that set out in the 'Birmingham City Centre Traffic Management and C-ITS Enhancements' bid which provides for a limited number (four) of VMS signs.

The VMS strategy will be developed in parallel to the signing and rerouting strategy funded through the first round of early CAZ measures and will take account of information from the recent ANPR surveys and the traffic modelling that is being undertaken for the Clean Air Zone Feasibility Study. This will consider how to reduce the impact of displacing traffic and prevent creating air quality problems on other roads within the city centre/wider city.

Estimated Impact of NOx emissions

This chapter outlines an estimate for:

- the change in NOx emissions from reducing vehicle kilometres travelled or vehicle technology, using the inputs and assumptions identified in the previous chapters.
- A 'NOx emission reduction per £' figure and '£ cost per 1 kg NOx saving'.

The latter figure has been produced, as it provides a useful comparison for the value of the scheme interventions against other interventions, as produced by Greener Journeys[2] for the cost to Treasury for saving 1kg of NOx:

- Retrofit buses: £12
- Bus scrappage: £16
- Grant for electric car: £108
- Diesel car scrappage: £175

Delivering mode shift on the bus network Package

Funding for bus-based schemes to improve bus journey time reliability and achieve modal shift. Detailed calculations for each scheme route are presented in **Appendix F**.

The estimate assumes that the bus fleet emissions are unchanged as a result of the scheme interventions. This will underestimate the potential NOx savings, as we would expect to see an increase in bus speeds, which would lead to direct NOx savings from lower bus emissions at higher speeds. Calculation based on the modal shift to bus (from car) and NOx savings as a result of fewer car veh kms.

GJT	*-0.58*
Diversion factor from cars to bus	*0.31*
Estimated average bus journey times decrease	By route, based on estimated maximum peak hour time savings (see table above) as a result of the interventions
Current bus journey time	By route, from existing speeds data for 1km section through the scheme location
Existing annual patronage (see table above):	63.2 million
Increase in bus patronage	By route – capped at 15% (see evidence chapter)
Increase in patronage (annual) due to the schemes	9.3 million
Annual patronage mode shift from car *(applying 0.31 diversion factor)*	2.9 million
Annual number cars reduced *(based on 1.2 average occupancy from city centre cordon data)*	2.4 million
Annual car veh kms reduction *(assumed 7.6km average one-way trip length to city centre – from Birmingham Connected Travel Surveys data)*	36.7 million
Car fleet composition – petrol / diesel	Data from the November 2016 ANPR city centre surveys
NOx savings per annum (tonnes)	**6.430**
Tonnes NOx savings / £ cost *(£1,097,740)*	**0.000005857**
£ per 1 kg NOx savings	***171***

[2] https://greenerjourneys.com/wp-content/uploads/2017/06/TACKLING-POLLUTION-AND-CONGESTION-15-JUNE-2017-FINAL.pdf

Traffic signal technology Package

Savings calculated using the DEFRA EFT and the following assumptions:

Annual vehicle demand city centre	40 million
Average Hourly vehicle flow (from ANPR cordons)	4,800 vehicles
Assume no change in vehicle demand	-
Average savings in travel time due to traffic signal technology improvements	12.8%[3]
Before intervention (base) vehicle speed	10kph
After intervention vehicle speed	11.3kph
Annual NOx emissions (kg) before intervention	297,948
Annual NOx emissions (kg) after intervention	291,584
NOx savings per annum (tonnes)	**6.364**
Tonnes NOx savings / £ cost *(£390,000)*	**0.000008055**
£ per 1 kg NOx savings	***124***

Project delivery

The measures submitted have been selected, inter-alia, on their deliverability and scalability, enabling the interventions to be delivered ahead of the CAZ to facilitate and embed change and allow for long-term air quality monitoring. The milestones below represent a consolidated programme covering all elements of this investment proposition. A high level milestone programme is outlined below.

Project plan – Bus Based Traffic Management, Shelter Enhancements & Traffic Signal Technology:

April 2018:	Governance Structure & Procurement Framework and Approvals
April 2018:	Consultation on TROs / commence detailed design / define VMS schedules
July 2018:	Completion – detailed design / commence marketing activities
July 2018:	Making of TROs
July 2018:	Procurement of services and resources
Autumn/Winter 2018:	Delivery
Early 2019	Opening date of capital works

A detailed project plan can be found in **Appendix G**. Design is already underway (at risk) for a number of projects which means that a number of schemes can be delivered early in the programme.

Where schemes cannot be delivered early in the programme, the project plan reflect the Purdah and post-election period at Birmingham City Council which will restrict consultation. For the delivery of bus priority measures, this effectively results in two periods of delivery; one leading up to late sping/Summer 2018 and a further tranche autumn/early 2019.

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

[3] http://www.itsinternational.com/sections/cost-benefit-analysis/features/tfl-expands-scoot-adaptive-traffic-management/

through the Council's governance process. The consultation programme takes account of Purdah and the core summer holiday period in late July August.

Resources and procurement:

It is proposed to work jointly with TfWM to deliver all identified interventions. To guarantee delivery, external partner support and consultancy support will further be required. The City Council has developed 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 and TfWM 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. This is covered further below

Inter-dependencies

There are a number of inter-dependencies as the City Centre goes through a once-in-a-generation physical transformation, requiring significant construction works and associated traffic management.

A City Centre traffic management group has been established - jointly chaired by the City Council's Assistant Director for Growth and Transportation and TfWM's Director of Network Resilience - to manage and coordinate the multitude of concurrent and conflicting work programmes. This has resulted in completion of a composite 'master programme', incorporating all city-centre related traffic schemes.

The first round of early award measures has already been included within the programme and is being managed by the group, in the context of the wider programme. If successful, the highway intervention proposed within this package would further be included within the master programme. All the intervention proposed within this application have been considered against the master programme and it is not considered any conflict existing, both in delivery and project outcome terms.

Project costs

As detailed above, a scalable package of works is proposed due to the funding constraints. The bus-based highway schemes have been further prioritised so investment can be targeted where most benefit is derived. This full cost package can delivered in discrete packages that build upon existing

and the prioritised works. The table below outlines the scheme costs associated with the package. A detailed breakdown of costs where capital highway works are required can be found below.

Package	Scheme
Bus priority package 1	Moor Street Q'way highway scheme
Bus priority package 2	B4127 Bath Row / Holloway Head highway scheme B4127 Bath Row / Holloway Head bus stop infrastructure (4)
Bus priority package 3	Pershore Road / Belgrave Midlway 1 highway scheme Pershore Road/Belgrave Midlway 1 bus stop infrastructure (2)
Bus priority package 4	A5127 Lichfield Road highway scheme
Bus priority package 5	Coventry Rd / Bordesley Circus highway scheme Coventry Rd / Bordesley Circus bus stop infrastructure (9)
Bus priority package 6	Pershore Road / Belgrave Mdlway 2 highway scheme
Bus priority package 7	Hockley Hill highway scheme Hockley Hill bus stop infrastructure (4)
Bus priority package 8	Bristol Street / Thorp Street highway scheme Bristol Street / Thorp Street bus stop infrastructure (6)
Bus priority package 9	Sherlock Street / Pershore Road highway scheme Sherlock Street / Pershore Road bus stop infrastructure (5)
Bus priority package 10	Longmore Street highway scheme Longmore Street bus stop infrastructure (4)
Bus Promotion	Off-board customer experience marketing
Traffic signal technology package – signal upgrade	5 sites as detailed above
Traffic signal technology package - VMS	10 sites as detailed above
Design fee – bus priority and traffic	Development costs to prepare the highway schemes for the 10 schemes above
	Programme total 2,043,680

Value for money:

The total cost of the package is £2,043,680.

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. Any cost overruns would be met by partners and not JAQU.

As discussed previously, due to the compressed timescales, no formal traffic modelling has been completed to derive a benefit cost ratio the bus priority and traffic signal element of the package. However, the robust approach taken to scheme evaluation, in terms of journey time benefits, means only schemes which are likely to delivery material benefits on high frequency bus services which generate significant levels of patronage are proposed to be taken forward to delivery.

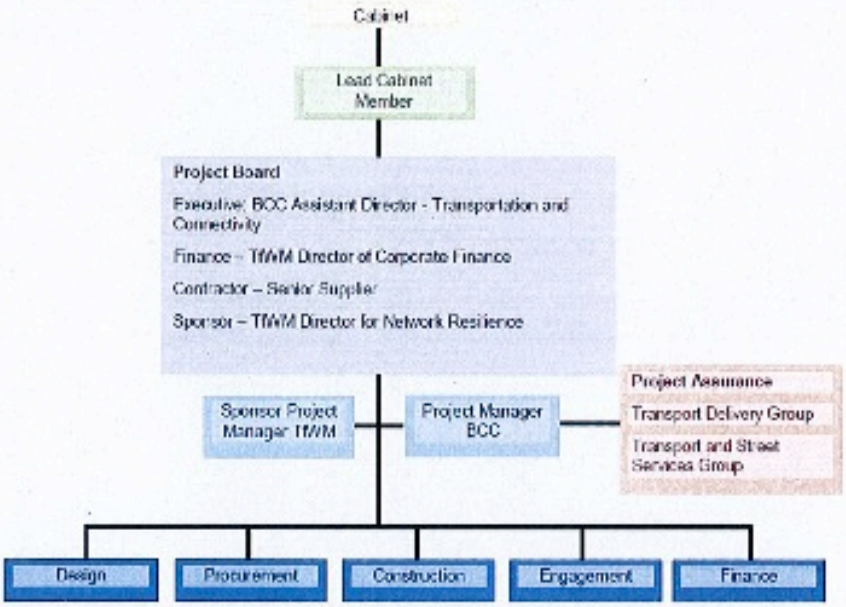
As also discussed above, with all of the identified measures, it remains difficult to accurately quantify the potential impacts of these measures in terms of their benefits to air quality, however, the various evidence set out in this document suggests that the impact will overall be positive for air quality.

The table above shows the breakdown of the capital implementation costs. Additionally, £[redacted] of fee is included which would allow dedicated project management and engineering resource to be appointed to ensure expedient delivery of the programme on the ground.

Project management and evaluation

Project Management / Governance

Given the successful bid for early measures, confirmed in December 2017, it is proposed that successful award for this round of funding will necessitate the establishment a Project Board to oversee delivery of tranche 1 and 2 schemes, consisting of the Executive (SRO), Senior User, Finance and Contractor. These would be joined by a senior member of the contractor's teams and TfWM's Director of Network Resilience, acting as project sponsor.



The project board will meet with predefined regularity and together will be responsible for the project control. They will make decisions within the scope of any Cabinet approval and where appropriate decision on any minor scope alterations are required. Any exceptional decisions, including decisions outside of the approved scope of the scheme, will be referred to the relevant Cabinet Member.

The project manager will manage the project, tracking progress against scope, time and budget. They will give direction to officers across the authority with a specific role in delivering the project, meeting with each area regularly to ensure any risks or issues are identified and providing challenge were needed. They will also report to the Board on a regular basis, escalating any issues for discussion or decisions outside of their remit. Members of the project team will work together to deliver the project, ensuring a joined up approach.

As part of the City Council's obligations under the HMMPFI contract, the Service Provider, Amey will be fully consulted to ensure close coordination between its programmed routine maintenance works and the proposed developments. This will avoid duplication enable better overall use of resources and improved overall value. Two well established officer groups within the authority, the Transport Delivery Group (TDG) and Transport & Street Services Group (TSSG), will provide project assurance. They will scrutinise delivery, finances and procedures, providing challenge to the Project Manager and Project Board and recommendations for improvements where appropriate.

Consultation, particularly in gaining political/stakeholder support for the highway interventions, represent the main risks to the project. However, given the significant policy drivers in supporting air quality improvements within the City Centre and the low risk nature of schemes/

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.

Risk

In the event of successful funding, a risk assessment of key risk has been completed for both rounds of early measures funding and outlined below.

Likelihood	Description
1	Very Unlikely
2	Unlikely
3	Possible
4	Very Possible
5	Almost Certain
6	Certain

Timescale Impact		Min		Max
1	Insignificant	None	1 week	2 weeks
2	Minor	1 week	2 weeks	1 month
3	Moderate	2 weeks	1 month	3 months
4	Serious	1 month	3 month	6 months
5	Catastrophic	3 months	6 months	1 year

Risk Ref.	Nature of Risk	Implication	Mitigation	Action Owner	Risk Owner		Impact Type	
R1	Traffic signal asset inventory inaccurate or incomplete leading to incomplete	Cost estimates may be wrong resulting in possible claims for	Ensure accuracy and updating of inventory and databases.	BCC	BCC	2	Cost	1

	understanding of asset condition	variations from the contractor.						
R2	Returned tenders exceeds budget.	Additional borrowing would be required to cover the shortfal	Develop a plan identifying the maximum limit of construction tender cost and applicable split between parties. Ensure cost estimates are as robust as can be at this stage. Correct procurement process identified to ensure best value	TMM	BCC	3	Cost	1
R3	Works require diversions of statutory undertakers	Potential for significant cost increases	Obtain C3 estimates and early stage and commence value engineering exercise	TMM	TMM	2	Cost	4
R4	Underestimation of costs at application stage	Costs inaccurate adverse effect on affordability of scheme	Technical and financial due diligence and pre-procurement to test application assumptions.	TMM	TMM	2	Cost	1
R5	Public and third party consultation results in a change to the scheme	Objections could cause delay.	Ensure scheme elements are not controversial, in terms of design and scheme impact on other road users	TMM	BCC	3	Delay	2
R6	Potential for design changes to come forward during construction	Could lead to a change in the Works Information and therefore lead to Compensation Events resulting in extra costs.	Effective project management. Peer reviews of projects at critical stages.	TMM	TMM/BC C	2	Delay	2
R8	Availability of contractors limited leading to increased tender prices or delay to programme	Delays to the programme and increase costs	Include an allowance in the risk budget to cover this - allow for % increase in cost of materials. Plan for financing in the event of delays to the programme	TMM	BCC	2	Cost	2
R9	Increased costs of procurement of Variable Message signs	Increase in costs could result in overruns	Develop prioritisation list of locations of most importance for VMS.	TMM	BCC	2	Cost	2
R10	Traffic Management – possible adverse effect on the network, especially on Primary routes.	Increase in short tem delay and congestion	Works on the primary routes could be carried out overnight, all works will be restricted to off-peak working on Primary routes. Contractor should clearly identify the planned TM and seek relevant approvals, adhering to all relevant notice periods etc.	BCC	BCC	4	Both	1

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

Monitoring and Evaluation

An evaluation framework, to monitor progress and impact, has been developed to support the operational delivery of all early measures proposals. 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. Further measuring of bus patronage and journey times through junctions will further measure success of the package.

It will also assist in maximising the benefits at project inception and help ensure these benefits are realised as the project is developed and implemented; understanding the scheme's impacts is required to enable meaningful feedback to take place.