

# Funding for Innovation: Cooperative Intelligent Transport Systems



Department  
for Transport

## Application Form

The level of information provided should be proportionate to the size and complexity of the scheme proposed. As a guide, we would suggest around 10 to 15 pages including annexes would be appropriate.

**A separate application form should be completed for each scheme.**

### Applicant Information

**Local authority name(s)\*:** West Midlands Combined Authority (lead), Birmingham City Council

**Bid Manager Name and position:**

*Mike Waters, Head of Policy & Strategy, Transport for West Midlands*

**Contact telephone number:** 0121 214 7150    **Email address:** [mikewaters@wmita.org.uk](mailto:mikewaters@wmita.org.uk)

**Postal address:** Transport for West Midlands, 16 Summer Lane, Birmingham, B19 3SD

When authorities submit a bid for funding to the Department for Transport, as part of the Government's commitment to greater openness in the public sector under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, they must also publish a version excluding any commercially sensitive information on their own website within two working days of submitting the final bid to the Department for Transport. The Department for Transport reserves the right to deem the business case as non-compliant if this is not adhered to.

**Please specify the web link where this bid will be published:**

The bid will be published on: <https://westmidlandscombinedauthority.org.uk/>

## **SECTION A - Scheme description and funding profile**

**A1. Scheme name:** TfWM GLOSA Trial, A45 Coventry Road

### **A2. Headline description:**

The scheme will deliver GLOSA and real time information messages to HGV drivers. It will build upon existing ITS systems and services to enable driver assist messages to be delivered via a newly developed smartphone App. The intention is to provide journey time reliability for HGV vehicles during free flow conditions and to avoid them making unnecessary stops at traffic signal junctions. We will use information from the app to support network resilience planning. The project will be located on sections of the key route network that have major transport links including the airport and the M42.

### **A3. Geographical area:**

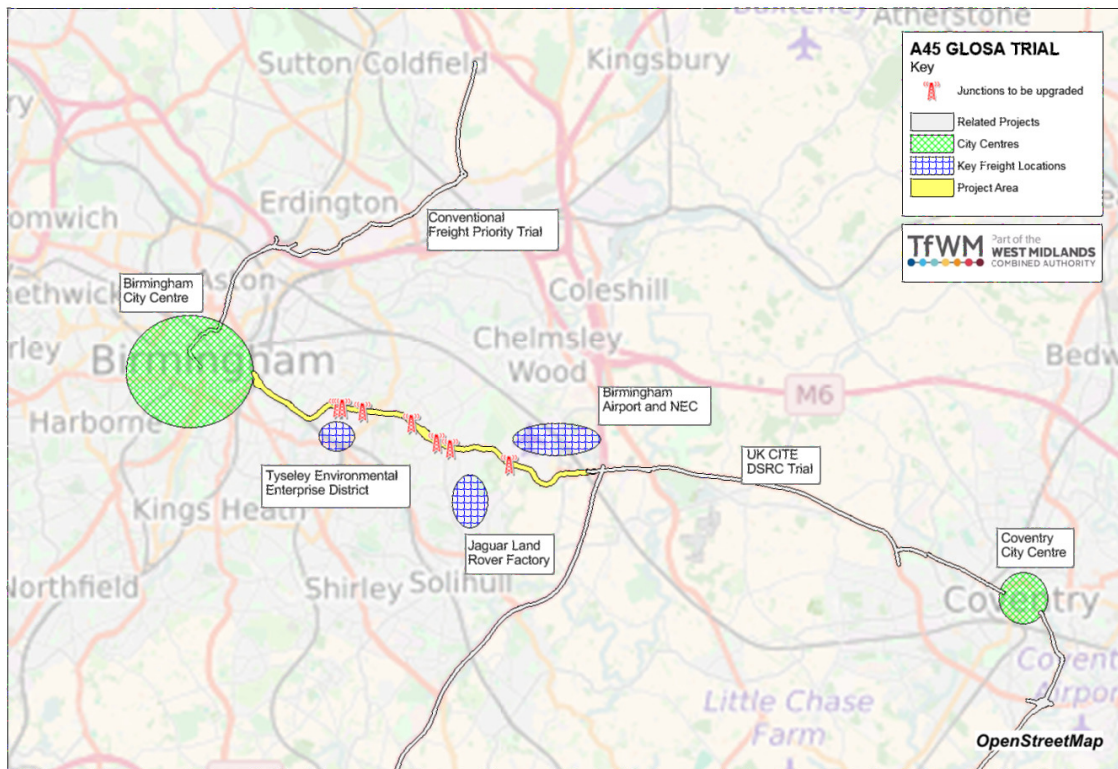
Trials will be on sections of the key route network including a cross boundary section between Birmingham and Solihull along the A45 Coventry Road. This location is ideal because it carries some of the highest proportion of freight vehicles across the inter-urban road corridors within the constituent member WMCA geography.

OS Grid Reference: A45 Coventry Road / Sheaf Lane 414907 / 283778

Postcode: B26 3EH

#### *Associated sites:*

<i>A45 Coventry Road / Kings Road</i>	<i>411280,285065</i>	<i>B25 8DP</i>
<i>A45 Coventry Road / Berkley Road</i>	<i>411424,285055</i>	<i>B25 8DT</i>
<i>A45 Coventry Road / Holder Road</i>	<i>412075,284968</i>	<i>B25 8AW</i>
<i>A45 Coventry Road / Gilbertstone Avenue</i>	<i>413669,284586</i>	<i>B26 1PA</i>
<i>A45 Coventry Road / Lyndon Road</i>	<i>414471,283958</i>	<i>B26 3JA</i>
<i>A45 Coventry Road / Damson Parkway</i>	<i>416832,283273</i>	<i>B26 3QS</i>



Proposed Project Location: A45 GLOSA Trial

**A4. Type of bid (please tick relevant box):**

- C-ITS: Connected Vehicle
- C-ITS: Real Time Information
- C-ITS: Smart Parking
- C-ITS: Vulnerable Road Users

Other (please specify)

**A5. Equality Analysis**

Has any Equality Analysis been undertaken in line with the Equality Duty?

Yes, an initial screening has been undertaken that suggests no adverse impacts for any of the protected groups.

## **SECTION B – The Business Case**

### **B1. The Scheme – Summary/History** (Maximum 200 words)

The scheme will test the viability of delivering GLOSA messages and real time information on journey times and planned and unplanned incidents to HGV drivers. The project aims to improve journey time reliability and reduce emissions. This approach builds on previous work in Birmingham (the OPTICITIES EU project) that has delivered a significant knowledge base in this area that can be exploited in this scheme. We will demonstrate the provision of green light prediction information to drivers without the need for significant replacement of existing hardware and systems. The project will provide the following elements: 1) Capture of current traffic signal stage and phase information from the roadside infrastructure 2) Processing of traffic signal data in a UTMC common database in combination with junction layout and accurate timing information 3) Access Controlled Open API that delivers standards compliant SPAT and MAP messages to vehicles 4) Prototype in-vehicle smart phone application providing GLOSA messages and real time information. The app will broadcast vehicle location to the API and process the SPAT and MAP messages received. This scheme will test and challenge the importance of C-ITS to LHAs by providing real world input to the developing business case for its use.

### **B2. The Strategic Case** (Maximum 350 words)

A C-ITS trial for HGV vehicles is in accordance with the West Midlands freight strategy, referred to in the national and regional tier section of the Strategic Transport Plan (STP). It supports the metropolitan tier's role for the Key Route Network to help serve the main strategic demand flows of people and freight across the metropolitan area and the vision for smart mobility of the STP. This has a strong emphasis on making better use of existing transport capacity by using smart technology and better integration of transport to manage demand better.

Current demand management improvements focus on providing journey time reliability across key junctions on the urban network. Whilst this approach delivers immediate benefits it may not meet increased demand from future traffic growth and disruption from major schemes such as HS2. Our involvement in the OPTICITIES project has already provided essential R&D into the use of predictive traffic information, decision support tools and the intelligent use of data. This forms part of a natural progression, exploring aspects of C-ITS which enable us to move to a smarter, more integrated, transport system.

The impact of freight specific C-ITS technology is intended to link strategically with other existing projects, including the UK CITE project, and the Journey Time for Growth (JTfG) project. Within the scope of this project we'll explore linking to the connected road infrastructure at the eastern end of the A45 corridor and the freight based priority measures implemented by JTfG measures. The combined output of these projects will enable TfWM to determine a holistic approach to the use of C-ITS technology on the key route network based on the exploitable, real world, benefits that each project delivers for routes with significant HGV flows.

The learning from the scheme benefits future network resilience measures and its associated strategy and during the next 10 years there will be a need to implement a range of measures to keep the economy moving. As part of this, enabling the logistics sector to keep critical industries (e.g. automotive manufacturing) functioning with maximum reliability will be key.

**Further supporting evidence is provided in Annex A**

### **B3. The Financial Case – Project Costs**

Financial information removed for website publication.

### **B4. The Financial Case - Local Contribution / Third Party Funding**

Financial information removed for website publication

### **B5. The Financial Case – Affordability and Financial Risk** (maximum 300 words)

This section should provide a narrative setting out how you will mitigate any financial risks associated with the scheme.

Please provide evidence on the following points (where applicable):

- a) What risk allowance has been applied to the project cost?
- b) How will cost overruns be dealt with?
- c) What are the main risks to project delivery timescales and what impact this will have on cost?

We believe it is prudent to allow a small contingency allowance to be included in the project cost to cope with potential cost overruns and, as such, a small allowance has been made. However, we do not expect to call on this allowance and that it will be used to enhance the technical output of the project.

The main risks relate to the innovative nature of the technology meaning that changes to the project schedule may need to occur in order to ensure that the project aims and objectives are fulfilled. However, to mitigate these risks we have a programme that is a) sufficiently robust to provide confidence in an overall completion by March 2018 and b) informed by the existing experience we have with delivering similar technically innovative projects on time and to budget. Our key reference here is the OPTICITIES EU FP7 project that has required us to deliver innovative technology similar (and complementary) to the requirements of this project. It is our intention to use key members of the OPTICITIES delivery team for this project utilising existing framework contracts, technical expertise and technology continuity.

The potential for cost overruns will be initially handled through robust project planning and subsequent project management (utilising PRINCE 2). Detailed procurement specifications will be written that accord to the approved procedures of Birmingham City Council and WMCA. Contracts will have a fixed cost and time scale for the delivery of the specified outputs. There will also be an opportunity to make changes to the scope of the works, whilst still delivering on the overall aims and objectives of the project. Once these options have been exhausted, WMCA and BCC accept that they will pay for the cost overruns.

## **B6. The Economic Case – Value for Money**

### **If available, promoters may provide an estimate of the Benefit Cost Ratio (BCR) of the scheme (particularly for schemes costing more than £100,000)**

A BCR of 2.0 has been estimated for the scheme, based on the calculations in Annex C. There is a high initial investment cost to upgrade systems, but the 'per junction' cost of the scheme would be low. Due to the funding level available, the trial will be restricted to 7 junctions. However, the BCR therefore assumes a successful trial and that the project would be rolled out at 30+ junctions across the west midlands.

The BCR does not evaluate other benefits, such as the benefits to network resilience of having individual freight operator connected directly to the centralised control system allowing them more robust commercial performance against KPIs etc. The BCR also does not quantify the CO<sub>2</sub>, Air Quality and Noise benefits of the scheme, which will be calculated as a part of the trial.

### **B7. The Commercial Case** (maximum 300 words)

The required services are Professional Services Support, Works Contractors, PFI Maintenance contractor and App Development. It is proposed to use existing Framework Agreements to procure these services in view of the short timescales available for the project.

External Professional Services Support is required for technical co-ordination of the project. This support will be secured through the BCC Associates Framework. This is appropriate, as the council requires independent technical support and advice.

A contractor will be appointed to deliver the highway infrastructure works. The contractor will be appointed through the City Council's 'Highways and Infrastructure Works Framework Agreement' in accordance with the City Council's 'Standing Orders relating to Contracts and Procurement Governance Arrangements'. This contract is appropriate for the delivery of standard highway works.

A contractor will be appointed for the delivery of Intelligent Transport Systems services (comprising software changes and upgrade, IT equipment and application development). It is proposed to use the 'Government Procurement Services - Traffic Management Technology (RM1089)' if available by the time of the contract. This contract is preferred as it is focused in the specialist area of traffic management technology. Alternatively the contractor will be appointed using the 'Birmingham Professional/Consultancy Services Framework'.

The above will be in accordance with the City Council's 'Standing Orders relating to Contracts and Procurement Governance Arrangements'.

Contracts will be advertised on the council's In-Tend procurement portal.

The following risks reside with the client team and the private sector:

1. Design, Construction and Development Risk
2. Transition and Implementation Risk
3. Availability and Performance Risk
4. Technology and Obsolescence Risk
5. Control Risks
6. Residual Value risks.

The following risks reside with the public sector:

1. Variability of revenue risks
2. Termination risks financing risks and legislative risks.

Operating risks will sit with the PFI contractor maintaining the BCC highway network.

**B8. Management Case - Delivery** (maximum 300 words)

Deliverability is one of the essential criteria for this Competition and as such any bid should set out if any statutory procedure are needed before it can be delivered.

- a) An outline project plan (typically in Gantt chart form) with milestones should be included as an annex, covering the period from submission of the bid to scheme completion. The definition of the key milestones should be clear and explained. The critical path should be identifiable and any contingency periods, key dependencies (internal or external) should be explained.

Has a project plan been appended to your bid?

**Yes, please refer to Annex D**

- b) A statement of intent to deliver the scheme within this programme from a senior political representative and/or senior local authority official.  
**version as it includes financial information.**

**Letter removed from website**



**B9. Management Case – Governance** (maximum 300 words)

Please name who is responsible for delivering the scheme, the roles (Project Manager, SRO etc.) and set out the responsibilities of those involved and how key decisions are/will be made. An organogram may be useful here. This may be attached as an Annex.

The project will be governed according to the PRINCE 2 project management process. A governance chart is attached as Annex E.

The Project Board will be made up of a Senior Responsible Officer (who will be the individual responsible for ensuring that the project meets its objectives and delivers the projected benefits), a representative of the freight operator involved in the trial and a senior supplier representation. The project board will be responsible for all key decisions made in the project and the overall delivery of the project.

The Project Manager will be responsible for organising and controlling the project, and will work closely with the technical co-ordinator, who will provide industry specific advice about the project. The Project Manager will regularly report to the board and will also be supported by project assurance and project support teams.

There will be 5 work packages, comprising system improvements (covering changes to IT systems), junction improvements (covering on site works), Application development (for the in vehicle app), Trial- co-ordination and finally monitoring and evaluation. Each work package will have a work package leader, who will be responsible for day-to-day management and delivery of the work package.

Project approvals will be through the Birmingham City Council's Gateway process for projects and Programmes.

**B10. Management Case - Risk Management**

Risk management is an important control for all projects but this should be commensurate with cost. For projects where the costs exceed £100,000, a risk register covering the top 5 (maximum) specific risks to this scheme should be attached as an annex.

*Please ensure that in the risk register cost that you have not included any risks associated with ongoing operational costs and have used the P50 value.*

Has a risk register been appended to your bid?            Yes  No

Risk Register is attached as Annex F.

## **SECTION C – Monitoring, Evaluation and Benefits Realisation**

### **C1. Benefits Realisation** (maximum 250 words)

The primary benefit of providing GLOSA information is to smooth road traffic flow to provide reliable journey times for drivers and assisting businesses to achieve efficiencies in the movement of goods that ultimately contribute towards the economic growth of the city.

It is expected that by having to stop and start less often, HGVs will use less fuel with the combined effect of reducing localised pollution and reduce CO2 emissions leading to better health outcomes and a potential reduction in traffic noise for local residents.

Connected freight vehicles travelling around the network enables interaction with the traffic management centre on vehicle speed and location, provides the ability to disseminate individualised travel advice to drivers. This enhances our ability to plan and manage the network and improve network resilience at a particularly important time when the local network is expected to be compromised by major construction work such as HS2. The information on vehicle speed and location will also feed into the councils monitoring processes, leading to improved traffic modelling and potential changes in transport policy.

This project forms a building block to our overall strategy to build a world leading connected vehicle environment that also supports UK strategic aims. This project complements the UK CITE (and UK Autodrive) project by providing the opportunity for collaborative work and testing to be carried out over a wider, diverse, urban area with a broader range of vehicle types than in currently in scope for these projects.

**Further information is provided in Annex G.**

### **C2. Monitoring and Evaluation** (maximum 250 words)

The project will monitor against the following indicators (shown as a diagram at Annex H):

**Baseline indicators: traffic speed, flow and HGV%**

These will be used to understand if the baseline situation changes, which could have an effect on the overall operation of the scheme

**System indicators: Data accuracy, system latency, availability of prediction%, number of times priority activated.**

These indicators will be used to understand how well the GLOSA prediction system is working. It will not be possible to obtain the benefits if the systems do not work properly. A particular concern is around how well GLOSA will work in an adaptive control environment.

**Output indicators: Total Journey Time (freight and general traffic), Journey Time reliability (freight and general traffic), Driver compliance with instructions, Fuel usage.**

These will be used to assess if GLOSA delivers the expected aims.

**Outcome indicators: Pollution, Noise, CO2, network resilience, evaluation survey.**

These will largely be used to assess the extent to which the expected outcomes are achieved. The evaluation survey will be used to determine the satisfaction of different groups and will involve interviews with drivers, business, traffic managers and politicians.

An evaluation report and presentation will be produced before, during and after the trial in order to show the progression of the project.

TfWM and BCC will be happy to contribute to sharing and dissemination platforms as specified by the DfT.

## **SECTION D: Declarations**

### **D1. Senior Responsible Owner Declaration**

As Senior Responsible Owner for West Midlands GLOSA Trial I hereby submit this request for approval to DfT on behalf of Transport for West Midlands and confirm that I have the necessary authority to do so.

I confirm that Transport for West Midlands will have all the necessary powers in place to ensure the planned timescales in the application can be realised.

Name: **Mike Waters**

Signed:

Position: **Head of Policy & Strategy**



### **D2. Section 151 Officer Declaration**

As Section 151 Officer for Transport for West Midlands I declare that the scheme cost estimates quoted in this bid are accurate to the best of my knowledge and that Transport for West Midlands

- has allocated sufficient budget to deliver this scheme on the basis of its proposed funding contribution
- will allocate sufficient staff and other necessary resources to deliver this scheme on time and on budget
- accepts responsibility for meeting any costs over and above the DfT contribution requested, including potential cost overruns and the underwriting of any funding contributions expected

from third parties

- accepts responsibility for meeting any on-going revenue requirements in relation to the scheme
- accepts that no further increase in DfT funding will be considered beyond the maximum contribution requested
- has the necessary governance / assurance arrangements in place
- has identified a procurement strategy that is legally compliant and is likely to achieve the best value for money outcome
- will ensure that a robust and effective stakeholder and communications plan is put in place.

Name:

**J. Aspinal**

Signed:



### **Submission of bids:**

The deadline for bid submission is **5pm, 30 September 2016**.

An electronic copy only of the bid including any supporting material should be submitted to:  
TRAFFIC.COMP@dft.gsi.gov.uk

## **Annex A: Strategic Case Supporting Evidence**

### **The Local Context:**

A typical example of the current issues we face on key routes is the A45 Coventry Road. It is a major component of the West Midlands Key Route Networks linking Birmingham City Centre with the Airport, NEC complex and Coventry City Centre. It carries over 2000 Heavy Goods vehicles and 4000 light goods vehicles each weekday. The road also provides access to the Jaguar Land Rover assembly plant in Solihull and to the Tyseley Environmental Business District. The key issues on the corridor are:

- Peak hour congestion that causes considerable journey time uncertainty for business, in particular companies, such as Jaguar Land Rover, that are operating just in time delivery systems
- Air Quality and CO<sub>2</sub> where HGVs stopping and starting emit significant amounts of air pollution and CO<sub>2</sub>

To counter these issues previous options considered include:-

- Freight priority lanes, which would provide a high level of priority for freight, however, they involve significant land take and are not always acceptable to the travelling public
- Conventional freight priority – freight vehicles can be detected as the cross existing traffic loops and provided with signal priority. However, this is an all-or nothing approach which can lead to considerable delay for other vehicles.

We believe that the C-ITS option potentially allows a finer grain approach to priority, by allowing particular vehicles to be selected to receive priority. The approach of allowing vehicles to slow down on the approach to the signals, rather than stop completely can enhance the throughput of the junction without any change to signal timings resulting in a positive impact to:

- Reduced fuel consumption for lorries
- Improved journey time reliability
- Better information for BCC on the status of the network (with HGVs acting as probe vehicles)

In terms of outcomes:

- For businesses running HGVs: reduced costs, improved efficiencies
  - Improved health outcomes for people living along the route
  - Improvements to economy of Birmingham and the surrounding area
  - Reduction in noise nuisance
-

## **The Regional Context:**

This project, if successful, will be connected to existing CAV projects underway within the West Midlands Combined Authority, namely the UK CITE and UK Autodrive projects. This action will form part of an overall strategy to build a world leading connected vehicle environment in the West Midlands that supports UK strategic aims. The project has the ability to engage with the broader range of TfWM Local Highway Authorities by demonstrating the real world exploitable benefits of C-ITS in terms of replication and transferability of the developed technology. The UK CITE consortium recognise the relevance of this project and the collaborative benefits that can be achieved for both projects (ref. letter of support, Annex B). The section of the A45 chosen as the primary target for this project was deliberately chosen not only for the logistics issues identified above but also its ultimate ability to link with the UK CITE section of the same route in Coventry.

Whilst UK Autodrive will primarily test and demonstrate various examples of connected and autonomous vehicle operation in Coventry, approximately 18 different ‘use cases’ will also be tested, a number of which will require Coventry’s signal equipment or other specialist road side equipment to broadcast to connected vehicles information in a secure and time critical way – essentially to accurately describe the junction, size, layout, configuration and status of the signals and traffic detected on it. The output of this project is highly complimentary to the use cases being developed and, as with UK CITE, a collaborative approach will be taken between the projects.

In the wider context TfWM has defined a West Midlands Key Route Network (KRN) and this project will be used to form an important part of a broader strategy to improve the performance of the KRN in terms of improving journey time reliability, congestion management and improving network resilience. This is particularly important as we head towards a period of major disruption from construction works, such as the delivery of HS2. This project will form part of strategy to assist freight and logistics operators to be more efficient and interact with our traffic management systems in a way that has not been achieved to date. It is important that we support the manufacturing sector that relies on just in time deliveries and the logistics sector that move goods across the KRN and improved efficiency is essential to meeting this aim.

## **The European Context**

Birmingham City Council has current direct experience of delivering the level of innovation required for this project. As a partner in the OPTICITIES EU FP7 R&D project we have successfully built and demonstrated the use of a traffic management Decision Support Tool based on using predictive traffic algorithms. The DST utilises data from roadside equipment to detect abnormal congestion and incidents on strategic routes to provide alert notifications to UTC operators who can then decide how to mitigate the problem (utilising traffic management strategies). The DST is provided as an Expert Module to the existing UTMC Common Data Base that, in turn, is linked to an Open Data Platform to allow exploitation of this data

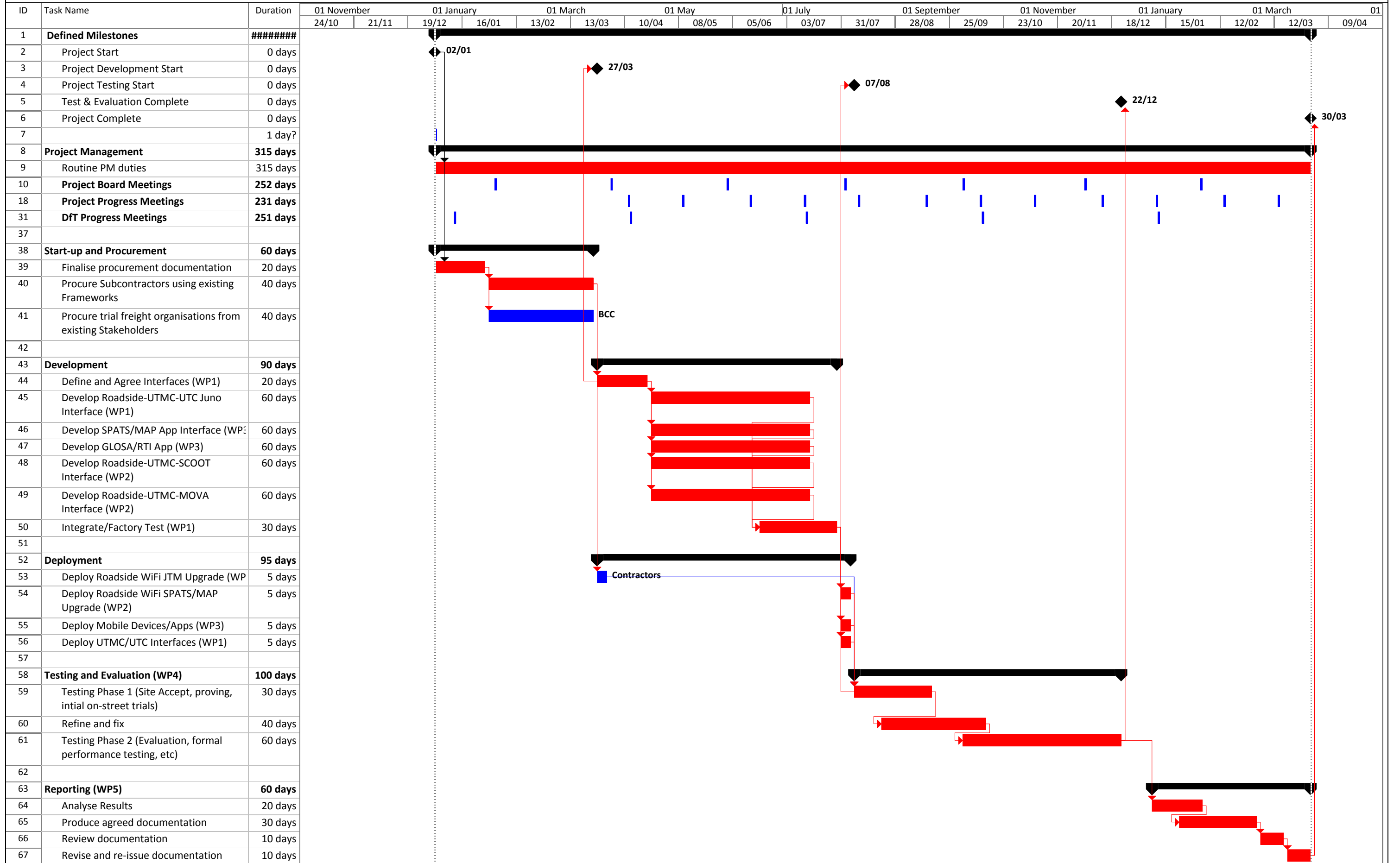
A further specific implementation of the DST has focussed on providing journey time reliability for HGVs and Freight Driver Assist Services via the delivery of a prototype Driver Assist App. During this phase of the project we added the innovative use of roadside WiFi communications to derive journey time data from smartphones. The technology and services developed within OPTICITIES is highly supportive of this project and can be utilised to bring real time data to the GLOSA trial and experience of utilising real time data from roadside devices.

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The output of the OPTICITIES project can be found at: [www.opticities.com](http://www.opticities.com).

Birmingham City Council has a very active transport R&D programme, with other EU projects including Open Transport Network, which seeks to make transport open data easier to use, OPTIMUM, which is using app technology to develop a behavioural model for modal shift and project SETA, which is using the internet things, to develop better transport modelling and analysis.

Annex D - A45 Glosa Trial - Project Plan



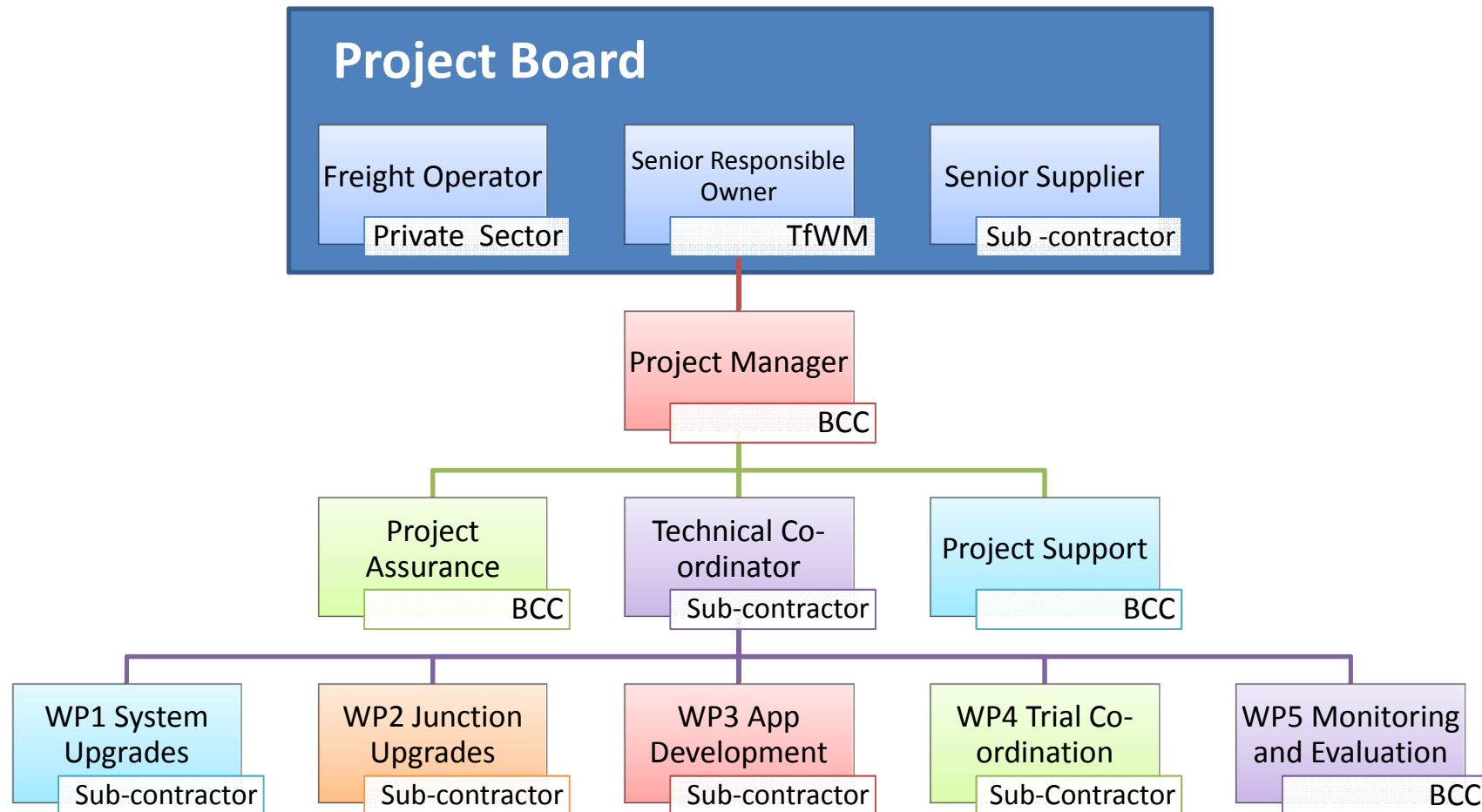
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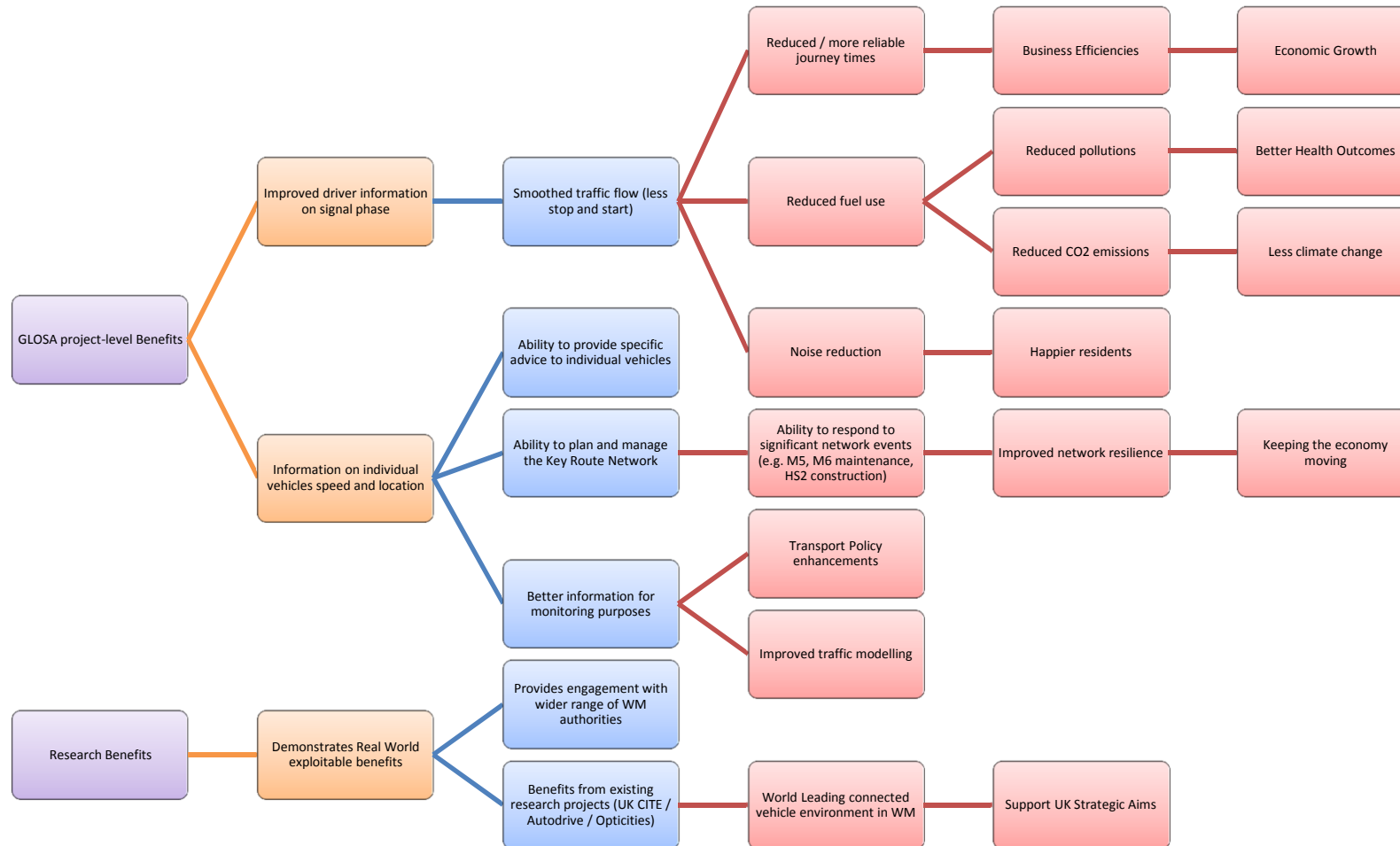
# Annex E - Governance Chart



## Annex F - Risk / Opportunity Register

No	Risk (R) / Opportunity (O)	Owner	Date Last Reviewed	Risk / Opportunity	Description / Consequence	Risk Assessment Before Mitigation					Mitigation Measure	Risk Assessment After Mitigation						
						Severity			Likely-hood	Extent		RAG	Severity			Likely-hood	Extent	RAG
						Rep	SHE	Com					Rep	SHE	Com			
1	Solution is not delivered to technical specification	BCC	Sep-16	Risk	Clawback of grant, impact on reputation	4			3	12	R	Appoint specialist technical co-ordinator to provide day-to-day overview of project	3			2	6	A
2	Solution does not deliver the expected outcomes	BCC	Sep-16	Risk	Journey Time Savings and/or emissions and therefore air quality improvements are not as predicted	3			2	6	A	Project will continuously learn from project outcomes from elsewhere, such as the COMPASS4D project, and will liaise with other related scheme such as the Birmingham Clean Air Zone ones	3			2	6	A
3	Project costs exceed the available budget	BCC	Sep-16	Risk	Exceedence would require that Birmingham City Council / TfWM would be required to find additional resources to ensure the project proceeded.	3			3	9	A	Early Contractor involvement and ensuring that risks and issues are identified early and managed appropriately.	2			2	4	G
4	Driver Compliance	BCC	Sep-16	Risk	Drivers ignore the advice provided to them even if the information is of good quality, resulting in a lack of good data for the project to analyse and report on	3			2	6	A	Drivers will be individually briefed so that they understand the importance of following advice to the outcomes of the project	3			1	3	G
5	System Performance	BCC	Sep-16	Risk	Implementation of the various elements using platforms and/or interfaces with inadequate resources result in issues with data quality, availability and timeliness	3			3	9	A	The system architecture will be regularly assessed to ensure sufficient quality and availability of data with low latency, in particular during development and scenarios used for factory and site testing	3			2	6	A

# Annex G - Benefits Realisation



# Annex H - Monitoring

