



# UTC PHASE 1

Full Business Case

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## Introduction

We are proud to present the ‘Urban Traffic Control’ programme; an integrated programme of investment in the Key Route Network (KRN) that contributes to growth in the Liverpool City Region (LCR). The KRN and LA highway network is integral to the success of the LCR Growth Strategy. We have carefully designed our UTC investment programme to support the economic growth of our region and maximize the benefits for our residents, visitors and businesses and help the region to build back better in a sustainable way.

# 1. Strategic Case

## 1.1 Introduction

This document contains the Full Business Case (FBC) for investment between 2021-2023. Proposed investment across the two years of the programme totals **£8,941,631**, which is sought through the Transforming Cities Fund (TCF). The programme has a **BCR of 2.6**, representing very high value for money.

As a City Region, we have undergone significant economic and social transformation in recent years. We have witnessed a net increase of 31,000 private sector jobs since the lowest point in the recession cycle and the potential for further growth is substantial. Large-scale investments such as the £1.8bn SuperPort programme are now underway to further boost our growth. Now that COVID 19 has hit the economy, it is more essential than ever to invest to grow our economy back to full strength.

Our ambition is to support our economic resurgence by building on our competitive strengths, whilst at the same time opening new opportunities for disadvantaged communities so that everyone in the City Region can benefit from economic growth. We believe that a high-quality KRN and strategic road network is a vital component in achieving this ambition and good quality, well linked traffic signals and systems are a key part of this. As we Build Back Better in the Region following on from the economic effects of the Covid-19 pandemic, a sustainable and resilient road network is vital to getting the economy back on track.

This scheme represents phase 1 of a plan to align traffic signals and systems across the Liverpool City Region. As a Combined Authority there is an opportunity to move towards streamlined functionality across the region. We know that people in the region travel across local authority boundaries for many journeys on our highway network, and there should be continuity of systems, both in the quality and in the technologies we use to improve the efficiency of travelling those routes.

Sustainability in our highway network is as important as ever, and the LCRCA has declared a Climate Emergency. As our region recovers from the Covid-19 pandemic, it is important that our roads function efficiently, but also sustainably. By improving the quality, consistency and the sustainability of the regions traffic signals and systems and helping to improve the efficiency of journeys across the region we can help the region to Build Back Better.

### 1.1 Context

- 1.1.1 Each of the six districts in the LCRCA currently manages traffic signals and systems individually for their Local Authority area. A Traffic Signals LCRCA group meets regularly to enable good communication and identify opportunities for co-working and implementation of best practice.
- 1.1.2 Some other Combined Authority cities (such as Greater Manchester Combined Authority) have a single traffic signals and systems function. This scheme looks to emulate the

efficiencies and advantages of such a system, whilst retaining the local expertise and knowledge that benefits of the current LCRCA arrangement.

- 1.1.3 All six authorities have at least one boundary with another LCRCA highway authority and many journeys in the LCRCA cross these boundaries. Road users are largely unaware of the highway authority area boundaries, and traffic signals and systems that are consistently high quality and enable delay minimisation strategies for cross boundary routes, amongst other elements included within the scheme will help to improve traffic management right across the region.

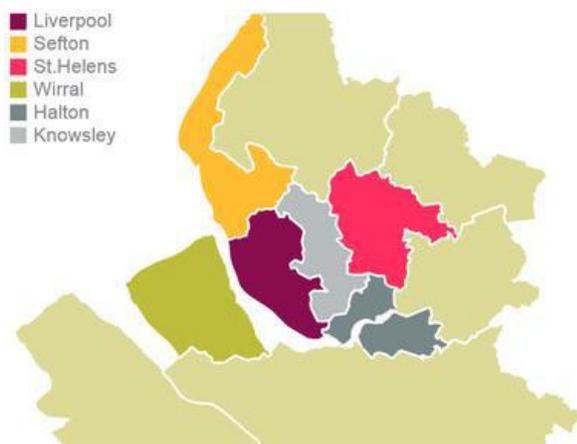


Figure 1 LCR Local Authorities Source: wikipedia.org

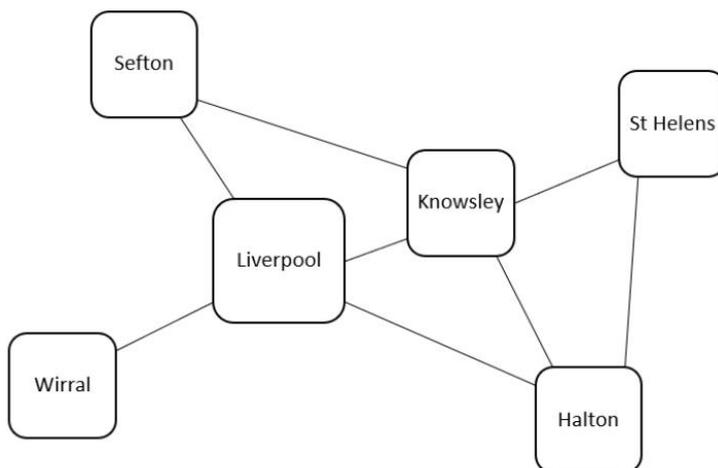


Figure 2 Diagram demonstrating the shared boundaries between the LCR authorities

## **1.2 Scheme Objectives**

1. To improve the operation of traffic signals and systems to a level that is consistent, high quality and sustainable throughout the Liverpool City Region
2. To work towards the co-operation and consolidation of traffic signals and systems operations across the City Region to improve the user experience for all road user groups including walking, cycling, bus, freight, taxis and private vehicle usage.
3. To maximise the opportunities of existing and new technologies in LCRCA traffic signals and systems

## **1.3 The Scheme**

The scheme is presented as a package of interventions that will interlink to improve the traffic signals and systems operations overall across the City Region. These elements have been identified to work in collaboration to achieve the benefits that the scheme is designed to achieve.

Work Package 1 – LED Signals retrofit upgrades

Work Package 2 – Linking Stratos systems through cross tenancy

Work Package 3 – KRN Air Quality Monitoring System

## **1.4 Vision for Sustainable Traffic Signals and Systems Programme**

Following on from the work included within Phase 1, the vision for traffic signals and systems in the LCR continues the scheme Aims (1.3). A study is being undertaken by Siemens consultancy (for completion end January 2021) to consider measures that are longer term. Phase 2 of this programme is intended to comprise measures explored in the medium and long term options report that are supported by the LCRCA and districts to further the aims of this programme.

The programme follows on from the successful KRN programme, scheduled to finish by 31 March 2021 and had a BCR of 9.9, representing very high value for money. The 3<sup>rd</sup> theme listed saw a range of technological enhancements made across the KRN, notably installation of outstation routers, upgraded crossing and junctions, installation of modern signal technology and led street lighting columns. Due to the mature state of many of the proposals in this category, it was determined that there was more to be done after the programme.

## 1.2 Project Description

Following on from the KRN programme, it was determined that there was a lack of investment in Intelligent Transport Systems (ITS) in the City Region. An analysis of current provision identified a pipeline of interventions that form Merseytravel's short term plan for improving ITS provision.

The ask in the business case for the UTC project covers 3 strands:

### **1. Light Emitting Diode (LED) lamp retrofit**

LED retrofit is a process in which halogen lamps used to illuminate traffic signal heads are replaced with more energy efficient LEDs. Traditionally Halogen Lamps have been used to illuminate traffic signal heads. By current standards halogen lamps are not very energy efficient due to significant amounts of energy lost through heat generation. Halogen lamps have a lifespan of around 1 year and are changed annually a present under a bulk lamp change programme. In contrast, LEDs typically last over 6 years based on the same usage.

LED traffic signal heads provide reduced operational costs through reduced energy consumption and maintenance requirements.

As part of a European Union (EU) initiative to improve energy efficiency and reduce carbon emissions, halogen lamps for domestic use were banned on the 1st September 2018. Suppliers were able to sell existing lamps held in stock but were unable to replenish in a move to encourage a shift to more energy efficient alternatives such as LEDs or compact fluorescent lightbulbs. Exemptions exist for industrial use, which includes traffic signals with certain types of halogen lamps being made available until 2023. However, there is a potential risk that manufacturers could cease production sooner as demand decreases.

The proposed solution identifies sites suitable for conversion or upgrade to LED technology using LED retrofit solution for each of the six Local Authorities which form part of LCR. Sites suitable for LED conversion were identified using data exported from each of the Local Authority's fault and asset management systems.

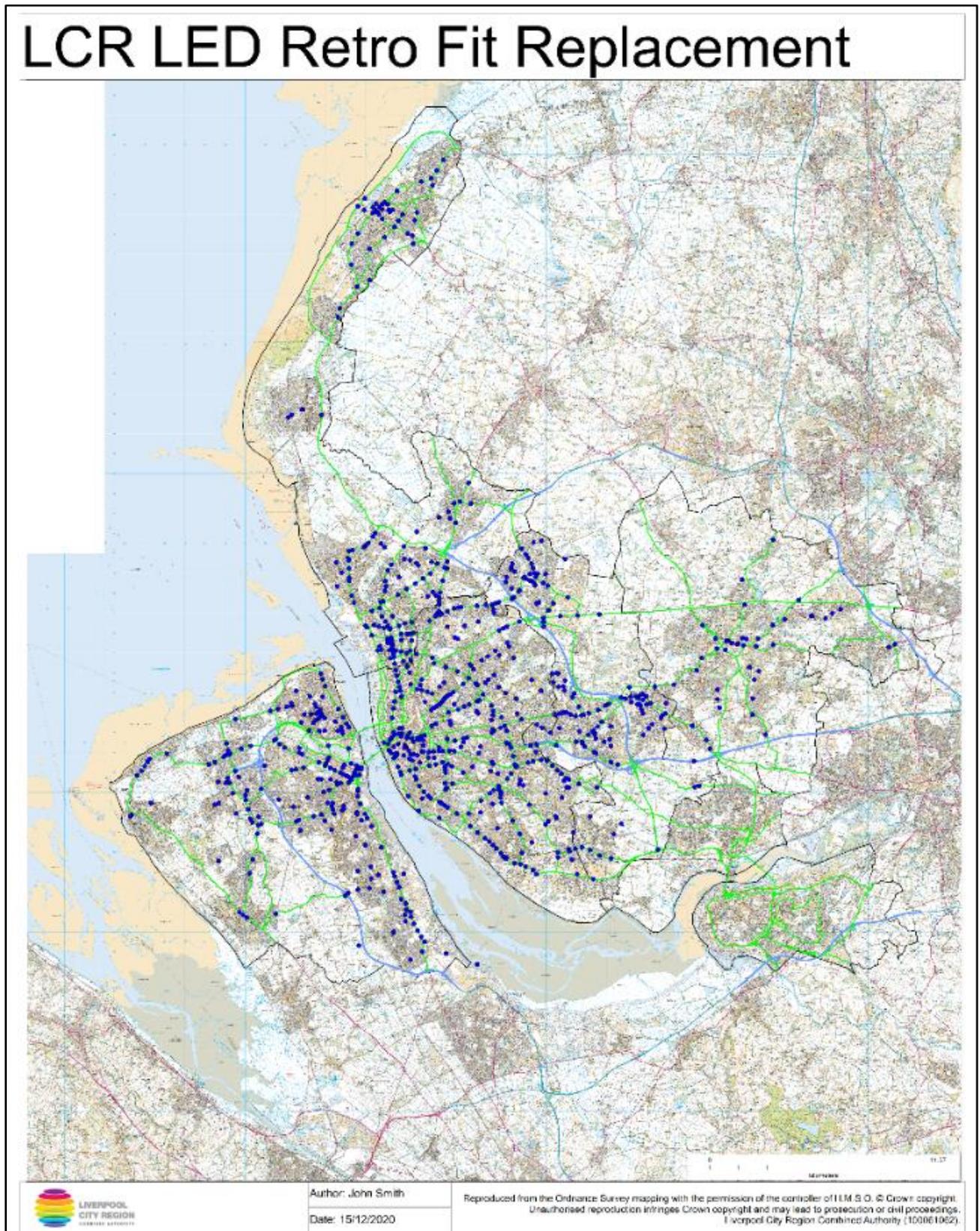
At some locations, the condition of the traffic signals poles are deteriorated such that it would not be appropriate to install a new signal head on a weakened pole. An allowance for a proportion of these to be replaced where required is therefore included in the programme costings.

To identify sites suitable for LED retrofit, asset information was collected from each of the local authorities traffic management systems. The data is presented in table 1-1.

**Table 1-1 Traffic signals by local authority**

Local Authority	Traffic signal installations	Of which LED	<b>Halogen (suitable for LED retrofit)</b>	Junction crossing	Pedestrian crossing
Halton	93	93	<b>0</b>	0	0
Knowsley	134	54	<b>80</b>	39	41
Liverpool	493	202	<b>291</b>	182	109
Sefton	235	67	<b>168</b>	124	44
St Helens	145	100	<b>45</b>	23	22
Wirral	305	106	<b>199</b>	93	106
	<b>1405</b>	<b>622</b>	<b>783</b>	<b>461</b>	<b>322</b>

Figure 1-2 Locations of retrofit sites



## 2. Cross tenancy of Stratos modules

Stratos is a software system used by all six districts. It is used to configure signal timings and strategies can be set up to link timings of different junctions to interact and follow timings dependent on traffic conditions, time of day etc. Cross-tenancy enables strategies to be set for signals that are within different authority boundaries.

Siemens Project Delivery are already working to deliver some cross-tenancy functionality to the LCR authorities. The table below summarises the tasks required to deliver cross-tenancy (Tasks 1-4) and includes additional recommended work to support cross-tenancy (5-7).

**Table 1-3 Stratos module tasks**

<b>Task</b>	<b>Description</b>
1 – Migration	<i>Existing Signs module is being replaced with the Driver Information Module. All six authorities to be migrated to Driver Information.</i>
2 – Review	<i>Following migration each system will need to be reviewed to ensure no issues.</i>
3 – Test	<i>Cross-tenancy can then be tested between the individual systems.</i>
4 – Basic Training	<i>Training will be delivered on the basic functionality of cross-tenancy.</i>
5 – Set-up	The desired cross-tenancy roles can then be set up between the different authorities.
6 – Training	In-depth training helping authorities get the full potential from cross-tenancy.
7 – Recommended Development	Recommended development to enable cross-tenancy functionality at a device level rather than at modular level.

By integrating the traffic systems across the LCR the authorities can make better use of their existing systems. Cross-tenancy functionality will allow the authorities to share information and collaborate to manage their traffic systems together. This should help improve the traffic management of the road network close to boundaries. Sharing information will help traffic operators have a more holistic view of how the greater network is performing. This information can help them to make appropriate decisions on how to manage their own network.

## 3. Air quality monitoring

For the CA and Local Authorities to gain a better understanding of air quality on the KRN, installation of air quality monitors is proposed. An options appraisal has highlighted 37 locations across the KRN for monitors to be placed, covering air quality management areas and hotspots for congestion.

The solution proposed is to install EarthSense Zephyr sensors or similar approved sensors onto existing traffic signal poles at key junctions. The sensors will detect in real-time the levels of Nitric Oxide, Nitrogen Dioxide, Ozone and Particulate Matter (PM<sub>1</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>) and feed into Local Authority's traffic management systems. This will allow traffic to be re-routed if pollutant levels become too high.

Using innovative and advanced technology, the sensors measure pollutants in real-time. Units commonly work by using built-in fan to draw air in and measure it, providing an accurate insight into the surrounding air quality. The measurement interval for each sensor can usually be configured and is typically set between 1 and 60 minutes.

The Stratos Environment module user interface has advanced graphing tools allowing various pollution and meteorological parameters to be compared. Notifications can be generated when customisable air quality limits are exceeded. Strategies can be triggered by the air quality data and can action commands to respond to the changing environment conditions.

The sensors will be procured to the specification determined and therefore may be the Earthsense Zephyr Sensor described above or another brand of real time air quality monitoring sensor that meets the specification in terms of pollutants measured and suitability to link in with Stratos. Development of the specification is being supported by input from district environment officers, LCRCA Environment Officer and Evidence and Intelligence team.

A map of proposed sites for air quality monitors is presented below. Site locator details are included in Appendix J. This list has been created with each authorities' Environmental Officers and approved by Air Quality/ Environment Officers in each district.

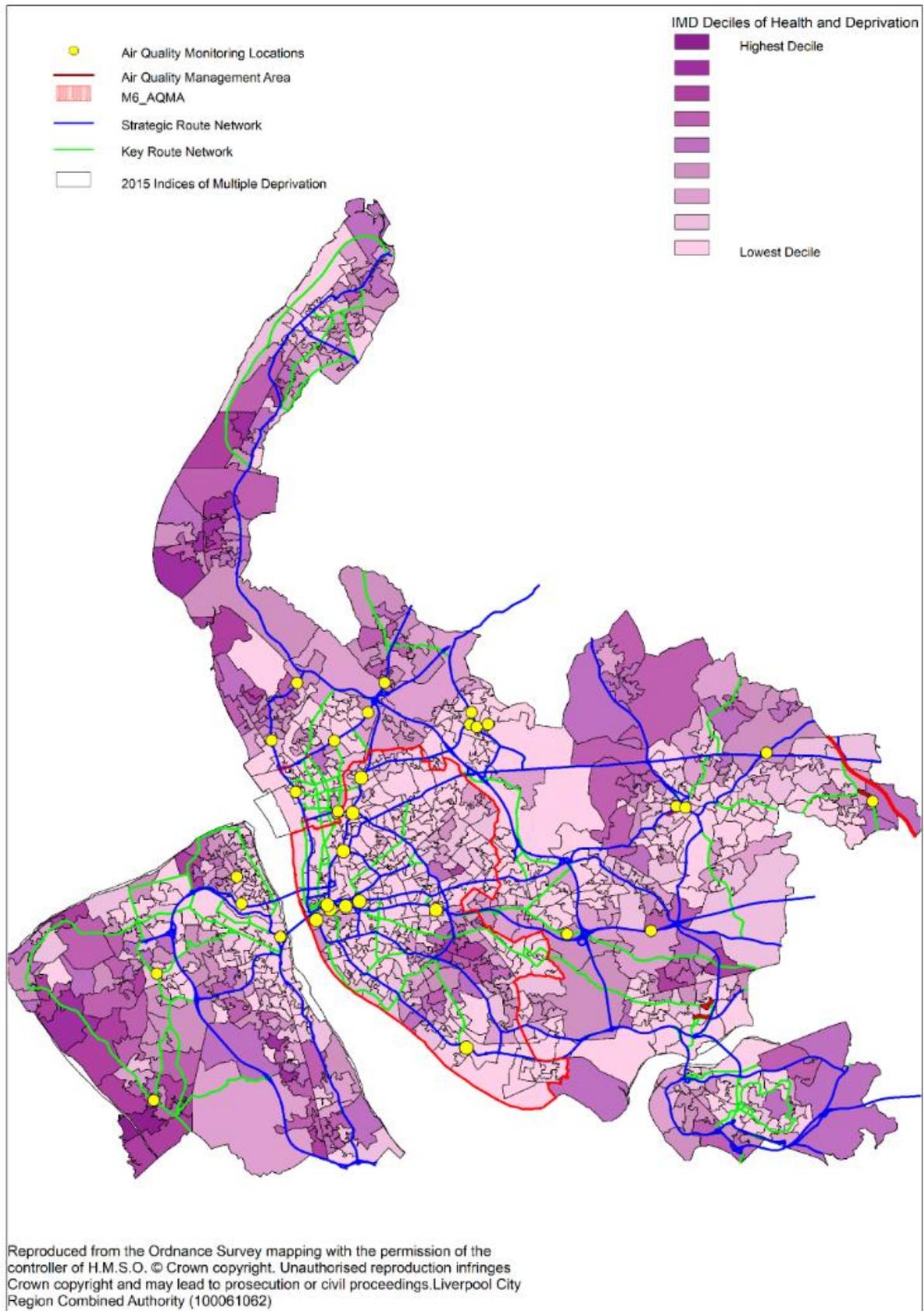
The following considerations were taken into account when determining the proposed locations:

- Air Quality Management Area (AQMA)
- Heath Deprivation Indices (Index of Multiple Deprivation (IMD))
- Properties close to major junction or road
- Scope for intervention through strategies

**Table 1-4 Air Quality sensors proposed in each Local Authority**

<b>Local Authority</b>	<b>Number of sensors</b>
Halton	5
Knowsley	5
Liverpool	10
Sefton	7
St Helens	5
Wirral	5
<b>Total</b>	<b>37</b>

Figure 1-5 Proposed Air Quality Sensor Locations



**Table 1-6 Scheme outputs and outcomes**

<b>Work Package</b>	<b>Description</b>	<b>Outputs</b>	<b>Outcomes</b>	<b>Constraints/ Dependencies</b>
1	LED Retrofit Signals	783 sites	All traffic signal sites in LCR retrofitted to LED	Some sites require controller upgrade to facilitate retrofit. Included within costs.
2	Linking Stratos systems through cross tenancy	6 existing individual LA Stratos systems linked with strategies	Strategies for traffic flow across boundaries.	Agreements between LAs on detail of which sites can be controlled.
3	KRN Air Quality Monitoring System	37 sites  Environment modules set up with sensor dashboards	Stratos strategies to improve air quality at hotspots.	Sites determined as described above.

### 1.3 Strategic Alignment

The LCR was awarded £172m to fund innovative transport projects through the Transforming Cities Fund (TCF). The CA set out three key themes for projects to align with:

- Theme 1 – Improving and expanding the public transport network to meet new areas of demand
- Theme 2 – Improving the appeal of public transport, and particularly bus, against private transport
- Theme 3 – Intervening for health and wellbeing.

The UTC project is a strong fit with theme 3:

- Theme 3 – Modernising signals will reduce energy consumption and collecting air quality data will allow local authorities to gain a better understanding of pollutant hot spots and improve their networks accordingly.

### 1.4 Case for Intervention

#### **Light Emitting Diode (LED) lamp retrofit**

As part of a European Union (EU) initiative to improve energy efficiency and reduce carbon emissions, halogen lamps for domestic use were banned on the 1st September 2018. Suppliers were able to sell existing lamps held in stock but were unable to replenish in a move to encourage a shift to more energy efficient alternatives such as LEDs or compact fluorescent lightbulbs. Exemptions exist for traffic signals with until 2023. However, there is a potential risk that manufacturers could cease production sooner as demand decreases.

Following the ban, future availability of halogen lamps will become increasingly limited ultimately making it difficult for Highway Authorities to maintain sites which use halogen lamps. Once stock of halogen lamps has been exhausted, Local Authorities will be forced to upgrade to LED lamps or ultimately difficult decisions regarding the operation of traffic signals, which could include the possibility of switching signals off.

### **Cross tenancy of Stratos modules**

Traffic operators across the LCR use Stratos to monitor and control their traffic network. Often, at areas which are across two local authority boundaries, it is more difficult to coordinate traffic management actions as the equipment is controlled in separate Stratos systems. The LCR authorities are interested in having cross-tenancy between their Stratos traffic management systems to be able to monitor and control neighbouring authorities traffic signal equipment through their own Stratos system. This would help the authorities improve traffic management across boundaries with the aim to improve overall network performance.

Authorities will need to collaborate to decide which roles they would like to enable in each other's systems. Authorities will also need to decide which tenants they would like to grant access to their system and which roles they want to assign. The tenants will need to decide if permission will be granted to all users or select specific users with different permissions.

### **Air Quality monitoring**

Due to the current climate emergency there has been an increased focus on improving air quality. The demand for air quality monitoring solutions (AQMS) has increased as authorities are interested in using the data in clean air initiatives, for increased understanding of problem areas and to monitor the effect on air quality when different control measures are put in place.

Air quality data can be used by traffic operators to implement control measures to try and reduce air pollution and advise road users of the current conditions. Traffic operators need to be able to monitor and react to air quality problems on their road network. Collecting and monitoring data in real-time provides traffic operators with an overview of the network performance and enables them to respond efficiently to incidents and react to changing traffic conditions.

Public Health England estimates that air pollution (of which road transport is a key cause) contributes to around 700 deaths a year in the Liverpool City Region. The negative health impacts of poor air quality have become well documented and are known to impact particularly on children and the elderly. The Liverpool City Region has particular pockets of air quality hotspots which have illegal and harmful concentrations of nitrogen dioxide (NO<sub>2</sub>).

In November 2019, the CA approved an Initial Air Quality Action Plan for the LCRCA, which recommended as an action the progression of improvements to the traffic signalised network. The

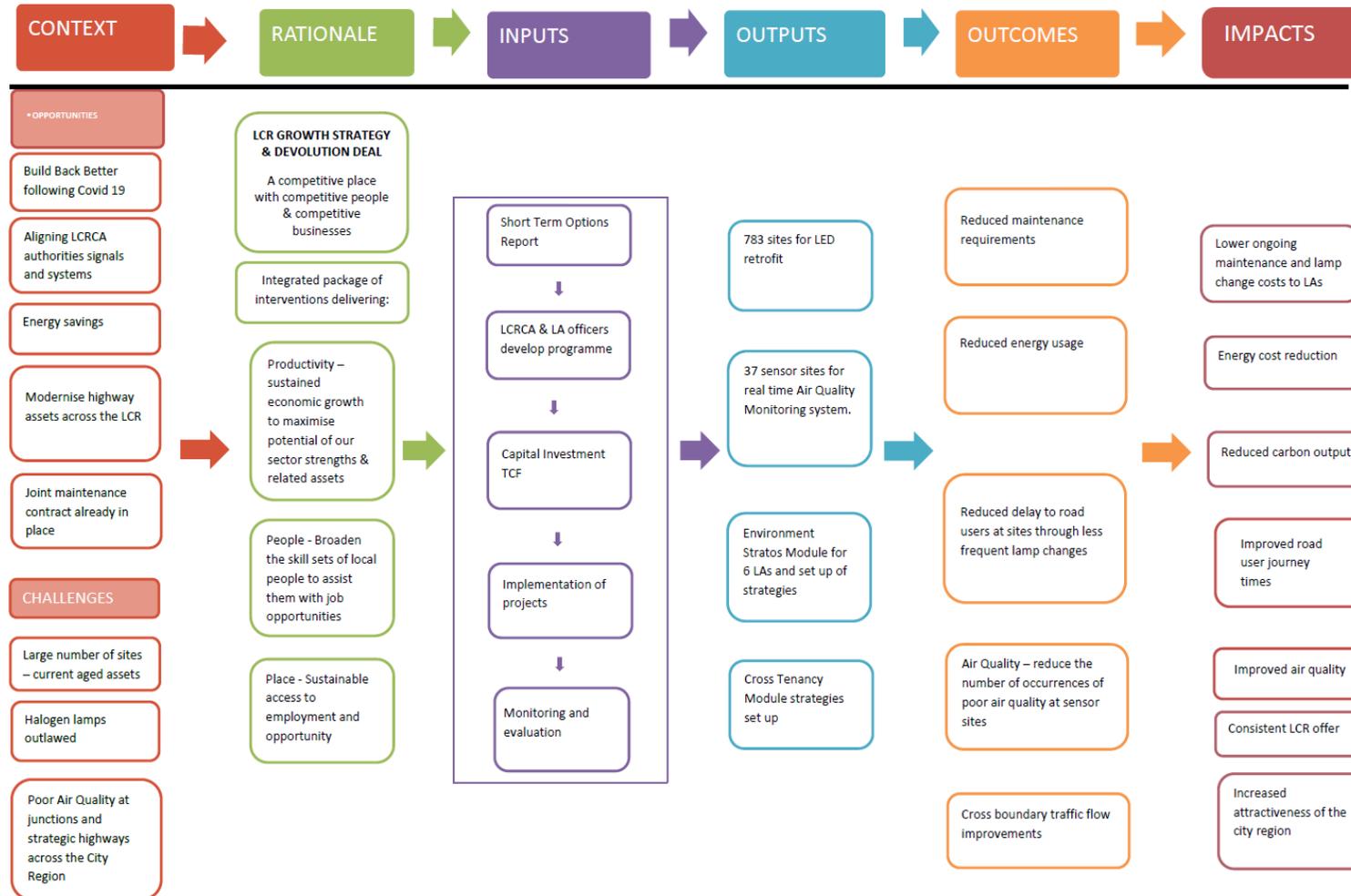
Liverpool City Council area is a 'mandated' city, required to assess a range of options in response to prevailing poor air quality. It is presently working through a detailed study and longlist of options against which to secure compliance, including a Clean Air Zone (CAZ).

### 1.5 Objectives

1. To improve the operation of traffic signals and systems to a level that is consistent, high quality and sustainable throughout the Liverpool City Region.
2. To work towards the co-operation and consolidation of traffic signals and systems operations across the City Region to improve the user experience for all road user groups including walking, cycling, bus, freight, taxis and private vehicle usage.
3. To maximise the opportunities of existing and new technologies in LCRCA traffic signals and systems.

Figure 1-7 Logic Map

LIVERPOOL CITY REGION UTC PHASE 1 - LOGIC MAP



## 1.6 Constraints and Dependencies

### Constraints

- Timescales – TCF Funding window to March 2023
- The scale of the project means that the works on site will need to be ongoing throughout the delivery window, with programming across the region to ensure maximum efficiency of rollout with minimised disruption to the network.
- Road space capacity will need to be planned closely with authorities Network Management Groups to ensure the works are allocated sufficient time, alongside other schemes in construction on the network including authorities' own maintenance and highway schemes as well as the Green Bus Routes TCF scheme which is also undertaking traffic signals work in 2021-23.
- The existing signals maintenance contractor has indicated issues surrounding installations that mix different brand of lamp and controller. The specification will take this into account to avoid this issue.
- Highways England are responsible for a small number of traffic signal sites in Sefton that are located on trunk roads. Liaison with Highways England is taking place.

### Dependencies

- Rollout of the scheme is not dependent on any other schemes being constructed prior.
- All sites are Local Authority highway with the exception of a small number of Highways England sites discussed above.
- Some LED sites require controller upgrade for LED lamps to function. This has been included within the costing of the scheme.

### Interfaces

- Asset management bus priority scheme
- Green Bus Routes
- Active Travel Fund and LCWIP active travel schemes

## 2. Economic Case

The economic case is prepared according to Treasury's Green Book guidance as relayed in TAG (WebTAG) DfT guidance. This section of the business case assesses the economic costs and benefits of the proposal to society, and spans the entire period covered by the proposal.

### 2.1 Options Considered

Option 1: Do nothing

Option 2: Do minimum

Option 3: Do something – preferred option

Advantages and disadvantages of Options 1 – 3 are tabulated in Appendix H Options Appraisal.

### 2.2 Estimating Benefits

The scheme benefits are based on the benefits of the LED retrofit programme, which includes the following quantitative monetised benefits;

- Replacement cost benefits - lower whole life cost of lamps
- Maintenance cost benefits - reduced maintenance costs to authorities
- Energy cost benefits - reduced energy costs to authorities
- Carbon benefits - reduced carbon output from lower energy usage of LED lamps
- User benefits - journey time benefits through reduction in traffic management for future lamp changes

The Air Quality Monitoring System benefits have not been included in the quantitative benefit assessment. The scheme is, however, expected to provide non-assessed benefit of improved air quality at the sensor sites. When monitors are installed it is expected that baseline readings will be taken to form a baseline of levels of pollutants sensed by the monitors at each of the sites.

- Air Quality – improved air quality at sensor sites
- Cross boundary benefits

Whilst Air Quality benefits are shown as qualitative, the Monitoring and Evaluation plan attached as Appendix G shows proposals to baseline readings from the Air Quality sensors in

order to enable some quantitative evaluation of Work Package 3 (Air Quality Monitoring System and associated strategies).

### **Extent of Appraisal: Approach, Methodology and Data Sources**

The table below shows the annual benefits of the scheme (2020 prices). GDP deflators were used in the BCR assessment to allow 2010 PVB and 2010 PVC to be used as per WebTAG guidance. Deflators from the TAG Databook annual parameters July 2020 update were utilised.

A 30 year appraisal period uses TAG Data book deflators (TAG July 2020). A discount rate of 3.5% has been applied to calculate the Present Value Benefits to reflect the decreasing annual benefit throughout the 30-year appraisal period.

One sensitivity test has been made, to show the impact of higher Carbon Values suggested potentially appropriate in TAG Table A 3.4 Greenhouse Gases Workbook.

As indicated in the table 2-4 below, the benefits of greatest magnitude are those associated with the user benefits due to reduced disruption from lamp failures and disruption from planned and reactive maintenance. Energy cost savings are second most significant benefit as detailed below. The carbon saving benefits of the scheme are also significant in the benefit calculations, and a sensitivity test as promoted by the TAG Data Book 2020 shows higher benefits still when the higher sensitivity value is used. Replacement and maintenance costs reflect the savings made by the less frequent lamp change required by the LED lamps. Data from Siemens showed the halogen lamps have a life of 1 year. The data used showed LED lamps having an average 6.3 year lifespan.

### **Quantitative Benefits**

**LED Retrofit** – This work package is assessed for benefits as detailed in the methodology above.

- Replacement cost benefits - lower whole life cost of lamps

Halogen lamps are changed annually. LED lamps have an average lifespan of 6.3 years.

- Maintenance cost benefits - reduced maintenance costs to authorities

Maintenance costings for savings were provided by Siemens, the maintenance term contractor for all six districts.

- Energy cost benefits - reduced energy costs to authorities

Energy costs expected to be saved were provided by Siemens as maintenance term contractor.

- Carbon benefits - reduced carbon output from lower energy usage of LED lamps

Carbon savings in tonnes were provided for expected annual reduction for all sites. TAG Table A 3.4 Greenhouse Gases Workbook was used to assess the monetarised benefits of this carbon reduction.

Sensitivity test 1 indicates the benefits when higher carbon values suggested as potentially appropriate in WebTAG guidance are used.

- User benefits - journey time benefits through reduction in traffic management for lamp changes

Without annual bulk lamp changes, the sites will not require traffic management for bulk lamp changes. With reliable infrastructure assets, site breakdowns are expected to reduce from 2 per annum to 0.3 per annum. This is based on maintenance contractor data.

Values of time from WebTAG A1.3.2 were used to calculate the value of these user benefits. Assumptions of throughput sites were made.

### **Qualitative Benefits**

**Cross –tenancy** of authorities accessing each others systems to make strategies that streamline the flow of traffic signals across boundaries. This is new technology and research has yet to be done on measurable outcomes of the strategies. As a low cost element of the programme, this work package has not been included in the benefits calculations (but costs are included within the BCR).

**Air Pollution strategies** – involve air pollution monitors linked to the Stratos traffic signal software that will set in place strategies to divert traffic away from air pollution hotspots once they reach a certain level.

Benefits will be reduction in air-pollution at air pollution hotspots. Whilst the TAG databook includes Carbon reduction (which has been included in the LED retrofit benefit calculations), this work package focuses on localised air pollution reduction. This work package is not included within the benefit calculations shown above (but costs are included in the BCR). Once in place, air quality readings will be baselined so that outcomes can be assessed based on those baselines.

**Table 2-1 Data from Siemens Short Term Options Report**

<b>Energy &amp; Maintenance Data</b>			
Initial cost of power (Adjust figure as necessary)	<b>0.15p per kWh</b>	Junction	<b>£94.39</b>
Energy Cost Escalation	<b>5%</b>	Pedestrian	<b>£56.64</b>
Maintenance Cost Escalation	<b>3%</b>	HI Lamp	<b>£0.61</b>
Estimated aspect maintenance cost saving	<b>£2.13</b>	Wait Lamp	<b>£1.03</b>
Estimated wait maintenance cost saving	<b>£6.07</b>		

**Table 1 – Assumed LCR Electricity and Maintenance Costs**

The calculations exclude the following items:

- Traffic Management (TM) or temporary traffic signals
- Working outside normal working hours
- Hi-abs or working platforms
- Project Management

### 2.3 Risk Analysis

Optimum bias has been reduced to 0% for the FBC economic analysis due to confidence in costing through soft market testing. Pricing is based on detailed asset data of sites and soft market testing. Assessment has been made on the number of poles likely to need replacing, which will often only become evident at delivery stage.

As soft market testing prices excluded high mast locations and out-of-hours working, an allocation for this element has been included as well as additional traffic management costs assessed on the number of junctions and ped crossings. Costs for supplier and LCRC project management and monitoring and evaluation have also been included.

### 2.4 Preferred Option

**Table 2-2 Benefit Cost Ratio**

Benefit Cost Ratio	BCR (Core scenario)	BCR Sensitivity Test (higher carbon value)
PVB/PVC	2.6	2.7

The BCR is calculated on the following Present Value Benefits (30 year appraisal with 3.5% annual discount rate) and Present Value Costs (2010) deflated using TAG data book July 2020.

**Table 2-3 Present Value Benefits**

PVB Total	£19,447,625	PVB Total (sensitivity test 1)	£20,388,897
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**Table 2-4 Present Value Cost**

£8,941,631	Bid Value Cost (2020)
£7,490,914	Present Value Cost (2010 values)

### Overall Summary of Monetised Benefits

*Currently not including air quality benefits associated with the cross-boundary benefits*

**Table 2-5 Annual Monetised Benefits of Preferred Option**

All values at 2020 prices	Benefits per annum	30 year appraisal (not discounted value)
Replacement costs benefits	£60,028	£1,800,838
Maintenance costs benefits	£65,871	£1,976,143
Energy costs benefits	£383,941	£11,518,230
Carbon benefits	£98,918	£5,757,290
Carbon benefits (higher sensitivity)	£149,093	£8,641,669
User benefits	£427,920	£19,102,018
<b>Total Benefits</b>	<b>£1,036,678</b>	<b>£40,154,519</b>
<i>Higher value carbon sensitivity</i>	£1,086,853	£43,038,898

### 3. Financial Case

#### 3.1 Financial Case Overview

##### Financial Work Packages

##### Work Package 1 : LED Retrofit Programme (junctions and crossing sites)

Local Authority	Traffic signal installations	Of which LED	Halogen (suitable for LED retrofit)	Junction crossing	Pedestrian crossing	Expected cost of installations
Halton	93	93	0	0	0	£0
Knowsley	134	54	80	39	41	£428,873
Liverpool	493	202	291	182	109	£2,972,720
Sefton	235	67	168	124	44	£723,186
St Helens	145	100	45	23	22	£223,684
Wirral	305	106	199	93	106	£1,058,912
	1405	622	783	461	322	£5,407,375

##### Work Package 2: Cross- Tenancy

Task Number	Task	Description	Cost
5	Set-up	Support to help each authority set appropriate roles for each user.	£4,500
6	Training	Additional training to help authorities understand cross-tenancy functionality including time to create an example strategy for each authority.	£9,000
7	Recommended Development	Recommended development to enable cross-tenancy functionality at a device level rather than at modular level.	£20,000
<b>Total</b>			<b>£33,500</b>

These tasks (5-7) are required to support the six authorities with setting up and use of the current cross-tenancy functionality and will deliver additional functionality which would improve the level of equipment access with cross-tenancy. Previous tasks to acquire the modules have already been funded by districts.

##### Work Package 3: Air Quality Monitoring System (AQMS)

##### Budgetary Costs

The budgetary costs for the AQMS are for a five-year service period and include the costs to set up and maintain the solution for this period. The costs are based on 37 sensors being installed on existing traffic signal poles and power being taken from the traffic signal

controller. All Stratos costs including the licences, hosting fees and device fees have been included for five years. The total budgetary cost for the AQMS is £435,000.

### 3.2 Costs

The base costs for the package have been developed using soft market testing of rates and detailed asset inventory data for each of the LED retrofit sites and air quality monitoring sensors. These rates are used for the development of highways schemes of a similar nature and experience as well as supplier soft market testing and therefore assurance is given on accurate costing.

Procurement has begun, with specification being developed by LCRCA with support from LCRCA Traffic Signals group.

### 3.3 Funding Requirement

Table 3-1 Funding Requirement

Funding (£)	Total	2021/22	2022/23
Transforming Cities Fund (TCF)	<b>£8,941,631</b>	£5,088,291	£3,853,339

Table 3-2 Funding Requirement Full Cost Breakdown

Proposed Costs	Year 1 (55% for retrofits and project costs)	Year 2 (incl. 2% inflation)	Costs	
£5,407,375	£2,974,056	£2,481,985	£5,456,041	Retrofit based on site data
£269,050	£147,978	£123,494	£271,471	Supplier project management
£1,905,000	£1,047,750	£874,395	£1,922,145	Estimate 50% proportion of poles listed to replace
£405,650	£223,108	£186,193	£409,301	Traffic management estimate - calculated on junctions and ped crossings
£435,000	£435,000	£0	£435,000	Air Quality Monitoring System: 5 year 'as a service' costs
£36,000	£36,000	£0	£36,000	Setting up of Stratos for Cross-tenancy
£108,000	£59,400	£49,572	£108,972	Scheme PM LCRCA
£250,000	£137,500	£114,750	£252,250	High mast allowance and out of hours working
£50,000	£27,500	£22,950	£50,450	Monitoring and evaluation independent reports
<b>£8,839,700</b>	<b>£5,088,291</b>	<b>£3,853,339</b>	<b>£8,941,631</b>	<b>Total</b>

No alternative funding arrangements have been identified. Without TCF funding, the UTC package of works will not go ahead. The UTC package of works adds value to the reduced Highways Maintenance and Transport funding, which is received by the CA, a capital fund which supports the delivery of transport investment. This application is unique to other funding asks as it seeks to deliver a coordinated, strategic package of works on the Key Route Network and other traffic signalised highway sites which will be centrally programme managed to realise benefits across the whole of the City Region.

Alternative to this TCF grant funding is the possibility that the CA could borrow funds to be used as an option given the reduced maintenance allocation, however this is not the preferred option as the CA have set out to central government the need for KRN investment in its TCF application.

All transport funds in the LCR now form part of the Single investment Fund (SIF), which is governed by an Assurance Framework. There are few alternatives for the funding of vital 'minor works' across the region which, for example, secure cycling and walking improvements that make significant contributions to the recently adopted Local Journeys Strategy. Therefore, this would not be a suitable pot of funding to use for KRN enhancements as it is already fully committed.

Section 73 Sign-Off is not required as the scheme is an LCRCA scheme.

## 4. Commercial Case

### 4.1 Delivery Structure

The proposed project set out in this document presents a straightforward but large scale scheme on the KRN and highway network across a large geographical area spanning multiple local authority boundaries. As a result, the procurement methodology for the UTC will be based on well-established contractual arrangements under the advise of Legal and Procurement teams in the LCRCA.

Due to the value of the scheme an open tender is required and this will be of a value where requirements of the former OJEU Tender process will be required.

The contracts will be managed by the responsible Project Manager in each district. These established procedures will ensure that implementation can start as soon as possible within the 2021/22 financial year.

The procurement methodology acknowledges that a single route will be used with the Combined Authority leading. The Combined Authority will oversee the delivery of the UTC project across the LCR, via the Transport Advisory Group (TAG), working with the Key Route Network Group supported by a Programme Management function. This is based on the governance and assurance framework approved by the CA.

The maintenance term contracts within each district is with Siemens plc. The option to utilise this existing contract is unavailable due to the size of contract required.

Project management will be required by the supplier side and is costed for LCRCA co-ordination project management. The LTP Development Team and PMO office will continue to ensure the programme is managed and monitored effectively. Within each district authority Traffic Signals department the appropriate existing and well-established management structures will be utilised for overseeing management at local authority level.

Monthly project control meetings will be scheduled throughout the delivery programme between the Programme Manager and the partner's Project Manager to monitor progress against the programme, assess risk and monitor spend against budget. These meetings will be supplemented at a local level by meetings between the Project Managers and the relevant contractors.

Moving forward, discussions are already underway as to how the LCR partners can develop and implement appropriate LCR-wide contractual arrangements to deliver greater efficiency and consistency of approach and management. Initially this will be the responsibility of the Transport Advisory Group (TAG) to develop proposals for recommendation.

## 4.2 Procurement Strategy

It is proposed for the scheme to be tendered as one contract that will encompass work packages 1 and 3 for all districts (LED Retrofits and Air Quality Monitoring). This will provide the economies of scale and the benefits of consistency across the LCR.

The LCRCA will tender this work through a procurement exercise. The project will be tendered for a single supplier framework. Each of the six constituent authorities will form contracts under this framework, which will relate solely to this programme.

The tender will be for NEC based contract. LCRCA Legal officers are determining the appropriate NEC contract type. Due to the value of the scheme, the tender opportunity will be advertised under the 'tender' publication arrangements that replace OJEU following the UK's exit from the EU on 31 December 2020.

Work Package 2 (Linking Stratos systems through cross tenancy) is intended to be undertaken through the existing maintenance contract held between the six districts and Siemens. Stratos is a Siemens operating system and the maintenance contract is already in place with all six districts.

It is proposed that LCRCA will tender this work and manage the contract, with districts drawing down on the single supplier framework as allocated for each districts sites. Suppliers own programme management costs will be included in the project brief and therefore scheme costs will be inclusive of that contract management element. Client project management inclusive of contract management, supplier and district liaison and overall programme management will be required to ensure appropriate delivery of the programme. These costs are included in the scheme costs in addition to supplier pricing values.

Contracts will clarify that this work relates to assets owned and maintained by Halton, Knowsley, Liverpool, Sefton, St Helens and Wirral Highway Authorities. All assets procured and/or improved will remain in ownership of the relevant Local Authority.

### **Next steps for procurement**

In order to proceed with this procurement strategy, we will prepare the following;

- The procurement route to be agreed
- A brief scope of requirements
- Specification
- Questions and weightings
- Price/Quality split
- Determine whether interviews will be required. If they are part of the quality section, questions and weightings will be shared with suppliers in advance.
- Price submission document (BoQ)
- Confirmation of whether site visits are required
- Terms and conditions to be agreed with Legal

**Table 4-1 Programme of Procurement**

	Potential dates
Publish FaTS Notice (Previously OJEU)	3 Feb
ITT period	5 Feb – 8 March
Evaluate ITT responses	By 15 <sup>th</sup> March
Select supplier – CA Board  Report submission Deadline for Key Decision (can be prior to evaluation but not the OJEU/FTS notice)	In light of cancelled April CA, Procurement Officers are investigating option to put report in for March CA meeting followed by Delegated Decision on tender completion which would be time efficient.
Key decision needs 5 working days before further action	CA Meeting 19/3/21
Alcatel standstill period ends  <b>Minimum 10 calendar days</b> (cannot end on a weekend)	
<b>Start of Contract</b>	

**Alternative procurement options explored**

**Existing Maintenance Contract** - There is an existing maintenance contract with Siemens and each of the six LCRCA Local Authorities. It was explored as to whether this contract could be utilised, however, on discussions with Halton Procurement (emails between KRN Manager and Halton procurement 03/07/2020) it was determined that the OJEU limit of that contract would be exceeded with the full scheme value of this programme. This option was therefore ruled out.

**Individual Authority Procurements** – If each authority procures their element of the work individually, there is risk that the efficiencies of the scheme will not be realised in terms of economies of scale and consistency across the LCR.

### 4.3 Statutory and Other Consents

Each of the Local Authority Partners will be required to legally contract with the Combined Authority, to the terms and conditions of the Assurance Framework, and provide evidence of the necessary consents, (planning, land ownership etc.) being in place. After consultation with the Local Authorities, it is determined that planning permission will not be required as this is part of the adopted highway network.

Section 73 Sign-Off which is not required as this is an LCRCAs scheme.

Merseytravel, on behalf of the Combined Authority, will put in place appropriate arrangements for the proper use and administration of TCF funding. Building on local government financial systems, the CA will require quarterly grant claims, signed and authorised by each of the Partner's Chief Financial Officer and Head of Internal Audit, whilst reserving the right to randomly audit Partner expenditure.

### 4.4 State aid

State aid arises whenever State support is used in the provision of goods or services by undertakings in a given market where these funds would distort that market and affect the ability of undertakings in the EU to compete on a level playing field.

State aid that meets the conditions of published European Commission Block Exemption Regulations, or prior approved (by the Commission) national framework schemes, may be deemed automatically legitimate. The main block exemptions are the 2014 General Block Exemption Regulation No. 651/2014 ("GBER") which exempts many different types of aid against different specific purposes and costs, and the de minimis block exemption. No. 1407/2013.

The scheme proposal represents local infrastructures and, as advised by the Section 7 of The State Aid Manual, this is covered by Section 13, Article 56 of the GBER. This article allows for the state to invest in infrastructure at a local level which contributes to improving the business and consumer environment and modernising and developing the industrial base (except for airport and port infrastructure). The proposed enhanced built infrastructure will be made available to road users on an open, transparent and non-discriminatory basis, with no charges for the public highway additions and improvements.

Highway infrastructure, where it is made available to end users on an open and non-discriminatory basis is considered in State Aid terms to be a non-economic activity which is eligible for 100% public funding. Highway infrastructure is a public good which is largely non-economic (unless it relates to a toll road, for example). Therefore, no State Aid would arise through the award of public sector funding towards up to and including 100% of the costs of this UTC project.

## 4.5 Risk Apportionment

The production of a risk register is an integral component of the standard project management procedures that are conducted by all partners involved in the UTC project. The risk register will be reviewed regularly throughout the detailed design, procurement, delivery and indeed post-delivery phases as a standing item in progress meetings. The full Risk Register is included in Appendix A and includes detailed risk registers for the following elements:

- Programme Governance Risks;
- Financial & Commercial Risks; and
- Scheme Delivery Risks.

A scheme delivery risk workshop was undertaken with partners in July 2020 to identify risks and mitigation measures associated with delivery of the UTC phase 1 project, and assess their likely impact in terms of both time and cost.

. Overall, the most pressing risks that came out of the workshop were;

- Securing funding – risk of not doing the scheme
- Staff resources

The risk register will be reviewed and changed accordingly as the project progresses.

### **Covid-19 Risk**

The Covid-19 pandemic still poses some risk to delivery of projects. Covid-19 could cause project to be delayed, de-prioritised or descoped due to;

- a change in operational priorities
- limited resource and support
- a reallocation of funding
- further restrictions placed on a national or regional level

Pandemic related risks were included in discussions in the risk workshop and included in the risk register with mitigation measures listed. It is not thought that there will be any notable impact under existing conditions, as highway works can continue, however risks are associated with any change in rules. Supply chains and contractor assurance should be reliable on the scheme as likely tenderers in this industry are commonly large multi-national companies with scope to overcome any local resource issues.

## 5. Management Case

### 5.1 Management Arrangements

City Region partners have agreed a governance structure which is designed to oversee implementation of the themes within the devolution process for the LCR. The SIF Assurance Framework developed for the CA, covers the expectations of Government in the following areas:

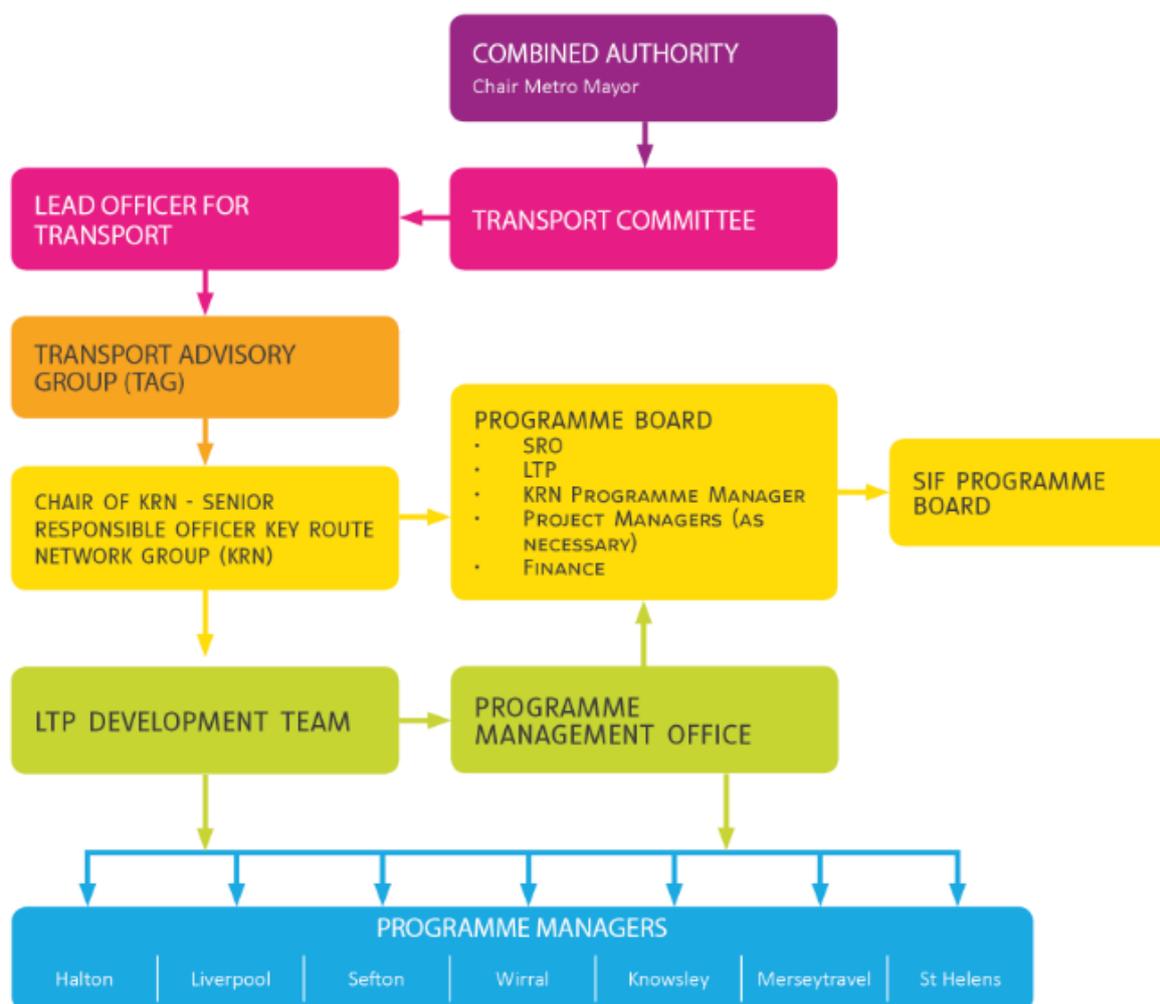
- Governance and decision making;
- Partnership working;
- Transparent decision making;
- Accountable decision making;
- Achieving Value for Money; and
- Independent Audit and Scrutiny

The Strategic LCR Governance Structure can be found in the SIF Assurance Framework.

With Specific reference to the UTC Phase 1 Project Governance:

The Combined Authority will oversee the delivery of the UTC Programme across the LCR, via the Transport Advisory Group (TAG), working with the Key Route Network Group, Traffic Signals Local Authority teams, supported by a Programme Manager, the LTP Development Team and Programme Management Office. This is based on the governance and assurance framework approved by the CA.

**Figure 5-2 Programme Management Governance for UTC Phase 1 programme**



**Table 5-3 LCR Strategic Transport Governance Roles and Responsibilities**

Group	Role	Responsibilities
Combined Authority	Metro Mayor and leaders of the LCR who meet Monthly	Responsible for taking key decisions on the executive functions for the LCR and the accountably body for the KRN
Transport Committee	Overall responsibility for both CA and District Operations	Overall responsibility for implementing key decisions on the executive functions of the CA and the KRN
Lead Officer for Transport	Lead Officer on Transport within the LCR reporting to the Chief Executives Group	Responsibility for Transport (including the KRN) in the LCR. To provide guidance to TAG.
Transport Advisory Group (TAG)	TAG will monitor the programme at a high level to ensure that it is being delivered on time and to budget.	To lead on Transport in the LCR and to advise the LCR, as appropriate. To act on behalf of the Lead Officer for Transport.

Group	Role	Responsibilities
Key Route Network Group / KRN Senior Responsible Officer	KRN group will manage coordination of the programme across the LCR partners ensuring progress and reporting to TAG as appropriate.	To advise on the specific press of the development of the Key Route Network and to provide guidance to the Programme Manager to ensure project stays on progress and to budget.
LTP Development Team	KRN Co-ordination Team across the LCR Partnership assisting in the Project Management of the KRN and feeding into the Programme Management Office (PMO)	To provide technical and financial project management functions.
Programme Management Office	To liaise with KRN Senior Responsible Officer and LTP Development Team to Programme Manage the KRN Programme as a key integral part of the SIF.	To independently raise issues of concern with SRO and to ensure a mechanism for resolving issues is brought forward. To independently report KRN progress on a quarterly basis to TAG within the context of wider programme progress within the LCR.
LCR Partners	The LCR partners will liaise with Chief Executives, the KRN Programme Manager and contractors to ensure implementation of measures.	To lead the development of particular components of the programme to support the Programme Manager.
Finance	To support the quarterly claims process and KRN Programme Board as necessary.	Quarterly claims
Legal	To support the production of the Grant Funded Agreements for KRN and other requests as necessary.	Draft and agree the Grant Funding Agreements with scheme promoters, in line with contractual arrangements.

## Evidence of Similar Projects in the LCR

Working together, partners from across the Liverpool City Region Combined Authority have a history of success in implementing sustainable transport and regeneration programmes.

The Liverpool City Region (LCR) Key Route Network (KRN) 'Invest for Growth' programme is now close to completion. This is an £25.1m integrated programme of interventions in the strategic highway routes designed to contribute to economic, housing and employment growth in the LCR. The success of that programme shows experience in a large-scale programme of highway improvements across all six Local Authorities in the LCRCA. Two projects within that programme were specifically similar to this Sustainable Traffic Signals and Systems programme, in that they involved upgrades to traffic signals equipment across the LCR. The larger of the two projects involved upgrades of Comms equipment to traffic signal sites that were previously operating on outmoded communications technologies.

Overall, the overarching objectives for the 'Invest for Growth' Package have been defined as follows:

- Support economic growth in the region, particularly around the known and future Growth Sites, to further the objectives of the LCR Growth Strategy;

- Build on the ongoing sustainable transport initiatives in the LCR to further expand the region’s multi-modal transport network;
- Deliver Transport Plan for Growth and LCR transport pipeline objectives;
- Remove travel barriers for local residents, by helping to improve journey times, and reliability, and addressing socio-economic issues in the region; and
- Improve transport provision to capitalise on growth in sectors of the economy where the LCR has a competitive advantage, particularly the low carbon and visitor economy sectors.

Table 5-4 below details the two closely comparable schemes that were included within the KRN programme.

**Table 5-4 KRN Schemes(elements of KRN programme) as evidence of similar projects in the LCR**

KRN Scheme Name	KRN Package	KRN Outputs	KRN Outcomes	Scheme Cost
ALL INVESTMENTS AREAS				
<b>LCR UTC Communication Upgrade</b>	UTC Communications Investments	352 Outstation routers 352 BT Connections 100 Controller changes	Improved reliability of traffic control systems Improved control to local authorities via new digital platform Reduced revenue costs of line rental Improved resilience, better co-ordination of traffic signals and controlled crossings	£2,380,500
<b>LCR Intelligent Transport Systems</b>	Bus and Freight Priority	12 upgraded pedestrian/cycle crossings 12 upgraded junctions 30 Other installations - modern signal technology, presence detectors and ITS	Improved reliability Improved journey times Increased patronage Improved air quality	£124,200

## 5.2 Stakeholder and communication arrangements

The UTC Phase 1 package of measures supports the LCR Growth Plan and Strategic Economic Plan and will help the region to Build Back Better from the impacts of the Covid 19 pandemic. It complements national policy to maximise growth by enhancing existing and planned developments and a range of funding opportunities and highlights the essential role of transport as an enabler in the on-going success of the LCR.

As part of the development of the UTC programme, a stakeholder mapping exercise was undertaken to identify key stakeholders and determine their likely level of interest and influence in terms of how their role interacts with the scheme. This has enabled us to determine how to engage with each group of stakeholders throughout the delivery process and in future development work.

The table below provides a summary of the views received on the UTC Phase 1 programme.

**Table 5-5 Communications: Stakeholder involvement**

Stakeholder	Consultation	Views/Attitudes	Evidence of Support
<b>Metro Mayor, LCR Officers, Politicians &amp; Partner Organisations</b>	<p>The scheme proposals are included in the TCF programme, shared/agreed with Metro Mayor, LCR Officers, Politicians &amp; Partner Organisations.</p> <p>The project developed from discussions by the Key Route Network (KRN) Group, and this group has been regularly updated on scheme development. The Traffic Signals Group are the operational group involved.</p> <p>Transport Advisory Group (TAG) oversee KRN</p>	<p>The proposals have been discussed with each of the districts throughout development of the project. This was done through the Traffic Signals Officer group. Individual meetings were offered to all districts and accepted by Liverpool, Wirral, St Helens and Sefton.</p>	<p>Traffic Signals Officer Group Minutes.</p> <p>KRN Group Minutes.</p> <p>Risk Register.</p> <p>Individual meetings with 4 districts and Merseytravel detailed in Siemens Short Term Options Report.</p>
<b>Bus Operators</b>	<p>Presented initial scheme information to bus operators Mon 9<sup>th</sup> December 2019 at Improving Network Resilience &amp; Punctuality Workstream meeting (6 weekly meetings held with bus operators via the Bus Alliance on various issues including access to new development sites and any road</p>	<p>Bus operators were supportive of road infrastructure improvements which promote better traffic flows for the bus services operating on the highway network and also supportive of long-term aspirations for further alignment of signals and systems across the City Region.</p>	<p>Minutes of meeting</p>

Stakeholder	Consultation	Views/Attitudes	Evidence of Support
	infrastructure/junction issues). Proposals are planned to be presented to the core Bus Alliance Group in October 2020.		
<b>Merseytravel (Asset Management)</b>	Merseytravel Asset Management individual meeting for Siemens Short Term Options Report.	Bus priority projects need to be supported by effective maintenance of assets along that route.	Meeting with Merseytravel and Siemens detailed in Siemens Short Term Options Report
<b>Air Quality</b>	Meeting with Chair of Air Quality Group  Environment/ Air Quality Officers worked with us to determine sites proposed for monitors.	Whilst real time sensor readings cannot be used for DEFRA legal monitoring submissions, districts recognise the benefits of live data.  LCC attended a session with Earthsense to find out about sensors made by that company and the operations and accuracies of their functionality. Earthsense  Officers are providing support in tender documentation to ensure brief will request required functionality and operations.	Minutes of Air Quality group Earthsense presentation
<b>Members of the Public &amp; Local Residents</b>	Public and stakeholder consultation via the Local Plans of the 6 district councils within the LCR, local ward member surgeries, public satisfaction surveys etc.	Recognition of the benefit of 'fit for purpose' road infrastructure, safer junctions for pedestrians, cyclists and car users and better traffic flows for improved journey times (to access employment, education and training), less congestion and improved air quality.	Feedback and support received for similar schemes funded via local highways maintenance allocations and Integrated Transport Block, Highways Incentive Fund, Highways Challenge Fund and National Productivity and Investment Fund etc.
<b>Siemens maintenance contractor for all six districts</b>	As maintenance contractor for all six districts, Siemens have been kept up-to-date with the project (in addition to additional consultancy work to support development of the project).		

Stakeholder	Consultation	Views/Attitudes	Evidence of Support

As this is a package of works at existing traffic signal-controlled junctions, no marketing strategy is necessary. However, communications are essential to ensure minimal disruption to the KRN and LCRCAs highway network. The Stakeholder Management and Communications Plan is included as Appendix C.

The Liverpool City Region road network (including Key Route Network (KRN)) provides multi-modal access to employment, social, health, leisure/tourism and education/training services amongst many others. Therefore, maintenance and investment in roads infrastructure (renewal and modernisation), is crucial to the economic development and growth of the region, and the wellbeing of its citizens. Multi-modal and safe access to employment and education/training is vital to support residents, job seekers and employers.

Local businesses and public transport operators benefit from improved signal reliability at junctions and crossings, which can alleviate congestion and provide improved access, better traffic flows and journey time savings.

The benefits of the UTC Phase 1 programme to cyclists and pedestrians includes improved reliability to puffin and toucan crossing point (crossings and at junctions), alleviating potential accidents.

A well - managed road network will assist in making the city region more attractive to residents, visitors and potential investors.

### 5.3 Key Milestones

#### **Programme Delivery**

A contractor delivery programme will be requested as part of the tender process. The supplier brief will establish the key milestones as detailed below. A Gantt chart setting out the delivery programme in line with these key milestones will be provided once the tendered contractor is on board to provide a robust case and assurance of delivery.

Soft Market Testing processes in developing the bid have indicated that a delivery programme from April/May 2021 to December 2022 is achievable to provide a window of one quarter prior to the TCF expenditure deadline of March 2023.

Works at sites across the districts will be programmed in close contact with each authority to ensure work is programmed around other highways works in line with the Traffic Management Act 2004.

The risk register notes that lead in times for parts have not been impacted by the Covid-19 pandemic at present.

Table 5-6 Key Milestones

Date	Milestone
19 March 2021	LCRCA Approval for tender process followed by Delegated Decision on completion of tender (April 2021).
May 2021	Start of contract (following procurement timetable detailed in Table 4-1).
May 2021	Contract Initiation meeting held
31 March 2022	55% (427) retrofit sites complete Air Quality Sensors installed (37) Cross-tenancy project complete
31 March 2023	100% 783 retrofit sites complete

## 5.4 Risk Management

The LCR partners have identified the risks associated with the management and delivery of the UTC programme in the form of a risk register, provided in Appendix A. The production of a risk register is an integral component of the standard project management procedures that are conducted by the LCR Combined Authority.

The project PM supported by LA signals teams will have day-to-day responsibility for managing the risks identified in the register and escalating any issues to the Transport Advisory Group (TAG). The risk register will be reviewed regularly throughout the delivery of the programme by the Project Manager. During the procurement phase, the holder (client or contractor) for any identified construction related risks will be clearly defined in the contract documentation. This established process has led to the successful delivery of a number of long-term transport programmes in the LCR, such as the Merseyside LSTF programme and Key Route Network (KRN) Programme.

The governance, finance and contract procedures set out in the Management and Commercial Cases of the business case provide a robust framework for delivery which give relevant officers the authority to action and allocate resources to mitigate any risks arising.

A risk workshop was undertaken with officers from each of the LCR partners in July 2020 to identify risks and mitigation measures associated with delivery of the UTC programme and

assess their likely impact in terms of both time and cost. This also includes risk assessment for programme wide governance, commercial and financial risks. The resulting risk register formed the basis of the Quantified Risk Assessment (QRA) undertaken.

The full risk register and associated QRA outputs can be found in supporting information appendices, Appendix A. The risk register is broken down into three sections:

- Programme Governance Risks;
- Financial & Commercial Risks; and
- Scheme Delivery Risks.

## 5.5 Benefits Maximisation

As a City Region, we are committed to continuous measuring and monitoring processes to make sure that we maximise the benefits of our that investments and outcomes achieved are in line with the strategic objectives we have defined. Overall, we see success for the UTC programme as consisting of:

- Scheme delivery to time, budget and specification;
- Increased accessibility and permeability of the City Region for employees, businesses and visitors;
- Enhanced access via the KRN and highway network for public transport & freight to key destinations;
- Reduction in congestion and air pollution;
- Reduction in costs and energy consumption;
- A well-functioning and reliable transport network;
- Increased attractiveness of LCR for investors, residents and visitors; and
- A safer transport network.

To ensure we realise success, we have developed a rigorous Benefits Realisation Plan and Monitoring and Evaluation Plan, as summarised below.

### **Benefits Realisation**

A Benefits Realisation Plan has been developed which identifies the key beneficiaries of the programme, as well as the outcomes, indicators, responsible body and timeframes for each of the strategic outcomes.

It will be the responsibility of the Project Manager working with relevant LA traffic signals team Project Managers to ensure that the tasks in the Benefits Realisation Plan are undertaken in a timely fashion. Appropriate feedback procedures will also be put in place with Project Managers to ensure that measurement and monitoring become dynamic tools to assist and enhance delivery as part of a regular project control meeting.

The Project Manager and Traffic Signals will report updates to the Programme Management Office and Combined Authority on a monthly basis; these reports will include updates on the key measures of the Benefits Realisation Plan.

The Benefits Realisation Plan will sit alongside the Governance Reporting Structure as outlined in The Management Case. This will ensure that:

- The Benefits Realisation Plan is effective, maintained and implemented;
- Benefits Realisation becomes a focus of the overall programme development; and
- Benefits Realisation allows for a dynamic process within the programme to enable each project to adjust and refine actions to ensure delivery of objectives.

On this basis, Benefits Realisation will become an integral part of the UTC programme. The Benefits Realisation Plan is included in the supporting appendices, Appendix F. Appendix G contains the Monitoring and Evaluation Plan for the UTC Phase 1 programme.

## 5.5 Programme Reporting

The evaluation of the UTC Phase 1 programme will primarily take the form of an outcome monitoring approach using a 'before and after' design to assess how outcomes have changed over the course of the interventions.

The benefits of using this approach include cost efficiencies through the use of existing data sources such as automated traffic counts and identification of the factors that make interventions successful and lessons learnt for developing future interventions.

Our approach to outcome monitoring is based on a combination of quantitative and qualitative data collection and analysis. A primarily quantitative approach will enable us to collect the large amount of data needed in an efficient manner to monitor and evaluate the scheme.

Performance information will be co-ordinated and assessed by the LCRCAs PMO. A Dashboard to assist with information capture will be provided and will be proportionate to the scale, complexity and risk of the project. An example of the dashboard that will be submitted to the project sponsor to complete monthly is attached in Appendix E.

All projects in delivery will be expected to report to the CA on:-

- Performance against Business Plans & Milestones;
- Risks;
- Issues;
- Financial performance information (as appropriate for the investment instrument);
- Quality; and
- Benefits, Outputs and Outcomes (as appropriate).

## Appendices

A Risk Register

B Scheme delivery programme

*This will be provided once contractor has been appointed*

C Stakeholder Management and Communications Plan

D Appraisal Summary Table

E Copy of PMO dashboard

F Benefits Realisation Plan

G Monitoring and Evaluation Plan

H Options appraisal

I Economic Case calculator spreadsheet

J Scheme Assets for LED Retrofit upgrade collated