

## FULL BUSINESS CASE: STRATEGIC CASE



# BEDFORD TOWN CENTRE TRANSPORT STRATEGY

## FULL BUSINESS CASE

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# 1. INTRODUCTION

## 1.1 Overview

1.1.1 This report forms part of the Final Transport Business Case for the proposed Bedford Town Centre Transport Strategy. The overarching business case sets out the evidence base in favour of the scheme, following the Department for Transport's (DfT) guidance on The Transport Business Cases by considering each of the five business cases in turn:

- Strategic Case;
- Economic Case;
- Financial Case;
- Commercial Case; and
- Management Case.

1.1.2 Bedford Borough Council has been awarded two funding packages from the Local Growth Fund for separate but co-located projects, the Bedford Town Centre Study and the Bedford Southern Gateway. The purpose of the Business Case is to explain how and why the Council is seeking to combine these two Local Growth Fund streams into one single project.

1.1.3 This report focuses specifically upon the **Strategic Case** and sets out how the original rationale for both projects developed and the additional benefits which will result from a combined approach .

## 1.2 Background to Bedford and the Transport Strategy

1.2.1 Bedford is the largest settlement within the Borough of Bedford with a population of around 80,000 out of a total of around 160,000.

1.2.2 The River Great Ouse passes through the town centre and is lined with public greenspace known as the Embankment and St Mary's Gardens. Bedford Castle Mound is the remnant of Bedford's medieval castle, located off the Embankment and close to the centre of the modern town, less than a hundred metres from the High Street. St Paul's Church sits within the square of the same name at the southern end of the High Street, providing a link between the River and Castle and the main pedestrianised retail core.

1.2.3 The recently completed Riverside Bedford development provides another connection from St Paul's Square through to the river, with a range of new leisure facilities, including a cinema. This also connects in to the established Harpur Centre Shopping Centre across Horne Lane.

1.2.4 Bedford has a legacy of previous trunk roads passing through the town. In recent years de-trunking and the completion of the Western bypass have removed all primary routes from the urban area, and there is no longer a need to cater for long-distance traffic through the town.

1.2.5 At the same time the constraints of the road network, in particular a river and rail lines with limited crossing points, continues to lead to traffic congestion arising a concentration of traffic on key junctions and particular routes.

1.2.6 The core town centre highway network operates on a one-way system, with southbound traffic along the High Street, westbound traffic along the south side of St. Paul's Square and Horne Lane, and northbound traffic up River Street. The High Street and St. Paul's Square are both two lanes, creating a significant barrier to pedestrian movements across

these routes. This has the impact of dissecting the town, reducing permeability between the retail quarter, the cultural quarter and the river.

- 1.2.7 Economic data indicates this is having a significant impact upon the value of property in different parts of the town centre. Business rate data indicates that equivalent rateable values on the High Street are around 40% of those within the heart of the pedestrianised area on Silver Street and Midland Road.
- 1.2.8 The Borough Council has been undertaking a Transport Strategy Development process over the last three years to support enhancements to the town centre, as well as to integrate with wider issues, such as the Local Plan Process, the One Public Estate programme, the Oxford to Cambridge Corridor (including the Expressway and East West Rail) and enhancement to the Midland Mainline (these are discussed in more detail in section 2.2.10).
- 1.2.9 A wide range of transport policy, strategy and scheme options has been considered for Bedford town centre, using the data collected in 2014, and a set of measures focused upon enhancing accessibility to and within the core town centre and extending out to the key A6 corridors to the north and south of the town has been developed. These measures represent the project.

### **1.3 The need for change**

- 1.3.1 Public realm and transport and traffic management projects are highway authority matters. Unless infrastructure improvements are associated with a particular development, there is no mechanism (and little incentive) for the private sector to deliver traffic management improvements.
- 1.3.2 Within this restricted context, the Borough Council has been seeking to continually enhance the public realm within the town centre and to minimise the impact of traffic on pedestrian and cycling movements. The town centre retail offer faces an increasingly competitive market against not only other town centres, but out-of-town retail offers, and on-line shopping.
- 1.3.3 The draft Local Plan identified considerable development growth across the borough up to 2035, with up to 8,500 new dwellings. In addition to this, there is the potential for considerable higher growth up to 2045. Establishing an effective traffic management system in advance of higher demand will provide the Borough Council with a mechanism with which effectively influence travel choices going forward and mitigate against the impacts of growth.
- 1.3.4 Parts of the former A6 corridor are specifically identified as potential risks for future constraint, recognising the importance of the connectivity this corridor provides for Bedford. Furthermore, reducing the impact of traffic on local communities, such as through the removal of traffic from town centres and the increasing the provision of alternatives to the car, is also recognised as key to creating conditions conducive to growth and in attracting investors to the area.
- 1.3.5 This is, therefore, a critical time to maximise the natural strengths of the town, including the River and Cultural Quarter, and ensure the on-going economic viability of the town. This Strategic Case sets out to demonstrate that the combined scheme offers benefits over and above those of the separate schemes.

## **2. THE STRATEGIC CASE**

### **2.1 Introduction**

2.1.1 Any new publicly funded major infrastructure project should be set within the context of, and measured against, local (and national) objectives. For this project, The South East Midlands Local Enterprise Partnership (SEMLEP) provides the context to development and is committed to supporting business investment, driving economic success and to creating the necessary infrastructure to develop new homes and jobs for the South East Midlands. The LEP will contribute to this through the delivery of a Strategic Economic Plan (SEP), which has eight strategic objectives designed to enhance:

- Business productivity
- Skills
- Markets
- Infrastructure

2.1.2 The SEP identified four principle areas for intervention to deliver growth:

- Transport
- Housing
- Jobs
- Growth and Skills

2.1.3 While this Strategic Case conforms to the DfT guidance, there is a particular focus on the strategic objectives of SEMLEP. As a project based around infrastructure provision and increased economic activity, it is well placed to create conditions conducive to growth and to attract inward investment. The opportunities resulting from reduced congestion and enhanced transport connectivity are recognised in providing a competitive advantage to firms and local authorities. In relation to delivering sustainable transport, the challenge is identified of managing congestion to ensure that it is not detrimental to local economic growth.

2.1.4 Within this context, this section provides an assessment of the strategic case for the scheme by setting out the following,

- The history of the project: two schemes into one
- The impact of 'do nothing'
- A description of the project; what will be delivered
- The evolution of the project from concept to objectives
- How the project meets the strategic aims of the delivery and funding partners
- How the project will be assessed and measured

### **2.2 History of the project: two schemes into one**

2.2.1 Bedford Borough Council (BBC) submitted a Local Growth Fund Round 2 (LGF2) bid to SEMLEP at the end of 2014. This original project bid centred on a new town centre road bridge at Batts Ford to the west of the town centre, as well as a range of public realm enhancement to the town centre.

2.2.2 The main objectives were to reduce traffic congestion within the town centre and enable the High Street to achieve traffic relief and improve the attractiveness of this part of town, thus supporting regeneration. The overall cost of the infrastructure needed was estimated at the time to be circa £30 million (£25 million LGF2 and £5 million local contributions).

- 2.2.3 Within the overall grant awarded to SEMLEP for LGF2 of £46.7 million, £11m was allocated towards the Bedford Town Centre Transport Strategy. This was significantly short of the resources need to deliver the promoted scheme. Subsequent informal advice suggested that it would not be prudent to submit a further bid for the shortfall.
- 2.2.4 As well as the original project being unaffordable, further evaluation since then has concluded that the original strategy might not provide the best value for money. Concerns have also been raised over its deliverability. Further technical assessment indicated that the transport benefits would be localised and that there were potential negative environmental impacts within the immediate area.
- 2.2.5 At the time of the LGF2 allocation, DfT indicated that this project would be included in their national programme of transport projects as a 'Portfolio' scheme and managed directly by them. Quarterly reports on the project to DfT since the allocation have simply indicated that the project details remain to be agreed.
- 2.2.6 The need for improvements to Bedford town centre traffic remains as pressing as ever and since the original decision in 2014 by the Borough Council to develop and deliver a new transport strategy for the centre of Bedford, the following key actions have been undertaken:
- Procurement of external consultant support to assist with technical aspects
  - Commissioning comprehensive travel surveys of the town centre area
  - Developing the tools needed to enable transport strategy options and schemes to be tested, including an update to the Borough-wide SATURN traffic model and a VISSIM micro-simulation model of the core town centre area
  - Testing a variety of alternative transport strategy options
  - Supplementary work on transport issues to inform the Local Plan review
- 2.2.7 Bedford Borough Council recognised that further funds were required if all the objectives of the Town Centre Strategy which were originally included in the LGF2 scheme were to be delivered, and a bid was made to LGF3 in June 2016. This was for enhancements to a critical corridor between Bedford Town Centre and the strategic road network at the A421 junction with the A6. The proposal was referred to as Bedford Southern Gateway in recognition of its importance to economic activity within the town. The bid for LGF3 was successful and the Council received £4.5m from the Local Enterprise Partnership to be topped up by £0.6m from local funds. The main objectives of the proposal include deliverables to,
- Improve journey time reliability
  - Improve technology and integration between systems and signals to provide a linked signal solution which responds to demand pressures
  - Improve capacity at key junctions for all users
  - Minimise the impact of traffic on residents and communities
  - Reduce the number, frequency and severity of accidents
  - Enable development opportunities to come forward
  - Safeguard existing employment opportunities and encourage new ones
  - Develop a prototype technology corridor for wider roll out
- 2.2.8 The Council was in the position of having two funding streams for projects with similar aims in co-located areas, one managed directly by DfT and the other by the LEP. Given that the strategy being suggested for the town centre described above is conceptually similar to that for the Southern Gateway, it has been agreed with SEMLEP that the sensible approach to project governance and management would be to merge the two projects into one overall coordinated programme.

- 2.2.9 Through discussions with DfT and SEMLEP it was agreed that as the total value of both LGF projects will not exceed £20 million, the DfT would support moving responsibility for the LGF2 scheme to SEMLEP for combination with the LEP managed LGF3 scheme. This would require a profile for the £11 million to be agreed and for DfT and DCLG to arrange for these sums to be added to the existing LGF3 allocation for SEMLEP.
- 2.2.10 In addition, the emergence of other town centre issues has helped to develop the context and opportunity for a change in emphasis from these two separate but co-located projects into one scheme. These include,
- Electrification of the Midland Main Line – the relevance of this programme of works centred on the fact that the Prebend Street corridor is one of the key pinch points in Bedford’s network, and the potential rebuilding of Ford End Road Bridge to accommodate new wires and pantographs looked for a while like it had the potential for bringing quantum change to Bedford’s transport systems.  
At the time the Council was awarded the LGF2 money, both the bridges in Bedford had yet to be modified to accommodate the new wiring, and so the Council entered discussions with Network Rail to try and secure a joint approach which would enable the Ford End Road Railway Bridge to be completely reconstructed and thus provide a road bridge over the railway which would accommodate the requirements of a renewed Bedford traffic system.  
However, because of the time constraints of the electrification programme, there has been insufficient time to develop a proposal which could accommodate the requirements of both parties. Also, Network Rail has been able to accommodate its own essential works by the lifting of just one arch which reduces the economic viability of a rebuild.
  - One Public Estate (OPE) - BBC in partnership with other public authorities is participating in the OPE programme to ensure best use is made of land and property within public sector ownership within the town. A number of sites are being progressed around the town centre; these are the land around the railway station, the land to the west of the town centred on FER, and land to the south of the town centre (centred round Kingsway).  
Some of the transport improvements which are required to release the growth potential and facilitate town centre traffic movement are of a scale which would be unviable within the normal redevelopment process. Rebuilding Ford End Road railway bridge for example to provide a relief road of Prebend Street and improved access into the Queens Park area would be outside the scope of regular development plans, and as such a wider contextual process is required.  
The town centre programme of works can be developed independently of any One Public Estate programme. However, as it is anticipated that the potential development areas will require transport and highway improvements to improve accessibility, the public realm, and increase the economic uplift of these areas, the Council will continue to develop the two schemes in parallel and improve synergies between them.
  - The emerging Local Plan – In addition to land use policy, there will be a need to incorporate the adopted transport strategy into the Local Plan framework for the town centre including whether to,
    - Review the current policy support for Batts Ford Bridge and the existing safeguarding scheme
    - Review the policy for the St John’s Relief Road and the existing safeguarding policy
    - Retain policy support and safeguarding for Prebend Street Link Road and review the safeguarding alignment in light of agreements made with Network Rail and the context of One Public Estate

- Review general policies about principles to be adopted in delivering transport, access and parking management in the town centre
- National Infrastructure Commission (NIC) and the Oxford Cambridge Corridor, including East West Rail – whilst Bedford is expected to play an important role in the growth plan for the Oxford – Cambridge corridor, and will be influenced by the strategic road and rail schemes already being progressed, these are not expected to undermine the town centre growth strategy. Rather, the strategic agenda points towards an increasing need to deliver a Bedford Town Centre offer which supports the overall growth plan. This is reinforced by the recognised need to consider ‘first mile / last mile transport issues in strategic transport policy.  
Approval has been given for Network Rail to progress the East West Rail Central Section and preliminary options for routes will be available by Autumn 2018. The emerging results from the route evaluation work, particularly around the station and Ford End Road, will influence and inform decisions and options for the future development of the whole area.

2.2.11 Within this evolving context, a revised approach to delivery was required. Given the indicative allocations of LGF2 and LGF3, the availability of other resources and on the basis of the current position on deliverability and strategy testing, a suggested overall approach to the town centre transport strategy was developed to include:

1. Improvements in the town centre highway/public realm quality to discourage unnecessary through traffic and improve the quality of the environment for users of the town centre;
2. A widespread programme of small/medium infrastructure improvements focussed on key junction pinch-points where worthwhile increases in capacity and reliability that assist all road users are justified and deliverable
3. A major upgrade to existing traffic management systems across the whole Town Centre and Southern Gateway area to provide the maximum delay reductions possible, provide real-time information to drivers to support their decision-making, and to be ready to incorporate emerging/future technology on Cooperative Intelligent Transport Systems (C-ITS), Expressway driver information systems, autonomous vehicles and mobility as a service technology.

## 2.3 Impact of Do Nothing

2.3.1 Without investment at this time, there is a perception that Bedford Town Centre will not be able to benefit from the potential growth which the sub national area expects to be delivered. The High Street will continue to underperform within the local economy, exacerbated by the narrow pavements and poor environment which will discourage higher value retail organisations from locating within the street.

2.3.2 East-west connectivity across the High Street and St. Paul’s Square will remain poor and will limited the ability to maximise the exiting historic and cultural assets of the town.

2.3.3 There is significant housing growth planned across the wider borough, with 8,500 dwellings by 2035 and a potential further 12,500 by 2045. This will have a significant impact upon the travel patterns across the borough and into the town centre and there is a risk that, without intervention in the High Street, the levels of traffic will gradually increase, negating the benefits achieved through completion of the Western Bypass.

2.3.4 More generally traffic conditions and journey time reliability are likely to remain poor and deteriorate further over time, reducing the attractiveness of Bedford as a business and employment location. The limited functionality of the current Urban Traffic

Management Control (UTMC) will soon be completed obsolete and so the Borough Council will be unable to manage the highway network effectively.

- 2.3.5 The scheme aims to remove unnecessary traffic from the town centre and to manage the network in response to demand so that access to the public realm can be enhanced. Alternative schemes have been considered but were discounted because they did not give the same level of benefit. An examination of these alternatives is included in the table below,

**Table 1. Consideration of alternatives**

ALTERNATIVE MEASURE	REASON FOR REJECTION
Focusing infrastructure and investment in one corridor (e.g. Batts Ford Bridge to the west of the town centre, Prebend Street)	Benefits were not considered to be widespread enough, or deliver mode choice
A new link road between Ampthill Road and Mile Road	High cost and only localised benefits
Widening Ampthill Road	High cost, localised benefits and environmental disbenefits (loss of mature trees).
Incremental junction and capacity improvements (dependent on development or Council resources)	No joined up programme so phased approach would be difficult. The chosen 'modular' approach allows for planned progress and minimal disruption

## **2.4 Description of the Scheme: what will be delivered**

- 2.4.1 Having examined the background to the scheme and set this within the local context, this section describes the three elements of the scheme. The focus of the measures is around the heart of the town centre, alongside the northern and southern corridors (the former A6 corridors). Within this area there are five targeted elements of scheme delivery, with the High Street and St. Paul's Square forming the primary focus. The UTMC and technology measures will encompass the whole area, but with a specific focus upon the Southern Gateway corridor, linking with the existing Park & Ride site. Elements of the central technology infrastructure will also facilitate wider traffic management controls across the whole town in the future. See figure 1. A description of the three themes is set out below.

## **2.5 Theme 1: Town Centre Public Realm Scheme**

- 2.5.1 The focus of the public realm scheme is within the core town centre, encompassing the length of the High Street, St. Paul's Square and the Town Bridge/St Mary's Street. It builds upon and compliments smaller scale public realm works already completed and / or planned in areas, such as the Riverside Bedford development.
- 2.5.2 Key features of the Public Realm scheme are:



- **High Street decluttering:** Removal of all unnecessary guardrail, signals and lines to reduce vehicle prominence and create an environment where all transport modes feel welcome.
- **High Street repaving and resurfacing:** Introduction of a cohesive materials palette to provide a visual uplift to the town and encourage walking and wider exploration. This includes both carriageway and footway surfaces, to ensure an improvement to visual amenity, the setting of heritage assets, and the introduction of features that will provide greater pedestrian priority.
- **High Street pavement widening to accommodate and encourage increased footfall and also café spill out in some locations:** To help reduce vehicle speeds and provide greater control over servicing, the High Street carriageway will be narrowed to accommodate wider pavements and spill-out spaces for businesses.
- **High Street and St Paul's Square introduction of high quality street furniture (including seating) and soft landscape, including trees:** Introduction of a consistent street furniture palette to reduce visual clutter. This would be complemented by a soft landscape scheme designed with full consideration of CCTV requirements. Fastigate tree varieties can be used to add an element of green and verticality without hindering CCTV provision. The considered use of street furniture and tree planting will also prevent/discourage drivers from entering pedestrian-only areas in places where vehicle and pedestrian priority are deliberately blurred to promote walking and cycling.
- **High Street improvement to on-street servicing:** On-pavement service bays are proposed so that when not in use, the space given over to pedestrians is maximised. It is imperative that restrictions on loading and servicing are actively enforced.
- **St Pauls Square decluttering:** The Square is at the heart of Bedford, yet is currently overwhelmed by wide vehicle carriageways and high volumes of traffic. The important views of the Church and surrounding buildings are lost amidst the signals, guardrailling and other street clutter. Removing these elements will open up the space, and enable the statue of John Howard and Church – both Grade I Listed – to be fully appreciated. The setting of these assets will be further enhanced through minimising road markings and changes to materials that will soften the space and tie the east and west sides of the town together.
- **St Paul's Square repaving and resurfacing:** The current paving would benefit from the introduction of natural stone over the concrete paving currently used. The area occupied by the market is currently surfaced with stone setts which provide a more appropriate setting to the buildings in this area. Carriageways will similarly be treated with pavements to help reduce traffic speeds and reduce the visual prominence of vehicle routes.
- **St Paul's Square pavement widening:** There are opportunities as part of wider traffic management initiatives to widen pavements on each side of the Square:
  - North: The carriageway could be reduced slightly make more efficient use of the land available and reduce the impact of junctions.
  - East: The carriageway could be reduced to one lane – providing an enhanced setting to the statue of John Howard – with a small flare to enable vehicles to enter the southern section.
  - South and west: the carriageway could remain as two lanes; however, additional tracking has identified where elements of the carriageway can be



reclaimed for pedestrian use, and reduce what in some locations are currently very wide crossing widths.

- **Town Bridge pavement widening:** to help reduce vehicles speeds and enhance east-west pedestrian and cyclist connections to the River Path, the carriageway over the bridge can be narrowed.
- **Rearrangement of junction layout of Cauldwell Street/St. Marys Street/St. John's Street:** to enhance the flow of traffic from Cauldwell Street into St. John's Street and tie-in with reduced carriageway width over the Town Bridge.
- **Wayfinding:** Introduction of a more consistent style of wayfinding infrastructure that matches other elements of street furniture. The addition of distance information, in terms of walk-times, will support aspirations to encourage walking and exploration of different parts of the town.

2.5.3 Preliminary concept drawings for the scheme are presented within **Appendix A** for the public realm measures. A full discussion of the public realm scheme development process is set out within the accompanying document '**Bedford High Street - Public Realm Framework**'.

## 2.6 Theme 2: Alleviating Pinch-points Schemes

2.6.1 Four key areas have been identified for highway mitigation measures to facilitate improvements to the operation of the highway network and complement both the proposed changes within the town centre and the package of technology measures.

2.6.2 Features of the schemes within the Pinch-point theme are:

- Area 1: A6 Northern Gateway
  - Signalisation of Clapham Road/Manton Lane/Shakespeare Road
  - Enhancement to the operation of the Paula Radcliffe Way/Great Ouse Way roundabout
  - Enhancement to the operation of the Manton Lane/Brickhill Drive Junction
- Area 2: Bromham Road Eastern Gateway
  - Realignment and signalisation of Bromham Road/Shakespeare Road/Ashburnham Road double mini roundabout
- Area 3: Around Hospital
  - Additional lane on northbound approach to Britannia Road/Cauldwell Street/Kempston Road junction
  - Rearrangement of junction layout of Britannia Road/Amphill Road
- Area 4: Amphill Road Southern Gateway
  - Additional lane capacity at Cowbridge
  - New pedestrian footbridges

2.6.3 Preliminary engineering scheme drawings are presented within **Appendix B** for each of the key elements of the schemes.

2.6.4 A full discussion of the pinch-point scheme development process is set out within the accompanying document '**Bedford Town Centre Pinch-point Schemes**'.

## 2.7 Theme 3: Urban Traffic Management Control & Technology measures

2.7.1 The Urban Traffic Management Control (UTMC) theme incorporates a package of measures to manage the flow of vehicular traffic across the core town centre and former A6 corridor, as well as promote enhanced information provision to enable travellers to make informed choices about how and when they travel.

2.7.2 The key features of the schemes are

- UTMC Common Database
- UTMC system encompassing the extent of scheme measures (see Figure 1)
- Remote Monitoring System
- CCTV / data integration for Journey Time Management
- Traffic Data Base and Control Room Equipment
- Traffic Signal Upgrades across the extent of scheme measures (see Figure 1)
- Signing, Information and Publicity Systems
- Extended coverage of ANPR cameras for enforcement of Bus Lanes

2.7.3 The UTMC and Technology package provides an opportunity for the following:

- Improving the capability of the urban transportation infrastructure to assist with incident management, traffic advisory to network users and long-term investment planning, including use of public and 3rd party data sources;
- Improving the performance of infrastructure, and ensuring the benefits of new infrastructure are maintained, by improving the coherence of regional and corridor traffic management systems;
- Improving the awareness of network users of performance, the availability of public transport, improved trip planning, and promotion of sustainable modes through an area-wide open data strategy
- Enhanced visibility of the performance of transport service providers, ensuring compliance with existing agreed service levels and providing a basis for dialogue on service improvements, for example to support improved connectivity with MML upgrades and sufficient capacity for the One Public Estate programme;
- Improve access for commuters and visitors by:
- increasing knowledge of parking availability: whether on-street, off-street public or privately owned, through roadside variable message signs and enabling 3rd party app development
- providing enhanced methods of payment for transport, through use of interoperable fare media
- Improved data exchange with local and regional transport operators, and adjacent regional economic hubs, including Cambridge, Milton Keynes and Northampton to advise on HazMat vehicles, other Vehicles Of Special Interest (VOSI), regional road closures, failures of the rail network or other man-made or natural events that could impact Bedford; and
- Encouraging and part-funding local innovation to improve accessibility, mobility and the sustainability of the transport network as a whole, such as establishing defined corridors for pilots of Advanced Traffic Management, including the use of Vehicle to Infrastructure (V2).

2.7.4 A full discussion of the traffic manage scheme development process is set out within the accompanying document '**Bedford Town Centre – a vision for Intelligent Mobility**'.

2.7.5 An overview of the geographic location of these scheme elements within the town centre strategy is provided in **Figure 1**.

**Figure 1. Scheme Overview**



- 2.7.6 In summary, the overarching aims of the combined package of scheme measures are to:
- Enhance the permeability of the core town centre, creating better connections between the retail quarter, the cultural quarter, and the Great River Ouse
  - Enhance the management of traffic movements into and across the town to improve journey time reliability

- Provide travellers with real-time information about traffic and travel conditions to allow them to make informed decisions about the travel behaviour

2.7.7 Overall, the enhancements aim to facilitate accessibility to Bedford, improvements in road network performance and improved regional connectivity, with a specific focus upon new or upgraded infrastructure. This includes scheme measures within both the 'Town Centre Public Realm' and the 'Alleviating Pinch-point' themes ensuring an integrated approach.

## 2.8 The evolution of the scheme: from concept to objectives

2.8.1 Any assessment of a scheme's value and potential effectiveness has to take account of how decisions were made. This section sets out how the evidence was collected and used, and what other influences were considered in arriving at the scheme details described above. It will consider the following,

- Data gathering
- Best practice from elsewhere
- Stakeholder involvement
- Strategic alignment

## 2.9 Data gathering

2.9.1 An extensive assessment of access and movement issues across Bedford Town Centre has been undertaken, encompassing all the major corridors leading into and out from the centre. This is documented within the technical reports referenced within Sections 2.4 – 2.7.

2.9.2 In addition to general assessment of levels of highway and public transport provision the evidence base includes:

- Automatic Number Plate Recognition (ANPR) cordon survey
- ANPR Car Park Survey
- Manual Classified Counts (MCC) at 27 junctions across the town
- Journey time survey on five routes across the town
- Pedestrian Environment Review System (PERS) audit within the town centre
- Cycle infrastructure audit within the town centre and routes leading into the centre
- Retail data assessment

2.9.3 In addition strategic, microsimulation and local junction model outputs have also been available with which to assess the performance of the transport network.

2.9.4 These varying sources of data and models have been analysed to identify the following key issues relating to access and movement in Bedford.

### Traffic Model Outputs – Key Issues

- Peak period capacity constraints through the Prebend Street / Midland Road junction (both with current peak traffic flows and forecast to become more severe with future growth)
- Peak period capacity constraints through the Bromham Road / Ashburnham Road double roundabout both with current peak traffic flows and forecast to become more severe with future growth, even with the completion of the Western Bypass)
- Peak period delays along the Ampthill Road Corridor (both with current peak traffic flows current and forecast to become more severe with future growth)

- Peak periods capacity constraints through Wilmers Corner (both with current peak traffic flows and forecast to become more severe with future growth)

#### Travel Survey Data – Key Issues

- There is a high volume of through trips from south of river that use the Town Bridge / Horne Lane / River Street to access the north of the town (the area to the north of Bromham Road). This equates to over half of the northbound flow across the Town Bridge in the peak periods (between 325 to 375 vehicles movements per peak hour).
- There is a high volume of through trips from north-west of the town (Clapham Road / Bromham Road) that use the High Street / Town Bridge / St. John's Street to access the area to the south of the Kings Quarter. This equates to up to half of the southbound flow over the Town Bridge in the peak periods (between 350 to 375 vehicle movements per peak hour)
- There is a notable volume of trips travelling south along High Street that subsequently turn east along Embankment that add to southbound congestion along the High Street. This trip movement account for up to 20% of southbound trips travelling down the High Street during the peak periods (between 150 to 175 vehicle movements per peak hour).
- There is considerable journey time variation across the network on key corridors leading into the town centre, in particular along the Amphill Road Corridor with average speeds as low as 5mph on parts of the network

#### Car Parking Data – Key Issues

- The high volume of traffic circulating around the core town centre network to access the car parks at the Harpur Centre, River Street, and Allhallows.
- The extent of rail related traffic heading to Bedford Midland Station car park from the west of Bedford along the Bromham Road corridor

#### Walking & Cycling Audit Data – Key Issues

- The lack of connectivity to rail by all modes of transport, particularly in the context of rail likely to become a more prominent mode in the future.
- The current restricted role of buses within transport hierarchy, with services all highly focused on town centre, despite relatively high density of built up area.
- The dominance of motorised vehicles on corridors leading into the town centre creating adverse conditions for non-motorised modes. There is currently a 20% bus, walk, cycle mode share, whereas the benchmarking exercise indicates that a level of 25% or higher is achievable.
- Concerns around air quality in core town centre.
- The sub-optimal connection of different 'quarters' around the town for pedestrians and cyclists, and the opportunity to create a more coherent and integrated town centre.

#### Town Centre Public Realm – Key Issues

- The town suffers from poor 'sense of arrival' with few well defined 'gateway' points into the core town centre
- High quality streets and spaces contrast with vehicular dominated areas such as the High Street and St Paul's Square
- Important buildings "disappear" in a vehicle dominated setting



- Limited greenery in the High Street and main shopping area
- Event spaces are scattered throughout the town centre but could be used for more than markets
- Opportunities to foster a cafe culture and encourage businesses to spill out into the street
- The proliferation of A4 drinking establishments make some parts of the town feel unsafe to some users
- The High Street and Midland Road generally feel unsafe, pedestrianised streets lack overlooking and feel desolate after dark
- Some parts of the town are disorientating
- Lack of legible, visual connections between some key destinations

#### **Retail Data – Key Issues**

- Business rate data indicates significant variation in rateable values across the core town centre with values on the High Street only around 40% of those within the heart of the pedestrianised area on Silver Street and Midland Road.

2.9.5 A number of background technical reports have been published, comprising:

- Report of Survey
- Benchmarking Report
- Transport Model – Local Model Validation Report
- Transport Model – Microsimulation Model Development
- Forecasting Report
- Issues and Opportunities
- Scheme Option Development
- Options Screening and Assessment
- Scheme 'Long List' Appraisal

2.9.6 These are available via:

[http://www.bedford.gov.uk/transport\\_and\\_streets/highways/schemes\\_and\\_projects/key\\_transport\\_projects.aspx](http://www.bedford.gov.uk/transport_and_streets/highways/schemes_and_projects/key_transport_projects.aspx)

## **2.10 Best Practice and Evidence**

2.10.1 As previously documented, the development of the package of town centre transport measures has been achieved through establishing a wide-ranging and robust evidence base, with multiple data sources. This included a benchmarking exercise (see link above) comparing Bedford to similar UK towns to understand comparable travel behaviours and learn lessons on how Bedford could achieve better provision.

2.10.2 As part of the work developing Theme 3 traffic management measures a comprehensive assessment of available technologies has been undertaken, engaging with suppliers and learning from world-wide examples. The technical note for Theme 3 provide a full summary of the best practice review and how this has influenced the development of the package of measures.

## **2.11 Stakeholders**

2.11.1 Bedford Borough Council has engaged with necessary stakeholders throughout the option development process and will continue to do so throughout the development of the scheme. As with most projects affecting town centres, public highways and the public realm, the range of stakeholders is wide and varied. In a sense, all residents, employees and visitors have an interest in the scheme and most will be affected by the

outputs, either directly or indirectly. Eliciting qualitative and meaningful responses to stakeholder consultations depends on how each event is managed.

- 2.11.2 The Town Centre has been subject to a range of different studies focused on retail, cultural as well as transport that have all involved engagement with key stakeholders to understand the key issues. In particular, the issue of what measures to take on the High Street has been the subject of local consultation for some years and various projects, in particular the Local Transport Plan, the Townscape Heritage and the Citizens Panel. While views have been split, in more recent years and particularly after the opening of the bypass, the consensus has been moving towards support for detrafficking, a view supported by the Bedford Improvement District (Bedford BID).
- 2.11.3 The Southern Gateway Corridor has been the subject of concerns raised by local businesses, specifically the Interchange Retail Park and potential occupiers of the land adjacent to Morrisons on Ampthill Road. Community representatives have also called for further investigation into the issues along the route. The owners of the Interchange Retail Park and other potential developers adjacent to the site have expressed their intention to work with the Council to look for area wide solutions. Highways England have also been consulted in relation to the A421 corridor and interchange with the A6 at the southern end of the scheme.
- 2.11.4 The Northern Gateway Corridor has been subject to a specific assessment study to examine future capacity issues, which involved engagement with key stakeholders.

## **2.12 Alignment with Bedford Strategic Aims**

- 2.12.1 Bedford Borough Council has three priority areas:
- 1.** A Thriving Local Economy – providing the environment to ensure that Bedford Borough's economy can continue to grow
  - 2.** Empowering Communities – supporting our communities and neighbourhoods
  - 3.** Supporting People – safeguarding our vulnerable residents
- 2.12.2 The package of schemes will directly support the first two priorities and contribute to delivery of the third.
- 2.12.3 The enhancement to the public realm will create an environment that promotes higher retail and leisure activity and will support the whole town centre economy. The provision of a wider transport network which offers employers reliable journey times to suppliers and customers, and employees better access to jobs, will increase the likelihood of inward investment.
- 2.12.4 The Town Centre Air Quality Management Area encompasses a specific proportion of the focus for the measures proposed. This encompasses a set of objectives for a range of pollutants that the Borough Council monitors annually. The Public Realm measures, and wider traffic management, will directly support the reduction in pollutants related to vehicular traffic within the area. There will also be wider environmental benefits in terms of noise, townscape and protection of historic assets within the town centre.
- 2.12.5 The package of measures has also been designed with specific links to future outcomes of the Local Plan process and the One Public Estate programme. The growth outlined within the draft Local Plan will have specific focus on the former A6 corridors, in particular to the north of Bedford, and so the measures outlined within this Town Centre Strategy will deliver an initial level of provision to facilitate this future growth. More specifically the proposals around Area 1 A6 Northern Gateway link with a National Productivity Funding bid to enhance accessibility to the north of town.

- 2.12.6 The emerging One Public Estate programme has a specific focus on development and associated infrastructure provision to the west and south of the town. Both elements would extend directly from the core measures proposed within this Town Centre Strategy, with potential public realm measures around Midland Road linking to the proposals for the High Street and St. Paul's Square in a holistic manner. Similarly potential enhancements around the Kingsway Gyratory would extend from the improvements to St. Mary's Street, providing a fully integrated package of measures.
- 2.12.7 The Southern gateway corridor is a mixed use linear routes with a range of uses including residential, employment, shops, leisure and community uses. The proposed improvements to the transport network will reduce the adverse impact of traffic bringing wider aspirational benefits to the cycling and walking network, as well as the local neighbourhood.

#### **Summary of issues identified and development of the strategy objectives**

- 2.12.8 Based on the evidence base, consideration of best practice, issues raised by stakeholders and an examination of Council priorities, the following four key overarching issues to address were identified as:
- High traffic flows along the High Street and narrow pavement widths creating an unwelcoming environment for pedestrians that has had a clear demonstrable impact upon the value of retail property along this street.
  - Lack of connectivity, permeability and legibility on the western and south-western sides of the town centre between the retail quarter and cultural quarter and River.
  - Identified pinch-points across the town highway network that create specific uncertainty in journey times
  - An absence of a functional traffic management system for the town to respond to incidences and inform travellers of congestion and delays
- 2.12.9 In response to the identification of these overarching issues to address, the Town Centre Transport Strategy development process established a set of ten strategic objectives that encompass the combined aims of the strategy. These remain the objectives against which the package of measures has been developed:
- TSO1 Support the heritage, cultural and economic regeneration in the town centre through enhanced access and improved town centre permeability.
  - TSO2 Manage vehicular activity in the core town centre, in particular through movements, to enhance the pedestrian retail, night-time, and visitor economy experience, whilst ensuring adequate town centre access for traders, freight, public transport and taxis and to car parks.
  - TSO3 Facilitate efficient cross town and end-to-end corridor movements, for all transport modes, through strategic routings, reduced congestion at network pinch-points and improved infrastructure provision
  - TSO4 Enhance strategic links to the town to secure the long term position of Bedford as a regional centre, whilst reducing the volume and impact of through vehicular traffic movements that could otherwise utilise the town ring road.
  - TSO5 Provide network resilience, across all modes, that accommodates forecast growth associated with future development aspirations of the town and changes to population demographics.
  - TSO6 Create a safe and secure environment for all transport users, taking particular account the needs of vulnerable users, and reduce conflicts between vehicular and non-vehicular transport movements.



- TSO7 Manage the environmental impacts of transport, in particular within the air quality management area, and promote sustainable modes of travel.
- TSO8 Proactively manage access to health and educational facilities, including hospital sites, schools, the college and the university, in order to make best use of transport network capacity.
- TSO9 Create a coherent 'sense of place' across the town quarters, ensuring clear vehicular and non-vehicular way-finding leading into and around the town centre, with a particular focus on ensuring connectivity with the river and the rail station.
- TSO10 Ensure inclusive, resilient, long-term, and low maintenance design of transport infrastructure and operational services.

2.12.10 These ten objectives form the basis against which the package of scheme measures are evaluated. To ensure an evidence-based approach an associated set of metrics have been developed for each objective and are presented in Table 3

## **2.13 Developing the objectives: from scope to options**

2.13.1 The focus of the full package of schemes measures encompasses the core town centre along with the former A6 corridors to the north and south of the town (as shown in Figure 1 in Section 2). In particular, this represents the initial focus for the enhanced UTM and technology measures to optimise the operating of the network and provide real-time information.

2.13.2 The specific infrastructure measures are focussed around five sub-areas:

- Town Centre – High Street / St. Paul's Square / St. Mary's Street
- Area 1: A6 Northern Gateway – Clapham Road / Manton Lane
- Area 2: Bromham Road Eastern Gateway – Bromham Road / Shakespeare Road / Ashburnham Road
- Area 3: Around Hospital – Britannia Road / Ampthill Road
- Area 4: Southern Gateway – Ampthill Road

2.13.3 Taking account of local priorities, and available resources the scope aligns directly with the wider vision for Bedford encompassing development to the west, north and south of the town centre area.

## **2.14 Constraints**

2.14.1 No specific constraints have been identified to delivering the scheme measures identified. As the highway authority, the Council has powers through various Highways Acts to deliver improvements to the highway. Other constraints such as the requirement for planning permission or railway possessions have been included in the risk register.

## **2.15 Interdependencies**

2.15.1 The extent of the Area 1 – Northern Gateway scheme measures have been revised following the successful outcome of the Borough Councils National Productivity Infrastructure Fund bid as announced by DfT in October 2017. The successful NPIF bid w permits the wider improvements across the Paula Radcliffe Way /Great Ouse Way and Manton Lane/Brickhill Drive junctions.

2.15.2 There is also the potential to tie in to any future scheme to improvement scheme promoted by Highways England at the A421 / A6 junction. In recognition of the potential movements between the Wixams / Wilstead and Bedford and the employment opportunities therein, Highways England is investigating the provision of signals at the A6/ A421 junction to aid non-motorised movements across the busy trunk / local slip

road. Although there is no definitive proposal in place, investigations into the feasibility of a scheme have been carried out and are likely to move forward.

## **2.16 Risks**

- 2.16.1 Project risk will be managed as an ongoing process as part of the scheme governance structure, as set out in The Management Case Section of this business case. A scheme risk register has been established and will be reviewed as a standing item at each of the two weekly Project Board meetings. Responsibility for the risk register being maintained is held by BBC's Technical Project Manager in conjunction with the Project Steering Group and is reported to the Project Board in the form of checkpoint reports.
- 2.16.2 Any high residual impact risks are then identified on the highlight report for discussion at the Programme Board meeting. Required mitigation measures are discussed and agreed at the meeting and actioned by The Technical Project Manager and Steering Group as appropriate.
- 2.16.3 In the Commercial and Management Case Section of this business case report, the experience of BBC's staff has been highlighted in terms of delivering major transport schemes effectively and with little adverse effect. In order to achieve successful delivery of major schemes, management policies, processes and procedures are required to be followed accurately. An important aspect of the management process is identifying risks associated with scheme delivery and funding early in the process to allow mitigation to be identified.
- 2.16.4 Risk workshops will be held prior to each design, procurement, mobilisation and construction stage as identified in Appendix 1 (Project Plan) of the Commercial and Management Case Section.
- 2.16.5 Risks that are best managed by the contractor will be allocated to be priced by the contractor accordingly. Risks best managed by BBC will be retained, so will be excluded from the contract(s).
- 2.16.6 A series of Risk workshops will be undertaken over the course of the project, with results compiled into the Risk Register included in Appendix 2 of the Commercial and Management Case Section. Risks are assessed on their likelihood and their severity, both with and without mitigation.
- 2.16.7 An initial Risk Assessment that has been carried out by the Steering Group and discussed by the Project Board to produce the Risk Register shown in Appendix 2 of the Commercial and Management Case Section. The initial Risk Assessment is to be used to develop a Quantitative Risk Assessment as part of the finalisation of the business case which will include an @risk mathematical model to produce a Monte Carlo simulation of the risk 'costs'.
- 2.16.8 The initial Risk Assessment work has identified a total of 99 general project related and theme specific risks. A summary of the initial risk assessment is shown in the table below:

Risk Assessment Summary November 2017				
Risk Category	Red (Critical)	Amber (Intermediate)	Green (Minor)	Mitigated (Closed)
Economic / Financial/ Management	0	4	7	1
Stakeholder Management / Consultation	2	4	12	0
Statutory / Legal	0	1	0	0
Strategic / Political / Policy	0	0	3	0
Design / Technical / Preparatory	1	4	19	0
Procurement	0	3	4	0
Construction	0	11	18	0
Environmental	0	4	1	0

2.16.9 The three critical risks identified at the initial stage are as follows:

- That the Network Rail works at Bromham Road delayed impacting upon the project plan
- Engagement with Network Rail for Cowbridge Scheme
- Detailed design of Bridge works for the Cowbridge Scheme.

In order to provide early mitigation of these critical risks High level discussions have been taking place between BBC and Network Rail over the Autumn of 2017 to clarify the requirements of each party. Additional Structural Design Engineers have also been recruited to the BBC design team to provide sufficient resource to deliver the relevant infrastructure improvements.

2.16.10 Other notable risks relating to the project are listed below and set out in more detail in the risk register.

- Phasing of delivery to ensure traffic management tools are in situ prior to implementation of public realm scheme;
- Coherent delivery with other town centre programmes; and
- Resilience of technology.

## 2.17 Options

2.17.1 The whole town centre transport strategy development process has gone through a detailed optioneering and sifting process, leading to further scheme option development and appraisal, prior to a package development & appraisal process. This then led to the identification of a combined package of scheme measures. This whole process has been undertaken applying the set of objectives outlined in Section 2.8 above, which were identified at the outset of the strategy development process and have remained the key overarching objectives for enhancing access and movement across the town.

2.17.2 A total of 213 scheme measures were initially identified and subject to an initial sifting process. This is outlined within the 'Options Screening and Assessment' report. Subsequent high-performing scheme measures were developed and then combined into packages of measures. This process initially identified three high-level packages,

including on based around the proposed bridge alignment at Batts Ford (included within the initial LGF2 bid).

- 2.17.3 As detailed earlier, the Batt's Ford bridge scheme was subsequently identified as being unaffordable; however, the public realm elements in the town centre were still recognised as a strongly performing measures. Combined with the best-performing pinch-point schemes and the measures from the LGF3 bid, these elements have been identified as the preferred package of measures that deliver against the original town centre transport strategy objectives and offer both high value for money and are deliverable.

## **2.18 Fit with SEMLEP strategic objectives and wider Government objectives**

- 2.18.1 In section 2.1, the report made reference to the fact that SEMLEP objectives were a crucial measure for the scheme's key deliverables and outcomes. As an additional measure of the scheme's strategic fit, it has been assessed against SEMLEP's strategic objectives, and national initiatives and policy direction. The overarching SEMLEP Strategic Objectives are set out in Table 2 below.

Table 2. SEMLEP Objectives

OBJECTIVE	DESCRIPTION
Objective 1	Stimulating enterprise and enhancing the competitiveness of SMEs.
Objective 2	Strengthening and exploiting our innovation and knowledge assets.
Objective 3	Support new and existing businesses to export their goods and services.
Objective 4	Attracting domestic and international investments.
Objective 5	Developing a skilled and adaptable workforce.
Objective 6	Addressing barriers to the labour market for disadvantaged groups.
Objective 7	Delivering infrastructure to accelerate sustainable growth in jobs, housing and investment in town centres.
Objective 8	Securing long term and on-going funding to deliver the infrastructure plan.
Objective 9	Unlock and accelerate the delivery of housing

- 2.18.2 The set of measures promoted by this project supports the following SEMLEP strategic objectives.

**Objective 1: Stimulating enterprise and enhancing the competitiveness of SMEs**

- 2.18.3 Enhancing the town centre public realm will increase pedestrian footfall creating additional opportunities for enterprising retailers

- 2.18.4 Reliable journey times can lead to increased confidence for local businesses. Similarly, the local shopping environment can become more attractive if the adverse impact of stacking traffic is removed.

**Objective 4: Attracting domestic and international investments**

- 2.18.5 Enhancing the town centre public realm will increase the attractiveness of the centre for investment

- 2.18.6 Reliability of journey time into Bedford from the strategic road network, and clear and effective information are critical for business visitors.

**Objective 7: Delivering infrastructure to accelerate sustainable growth in jobs, housing and investment in town centres**

- 2.18.7 Enhancing the town centre public realm will create an environment that will increase confidence in investing within the town centre.

- 2.18.8 Improved infrastructure at local pinch points will increase confidence in the business and commercial sector, and allow planned and future developments to come forward sooner rather than later because of increased viability of planned and future developments. The corridor leads directly into the town centre but is currently categorised as a local centre in its own right.

## Objective 8: Securing long term and on-going funding to deliver the infrastructure plan

- 2.18.9 The scheme supports the delivery of the Infrastructure Investment Plan by improving links to major residential development areas, including Wixams, and major employment areas such as Medbury Farm, Bell Farm, Wixams and west of B530 Kempston.

## Objective 9: unlock and accelerate the delivery of housing

- 2.18.10 Planning permission for housing exists along the Southern Gateway corridor but has not yet come forward for development. The scheme will increase the viability of the outstanding site by removing the requirement for highway improvements. In terms of the wider Government policies and strategies the scheme supports the growth agenda and fits within the initiatives described below
- National Infrastructure Commission (NIC) Growth Corridor. This strategy aims to maximise the potential of the Cambridge – Milton Keynes – Oxford corridor as a single, knowledge-intensive cluster that competes on a global stage, protecting the area's high quality environment, and securing the homes and jobs that the area needs. Bedford sits at the heart of this corridor and the scheme will facilitate growth across the town to facilitate access and movement.
  - Oxford – Cambridge expressway. As part of the NIC Growth Corridor, the Oxford – Cambridge Expressway has been identified as a key major new transport requirement. The Bedford Southern Gateway scheme provides a direct link from the proposed Expressway into Bedford town centre, fulfilling a key Highways England route strategy objective.
  - Improvements to cycling and walking infrastructure. The above scheme ties in with the Government's Cycling and Walking Investment Strategy which sets out a long term vision for walking and cycling to 2040, the aim being to make cycling and walking the norm for short journeys. The strategy will be progressed through a series of 5 year strategies.
  - Development of technology and innovation. Intelligent Mobility is a key objective of the Government's Transport Catapult. The concept is about taking a different approach to transport challenges by using technology to enable the smarter and more efficient movement of people and goods.
- 2.18.11 As an additional test of local policy fit, **Error! Reference source not found.** demonstrates the additional benefits as a result of combining both schemes. In addition to benefits for greater numbers of residents and visitors, the combined project has more wide reaching benefits, for example, technological opportunities, and environmental enhancements. The potential for additional investment is greater because more service areas are included within the project scope.

**Table 3. Enhanced Benefits of Combined Schemes**

ORIGINAL SCHEME OBJECTIVES		ENHANCED BENEFITS
Local Growth Fund 2	Local Growth Fund 3	Combined project
Decongestion for Bedford Town Centre	Improve journey time reliability Respond to demand pressure	Three themed approach targets interrelated issues rather than a single focus Potential for additionality is greater because project includes more spheres of influence for public and private sector investment
Improve other pinch points New river crossing Gateway treatments, improved signage	Improve key junction for all users	Focus on key pinch points, and development of technology infrastructure allows benefits to be spread over a wider geographical area, potentially benefiting more users Increased number of roads and junctions are improved than with individual schemes
	Improve technology and integration between signals and junctions to provide a linked signalled route	Provides the opportunity to build a digital platform and accommodate future technology developments Enables development of 'Mobility as a Service'
De-traffic High Street Improve public realm Provide new public spaces Enhance THI project and historic character		Builds on benefits provided by other initiatives (e.g. Bedford Western Bypass, Townscape Heritage Initiative, Riverside Bedford, Harpur Centre upgrade, local improvements) Provide new focal point to encourage dwell time and inward investment
Retention of existing businesses	Improve access to the SRN Enable development opportunities to be brought forward Improve access and reduce delays at key retail areas Remove constraints to development	Improves access more retail, employment and residential land within and adjacent to the key project areas Loses none of the benefits of the single schemes in terms of indirect and direct benefits to jobs and housing
Encourage pedestrian movement	Minimise impact of traffic on communities Improve air quality Reduce casualty	Increased benefits for non-vehicular transport modes COX/ NOX improvements are spread over a wider area particularly in relation to the designated Air Quality Management Area
Improve accessibility and connectivity	Encourage modal choice	Improved facilities for all transport modes Alleviate real and perceived blockages at pinch points

## 2.19 Measures of Success

- 2.19.1 In addition, the Pedestrian Environmental Review System (PERS) audit work, and associated valuing of the urban realm, along with the outputs from the strategic and local junction modelling exercises, have identified that the package of scheme measures will deliver significant enhancements to the value of the town centre, as well as improvements to journey time reliability across the wider A6 corridors.
- 2.19.2 In order to measure whether the scheme objectives set out above have been met, a series of specific; measurable; achievable; realistic and time-bound targets have been derived. Possible metrics are set out in Table 3 while Table 4 shows how these can be measured.

**Table 4. Metrics**

OBJECTIVE	METRICS
TS01	Journey times (all modes); accessibility and permeability (PERs audit); rateable values of retail properties
TS02	Town centre vehicle kms, town centre vehicles speeds
TS03	Journey times
TS04	strategic public transport services (rail routes/services; bus network kms); through traffic vehicle-trips within town centre cordon
TS05	Transport network capacity
TS06	Accident levels; security (PERS audit)
TS07	Town centre vehicle-kms;
TS08	accessibility contours to sites
TS09	qualitative assessment of design and signage (PERS audit)
TS10	qualitative assessment of design

**Table 5. Measures of Success**

OBJECTIVE	TARGETS
TS01 (Regeneration)	5% reduction in peak hour journey times (all modes) +2 points for PERS rating for Permeability 25% increase in rateable values
TS02 (Town Centre Traffic)	5% reduction in town centre vehicle kms 15% reduction in High Street average speeds
TS03 (Cross-town movements)	5% reduction in peak hour journey times (all modes)
TS04 (Strategic links)	5% increase in bus service levels 5% reduction in through traffic
TS05 (Network resilience)	10% increase in transport operating capacity
TS06 (Safety & Security)	10% reduction in accident levels +2 points for PERS rating for Security
TS07 (Environment)	5% reduction in town centre vehicle kms
TS08 (Access to health & education)	5% reduction in access times
TS09 (Sense of Place)	+2 points for PERS rating for Quality of Environment



- 2.19.3 A full monitoring and evaluation plan which encompasses SEMLEP's requirements in is included within 'The Management Case'.



## Appendix B – Pinch-Point Scheme Preliminary Engineering Drawings

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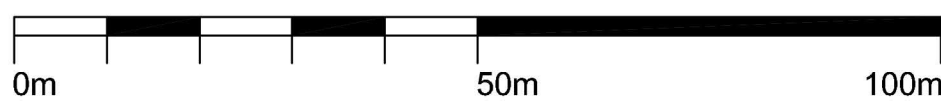
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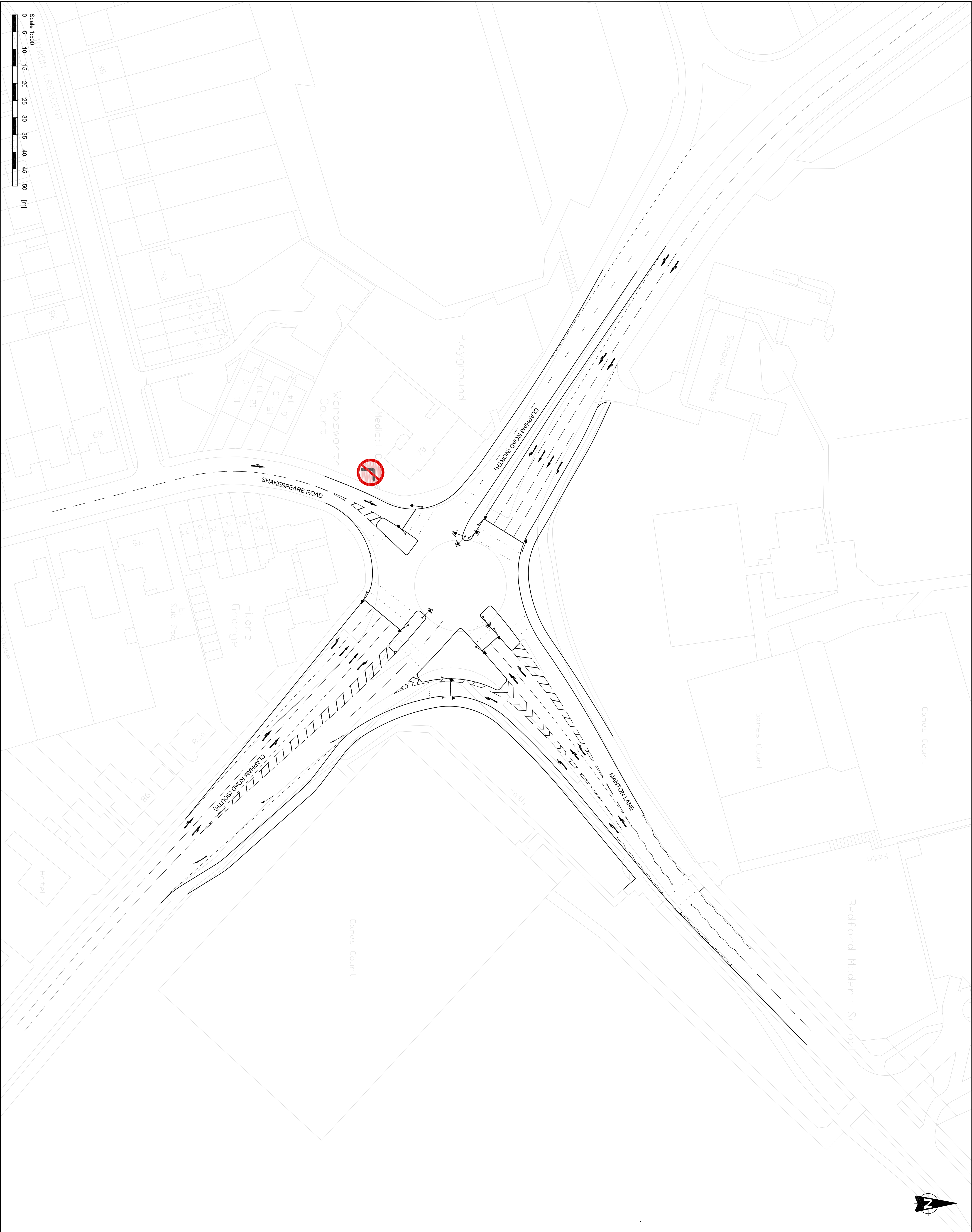
Option H





## **Appendix B Preliminary Scheme Drawings**

Drawing 105251-03	Area 1 – Clapham Road / Manton Lane / Shakespeare Road
Drawing 105251-05	Area 2 – Bromham Road / Shakespeare Road / Ashburnham Road
Drawing ST15226-035	Area 3 – Britannia Road / Cauldwell Street / Kempston Road
Drawing ST15226-005	Area 3 – Britannia Road / Ampthill Road
Drawing ST15226-006	Area 4 – Cowbridge (Ampthill Road)
Drawing 105251-06	Town Centre (South) – St. Mary's Street / Cauldwell Street / St. John's Street



Notes:

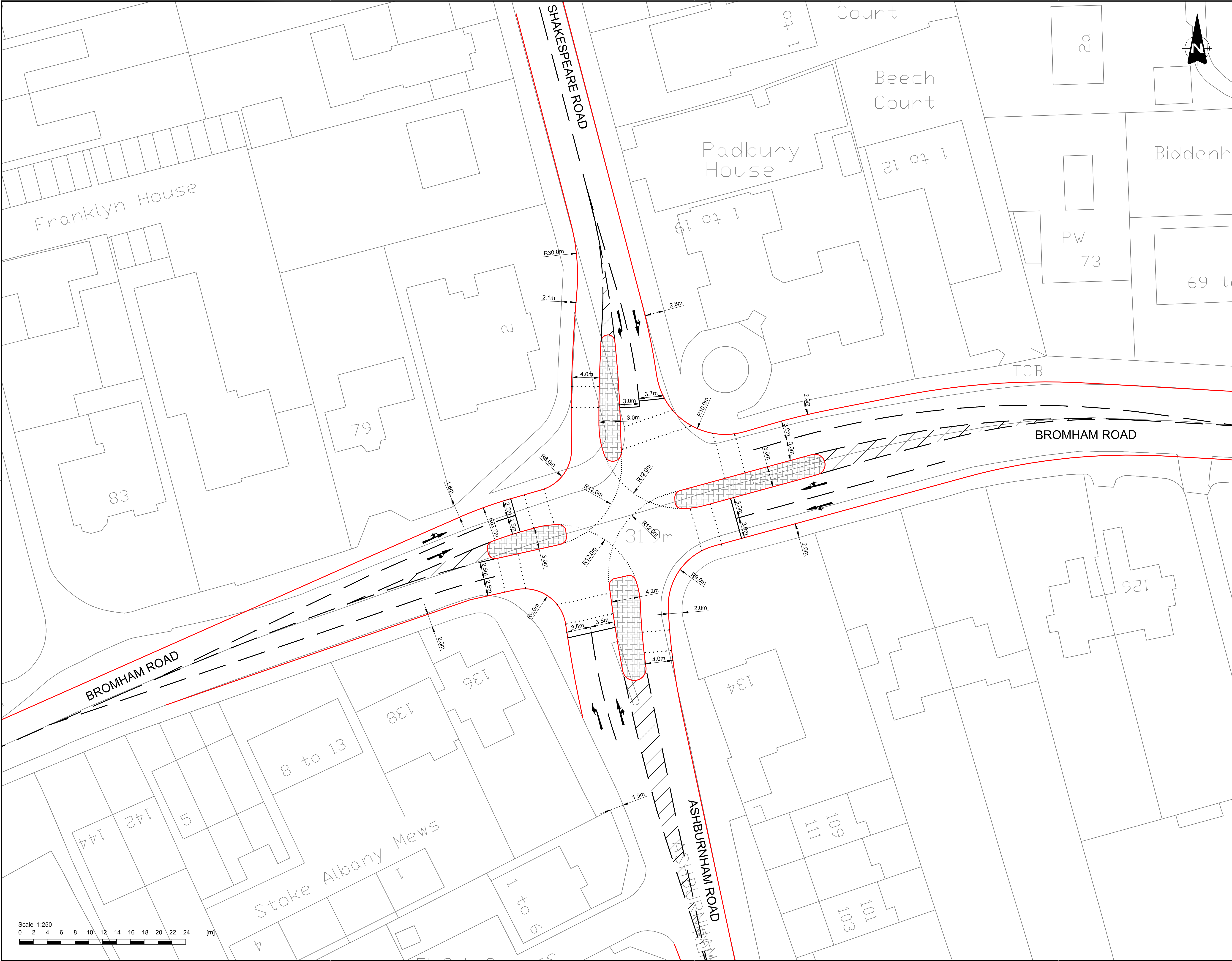
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Key:

- OS base
- Proposed features
- Proposed primary traffic signal
- Proposed secondary traffic signal

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Client Bedford Borough Council			
Project Bedford Town Centre Strategy			
Title Clapham Road / Manton Lane / Shakespeare Road Proposed Signal Junction Option 3			
Drawn	SRP	Checked	ON
Design Stage	A1	Date	11-09-2017
Drawing Status	Information	Drawing Number	105251-03





Notes:

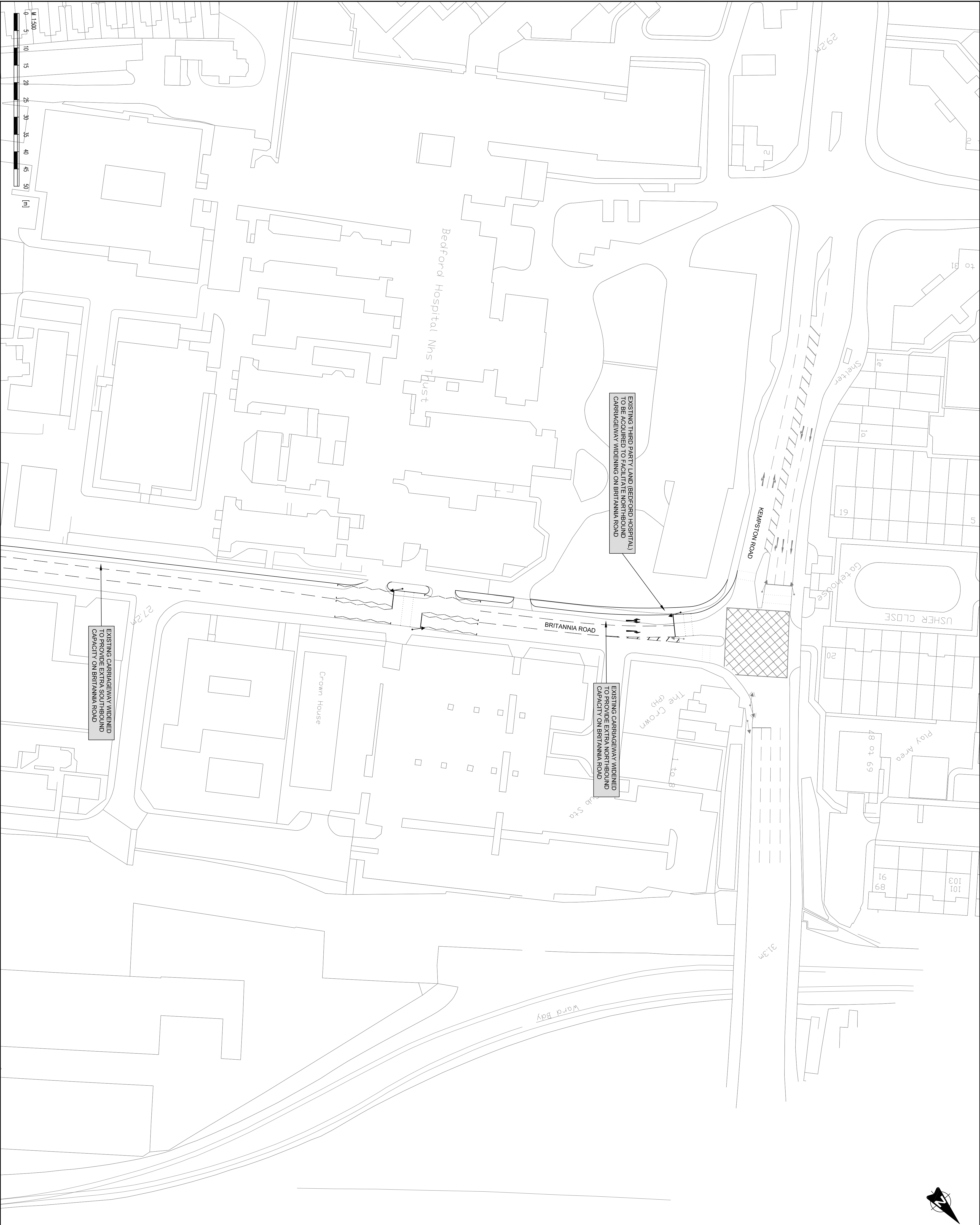
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Project <b>BEDFORD TOWN CENTRE STRATEGY</b>					
Title <b>BROMHAM ROAD JUNCTION WITH ASHBURNHAM ROAD AND SHAKESPEARE ROAD</b>					
Drawn <b>SK</b>		Checked <b>ON</b>		Approved <b>-</b>	
Original org. size <b>A1</b>		Date <b>18/09/2017</b>		Scale <b>1:250</b>	
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- Proposed secondary traffic signal
- Existing primary traffic signal
- Existing secondary traffic signal

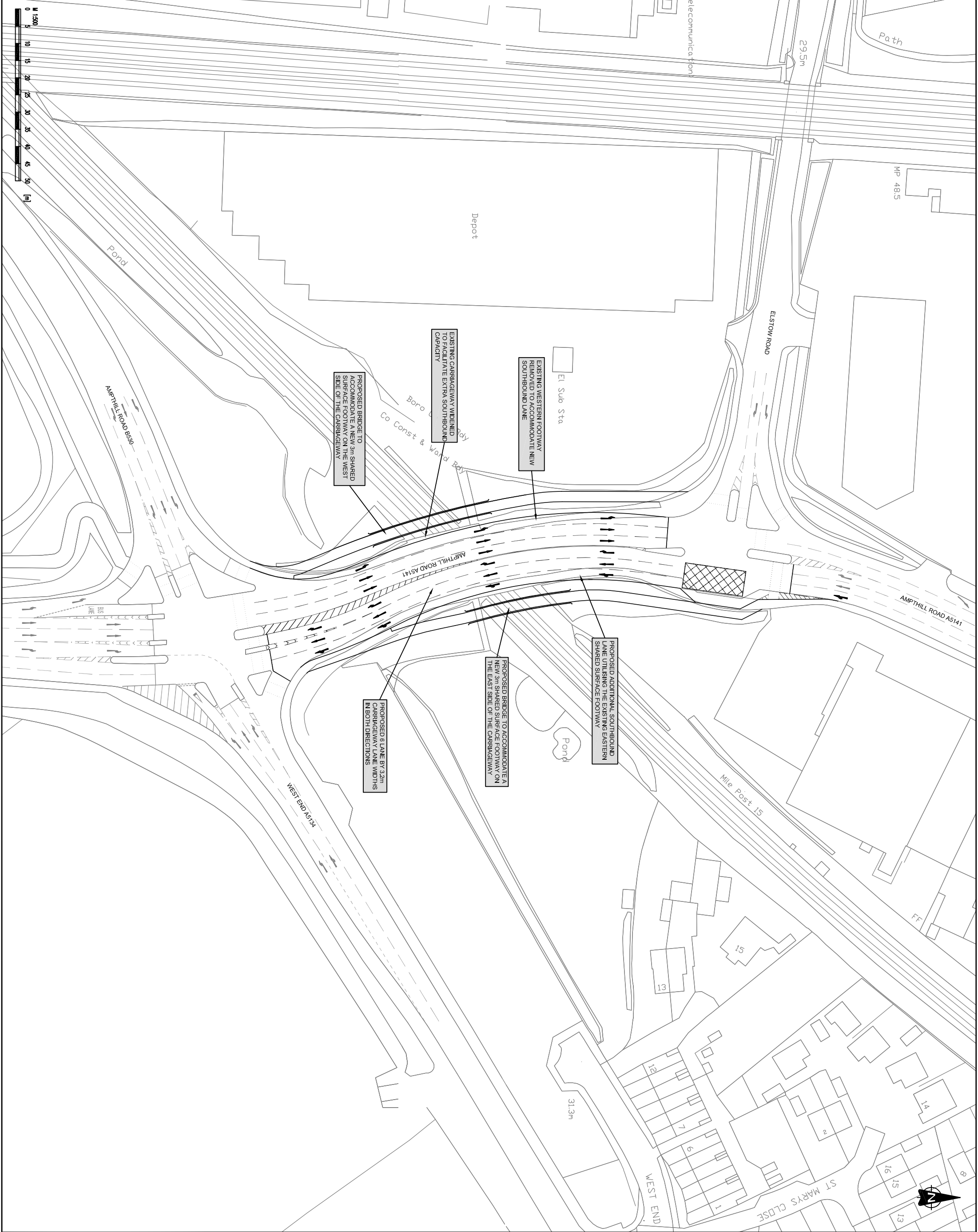
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AMPTHILL ROAD / BRITANNIA ROAD			
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Drawn by date	A1	Checked by date	October 2014
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Drawing Information	Working	ST15226-005	Rev





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Key:  
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Client  
**Bedford Borough Council**

Project  
**Bedford Town Centre Strategy**

Title  
**Cauldwell Street / St Mary's Street /  
Cardington Road / St John's Street Junction**

Drawn	SRP	Checked	ON	Approved	ON
Original dtp. size	A1	Date	14/09/2017	Scale	1:500
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## FULL BUSINESS CASE



# BEDFORD TOWN CENTRE TRANSPORT STRATEGY

## FULL BUSINESS CASE

### IDENTIFICATION TABLE

<b>Client/Project owner</b>	Bedford Borough Council
<b>Project</b>	Bedford Town Centre Transport Strategy
<b>Study</b>	Full Business Case
<b>Type of document</b>	Report
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<b>Reference number</b>	105251/GB01T14A88
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2	Author	B Hayward	PM	16/10/17	a) Table 1 individual elements costs changed b) Section 1.7.2 BBC funds c) Table 3 amended d) 1.2.6 NPIF e) 1.4.2 signpost to risk register f) 1.5.1 optimism bias
	Checked by	M McLeod	MfTP	19/10/17	
	Approved by	M McLeod	MfTP	19/10/17	
3	Author	B Hayward	PM	02/11/17	1.26 & Table 3 amended to show NPIF
	Checked by	B Hayward	PM	02/11/17	
	Approved by	M McLeod	MfTP	9/11/17	
4	Author	B Hayward	PM	13/11/17	Costs in S1.4 & 1.6 amended based on QRA
	Checked by	B Hayward	PM	13/11/17	
	Approved by	M McLeod	MfTP	13/11/17	

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# 1. THE FINANCIAL CASE

## 1.1 Introduction

1.1.1 This section of the report presents the Financial Case for the Bedford Town Centre Strategy package of measures. It concentrates on the affordability of the proposals, the funding arrangements and technical accounting issues. The total outturn costs and expenditure profile are presented, along with an assessment of the impact on public accounts.

1.1.2 The Financial Case for the identified package of measures is based on long-standing and significant levels of scheme optioneering and development. This has led to the identification, and costing, of a preferred package of measures as part of an on-going vision to develop the accessibility and attractiveness of the town centre. The proposed funding arrangements are set out and described, including the Local Growth Fund allocation and local contributions.

1.1.3 The full scheme cost was last updated in September 2017.

## 1.2 Base Costs

1.2.1 Table 8 shows that the base cost estimate for the package of measures is just over £15m. The overall cost estimate is based on individual assessments of scheme costs undertaken across the last 2 years and recently reviewed by SYSTRA in September 2017. They are considered by both SYSTRA and BBC to be up-to-date, robust and complete.

1.2.2 The public realm surfacing costs have been developed by understanding the physical scale of the overall measures and applying outturn unit cost rates based upon an understanding of the palette of materials to be applied. Additional assessments of cost to declutter the street environment and replace with high quality street furniture have been undertaken, alongside the provision of way-finding infrastructure.

1.2.3 Outline scheme costings have been produced for each of the 'Alleviating Pinch-point schemes' based upon a detailed bill of quantities and applying a set of standard construction rates (LoHAC), covering:

- Site clearance;
- Fencing;
- Drainage and service ducts;
- Earthworks;
- Pavement construction;
- Kerbs footways and blocked paved areas;
- Signs signals and road markings;
- Lighting;
- Electrical work for road lighting and traffic signals;
- Landscaping & ecology;
- Retaining walls;
- Street furniture; and
- Pedestrian footbridge

1.2.4 The UTMC and Technology scheme elements have been developed in partnership with external suppliers to determine the costings for:

- UTMC Common Database;
- UTMC system encompassing the extent of scheme measures;
- Remote Monitoring System;
- CCTV / data integration for Journey Time Management;
- Traffic Data Base and Control Room Equipment;
- Traffic Signal Upgrades across the extent of scheme measures;
- Signing, Information and Publicity Systems;
- Extended coverage of ANPR cameras for enforcement of Bus Lanes; and
- Travel demand support initiative and SMART mobility roadmap.

1.2.5 An overall summary of the basic cost elements, including allowance for preliminaries, traffic management and utilities, is presented within Table 1.

**Table 1. Components of Investment**

<b>COST ELEMENT</b>	<b>£</b>
Location 1 - High Street (The Broadway to St. Paul's Sq.)	1,046,750
Location 2 – High Street (St. Paul's Square to Town Bridge)	1,115,650
Location 3 – St. Pauls Square (carriageway)	2,047,125
Location 4 – St. Pauls Square (Public Space)	765,850
Location 5 – Silver Street (Public Space)	185,500
Location 6 – St Mary's Street / Cauldwell Street	437,308
<b>THEME 1 SUB TOTAL</b>	<b>5,598,182</b>
Area 1 Clapham Road / Manton Lane*	1,083,538
Area 2 Bromham Road / Shakespeare Road	780,025
Area 3 Britannia Road (around Hospital)	1,417,166
Area 4 Cowbridge (Amphill Road)	1,410,839
<b>THEME 2 SUB TOTAL</b>	<b>4,691,568</b>
UTMC, Traffic Signals and Monitoring Systems	932,000
Signage, Information, and ANPR enforcement	1,208,684
TDM support initiative and SMART Mobility Roadmap	135,000
<b>THEME 3 SUB TOTAL</b>	<b>2,347,684</b>
<b>Utilities</b>	<b>2,649,358</b>
<b>BASIC SCHEME COSTS</b>	<b>15,286,792</b>
<b>*Without NPIF funding</b>	

- 1.2.6 BBC have been awarded funding under the DfT National Productivity Investment Fund (NPIF) for the 'Bedford Northern Gateway'. This additional funding will facilitate further capacity improvements at and around the Clapham Rd / Manton Lane; Great Ouse Way / Paula Radcliffe Way & the Manton Lane/Brickhill Drive junction in a more comprehensive traffic management scheme. Benefits of the wider NPIF bid aren't included in the analysis for this scheme and the interdependency of the two projects is reflected in the strategic case rather than here in the Financial Case. The delivery of the NPIF project is referenced in the Risk Strategy and the project programme contained within the Business Case (Management Case) section.

### **1.3 Inflation**

- 1.3.1 An allowance for inflation has been applied to adjust the costs from September 2017 prices to April 2018 prices of @ 1.5% (£221,155).

### **1.4 Contingencies & Risk**

- 1.4.1 An allowance of £2,910,000 based on the P80 outputs from the Quantitative Risk Assessment has been applied to cover contingencies and risk across all elements of the project delivery.
- 1.4.2 The QRA has been developed to consider, manage and mitigate risks associated with delivery of the project, including a number of financial risks. LGF funding allocations are time limited to March 2021, which does create a risk if there are delays in delivery of the project. The Business case management case section outlines the robust approach to risk mitigation, delivery programming and monitoring to ensure spend of LFG funds before end of the programme.

### **1.5 Optimism Bias**

- 1.5.1 Optimism bias refers to the tendency for scheme promoters to be overly optimistic about scheme costs. DfT WebTAG unit A1.2 sets out the recommended contingency which should be added to the scheme costs. However, in line with HM Treasury guidance document "Early financial cost estimates of infrastructure programmes and projects and the treatment of uncertainty and risk- March 2015" optimism bias should not be included in project funding. The risk-adjusted scheme cost estimate is, therefore, considered robust but will be reviewed as the scheme proceeds. It is applied at 44% (which is obviously high for this stage of a project) but this is considered appropriate as the risk assessment is developed, and the UTM technology elements of the works package are refined.

## 1.6 Final Scheme Costs

1.6.1 Table 9 below indicates the costs associated with the proposed scheme including inflation and contingency & risk allowance.

**Table 2. Summary of Final Scheme Costs (2018 Q2)**

COST ELEMENT	COST (£)
Estimated Basic Scheme Costs	15,286,792
Inflation adjustment to 2019/20	221,155
Contingency & Risk	2,910,000
<b>Total</b>	<b>18,417,947</b>

## 1.7 Budgets and Funding Cover

1.7.1 The Bedford Town Centre Transport Strategy Scheme is a pipeline scheme planned to be delivered by BBC as part of the South East Midlands Local Enterprise Partnership (SEMLEP) Growth Deal originally agreed between SEMLEP and Government in 2014. A total of £15.5m is currently allocated to the scheme.

1.7.2 An additional £ 2,920,000 will be provided by a combination of BBC Capital budgets and CIL funding held by BBC to delivery the aims of the project. The timing of this funding will be reviewed throughout the programme in accordance with BBC Medium term financial strategy. Funding could continue after 2021 if required.

1.7.3 The total funding for the Bedford Town Centre Transport Strategy scheme is £18,420,000. The total cost is £18,417,947.

1.7.4 Details of the Councils forward capital budget can be seen online at [the Borough Councils Website here](#). Item 18 Appendix B confirms budgets allocated for 2018/19; 2019/20 of £2.208M each year. Part of this funding and a similar allocation planned for 2020/21) will be utilised for the Councils contribution to the project – along with any unforeseen additional costs, which would be covered by BBC.

1.7.5 The spend profile for the project is shown below in Table 3.

1.7.6 The BBC contribution would be flexible, up to the maximum of £2.300M per annum allocated within the Councils forward capital budget.

1.7.7 A supplementary appendix will be added to the business case with conformation from the BBC S151 officer of the BBC contributions to demonstrate surety about the complete funding package. LGF funding will be covered by a legal agreement which is expected to be finalised early in 2018.

**Table 3. Outturn Spend Profile**

	Total	2018/19	2019/20	2020/21
<b>TOTAL</b>	<b>£18,420,000</b>	£3,110,000	£6,710,000	£8,600,000
LGF Funding	<b>£15,500,000</b>	£2,800,000	£6,200,000	£6,500,000
Breakdown of LGF Funding				
LGF3	<b>£4,500,000</b>	£1,500,000	£1,300,000	£1,700,000
LGF2	<b>£11,000,000</b>	£1,300,000	£4,900,000	£4,800,000
BBC Funding	<b>£2,920,000</b>	£310,000	£510,000	£2,100,000

## 1.8 Whole Life Costs

- 1.8.1 Future maintenance works associated with the scheme will be added to the maintenance inventory and funded from BBCs maintenance budgets. It is anticipated that the provision of new or upgraded assets (such as drainage system and pavement/footways) could reduce some future maintenance liabilities on BBC. Overall an annual allowance of 1% of the base scheme costs (excluding traffic management, preliminaries, utilities and contingency) have been included to cover any additional maintenance costs. This equates to an undiscounted value of £83,363 pa.

## 1.9 Financial Risks

- 1.9.1 The project is conditional on the allocation of LGF monies.
- 1.9.2 Funding from BBC has been included in the Councils Revised Capital Programme 2017/2018 to 2020/2021, and agreed by the Councils Executive on 20 Sept 2017.
- 1.9.3 An initial risk management strategy is presented within the 'Management Case'. This would be developed further upon progression of the project; however, subject to the availability of the LGF contribution, the financial risks are considered to be low.

## 1.10 Accounting Implications

- 1.10.1 The following implications on public accounts are expected:
- Devolved LEP funding of £15.5m (84%) of the scheme costs is requested with expenditure starting in the 2018/19 financial year;
  - Maintenance costs will be added to the maintenance inventory and funded from BBC's maintenance budgets; and
  - There are no state aid issues to address

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## FULL BUSINESS CASE



# BEDFORD TOWN CENTRE TRANSPORT STRATEGY

## FULL BUSINESS CASE

### IDENTIFICATION TABLE

<b>Client/Project owner</b>	Bedford Borough Council
<b>Project</b>	Bedford Town Centre Transport Strategy
<b>Study</b>	Full Business Case
<b>Type of document</b>	Report
<b>Date</b>	09/11/2017
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	Approved by			
2	Author			
	Checked by			
	Approved by			

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## 1. THE ECONOMIC CASE

### 1.1 Introduction

- 1.1.1 The economic assessment is undertaken to ensure that the full extent of the impact of the scheme on the public account is understood and to ensure that the scheme offers value for money.
- 1.1.2 The overall package of scheme measures is anticipated to derive a wide range of benefits. Whilst some of the measures will engender traditional transport user benefits (such as junction infrastructure improvements), other elements (such as the High Street enhancements) are being developed to specifically enhance the town centre urban realm, so as to directly benefit the town economy, rather than purely focussing on improving overall journey times. Indeed, for certain parts of the core town centre network the proposed reduction in highway capacity may have some marginal negative impacts upon vehicular traffic, whilst at the same time improving accessibility and journey times for pedestrians.
- 1.1.3 Furthermore, whilst some of the benefits from the 'UTMC and Technology' package will significantly reduce journey times through enhanced network management, the package is also specifically aimed at enhancing the reliability of the transport network and improve the choices individuals have to travel, without always specifically improving overall journey times on some parts of the network.
- 1.1.4 This combination of benefits makes this package of measures challenging to appraise and, as such, requires a flexible approach to develop an accurate analysis of the overall impact of the scheme measures. The principles for the assessment are fundamentally based upon the DfT criteria, set out within WebTAG. Standard approaches to assessing transport user impacts have been undertaken applying the outputs from a traditional transport model. Whilst providing valuable insights into the performance of specific infrastructure measures, the modelling software has a variety of limitations for analysing some of the other key impacts of the overall package of measures. To assess some of these other impacts a range of other approaches have been adopted. These specifically include:
- Case study evidence of the impact of UTMC technology upon the efficient use of network capacity, including the potential reduction in congestion and delay
  - Transport for London's Valuing Urban Realm Toolkit (VURT) to assess the pedestrian user benefits from enhance public realm
  - Bedford property market assessment of rateable values and the rental market for retail units to determine the current variation in values across the town centre and the potential impact of the public realm scheme.
- 1.1.5 Each element of the benefits assessments process is set out in the sections below.

## 1.2 Direct Transport User Impacts

- 1.2.1 A range of elements within the overall package of measures will have a direct impact upon the operation of the transport network and result in potential changes to journey times and the user costs of travel. The 'Theme 2 Pinch-point' schemes are designed to have a positive impact upon available highway capacity to reduce congestion on key parts of the network. The 'Theme 1 Public Realm' measures include variations to the highway network within the core town centre, specifically the High Street, that will also directly impact upon the operation of the highway network. These elements of the overall package of measures have been evaluated within a traditional strategic highway network model.

## 1.3 Modelling Approach

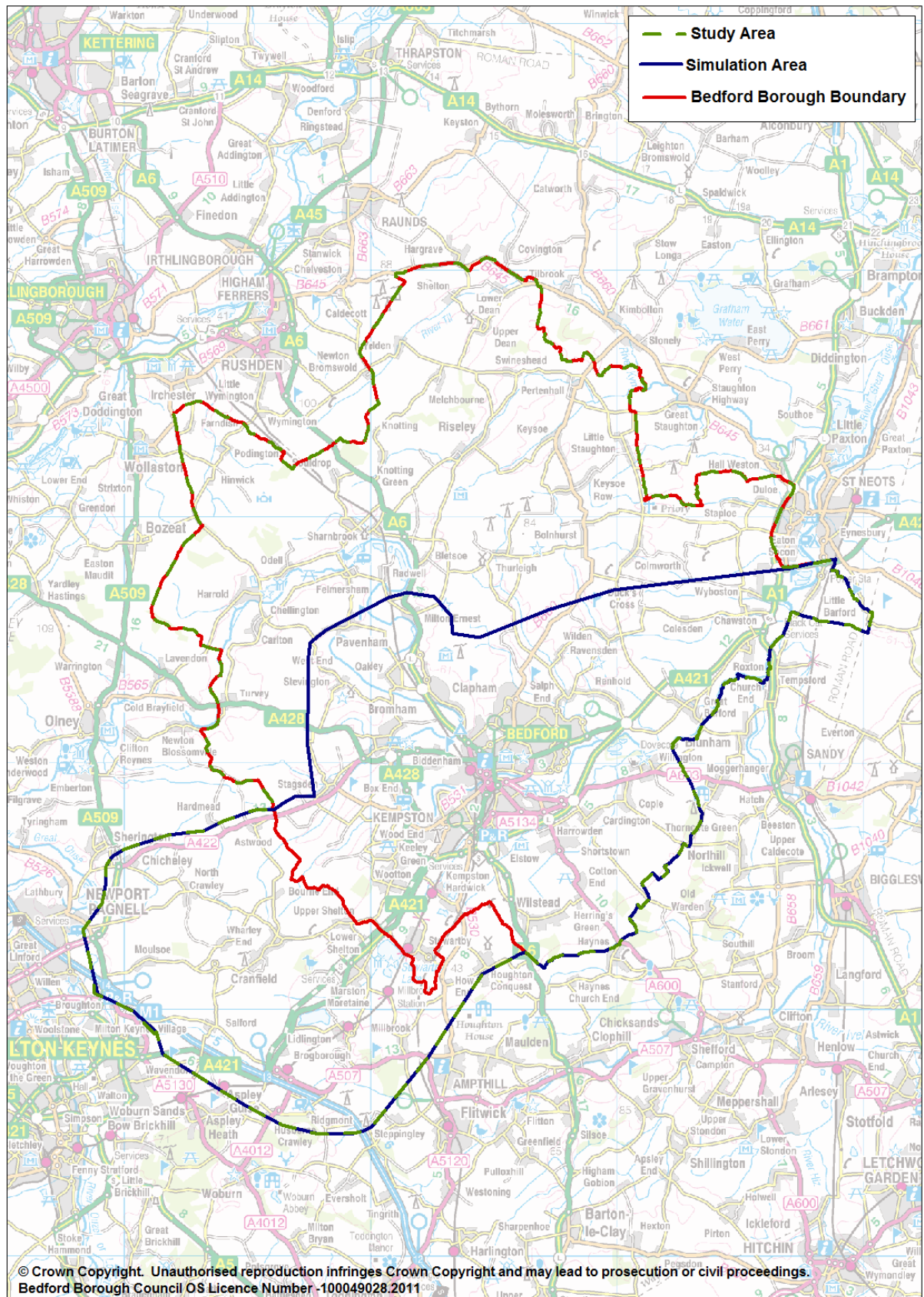
- 1.3.1 The direct transport modelling analysis has been undertaken using Bedford Borough Councils Strategic SATURN model. This model offers the capability to assess the network wide impact of the proposed physical infrastructure elements and to determine the impact on the overall operation of the highway network.

### **SATURN Model**

- 1.3.2 The baseline SATURN model has the following characteristics:
- 240 zones, including 43 'dummy' zones built into the model for the purpose of forecasting in relation to proposed development locations
  - The model represents the AM peak hour (0730-0830), Inter Peak hour (1000-1600 average) and PM peak hour (1700-1800).
  - It includes two user classes: light vehicles (cars and light goods vehicles) and heavy goods vehicles
- 1.3.3 The full network coverage of the SATURN model is provided in **Figure 1 and 2**.

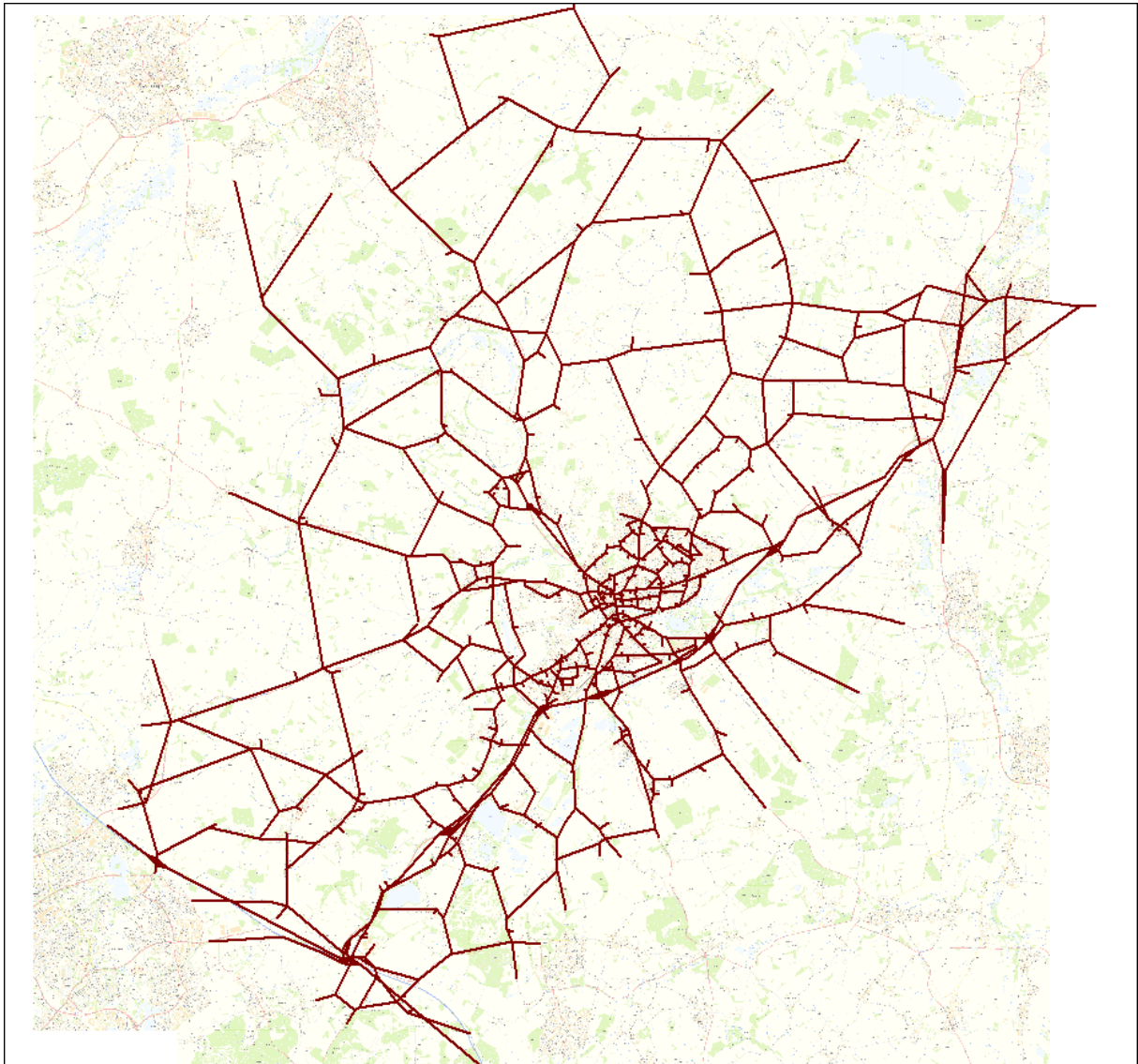


**Figure 1. Bedford SATURN Model Full Model and Simulation Area**





**Figure 2. Bedford SATURN Main Study Area Network Coverage**



- 1.3.4 The highway assignment model has been calibrated and validated following DMRB's and latest WebTAG guidance. This is fully documented in a Local Model Validation Report (LMVR) produced on behalf of Bedford Borough Council by JMP Consultants Ltd.
- 1.3.5 The original 2011 Bedford Base Year SATURN model was developed and validated in 2012 and covered the urban area of Bedford and the rural area in the north of the Borough. The matrices were created using the existing A421 forecast year 2011 model matrix, St. Neots base year model matrix, the 2001 Census and RSI data. The base year model was validated against 2011 observed traffic flow and journey time data.
- 1.3.6 Additional data was collected and collated in 2014/15 with which to update the model and re-calibrate and re-validate. This data included Manual Classified Counts, Traffic Master Journey Time Data, National Census Journey to Work Data from the 2011 Census, and Bus Route and Timetable Information.

- 1.3.7 Updates to the network structure were made, including node types, capacities, link distances and speed, signal timings, and zone connectors.

### Calibration

- 1.3.8 Table 1 provides a summary of the high level of overall calibration achieved for the AM and PM peak models.

**Table 1. Overall Calibration Statistics of the Model**

MODEL	CORDON	DIRECTION	GEH <5 CALIBRATION	FLOW CALIBRATION
AM	Cordon 1	IN	✓	✓
		OUT	✓	✓
	Cordon 2	IN	✓	✓
		OUT	✓	✓
	A421	IN	✓	✓
		OUT	✓	✓
IP	Cordon 1	IN	✓	✓
		OUT	✓	✓
	Cordon 2	IN	✓	✓
		OUT	x	x
	A421	IN	✓	✓
		OUT	✓	✓
PM	Cordon 1	IN	✓	✓
		OUT	✓	✓
	Cordon 2	IN	✓	✓
		OUT	✓	x
	A421	IN	✓	✓
		OUT	✓	✓

- 1.3.9 The AM peak calibration shows that the matrix estimation ensured that the post ME matrix met the DMRB criteria for both the cordons/A421 and individual links.

- 1.3.10 The Inter peak and PM peak calibration shows that the matrix estimation ensured that the post ME matrix met the DMRB criteria for individual links. The total of the cordons/A421 is just below the 85% criteria, noting that this equates to one of the six values not quite meeting the criteria.

### Validation

- 1.3.11 Table 2 presents the outputs of the validation process.

**Table 2. Overall Calibration Statistics of the Model**

MODEL	SCREENLINE	DIRECTION	GEH <5 CALIBRATION	FLOW CALIBRATION
AM	Screenline 1	NB	X	✓
		SB	✓	✓
	Screenline 2	NB	✓	✓
		SB	✓	✓
IP	Screenline 1	NB	x	X
		SB	✓	✓
	Screenline 2	NB	x	x
		SB	✓	✓
PM	Screenline 1	NB	✓	✓
		SB	x	✓
	Screenline 2	NB	✓	✓
		SB	✓	✓

- 1.3.12 The AM peak validation results shows that the model meets the GEH criteria overall, almost meeting the criteria for individual links. Conversely the model meets flow criteria for individual links, however the river screenline northbound falls just short of the 5% criteria. Overall it is considered that the AM peak model validates satisfactorily.
- 1.3.13 The PM peak validation results shows that the model has achieved DMRB flow and GEH criteria for individual links. GEH criteria are satisfied for all screenlines, however the river screenline does not quite meet the 5% flow criteria. Overall it is considered that the PM peak model validates satisfactorily.
- 1.3.14 The Inter peak validation results show that the model does not perform as well as the AM and PM models. This is considered to be due to the prior matrix construction as an average of AM and PM models, and the reduced traffic data available to inform the model. As such it was concluded that more weight be given to the AM and PM models.
- 1.3.15 Modelled journey times were compared with the observed journey time data across the 10 routes. Summaries of the overall modelled and observed journey time comparisons for each route are provided in Tables 5.13 to 5.15 for all the time periods. The results are summarised as
- in the AM peak 19 out of 20 routes (95%) satisfy the DMRB journey time validation criteria;
  - in the Inter peak all the routes (100%) satisfy the DMRB criteria for journey time validation; and
  - in the PM peak 17 out of 20 routes (85%) satisfy the DMRB journey time validation criteria
- 1.3.16 The LMVR report is provided in support of this submission.

### **Proportionality of Modelling Approach**

- 1.3.17 The Guidance for Technical Project Managers in WebTAG discusses the concept of proportionality in relation to model design. Below is a summary of the salient points in that section that need to be considered.
- 1.3.18 WebTAG sets out appropriate scheme modelling approaches taking into account the circumstances, objectives, and the stage of an appraisal and decision-making process. It discusses the trade-offs between model complexity and constraints on resource, data requirements and expertise. In general, the model design will depend on: the nature of the problem and likely solutions; the size of the study area; the number of options to be tested; data availability; the need to update models and conduct new surveys; timescales for model development; and finally the required accuracy of the recommendations. The previous section has demonstrated the capabilities and robustness of the SATURN model and its appropriateness for use in appraising the scheme.
- 1.3.19 For a standard highway schemes, WebTAG recommends that the potential effects of variable demand (resulting through induced or suppressed demand) are considered. Whilst the package of measures incorporates a range of interventions that impact upon the operation of the highway network, it does not specifically seek to increase physical capacity, rather there is a balance of physical measures, some increasing and some reducing overall highway capacity. Alongside this the 'UTMC and Technology' package seeks to improve the efficiency and reliability of the network, whilst providing the information for people to make informed decisions about the way that they travel. This could engender some changes in mode of travel with the potential for lower levels of private car trips. Due to the intricacies and interrelationships of the physical and technology measures it is challenging to predict the scale of these changes, so for the purposes of the appraisal a conservative approach has been adopted with a fixed highway matrix applied.
- 1.3.20 Whilst the SATURN model covers the AM peak, inter-peak, and PM peak periods, the LMVR highlights that the inter-peak model is, effectively, a hybrid of the AM and PM peak models. Its overall performance is not as strong as either the AM or PM peak models. Given the focus of the proposed highway measures is to mitigate against peak levels of congestion on the network, the impact of the scheme will be less significant in the inter-peak period. It is anticipated that the impact of the reduction of capacity on the High Street and St. Paul's Square will have limited impact with the lower traffic flows during the inter-peak and, similarly, the benefits from the Pinchpoint and UTMC & Technology schemes will also have limited impact. Given the limitations of the inter-peak model is has therefore been concluded that there was limit benefit from utilising this time period and that the direct user impacts of the measures, whilst likely to deliver some benefits, could broadly be considered neutral. This is considered to be a conservative approach.

### **Adopted Modelling Approach**

- 1.3.21 The adopted modelling approach incorporates a fixed highway matrix. Two forecast years have been utilised (2021 and 2032) with the modelling work carried out for two time periods (AM and PM peaks).
- 1.3.22 Model user distance, journey time and cost and costs skims have been exported from the DM and DS models to be fed into DfT's TUBA appraisal software.

## 1.4 UTMC and Technology Benefits

- 1.4.1 The technology package is considered to be dealing with a greenfield scheme on the basis that the current ITS equipment is fragmented and there has been limited integration to date which has rendered the provision less effective at managing the transport network than it could have been. Furthermore, the equipment has now reached end of life.
- 1.4.2 The benefits of this package of measures will cover a range of outputs and outcomes, including but not limited to: reduced congestion, long-term capacity planning, incident management, improved public transport (reduced delay), improved road safety, reduced fuel consumption and emissions, better assets management and more choice for the general public.
- 1.4.3 For the purpose of this benefit analysis we have assessed one metric, the total level of delay at each of the junctions listed below in the AM and PM peak (junction delay in seconds) in the 2021 baseline model. Local Plan growth rates have been applied to the delay savings to account for underlying growth in vehicle trips across the network.
- 1.4.4 The following junctions will be signalised, or current provision reviewed and upgraded to feed into the Urban Traffic Management and Control (UTMC) system:
- Clapham Road / Manton Lane / Shakespeare Road;
  - Bromham Road / Shakespeare Road / Ashburnham Road;
  - Midland Road / River Street;
  - Bromham Road / Union Street / Greyfriars;
  - Bromham Road / Hassett Street;
  - Dame Alice Street / The Broadway / St Peter's Street / High Street;
  - St Peter's Street / St Cuthbert's Street;
  - St Mary's Street / Cardington Road / St John's Street / Cauldwell Street;
  - Cauldwell Street / Kingsway;
  - Cauldwell Street / Prebend Street;
  - Kempston Road / Britannia Road / Cauldwell Street;
  - Britannia Road / Ampthill Road;
  - Elstow Road / London Road;
  - Elstow Road / Ampthill Road;
  - Ampthill Road / West End / A6;
  - Dame Alice Street / Harpur Street;
  - Tavistock Street / Harpur Street;
  - Ampthill Road (North of Cowbridge) ; and
  - Ampthill Road (South of Cowbridge)
- 1.4.5 The model shows 519 and 413 AM and PM peak hours of delay each weekday.
- 1.4.6 The associated 'Bedford UTMC and Technology Package Note' (submitted in support of this Business Case) sets out a range of benchmarking case studies that establish a range of benefits derived from these types of schemes. Whilst there is relatively limited recent evidence, there are some useful examples that are directly relevant to Bedford, given the

underlying basis that the current traffic management systems in the town are obsolete and so the scheme is, effectively, starting from a position with no underlying system. The evidence base indicates a range of delay reductions between 12% and 30%, with an average of 23%.

1.4.7 This evidence base has been utilised to determine the potential impact of the scheme in reducing delay across the junctions outlined above. A relatively conservative approach has been adopted as follows:

- 17.3% Central Case (75% of the average delay reduction benefits from case study schemes of 23%)
- 23% High (100% of the average delay reduction benefits)
- 11.5% Low (50% of the average delay reduction benefits)

1.4.8 The Central Case represented three quarters of the average benefits derived within the case study examples. In reality, with the continued progression of technological systems, it would be anticipated that much higher benefits are likely to be derived up to or exceeding the 30% benefits observed in the scheme in Southampton.

1.4.9 The Central Case journey time savings are forecast to be equivalent to 241 hours across a typical weekday, incorporating two 90 minute peak periods. In reality, the systems should also deliver additional benefits across other time periods in the week through better routing of traffic and phasing of traffic signals.

## 1.5 VURT Benefits

1.5.1 The package of transport improvements proposed for Bedford includes significant improvements to the public realm in the town centre focused on, but not exclusive to, the High Street. Although not a traditional methodology in transport appraisal, the consideration of wider benefits brought by urban realm improvements is becoming an integral part of the process. Urban realm assessment allows the monetisation of benefits associated with improved journey ambience experienced by pedestrians moving through the area.

1.5.2 This economic benefit can be quantified using the Valuing Urban Realm Toolkit (VURT) methodology developed by Transport for London (TfL). In order to capture the intrinsic value of how users assess enhanced urban realm TfL completed stated preference research to estimate respondents' willingness to pay for improvements to spaces they use. The results of this study have been applied to the Pedestrian Environment Review System (PERS) to allocate a monetary value to individual PERS scores. By completing a PERS audit before and after a scheme is implemented, and using the values proposed by TfL, it is possible to estimate the benefits derived from urban realm improvements.

1.5.3 The TfL methodology is applicable to the Bedford with some modification to accommodate the socio-economic differences between the study area and London. This approach has been chosen because through being based on PERS scores VURT allows an assessment in change in quality of a range of different factors which contribute to the perception of urban realm. This is a more nuanced approach than the simple values per



km of the introduction of seven specific aspects that are listed in the March 2017 WebTAG release.

1.5.4 The VURT methodology relies upon breaking a given area into a section of links and public spaces that can be scored using the PERS. PERS aims to be ‘a systematic process designed to assess the quality of the pedestrian environment within a framework that promotes objectivity’<sup>1</sup>. Areas used by pedestrians are assessed on a number of criteria for which a score is generated on scale of -3 to 3. Different criteria are used to assess pedestrian environments, with environments classified as links or spaces being utilised by VURT. Any footway, footpath or highway can be classified as a link, whilst a public space is seen as an area primarily for the public to rest in and enjoy.

1.5.5 The process of using the VURT is as follows:

- Identify links and spaces within study area;
- Complete PERS audit of links and spaces under current conditions;
- Estimate likely PERS scores for each link and space for future scenario on completion of urban realm improvements;
- Establish volumes of pedestrians using each link and space currently;
- Forecast future scenario pedestrian volumes;
- Estimate time spent by pedestrians in study area by estimating average dwell time for spaces or calculating using link length and average walking speed for links;
- Enter current and future PERS scores and pedestrian counts into VURT spreadsheet, which establishes value of change in PERS scores and multiplies by number of pedestrians and time spent in environment to estimate total journey ambience benefit.

1.5.6 To take account of the difference in socio-economic conditions of the study area in comparison to London, the willingness to pay values within the VURT have been adjusted. Gross Disposable Household Income (GDHI) has been used to factor these values. The latest ONS data for 2015, estimates GDHI for London at £25,293 and for Bedford at £19,092<sup>2</sup>. Therefore the forecast benefits have been reduced by 0.75 as per the ratio between these two values.

#### **Pedestrian Environment Reviews System (PERS) Audits**

1.5.7 PERS audits were originally conducted across Bedford Town Centre in 2014 by a team of three trained auditors. In 2017, a Principal Urban Designer went back out on site to review and verify the audits specifically for the High Street and St. Paul’s Square. The audit area was broken into four designated ‘links’ and one designated ‘space’. A PERS Audit was completed for each link and space

1.5.8 The Principal Urban Designer subsequently evaluated the proposed public realm scheme enhancements. This concluded that it will deliver an increase in PERS scores by +2 in all aspects for all links, excluding lighting as the maximum benefits attributable to lighting

<sup>1</sup> PERS Handbook Version 2, May 2006, TfL

<sup>2</sup><https://www.ons.gov.uk/economy/regionalaccounts/grossdisposablehouseholdincome/bulletins/regionalgrossdisposablehouseholdincomegdhi/2015>



have already been achieved through completion of a DfT Challenge Fund Project to modernise street lighting across Bedford.

### **Pedestrian Counts**

- 1.5.9 The Pedestrian counts were broken up into three sites, with each site breaking the counts up into a number of links and crossing points. These links and crossing points took counts of pedestrians travelling in North and South bound directions, as well as East and West directions, which depends on the orientation of the crossing.
- 1.5.10 The Pedestrian counts took place over a four day period, starting on a Wednesday and ending on a Saturday.
- 1.5.11 Future pedestrian numbers have been estimated by applying the underlying profile of housing growth across the whole of Bedford as a proxy for growth in retail and leisure activity within the town centre. No specific allowance for induced pedestrian trips has been included, albeit that the scheme is envisaged to encourage much higher levels of footfall across the High Street and St. Paul's Square. As such, the pedestrian numbers applied are considered to be conservative in nature.

### **VURT Method and Assumptions**

- 1.5.12 To attain the average daily footfall through a PERS link, the weekly average was first calculated. The method to calculate this was as follows:
- The first two days of the pedestrian counts, were totalled together and divided by two to provide an average. This average is assumed to represent the average daily footfall on any day Monday to Thursday.
  - The third day of pedestrian counts were then totalled and this represented the Friday average footfall.
  - The last day of pedestrian counts that took place on a Saturday, was then totalled and is assumed to also be the Sunday average.
  - Finally, to attain a weekly average, the average footfall for a day Monday to Thursday was multiplied by four to give the four day average footfall. The average for Friday was then combined with this, as is the Saturday and Sunday figure. This gave the weekly average footfall, this was then divided by seven to provide an average daily footfall through a PERS link.
- 1.5.13 For PERS Link 1, the North and Southbound pedestrian counts from Site 1 were used.
- 1.5.14 For PERS Link 2, the North and Southbound pedestrian counts from Site 3 were used.
- 1.5.15 For PERS Link 3, the pedestrian counts from Crossing point 2 in Site 3 were used and then multiplied by 2. This was done as Crossing point 2 is not capturing all of the footfall through Link 3, because many pedestrians may not use Crossing point 2 to enter and exit the square.
- 1.5.16 For PERS Link 5, the pedestrian counts from Crossing point 2 and 3 in Site 2 were used.

- 1.5.17 For PERS Space 2, the Northbound and Southbound count on the western side of the High Street in Site 3 was used. However, when calculating the benefits of a space VURT needs the number of static users and their dwell times within the space. So, the assumption was made that only half of the daily footfall were used to represent static users within the space, with the average dwell time being set to 10 mins.

#### VURT Appraisal Outputs

- 1.5.18 The TfL VURT 2016 has been updated with July 2017 WebTAG Value of Time Multipliers, GDP Deflators and Discount Factors<sup>3</sup>. Through combining the PERS scores and estimates of pedestrian footfall, the following user benefits from journey ambience have been estimated from the urban realm in Bedford.

**Table 3. Urban Realm Pedestrian Journey Ambience Benefits (2021 in 2010 Prices)**

AREA	SINGLE YEAR SCHEME OPENING YEAR BENEFITS
Link 1	£16,475
Link 2	£9,606
Link 3	£18,122
Link 5	£5,563
Space 2	£5,452
<b>Total</b>	<b>£55,219</b>

## 1.6 Retail Market Benefits

- 1.6.1 A primary aim of the proposed 'Theme 1 Public Realm' package of measures is to re-balance functional space within the heart of the town centre along the High Street and St. Paul's Square, to provide improved permeability for pedestrians and create an enhanced retail and leisure environment, with wider pavements and high quality, safe and secure, urban realm.
- 1.6.2 Some of the direct benefits from this scheme have been measured through the VURT assessment (described in Section 1.5); however, the benefits will extend far beyond these to the underlying value of retail properties within the area. Whilst the VURT tool also provides a mechanism for assessing property values, a set of Bedford specific data is available that provides a direct assessment of the impact of different urban realm context upon the subsequent value for property in the town centre. This is considered to provide a significantly more robust assessment of the impacts in Bedford than the VURT tool.
- 1.6.3 The stakeholder engagement process put forward a hypothesis that there are significant variations in the rateable values for retail outlet across the core town centre. More

<sup>3</sup> <https://www.gov.uk/government/publications/webtag-tag-data-book-july-2017>

specifically, the anecdotal evidence indicated that rateable values, and hence rental values, are considerably higher within the heart of the core pedestrianised town centre, than they are on the heavily trafficked High Street.

- 1.6.4 To test this hypothesis data was obtained from the Business Rate Valuation (<https://www.tax.service.gov.uk/business-rates-find/search>) service. This allows a search of rateable values by categories for different locations. Two separate searches were undertaken for 'Shop & Premises' specifically examining 'Retail Zone A' rates. One search focused upon five properties on the High Street, the other for five properties within the heart of the pedestrianised retail area in Bedford, e.g. at the junction of Silver Street, Harpur Street, Midland Road. The full set of data is presented within **Appendix B**, with the average rateable value for 'Retail Zone A' were as follows:

- High Street = £305/sqm
- Pedestrianised Core = £772/sqm

- 1.6.5 This demonstrates a significant variation in rateable values, with the average for the 'Pedestrianised Core' over 250% higher. There will clearly be a number of influences over this variation in value; however, fundamentally these areas are very closely, geographically located and the divergence in value can only, ultimately, be driven off the fact that Silver Street, Midland Road, and Harpur Street became part of the core pedestrianised area, and the focus for retail, whereas the High Street has remained primarily a vehicular thoroughfare, with retail a secondary function. Were this dynamic to change, there is no logical reason why the High Street could not develop into a similarly important retail centre over time. Such a change would not be immediate; rather it would develop over time as the High Street became a more prominent locality.

- 1.6.6 The proposed 'Theme 1 Public Realm' package, whilst not delivering full pedestrianisation, will result in a significant enhancement to the retail environment. As an example, the overall Pedestrian Environmental Review Survey (PERS) scores for the north of the High Street are currently rated at 7. The proposed improvements are forecast to increase this to a score of around 30. This compares to a maximum score for full pedestrianisation of 36. The proposed scheme is, therefore, predicted to improvement the standard of the urban realm to a level the equivalent of 83% of full pedestrianisation.

- 1.6.7 Applying this factor to differential in rateable values between the High Street and the 'Pedestrianised Core' would suggest the scheme could increase rateable values by up to 211%.

- 1.6.8 The subsequent challenge is to determine how important a factor the 'quality of the urban realm' is in terms of value placed upon a retail locality, and hence its rateable value. Putting aside the actual quality of the retail property itself (which can clearly vary whatever the locality of the premises), there are undoubtedly a range of other influences upon the rateable value, such as proximity to other retail outlets and facilities that are in the core of the pedestrianised area. It can be argued, however, that all of these could change over time if the central 'gravity' of the town retail core was extended eastwards towards the High Street. The quality of urban realm in creating attractive locations for shoppers to dwell, therefore, becomes a key element. Even so, without any specific

qualitative data with which to determine the importance of public realm, a conservative approach has been undertaken, with the following assumed proportional impact:

- Central Case = 25% of differential impact attributed to Urban Realm
- High Case = 30%
- Low Case = 20%

1.6.9 On the basis of these assumed proportional impacts, the overall assessment of the benefit generated as a result of the 'Theme 1 Public Realm' scheme would be:

- Central Case = 53% uplift in rateable value (183% \* 25%)
- High Case = 63% (183% \* 30%)
- Low Case = 42% (183% \* 20%)

1.6.10 These uplifts have been applied to current average rateable value as follows:

- Central Case = £305/sqm \* 53% = £160.89 uplift
- High Case = £305/sqm \* 63% = £193.07 uplift
- Low Case = £305/sqm \* 42% = £128.71 uplift

1.6.11 These uplifts in rateable value have then been applied to the estimated retail floorspace located in direct contact with the proposed public realm enhancements on the High Street and St. Paul's Square, of around 28,500 sqm. This would generate the following total uplift in rateable values:

- Central Case = £160.89 \* 28,500 = £55,023,525
- High Case = £193.07 \* 28,500 = £66,028,230
- Low Case = £128.71 \* 28,500 = £44,018,820

1.6.12 As discussed above, it is acknowledged that these benefits are unlikely to be engendered immediately as it will both take time for the dynamic of the town centre to change but also there will be existing rental contracts in place. To account for these factors, it has been assumed that the benefits will be realised over the first 5 years, as per the following profile:

- Year 1 Benefits = 10%
- Year 2 = 25%
- Year 3 = 50%
- Year 4 = 75%
- Year 5 = 100%

1.6.13 Evidence suggests that there is strong potential for these uplifts to be achieved, with demand for retail space and evidence of pedestrian growth in the town centre. Latest footfall figures<sup>4</sup> show a 5.3% increase in town centre footfall in the first six months of 2017 compared to the same period in 2016.

<sup>4</sup> [https://www.bedford.gov.uk/council\\_and\\_democracy/council\\_news/archived\\_news/july\\_2017/footfall.aspx](https://www.bedford.gov.uk/council_and_democracy/council_news/archived_news/july_2017/footfall.aspx)

## 1.7 Appraisal Assumptions

- 1.7.1 The direct transport user benefits related to infrastructure measures have been assessed within the SATURN model, with the outputs extracted into TUBA. The latest 2017 version of TUBA has been applied, with the standard economic factors. This includes the latest Values of Time from the July 2017 WebTAG databook.
- 1.7.2 An annualisation factor of 253 has been applied, capturing the benefits across the standard number of weekdays across a year (52\*5 minus 7 bank holidays).
- 1.7.3 All AM and PM benefits and disbenefits have been factored by 1.5 to reflect the observed 90 minute peak periods of traffic flow across Bedford, as documented within the 'Bedford Town Centre Transport Strategy – Report of Surveys (2015)'.
- 1.7.4 All of the measures have been appraised across a 30 year period, reflecting the range of some scheme elements in terms of technology and urban realm improvements. All benefits are discounted to 2010 prices, in line with DfT WebTAG guidance.
- 1.7.5 Development growth forecasting data is available up to 2032 and is set out within 'Bedford Forecasting Report (2015)'. This has been applied within the analysis. Absolute levels of traffic, and journey times, and hence benefits, are assumed to remain constant from 2032 onwards.
- 1.7.6 Public Transport impacts have not been quantified within the appraisal. The package of scheme measures will benefit bus services operating along the former A6 northern and southern gateway corridors, both in the potential to reduce journey times, but explicitly in terms of improving journey time reliability. In the absence of a multi-modal model, it has not been feasible to explicitly examine the impact upon public transport; however, given the improvements will impact both bus passengers and car drivers/passengers, it is not anticipated that there will be any significant mode shift resulting from the package of measures. An assessment of the impact of the measures on public transport provision is included within the qualitative assessment.

## 1.8 Options Appraised

### Reference Scenario

- 1.8.1 A Reference Scenario has been created for both 2021 and 2032 that reflects committed development and the transport highway schemes that will be delivered in isolation of the delivery of the proposed town centre transport strategy package of measures.
- 1.8.2 Details of the future year forecasting are set out within the 'Bedford Forecasting Report (2015)', which sets out the profile of development growth to 2021 and 2032, alongside details of the TRICS-based trip generation process.

### Core Scenario

- 1.8.3 The Core Scenario reflects the Reference Scenario but includes the all three elements of the proposed package of scheme measures.

### High and Low Scenarios

1.8.4 High and low sensitivity tests have been undertaken to understand the impact of different underlying growth assumptions on the Core Scenario. The details of these sensitivity tests have been described in some of the sections previously but are summarised within Section 1.1. They include:

- a high and low growth assessment (+/- 7.9% for 2021 and +/- 11.5% for 2032)
- a high and low 'UTMC and Technology' impact
- a high and low 'public realm' impact

### Construction Impacts

1.8.5 The public realm and highway infrastructure elements of the package of measures will require temporary traffic management measures during the construction phase; however, major works will be timed to co-inside with low levels of traffic or will be very short-term in nature. The implementation of the UTMC and Technology measures will have limited disruption to the operation of the transport network.

1.8.6 The delivery of the package of measures has been phased to ensure the implementation of some UTMC and Technology measures in advance of the highway infrastructure works to ensure the benefits of these systems are in place before major roadworks commence. Furthermore, the infrastructure schemes will be delivered in a manner that minimises the level of disruption to general traffic movements. In regards to the public realm works on the High Street and St. Paul's Square, whilst the works will require reduction in highway capacity, this will be no greater than the final scheme itself.

1.8.7 Overall, any significant negative impact during the construction phase will be very short-term in nature. By phasing the implementation of UTMC measures, the benefits of these schemes will be delivered in advance of any general disruption from highway infrastructure works. Whilst the impacts have not been quantified, there are considered to be very small in nature.

## 1.9 Appraisal Summary Table

1.9.1 This section sets out the qualitative and quantitative impacts of the transport scheme which will then be used to inform the Value for Money Statement (Section 1.10). The completed Appraisal Summary Table is provided in **Appendix A**.

### Economy

#### Direct User Benefits

1.9.2 The direct user benefits have been forecast through a combination of the outputs from the TUBA model assessment, as well as the separate 'UTMC and Technology' benefits. A summary is provided in the following table.

**Table 4. Transport User Benefits (£,000s) Discounted to 2010 prices**

USER BENEFIT	TUBA (INFRASTRUCTURE) BENEFIT (£,000)	UTMC & TECHNOLOGY BENEFIT (£,000)	TOTAL BENEFIT (£,000)
Consumer Users (Commuting)	-3,274	8,289	5,015
Consumer Users (Other)	-1,801	4,559	2,728
Business Users and Providers	-1,874	4,745	2,871

1.9.3 The direct user benefits show the overall impact of the package of scheme measures is forecast to have a positive benefit in terms of reducing journey times and vehicle operating costs across the town centre network.

1.9.4 There are, however, a variety of impacts from individual elements of the overall package of measures. The reduction in highway capacity along the High Street and St. Paul's Square is forecast to result in some increases in journey times for certain trip movements. This, though, is part of the wider strategy to minimise the impact of vehicular traffic upon the retail centre, so whilst acting as a disbenefit to private car and freight movements, it offers significant enhancements to pedestrians within the town centre.

1.9.5 The additional 'Alleviating of Pinch-point' and 'UTMC and Technology' packages of measures has been designed to off-set the negative impact of the capacity reduction in the highway and provide more efficient movement of vehicles around the core town centre. The results demonstrate these benefits outweigh the disbenefits to private car and freight movements on the High Street.

#### **Reliability**

1.9.6 Journey time reliability is acknowledged as a key issue currently with parts of the Bedford transport network during peak periods. There is very limited contingency within the network meaning it is susceptible to significant delays as a result of relatively minor incidents.

1.9.7 Journey time reliability has been identified as a particularly key issue along the Ampthill Road corridor. Journey time surveys along the corridor indicate significant variation in times. Within the core 1.5km stretch from Cowbridge to Britannia Road, free-flow journey times are around 2.5 minutes. This increases to around 5 minutes on average, but with peak journey times reaching above 7.5 minutes.

1.9.8 In addition, the completion of the Western Bypass has resulted in a change in vehicle movements around the Clapham Road and Manton Lane area, resulting in perceived significant variability in journey times in this area, albeit detailed journey time data is not yet available.

1.9.9 The UTMC and Technology package of measures are aimed not specifically at just reducing journey times but also ensuring a more consistent journey time along the north and south former A6 corridor leading into the town centre during peak periods. The UTMC system



will aim to regulate traffic to provide more consistency, both across the peak periods but also on a day-to-day basis, increasing the resilience of the network. The benefits will accrue not just on the northern and southern approach corridors, but also within the town centre, where traffic flows into the centre can be regulated to avoid peak network congestion.

- 1.9.10 Whilst WebTAG provides a range of mechanisms to quantify these potential benefits, insufficient data on current journey time variability was available to provide a robust assessment of the current standard deviation of journey times across the corridor. No quantified assessment of benefits is, therefore, presented; however, this is considered to be a strong, positive benefit of the package of measures.

#### **Wider Economic Impacts**

- 1.9.11 Whilst that the package of measures is focused around transport provision, one of the primary objective is to engender wider economic benefits to the local town economy, focusing upon the retail core, as well as providing wider efficiencies to businesses across the town, including the former A6 northern and southern corridors.
- 1.9.12 The public realm enhancements along the High Street and St. Paul's Square are designed to significantly enhance the pedestrian environment to encourage footfall and enhance the retail economy in this part of the town. Section 1.6 sets out the scale of current differential in retail value between the High Street and the core pedestrianised retail centre of the town. The package of improvements is forecast to deliver equivalent uplifts in rental values within the High Street and St. Paul's Square of around £2.1m pa.
- 1.9.13 These are only the direct benefits to the retail properties on the High Street and St. Paul's Square. In addition, there are likely to be uplifts to other commercial properties in close proximity, such as office premises, albeit the impacts are considered likely to be significantly lower. A key element of the public realm package of measures is to increase permeability and connectivity between the current core retail area and the Cultural Quarter to the south east of the town, as well as connections to the River. This is predicted to deliver multiplier benefits to the economy by creating a more coherent town centre for visitors and so attract greater footfall, and hence economic activity.
- 1.9.14 The direct retail market benefits are, therefore, considered to be a relatively conservative quantitative estimate of the ultimate overall benefits that will be delivered to the town centre economy.
- 1.9.15 The combined package of measures will also directly support a range of short, medium and long-term developments opportunities within the former A6 northern and southern corridors leading into the town centre, as well as at sites at either ends of these corridors. Both corridors are already congested during peak period restricting access to employment and retail sites along the corridor, as well as affecting arterial travel to and from the town centre.
- 1.9.16 The proposed measures will provide some additional capacity but also enhance the efficiency of the network and manage traffic flows to make the most of the existing capacity.
- 1.9.17 Development opportunities that will indirectly benefit within the corridors themselves include:

- The development of an Aldi, DIY Store, light industrial, residential dwellings at the Morrisons and Technology House sites
- 24,500 sqm GFA of employment at Interchange Retail Park
- At the northern end of the corridor there are a wide range of potential development opportunities to the south of the River Great Ouse around Bedford Hospital and the Kingsway Gyratory. This includes a range of public assets that are subject to a One Public Estate bid to regenerate land in this area, with opportunities for residential and commercial development
- At the southern end of the corridor there, along the A6 / B530, there are a number of long-standing residential and commercial development proposals including:
  - 16,000 (all by 2021) sqm GFA employment at Coronation Business Park
  - 124,000 (80,000 by 2021) sqm GFA employment at Medbury Farm
  - Around 7,000 (3,000 by 2021) Residential Dwellings across five sites and over 12,000 (all by 2021) sqm GFA employment at Wixams
  - Access to a new supermarket development off the Great Ouse Way / Paula Radcliffe Way Roundabout

1.9.18 It is also possible that the development of a new settlement north of Bedford, with access from the A6, will have commenced by 2027.

#### **Scheme Revenues**

1.9.19 There are no specific revenue streams associated with the package of measures, although the 'Technology' package offers the potential for increased public transport patronage and, hence, associated fare revenue. For the purposes of the appraisal this has been assumed to be neutral.

### **Social and Distributional Impacts**

1.9.20 The social and distributional impacts of the scheme have been considered using guidance set out in WebTAG Units 4.1 and 4.1. An initial screen process was undertaken to identify the potential impacts of both individual scheme elements, as well as the overall package of measures. This identified three social impacts that could be most affected by the highway scheme measures proposed, these are:

- Physical Activity;
- Accidents;
- Severance;
- Journey Quality;
- Security;
- Access to services; and
- Option and non-use values.

1.9.21 The elements of physical activity, security, option value and non-use value, accessibility and personal affordability are considered to have no, or negligible, impact.

### **Physical Activity**

- 1.9.22 The Public Realm enhancements within the core town centre will make the town more permeable with improved east-west connections. This will encourage greater levels of pedestrian activity across the area. The wider UTM and Technology package will facilitate greater mode choice through enhanced information provision and improved traffic management. This is forecast to deliver a small beneficial impact for this metric.

### **Accidents**

- 1.9.23 The package of measures will offer a range of potential benefits, in terms of accidents savings, through targeted enhancements to the pedestrian with reductions in traffic speeds, as well as improvement management of the wider highway network.
- 1.9.24 The 'Theme 1 Public Realm' package of measures in the High Street and St. Paul's Square will create a greater balance in priorities between vehicular traffic and pedestrian movements. The scheme will reduce the High Street to a single lane, with wider pavements and lower traffic speeds. This is anticipated to engender notable benefits in reducing long term levels of accidents, albeit there is likely to be a period of adjustment to the new highway arrangements where the affects may be neutral in the short term.
- 1.9.25 The public realm scheme will also result in some diversion of traffic onto other routes, potentially increasing the risk of accidents on those routes.
- 1.9.26 Within the original assessment of issues and opportunities, as part of the Bedford Transport Strategy development process, the Ampthill Road corridor was identified as a having the highest level of accidents, As such a number of measures within the package are aimed specifically at reducing the level of accidents across this corridor. These include the Ampthill Road / Britannia Road Junction Enhancement providing, access to Bedford Hospital from the Ampthill Road, as well as the dedicated cycle facilities along the Ampthill Road Corridor.
- 1.9.27 Over the last five years, two serious accidents and 10 slight accidents have been recorded around the Ampthill Road entrance to the Hospital and at least one accident involving a cyclist has occurred along that corridor<sup>5</sup>, giving an average annual accident rate of 3.4 in the area directly impacted by this scheme.
- 1.9.28 Using DfT WebTAG values for serious and slight accident savings (WebTAG databook Table A1.1.3, July 2017), prevention of these accidents through the scheme improvements would translate to an annual benefit of £157,152, in 2010 prices.
- 1.9.29 Overall, the package of measures is forecast to deliver a Present Value of Accident Benefits of £4.198m over 30 years. These results are fed into the Analysis of Monetised Benefits (AMCB) Table as part of the Value for Money Statement (Section 3.6).
- 1.9.30 This analysis has focused on one area of the scheme proposals and has not accounted for any re-distribution in traffic flows across the town centre as a result of the wider highway/UTM proposals. On some links where additional traffic will occur this may have modest safety disbenefits that have not been calculated.

<sup>5</sup> [www.crashmap.co.uk](http://www.crashmap.co.uk)

### Severance

- 1.9.31 Community severance is defined as “the separation of residents from facilities and services they use within their community”. Severance primarily concerns those using non-motorised modes, particularly pedestrians. The WebTAG guidance advises that to ensure a consistent approach, classification should be based on pedestrians only
- 1.9.32 The ‘Theme 1 Public Realm’ scheme will offer significant reduction in east-west severance for pedestrians across the town centre from the east of the town into the heart of the retail area. It will also reduce severance to and from the River, ensuring much greater connectivity across the town.
- 1.9.33 The ‘Theme 2 Alleviating Pinch-point schemes’ and ‘Theme 3 UTM and Technology’ measures will also provide benefits to pedestrians along the former A6 northern and southern corridors. Enhanced crossing facilities will be incorporated into a number of enhanced junction layouts, as well as SMART technology for pedestrian crossing facilities along the southern gateway corridor.
- 1.9.34 Due to an absence of specific footfall data in some of these locations the direct impact has not been monetised and is presented as a qualitative assessment in the Appraisal Summary Table.

### Journey Quality

- 1.9.35 The package of scheme measures will embody two elements of improvement to journey quality:
- Value of Urban Realm Enhancements
  - Traveller stress
- 1.9.36 Section 1.5 has set out the Valuing Urban Realm Toolkit (VURT) assessment that has been undertaken to demonstrate that positive impact of the Theme 1 Public Realm scheme upon the urban environment. The analysis concluded that total pedestrian journey quality benefits associated with the urban realm improvements that will accompany the scheme will be £1,381,383 in discounted 2010 prices.
- 1.9.37 Journey quality is defined within WebTAG Unit 4.1 as “a measure of the real and perceived physical and social environment experienced while travelling”. Many of these aspects relate to information provision and perceptions of safety but it also includes aspects relating to traveller stress, defined as “the frustration, fear of accidents and route uncertainty”.
- 1.9.38 The reductions in journey times and improved reliability will contribute a positive benefit for journey quality, by all modes, across the former A6 northern and southern corridor. As has been highlighted within Section 1.4 and 1.9.6 the impacts are anticipated to be significant in terms of reducing uncertainty and so will have a moderate positive impact upon traveller stress. The absence of quantifiable data for these benefits means they have not been monetised.

### **Security**

- 1.9.39 The Public Realm enhancements will improve levels of safety and security for pedestrians within the High Street and St. Paul's Square, with wider pavements and improved natural surveillance. This is forecast to deliver a small beneficial impact for this metric.

### **Access to services**

- 1.9.40 The Public Realm enhancements will improve the permeability of the core town centre enhancing accessibility to town centre services. In particular, it will improve connections from the east of the town, including the residential areas, into the core pedestrianised centre.
- 1.9.41 The wider package of measures will improve accessibility to services throughout the former A6 northern and southern corridors. This includes the Hospital located at the northern end of the Ampthill Road corridor. The technology package will deliver a range of information and travel demand support initiatives to make it easier for individuals to travel by a range of different modes to access services.
- 1.9.42 These impact area forecast to deliver a moderate beneficial impact for this metric.

### **Option and non-use values**

- 1.9.43 The whole package of measures will deliver improvements to all modes of travel along the former A6 northern and southern corridors. The UTM and Technology package will include a variety of measures to enhance information provision for travellers helping them to make informed decisions about which travel options to utilise. This is forecast to deliver a small beneficial impact for this metric.

## **Environmental Impacts**

- 1.9.44 The Assessment Matrix from the Design Manual for Roads and Bridges (Volume 11 Section 2 Part 5) has been used to identify seven environmental topics to be reviewed in the Appraisal Summary Table.

### **Noise**

- 1.9.45 An initial scoping exercise has been undertaken to establish an appreciation of the likely noise and vibration consequences associated with the proposed scheme. DMRB Volume 11, Section 3, Part 7 – Noise and Vibration 2011 HD213/11 Revision 1 provides threshold values against which changes in noise due to the project should be compared, and assessed.
- 1.9.46 The assessment considers the impact of changes in traffic flow and speed may have upon noise levels, as well as the extent to which the study area includes noise sensitive receptors, such as dwelling, schools and community facilities. If there is clear evidence that any threshold limits are likely to be exceeded then a detailed assessment will follow.
- 1.9.47 The package of scheme measures encompasses the majority of the core town centre and so potentially affects a wide range of noise sensitive receptors; however, the impacts of

the scheme measures will incorporate some reductions and some increases in traffic flows across the town.

- 1.9.48 A key component of the 'Public Realm' and 'UTMC and Technology' package is to control vehicular speeds both in the core town centre but also the former A6 northern and southern corridors. Whilst the scheme should deliver reduced journey times, this will be through reduced congestion at junctions, without inducing higher speeds on links between junctions.
- 1.9.49 Understanding the potential changes in flows across the town is challenging, as it has not been feasible to model many of the UTMC and Technology measures. The outputs from the SATURN model do demonstrate that the Public Realm scheme along the High Street and St. Paul's Square will discourage traffic volumes along these routes. This, along with reduced speeds, will provide positive benefits in terms of noise reduction to properties all along the High Street and St. Paul's Square.
- 1.9.50 The reduced flows on the High Street will result in diverted traffic on other routes. The model outputs indicate that some of the traffic will instead utilise more strategic routes, such as the Western Bypass and the A421, which is precisely the aim to remove through traffic from the town centre and encourage it to use the bypass routes. The noise implication for these routes is minimal as they are designed to take this form of traffic and are in much less sensitive areas than the core town centre.
- 1.9.51 Some additional traffic is also forecast to utilise Greyfriars and Midland Road as an alternative route. Whilst this is clearly within the built up area of the town centre, in effect, the potential negative impacts on these roads are a direct off-set of the positive benefits engendered by the High Street and St. Paul's Square. Significantly none of the speeds on these routes will exceed the 40km/hr, the level at which the DMRB guidance states that speed has a direct influence upon noise.
- 1.9.52 Given the absence of a complete dataset on future traffic movements, a detailed noise assessment has not been undertaken at this stage; however, the individual scheme elements will be designed with any necessary mitigation measures to minimise the impact upon noise or vibration resulting from the scheme, utilising natural barriers, purpose built environmental barriers and low-noise surfaces, as required.

#### **Air Quality**

- 1.9.53 The town centre encompasses an Air Quality Management Area (AQMA), detailed within the figure below.



- 1.9.54 The Town Centre AQMA 5 was declared on 6th November 2009. The Environmental Health department carry out air quality monitoring around the Borough to assess the air quality. This includes the use of diffusion tubes, small plastic tubes that absorb pollutants, which are then sent to a laboratory for analysis. The results obtained are monthly averages and are used to give long term trends in levels of pollutants in an area. Real time analysers are also used that accurately measure levels of pollutants in the air constantly. Bedford currently uses 65 diffusion tubes to monitor nitrogen dioxide and two real time analysers to monitor nitrogen dioxide, located on the Prebend Street and Lurke Street.
- 1.9.55 The Council produces annual status report providing an overview of air quality in Bedford Borough during the previous year, fulfilling the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents. The authority also has an Air Quality Action Plan (AQAP) setting out measures it intends to put in place in pursuit of improving air quality within the AQMA.
- 1.9.56 Much of the area that is the focus of the proposed package of scheme measures falls within the AQMA. As such, it is a critical objective that the overall outcomes of the implemented measures will support the requirements of the AQP. The scheme measures have been developed with this firmly in mind. As such, the package does not simply seek to build additional highway capacity that could induce additional vehicular trips into the town centre, and the AQMA, rather is seeks to provide a balance of improvements to both



motorised and non-motorised modes of transport and seeks to encourage sustainable travel through enhanced information and technology provision.

- 1.9.57 The package of measures will clearly deliver specific benefits to individual geographic locations within the town centre, in terms of reduced vehicular traffic and improved air quality. This includes the High Street and St. Paul's Square. Other roads within the AQMA will have increased levels of traffic, such as Greyfriars and Midland Road, off-setting some of the benefits; however, the model outputs indicate that some diverted traffic will utilise more strategic routes, including the Western Bypass and the A421, outside of the AQMA, and so there could be some overall positive air quality impacts within the critical AQMA.
- 1.9.58 The specific requirement for an air quality assessment is determined in accordance with traffic change criteria set out in HA207/07 DMRB Volume 11 Section 3 Part 1. The traffic change criteria are:
- road alignment will change by 5m or more, or
  - daily traffic flows will change by 1,000 annual average daily traffic (AADT) or more, or
  - HGV flows will change by 200 AADT or more, or
  - daily average speed will change by 10 km/hr or more, or
  - peak hour speed will change by 20 km/hr or more
- 1.9.59 Whilst the traffic model outputs do not provide a definitive assessment of these changes, due to the inability to model many of the UTM and Technology measures, it is not anticipated that any of these criteria will be exceeded.
- 1.9.60 This will be reviewed as and when further evidence is available during the detailed design of the UTM and Technology measures.

#### **Greenhouse Gases**

- 1.9.61 The requirement to conduct a detailed assessment of the impact of greenhouse gases applies the same criteria as for the air quality assessment and so is challenging to undertake with the available data but is broadly considered unlikely.
- 1.9.62 The outputs from the TUBA model assessment and the UTM and Technology benefits have been utilised to provide an assessment of potential impacts. This indicates a potential small disbenefit of £67,000 over the 30 year appraisal period, discounted to 2010 prices.

#### **Landscape and Townscape**

- 1.9.63 The Theme 1 Public Realm package of measures will deliver a clear positive benefit in terms of enhanced townscape. The concept design is outlined within the 'Bedford High Street Public Realm Framework' and details the proposed palette of materials that will be utilised to create positive public spaces and permeable streetscapes that will complement the historic buildings within the area and connect to the landscape of the River.
- 1.9.64 The other physical infrastructure elements of the package of measures will be delivered in a manner sensitive to the local environment so as to either have a neutral or positive impact upon the landscape and townscape.

### Heritage and Historic Resource

- 1.9.65 The package of scheme measures will not directly impact upon any heritage or historic resources; however, as outlined within the Landscape and Townscape section, the public realm measures will be designed to complement historic buildings around St. Paul's Square, as well as providing greater connectivity to the cultural quarter and the historic Castle Mound.

### Ecology and Nature Conservation

- 1.9.66 There are no Wetlands of International Importance (Ramsar), Special Protection Areas (SPA), Special Area of Conservation (SAC), Sites of Special Scientific Interest (SSSI) within the immediate vicinity of the proposed works.
- 1.9.67 The package of scheme measures will have no impact upon this criteria.

### Water Environment

- 1.9.68 The package of scheme measures may impact upon drainage and water run-off as a result of the reconfiguration of junctions and highway links.
- 1.9.69 The highway engineering has been designed to mitigate against any impact upon drainage, with culverts replaced, and replicating existing run-off. The scheme does not impact upon any existing water courses.
- 1.9.70 It is, therefore, concluded that the schemes will not any have any notable impact on the water environment, particularly as design mitigation measures will be incorporated, as required.

## Public Accounts

### Cost to Broad Transport Budget

- 1.9.71 The capital costs of the scheme implementation are set out in detail within the Financial Case.
- 1.9.72 The base costs of implementing the package of scheme measures has been identified at £15.287m and are broken down as follows:
- |                                      |   |        |
|--------------------------------------|---|--------|
| ○ Theme 1 – Public Realm             | = | 5.598m |
| ○ Theme 2 – Alleviating Pinch-points | = | 4.692m |
| ○ Theme 3 – UTM and Technology       | = | 2.348m |
| ○ Utilities                          | = | 2.649m |
- 1.9.73 This includes an allowance of 20% traffic management costs and 12% for preliminaries.
- 1.9.74 In addition to this, a quantified risk assessment (QRA) has been undertaken using @Risk software to derive a P80 value for all risks of £2.91m. This represents 19% of total scheme costs and has been added to these base costs in the financial case and to generate the adjusted scheme cost estimate for this economic assessment.

- 1.9.75 All costs have been adjusted for real cost inflation (6% per annum), as well optimism bias, at 44%, and input into the cost benefit analysis they have been discounted to 2010 prices.
- 1.9.76 The maintenance costs associated with the schemes have been estimated at 1% of the base scheme costs (excluding traffic management, preliminaries, utilities and contingency) and equate to a discounted value of £1.715m across the appraisal period.
- 1.9.77 The Broad Transport Budget for the scheme, including the optimism bias, is £27.791m over the 30 year period.

#### **Indirect tax**

- 1.9.78 The loss of indirect tax revenues as a result of road users making more efficient journeys, due to the scheme, is forecast using TUBA to be £0.671m over the 30 year appraisal period (discounted to 2010 prices). The impact this will have on the overall Benefit Cost Ratio (BCR) of the scheme will be discussed in the following section.

### **1.10 Value for Money Statement**

- 1.10.1 This section provides a value for money conclusion by considering all of the evidence pulled together as part of the Appraisal Summary Table. This provides evidence to inform the final judgement on the Value for Money category of the scheme as recommended by DfT<sup>6</sup>. It summaries:
- The options considered and the do-nothing scenario
  - Initial and adjusted BCRs
  - Non-monetised benefits
  - Risks and uncertainties
- 1.10.2 Sensitivity tests have also been undertaken to the test the robustness of the scheme's forecasted benefits and the results of these are set out in Section 1.11.
- 1.10.3 To support the value for money assessment the following tables are provided in the following pages:
- Public Accounts (PA) Table;
  - Economic Efficiency of the Transport System (TEE) Table; and
  - Analysis of Monetised Benefits (AMBC) Table
- 1.10.4 In addition, an Appraisal Summary Table (AST) is presented within **Appendix A**.
- 1.10.5 The AMBC table provides the user benefits (TEE table) and costs (PA table) derived from TUBA, as well as the wider benefits from the public realm enhancements to the town centre economy, greenhouse gas impacts, and accident savings benefits.

<sup>6</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/267296/vfm-advice-local-decision-makers.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267296/vfm-advice-local-decision-makers.pdf)

**Table 5. Central Case Public Accounts Table**

	ALL MODES	ROAD
<u>Local Government Funding</u>	<u>TOTAL</u>	<u>INFRASTRUCTURE</u>
Revenue	0	0
Operating Costs	1715	1715
Investment Costs	26076	26076
Developer and Other Contributions	0	0
Grant/Subsidy Payments	0	0
<b>NET IMPACT</b>	27791 (7)	27791
<b><u>Central Government Funding: Transport</u></b>		
Revenue	0	0
Operating costs	0	0
Investment Costs	0	0
Developer and Other Contributions	0	0
Grant/Subsidy Payments	0	0
<b>NET IMPACT</b>	0 (8)	0
<b><u>Central Government Funding: Non-Transport</u></b>		
Indirect Tax Revenues	671.0896696 (9)	671.0896696
<b><u>TOTALS</u></b>		
<b><u>Broad Transport Budget</u></b>	27791 (10) = (7) + (8)	
<b><u>Wider Public Finances</u></b>	671.0896696 (11) = (9)	

**Table 6. Central Case TEE Table**

<b><u>User benefits</u></b>	<b>TOTAL</b>		<b>Private Cars and LGVs</b>
Travel time	4,869.4		4,869.4
Vehicle operating costs	79.9		79.9
User charges	0		0
During Construction & Maintenance	0		0
<b>NET NON-BUSINESS BENEFITS: COMMUTING</b>	<b>4,949.3</b>	<b>(1a)</b>	<b>4,949.3</b>
<b><u>Non-business: Other</u></b>	<b>ALL MODES</b>		<b>ROAD</b>
<b><u>User benefits</u></b>	<b>TOTAL</b>		<b>Private Cars and LGVs</b>
Travel time	2,691.1		2,691.1
Vehicle operating costs	67.0		67.0
User charges	0		0
During Construction & Maintenance	0		0
<b>NET NON-BUSINESS BENEFITS: OTHER</b>	<b>2,758.1</b>	<b>(1b)</b>	<b>2,758.1</b>
<b><u>Business</u></b>			
<b><u>User benefits</u></b>			<b>Goods Vehicles</b> <b>Business Cars &amp; LGVs</b>
Travel time	2,494.5		1,775.1      719.4
Vehicle operating costs	376.1		237.9      138.2
User charges	0		0      0
During Construction & Maintenance	0		0      0
<b>Subtotal</b>	<b>2,870.6</b>	<b>(2)</b>	<b>2,013.0      857.6</b>
<b><u>Private sector provider impacts</u></b>			
Revenue	0		
Operating costs	0		
Investment costs	0		
Grant/subsidy	0		
<b>Subtotal</b>	<b>0</b>	<b>(3)</b>	
<b><u>Other business impacts</u></b>			
Developer contributions	0	<b>(4)</b>	
<b>NET BUSINESS IMPACT</b>	<b>2,870.6</b>	<b>(5) = (2) + (3) + (4)</b>	
<b>TOTAL</b>			
Present Value of Transport Economic Efficiency Benefits (TEE)	10,578.1	<b>(6) = (1a) + (1b) + (5)</b>	
	numbers.		

All entries are discounted present values, in 2010 prices and values

**Table 7. Central Case Analysis of Monetised Costs and Benefits Table**

Noise	0	(12)
Local Air Quality	0	(13)
Greenhouse Gases	-67.0	(14)
Journey Quality	1,381.4	(15)
Physical Activity	0	(16)
Accidents	4,197.9	(17)
Economic Efficiency: Consumer Users (Commuting)	4,949.3	(1a)
Economic Efficiency: Consumer Users (Other)	2,921.2	(1b)
Economic Efficiency: Business Users and Providers	2,870.6	(5)
Wider Public Finances (Indirect Taxation Revenues)	-671.1	(11) - sign changed from PA table, as PA table represents costs, not benefits
Present Value of Benefits (see notes) (PVB)	15,582.4	(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)
Broad Transport Budget	27,791.0	(10)
Present Value of Costs (see notes) (PVC)	27,791.0	(PVC) = (10)
<b>OVERALL IMPACTS</b>		
<b>Net Present Value (NPV)</b>	-12,208.6	NPV=PVB-PVC
<b>Benefit to Cost Ratio (BCR)</b>	0.56	BCR=PVB/PVC

### Do-nothing Scenario and Options Considered

- 1.10.6 The do-nothing scenario would constitute the status quo in terms of the operation of the current highway network across the town centre, including current highway link and junction capacities and the absence of a functional UTM system.
- 1.10.7 A broad range, and extensive number, of alternative scheme measures, and packages of scheme measures, have been considered over the last three years as part of the wider Town Centre transport strategy development process. All of these have been subject to extensive appraisal processes to establish the optimum package of measures within the available funding constraints.
- 1.10.8 Within the 'Pinch-point' theme, 11 separate scheme elements were examined and appraised, with six of these taken forward for inclusion within the final preferred package of measures.
- 1.10.9 Within the 'Public Realm' package, a town centre framework was established to consider both the geographical extent of potential measures (High Street, St. Paul's Square, Embankment, Horne Lane, River Street, Greyfriars, Allhallows, Midland Road, Silver Street, Harpur Street) as well as the type of measures that could be employed (full pedestrianisation or reduced highway capacity). On the basis of detailed analysis and appraisal the preferred package of measures was identified as a reduction in highway

capacity and enhancement public realm provision along the High Street and St. Paul's Square.

- 1.10.10 Within the 'UTMC and Technology' package, the option development process has considered the wide range of current and emerging technologies available and evaluated the potential benefits from implementation of different corridors leading into the Core Town Centre, as well as across the Core Town Centre itself. The preferred package of measures identified the Southern and Northern Gateway corridors, along the former A6, as well as the Core Town Centre as the preferred option for implementing a UTMC and Technology package to enhance the efficiency of highway network operations.

**Initial Benefit Cost Ratio**

- 1.10.11 The Initial Net Present Value (NPV) for the scheme, encompassing the direct transport user benefits is forecast to be -£12.209m, with the expected Cost Benefit Ratio of the scheme at 0.56 to 1. This is a clear demonstration that the benefits of the scheme are not singularly about enhancing traditional transport provision.
- 1.10.12 The initial NPV represents a quantified assessment of monetised benefits in terms of a traditional set of transport scheme impacts. Not only does it exclude a range of non-monetised impacts (discussed below) but a major element of the package of measures is also designed to the enhance the town centre urban realm to support and grow the local economy. Excluding these benefits does not provide a full assessment of the impact of the scheme.



### Adjusted Benefit Cost Ratio

- 1.10.13 The adjusted NPV for the scheme is forecast to be around £31.887mm with the expected Cost Benefit Ratio of the scheme at 2.15 to 1. This represents a high value for money category.
- 1.10.14 This incorporates an additional £44.2 million benefits over 30 years in relation to enhanced town centre economic retail value, as set out in Section 1.6.
- 1.10.15 As presented in section 1.16 of this Economic Case, we have taken a conservative estimate of 25% of the anticipated potential uplift in retail values as a result of the urban realm improvements. Even with this conservative estimate, these benefits are what is driving the positive BCR for this scheme and therefore we have undertaken additional sensitivity tests to account for the risk that these retail value uplifts may not be realised. Our assessment shows that a 1.85:1 BCR could be achieved if only 20% of the retail value uplift was realised.
- 1.10.16 A further sensitivity test incorporating this scenario as well as more conservative estimates on growth rates and the benefits of the UTM package is presented in Section 1.11.

### Non-monetised Impacts

- 1.10.17 In addition to the monetised benefits set out above, the package of scheme measures is forecast to deliver a range of non-monetised impact. Those criteria for which there is anticipated to be either positive or negative impacts are summarised within Table 8, with a full analysis of outcomes for all criteria, presented within the AST in **Appendix A**.

**Table 8. Summary of Non-Monetised Benefits**

IMPACT		DESCRIPTION	BENEFIT
Economy	Reliability impact on Business users	The proposed package of UTM and Technology measures are anticipated to significantly enhance the reliability of journey times along the former A6 northern and southern corridors, as well as across the core town centre, in addition to reducing unpredictable variation in journey times.	High Beneficial
	Regeneration	The scheme will support local development; however, specific regeneration impacts, as defined by WebTAG guidance, will not be realised and therefore no assessment has been carried out to capture these.	Small Beneficial
Environmental	Townscape	The Public Realm package of measures will deliver a clear positive benefit in terms of enhanced townscape within the High Street and St. Paul's Square. Other physical infrastructure elements of the package of measures will be delivered in a manner sensitive to the local environment.	Moderate Beneficial
	Historic Environment	The package of scheme measures will not directly impact upon any heritage or historic resources; however, the public realm measures will be designed to complement historic buildings around St. Paul's Square, as well as providing greater connectivity to the cultural quarter and the historic Castle Mound.	Small Beneficial
Social	Reliability impact on Commuting and Other users	The proposed package of UTM and Technology measures are anticipated to significantly enhance the reliability of journey times along the former A6 northern and southern corridors, as well as across the core town centre, in addition to reducing unpredictable variation in journey times.	High Beneficial
	Physical activity	The Public Realm enhancements within the core town centre will make the town more permeable with improved east-west connections. This will	Small Beneficial

IMPACT	DESCRIPTION	BENEFIT
	encourage greater levels of pedestrian activity across the area. The wider UTMC and Technology package will facilitate greater mode choice through enhanced information provision and improved traffic management.	
Journey quality	Journey quality within the town centre will be enhanced by the improvements to the public realm within the High Street and St. Paul's Square. The reductions in journey times and improved reliability will contribute a positive benefit for journey quality across the former A6 north and south corridor.	Moderate Beneficial
Security	The Public Realm enhancements will enhance the safety and security for pedestrians within the High Street and St. Paul's Square	Small Beneficial
Access to services	The Public Realm enhancements will improve the permeability of the core town centre enhancing accessibility to services. The wider package of measures will improve accessibility to services throughout the former A6 northern and southern corridors, including the Hospital. The technology package will deliver a range of information and travel demand initiatives to make it easier for individuals to travel by different modes to access services.	Moderate Beneficial
Severance	The Public Realm enhancements will reduce severance impacts of the High Street and St. Paul's Square providing improved permeability between the core pedestrianised retail area and the 'Cultural Quarter' and the River.	Small Beneficial
Option and non-use values	The package of measures will deliver improvements to all modes of travel along the former A6 northern and southern corridors. The UTMC and Technology package will include enhance information provision for travellers helping them to make informed decisions about travel options.	Small Beneficial

## 1.11 High and Low Case Scenario Tests

1.11.1 WebTAG Unit M4<sup>7</sup> states that although the core scenario (of which results have been provided above) is intended to be the best basis for decision making, there is no guarantee that the outturn will match assumptions. Therefore sensitivity tests are undertaken to determine the potential impact under alternative scenario outcomes and to address the following questions:

- Under high demand assumptions, is the intervention still effective in reducing congestion or crowding, or are there any adverse effects, e.g. on safety or the environment?; and
- Under low demand assumptions, is the intervention still economically viable?

1.11.2 Section 4.2 of WebTAG Unit M4 sets out guidance on defining High and Low growth scenarios. The high growth scenario should consist of forecasts that are based on a proportion of base year demand added to the demand from the core scenario. The low growth scenario should be based on the same ranges but as a reduction to the core scenario demand.

1.11.3 The proportion of base year demand to be added/subtracted is based on a parameter **P** which varies by mode. The proportion is calculated based on the following:

<sup>7</sup> Tag Unit M4: Forecasting and Uncertainty: <https://www.gov.uk/guidance/transport-analysis-guidance-webtag>

- For 1 year after the base year, proportion  $p$  of base year demand added to the core scenario;
- for 36 or more years after the base year, proportion  $6 \cdot p$  of base year demand added to the core scenario;
- between 1 and 36 years after the base year, the proportion of base year demand should rise from  $p$  to  $6 \cdot p$  in proportion with the square root of the years.

1.11.4 For highway demand at the national level, the value of **P** is 2.5%, reflecting uncertainty around annual forecasts from the National Transport Model (NTM), based on the macro-economic variables that influence the main drivers of travel demand.

1.11.5 For this scheme the base modelled year is 2011 and future year model forecasts are 2021 and 2032. For 2021, this is 10 years from the base therefore the proportion to be applied to **P** is square root of 10 = 3.163. For 2032, this is 21 years from the base therefore the proportion to be applied to **P** is square root of 10 = 4.583.

1.11.6 Therefore the high and low growth sensitivity tests are defined as:

**Table 9. High and Low Sensitivity Tests**

SENSITIVITY TEST	FORECAST YEAR	FORMULA	CHANGE IN DEMAND
High Growth	2021	Core demand + $3.163 \cdot p$	+7.9%
	2032	Core demand + $4.583 \cdot p$	+11.5%
Low Growth	2021	Core demand + $3.163 \cdot p$	-7.9%
	2032	Core demand + $4.583 \cdot p$	-11.5%

1.11.7 The overarching impact of the high and low growth have been assessed within the SATURN model.

1.11.8 Alongside the potential variations in underlying growth, the sensitivity tests also encompass assessments of potential variations in the levels of benefits generated from the UTM and Technology and Public Realm packages. Both these elements have been discussed earlier in the note (in Sections 1.4 and 1.6, respectively) and simply reflect higher or lower generation of benefits for analytical elements where there is less certainty. The UTM high and low scenarios also incorporate the high and low traffic growth scenarios in deriving the value of the forecast delay reduction.

1.11.9 It should be noted that, in both cases, the Central Case forecast is considered to be conservative in nature and so the 'High Case' outcome is perceived to be a more likely outcome than the 'Low Case'.

1.11.10 The outcomes of the three elements of sensitivity testing have been combined to present the maximum variation in the potential economic outcomes, in terms of 'High Case' maximum benefits and 'Low Case' minimum benefits.

1.11.11 A summary of the two sensitivity scenarios is as follows:

- High Case

- High growth (2021 = +7.9%, 2032 = +11.5%)
- UTMC and Technology delay reduction = 23% of forecast delay
- Retail benefits attributed to public realm enhancements = 30% of differential in retail values from High Street to Core Town Centre

○ Low Case

- Low growth (2021 = -7.9%, 2032 = -11.5%)
- UTMC and Technology delay reduction = 11.5% of forecast delay
- Retail benefits attributed to public realm enhancements = 20% of differential in retail values from High Street to Core Town Centre

1.11.12 Under the high case scenario, the assessment the appraisal outcomes are:

○ Present Value of Benefits	=	£80.535m
○ Present Value of Costs	=	£27.791m
○ Net Present Value	=	£52.744m
○ Benefit Cost Ratio	=	2.90

1.11.13 Under the low case scenario, the assessment the appraisal outcomes are:

○ Present Value of Benefits	=	£45.740m
○ Present Value of Costs	=	£27.791m
○ Net Present Value	=	£17.949m
○ Benefit Cost Ratio	=	1.65

## 1.12 Summary

### Key Risks and Uncertainties

1.12.1 A comprehensive quantified risk assessment (QRA) has been undertaken and is included as part of the Management Case. This suggests a P80 value of £2.91m should be applied in considering financial risk at this stage of scheme development. This is 19% of the scheme costs (excluding optimism bias). Optimism bias has been added at 44%, recognising that although considerable work has been undertaken to develop the scheme to this stage particularly on the pinch-point elements, there is further work to do and therefore greater uncertainty on the technology elements of the UTMC.

1.12.2 The other uncertainty to note is the level of retail value uplift that may be generated from public realm improvements. Our assessment, comparing values from similar pedestrianised areas in Bedford town centre core, is that the uplift will be significant. However, as a large proportion of the benefits of this package are derived from this anticipated we have undertaken some sensitivity tests around this to demonstrate that even with a lower than anticipated retail value uplift, significant benefits would still be delivered as reported in the Adjusted Benefit Cost Ratio section above.

### Assumptions

1.12.3 Assumptions made in line with WebTAG have been documented throughout this Economic Case. We have also made several assumptions about the impacts of various scheme elements as these cannot be fully captured in the standard transport modelling

undertaken. This is reflective of the fact that the scheme itself is a broader town centre improvement package and not just a transport scheme.

1.12.4 The main assumptions made can be summarised as:

- Modelling approach:
  - Fixed matrices used
  - Impacts on Interpeak period, including Saturday, not modelled but assumed to be neutral impact
- Delay reduction generated by UTM C
  - Greenfield scheme
  - Evidence of similar schemes suggests average of 23% reduction in delay. Conservative estimate of 75% of this reduction assumed for the central case (i.e. 17.3% reduction in delay at affected junctions)
  - Local Plan growth rates applied as a proxy for increase in vehicles on the network. High and low growth rates also applied in corresponding sensitivity tests
- Rateable value uplift from public realm improvements
  - Evidence from other parts of Bedford Town Centre suggests potential for over 200% uplift in value. Conservative estimate of 25% of this uplift assumed for the central case (i.e. 53% uplift in rateable values)

#### Benefit Cost Ratios

1.12.5 The following table summarises the impact of these risks and sensitivity tests on the BCR.

**Table 10. BCRs**

SCENARIO	PVC (£M)	PVB (£M)	NPV (£M)	BCR
Initial Central Case	27.79	15.58	-12.21	<b>0.56</b>
Adjusted Low case	27.79	45.74	17.95	<b>1.65</b>
Adjust Central Case with 20% rateable value uplift	27.79	51.51	23.72	<b>1.85</b>
Adjusted Central case	27.79	59.68	31.89	<b>2.15</b>
Adjusted High Case	27.79	80.54	52.74	<b>2.90</b>

1.12.6 The initial BCR is based only on the direct transport user benefits and does not fully capture the significant benefits that will be derived from the improvement to the public realm around the High Street and the subsequent impact on retail rental values and the local economy. Furthermore, it does not include a range of non-monetised impacts, particularly in relation to improved journey time reliability generated from the pinch-point schemes and introduction of UTM C.

- 1.12.7 The adjusted BCR presented incorporates the benefits derived from the retail rental value uplift to give a fuller appreciation of the likely benefits of the scheme. Sensitivity tests have been undertaken on this core adjusted BCR that demonstrate if only 20% of the potential retail rental value uplift was achieved, the BCR for the scheme would be 1.85:1.
- 1.12.8 When considering the central case adjusted BCR of **2.15:1** and including the anticipated non-monetised benefits, we consider this scheme to represent a **High Value for Money** investment.



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Appraisal Summary Table						Date produced:		09/11/2017		Contact:		
Name of scheme:		Bedford Town Centre Transport Strategy								Name	Brian Hayward	
Description of scheme:		Combined package of measures based around three themes: - Theme 1: Public Realm enhancement along High Street and St. Paul's Square - Theme 2: Alleviating Pinch-points at four locations across the highway network								Organisation	Bedford Borough Council	
										Role	Town Centre Strategy Project Manager	
Impacts		Summary of key impacts				Assessment						
						Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp	
Economy	Business users & transport providers	Whilst the scheme will reduce highway capacity along the High Street and St. Paul's Square, resulting in some diversion of traffic, the additional infrastructure schemes to alleviate Pinch-points and the UTMC and Technology measures will deliver reductions in overall travel times during peak periods, particularly along the former A6 northern and southern corridors.				Value of journey time changes(£)		2871	Low Beneficial	2,871	Neutral	
						Net journey time changes (£)						
		0 to 2min		2 to 5min		> 5min						
	Reliability impact on Business users	The proposed package of UTMC and Technology measures are anticipated to significantly enhance the reliability of journey times along the former A6 northern and southern corridors, as well as across the core town centre, in addition to reducing unpredictable variation in journey times. Insufficient data is available to quantify this benefit.							High Beneficial	N/A		
	Regeneration	The scheme will support local development; however, specific regeneration impacts, as defined by WebTAG guidance, will not be realised and therefore no assessment has been carried out to capture these.							Small Beneficial	N/A		
	Wider Impacts	The Public Realm enhancements along the High Street and St. Paul's Square offer strong potential to enhance the retail offer in this area to bring it up towards a similar standard as the core pedestrianised retail core. Using rateable value comparison we have assessed this could generate an undiscounted benefit in the region of £55m. The wider scheme measures will also have a positive impact on business in terms of business trips, deliveries, and commuting (labour supply); however, no monetised assessment of these benefits have been undertaken.							Large Beneficial	44,193		
Environmental	Noise	The package of scheme measures encompasses the majority of the core town centre and so potentially affects a wide range of noise sensitive receptors; however, the impacts of the scheme measures will incorporate some reductions and some increases in traffic flows across the town. A key component of the 'Public Realm' and 'UTMC and Technology' package is to control vehicular speeds, both in the core town centre, but also the former A6 northern and southern corridors and all parts of the network. There will be reduced flows of traffic on the High Street, but this will be partially off-set by increases on other part of the core town centre network, such as Greyfriars and Midland Road. Some through traffic will be diverted onto the bypass and A421 and so offer a positive benefit in terms of reducing traffic levels in noise sensitive areas in the town centre							Neutral	N/A	Neutral	
	Air Quality	None of the traffic change criteria in DMRB volume 11 for Air Quality are forecast to be met, therefore a detailed assessment has not been required. The changes in in traffic flows will result in some variations in dispersement pattern; however, overall the impact is anticipate to be broadly neutral, and positive in key town centre locations, such as the High Street.							Neutral	N/A	Neutral	
	Greenhouse gases	The impact of the public realm measures in the town centre may result in some longer journeys resulting in modest increases in greenhouse gas emissions benefits.				Change in non-traded carbon over 60y (CO2e)		1627	Small negative	-67		
						Change in traded carbon over 60y (CO2e)		-4				
		Landscape	The Public Realm package of measures will deliver a positive benefit in terms of the quality of connections to the River around St. Pauls' Square and Embankment. Other physical infrastructure elements of the package of measures will be delivered in a manner sensitive to the local environment.							Neutral	N/A	
		Townscape	The Public Realm package of measures will deliver a clear positive benefit in terms of enhanced townscape within the High Street and St. Paul's Square. Other physical infrastructure elements of the package of measures will be delivered in a manner sensitive to the local environment.							Moderate Beneficial	N/A	
		Historic Environment	The package of scheme measures will not directly impact upon any heritage or historic resources; however, the public realm measures will be designed to complement historic buildings around St. Paul's Square, as well as providing greater connectivity to the cultural quarter and the historic Castle Mound.							Small Beneficial	N/A	
		Biodiversity	The physical infrastructure elements will be within the current confines of the highway boundary and the town centre locality means there is considered to be no impact upon this criteria.							No impact	N/A	
	Water Environment	The highway engineering has been designed to mitigate against any impact upon drainage, with culverts replaced, and replicating existing run-off. The scheme does not impact upon any existing water courses.							No impact	N/A		
Social	Commuting and Other users	Whilst the scheme will reduce highway capacity along the High Street and St. Paul's Square, resulting in some diversion of traffic, the additional infrastructure schemes to alleviate Pinch-points and the UTMC and Technology measures will deliver reductions in overall travel times during peak periods, particularly along the former A6 northern and southern corridors.				Value of journey time changes(£)		9154	Low Beneficial	9,154	Neutral	
						Net journey time changes (£)						
		0 to 2min		2 to 5min		> 5min						
		Reliability impact on Commuting and Other users	The proposed package of UTMC and Technology measures are anticipated to significantly enhance the reliability of journey times along the former A6 northern and southern corridors, as well as across the core town centre, in addition to reducing unpredictable variation in journey times. Insufficient data is available to quantify this benefit.							High Beneficial	N/A	
		Physical activity	The Public Realm enhancements within the core town centre will make the town more permeable with improved east-west connections. This will encourage greater levels of pedestrian activity across the area. The wider UTMC and Technology package will facilitate greater mode choice through enhanced information provision and improved traffic management.							Small Beneficial	N/A	
		Journey quality	Journey quality within the town centre will be enhanced by the improvements to the public realm within the High Street and St. Paul's Square. The reductions in journey times and improved reliability will contribute a positive benefit for journey quality, by all modes, across the former A6 northern and southern corridor.							Moderate Beneficial	1,381	
		Accidents	The package of measures will offer a range of potential benefits, in terms of accidents savings, through targeted enhancements to the pedestrian with reductions in traffic speeds, as well as improvement management of the wider highway network. The Former A6 southern corridor has specifically been identified as part of the network suffering from higher levels of accidents and the package of infrastructure and technology measures will improve safety conditions for vulnerable road users.				Reduction of 2.4 accidents per annum around the entrance to the Hospital and reduction of one cyclist accident per annum across the corridor. Quantified annual accident savings of £157k in 2010 prices.			Moderate Beneficial	4,198	Neutral
		Security	The Public Realm enhancements will enhance the safety and security for pedestrians within the High Street and St. Paul's Square							Small Beneficial	N/A	Neutral
		Access to services	The Public Realm enhancements will improve the permeability of the core town centre enhancing accessibility to town centre services. The wider package of measures will improve accessibility to services throughout the former A6 northern and southern corridors. This includes the Hospital located at the northern end of the Ampthill Road corridor. The technology package will deliver a range of information and travel demand support initiatives to make it easier for individuals to travel by a range of different modes to access services.							Moderate Beneficial	N/A	Neutral
Public Accounts	Affordability	None							No Impact	N/A	N/A	
	Severance	The Public Realm enhancements will reduce severance impacts of the High Street and St. Paul's Square providing improved permeability between the core pedestrianised retail area and the 'Cultural Quarter' and the River							Small Beneficial	N/A	Neutral	
	Option and non-use values	The whole package of measures will deliver improvements to all modes of travel along the former A6 northern and southern corridors. The UTMC and Technology package will include a variety of measures to enhance information provision for travellers helping them to make informed decisions about which travel options to utilise.							Small Beneficial	N/A		
Public Accounts	Cost to Broad Transport Budget	Scheme costs total £17.8m, including allowance for traffic management, preliminaries, utilities, 15% contingencies and 44% optimism bias.								22,791		
	Indirect Tax Revenues	The loss of indirect tax revenues as a result of road users making more efficient journeys is forecast as £0.703m over the 30 year appraisal period								671		

### High Street

Address	Category	Rateable values for Retail Zone A £/sqm
15 High Street	Shop & Premises	300
43 High Street	Shop & Premises	325
61 High Street	Shop & Premises	350
76 High Street	Shop & Premises	275
86 High Street	Shop & Premises	275
<b>Average</b>		<b>305</b>

### Pedestrianised Core

Address	Category	Rateable values for Retail Zone A £/sqm
36 Silver Street	Shop & Premises	803.25
15 Silver Street	Shop & Premises	765
5 Midland Road	Shop & Premises	725
23-25 Midland Road	Shop & Premises	765
31 Midland Road	Shop & Premises	803.25
<b>Average</b>		<b>772</b>

Source\* <https://www.tax.service.gov.uk/business-rates-find/search>

\*All of these values were accessed in October of 2017

## VALUE FOR MONEY STATEMENT SUMMARY



# BEDFORD TOWN CENTRE TRANSPORT STRATEGY

## VALUE FOR MONEY STATEMENT SUMMARY

### IDENTIFICATION TABLE

<b>Client/Project owner</b>	Bedford Borough Council
<b>Project</b>	Bedford Town Centre Transport Strategy
<b>Study</b>	Value for Money Statement Summary
<b>Type of document</b>	Report
<b>Date</b>	09/11/2017
<b>File name</b>	Bedford Town Centre Strategy - Value for Money Statement Summary.docx
<b>Reference number</b>	105251/GB01T14A88
<b>Number of pages</b>	9

### APPROVAL

Version	Name	Position	Date	Modifications
1	Author			
	Checked by			
	Approved by			
2	Author			
	Checked by			
	Approved by			



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## 1. VALUE FOR MONEY STATEMENT

### 1.1 Introduction

1.1.1 This section provides a value for money conclusion by considering all of the evidence pulled together as part of the Appraisal Summary Table. This provides evidence to inform the final judgement on the Value for Money category of the scheme as recommended by DfT<sup>1</sup>. It summaries:

- The options considered and the do-nothing scenario
- Initial and adjusted BCRs
- Non-monetised benefits
- Risks and uncertainties

1.1.2 Sensitivity tests have also been undertaken to the test the robustness of the scheme's forecasted benefits and the results of these are set out in Section 1.11.

1.1.3 Supporting tables for Public Accounts (PA), Economic Efficiency of the Transport System (TEE); and Analysis of Monetised Benefits (AMBC) are provided in the full Economic Case, to which an Appraisal Summary Table (AST) is also appended.

### 1.2 Summary

#### Options Considered

1.2.1 The do-nothing scenario would constitute the status quo in terms of the operation of the current highway network across the town centre, including current highway link and junction capacities and the absence of a functional UTMC system.

1.2.2 The package of measures assessed in the do-something scenario includes:

- Improvements in the town centre highway/public realm quality to discourage unnecessary through traffic and improve the quality of the environment for users of the town centre;
- A widespread programme of small/medium infrastructure improvements focussed on key junction pinch-points where worthwhile increases in capacity and reliability that assist all road users are justified and deliverable
- A major upgrade to existing traffic management systems across the whole Town Centre and Southern Gateway area to provide the maximum delay reductions possible, provide real-time information to drivers to support their decision-making, and to be ready to incorporate emerging/future technology on Cooperative Intelligent Transport Systems (C-ITS), Expressway driver information systems, autonomous vehicles and mobility as a service technology.

1.2.3

1.2.4

<sup>1</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/267296/vfm-advice-local-decision-makers.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267296/vfm-advice-local-decision-makers.pdf)

#### **Initial Benefit Cost Ratio**

1.2.5 The Initial Net Present Value (NPV) for the scheme, encompassing the direct transport user benefits is forecast to be -£12.209m, with the expected Cost Benefit Ratio of the scheme at 0.56 to 1. This is a clear demonstration that the benefits of the scheme are not singularly about enhancing traditional transport provision.

1.2.6 The initial NPV represents a quantified assessment of monetised benefits in terms of a traditional set of transport scheme impacts. Not only does it exclude a range of non-monetised impacts (discussed below) but a major element of the package of measures is also designed to enhance the town centre urban realm to support and grow the local economy. Excluding these benefits does not provide a full assessment of the impact of the scheme.

#### **Adjusted Benefit Cost Ratio**

1.2.7 The adjusted NPV for the scheme is forecast to be around £31.887mm with the expected Cost Benefit Ratio of the scheme at 2.15 to 1. This represents a high value for money category.

1.2.8 This incorporates an additional £44.2 million benefits over 30 years in relation to enhanced town centre economic retail value, as set out in Section 1.6.

1.2.9 We have taken a conservative estimate of 25% of the anticipated potential uplift in retail values as a result of the urban realm improvements. Even with this conservative estimate, these benefits are what is driving the positive BCR for this scheme and therefore we have undertaken additional sensitivity tests to account for the risk that these retail value uplifts may not be realised. Our assessment shows that a 1.85:1 BCR could be achieved if only 20% of the retail value uplift was realised.

1.2.10 A further sensitivity test incorporating this scenario as well as more conservative estimates on growth rates and the benefits of the UTM package is presented in Section 1.11.

#### **Non-monetised Impacts**

1.2.11 In addition to the monetised benefits, the package of scheme measures is forecast to deliver a range of non-monetised impact. Those criteria for which there is anticipated to be either positive or negative impacts are summarised below, with a full analysis of outcomes for all criteria, presented within the full Economic Case.

- Economy
  - Reliability impact on Business users - High Beneficial
- Environmental
  - Regeneration - Small Beneficial
  - Townscape - Moderate Beneficial
  - Historic Environment - Small Beneficial
- Social
  - Reliability impact on Commuting and Other users - High Beneficial

- Physical activity - Small Beneficial
- Journey quality - Moderate Beneficial
- Security - Small Beneficial
- Access to services - Moderate Beneficial
- Severance - Small Beneficial
- Option and non-use values - Small Beneficial

### Key Risks and Uncertainties

1.2.12 A comprehensive quantified risk assessment (QRA) has been undertaken and is included as part of the Management Case. This suggests a P80 value of £2.91m should be applied in considering financial risk at this stage of scheme development. This is 19% of the scheme costs (excluding optimism bias). Optimism bias has been added at 44%, recognising that although considerable work has been undertaken to develop the scheme to this stage particularly on the pinch-point elements, there is further work to do and therefore greater uncertainty on the technology elements of the UTM.

1.2.13 The other uncertainty to note is the level of retail value uplift that may be generated from public realm improvements. Our assessment, comparing values from similar pedestrianised areas in Bedford town centre core, is that the uplift will be significant. However, as a large proportion of the benefits of this package are derived from this anticipated we have undertaken some sensitivity tests around this to demonstrate that even with a lower than anticipated retail value uplift, significant benefits would still be delivered as reported in the Adjusted Benefit Cost Ratio section above.

### Assumptions

1.2.14 Assumptions made in line with WebTAG have been documented throughout this Economic Case. We have also made several assumptions about the impacts of various scheme elements as these cannot be fully captured in the standard transport modelling undertaken. This is reflective of the fact that the scheme itself is a broader town centre improvement package and not just a transport scheme.

1.2.15 The main assumptions made can be summarised as:

- Modelling approach:
  - Fixed matrices used
  - Impacts on Interpeak period, including Saturday, not modelled but assumed to be neutral impact
  - Accident benefits cannot be captured in COBALT as it the full scheme impacts are not captured in standard appraisal. Proxy of potential accident rate reduction on key Ampthill Road corridor taken. However, it is noted that this analysis has focused on one area of the scheme proposals and has not accounted for any re-distribution in traffic flows across the town centre as a result of the wider highway/UTM proposals. On some links where additional traffic will occur this may have modest safety disbenefits that have not been calculated

- Delay reduction generated by UTM C
  - Greenfield scheme
  - Evidence of similar schemes suggests average of 23% reduction in delay. Conservative estimate of 75% of this reduction assumed for the central case (i.e. 17.3% reduction in delay at affected junctions)
  - Local Plan growth rates applied as a proxy for increase in vehicles on the network. High and low growth rates also applied in corresponding sensitivity tests
- Rateable value uplift from public realm improvements
  - Evidence from other parts of Bedford Town Centre suggests potential for over 200% uplift in value. Conservative estimate of 25% of this uplift assumed for the central case (i.e. 53% uplift in rateable values)

### Sensitivity Tests

1.2.16 A summary of the two sensitivity scenarios is as follows:

- High Case
  - High growth (2021 = +7.9%, 2032 = +11.5%)
  - UTM C and Technology delay reduction = 23% of forecast delay
  - Retail benefits attributed to public realm enhancements = 30% of differential in rateable values from High Street to Core Town Centre
- Low Case
  - Low growth (2021 = -7.9%, 2032 = -11.5%)
  - UTM C and Technology delay reduction = 11.5% of forecast delay
  - Retail benefits attributed to public realm enhancements = 20% of differential in rateable values from High Street to Core Town Centre

1.2.17 A further sensitivity test was conducted to assess the impact of the retail benefits only, using the low case scenario of 20% differential in rateable values.

### Benefit Cost Ratios

1.2.18 The following table summarises the impact of these risks and sensitivity tests on the BCR.

**Table 1. BCRs**

SCENARIO	PVC (£M)	PVB (£M)	NPV (£M)	BCR
Initial Central Case	27.79	15.58	-12.21	<b>0.56</b>
Adjusted Low case	27.79	45.74	17.95	<b>1.65</b>
Adjust Central Case with 20% rateable value uplift	27.79	51.51	23.72	<b>1.85</b>
Adjusted Central case	27.79	59.68	31.89	<b>2.15</b>
Adjusted High Case	27.79	80.54	52.74	<b>2.90</b>



- 1.2.19 The initial BCR is based only on the direct transport user benefits and does not fully capture the significant benefits that will be derived from the improvement to the public realm around the High Street and the subsequent impact on retail rental values and the local economy. Furthermore, it does not include a range of non-monetised impacts, particularly in relation to improved journey time reliability generated from the pinch-point schemes and introduction of UTMC.
- 1.2.20 The adjusted BCR presented incorporates the benefits derived from the retail rental value uplift to give a fuller appreciation of the likely benefits of the scheme. Sensitivity tests have been undertaken on this core adjusted BCR that demonstrate if only 20% of the potential retail rental value uplift was achieved, the BCR for the scheme would be 1.85:1.
- 1.2.21 When considering the central case adjusted BCR of **2.15:1** and including the anticipated non-monetised benefits, we consider this scheme to represent a **High Value for Money** investment.

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## FULL BUSINESS CASE



# BEDFORD TOWN CENTRE TRANSPORT STRATEGY

## FULL BUSINESS CASE

### IDENTIFICATION TABLE

<b>Client/Project owner</b>	Bedford Borough Council
<b>Project</b>	Bedford Town Centre Transport Strategy
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## **1. THE COMMERCIAL CASE**

### **1.1 Introduction**

1.1.1 The Commercial Case for the Bedford Town Centre Transport Strategy scheme provides evidence that the proposed investment can be procured, implemented and operated in a viable and sustainable way. Adopting a commercial approach to the project is fundamental to determining that BBC gets the best deal from the market.

1.1.2 This chapter defines the current progress of the commercial aspects requirements. Areas this chapter considers include:

- Output Based Specification;
- Procurement Options
- Procurement Strategy;
- Payment Mechanisms;
- Pricing Framework and Charging Mechanisms;
- Potential for Risk Transfer;
- Contract Length; and
- Contract Management

### **1.2 Output Based Specification**

1.2.1 The outcomes which the procurement strategy must deliver are to:

- Achieve cost certainty, or certainty that the scheme can be delivered within the available funding constraints;
- Minimise further preparation costs with respect to scheme design by ensuring best value, and appropriate quality;
- Obtain contractor experience and input to the construction programme to ensure the implementation programme is robust and achievable; and
- Obtain contractor input to risk management and appraisals, including mitigation measures, to capitalise at an early stage on opportunities to reduce construction risk and improve out-turn certainty thereby reducing risks to a level that is 'As Low As Reasonably Practicable'.

1.2.2 The Output Based Specification for the scheme has yet to be developed, this is to be expected at this stage for the following reasons:

- The need to secure funding approval for the preferred scheme prior to undertaking this significant piece of work; and
- The tendering process has not begun.

1.2.3 BBC will use a combination of experienced in-house resources and specialist external consultants to develop the specifications for the distinct elements of the overall package of measures..

1.2.4 The specification for the package of scheme measures is broadly as follows:

- Public realm enhancements and footway widening along the High Street and around parts of St. Paul's Square and St. Mary's Street;
- Junction widening and signalisation schemes at Clapham Road / Manton Lane and Bromham Road / Shakespeare Road junctions;
- Carriageway widening along Britannia Road and across Cowbridge;
- Provision of new pedestrian and cycling footbridges at Cowbridge;
- Installation of new UTM system across the core town centre and Northern and Southern Gateway corridors, incorporating new or upgraded signals;
- Provision of new UTM common database, monitoring equipment, traffic database and control room equipment; and
- Installation of new signage, information and publicity systems and ANPR cameras.

### 1.3 Procurement Options

1.3.1 BBC have identified three procurement options for the delivery of their LEP funded schemes. The alternative options are:

- Full OJEU Tender;
- Delivery through existing Minor Highways Improvement Works Contract
- Delivery through existing framework contracts such as the Eastern Highways Alliance or
- A combination of all elements

1.3.2 The 'Full OJEU' approach would require an 'open' tender, where anyone may submit a tender, or a 'restricted' tender, where a Pre-Qualification is used to whittle down the open market to a pre-determined number of tenderers. This process would take a number of months to establish and evaluate and would then be followed up by the main tender process with at least 6 weeks for tender returns, a review process, and a period of stand-still.

1.3.3 Delivery through BBC's existing highways term contract or an existing framework contract would not strictly be a procurement process as it is an existing contract. The contract is based on mini completion or an agreed schedule that is utilised to determine a bill of quantities for any specific works. This provides BBC certainty on the magnitude of costs for delivering work. Given the relatively standard nature of the schemes, in highway design terms, this approach is considered to be an appropriate approach.

### 1.4 Procurement Strategy

1.4.1 The procurement process will be governed by the Council's own constitutional procurement Rules. The strategy will be subject to review by the Project Governance Board including the Council's Procurement Manager, senior Legal officer and senior officers from across the Council who are highly experienced in strategic procurement and contract management.

Express approval by the Project Board will oversee the release of tender documentation and secondly to enable the procurement to move to the award procedure stage following review of the award recommendation.

- 1.4.2 The Council's preferred route (based on previous experience of delivering long term time limited projects such as the DfT Challenge fund project for street lighting upgrades, large civil engineering projects such as Phases 1 and 2 of the Bedford Western bypass, and a number of large traffic engineering schemes within the urban environment), is to use in house design capabilities to undertake detailed scheme design and to use a variety of procurement methods for construction, giving the greatest flexibility and options for the differing types of works in the pinch point, technology and public realm tranches.
- 1.4.3 The Councils existing term maintenance contract has been recently tendered and has been procured to allow sufficient headroom for elements of scheme delivery. Rates are considered competitive for Highways Engineering given the bespoke item coverage and currency of the contract. The scheme design team are well versed in use of the contract which has been used frequently over the last eight years to deliver a range of highways maintenance and junction improvement schemes on time and on budget. The contractual arrangements are tailored for the type of individual projects which are similar in nature of the pinch point tranche of schemes.
- 1.4.4 The package of works for pinch point schemes and public realm works has also been entered onto the Eastern Highways Alliance Framework contract forward programme. Direct award or mini competition using this framework allows the Council to encourage the most competitive tendering, and access contractors who have a proven track record of delivering similar schemes across the region. This mechanism allows the Council to quickly access a body of resource of slightly larger contractors who have the capacity and experience in delivering some of the larger pinch point schemes and the public realm works.
- 1.4.5 Schemes that require specialist construction elements (e.g. works near railway infrastructure) would be programmed for delivery later in the overall delivery programme and these schemes would be procured through individual tenders. tendered. This approach will also be taken with the technology element of works. A framework contract has already been put in place to provide the Council with an expert client / design and project management resource in this field.

## **1.5 Payment Mechanisms**

- 1.5.1 Payment timing will be adopted to maximise the value from the contract through minimising financing and construction costs. Prompt and fair payment mechanisms will be applied throughout the supply chain. This is covered under the procurement process and will be monitored during the contract to ensure full value is delivered.

## **1.6 Pricing Framework and Charging Mechanisms**

- 1.6.1 The tendered elements of the programme delivery will require the appointed Contractor to deliver the individual work elements for a specified lump sum of money. These contracts will provide for specific risks associated with delivery of the individual work

elements that will be carried by the Contractor, which would result in the lump sum being adjusted if the compensation events occur.

1.6.2 The council has various procurement options available to deliver these works, these include but are not limited to, the following:

1. The Eastern Highways Alliance Framework – works can be awarded through this framework via direct award or mini-competition using either lot 1 (schemes with a value of up to £1.5 million) or lot 2 (schemes with a value of between £1 and £20 million).
2. The Bedford Borough Council Minor Highways Works contract an existing tendered contract with a priced schedule of rate but also allows the facility to use day works or a cost plus options.
3. The Bedford Borough Council Carriageway resurfacing contract – this is a contract currently being tendered and due to commence April 2018, this will have a priced schedule of rates but will also include the facility to use day works or cost plus options.
4. The Bedford Borough Council professional services agreement for traffic signal advice and design (currently with Kiers) and the joint Bedfordshire / Cambridgeshire traffic signals maintenance and renewal contract (currently with Dynniq)
5. The council also has the option to use existing Eastern Shires Procurement Office frameworks where applicable.

## **1.7 Risk Allocation and Transfer**

1.7.1 Although many of the design risks can only be resolved through rigorous design and review processes, once the design options are clear and the scope of land acquisition, highway requirements, environmental requirements are fully identified; the primary risks will be related to construction. There is potential for transferring these risks through the construction procurement process. This will be explored fully as the design and procurement process progresses.

## **1.8 Contract Lengths**

1.8.1 The existing BBC Minor Highways Improvements works is valid until July 2019 9at which point it will be retendered) .

1.8.2 The Eastern Highways Alliance Framework (Lot 2) is in place until 2021.

1.8.3 It is envisaged that individual schemes contracts will be for periods of around 6 months.

## **1.9 Contract Management**

- 1.9.1 BBC will meet with external contractors on a monthly basis throughout the construction and deliver periods on each individual scheme, or more frequently if this is deemed necessary by the Project Manager.
- 1.9.2 All contractors will be contractually obliged to provide monthly progress and financial updates to BBC, which will include updates to the project programme.



## 2. THE MANAGEMENT CASE

### 2.1 The Introduction

- 2.1.1 The purpose of the Management Case is to outline how the proposed scheme and its intended outcomes will be delivered successfully. It gives assurances that the scheme content, programme, resources, impacts, problems, affected groups and decision makers, will all be handled appropriately, to ensure that the scheme is ultimately successful.

### 2.2 Evidence of Similar Projects

- 2.2.1 BBC can demonstrate a successful record of delivering public realm and highway improvements schemes across the borough network, working alongside their Highways Term Contractors and other external contractors . Previous schemes include:
- Town Centre Public Realm improvements in All Hallows; and Greyfriars Bus Station
  - Bedford Western Bypass (Western Section opened 2010 & Northern section opened 2016)
  - Major town centre junction/link improvements at Tavistock Street; Dame Alice Street and Goldington Road.
  - Borough-wide Street lighting upgrade (DfT Challenge Fund tranche1)
- 2.2.2 The UTMC and Technology elements of the project are, by their very nature, innovative and new; however, the Borough Council will work with specialist agents who have previous experience of delivering these types of systems and technologies.

### 2.3 Project Dependencies

- 2.3.1 The scheme programme is relatively free from dependencies, with the exception of the require for utilities diversions, streetworks coordination and engagement with Network Rail for the Cowbridge infrastructure improvements

#### ***Utility Diversions***

- 2.3.2 It is anticipated that some utility diversions will be required as a consequence of the scheme. These diversions could involve some engineering challenges; however, early contractor involvement will mitigate against any potential utility or construction risks. Trial holes will be undertaken to establish the location of apparatus in key areas to ensure an accurate assessment of impacts and costs can be made at this stage of the project.

#### ***Network Rail***

- 2.3.3 One of the significant infrastructure elements is a junction improvement at Cowbridge on Ampthill road. This scheme will include a new pedestrian / cycle bridge rail overbridge on the Marston Vale branch line. In is anticipated that this element of works will take place towards the end of the project timeframe to allow sufficient engagement with network rail on design and programme considerations.

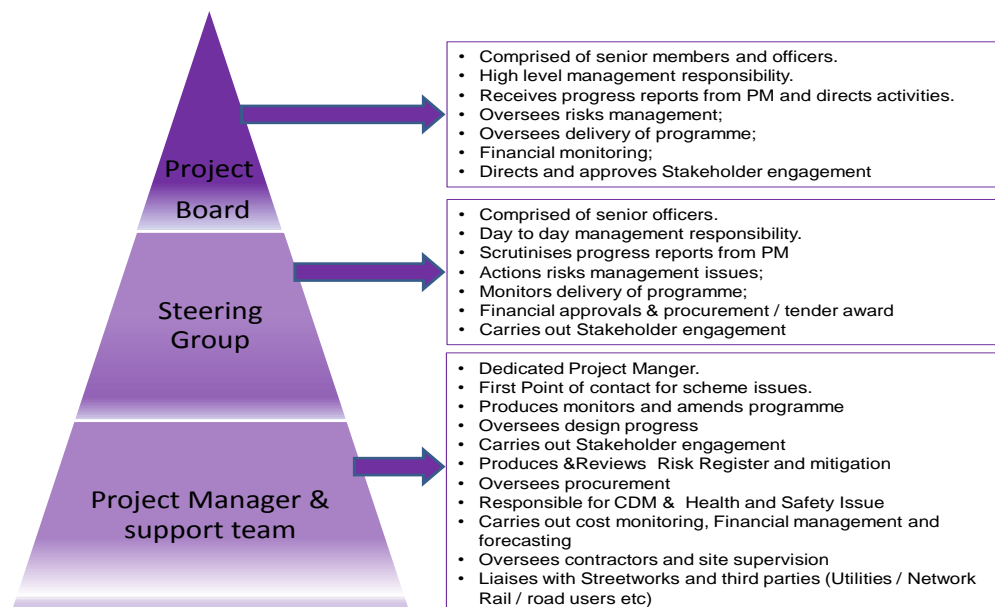
#### **Streetworks coordination**

- 2.3.4 There are a number of significant third party works planned for Bedford town centre over the coming years. These include Network Rail replacement of Ford End Road and Bromham Road bridges as part of the Midland Mainline electrification works, which are scheduled for spring 2018 and summer 2019 respectively.
- 2.3.5 Cadent Gas are carrying out a number of gas main replacement works throughout the town centre. Some of this work (e.g. Bedford High street) has already been brought forward and completed so as not to impact the public realm schemes planned as part of this project.
- 2.3.6 Early and continued engagement through the Councils established streetworks permitting scheme will allow constraints in programming and opportunities for joint use of road space to be identified and planned.

## 2.4 Governance, Organisational Structure & Roles

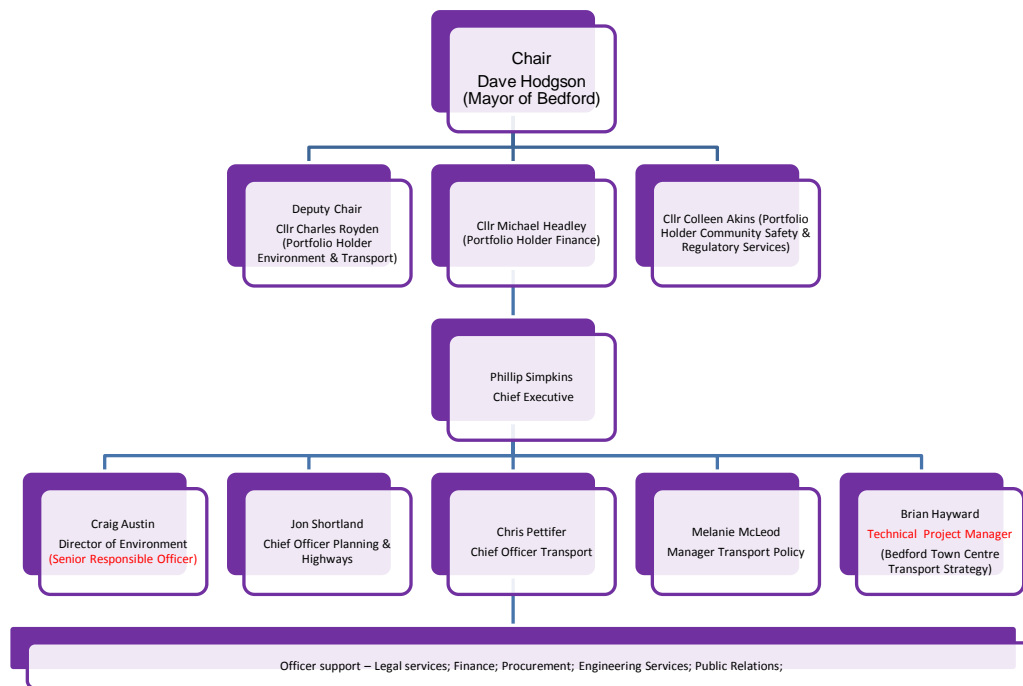
- 2.4.1 Ultimate responsibility for delivery of the scheme rests with BBC, who will assume an overall project management role. The hierarchy of the project management governance structure is shown in the figure below

Bedford Town Centre Transport Strategy – Governance arrangements diagram



- 2.4.2 The Project Board includes the Mayor; Portfolio Holders for Environment and Finance; Chief Executive; Director for Environment; Chief Officer for Transportation and the Project Manager. The Project Board structure is shown below:

### Bedford Town Centre Transport Strategy – Project Governance Board



2.4.3 The Project Board will make key decisions in relation to the project and will have the final say on committing funds; awarding contracts and managing risk. The Project Board – whose membership includes the Projects Senior Responsible Officer - will receive technical input from a Steering Group (mentioned below).

2.4.4 The Board will initially meet fortnightly during the first year of the project. Standing items on the Project Board agenda will include:

- Review of programme and delivery
- Receive Checkpoint Reports
- Detailed review of scheme design progress
- Stakeholder engagement
- Review of Risk Register
- Review of Health and Safety Issues
- Procurement & approvals
- Financial management and cost monitoring
- Outcome monitoring

**2.4.5** A Steering Group has been established to oversee reports made to the project board and ensure actions required by the are completed on time. The group comprises of Chief Officers, Team leaders in Traffic Management , Programme Management and Transport Policy and the Councils dedicated Project Manager. The Steering Group will meet on a weekly basis to produce and review checkpoint reports , update the risk register, and make recommendations to the project governance board for decisions. There is a deliberate overlap in membership of the two groups to ensure clarity of communication and a wider corporate responsibility.

**2.4.6** The Steering Group comprises of the following and :

Chief Officer for Transport – Chris Pettifer.

*Chris has over twenty five years experience working at a senior level in Transport Operations, specialising in Public and client transport policy and operations at a number of local authorities. He is the Councils lead officer for rail issues and is working with Network Rail on projects such as the Midland Mainline Electrification project and East West Rail. He recently oversaw the redevelopment of Bedford's Greyfriars bus station and has a close working relationship with bus operators in the Borough. Chris' current role includes responsibility for Parking operations and Traffic Management.*

Chief Officer for Planning & Highways – Jon Shortland

*Jons background is in Road safety and Transport Planning. With over 30 years experience. He is a chartered engineer with RosPA qualifications. More recently Jon has carried out a 'watchman' role on a County Council Managing Agent Contract and as Contract Manager for a multinational Civil Engineering company. His role at Bedford includes management of the Councils Engineering Services team who will be carrying out detailed design activities on this project.*

Manager for Transport Policy – Melanie McLeod

*Melanie is a qualified Transport Planner, has worked for Bedford Borough and County Councils for over twenty years and is the Councils lead officer on Transport Policy. Mel has been involved with this project since the initial conception stages and led the Councils work on the transport study that underlines the project. Mel has led numerous transport related stakeholder engagements through her work on developing the Councils Local Transport Plan and various strategic Transport projects.*

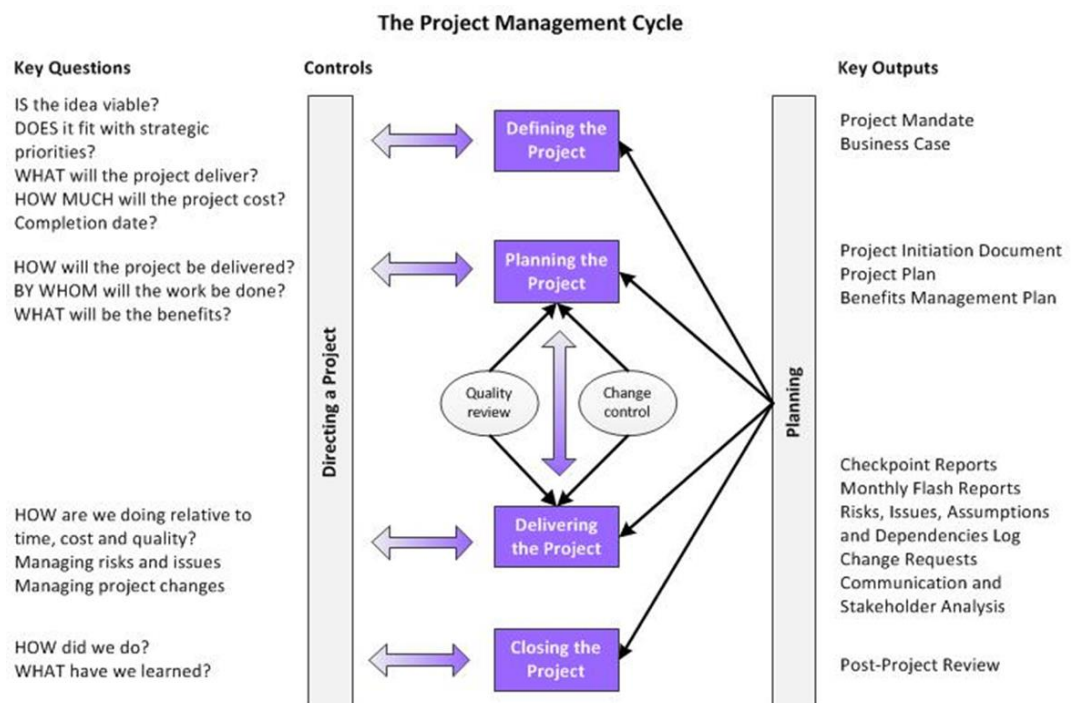
Bedford Town Centre Strategy Technical Project Manager – Brian Hayward (TPM)

*Brian is a qualified Civil Engineer and Fellow of Chartered Institution of Highways & Transportation. He has a background in Highways design and site supervision and has worked as contract manager overseeing local Highways Authority contracts from the client side, has ten years experience as Head of Highways at Bedford BC overseeing capital programmes of work and managing annual budgets in excess of £12m. He has recently overseen the delivery of the Bedford Bough Council DfT challenge fund project for street lighting improvements and project managed the successful delivery of the £18M Bedford Western bypass project.*

**2.4.7** The day-to-day management and delivery of the project will be the responsibility of the Technical Project Manager and Engineering support staff. They will work closely with the Term Contractors and other delivery partners, and also form a point of contact for stakeholders.

2.4.8 The usual Council governance procedures will apply to all aspects of the project management, as set out in Bedford Borough Councils PMO Manual (as shown in Appendix 3) with issues being escalated in accordance with Council protocols as necessary. The Director of Environment and the Councils Project Manager will have delegated authority to take operational decisions. Financial management will be in accordance with Councils established protocols. The Project Manager will be the budget holder for the project and will have authority on all transactions up to £5000. Transactions up to £50,000 can be approved by Chief Officers and amounts about £50,000 will require Director approval. The Chief Officers and Directors are members of the Project Governance Board.

2.4.9 The Project will be managed in accordance with Bedford Borough Councils PMO Manual (as shown in Appendix 3). An extract from the PMO manual showing the overarching project management cycle is shown below.



2.4.10 Stage 3 of the PMO Manual "Delivering the Project" states how activities relating to monitoring and controlling a project will take place.

2.4.11 Monitoring and Controlling includes:

- Measuring the ongoing project activities (where we are);
- Monitoring the project variables (cost, effort, ...) against the project plan and the project baseline (where we should be);
- Identify corrective actions to properly address issues and avoid risks (How can we get on track again);

- Influencing the factors that could result in arbitrary changes to the project so only changes that have been subject to a formal change control process are implemented.

2.4.12 The methods used for this will vary for the various Tranches of work explained elsewhere in this business case, but a form of regular update reporting to both the Steering Group and Project Board to ensure robust governance is usual.

Where issues are identified which are beyond the authority of the Project Manager or Steering Group to influence or resolve, the issue will be escalated to the Project Board.

#### 2.4.13 Checkpoint Reporting

All BBC led projects have a formal system of reporting, to ensure that progress updates are circulated and everyone is kept informed.

To enable this regular Checkpoint Reports are provided . The template for this document is in Appendix 4. Note that Checkpoint Reports will be prepared by the Technical Project Manager and submitted to the Steering Group and Project Board prior to submission to the Project Board for sign-off .

The Checkpoint Report will be completed by the Project Manager to capture the current status of the project. These reports are the source of understanding of the current progress or issues with the project. The checkpoint report summarises Project, risks, issues, assumptions and dependencies (known as RAIDs). ie items which could impact adversely on the project. The project plan will be updated to show expected and actual timeframes for the checkpoint reports / decisions.

## 2.5 Project Plan

2.5.1 A provisional Project Plan has been developed. It covers each key stage of the project and the critical path. The tasks that have a critical end date that affect the delivery timescale are highlighted on the Project Plan. The plan will be reviewed and updated on regular basis and will be considered at fortnightly Governance Board meetings. A Gantt chart of the project plan is shown in Appendix 1.

2.5.2 The Project Manager will have overall responsibility for delivering the tasks required to achieve key milestones. Key milestones, timescales and tasks are summarised below:

- Full Business Case submitted October 2017;
- Approval sought from SEMLEP: November 2017;
- Detailed design begins: December 2017;
- Establishment of contracting arrangements: February 2018;
- Works begin on ground: September 2018;
- Completion works – Pinch Points February 2021;
- Completion works – Technology October 2020;
- Completion works – Public Realm April 2021



## **2.6 Assurance and Approvals Plan**

- 2.6.1 Project assurance and approvals are the main responsibility of the Project Board supported by the Steering Group who will also ensure the quality of the work carried out. The scheme will be managed in line with the Project Plan and the Project Board will sign off each stage and give the go/no go decision at the gateway to start the following stage. Although the different tranches of the project have subtly different requirements in design procurement, stakeholder engagement and construction the project management process will be tailored to provide a consistent format of reports allowing risks, cost implications and delivery implications to be recorded and clearly expressed at each gateway stage (ie commencement of detailed design, commencement of procurement, commencement of works etc).
- 2.6.2 Further project assurance will be undertaken in the form of the checkpoint reports which will be produced by the Technical Project Manager, agreed by the Steering Group and signed off by the Project Board. The project plan will be updated to show expected and actual timeframes for the checkpoint reports / decisions.

## **2.7 Communications and Stakeholder Management**

- 2.7.1 BBC have a tried and tested Stakeholder Engagement process which is used on all significant projects. Effective use of the process has resulted in limited adverse feedback from the public and ensured successful delivery of schemes both from a project management and public relations perspective.
- 2.7.2 The main aim from the Stakeholder Engagement process is to ensure that stakeholders and members of the general public are kept informed throughout the development and implementation of a scheme. This can range from keeping key stakeholders updated with critical information, essential to the successful delivery of the scheme to providing information to the general public
- 2.7.3 A range of target audiences are identified, including: those who will benefit (directly or indirectly) from the scheme; those affected (directly or indirectly); those who may have an interest without being directly affected; those with a statutory role; and those involved in the funding of the scheme.
- 2.7.4 The level of information provided to each group will vary based upon the specific needs ranging from intensive consultation, general consultation, through to information provision.
- 2.7.5 A detailed stakeholder management strategy has been developed that identifies specific stakeholders and interest groups, categorises them in terms of impact, and establishes the required level of engagement.

## **2.8 Contract Management**

- 2.8.1 The project will be managed by BBC Project Delivery Manager (Brian Hayward) with officers from their in house design team and contracts team delivering the works streams with support from Transport Consultants (SYSTRA) providing additional resources where required and specialist services that cannot be provided in-house.

## 2.9 Project Reporting

2.9.1 Progress Reports will be produced by the Project Manager for consideration by the Project Governance Board and comprise updates on:

- Review of programme and delivery
- Detailed scheme design progress
- Stakeholder engagement
- Review of Risk Register
- Review of Health and Safety Issues
- Procurement & approvals
- Financial management and cost monitoring
- Outcome monitoring

2.9.2 The report identifies any areas of concern or where decisions are required by the Steering Group.

## 2.10 Risk Management Strategy

i. The Technical Project Manager will be responsible for the management of risks associated with the project, including chairing regular risk workshops and maintaining the Risk Register. The risk management process improves when responsibility for individual risks are delegated to team members, where necessary. Therefore Risk workshops will be held at regular intervals during the development of the project and will be timed to coincide with various activities shown on the programme. Typically Risk Workshops will be held at the following milestones:

- Start of detailed design for scheme elements
- Midpoint of detailed design for scheme elements
- Start of procurement for individual scheme elements
- Following award of contract for individual scheme elements
- During mobilization period
- At frequent intervals during construction period.

The Project Manager will re-issue the Risk Register as and when it is revised. Membership of the risk workshops will vary depending upon the stage of the project.

ii) The effective management of risk and uncertainty through accurate evaluation and proactive mitigation of risks is critical to the success of the project. The following guiding principles will be adhered to:

- Risk management is part of all project management board meetings and decision-making  
Project risk will be managed as an on-going process as part of the scheme governance structure. A scheme risk register is maintained and updated at each of the two-weekly Project Governance Board meetings. Responsibility for the risk register being maintained is held by BBC's Technical Project Manager.

- Risk management will be proactively and consistently applied throughout the project lifecycle
  - The management of risks is to ensure their reduction to a level as low as 'reasonably practical' or adopt appropriate mitigation strategy
  - A QRA will be initiated at the beginning of the project
  - Risk communication will be open and transparent to all stakeholders
- iii) The QRA commences at the initial stage of the project with the identification and assessment of risks in terms of their likelihood and associated cost outcomes, and follows a cyclic process as shown below.



A QRA has been undertaken for the project initially and results presented at this stage. Further reviews of QRA will be undertaken as required for this project. QRA will be reviewed in line with the WebTAG guidance on Scheme Costs. The Steering Group & Project Board will identify risks and measure their impacts on the programme. All risks will be documented in a register with the impact on programme clearly defined and the mitigation set out. The programme will take account of the 'most likely' scenario after mitigation.

The top risks and our measures to mitigate them are included in the Quantified Risk Assessment Shown in Appendix 2.

iv. QRA Process model through the life of the project

The QRA process involves four steps.



Step 1 is identification of all risks affecting the project through risk workshops and risk reviews, resulting in a risk register. Risk workshops typically include a mixture of expertise such as engineers, designers, finance officers, procurement specialists, and environmentalists.

Typically, the risk register is instigated with a list of project risks with qualitative information, then through various workshops and iterations, it will be developed to a comprehensive risk register to log the full spectrum of potential risks (also opportunities if necessary). Appropriate risk owners will be allocated for each risk, and progress on the management of the key risks will be discussed at each Project Board meeting. Periodic risk workshops will review all risks, add new risks, and close expired risks as the project progresses.

Step 2 of the QRA process is analysis of the various risks by defining their distributions in terms of probabilities, impacts and knock-on effects. This information is gathered through risk workshops and other interactions. A qualitative risk ranking will be undertaken in the form of a standard decision matrix using the concept shown below. Each risk will be assessed using a score; High, Medium, Low, etc., for Cost, Time, Performance, and Probability to calculate an overall risk scoring and to categorise into Red, Amber, or Green.

Bedford Borough Councils standard risk matrix is :

Risk Scoring Matrix					
Impact	High/ Critical	3	3	6	9
	Medium/ Serious	2	2	4	6
	Low/ Marginal	1	1	2	3
			1	2	3
			Low/ Improbable	Medium/ Could happen	High/ Probable
			Probability		

Probability Categories				
Description		Prob	Scale Value	
H	Probable	>70%	3	
M	Could happen	30-70%	2	
L	Improbable	<30%	1	

Impact Categories				
Description		Guide Scenario		Scale Value
H	Critical	Failure that involves significant rework, modification or reassessment		3
M	Serious	Failure or setback that causes additional work and reassessment but containable		2
L	Marginal	Impact has some effect causing rework or reassessment but easily handled		1

Risk Category & Action	
	Key/ Critical Risks - closely monitor, manage & develop fallback plans
	Intermediate Risks - monitor and manage to mitigate/ include specific risk allowances in cost estimate/ programme
	Minor Risks - general allowance in base cost estimate & programme

In addition to the above, for the QRA process, monetised risk quantities will be agreed through group consensus for each individual risk for the minimum impact, maximum impact, likely impact, and likelihood/probability of occurring.

Step 3 A risk model will be constructed using the Microsoft Excel and @Risk® software packages. The model will use the Monte-Carlo simulation theory by replicating a large number of iterations of likely project risk scenarios. Confidence levels relating to the cost of the scheme are obtained from the distribution of the averaged results produced by the simulations.

Step 4 is analysing the results against required contingency needs for the project. The 50% percentile value P(50) will be reported in line with WebTAG guidance. The Project Board will use other results of the QRA, including other percentile values, to monitor and manage risks at overall project level.

- v) The management strategy will enforce a systematic approach to responding to the various risks during the project lifecycle, and will continuously look to avoid, mitigate, transfer, or accept risks. In many cases, additional technical work or surveys, or early discussions with partners will reduce or mitigate risks. Risk control measures such as preventive, corrective, directive, or detective measures will be in place to treat risks. Delivery and contractor teams will be responsible for managing their risks and reporting any newly identified risks to the Project Manager. Risks escalated to Medium or High which could impact on the progress or financial position of the project will be referred by the Project Manager to the Project Board.

## 2.11 Scheme Delivery Risks

- 2.11.1 Earlier in this section of the report, the experience of BBC's staff has been highlighted in terms of delivering major transport schemes effectively and with little adverse effect. This was achieved through rigorous management policies, processes and procedures that were effectively and accurately implemented. An important aspect of the management process is identifying risks associated with scheme delivery and funding early in the process to allow mitigation to be identified.
- 2.11.2 Appendix 2 shows the Project Risk Register, with risks categorised in accordance with BBC established risk management policy. The Project Governance Board will review the risk register at its fortnightly meetings and oversee mitigation measures. A collegiate approach will be taken to risk appraisals to reduce the effects of risk appetite skewing the register. The project risk register will be entered onto the BBC corporate 'Assessnet' system to ensure full visibility and access to the risk register.
- 2.11.3 The risk register – including all scheme delivery risks – will also form part of the Quarterly monitoring reports to SEMLEP.

## **2.12 Benefits Realisation and Monitoring**

- 2.12.1 The purpose of benefits realisation is to plan for and track the benefits that are expected to be accrued over the lifetime of the scheme. The plan will detail the activities required to track the progress of the scheme including project milestones and responsibilities.
- 2.12.2 Monitoring will take place prior to scheme opening (baseline) and at predefined intervals upon successful delivery of the scheme, notably:
- 1 year post scheme opening;
  - 4 years post scheme opening; and
  - 9 years scheme opening.
- 2.12.3 The key scheme benefit indicators set out against the scheme objectives are shown within Table 2 below.



**Table 1. Scheme Benefits Indicators**

OBJECTIVE	DESIRED OUTCOMES
TS01 (Regeneration)	Support the heritage, cultural and economic regeneration in the town centre through enhanced access and improved town centre permeability.
TS02 (Town Centre Traffic)	Manage vehicular activity in the core town centre, in particular through movements, to enhance the pedestrian retail, night-time, and visitor economy experience, whilst ensuring adequate town centre access for traders, freight, public transport and taxis and to car parks
TS03 (Cross-town movements)	Facilitate efficient cross town and end-to-end corridor movements, for all transport modes, through strategic routings, reduced congestion at network pinch-points and improved infrastructure provision
TS04 (Strategic links)	Enhance strategic links to the town to secure the long term position of Bedford as a regional centre, whilst reducing the volume and impact of through vehicular traffic movements that could otherwise utilise the town ring road
TS05 (Network resilience)	Provide network resilience, across all modes, that accommodates forecast growth associated with future development aspirations of the town and changes to population demographics
TS06 (Safety & Security)	Create a safe and secure environment for all transport users, taking particular account the needs of vulnerable users, and reduce conflicts between vehicular and non-vehicular transport movements
TS07 (Environment)	Manage the environmental impacts of transport, in particular within the air quality management area, and promote sustainable modes of travel
TS08 (Access to health & education)	Proactively manage access to health and educational facilities, including hospital sites, schools, the college and the university, in order to make best use of transport network capacity
TS09 (Sense of Place)	Create a coherent 'sense of place' across the town quarters, ensuring clear vehicular and non-vehicular way-finding leading into and around the town centre, with a particular focus on ensuring connectivity with the river and the rail station
TS10 (Design)	Ensure inclusive, resilient, long-term, and low maintenance design of transport infrastructure and operational services

2.12.4 In order to ensure that the objectives are being realised, a method for measuring outputs from the scheme are classified in Table 3 below. The acceptable thresholds are deemed to be realistic and achievable, based on outputs from the PERs audit and forecast highway model for the package of scheme measures. Baseline data and

methods of measurement will be clearly set out in a monitoring and evaluation template.

**Table 2. Outcome Measurement and Acceptability thresholds**

MONITORING INDICATOR	MEASUREMENT	ACCEPTABLE THRESHOLD
TS01 (Regeneration)	Journey times (all modes); accessibility and permeability (PERS audit); rateable values of retail properties	5% reduction in peak hour journey times (all modes) +2 points for PERS rating for Permeability 25% increase in rateable values
TS02 (Town Centre Traffic)	Town centre vehicle kms, town centre vehicles speeds	5% reduction in town centre vehicle kms 15% reduction in High Street average speeds
TS03 (Cross-town movements)	Journey times	5% reduction in peak hour journey times (all modes)
TS04 (Strategic links)	strategic public transport services (rail routes/services; bus network kms); through traffic vehicle-trips within town centre cordon	5% increase in bus service levels 5% reduction in through traffic
TS05 (Network resilience)	Transport network capacity	10% increase in transport operating capacity
TS06 (Safety & Security)	Accident levels; security (PERS audit)	10% reduction in accident levels +2 points for PERS rating for Security
TS07 (Environment)	Town centre vehicle-kms;	5% reduction in town centre vehicle kms
TS08 (Access to health & education)	accessibility contours to sites	5% reduction in access times
TS09 (Sense of Place)	qualitative assessment of design and signage (PERS audit)	+2 points for PERS rating for Quality of Environment
TS10 (Design)	qualitative assessment of design	Design review

2.12.5 BBC will conduct a full evaluation of the impact of the package of scheme measures in the period after it is completed. The Council will prepare evaluation reports for short, medium and long term horizons ie one year (2022), four years (to 2025) and nine years (to 2030) after scheme opening, using the information to be collected as set out above to gauge the impact of the scheme on the traffic and transport network, and assess the success in meeting the scheme objectives. Unexpected effects of the scheme will be reported upon and, where appropriate, remedial measures identified.

2.12.6 BBC undertake to provide funding for short medium and long term monitoring. The form of monitoring and reporting will be as specified by SEMLEP.

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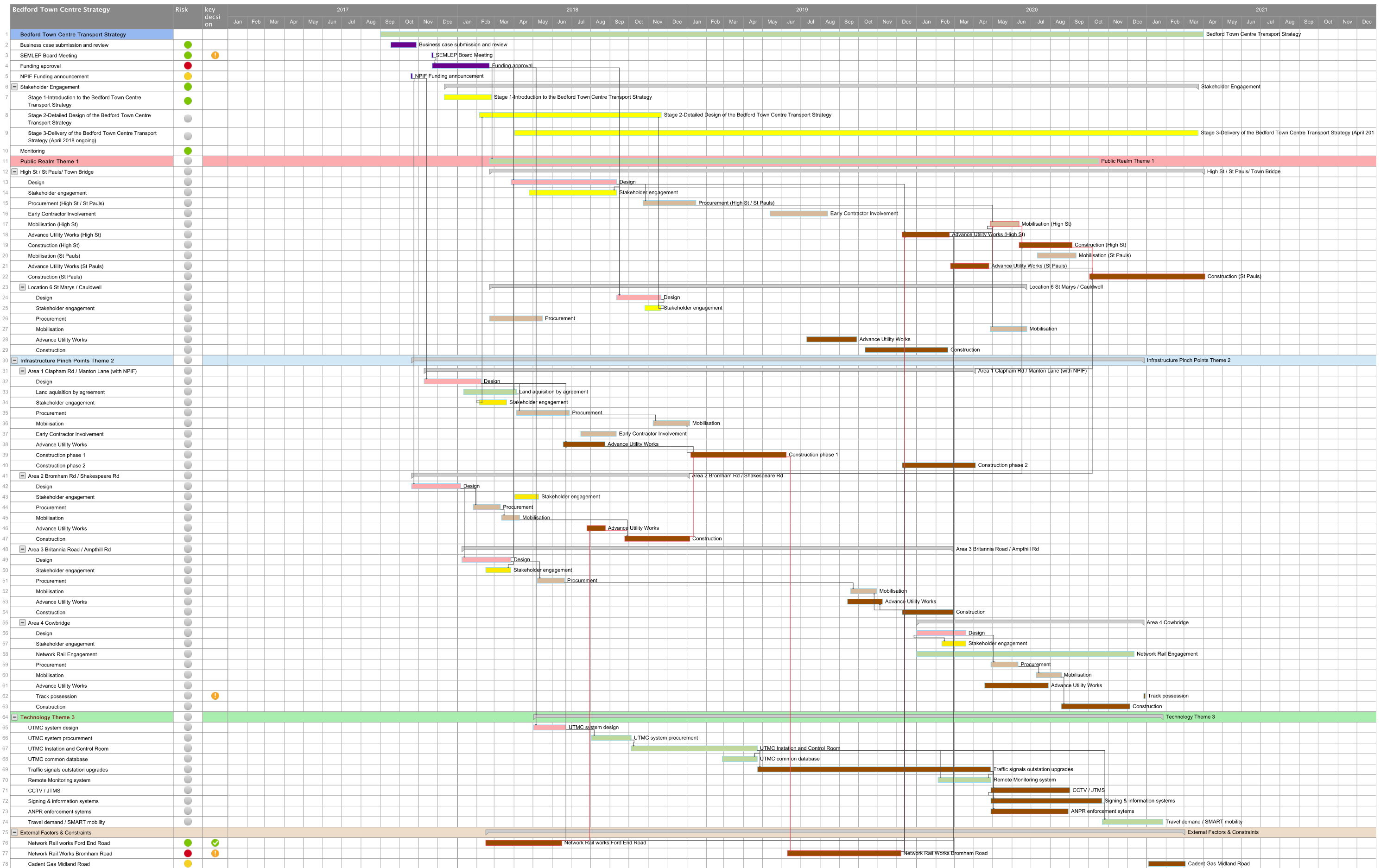
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## Bedford Town Centre Transport Strategy Programme Revision B 19 Oct 2017



CURRENT RISKS

Project Name:	Bedford Town Centre Strategy	No. of Risks	Total Approx £ impact of Risks at level
Project No:	TBC	3	
Project Manager:	Brian Hayward	3	
Project Team:	Melanie McLeod / Brian Hayward / Craig Austin / Chris Pettifer	63	
Date:	19/10/2017		
Revision:	E		

KEY:	
Project Board	Project Brief / User Requirements
Team	Design Team
External	Procurement (ESPO framework), Third Parties, Statutory Bodies
Design	Engineering Services
Construction	Direct Works
Handover	Project Closeout & Handover
Operations	Highways / Contractors



RISK IDENTIFICATION & MITIGATION					RISK ASSESSMENT - RESIDUAL RISK					ACTION PLAN - RESIDUAL RISK					COMMENTS
Ref	Category	Risk	Potential Impact	Completed Mitigation Action (to date)	Probability	Impact	Risk Score/Category	Cost Impact (Project Costs) [€K]	Schedule Impact [weeks]	Action Plan	Action Owner	Next Action Target Date	Date Achieved	Risk Status	
General Risks applying to whole project															
1	Economic / Financial/ Management	BBC funding not confirmed	Insufficient funds to deliver project	BBC MTFs approved Sept 2017. CIL 123 funding to be allocated	1	3	3			S151 undertaking to be provided to SEMLEP board	Brian Hayward	01/11/17		OPEN	
2	Economic / Financial/ Management	BBC is not able to commit enough senior management resource to the project	Poor project governance or delays to implementation programme	A project Management Board has been formed to meet throughout the project with attendance from all of the senior BBC staff. Board is supported by Steering group comprising Chief Officers and PM.	1	2	2				Brian Hayward	01/01/18		OPEN	
3	Economic / Financial/ Management	Changes to inflation assumptions (potentially as a result of lack of contractor capacity)	Insufficient funds to deliver project	Inflation allowance built into cost base - procurement method uses existing frameworks where possible, relatively short duration of overall programme in terms of inflation risk	1	1	1				Brian Hayward	01/02/18		OPEN	
4	Economic / Financial/ Management	Funding approval delayed by SEMLEP Board	programme start delayed - insufficient time to complete early design & stakeholder engagement	BBC funding in place to fund project manager - Board decision anticipated in November, with contingency date of February 2018	2	2	4			Submission timetable for business case and due diligence agreed with SEMLEP	Brian Hayward	11/11/17		OPEN	
5	Economic / Financial/ Management	Housing Infrastructure Fund bid and related works	Successful bid would increase possibility of major works at Ford End Road which would conflict with some pinch point schemes	Monitor bid outcome - design expected early 2018	1	3	3				Brian Hayward			OPEN	
6	Economic / Financial/ Management	Local authority contribution of is not forthcoming due to pressures on other budgets	Insufficient funds to deliver project at end of project timeframe	Members are aware that the LEP have prioritised the scheme which, subject to statutory consents being obtained and design / procurement, will be affordable and delivered within the approved funding envelope. There would be considerable reputational damage if BBC decided to abandon the scheme because of a change in short term funding priorities.	1	1	1			Funding to be secured as part of CIL. Review after 2019 elections	Brian Hayward	01/02/18		OPEN	
7	Economic / Financial/ Management	NPIF bid announcement delayed	programme start delayed - pinch point scheme at Clapham Rd / Manton Lane unable to proceed	Bid for funding submitted - announcement expected Autumn 2017. Design for Clapham Rd pinch point scheme can proceed as reduced scheme	0	0					Brian Hayward		19/10/17	CLOSED	NPIF funding allocation confirmed 19/10
8	Economic / Financial/ Management	Scheme costs	Scheme costs not properly identified due to optimism bias	Overall optimism bias of 44%. Detailed estimate to be completed as part of detailed design process 15% contingency to be provided in project cost. BBC funding to cover risk and contingency.	1	2	2			Scheme estimates based on LoHAC rates. Key infrastructure elements to be procured through competitive tender or EHA mini competition to secure best rates. BBC funding to be reviewed and increased if costs base changes.	Brian Hayward	01/12/18		OPEN	
9	Economic / Financial/ Management	Scheme costs	programme overrun beyond March 2021	Programme established taking into account road space constraints and sequencing of projects. Schemes with greatest engineering difficulty separated in programme to provide long lead in times; high value but more straightforward schemes programmed for end of project; BIP funding elements allow flexibility.	1	3	3			Governance methodology for risk review and programme monitoring established to facilitate contingency planning	Brian Hayward	01/12/18		OPEN	
10	Stakeholder Management / Consultation	Coherent delivery with other town centre projects and programmes	Project will not be delivered on time, may also impact budget	All key programmes, such as the One Public Estate, have BBC involvement and so good communication across departments will ensure coherent delivery. Through partnership working with other organisations, including utilities companies and Network Rail, opportunities for synergies between Streetworks will be identified.	1	2	2			Project Governance Board to review programme as part of corporate project plan.	Brian Hayward	01/02/18		OPEN	
11	Stakeholder Management / Consultation	Network Rail works at Bromham Road delayed	Delays to programme	Discussions on work programme at an advanced stage with NR - Key infrastructure works scheduled to be completed before anticipated date of NR works.	2	3	6			Continue discussions with Network Rail	Brian Hayward	01/02/18		OPEN	
12	Stakeholder Management / Consultation	Network Rail Works at Ford End Road delayed	Delays to programme	Works commence Oct 2017, programme of works established.	1	3	3			Monitor progress of NR works	Brian Hayward	01/11/17		OPEN	
13	Stakeholder Management / Consultation	Project programming optimistic	Project will not be delivered on time, may also impact budget	NRSWA notices issued to reserve road space; design of early start elements underway; ECI to mobilise contractors. TM requirements prepared SMP established.	1	2	2			Review at each detailed design stage and mobilisation stage	Brian Hayward	01/12/17		OPEN	
14	Statutory / Legal	Legal agreement between BBC & SEMLEP not in place or delayed.	Financial transactions not binding or properly governed.	Early engagement with SEMLEP about form of agreement	1	3	3			Draft agreement scheduled to be in place early 2018	Brian Hayward	01/02/18		OPEN	
15	Strategic / Political / Policy	Equality Impact Assessments not completed	BBC not acting in accordance with Public Sector requirements on Equal Opportunity Impact Assessments	EQIAs to be carried out on each Tranche as part of detailed design process.	1	1	1			Activities not on critical path of programme, allowance for slippage in delivery programme.	Brian Hayward	01/01/18		OPEN	
16	Strategic / Political / Policy	Monitoring requirements not established or completed	Incorrect governance or ability to demonstrate fulfilling of objectives	Benefits quantified in business case. Requirements for SEMLEP quarterly monitoring understood	1	2	2			Base line of monitoring requirement to be established - project governance agenda includes submission of monitoring forms and establishment of process beyond delivery period up to 2025.	Brian Hayward	01/01/18		OPEN	
17	Strategic / Political / Policy	Political / Public objection to scheme preventing its progression	Delays to programme	Stakeholder Management Plan in place. Project details to be discussed by overview and scrutiny committee in November 2017-March 2018. Traffic Regulation Order process allowed for in design element of programme	1	1	1			establish sub teams to carry out stakeholder engagement. Review of required TROs throughout stakeholder engagement and design steps.	Brian Hayward	01/01/18		OPEN	
18	Design / Technical / Preparatory	Capacity to produce detailed design	Delays to design stages in programme	Resourcing requirements identified as part of project plan development ; specialist design resource secured through existing framework contracts.	1	2	2			Additional support available through agency or external consultants	Brian Hayward	01/12/17		OPEN	
19	Procurement	Challenge from unsuccessful contractors following procurement process	Delays to programme	Diligent procurement procedure and involvement of procurement specialists in process.	1	1	1			ensure procurement methods follow corporate guidelines	Brian Hayward	01/02/18		OPEN	
20	Procurement	Delays in awarding contract due to extended queries on tenders	Delays to programme	Allowance made in project plan for full review of tender documents and process	1	1	1			maximise tender periods for individual scheme packages	Brian Hayward	01/02/18		OPEN	
21	Construction	Delays in construction programme resulting in increased contract administration requirements / costs	Delays to programme	Procurement uses established methods with high degree of staff familiarity	1	1	1			Review introduction of CEMAR for EHA framework in summer 2018	Brian Hayward	01/02/18		OPEN	
22	Construction	Unknown major utility works during programme of scheme delivery	Disruption to programme	NRSWA notices issued. Streetworks team appraised of anticipated programme	1	3	3			advance notices to be issued once funding agreed. Draft programme coordinates with all known risks	Brian Hayward	01/12/17		OPEN	
Infrastructure Theme															
101	Construction	Adverse ground conditions and/or contamination delays completion of works.	Increased Costs and delays to programme	As built drawings available from recent works at Cowbridge and Cauldwell St. Geotechnical surveys will be commissioned for high risk sites where information on previous site works is not available. The current cost estimate makes allowances for risk associated with unforeseen ground conditions.	1	2	2			review design following topographical and geotechnical surveys	Brian Hayward	01/02/18		OPEN	
102	Construction	Disruption to public transport during the works and resulting reduction in patronage	Loss of reputation - increased congestion affects duration of works	Early discussion with stakeholders as part of SMP	1	1	1			Monitor as part of SMP, use RTI and performance indicator on bus punctuality information to assess	Brian Hayward	01/02/18		OPEN	
103	Construction	Higher than expected traffic delays during construction leading to changes being required during works to TM arrangements	Loss of reputation - increased congestion affects duration of works	Advance planning with Streetworks team to agree TM proposals in relation to known traffic flows and any measures that can mitigate. SMP includes use of VMS signs to provide information on works.	1	1	1			Monitor delays using existing traffic journey time methodology; positive messages reinforced as part of SMP via social media and VMS	Brian Hayward	01/01/18		OPEN	
104	Construction	Impacts during construction	Disruption to local economy; Delays to programme, negative impact upon reputation and poor perception of overall improvements.	SMP outlines process to engage with local businesses; PM to act as central point of contact.	2	1	2			Keep log of incidents / complaints and carry out positive engagement before during and after scheme delivery	Brian Hayward	01/01/18		OPEN	
105	Construction	Long lead in times for permanent service diversions	Delays to programme	Programme established to allow timeframe for utility works in advance of main construction periods. Early Liaison with utility companies to ensure stats get diverted before construction	1	3	3			Review C18 returns as part of design process	Brian Hayward	01/01/18		OPEN	
106	Construction	Manton Lane Rbt - Highways drainage of the existing roundabout may introduce a significant change to the highway drainage provision needing extensive works than currently foreseen	Increased scheme costs & delay to programme	Establish drainage survey of existing highways drainage that will enable this to be assessed	1	3	3			Review drainage survey results as part of detailed design	Brian Hayward	01/02/18		OPEN	
107	Construction	Poor asset condition requiring increased remedial works as part of scheme eg drainage lighting, pavement	Increased costs of scheme elements and/or further maintenance works required	Utilise existing asset management inventory and condition data during design Establish asset condition through surveys and due diligence	1	2	2			Review need for additional BBC maintenance schemes in vicinity of works post scheme delivery	Brian Hayward	01/02/18		OPEN	
108	Construction	Road space / Traffic Management Act implications if utility works present	Delays to programme	programme considers the impact of known and necessary utility works - Road space requirements arising from programme logged with streetworks team; HAUC meetings to be included as part of SMP	2	2	4			Streetworks permit conditions to be reviewed	Brian Hayward	01/02/18		OPEN	
109	Construction	Roadworks coordination - own works programme	Delays to programme	Initial discussions with traffic manager; public transport operators; schools to take place having due regard to overall existing programme.	1	2	2			advance notices to be issued once funding agreed. Draft programme coordinates with all known risks. BBC own works programme to be fitted around this project.	Brian Hayward	01/12/17		OPEN	
110	Construction	Tar bound materials in existing surfacing being planned out - treated as U2 material	Increased costs of scheme elements and/or further maintenance works required	Materials known at all sites apart from Manton Lane - Pre test carriageway material at sites where composition is unknown. Procedures in place via DMRB for the identification and disposal of material. Design to consider recycling where appropriate.	2	2	4			Review following pre test of materials	Brian Hayward	01/01/18		OPEN	
111	Construction	Unknown services struck during construction period	Increased scheme costs & delay to programme	Utility searches at pre design stage; GPR survey undertaken to establish location of statutory undertakers equipment and unmarked services. Trial holes and CAT scans in advance of works permit to dig for main works.	1	3	3			ensure trial holes carried out in advance of design stage. Consider use of specialist company to survey and locate.	Brian Hayward	01/01/18		OPEN	
112	Construction	Use of sub standard material in construction resulting in earlier failure or remedial work.	Extension of scheme programme	Site supervision protocols will include material quality checks, contractors risk.	1	1	1			Ensure qualified and competent resource for site supervision	Brian Hayward	01/02/18		OPEN	
113	Construction	Working restrictions as a result of the need to avoid disruption during peak periods	Delays to programme	Programme will consider seasonality - the available number of hours for different works locations and phases and ensure programme allowance is sufficient. Ensure compliance requirements are included in tender	2	2	4			Clarify restrictions and timeframes during procurement	Brian Hayward	01/02/18		OPEN	
114	Construction	Works taking place on local strategic road network - timing of works required to avoid key dates relating to Christmas / events etc.	Delays to programme	current programme of works avoids other disruptive works on network, works in this tranche phased to avoid conflict, early engagement with Streetworks team and roadworks info being provided as part of SMP	2	2	4			Clarify restrictions and timeframes during procurement	Brian Hayward	01/02/18		OPEN	
115	Design	Land acquisition	Changes to scheme design	Initial meetings held between CEO and Bedford Modern School held and agreement in principle reached	1	3	3			Allowance for detailed design and land acquisition to take place in programme, and 8 month buffer until construction works commence	Brian Hayward	01/02/18		OPEN	
116	Design	Planning approval required to implement schemes	Delays to programme	Works all deliverable within public highways boundary and under highways powers - possible requirement for some ancillary works at Manton Lane that may require planning permission.	1	3	3			Discussions with school regarding transfer of land to commence Jan 2018 - including possible need for retaining wall on school land.	Brian Hayward	01/01/18		OPEN	
117	Design	Statutory process (inc TTRO & TRO)	Delays to programme	Traffic regulation order processes carried out in house, timescales identified and contained within design stage /mobilisation stage	1	1	1			Full suite of TROs and TTROs to be overseen by PM / Design team.	Brian Hayward	01/01/18		OPEN	
118	Design / Technical / Preparatory	Changes in design standards during scheme leading to rework/delays	Changes to scheme design	Regular review of any changes to standards. Local standards well established, potential requirement of NR design standards to be reviewed during discussions with NR. Established mechanism for applying departures from standards.	1	2	2			Design team to follow DMRB and BBC Highways design guide	Brian Hayward	01/01/18		OPEN	
119	Design / Technical / Preparatory	Changes to design after construction has commenced	Increased scheme costs & delay to programme	The detailed design for the contract tender documents will provide as much detail as possible on the site conditions and methods of construction; so as to avoid questions about "buildability" early contractor involvement in larger schemes	1	1	1			Sign of process as part of BBC PMO gateway requirements	Brian Hayward	01/02/18		OPEN	
120	Design / Technical / Preparatory	Cowbridge - road restraint on bridge is substandard and needs upgrading	Increased scheme costs & delay to programme	Asset inventory reviewed and site assessment carried out	1	3	3			a full assessment of the existing parapets at the bridge and approach road restraint will be required and new design conducted	Brian Hayward	01/02/18		OPEN	
121	Design / Technical / Preparatory	Cowbridge - the proposed widening may require strengthening of the bridge deck to adequately support the widened live loading	Increased scheme costs & delay to programme	Engagement with NR commenced	2	3	6			detailed survey of the bridge will be required to establish current bridge strength	Brian Hayward	01/01/18		OPEN	
122	Design / Technical / Preparatory	Design errors/ omissions that could lead to designs being revised and could cause delay	Delay in finalising design and costs	Established check / approval process for design	1	1	1			Sign of process as part of BBC PMO gateway requirements	Brian Hayward	01/02/18		OPEN	
123	Design / Technical / Preparatory	Impact upon design due to locality of utility services	Delay in finalising design and costs	Utility searches & NRSWA C18 process early in programme; Identify precise location of services and agree constraints with utility companies at earliest opportunity - arrange for trial pits during design stage.	1	2	2			Sign of process as part of BBC PMO gateway requirements	Brian Hayward	01/02/18		OPEN	
124	Design / Technical / Preparatory	Inaccuracy of base mapping and land boundary information compared to that used for outline design costs	delay to programme and additional survey / design costs	Topographical surveys have been commissioned. The current cost estimate makes allowances for risk associated design changes resulting from more accurate topographical information	1	2	2			Sign of process as part of BBC PMO gateway requirements	Brian Hayward	01/01/18		OPEN	
125	Design / Technical / Preparatory	Incomplete or late delivery of outputs by design teams	Delay in finalising design and costs	Ongoing programme monitoring and checkpoint reports. Other resources available where hold ups occur.	1	1	1			weekly progress meetings to be held between design team and PM	Brian Hayward	01/01/18		OPEN	
126	Economic / Financial/ Management	Estimated scheme costs inaccurate	Cost overrun	Detailed estimate to be completed based on site investigations, lessons learnt from previous works in vicinity. 15% contingency to be provided in project cost	1	2	2			Scheme estimates based on LoHAC rates. Key infrastructure elements to be procured through competitive tender or EHA mini competition to secure best rates.	Brian Hayward	01/12/18		OPEN	
127	Environmental	Ashburnham Road / Shakespeare Road - felling of trees causes public complaints	Delays to programme	Check requirements of TPO with Tree team, early issue for discussing as part of stakeholder management strategy	2	2	4			Engagement with local members and community groups - commensurate measures to remediate effects to be identified	Brian Hayward	01/02/18		OPEN	



Project Name:	Bedford Town Centre Strategy		No. of Risks	Total Approx £ Impact of Risks at level
Project No:	TBC	Red (Critical)	3	
Project Manager:	Brian Hayward	Amber (Intermediate)	31	
Project Team :	Melanie McLeod / Brian Hayward / Craig Austin / Chris Pettifer	Green (Minor)	63	
Date:	19/10/2017			
Revision:	E			

KEY:	
Project Board	Project Brief / User Requirements
Team	Design Team
External	Procurement (ESPO framework), Third Parties, Statutory Bodies
Design	Engineering Services
Construction	Direct Works
Handover	Project Closeout & Handover
Operations	Highways / Contractors



RISK IDENTIFICATION & MITIGATION					RISK ASSESSMENT - RESIDUAL RISK					ACTION PLAN - RESIDUAL RISK					COMMENTS
Ref	Category	Risk	Potential Impact	Completed Mitigation Action (to date)	Probability	Impact	Risk Score/Category	Cost Impact (Project Costs) [£K]	Schedule Impact [weeks]	Action Plan	Action Owner	Next Action Target Date	Date Achieved	Risk Status	
128	Environmental	Programme delayed due to incident affecting Highways Network	Delays to programme	programme identifies critical path activities	1	2	2			Schemes to be moved off critical path if opportunity allows - if elements are significantly delayed then BBC funding to be made available for completion of project	Brian Hayward	01/03/18		OPEN	
129	Environmental	Programme delayed due to inclement weather	Delays to programme	Initial programme includes extra time allowance for schemes being constructed in winter periods	2	2	4			Review programme, use forecast data from winter service activities to identify potential issues, move schemes off critical path if opportunity allows.	Brian Hayward	01/03/18		OPEN	
130	Environmental	Working restrictions due to environmental constraints	Delays to programme	Programme will consider seasonally the available number of hours for different works locations and phases and ensure programme allowance is sufficient. Ensure compliance requirements are included in tender documents	1	3	3			Tender documentation to include mitigation measures on - for example - noise and dust.	Brian Hayward	01/02/18		OPEN	
131	Procurement	Procurement of works	project will not be delivered on time budget will not be spent	Maximum use of existing contractual arrangement and application of robust procurement framework. Procurement options already evaluated (existing contract, in house delivery or framework contract)	1	3	3			Existing suppliers in place for technology elements; Infrastructure / public realm schemes identified on EHA framework forward plan; BBC works tender to be issued winter 2017 includes facility to deliver elements of works.	Brian Hayward	01/11/17		OPEN	
132	Stakeholder Management / Consultation	Cauldwell St Jctn - Bedford College and Bedford Free school access issues delay programme	Delays to programme	College & BFS identified as a key stakeholders and will be involved in key planning discussions	1	1	1			Direct engement from PM prior to construction period	Brian Hayward	01/02/18		OPEN	
133	Stakeholder Management / Consultation	Cauldwell St Jctn - OPE development leads to a change in design	Abortive works	Design to be 'future proofed' to allow retro fit of new road layout with minimal disruption	1	2	2			PM to liaise with OPE PM	Brian Hayward	01/01/18		OPEN	
134	Stakeholder Management / Consultation	Cowbridge - site on diversion route for A421	incident on A421 during works period may delay works	Incident most likely to be of short duration - VMS signs to be placed in advance of site and A421 diversion route amended with agreement of HE	1	1	1			PM to liaise with HE	Brian Hayward	01/02/18		OPEN	
135	Stakeholder Management / Consultation	Cowbridge - disruption to Interchange Retail park access during works	Disruption to local economy; Delays to programme, negative impact upon reputation and poor perception of overall improvements.	IRP identified as a key stakeholders and will be involved in key planning discussions	3	1	3			Direct engement from PM prior to construction period	Brian Hayward	01/02/18		OPEN	
136	Stakeholder Management / Consultation	Engagement with network Rail for Cowbridge Scheme	Delays to programme	Feasibility design identifies requirements. Infrastructure works scheduled at end of overall programme to provide sufficient headroom for NR engagement	2	3	6			Detailed design and engagement with NR to commence once funding agreement in place	Brian Hayward	01/01/18		OPEN	
137	Stakeholder Management / Consultation	Manton Lane -Bedford Modern School access issues delay programme	Disruption to local amenity; Delays to programme, negative impact upon reputation and poor perception of overall improvements.	BMS identified as a key stakeholder and will be involved in key planning discussions	3	1	3			Direct engement from PM prior to construction period	Brian Hayward	01/02/18		OPEN	
138	Stakeholder Management / Consultation	Stakeholder engagement with Public Transport operators delayed	Lack of engagement with scheme intentions or deliverables	Project plan in development; communication strategy and stakeholder engagement identified as early activities.	1	2	2			establish sub teams to carry out stakeholder engagement	Brian Hayward	01/12/17		OPEN	
Public Realm Theme															
201	Design	Planning constraints	Delays to programme	Planning approval required to implement scheme. Works contained within public Highway and deliverable under Highways powers. Area around old bank owned by BBC but not highway - boundaries clearly established.	1	1	1			ensure property team input into detailed design stage	Brian Hayward	01/02/18		OPEN	
202	Design	Statutory process (inc TTRO & TRO)	Delays to programme	Traffic regulation order processes carried out in house, timescales identified and contained within design stage /mobilisation stage	1	1	1			Full suite of TROs and TTROs to be overseen by PM / Design team.	Brian Hayward	01/02/18		OPEN	
203	Design / Technical / Preparatory	Changes to design of High St / Public realm after construction has commenced		SMP to include details of street furniture and material specifications. Traffic modelling required as part of design stage to give assurance on requirement for signals/crossing points etc. The detailed design for the contract tender documents will provide as much detail as possible on the site conditions and methods of construction; so as to avoid questions about "buildability" early contractor involvement in larger schemes	1	1	1			Sign of process as part of BBC PMO gateway requirements	Brian Hayward	01/01/18		OPEN	
204	Economic / Financial/ Management	Scheme costs	cost overrun	Detailed estimate to be completed based on site investigations, lessons learnt from previous works in vicinity. 15% contingency to be provided in respect cost	1	2	2			Scheme estimates based on LoHAC rates. Key infrastructure elements to be procured through competitive tender or EHA mini competition to secure best rates.	Brian Hayward	01/12/18		OPEN	
205	Environmental	Programme delayed due to inclement weather	Delays to programme	Initial programme includes extra time allowance for schemes being constructed in winter periods	2	2	4			Review programme, use forecast data from winter service activities to identify potential issues, move schemes off critical path if opportunity allows.	Brian Hayward	01/03/18		OPEN	
206	Procurement	Contractors not interested in work on offer through framework agreements	Delays to programme	Project identified on EHA forward plan - early engagement of contractors.	2	1	2			Back up procurement options with existing contractors and /or in house delivery to be considered if necessary.	Brian Hayward			OPEN	
207	Procurement	Procurement of works	project will not be delivered on time budget will not be spent	Maximum use of existing contractual arrangement and application of robust procurement framework. Procurement options already evaluated (existing contract, in house delivery or framework contract).	1	3	3			Existing suppliers in place for technology elements. Infrastructure / public realm schemes identified on EHA framework forward plan; BBC works tender to be issued winter 2017 includes facility to deliver elements of works.	Brian Hayward	01/11/17		OPEN	
208	Stakeholder Management / Consultation	Stakeholder engagement on public realm schemes delayed	Lack of engagement with scheme intentions or deliverables	Project plan in development; communication strategy and stakeholder engagement identified as early activities.	1	2	2			establish sub teams to carry out stakeholder engagement	Brian Hayward	01/12/17		OPEN	
209	Stakeholder Management / Consultation	Stakeholder engagement with Public Transport operators delayed	Lack of engagement with scheme intentions or deliverables	Project plan in development; communication strategy and stakeholder engagement identified as early activities.	1	2	2			establish sub teams to carry out stakeholder engagement	Brian Hayward	01/12/17		OPEN	
210	Stakeholder Management / Consultation	Works extended due to requirement to facilitate access to shops	Delay to programme; Loss of reputation - increased congestion affects duration of works	Programme allows facility for delivery periods - design to include buildability audit and early contractor engagement to tailor works	1	2	2				Brian Hayward	01/02/18		OPEN	
211	Construction	Adverse ground conditions in High St and/or contamination delays completion of works.	Increased Costs and delays to programme	Ground radar surveys will be commissioned. The current cost estimate makes allowances for risk associated with unforeseen ground conditions	2	2	4			Carry out trial excavations before design commences.	Brian Hayward	01/02/18		OPEN	
212	Construction	Disruption to public transport during the works at StPauls Square where there are a number of bus stops leading to a reduction in patronage	Loss of reputation - increased congestion affects duration of works	Early discussion with stakeholders as part of SMP - use knowledge gained from recent maintenance works in St Pauls to provide workable alternative arrangements for bus routes.	1	2	2			Ensure issues are picked up in SMP - make best use of comms prior to construction period	Brian Hayward	01/01/18		OPEN	
213	Construction	Impacts during construction - disruption to local businesses	Delay to programme; Loss of reputation - increased congestion affects duration of works	Early discussion with stakeholders as part of SMP - use knowledge gained from recent Gas main renewal works to inform best working practices	1	2	2			Ensure issues are picked up in SMP - make best use of comms prior to construction period	Brian Hayward	01/01/18		OPEN	
214	Construction	Long lead in times for permanent service diversions	Delays to programme	Programme established to allow timeframe for utility works in advance of main construction periods. Early Liaison with utility companies to ensure assets get diverted before construction	1	3	3			Review C18 returns as part of design process	Brian Hayward	01/02/18		OPEN	
215	Construction	Noise pollution complaints raised during construction works affecting programme.	Restrictions on working hours extend programme	Consider undertaking noise impact assessments as part of EIA	1	2	2			working hours to be reviewed and specified in tender documents	Brian Hayward	01/02/18		OPEN	
216	Construction	Poor asset condition requiring increased remedial works as part of scheme eg drainage lighting, pavement	Increased costs of scheme elements and/or further maintenance works required	Utilise existing asset management inventory and condition data during design Establish asset condition through surveys and due diligence	1	2	2			Review need for additional BBC maintenance schemes in vicinity of works post scheme delivery	Brian Hayward	01/02/18		OPEN	
217	Construction	Roadworks coordination - own works programme	Delays to programme	Initial discussions with traffic manager; public transport operators; schools to take place having due regard to overall existing programme	1	2	2			advance notices to be issued once funding agreed. Draft programme coordinates with all known risks. BBC own works programme to be fitted around this project.	Brian Hayward	01/12/17		OPEN	
218	Construction	Shortage of specialist materials or labour for works on public realm schemes	Delays to programme	Design to be completed well in advance of construction period allowing long lead in time for sourcing materials. Materials to be non specialist wherever possible Requirements to be clearly stated in procurement phase and additional cost risks to be borne by contractor.	2	1	2			review material specification following SMP	Brian Hayward	01/02/18		OPEN	
219	Construction	Unknown services struck during construction period	Increased scheme costs & delay to programme	Utility searches at pre-design stage - GPR survey undertaken to establish location of statutory undertakers equipment and unmarked services. Trial holes and CAT scans in advance of works, permit to dig for main works	1	3	3			ensure trial holes carried out in advance of design stage. Consider use of specialist company to survey and locate.	Brian Hayward	01/02/18		OPEN	
220	Construction	Use of sub standard material in construction resulting in earlier failure or remedial work.	Extension of scheme programme	Site supervision protocols will include material quality checks, contractors risk.	1	1	1			Ensure qualified and competent resource for site supervision	Brian Hayward	01/02/18		OPEN	
221	Construction	Works impacted by river festival	Disruption to scheme programme	Current programme set out to avoid clashes	1	1	1			dates of river festival to be added as a constraint to scheme project plan	Brian Hayward	01/02/18		OPEN	
Technology Theme															
301	Design / Technical / Preparatory	statutory process (inc TTRO & TRO) undefined for area wide delivery	Delays to programme	Traffic regulation order processes carried out in house, timescales identified and contained within design stage /mobilisation stage. Individual work areas to be viewed as self contained packages with specialist delivery team	1	1	1			Full suite of TROs and TTROs to be overseen by PM / Design team.	Brian Hayward	01/02/18		OPEN	
302	Design / Technical / Preparatory	Capacity to produce detailed design	Delays to programme	Initial feasibility works completed. Framework contract in place with Keir to provide specialist design resource	1	2	2			Additional support available through agency or external consultants	Brian Hayward	01/12/17		OPEN	
303	Design / Technical / Preparatory	CCTV / JTMS compatability issues	Disruption to scheme programme	Cloud based system to be used with common UTMCM protocols	1	1	1			Activities not on critical path of programme, allowance for slippage in delivery programme. Engage specialist to delivery UTMCM and Technology elements. Ensure procurement and construction procedures are sufficiently robust to minimise likelihood of construction difficulties.	Brian Hayward	01/02/18		OPEN	
304	Design / Technical / Preparatory	Impact upon design due to locality of utility services	Delay in finalising design and costs	Utility searches & NRSWA C18 process early in programme. Identify precise location of services and agree constraints with utility companies at earliest opportunity - arrange for trial pits during design stage	1	1	1			SMP to review	Brian Hayward	01/01/18		OPEN	
305	Design / Technical / Preparatory	Remote Monitoring system compatability issues	Disruption to scheme programme	Cloud based system to be used with common UTMCM protocols	1	1	1			Activities not on critical path of programme, allowance for slippage in delivery programme. Engage specialist to delivery UTMCM and Technology elements. Ensure procurement and construction procedures are sufficiently robust to minimise likelihood of construction difficulties.	Brian Hayward	01/01/18		OPEN	
306	Design / Technical / Preparatory	Technology elements not properly defined or Changes to design after construction has commenced due to changes in technology	Change in scope and costs of technology tranche	Industry market testing completed. Early activities with existing partners underway to refine scope. Gateway process to determine specifications, common protocols to be used to provide future proofing in fast changing sector	2	2	4			Activities not on critical path of programme, allowance for slippage in delivery programme. Engage specialist to delivery UTMCM and Technology elements. Ensure procurement and construction procedures are sufficiently robust to minimise likelihood of construction difficulties.	Brian Hayward	01/02/18		OPEN	
307	Design / Technical / Preparatory	UTMCM common database compatability issues	Disruption to scheme programme	Cloud based system to be used with common UTMCM protocols	1	1	1			Activities not on critical path of programme, allowance for slippage in delivery programme. Engage specialist to delivery UTMCM and Technology elements. Ensure procurement and construction procedures are sufficiently robust to minimise likelihood of construction difficulties.	Brian Hayward	01/02/18		OPEN	
308	Design / Technical / Preparatory	UTMCM system design delayed due to specialist resource issues	Delay in finalising design and costs	Initial feasibility works completed. Framework contract in place with Keir to provide specialist design resource	1	2	2			Initial project inception meetings planned for January 2018	Brian Hayward	01/02/18		OPEN	
309	Design / Technical / Preparatory	UTMCM system procurement undefined or not deliverable as single package	Delays to programme	Industry market testing completed. Early activities with existing partners underway to refine scope. Gateway process to determine specifications, common protocols to be used to provide future proofing in fast changing sector	2	1	2			Activities not on critical path of programme, allowance for slippage in delivery programme. Engage specialist to delivery UTMCM and Technology elements. Ensure procurement and construction procedures are sufficiently robust to minimise likelihood of construction difficulties.	Brian Hayward	01/02/18		OPEN	
310	Economic / Financial/ Management	Scheme costs	Cost overrun	Detailed estimate to be completed based on site investigations, lessons learnt from previous works in vicinity. 15% contingency to be provided in respect cost	1	2	2			Scheme estimates based on LoHAC rates. Key infrastructure elements to be procured through competitive tender or EHA mini competition to secure best rates.	Brian Hayward	01/12/18		OPEN	
311	Procurement	Procurement of Signing & information systems	Disruption to scheme programme	Similar works recently procured through framework contract	1	1	1			Make use of previous tender specification	Brian Hayward	01/02/18		OPEN	
312	Procurement	Procurement of works	Project will not be delivered on time budget will not be spent	Maximum use of existing contractual arrangement and application of robust procurement framework. Procurement options already evaluated (existing contract, in house delivery or framework contract).	1	3	3			Existing suppliers in place for technology elements with Dynnic; Infrastructure / public realm schemes identified on EHA framework forward plan; BBC works tender to be issued winter 2017 includes facility to deliver elements of works.	Brian Hayward	01/11/17		OPEN	
313	Stakeholder Management / Consultation	ANPR enforcement systems not compatable with existing BBC systems	Disruption to scheme programme	BBC PMO procedure to provide high level corporate project visibility and direction. Existing system specifications to be used as basis for design	1	1	1			Sign of process as part of BBC PMO gateway requirements	Brian Hayward	01/02/18		OPEN	
314	Stakeholder Management / Consultation	Stakeholder engagement not defined	Lack of engagement with scheme intentions or deliverables	Project plan in development; communication strategy and stakeholder engagement identified as early activities.	1	2	2			establish sub teams to carry out stakeholder engagement	Brian Hayward	01/12/17		OPEN	
315	Stakeholder Management / Consultation	Travel demand / SMART mobility aspects undefined	Delay in finalising design and costs	Industry market testing completed. Early activities with existing partners underway to refine scope.	2	2	4			SMP to develop concept	Brian Hayward	01/02/18		OPEN	
316	Stakeholder Management / Consultation	UTMCM Instation and Control Room not supported by internal IT or property	Delays to programme	BBC PMO procedure to provide high level corporate project visibility and direction	1	1	1			Sign of process as part of BBC PMO gateway requirements	Brian Hayward	01/02/18		OPEN	
317	Construction	Roadworks coordination	programme of scheme	Initial discussions with traffic manager; public transport operators; schools.	1	2	2			advance notices to be issued once funding agreed. Draft programme coordinates with all known risks	Brian Hayward	01/12/17		OPEN	
318	Construction	Traffic signals outstation upgrades delivery programme conflicts with other works	Delays to programme	Initial discussions with traffic manager taken place having due regard to overall existing programme.	1	2	2			flexibility in order of delivery retained in project plan BBC own works programme to be fitted around this project.	Brian Hayward	01/02/18		OPEN	



## Appendix 3

# **Bedford Borough Council Programme Management Office Manual**

## Appendix 3

### Document History

Issue	Date	Comment	Author
V0.1	14/09/16	First draft for review.	Lynne Davison
V0.2	16/09/16	Review for comments.	Lynne Davison
V0.3	23/09/16	Amendments made to content and layout.	Lynne Davison
V0.4	30/09/16	Following feedback from Management Team, section 5.3.6 tolerances removed and additional Business Case sign off requirements added (HR and Finance). Business Case template updated to reflect these changes.	Lynne Davison
V0.5	07/10/16	Minor format changes to templates following final review.	Lynne Davison
V1.0	07/10/16	Document approved by Mark Stephens	Lynne Davison
V1.1	22/11/16	Risk rating information updated.	Lynne Davison
V1.2	12/12/16	Checkpoint report updated with Dependencies section. Project Mandate updated with list of internal support services to consider and liaise with.	Mary Lee

### Reviewers

Name	Role	Signature	Date
Mark Stephens	Assistant Chief Executive (Business Transformation)	M Stephens	23/09/16

### Approvers

Name	Role	Signature	Date
Mark Stephens	Assistant Chief Executive (Business Transformation)	M Stephens	07/10/16

## Appendix 3

### Quick Reference – Easy to Use Guide

Your requirements	Sections to read
If you are a <b>Project Manager</b> or new to project management	1, 2, 3, 4, 5 and appendix 1 and 2
If you are a <b>Project Sponsor</b> (Business Owner)	2, 3, 4, 5 and appendix 2
If you are a member of a <b>Project Board</b>	3
If you are registering a project <b>proposal</b>	4
If you are preparing a <b>Business Case</b>	4
If you are <b>preparing and planning</b> a project	5
If you want to understand more about <b>risks</b>	5.3.4
If you want to understand more about <b>change control</b>	5.3.5
If you want to understand more about <b>benefits</b>	5.3.7
If you are <b>closing down</b> a project	5.4

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If you require any further information on the methodology of project management in general	Contact the Project Management Office
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## Appendix 3

### 1.0 Purpose

This manual is not just for Project Managers, it has been designed for everyone at the Council who is involved in delivering a project. It provides the guidance to help organise, plan and control projects. It provides a standard framework, which is flexible for all sizes and types of projects.

Bedford Borough Council is entering a time of rapid change, facing the challenges of reduced funding for local government, increased demand for many of our services and the need to continue to improve the experiences of our residents. This has led to the development of a wide-ranging transformation programme – Bedford Borough 2020. The programme outlines the council's ambition to redesign how the council delivers services and manages operations in 2020 and beyond. It has at its heart a strategy to transform and modernise the delivery of all services to our residents. We need to look at new ways of delivering services which allows us the ability to focus resources on services for our more vulnerable residents where we can.

In order to achieve this we need to develop a standard approach to managing projects. This manual documents the framework the Council will use for the management of all Projects.



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### 2.0 What is Project and Programme Management?

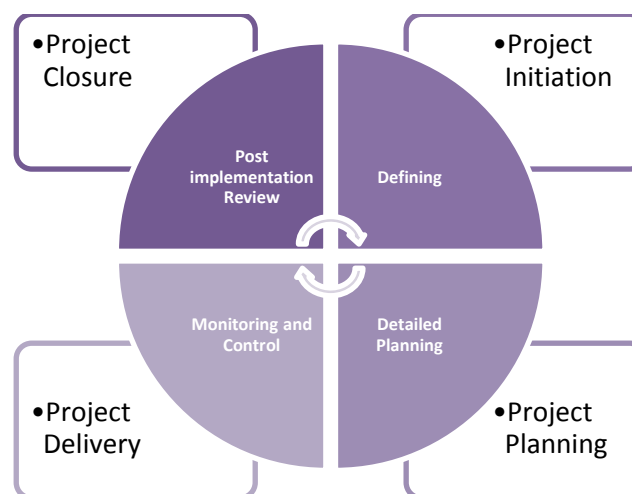
#### 2.1 What is a Project?

A **project** is a defined series of related activities which are being conducted to bring about a specific outcome and are not part of 'business as usual'. In addition, most projects have to be completed within agreed limits (often referred to as 'constraints') of resource and time.

A project can be defined as an activity with:

- An agreed benefit, reason or justification,
- A clearly defined beginning and end, and
- Clearly stated objective(s).

The diagram below details the 4 stages of the project lifecycle:



A project can vary in size, with some being relatively small or short pieces of work. However, they will all share the need for an organised approach, for someone to keep the project moving along, and for management involvement or governance. Reporting to a Project Sponsor, and in some cases a Project Board, is required as this layer of governance is responsible for ensuring that decisions are made and issues are resolved.

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### 2.2 What is a Programme?

A **programme** is a set of projects that need to be coordinated in some way and tend to be wider-ranging often enabling strategic outcomes. Projects which make up a programme will usually be interdependent on each other and will all contribute towards a single outcome. Projects in a programme may have similar aims and benefits, even if the actual projects are very different.

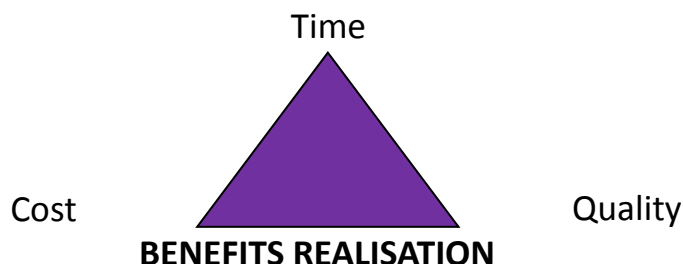
At Bedford Borough, our programmes are overseen by Programme Boards and the individual projects which contribute to the programme goals give regular updates into the Programme Board, although day to day guidance will usually remain with the Project Sponsor/Board.

A project can exist without a programme, but a programme will only exist where there are a number of inter-related projects being managed as a unit.

### 2.3 What is Project Management?

Project management is the process by which projects are defined, planned, delivered and closed. The whole process is guided by a Project Manager, who has clear responsibility for documenting the stages, managing costs and resources, coordinating project workstreams, resolving issues and seeking the appropriate approvals to proceed.

Managing a project requires balancing three main factors: Time, Cost and Quality. The diagram below shows how these factors relate to each other. When the project is planned, the three factors are balanced so that each of these is acceptable to the service area and an appropriate amount of benefits realisation can be achieved to justify the work. If any of the points of the triangle slips or stretches during the life of the project, it will impact on the other two points and also on the amount of benefit realised from the project.



It is the Project Manager's role to work within the limits set for these three factors at the start of the project and monitor them throughout. This is done through maintaining a series of documents, which detail the aims of the project, how long it will take and what the budget is. It requires a structured approach, formal planning and an understanding of the key stages in the lifecycle of a project.

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### 2.4 What is Project Governance?

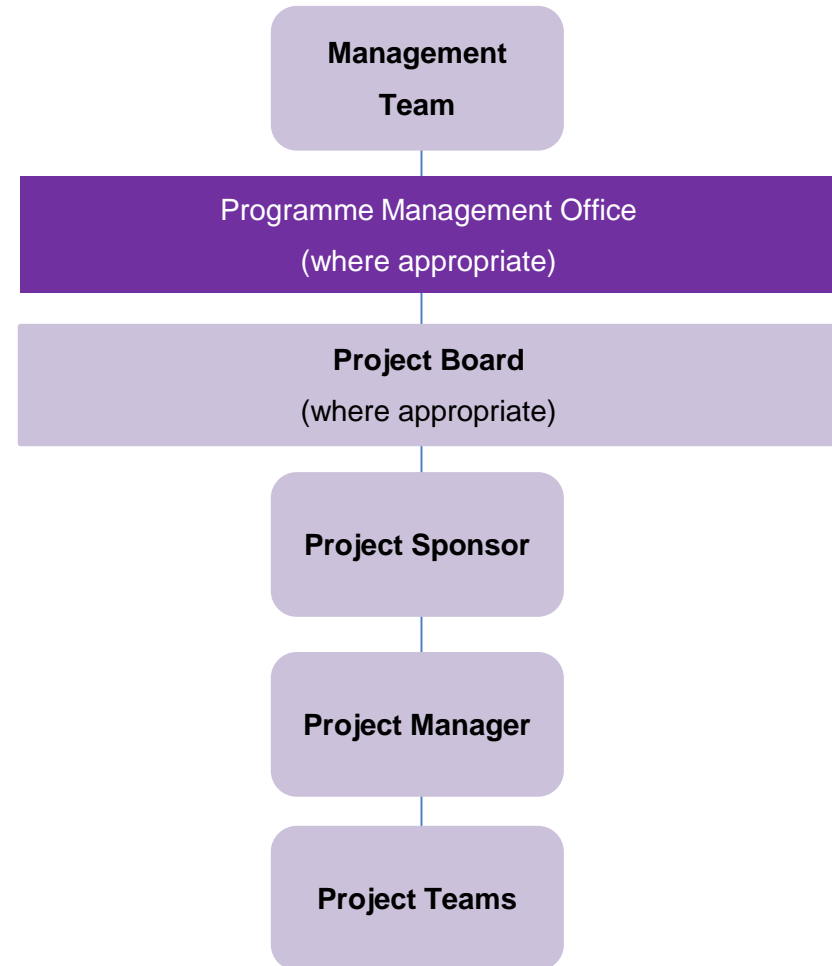
A Project Manager has a certain level of authority for day to day decision making on a project, but there will also be a management framework in which decisions are made. This is called governance and is provided at a project level by the Project Sponsor, and in some cases by a Project Board depending on the requirements of the project. Some projects will have another layer of governance provided at a programme level by a Programme Board. This second layer of governance provides the organisation with clarity and oversight of how projects link, leading to better informed decision making. These roles are discussed in more detail in the next section.

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### 3.0 Roles and Responsibilities

Project roles can be tailored to suit the needs of any project. Tailoring may include combining roles or dividing a role between two or more people. Some of these roles are outlined below with an example of a typical project structure.

Roles	Responsibilities
<b>Programme Management Office</b>	Responsible for managing and maintaining the Corporate Project Register, providing support to project managers and providing project updates to Management Team (MT).
<b>Project Sponsor</b>	Accountable for the project and ensuring that the project is focused throughout its life cycle on achieving its objectives and delivering the projected benefits. A key member of the Project Board and a direct line of contact for the Project Manager.
<b>Project Board</b> <i>(established where necessary)</i>	Responsible for overall direction and management of the project.  The Board makes the decisions during the project, resolves issues and manages any risks, and negotiates to resolve any conflicts within the project or between the project and external bodies.
<b>Project Manager</b>	Responsible for the planning, management and reporting of delivery of the project, its timescales, resources, finances, benefits and the quality of its results. A project manager is the day to day driver of the project.



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A full list of possible project personnel is available in the Glossary at Appendix 1.

### 4.0 The Gateway Process (Feasibility)

#### 4.1 Identifying an Opportunity

Every project starts with identifying an opportunity for change. These can be identified anywhere in the Council, and can range from revisions of existing systems and processes to a completely new way of working.

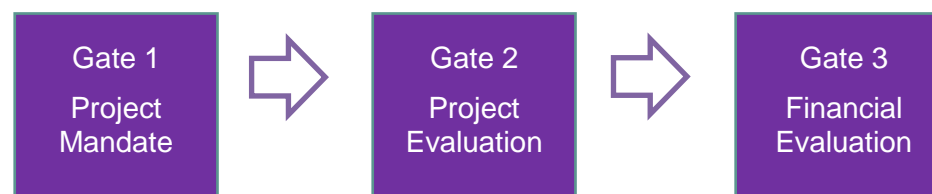
As an idea or business need is identified in a service area, a representative from that service area will become the person responsible for progressing it. They will be responsible for researching the opportunity, championing the benefits it will bring and understanding the risks and costs associated with it. If the idea or opportunity passes through the approval process and becomes a project, the Service will be responsible for resourcing a project sponsor and manager.

#### 4.2 The Gateway Process

The Gateway Process is designed to ensure that all projects are properly defined and evaluated before they begin, and that we only spend our time, budgets and energies on project work which will contribute to our corporate goals.

The gateway process requires that some research is completed before the project begins. It ensures that projects are only started when they are feasible and have been fully costed. It gives Management Team oversight of all of the projects ensuring that the projects are properly controlled, supporting effective project delivery.

There are three gates:



At each gate, Management Team reviews the project viability and concludes whether the project is to proceed.

**Not all projects will need to go through all three gates**, but all need to start at Gate 1. As part of the Project Mandate, each project is categorised based on the level of risk and impact to the Council. A risk and impact assessment will be required for all new projects to

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determine the extent at which the gateway process will apply (see Appendix 2, Project Mandate template). The proposed assessment process below has been designed to determine a project category and in turn the level of Management Team inclusion.

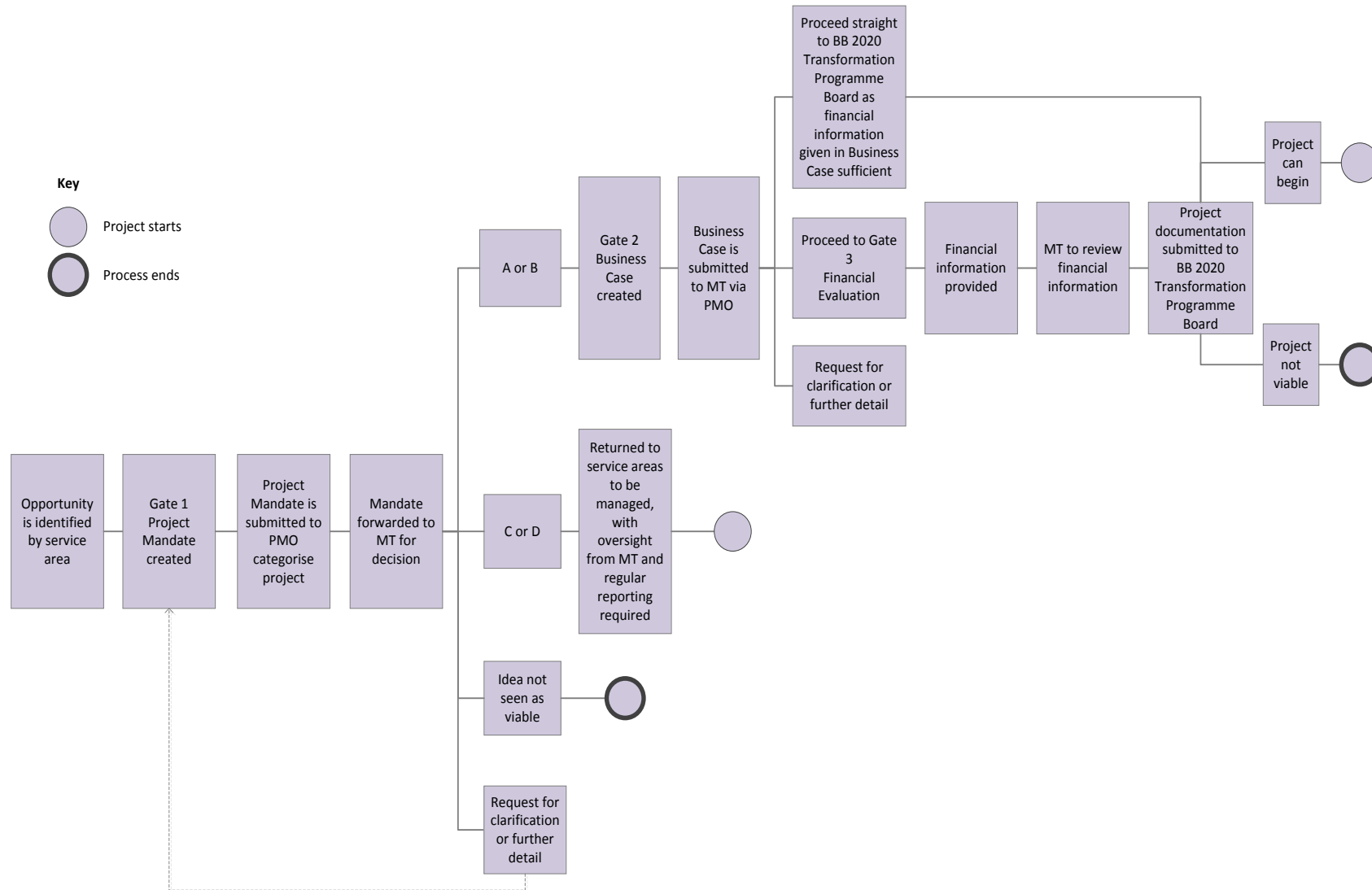
Project category definitions are as follows:

- **Category A projects** (high risk / high cost / high impact / cross cutting) will be subject to the full gateway process, and will be monitored by Management Team, Bedford Borough 2020 Transformation Programme Board, and the PMO. Given the nature of category A projects, additional information may be required to external parties such as other Government or thematic boards.
- **Category B projects** will also be subject to the full gateway process and monitored by MT and the PMO.
- **Category C projects** will not be subject to the gateway process, but will be monitored by MT and the PMO.
- **Category D projects** will not be subject to the gateway process. Reporting to MT will be by exception only.



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The Gateway Process is demonstrated in the diagram below:



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### 4.3 Gate 1 Project Mandate – category A, B, C or D

To pass through Gate 1 the approval of a **Project Mandate** (see appendix 2) is required by Management Team.

The Project Mandate should detail the idea or business need, and describe the benefits which it will achieve. If you have researched several options to meet the business need, then an outline of the options appraisal should also be included.

Part of the Project Mandate includes an assessment of the level of value, risk and impact the project will have on the Council. The Head of Service or above will be responsible for authorising the Project Mandate form before submitting it to the PMO.

The Risk and Impact assessment in the Project Mandate form determines a category for the project, A, B, C or D. When it is received in the PMO, it will be cross referenced with the other projects and programmes already in progress, to see whether it fits with an ongoing programme.

The Project Mandate is then added to the Corporate Projects Register and forwarded to Management Team for discussion. After discussion, Management Team will give direction as to how the Project Mandate is to proceed.

The PMO will then contact you to discuss the outcome.

### 4.4 Gate 2 Project Evaluation (Business Case) – category A or B projects only

To pass through Gate 2, a Business Case is required to enable full evaluation of the proposed project. There is a template for this document in Appendix 2. All Business Cases should be authorised by a Head of Service or above. These must also be signed off by lead officers within Finance and HR.

The Business Case provides the backbone of the project and should demonstrate that the project meets the business need, is affordable, is feasible and achievable in the time allowed, delivers clear benefits and is good value for money.

You can ask for assistance from the PMO in completing the Business Case. Once completed, the Business Case should be forwarded to the PMO. Who will then circulate it to Management Team.

The PMO will then contact you to discuss the outcome.

### 4.5 Gate 3 Financial Evaluation – category A or B projects only

To pass through Gate 3, a full financial evaluation is required and this must be approved by both Management Team and the Bedford Borough 2020 Transformation Board. In many cases, the Business Case documentation produced for Gate 2 will include a detailed financial breakdown

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for the project. If this is the case, Management Team may be content to pass the project documentation straight the Bedford Borough 2020 Transformation Board.

There isn't a template for a financial evaluation document as the requirements will vary widely from project to project, and in most cases additional documents to support the Business Case will be sufficient.

Management Team will review the financial information and will either return it to the service area for more detail or pass it to the Bedford Borough 2020 Transformation Board.

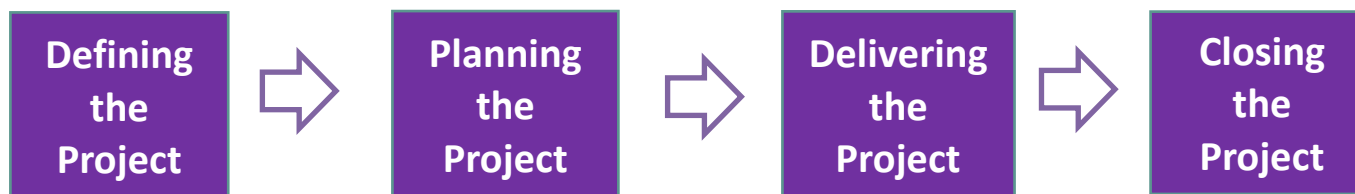
Once all gateway documentation has been received, Management Team or the Bedford Borough 2020 Transformation Board will indicate whether the project is to proceed to delivery stage or whether the project terminates before start.

Once approval to start has been given the PMO will advise on the project documentation requirements.

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### 5.0 Project Management in Bedford Borough Council

The Bedford Borough approach to project management will centre around four stages:



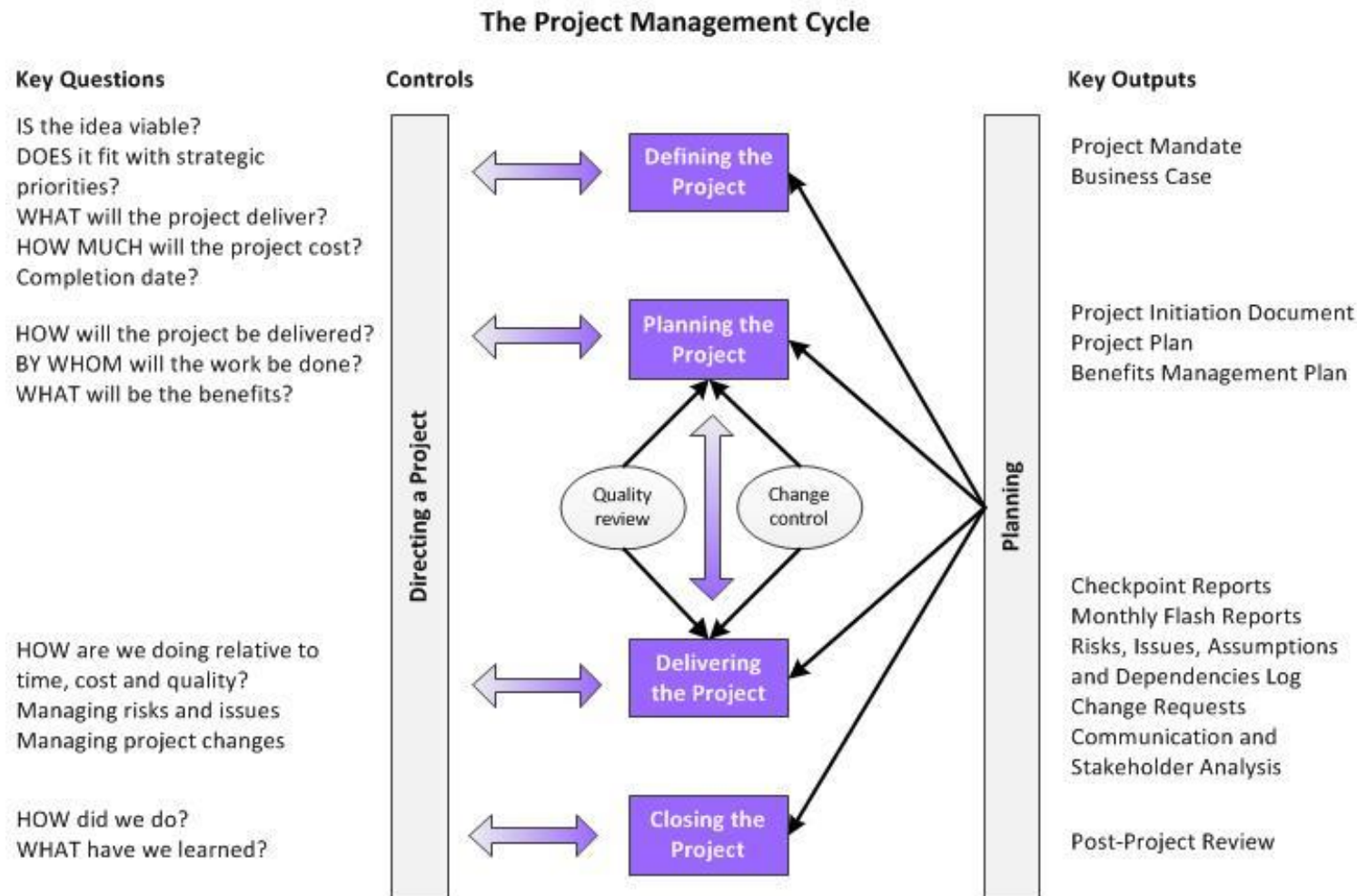
These stages follow on from the Gateway process, and ensure that projects have the project aims and scope agreed up front and a clear and achievable plan for delivery. This promotes a smoother delivery phase and ensures that the project is completed within the required timeframe and budget.

Each stage has a set list of tasks which should be completed, to ensure that the appropriate project controls are in place. The PMO has devised a range of templates to assist at each stage, which are referenced in the text below and are available in Appendix 2. The PMO will advise on which documents will be required for your specific project.

Each of these stages is discussed in more detail below. As each stage finishes, the Project Sponsor/Board should take the opportunity to review the project, and reflect on progress so far. Project stages will be marked with a formal sign off by the Project Sponsor or Project Board, to reflect that the next stage can commence. In this way, areas of concern can be identified and actions put in place to ensure that the project progresses smoothly.

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The Project Management Cycle below provides a framework which should be followed on all projects although the precise detail will vary according to the individual project.



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### 5.1 Stage 1 Defining the Project

By the time the business need or idea has been through the gateway process, much of the work to define the project has been done. The Project Mandate and the Business Case (if required) should ensure that you have clear outcomes in mind for the project and an outline of how they will be achieved.

Formal governance arrangements should now be set up and the Project Sponsor and Project Manager should be in place. The Project Sponsor/Board should give authority for the Project Planning stage to begin.

At this stage the main project management deliverables are:

Inputs	Outputs
Documented Project Mandate	Completed project proposal
Documented Business Case (if required)	Management Team and Bedford Borough 2020 Transformation Programme rejection/approval of proposal – project registered
Agreed roles and responsibilities of the project team	Appointment of the project team including Project Manager

### 5.2 Stage 2 Planning the Project

There are several documents which are key at this stage and these are summarised below:

**The Project Initiation Document (PID).** The PID is the starting point for the project. It draws on the Business Case to detail the mechanics of getting the work done, such as workstreams and governance arrangements. It will include information about the range of authority the Project Manager will have, and the scope of changes which can be resolved by the Project Manager without referral to the Project Board (these are called tolerances and are included in the PUD template).

**The Project Plan.** A detailed plan of how the project will be implemented needs to be created.

When creating a project plan, consider the logical order of things in your project and note any items which are dependent on others. For example, new equipment might need to be installed and tested by the supplier, before you can start training staff in how to use it. Remember to leave enough time for tasks to be completed, especially for purchasing of items, or ICT set up. Some of these timeframes will be estimates but the Project Manager should make every effort to keep them realistic. The Project Plan needs to be thorough, and include all of the work which needs to take place. The project plan should also be resourced. If a task will take two people a week to complete, this is where the project needs to have names put against it. Staff and their managers should be asked to commit to their roles in the project. The PMO will provide support and advice where required.



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**The Benefits Management Plan.** All projects will come through the gateway process with a clear set of benefits, and the Benefits Management Plan details how and when these will be realised. It is important not only that all project costs are offset against financial savings, but that non-financial benefits are captured and acknowledged. With some projects, you will be able to see the benefits as soon as the projects start, while others will need to wait for a specific launch or go live date. For benefits that will be realised after a project has ended, a Benefits Realisation Plan will be agreed at Project Closure (see section 5.4). All costs on the project should be carefully tracked. Usually a project budget will include a small amount of contingency for unexpected events, but if this is dipped into too frequently there will be no extra left.

Templates for the above are available in Appendix 2. All of these documents will remain live for the duration of the project and should be updated regularly. The Project Plan particularly should be used to track project actions completed and milestones reached.

Other tasks at this stage **might include**:

- Creating a **Communications and Stakeholder Plan** to identify who is involved in the project, what communications they need to receive about it and how they will receive it. This plan is discussed in more detail in the next section.
- Setting up the **Risks, Issues, Assumptions and Dependencies (RAID) Log**, especially if risks or assumptions are identified at the PID stage. This log is discussed in more detail in the next section.
- Starting regular reporting on progress, as **Checkpoint Reports**.
- Starting a tendering or purchasing exercise, if required.
- Engaging staff to work on the project.

At this stage the main project management deliverables are:

Inputs	Outputs
Documented Project Initiation Document	Completed project planning documents
Documented Project Plan (as appropriate)	Exception reporting to Project Sponsor/Board and Management Team
Documented Benefits Management Plan (as appropriate)	
Initial RAID log and Communications and Stakeholder Plan (as appropriate)	
Documented Checkpoint and Dashboard Reports	

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All of these documents should be checked and signed off by the Project Sponsor/Board. The sign off should be included as an event in the Project Plan. Sign off at this stage indicates that the stage is complete.

### 5.3 Stage 3 Delivering the Project

#### 5.3.1 Monitoring and Controlling a Project

It is essential that projects are subject to active monitoring and control and this is part of the Project Manager's job. All project activities should be regularly observed to ensure that work is progressing according to the plan.

Monitoring and Controlling includes:

- Measuring the ongoing project activities (*where we are*);
- Monitoring the project variables (cost, effort, ...) against the project plan and the project baseline (*where we should be*);
- Identify corrective actions to properly address issues and avoid risks (*How can we get on track again*);
- Influencing the factors that could result in arbitrary changes to the project so only changes that have been subject to a formal change control process are implemented.
- Measuring and managing the realisation of benefits

The methods used for this will vary from project to project, but a form of regular update reporting to both the Project Sponsor/Board and programme level governance is usual.

Where issues are identified which are beyond the authority of the Project Manager to influence or resolve, the issue should be escalated to the Project Sponsor/Board.

#### 5.3.2 Checkpoint and Dashboard Reporting

All projects need a formal system of reporting, to ensure that progress updates are circulated and everyone is kept informed.

The PMO will require a regular **Checkpoint Report** for all projects. The template for this document is in Appendix 2. Note that Checkpoint Reports must be provided to the Project Sponsor/Board for sign-off prior to being submitted to Programme level governance.

The Checkpoint Report should be completed by the Project Manager to capture the current status of the project. These reports are the source of understanding of the current progress or difficulties of your project and can be requested by staff outside of your Project Board. They are reviewed by the PMO.

**The PMO produces a regular Programme Dashboard** showing the combined status of all projects at the Council. This Dashboard is discussed at Management Team as part of project governance arrangements unless agreed otherwise.

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### 5.3.3 Communicating with Stakeholders

If not already in progress, this stage is when the **Communications and Stakeholder Plan** should be created. This document identifies who is involved in the project, what communications they need to receive about it and how they will receive it. Project communications might be in the form of attendance at workstream meetings, or circulation of checkpoint reports. Once created, this plan should be signed off by the Project Sponsor/Board and updated as required.

### 5.3.4 Managing Risks, Issues, Assumptions and Dependencies

Projects are the vehicle we use for implementing changes, change equals uncertainty and uncertainty leads to risk. The challenge for the effective project manager is to stay in control of risk throughout the life of the project.

On a project, risks, issues, assumptions and dependencies are known as RAIDs. These are all items which could impact adversely on the project, and it is important to keep sight of them and their potential effects.

**Risks.** Risks are items which might occur and threaten the successful delivery of the project. Effective project management requires that risks are recognised and managed in a structured fashion.

**Issues.** These are risks which have manifested. Many project issues will have previously been logged as risks and should have a plan for managing them. Any unexpected issues which arise should be dealt with promptly, to minimise the impact they could have.

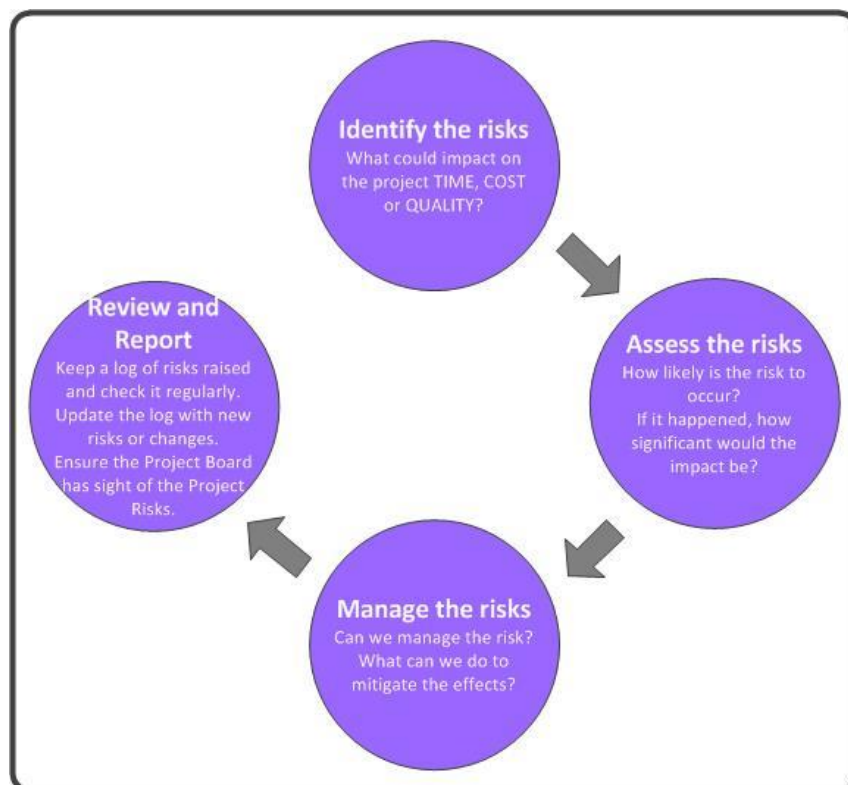
**Assumptions.** These are assumptions made about the project or the wider Council operating framework which must hold true for the project to be successful. Assumptions should be managed in the same way as risks, given a rating and reviewed regularly.

**Dependencies.** These are dependencies which impact on the project as a whole, not just those which might be highlighted in the Project Plan. For example, a project which involves tendering for a project component is dependent on the procurement process being followed.

Risks, issues, assumptions and dependencies must be managed on a project to ensure that they are reviewed and controlled.

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The Risk Management Process can be summed up as follows:



As risks are identified, they should be added to the log. The Project Manager is responsible for maintaining this, and should make sure that all project members are invited to contribute.

Project risks are then assessed by the Project Manager and this should be in discussion with the Project Sponsor/Board. To assess a risk, consider how likely it is to occur, and what the impact to the project or the Council if it does occur. The table below shows the ratings to use when assessing risk.

Probability	(Score)	Impact	(Score)
Very Likely	(4)	Very High	(4)
Likely	(3)	High	(3)
Unlikely	(2)	Low	(2)
Very Unlikely	(1)	Very Low	(1)

Once given a score, risks must be considered in terms of how the project will treat them. Low-scoring risks might simply be tolerated, and regularly re-evaluated to ensure that project (or Council) events do not increase their score. Medium-range risks can usually be treated in some way – with processes put in place to reduce the likelihood of the risk occurring or mitigate their impact. Again, these arrangements should be re-evaluated regularly with the Project Sponsor/Board to ensure they remain current.

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Where risks have a high score, they are of a serious nature and will need additional management by the Project Sponsor/Board. Where high-scoring risks are identified, consider who else needs to be notified - any project risk scoring 11 or above should be considered for addition to the Corporate Risk Register, and should be highlighted to Programme Boards and/or Management Team via Checkpoint Reporting.

Probability	4	7	11	14	16
	3	4	8	12	15
	2	2	5	9	13
	1	1	3	6	10
		1	2	3	4
	Impact				

Issues and assumptions should be managed in the same way as risks, using the same scoring mechanism to highlight those which are potentially most dangerous to the project and to identify mitigating factors early on.

Dependencies should also be recorded and scored, but the management plan for each should be developed on a case-by case basis. You can contact the PMO for advice about dependency management techniques if required.

RAIDs are usually kept on a spreadsheet, with a separate tab for each type.

### 5.3.5 Managing project changes

When a project is defined, the project resources and timeframes will be closely tied to the scope (i.e., what is being delivered). All proposed changes should be documented by the Project Manager along with an assessment of their impact. If a change is within the tolerance level and can be resolved by the Project Manager, it should be done. For changes with a wider impact, the change should be raised with the Project Sponsor/Board for their decision. Significant change will be reported to Management Team through the agreed reporting mechanisms. The **Change Control** template enables the Project Sponsor/Board to make informed decisions about whether and how changes should be implemented. For major or complex changes, or where there is a significant impact, it may be prudent to undertake an options appraisal as well (the PMO can advise).

### 5.3.6 Benefits Management and Review

This stage is when the **Benefits Management Plan** should be updated. This will document the following:

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- The expected benefits as outlined in the Business Case
- How these will be measured objectively – and against which base line value from before the project was initiated
- Who and when will measure the benefits
- Tolerances, dependencies and disbenefits (expected negative outcomes)

The Benefit Management Plan will be regularly reviewed and reported to Project Sponsor/Board. It is revised at the end of each stage within the project, usually with separate benefits for each stage of the project. During the final benefits review, the Project Sponsor will identify and evidence benefits that have been gained.

All of the templates are available in Appendix 2 for this stage.

At this stage the main project management deliverables are:

Inputs	Outputs
Completed RAID log with new information	Updated project documents
Request for change, if required	Exception reporting to Project Sponsor/Board and Management Team
Delivery of Project Plan	
Checkpoint and Dashboard Reports	

### 5.4 Stage 4 Closing the Project

A project always has a definite beginning, middle and an end. Some projects will work towards a single event such as a launch date, while others will have several smaller milestones spread throughout the life of the project. This is the Project Closure stage, which is an opportunity to reflect on how it went - see appendix 2.

For all category A and B projects a **Post Project Review** document is to be completed. This involves revisiting the early project documentation, and checking that the expected benefits have materialised. The Post Project Review should take place promptly at the project finishing point to ensure that knowledge is captured whilst the experience is still fresh in people's minds.

If a project ends before completion a Post Project Review should still be completed to fully investigate the lessons learned.

The Post Project Review and the Benefits Realisation Plan should both be forwarded to the PMO when complete, for circulation to Management Team. If benefits are expected to be realised after the project completion, the PMO can advise on the most appropriate method for this.



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At this stage the main project management deliverables are:

Inputs	Outputs
Finalise Benefits Management Plan	Completed project documents
Stakeholder and Project Sponsor/Board feedback	Final reporting to Project Sponsor/Board and Management Team
Documented Post Project Review document	

# Appendix 3

## Appendix 1 Glossary of Project Terms

This section lists some terms which are frequently used in Project Management. Please note these are basic definitions and not all will apply for each project. Please contact the PMO for further information about these terms, or any others you may have encountered.






Acceptance Criteria	The requirements and essential conditions that have to be achieved before a deliverable is accepted.
Assumptions	Any factors that you are assuming to be in place that will contribute to the successful outcome of the project.
Business Case	A document recording the justification for starting a project. It describes the benefits, costs and impact, plus a calculation of the financial case.
Change Control	The practice of identifying, documenting, approving and carrying out changes within a project.
Constraints	The factors that you will need to consider during the life of the project that you cannot change. These may include deadlines, regulatory requirements and dependencies on other projects to deliver.
Cost Benefits Analysis	The cost benefit analysis is used to show the expected benefits of a project are sufficient to warrant the cost of carrying it out. Monetary units are usually used for the comparison.
Deliverable	A tangible or intangible object produced through project execution. A deliverable can be created from multiple smaller deliverables.
Dependencies	Any events or work that are either dependent on the outcome of the project or the project will depend on.
Gantt Chart	A popular project management bar chart that tracks tasks across time. When first developed in 1917, the Gantt chart did not show the relationships between tasks. This has become common in current use, as both time and interdependencies between tasks are tracked.
Issue	A formal issue occurs when the tolerances of delegated work are predicted to be exceeded or have been exceeded. This triggers the escalation of the issue from one level of management to the next in order to seek a solution.
Lessons learned	Documented experiences that can be used to improve the future management of projects, programmes and portfolios.
Milestone	A key event during the life of a project, usually completing project deliverables or other noteworthy achievement.

## Appendix 3






Objectives	Predetermined results towards which effort is directed. Objectives may be defined in terms of outputs, outcomes and/or benefits.
Programme	A group of related projects and change management activities that together achieve beneficial change for an organisation.
Resources	Everything needed to complete a project, but in particular people and money.
Risk	The potential of an action or event to impact on the achievement of objectives.
Scope	The overall definition of what the project should achieve and a specific description of what the result should be. A major ingredient of scope is the quality of the final product.
Senior Supplier	Represents the interests of those designing, developing, facilitating, procuring and implementing the project products. Is accountable for the quality of products delivered by the supplier(s).
Senior User	Is responsible for the specification of the needs of all those who will use the final product(s).
Stakeholder	A stakeholder is anyone, internal or external to an organisation that has an interest in a project or will be affected by its deliverables.
Project Board	The Board should consist of at minimum the Project Sponsor, Senior User, and Senior Supplier. Additional stakeholders may participate however ultimate decision making authority on the project lies with these three key members.
Tolerance	A permissible variation in performance parameters.

## Appendix 3

### Appendix 2 PMO Documents and Templates

Number	Name	Description	Link
1	Project Mandate	All projects start with a Project Mandate, which is then submitted to Management Team for project approval. This is the template to use for the Project Mandate. All sections on the form must be completed.	 1. Project Mandate_final.docx
2	Business Case	Projects which are high value / high risk (category A and B) require a Business Case for Management Team to approve. Category C and D projects may also require a business case.	 2. Business Case_final.docx
3	Project Initiation Document (PID)	All projects require a Project Initiation Document (PID), as this details what the project is and how it will be delivered. The Project Manager is responsible for creating the PID.	 3. Project Initiation Document (PID)_final
4	Project Plan	This is an example of a high level Project Plan. Larger or more complex projects will require a more detailed plan.	 4. Project Plan (example).xlsx
5	Benefit Management Plan	All projects require a Benefit Management Plan, to explain what benefits the project will bring and how they will be realised.	 5. Benefit Management Plan_fin

## Appendix 3

6	Checkpoint Report	All projects must report to the PMO on a regular basis using this template.	 <b>06. Checkpoint Report_ PROJECTNAM</b>
7	Risks, Assumptions, Issues and Dependencies (RAID) Log	All projects must maintain a RAID log and project RAIDs must be actively managed. Please contact the PMO if you require assistance is scoring or managing RAIDs.	 7. RAID_final.xls
8	Communication and Stakeholder Analysis	All projects must have a communication and stakeholder analysis, to ensure that internal and external communications on the project are managed.	 8. Communications Plan and Stakeholder
9	Change Control	Most projects undergo changes. These changes must be managed and rigorous monitoring applied.	 9. Change Control Document_final.docx
10	Post Project Review	All projects require a post project review, to document the benefits which have been achieved and any lessons learned.	 10. Post Project Review_final.docx

The PMO can provide support to complete any of the above documents. In addition, a project may require additional documentation e.g. Test Plan, the PMO can also support in these areas.

Project Title	<Insert Project Name here>	
Project Manager	<Insert Project Manager name here>	
Project Sponsor	<Insert Project Sponsor name here>	
Reporting Period	From	DD/MM/YYYY
	To	DD/MM/YYYY

[Click here to submit report](#)
**Bedford Borough**  
**2020**

Reporting Frequency: Weekly Monthly

**To be completed by the PMO:**

RAG Summary	Last Period	Current Period
Overall project		

Overall Progress Summary

Schedule	Last period RAG	Current period RAG	People	Last period RAG	Current period RAG	Scope	Last period RAG	Current period RAG	Cost	Last period RAG	Current period RAG	Benefits	Last period RAG	Current period RAG

High risk, new risk or changed risk description	Action Steps	Date raised	Probability	Impact	Risk Score	Last period RAG	Current Period RAG

High priority issue, new issue or changed issue description	Action Steps	Date raised	Last period RAG	Current period RAG

Upcoming (and new) Milestones								External Project Dependencies									
Ref	Project area	Milestone description	Baseline start	Baseline finish	Revised start	Revised finish	RAG	Type	Resource Name	Activity Required	Start Date	End Date	Number of Days	Comment	Revised Start Date	Revised End Date	Revised Days

Change requests and key decisions to be made by Management Team / BB2020 Board					
Cause of deviation or key decision	Project area impacted	Recommendation	Decision making body	Date submitted	Date required



## BEDFORD TOWN CENTRE PINCH-POINT SCHEMES



# BEDFORD TOWN CENTRE TRANSPORT STRATEGY

## BEDFORD TOWN CENTRE PINCH-POINT SCHEMES

### IDENTIFICATION TABLE

<b>Client/Project owner</b>	Bedford Borough Council
<b>Project</b>	Bedford Town Centre Transport Strategy
<b>Study</b>	Bedford Town Centre Pinch-point Schemes
<b>Type of document</b>	Report
<b>Date</b>	21/09/2017
<b>File name</b>	Bedford Town Centre Pinch-point Schemes.docx
<b>Reference number</b>	105251/GB01T14A88
<b>Number of pages</b>	21

### APPROVAL

Version	Name		Position	Date	Modifications
1	Author	JB/KH	SYSTRA	21/09/17	
	Checked by	BH	PM	16/10/17	
	Approved by	BH	PM	19/10/17	
2	Author				
	Checked by				
	Approved by				

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# **1. INTRODUCTION**

## **1.1 Overview**

- 1.1.1 As part of the Bedford Town Centre Transport Strategy development process, a detailed baseline assessment of issues and opportunities was conducted in relation to access and movement across the town. The data collated, and subsequent analysis, is detailed within the 'Bedford Town Centre Transport Strategy – Issues and Opportunities Report (2015)'.

## **1.2 Network Pinch-Points**

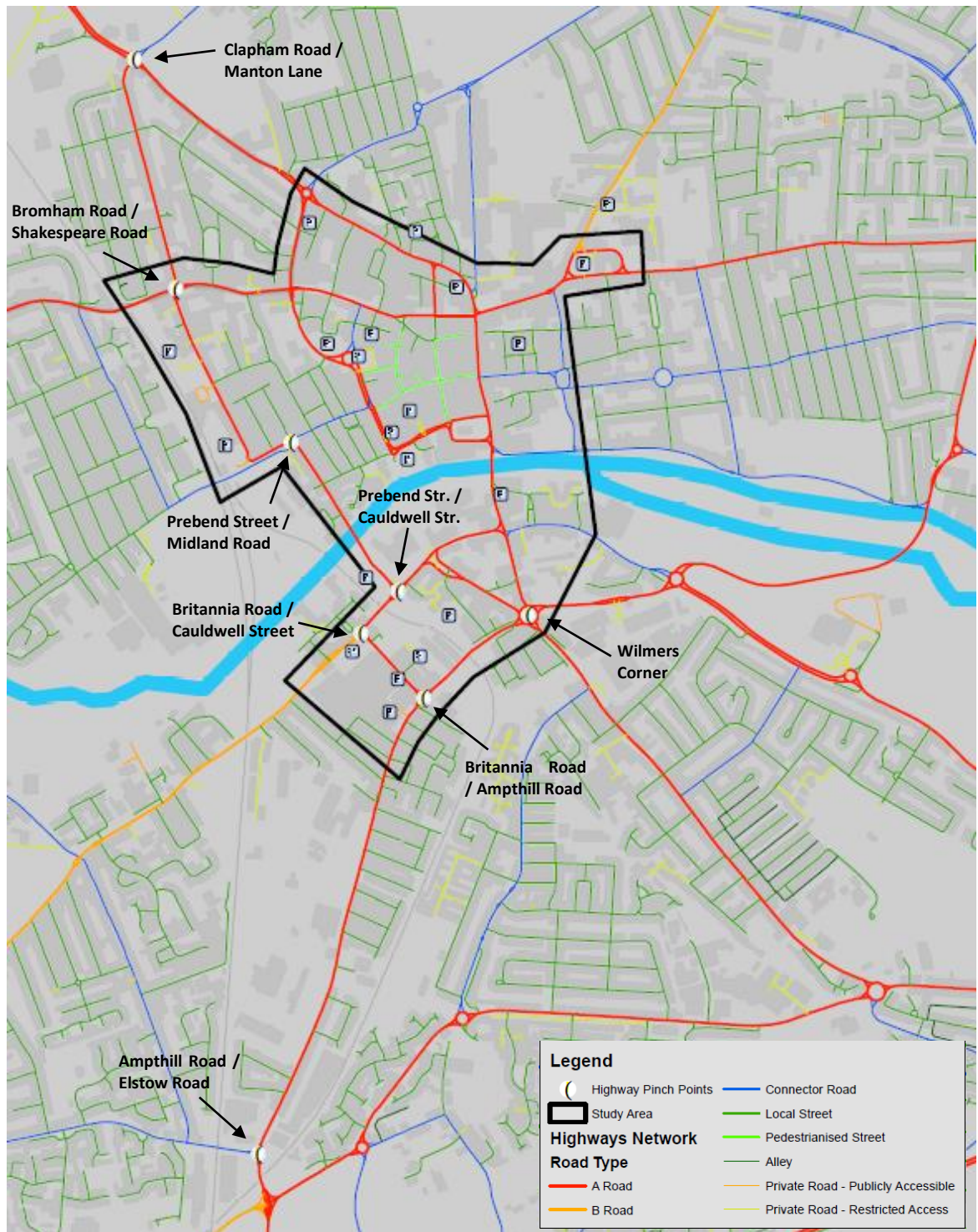
- 1.2.1 Amongst the range of issues identified, a key element was the underlying operation of the town centre highway network during the AM and PM peak periods, and the impact of specific 'Pinch-points' on the network that constrain the flow of traffic and create congestion.

- 1.2.2 A total of eight initial Pinch-points were identified, including:

- Clapham Road / Manton Lane / Shakespeare Road
- Bromham Road / Shakespeare Road / Ashburnham Road
- Midland Road / Prebend Street / Ford End Road
- Prebend Street / Cauldwell Street
- Britannia Road / Cauldwell Street / Kempston Road
- Britannia Road / Ampthill Road
- Wilmers Corner (Ampthill Road / Kingsway / St. Johns Street / Rope Walk / London Road)
- Cowbridge (Ampthill Road / Elstow Road / W End)

- 1.2.3 The location of these junction are highlighted within Figure 1.

**Figure 1. Initial Identification of Highway Network Pinch-points**



### 1.3 Delays

- 1.3.1 Significant delays were observed to occur at each of the Pinch-point localities set out in Figure 1 within the peak periods, with, in many instances, delays extending between junctions affecting the whole network..
- 1.3.2 The 'Bedford Report of Surveys (2015)' presents data on journey times surveys and identifies the following 'Hot Spots' across the network, set out within Table 1.



**Table 1. Hot Spots (Delay in Journey Time at the Busiest Times of the Day)**

LOCATION	APPROACH	AM DELAY (MINS:SECS)	PM DELAY (MINS:SECS)
Bromham Road / Greyfriars / Union St	Greyfriars (NB) Bromham Road (EB) Bromham Road (WB)	- 4:00* -	5:20* - 8:40*
Amphill Road – Elstow Road Junction to W End Junction (SB)		2:00	2:40
Britannia Road and Cauldwell Street (NB)		3:20	2:40
Shakespeare Road / Clapham Road / Manton Lane Roundabout	Shakespeare Road (NB)	2:30	2:10
Bromham Rd / Shakespeare Rd / Ashburnham Rd Double Roundabout	Bromham Road (WB) Shakespeare Road (SB)	- 6:20*	4:30* 6:00*
Clapham Road / Tavistock Street	Union St (NB)	-	5:00*
Bromham Road – Hassett Street to Shakespeare Road double roundabout	Westbound	-	12:00*

\* With respect to an assumed free flow average speed of 20mph

1.3.3 The slowest recorded speeds are also presented in Figure 2.

**Figure 2. Slowest Recorded Speeds during AM and PM Peak Periods**



## 2. SCHEME OPTIONEERING

### 2.1 Overview

- 2.1.1 In response to the identification of network Pinch-points, areas of congestion and opportunities for enhancement to the operation of the highway network, a scheme optioneering process was undertaken in 2014/15, as part of the wider transport strategy development process. This initially produced a long-list of scheme measures, which were then subject to an option sifting process to identify a shorter set of deliverable measures. The shorter set of measures were then developed and appraised in more detailed to establish high performing measures.

### 2.2 Long List of Highway Measures (11 schemes)

- 2.2.1 An initial long-list of 28 highway infrastructure measures were developed, as part of a wider option development process encompassing all potential transport measures. Of these 28 highway infrastructure measures, 11 were focused upon improving traffic flows through Pinch-points and congested junctions across the town centre highway network, including:

- H11 High Street/St. Paul's Square Junction
- H12 Clapham Road/Manton Lane/Shakespeare Road Junction
- H13 Bromham Road/Ashburnham Road Junction
- H14 Prebend Street/Midland Road Junction
- H15 Prebend Street/Cauldwell Street Junction
- H16 Cauldwell Street/Britannia Road Junction
- H17 Ampthill Road/Britannia Road Junction
- H18 St. John's Street/London Road Junction
- H19 Ampthill Road/Elstow Road Junction
- H20 Longholme Way/Rope Walk Junction
- H21 Goldington Road/Kimbolton Road Junction

- 2.2.2 These were subject to a PESTLE-analysis, reported within the 'Bedford Option Screening and Reporting Assessment (2015)' where each option was appraised on a 3-point Red / Amber / Green scale against six metrics:

- Political;
- Economic;
- Social;
- Technological;
- Legal; and
- Environmental.

- 2.2.3 This process identified eight of the eleven schemes as 'high-ranking' measures that should be taken forward for further development and appraisal.

### 2.3 Shortlisted Highway Schemes (8 schemes)

- 2.3.1 The high ranking schemes identified were taken forward for further development and appraisal. A summary of the key findings, presented in the paragraphs below.

#### **H14: Prebend Street/Midland Road Junction (Appraisal Ranking = 4)**

- 2.3.2 The Prebend Street/Midland Road junction suffers from significant congestion. Whilst the primary flow through the junction is north-south (Prebend Street – Ashburnham Road) there are also relatively high flows from Ford End Road and Midland Road. The roundabout covers a relatively large area, however, there is limited deflection on a number of approaches that results in certain traffic movements occurring at relatively high speeds. This restricts movements from other arms, which influences the overall

operation of the junction. Similarly different arms have considerably different sight lines upon the approach to the junction.

2.3.3 Within the existing operation of the highway network there are very limited options for enhancing the operation of the junction. Providing a signalised junction would be difficult without significant land take and, even then, is constrained by the differences of levels, particularly from the Ford End Road approach.

2.3.4 As part of wider changes to the network some additional scheme options are feasible. In particular, the delivery of the Prebend Street Link Road provides a number of different options for reconfiguring the junction.

2.3.5 Overall, three broad options were developed for the junction:

- H14a Minor improvement to the approaches and alignment of the junction
- H14b Signalised scheme with one-way eastbound on Midland Road (only deliverable with Prebend Street Link Road)
- H14c Signalised scheme with one-way westbound on Midland Road and one-way southbound on Prebend Street (only deliverable with Prebend Street Link Road)

2.3.6 The benefits of all the schemes were considered likely to be minimal but Options B and C could form part of wider network enhancements around the town centre with the Prebend Street Link Road.

#### **H12: Clapham Road/Manton Lane/Shakespeare Road Junction (Appraisal Ranking = 3)**

2.3.7 This junction is an existing roundabout with two-lane approaches on all arms. Output from previous modelling exercises indicates queues on Clapham Road (north and south) and Shakespeare Road.

2.3.8 There is limited space to expand the size of the junction without significant land take. The existing roundabout is probably of insufficient size to be signalised as right-turning cars would have poor visibility of the signals on the roundabout (scheme reference H12a).

2.3.9 The only viable option would be to introduce a signalised junction. This could potentially provide sufficient space to have three lanes of traffic on approaches along Clapham Road arms. The difficulty would be in providing both Clapham Road (south) and Shakespeare Road arms each with sufficient green time (scheme reference H12b).

2.3.10 Overall, two broad options were developed for the junction:

- H12a Signalisation of roundabout; and
- H12b Signalisation of road junction.

#### **H13 Bromham Road/Ashburnham Road Junction Improvement (Appraisal Ranking = 3)**

2.3.11 This junction is currently a double roundabout that suffers from peak time congestion. A separate local junction modelling note is available that details the operation of the junction.

2.3.12 No major improvements were identified that would be feasible to deliver without land-take, including the removal of trees. At that stage, there were concerns over public acceptance of such a scheme and so no formal scheme was proposed at the time.

#### **H15 Prebend Street/Cauldwell Street Junction Improvement (Appraisal Ranking = 3)**

2.3.13 This is currently a signalised junction that suffers from congestion at peak times. The junction has been assessed and there are not considered to be any significant design or capacity issues for volume of traffic observed. The problems that arise are related to traffic queuing back from Midland Road junction. Enhancing the capacity of this junction will not resolve the issues identified.

#### **H16 Cauldwell Street/Britannia Road Junction Improvement (Ranking = 3)**

2.3.14 This is currently a signalised junction that suffers from congestion at peak times. The junction has been assessed and, like the adjacent Prebend Street/Cauldwell Street Junction (H15), the majority of problems that arise are related to traffic queues that originate from Prebend Street. Enhancing the capacity of this junction will not specifically resolve this issue.

2.3.15 A scheme was identified that provides additional queuing capacity on Britannia Road that would reduce queues back towards Ampthill Road and would reduce congestion along the Ampthill Road corridor. This scheme requires land take, including the removal of some trees.

**H17 Ampthill Road/Britannia Road Junction Improvement (Appraisal Ranking = 3)**

2.3.16 This is currently a signalised junction that suffers from congestion at peak times. The junction has been assessed and, like the adjacent Britannia Road/Cauldwell Street Junction (H16) Prebend Street/Cauldwell Street Junction (H15), the majority of problems that arise are related to traffic queues that originate from Prebend Street.

2.3.17 A scheme was identified that provides additional queuing capacity at the junction and also ties in with an identified requirement to improvement safety outside the entrance to the Hospital on Ampthill Road. The capacity enhancement scheme requires minor land take, including the removal of some trees.

**H18 Wilmer's Corner Improvement (Appraisal Ranking = 3)**

2.3.18 This is currently an unsignalised roundabout with five arms (Rope Walk, London Road, Ampthill Road, Kingsway and St John's Street), the latter two of which are one-way traffic. The junction suffers from congestion in the peak periods.

2.3.19 A number of junction options were considered with a signalised junction considered to offer the most theoretical capacity (reference H18a). Analysis indicated that the scheme would offer benefits, albeit at a relatively high scheme cost.

2.3.20 A second scheme option (H18b) was designed to facilitate the introduction of two-way traffic along Kingsway. This requires an additional entry point onto the Wilmer's Corner roundabout from the Kingsway arm.

**H19 Ampthill Road/Elstow Road Junction Improvement (Appraisal Ranking = 3)**

2.3.21 This area of the highway network consists of two separate junctions within close proximity with a bridge over the railway line linking the two with five lanes of traffic. The combined junction acts as a Pinch-point on the network.

2.3.22 A scheme has been developed that removes the pedestrian pavements from the bridge and allows for six lanes of traffic between the junctions. Two new pedestrian/cycle bridges are built on either side of the existing structure to provide safe, segregated provision for walking and cycling (scheme reference H19a).

2.3.23 An alternative scheme option was considered that creates a new link from Ampthill Road, to the north of the existing junction, and links through to a roundabout junction of Progress Way/Elstow Road/Mile Road. This would require the construction of a new road bridge over the railway line.

2.3.24 Scheme H19a represents a lower cost scheme and was considered to offer significantly better value for money.

## **2.4 Additional Schemes (1 scheme)**

2.4.1 As part of the scheme development process a number of other complementary schemes were identified that could improve transport provision and access around Bedford. Some of these schemes were already included within the long list of schemes identified

in Phase 1, but scored medium or low in Phase 2 sifting process, whilst others are new schemes.

- 2.4.2 One of the additional schemes identified was a highway junction improvement.

#### **H29 Cauldwell Street / St. John's Street Junction**

- 2.4.3 The baseline highway assessment identified a number of issues with the operation of this junction in the PM peak. Traffic was observed queuing in the right hand lane on Cauldwell Street all the way back to the Prebend Street. This was despite the left-hand lane being empty. This was affecting the operation of the Prebend Street junction and creating queues along Prebend Street.
- 2.4.4 The reason for the motorist behaviour is that only the right-hand lane permits traffic to turn right onto St. John's Street and so drivers automatically try to position themselves in this lane at the earliest opportunity.
- 2.4.5 In order to attempt to mitigate this impact a scheme has been developed that permits two right-turn lanes onto St. John's Street, one of which would be accessible from the left-hand lane on Cauldwell Street. This should help to maximise the available road space along Cauldwell Street and reduce queuing.

## **2.5 Scheme Appraisal Summary**

- 2.5.1 An extract of the summary of the outputs from the scheme option appraisal process is shown in Table 2.

**Table 2. Extract from Scheme Option Appraisal Summary Table**

REF	SCHEME NAME	DESCRIPTION	KEY APPRAISAL OUTCOME	TYPE OF BENEFIT
H12a	Clapham Rd/Shakespeare Rd Junction (Option A)	Signalisation of roundabout	Insufficient size to signalise safely	Congestion relief
H12b	Clapham Rd/Shakespeare Rd Junction (Option B)	Signalised junction	Preferred option for H12 junction	Congestion relief
H13	Bromham Road / Ashburnham Rd Junction	Expansion of junction	Requires land take incl. removal of trees	Congestion relief
H14a	Prebend Street / Midland Road Junction (Option A)	Minor amendments to roundabout layout	Minimal Impact	Safety
H14b	Prebend Street / Midland Road Junction (Option B)	Signalisation scheme with one-way eastbound on Midland Road	Deliverable only with Prebend Street Relief Road	Safety and Congestion Relief
H14c	Prebend Street / Midland Road Junction (Option C)	Signalisation scheme with one-way westbound on Midland Road	Deliverable only with Prebend Street Relief Road	Safety and Congestion Relief
H15	Prebend Street / Cauldwell Street Junction	Expansion of junction	Capacity of junction is not key issue	Congestion relief
H16	Cauldwell Street / Britannia Road Junction	Expansion of junction	Requires land take incl. removal of trees	Congestion relief
H17	Amphill Road / Britannia Road Junction	Expansion of junction	Requires land take incl. removal of trees	Congestion relief
H18a	Wilmer Junction (Option A)	Signalised junction	Deliverable scheme	Congestion relief
H18b	Wilmer Junction (Option B)	Additional entry onto roundabout from Kingsway	Only deliverable as part of wider network alterations	Congestion relief
H19a	Amphill Road / Elstow Road Area (Option A)	Carriageway widening	Preferred option for H19	Congestion relief
H19b	Amphill Road / Elstow Road Area (Option B)	New link road from Amphill Road to Progress Road/Mile Rd Junction	Higher cost but could be tested further	Congestion relief
H29	Cauldwell Street / St. John's Street Junction	Reallocation of roadspace to create two-lane right turn from Cauldwell Str.	Requires further model analysis	Congestion relief

### 2.5.2

The appraisal process identified a range of schemes that would benefit the operation of the current and future highway network. Many of them required alterations to the layout of junctions that would necessitate additional land or removal of trees, thus creating challenges to deliverability.



## 2.6 Package Development: Pinch-point and Traffic Management

- 2.6.1 At this stage of the transport strategy development process, three separate ‘themed’ packages of measures were assembled out of the best performing transport measures. This included one theme related to addressing Pinch-points, traffic management and encouraging mode shift.
- 2.6.2 The package focused on resolving issues with existing pinch points across the highway network and providing additional vehicular, public transport and walking & cycling network capacity and provision. The objective would be to manage and facilitate the underlying development aspirations of the town.
- 2.6.3 The aim was to address the immediate issues experienced at congested junctions and radial routes, as well as support non-motorised user schemes that promote cycling and public transport. Such schemes would support air quality improvements by easing traffic flow on the network and promoting active travel through cycling and pedestrian facilities. There were considered to be a number of schemes that could be implemented in the short term as the theme looked to make the best use of the existing facilities rather than invest in major infrastructure works, which were included within the other two packages that were appraised.
- 2.6.4 The Pinch-point package included the following five proposed highway infrastructure schemes, alongside a wide range of other traffic management and mode shift schemes:
- H12b:** Clapham Road / Manton Lane / Shakespeare Road – Signalised junction with increase lanes on approaches
  - H16:** Cauldwell Street / Britannia Road – Additional queuing capacity on Britannia Road
  - H17:** Ampthill Road / Britannia Road – Additional queuing capacity at the junction
  - H18a:** Wilmers Corner – Signalise junction
  - H19a:** Ampthill Road / Elstow Road (Cowbridge) – Removal of footway to create additional lane. Additional pedestrian cycle bridges installed to compensate
- 2.6.5 The package appraisal process conducted at that time identified the Pinch-point, traffic management and mode shift package as scoring well against nearly all of the identified Transport Strategy Objectives, as summarised in Table 3.

**Table 3. Performance of Pinch-point, traffic management and mode shift package against Objectives**

TRANSPORT STRATEGY OBJECTIVE		RATING (+3 TO -3)
TSO1	Economy	+1
TSO2	Traffic Management	+2
TSO3	Cross-town movements	+1
TSO4	Strategic Links	+1
TSO5	Network Resilience	0
TSO6	Safety	+2
TSO7	Environment	+2
TSO8	Access to services	+1
TSO9	Sense of Place	+1
TSO10	Design Longevity	+1

- 2.6.6 At that time, a second package of measures, including a proposed bridge at Batts Ford, also scored well against the objectives and this became the focus of the original Local Growth Fund (LGF) 2 bid to SEMLEP. Whilst this funding bid was successful, it was only allocated £11m out of a total scheme cost of £30m. The Batts Ford scheme has, therefore, informally become regarded as unaffordable and difficult to guarantee delivery, whilst the need for improvements to Bedford Town Centre traffic and environment remains as pressing as ever. This sequence of events brought the focus of attention back to the Pinch-point schemes as a deliverable alternative to improve the operation of the town centre highway network.
- 2.6.7 As part of the successful LFG3 Bedford Southern Gateway submission, the Pinch-point schemes H16 (Cauldwell Street / Britannia Road), H17 (Amphill Road / Britannia Road), and H19a (Amphill Road / Elstow Road) (Cowbridge) were included alongside the wider package of Urban Traffic Management and Control (UTMC) and Technology measures.

### 3. SCHEME DEVELOPMENT

#### 3.1 Introduction

- 3.1.1 In seeking to combine the delivery of the LGF2 Bedford Town Centre and LGF 3 Bedford Southern Gateway projects, whilst acknowledging the constraints on delivering the Batts Ford bridge scheme, a further process of scheme development has been undertaken. The aim was to revisit the key Pinch-points across the network and to determine an optimum package of measures to support the wider delivery on public realm improvements within the High Street and the UTMC and Technology measures.
- 3.1.2 In revisiting the potential Pinch-point schemes the previous work outlined in Section 2 has been utilised as the clear foundation of work. However, changes in wider contextual factors provided the opportunity to review, revise and enhance some of the proposals. These contextual factors included:
- Completion of the Western Bypass permitting outturn observation of the impact upon traffic flows across the town, in particular around Clapham Road, Shakespeare Road and Bromham Road;
  - Acceptance that some degree of land-take and removal of trees could be taken into account within the design process; and
  - Acknowledgement that by delivering the scheme alongside a new UTMC and Technology package there will be additional network benefit, over-and-above the direct benefits to a single junction operation, from introducing signalisation.
- 3.1.3 These changes in context permitted the development of new highway infrastructure schemes for consideration within the overall package of scheme measures.

#### 3.2 Scheme Refinement

- 3.2.1 Seven of the previously developed nine Pinch-point schemes have been subject to peer review and then refined, or enhanced, according to the new contextual factors described above.
- 3.2.2 This process did not include the junctions at either end of Prebend Street, with Midland Road or with Cauldwell Street. The latter junction is not considered to be a capacity constraint in itself, rather, its operation is affected by delay and congestion at surrounding junctions. No significant enhancement to the Midland Road / Prebend Street roundabout can be made without demolition of surrounding buildings. The future operation of the junction is also subject to a separate Housing Infrastructure Fund bid in relation to Ford End Road Bridge and the safeguarded route for a Prebend Street Relief Road.
- H12: Clapham Road/Manton Lane/Shakespeare Road Junction**
- 3.2.3 Previous scheme designs for this junction excluded any land-take. After preliminary discussions with the Harpur School, who own the land to the northeast of the junction, a revised design has been produced to deliver a signalised junction with additional lane capacity.
- 3.2.4 The scheme is detailed in Appendix A, drawing reference 105251-03.
- H13: Bromham Road/Ashburnham Road Junction**
- 3.2.5 Previous scheme designs for this junction have been restricted by a desire to retain an existing tree line to the northwest of the junction and to avoid land-take. With the completion of the Western Bypass it was anticipated that flows would decrease significantly, avoiding the need to deliver a scheme of this nature. Review of outturn traffic movements after the completion of the Western Bypass and, more significantly, the impact of forecast future year growth, has led to an acceptance of the need to consider a revised design. By altering the alignment of the junction it has been feasible

to develop a signalised junction with two approach lanes on each arm, providing additional capacity over the current double mini-roundabout design.

- 3.2.6 The scheme is detailed in Appendix A, drawing reference 105251-05.

**H16: Cauldwell Street/Britannia Road Junction**

- 3.2.7 The original scheme design was reviewed but was considered to remain the optimum solution. It is detailed in Appendix A, drawing reference ST15226-035.

**H17: Ampthill Road/Britannia Road Junction**

- 3.2.8 The original scheme design was reviewed but was considered to remain the optimum solution. It is detailed in Appendix A, drawing reference ST15226-005.

**H18 Wilmer's Corner**

- 3.2.9 Whilst it has long been acknowledged that this is one of the primary Pinch-points across the Bedford Town Centre transport network, the physical constraints of the site and its contextual location mean that any improvements must remain at-grade, restricting the overall addition capacity that can be provided.

- 3.2.10 There are a wide range of movements across the current junction, with relatively high level of right-turn movements. As such, whilst signalisation does improve the overall capacity of the junction, it is not hugely significant due to the level of green time that needs to be provided to right-turn traffic.

- 3.2.11 An enhanced signalisation scheme has been developed that seeks to minimise the distances travelled across the junction, and hence the time it takes vehicles to clear the junction, so as to reduce the total level of 'all red' time at the junction. Whilst this has provided additional refinement to the design it still remains a marginal scheme, in terms of value for money. The scheme is detailed in Appendix A, drawing reference 105251-04.

- 3.2.12 One distinct advantage of signalising the scheme is that it would enable it to become part of the UTMN managed network. This should deliver wider network efficiencies, particularly around Kingsway Gyratory and along the Ampthill Road corridor.

- 3.2.13 Alongside the development of the Town Centre Transport Strategy measures, the One Public Estate (OPE) programme has also been examining development opportunities around the Kingsway Gyratory. As part of these measures there are potential plans to change the operation of the gyratory. This could potentially significantly affect the required operation of Wilmer's Corner. Until the OPE proposals are formalised it has been concluded that it would be inappropriate to pursue a signalisation scheme at Wilmer's Corner at this time.

**H19 Ampthill Road/Elstow Road Junction**

- 3.2.14 The original scheme design was reviewed but was considered to remain the optimum solution. It is detailed in Appendix A, drawing reference ST15226-006.

**H29 Cauldwell Street / St. John's Street Junction**

- 3.2.15 The original scheme design was reviewed and subject to minor refinement to optimise the layout and reflect the wider proposals to traffic operations over the Town Bridge and St. Pauls Square . It is detailed in Appendix A, drawing reference 105251-05.

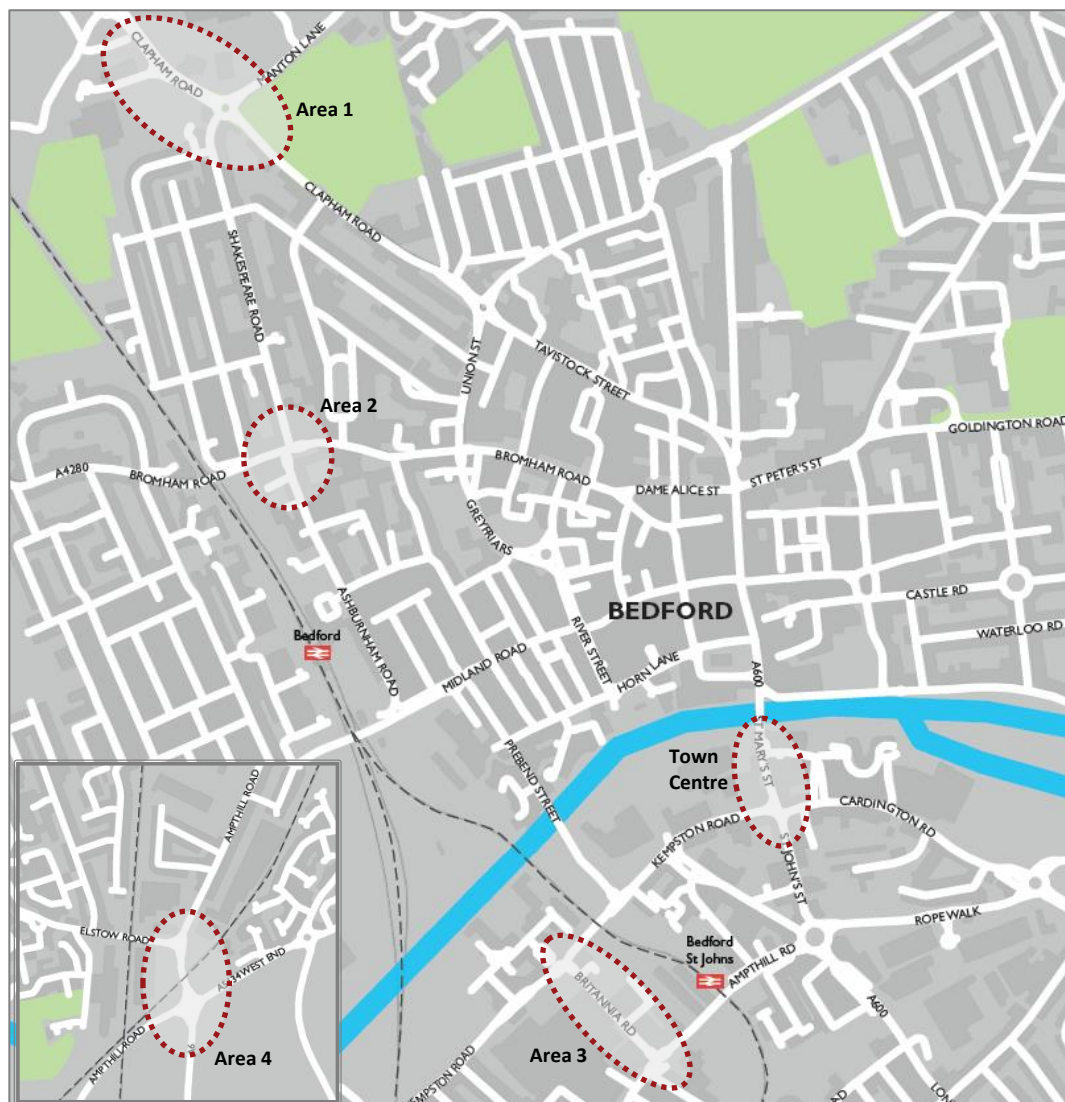
### 3.3 Preferred Scheme Options

3.3.1 On the basis of the scheme refinement process, six of the seven schemes have been taken forward for inclusion within the proposed package of measures for the final Town Centre Transport Strategy.

3.3.2 For presentational purposes, the schemes have been grouped into areas, and are presented in Figure 3.:

- **Area 1: A6 Northern Gateway**
  - H12: Signalisation of Clapham Road/Manton Lane/Shakespeare Road
- **Area 2: Bromham Road Eastern Gateway**
  - H13: Realignment and signalisation of Bromham Road/Shakespeare Road/Ashburnham Road double mini roundabout
- **Area 3: Around Hospital**
  - H16: Additional lane on northbound approach to Britannia Road/Cauldwell Street/Kempston Road junction
  - H17: Rearrangement of junction layout of Britannia Road/Amphill Road
- **Area 4: Amphill Road Southern Gateway**
  - H19: Additional lane capacity at Cowbridge and new pedestrian footbridges
- **Town Centre**
  - H29: Cauldwell Street / St. John's Street

**Figure 3. Location of Preferred Scheme Options**



- 3.3.3 The Area 1 scheme sits alongside wider proposals that incorporate enhanced operation of the Paula Radcliffe Way/Great Ouse Way roundabout and enhanced operation of the Manton Lane/Brickhill Drive Junction. This is currently subject to a separate National Productivity infrastructure Fund (NPIF) bid.

### 3.4 Scheme Costs

- 3.4.1 All of the schemes have been subjected to either a review of previous costs estimates, or the development of new costs. A summary of these costs is provided in Table 4, with a breakdown set out within Appendix B.
- 3.4.2 These costs are in 2017 prices and include preliminaries (at 15%) and traffic management (at 25%) but exclude utilities work.

**Table 4. Summary of Pinch-point Scheme Costings (September 2017)**

COST ELEMENT	£
Area 1 Clapham Road / Manton Lane	1,083,538
Area 2 Bromham Road / Shakespeare Road	780,025
Area 3 Britannia Road (around Hospital)	1,417,166
Area 4 Cowbridge (Amphill Road)	1,410,839

### 3.5 Scheme Benefits

- 3.5.1 Whilst many of the individual benefits from each scheme have been assessed as part of previous work, the overall combined impact of the measures will be tested as part of the business case development work, utilising the Bedford SATURN model.







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# DRAFT 5: BEDFORD TOWN CENTRE PUBLIC REALM FRAMEWORK

24 October 2017



# EXECUTIVE SUMMARY

This document has been produced in support of the Business Case for improvements to Bedford High Street, to be submitted to the LEP.

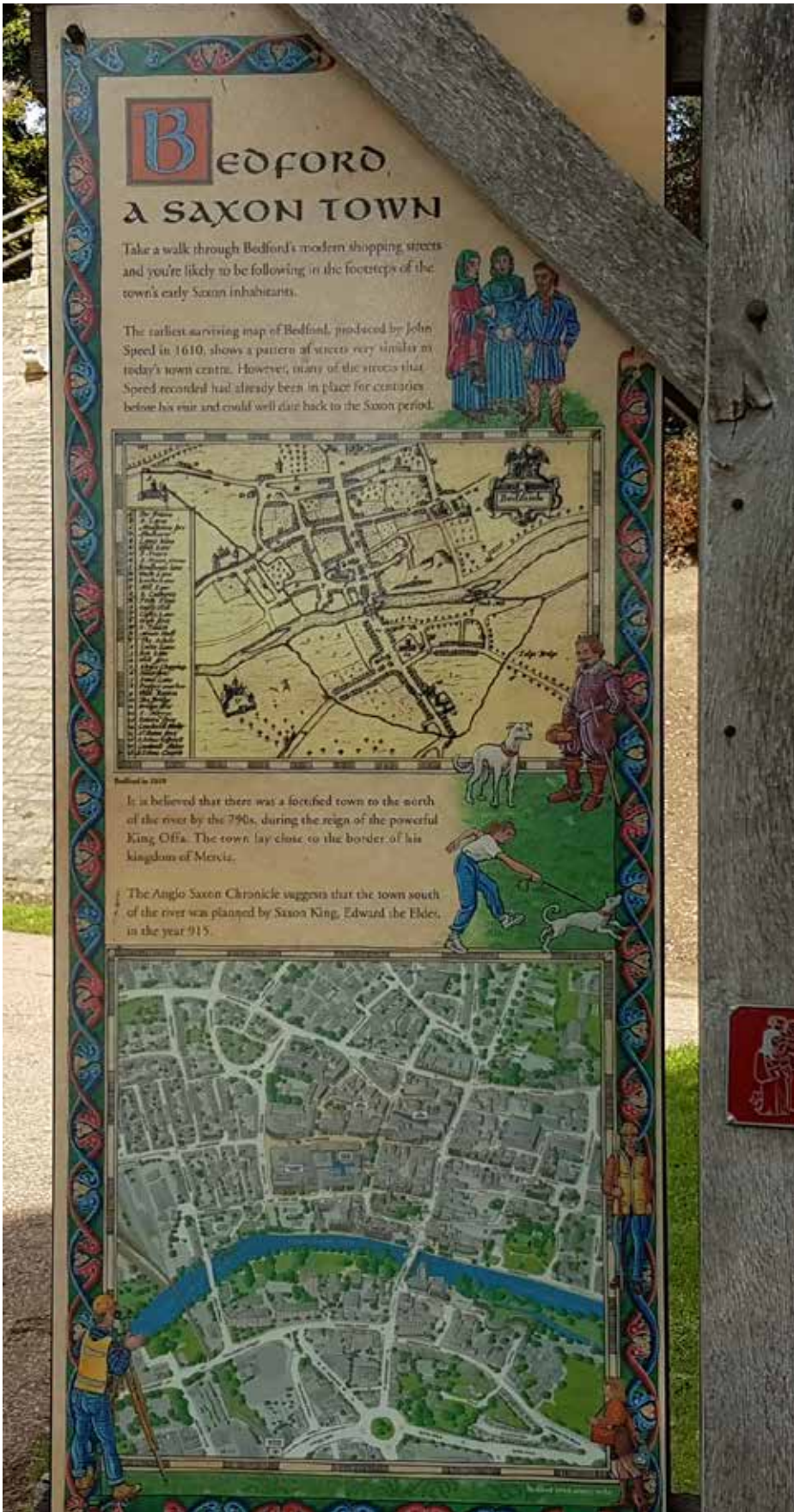
It sets out an Urban Design and Public Realm Framework for the town, and has been informed by the outcomes of a stakeholder workshop held on 8 August 2017 with key Officers from the Borough Council.

In summary the document sets out the current context of the town centre in terms of Policy background and physical layout, identifying assets and constraints to the movement and place network.

It then goes on to identify relevant precedent examples of successful street enhancements from the UK and abroad, and sets out a number of objectives for the future town centre public realm that inform a deliverable Framework.

Appendix A provides a detailed analysis of the stakeholder workshop, and identifies where the outputs of the workshop have informed the production of the Framework.

Appendix B sets out the findings of a PERS (Pedestrian Environment Review System) Audit of the town centre, identifying where improvements to the walking environment should be made.



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# INTRODUCTION

# INTRODUCTION

SYSTRA have been commissioned to review and support ambitions to enhance Bedford High Street.

The High Street is lined by some primary but mainly secondary shopping frontages and provides the main vehicular route to and from Bedford Bridge. It is therefore important as a destination in its own right, and also as a strategic movement artery in the town.

There are currently three road bridges spanning the River Great Ouse, two of which create important nodes and gateways to the town:

1. Bedford Bridge is the central link and creates the intuitive route to the town centre and shopping area.
2. The A5141 to the west is the intuitive route to the railway station and Council offices.
3. The A5140 to the east creates a crossing point further away from the town centre, providing access to the stadium and other out-of-town uses.

As with many other towns, the limited vehicular crossings funnel traffic to these crossing points, contributing to the severance created by the approach routes and other issues such as air and noise pollution.

The High Street runs north-south through the middle of the town centre, with the shopping heart, bus and train stations, civic buildings, schools and places of worship to the west, and the castle, museum, attractive riverside walks and extensive residential areas to the east. As a result, the High Street poses a physical and also psychological barrier to east-west movement through the town. An opportunity exists to better connect the town, enhance the High Street as a place to visit, and encourage more local journeys to be made on foot or by bike.

This Framework seeks to investigate the issues currently facing the town in terms of pedestrian, cycle and vehicle movement and suggest improvements to the general traffic management arrangements. The findings are supported by engagement with key Officers from the Council and also the policy aspirations for the town, which seek to reduce severance and increase opportunities for active travel.

The Framework is therefore split into the following sections, which set out the narrative for improvements:

- Bedford Now: the current context of the town in policy and physical terms
- Bedford Town Centre Precedents: good practice examples from elsewhere in the UK that could be used to inform and inspire improvements to the town centre
- Public Realm Objectives: eight outcomes for the town that the Framework seeks to deliver
- The Public Realm Framework itself: this section draws together all previous outcomes and sets out practical design guidance and deliverable outcomes for the town

The current context of the town will now be discussed.



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# EXISTING CONTEXT



# EXISTING CONTEXT

This section includes a high level review of:

- National and Local Policy
- Built form and morphology
- Traffic Management

From this review, Key Issues and Drivers for Change are identified.

## NATIONAL POLICY CONTEXT

### THE NATIONAL PLANNING POLICY FRAMEWORK (NPPF) (2012)

The Framework will support the local delivery of a number of themes in the NPPF, including *Building a strong, competitive economy* and *Ensuring the vitality of town centres*. More specifically it supports Promoting sustainable transport: at paragraph 29, the NPPF states that *“the transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel”*. Paragraph 34 states that *“plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised”*. Paragraph 35 states that development should be designed to:

- Accommodate the efficient delivery of goods and supplies;
- Give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;
- Create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter...;
- Incorporate facilities for charging plug-in and other ultra-low emission vehicles; and
- Consider the needs of people with disabilities by all modes of transport.

The Framework also supports the following themes:

Requiring good design: Paragraph 56 states that *“good design is a key aspect of sustainable development, is indivisible from good planning, and should contribute positively to making places better for people”*. Paragraph 57 continues: *“it is important to plan positively for the achievement of high quality and inclusive design for all development, including individual buildings, public and private spaces and wider area*

*development schemes”*. Paragraph 61 states that planning decisions should *“address the connections between people and places and the integration of new development into the natural, built and historic environment”*.

Meeting the challenge of climate change, flooding and coastal change: Paragraph 96 states that new development should *“take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption”*.

Conserving and enhancing the historic environment: Paragraph 137 states that new development within the setting of conservation areas should *“enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to or better reveal the significance of the asset should be treated favourably”*.

### MANIFESTO FOR THE NIGHT TIME ECONOMY (2016)

To enhance the city’s evening and night time economies, the delivery of a safe and accessible public realm and public transport system is essential if Bedford is to become a place in which those living, working or visiting the area will feel safe and want to explore the town out of hours. The town already has a vibrant offer of restaurants, bars and clubs. The public realm can offer opportunities for such uses to spill out into the street, creating clusters of activity.

Nationally the night-time economy generates approximately £70bn annually in revenue and employs over 1.3 million people. The contribution of an active and vibrant night-time economy to a city’s economy, tourist and cultural offer, cannot be underestimated.

In 2016 Philip Kolvin QC published a Manifesto for the Night Time Economy. The Vision of this document states:

*“A great night economy is unlikely to happen and will never be sustained by accident. It must be planned. And to be planned there must be a vision. The vision must then be translated into action by gathering the power and talents of all the agents of change – public authorities, investors, leisure operators, transport providers and residents representing all population sectors and interests.*

*The partnerships must have access to all levers of control – planning, regeneration, licensing and policing, to drive the economy towards the shared vision”* (page 5).

Kolvin’s Manifesto is clear that every town and city should have a vision for its night-time economy, and that urban design is fundamental to the creation of a safe and attractive environment for people to visit at night. Improvements to the High Street have a key role to play in helping Bedford’s night time economy to flourish.

## LOCAL POLICY CONTEXT

### CORE STRATEGY, 2008

At the heart of the Core Strategy is the requirement to adopt Sustainable Development Principles (Policy CP2), which include promoting public transport use, walking and cycling, and reducing car use.

To improve the connectivity of the town centre, the Core Strategy seeks to *“improve access to the town centre through the provision of new public transport interchanges new highway infrastructure public transport priority when feasible, the use of park and ride facilities and improved facilities for pedestrians, cyclists, taxis and private hire vehicles. Where and when highway capacity can be increased, priority should be given to modes other than private cars.”*

There is also an aspiration to *“improve the number and quality of the connections within the town centre, and between the centre and the river and railway station.”*

Similarly, to ensure delivery of sustainable development, new development must be able to integrate with *“non-car modes of transport.”*

At the time the Core Strategy was adopted the Council had no direct responsibility for transport matters, and the policies were therefore seen to have a role in supporting the programmes of other agencies, and the proposals in the Local Transport Plan 2, which recognised the *“important role of walking, cycling and public transport.”*

## LOCAL TRANSPORT PLAN 3 (LTP3), 2011

Since the publication of the Core Strategy, the Borough has become a Unitary Authority and as such has published its own Local Transport Plan. The Transport Vision for the Borough is:

*“To create a transport system in which walking, cycling and public transport are the natural choices of travel for the majority of journeys because they are affordable, healthy, convenient and safe alternatives to the private car.”*

To deliver this Vision, the LTP3 is split into the following eight *Strategies*:

- 1. Active Travel:** to improve health, walking and cycling should be *“seen as the natural choices of travelling because they are convenient, safe, comfortable, healthy and attractive.”*
- 2. Freight:** whilst important to the local and national economies, it is recognised that HGVs can contribute to community severance as well as create impacts in terms of noise, visual intrusion and carbon footprint. In the town centre, freight routing should be assessed to ensure walking and cycling are not discouraged.
- 3. Network Management:** this Strategy seeks to *“provide a highway network which effectively meets the daily demands placed on it by traffic, while contributing to safer, more efficient movement by buses, pedestrians and cyclists.”*
- 4. Parking:** whilst an important function within the town centre, the parking strategy seeks to *“effectively use parking controls and resources to stimulate regeneration and local economic activity whilst also supporting the LTP3 objectives in promoting sustainable travel choices.”*
- 5. Passenger Transport:** an effective, joined up and affordable public transport system opens up opportunities to those without access to cars and supports the sustainable development agenda. The vision is to provide and promote a system that is *“accessible, efficient and affordable for users providing a real travel choice to destinations”*, in particular the town centre.
- 6. Road Safety:** Reducing road casualties is a high priority and the success of the Council in achieving this is reliant on the delivery of the other 7 LTP Strategies. Removing barriers to active travel, particularly for vulnerable pedestrians and cyclists, enhancing wayfinding and reducing speed limits all have a role to play in improving the safety of the Borough’s roads.

**7. Sustainable Modes of Travel to School (SMoTS):** as with the Active Travel Strategy, the delivery of SMoTS will be reliant on creating an environment in which *“walking and cycling and passenger transport (of all forms) are seen as the natural choices for travelling to school because they are convenient, affordable, safe, comfortable and attractive.”*

**8. Transport Asset Management Plan (TAMP):** the Plan seeks to deliver the *“best use of resources for the management, operation, preservation and enhancement”* of the Borough’s transport system, and has a role to play in improving town centre access and public transport accessibility.

## BEDFORD TOWN CENTRE AREA ACTION PLAN (AAP), 2008

The AAP identifies reducing reliance on car travel, putting greater emphasis on cycling, and improving public transport as opportunities for the town.

In contrast, congestion and through traffic in the town centre, and poor legibility, are seen as weaknesses. Air quality reduction resulting from congestion, excessive car use and constraints on radial route improvement and full bus priority provision, are seen as threats. Deterioration of the public realm, and the movement barrier created by the river are also considered to be threats to the town.

To begin to address these issues, the provision of new public transport interchanges, highway infrastructure and improved walking, cycling and taxi provision are seen as key to improving connections.

The AAP also seeks to enhance the public realm by *“street improvement, public art and the reduction of traffic in the High Street, St Paul’s Square and elsewhere.”*

The document also notes the potential to reduce traffic levels in the High Street to *“substantially improve environmental conditions and provide the space for uses to spill out into the street. De-trafficking brings with it the opportunity to enhance facilities for public transport, taxis and private hire vehicles. It also provides potential in the long term to create a north-south cycle link.”*

The de-trafficking of the High Street and St Paul’s Square north is seen as a long term aspiration, and the on-going need to improve facilities for walkers and cyclists are identified.

To improve connections in the town, the AAP aims to satisfy the following four objectives:

- Mitigate traffic impacts
- Improve routes and spaces for vulnerable road users
- Improve bus services
- Regularise parking

A number of Urban Design Principles are set out to help achieve these aims. These include:

- Improving the quality of the public realm to create *“attractive and successful public spaces and routes which are safe, attractive and accessible by all...”*
- Ensuring the town is *“easy to get to and move through, which promotes accessibility and permeability, connects with its surroundings, puts people before traffic and integrates land uses and transport.”*
- Make sure the place has a *“clear image and is easy to understand by incorporating recognisable routes, junctions and landmarks.”*

## A STRATEGY FOR BEDFORD HIGH STREET, 2010

The Vision of this document seeks to:

*“Recreate the traditional heart of the town centre and maximise its townscape and heritage quality by the removal of all unnecessary general traffic, the creation of a high quality people friendly and safe public realm (where public art has a place), upgrading the built fabric, reintroducing attractive traditional shopfronts and regular markets, encouraging street cafes and restaurants, increasing upper floor residential and commercial use and creating life and vitality making it a destination for people of all ages at all times.”*

With regard to Access and Movement, the High Street is recognised as the historic and primary north-south route and accommodates around 11,000 vehicles per day. Unregulated servicing and parking contribute to congestion, accessibility issues and conflicts between vehicles, pedestrians and cyclists.

As seen in other documents, the High Street Strategy also promotes:







## TRANSPORT CONTEXT

### GENERAL TRAFFIC MANAGEMENT

The current arrangement shows a one-way system that utilises St Paul's Square as a gyratory.





Two lanes of one-way traffic travel south down the High Street, to the junction south east of St Paul's where two-way flow resumes. Vehicles travelling north across Bedford Bridge are therefore forced around the Church, including those wanting to turn right onto The Embankment.

The multi-storey car park at Horne Lane contributes to the circulating traffic as no right-turn towards River Street is possible upon exiting the car park. Horne Lane itself is primarily an easterly bus route and a series of bus stops are located on the northern side of St Paul's Square. Whilst these are in an excellent position to serve the town's evening and night-time leisure offer, the associated bus shelters narrow the pavement and the carriageway is cluttered with associated road markings.

It is therefore complicated for drivers to access the parts of the town they need, resulting in dead mileage and additional noise and air pollution in the heart of the town. This also has an additional adverse impact on the setting of the conservation area and nearby heritage assets.

Regularising the network flow in the town centre will be an important step in smoothing journeys for drivers, reducing congestion and pollution, and providing bus operators with improved efficiency and passenger facilities.

#### Legend

-  Direction of Travel
-  Bus Stops
-  Loading
-  Taxi Rank



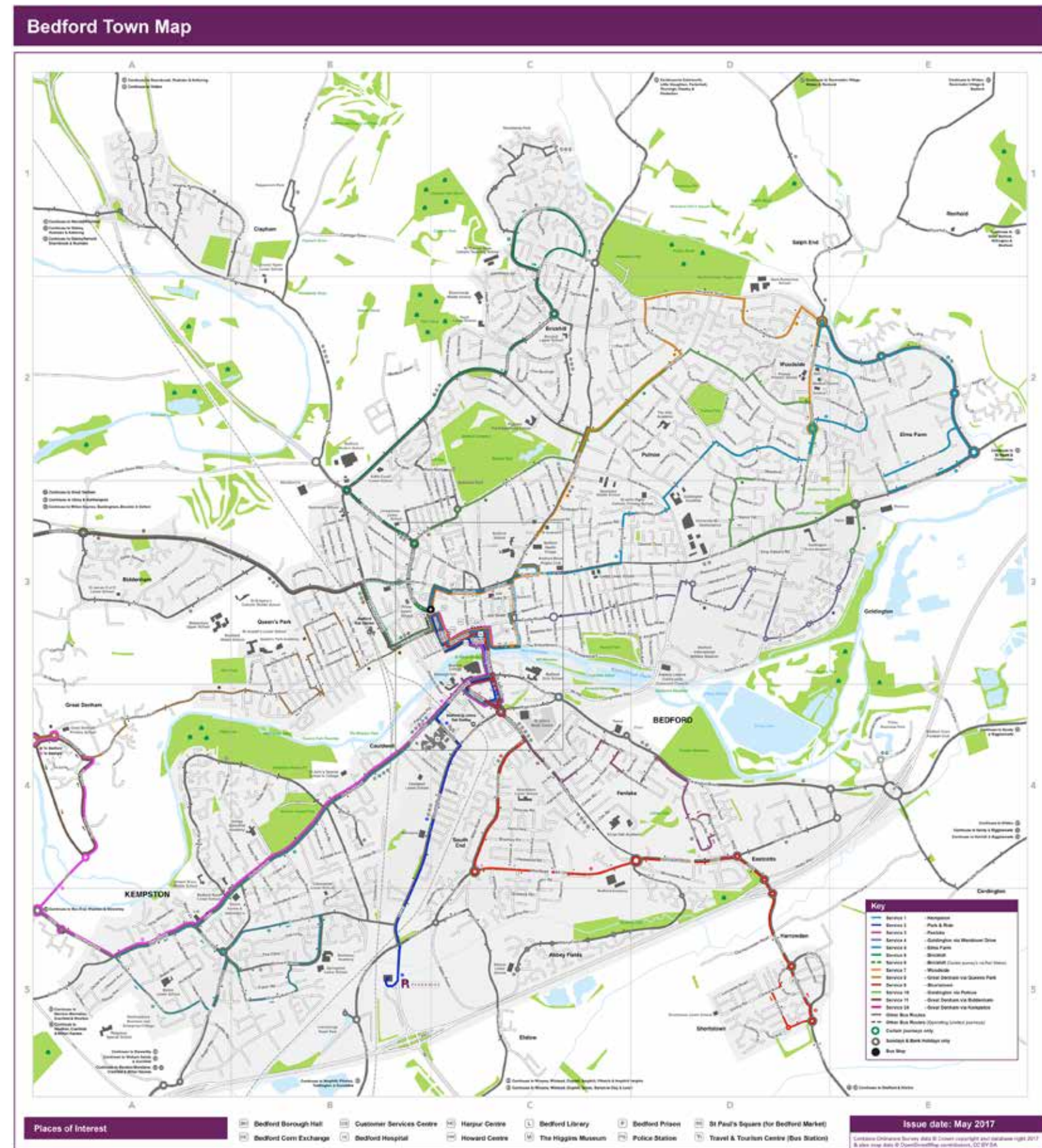
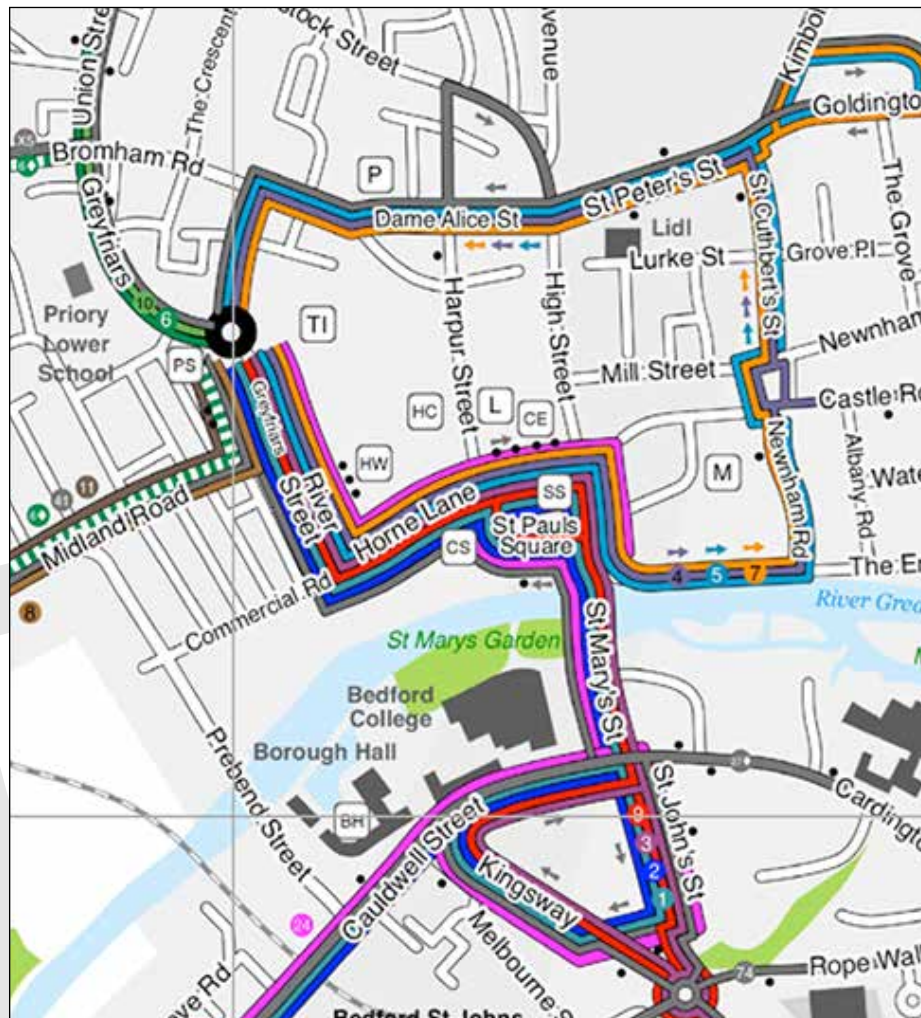


# EXISTING CONTEXT

## BUS ROUTES

Bedford Bridge and St Paul's Square are the primary focus of bus movements in the town. The Bedford Town Centre Transport Strategy identified that congestion on the roads had a significant impact on bus provision, with cross-town services cut as a result, and the bus station becoming the primary hub.

As with cycling, a revision of traffic management in the town can be used to improve bus reliability, and also potentially open up opportunities to reinstate cross-town services and also improve bus access to the railway station. The provision of new bus lanes could also be undertaken as part of this work.





# EXISTING CONTEXT

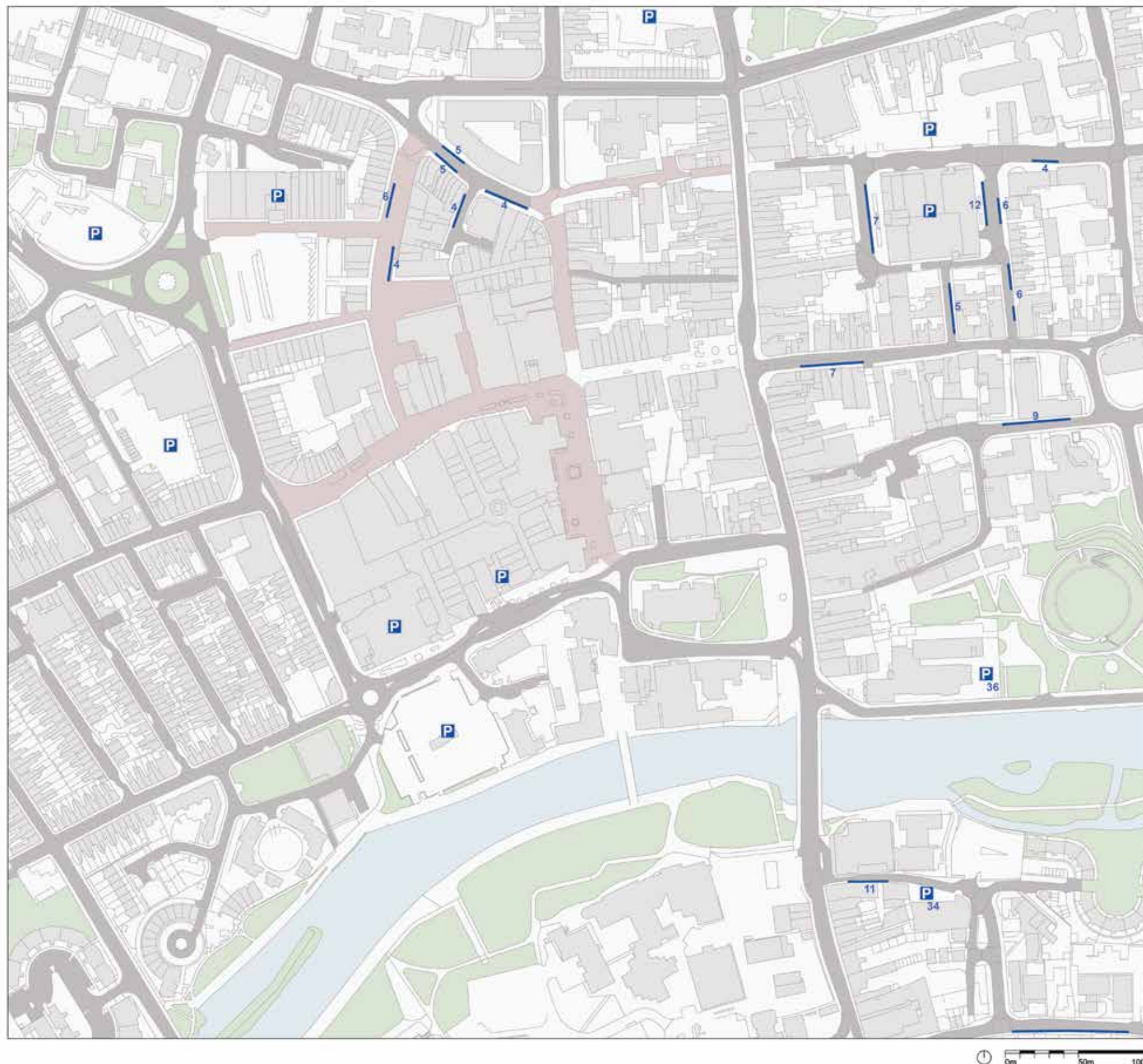
## CAR PARKING

Multi-storey and surface public car parks are generally sited in edge-of-centre locations and with the exception of the Horne Lane car parks, drivers can access and exit without having to traverse the one-way system.

On-street parking is similarly limited to more peripheral locations, although blue-badge parking is available in the shared space element of Allhallows and general on-street parking is provided in Mill Street, Duke Street and Gadsby Street. These latter locations will almost certainly contribute to traffic entering the one-way system in the High Street via the Mill Street junction.

Providing a suitable mix of parking in any town is a challenge but as part of the overall network improvements envisaged for Bedford, a review of parking facilities will help ensure that the right levels and types of parking are provided in areas that support the local economy whilst helping deliver wider growth and place aspirations for the town.

To support this aim, a Variable Message Signs (VMS) system is to be installed in the town, to direct drivers to the most convenient parking location. This will support a reduction in circulating traffic and help reduce congestion in the town.



### Legend

- P Car Parking- public
- 4 Car Parking- on street



# EXISTING CONTEXT

## WALKING

Detailed pedestrian data was collected by Tracsis plc between 23 and 26 August 2017 at three crossing locations on the High Street:

- Junction of High Street and Lurke Street
- Junction of High Street, Mill Street and Silver Street
- Junction of High Street and St Paul's Square (north)

The data relating to the crossing points has been averaged, and the broad findings are shown in the adjacent graphs.

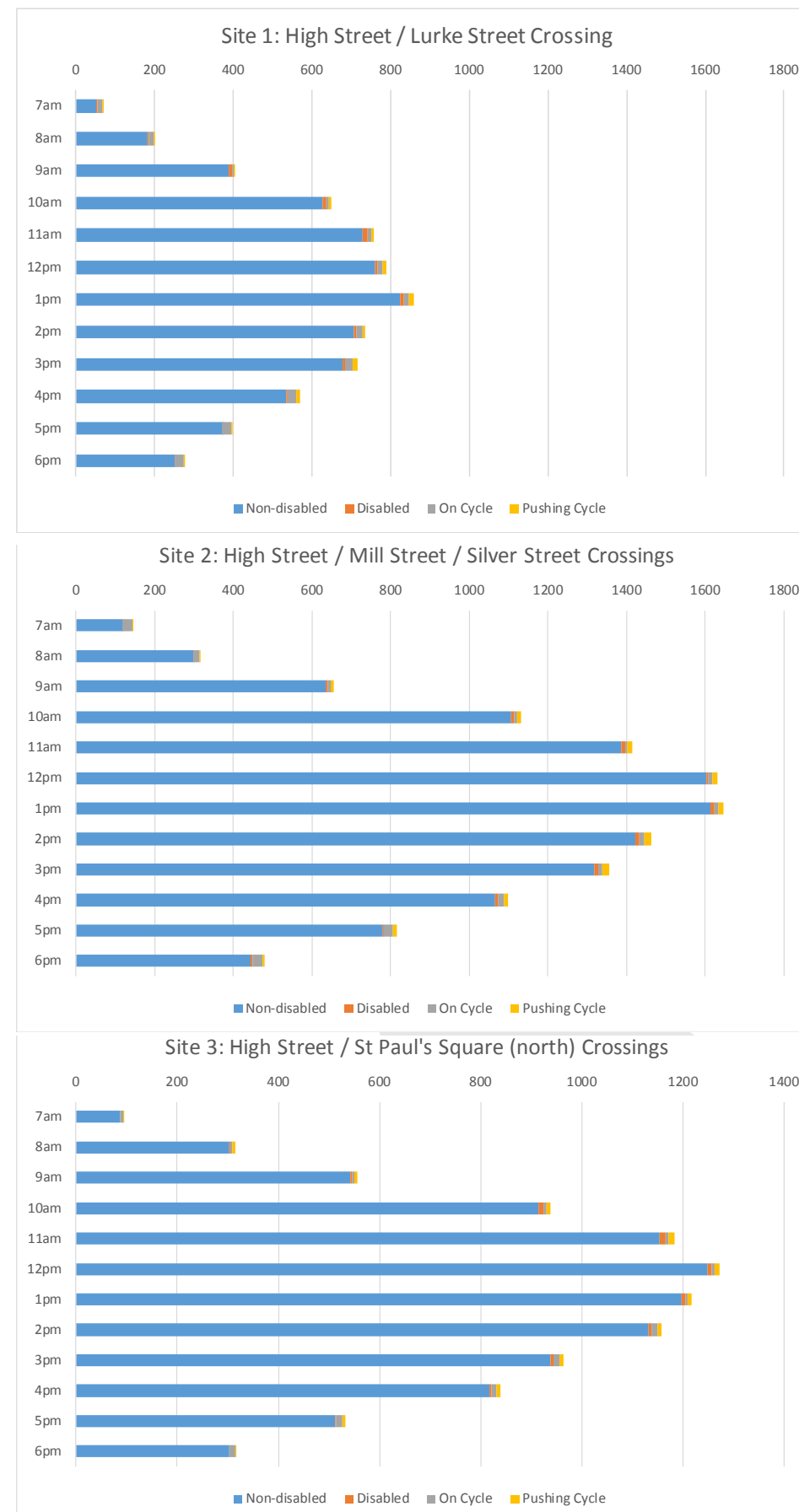
It can be seen that each study location experiences a similar pattern of flow throughout the day. However, Site 2 experiences the highest pedestrian volumes, and Site 1 the least.

Comparing these figures to vehicle flows, it has been found that during the AM Peak (07:30-08:30) there are currently an average of 480 pedestrian and cycle movements spread between the three crossings, with 1100 vehicles making the southerly journey from St Peter's Street to St Paul's Square south. This means that of all the c1580 movements within the High Street, 30% are carried out by pedestrians and cyclists.

The bulk of pedestrian and cycling movements take place between 1pm and 2pm. Across the three study areas, this accounts for a total of 3,721 pedestrian and cycle movements. Compared to the AM peak, this is an increase of 675%.

It is easy to forget how many people are walking and cycling through the town at busy times, and cycle movement in particular is hindered by the restriction in the pedestrian zone- see following section.

There is clear scope within Bedford to build on the popularity of active travel as a mode that is deserving of additional investment. Improvements to the quality of the public realm and supporting revisions to traffic management to calm speeds and remove unnecessary vehicle trips from the High Street will help encourage more residents and visitors to get walking and cycling, and make it easier to reach key destinations within the town.





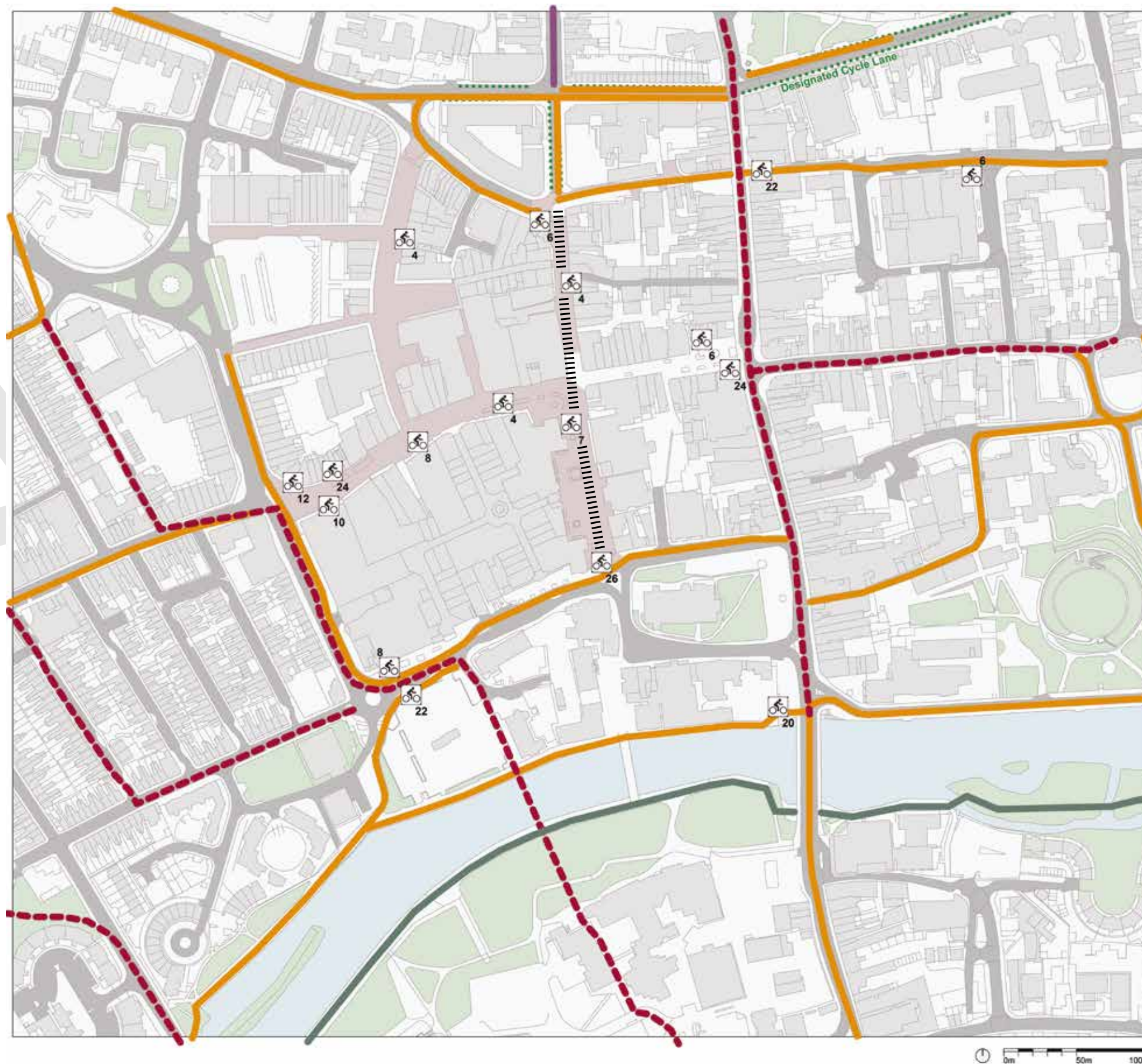
# EXISTING CONTEXT

## CYCLING


Provision for cycling is currently disjointed with very limited formal on-carriageway provision of cycle lanes. This, coupled with the one-way system, means that pavement cycling is commonplace, even on relatively quiet streets. This is not desirable and can be intimidating to some pedestrians, discouraging walking.

An opportunity exists as part of wider traffic management, to carry out improvements and join up the missing links in the cycle network. The main shopping streets in the town centre are pedestrianised, however cycling is allowed in these spaces between 6pm and 9am.

Allowing considerate cycling at other times would enable strong north-south and east-west links through the centre to be created. The north-south route indicated on the plan is particularly important as it will allow cyclists to ride northbound through the town centre.



### Legend

- ..... Cycle Lanes
-  Cycle Stands
- Existing Cycle Route
- Proposed Cycle Route
- - - Cycle Route requiring improvements
- Existing Sustrans Route 51
- - - Key cycling opportunities



# EXISTING CONTEXT

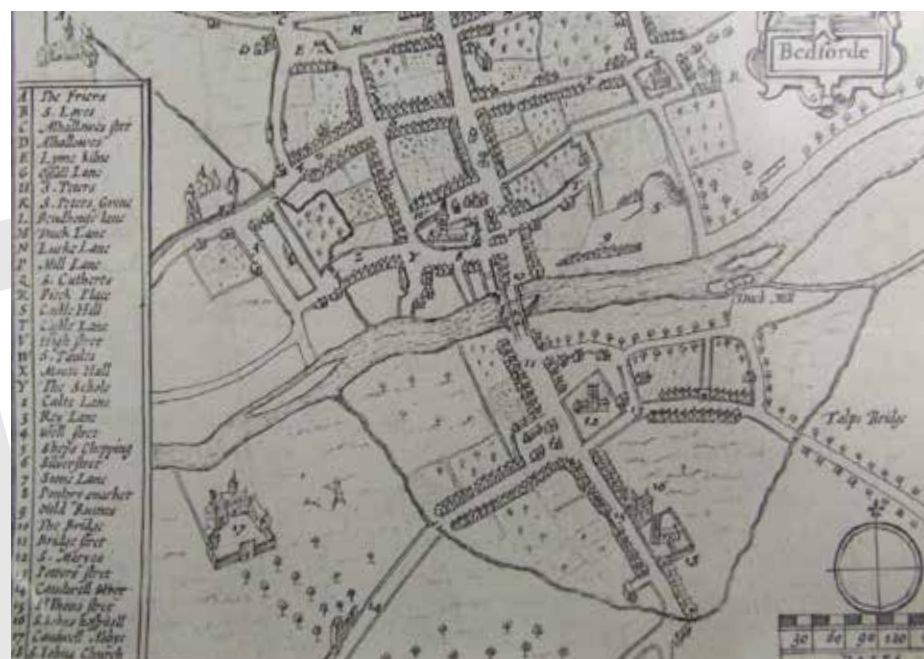
## TOWNSCAPE CONTEXT

### HERITAGE

Bedford has a rich heritage that dates back to Saxon times. Historic map regression from the Bedford Conservation Area Character Appraisal (2008), indicates that at the core of the Conservation Area, the street pattern remains largely intact, and the fine grain of development on the High Street continues to display the original burgage plot layout.

The historic core of the town is centred around St Paul's Square, with a fine collection of buildings that culminate at the Castle. The Bedford Conservation Area Appraisal identifies heavily trafficked streets as being detrimental to the setting of St Paul's Square and the High Street, and calls for a heritage-led design approach to any aspiration to de-traffic the High Street and improve the appearance of the town.

The historic maps show Bedford Bridge as the solitary original river crossing and the land to the north developed as the focus of the early settlement, with development clustering around St Paul's Church. Then as now the church is bounded by streets but the volume of traffic today and its associated signs, signals and lines has had a significant impact on the setting of this historically important environment. Revisions to traffic management and a sensitive approach to street design will enable the fine buildings that line the High Street and St Paul's Square to regain their former prominence.



John Speed's Map, 1610



Thomas Jeffrey's Map, 1765

#### Legend

- Scheduled Ancient Monument
- Grade I Listed Building
- Grade II\* Listed Building
- Grade II Listed Building
- Conservation Area



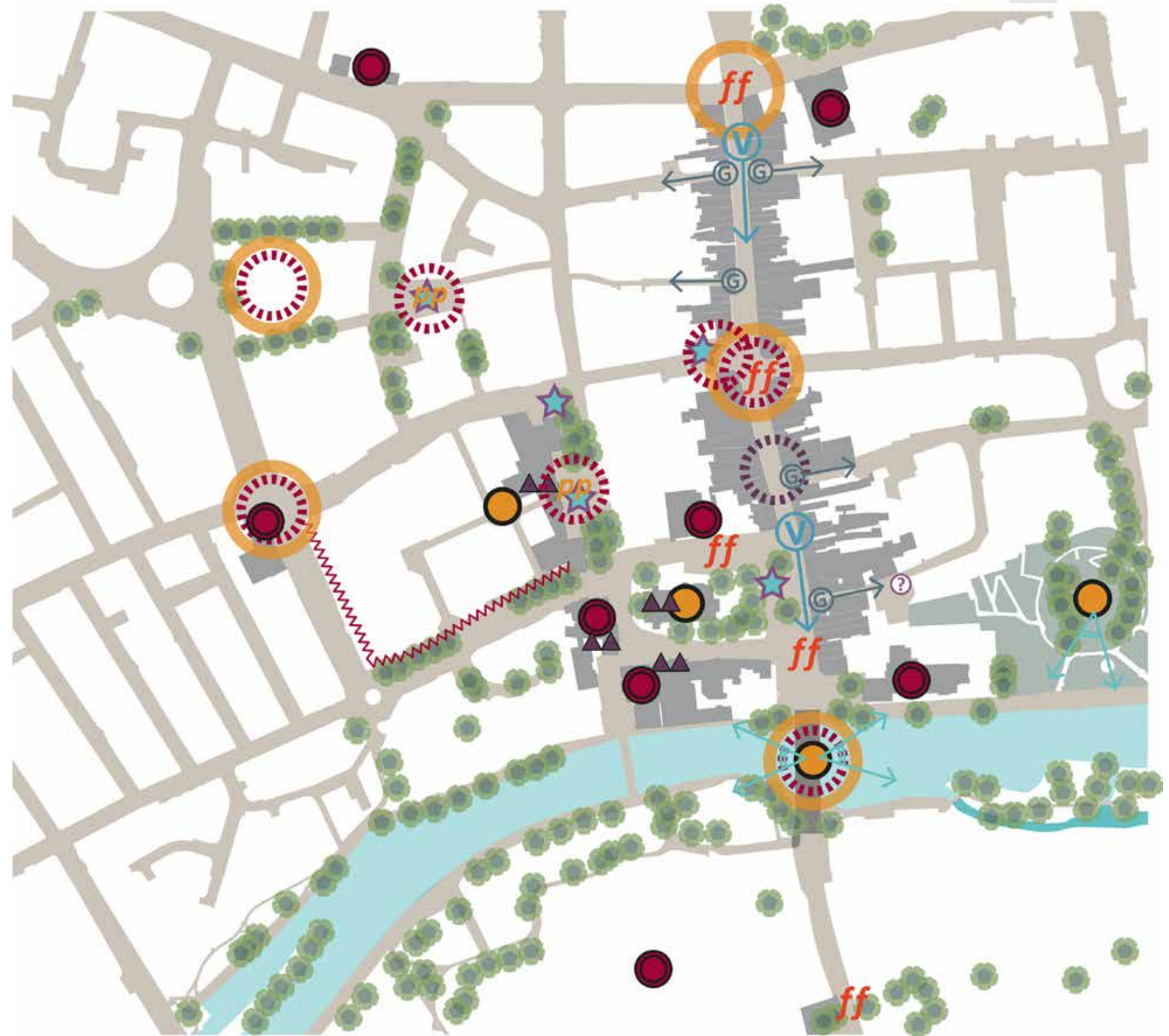
## TOWNSCAPE

The core elements of townscape are illustrated here.

Bedford Bridge, the bus station and junctions at River Street, Mill Street and St Peter's Street form the main gateways to the town.

Open spaces create important nodes where people can gather, and sit and rest.

The high quality townscape around St Paul's Square contains a number of landmarks, whilst the bridge enables spectacular vistas to east and west.



### Legend

- |                       |                   |
|-----------------------|-------------------|
| Gateways              | Skyline Interest  |
| Nodes                 | Intrusive Feature |
| Node- evening economy | Disorientation    |
| Vistas                | Noisy Area        |
| Views                 | Quiet Area        |
| Glimpses              | Space to linger   |
| Major Landmarks       | Street Trees      |
| Local Landmarks       |                   |



# EXISTING CONTEXT

## SWOT ANALYSIS

A SWOT analysis was undertaken as part of the stakeholder engagement exercises and the following issues were raised:

### STRENGTHS

- Historic buildings and heritage assets
- Compact and walkable town
- Pedestrianised areas
- Markets
- Public transport
- The river, and waterside apartments
- Retail offer

### WEAKNESSES

- Relationship of the train station to the town centre
- Poor quality of the pedestrian environment
- Severance caused by the High Street
- St Paul's disconnected from the rest of the town
- Town Centre assets are disconnected
- Poor cycling permeability
- Scale of buildings

### OPPORTUNITIES

- Pedestrianised areas
- Relationship of the train station to the town centre
- Reduce the impact of traffic
- Improve key gateways
- Improve the Midland Road area
- Make more of the river
- Increase physical activity
- Bus stops and routes, improve St Paul's Square

### THREATS

- Milton Keynes
- Difficult building consensus
- Anti-social behaviour
- Bus stops and routes- impact on St Paul's Square



*There are opportunities to enhance shopping streets and add more vitality*



*Bedford's rich history and heritage is a strength*



*Littering and other anti-social behaviour needs to be addressed*



*Some pedestrian links would benefit from additional maintenance*



*Bus stops and a wide carriageway clutter St Paul's Square*



# EXISTING CONTEXT

## KEY ISSUES

This review of Bedford's existing context and the SWOT findings from the stakeholder engagement have identified the following *Key Issues* relating to the streets and spaces within the city centre. These issues present a series of challenges that need to be addressed to ensure the aspirations for growth within the town centre are achieved.

### SENSE OF ARRIVAL AND GATEWAYS

- Poor sense of arrival from the train station and disorientation / lack of legibility to find the town centre
- Bedford Bridge is dominated by vehicles despite its heritage status
- Poor cycling connections through the town

### SAFETY

- The proliferation of A4 drinking establishments make some parts of the town feel unsafe to some users
- The High Street and Midland Road generally feel unsafe, pedestrianised streets lack overlooking and feel desolate after dark
- The High Street and other busy streets should be easier to cross
- Some parts of the town are disorientating

### LEGIBILITY AND WAYFINDING

- Lack of legible, visual connections between some key destinations
- Lack of distance information on pedestrian signage whether in meters or walking time
- Limited knowledge of wider city centre from people using the city centre core or university
- Lack of distance information on wayfinding infrastructure

### SEVERANCE AND DISCONNECTION

- The High Street severs the town
- Cycle routes are disconnected and fail to link up

### FUN AND DELIGHT

- Event spaces are scattered throughout the town centre but could be used for more than markets
- Opportunities to foster a cafe culture and encourage businesses to spill out into the street

### VEHICLE DOMINATED TOWN CORE

- Traffic management arrangements are confusing due to the one way street network
- Highway infrastructure dominates city centre streets harming streetscape, severing the town and reducing walkability
- Proliferation of signalised junctions creates additional visual clutter
- Issues with noise and air pollution
- Number of HGVs create an intimidating environment
- On street servicing widens the carriageway and in some cases is utilised by businesses that benefit from rear access

### IDENTITY AND QUALITY

- High quality streets and spaces contrast with vehicular dominated areas such as St Paul's Square
- Important buildings "disappear" in a vehicle dominated setting
- Limited greenery in the High Street and main shopping area



Bedford Bridge: this gateway is currently dominated by the highway



Wayfinding lacks distance information



The town core is dominated by vehicles

D

R

A





# TYPOLOGIES & PRECEDENTS

# TYOLOGIES & PRECEDENTS

## ASSETS

As a refinement of the basic street hierarchy, the *Town Spaces*, *Shopping Streets*, *Town Streets* and *Pedestrian Lanes* together combine to create the key linkages to the town's assets, namely:

- Bedford Castle
- The River Great Ouse
- Riverside Square
- St Paul's Square
- Mill Street

This compact street network constitutes the “core” public realm within the town.

It can be seen that the High Street forms the “spine” of this armature, the linking element between the east and west of the town. Improvements to links to the east are especially needed.

## GATEWAYS & NODES

Gateways need to be designed to create a welcoming and attractive first impression of the town. They are important arrival and departure points and host significant movement functions, however, in some cases they are destinations in their own right and it is important they are designed to reflect the identity of Bedford and contribute to Place.

Gateways where people will be waiting or lingering, such as public transport interchanges, need to be designed to facilitate these activities in a pleasant, safe and interesting environment.

## PUBLIC ART

Public art can be used to embellish gateways, nodes and important spaces, and reinforce local distinctiveness, not necessarily in an obvious way. Subtle aesthetic interventions can be used to add a human touch to what in some cases are currently bland and potentially intimidating spaces.





## PRECEDENTS

The following exemplars exhibit good practice principles that could be applied to Bedford:

### TOWN SPACES: KINGSTON ANCIENT MARKETPLACE

Town Spaces are important focal points and places to rest and linger, whilst still maintaining an important pedestrian movement function. The Ancient Marketplace project in Kingston sought to provide a quality offer to draw people into the historic town core and improve the setting of the Grade II\* Listed Market House. New market stalls incorporate a “glowing orchard” artwork that illuminates the stalls after hours and help bring vibrancy to the space in the evenings. A similar approach in Bedford would help animate some parts of the town centre after hours.



Image capture July 2016, © Rupert Cheek

### SHOPPING STREETS: NEW ROAD, BRIGHTON

This project adopted a pedestrianisation approach with strong café culture, utilising parklets and controlled vehicular access. The Vision for Bedford High Street, as set out in the High Street Strategy, provides opportunities for cafés and restaurants to adopt spill-out spaces and parklets themselves, further animating and adding visual interest to the street, and importantly providing animation and passive surveillance after hours. Parklets can be used to define those areas where vehicles have access at certain times



Image capture June 2016, © Google 2017

### TOWN STREETS: OXFORD STREET, SOUTHAMPTON

This example also supports café culture in Bedford. This street in Southampton benefits from resurfacing of the carriageway, which significantly changes the feel and psychology of the place, and supports the important role of this street in the city’s evening and night-time economies. A similar approach could be taken in Bedford to support suggestions to significantly revise traffic management and support pedestrian priority in the High Street, creating a space that is easy and pleasurable for people to walk and cycle in.

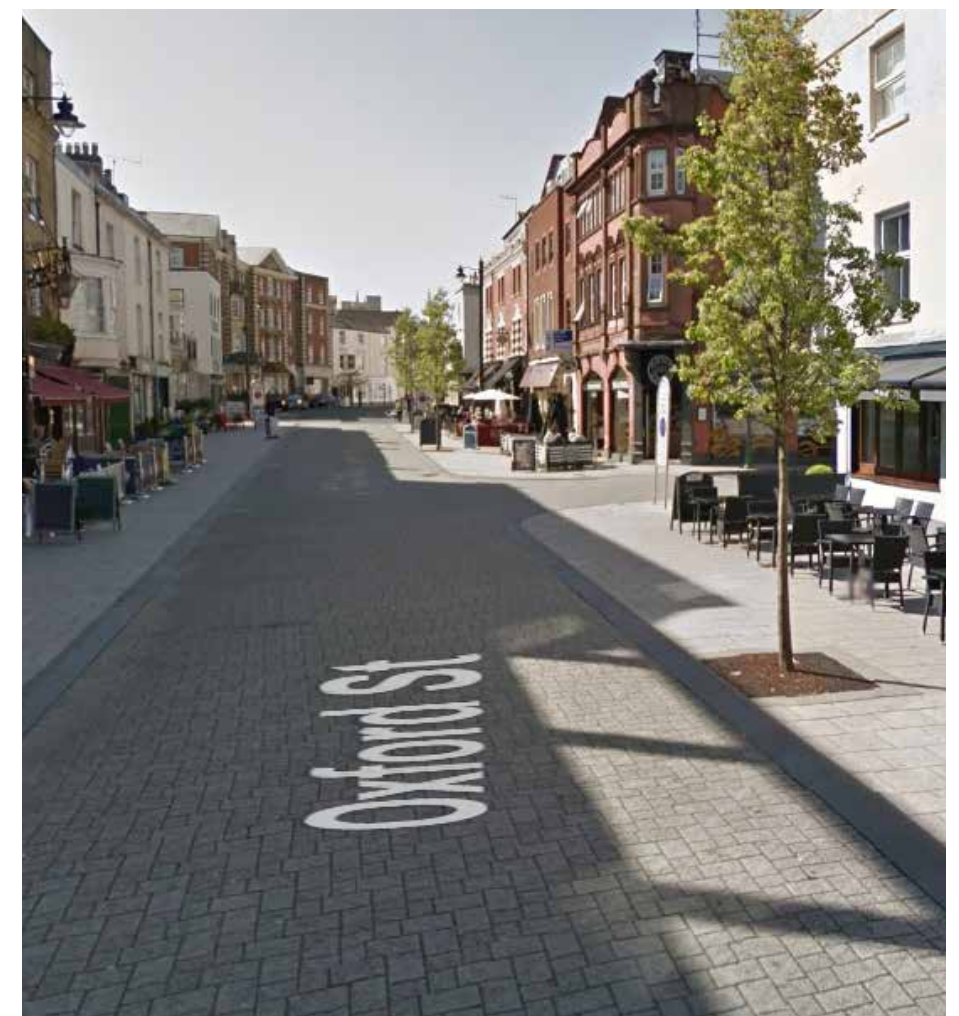


Image capture April 2015, © Google 2017



# TPOLOGIES & PRECEDENTS

## PEDESTRIAN LANES: NORTH PARADE PASSAGE, BATH

The core of Bath is interconnected by a plethora of small lanes and alleys that run between the main streets. They have a vital role to play as shopping destinations in their own right as well as adding permeability to the city.



Image capture July 2014, © Google 2017

## ACCESS STREETS: BONNINGTON SQUARE, LONDON

Access streets have a vital role to play, providing vehicular access to homes and workplaces. However, as this example shows, they can be treated imaginatively to reduce vehicular dominance, and enable surrounding uses to spill out onto widened pavements, perhaps incorporating the parklets introduced under *Shopping Streets*. In residential areas the introduction of parklets could create informal play spaces or spaces for residents to meet.



Before and after photo courtesy of urb-i.com

## BUSY STREETS: LONDON ROAD, SOUTHAMPTON

London Road is a *Mixed Priority Street* linking the A3024 to the A33. It is an important link for all transport modes and a destination in its own right, contributing to the city's day, evening and night time economies. Simple interventions have made the street easier to cross, regularised on-street parking, and created spill-out space for businesses. The Design Process included a Placecheck exercise with stakeholders to identify Likes, Dislikes and Improvements required, and this approach could be replicated in Bedford.

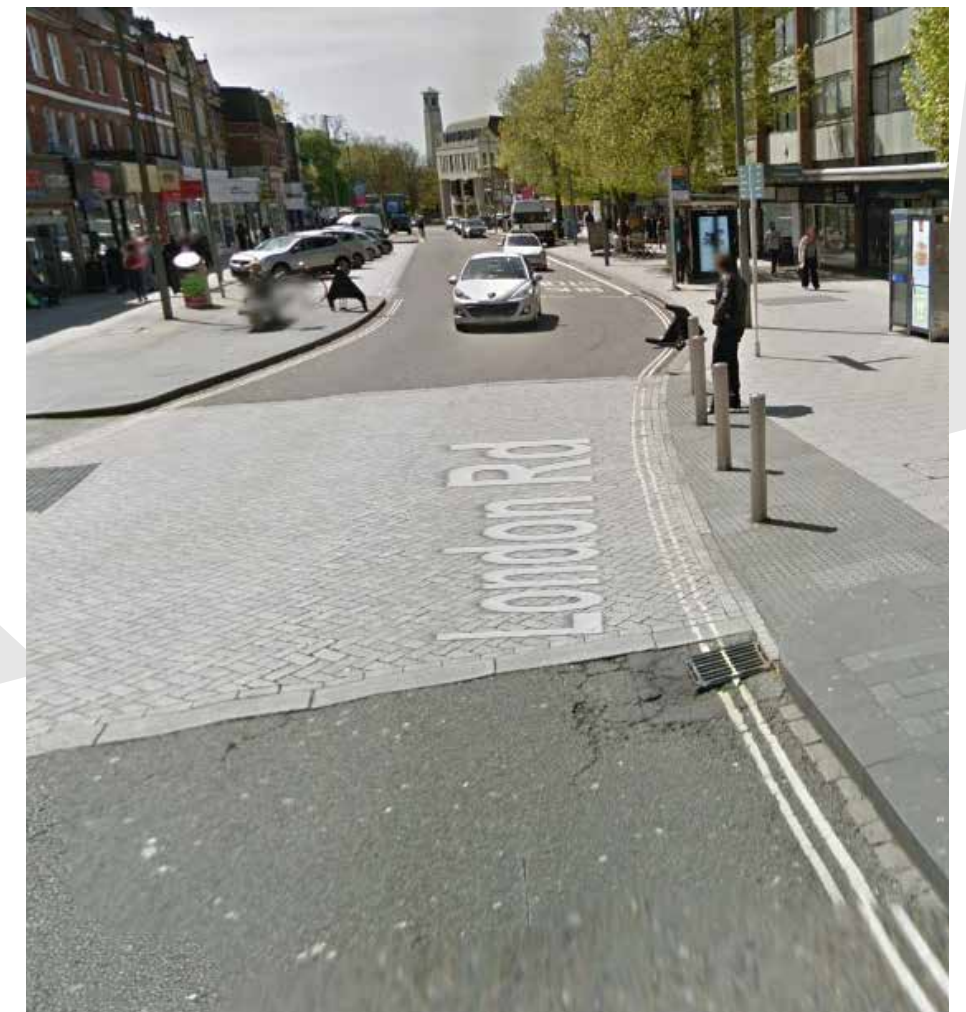


Image capture May 2016, © Google 2017



# TYOLOGIES & PRECEDENTS

## GATEWAYS: ASHFORD RING ROAD

Ashford combined art with engineering to create a strong sense of place and arrival. Research had shown that "... motorists by and large loved the ring road, although often complaining of congestion, but pedestrians hated it and the barrier it created between them and their town centre... The intention would be that the new streets become destinations in their own right and attractive places for people to visit, live and shop. Clearly there was a major challenge to ensure that these new streets also still fulfilled an important traffic function, needing to accommodate up to 10,000 vehicles per day". This project has

dramatically reduced the severance caused by the ringroad (A292) and provides enhanced walking and cycling links from residential areas into the town centre. There is scope for the severance caused by Bedford High Street to be similarly calmed and enable the street to become a stronger destination in its own right, despite its strategic movement function.

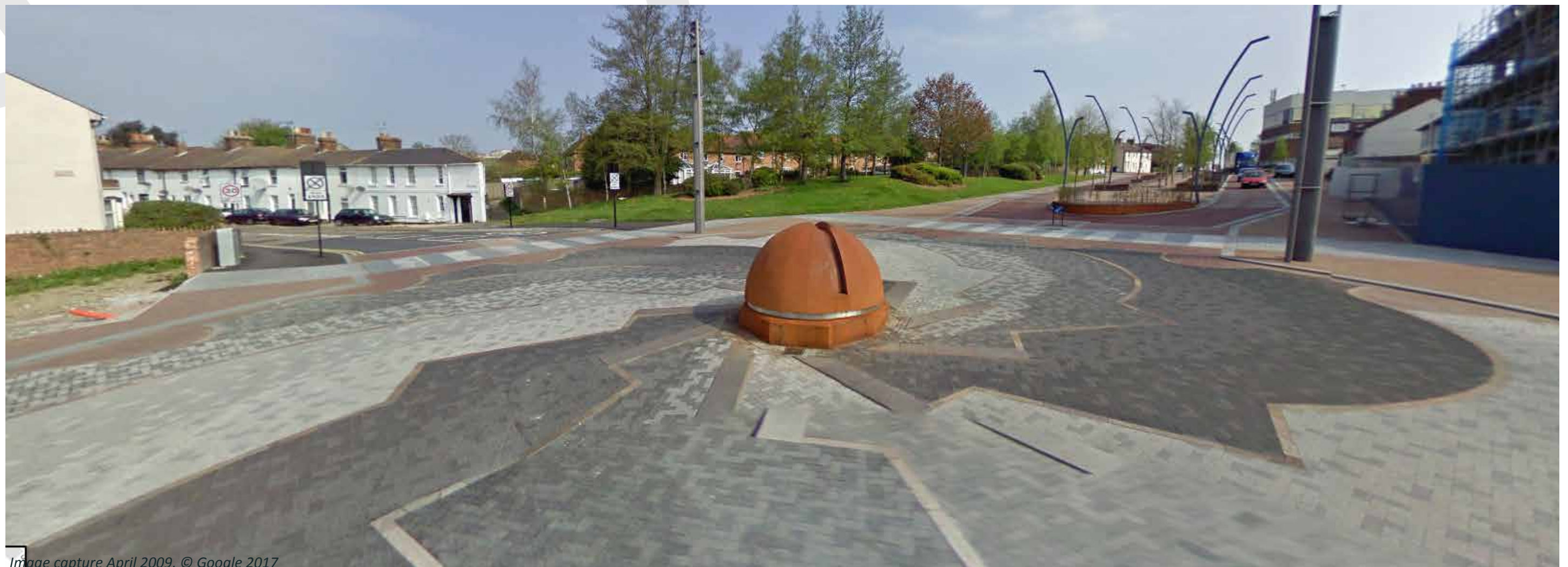


Image capture April 2009, © Google 2017









# PUBLIC REALM OBJECTIVES



# PUBLIC REALM OBJECTIVES

## VISION FOR BEDFORD HIGH STREET

The High Street Strategy states that the Vision is to:

*“Recreate the traditional heart of the town centre and maximise its townscape and heritage quality by the removal of all unnecessary general traffic, the creation of a high quality people friendly and safe public realm (where public art has a place), upgrading the built fabric, reintroducing attractive traditional shopfronts and regular markets, encouraging street cafes and restaurants, increasing upper floor residential and commercial use and creating life and vitality making it a destination for people of all ages at all times.”*

In order to deliver this vision, the following overarching Public Realm Objectives have been identified by stakeholders:

### EIGHT OBJECTIVES FOR BEDFORD

1. Ensure the town centre is safe and feels safe at all times
2. Ensure the town centre is accessible for all and by all transport modes, in particular active travel
3. Minimise the negative impact of vehicles on the town centre and reduce street clutter
4. Introduce additional trees and greenery within the streetscape and town spaces
5. Ensure the town centre is enjoyable and fun to spend time in
6. Make the most of the town's rich heritage and cultural assets
7. Make the town centre easier to navigate and raise awareness of what's on offer
8. Improve the quality and cleanliness of the town centre

These objectives will now be expanded upon.





# PUBLIC REALM OBJECTIVES

## 1. ENSURE THE TOWN CENTRE IS SAFE AND FEELS SAFE AT ALL TIMES

Perceived and actual safety are key considerations. New development needs to address the following issues:

- There is currently a lack of residential population within the town centre, resulting in a lack of natural surveillance, particularly outside trading hours
- The High Street creates a barrier to east-west movement and some junctions are land-hungry and intimidating to pedestrians
- There is an increased perception of fear at night due to the lack of activity in the Shopping Streets
- Parts of the High Street are considered unsafe at night due to the evening and night-time economies being focussed around Class A4 drinking establishments
- Some parts of the town are disorientating and visual connections to key destinations are poor

To address these issues, the following steps should be taken:

- Ensure all lighting conforms to current standards, and where appropriate, contributes to wayfinding and creates visual interest
- Encourage a wide mix of uses within the town centre, including new residences on upper floors, to ensure a wide mix of people are using the town centre throughout the day and night and generating natural surveillance
- Deliver a high quality public realm that provides a strong setting for retail, events and heritage assets
- Soften the appearance of the High Street to reduce its vehicular dominance and make it easier to cross
- Reduce the number of drinking establishments

and encourage cafe culture

- Better enforce against rough sleepers and street begging



*Forgotten spaces create an edgy feel*



*Lighting must conform to current standards*



*Some parts of the town are disorientating*

## 2. ENSURE THE TOWN CENTRE IS ACCESSIBLE FOR ALL AND BY ALL TRANSPORT MODES, IN PARTICULAR ACTIVE TRAVEL

Despite the walkability of the town centre, some a number of factors currently discourage walking and cycling journeys across the town. New development needs to address the following issues:

- Some streets are difficult to cross, discouraging walking and cycling
- Vehicles currently have a negative impact on the town in terms of congestion, and noise and air pollution
- Wayfinding provision for pedestrians and cyclists is currently poor and lacks distance information

To address these issues, the following steps should be taken:

- Ensure opportunities for walking and cycling are accessible to all to encourage healthy lifestyles and also ensure that those without access to a car can easily access services and facilities
- Ensuring car access is available, but in a way that effectively moderates the negative impacts of cars on the town
- Balance vehicle access against the need to create liveable, attractive places and pleasant streets for all, making sure the town's assets are not vehicle dominated
- Develop a clear, consistent and inclusive approach to street design and traffic management along with a clear plan to accommodate the town's growth in travel demand
- Improve the quality of walking and cycling routes and the ease of wayfinding and legibility to enable people of all ages and abilities to walk and cycle
- Improve the town's wayfinding with the

installation of a unified, up-to-date wayfinding system across the whole of Bedford, that links the town centre to adjacent neighbourhoods and provides distance information

- Widen pavements where possible
- Strengthen east-west as well as north-south links
- Strengthen connections and associated public spaces- Silver Street, Lime Street, Lurke Street, the passages, St Paul's Square, Castle Lane



*Bus shelters narrow the pavement*



*Lack of cycle facilities encourages pavement cycling*



# PUBLIC REALM OBJECTIVES

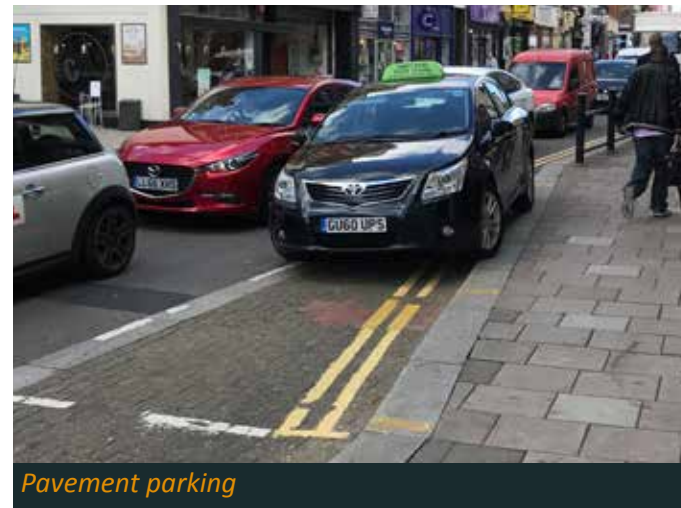
## 3. MINIMISE THE NEGATIVE IMPACT OF VEHICLES ON THE TOWN CENTRE AND REDUCE STREET CLUTTER

The limited river crossings funnel vehicles down the High Street and the one-way system creates convoluted routes. New development needs to address the following issues:

- Noise and air pollution in the High Street and the impact of this on health and well-being and sociability
- Fast moving traffic and sweeping curves make crossing streets difficult
- Narrow pavements place pedestrians in close proximity to traffic, resulting in intimidating environments
- Restrictions relating to on-street servicing are not strictly enforced

To address these issues, the following steps should be taken:

- Revise traffic management to remove all unnecessary traffic and create a feature street
- Widen pavements where possible to reinforce pedestrian priority and create spill out spaces for businesses
- Reclaim carriageway space for cyclists and explore the possibility of accommodaing two-way cycling
- Reduce speed limits throughout the town centre to 20mph
- Ensure on-street servicing is regulated
- Plant new street trees where underground infrastructure allows, to psychologically slow traffic
- Consider banning HGVs from the High Street at all times, and full day-time closure to all vehicles



## 4. INTRODUCE ADDITIONAL TREES AND GREENERY WITHIN THE STREETScape AND TOWN SPACES

Trees not only soften urban environments, but also slow rainfall and absorb pollution. New development needs to address the following issues:

- There is currently a lack of street trees or soft landscape in some parts of the town including the High Street

To address these issues, the following steps should be taken:

- Encourage new planting where underground infrastructure allows
- Consider the use of fastigate varieties close to carriageways
- Consider the creation of a boulevard within the High Street and into St Mary's Street to create welcoming gateways to the town and a feature that draws people through the area and encourages exploration





# PUBLIC REALM OBJECTIVES

## 5. ENSURE THE TOWN CENTRE IS ENJOYABLE AND FUN TO SPEND TIME IN

Encouraging people to spend more time in the town centre is good for business. New development needs to address the following issues:

- There is currently a lack of residential population within the town centre, resulting in a lack of natural surveillance, particularly outside trading hours
- The High Street creates a barrier to east-west movement and some junctions are land-hungry and intimidating to pedestrians
- There is an increased perception of fear at night due to the lack of activity in the Shopping Streets
- Parts of the High Street are considered unsafe at night due to the evening and night-time economies being focussed around Class A4 drinking establishments
- Some parts of the town are disorientating and visual connections to key destinations are poor

To address these issues, the following steps should be taken:

- Ensure all lighting conforms to current standards, and where appropriate, contributes to wayfinding and creates visual interest
- Regularise the number and distribution of drinking establishments in the High Street through new planning policies
- Encourage shops to stay open later and improve the quality of the A1 retail offer
- Reduce the impact of traffic to create a more relaxed environment
- Design streets and spaces to be adaptable and able to accommodate events and staying activities as well as movement functions
- Provide underground water and electricity supplies to accommodate events, markets and

other outdoor activities

- Where necessary upgrade and improve seating areas and spaces for lingering



## 6. MAKE THE MOST OF THE TOWN'S RICH HERITAGE AND CULTURAL ASSETS

A town's cultural offer has an important role to play in the local economy. New development needs to address the following issues:

- Some assets would benefit from greater visual prominence
- Heavy traffic in the High Street and St Paul's Square draws attention away from the heritage assets that frame these spaces

To address these issues, the following steps should be taken:

- Consider revisions to traffic management to significantly reduce vehicular traffic in the town centre
- Work with business owners to improve shopfronts
- Improve the prominence of shopping arcade
- Improve the prominence of the lanes to encourage exploration of the Cultural Quarter





# PUBLIC REALM OBJECTIVES

## 7. MAKE THE TOWN CENTRE EASIER TO NAVIGATE AND RAISE AWARENESS OF WHAT'S ON OFFER

Enabling people to move confidently through the town centre improves safety and encourages people to travel actively. New development needs to address the following issues:

- Wayfinding infrastructure currently lacks distance information
- Some visual connections are blocked by built form and would benefit from additional wayfinding improvements
- Some parts of the town are disorientating as a result of a lack of visual connections
- A range of signage and styles resulting in visual clutter
- Tactile information not consistently applied

To address these issues, the following steps should be taken:

- Introduce a more consistent wayfinding style that reflects Bedford's brand and creates a more positive image to users
- Encourage exploration through provision of information relating to events and activities in key spaces
- Ensure tactile provision is applied continuously and is well maintained



*Navigation lacks distance information*



*Ordinary objects can act as local landmarks*



*Avoid interruptions in tactile provision*

## 8. IMPROVE THE QUALITY AND CLEANLINESS OF THE TOWN CENTRE

Surface materials and street furniture need to be chosen with ease of maintenance in mind, as well as their visual impact on townscape. Air quality can be improved through innovative traffic management. New development needs to address the following issues:

- Broken and damaged street furniture create a negative impression of the town
- Some shopfronts are poorly maintained and look untidy
- Some bin stores are visually prominent, within the setting of heritage assets and public art
- Traffic noise and proximity to pedestrians

To address these issues, the following steps should be taken:

- Choose materials with regard to the context of the street or space and the potential impact on the setting of heritage assets
- Ensure easy access to all parts of the streetscape by cleansing vehicles
- Use a visually cohesive range of street furniture, including bins, benches, bollards, signage, lighting and bus shelters to reduce visual clutter
- Remove pedestrian guardrail to reduce visual clutter and create a more inclusive environment
- Revise traffic management to reduce vehicle flows and improve air quality
- Continue to commission public art or other aesthetic interventions- this includes imaginative use of surface materials to soften environments
- Widen pavements where necessary to provide greater separation
- Slow vehicle speeds to below 20mph



*A generous act results in an untidy street*



*Some repairs and reinstatements could be improved*



*Is this the best place for the bins?*



# PUBLIC REALM FRAMEWORK



# PUBLIC REALM FRAMEWORK

## INTRODUCTION

The previous sections have identified the issues affecting Bedford, the various street types and important assets within the town.

An overarching Vision and Objectives for the public realm have then been identified.

This section combines the analysis, Vision and Objectives into a deliverable strategy the Bedford Town Centre Public Realm Framework.

## STREET HIERARCHY

This plan illustrates the four broad street types that exist in Bedford Town Centre. The table opposite illustrates the characteristics needed to deliver the vision and objectives.



### Legend

- Pedestrian-focussed streets and spaces
- Vehicular routes with high place value
- Linking streets with high place value
- Strategic vehicular routes



# PUBLIC REALM FRAMEWORK

## MOVEMENT

## PLACE

Typology

Description

Design Checklist

Design Checklist

<b>Pedestrian focussed streets and spaces</b>	<p>Pedestrian priority city spaces. Delightful places to stay with legible and inclusive access to all through routes. Considerate cycling generally allowed. Vehicles enter as guests.</p>	<ul style="list-style-type: none"> <li>• Limited vehicle access for servicing, cleaning and events, restricted to certain times</li> <li>• Less than 10mph</li> <li>• Cyclists defer to high pedestrian traffic</li> <li>• No parking</li> <li>• Service space provided, restricted and controlled</li> </ul>	<ul style="list-style-type: none"> <li>• High place functions with pedestrian priority</li> <li>• Highest quality materials</li> <li>• Active frontages frame spaces and spill-out space animates the street</li> <li>• Generous seating provision</li> <li>• Parklets encouraged to add visual interest and encourage activity</li> <li>• Space and infrastructure for events and outdoor activities</li> <li>• Public Art</li> <li>• Trees and soft landscape soften spaces and provide shade</li> </ul>
<b>Vehicular routes with high place value</b>	<p>Full vehicular access. Important through and access routes that need to respond to local context. Slower streets where vehicles enter as guests to encourage active travel and exploration. May be closed to accommodate special events. Courtesy crossings for pedestrians. Cycling on-carriageway.</p>	<ul style="list-style-type: none"> <li>• Full vehicular access except on event days</li> <li>• Controlled access for servicing and cleaning</li> <li>• Up to 20mph</li> <li>• Cyclists share the carriageway</li> <li>• Limited on-street parking provided for blue-badge holders</li> </ul>	<ul style="list-style-type: none"> <li>• High place functions with pedestrians and cyclists sharing space</li> <li>• Highest quality materials</li> <li>• Active frontages frame spaces and spill-out space animates the street</li> <li>• Generous seating provision</li> <li>• Parklets encouraged to add visual interest and encourage activity</li> <li>• Infrastructure to support events and outdoor activities during road closures</li> <li>• Public Art</li> <li>• Trees and soft landscape soften spaces and provide shade</li> </ul>
<b>Linking Streets with important place value</b>	<p>Full vehicular access. Important access streets to employment and residential areas. Slower streets to encourage sociability. Courtesy crossings for pedestrians. Cycling on-carriageway.</p>	<ul style="list-style-type: none"> <li>• Full vehicular access at all times</li> <li>• Up to 20mph</li> <li>• Cyclists share the carriageway</li> <li>• On-street parking provided</li> </ul>	<ul style="list-style-type: none"> <li>• Relatively high place functions to create neighbourhood identity</li> <li>• High quality materials</li> <li>• Active frontages frame spaces and spill-out space animates the street where possible</li> <li>• Seating provided at regular intervals</li> <li>• Trees and soft landscape soften the environment and provide shade</li> </ul>
<b>Strategic Vehicular routes</b>	<p>Medium quality, pleasant spaces. Pedestrians and cyclists segregated from each other and vehicles. Slightly higher vehicle speeds. Generous crossing times for pedestrians.</p>	<ul style="list-style-type: none"> <li>• Full vehicular access at all times</li> <li>• Up to 30mph</li> <li>• At-grade pedestrian crossings with generous timings</li> <li>• Elephants' feet to accommodate cycle crossings at junctions</li> <li>• Cyclists segregated from pedestrians and vehicles</li> <li>• On-street parking provided</li> <li>• Service space provided, restricted and controlled</li> </ul>	<ul style="list-style-type: none"> <li>• Lower place functions with pedestrians and cyclists fully segregated</li> <li>• Medium quality materials</li> <li>• Active frontages frame spaces and spill-out space animates the street where possible</li> <li>• Seating provided at regular intervals</li> <li>• Trees and soft landscape soften the environment and provide shade</li> </ul>



# PUBLIC REALM FRAMEWORK

## WAYFINDING

Wayfinding has been identified as an issue in the town. The key issues to be addressed are:

- The poor state of some of the signage and the range of styles, creating visual clutter
- The need to update content and provide additional information
- Improve mapping
- Ensure greater consistency to create a positive image of the town that will encourage greater exploration, and better connect the surrounding areas to the town centre

The town's identity is defined by a mix of its earlier heritage with some iconic quality buildings, public spaces and more modern architecture and a retail based economy. Further, it benefits from a very compact and walkable central area.

However, the High Street creates a strong visual and mental barrier to east-west pedestrian connections and the wayfinding strategy needs to reinforce the town centre shopping and leisure zone, and build connections to the adjoining neighbourhoods. This will enable residents and visitors to build up a positive mental map of the wider city centre experience.

Introducing an improved wayfinding system presents an opportunity to reinforce local character. Identity does not necessarily mean a logo but rather a combination of colour, form, typeface, materials and styling to reinforce the unique sense of place and, where appropriate, make reference to the town's unique heritage and cultural offer.

Some good practice examples from other towns and cities where wayfinding has reinforced local distinctiveness are shown here.



*Finger signs need to convey a significant amount of information*



### DERBY

Forms that reflect Derby's engineering heritage are combined with modern typefaces and mapping to build an image of the city and its urban quarters.



### HARROGATE

Harrogate is an historic spa town with an interesting and unique skyline silhouette, reflected in a cut-out detail on the signs. A cut-out 'H' has been used as a fingerpost finial.

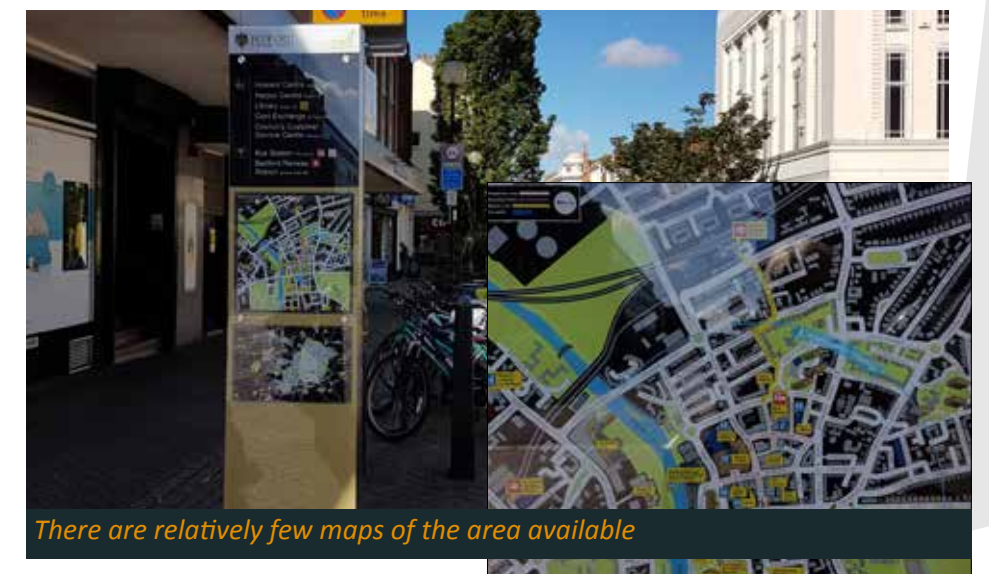


### BOSTON

Boston uses a simple monolith form, but with colour and styling to suit the riverside and former port location, and skyline of existing landmark buildings showing its trading heritage.



*This finger sign includes additional information on local heritage*



*There are relatively few maps of the area available*



*Ground level signs are prone to wear, but the distance information is useful*



# PUBLIC REALM FRAMEWORK

## MATERIALITY

Materials to be used for kerbs, pavements and carriageways need to be chosen with regard to the context of the space and the potential impact of the materials on the setting of heritage assets.

A mixture of unit sizes can enable visual interest to be created in the streetscape. With appropriate consideration of the sub-structure, the continuation of unusual or patterned paved surface treatments across carriageways in low speed streets can be used to create cohesive places, where it is considered appropriate to blur the segregation between vehicles, cyclists and pedestrians.

The use of hazard paving materials at pedestrian crossing points should be chosen with regard to the context of the site to ensure sensitive environments are not visually cluttered with inappropriate materials by virtue of their colour or finish.

A visually cohesive range of street furniture should be used to introduce visual harmony to the city and enhance its image. Materials chosen should be robust and capable of withstanding adverse weather conditions and climate change, whilst being pleasant to use by all. The street furniture palette includes:

- Litter bins
- Benches
- Bollards
- Signage
- Lighting
- Bus shelters

Where possible, pedestrian guardrail should be removed, to reduce visual clutter and create a more inclusive environment. Also, the impact of fully laden vehicles on innovative carriageway design needs careful assessment to ensure materials do not fail.



*Cobbled finishes can enhance historic environments, but can cause issues for the mobility impaired and cyclists*



*Tactile surfaces need to be laid and maintained to ensure flush finishes and avoid trip and slip hazards. Worn and discoloured surfaces should be replaced. Utility covers should be designed to avoid interruptions in provision.*



*The innovative use of paviors and lighting can help animate a space at night, encouraging exploration*

## INCLUSIVE ACCESS

All parts of the public realm must be accessible to all at all times, with stepped accesses avoided where possible. Surfaces should be devoid of trip hazards and capable of subtly delineating different elements of the street to assist the visually impaired.

To ensure delivery of an accessible and inclusive environment, a PERS (Pedestrian Environment Review System) audit has been undertaken, looking in detail at different aspects of the public realm. PERS seeks to ensure that routes and spaces are designed around the “5Cs” and are:

- Convenient- direct and easy to navigate
- Connected- link origins and destinations
- Convivial- pleasant to use with potential for activity
- Coherent- continuous and obvious
- Conspicuous- enable users to be seen by, and see, other users

Designing with the less mobile and more vulnerable pedestrian in mind ensures that streets and spaces cater well for everyone. It forms the foundation from which a balanced approach to street design can be taken, making sure pedestrians are catered for alongside cyclists and drivers.

Using PERS, the existing quality of Links and Spaces were reviewed on 31 July 2017, and the results are included in Appendix B. The audit identifies a number of “quick wins” that would improve the pedestrian experience including:

- Widening pavements where possible
- Decluttering unnecessary guardrail and other highways paraphernalia
- Ensuring paving slabs and utility covers create a smooth surface and avoid creating trip and slip hazards
- Ensuring tactile surfaces are well maintained and consistent
- Provision of additional seating
- Improvements to the setting of squares and heritage assets
- Improving wayfinding to provide additional information
- Removing graffiti and litter
- Ensuring high quality reinstatements following utility works



# PUBLIC REALM FRAMEWORK

## PRIORITY INTERVENTIONS

The site audit and stakeholder engagement have identified where improvements are needed and should be focussed.

The plan below illustrates the the three priority areas identified with stakeholders, and the design of these streets and spaces should accord with the design guidance set out in this document.

The High Street and St Paul's are identified as the top two priorities for the town, and given their relationship to each other and the need to enhance the setting of the conservation area, should be viewed together.

Midland Road being a strategic route can be viewed separately, and will require significant visual and wayfinding improvements, to enhance the legibility of walking routes to the rail station.



Legend

- Priority Area 1 (most important)
- Priority Area 2
- Priority Area 3





## EMERGING SOLUTIONS

The approach shown to the right draws on the findings of the stakeholder engagement and street audit. This scheme seeks to:

- Create a single one-way vehicle lane with on-carriageway cycling in the High Street.
- Widen footways throughout the area
- Improve pedestrian links to the Castle via Castle Lane
- Reduce northbound vehicular traffic from Bedford Bridge to a single lane, turning left into St Paul's Square
- Retain key bus stops on the north side of St Paul's Square
- Improve east-west pedestrian links at all junctions and include additional courtesy crossings
- Adjust carriageway geometry to slow vehicle speeds
- Utilise the 20mph speed limit to enable on-carriageway cycling

To encourage east-west pedestrian movement it is imperative that carriageway treatments are stripped of excessive lines, signals, guardrail and other clutter. This will create a more relaxed, slow speed atmosphere where crossing the street is easy and Bedford's heritage and townscape can take centre stage.

## MATERIALITY

Shown to the right are suggestions for the materials palette throughout the High Street and St Paul's Square area.

Visualisations of how this could look are included on the following pages.





# PUBLIC REALM FRAMEWORK

High Street, Mill Street and Silver Street Intersection  
Southbound



*Illustrative view of enhanced public realm*



# PUBLIC REALM FRAMEWORK

High Street and St Paul's Square  
Northbound



*Illustrative view of enhanced public realm*









# CONCLUSIONS AND NEXT STEPS

# CONCLUSION & NEXT STEPS

## CONCLUSION

High quality public realm is a key component of economically successful town centres.

This public realm framework has been developed to set out how Bedford's town centre public realm should be developed and the priorities for delivery.

The Public Realm Framework when delivered will;

- Coherently link together and integrate the town centres key assets.
- Significantly improve the quality of the town centre environment.

This will support the development of the town centre economy by;

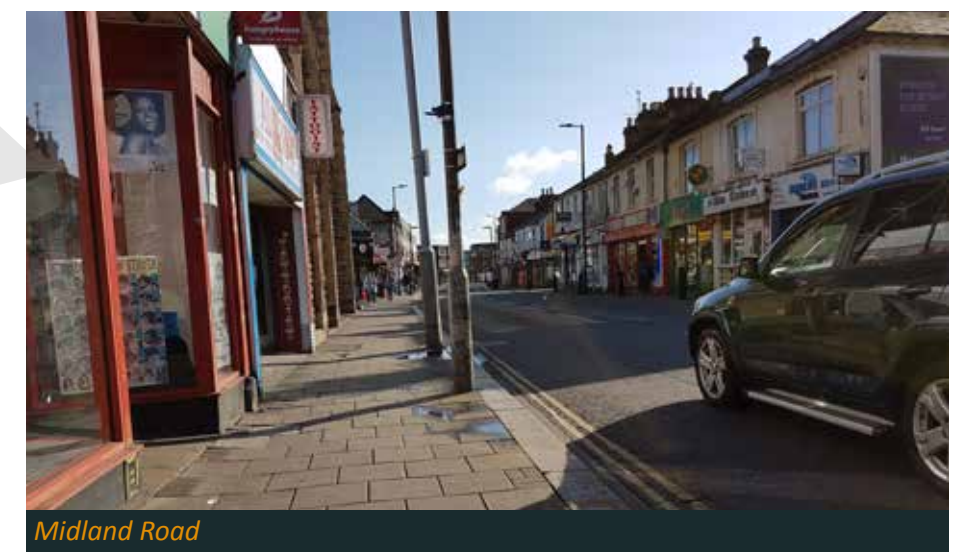
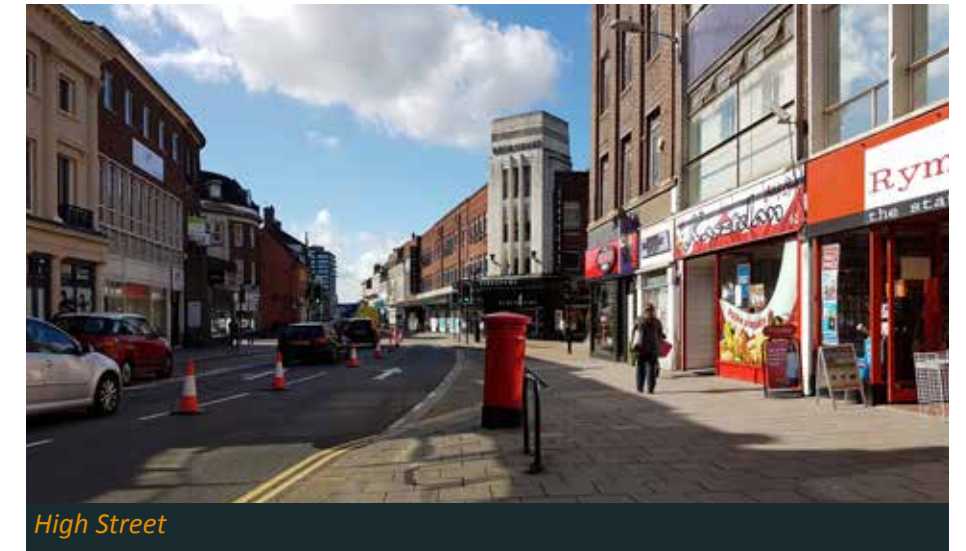
- Improving the town centre 'offer' and therefore increasing footfall by increasing visitor numbers and length of stay.
- Strengthening the evening economy.

## PRIORITIES

The three proposed priorities for investment are;

- High Street
- St Paul's Square- north side
- Midland Road

These priorities were identified by key stakeholders and support the findings of analysis carried out by SYSTRA.



INTERDEPENDENCIES

There are several issues that are influenced by, and influence the delivery of, the Framework. The table to the right sets out key interdependencies and their potential effect on and relationship with the Framework.

Further work and engagement with key stakeholders including Officers, bus operators and taxi drivers will be necessary to determine the best approach and how changes to traffic management and vehicular access should be phased and refined.

Issues	Interdependencies
Traffic Management	In order to deliver the proposed interventions and in particular remove or significantly reduce traffic from the High Street, alterations to traffic management are required. This will require collaborative engagement with all relevant stakeholders including the Council and bus operators. Traffic management within the town centre is complex and to improve streetscape, ease of access and the quality of the walking environment, requires simplification.
Bus Network & Routing	To enable the transformation of the High Street and St Paul’s Square bus routing through the town centre may require alteration. This will require detailed work with the Council and the bus operators to ensure good bus access to the town centre is maintained and where possible enhanced.
Car Parking	To support ambitions to reduce unnecessary trips, the location and quantum of new car parking in the town centre needs to be approached strategically.
High Street	The High Street is a key through route and shopping destination creating conflict between drivers, pedestrians and cyclists. Reducing vehicular severance to improve and encourage east-west walking connections is a key outcome of this Strategy.
St Paul’s Square	This key, historic space is currently dominated by the vehicle gyratory that encircles it. Sympathetic alterations to traffic management that remove unnecessary trips through the town centre will be critical to opening up this space and creating a strong focal point for the town.
Midland Road	Midland Road is the key walking route to the town centre from the railway station. Upgrades to the walking and cycling environment and wayfinding are necessary to reduce vehicular dominance and improve the town’s legibility

# CONCLUSIONS & NEXT STEPS

## NEXT STEPS

The table on the right sets out suggested short, medium and long term actions to deliver the proposed Bedford Town Centre Public Realm Framework.

Short Term: Design & Stakeholder Engagement (0 to 2 years)	Medium Term: Delivery up to 2021	Long Term: 2021 and beyond
<ul style="list-style-type: none"><li>• Develop public realm masterplan for High Street, St Paul's Square and Midland Road to RIBA stage 2 – Concept Design</li><li>• Develop business case.</li><li>• In parallel develop traffic management 'end game' and phasing, including exploring revenue benefits of removing signals</li><li>• In parallel develop approach to bus network changes in conjunction with bus operators</li><li>• Set up governance arrangements to ensure:<ul style="list-style-type: none"><li>• Capital funding for priorities is sought and delivered</li><li>• A communication plan for the project is developed with key overarching messages about the project</li><li>• Incremental changes to public realm within the city centre are aligned with the Framework</li><li>• Policies relating to planning, transport and operations are aligned with Framework</li><li>• Decision making happens in a timely way</li></ul></li><li>• Develop a wayfinding strategy</li><li>• Develop delivery programme</li></ul>	<ul style="list-style-type: none"><li>• Develop business case and recommend approval for St Paul's Square</li><li>• Develop business case and recommend approval for Midland Road</li><li>• Implementation of High Street improvements and associated works</li><li>• Implementation of St Paul's Square improvements and associated works</li><li>• Wayfinding improvements</li></ul>	<ul style="list-style-type: none"><li>• Midland Road improvements</li><li>• Wayfinding improvements</li><li>• Delivery of public realm improvements beyond initial priorities.</li></ul>





# APPENDIX A: WORKSHOP REPORT

# APPENDIX A: WORKSHOP REPORT

## INTRODUCTION

A stakeholder workshop was held at the Council offices with 15 key Officers on 8 August 2017. The findings and conclusions of that exercise are presented here.

During the workshop, attendees were split into three groups to facilitate discussion, but were encouraged throughout the process to highlight and raise their own, individual views.

The group took part in 7 tasks:

1. A SWOT analysis
2. A review of Bedford as it is Now
3. A review of how Bedford should be in the Future
4. Identification of the top 3 Priority Locations for Public Realm Investment
5. Identification of 6-8 priority improvements
6. A review of the High Street in terms of sections and carriageway widths
7. A redesign of the High Street

## TASK 1: SWOT ANALYSIS

This was conducted as a round-table discussion with the following results:

### STRENGTHS

- Historic Buildings
- Compact and walkable town
- Pedestrianised areas
- Markets
- Public transport
- The river, and waterside apartments
- Retail offer

### WEAKNESSES

- Relationship of the train station to the town centre
- Poor quality of the pedestrian environment
- Severance caused by the High Street
- St Paul's disconnected from the rest of the town
- Town Centre assets are disconnected
- Poor cycling permeability
- Scale of buildings

Town Centre Public Realm Workshop - 08/08/2017

List of Attendees



Name	RSVP	Department	Email address	Sign in
Andrew Prigmore	Y	Highways	andrew.prigmore@bedford.gov.uk	
Catherine Hutchinson	Y	Public Health	catherine.hutchinson@bedford.gov.uk	
Chris Pettifer	-	Transport Operations	chris.pettifer@bedford.gov.uk	
Ian Johnson	Y	Heritage and Compliance (Planning)	ian.johnson@bedford.gov.uk	
John Molyneux	Y	Environmental Health	john.molyneux@bedford.gov.uk	
Keiron Fletcher	Y	Communications and Marketing	keiron.fletcher@bedford.gov.uk	
Kim Wilson	Y	Planning Policy	kim.wilson@bedford.gov.uk	
Margaret Birtles	-	Property Services	margaret.birtles@bedford.gov.uk	
Matthew Soper	Y	Engineering Services	matthew.soper@bedford.gov.uk	
Melanie MacLeod	Y	Transport Policy	melanie.macleod@bedford.gov.uk	
Patrick Lingwood	Y	Walking and Cycling	patrick.lingwood@bedford.gov.uk	
Paul Pace	-	Environment	paul.pace@bedford.gov.uk	
Sian Hughes	Y	Town Centre Projects & Research	sian.hughes@bedford.gov.uk	
Sonia Gallaher	Y	Planning Policy	sonia.gallaher@bedford.gov.uk	
Sue Bearman	Y	Transport Operations	sue.bearman@bedford.gov.uk	
Sarah Fleckney		Public Transport		
Jon Pinner		Public Transport		
Kasia Dzuszek		Communications		
Barbara Wintford		Public Health	Barbara.Wintford@bedford.gov.uk	

# APPENDIX A: WORKSHOP REPORT

## OPPORTUNITIES

- Pedestrianised areas
- Relationship of the train station to the town centre
- Reduce the impact of traffic
- Improve key gateways
- Improve the Midland Road area
- Make more of the river
- Increase physical activity
- Bus stops and routes, improve St Paul's Square

## THREATS

- Milton Keynes
- Difficult building consensus
- Anti-social behaviour
- Bus stops and routes- impact on St Paul's Square



## STRENGTHS

Historic Buildings

Compact ~ walkable

Pedestrianised areas

Markets River ~ apartments

Public transport. Retail offer

## WEAKNESSES

Rd. of train station to TC

Poor quality ped'n environment

High street → severance

St. Paul's disconnected.

TC assets disconnected

Cycling permeability

Scale of buildings

## Opportunities

Pedestrianised areas

Rd. of train station to TC

Reduce impact of traffic

Improve Key Gateways

Improve Midland Road area

Make more of the River

Increase physical activity

Bus stops & routes ~ St. Paul's Sq.

## THREATS

Milton Keynes

Difficult building consensus

Anti-social behaviour

Bus stops & routes. St. Paul's Sq.



# APPENDIX A: WORKSHOP REPORT

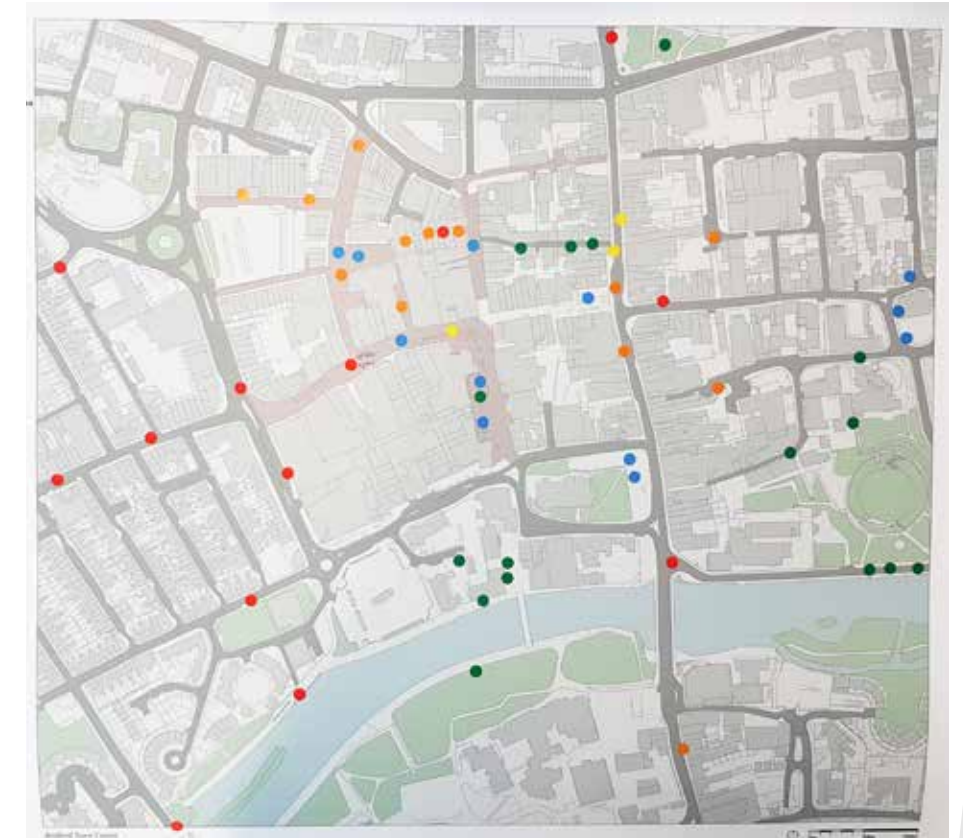
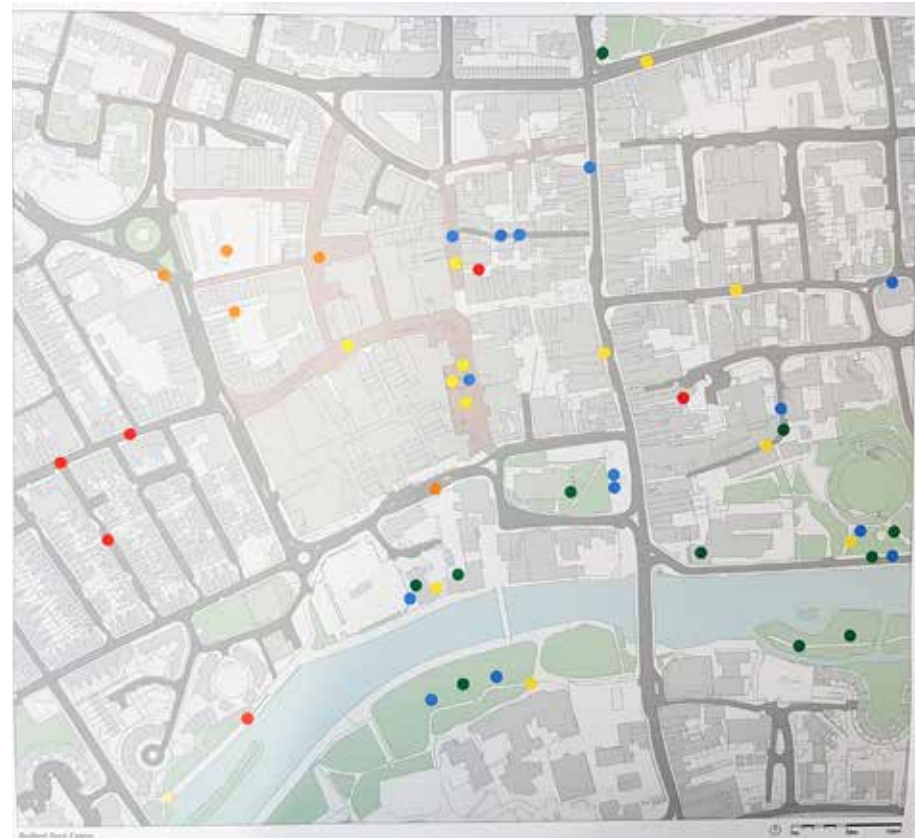
## TASK 2: BEDFORD NOW

Attendees were asked to individually assess Bedford as it is now by highlighting areas of delight and concern on a plan in the following way:

- High quality destination space / love
- Pleasant and attractive environment / like
- Feels safe and comfortable
- Feels uncomfortable / don't like
- Feels unsafe

In general it can be seen that:

- The riverside walks and castle scored well in terms of current quality
- The Midland Road area west of River Street scored poorly for all groups
- Silver Street was generally considered attractive
- The High Street was considered uncomfortable and unsafe in some locations, in particular the junction with The Embankment
- St Paul's Square was generally considered attractive but one group considered it uncomfortable
- The pedestrianised areas of Harpur Street and Midland Road generally felt comfortable: but after 6pm it was considered by one group that this area felt unsafe
- Allhallows Square generally felt uncomfortable





# APPENDIX A: WORKSHOP REPORT

## TASK 3: BEDFORD FUTURE

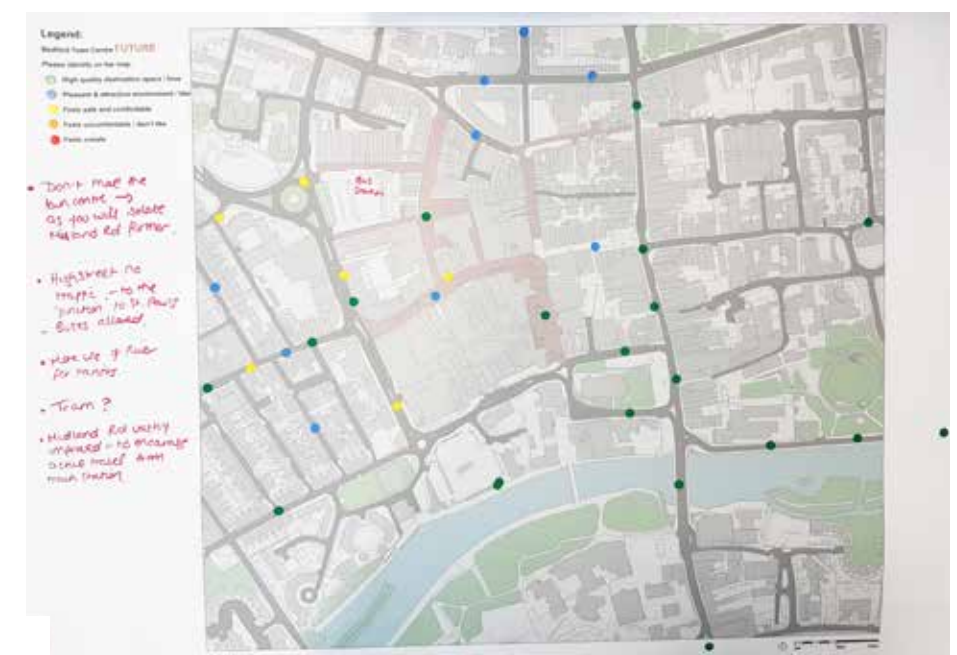
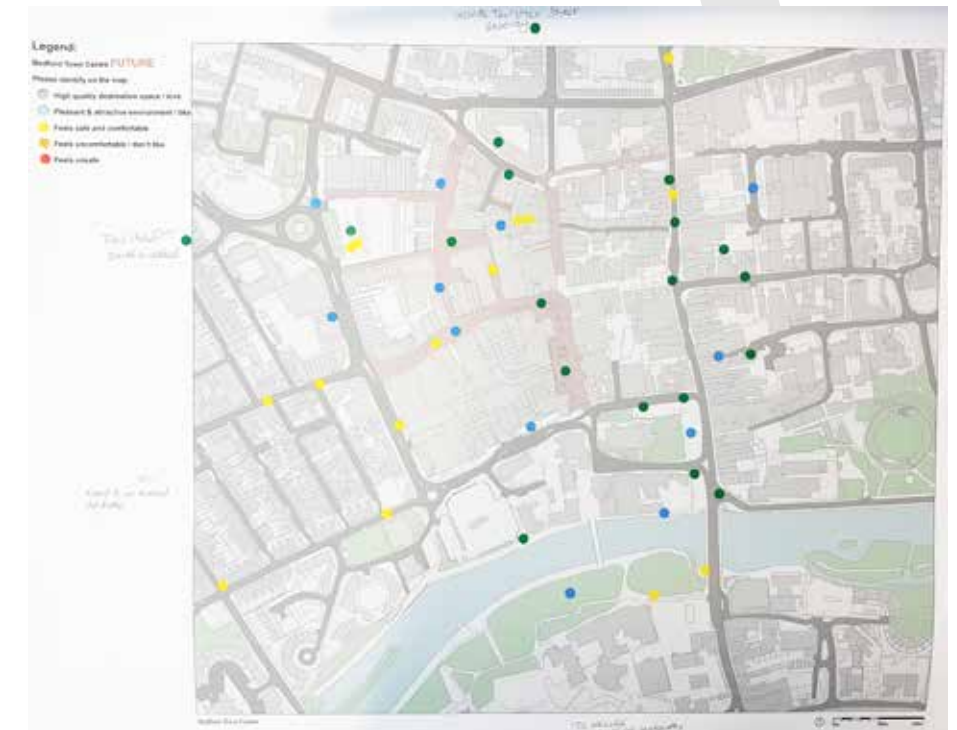
The attendees were then asked to individually highlight on a plan where improvements should be made, once again using the following criteria:

- High quality destination space / love
- Pleasant and attractive environment / like
- Feels safe and comfortable
- Feels uncomfortable / don't like
- Feels unsafe

In general it can be seen that:

- The riverside walks and castle remain a high priority and should be improved in the future
- The Midland Road area west of River Street should be improved to feel more safe and comfortable
- Silver Street should be maintained as an attractive environment
- The High Street should be improved along its length, in particular the junction with The Embankment should become a high quality space
- St Paul's Square should be upgraded to a high quality destination space
- The pedestrianised areas of Harpur Street and Midland Road should be upgraded to high quality destination spaces
- Allhallows Square should be upgraded to a high quality destination space

All groups considered that at the very least, spaces should feel safe and comfortable.





# APPENDIX A: WORKSHOP REPORT

## TASK 4: 3 PRIORITY LOCATIONS FOR PUBLIC REALM INVESTMENT

The attendees were asked to individually identify on a plan, 3 locations where they considered investment should be made as a priority. The areas were ranked in the following way:

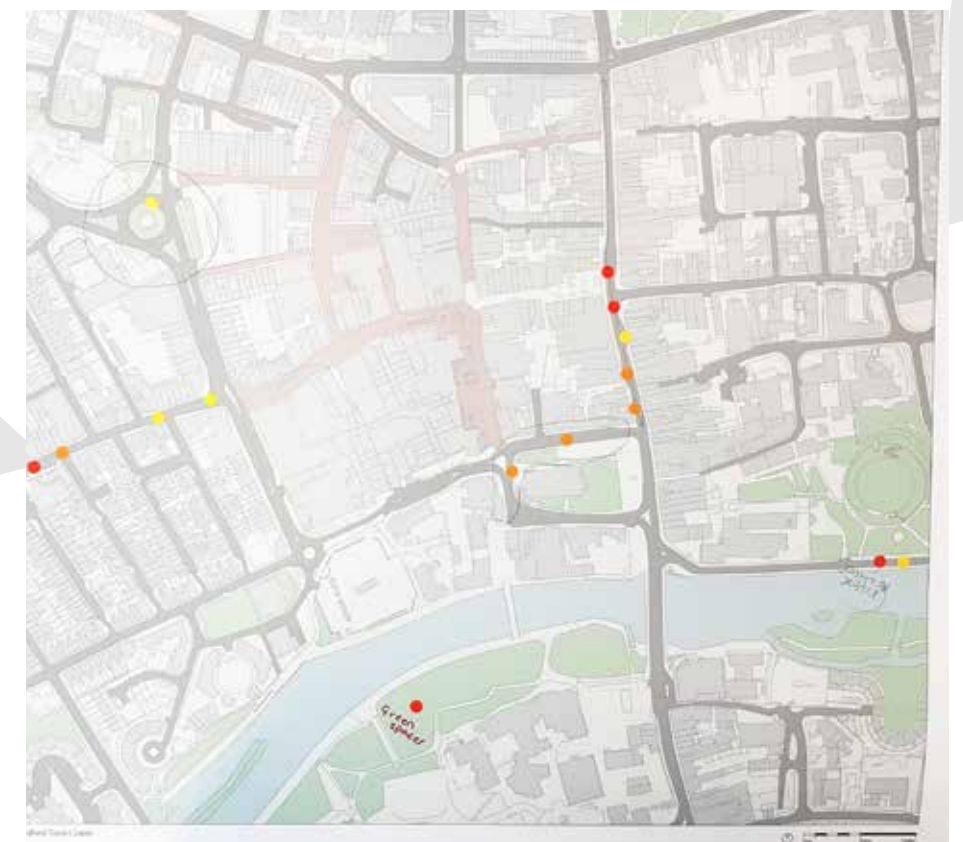
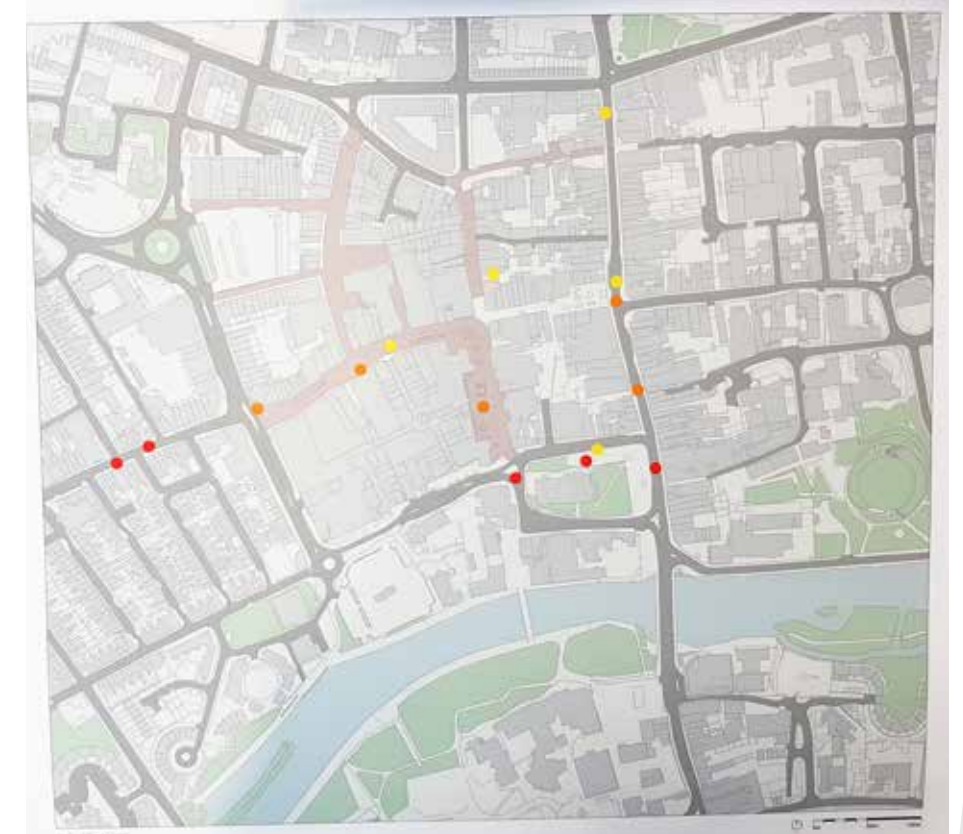
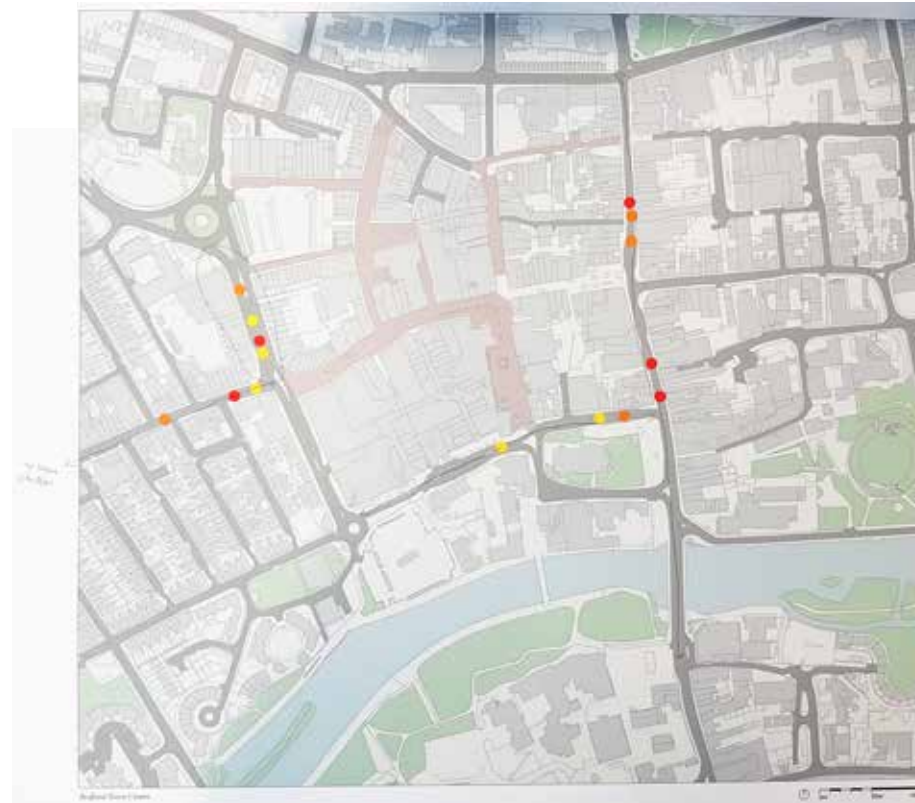
- Priority Area 1 (most important)
- Priority Area 2
- Priority Area 3

In general, three main areas for prioritisation emerged:

- Improvements to the High Street are considered important, in particular the area around the Mill Street junction, and also the area around the cluster of drinking establishments further south towards St Paul's Square
- The northern edge of St Paul's Square was considered to be a high priority
- Midland Road and its junction with River Street, highlighting the importance of this as a walking route to the train station

Other investment areas include:

- The riverside walks and setting of the castle
- The pedestrianised areas of Midland Road and Harpur Street





# APPENDIX A: WORKSHOP REPORT

## TASK 5: IDENTIFY 6-8 PRIORITY IMPROVEMENTS

For this task each group was asked collectively to agree 6-8 priorities for the High Street. Common themes include:

- Widen and improve the pavements
- Reduce traffic / full day-time closure to all vehicles / Deliveries only. Ban HGVs.
- Improve the pedestrian offer: quality A1 retail offer / seating / space
- Enable cycling on carriageway, in both directions
- Strengthen connections and public spaces- Silver Street, Lime Street, Lurke Street, the passages, St Paul's Square, Castle Lane

Other suggestions include:

- Cafe culture (not bars) spilling out after 6pm
- Reduce carriageway to a single lane (with loading bays)
- Greenery
- Reduce A3 uses
- Better enforce against on-street begging / rough sleepers
- Create a feature street
- Reduce air pollution
- Strengthen cross-town as well as north/south links
- Increase footfall
- Improve the arcade frontage to draw attention to the existing benefit



- 1) Café culture (not bars) spilling out - after 6pm offer
- 2) Widen + improve pavements
- 3) Single lane (with loading bays) + day time closure to all vehicular traffic - rising bollards. / Ban HGVs.
- 4) Greenery
- 5) Encourage more <sup>quality</sup> retail (A1 occupiers) - lessen A5
- 6) Cycling - on carriageway
- 7) Improve connections / public spaces e.g. Silver St, Lime St, Lurke St, Passages, St. Paul's Square
- 8) More enforcement on street begging / rough sleepers

- ① FEATURE STREET
- ② REDUCING AIR POLLUTION - NO TRAFFIC (EXCEPT DELIVERIES)
- ③ CYCLISTS IN BOTH DIRECTIONS (ANYTHING THAT ↑ PHYSICAL ACTIVITY)
- ④ STRENGTHENING CROSS-TOWN LINKS + NORTH-SOUTH.
- ⑤ PEDESTRIAN IMPROVEMENTS (SEATING & SPACE)
- ⑥ INCREASE FOOTFALL

- 1) Improved pedestrian offer / environment
  - ↳ access
  - ↳ use
  - ↳ pleasant place to spend time
  - ↳ wider pavements
- 2) Need to retain access for servicing - necessary for shops
- ~~3) Improved cycle links (?)~~
- 3) Traffic reduction
- 4) Improved town centre offer
- 5) ~~Utilise~~ Arcade frontage - draw attention to existing benefit
- 6) Strengthen connections b/t key assets
  - ↳ St Pauls
  - ↳ Castle Lane
- 7)

# APPENDIX A: WORKSHOP REPORT

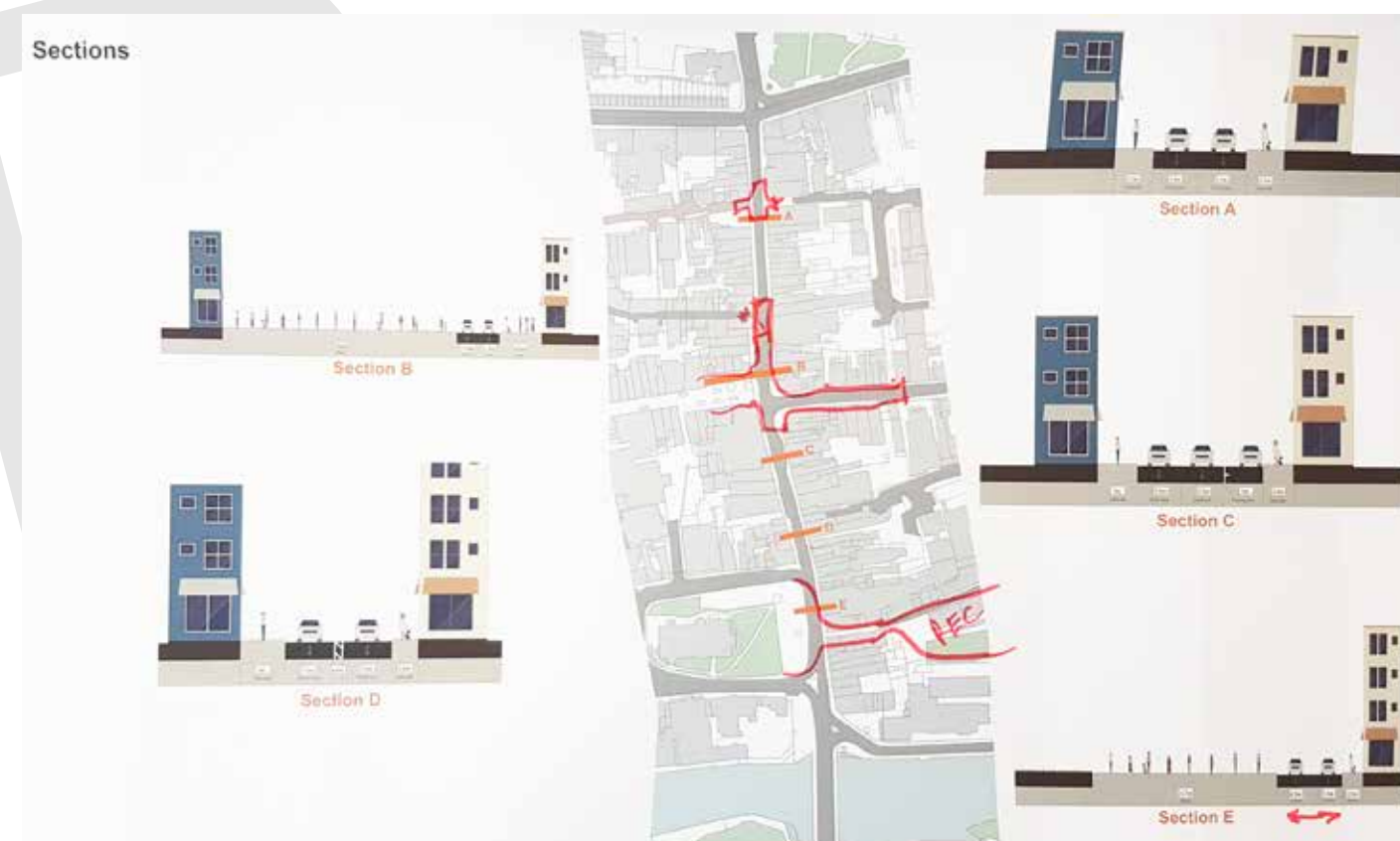
## TASK 6: HIGH STREET REVIEW

During this task, the teams were asked to begin a review of the High Street by assessing existing dimensions and suggesting where improvements could be made.

Only two teams chose to annotate their plan.

There was a general consensus that the carriageway should be narrowed, with greater priority given to pedestrians and cyclists.

Junction design should also be amended to reduce landtake. There were also suggestions that links through the lanes to Bedford Castle should be improved, providing enhanced and more legible links to St Paul's Square.





# APPENDIX A: WORKSHOP REPORT

## TASK 7: HIGH STREET REDESIGN

The groups put forward many ideas to improve the High Street:

- Changing signage on The Broadway to reduce the High Street to a single lane in advance
- Create a single one-way vehicle lane and a one-way cycle lane.
- Consider closure of the High Street to vehicles between 09:30 and 16:30
- Widen footways in the central section between the Arcade and the Rose PH, and also between St Paul's south side and The Embankment
- Improve pedestrian links to the Castle via Castle Lane
- No southbound right turn at St Paul's
- Reduce northbound vehicular traffic from Bedford Bridge to a single lane, turning left around St Paul's
- Consider closing St Paul's south side to traffic, or reduce to a single lane
- Restrict traffic in Horne Lane eastern side to car park access only westbound, eastbound traffic restricted to buses only with key bus stops retained in St Paul's Square north side
- Enable two-way traffic flow in River Street and Horne Lane western side- car park traffic will exit along this westerly route
- Improve east-west pedestrian links at all junctions
- Adjust carriageway geometry to slow vehicle speeds
- Create destination spaces
- Amend the street cross-section to accommodate wider pavements, revised loading arrangements and narrower carriageway











# APPENDIX B: PERS AUDIT

# APPENDIX B: PERS AUDIT

## INTRODUCTION

PERS (Pedestrian Environment Review System) is a “systematic process designed to assess the quality of the pedestrian environment within a framework that promotes objectivity.” It can be used to assist with strategic planning and also provides an opportunity to review a place in detail to identify opportunities for improving the walking environment.

PERS can be applied to the following types of pedestrian environment: Links, Crossings, Routes, Public Transport Waiting Areas, Interchange Spaces, and, Public Spaces. For the purposes of this project, seven Links and three Public Spaces have been assessed, as shown on the plan.

These elements have been reviewed and scored using the forms and methodology provided in the PERS Handbook as follows:

“The forms are designed to be numerically scored so that each individual component of the pedestrian environment, having been reviewed, can be rated. The combination of these characteristics gives an overall score for a facility that can be used as a basis of comparison with other pedestrian facilities. The scoring scale is set out below. Each characteristic is scored on a range from -3 to +3, where +3 is the highest score and -3 the lowest. For a parameter to warrant a score of +3, it would need to be exemplary and of a standard to be identified as best practice. The scores are therefore allocated on a range from very poor to optimum with 0 representing the average.”

A score of “N” indicates the characteristic was not assessed or there was no data available.

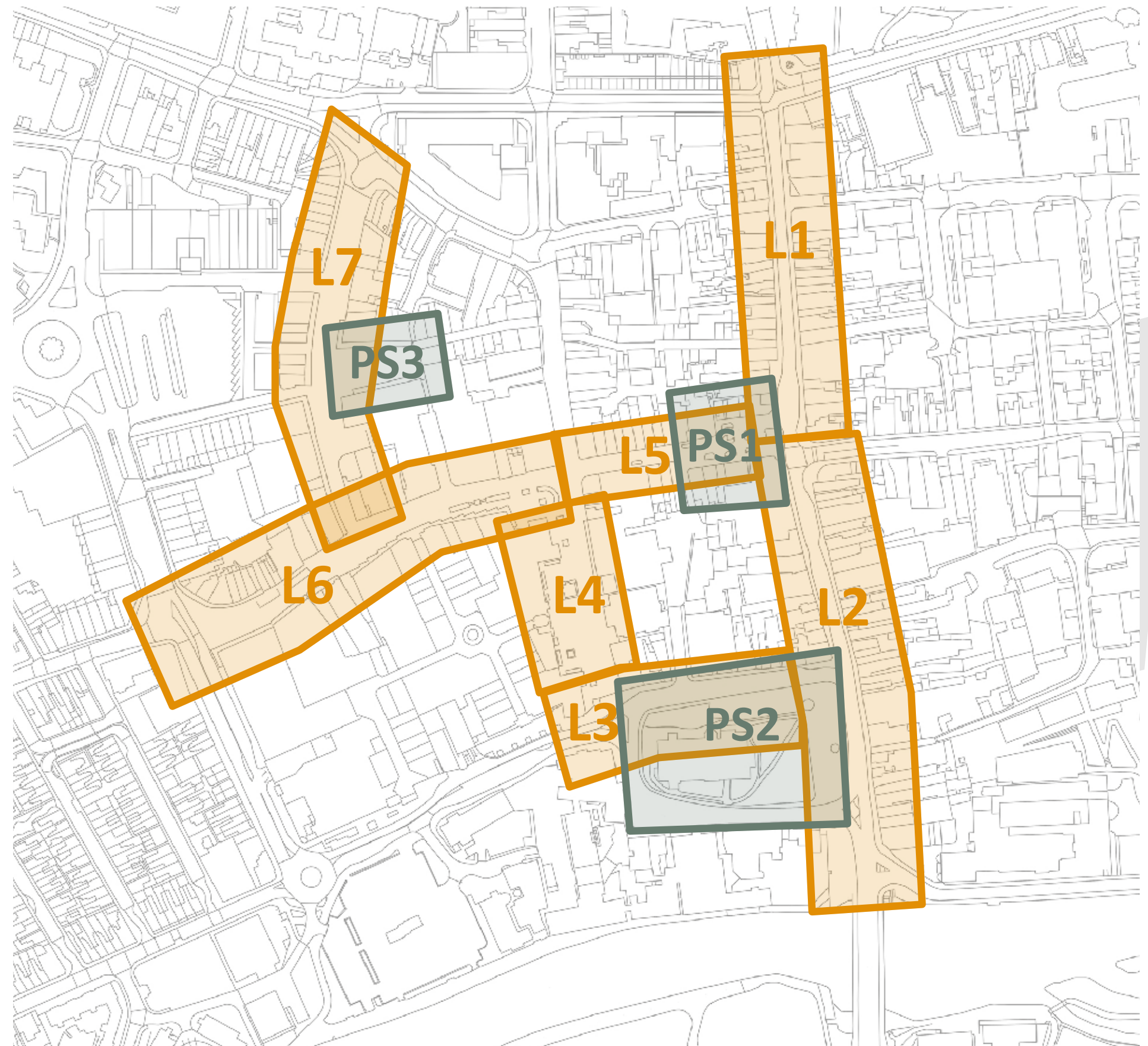


### LINKS

- L1: Bedford High Street North
- L2: Bedford High Street South
- L3: St Paul's Square, north side
- L4: Harpur Street
- L5: Silver Street
- L6: Midland Road
- L7: Allhallows

### PUBLIC SPACES

- PS1: Silver Street Square
- PS2: St Paul's Square and Market
- PS3: Allhallows Square





APPENDIX B: PERS AUDIT

Link 1 Assessment Form

Page 1 of 2

Project: Bedford High Street

Link Name: High Street North

Auditor: AK

Link Ref:

Date: 31/7/17

Time: 08:50

Parameter	Checklist Factors	Checklist			Overall Score	Comments
		-ve	-/+	+ve	-3 to +3	
Effective Width	Width for pedestrian flow		•		0	+ Width generally good and widens at the southern end of the link. Highways obstructions aligned. At-grade crossings and pavement finish supports wheelchair accessibility. Pavements widen towards southerly end of link.
	Wheelchair Accessibility		•			
	All sections acceptable width		•			
	Separation from traffic	•				
	Allowance for obstructions		•			
Dropped Kerbs	Pedestrian congestion		•			
	Located on desire lines			•	1	+ Dropped kerbs / flush pavements at all crossing points, mainly on desire lines. Side streets are pedestrianised directly adjacent to the crossing, therefore no level change.
	Adequate capacity		•			
	Level dropped / flush			•		
	Gradient of drop			•		
	Consistency			•		
Gradient	Frequency of dropped kerbs			•		
	Severity			•	2	+ The link has a very gentle gradient falling from north to south, which is not a hindrance to inclusive access. No crossfalls, or requirements for ramps, handrails etc. Pavement remains at grade throughout the link.
	Steps / ramps			•		
	Rest points	•				
	Undulations			•		
	Handrail provision			•		
Obstructions	Presence of crossfalls			•		
	Presence of obstructions	•			2	+ Obstructions mainly confined to northerly end of the link, Obstructions mainly aligned, Sightlines not affected. No tapering, oblique or overhead obstructions. Gradient negates need for tactile warnings away from crossing points.
	Location / alignment			•		
	Overhead obstructions			•		
	Tapering / opaque obstructions			•		
	Tactile warnings			•		
Permeability	Sightline reduction			•		
	Frequency of crossing points		•		0	+ Able-bodied pedestrians can cross along almost all the length of the link informally. Flush crossing at Lurke Street. Low kerbs elsewhere. Good sightlines. No parked vehicles
	Parked cars / physical barriers		•			
	Traffic flow	•				
	Dropped kerbs			•		
	Pedestrian barriers		•			
Legibility	Sightlines			•		
	Signage provision		•		-1	+ Finger signs provided at Lurke Street crossing but only on eastern side, and Mill Street crossing but only on western side. Signs are clear. Straight nature of streets frames sightlines north/south, aiding navigation.
	Signage clarity		•			
	Information boards	•				
	Distances given on signs	•				
	Sightlines		•			
Lighting	Built form aids navigation			•		
	Intensity / frequency		N		N	+ Lighting positioned on buildings, reducing clutter and obstruction at street level. Lighting not obstructed by trees etc.
	Definition / colour		N			
	Maintenance		N			
	Context suitability		•			
	After-dark		N			
Other Notes:	Obstructions			•		
	A night-time survey was not undertaken therefore lighting not assessed as part of this survey. Weather was warm and sunny following a relatively dry spell, therefore no drainage issues were observed.					

Link 1 Assessment Form

Page 2 of 2

Parameter	Checklist Factors	Checklist			Overall Score	Comments
		-ve	-/+	+ve	-3 to +3	
Tactile Information	Evident			•	1	+ Tactiles installed at all formal crossing points. Good contrast - red tactiles on natural background. No interruptions in application.
	Consistent / correct			•		
	Maintained		•			
	Appropriate colour			•		
	Interruptions			•		
Colour contrast	Tapping line	•				
	Tonal contrast			•	1	+ Good tactile contrast. Black railings, signal columns etc. give good contrast against the natural coloured pavement. Assists navigation at formal crossings. Pavement clearly delineated from carriageway. Semi-private forecourt at Lurke Street clearly delineated by colour.
	Location			•		
	Assists navigation			•		
	Enhanced visibility / obstructions		•			
	Space identification			•		
Personal Security	Made to specification			•		
	Perceived / sense of crime			•	1	+ No sense of crime during survey (day time). This is a main shopping street, so high level of activity. Relatively good visual appeal, some interesting architecture/buildings. CCTV observed.
	Activity on the street			•		
	Lighting		N			
	Police presence	•				
	CCTV			•		
Surface Quality	Visual appeal			•		
	Smoothness / trip hazards		•		0	+ Surface relatively smooth. Generally well maintained, not much litter. Considered suitable to context, improved maintenance would be of benefit.
	Surface friction		•			
	Slippery surfaces	•				
	UKPMS CVI hierarchy		•			
	Maintenance		•			
User Conflict	Context suitability		•			
	Conflicting movements		•		0	+ No bus stops in the link. No pavement parking or prohibitive pedestrian crowding observed.
	User flows		•			
	Encroachment on pedestrian space			•		
	Segregation from cyclists	•				
	Bus queues an obstruction			•		
Quality of Environment	Adequate space provision		•			
	Traffic / noise	•			0	+ Generally high quality architecture, some good shopfronts. Sense of place derived from historic importance of this route. No leaf litter. No ponding or drainage issues observed.
	Aesthetics			•		
	Soft landscape	•				
	Quality of materials		•			
	Quality of private frontages		•			
Maintenance	Sense of place			•		
	Cleanliness		•		0	+ Generally clean, limited litter. No graffiti observed.
	Drainage		N			
	Evidence of neglect		•			
	Seasonal foliage	•				
	Graffiti			•		
Other Notes:	Landscape	•				
	Links to other Review Forms:					
Name:	Ref:	Name:		Ref:		
	Ref:	Name:		Ref:		
Name:	Ref:	Name:		Ref:		
	Ref:	Name:		Ref:		
Other Notes:						

## APPENDIX B: PERS AUDIT

Link 2 Assessment Form						Page 1 of 2	
Project: Project: Bedford High Street							
Link Name: High Street South					Link Ref:		
Auditor: AK					Date: 31/7/17    Time: 09:50		
Parameter	Checklist Factors	Checklist			Overall Score	Comments	
		-ve	-/+	+ve	-3 to +3		
Effective Width	Width for pedestrian flow		•		0	+	Width generally good. Highways obstructions aligned. At-grade crossings and pavement finish supports wheelchair accessibility. No pedestrian congestion observed.
	Wheelchair Accessibility		•				
	All sections acceptable width			•			
	Separation from traffic		•				
	Allowance for obstructions	•					
	Pedestrian congestion		•			-	Highways clutter - signs, railings, signals - and A boards etc. narrow width of pavement. Need for railings questioned. Pedestrians in close proximity to traffic. Loading bays narrow width in northern part.
Dropped Kerbs	Located on desire lines		•		0	+	Dropped kerbs / flush pavements at most crossing points.
	Adequate capacity		•				
	Level dropped / flush		•				
	Gradient of drop		•				
	Consistency		•				
	Frequency of dropped kerbs		•			-	Deviations from desire lines at Mill Street junction due to gaurdail. No dropped kerb at junction with the Embankment.
Gradient	Severity			•	1	+	The link has a very gentle gradient falling from north to south, which is not considered a hindrance to inclusive access. No severe crossfalls, or requirements for ramps, handrails etc.
	Steps / ramps			•			
	Rest points		•				
	Undulations			•			
	Handrail provision			•			
	Presence of crossfalls		•			-	Very limited seating in St Paul's Square - limited pavement width would preclude provision in other locations. Pavement at lower level to carriageway in southern section, slight crossfall.
Obstructions	Presence of obstructions	•			1	+	Obstructions mainly aligned at kerbside, sightlines not affected. No tapering, oblique or overhead obstructions. Gradient negates need for tactile warnings away from crossing points.
	Location / alignment			•			
	Overhead obstructions			•			
	Tapering / opaque obstructions			•			
	Tactile warnings			•			
	Sightline reduction			•		-	"A" boards on the pavement. Excessive guardrail limits access to St Paul's Square. Bins, bollards and utility company roadworks. Kerbs create obstruction to some pedestrians in crossing the street.
Permeability	Frequency of crossing points	•			0	+	Able-bodied pedestrians can cross along almost the entire length of the link. Flush formal crossings at High Street and St Paul's Square. Low kerbs. Good sightlines.
	Parked cars / physical barriers		•				
	Traffic flow	•					
	Dropped kerbs		•				
	Pedestrian barriers		•				
	Sightlines			•		-	Traffic flow high due to importance of this route in the network. Need for railings, which appear sporadically, questioned. St Paul's Square junction guardrail deflects desire lines to accommodate vehicles. Complete lack of crossing facilities at The Embankment. An additional courtesy crossing would be useful to provide extra permeability to the mobility impaired in this busy leisure hub.
Legibility	Signage provision	•			-1	+	Straight nature of streets frames sightlines north/south, aiding navigation, St Paul's Church acts a landmark.
	Signage clarity		•				
	Information boards	•					
	Distances given on signs	•					
	Sightlines			•			
	Built form aids navigation			•		-	Finger signs provided at St Paul's Square but have no distance information (meters or time). Signs missing from all formal crossing points.
Lighting	Intensity / frequency		N		N	+	Lighting not obstructed by trees etc. Some lighting in St Paul's Square.
	Definition / colour		N				
	Maintenance		N				
	Context suitability		N				
	After-dark		N				
	Obstructions			•		-	Lighting provided by lamp columns, which create some clutter and obstruction at street level.
Other Notes:							
A night-time survey was not undertaken therefore lighting not assessed as part of this survey. Weather was warm and sunny following a relatively dry spell, therefore no drainage issues were observed. Gas board carrying out utility works.							

Link 2 Assessment Form					Page 2 of 2	
Parameter	Checklist Factors	Checklist			Overall Score	Comments
		-ve	-/+	+ve	-3 to +3	
Tactile Information	Evident		•		-1	+ Tactiles installed at all formal crossing points. Good contrast - red tactiles on natural background.
	Consistent / correct	•				
	Maintained		•			- Some worn / cracked units. No tapping line. Interruptions in application in some locations due to utility covers. Mix of buff and red tactiles, buff colour has lower contrast. Omitted from The Embankment crossing.
	Appropriate colour		•			
	Interruptions	•				
	Tapping line	•				
Colour contrast	Tonal contrast			•	0	+ Generally good tactile contrast. Black railings, signal columns etc. give good contrast against the natural coloured pavement. Assists navigation at some formal crossings. Pavement clearly delineated from carriageway.
	Location		•			
	Assists navigation		•			- Slightly less contrast from dark grey lamp columns.
	Enhanced visibility / obstructions		•			
	Space identification		•			
	Made to specification			•		
Personal Security	Perceived / sense of crime			•	1	+ No sense of crime during survey (day time). This is a main shopping street, so high level of activity. Relatively good visual appeal, some interesting architecture/buildings, the Church is a fine local landmark and creates a high quality setting to the link. CCTV evident.
	Activity on the street			•		
	Lighting		N			- No Police observed.
	Police presence	•				
	CCTV		•			
	Visual appeal			•		
Surface Quality	Smoothness / trip hazards		•		0	+ Surface relatively smooth. No observable/obvious trip-hazards. Generally well maintained, not much litter. Considered suitable to context.
	Surface friction		•			
	Slippery surfaces	•				- Metal utility hatches could become slippery in the rain - generally located in centre of pavement. Concrete flagged footway - UKPMS CVI score not tested but likely to be: 0/1
	UKPMS CVI hierarchy		•			
	Maintenance		•			
	Context suitability		•			
User Conflict	Conflicting movements	•			0	+ No bus stops in the link. No pavement parking observed. No adverse pedestrian crowding observed.
	User flows			•		
	Encroachment on pedestrian space			•		- 2 pavement cyclists observed. Pedestrian and vehicle flow increases at southern end of link. No on-carriageway formal provision for cyclists. Some pinch points due to railings and scaffolding. Loading bays encroach into pavement space, deflecting pedestrian desire lines. No pedestrian crossing facilities at The Embankment creating conflict with vehicles. Narrow pavement at southern end on east side.
	Segregation from cyclists	•				
	Bus queues an obstruction			•		
	Adequate space provision		•			
Quality of Environment	Traffic / noise	•			1	+ High quality architecture, some good shopfronts. Street trees in St Paul's Square only. Sense of place derived from historic importance of this route and proximity to, and views of, the river, and St Paul's Church.
	Aesthetics			•		
	Soft landscape		•			- High traffic flow including HGV's, noise and fumes. Carriageway markings create visual clutter. No hanging baskets etc.
	Quality of materials		•			
	Quality of private frontages		•			
	Sense of place			•		
Maintenance	Cleanliness		•		0	+ Generally clean, limited litter. No graffiti observed. No leaf litter or ponding.
	Drainage		N			
	Evidence of neglect		•			- 2 vacant units. Seasonal foliage limited to St Paul's Square.
	Seasonal foliage	•				
	Graffiti			•		
	Landscape			•		

Links to other Review Forms:

Name:

Ref:

Name:

Ref:

Name:

Ref:

Name:

Ref:

Name:

Ref:

Name:

Ref:

Other Notes:

APPENDIX B: PERS AUDIT

Link 3 Assessment Form

Page 1 of 2

Project: Bedford High Street

Link Name: St Paul's Square, north side

Link Ref:

Auditor: AK

Date: 31/7/17

Time:

Parameter	Checklist Factors	Checklist			Overall Score	Comments
		-ve	-/+	+ve	-3 to +3	
Effective Width	Width for pedestrian flow	•			0	+ Width generally good. Highways obstructions aligned. At-grade crossings and pavement finish supports wheelchair accessibility. No pedestrian congestion observed.
	Wheelchair Accessibility		•			
	All sections acceptable width		•			- Highways clutter - signs, railings, signals - and A boards etc. plus bus shelters narrow width of pavement on north side, market on south side. Need for railings questioned. Pedestrians in close proximity to traffic.
	Separation from traffic		•			
	Allowance for obstructions	•				
Dropped Kerbs	Pedestrian congestion		•		1	+ Dropped kerbs / flush pavements at all crossing points, mainly on desire lines.
	Located on desire lines	•				
	Adequate capacity		•			- Slight deviations from desire lines at Harpur Street junction. Additional crossing midway along link to provide inclusive access between market and bus stops would be useful and help slow traffic.
	Level dropped / flush			•		
	Gradient of drop			•		
Gradient	Consistency			•	1	+ The link has a gentle gradient falling from east to west, which is not considered a hindrance to inclusive access. No severe crossfalls, or requirements for ramps, handrails etc.
	Frequency of dropped kerbs		•			
	Severity			•		- No seating / rest points despite proximity to St Paul's Church and churchyard - pavement width and bus shelters on north side will preclude provision of seating in some locations.
	Steps / ramps			•		
	Rest points	•				
Obstructions	Undulations		•		1	+ Obstructions mainly confined to northerly side of the link, and southerly side on market days. Permanent obstructions mainly aligned, sightlines not affected. Tactiles not considered necessary.
	Handrail provision			•		
	Presence of crossfalls		•			- No overhead obstructions. A boards on the pavement. Obstructions partially aligned.
	Presence of obstructions	•				
	Location / alignment		•			
Permeability	Overhead obstructions			•	-1	+ Able-bodied pedestrians can cross informally along almost the entire length of the link. Flush crossing at High Street and Harpur Street. Low kerbs. Relatively ood sightlines depsite bus shelters.
	Tapering / opaque obstructions			•		
	Tactile warnings			•		- Traffic flow high due to importance of this route in the network and bus stops. Need for railings which appear sporadically questioned. Waiting buses can cause an obstruction. Mobility impaired limited to formal crossings at each end of link only.
	Sightline reduction			•		
	Frequency of crossing points		•			
Legibility	Parked cars / physical barriers		•		0	+ Finger signs provided at Market place and in the Square. Signs are clear but Straight nature of streets frames sightlines north/south, aiding navigation. Church acts as landmark, aiding navigation.
	Traffic flow	•				
	Dropped kerbs	•				- No information boards. No distance information provided (meters or time).
	Pedestrian barriers		•			
	Sightlines		•			
Lighting	Built form aids navigation			•	N	+ Lighting positioned on buildings, reducing clutter and obstruction at street level. Lighting not obstructed by trees etc.
	Intensity / frequency		N			
	Definition / colour		N			- Lighting on buildings is dated and would benefit from modern uplift.
	Maintenance		N			
	Context suitability		N			
Other Notes:	After-dark		N			
	Obstructions		N			
A night-time survey was not undertaken therefore lighting not assessed as part of this survey. Weather was warm and sunny following a relatively dry spell, therefore no drainage issues were observed.						

Link 3 Assessment Form

Page 2 of 2

Parameter	Checklist Factors	Checklist			Overall Score	Comments
		-ve	-/+	+ve	-3 to +3	
Tactile Information	Evident			•	-1	+ Tactiles installed at all formal crossing points. Good contrast - red tactiles on natural background. No interruptions in application.
	Consistent / correct			•		
	Maintained		•			- Some worn / cracked units. No tapping line. Mix of red and buff colour, which has lower contrast.
	Appropriate colour		•			
	Interruptions	•				
Colour contrast	Tapping line	•			2	+ Good tactile contrast. Black railings, signal columns etc. give good contrast against the natural coloured pavement. Assists navigation at formal crossings. Pavement clearly delineated from carriageway.
	Tonal contrast		•			
	Location			•		- Dark grey lamp column has slightly lower contrast.
	Assists navigation			•		
	Enhanced visibility / obstructions		•			
Personal Security	Space identification			•	1	+ No sense of crime during survey (day time). This is a busy shopping and leisure street, so high level of activity. Relatively good visual appeal, some interesting architecture/buildings. CCTV in operation.
	Made to specification			•		
	Perceived / sense of crime			•		- No police observed.
	Activity on the street			•		
	Lighting		N			
Surface Quality	Police presence	•			0	+ Surface relatively smooth. Generally well maintained, not much litter. Considered suitable to context.
	CCTV			•		
	Visual appeal			•		- Some slightly raised blocks/utility hatches. Metal utility hatches could become slippery in the rain, generally located in centre of pavement. Concrete flagged footway - UKPMS CVI score not tested but likely to be: 0/1, natural stone would be a good alternative.
	Smoothness / trip hazards		•			
	Surface friction		•			
User Conflict	Slippery surfaces		•		0	+ Bus stops in the link, shelters and waiting passengers create pinch points. No pavement parking observed.
	UKPMS CVI hierarchy		•			
	Maintenance		•			- Pedestrian flow increases towards eastern end of link and main shopping area. No on-carriageway formal provision for cyclists. Some pinch points due to railings and bus stops. Pavement cycling observed. Light pedestrian crowding observed around the bus stops.
	Context suitability		•			
	Conflicting movements		•			
Quality of Environment	User flows		•		1	+ High quality architecture, some good shopfronts. Trees in the churchyard. No hanging baskets. Sense of place derived from historic importance of this route and the setting within the Church precinct.
	Encroachment on pedestrian space		•			
	Segregation from cyclists	•				- High traffic flow including HGV's, buses, noise and fumes. Carriageway markings create visual clutter.
	Bus queues an obstruction		•			
	Adequate space provision		•			
Maintenance	Traffic / noise	•			1	+ Generally clean, limited litter. No graffiti. No leaf litter. No ponding? Some seasonal foliage at Harpur Street crossing.
	Aesthetics			•		
	Soft landscape			•		- Poor maintenance of some shop fronts.
	Quality of materials		•			
	Quality of private frontages			•		
Other Notes:	Sense of place			•		
	Cleanliness		•			
Links to other Review Forms:	Drainage		N			
	Evidence of neglect		•			
Name:	Ref:	Name:	Ref:	Name:	Ref:	
Name:	Ref:	Name:	Ref:	Name:	Ref:	
Name:	Ref:	Name:	Ref:	Name:	Ref:	
Other Notes:						



# APPENDIX B: PERS AUDIT

Link 4 Assessment Form						Page 1 of 2	
Project: Bedford High Street							
Link Name: Harpur Street - Pedestrian Zone				Link Ref:			
Auditor: AK				Date: 31/7/17    Time: 11:25			
Parameter	Checklist Factors	Checklist			Overall Score	Comments	
		-ve	-/+	+ve	-3 to +3		
Effective Width	Width for pedestrian flow			•	3	+	Width good, this is a Pedestrian Zone where vehicles enter as guests. Highways obstructions aligned. Carriageway and pavement at same level supporting wheelchair accessibility. No pedestrian congestion observed. Market narrows width in central part on certain days.
	Wheelchair Accessibility			•			
	All sections acceptable width			•			
	Separation from traffic			•			
	Allowance for obstructions			•			
	Pedestrian congestion			•			
Dropped Kerbs	Located on desire lines			•	3	+	Dropped kerbs / flush pavements at St Paul's crossing point, on desire line. Side streets are pedestrianised, therefore no level changes or requirement for dropped kerbs.
	Adequate capacity			•			
	Level dropped / flush			•			
	Gradient of drop			•			
	Consistency			•			
Frequency of dropped kerbs			•	-	Slight deviations from desire lines at St Paul's Square.		
Gradient	Severity			•	3	+	The link has a very gentle gradient falling from north to south, which is not considered a hindrance to inclusive access. No crossfalls, or requirements for ramps, handrails etc. Seating provided within the square.
	Steps / ramps			•			
	Rest points			•			
	Undulations			•			
	Handrail provision			•			
Presence of crossfalls			•	-			
Obstructions	Presence of obstructions			•	2.5	+	No significant obstructions to movement. Planters and benches mainly aligned within the square, trees are boulevarded, signage is aligned.
	Location / alignment			•			
	Overhead obstructions			•			
	Tapering / opaque obstructions			•			
	Tactile warnings			•			
Sightline reduction			•	-	Trees create overhead obstructions and some obstructions to sight lines and visual connectivity. Market narrows pavement on certain days.		
Permeability	Frequency of crossing points			•	2.5	+	Pedestrians can cross informally along the length of the link, no level changes or barriers to crossing. Good sightlines. Authorised traffic flow low and slow due to pedestrian zone designation.
	Parked cars / physical barriers			•			
	Traffic flow			•			
	Dropped kerbs			•			
	Pedestrian barriers			•			
Sightlines			•	-	Trees reduce some sightlines and visual connections.		
Legibility	Signage provision			•	3	+	Finger sign and information board provided at sotherly end. Signs are clear but no distance information. Straight nature of the street frames sightlines north/south, aiding navigation.
	Signage clarity			•			
	Information boards			•			
	Distances given on signs			•			
	Sightlines			•			
Built form aids navigation			•	-			
Lighting	Intensity / frequency		N		N	+	Lighting positioned on buildings and via columns. Lighting obstructed by trees etc.
	Definition / colour		N				
	Maintenance		N				
	Context suitability		N				
	After-dark		N				
	Obstructions		N			-	
Other Notes:							
A night-time survey was not undertaken therefore lighting not assessed as part of this survey. Weather was warm and sunny following a relatively dry spell, therefore no drainage issues were observed.							

Link 4 Assessment Form						Page 2 of 2	
Parameter	Checklist Factors	Checklist			Overall Score	Comments	
		-ve	-/+	+ve	-3 to +3		
Tactile Information	Evident			•	2.5	+	Tactiles installed at St Paul's Square crossing point, otherwise not required. Good contrast - red tactiles on natural background. No interruptions in application. No worn or cracked units.
	Consistent / correct			•			
	Maintained			•			
	Appropriate colour			•			
	Interruptions			•			
	Tapping line			•			
Colour contrast	Tonal contrast			•	3	+	Good contrast for tactiles and delineation of the "carriageway" to identify space. Black railings, signal columns etc. give good contrast against the natural coloured pavement. Assists navigation at formal crossings.
	Location			•			
	Assists navigation			•			
	Enhanced visibility / obstructions			•			
	Space identification			•			
	Made to specification			•			
				•		-	
Personal Security	Perceived / sense of crime			•	2	+	No sense of crime during survey (day time). This is a main shopping street, so high level of activity. Relatively good visual appeal, some interesting architecture/buildings. CCTV in operation.
	Activity on the street			•			
	Lighting			•			
	Police presence	•					
	CCTV			•			
	Visual appeal			•			
Surface Quality	Smoothness / trip hazards			•	2	+	Surface relatively smooth. No observable/obvious trip-hazards. Generally well maintained, not much litter. Considered suitable to context.
	Surface friction			•			
	Slippery surfaces			•			
	UKPMS CVI hierarchy		N				
	Maintenance			•			
	Context suitability			•			
User Conflict	Conflicting movements			•	3	+	No bus stops in the link. No pavement cycling, pavement parking or pedestrian crowding observed. High pedestrian flow throughout, but zone prevents conflict. No formal provision for cyclists. Some pinch points due to railings. Cycling permitted out of hours.
	User flows			•			
	Encroachment on pedestrian space			•			
	Segregation from cyclists			•			
	Bus queues an obstruction			•			
	Adequate space provision			•			
Quality of Environment	Traffic / noise			•	3	+	High quality architecture, some good shopfronts. Street trees soften the environment. Hanging baskets etc. Sense of place derived from historic importance and setting of this route. Authorised vehicles only.
	Aesthetics			•			
	Soft landscape			•			
	Quality of materials			•			
	Quality of private frontages			•			
Sense of place			•	-			
Maintenance	Cleanliness			•	3	+	Generally clean, limited litter. No graffiti or leaf litter? No ponding or drainage issues observed. No evidence of neglect, reinstatements generally carried out well. Some seasonal foliage.
	Drainage			•			
	Evidence of neglect			•			
	Seasonal foliage			•			
	Graffiti			•			
Landscape			•	-			
Links to other Review Forms:							
Name:		Ref:		Name:		Ref:	
Name:		Ref:		Name:		Ref:	
Name:		Ref:		Name:		Ref:	
Other Notes:							

APPENDIX B: PERS AUDIT

Link 5 Assessment Form

Page 1 of 2

Project: Bedford High Street

Link Name: Silver Street - Pedestrian Zone

Link Ref:

Auditor: AK

Date: 31/7/17

Time:

Parameter	Checklist Factors	Checklist			Overall Score	Comments
		-ve	-/+	+ve	-3 to +3	
Effective Width	Width for pedestrian flow			•	3	+ Width good, this is a Pedestrian Zone where authorised vehicles enter as guests. Highways obstructions aligned. Carriageway and pavement at same level supporting wheelchair accessibility. No pedestrian congestion observed.
	Wheelchair Accessibility			•		
	All sections acceptable width			•		
	Separation from traffic			•		
	Allowance for obstructions			•		
	Pedestrian congestion			•		
Dropped Kerbs	Located on desire lines		•		3	+ Dropped kerbs / flush pavements at High Street crossing points, mainly on desire lines. Harpur Street also pedestrianised, therefore no level change. Adequate capacity noted.
	Adequate capacity			•		
	Level dropped / flush			•		
	Gradient of drop			•		
	Consistency			•		
Gradient	Severity			•	2.5	+ The link has a very gentle gradient falling from east to west, which is not considered a hindrance to inclusive access. No crossfalls, severe undulations or requirements for ramps, handrails etc. Low walls and planters create informal seating/rest areas.
	Steps / ramps			•		
	Rest points		•			
	Undulations			•		
	Handrail provision			•		
	Presence of crossfalls			•		
Obstructions	Presence of obstructions		•		0	+ No overhead obstructions. Tactiles at formal crossings.
	Location / alignment		•			
	Overhead obstructions			•		
	Tapering / opaque obstructions		•			
	Tactile warnings			•		
Permeability	Sightline reduction	•			0	- Obstructions caused by advertisements, signs, cycle parking and planters. A boards on the pavement. Some sightlines affected by obstructions.
	Frequency of crossing points			•		
	Parked cars / physical barriers	•				
	Traffic flow			•		
	Dropped kerbs			•		
	Pedestrian barriers		•			
Legibility	Signage provision			•	1	+ Finger signs and information board provided at eastern end. Signs are clear. Straight nature of street frames sightlines east/west, aiding navigation.
	Signage clarity			•		
	Information boards			•		
	Distances given on signs	•				
	Sightlines		•			
Lighting	Built form aids navigation			•	N	- No distance information on signs. Some sightlines obstructed by planting.
	Intensity / frequency		N			
	Definition / colour		N			
	Maintenance		N			
	Context suitability		N			
	After-dark		N			
Other Notes:	Obstructions		N			
	A night-time survey was not undertaken therefore lighting not assessed as part of this survey. Weather was warm and sunny following a relatively dry spell, therefore no drainage issues were observed.					

Link 5 Assessment Form

Page 2 of 2

Parameter	Checklist Factors	Checklist			Overall Score	Comments	
		-ve	-/+	+ve	-3 to +3		
Tactile Information	Evident			•	2.5	+ Tactiles installed only at formal crossing points. Good contrast - red tactiles on natural background. No interruptions in application. Generally well maintained.	
	Consistent / correct			•			
	Maintained			•			
	Appropriate colour			•			
	Interruptions			•			
	Tapping line	•					
Colour contrast	Tonal contrast		•		0	+ Good tactile contrast. Black railings, signal columns etc. give good contrast against the natural coloured pavement. Assists navigation at formal crossings.	
	Location		•				
	Assists navigation		•				
	Enhanced visibility / obstructions		•				
	Space identification		•				
	Made to specification		•				
Personal Security	Perceived / sense of crime			•	2	+ No sense of crime during survey (day time). This is a main shopping street, so high level of activity. Relatively good visual appeal, some interesting architecture/buildings. Police and CCTV observed.	
	Activity on the street			•			
	Lighting		•				
	Police presence			•			
	CCTV			•			
	Visual appeal		•				
Surface Quality	Smoothness / trip hazards		•		0	+ Surface relatively smooth, only minor observable/obvious trip-hazards. Generally well maintained, not much litter. Considered suitable to context.	
	Surface friction			•			
	Slippery surfaces		•				
	UKPMS CVI hierarchy		N				
	Maintenance		•				
	Context suitability		•				
User Conflict	Conflicting movements			•	0	+ No pavement cycling, pavement parking or pedestrian crowding observed. This is not a bus route. Adequate space provided for the flows observed.	
	User flows			•			
	Encroachment on pedestrian space		•				
	Segregation from cyclists		•				
	Bus queues an obstruction		N				
	Adequate space provision			•			
Quality of Environment	Traffic / noise			•	2	+ Some high quality architecture and good shopfronts. Street trees, seasonal planting. Sense of place derived from retail importance of this route and widening into the square at the eastern end. Authorised vehicles only.	
	Aesthetics			•			
	Soft landscape			•			
	Quality of materials		•				
	Quality of private frontages		•				
	Sense of place			•			
Maintenance	Cleanliness		•		0	+ Generally clean, limited litter. No leaf litter or ponding observed. Seasonal foliage.	
	Drainage		N				
	Evidence of neglect		•				
	Seasonal foliage			•			
	Graffiti		•				
	Landscape		•				
Links to other Review Forms:							
Name:		Ref:		Name:		Ref:	
Name:		Ref:		Name:		Ref:	
Name:		Ref:		Name:		Ref:	
Other Notes:							

# APPENDIX B: PERS AUDIT

Link 6 Assessment Form

Page 1 of 2

Project: Bedford High Street

Link Name: Midland Road - Pedestrian Zone

Link Ref:

Auditor: AK

Date: 31/7/17

Time: 11:45

Parameter	Checklist Factors	Checklist			Overall Score	Comments
		-ve	-/+	+ve	-3 to +3	
Effective Width	Width for pedestrian flow			•	3	Width generally good, link within Pedestrian Zone. Highways obstructions aligned. At-grade crossings and pavement finish supports wheelchair accessibility. No pedestrian congestion observed.
	Wheelchair Accessibility			•		
	All sections acceptable width			•		
	Separation from traffic			•		
	Allowance for obstructions			•		
	Pedestrian congestion			•		
Dropped Kerbs	Located on desire lines		•		2	Dropped kerbs / flush pavements at River Street crossing point only. Harpur Street also pedestrianised, therefore no level change. Level surface and access throughout.
	Adequate capacity			•		
	Level dropped / flush			•		
	Gradient of drop			•		
	Consistency			•		
Gradient	Severity			•	3	The link has a very gentle gradient falling from west to east, which is not considered a hindrance to inclusive access. No significant crossfalls, or requirements for ramps, handrails etc. Some seating / rest points provided.
	Steps / ramps			•		
	Rest points			•		
	Undulations			•		
	Handrail provision			•		
	Presence of crossfalls			•		
Obstructions	Presence of obstructions		•		1	Obstructions caused by play space, street trees, planters, cycle parking, pavement cafe etc., some tapering obstructions but the impact of obstructions is not considered detrimental given the width of space available. Sightlines not affected. No overhead obstructions.
	Location / alignment		•			
	Overhead obstructions			•		
	Tapering / opaque obstructions		•			
	Tactile warnings			•		
Permeability	Frequency of crossing points		•		1	Pedestrians can cross informally along the length of the link, no significant level changes. Good sightlines. Traffic flow low and slow due to pedestrian zone designation. Opportunities for the able-bodied to cross River Street informally.
	Parked cars / physical barriers		•			
	Traffic flow		•			
	Dropped kerbs			•		
	Pedestrian barriers	•				
Legibility	Signage provision		•		0	Finger signs provided. Signs are clear. Straight nature of street frames sightlines east/west, aiding navigation.
	Signage clarity		•			
	Information boards	•				
	Distances given on signs	•				
	Sightlines		•			
Lighting	Built form aids navigation			•	N	Lighting positioned on buildings, unlikely to be obstructed.
	Intensity / frequency		N			
	Definition / colour		N			
	Maintenance		N			
	Context suitability		N			
	After-dark		N			
Other Notes:	Obstructions		N			Lighting on buildings is dated and would benefit from modern uplift.
A night-time survey was not undertaken therefore lighting not assessed as part of this survey. Weather was warm and sunny following a relatively dry spell, therefore no drainage issues were observed.						

Link 6 Assessment Form

Page 2 of 2

Parameter	Checklist Factors	Checklist			Overall Score	Comments	
		-ve	-/+	+ve	-3 to +3		
Tactile Information	Evident			•	2.5	Tactiles installed only at River Street crossing points. Good contrast - red tactiles on natural background. No interruptions in application. No worn / cracked units observed.	
	Consistent / correct			•			
	Maintained			•			
	Appropriate colour			•			
	Interruptions			•			
	Tapping line	•					
Colour contrast	Tonal contrast		•		1	Good tactile contrast. Black railings, signal columns etc. give good contrast against the natural coloured pavement. Assists navigation at formal crossings. Pavement clearly delineated from carriageway.	
	Location			•			
	Assists navigation			•			
	Enhanced visibility / obstructions		•				
	Space identification			•			
	Made to specification			•			
Personal Security	Perceived / sense of crime			•	0	No sense of crime during survey (day time). This is a main shopping street, so high level of activity. Relatively good visual appeal, some interesting architecture/buildings. CCTV provision noted.	
	Activity on the street			•			
	Lighting		•				
	Police presence	•					
	CCTV			•			
	Visual appeal		•				
Surface Quality	Smoothness / trip hazards		•		0	Surface relatively smooth. No observable/obvious trip-hazards. Generally well maintained, not much litter. Considered suitable to context.	
	Surface friction		•				
	Slippery surfaces		•				
	UKPMS CVI hierarchy		•				
	Maintenance		•				
	Context suitability			•			
User Conflict	Conflicting movements			•	3	No pavement cycling, pavement parking or pedestrian crowding observed. High pedestrian flow throughout, but zone prevents conflict. No formal provision for cyclists. No bus route.	
	User flows			•			
	Encroachment on pedestrian space			•			
	Segregation from cyclists			•			
	Bus queues an obstruction			•			
	Adequate space provision			•			
Quality of Environment	Traffic / noise		•		0	Somewhat dated architecture, but relatively well maintained. Sense of place derived from retail importance of this route rather than quality of built form or heritage. Traffic and noise limited to the western end of the link.	
	Aesthetics		•				
	Soft landscape		•				
	Quality of materials		•				
	Quality of private frontages		•				
	Sense of place		•				
Maintenance	Cleanliness			•	1	Generally clean, limited litter. No graffiti, leaf litter or drainage issues observed. No obvious evidence of neglect, overall a pleasant shopping street.	
	Drainage		•				
	Evidence of neglect			•			
	Seasonal foliage		•				
	Graffiti			•			
	Landscape		•				
Links to other Review Forms:							
Name:		Ref:	Name:		Ref:		
Name:		Ref:	Name:		Ref:		
Name:		Ref:	Name:		Ref:		
Other Notes:							



# APPENDIX B: PERS AUDIT

Link 7 Assessment Form					Page 1 of 2	
Project: Bedford High Street						
Link Name: Allhallows - Pedestrian Zone				Link Ref:		
Auditor: AK				Date: 31/7/17    Time: 11:55		
Parameter	Checklist Factors	Checklist			Overall Score	Comments
		-ve	-/+	+ve	-3 to +3	
Effective Width	Width for pedestrian flow		•		0	+ Width generally good. Highways obstructions aligned. At-grade crossings and pavement finish supports wheelchair accessibility. No pedestrian congestion observed.
	Wheelchair Accessibility		•			
	All sections acceptable width		•			- Highways clutter - signs, bollards - and A boards, cycle parking, planters and on-street parking etc. narrow pedestrian comfort zone in some parts of the link. Pedestrians in close proximity to traffic, albeit slow moving.
	Separation from traffic		•			
	Allowance for obstructions		•			
	Pedestrian congestion			•		
Dropped Kerbs	Located on desire lines			•	3	+ Level surface throughout. Side streets included in pedestrian zone, therefore no level change, shared space design. Dropped kerbs only required at St Loyes Street junction, sited on desire lines.
	Adequate capacity			•		
	Level dropped / flush			•		- The link has a very gentle gradient falling from north to south, which is not considered a hindrance to inclusive access. No significant crossfalls, undulations or requirements for ramps, handrails etc. Seating / rest points provided.
	Gradient of drop			•		
	Consistency			•		
	Frequency of dropped kerbs			•		
Gradient	Severity			•	3	+ The link has a very gentle gradient falling from north to south, which is not considered a hindrance to inclusive access. No significant crossfalls, undulations or requirements for ramps, handrails etc. Seating / rest points provided.
	Steps / ramps			•		
	Rest points			•		- The link has a very gentle gradient falling from north to south, which is not considered a hindrance to inclusive access. No significant crossfalls, undulations or requirements for ramps, handrails etc. Seating / rest points provided.
	Undulations			•		
	Handrail provision			•		
	Presence of crossfalls			•		
Obstructions	Presence of obstructions	•			-1	+ Obstructions placed throughout the link but help slow vehicle speeds. Obstructions mainly aligned.
	Location / alignment		•			
	Overhead obstructions		•			- Some overhead obstructions created by street trees. A boards on the pavement. No tactile to delineate carriageway despite active shared space layout. Trees reduce some sightlines.
	Tapering / opaque obstructions		•			
	Tactile warnings	•				
	Sightline reduction		•			
Permeability	Frequency of crossing points			•	1	+ All pedestrians can cross informally along the length of the link due to the level surface. Good sightlines. Traffic flow low and slow due to pedestrian zone designation. No barriers. Dropped kerbs confined to St Loyes Street junction.
	Parked cars / physical barriers		•			
	Traffic flow		•			- Parked cars and loading areas reduce permeability when in use.
	Dropped kerbs			•		
	Pedestrian barriers			•		
	Sightlines		•			
Legibility	Signage provision		•		0	+ Finger signs provided. Straight nature of street frames sightlines north/south, aiding navigation.
	Signage clarity		•			
	Information boards	•				- No information boards or distance information on finger signs. Some sightlines obscured by trees.
	Distances given on signs	•				
	Sightlines		•			
	Built form aids navigation			•		
Lighting	Intensity / frequency		N		N	+ Lighting positioned on columns.
	Definition / colour		N			
	Maintenance		N			- Lighting possibly obstructed by trees.
	Context suitability		N			
	After-dark		N			
	Obstructions		N			
Other Notes:						
A night-time survey was not undertaken therefore lighting not assessed as part of this survey. Weather was warm and sunny following a relatively dry spell, therefore no drainage issues were observed.						

Link 7 Assessment Form					Page 2 of 2	
Parameter	Checklist Factors	Checklist			Overall Score	Comments
		-ve	-/+	+ve	-3 to +3	
Tactile Information	Evident	•			-3	+ No tactile provided in this link, no formal delineation between pedestrian comfort space and the carriageway and parking/loading areas.
	Consistent / correct	•				
	Maintained	•				- No tactile provided in this link, no formal delineation between pedestrian comfort space and the carriageway and parking/loading areas.
	Appropriate colour	•				
	Interruptions	•				
	Tapping line	•				
Colour contrast	Tonal contrast			•	0	+ Good paving colour contrast between "carriageway" and pedestrian comfort areas.
	Location		•			
	Assists navigation		•			- Supports navigation and helps space identification but would be better supported by appropriate tactile provision.
	Enhanced visibility / obstructions		•			
	Space identification		•			
	Made to specification		•			
Personal Security	Perceived / sense of crime			•	1	+ No sense of crime during survey (day time). This is a main shopping street, so high level of activity. Relatively good visual appeal, some interesting architecture/buildings. Police and CCTV observed.
	Activity on the street			•		
	Lighting		•			- Some dead frontage from vacant units in prominent locations.
	Police presence		•			
	CCTV			•		
	Visual appeal		•			
Surface Quality	Smoothness / trip hazards		•		0	+ Surface relatively smooth. No observable/obvious trip-hazards. Generally well maintained, not much litter. Considered suitable to context.
	Surface friction		•			
	Slippery surfaces		•			- Metal utility hatches could become slippery in the rain. Block-paved footway - UKPMS CVI score not tested but likely to be: 0/1.
	UKPMS CVI hierarchy		•			
	Maintenance		•			
	Context suitability		•			
User Conflict	Conflicting movements		•		0	+ No pavement cycling, pavement parking or pedestrian crowding observed. High pedestrian flow throughout, but zone prevents conflict. Not a bus route.
	User flows			•		
	Encroachment on pedestrian space		•			- No formal provision for cyclists. Some pinch points due to parking and loading bays. Shared space environment can be intimidating to some pedestrians.
	Segregation from cyclists		•			
	Bus queues an obstruction			•		
	Adequate space provision		•			
Quality of Environment	Traffic / noise		•		0	+ Limited quality architecture. Street trees. Limited traffic noise.
	Aesthetics		•			
	Soft landscape		•			- Mix of often bland architectural styles, some dead frontage. Sense of place derived from retail importance of this route rather than architectural quality or heritage.
	Quality of materials		•			
	Quality of private frontages		•			
	Sense of place		•			
Maintenance	Cleanliness		•		0	+ Generally clean, limited litter. No graffiti, leaf litter or ponding observed. Some seasonal foliage.
	Drainage		•			
	Evidence of neglect		•			- Some vacant units.
	Seasonal foliage		•			
	Graffiti			•		
	Landscape		•			
Links to other Review Forms:						
Name:		Ref:		Name:		Ref:
Name:		Ref:		Name:		Ref:
Name:		Ref:		Name:		Ref:
Other Notes:						

# APPENDIX B: PERS AUDIT

Public Space 1 Assessment Form									
Project: Bedford High Street									
Public Space Name: Silver Street Square					Public Space Ref:				
Auditor: AK					Date: 31/7/17 Time: 12:35				
Parameter	Checklist Factors	Checklist			Overall Score	Comments			
		-ve	-/+	+ve	-3 to +3				
Moving in the Space	Provision for moving in the space			•	0	+	Good provision, wide space, level surface. Surface appears generally well maintained. No conflict between pedestrians, pedestrians/cyclists or pedestrians/vehicles observed. No inhibiting barriers to the mobility impaired.		
	Surface quality		•						
	Ease of movement		•						
	Barriers to the mobility impaired		•			-	Public art, finger posts, utility boxes, wayfinding totem, cycle parking planters etc. cause obstructions. Cluster of obstructions at High Street crossing.		
	Frequency of obstructions	•							
	User conflict		•						
Interpreting the space	Presence of maps			•	1	+	Wayfinding totem has a useful map. Built form encloses space, with good sense of enclosure. Public art creates a landmark, in highly prominent position close to the High Street.		
	Use and appropriateness of signage		•						
	Signage consistency		•						
	Provision for mobility / sensory impaired people	•				-	Mix of signage - finger posts and wayfinding totem. No specific surface treatment for visually impaired.		
	Layout of the built form			•					
	Landmark visibility			•					
Personal Safety	Perceptions of safety			•	2	+	Lighting present. Possible to report an incident via public telephones. No homeless observed. Very good passive surveillance. Busy shopping area adjacent to a main junction on the High Street.		
	Informal surveillance			•					
	Formal surveillance		•						
	Ease of reporting an incident		•			-	Some anti-social behaviour observed in a hidden corner - graffiti and littering. Formal surveillance restricted to CCTV, no police observed.		
	Lighting provision		•						
	Type of area / environment			•					
Feeling Comfortable	Spending time in the space			•	0	+	Pavement cafe animates the space. Pleasant, but not currently a place to linger.		
	Provision of shelter	•							
	Seating provision		•						
	Toilets	•				-	Proximity to High Street results in noise. Fumes potentially impacting air quality. Currently a space to pass through rather than linger, limited seating. No shelter. No public toilets.		
	Noise level		•						
	Impact of traffic		•						
Sense of Place	Quality of materials			•	0	+	Mix of standard materials, relatively well maintained. Mix of architectural styles with some interesting original buildings in the High Street. Public art provides visual interest. Relatively pleasant atmosphere to the space.		
	Character of the built environment			•					
	Aesthetics			•					
	Sense of identity			•		-	Space isn't quite fulfilling its potential as a destination at the heart of the High Street, pleasant but bland.		
	Distinctiveness			•					
	Ambience			•					
Opportunity for Activity	Evidence of social interaction			•	0	+	A few people sitting, chatting, most are passing through. A busy space during the day but seems to have a passive atmosphere, primarily used by shoppers. Active frontages are spill out into the space. No leaf litter or drainage issues observed.		
	Atmosphere			•					
	Diversity of user types			•					
	Type of activity appropriate for space			•		-	The space feels under-used for the functions it was intended for. No play equipment. Some signs of littering, a little graffiti. One vacant unit. Opportunities for activities not fully exploited.		
	Function of space used appropriately			•					
	Evidence of decay / dereliction / lacks activity			•					
Linkages to other Review forms:									
Name:		Ref:		Name:		Ref:			
Name:		Ref:		Name:		Ref:			
Name:		Ref:		Name:		Ref:			
Other Notes:									
A night-time survey was not undertaken therefore lighting not assessed as part of this survey.									

Public Space 2 Assessment Form									
Project: Bedford High Street									
Public Space Name: St Paul's Square & Market					Public Space Ref:				
Auditor: AK					Date: 31/7/17 Time: 11:05				
Parameter	Checklist Factors	Checklist			Overall Score	Comments			
		-ve	-/+	+ve	-3 to +3				
Moving in the Space	Provision for moving in the space			•	0	+	Good provision, wide space, level surface. Surface appears generally well maintained. No conflict between pedestrians, pedestrians/cyclists or pedestrians/vehicles observed.		
	Surface quality		•						
	Ease of movement		•						
	Barriers to the mobility impaired		•			-	Public art, finger posts, pavement cafe cause obstructions but the space is wide enough to prevent hindrance to movement. Cobble surface in the market could create an issue for some with mobility impairments.		
	Frequency of obstructions		•						
	User conflict			•					
Interpreting the space	Presence of maps	•			1	+	Public art creates a landmark, in highly prominent position close to the High Street. The space sits within the historic core of the town and hence built form encloses the space with a human scale form of development.		
	Use and appropriateness of signage		•						
	Signage consistency		•						
	Provision for mobility / sensory impaired people	•				-	No maps. No specific surface treatment for visually impaired. Differing styles between finger posts, no distance information.		
	Layout of the built form			•					
	Landmark visibility			•					
Personal Safety	Perceptions of safety			•	1	+	Lighting present. No homeless observed. Very good passive surveillance. Busy shopping and leisure area, and important vehicular route adjacent to the High Street and in close proximity to Bedford Bridge.		
	Informal surveillance			•					
	Formal surveillance		•						
	Ease of reporting an incident	•				-	Formal surveillance restricted to CCTV, no police observed and no public telephone.		
	Lighting provision		•						
	Type of area / environment			•					
Feeling Comfortable	Spending time in the space			•	-1	+	Pavement cafe animates the space. Pleasant, but limited public seating considering the size of the area.		
	Provision of shelter	•							
	Seating provision	•							
	Toilets	•				-	Proximity to High Street results in noise. Fumes potentially impacting air quality. Currently a space to pass through rather than linger, limited seating. No shelter. No public toilets. Difficult to access due to busy roads.		
	Noise level	•							
	Impact of traffic	•							
Sense of Place	Quality of materials			•	-1	+	Mix of standard and bespoke materials, surfaces relatively well maintained. Mix of architectural styles with some interesting original buildings surrounding the space. Public art, trees, surrounding uses and the churchyard provide visual interest. Relatively pleasant atmosphere to the space.		
	Character of the built environment			•					
	Aesthetics	•							
	Sense of identity	•				-	Space isn't quite fulfilling its potential as a destination at the heart of historic Bedford, pleasant but bland and dominated by roads. Broken bollards and twisted guardrail observed. Aesthetics and sense of identity eroded by heavy traffic and lengths of poorly maintained guardrail. High quality built environment is "lost" behind dominating highways and associated paraphernalia. Bin store is an eyesore.		
	Distinctiveness		•						
	Ambience			•					
Opportunity for Activity	Evidence of social interaction			•	0	+	A few people sitting chatting at the cafe, most are passing through. A busy space during the day but seems to have a passive atmosphere, primarily used by shoppers. No leaf litter or drainage issues observed. No vacant units.		
	Atmosphere			•					
	Diversity of user types			•					
	Type of activity appropriate for space			•		-	The space adjacent to the High Street is under-used for functions it was intended for. No play equipment. Some signs of littering, a little graffiti. Opportunities for activities not fully exploited. No spill out from surrounding businesses.		
	Function of space used appropriately			•					
	Evidence of decay / dereliction / lacks activity			•					
Linkages to other Review forms:									
Name:		Ref:		Name:		Ref:			
Name:		Ref:		Name:		Ref:			
Name:		Ref:		Name:		Ref:			
Other Notes:									
A night-time survey was not undertaken therefore lighting not assessed as part of this survey. The survey day was not a market day.									



# APPENDIX B: PERS AUDIT

Public Space 3 Assessment Form

Project: Bedford High Street

Public Space Name: Allhallows Square

Public Space Ref:

Auditor: AK

Date: 31/7/17    Time: 12:20

Parameter	Checklist Factors	Checklist			Overall Score	Comments					
		-ve	-/+	+ve	-3 to +3						
Moving in the Space	Provision for moving in the space			•	1	+ Good provision, wide space, level surface. Surface appears generally well maintained. No conflict between pedestrians, pedestrians/cyclists or pedestrians/vehicles observed. No inhibiting barriers to the mobility impaired.					
	Surface quality		•								
	Ease of movement			•							
	Barriers to the mobility impaired		•			- Public art, planters, trees, bins and seating cause obstructions but the space is wide enough to prevent hindrance to movement.					
	Frequency of obstructions	•									
	User conflict			•							
Interpreting the space	Presence of maps	•			-1	+ Built form encloses space, with good sense of enclosure. Fountain creates a landmark, in prominent position on Allhallows.					
	Use and appropriateness of signage	•									
	Signage consistency	•									
	Provision for mobility / sensory impaired people	•				- No maps or signage. No specific surface treatment for visually impaired.					
	Layout of the built form			•							
	Landmark visibility			•							
Personal Safety	Perceptions of safety			•	0	+ Lighting present. No homeless or anti-social behaviour observed. Very good passive surveillance. Adjacent to busy shopping area and forms part of walking route between bus station and Harpur Street.					
	Informal surveillance			•							
	Formal surveillance	•									
	Ease of reporting an incident	•				- Formal surveillance restricted to CCTV, no police observed and no public telephones. Dead frontage caused by large vacant unit on southern side. Space could accommodate additional activities.					
	Lighting provision		•								
	Type of area / environment		•								
Feeling Comfortable	Spending time in the space			•	1	+ Pleasant, and a popular place to linger, a sun-trap. Quiet due to pedestrianised location, generous seating, all well-used. Overall a pleasant place to spend time.					
	Provision of shelter	•									
	Seating provision			•							
	Toilets	•				- No shelter. No public toilets.					
	Noise level			•							
	Impact of traffic			•							
Sense of Place	Quality of materials		•		0	+ Mix of standard materials, relatively well maintained. Pleasant atmosphere to the space.					
	Character of the built environment		•								
	Aesthetics		•								
	Sense of identity		•			- Pleasant but somewhat bland environment created by contemporary architecture. Dead frontage.					
	Distinctiveness		•								
	Ambience		•								
Opportunity for Activity	Evidence of social interaction			•	1	+ Many people sitting, chatting, some passing through. A busy space during the day although the sitting activities create a more passive atmosphere, primarily used by shoppers and workers on lunch breaks. No leaf litter or drainage issues observed.					
	Atmosphere			•							
	Diversity of user types		•								
	Type of activity appropriate for space			•		- The space feels well used for the functions it was intended for. No play equipment. Generally clean. One large vacant unit on the southern side.					
	Function of space used appropriately			•							
	Evidence of decay / dereliction / lacks activity		•								
Linkages to other Review forms:											
Name:	Ref:	Name:	Ref:								
Name:	Ref:	Name:	Ref:								
Name:	Ref:	Name:	Ref:								
Other Notes:											
A night-time survey was not undertaken therefore lighting not assessed as part of this survey.											

## CONCLUSIONS

### KEY ISSUES

The following common issues arose throughout the PERS audit:

- All the study areas are relatively flat with gentle gradients that support walking
- Inconsistency in design, and lack of information, on wayfinding infrastructure
- Passive atmosphere in key spaces throughout the town despite it being a busy weekday
- Historic environments are overwhelmed by traffic infrastructure and high vehicle flows
- Lack of police presence and formal surveillance
- Limited and sometimes interrupted provision of specialist interventions for the partially sighted and mobility impaired to assist navigation
- Lack of play opportunities
- Lack of trees and soft landscape in some links
- Pavement cycling is common due to lack of formal facilities

### LINKS

The two High Street links and St Paul's Square score relatively poorly whilst those links in the pedestrian zone rate quite well. This outcome is not surprising given the prominence of vehicles in the High Street and barriers preventing free pedestrian movement.

### PUBLIC SPACES

All the spaces benefit from southerly aspect, but only Allhallows Square was observed to cater for significant lingering activities, even though it is surrounded by mediocre architecture. Its popularity is perhaps supported by the good seating provision. This space is also on a busy walking route and is not disconnected from its surroundings by busy roads.

None of the spaces benefit from weather protection but all contained an element of public art, contributing to the aesthetic value and visual interest of the space. It is considered that additional activity could be accommodated in all three locations and it is acknowledged that the survey was not conducted on a market day.







**SYSTRA**



## **UTMC AND TECHNOLOGY PACKAGE**



**SYSTR**

# BEDFORD TOWN CENTRE TRANSPORT STRATEGY

## UTMC AND TECHNOLOGY PACKAGE

### IDENTIFICATION TABLE

Client/Project owner	Bedford Borough Council
Project	Bedford Town Centre Transport Strategy
Study	UTMC and Technology Package
Type of document	Report
Date	18/10/2017
File name	2017-10-18_Bedford Technology Package Note_FINAL
Reference number	105251/GB01T14A88
Number of pages	30

### APPROVAL

Version	Name		Position	Date	Modifications
1	Author	David Alderson	Associate	18/10/2017	
	Checked by	Andrew Pickford	Technical Director	18/10/2017	
	Approved by	Jon Bunney	Associate Director	19/10/2017	



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# 1. INTRODUCTION

## 1.1 Introduction

- 1.1.1 The existing application of urban traffic management consists of discrete local areas of signal coordination with limited capability to implement area-wide coordination and operational optimisation. Some progress is being made with incremental improvements to the underlying communications network, and individual traffic signal sites are being replaced on a priority basis where the risks of serious failure and commensurate reduction in road network performance are becoming acute. The long-term sustainability is uncertain.
- 1.1.2 The current investment programme does include the introduction of dynamic Variable Message Signing for the main car parks in the town, alongside updating the general direction signing to reflect recent changes in road classifications (including the Great Ouse Way). Whilst this will be very worthwhile, it will not in itself offer the opportunity to provide more comprehensive management of the network or to alert road users to congestion or incidents.
- 1.1.3 The premise of the original Southern Gateway project was to overcome the limitations in the current traffic management capability; to improve the information available to road users on conditions; and to provide more reliable journey times along the corridor. Given the suggested way forward for the town as a whole, now is the ideal opportunity to extend this approach to the whole town centre area and modernise the monitoring, control and information systems for the whole of the congested road network, including areas of worsening congestion.
- 1.1.4 The opportunity and benefits available from this approach are expected to be significant and provide the ideal platform to realise the benefits of Intelligent Transport Systems as well as enabling provision of high quality real-time open data to support a range of emerging Smart Mobility applications, such as Mobility as a Service (MaaS), demand-responsive public transport and autonomous vehicles.

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*The focus of the package will be:*

*A major upgrade to existing traffic management systems across the whole Town Centre and Southern Gateway area to improve journey time reliability, shorten journey times, provide real-time information to drivers to inform route choice, to develop an applications road map and improve readiness to integrate emerging/future technologies for Cooperative Intelligent Transport Systems (C-ITS), expressway driver information systems, Connected Autonomous Vehicles and Mobility as a Service operating strategies.*

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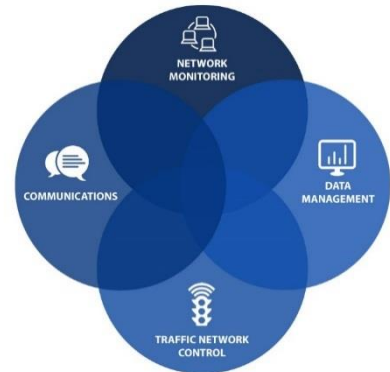


1.1.5 There is a range of viable technology enablers that could underpin this package described above. Our proposed approach for Active Multi-Modal Management has four interconnected elements:

- I. Network Monitoring;
- II. Communications;
- III. Traffic Network Control; and
- IV. Data Management.

1.1.6 In addition this will be supported by:

- V. Travel Demand Support Initiatives; and
- VI. Development of a Smart Mobility Roadmap.



## 2. PACKAGE MEASURES

2.1.1 The following section outlines the planned measures for the technology package.

### i) Network Monitoring

2.1.2 Traffic network monitoring will be enhanced and expanded via:

- Integration of the CCTV system managed by Bedford's Community Safety Team into the Bedford Borough Council intranet. This measure will allow traffic officers to view, pan, tilt and zoom these cameras from their weekday office desks. This facility will also allow the recording of CCTV footage for enforcement and traffic survey purposes. Hyperlinks to still shots (updated every 5 minutes) from these cameras will be available on an ITS map-based front end, readiness for Automated Incident Detection (AID) will be ensured;
- Additional Pan Tilt Zoom cameras. Although the video data will be shared with the Bedford Borough Council intranet subject to confirmation of data sharing arrangements these cameras will be required in order to monitor the impact of Bedford traffic officers manually applying contingency signal timings implemented during "incident" conditions;
- Vehicle emission monitoring stations installed at selected locations on congested corridors to enable variations in traffic management strategies to be assessed. Readings from these stations will be plotted on the map-based front end;
  - Three vehicle Emissions stations will be installed in the congested northern hub of the corridor (Kingsway Gyratory System).
  - Potentially data collected can be used for emissions modelling to test the impact of different traffic management scenarios and the impact of revised bus routes.
- The Traffic Master BaseMap system will be configured to collect and process journey time reliability data for key corridors;
- Bus journey time data plus "typical" averages will also be plotted on the map-based front end;
- Real time SCOOT (Split Cycle Offset Optimisation Technique) traffic congestion data (Red, Amber, Green) plus "typical" averages will also be fed onto the map based front end, potentially via a standards compliant data interface to permit data exchange with other Council data users;
- Bedford's road and street works database will be integrated into the map based front end. This will enable the public, emergency services, bus operators and traffic officers to see at a glance the location and planned duration of road and street works;
- Other 3<sup>rd</sup> party data sources (e.g. from Mobile Network Operators) will be identified and rated to improve data capture coverage within the sub-region.

2.1.3 This array of real-time data will inform the public on their choice of mode of transport and assist Bedford's traffic officers, it will support the following:

- The choice of traffic management and traffic signal timings strategies;
- The development and assessment of levels of service for the road network;
- Act as a source of data for long-term capacity planning;
- Detect and support the validation of unplanned incidents;
- Better assess the impact on traffic of planned and unplanned incidents;
- Detect unserved mobility needs;
- Permit an informed dialogue with local transport providers to better evolve services provision; and
- Provide a platform for innovation in mobility in the long-term.

## ii) Communications

2.1.4 The Technology Strategy for Bedford Town Centre aims to help the public and business improve the timing, mode choice and routing of their journeys. It will have the following components:

- Variable Message Signs (VMS) at key locations:
  - One for inbound traffic (southern entry to the corridor) and one for southbound traffic (northern entry to the corridor) providing incident and journey time information.
- LED Message boards at key locations to publicise expected journey times and the benefit of delaying your journey:
  - The Interchange Retail Park.
- The ITS map based front end presenting all the network monitoring data feeds will be placed on the Bedford Borough Council Website ([bedford.gov.uk](http://bedford.gov.uk)) and shared with other websites (e.g. [lovebedfordbusinesses.co.uk](http://lovebedfordbusinesses.co.uk)) in a form that would permit innovation in 3<sup>rd</sup> party application development;
- A Twitter Feed will broadcast traffic network updates and advance alerts; and
- Bedford radio stations will also be fed this Twitter Data.

## iii) Traffic Signal Control

2.1.5 This will be the main real-time mechanism for mitigating poor traffic conditions.

2.1.6 The following junctions will be signalised, or current provision reviewed and upgraded to feed into the Urban Traffic Management and Control (UTMC) system:

- Clapham Road / Manton Lane / Shakespeare Road;
- Bromham Road / Shakespeare Road / Ashburnham Road;
- Midland Road / River Street;
- Bromham Road / Union Street / Greyfriars;
- Bromham Road / Hassett Street;
- Dame Alice Street / The Broadway / St Peter's Street / High Street;
- St Peter's Street / St Cuthbert's Street;
- St Mary's Street / Cardington Road / St John's Street / Cauldwell Street;
- Cauldwell Street / Kingsway;
- Cauldwell Street / Prebend Street;
- Kempston Road / Britannia Road / Cauldwell Street;
- Britannia Road / Ampthill Road;
- Elstow Road / London Road;
- Elstow Road / Ampthill Road;
- Ampthill Road / West End / A6;
- Dame Alice Street / Harpur Street;
- Tavistock Street / Harpur Street;
- Ampthill Road (North of Cowbridge); and
- Ampthill Road (South of Cowbridge).

2.1.7 SCOOT traffic signal control will be rolled out on key corridors. This will involve installing SCOOT at key sets of signals on these corridors:

- SCOOT traffic signal control will be rolled out the full length of the 3 km corridor on the Southern Gateway. This will involve installing SCOOT at seven sets of signals between the Park & Ride exit and the Kingsway Gyratory System;
- Bedford will have joint access to control the A421/A6 SCOOT controlled junction signals and CCTV that Highways England plans to install. This is to allow Bedford to gate northbound A6 traffic at the A421 before it floods into the Southern Gateway.



- 2.1.8 Bus priority detection systems should be upgraded to ensure that all bus transponders trigger bus priority at traffic signals, this priority could be conditional i.e. based on lateness.

#### **iv) Data Management Hub**

- 2.1.9 This will be the foundation stone of the Technology Strategy. It is here that:

- Real time data feeds will be plugged into the ITS map based front end;
- Data will be analysed to determine how current Journey Time Reliability (JTR) compares with typical average values (i.e. red, amber or green) and reports on network performance will be provided;
- Additional data input feeds can be plugged in;
- As a platform for real time data analytics and the storage of long-term historic data for planning purposes; and
- As a source of information to be disseminated to internal and external stakeholders.

- 2.1.10 The map-based front end will be based on the Esri ArcGIS mapping system using the highly granular Ordnance Survey TOID based road network coding standard.

- 2.1.11 The Data Management Hub will be underpinned by a comprehensive Common Database (CDB) which will enable Intelligent Mobility services to maximise the productivity of the Strategic Road Network (SRN). The CDB will also enable scalable applications for traffic management, data collection and information dissemination; it will allow for simple monitoring all the way through to the strategic control of complex traffic environments.

- 2.1.12 The CDB should include intelligent tools to manage and utilise data (local, regional and national), remote monitoring of critical assets and to control the network, providing a platform for strategic management today and in the future. The CDB should make provision for:

- Multi-tenancy capability;
- Web interface;
- VMS management;
- Crowd source journey time;
- Journey time management;
- Parking guidance;
- Incident & event management; and
- Policy based Urban Traffic Management.

- 2.1.13 The aim of the CDB will be to bring the overall benefits listed below:

- Reduce traffic congestion by accurately matching signal controller operation to prevailing traffic conditions;
- Improve specific routes by prioritising the traffic flows;
- Reduce the waiting time for pedestrians and cyclists including information about the remaining waiting time, reducing red light negation;
- Improve public transport by minimising the delay and stops and enabling the adherence to schedule;
- Give conditional priority to vehicles equipped with cooperative technology, promoting schemes like eco-driving for heavy trucks;
- Provide emergency vehicles with a quick and safe passage through the network, providing absolute priority where applicable;
- Improve road safety by identifying issues and mitigation measures;
- Reduce fuel consumption and harmful emissions by making traffic flows smoother, minimising stops, reducing travel times (and travel time variations) to destinations;

- Reallocation of demand throughout the road network and amongst transport modes; influence the location and the severity of traffic to parts of the road network that is better able to cope with the demand;
- Enable informed choice of road users on the time of travel and the choice of mode, before and during a journey; and
- Provide the means to measure and monitor the performance of the road network and the public transport services that depend on efficiently managed road infrastructure to maintain high quality services.

## **v) Travel Demand Support Initiatives**

2.1.14 The inclusion of Travel Demand Support (TDS) measures will reduce background traffic along the corridor therefore maximising the impact of other measures and optimising the overall efficiency of the corridor. TDS is a targeted communication campaign. Linking this messaging with the proposed technology options within the corridor will provide a real-time experience for users and encourage changes in travel behaviour. TDS uses the '4R Principle' of 'Reduce', 'Remode', 'Retime', 'Reroute'.

- Reduce:
  - Forego number of journeys;
  - Car Share;
  - Flexible working.
- Remode:
  - Use alternative means of travel e.g. cycle, walk and public transport.
- Retime:
  - Travel at a different time of day to avoid congestion.
- Reroute:
  - Travel by a different route to avoid congestion

2.1.15 The target audiences for communication should be the hospital, education sites, businesses, visitors and residents. Communication would be via a range of channels based on 4 R's:

- Mass media (billboards, lamp post banners, local radio, dynamic electronic displays, printed press, petrol pumps, parking tickets, VMS, social media); and
- Corridor specific marketing (targeting land uses within half a mile of a corridor, business, leisure, education, retail).

2.1.16 A TDS campaign could include branding and internal communications within BCC to maintain data and exchange information. It can also include other technology options which will incentivise behaviour change and provide real-time information on the effectiveness of the technology being used on the corridor for example, using a product like BetterPoints ([www.betterpoints.uk](http://www.betterpoints.uk)).

2.1.17 BetterPoints is a Smartphone application and web platform that uses Geographical Positioning System (GPS) and other technologies to track people's movements and rewards them for being active. Systems like BetterPoints are able to track actual travel carried out as well as other forms of physical activity and provide live data at any point throughout the project. This will enable frequent reviews and adaptations to the measures on the corridor (including TDS messaging) to ensure objectives are met.

2.1.18 The BetterPoints system also harnesses new technology to provide a strong incentive and reward system that is crucial in the behaviour change process. The BetterPoints application provides a platform to not only engage a wide audience but also monitor their behaviour and provide high quality data and evidence.

## **vi) Smart Mobility Roadmap**

- 2.1.19 The Smart Mobility Roadmap, will underpin the short term ITS based measures and longer term move towards Smart Mobility in Bedford, providing a firm platform for Bedford to build upon in future.
- 2.1.20 The roadmap will also establish what is available and upcoming regionally, nationally and internationally, ensuring Bedford can gain efficiencies and also ensuring Bedford is resilient for the future and prepared for new and emerging technologies, for example Autonomous Vehicles.
- 2.1.21 The roadmap will include the following elements:
- ITS Development;
  - Data sets:
    - Local;
    - Regional;
    - National.
  - Planning for electric vehicles (EV);
  - Ticketing/Payment;
  - Parking; and
  - Enabling MaaS.
- 2.1.22 ITS development is the bedrock of this strategy. The proposed package will see Bedford's end of life system updated, but it is important the technology is resilient and enabled for the likes of Connected and Autonomous vehicles.
- 2.1.23 Datasets will support the short term ITS based measures and feed the development of the Common Database. It will also provide an outlook of what is available or upcoming regionally and nationally that could be plugged into Bedford.
- 2.1.24 Electric Vehicle Recharging: Predicting demand, interface with parking & parking regulation, grid-related constraints, impacts on EV ownership & use, apps and incentives for matching supply & demand.
- 2.1.25 Smart Parking Strategy: Incorporating mode & destination choice behaviours, ITS, EV strategy, development control, parking legislation, revenue opportunities, retail/leisure impacts, enforcement and the opportunities/impacts of real-time information.
- 2.1.26 Payment systems and technology: Everything from cash to automatic facial recognition and covering on-board, on-line and back office aspects, ease of use, public acceptance, security & opportunities for system failure & fraud.
- 2.1.27 Enabling Mobility as a Service (MaaS): Bringing together all modes of travel and encompassing different transport operators within a single mobility platform, accessing multiple applications. Using mobile data, real-time information, and associated Apps to influence the way people make decisions about travel and presenting integrated end to end purchase options, with fees linked to both the journey and experience of the service received.



### 3. SUMMARY OF CURRENT ITS PROVISION

#### 3.1 Introduction

- 3.1.1 The current ITS equipment is fragmented, both in terms of range of technologies and the geographic coverage, furthermore the current provision has also reached end of life.
- 3.1.2 There has been limited integration in the current systems rendering the provision to be less effective at managing the transport network than might otherwise be the case.
- 3.1.3 One the above basis the technology package could therefore be considered to be dealing with a greenfield scheme.

#### 3.2 Urban Traffic Control (UTC)

- 3.2.1 The legacy UTC system is Alpha based which is no longer manufactured by HP and has become an obsolete product. To address this, Siemens migrated its UTC software to Intel based servers and MAINDEC, the service agents that both Peek and Siemens use.
- 3.2.2 All software development and SCOOT (Split Cycle Offset Optimisation Technique) upgrades by Siemens are now for PC SCOOT only. Siemens is still providing software support for the Alpha, although this is restricted to bug fixes and, no new facilities have been introduced on this platform.
- 3.2.3 A second Alpha was also procured to act as a backup system in the event of a system failure.
- 3.2.4 Furthermore the Outstation Transmission Units (OTU's) were life expired and should be replaced with UG405 units.
- 3.2.5 Major upgrades are now available and in development for SCOOT. The Kernel has been developed with improved algorithms and special conditioning facilities.
- 3.2.6 The new system procured by Bedford should be a new generation Hosted UTC System and include upgrading signal controllers with integral UG405 units replacing OTU's which are life expired, enabling the use of IP based communications and WiFi equipment.
- 3.2.7 Consideration should be given to implementing MOVA (MOVA is a strategy for the control of traffic light signals at isolated junctions) for isolated junctions to improve efficiency of junctions (MOVA 8 is in development).
- 3.2.8 Furthermore, Bedford currently own no licenses to microsimulation modelling software packages and the purchase of licences would be viewed as beneficial, with associated training for relevant officers.

##### **Amphill Road Corridor**

- 3.2.9 The Amphill Road Corridor is SCOOT controlled in parts, at the southern end around the Cowbridge junction, and to the north around sections of the Kingsway Gyratory System and at the junctions on Cauldwell Street with Prebend Street and Britannia Road.
- 3.2.10 There are six sets of signals in between the southern and northern sections that are not SCOOT controlled. These are:
  - The Morrison's signalised junction – this is currently MOVA (Microprocessor Optimised vehicle Actuation) controlled for optimisation of the junction operation in isolation of surrounding traffic signal controls;
  - The Offa Road bus gate signals – this has bus detection technology to prioritise bus movements;

- Ampthill Road/Britannia Road junction signals;
  - Three separate sets of pelican crossing signals:
    - To the north of Sexton Road;
    - To the north of Lynton Grove;
    - Between College Road and Muswell Road.
- 3.2.11 The exiting SCOOT UTC system on Ampthill Road seems to be compartmentalised into separate North and South Cells. These Cells do not appear to be able to share SCOOT flow and congestion data. This needs to be resolved in order for SCOOT to optimise effectively along this corridor.
- 3.2.12 The A421 / A6 junction to the far south of the Ampthill Corridor is not currently signalised; however, we understand that Highways England is considering options to introduce some form of signalisation at this junction along with SCOOT. As vehicles travel northbound from the A421/A6 junction, the point at which to potentially control traffic is at the signalised access to the Southern Park & Ride Site at Progress Park. It is understood that this is not currently SCOOT controlled, but can provide priority for outbound bus movements from the site.
- 3.2.13 There are no signalised junctions along the A5141 corridor, to the west of Bedford Town Centre, including at Midland Road / Prebend Street. The flow of traffic is uncontrolled over the Prebend Street Bridge. The first point at which to control traffic heading towards the Ampthill Road Corridor is, therefore, at the Prebend Street / Cauldwell Street junction. Wilmer Corner is also un-signalised and so traffic southbound traffic from St. John's Street and westbound traffic from Rope Walk and so the first opportunity to control traffic is at the Ampthill Road / Britannia Road signalised junction.
- 3.2.14 At the A421/A6 intersection, Highways England is planning to introduce SCOOT signal control as part of a separate £1.8m scheme. Bedford hopes to incorporate cycle lanes into this scheme. However, the Southern Gateway ITS strategy also needs to ensure that SCOOT control at this junction resides with Bedford, or a Centre-to-Centre interface is implemented to permit coordination between the SCOOT systems. This is because these signals are only 700m from the Cowbridge junction SCOOT signals. Also, this is a natural gating point for northbound A6 traffic flooding into the Southern Gateway in the AM peak.

### **3.3 Remote Monitoring System**

- 3.3.1 Maximising the availability of on-street technology assets helps to minimise the environmental impact of traffic and lowers operating costs. The management of congestion, safety and road user experience are all improved by effective network infrastructure management. The RMS supports the need for informed decisions in a timely manner.
- 3.3.2 Bedford will procure a Hosted RMS (Remote Monitoring System) to help manage its network where Traffic Signals are installed but not operating under the UTC (Urban Traffic Control) system.
- 3.3.3 The system gives Bedford the ability to control individual or groups of devices remotely, via the issuing of commands; operations can also be scheduled to occur at pre-defined times of the day or at any given time (e.g. planned roadworks or an emergency such as an RTA).
- 3.3.4 RMS also improves the asset management which is subsequently used for future Government funding and helps the Council to meet its aspirations as set out in TAMP (Transport Asset Management Plan) and keeping with recommendations made in the Highways Infrastructure Asset Management Plan (HIAMP) published by the UK Roads Liaison Group (UKRLG), Highways Maintenance and Efficiency Programme (HMEP).
- 3.3.5 The RMS is a cloud based, IP enabled solution, enabling all users to have remote access using standard web browser software. This approach enables the system to be hosted by the system operator. Hosting in a secure data centre (or via a cloud based solution) reduces

the level of support required by the Council's IT department and reduces responsibility on the Council to maintain its server.

- 3.3.6 It is noted the current outstation units (OMU's) are now obsolete and at the end of their design life.
- 3.3.7 The current OMU's should be replaced with the latest Peek Chameleon units. These units can utilise the latest IP based communications, as well as the traditional legacy dial up system, and are supported by the new in-station software.

### **3.4 Common Database**

- 3.4.1 The current common database has become stagnated with no future development or enhancement opportunities. It is therefore recommended that the Borough procures a new CDB. The CDB will underpin the Data Management Hub package measure.
- 3.4.2 BBC has a desire to purchase a fully comprehensive Common Database (CDB) which enables Intelligent Mobility through the effective delivery of traffic management solutions, enabling Bedford to maximise the capacity of the strategic road networks. With scalable real-time traffic management, information and control from simple monitoring to the strategic control of complex traffic environments, the CDB should help Bedford manage the increasing demands of the users of the network.
- 3.4.3 The CDB should include intelligent tools to manage and utilise data, remote monitor critical assets and control Bedford's network, providing a platform for strategic management today and in the future. The CDB should make provision for:
  - Multi-tenancy capability;
  - Web interface;
  - VMS management;
  - Crowd source journey time;
  - Journey time management;
  - Parking guidance;
  - Incident & event management; and
  - Policy based Urban Traffic Management.
- 3.4.4 This will give the Traffic Manager a comprehensive overview of what is happening within the Borough on the trunk road network.

### **3.5 IMTRAC Asset Management**

- 3.5.1 The IMTRAC asset management system has been introduced. This is the main repository for traffic signal asset data and holds the inventory, site configurations, photos, correspondence etc.
- 3.5.2 Moving forwards an interface should be developed for the Common Database allowing users to access the IMTRAC data from the mapping system within the Common Database.
- 3.5.3 In addition to this, IMTRAC has the facility to output basic site data to a CSV file which can be imported in to Insight to update the asset register.

### **3.6 Fault Management System (FMS)**

- 3.6.1 The Kolar fault management system is in use. This is a web based application providing access via any PC connected to the internet. There are no changes planned to the current FMS.
- 3.6.2 Using a web based application enables faults to be input direct from site and for the maintenance engineer to input the 'clear' information direct from site prior to leaving. The

other major benefit of using this system is that the Highways Helpdesk could view the data and advise members of the public on the current status of faults. Likewise the Client staff at BBC could also view this data, keeping them informed of the current situation.

### **3.7 Journey Time Measurement System (JTMS)**

- 3.7.1 It is recommended that consideration be given to a more cost effective method of capturing Journey Time information, which could be by procuring Crowd source journey time (e.g. mobile network operators and telematics service providers) which will be managed within the Councils future CDB.
- 3.7.2 The Council can also undertake effective Journey Time Management by utilising any upgraded equipment by integrating and sharing data from inputs such as loops, Bluetooth / WiFi MAC address detection and ANPR cameras.
- 3.7.3 Bedford has now adopted ANPR camera enforcement in Bus Lanes and now specifies this within its Policy when working with developers.
- 3.7.4 A partnership should also be formed with the Police and a link provided to the Police ANPR system. This will provide a significant data stream for the Police that can be used for intelligence gathering. The sharing of ANPR information will provide a useful tool for the Police to track vehicles through the town.
- 3.7.5 If possible, any cameras connected to the MESH network should be updated to provide full 'Police spec' capabilities, though bandwidth requirements will need to be reviewed. This should be a simple firmware update for the camera which will enable overview images to be collected and passed to the Police ANPR system. These can then be used as full evidential records.
- 3.7.6 To provide comprehensive coverage and more accurate journey time data, additional ANPR cameras should be deployed on the network.
- 3.7.7 JTM cameras and an associated Comet database were previously installed along the Ampthill Road Corridor. However these were decommissioned as, despite providing information about variations in journey times, there were no integrated tools with which to rectify identified issues, thus rendering the information very limited in its use.
- 3.7.8 ANPR technology should also be considered for bus lane and bus gate enforcement, the ANPR cameras can be used to automatically compare the number plate data with lists of permitted vehicles, with evidence packs created where an offence is believed to have taken place. This would replace any rising bollards which have historically proved unpopular with the public and require considerable maintenance.

### **3.8 Variable Message Signs (VMS)**

- 3.8.1 VMS can be a useful tool in passing network information to the travelling public. VMS can provide road users with general information about the road network. It can advise about roadworks or other incidents, allowing drivers to make Informed routing decisions. By providing road users with this information, the Authority can potentially reduce the impact of incidents and therefore congestion on the network. Individual road users will benefit by avoiding unnecessary delays.
- 3.8.2 Each VMS is controlled via the Common Database. Messages can be pre-set or 'free text' according to need. Free text allows greater flexibility but must be used with caution, as inappropriate messages can confuse drivers and add to congestion or cause dissatisfaction.
- 3.8.3 When linked to a UTM system, signs can be activated automatically according to pre-set rules and triggered by information from other systems. For instance, if key car parks were



full, a message to use Park & Ride could be set; or if the SCOOT UTC system detected congestion on a key radial, a message about delays and alternate routes set.

- 3.8.4 Legally the only legends that can appear on VMS are those contained in Schedule 15 of the Traffic Signs Regulations & General Directions. However the Traffic Management Act 2004 allows the nominated Traffic Manager for the Authority to authorise any message they deem appropriate. This can be used to cover things like local events, road closures or incidents which may require a non-generic message to be displayed. A library of 'non-standard' messages should be prepared and agreed with the Traffic Manager.
- 3.8.5 Bedford has recently procured additional VMS to support network management along the perimeters of the Urban Network, facilitate effective car park management, reduce emissions in town centre locations and to deal with efficient network management in rural locations vulnerable to flooding.
- 3.8.6 The provision of further VMS on the outskirts of Bedford will provide a useful network management tool. Proposed locations for additional signs are:
- One in-bound VMS will be installed on the Southern Gateway just north of Elstow Road;
  - A428 (western side of town) near the river bridge, before the Bedford Western bypass roundabout (possible inclusion in Bedford Western Bypass Phase 2);
  - A4280 St Neots Road, between the A421 interchange and Norse Road; and
  - A6 at the Milton Ernest end of the A6 Clapham bypass.
- 3.8.7 The existing sign on the A6 near the Park & Ride also needs to be refurbished.

### **3.9 CCTV**

- 3.9.1 To undertake management of the network UTM operators need to have vision of the network itself. CCTV is currently managed by the Community Safety Team and is not traffic focussed.
- 3.9.2 At present there are no fixed CCTV cameras for traffic monitoring and no access exists to the town centre security system. This makes both pro-active and reactive network management difficult.
- 3.9.3 Bedford has a mobile CCTV camera that can be deployed at signal sites to monitor traffic and assist with diagnosing problems.
- 3.9.4 IP CCTV operates on existing wired & wireless TCP/IP computer networks and removes the need for running separate cables for the CCTV system, making installation quick, convenient and inexpensive. As the CCTV system operates over an IP network, the cameras can be accessed by anyone on the same network. Another advantage of IP CCTV cameras is that they can connect directly to the network and no PC is required. The cameras are self-contained and supplied ready for connection.
- 3.9.5 It is proposed that a number of cameras are installed at strategic locations to assist with traffic management.

### **3.10 Real Time Passenger Information (RTPI)**

- 3.10.1 The RTPI system should be used to drive bus priority using local ACIS readers. The outputs from this unit can be used to request a priority demand either via SCOOT or locally through the controller. SCOOT would also manage the 'time recovery' process after access has been granted.
- 3.10.2 There is currently an ACIS real time bus information system in place which drives real time information at a number of bus stops and information points across the town.

- 3.10.3 The majority of the bus fleet is now equipped with real time equipment.
- 3.10.4 Bus priority at the Cowbridge site has recently been introduced which uses the bus real time information to generate priority calls.

### 3.11 Bus Priority

- 3.11.1 It is understood that the majority of local buses are equipped with transponders for detection and monitoring. However, there is inconsistency and incompatibility in the format of technology such that only some buses are recognised at traffic signals for the purposes of granting bus priority. There is also currently no system in place for measuring bus occupancy levels and delay levels and thereby offering “differential” priority at signals.
- 3.11.2 A facility was introduced as part of SCOOT 3.1 in 1995 to integrate active priority to buses or other public transport vehicles with the SCOOT UTC system. The method of doing this is described below.

- **Detection and Identification**

The SCOOT kernel software allows for buses to be detected by selective vehicle detectors (SVD), e.g. using an automatic vehicle location (AVL) system. Where SCOOT is given a bus identifier as part of the bus detection, it can match this detection with a previous detection of the same bus.

- **Optimisation**

The signal timings are optimised to benefit the buses by either extending a current green signal (an extension) or causing succeeding stages to occur early (a recall). Extensions can be awarded centrally, or the signal controller can be programmed to implement extensions locally on-street (a local extension). SCOOT can be configured by node to allow or disallow each of these methods of priority. In principle, recalls could also be awarded locally, but the timing is less critical and the extra programming of the controllers is not considered cost effective.

- **Local extension**

Extensions awarded in the controller can be advantageous as they eliminate 3 to 4 seconds transmission delay from the UTMIC outstations to the central computer and back to the outstation, and so allow the system to grant extensions to buses which arrive in the last few seconds of green. SCOOT is still in control as it sends a bit each second to permit local extensions only when the saturation of the junction is sufficiently low.

- **Recovery**

Once the bus has passed through the signals, a period of recovery occurs to bring the timings back into line with the normal SCOOT optimisation. Four methods of recovery are provided for operation after extensions and recalls, of which two methods (one for extensions and one for recalls) are recommended for normal use and operate by default.

- **Restrictions on priority**

The amount of priority given to buses can be restricted depending on the saturation of the junction as modelled by SCOOT. This is controlled by target degrees of saturation for extensions and recalls. Data from the AVL system can also be used to impose restrictions on priority and the system can be configured to only grant priority to late running buses, assuming access to timetable data; a separate Fleet Management System (FMS) may be required to confirm if the request should be issued or not.

- 3.11.3 These facilities exist on the current UTC system and should be utilised to provide intelligent bus priority. Detection should be provided via ACIS local readers or in the case of bus lanes/gates via the RTEM signature profiling unit.
- 3.11.4 New technology such as iBus transponder units and differential bus priority (DBP) using a priority system should be considered. The deployment of 4G communication equipment should be included with resilience in preparation for 5G.

### **3.12 Communication**

- 3.12.1 As far as possible, the use of the Borough's IT infrastructure should be used.
- 3.12.2 Technology has moved rapidly and where possible, IP enabled solutions should be sought (dependant on local signal strength).
- 3.12.3 MESH communication should also be upgraded along certain corridors for enhanced comms. Where possible, Fibre can be implemented but may be limited due to costs.
- 3.12.4 Current dial up BT comms lines will reportedly be decommissioned in 2020 and so Bedford must act quickly to ensure suitable comms portals are made available for the technology it intends to use on the highway network.

### **3.13 Disaster Recovery**

- 3.13.1 To provide system resilience it is proposed that a standby UTC system is provided at the CCTV control room. Assuming that the OTU's have been replaced then all that will be required is a standby Alpha.
- 3.13.2 Cloud based solutions are also becoming available for the disaster recovery centre and could present an alternative to the control room. Cloud based option could also be utilised for non-critical systems such as the JTMS and CDB, with backups to the Cloud rather than the current NAS drive.

## 4. STAKEHOLDERS

4.1.1 The technology package includes the following stakeholders who will be engaged throughout the programme:

- Existing and potential UTM systems integrators;
- 3rd party data providers: all mobile network operators and a selection of telematics service providers;
- All existing transport operators based in or serving Bedford;
- Parking operators;
- Business associations and major employers; and
- Academia (e.g. Cranfield University).

4.1.2 In addition Bedford has also formed a Bedford Technology (Transport) Task Group bringing together a panel of experts in the area to guide both the short and long term planning. The following members have already agreed to join the Task Group:

- Oxfordshire County Council, (Regional experience) – Llewelyn Morgan;
- Method City (Founder) and TravelSpirit (Chief Technology Officer) – Jeremy Dalton;
- SYSTRA (International ITS expert) – Andrew Pickford;
- Leeds ITS (Academic) – Professor Greg Marsden (invited);
- Melanie MacLeod – Bedford;
- Brian Hayward – Bedford; and
- Johnathon Sahota – Bedford.

4.1.3 Alongside the core Task Group, the following organisations will be engaged:

- Transport Systems Catapult; and
- Cranfield University.



## 4.2 Technology Strategy Principles

4.2.1 The package of measures described above will provide the opportunity to implement the following generic principles underpinning the short term ITS-based measures and longer term move towards Smart Mobility:

- Improving the visibility of the performance of the sub-regional and urban transportation infrastructure to assist with incident management, traffic advisory to network users and long-term investment planning, including use of public and 3rd party data sources;
- Improving the performance of infrastructure, at least to ensure that benefits of new infrastructure are maintained, by improving the coherence of regional and corridor traffic management systems;
- Improving the awareness of network users of network performance, availability of public transport, improved trip planning and promotion of sustainable modes through a town-wide open data strategy;
- Enhanced visibility of the performance of transport service providers, ensuring compliance with existing agreed service levels and providing a basis for dialogue on service improvements for example to support improved connectivity with MML upgrades and sufficient capacity for One Public Estate;
- Improving access for commuters and visitors;
- Improving knowledge of parking availability: whether on-street, off-street public or privately owned, through roadside variable message signs and enabling 3rd party app development, including the deployment of sensors;
- Enhanced methods of payment for transport, through use of interoperable fares;
- Improved data exchange with local and regional transport operators, and adjacent regional economic hubs, including Cambridge, Milton Keynes and Northampton to advise on HazMat (hazardous goods) vehicles, other Vehicles Of Special Interest (VOSI), regional road closures, failures of the rail network or other man-made or natural events that could impact Bedford;
- A roadmap to guide Bedford, providing resilience, links to regional activity and a platform for future developments in this space, including facilitating funding bids; and
- Encouraging and part-funding local innovation to improve accessibility, mobility and the sustainability of the transport network as a whole such as establishing defined corridors for pilots of Advanced Traffic Management, including the use of Vehicle to Infrastructure (V2I) and implementing driverless shuttles between the station, city centre and the new bus station.

## 5. DELIVERY MEASURES

### 5.1 Introduction

- 1.1. The following packages of technology interventions have been detailed above and in previous SYSTRA reports and are summarised in the table below:

**Table 1. Delivery Measures**

Interventions	Detail
Traffic Signal Control	<p>SCOOT controlled junction signals and CCTV at primary intersections along radial corridors leading into the town centre. This would be used to optimise traffic flows and prioritise bus movements, in particular from the Park &amp; Ride sites.</p> <p>Estimated Scheme Cost = £500,000 to £750,000 per corridor</p>
Variable Message Signs (VMS)	<p>VMS provision on radial corridors into Bedford providing real-time driver information on congestion, routings, car park provision, events etc.</p> <p>Estimated Scheme Cost = £50,000 per sign</p>
Journey Time Reliability (JTR)	<p>Traffic Master BaseMap system to provide a real-time JTR monitoring and analysis capability. Linked with Luton BC.</p> <p>Estimated Scheme Cost = £175,000 per corridor</p>
Network Monitoring	<p>An array of real time data from CCTV, emission stations, JTR data, bus journey time, SCOOT and streetworks database will inform the public on their choice of mode of transport and assist Bedford's traffic officers in their choice of traffic signal timings strategies.</p> <p>Estimated Scheme Cost = £200,000</p>
Communications to the public	<p>Data generated will help the public improve the timing, mode choice and routing of their journeys via VMS, LED message boards at key land uses e.g. Interchange Retail Park, websites e.g. Bedford.gov.uk and lovebedfordbusinesses.co.uk, Twitter feeds and radio stations</p> <p>Limited additional scheme costs</p>

#### Smartphone technology marketing and incentivisation

BetterPoints is a Smartphone application and web platform that uses Geographical Positioning System and other technologies to track people's movements and rewards them for reducing impact on the road network. Systems like BetterPoints are able to track actual travel carried out as well as other forms of physical activity and provide live data at any point throughout the project. This will enable frequent reviews and adaptations to the measures on the corridor.

The BetterPoints system also harnesses new technology to provide a strong incentive and reward system that assists the behaviour change process. The BetterPoints application provides a platform to not only engage a wide audience but also monitor their behaviour and provide high quality data and evidence.

Estimated Scheme Cost = £50,000 per campaign

#### Smart Mobility Roadmap

Develop a roadmap to guide Bedford, providing resilience, links to regional activity and a platform for future developments in this space, including facilitating funding bids. This will include:

**ITS development:** This is the bedrock of this strategy. The proposed package will see Bedford's end of life system updated, but it is important the technology is resilient and enabled for the likes of Connected and Autonomous vehicles.

**Datasets:** This will support the short term ITS based measures and feed the development of the Common Database. It will also provide an outlook to what is available or upcoming regionally and nationally that could be plugged into Bedford.

**Electric Vehicle Recharging:** Predicting demand, interface with parking & parking regulation, grid-related constraints, impacts on EV ownership & use, Apps and incentives for matching supply & demand

**Smart Parking Strategy:** Incorporating mode & destination choice behaviours, ITS, EV strategy, development control, parking legislation, revenue opportunities, retail/leisure impacts, enforcement and the opportunities/impacts of real-time information

**Payment systems and technology:** Everything from cash to automatic facial recognition and covering on-board, on-line and back office aspects, ease of use, public acceptance, security & opportunities for system failure & fraud

**Enabling Mobility as a Service:** Bringing together all modes of travel and encompassing different transport operators within a single mobility platform, accessing multiple applications. Using mobile data, real-time information, and associated Apps to influence the way people make decisions about travel and presenting integrated end to end purchase options, with fees linked to both the journey and experience of the service received.

Estimated Scheme Cost = £50,000



## 6. BUDGET

6.1.1 Costs have been obtained for a range of suppliers and through discussions with specialist who have implemented similar systems previously. The estimate total cost of the UTMC and Technology package is £2,059,000.

6.1.2 The base costs are detailed below.

**Table 2. Budget**

PROJECT	TOTAL COST (£K)	2018/19 (£K)	2019/20 (£K)	2020/21 (£K)
UTMC Common Database	204	204		
UTMC System	75	75		
Remote Monitoring System	230		230	
CCTV / Traffic Monitoring	275		275	
Traffic Database	220	220		
Control Room Equipment	35	35		
Traffic Signal Upgrades, Replacement and New	695	280	215	200
Signing, information and publicity systems	190	40	75	75
Travel Demand Support Initiatives	85		35	50
Smart Mobility Roadmap	50	25	25	
<b>UTMC &amp; Technology TOTAL</b>	<b>2,059</b>	<b>879</b>	<b>855</b>	<b>325</b>

6.1.3 An additional allowance for preliminaries and traffic management of £288,611 is included, as well as a further allowance for inflation, contingency and risk of £552,438 is allocated to the delivery of the package of measures. In addition, a budget for utilities of over £2.6m is incorporated within the overarching Town Centre Transport Strategy project.

## 7. VALUE FOR MONEY

### 7.1 Introduction

- 7.1.1 In addition to any absolute reduction in journey times, one of the key benefits from the proposed package of measures will be the improvements to the reliability in journey times. In particular, the ITS and TDS measures are aimed not specifically at reducing journey times but in ensuring a more consistent journey time along the corridor during peak periods.
- 7.1.2 The package of measures will aim to regulate traffic to provide more consistency, both across the peak periods but also on a day-to-day basis, increasing the resilience of the network as traffic flows into and out of the centre are regulated to avoid peak network congestion.

### 7.2 Journey Time Reliability benchmarking

- 7.2.1 To both establish the context for the provision of Urban Traffic Management and Control (UTMC) in Bedford and understand the potential benefits of implementing such a system on journey times and delay reductions, a review of other instances where UTMCs have been implemented has been undertaken.
- 7.2.2 The following documents and case studies have been reviewed:

#### Documents

- Advice Leaflet 1: The “SCOOT” Urban Traffic Control System;
- Department for Transport: Traffic Advisory Leaflet 4/95 – The “SCOOT” Urban Traffic Control System;
- Department for Transport: Traffic Advisory Leaflet 1/06 - Understanding the Benefits and Costs of Intelligent Transport Systems - A Toolkit Approach;
- TRAFFIC MANAGEMENT: Seattle deploys adaptive traffic-control system along congested corridor;
- The Institute of Highway Engineers: SCOOT: Basic Principle;
- SCATS 6: An Introduction; and
- An example of dynamic public transport priority using SCATS.

#### Case Studies

- Worcester;
- Southampton;
- Glasgow;
- Foleshill Road, Coventry.
- Seattle
- Sydney
- New South Wales

#### Advice Leaflet 1: The “SCOOT” Urban Traffic Control System

- 7.2.3 SCOOT is the (Split, Cycle and Offset Optimisation Technique) which was developed by TRL to manage and control traffic on networks. When signals are being coordinated the system “responds intelligently and continuously as traffic flow changes and fluctuates throughout the day”. SCOOT has been used in over 200 towns in over 14 countries around the world. The applications of SCOOT vary from being used in large cities such as Beijing to small networks in areas such as Heathrow Airport.

7.2.4 Detectors are essential part of a SCOOT system due to the fact that the system relies on good traffic data being provided.

7.2.5 Some of the benefits of the system are that it enables:

- Reductions in delay – compared with Vehicle Actuation (VA) (i.e. non co-ordinated) signal operation, typical delay reductions were 23% in Worcester and 30% in Southampton;
- Maximised network efficiency;
- Public transport priority – bus priority in SCOOT enables the skipping of stages in the traffic signal cycle. In London results have showed “typical average benefits of 4 seconds per bus through each junction”;
- Incident detection; and
- Vehicle emissions estimation.

7.2.6 Other benefits include that the “signal timings evolve as the traffic situation changes without any of the harmful disruption caused by changing fixed time plans”. Furthermore SCOOT can take account of unusual traffic conditions for example during events. An example of this is in *“Toronto following a baseball game, delays were reduced by 61%”*.

**Department for Transport: Traffic Advisory Leaflet 4/95 – The “SCOOT” Urban Traffic Control System**

7.2.7 The Department for Transport (DfT) suggests that the installation of a SCOOT system has the potential to reduce delays by “approximately 12% against up-to-date and 20% over a typical fixed-time system” on average.

7.2.8 It goes further to highlight the fact that SCOOT, a key part of UTMCS, “has proved to be an effective and efficient tool for managing traffic on signalised road networks”, and notes that such systems have been in use in the over 130 towns and cities within the United Kingdom and overseas since the mid-1990s.

7.2.9 The Note recognises that in comparison to alternative methods of control, SCOOT has led to delay reductions of 23% in Worcester and 30% in Southampton compared to prior to installation. It also highlights that SCOOT systems also have benefits when compared to good fixed time plans, with reductions in delays to vehicles of 12% identified in Glasgow and 27% at Foleshill Road in Coventry.

**Department for Transport: Traffic Advisory Leaflet 1/06 - Understanding the Benefits and Costs of Intelligent Transport Systems - A Toolkit Approach**

7.2.10 This information source shows that in Southampton, the use of a Parking Guidance and Information system as a part of an ITS, led to the average time spent searching for a parking space being reduced by 50%.

7.2.11 In London, the Cleopatra project found that 58% of respondents would immediately respond to VMS congestion warnings.

**TRAFFIC MANAGEMENT: Seattle deploys adaptive traffic-control system along congested corridor**

7.2.12 Seattle, USA, has introduced an *“adaptive traffic-control system to help reduce congestion along one of its busiest corridors”*. Seattle also used a SCOOT system, as described above. Seattle chose a SCOOT system due to the benefits including *“reliable travel times through the network; enhanced transit operations; reduced overall emissions and fuel consumption; and being especially effective in situations in which traffic fluctuates due to special circumstances and/or special events”*.

- 7.2.13 A total of 32 junctions in Seattle are operational with SCOOT with positive results, for example in an eastbound direction drivers have seen are moving at an average of 2.7 minutes faster and also experiencing increasing journey time reliability, this has increased by 38%.

#### **SCOOT: Basic Principle – The Institute of Highway Engineers**

- 7.2.14 The Institute of Highway Engineers argues that UTC/SCOOT Systems are extremely cost effective, stating that “almost all systems repay their capital costs within one year”.

**Table 3. Data Table – SCOOT vs Alternative Methods**

LOCATION	DELAY REDUCTION
Worcester	23%
Southampton	30%

**Table 4. SCOOT vs Fixed time plans**

LOCATION	DELAY REDUCTION
Glasgow	12%
Folsehill Road (Coventry)	27%

#### **SCATS 6: An Introduction**

- 7.2.15 SCATS, or Sydney Coordinated Adaptive Traffic System, is a key example of a well-developed and sophisticated adaptive traffic control system. “SCATS tracks critical traffic demand to adjust the effective road capacity with cycle time changes and optimises phase (or stage) times to fit the varying demands of competing movements.”
- 7.2.16 “At the tactical level: SCATS responds in real-time to significant changes in the traffic state to reduce inefficiencies through terminating under-utilised movements and to capture efficiencies by re-allocating time to competing movements.”
- 7.2.17 “SCATS interfaces with public transport priority systems that include the more traditional forms such as bus lane or dedicated tram detection, and the more sophisticated tracking of public transport vehicles. For example, in Sydney, thousands of buses are tracked through the road network using GPS and SCATS reschedules appropriate traffic signals in real-time to provide higher levels of service to individual tracked buses.”
- 7.2.18 A study of the value of SCATS indicated that “comparative reductions of physical costs for vehicles of 28% travel time and 25% stops were determined”. “The total cost reductions were interpreted as a total opportunity cost saving of AUD \$24,020,102 or 28% of the total cost at 2009 values for 24 hours for all vehicles across the Sydney metropolis.”

#### **An example of dynamic public transport priority using SCATS**

- 7.2.19 SCATS operates in New South Wales, Australia and is an example of a dynamic traffic signal priority. SCATS in New South Wales adapts to priority requests and adjusts in real-time. The



system here operates at selected junctions, reacting to a selection of public transport buses; effectively what occurs is the *“rescheduling of traffic signals in real-time to advantage the travel of select, individually-tracked vehicles”*.

- 7.2.20 SCATS can ensure traffic signal phases can be skipped to allow priority to the public transport vehicles however in New South Wales SCATS operates in a different manner. In New South Wales phases are not skipped they are just terminated early, at the their minimum time.
- 7.2.21 The New South Wales SCATS system is a large scale system that *“facilitates approximately forty thousand prioritisation requests and twenty thousand prioritisation terminations a weekday”*. Furthermore, after a change in traffic signals for prioritisation SCATS detector measurements analyse the effects and subsequent responses in scheduling of the traffic signals allow recovery.

### 7.3 Benefits

- 7.3.1 The technology package is considered to be dealing with a greenfield scheme on the basis that the current ITS equipment is fragmented and there has been limited integration to date which has rendered the provision less effective at managing the transport network than it could have been. Furthermore, the equipment has now reached end of life.
- 7.3.2 The benefits of this package of measures will cover a range of outputs and outcomes, including but not limited to: reduced congestion, long-term capacity planning, incident management, improved public transport (reduced delay), improved road safety, reduced fuel consumption and emissions, better assets management and more choice for the general public.
- 7.3.3 For the purpose of this benefit analysis we have assessed one metric, the total level of delay at each of the junctions listed below in the AM and PM peak (junction delay in seconds) in the 2021 baseline model.
- 7.3.4 The following junctions will be signalised, or current provision reviewed and upgraded to feed into the Urban Traffic Management and Control (UTMC) system:
- Clapham Road / Manton Lane / Shakespeare Road;
  - Bromham Road / Shakespeare Road / Ashburnham Road;
  - Midland Road / River Street;
  - Bromham Road / Union Street / Greyfriars;
  - Bromham Road / Hassett Street;
  - Dame Alice Street / The Broadway / St Peter’s Street / High Street;
  - St Peter’s Street / St Cuthbert’s Street;
  - St Mary’s Street / Cardington Road / St John’s Street / Cauldwell Street;
  - Cauldwell Street / Kingsway;
  - Cauldwell Street / Prebend Street;
  - Kempston Road / Britannia Road / Cauldwell Street;
  - Britannia Road / Ampthill Road;
  - Elstow Road / London Road;
  - Elstow Road / Ampthill Road;
  - Ampthill Road / West End / A6;
  - Dame Alice Street / Harpur Street;
  - Tavistock Street / Harpur Street;
  - Ampthill Road (North of Cowbridge) ; and
  - Ampthill Road (South of Cowbridge)
- 7.3.5 The model shows 519 and 413 AM and PM peak hours of delay each weekday.

- 7.3.6 The associated 'Bedford UTMC and Technology Package Note' sets out a range of benchmarking case studies that establish a range of benefits derived from these types of schemes. Whilst there is relatively limited recent evidence, there are some useful examples that are directly relevant to Bedford, given the underlying basis that the current traffic management systems in the town are obsolete and so the scheme is, effectively, starting from a position with no underlying system. The evidence base indicates a range of delay reductions between 12% and 30%, with an average of 23%.
- 7.3.7 This evidence base has been utilised to determine the potential impact of the scheme in reducing delay across the junctions outlined above. A relatively conservative approach has been adopted as follows:
- 17.3% Central Case (75% of the average Case Study benefits)
  - 23% High (100% of the average Case Study benefits)
  - 11.5% Low (50% of the average Case Study benefits)
- 7.3.8 The Central Case represented three quarters of the average benefits derived within the case study examples. In reality, with the continued progression of technological systems, it would be anticipated that much higher benefits are likely to be derived up to or exceeding the 30% benefits observed in the scheme in Southampton.
- 7.3.9 The Central Case journey time savings are forecast to be equivalent to 241 hours across a typical weekday, incorporating two 90 minute peak periods. In reality, the systems should also deliver additional benefits across other time periods in the week through better routing of traffic and phasing of traffic signals.

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The SYSTRA logo is rendered in a bold, red, sans-serif typeface. The letters are thick and closely spaced, with a modern, slightly geometric feel. The 'S' and 'Y' are particularly prominent due to their size and the way they connect to the following letters.

# BEDFORD TOWN CENTRE TRANSPORT STRATEGY

## Bedford Town Centre Transport Strategy: Stakeholder Management Plan (including Travel Demand Management) – Technical Note

### IDENTIFICATION TABLE

Client/Project owner	Bedford Borough Council
Project	Bedford Town Centre Transport Strategy
Study	Bedford Town Centre Transport Strategy: Stakeholder Management Plan (including Travel Demand Management)
Type of document	Technical Note
Date	19/10/2017
File name	Bedford Town Centre Pinch-
Reference number	105251/GB01T14A88
Number of pages	

### APPROVAL

Version	Name		Position	Date	Modifications
1	Author	JB/KH	SYSTRA	16/10/17	initial
	Checked by	BH	PM	18/10/17	
	Approved by	BH	PM	19/10/17	
2	Author				
	Checked by				
	Approved by				



## 1. Background

- 1.1. This note has been produced in support of the Business Case for improvements to Bedford Town Centre, to be submitted to the LEP.
- 1.2. The purpose of this note is to set out a Stakeholder Management Plan (SMP) to outline how wider stakeholder and community interests will be involved in the Bedford Town Centre Transport Strategy. The aim of the SMP will be to:
  - Communicate the aims and objectives of Bedford Town Centre Transport Strategy to stakeholders and enable consultation to refine individual component projects;
  - Influence stakeholders through communication of a Travel Demand Management (TDM) strategy at the Delivery stage.
- 1.3. Regarding the second aim, TDM provides enhanced information and travel advice during construction periods to mitigate congestion and reduce customer impact. TDM uses the '4R Principle' of encouraging drivers to 'Reduce', 'Remode', 'Retime', 'Reroute'.<sup>1</sup>
- 1.4. The SMP will therefore assist in keeping stakeholders informed, upholding the reputation of Bedford Borough Council (BBC) during the construction period and ensure wider stakeholder support for the Bedford Town Centre Transport Strategy.

## 2. Key Engagement Issues

- 2.1. The Bedford Town Centre Transport Strategy has three distinct themes:

### **Public Realm**

- Improvements in the town centre public realm focussed on Bedford High Street as the main area of pedestrian/vehicle conflict and on existing pedestrian areas most in need of revitalisation in Allhallows and St Paul's Square, to improve the quality of the environment for users of the town centre.

### **Managing Congestion**

- A widespread programme of small/medium scale infrastructure improvements focussed on the most severe junction pinch-points where worthwhile increases in capacity and reliability are justified and will benefit all road users.

### **Intelligent Transport Corridor**

- A major upgrade to existing traffic management systems across the whole Town Centre and Southern Gateway area to provide the maximum delay reductions possible, provide real-time information to drivers to support their decision-making, and to be ready to incorporate emerging/future technology on Cooperative Intelligent Transport Systems (C-ITS), Expressway driver information systems, autonomous vehicles and Mobility as a Service (MaaS) technology.

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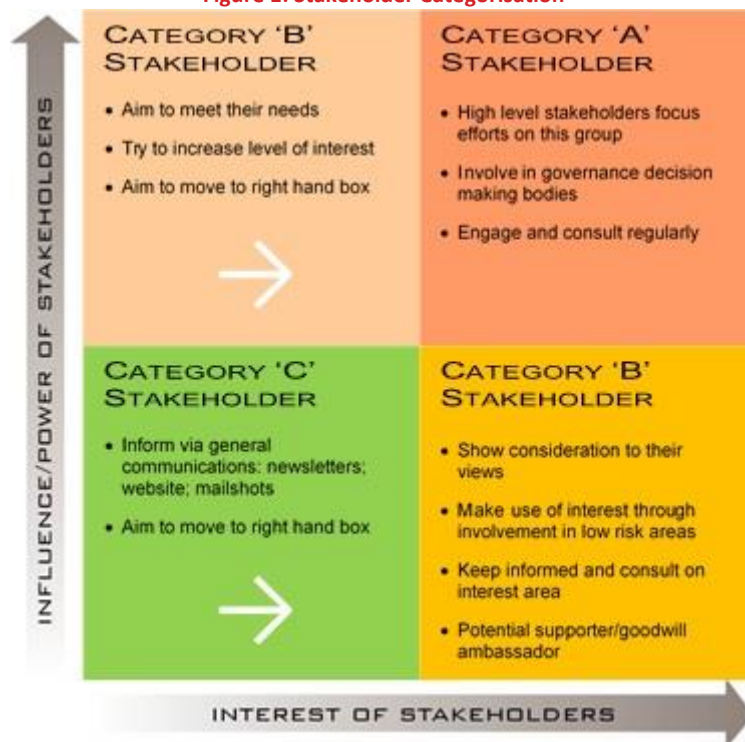
<sup>1</sup> Research by TfL has shown that TDM can influence around 14% of frequent drivers to change their behaviour during the time of construction because of enhanced communications resulting in up to 30% reduction in background traffic. The monetised social benefit of the behaviour change set against the cost of enhanced communications generates a BCR of more than 4:1.

- 2.2. Key stakeholder engagement has already been undertaken and is documented in supporting documents. This stakeholder engagement includes:
- Public Realm Stakeholder Engagement relating to Bedford High Street in August 2017;
  - One Public Estate (2016);
  - Citizens Panel (Ongoing);
  - Network Rail (2016 & 2017).
- 2.3. The components of the strategy are conceptually different, are spread across an area (rather than having a clear single location) and will be delivered as a series of discrete projects. There will also be the potential for confusion with other highway works, such as routine maintenance and utility repairs/upgrades. As well as these factors, elements may change because of technological changes and new funding sources becoming available.
- 2.4. Communicating the three workstreams as one coherent programme that demonstrates how they support each other will be a key narrative to give to stakeholders. In addition, communicating the construction impacts of the programme to stakeholders in advance will enable congestion to be managed during the periods of roadworks which are as a direct result of the Bedford Town Centre Transport Strategy as well as other highway works.

### **3. Stakeholders**

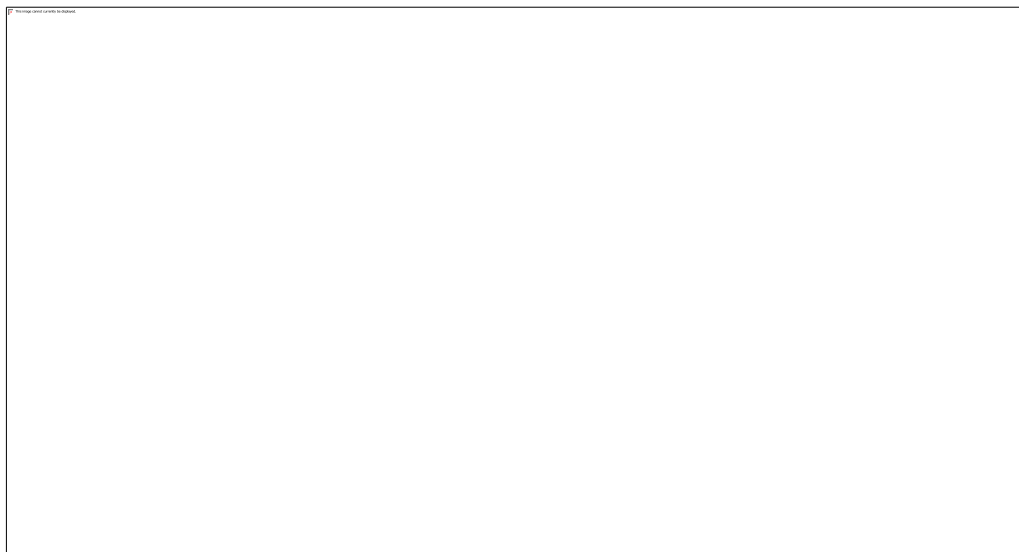
- 3.1. In order that the stakeholder engagement is efficient and effective the stakeholders have been categorised as 'A', 'B' and 'C' stakeholders to ensure that the most appropriate engagement methods are used with different stakeholders. Categorising stakeholders is crucial to the success of the Transport Strategy because there are many groups that will be influential in key decisions.
- 3.2. For example, 'Category A' stakeholders have a high political interest and are powerful enough to offer significant support with planning and delivering transport schemes, whilst stakeholders with lower levels of interest and influence need to be kept informed but require less stakeholder engagement resources.
- 3.3. Figure 1 below shows the categorisation.

Figure 1: Stakeholder Categorisation



- 3.4. Using this approach, we have broadly categorised stakeholders based on influence and interest (see Table 1) and then applied appropriate communication methods so that the SMP is efficient and cost-effective. The diagram below (Figure 2) illustrates the relationship between stakeholder influence/power and stakeholder engagement approaches.

**Figure 2: Relationship between stakeholder influence/power and stakeholder engagement approaches**



- 3.5. Table 1 provides an outline categorisation of known stakeholders, although this list will be refined throughout the SMP process.

**Table 1: Categorisation of stakeholders**

<b>Stakeholder Category</b>	<b>Stakeholder Groups</b>	<b>Engagement Method</b>
Category A Stakeholders (Power & Interest)	Bedford Borough Council – Environment, Transport, Planning, Economic Development One Public Estate SEMLEP transport officers group DfT and CLG contacts Key landowners and developers Network Rail Ward Councillors	<b>Partnership</b> via meetings or workshops
Category B Stakeholders (Power)	MPs	<b>Participation</b> via meetings or focus groups and reports



Category B Stakeholders (Interest)	<p>Adjacent authorities</p> <p>England's Economic Heartland</p> <p><b>Town Centre Organisations:</b></p> <p>Bedford BID (and its members)</p> <p>Bedfordshire Chamber of Commerce</p> <p>Bedford Business Breakfast</p> <p>Green Business Network</p> <p>Federation of small businesses</p> <p>Bedford High St THI Board</p> <p>Harpur Trust schools</p> <p>Bedford College</p> <p>University of Bedfordshire</p> <p>NHS Trust</p> <p><b>Transport Groups:</b></p> <p>Cycle Strategy Group (and all its member groups)</p> <p>Bedford Commuters Association</p> <p>Bedford Bus Users Group</p> <p>Marston Vale Community Rail Partnership</p> <p>Stagecoach</p> <p>Grant Palmer</p> <p>Taxi and Private Hire Associations</p> <p>East Midlands Trains</p> <p>Govia Thameslink Railway</p> <p>RAC</p> <p>Freight Haulier Groups</p> <p>Utility Representatives</p>	<p><b>Consultation</b> via workshops or telephone interviews</p>
Category C Stakeholders	<p>Residents</p> <p>Resident groups</p> <p>Public</p>	<p><b>Information provision</b> via letters, exhibition, email, brochures, webpages, newsletters, social media, adverts, digital adverts.</p>

## 4. Our Approach to Engagement

- 4.1. The approach to engagement set out below will involve the preparation of four strands of engagement work focused around 'Introduction', 'Detailed Design' and 'Delivery'. The first two elements will focus on the three workstreams of 'public realm', 'managing congestion' and 'intelligent transport corridor'. The 'Delivery' element will focus on 'Travel Demand Management'.



## Stage 1: Introduction to the Bedford Town Centre Transport Strategy (December 2017 – February 2018)

### Category A Stakeholders

- 4.2. Initial consultation will be held with the Category A Stakeholders in December 2017. The purpose of this consultation will be to:
- Explain the process to date;
  - Explain the decisions taken by Bedford Borough Council and SEMLEP;
  - Gather views;
  - Identify additional stakeholders to engage and the important issues for key groups;
  - Discuss how best to inform Category A, B and C stakeholders about the developing programme and the construction and roadworks programme to mitigate congestion through travel demand management.
- 4.3. For this initial consultation, we will carry out an **‘all workstreams’ workshop** within Bedford Borough Council with Councillors and staff to explain the planned programme of investment and gain insight that will inform ongoing engagement.
- 4.4. A key output of this workshop will be to confirm a complete list of stakeholders and categorise them as follows:
- Those who will **benefit** (directly or indirectly) from the scheme;
  - Those **affected** (directly or indirectly);
  - Those who may have an **interest** without being directly affected;
  - Those with a **statutory** role; and
  - Those involved in the **funding** of the scheme.
- 4.5. We have already identified and engaged with some of the stakeholders listed in Table 1. Confirming and adding to our list of stakeholders at the workshop will ensure our ongoing engagement is comprehensive and facilitates stakeholder support of the projects.
- 4.6. Following the workshop, we will carry out **telephone interviews** with key Category B stakeholders identified at the workshop. The workshop and interviews will shape our ongoing consultation. From previous stakeholder engagement we are aware that some stakeholders (particularly the transport groups), are more interested in the ‘intelligent transport corridor’ workstream, key businesses near key junctions are interested in the ‘managing congestion’ workstream whereas retailers are interested in the ‘public realm’ workstream. We will tailor our conversations to cater to the interest identified.

### Category C Stakeholders

- 4.7. We will utilise a range of media to communicate with Category C stakeholders to ensure maximum reach. This will include:
- Press releases
  - A social media campaign to engage large audiences based on their interests (what they have previously ‘liked’);

- Engaging business networks to talk directly to the business community about issues that are relevant to them;
- Use of the council's own channels to reach the public (local press, resident groups) to engage the general public.

4.8. Therefore, at Stage 1 we will:

- Issue a press release in December to engage the general public about the Bedford Town Centre Transport Strategy;
- Attend business networking events to inform the business community;
- Develop a webpage situated on BCC website to communicate the strategy and encourage sign up to quarterly e-newsletters;
- Issue the first of a quarterly e-newsletter as an initial consultation and communication leaflet to Category C stakeholders.
- Publish a leaflet outlining the strategy
- Hold public exhibitions at key locations in the Borough

## **Stage 2: Detailed Design of the Bedford Town Centre Transport Strategy (February 2018 ongoing)**

### **Category A Stakeholders**

- 4.9. Monthly meetings will be held with the Category A stakeholders regarding the Bedford Town Centre Transport Strategy. The meetings will cover all the workstreams to ensure the linkages are made and communicated. It is likely that this meeting can be included as part of an existing meeting e.g. Bedford Congestion Meeting.
- 4.10. A specific market testing event will be held regarding the **intelligent transport corridor** work stream. The purpose of the event will be to identify what is possible within Bedford in terms of technological interventions. Invitees will include Category A stakeholders as well as technology providers who can offer solutions to Bedford.

### **Category B Stakeholders**

- 4.11. As the strategy moves towards implementation it will be important to engage with Category B stakeholders to reassure them of the improvements that will be made as a result of the programme. Table 2 shows the key messages that the SMP will focus on for these groups.

**Table 2: Category B Stakeholder interests**

<b>Work packages</b>	<b>Stakeholders</b>	<b>Key Issues / Messaging</b>
Public Realm	Town centre retailers	Footfall
	Town centre businesses	Deliveries
	Utility companies	Access to infrastructure
Managing Congestion	Businesses	Access Commuting Deliveries
Intelligent Transport Corridor	Transport groups	The effect on various modes of travel

- 4.12. A meeting will be held with town centre retailers and businesses and businesses located adjacent to key pinch-points. The meeting will present the developing public realm narrative and provide an update on the design of junction schemes as well as the intelligent transport corridor approach. Illustrations of the work to be undertaken in Bedford Town Centre on the public realm, pinch-points and technology will be outlined and the timescales, costs and benefits communicated. The meeting will include an opportunity for stakeholders to provide further input into the design of the schemes. Those unable to attend the meeting will be issued with a letter summarising the meeting that will outline the developing programme of works.

#### **Category C Stakeholders**

- 4.13. At Stage 2 we will:
- Regularly update the webpages on BBC's website and encourage sign up to quarterly e-newsletters;
  - A public exhibition will be held in a convenient and well-known town centre location, and be open for a 1 week period where people can drop in and view the exhibition materials with timeslots for when proposals can be discussed face-to-face;
  - Issue quarterly e-newsletters to those signed up to update stakeholders on the design of the strategy;
  - Social media campaign.
- 4.14. Key messages to be communicated to the Category C stakeholders will be on quality of life improvements, congestion reduction and journey time reliability.

### **Stage 3: Delivery of the Bedford Town Centre Transport Strategy (April 2018 ongoing)**

#### **Category A Stakeholders**

- 4.15. Regular meetings (as outlined above) held to cover Stage 3 Delivery. A key focus of the meetings will be to discuss the Travel Demand Management strategy and how to ensure effective communication of TDM to Category B and C stakeholders.

#### **Category B Stakeholders**

- 4.16. A TDM programme will engage Category B stakeholders to disseminate key messages to residents and employees (Category C stakeholders). The purpose of the TDM programme is to:
- Deal with road safety risks, particularly for non-motorised users such as pedestrians and cyclists.
  - Maximise the opportunities for managing travel, particularly to encourage modal shift through increased levels of walking and cycling.
  - Achieve reliability and consistency of journey times across Bedford during construction of the schemes.
- 4.17. To maximise impact, we will:
- Engage one-to-one with businesses and educational establishments within 400m of the construction site. In addition, we will also communicate with community groups and influencers (MPs, Councillors) throughout the construction period;





- Manage the risk of congestion by creating a database of 'hotspot' junctions and routes affected by construction;
- Create weekly calendars, with a red, amber and green warning system on likely impact of construction work at key locations;
- Plan communications around construction activities and communicate to affected businesses, educational establishments and community groups in an efficient and timely manner based on the 4R's e.g. 'Remode', 'Retime', 'Reroute', 'Reduce';
- Build road safety into our messaging;
- Work with Category B stakeholders in advance of major disruption to ensure measures are introduced to support site users change journeys when disruption occurs. This may include introducing more flexible working arrangements, changing mode, etc.

4.18. The TDM strategy will be communicated to Category B stakeholders through business network meetings, schools' meetings and community groups. For key stakeholders who have significant reach, face-to-face communication will be arranged initially with subsequent information provided by email and website updates.

### **Category C Stakeholders**

4.19. At Stage 3 we will:

- Issue quarterly e-newsletters to update Category C stakeholders on the delivery of the strategy and to communicate the 4Rs;
- Update the website with information about hotspots;
- Use social media to communicate to the public.
- Make use of on street Variable message signs (VMS) to deliver key messages



## 5. Summary of the SMP

### 5.1. The SMP can be summarised as follows:

Stage 1	Introduction to Bedford Town Centre Transport Strategy		
Stakeholders to be involved/contacted	Category A <ul style="list-style-type: none"> <li>• Bedford Borough Council – Environment, Transport, Planning, Economic Development</li> <li>• One Public Estate</li> <li>• SEMLEP transport officers group</li> <li>• DfT and CLG contacts</li> <li>• Key landowners and developers</li> <li>• Network Rail</li> <li>• Ward Councillors</li> </ul>	Category B <ul style="list-style-type: none"> <li>• To be agreed with Category A Stakeholders at workshop</li> </ul>	Category C <ul style="list-style-type: none"> <li>• Public</li> </ul>
Method of engagement	<ul style="list-style-type: none"> <li>• Workshop</li> </ul>	<ul style="list-style-type: none"> <li>• Telephone interviews</li> </ul>	<ul style="list-style-type: none"> <li>• Press release</li> <li>• Business networking events</li> <li>• Webpage</li> <li>• First quarterly e-newsletter</li> <li>• Leaflet</li> <li>• Exhibition</li> </ul>



Stage 2	Detailed Design of Bedford Town Centre Transport Strategy		
Stakeholders to be involved/contacted	Category A <ul style="list-style-type: none"> <li>• Bedford Borough Council – Environment, Transport, Planning, Economic Development</li> <li>• One Public Estate</li> </ul>	Category B <ul style="list-style-type: none"> <li>• Town centre retailers</li> <li>• Town centre businesses</li> <li>• Utility companies</li> <li>• Businesses</li> <li>• Transport groups</li> </ul>	Category C <ul style="list-style-type: none"> <li>• Public</li> </ul>
Method of engagement	<ul style="list-style-type: none"> <li>• Monthly meetings</li> <li>• Market testing of emerging technologies for Intelligent</li> </ul>	<ul style="list-style-type: none"> <li>• Meeting</li> <li>• Letter</li> </ul>	<ul style="list-style-type: none"> <li>• Website</li> <li>• Exhibition</li> <li>• Quarterly e-newsletter</li> <li>• Social media</li> </ul>

	Transport Corridor		
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Stage 3	Delivery of the Bedford Town Centre Transport Strategy		
Stakeholders to be involved/contacted	Category A <ul style="list-style-type: none"> <li>Bedford Borough Council – Environment, Transport, Planning, Economic Development</li> <li>One Public Estate</li> </ul>	Category B <ul style="list-style-type: none"> <li>Businesses</li> <li>Educational establishments</li> <li>Community groups</li> <li>Key influencers</li> </ul>	Category C <ul style="list-style-type: none"> <li>Residents</li> <li>Employees</li> <li>Public</li> </ul>
Method of engagement	<ul style="list-style-type: none"> <li>Monthly meetings</li> </ul>	<ul style="list-style-type: none"> <li>Meetings</li> <li>Email</li> <li>Website</li> </ul>	<ul style="list-style-type: none"> <li>Website</li> <li>Quarterly e-newsletter</li> <li>Social media</li> <li>VMS</li> </ul>

