



St Botolph's Circus Stage 2 Technical Report v1.0

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Document prepared by:

Katherine Carr &
Graham Dean

Transport Planning
Victoria House
Chelmsford
CM1 1JR

T
E
W

0845 603 7631
Katherine.Carr@jacobs.com
www.essex.gov.uk/highways

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Abbreviations and Acronyms

| | |
|-----------------|---|
| AEP | Annual Exceedance Probability |
| AQMA | Air Quality Management Area |
| AQO | Air Quality Objective |
| ARN | Affected Road Network |
| ATF | Active Travel Fund |
| BID | Business Improvement District |
| CCC / CBC | Colchester City Council, previously Colchester Borough Council |
| CCMP | (Colchester) City Centre Masterplan |
| CCTP | (Colchester) City Centre Transport Plan |
| CDA | Critical Drainage Area |
| CFTS | Colchester Future Transport Strategy |
| Defra | Department for Environment Food Rural Affairs |
| DLUHC | Department for Levelling Up, Housing and Communities |
| DMRB | Design Manual for Roads and Bridges |
| ECC | Essex County Council |
| GCN | Great Crested Newt |
| HIF | Housing Infrastructure Fund |
| IMD | Index of Multiple Deprivation |
| LCA | Landscape Character Areas |
| LCT | Landscape Character Types |
| LCWIP | Local Cycling Walking Infrastructure Plan |
| LNR | Local Nature Reserve |
| LoWS | Local Wildlife Sites |
| LSOA | Lower-layer Super Output Areas |
| LTN1/20 | Local Transport Note 1/20 (Government guidance on cycling infrastructure) |
| LUF | Levelling Up Fund |
| MCA | Multi-Criteria Assessment |
| MHCLG | Ministry of Housing, Communities & Local Government |
| MPCM | (Essex Highways') Major Projects Contract Manual |
| NCA | National Character Area |
| NIA | Noise Important Areas |
| NO ₂ | Nitrogen Dioxide |
| NPPF | National Planning Policy Framework |
| RAG | Red-Amber-Green (classification) |
| RoFSW | Risk of Flooding from Surface Water |
| RTS | Rapid Transit Scheme |
| SELEP | South East Local Enterprise Partnership |

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| SuDS | Sustainable Drainage Systems |
| SWMP | Surface Water Management Plan |
| TCA | Townscape Character Areas |
| TCBGC | Tendring Colchester Borders Garden Community |
| TCT | Townscape Character Types |
| TPO | Tree Preservation Order |
| VoC | Volume over Capacity |

0 Executive Summary

Essex Highways (EH) has been commissioned by Essex County Council (ECC) to develop and appraise traffic and public realm improvement options for the St Botolph's junction, also known as St Botolph's Circus, in Colchester.

This work has been undertaken as Stage 2 (Scheme Identification) as defined in the Essex Highways' Major Projects Contract Manual (MPCM).

0.1 Background and context

Colchester City Council (CCC), in partnership with ECC, has been awarded £19.66m from the Government's Levelling-Up Fund (LUF) to support improvements to Colchester's city centre.

The LUF monies will be spent on several high-profile projects that focus on improving the feel of the city centre and tackling poor air quality and traffic congestion. One of these projects is a new layout at St Botolph's roundabout, with a funding allocation of £11.8m.

The St Botolph's scheme aims to:

- Create a good quality urban realm and gateway to the city centre.
- Develop an improved, safer environment for everyone.
- Improve connectivity for communities to local and wider transport networks through bus, rapid transit and rail services and walking and cycling routes.
- Ensure an inclusive and accessible area for all.
- Balance the requirements of different travel modes
- Reduce anti-social behaviour and the fear of crime.
- Improve health and wellbeing for Colchester residents.
- Increase footfall to encourage wider economic growth of the area, provide development opportunities and support local business.

One option - a public realm orientated plaza-style highway - was presented for the LUF bid. Following the award of funding and as part of the option development, four additional options were developed. An initial sift was undertaken on all five options including the scheme submitted for the LUF bid, with three progressing to optioneering and appraisal to identify a preferred option for public consultation and next steps.

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This report documents the work undertaken to generate and assess the five options for the St Botolph's roundabout and outlining the preferred option which was consulted on.

Following the consultation and engagement in June and July 2023 there was additional technical input and refinement to the scheme design, taking into account common feedback themes and the need for the scheme to remain affordable within the LUF budget. This resulted in a new elliptical roundabout design.

To enable Officers to provide and present a coherent evidence base, the report details:

- the option appraisal process, demonstrating clear links with key local and national strategic policy frameworks;
- the option taken forward for consultation; and
- the development of the elliptical roundabout design which is recommended to be progressed in the next stage of Preliminary Design.

0.2 Option development and overview

An assessment of the viability of on original public realm orientated 'plaza-style' highway scheme (developed prior to the LUF bid) was undertaken. In July 2021 CCC's Leader and Cabinet meeting agreed to look at alternative highway layouts.

As a result, the Option 1 plaza scheme was developed for the LUF Bid, with an additional four options (2 to 5) being developed in early 2023 as part of Stage 2 option appraisal work. These options are detailed below:

- Option 1 – the original public realm orientated plaza'-style highway scheme, submitted for the LUF bid in 2022.
- Option 2 – a simpler, and more refined version of the Option 1 concept, with a crossroad junction layout
- Option 3 – as Option 2 above, but with a left-turn slip road eastbound from A134 Southway into 'up' vehicle ramp of the Osborne Street NCP car park. Also, a very small eastbound bus lane on Southway to the junction.
- Option 4 – a variation of Option 2 with the introduction of a dedicated left turn slip road eastbound from A134 Southway into St Botolph's Street and for Osborne Street.

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- Option 5 – another variation of Option 2 described above, but with an extra pedestrian and cycle crossing on the western arm of the crossroad for active travel movements from north to south and vice-versa.

Whilst Option 3 removed a limited amount of traffic from the junction and from St Botolph's Street and Osborne Street, it was not taken any further due to concerns about the very short slip-road from A134 Southway into the car park and the risk of traffic backing onto Southway from the access ramp. There was a high risk of rear-end collisions if there was any slight delay to traffic accessing the car-park. Also the extra car park access would cut across the pavement to the south of the NCP car park.

Option 5 was not taken further in the assessment process due to the negative impacts on highway capacity caused by the extra pedestrian and cycle crossing to the west of the junction, which is mostly duplicated by the new pedestrian / cycle crossing across Southway to Stanwell Street.

Options 1, 2 and 4 were carried forward to the multi-criteria assessment (MCA) stage. The MCA was used to identify the relative performance of each option with quantitative and qualitative criteria including traffic flow, degree of saturation, alignment with LTN1/20, journey quality for pedestrians and cyclists, air quality, noise, bus journey times, enhancements to the public realm, costs, and deliverability.

0.3 Summary of findings

All three options (options 1, 2 and 4) were compared with the Do Nothing or Do Minimum baseline scenario/current situation for **network performance** (traffic flow, degree of saturation, delay, journey time and re-routing of public transport). Overall, Option 1 (plaza layout) outperforms Options 2 and Option 4 – although it does force extra traffic through Osborne Street which would have a negative impact on bus operations.

Quantitative and qualitative impacts for **walking and cycling** were assessed. Option 1 presents the shortest journey times, but Option 2 (crossroads layout) provides the most benefit to pedestrians and cyclists.

All three options scored similarly, with minimal differentiators, for **environment**. Option 1 did show a deterioration in air quality along Osborne Street, caused by increase numbers of vehicles.

Impacts on **public transport** (access to the bus station and road layout changes) were assessed. Overall, Option 1 (plaza layout) and Option 2

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(crossroads layout) provide the highest quality of interchange and sense of arrival. Option 3 scored lower due to more moderate improvements in public realm design, sight lines and wayfinding.

People and place based **urban design and placemaking** considerations were at the heart of the original (Option 1) submission. Option 1 (plaza layout) provides a larger reclaimed public space area but Option 2 (crossroads layout) provide better connectivity and more pedestrian crossing opportunities.

All three options were scored equally for **buildability**.

0.4 Consulted option

The best performing of the five options, based on the sifting, MCA, traffic modelling and environmental assessments, is **Option 2** (crossroads layout). This is the option that was consulted on.

The existing St Botolph's roundabout is prime example of a poor public realm that reinforces severance and prevents the use of sustainable travel modes. The proposed / consulted scheme aimed to regenerate and enhance the public realm creating a 'gateway' feature, aligned with the CCMP.

Option 2 presented the best opportunity of the five assessed options to realise LUF objectives with minimal effect on highway capacity and whilst enhancing the provision for pedestrians, cyclists and public transport operations.

0.5 Development of the elliptical roundabout

A buildability and cost review of the consulted option alongside feedback from the public consultation for the CCMP (where the consulted option was presented), resulted in a design review of the consulted option. This resulted in an elliptical roundabout configuration.

Overall, the elliptical roundabout performs better than the consulted option and is considered to provide a balanced response to achieving public realm and accessibility improvements. It is also affordable within the agreed LUF allocation, and can be constructed in a shorter period than the consulted option which will mean less disruption to Colchester residents and visitors.

0.6 Next steps

EH recommends that ECC works closely with CCC to develop a Stage 3A preliminary design and then a Stage 3C detailed design of the elliptical configuration. This will enable the scheme to be tendered and taken forward to

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commence construction in the summer of 2025, with completion in very early 2027.

1 Introduction

Essex Highways (EH) have been commissioned by Essex County Council (ECC) to develop and appraise traffic and public realm improvement options for the St Botolph's roundabout in Colchester.

This work has been undertaken as Stage 2 (Scheme Identification) as defined in the Essex Highways' Major Projects Contract Manual (MPCM).

It should be noted that Colchester was awarded city status in November 2022 so it is referred to as a town in policy documents prior to that time, but as a city since then and in the current context. However, Colchester Town railway station (next to Botolph's) still uses that name.

1.1 Background and context

Colchester City Council (CCC) sought capital funding through the Levelling Up Fund (LUF) 2, for a series of infrastructure interventions in the south-east of Colchester city centre, with the intention to regenerate this gateway to the central area of Colchester. Funding was awarded in February 2023, with the St Botolph's roundabout being a significant focus of the award and receiving £9.3m of the overall funding, supported by an additional £2.5m of Section 106 funding to give a total scheme budget of £11.8m

The illustrative design proposed in the LUF bid, aims to reclaim road space to enable enhanced public realm, greening, seating for social interactions and a space for pop up kiosks that can provide a platform for local businesses and activate this key gateway node. By removing the outdated subways that have been associated with anti-social behaviour, the improvements at St Botolph's aim to play a part in reducing crime and the perception of crime that should help make walking and cycling more attractive to a wider area in the city centre's catchment.

A public realm orientated plaza-style layout was presented for the LUF bid. Following the award of funding, four additional options were developed. An initial sift was undertaken on all five options (included the LUF submitted design), with three options progressing to optioneering and appraisal to identify a preferred option to be consulted on.

This report documents the work undertaken to generate and assess the five options for the St Botolph's roundabout and the resulting preferred option review. This report also described the development of the consulted option following feedback and the resulting elliptical roundabout design.

1.2 Location and Description

The St Botolph's Roundabout is situated to the south of Colchester city centre on the A134 Southway at its junction with St Botolph's Street, Mersea Road and Magdalen Street. The site functions as a large 'gateway' to the city centre.

Dominant highway infrastructure, poor streetscape and a high intrusion of traffic currently has a negative impact on the character of the streetscape/ townscape and has eroded any sense of 'arrival' for visitors.

The study area for this Stage 2 work is shown in Figure 1.

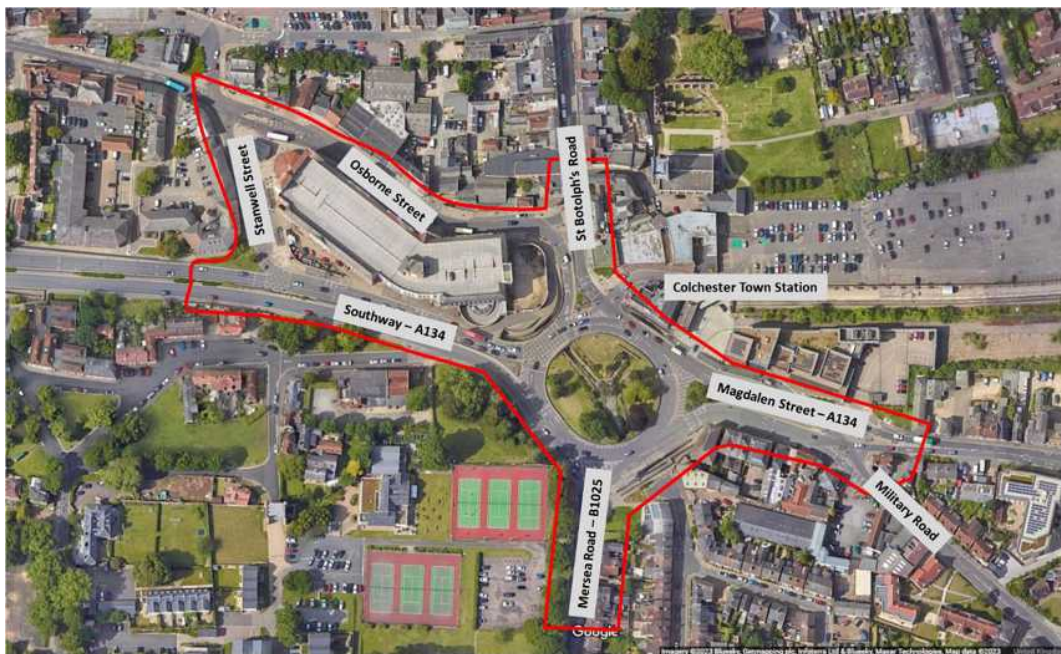


Figure 1 – St Botolph's Scheme Area

It should be noted that reconfiguration of the Osbourne Street bus station is outside the scope of this study. Other separate but related studies are focusing on bus station capacity and operations. The St Botolph's Circus scheme does interact with the bus station with Osborne Street and Stanwell Street which are considered within the study area.

1.3 Previous work

Over a number of years various proposed junction improvement options for St Botolph's roundabout have been developed jointly between ECC and CCC (previously Colchester Borough Council (CBC)) working groups. Option appraisals were undertaken in 2018 and measured against objectives agreed between ECC & CBC from earlier workshops held in 2016, as well as wider strategic priorities (i.e. Local Transport Plan).

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The 2018 option appraisals identified four masterplan options. These reflected a mixture of layouts both highways orientated (i.e. traditional roundabout layout) and those that reflected a more public realm orientation (i.e. plaza space).

In 2019 a consultation was held on a redesign of the roundabout that would be adapted to increase capacity for more vehicles, new crossing points would be created, and the underpasses infilled to improve safety.

While there was recognition that this design reduced anti-social behaviour, it was felt the lack of focus on walking and cycling did not adequately improve connectivity. The feedback also suggested that the proposal did not go far enough to improve the look and feel of the area or create the welcoming gateway the city needs.

Additionally, the design did not adequately provide safety features, highlighting that safety, particularly for cyclists is poor.

Reflecting on the consultation responses at the time, and the clear need to focus on St Botolph's as a gateway to the city centre, as well as a meeting point of transport, the scheme was refined.

At a joint CBC-ECC members meeting in September 2020, through open discussion there was agreement to reflect a more public-realm orientated approach, promoting greater sustainable modal choice over the more traditional highway (roundabout) layout. This approach aligned with the jointly endorsed 'Colchester Future Transport Strategy' promoting a 'zonal' approach, focused on types of journeys, and supporting alternative modes of transport for the city centre area. CBC & ECC members agreed that St Botolph's would follow this 'strategy-led' approach, with the 'plaza' layout taken forward for development.

Additionally, it was agreed that the original 2016 objectives for St Botolph's would be updated to reflect an amendment to replace 'improve traffic flows', to 'provide Safer Greener Healthier infrastructure', thus giving the current agreed objectives:

- Create a good quality urban realm and gateway to the city centre.
- Develop an improved, safer environment for everyone.
- Improve connectivity for communities to local and wider transport networks through bus, rapid transit and rail services and walking and cycling routes.
- Ensure an inclusive and accessible area for all.
- Balance the requirements of different travel modes
- Reduce anti-social behaviour and the fear of crime.
- Improve health and wellbeing for Colchester residents.

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- Increase footfall to encourage wider economic growth of the area, provide development opportunities and support local business.

This work recognises the A134 corridor status as a Priority 1 route and therefore that the optioneering of Stage 2 reflects the balance of improving the sustainability of the junction, but also the impact on the traffic movements as part of the optimised preferred route selected to be recommended.

From the September 2020 meeting it was agreed to develop the original 2018 'plaza' option further, to reflect a reduced highway footprint and improved provisions for sustainable modes of travel. ECC Transportation returned back to ECC and CBC Members in February 2021 with a concept plaza layout with enhanced active travel measures.

It was acknowledged that this layout did reflect a reduction in highway carriageway capacity (to create the space for compliant sustainable active travel provisions) for general traffic. The layout was endorsed by ECC & CBC members, and ECC Transportation was requested to progress the scheme on this basis to preferred route stage. This was the scheme taken forward as part of the LUF bid.

1.3.1 Levelling Up Fund Bid

The scheme focuses on regeneration, transforming city centre infrastructure and accessibility to drive footfall and city centre vitality. Improved public realm, shopfront makeovers, new residents, and active travel connections will help deliver jobs, decarbonisation, and pride in place.

Accordingly, the redevelopment of St Botolph's roundabout into a new active travel mobility friendly junction, including removal of subways and improved public realm, is expected to support a range of positive outcomes.

- Reduce severance issues, promoting walking, cycling and shared mobility for short local journeys from south and east urban areas which face significant deprivation challenges.
- Improve safety and helping 'design out' crime and anti-social behaviour.
- Enhance the environment on sections of several Local Cycling and Walking Implementation Plan (LCWIP) schemes.
- Reclaim road space alongside taking opportunities for greening. To create potential for local pop-up retail opportunities in the short term and encourages permanent commercial development plans to come forward in the long term, in line with the emerging City Centre Masterplan (CCMP).
- Reclaim road space alongside improving active travel connections to pivot travels choices to sustainable modes, which contributes to improving air quality and support wayfinding and access to heritage assets in the area.

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This was the starting point for the Stage 2 work that is documented in the rest of this Stage 2 Technical Report.

Given the junction's location as a key gateway, it interacts with a number of other key strategic schemes within the city centre, which are summarised in the following sub-sections.

1.4 Future Plans for Colchester

1.4.1 Colchester Future Transport Strategy

The Colchester Future Transport Strategy (CFTS) sees the creation of four distinct zones depending on the type of journey. The St Botolph's scheme area as shown in Figure 1 above, is split into two different zones. St Botolph's Street / Osborne Street / Stanwell Street / Vineyard Gate and Britannia Way are all in Zone 1 and A134 Southway / Magdalen Street which cross the roundabout from east to west are located in Zone 4.

Zone 1, which includes the city centre, focuses primarily on walking, the quality of the public realm and experience of Colchester as a high-quality place. It can also support passenger transport access into the city centre. St. Botolph's Circus is the main urban and strategic project of this zone.

Zone 4, on the other hand, represents key strategic corridors, as A134 road is, which over time these would look to move people from highway to passenger transport. The Rapid Transit System (RTS) is one of the proposals underway on the east side of Colchester.

1.4.2 Colchester City Centre Masterplan

The Colchester CCMP focuses on 'building on existing strengths and transforming our city centre while conserving its proud heritage'¹. It has looked at how people travel through the city centre and has developed a future looking approach for the city.

The CCMP specifically interacts with the St Botolph's scheme, noting it as one of the 'gateways' into the city centre. It has highlighted improvements to the roundabout which are required to support this 'gateway' with the interaction of buses, rail, car parks, cycling, walking and public realm. The CCMP objectives are being considered throughout the development of the St Botolph scheme optioneering to ensure alignment (Figure 2).

¹ <https://www.colchester.gov.uk/colchester-city-centre/masterplan/>

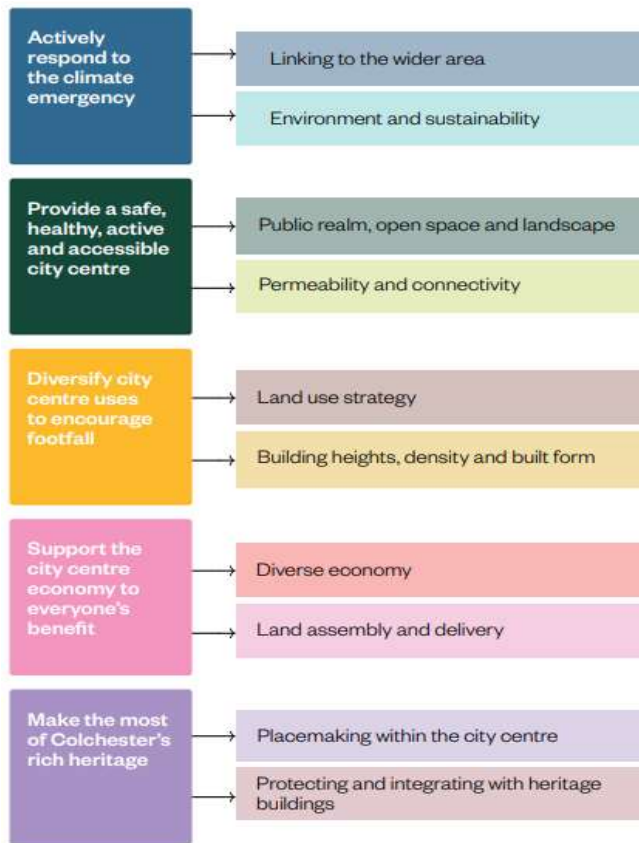


Figure 2 – Colchester City Masterplan Objectives¹

1.4.3 Rapid Transit System

The Housing Infrastructure Fund (HIF) has funded the first phase of Colchester's RTS, which will open in 2026 and will pass through the north of the St Botolph's scheme area. As outlined within the LUF bid, this will '*dramatically boost the connectivity between the LUF-funded scheme area, major employment, education and leisure assets across the town, and key infrastructure including the main railway station and the town's hospital; putting all of these assets in easy reach by fast and very sustainable travel*²'.

The RTS will not use the remodelled St Botolph's junction directly but will interact nearby as it travels down Queen Street and into Osborne Street. As part of the St Botolph's optioneering consideration will be taken to the connectivity between the Colchester Town railway station, the residential area to the south of the junction, the RTS and the bus station for those walking and wheeling. It is assumed that the RTS will be operational from 2026. Further details of this are outlined in the Future Situation chapter (Section 3.3.2).

² LUF Bid 2022

1.4.4 Queen Street – SELEP Local Growth Fund

The South East Local Enterprise Partnership (SELEP) Local Growth Fund (LGF) has recently brought £3.77m investment to Queen Street within the St Botolph's regeneration quarter; adjacent to the development scheme. It will deliver 6,469 sq.ft of growth space for businesses and an additional 1,044 sq.ft for a digital working hub. This is a key part of Colchester's employment and innovation infrastructure with high numbers of start-up enterprises and strong potential for Digital and Creative sector businesses to scale up.

Currently the development is in its construction phase which is due to complete in the summer of 2024. As noted within the LUF bid, *'this facility is vital to drive business and jobs growth through the LUF funded scheme as these expanding businesses seek attractive and convenient commercial workspace close to the existing cluster for the creative and digital industries'*³.

This scheme interfaces with the St Botolph's roundabout with the business case stating that *'The St Botolph's Quarter is a prime regeneration area in the town and investing in this historic and characterful location offers potential to strengthen the infrastructure for further development of a cultural quarter alongside existing creative workspace.... The original entrance to the 'Old Bus Garage' faces Queen Street, a narrow street, which plays a vital part in the towns transport infrastructure as a principle bus route; pedestrian route to the bus station on Osborne Street; route to Colchester Town Train Station and to several of the main car parks serving the town centre'*⁴ Connectivity across the St Botolph's junction and associated public realm within the scheme area to this key employment location will be considered throughout the optioneering process.

1.4.5 LCWIP Routes – Active Travel Fund

ECC has been successful in being awarded several tranches of Active Travel Fund (ATF) funding from Department for Transport (DfT) which are enabling the delivery of significant walking and cycling improvements in Colchester. This is being delivered as a network of cycle routes, with one of the routes forming a vital new east-west cycle route which will pass through the St Botolph's scheme boundary. This new east-west route will feed into any additional cycle and walking enhancements identified necessary for improved connectivity across the scheme area.

³ LUF Bid 2022

⁴ <https://www.southeastlep.com/app/uploads/2021/01/Colchester-Grow-on-Space-Business-Case.pdf>

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Further detail of the network of LCWIP cycle routes across Colchester and their interaction with the St Botolph's roundabout can be found in the Future Situation chapter of this report (Section 3).

1.5 Policy Review

The assessment of the options considered in this Stage 2 Report have been developed, assessed and appraised considering current planning policies.

The key national, regional, and local level strategies and policies are listed below.

Detail of each strategy / policy, and the relevance to the St Botolph's scheme, is provided within Appendix A.

Table 1 Policy Reviewed

National Policy

- Decarbonising Transport
- Levelling Up
- High Street Strategy
- National Bus Strategy
- Cycling and Walking Plan
- Ten Point Plan for a Green Industrial Revolution
- Health White Paper
- UK Shared Prosperity Fund
- LCWIP Guidance
- Tourism Recovery Plan

Regional Policy

- Transport East Strategy

Local Policy

- Colchester Town Investment Plan
- Colchester Local Plan
- North Essex Economic Strategy
- Colchester Future Transport Plan
- Colchester's Strategic Plan 2020-23
- Colchester Bus Network Review (2022 BSIP)
- Essex Local Transport Plan

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1.6 Overview of Stage 2 work

This Stage 2 Report takes into account the following stages as set out in the MPCM; Review Outcome of Stage 1; Assessment of Options; Selection of Options and Stage 2 Solutions Investigations.

1.7 Structure of this Report

The remainder of this Stage 2 Report is structured as follows:

- Design Stage 2 – Scheme identification
- Future Situation
- Need for Intervention
- Assessment and Selection of Options
- Development of the Elliptical Roundabout
- Comparison with Consulted Option
- Summary and Next Steps
- Supporting Information

2 Design Stage 2 – Scheme identification

2.1 Introduction

This section provides a summary of the current situation in the study area with regards to existing land use, demographics, and transportation infrastructure supply and demand. Travel conditions within the study area are described using a variety of metrics including traffic volume, journey patterns, and congestion and delay. Provision for public transport and non-motorised users is also described.

2.2 Land Use and Demographics

A land use and demographics review has been undertaken to understand the characteristics of the city centre and the direct vicinity around the scheme area. The following data has been reviewed with the outputs detailed in Appendix B.

This review has focused on schools, land use, population, car ownership, travel to work, job density and employment.

It has highlighted that there are a high number of attraction amenities within walking distance of the junction, given the proximity to the city centre. There are 9 schools within 20 minutes' walk of the junction, spread across the retail land use area to the north of the junction, and the residential land use to the south. There are small pockets of greenspace within these areas.

The population of the district is growing, and most notably concentrated within the city centre. This population directly around the junction has a moderate car ownership of 61%, with 39% of households not having access to a car or van, indicating walking, cycling and public transport links from these immediate areas to the city centre are essential. Also, when looking at travel to work data for this immediate area, 20% travel less than 10km to get to work, which shows a high potential within the centre of the city for travel mode behaviour change to access work.

Colchester City Centre offers the highest concentration of employment opportunities with industrial parks, business parks and retail centres. In close proximity to the scheme area (5 mins on foot) there are predominantly retail opportunities such as local shops and supermarkets as well as restaurants or take away shops.

2.3 Transport Network

The scheme should build upon recent and planned investment in active travel infrastructure including the new east-west cycling corridor passing through this

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site, and links into the first phase of the city's LCWIP which has recently been funded under ATF Round 3 and Towns Fund, linking the city centre with the University and the Greenstead housing estate 2 miles east, which includes a ward in the 10% most deprived in England (IMD, 2019 census).

2.3.1 Highway

Colchester is bounded by the A12 to the north and west, with the A120, A134 and A133 cross cutting the town.

The study area is situated along the A134 which routes directly across the south of the city centre, linking the A120 and the A1124. The A134 is a highly trafficked route, which severs the City Centre from the surrounding residential suburbs to the south.

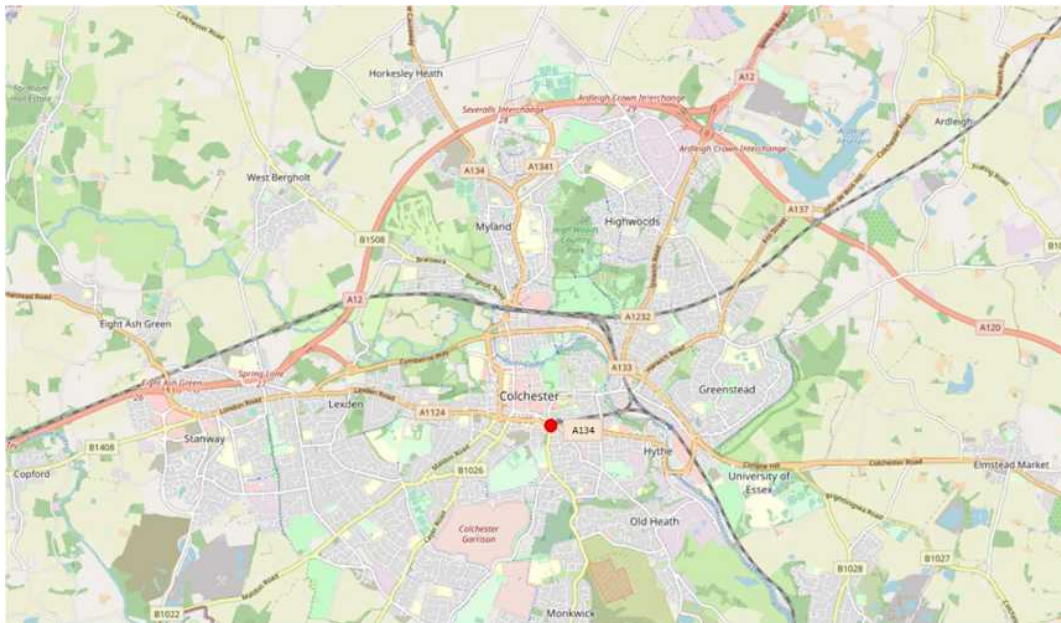


Figure 3 –Colchester Highway Network, Scheme Location Marked in Red (Source: OpenStreetMap)

2.3.2 Pedestrians

There are several footpaths within the study area, with the identified Public Rights of Way and designated highway footpaths identified in Figure 4. Currently there are Local Cycling and Walking Infrastructure Plan routes being developed which will make the walking network more extensive, these will integrate with the current City Centre infrastructure. Further details are set out in the Future Situation chapter.

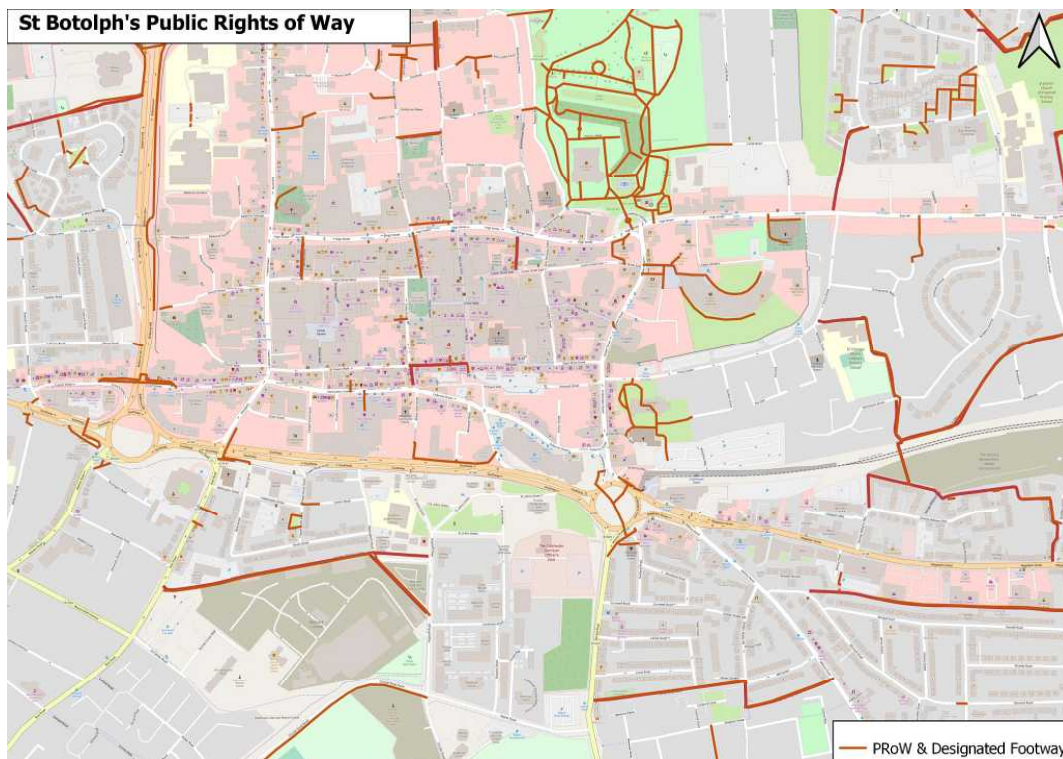


Figure 4 – Scheme Area Public Rights of Way (Source: OpenStreetMap)

Currently there is step-only access from the St Botolph's subways in the north-east corner for the railway station which means a long way around for users who would struggle with/not be able to manage steps. The current subways/underpasses are very unattractive and perceived to be unsafe with high levels of anti-social behaviour reported. A usage count undertaken in September 2023 showed that just under 1,500 pedestrian movements were made in the subways on a typical weekday in a 12 hour period from 06:00 to 19:00.

The following figures show the current pedestrian routes across the junction.

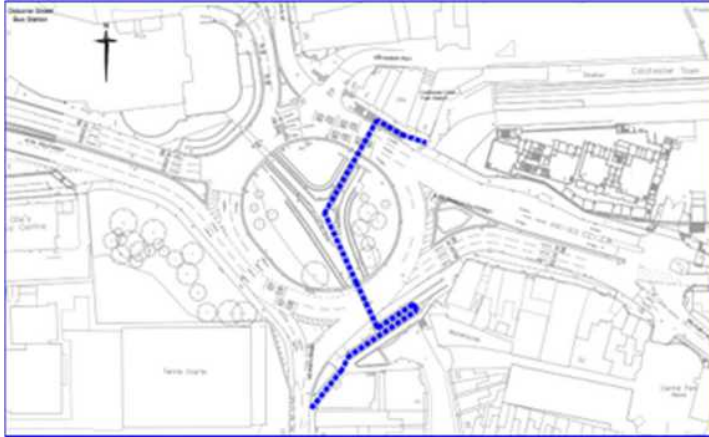


Figure 5 – Walking route 180m using underpasses

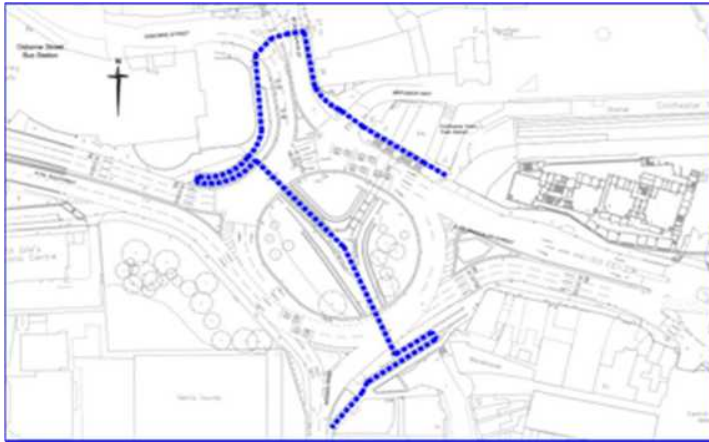


Figure 6 – Walking route 350m using underpasses

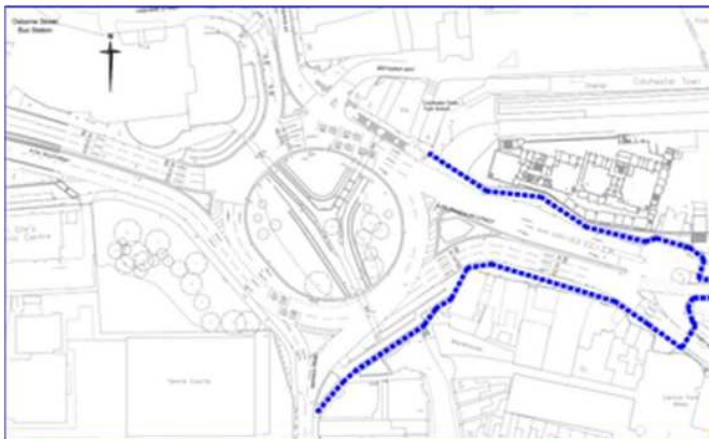


Figure 7 – Walking route 330m avoiding underpasses

Within 1km of the scheme (approximately 10-12 minutes' walk) there are six schools, the city centre retail area, one railway station, one bus station and eight heritage assets. The A134 and other city centre orbital routes currently

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sever pedestrian access, particularly walking links from the south feeding into the city centre and vice versa.

2.3.3 Cyclists

Essex currently has 177 miles of National Cycle Route, over 200 miles of off-road cycle routes and 43 miles of on-road cycle routes. Figure 8 shows Colchester's existing cycling network.

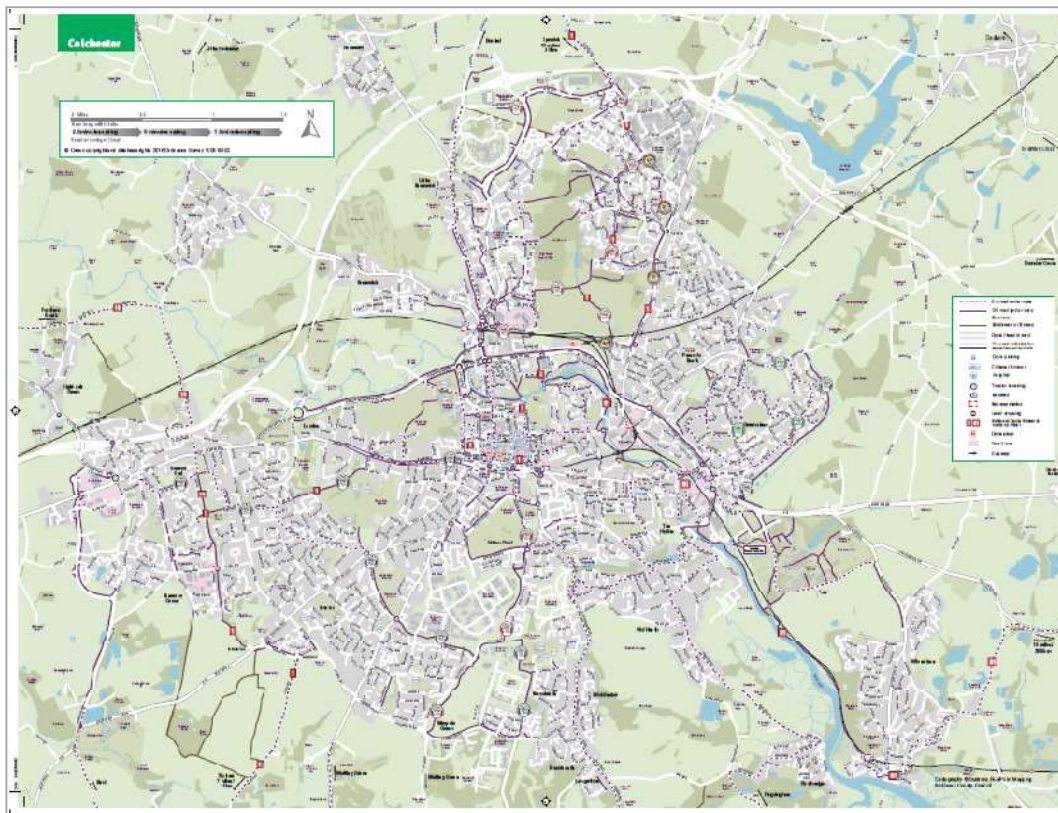


Figure 8 –Colchester cycling map (EH, 2016 most recent mapping)

Additional information on cycling can be extracted from the Propensity to Cycle tool, which uses data from Census 2011, as shown in the figure below. This can also provide information on the potential future situation, should there be cycling infrastructure investment.

Figure 9 indicates that the LSOA areas around the scheme have a low cycle share, particularly north of the A134 with 0-6% cycling to work. South of the A134 there is a higher share of 10-14%, indicating that by removing the severance of the A134 may support cycle trips into the city centre area. When looking directly at the flows of cyclists the highest number using the roundabout are to the north-east of the junction by the rail station (123 cyclists), with the south and east of the roundabout having around 1/6th of the relative number of movements (24 cyclists).

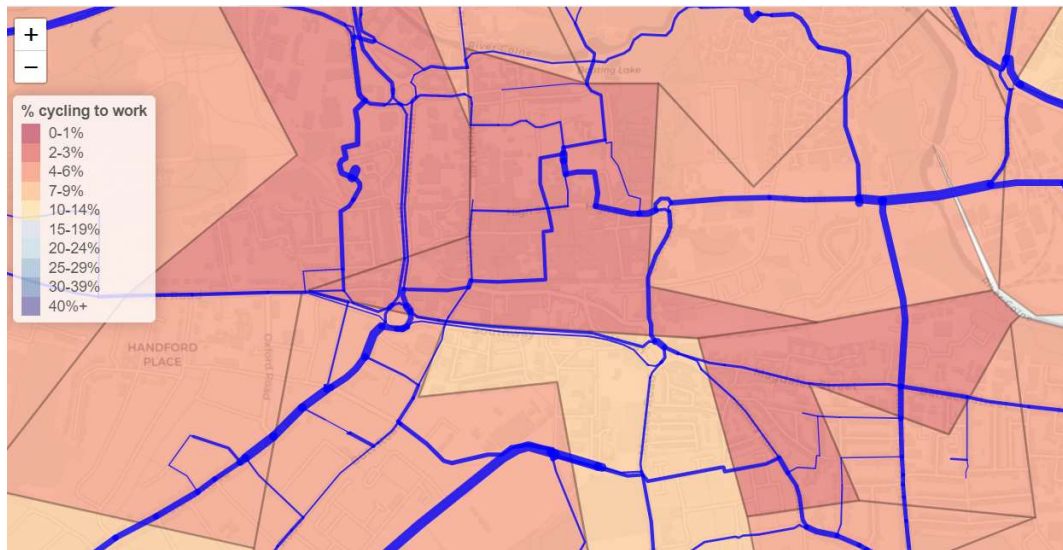


Figure 9 – Colchester cycling map

The wider Colchester district has been reviewed in the same manner. In terms of cycling levels, there is relatively low uptake. Only one area south of Colchester has a commuting level of cycling above 15%, in the residential area north of Maypole Green.

Currently there are LCWIP routes being developed within Colchester which will make the cycling network more extensive, these will integrate with the current city centre infrastructure. Further details are set out in the Future Situation chapter.

2.3.4 Bus Routes

The bus network in Colchester is radial from the city centre, with Osborne Street, Head Street and High Street being key locations for bus stops. With the city centre being a key interchange point for all routes and an attractor for inter-urban routes from Tendring, Braintree and Maldon, there are significant capacity issues within the city centre.

The 'bus station' is located slightly to the north-west of the St Botolph's roundabout along Osborne Street, so is a key consideration in any scheme development, but also means that there is a high frequency of buses moving through this junction to access the station. According to the 2022 Colchester Bus Network Review, there are 5,431 weekly departures from the 'bus station'.

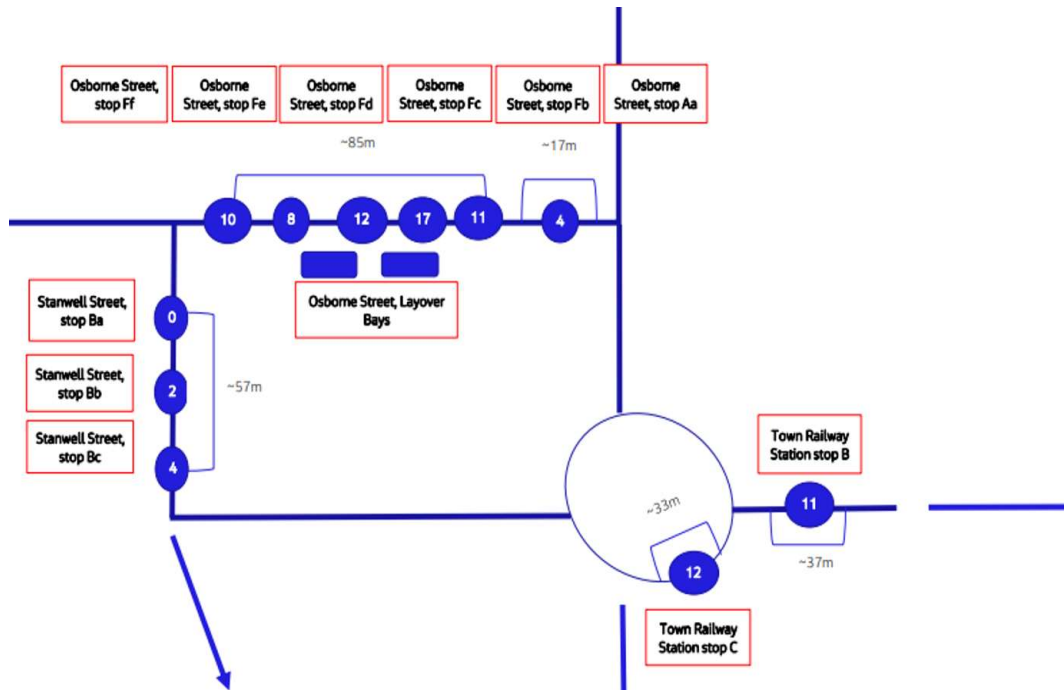


Figure 10 Number of Buses Stopping and Each Stop (8-9 am weekdays)

The current bus routes using the junction are shown in Figure 11 as identified using 2023 EssexBus.info website. With the relative frequencies using the Colchester Bus Network Review data across the scheme area for Weekday, Saturday and Sunday AM peaks shown in Figures 12 to 14, where the frequency categories are as follows:

- 'High' frequency refers to <8 two-way buses average per hour or an average headway of 15 minutes or less;
- 'Medium' frequency refers to >4 two-way buses average per hour or an average headway of 30 minutes or less;
- 'Low' frequency refers to >2 two-way buses per hour or an average headway of 60 minutes or less; and
- 'Limited' frequency refers to <2 two-way buses average per hour or an average headway greater than 60 minutes.

Given the strategic location of the junction, even in over the weekend Saturday and Sunday mornings, the corridors through the junction are still high frequency.

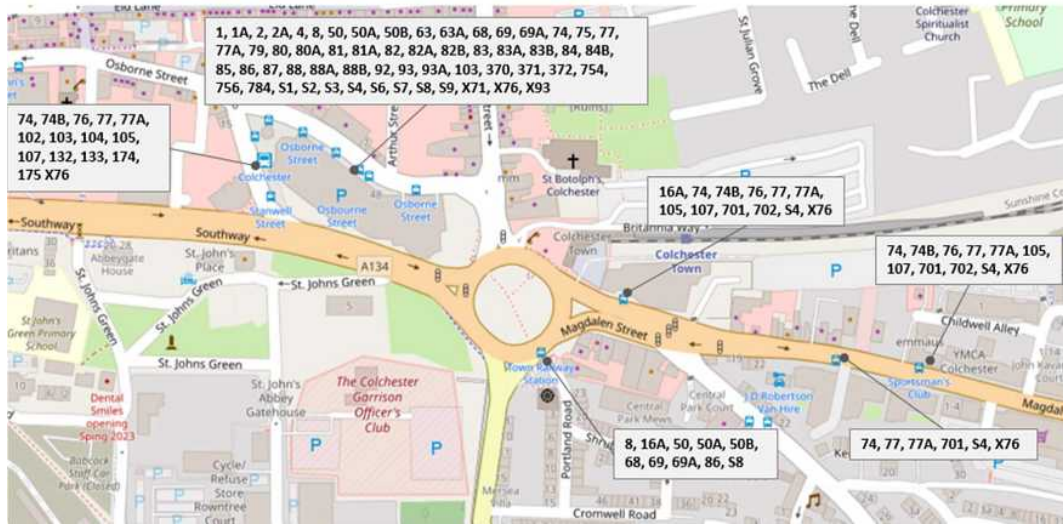


Figure 11 –Bus routes through St Botolph's junction

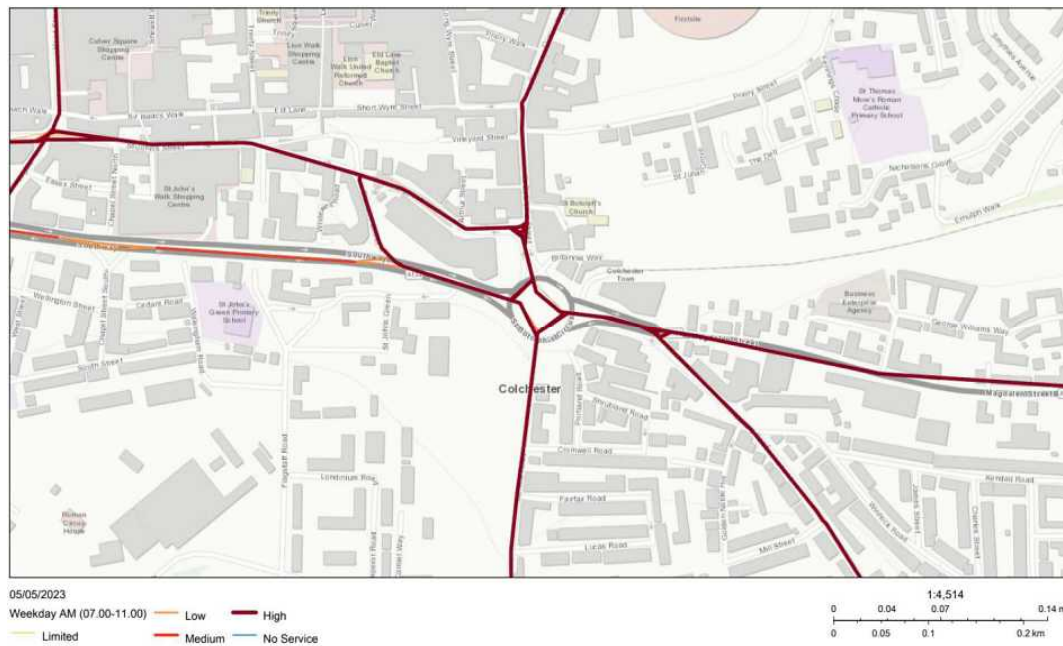


Figure 12 –Bus frequency (Weekday AM) through St Botolph's junction



Figure 13 –Bus frequency (Saturday AM) through St Botolph's junction



Figure 14 –Bus frequency (Sunday AM) through St Botolph's junction

2.3.5 Rail

There are three rail stations within Colchester (Colchester North, Colchester Town and Hythe), with Colchester Town being on the north-east of the study area within 100 metres of the St Botolph's roundabout. The Colchester Town Station sits along the Sunshine Coast branch line. It has connections directly to

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London but at lower frequencies to the Colchester North Station which is on the Great Eastern Mainline route (Figure 15)



Figure 15 –Local rail network

The period between April 2021 and March 2022 saw 504,448 people entering and exiting the Colchester Town Station (Office of Rail and Road – Table 1410). Looking at the station usage over time, it is clear that there has been a significant drop off in usage since pre-pandemic levels, possibly linked to a reduction in commuting use. Nonetheless, this patronage relates to 1,382 passengers using the station every day on average.

The St Botolph's junction has to therefore accommodate for these trips to and from the station by either bus, cycle, walk or private vehicle (either to park or to 'kiss & drop')

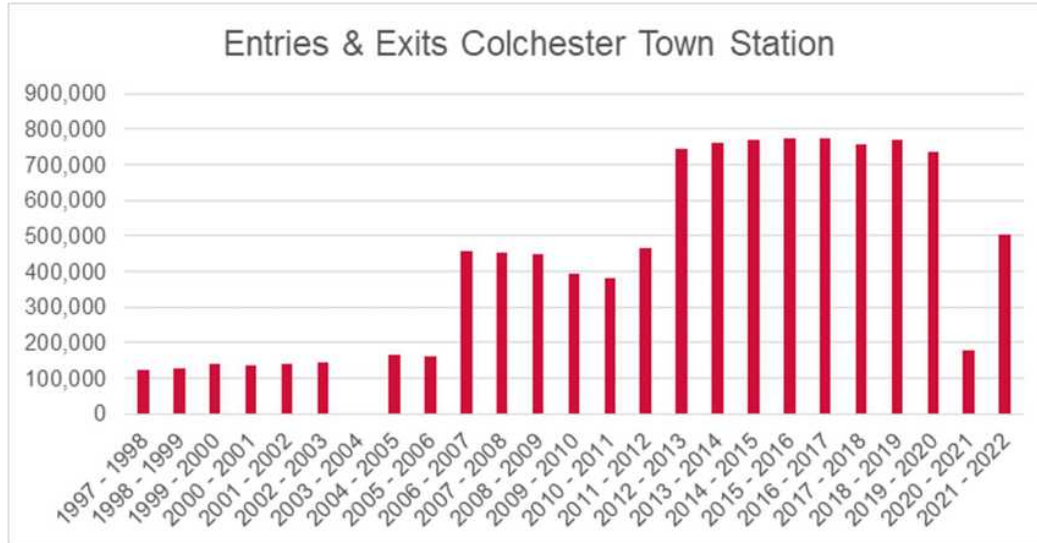


Figure 16 –Colchester Town Entries and Exits April-March Annually (Office of Rail and Road Table 1415)

2.4 Route Performance

2.4.1 Travel Patterns

Where people travel to and from is largely a function of the spatial distribution of different land use activities, for example, the location of housing in relation to employment, shopping, or recreation opportunities.

Data on these items has been used to support the development of the Colchester Transport Model which forecasts future travel patterns and traffic levels, and which has been used to assess the impact of the scheme options on travel and traffic.

2.4.2 Existing Traffic Flows

Figure 17 to Figure 20 show AM and PM Peak hour traffic flows for Central Colchester, as captured by the Colchester Transport Model for its' 2019 Base Year. These represent the starting point for analysis of future traffic levels without the St Botolph's Junction scheme, and the impact of the three scheme options considered.

In both time periods St Botolph's Junction is a key node on the south side of the city centre.

More information on the traffic modelling is given in Appendix C.

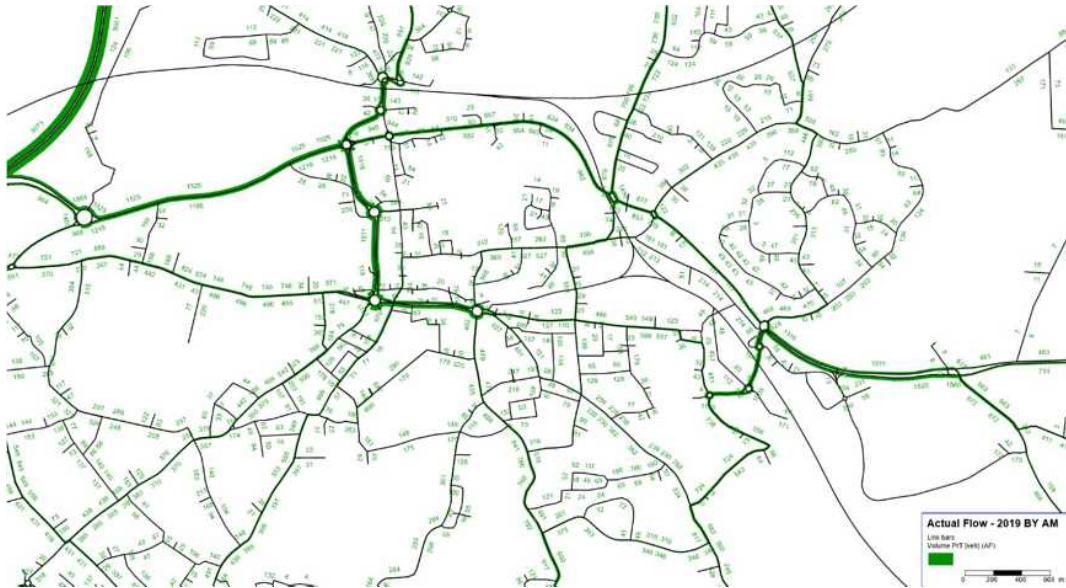


Figure 17 - Traffic volumes, 2019 AM Peak hour, Colchester City Centre

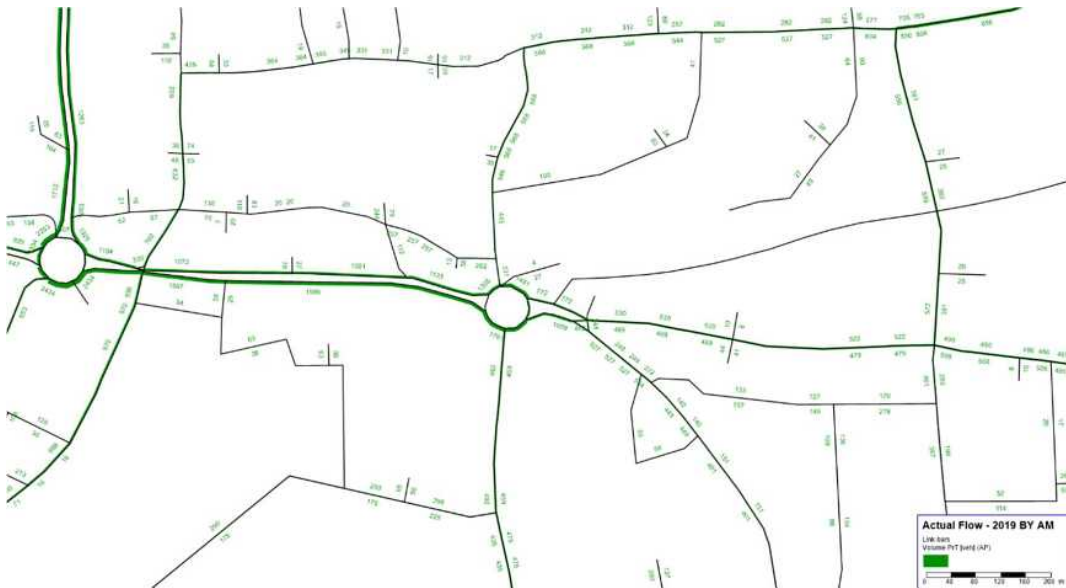


Figure 18 - Traffic volumes, 2019 AM Peak hour, St Botolph's area

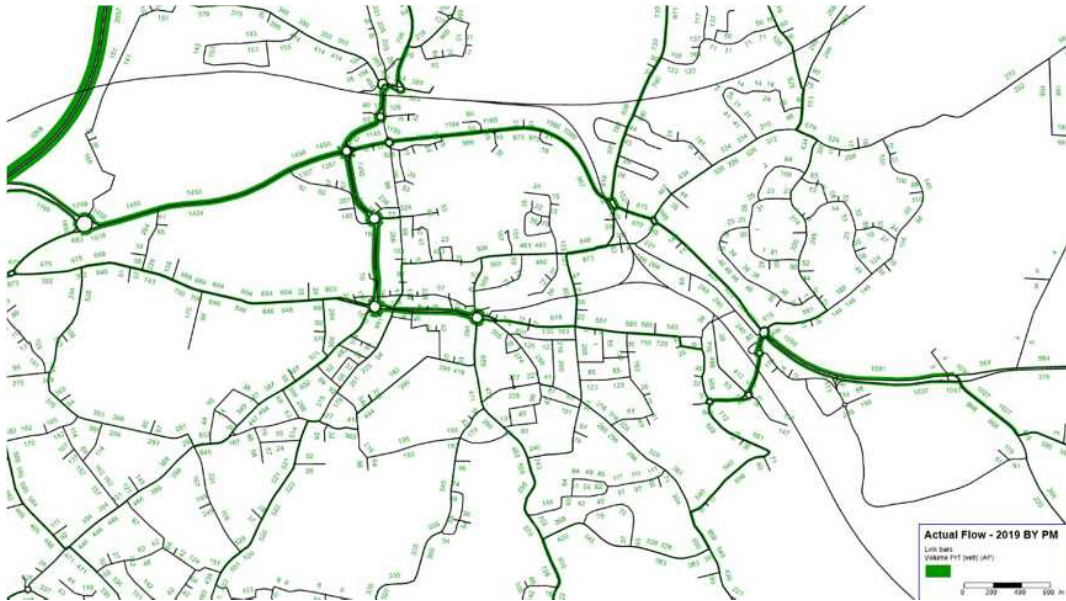


Figure 19 - Traffic volumes, 2019 PM Peak hour, Colchester City Centre

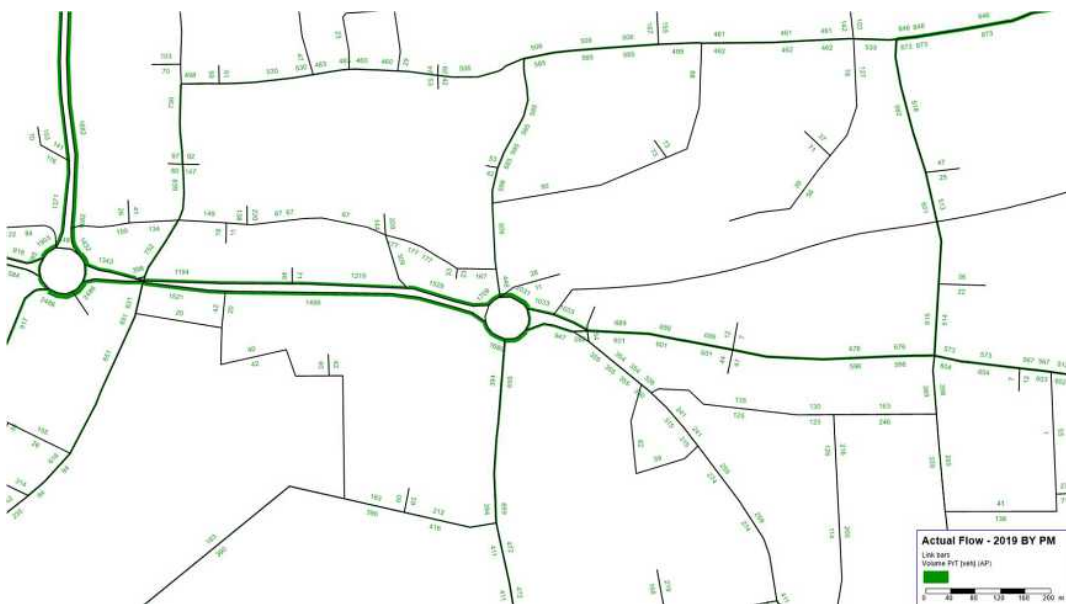


Figure 20 - Traffic volumes, 2019 PM Peak hour, St Botolph's area

2.4.3 Capacity and Capability

A review of existing congestion issues on the network around the St Botolph's junction has been undertaken using Colchester Transport Model outputs for the 2019 Base Year scenario.

Figure 21 and Figure 22 present analysis of three different congestion measures for the AM and PM respectively.

Whilst queuing is not specifically identified as an issue in the St Botolph's area, a number of junctions/junction arms experience delays with multiple junctions

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operating at Level of Service D in both the AM and PM peaks (equivalent to average user delays of 35-55 seconds).

High link volume over capacity (VoC) ratios are seen in a range of locations around St Botolph's including East Hill and approaching Maldon Road roundabout. Adjacent to St Botolph's both Mersea Road and Magdalen Street experience a VoC of between 75-85% in the PM peak.

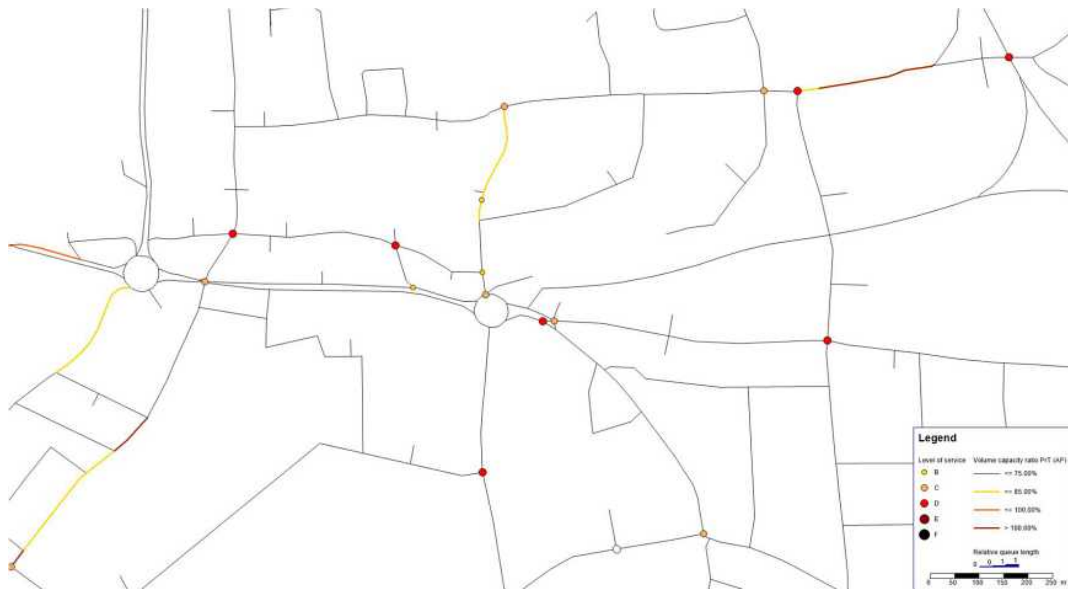


Figure 21 – Colchester Transport Model, AM peak Junction LoS, VoC and queuing, 2019 Do-Minimum, St Botolph's Area

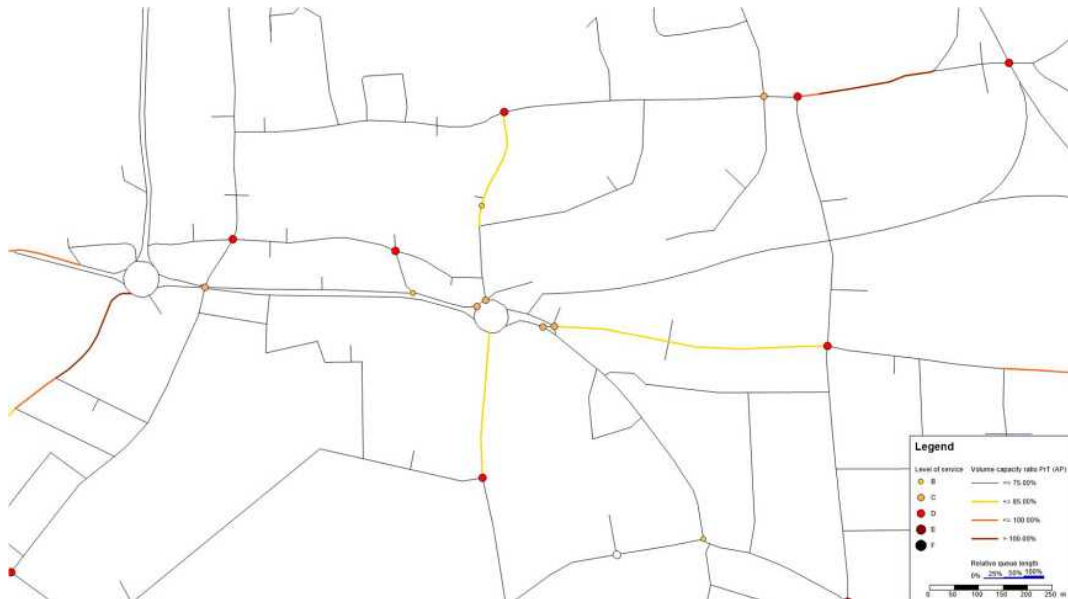


Figure 22 – Colchester Transport Model, PM peak Junction LoS, VoC and queuing, 2019 Do-Minimum, St Botolph's Area

2.4.4 Collisions

Figure 23 shows collision data across the scheme area for the period between 01/04/2018 – 31/03/2023. The blue circle icon represents the serious and the green triangle the slight collision data respectively.

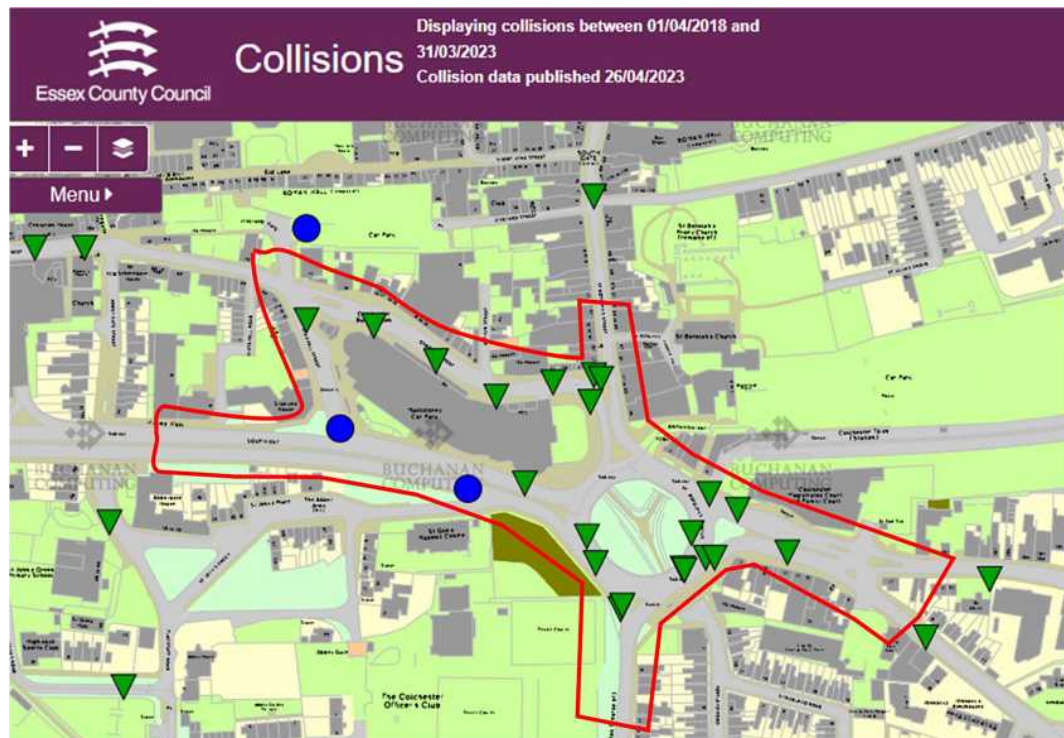


Figure 23 –Collision data St Botolph's Junction April 2018 – April 2023 (<https://essex.traffweb.app/>)

Serious collisions are dispersed across the area, with the two notable collisions in the scheme area concentrated to the west of the junction interacting with Southway. Neither of these involved pedestrians or cyclists. One of these was in 2018 and the other in 2022, meaning that these serious collisions are not a frequent occurrence in this area despite the high levels of traffic flow.

On the junction itself, there were 13 slight collisions recorded. Of these, only two involved cyclists and one involved a pedestrian. Looking along Osborne Street and Stanwell Street through the bus interchange, there were eight collisions recorded, all of which involved a pedestrian, five of whom were classified as OAPs. Although the bus station is out of scope for this project, four of these collisions occurred close to the junction with St Botolph's Street where vehicles and buses are accessing the Bus Station and car park. Given the gateway nature of this area of the city centre, it is clear that enhancements to pedestrian safety are required to align with objectives.

2.5 Environment

2.5.1 Air Quality

Baseline Conditions

Local air quality is reported within CCC's Air Quality Annual Status Report (CBC, 2022⁵). CCC has declared three Air Quality Management Areas (AQMAs) due to exceedance of the annual mean nitrogen dioxide (NO₂) Air Quality Objective (AQO). CCC's Air Quality Action Plan (Colchester, 2016⁶), sets out what actions the Council is taking to improve air quality, particularly within these AQMAs.

The scheme's air quality study area includes roads within 200m of the combined Affected Road Network (ARN) (defined in accordance with the methodology outlined in the Design Manual for Roads and Bridges (DMRB) LA105 (Highways Agency, 2019⁷) guidance). The study area includes roads within the Area 1 - Central Corridors AQMA, as shown in Figure 24.

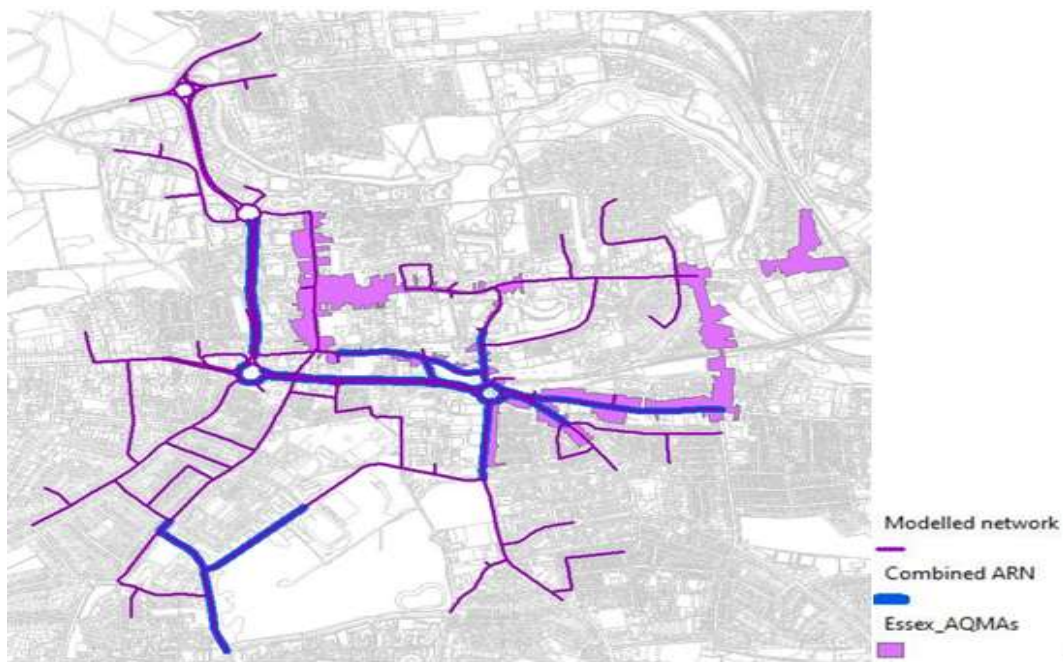


Figure 24 – Modelled road network, Affected Road Network (ARN) and CCC Area 1 AQMA

⁵ Colchester Borough Council, 2022. Colchester 2022 Air Quality Annual Status Report, 12th July 2022.

⁶ Colchester Borough Council, 2016. Colchester Air Quality Action Plan 2016–2021. Online. Available at [Colchester Air Quality Action Plan 18-03-16.pdf \(windows.net\)](#). Accessed May 2023

⁷ Highways Agency, 2019. Highways England, Transport Scotland, Welsh Government and The Department for Infrastructure Northern Ireland (2019) Design Manual for Roads and Bridges (DMRB) LA 105 Air Quality. Online. Available at: <https://www.standardsforhighways.co.uk/dmrbs/search/10191621-07df-44a3-892e-c1d5c7a28d90>. Accessed May 2023.

Local Air Quality Management

Ambient monitoring of NO₂ is undertaken by CCC using a network of one automatic monitoring station and 62 passive NO₂ diffusion tubes, collectively. There is no particulate matter (PM₁₀ or PM_{2.5}) monitoring undertaken in the area administered by CCC.

There have been a number of measured exceedances of the level of the annual mean NO₂ AQO (40µg/m³) within and close to the study in recent years, as shown in Table 2. In 2019 for example, there were multiple measured concentrations that exceeded the level of the AQO in the city centre, particularly along Brook Street, Mersea Road and Osbourne Street.

It should be noted that results for 2020 and to a lesser extent 2021 are not considered representative of 'typical' air quality conditions due to the impact of COVID-19 travel restrictions on traffic flows, which typically resulted in much lower annual mean NO₂ concentrations at roadside sites than in previous years. The use of these values to understand existing baseline conditions could lead to false conclusions being drawn. Therefore, the data for the results from 2019 have been used to establish baseline conditions.

Table 2 CCC Nitrogen Dioxide (NO₂) Diffusion Tube Monitoring Results within the Study Area

| Monitoring Site ID | Site Name | Site Type | Annual Mean Nitrogen Dioxide Concentration (µg/m ³) | | | | |
|--------------------|--|-----------|---|------|------|------|------|
| | | | 2017 | 2018 | 2019 | 2020 | 2021 |
| CBC2 | Fairfax Road, 1 | K | 31.2 | 28.0 | 30.0 | 24.3 | 23.6 |
| CBC3A/B/C | Mersea Road, 21 | R | 48.2 | 54.5 | 55.4 | 43.9 | 46.4 |
| CBC20 | Papillon Road | UB | 20.6 | 21.7 | 19.5 | 14.1 | 17.1 |
| CBC21 | Head Street | R | 45.0 | 48.7 | 51.9 | 35.1 | 39.1 |
| CBC22 | Trinity Street-Christian Science Society | UC | 20.9 | 20.9 | 20.3 | 13.8 | 0.0 |
| CBC43 | Magdalen Street | R | 31.9 | 32.8 | 32.5 | 25.4 | 25.0 |

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| Monitoring Site ID | Site Name | Site Type | Annual Mean Nitrogen Dioxide Concentration ($\mu\text{g}/\text{m}^3$) | | | | |
|---|-----------------------------|-----------|---|------|------|------|------|
| | | | 2017 | 2018 | 2019 | 2020 | 2021 |
| CBC48 | St Botolphs Street, 33 | R | 35.4 | 42.5 | 39.9 | 30.3 | 30.9 |
| CBC54 | Mersea Road, 10 | R | 42.2 | 47.1 | 42.8 | 35.1 | 37.8 |
| CBC62/A/B | Mersea Road, 9 | R | 39.2 | 42.9 | 40.7 | 31.8 | 35.2 |
| CBC63 | Mersea Road, 12 | R | 43.9 | 48.6 | 45.0 | 37.4 | 39.7 |
| CBC66 | Brook Street RAB | R | 26.5 | 25.7 | 25.6 | 19.5 | 18.7 |
| CBC71 | Osborne Street, 6 | R | 43.3 | 51.6 | 46.5 | 37.8 | 40.2 |
| CBC93 | Butt Road, 129 | R | 20.7 | 20.4 | 20.4 | 14.4 | 14.5 |
| CBC104 | Military Rd, 37 | R | 27.9 | 29.0 | 29.7 | 22.9 | 21.9 |
| CBC106 | Mersea Rd, 30 | R | 35.6 | 36.4 | 35.9 | 34.2 | 33.4 |
| CBC107 | North Hill, 49 | R | 30.5 | 30.9 | 32.3 | 28.3 | 24.1 |
| CBC109 | North Hill, Strada | R | 31.2 | 33.3 | 34.5 | 29.9 | 29.6 |
| CBC110 | St Botolphs Street, 1A | R | 31.5 | 32.2 | 32.4 | 24.2 | 26.7 |
| CBC111 | St Johns Street, Lemon Tree | UC | 42.8 | 42.3 | 44.2 | 37.3 | 37.3 |
| CBC117 | High Street, 71 | R | 41.1 | 39.8 | 41.7 | 33.5 | 31.8 |
| <p>Notes: Measured exceedances of annual mean NO_2 AQO ($40\mu\text{g}/\text{m}^3$) shown in bold type. Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.</p> <p>K=Kerbside, R= Roadside, UB=Urban Background, UC=Urban Centre</p> | | | | | | | |

Mapped Background Concentrations

The Department for Food and Rural Affairs (Defra) (Defra, 2023⁸) provides predicted modelled background maps for a range of pollutants in the UK in 1km x 1km grid squares for each year between 2018 and 2030. All predicted pollutant concentrations are within the relevant AQOs.

Sensitive receptors

A desktop review has identified human health receptors within close proximity to the ARN (e.g. residential properties and schools) that could potentially be affected by changes in road traffic conditions owing to the operation of the scheme. Receptors likely to experience the greatest changes or experience the highest pollutant concentrations have been modelled. There are no identified designated habitats within the study area.

2.5.2 Noise and Vibration

Baseline Conditions

There are a mix of noise sensitive receptors within the immediate vicinity of the proposed scheme including residential dwellings, business/office premises, and recreational areas. A variety of noise sensitive receptors also exist adjacent to roads connecting into the proposed scheme, including Southway (A134), Magdalen Street (A134), Mersea Road (B1025), and St Botolph Street.

The noise climate in the immediate area of the proposed scheme and of the adjoining main roads will be largely dominated by road traffic. Defra noise mapping (provided by Extrium⁹) identifies that day-time noise levels exceed 65 dB L_{Aeq,16hr} for those sensitive receptors closest to the existing St Botolph's Roundabout and 60 dB L_{Aeq,8hr} at night. Whereas sensitive receptors closest to Southway (A134) and Magdalen Street (A134) are shown to be exposed to existing noise levels exceeding 70 dB L_{Aeq,16hr} during the day and 65 dB L_{Aeq,8hr} at night.

Defra have undertaken noise mapping exercises, the latest of which (Round 3 mapping) was published in 2019. Defra has produced a list of Noise Important Areas (NIA), identified as areas requiring action to reduce noise levels. No NIAs exist on the existing St Botolph's roundabout; however, NIA ID 12068 exists approximately 250m to the west of St Botolph's roundabout on the Southway (A134), which includes 6 residential dwellings and accommodation at Bernard

⁸ Defra, 2023. Department for Environment, Food and Rural Affairs (Defra) (2020) NOx, NO2, PM10 and PM2.5 Background Maps 2018. Online. Available at: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>. Accessed May 2023.

⁹ <http://www.extrium.co.uk/noiseviewer.html>

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Brett House. A number of other NIAs exist within Colchester, further from the proposed scheme, largely along the A134, A133, and A1232.

2.5.3 Cultural Heritage

A heritage asset is defined by the National Planning Policy Framework (NPPF) as 'a building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest' (MHCLG, 2021, 67). This includes designated and non-designated sites. Designated sites include World Heritage Sites, Scheduled Monuments, Listed Buildings, Conservation Areas, Registered Parks and Gardens, Registered Battlefields and Registered Historic Wrecks. Non-designated assets are identified by the Local Planning Authority (LPA), and include locally listed buildings, archaeological sites and monuments identified in the Historic Environment Record and historic landscapes. Given that the cultural heritage resource is non-renewable, designated assets are protected by law such as the Ancient Monuments and Archaeological Areas Act 1979 and the Planning (Listed Buildings and Conservation Areas) Act 1990.

Baseline Conditions

An archaeological desk-based assessment and heritage statement was prepared by Place Services in December 2018 centred on the Proposed Scheme.

The report demonstrates the site and surrounding area is rich in archaeology, dating from the prehistoric period with the possible presence of a Neolithic or Bronze Age occupation site extending onto the roundabout site, as suggested by the discovery of pits and pottery found during excavations in the early 1970s (Place Services, 2018).

Colchester was also important during the Roman period, as it was the most important Roman town outside of London. A Roman fortress was built to the north-west of St Botolph's roundabout in around AD49, and as the settlement grew around the fortress, it was converted to a Colonia and much of the street and grid and core was reused. Given its importance, Colchester included theatres and worship sites, and it may have also contained public baths and a possible amphitheatre however no evidence of these have been found to date (ECC, 2009). Excavations have established that St Botolph's roundabout lies along one of the major Roman routes out of the Roman town and given its location outside the Roman walls, west of Balcerne Gate, St Botolph's Roundabout lies in a cemetery area, where a number of Roman burials have been found, such as those discovered during excavations at Osbourne Street and in St John's Abbey Grounds (Place Services, 2018).

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Colchester continued to be occupied into the Anglo-Saxon and medieval period and in 1095 the St John's Abbey and Church precinct was founded and its construction was completed by 1115, part of which extended beneath St Botolph's Roundabout (Place Services, 2018). Between the 12th and 16th century a number of important buildings were constructed within Colchester namely Colchester Castle, a large number of parish churches such as St Nicholas' Church, St Peter's Church and St Helen's Chapel. Despite the event of the Black Death which hit Colchester in the late 1340s the town continued to grow (Place Services, 2018). Colchester has undergone a number of developments during the post-medieval and modern period including the formation of St Botolph's Roundabout in the 1970s.

Given the location, within Colchester, the Proposed Scheme is situated close to a number of designated heritage assets, namely:

- St Botolph's Augustinian Priory Scheduled Monument (NHLE Ref.: 1013764)
- The Benedictine Abbey of St John Scheduled Monument (NHLE Ref.: 1015015)
- The Roman Circus 200m south of Abbey House Scheduled Monument (NHLE Ref.: 1021426)
- Ruins of Priory Church of St Botolph (NHLE Ref.: 1337764; Grade I)
- Station House, St Botolph's Station (NHLE Ref.: 1123507; Grade II)
- Church of St Botolph (NHLE Ref.: 1123508, Grade II)
- St John's Abbey Gatehouse (NHLE Ref.: 1337765; Grade II)
- Church of St Giles NHLE Ref.: 1123520; Grade II)
- Colchester Town Centre Conservation Area (Ref. DEX22998)
- Hythe Conservation Area (Ref. DES22994)

It is proposed that a Heritage Statement be prepared to support the planning process to establish the baseline conditions and assess the impacts the Proposed Scheme may have on designated and non-designated assets up to 300m from the scheme boundary.

2.5.4 Landscape

This section provides a summary of the arboricultural, landscape and visual baseline conditions.

For simplicity, the term 'landscape' has been used throughout to describe areas of landscape and townscape, in line with LA 107 Landscape and visual effects (2019) (hereafter referred to as 'LA 107') which explains that landscape assessment does not differentiate between 'landscape' and 'townscape', as it is applicable to any landscape - urban, rural or a combination of both...'

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Landscape Designations

CCC online mapping identifies a line of mixed tree species with Tree Preservation Orders (TPO) within Colchester Garrison, on the edge of the study area, otherwise there are no TPO within the study area. However, it should be noted that any trees located within the two adjacent Conservation Areas should be considered similarly to a tree with a TPO. The two Conservation Areas are:

- Colchester Town Centre/Colchester Area 1 Conservation Area; and
- Garrison Conservation Area

There are no veteran trees noted on the Ancient Tree Inventory (checked June 2023), and one notable tree identified, a London Plane, within the grounds of the St. Botolph's Augustinian Priory. There are no areas of ancient woodland identified on the Ancient Woodland Inventory in close proximity to the study area. An Arboricultural Survey, undertaken in December 2018, did not identify any notable or veteran trees within the site.

There are a number of allocated public open spaces within Colchester, identified in the local plan. Those in closest proximity to the scheme include the green space associated with the St. Botolph's Augustinian Priory, Scheduled Monument, which is located immediately northeast of the study area and the green spaces on the southern side of Southway, bordering the south-eastern boundary of the scheme.

A full policy review at a national, regional and local level has been provided in Chapter 1 and in Appendix A and sets out all policies relevant to the scheme. Some however, are particularly relevant to the development of the scheme's landscape and public realm design:

- Policy ENV1: Environment
- Policy ENV3: Green Infrastructure
- Policy CC1: Climate Change
- Policy PP1: Generic Infrastructure and Mitigation Requirements
- Policy DM16: Historic Environment
- Policy DM17: Retention of Open Space and Recreation Facilities
- Policy DM 20 Promoting sustainable transport and Changing Travel Behaviour

Key to the context and the development of the scheme at St. Botolph's junction are two recent guidance documents:

- Colchester City Centre Transport Plan (CCTP), (Steer, December 2022);

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The CCTP shortlists a range of transport and urban realm interventions proposing St. Botolph's Circus as a Key City Gateway

- Colchester City Colchester City Centre Masterplan (We Made That, December 2022)

The CCMP sets out a vision for the future development of Colchester city centre driven by the five themes:

- Actively responds to climate emergency.
- Provide a safe, healthy, active, and accessible city.
- Diversity city centre uses to encourage footfall.
- Support the city centre economy to everyone's benefit.
- Make the most of Colchester's rich heritage.

The CCMP identifies St. Botolph's junction as a key site within the city centre that would benefit from public realm improvements. Reclaiming space for people, facilitate improved interchange between different travel modes, and to free up land for potential development. The improvements recommended include:

- Reconfiguration as a signalled four-way junction.
- Generous public realm at north-east corner of junction.
- Integrate tree planting to new and improved public realm.
- Potential for development of Colchester Rapid Transit Stops within the transport exchange.

In addition to the key Gateway Site at St. Botolph's junction the CCMP notes the importance of the pedestrian and cycling connections to and from the junction for the adjacent key development sites at Vineyard Gate and Britannia Yard.

Other local guidance documents that are a material consideration include:

- The Essex Green Infrastructure Strategy (ECC, 2020)
- The Essex Design Guide (Essex Planning Officers Association, 2018)
- The Colchester Borough Green Infrastructure Strategy (Land Use Consultants, 2011)
- Colchester Town Centre Public Realm Strategy (Colchester Borough Council, 2011)
- External Artificial Lighting, Planning Guidance Note 2012 (Colchester Borough Council, 2012)

Cultural heritage designations are set out in detail within section 2.5.3 Cultural Heritage. However, as the landscape setting of heritage features is relevant to

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the vision set out of the CCMP to make most of Colchester's rich heritage the following locations have been identified as being key in the development of the public realm:

- The scheme borders two conservation areas; Colchester Town Centre, Colchester Area 1 and The Garrison. For both locations 'Special protection exists for built and natural environment to protect the appearance and character of the area.'
- The Grade II listed building, Station House, St Botolph's Station, (117172) lies outside of the Colchester Area 1 Conservation Area. CCC's online information notes that 'the listing covers the both the inside and the outside of the building'.

Landscape Character

At the national scale, Natural England has divided England into 159 No. character areas, based on a combination of landscape, biodiversity, geodiversity and cultural and economic activity. The study area falls within National Character Area (NCA) 111: Northern Thames Basin.

At a regional scale, landscape character has been assessed within Essex Landscape Character Assessment (Chris Blandford Associates, 2003). A number of broad landscape character types (LCTs) and landscape character areas (LCAs). The scheme lies within LCT G Urban Landscapes and LCA G4 Colchester and Environs.

The character areas of Colchester have been defined and described in further detail in the Townscape Character Assessments for Colchester, Tiptree, West Mersea & Wivenhoe (Chris Blandford Associates, 2006). This identifies townscape character types (TCTs) within Colchester, which are subdivided into a large number of smaller townscape character areas (TCAs). The TCAs that fall within the study area include:

- A4 – Scheregate, Historic Core
- A8 – Queen Street, Historic Core
- A9 – St Botolph's Priory and Priory Street, Historic Core
- A11- St. John's Green, Historic Core
- D3 - Old Heath Road, Victorian Suburbs
- G1 – Cavalry, Le Cateau and Goojerat Barracks, Garrison
- J15 – Magdalen Street, Mixed Age Suburbs

Whilst the bulk of the St. Botolph's junction study area lies within the J15 Magdalen Street character area, the study area extends over the borders of the other six identified character areas.

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A major change to the overarching landscape character of the study area since the townscape character assessment was undertaken is the closure of the previous bus station off Queen Street and the increased use of Osborne Street as the main bus interchange. This intense traffic use dominates the streetscape, footways are minimal with frequent cross overs including access and egress for the NCP car park. These constant interruptions to the footway, combined with the need to share the footway space with a continuous line of bus stops reinforces the traffic dominated character of the area, with little relief for pedestrians.

The dominance of vehicular traffic and highways infrastructure continues at the junction. Pedestrians and cyclists are directed into subways connecting east-west across St. Botolph's Street and north-south use. Although the perception of the subways being unsafe, results in their being underused, heightening the sense of severance caused by the A134/Southway.

The roundabout contains some tree and shrub planting that visually breaks up the dominance of the highways character, however their location and elevation lying below road level, emphasises their isolation from the surrounding landscape.

Visibility and Potential Visual Receptors

Views around the study area are generally contained by surrounding buildings, topography and strong stands of trees southeast of the junction. Whilst some landmarks can be recognised, St. Botolph's Church tower, St. Giles Centre, Colchester Town Rail Station, Colchester City Hall and the spire of the Lion Walk United Reform Church, the scale and disparate nature of the city scape viewed from the junction, means that these landmarks visually recede and the scale and monolithic nature of the NCP car park and the prominence of the traffic dominate the view.

The range of views towards the junction are also generally local or directed along the A134/Southway, as buildings, topography and vegetation generally screen views towards the corridor from the adjacent urban areas.

Potential sensitive visual receptors would include:

- Residents, southwest of the junction.
- Visitors to St. Botolph's Priory, northwest of the junction.
- Visitors to The Benedictine Abbey of St John and the Roman Circus to the southeast of the junction.
- Commuters, shoppers and visitors to the city centre arriving at Colchester Town Train Station.

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Road users and people working within commercial properties would also have views of the proposed scheme but are considered to have low sensitivity to the scheme.

2.5.5 Ecology and Nature Conservation

Baseline Conditions

A desk study and site survey of the proposed scheme were carried out in 2018. The desk study found that there are two Statutory Designated sites located within 2 km of the proposed scheme; Bull Meadows Local Nature Reserve (LNR) located approximately 1.1 km north, and Hilly Fields LNR located approximately 1.2 km north west from the proposed scheme. There are also 13 Non-Statutory Designated sites within 2 km of the proposed scheme; these all consist of Local Wildlife Sites (LoWS), with the closest being Colchester Roman Walls LoWS located approximately 0.1 km north of the proposed scheme.

The site survey identified habitats including; building and hardstanding, amenity grassland with mixed scattered trees, broadleaved woodland, introduced shrubs, boundary walls, and boundary fence.

Based on the desk study, the presence of protected species such as bats, Great Crested Newt (GCN), reptiles, birds, badger, riparian mammals, and invertebrates were considered during the site survey. However, results from the site survey found that the presence of GCN, reptiles, badger, riparian mammals and invertebrates were considered unlikely for the proposed scheme area.

Birds were observed on site during the survey and bird nests were observed in trees likely to be affected by the proposed works.

Trees were assessed as having negligible or low potential to support roosting bats; however, it was noted that the subway structures in the centre of the roundabout had potential bat roost features, and a subsequent bat roost assessment survey of the subway structures was undertaken in 2019. The results of this assessment concluded that all three subways have negligible potential for roosting bats and it was considered unlikely that bat species are utilising the subways for roosting.

The 2018 site survey also found a strip of broadleaved woodland south west of St Botolph's Roundabout, which was connected to a block of broadleaved woodland to the south. These woodlands, which are Deciduous Woodland Priority Habitats, have the potential to support foraging bats; however, this area is unlikely to be affected by the proposed works.

During the site survey, no invasive non-native plant species were recorded.

It is proposed that a re-survey of the site is undertaken at the next design stage in order for the ecological baseline conditions to be updated.

2.5.6 Road Drainage and Water Environment*Fluvial Flood Risk*

Environment Agency Flood Map for Planning (Environment Agency, 2023) (seen in Figure 25) indicate that the study area is not within an area at risk of fluvial flooding as there are no areas of Flood Zone 3 (greater than a 1% (1 in 100) Annual Exceedance Probability (AEP) of fluvial flooding) and Flood Zone 2 (between 0.1% (1 in 1000) and 1% (1 in 100) AEP of fluvial flooding) within the proposed scheme 500m buffer area. Therefore, the site is located entirely within Flood Zone 1, which is defined as low probability of flooding from rivers.

There are no ordinary watercourses within close proximity to the site, and the closest main river is the River Colne, approximately 1km away from the proposed scheme.

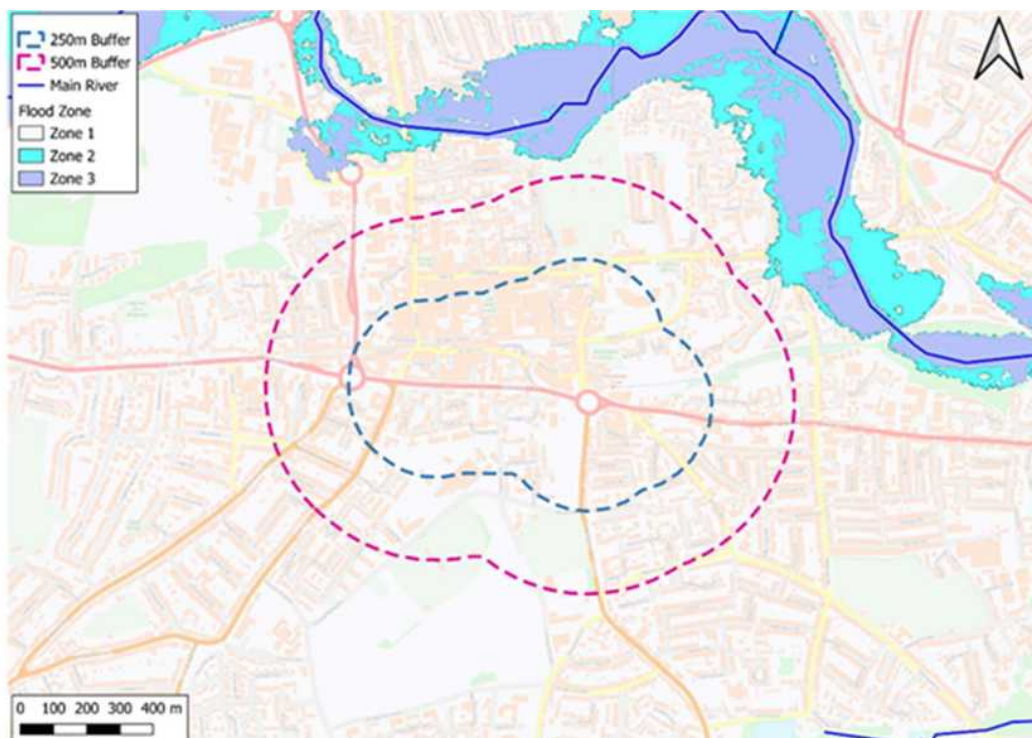


Figure 25 – Risk of Fluvial Flooding – Main River

Surface Water (Pluvial) Flood Risk

The Environment Agency Risk of Flooding from Surface Water (RoFSW) mapping (Environment Agency, 2023) indicates the study area has a range of flooding risk from high (greater than 3.3% (1 in 30) AEP) to low (between 0.1% (1 in 1000) and 1% (1 in 100) AEP) risk of surface water flooding as seen in Figure 26.

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There are a number of areas, within the footprint of the proposed scheme that are high risk of flooding from surface water, for example; The underpass within the St Botolph's roundabout, St Botolph's Street and Osbourne Street. This is attributed to a large overland surface water flow path which runs south-west to north-east from Maldon Street through the centre of the study area to the River Colne, as well as the subway passages underneath the roundabout.

Furthermore, this could further increase with climate change. Peak rainfall intensity could potentially increase by 25-45%³ over the next 100 years. Therefore, the overall risk of surface water flooding would be high.

The site also lies within the Critical Drainage Area (CDA) (Colchester Town Area) identified during the preparation of the town of Colchester Town Surface Water Management Plan⁴ (SWMP) (Capita Symonds, 2013). A CDA is a discrete geographic area (usually a hydrological catchment), within the SWMP study area where multiple or interlinked sources of flood risk cause flooding during a severe rainfall event thereby affecting people, property, or local infrastructure.

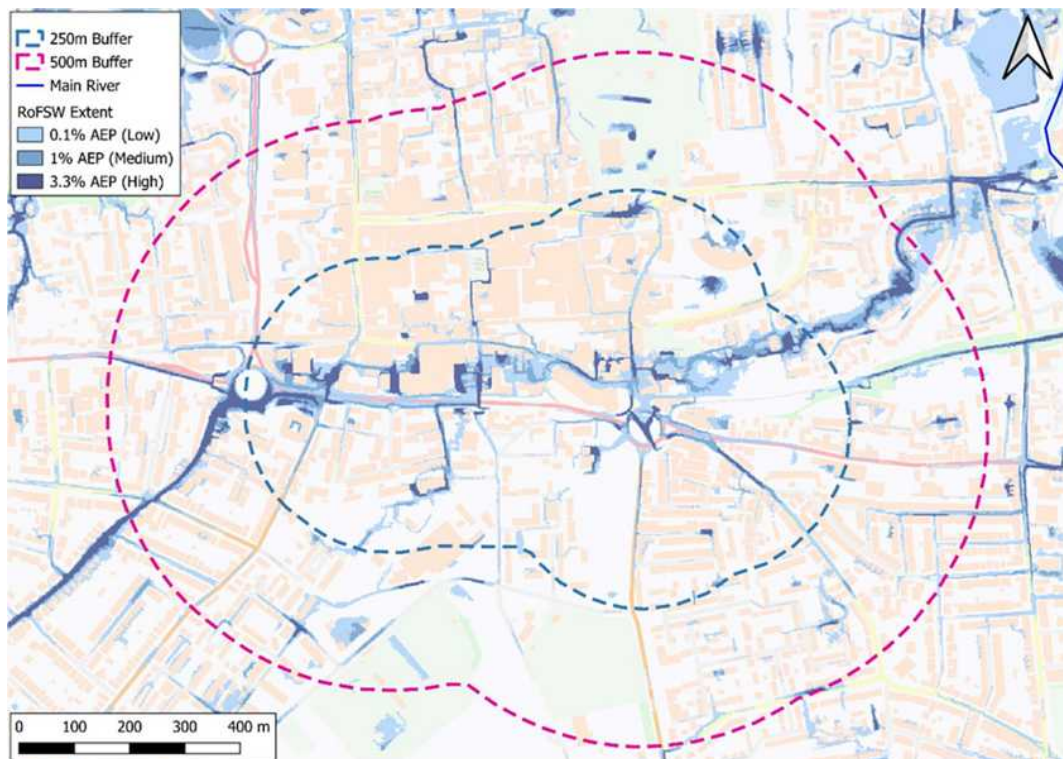


Figure 26 – Risk of Flooding from Surface Water

Groundwater Flood Risk

The CBC Level 1 SFRA (AECOM, 2016) states that there is no record of previous event being attributed to groundwater flooding in the borough (now a city). Furthermore, mapping based on the Environment Agency's Areas

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Susceptible to Groundwater Flooding mapping demonstrates the proposed scheme is located within 1km squares of which 25-50% is susceptible to groundwater emergence.

The risk of groundwater flooding is therefore considered to be medium. The potential for groundwater flooding in this area will need to be confirmed during site investigation survey.

Tidal Flood Risk

Environment Agency Flood Map for Planning (Environment Agency, 2023) indicates that the Proposed Scheme is not located within an area that is influenced by tidal activity and is therefore not at risk of coastal flooding.

The CBC Level 2 SFRA⁵ (AECOM, 2016) mapping shows that the proposed scheme, is outside the 1 in 1000-year (including climate change 2115) Colne and Blackwater Estuary flooding extents, and that flood water would not inundate the site or affect safe access / egress routes. Therefore, the study area is not at risk of tidal flooding.

Flood Risk from Reservoirs

The Environment Agency Risk of Flooding from Reservoirs mapping indicates that the site is far outside the predicted extents of flooding as a result of the failure of any upstream reservoir covered by the Reservoirs Act 1975 (reservoirs containing more than 25,000m³ of water). Therefore, there is no risk of flooding to the proposed scheme as a result of a failure of an upstream reservoir or canals, nor is there any areas benefitting from flood defences.

Flood Risk from Sewers

The CBC Level 1 SFRA (AECOM, 2016) states that to date, no data has been received from Anglian Water to inform the SFRA, however the records of sewer flooding held by ECC identifies some historic flooding due to infrastructure failures within the Colchester Town Area, however, no flood records are located within to the study area or 500mm buffer as seen on the SFRA RoFSW mapping. Therefore, the flood risk from sewers is considered to be low.

2.6 Constraints and Opportunities

The overall constraints and the opportunities affecting the potential scheme and surrounding area are outlined to assist with the development of potential options. This summarises evidence presented in this report.

2.6.1 Constraints

The LUF bid identified that there are a range of constraints in the St Botolph's scheme area which range from demographics, public transport accessibility, highway capacity, structural and design.

The site has a challenging topography with steep incline from the north to the south of the junction. For at grade cycling and walking accessibility across the junction, structural work will be required to support the levelling of the junction.

In addition, the current roundabout has a series of underpasses for pedestrians and cyclists. To peninsularise the area, this network of underpasses will require infilling and structural work.

There is a high level of public transport operational use of the St Botolph's junction, being one of two key access routes for the bus station along Osborne Street. Maintaining full accessibility for 12m bus vehicles across a peninsularised junction is a key consideration. Equally the interaction with the bus station is a key constraint given any changes to the bus station are out of scope for this study, however any changes to the junction need to consider future proofing the bus station and maintaining capacity.

Given the strategic nature of the A134 which routes through the scheme area, highway capacity is a key constraint to any optioneering. Consideration will be taken to maintaining highway capacity as near as possible to what is already provided in a roundabout configuration.

Managing and aligning potentially conflicting scheme priorities in this location could be a constraint, given that there is a lot of development planning. The CCMP will be the overarching scheme to align with, which sets out the overall ambition of the city centre, with additional conflicts posed by the development of RTS accessing Osborne Street and the development along Queen Street.

2.6.2 Opportunities

The options developed for St Botolph's will also need to consider opportunities with nearby schemes / land uses. These include, but are not exhaustive of:

- A possible new bus station interchange / bus stops on the Stanwell House site.
- The opportunity to expand on the existing bus stand/layover capacity within the existing highway corridors.
- Align with the wider LUF bid objectives.
- Development of Vineyard Gate.
- Development of the Britannia Street Car Park (Britannia Gate).
- LCWIP cycle networks.
- Other schemes identified in the CCMP.

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- Possible changes to the access to NCP Osborne Street car park, such as a direct access in to the car park from the A134 Southway.

In addition to the above identified opportunities the LUF bid stated that there is the opportunity for the scheme to deliver a sustainable impact to¹⁰:

- Increase quality of life.
- Raise economic activity levels.
- Deliver pride in place.
- See Colchester portrayed as an exemplar for low carbon in regeneration, heritage and active travel.

The 'City' status awarded to Colchester and the plethora of heritage assets provide an opportunity to break a cycle of decline in central areas¹¹, particularly in relation to this scheme, offering a gateway to accessing the city centre, lowering anti-social behaviour and supporting the regeneration of this area of the city. More specifically the opportunity to attract more footfall via new housing, create new routes for local visitors and tourists, and increase the number of jobs and jobs density in the central area.

The scheme will correspond with Levelling-Up missions with a focus on LUF six capitals:

- Physical capital – through better access and design of inclusive, safe places to live, work, and play and stay active;
- Intangible capital – through designing out anti-social behaviour and supporting pride in place through investment in the look and feel of the central areas -supporting community assets like Firstsite;
- Human capital – connecting new jobs in the central area with our most deprived neighbourhoods, promoting health and well-being through active travel;
- Financial capital – leveraging private monies to support residential development and longer-term projects including LCR investment around the railway station; and
- Social capital – bringing new life, families, and visitors to the central areas, providing an environment where our communities can see our history and feel part of our future.

¹⁰ LUF Bid 2022

¹¹ LUF Bid 2022

3 Future Situation

3.1 Introduction

This chapter of the report sets out the future transport infrastructure for the area around the St Botolph's junction. It outlines assumptions within future modelling alongside expected developments in walking and cycling.

3.2 Forecasting and Scenario Development

The future developments within or in close proximity to the study area largely come from the Colchester Local Plan. Using this as a source of information, it provides an estimate of the future housing supply.

The local plan contains information on future employment and developmental infrastructure. This informs modelling and design assumptions.

Within the Colchester Town Centre Model used for the modelling analysis of the scheme options, a series of parking, development, and public transport assumptions have been included for the 2026 assessment. These are as follows:

Table 3 Car Parks included within Modelling Assumptions

| Parking | Development | Public Transport |
|---------------------------------|---|-----------------------------------|
| Britannia - closed | Garden Community: 700 dwellings, of an expected 7,800 total by 2051 | RTS at a 10 minute headway. |
| Vineyard Street - closed | 2026 core growth scenario does not include developments at Vineyard Street Car Park or Britannia Car Park, although both are assumed to be out of use. | Park and Choose East in operation |
| Osborne Street – open | | |
| St Mary's – open | | |
| St John's - open | | |

A series of highway improvement assumptions have also been included to provide a likely picture of what the highway environment in and around the scheme area will look like. These are as follows:

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Table 4 Highway Improvements included within Modelling Assumptions

| Scheme | 2026 DM |
|--|---------|
| A120-A133 Link Road | Yes |
| North East Bypass | Yes |
| Ipswich Road to Harwich Road Highway Improvements | Yes |
| A120 Millennium | Yes |
| RTS Section A | Yes |
| RTS Section C | Yes |
| Axial Way | Yes |
| Speed limit of 30 mph on Northern Approach + signals | Yes |
| Headgate/Crouch St/St John's St/Head Street junction signals | Yes |
| Headgate - 2 lanes NB from Southway up to Essex Street - 1 lane between Essex Street and Crouch Street/St John's Street junction | Yes |
| St John Street - 1 lane per direction - WB only for buses, cyclists and permitted vehicles | Yes |
| Head Street - 1 lane NB from the Crouch Street/St John's Street junction | Yes |
| North Hill - SB buses only | Yes |
| High Street closed to traffic - for access only | Yes |
| Closure of right turn Southway to Headgate | Yes |
| Balkerne Hill North Traffic Signals | Yes |
| Butt Road - 1 lane closed for cars | Yes |
| Single phase pedestrian crossing on Balkerne Hill | Yes |
| North Station Road closure NB to general traffic | Yes |
| A134 Station Rd - Removal of the bus lane | Yes |
| LCWIP4 | Yes |

3.3 Public Transport & Active Transport

3.3.1 Bus Station & Bus Capacity

The bus station suffers significant challenges. With its strategic location and the interaction with both the St Botolph's scheme, CCMP and the CFTS, a stand-alone piece of work is being undertaken to understand the supply and demand in this location.

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combined and coordinated with cycle ways. RTS contributes to ambitious sustainable travel targets at Tendring Colchester Borders Garden Community (TCBGC) and wider objectives for sustainable travel throughout Colchester, which are emerging as part of the new Colchester Future Transport Strategy.

The future assessment of the St Botolph's junction in 2026, assumes a maximum of 700 homes to have been built out at the TCBGC and the associated Park and Choose to be in operation. However, the impacts of the Park and Choose would be negligible if any at the St Botolph's junction.

3.3.3 LCWIP Cycling Network & Active Travel Fund Schemes

The LCWIP cycling network as outlined in Section 1.4.5 interacts with the St Botolph's scheme area. The Corridor 5 route sits at the western edge of the scheme area, crossing the A134 Southway. As highlighted in Section 2.3.3 the topography causes some difficulty providing step free access between each side of the road.

The optioneering of the scheme will consider high quality cycling routes connecting directly into this cycling network, expanding the off-road cycling offering to access the city centre from surrounding residential areas.

Complementing the LCWIP network, a series of ATF scheme have been designed to feed directly into the LCWIP routes. Although none directly sit within the St Botolph's scheme area the design of scheme options will need to consider connectivity to these areas for a seamless user experience.

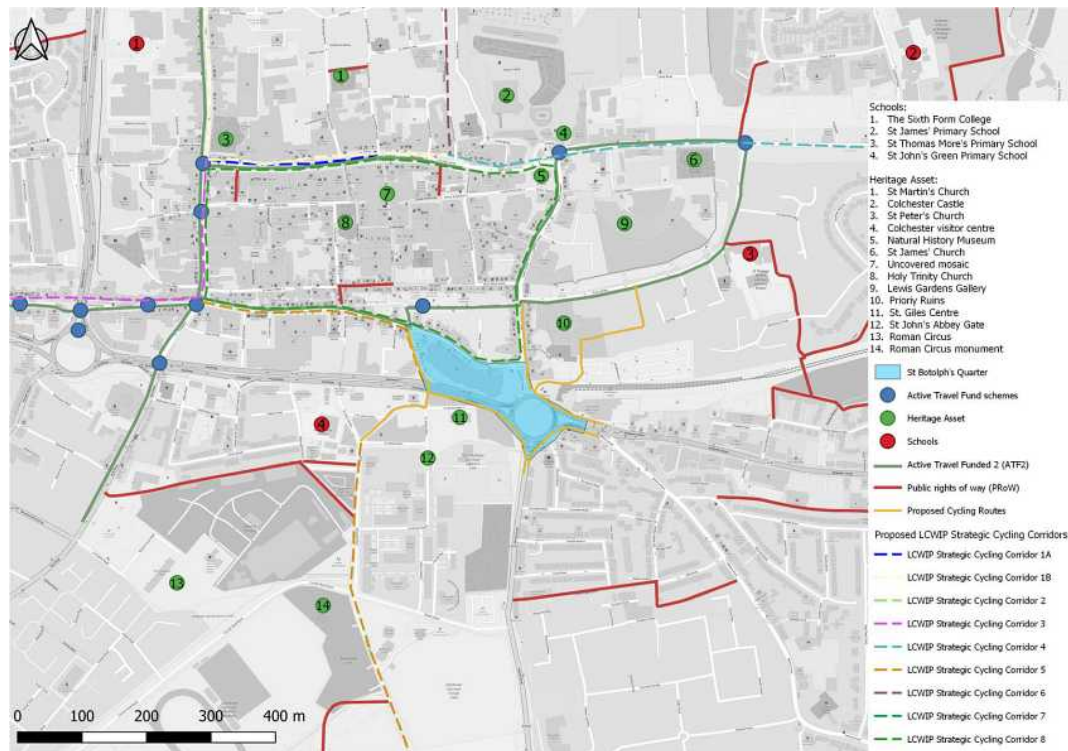


Figure 28 – Existing and Proposed Active Travel Routes

3.3.4 Mobility Hubs

Based around Collaborative Mobility UK (CoMoUK) guidance, a definition of mobility hubs is:

'Safe and connected places that facilitate convenient access to public, shared and active modes'.

They can provide enhanced facilities to benefit the local community; they can incorporate a logistics element for goods/services to enhance the local economy; and they can help create high quality public realm spaces.

Looking at the St Botolph's scheme area as a whole against the LUF and CCMP objectives the outcome aligns with the definition of a mobility hub. During the upcoming design stages future mobility hub principles will be considered.

4 Need for Intervention

This section brings together the findings from Chapters 2 and 3 and outlines the process of consultation and engagement processes. Current and future transport-related problems are highlighted that establish the need for intervention in terms of improvements to St Botolph's junction.

4.1 Summary of Current Transport Related Problems

Based on the information in the chapters above, the current transport related problems have been identified within the study area:

- Severance of city centre and residential areas with strategic A134 highway.
- High level of car ownership and car use for short journeys – high potential for travel mode behaviour change in the junction vicinity.
- Public rights of way consist of underpasses beneath the junction.
- Low cycle share in vicinity of the junction scheme area.
- High volume of buses accessing the bus station from the St Botolph's junction.
- At capacity link along Queen Street feeding into the north of the junction.
- Collisions predominantly slight across the junction, all collisions along Osborne Street involved a pedestrian.
- Junction within the 200m affected area of the AQMA – high traffic flows and concentration of diesel buses likely contributors.

The above problems were summarised within the LUF Bid, stating that 'The roundabout is a prime example of poor public realm design that reinforces severance from the town for some of our most deprived communities. Private car has primacy over active and safe routes for pedestrians and cyclists exemplified by 1960's underpass walking routes'¹³.

Addressing these issues whilst minimising the effect on highway capacity is a key challenge.

4.2 Impact of Not Changing (Future Problems)

The following sub-sections address the issues across the network and in the local vicinity of the St Botolph's junction should no intervention be undertaken as part of this scheme.

¹³ LUF Bid 2022

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4.2.1 Movement and Accessibility

Essex Climate Action Plan¹⁴ outlines that in the future there needs to be a blend of travelling less, modal shift and decarbonisation. In the context of the St Botolph's junction, being so integral in connecting the city centre, with the bus station at Osborne Street and Colchester Town railway station, investment is required to alleviate significant transport and connectivity challenges and realise opportunities to achieve significant mode shift and transport decarbonisation.

Transport modelling indicates that there will be an increase in traffic flow in the 2026 do nothing scenario, which will likely increase community severance from the south of the junction and provide disincentive for active travel accessing the city centre.

4.2.2 Economic Growth and Prosperity

It has been noted within the LUF bid and through the development of the CCMP, that this gateway to the city centre suffers from a 'tired' public realm with increasingly high vacancy rates, as well as a creeping upward trend in crime and anti-social behaviour.

The LUF bid states that, 'Commercial property owners have indicated that they are minded to invest in their properties but are unwilling to do so until and unless they see public sector partners attracting investment into this part of the town centre.'¹⁵

An advantage of the scheme area is the opportunity afforded to regeneration, given lower land values particularly to the south and east of the scheme. However as mentioned previously this can only be unlocked through future investment.

4.2.3 Society

As mentioned within the previous section, there is an issue with anti-social behaviour and crime within the scheme area, without investment into the area it will be difficult to improve the safety for those using the transport modes and accessing the city centre.

Vulnerable people such as elderly, disabled, women and care givers tend to disproportionate use buses – which directly links into the scheme area, with the bus interchange at Osborne Street.

¹⁴

https://www.essex.gov.uk/sites/default/files/migration_data/files/assets.ctfassets.net/knkzaf64jx5x/4lhrw6uXe2g19YxYWkfsk6/eba8f76776738b010f21d3e7f3b9add2/9422_Climate_Action_Plan_Report_v3_-_Digital_Accessible.pdf

¹⁵ LUF Bid 2022

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Scheme interventions such as improving the public realm and access to the bus interchange are primarily designed to make the areas safer through design.

4.2.4 Environment

As outlined in Chapter 2, the scheme area is already within an AQMA.

Transport modelling identifies that there is an increase in queuing at the St Botolph's junction between the 2019 baseline and the 2026 do nothing scenario, which with increase idling increases transport emissions in the direct area. The delay difference observed is as follows:

- Queues are notably longer on all arms at the A134 / Brook Street junction as traffic volume increases in 2026. In particular, the Eastbound queue on Magdalen Street often extends to the junction with Military Road and St. Botolph's Roundabout in the PM peak.
- At the St. Botolph's Roundabout, queues on most approaches in 2026 are similar to the base except Mersea Road which is predicted to increase by 80m in the AM peak.
- At Maldon Road Roundabout, substantial queuing is observed in the base, but with no significant change in queue length expected.
- Queues at A134 / Butt Road are shorter in 2026. This is due to large decreases in flow on Butt Road.
- No significant change in queues at the A134 / Stanwell Street junction.
- No significant change in queues at the A134 / Military Road junction with queue increases slightly on the Magdalen Street EB in the PM peak due to exit blocking from the A134 / Brook Street junction.

Linking with the movement and accessibility considerations, with the opportunity to support modal shift and transport decarbonisation, this supports the potential for future environmental improvements.

4.3 Consultation and Engagement

This Stage 2 work has been informed by consultation and engagement with the local community, local landowners and stakeholders. This included consultations in 2019, 2020, 2022 and 2023.

The key aims of the consultation exercises were to:

- Inform the decision-making processes involved in the identification of a preferred option for St Botolph's.
- Demonstrate that feedback from the public has been taken into account.
- Deliver a robust and legally sound consultation that complies with the 'Gunning Principles' (four established rules to make consultation

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fair and a worthwhile exercise) and follows consultation best practice and due process.

- Present the options clearly, explaining the likely benefits and impacts of each.
- Improve understanding of the project objectives, the challenges faced and the need for the scheme within the context of the wider Colchester network.
- Ensure walking/cycling and sustainable travel opportunities are highlighted.
- Manage, protect and enhance the reputations of ECC and EH, including promotion of the Safer, Greener, Healthier initiative.

In 2019 a consultation was held on a re-design of the roundabout that would be adapted to increase capacity for more vehicles, new crossing points would be created, and the underpasses infilled to improve safety. Feedback was gathered and compiled in a consultation report.

In 2020 the Council undertook extensive consultations on the future of the town centre encompassing general state of repair, issues for residents, businesses, and tourists to inform the Town Investment Plan. This engagement was coupled with key stakeholder events and interviews including community and business groups and representatives of Colchester's Business Improvement District (BID). Consistently clear messages and themes were apparent and support the broader Town Deal and the LUF projects of:

- A greener Colchester.
- A more attractive public realm.
- More activities for young people.
- Better walking and cycle infrastructure.

A presentation was given to 'We are Colchester', the Town Deal Board in May 2022 where the LUF bid was endorsed. This included representation from local community sector organisations, civic society, the private sector, and local businesses. Recognising the crucial importance of support from local businesses within the intervention area, the Chair of the 'Our Colchester' (BID) Board was briefed and provided a face-to-face briefing to the whole board in June 2022, fully explaining the proposed scheme, its rationale, and the implications for this core area.

The Colchester Civic Society was briefed on this proposal via a face-to-face workshop held in June 2022 to explain the proposed scheme and provide a virtual 'walk through' of its elements. Views were considered and included in the LUF bid. ECC consulted extensively on the 'Future Transport of Colchester Strategy' which underpins the active travel interventions. Noting the vital and statutory role of Historic England, a virtual meeting with the East of England

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regional office including the inspector of monuments was held in June 2022. The meeting generated several improvements and refinements which have been scoped and added to the LUF bid.

Other in-depth briefings to other key stakeholders including the local MP and Network Rail – noting the crucial need for close working and early support for the proposed improvements at the railway station. The councils are working closely with the NHS through existing partnerships including the Local Delivery Pilot, and it is recognised that facilitating more active travel (walking and cycling) can lead to health benefits in controlling issues such as Type 2 Diabetes, Cardiovascular Health and Mental Health in the community.

The results of these consultations and engagements in 2019, 2020 and 2022 were taken into account in the identification, development and evaluation of the options for this Stage 2 work.

In June and July 2023 ECC and CCC consulted on a 'crossroad' design with a right turn from St Botolph's Street to A134 Southway. As part of the consultation there were two public events as well as six separate engagement meetings. This includes Councillor briefings, a Colchester residents panel, a briefing to a group of statutory stakeholders, a meeting with the Colchester Civic Society and an event with a local sixth form college. The results of this consultation are described later in this report in Chapter 6 on the Development of the Elliptical Roundabout.

5 Assessment and Selection of Options

5.1 Background

Improvements to the St Botolph's junction has been a long-standing aspiration and the need to look at alternative highway layouts. Further to this, the CCMP identified aspirations for the St Botolph's Quarter indicated a number of new developments and the need to connect up key arrival points such as the city centre, bus interchange and key developments.

This chapter outlines the assessment and selection of options considered for the St Botolph's scheme area as part of the Stage 2 process, and the identification of a preferred option for consultation.

5.2 Initial Sifting

A series of five design options were tabled during the initial development of this scheme. Prior to these being developed in more detail an initial sift was undertaken to understand how each option performed using eight more detailed evaluation criteria.

The outcome of this assessment is shown in Table 5. As shown, three options were selected for further development, with Option 3 and Option 5 being excluded based on concerns around their safety and their impacts on junction capacity.

Whilst Option 3 removed a limited amount of traffic from the junction and from St Botolph's Street and Osborne Street, it was not taken any further due to concerns about the very short slip-road from A134 Southway into the car park and the risk of traffic backing onto Southway from the access ramp. There was a high risk of rear-end collisions if there was any slight delay to traffic accessing the car-park. Also, the extra car park access would cut across the pavement to the south of the NCP car park.

Option 5 was not taken further in the assessment process due to the negative impacts on highway capacity caused by the removal of one of the three eastbound traffic lanes on Southway. Also due to the extra pedestrian and cycle crossing to the west of the junction, which is mostly duplicated by the proposed new pedestrian / cycle crossing across Southway to Stanwell Street.

| Option sifting criteria | Option 1 | Option 2 | Option 3 | Option 4 | Option 5 |
|--|----------|----------|----------|----------|----------|
| Minimises the effect on highway capacity | - | ✓ | X | ✓ | XX |
| Improves active travel routes and crossings | ✓ | ✓ | ✓ | ✓ | ✓✓ |
| Opportunity for new development site (S-E corner) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Opportunity for new public realm (N-E corner) | ✓✓ | ✓ | ✓ | ✓ | ✓ |
| Enables right turn from St Botolph's St. to Southway | X | ✓ | ✓ | ✓ | ✓ |
| Facilitates direct access to NCP car park & new bus lane | - | - | ✓ | - | - |
| Provides left turn slip (Southway > St Botolph's St.) | - | - | - | ✓ | - |
| New Stanwell Street right turn junction and active travel crossing | ✓ | ✓ | ✓ | ✓ | ✓ |

5.3 Options Descriptions

This section focuses on the three options which were taken forward for further assessment following the aforementioned initial sift of schemes.

5.3.1 Option 1

Option 1 is the plaza style highway option submitted as part of the LUF bid in 2022.

The Option 1 layout is shown in Figure 29, and its key characteristics include:

- No right turn southbound out of St Botolph's Street, so any right turning traffic from Queen Street would need to turn right into Osborne Street, left into Stanwell Street and into a new right hand turn onto A134 Southway.
- There would be a new pedestrian and cycle crossing across Southway, with a new right-turn signal-controlled junction with Stanwell Street.
- This option reclaims a significant amount of land with the opportunity for new development in the south east corner, and new public realm in front of the Colchester Town Railway Station.
- New crossings on the south, east and north of the junction. Allows access to potential new bus stands should a future bus interchange be identified through Colchester Bus Capacity work.
- Signalised staggered cross-road at A134 Southway/St Botolph's St
- At A134 Southway/St Botolph's St junction, all movements are allowed apart from right turn out from St Botolph's St.
- Most approaches allow cross-walks.
- Supporting developments in Britannia Way / Vineyard Street / Stanwell House.



Figure 29 - Option 1 Drawing

5.3.2 Option 2

Option 2 further develops the Option 1 concept, offering further refinement with a more direct cross-road layout. The Option 2 layout is shown in Figure 30 and includes the following elements:

- Allowance of a right turn out of St Botolph's Street.
- Signalised crossroad at A134 Southway/St Botolph's.
- At A134 Southway/St Botolph's St junction, all movements are allowed.
- Most approaches allow cross-walks.
- Less opportunity than option 1 for new public realm in the north-east quarter by the Colchester Town Railway Station but still a significant area.
- Retaining balanced capacity for all modes; the proposals will ensure traffic can flow efficiently and provide easier access into the railway station.
- The scheme offers the potential to release development space released (subject to detailed design):
 - New development in south-east corner
 - Two Kiosks / Hubs
 - Other opportunities for micro-businesses / pop-ups / street-food
- Supporting developments in Britannia Way / Vineyard Street / Stanwell House.

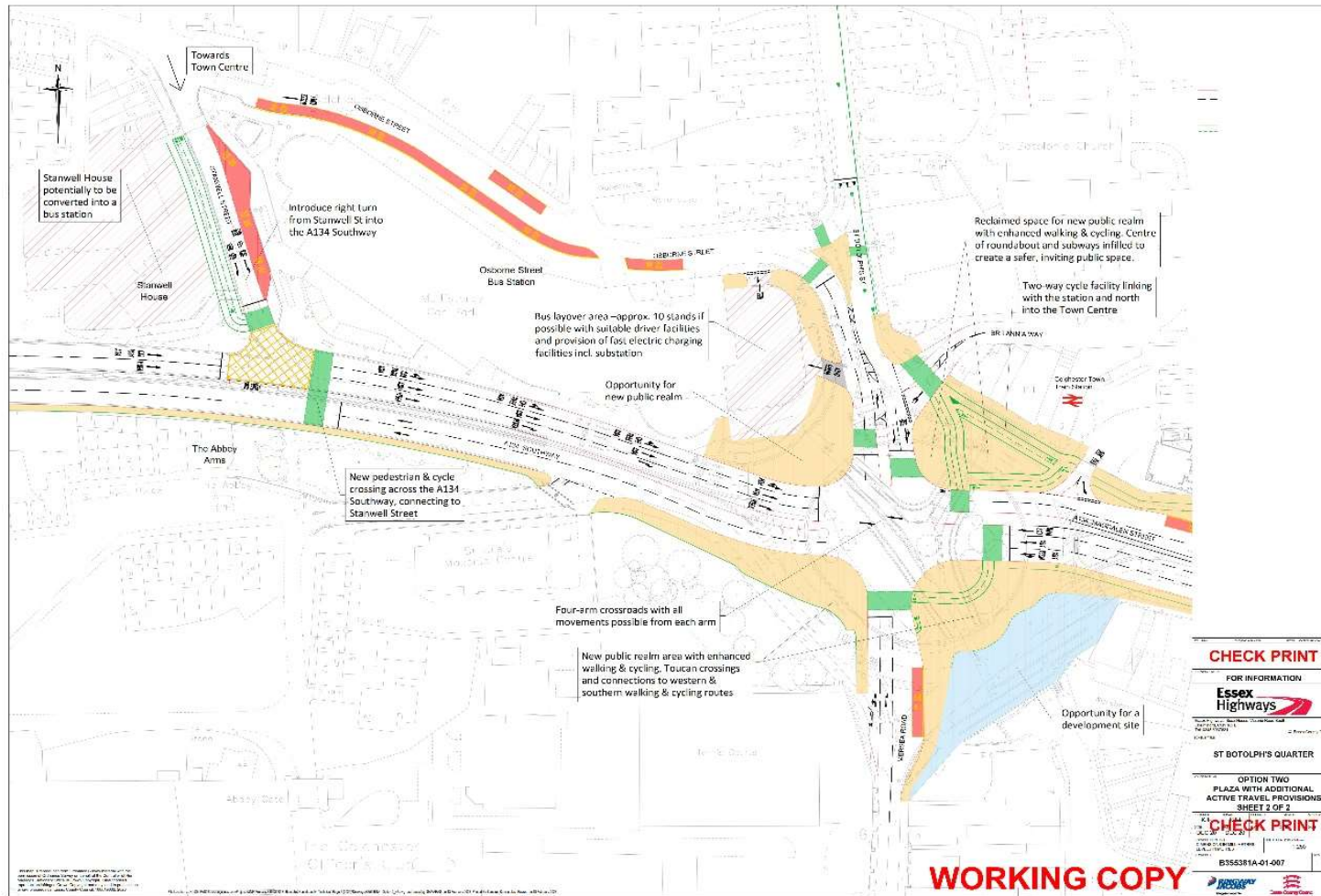


Figure 30 - Option 2 drawing

5.3.3 Option 4

Option 4 is a variation of Option 2 with the introduction of a dedicated left turn slip road from A134 Southway (Westbound) into St Botolph's for Osborne Street this is illustrated in Figure 31.

- Signalised cross-road at A134 Southway/St Botolph's St.
- At A134 Southway/St Botolph's St all movements are allowed; Segregated left turn from A134 Southway West is introduced.
- Most approaches allow cross-walks.
- Supporting developments in Britannia Way / Vineyard Street / Stanwell House.

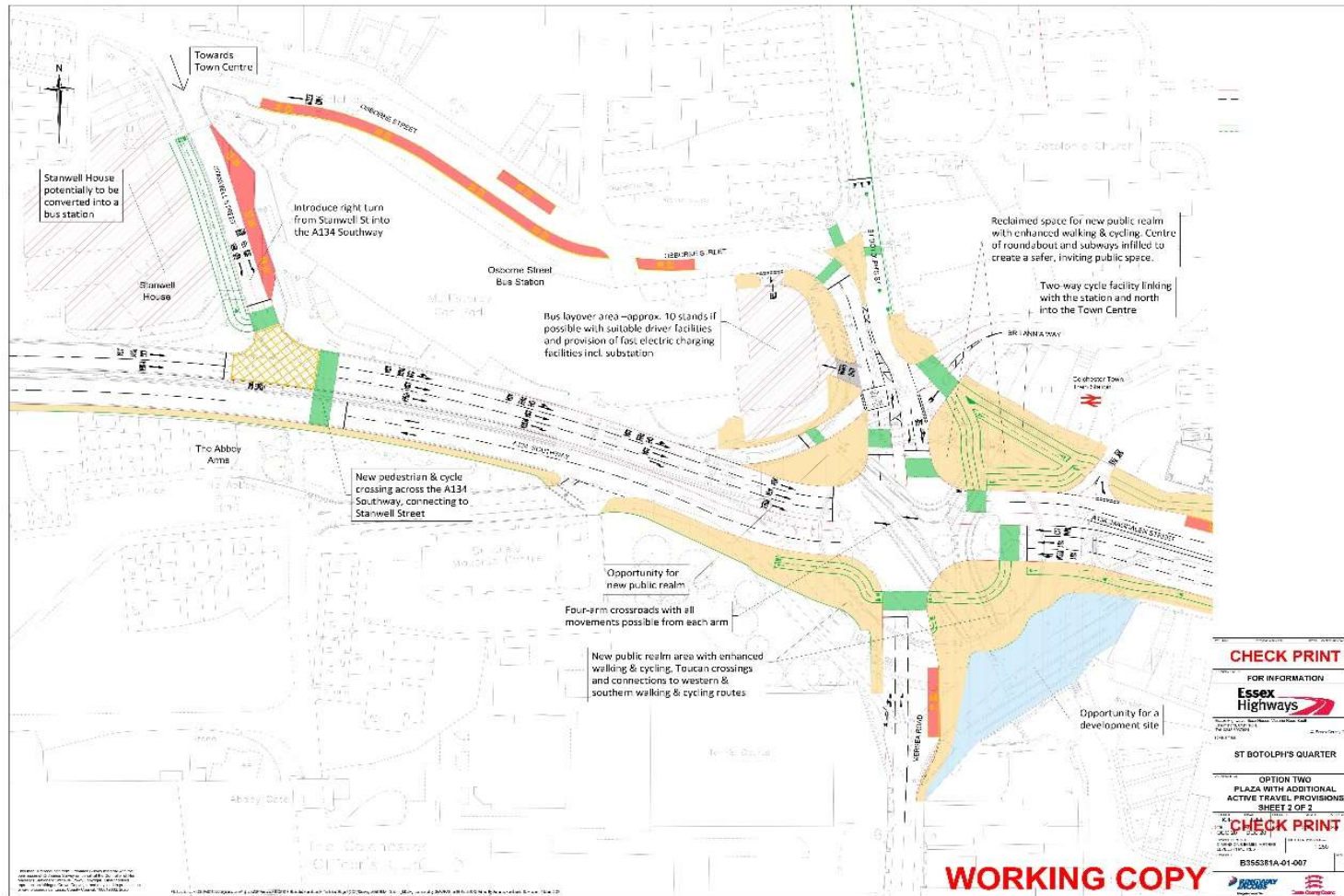


Figure 31 - Option 4 drawing

5.4 Multi-criteria assessment

To identify the relative performance of each of the options, a MCA framework was developed, where each of the remaining three options was rated against agreed criteria to determine which option to take forwards to consultation.

As well as quantitative data and qualitative commentary, all criteria will be presented and scored as red-amber-green (RAG) and a score of 1, 2 or 3 respectively. The measures, their categories, and agreed measurement criteria are shown in Appendix D. The categories and their associated measures are shown in Table 6.

Table 6 Option Assessment Categorisation

| Category | Measure |
|-----------------------------------|--|
| Network Performance | Traffic Flow (Compared with Do Nothing scenario) |
| | Degree of Saturation (<i>Overall Junction</i>) |
| | Delay over and area – Network Statistics |
| | Point to Point Journey Time (<i>for all vehicles</i>) |
| | Reallocation to key routes |
| Walking and Cycling | Point to Point Journey Time (<i>pedestrians and cyclists</i>) |
| | Links to existing and proposed cycling provision |
| | Alignment with LTN1/20 |
| | Journey Quality – walking and cycling |
| Environment | Air Quality to meet DRMB LA105 screening criteria |
| | Noise to meet DMRB LA111 threshold criteria |
| Public Transport | Bus Stands (additional capacity) |
| | Point to Point Journey Time – Buses |
| | Quality of Interchange / Sense of arrival at interchange (bus/rail/mobility hub) |
| Urban Design / Placemaking | Reclamation of road space for placemaking to create a gateway |
| | Quality of public realm |
| | Utilisation and effectiveness of space |
| | Supporting wider regeneration |
| | Potential redevelopment land |
| Buildability | Cost |
| | Programme (excluding procurement) |
| | Programme Commercially Committed |
| | Complexity of construction |

5.5 Network Performance criteria and analysis

Evaluation of the network performance of each option was undertaken on the basis of a 'basket' of five measures, including:

- Traffic flows: based on flows on four links.
- Degree of saturation: based on six junction locations.
- Area wide delay changes.
- Point to point journey times: based on nineteen routes.
- Re-routing impacts on other routes.

Performance on each of the five metrics was scored individually, based on traffic model outputs for the AM and PM peaks, then summed to generate a consolidated score for each option.

As outlined in Section 5.10, the Network Performance score was subsequently weighted by a factor of 1 to give the final option scores for this measure.

The following sections provide a summary of the options on each of the five measures.

5.5.1 Traffic Flows

Traffic flows have been evaluated based on changes in traffic volumes relative to the Do-minimum scenario on four links (A134 EB, A134 WB, Mersea Street and St Botolph's Street).

For each link performance was rated on a scale of 1-3, based on the following criteria:

- 1 - Worsening compared with the Do Minimum scenario
- 2 - Negligible impact compared to the Do Minimum scenario
- 3 - Improvement compared with the Do Minimum scenario

Table 7 summarises this evaluation, which indicates all options perform slightly worse than the Do-Minimum scenario on this measure. Of the three options, options 2 and 4 are seen to perform best.

5.5.2 Junction performance (degree of saturation)

Junction performance has been evaluated based on the degree of saturation for six locations (the four arms of St Botolph's junction and two arms of the Stanwell Street / A134 junction).

Each location is evaluated on a 1-3 scale using the following criteria:

- 1 – In excess of 100% saturation
- 2 – 90-100% saturation

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3 – below 90% saturation

Table 8 summarises this evaluation, which shows all options perform very similarly, with a minor decline in performance identified for option 2.

5.5.3 Area wide delays

The third measure of network performance was the change in area wide delays relative to the Do-Minimum scenario. Options were rated on a 1-3 scale with the following categories.

1 - Worsening compared with the Do Minimum scenario

2 - Negligible impact compared with the Do Minimum Scenario

3 - Improvement compared with the Do Minimum scenario

As summarised in Table 9, all options are evaluated as having a negligible impact compared with the Do-Minimum.

5.5.4 Point to point journey-time

The point to point journey-time metric compares the options on the basis of the journey times offered for 15 unique routes through St Botolph's and Stanwell Street junction and four longer distance routes via St Botolph's.

Journey-times are evaluated relative to the Do-Minimum, based on the following categorisation:

1 - Journey time >15% or 60s of baseline

2 - Journey time within 15% or 60s of baseline

3 - Journey time better than the baseline

As shown in Table 10, all options experience a mixed impact with some routes experiencing worsened journey times but also some improvements (varying by option).

Averaged across all routes Options 1 and 4 achieve a score of 1.84, while Option 2 is evaluated as 1 scoring 1.74.

5.5.5 Re-routing to other key routes

The final network performance metric relates to re-routing to other key routes, providing an opportunity to capture any re-routing effects of the options which impact on other key routes.

These are outlined for all three options in Table 11, this indicates slightly more significant impacts on other routes from Options 2 and 4.

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Table 7: Network Performance, Traffic flows

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|--|------------------------------|-----------|-----------------|--|-----------------|---|-----------------|---|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Traffic Flow (compared with Do Nothing scenario) <i>Takes an average of the individual route scoring</i> | 2 | | 1.25 | | 1.50 | | 1.50 | |
| St Botolph's St | 2 | No change | 1 | Decrease of 131veh in the AM and decrease of 179veh in the PM | 2 | Increase of 23veh in the AM and decrease of 13veh in the PM | 2 | Increase of 25veh in the AM and decrease of 3veh in the PM |
| Mersea Road | 2 | No change | 1 | Decrease of 238veh in the AM and decrease of 130 veh in the PM | 2 | Increase of 26veh in the AM and 19veh in the PM | 2 | Increase of 17veh in the AM and 11veh in the PM |
| A134 EB | 2 | No change | 1 | Decrease of 188veh in the AM and decrease of 169 veh in the PM | 1 | Decrease of 251veh in the AM and decrease of 283veh in the PM | 1 | Decrease of 207veh in the AM and decrease of 265veh in the PM |
| A134 WB | 2 | No change | 2 | Increase of 94veh in the AM and decrease of 189 veh in the PM | 1 | Decrease of 239veh in the AM and decrease of 298veh in the PM | 1 | Decrease of 237veh in the AM and decrease of 297veh in the PM |

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Table 8: Network Performance, Junction performance

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|----------|-----------------|---|-----------------|----------|-----------------|---------|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Degree of Saturation - Overall Junction Wide <i>Takes an average of the individual arm scoring</i> | 2.83 | | 2.83 | | 2.67 | | 2.83 | |
| St. Botolph's Street | 3 | | 3 | | 3 | | 3 | |
| Mersea Road | 3 | | 3 | | 2 | | 2 | |
| A134 EB @ St. Botolph's | 2 | | 3 | | 2 | | 3 | |
| A134 WB | 3 | | 3 | | 3 | | 3 | |
| Stanwell Street | 3 | | 3 | | 3 | | 3 | |
| A134 EB @ Stanwell St. junction | 3 | | 2 | More green time re-allocated to Stanwell St. to accommodate increased traffic on Stanwell St. | 3 | | 3 | |

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Table 9: Network Performance, Area wide delays

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|----------|-----------------|--|-----------------|--|-----------------|--|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Delay over an area – Network Statistics | 2 | | 2 | 0% change in travel time for the Network in the AM, 0.3% Increase in travel time for the network in the PM peak. | 2 | 1.2% increase in travel time for the Network in the AM, 0.8% Increase in travel time for the network in the PM peak. | 2 | 1.1% increase in travel time for the Network in the AM, 0.6% Increase in travel time for the network in the PM peak. |

Table 10: Network Performance, Point to point journey time

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|----------|-----------------|----------|-----------------|----------|-----------------|---------|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Point to point journey time <i>Takes an average of the individual route scoring - modelled all journey times for all routes for vehicle users through the junction</i> | 2.00 | | 1.84 | | 1.74 | | 1.84 | |
| Mersea Road to Osborne St | 2 | | 2 | | 1 | | 2 | |
| Mersea Road to Magdalen St | 2 | | 3 | | 2 | | 2 | |
| Mersea Road to Southway | 2 | | 2 | | 1 | | 2 | |
| Southway to Osborne St | 2 | | 1 | | 2 | | 2 | |
| Southway to Magdalen St | 2 | | 2 | | 2 | | 2 | |

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|--|------------------------------|--|----------|--|----------|--|----------|--|
| Southway to Mersea Rd | 2 | | 2 | | 2 | | 2 | |
| St. Botolph's St to Magdalen St | 2 | | 2 | | 2 | | 2 | |
| St. Botolph's St. to Mersea Rd | 2 | | 2 | | 2 | | 2 | |
| St. Botolph's St to Southway | 2 | | 2 | | 2 | | 2 | |
| Magdalen Street to Mersea Rd | 2 | | 2 | | 1 | | 1 | |
| Magdalen Street to Southway | 2 | | 2 | | 1 | | 1 | |
| Magdalen Street to Osborne St | 2 | | 2 | | 2 | | 2 | |
| Stanwell Street to Magdalen St | 2 | | 1 | | 1 | | 1 | |
| Stanwell Street to Mersea Rd | 2 | | 1 | | 1 | | 1 | |
| Stanwell Street to Southway | 2 | | 2 | | 3 | | 3 | |
| A134 EB | 2 | | 2 | | 2 | | 2 | |
| A134 WB | 2 | | 2 | | 2 | | 2 | |
| Queen Street (from High St) / Mersea Road (up to Pownall Cres) - NB | 2 | | 1 | | 2 | | 2 | |
| Queen Street (from Osborne St) / Mersea Road (up to Pownall Cres) - SB | 2 | | 2 | | 2 | | 2 | |

Table 11: Network Performance, Re-routing to other key routes.

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|----------|-----------------|---|-----------------|---|-----------------|---|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Re-routing to key routes/public transport corridor (East Hill etc.) | 3 | | 2 | <p>Minor flow increases/ decreases on sections of East Hill/ Ipswich Road/ Cowdry AV in the AM.</p> <p>Flow difference on Cowdry AV WB PM 65 veh, but no changes to queueing.</p> | 1 | <p>Minor flow increases and some decreases on sections of East Hill/ Ipswich Road/ Cowdry AV in the AM with some additional queueing WB on East Hill and SB on Ipswich Road.</p> <p>Flow increases on Cowdry AV WB PM 62 veh. with decreases on sections of East Hill. No changes predicted to Cowdry Av WB queueing. Some additional queueing WB on East Hill in the PM.</p> | 1 | <p>Minor flow increases and decreases on East Hill/ Ipswich Road/ Cowdry AV in the AM, with increases in queueing on East Hill and Ipswich Road.</p> <p>Flow increases on Cowdry AV WB PM, no additional queueing. Additional queueing on East Hill and Ipswich Road.</p> |

All three options were compared with the Do Nothing or Do Minimum baseline scenario/current situation for network performance (traffic flow, degree of saturation, delay, journey time and re-routing of public transport). Overall, Option 1 (plaza layout) outperforms Options 2 and Option 4.

5.6 Public Transport criteria and analysis

Impacts on public transport, particularly buses accessing the bus station (Osborne Street) via the St Botolph's junction have been assessed to understand the impact of changes to the junction layout.

This has been undertaken using three metrics, which have been evaluated on the basis of traffic model outputs for the AM and PM peaks, review of bus facilities in the proposed design and a qualitative review of the interchange design. Results for each of the three metrics are summed to generate a consolidated score for each option.

As outlined in Section 5.10 below, the Public Transport score was subsequently weighted by a factor of 2 to give the final option scores for this measure.

The following sections provide a summary of the options on each of the three measures.

5.6.1 Bus stands (existing)

This measure relates to impacts on existing bus stops and stands on Osborne and Stanwell Streets. As shown in Figure 29, Figure 30 and Figure 31 all options include a new pedestrian crossing of the A134 immediately to the east of the junction with Stanwell Street.

As summarised in Table 12, the revised junction layout to accommodate this results in a small reduction in the length of bus stop on bC.

The wider strategic opportunity for additional bus stand capacity at St Botolph's will be considered separately as part of the wider CCMP.

5.6.2 Point to point journey time

Given the interface with the Osborne Street bus station, options have been assessed in terms of their impacts on a range of twelve point to point movements to/from Osborne Street/Stanwell Street.

Journey times are evaluated relative to the Do-Minimum, based on the following categorisation:

- 1 - Journey time >15% or 60s of baseline
- 2 - Journey time within 15% or 60s of baseline
- 3 - Journey time better than the baseline

Evaluation for each of the twelve routes is presented in Table 13, with overall option scores taken as the average across all routes.

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5.6.3 Quality of interchange/sense of arrival

Quality of interchange / sense of arrival has been evaluated based on qualitative review of the design options.

As shown in Table 14, each option was scored on a 1 to 3 scale based on the following criteria.

- 1 - No improvement in quality of interchange and wayfinding
- 2 - Moderate improvement in directional quality in public realm design, leading to different interchange opportunities, wayfinding and sight lines
- 3 - High directional quality in public realm design, leading to different interchange opportunities, high quality wayfinding & clear sight lines

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Table 12: Public Transport, Bus stands

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|--|-----------------|--|-----------------|--|-----------------|--|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Bus Stands <i>Only focuses on additional capacity in existing highway. Excludes Stanwell St House, UKPN site, Vineyard Gate area</i> | 2 | All options compared with the baseline | 1 | Reduction in length of bus stop bC on Stanwell St. to accommodate new crossing | 1 | Reduction in length of bus stop bC on Stanwell St. to accommodate new crossing | 1 | Reduction in length of bus stop bC on Stanwell St. to accommodate new crossing |

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Table 13: Public Transport, Point to point journey time

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|--|-----------------|----------|-----------------|----------|-----------------|---------|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Point to point journey time <i>Takes an average of the individual route scoring - modelled all journey times for all routes for buses through the junction</i> | 2 | All options compared with the baseline | 1.83 | | 1.67 | | 1.83 | |
| Mersea Road to Osborne St | 2 | | 2 | | 1 | | 2 | |
| Mersea Road to Southway | 2 | | 2 | | 1 | | 2 | |
| Southway to Osborne St | 2 | | 1 | | 2 | | 2 | |
| Southway to Mersea Rd | 2 | | 2 | | 2 | | 2 | |
| St. Botolph's St to Magdalen St | 2 | | 2 | | 2 | | 2 | |
| St. Botolph's St. to Mersea Rd | 2 | | 2 | | 2 | | 2 | |
| St. Botolph's St to Osborne St | 2 | | 2 | | 2 | | 2 | |
| Magdalen Street to Southway | 2 | | 2 | | 1 | | 1 | |
| Magdalen Street to Osborne St | 2 | | 2 | | 2 | | 2 | |
| Stanwell Street to Magdalen St | 2 | | 1 | | 1 | | 1 | |
| Stanwell Street to Mersea Rd | 2 | | 1 | | 1 | | 1 | |
| Stanwell Street to Southway | 2 | | 3 | | 3 | | 3 | |

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Table 14: Public Transport, Quality of interchange/sense of arrival

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|----------|-----------------|----------|-----------------|----------|-----------------|--|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Quality of interchange/ sense of arrival at interchange (bus/rail/mobility hub) | 1 | | 3 | | 3 | | 2 | Scores less than options 1 and 2 due to the additional road access in the north-east corner. |

Impacts on public transport (access to the bus station and road layout changes) were assessed. Overall, Option 1 (plaza layout) and Option 2 (crossroads layout) provide the highest quality of interchange and sense of arrival.

5.7 Walking and Cycling

Impacts on walking and cycling, are a key area of positive impact for the St Botolph's Junction proposals, with improving performance in this area a key motivating factor for the scheme,

In evaluating the performance of the three design options, walking and cycling impacts have been assessed over four metrics:

- Point to point journey time.
- Links to existing and proposed provision.
- Alignment with LTN1/20.
- Journey quality.

These have been evaluated using a mix of quantitative and qualitative approaches. As outlined in Section 5.10 below, the final walking and cycling score was subsequently weighted by a factor of 2 to give the final option scores for this measure.

The following sections provide a summary of the options on each of the three measures.

5.7.1 Point to point journey-times

Point to point journey-times for pedestrian and cyclists have been reviewed for all three options, based on ten individual routes. Due to the scale of the changes and the accessibility issues with the existing layout, the evaluation reviewed the three options in a comparative fashion based on distance, number of crossings traversed and signal times per crossing. Options were evaluated as either:

- 1 - Worst of the three scheme options
- 2 - Second of the three scheme options
- 3 - Best of the three scheme options

Where options provide equivalent performance for a given route, a shared rating can be used.

Total scores on this metric are based on the average of the ten routes, giving a potential range of 1 - 3 with the baseline (Do-Minimum) layout scored as 1.

As shown in Table 15, Option 1 was identified as the best performer, then 2 and then 4.

5.7.2 Links to existing and proposed cycle provision

Links to existing and proposed cycle provision is evaluated based on the level of coordination achieved with existing and proposed provision. Given the lack of

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existing cycling facilities in this location, alignment with nearby LCWIP proposals is a key factor. As with other measures Options were scored on a 1-3 scale.

1 - No improvement in connectivity between cycling schemes compared to current situation

2 - Moderate improvement in connectivity between cycling schemes compared to the current situation

3 - Significantly improved connectivity between cycling schemes compared with the current situation

As shown in Table 16, all options are considered to offer moderate improvements on this dimension. Figure 32 illustrated the connections provided by Option 2 specifically.

5.7.3 Alignment with LTN1/20

As shown in Table 16, a high degree of alignment with LTN1/20 is anticipated for all three options, formal appraisal using the junction appraisal tool is not however possible at this stage of the design process.

5.7.4 Journey quality (walking and cycling)

A qualitative appraisal of journey quality was undertaken to support the evaluation of this fourth walking and cycling metric. This seeks to identify impacts on traveller stress, route uncertainty and levels of cleanliness, facilities, information and environment, using the following three point scale.

1 - Levels of traveller stress, route uncertainty neutral. Levels of cleanliness, facilities, information and environment neutral to current situation

2 - Levels of traveller stress, route uncertainty moderately improved. Levels of cleanliness, facilities, information and environment moderately improved compared to current situation

3 - Levels of traveller stress, route uncertainty significantly improved. Levels of cleanliness, facilities, information and environment significantly improved compared to current situation

As shown in Table 16, Option 2 is identified as offering the most improvement relative to the current situation.

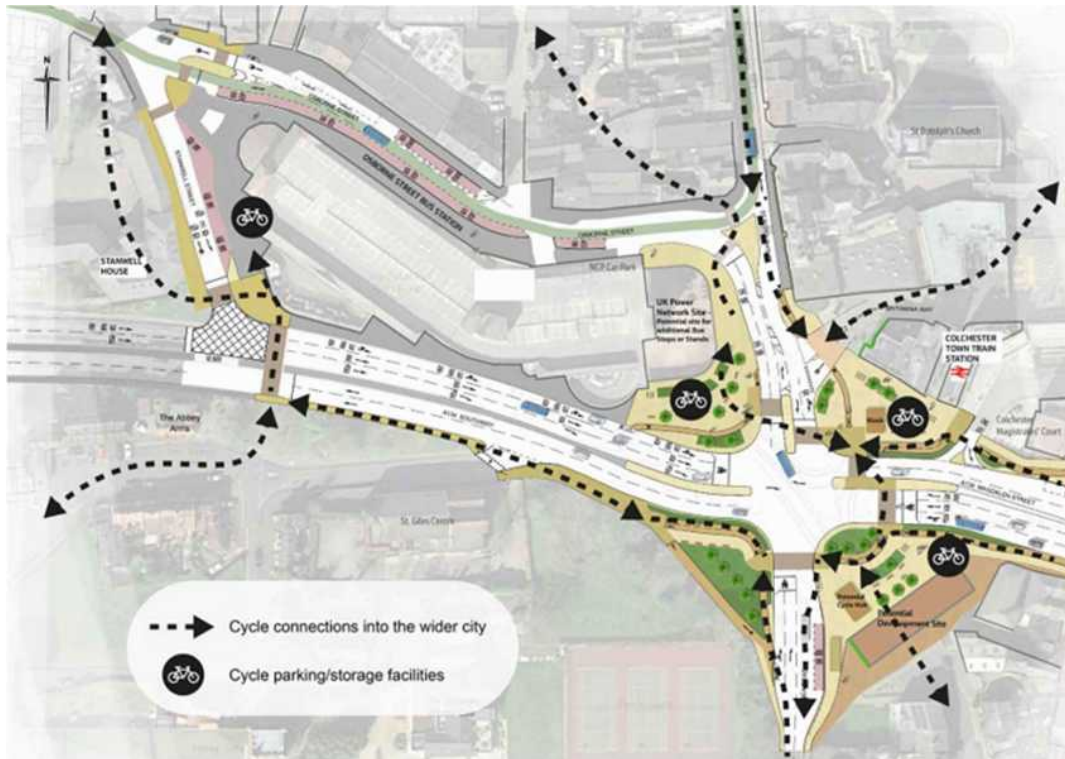


Figure 32 - Increased cycling links to wider area – Option 2

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Table 15: Walking and cycling, Point to point journey time

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|--|-----------------|---|-----------------|----------|-----------------|---|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Point to point journey time - Not possible to compare against baseline so comparison between three options agreed <i>Takes an average of the individual route scoring.</i> | 1 | No Baseline to compare journey time with | 2.90 | Option 1 signals run shorter cycle time therefore less wait times for pedestrian/ cyclists at each crossing | 2.10 | | 1.70 | |
| Mersea Road to UKPN Site | | No Baseline to compare journey time with | 3 | | 2 | | 1 | Option 4 has an additional crossing on the left turn slip from Southway |
| Mersea Road to Train Station | | | 3 | Option 1 signals run shorter cycle time therefore less wait times for pedestrian/ cyclists | 2 | | 2 | |
| Magdalen Street to St Botolph's Street | | No Baseline to compare journey time with | 3 | | 2 | | 2 | |
| Magdalen Street to Southway (via Mersea Rd) | | | 3 | | 2 | | 2 | |

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|--|----------|---|----------|--|----------|---|
| Southway to Train Station (via St. Botolph's St.) | | | 3 | | 2 | | 1 | Option 4 has an additional crossing on the left turn slip from Southway |
| UKPN Site to Mersea Road | | | 3 | | 2 | | 1 | |
| Train Station to Mersea Road | | | 3 | | 2 | | 2 | |
| St. Botolph's Street to Magdalen Street | | | 3 | | 2 | | 2 | |
| Southway to Magdalen Street (via Mersea Rd) | | | 2 | Staggered crossing on Mersea Rd in Option 1 vs Straight crossing in Opt 2 and 4 | 3 | | 3 | |
| Train Station to Southway | | | 3 | | 2 | | 1 | Option 4 has an additional crossing on the left turn slip from Southway |

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Table 16: Walking and cycling, Other metrics

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|--|------------------------------|----------|-----------------|--|-----------------|--|-----------------|---|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Links to existing and proposed cycle provision <i>Qualitative comments essential in detailed assessment</i> | 1 | | 2 | Toucan crossing on Southway provide connection to LCWIP | 2 | Toucan crossing on Southway provide connection to LCWIP | 2 | Toucan crossing on Southway provide connection to LCWIP |
| Alignment with LTN1/20 <i>Level of service score from the LTN1/20 junction assessment tool</i> | 1 | | 2 | The designs for cycling facilities not yet fully developed, but high degree of compliance anticipated. | 2 | The designs for cycling facilities not yet fully developed, but high degree of compliance anticipated. | 2 | The designs for cycling facilities not yet fully developed, but high degree of compliance anticipated. |
| Journey quality - walking and cycling <i>Qualitative comments RAG specification derived from Transport Appraisal Guidance (TAG) Journey Quality Worksheet</i> | 1 | | 2 | Less direct route across St. Botolph's Street and staggered crossing on Mersea Road | 3 | Well located crossing across St Botolph's Street and direct crossing on Mersea Road. | 2 | Less direct route across St. Botolph's Street with an additional crossing on the left turn slip from Southway |

5.8 Environment

Detailed assessments have been undertaken for both air quality and noise to understand the impacts of each of the options considered.

5.8.1 Air Quality

Option 1 has the potential to increase annual mean NO₂ concentrations along Osborne Street and Stanwell Street caused by modelled increase in traffic flows along Osborne Street and a substantial decrease in traffic speeds during certain time periods. These changes are considered to represent a significant adverse effect, and located within AQMA1, results in a conclusion of significant air quality effects at sensitive human health receptors for this option.

All options have the potential to decrease annual mean NO₂ concentrations along Mersea Road due to decreases in traffic flows.

There are small differences in pollutant concentrations for Options 2 and 4, but little to differentiate them in terms of local air quality.

5.8.2 Noise

Noise modelling was undertaken using traffic data provided from traffic modelling (data outlined in the above section). A comparison has been undertaken for all options in both the short and long-term to assess whether the options are likely to result in adverse increases or beneficial decrease in noise levels in both the daytime and night-time periods.

In the short-term, all three options demonstrate a small number of adverse increases in noise level; however, none are predicted to experience moderate or major adverse increases. In the long-term, none of the three options are set to experience more than a negligible noise change.

Option 1 is predicted to result in the highest number of noise sensitive receptors set to experience beneficial decreases in noise levels for both the short and long-term scenarios.

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Table 17 Air Quality Assessment Against Baseline

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|--|-----------------|----------|-----------------|----------|-----------------|---------|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Air Quality to meet thresholds in NO ₂ concentrations. Options are compared against the future Baseline (opening year) <i>Takes an average of five key road areas in the Study Area</i> | 2.6 | Based on 2021 (ASR 2022) Annual Mean pollutant concentrations (ug/m ³) | 2.6 | | 2.8 | | 2.8 | |
| Osborne Street | 3 | | 1 | | 3 | | 3 | |
| Mersea Road | 1 | | 3 | | 2 | | 2 | |
| A134 Southway | 3 | | 3 | | 3 | | 3 | |
| Queen Street | 3 | | 3 | | 3 | | 3 | |
| A134 Magdalen Road | 3 | | 3 | | 3 | | 3 | |

Table 18 Noise Assessment Against Baseline

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|--|--|--|-----------------|---|-----------------|---|-----------------|---|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| Noise to meet DMRB LA111 threshold criteria <i>Takes an average of six key road areas</i> | All options compared with the baseline | | 3 | | 3 | | 3 | |
| Brook Street | | The existing noise environment for receptors adjacent to these roads will be dominated by road traffic noise | 3 | The predicted road traffic noise level for this road shows negligible or no noise change. | 3 | The predicted road traffic noise level for this road shows negligible or no noise change. | 3 | The predicted road traffic noise level for this road shows negligible or no noise change. |
| Osborne Street | | | 3 | | 3 | | 3 | |
| Mersea Road | | | 3 | | 3 | | 3 | |
| A134 Southway | | | 3 | | 3 | | 3 | |
| Queen Street | | | 3 | | 3 | | 3 | |
| A134 Magdalen Road | | | 3 | | 3 | | 3 | |

5.9 Urban Design Option Development

People and place based Urban Design and Placemaking considerations has been at the heart of the optioneering work considering this location is a key gateway into the city centre. This section outlines the key urban design, placemaking and landscape design considerations for all the options including:

- Creating a better people and placed based gateway environment into the city centre and Colchester Town Station forecourt.
- Creating safer and improved pedestrian and cycle paths and crossings.
- Enhancing perception of safety in this area, especially gender-based safety, aligning with the Jacobs *Fearless Streets and Places* approach by removing the existing dated subways and creating more inclusive at-grade crossings. This significant design move will improve safety in this area which has recorded crime stats, especially in later hours.
- Reclaiming road space using the 'Grey to Green' philosophy to create more attractive and functional placemaking opportunities including more planting and trees that would create an attractive plaza environment as a gateway into the station and city centre. This also creates opportunity for air quality improvements, biodiverse planting opportunities and Sustainable Drainage Systems (SuDS) such as rain gardens.
- The reclaimed plaza area provides opportunity for social gathering spaces with seating, a kiosk to support local businesses and activate the area and placemaking design that accentuates the key desire lines in the area, including towards the bus station area.
- High quality materials that enhance the Conservation Area.
- Way finding totem and finger posts that enhance the wayfinding and legibility to various parts of the interchange area and city centre.
- Enhanced interchange environment through placemaking design and signage.
- Reclaiming land from road to public realm opens the possibility to explore a development site to the south-east of the roundabout. This will enhance the opportunities for housing in upper levels with retail functions at ground level that would further activate and enhance this key gateway interchange area.
- Opportunities for more cycling amenity including cycle racks, cycle hub shelter and better cycle routes and crossings to encourage active travel in the area.

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5.9.1 Option 1

The plaza style highway option submitted as part of the LUF bid presents a larger reclaimed plaza area to the north-west of the junction and presents all the placemaking features described above.

5.9.2 Option 2

Exploring a simpler crossroad junction arrangement presents an opportunity to balance the available public space reclaimed from the road and roundabout more evenly between the four quadrants of the junction. The placemaking considerations outlined above are reflected in this option too. This option presents a smaller plaza space to the north-east but opens the opportunity to have more space to the north-west, with a better connectivity and crossings between the train and bus stations, this enhancing interchange opportunities.

5.9.3 Option 4

The simpler junction arrangement presents more balanced public spaces in all four quadrants but the slip road in the north-west quadrant reduces the amount of useable public space in that quadrant.

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Table 19 Reclamation of Road Space

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|--|-----------------|---|-----------------|---|-----------------|--|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| <i>Reclamation of road space for placemaking to create a gateway. RAG measures relate to comparative view of the scale of change between each option compared to each other</i> | 1 | Dominated by current roundabout. Limited public space. The current traffic layout, level differences, current subway arrangement, inactive green area at lower levels present inaccessible and underutilised public spaces | 3 | Peninsularisation of the roundabout creates a large space outside the station. Not as much reclamation of other quadrants | 3 | An even distribution of reclaimed space on all quadrants. Highest level of reallocation of road space for placemaking opportunities. Lesser carriageway. More opportunities for placemaking on all quadrants. | 2 | This option does offer a similar area of placemaking opportunities on all quadrants but the slip road in the western quadrant makes this area a bit less useful as a public space. |

Table 20 Quality of Public Realm

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|---|-----------------|---|-----------------|---|-----------------|---|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| <p><i>Quality of public realm.</i></p> <p><i>Measures in alignment with TfL Interchange Best Practice</i></p> | 1 | Poor quality of urban realm. Traffic dominated and hard to navigate for pedestrians and cyclists. | 3 | Potential for high quality public realm areas. The space in front of the station has potential for a café kiosk, stating, planting and places to gather and interchange efficiently | 3 | Potential for high quality public realm areas. The space in front of the station has potential for a café kiosk, stating, planting and places to gather and interchange efficiently. Potential for high quality urban realm in all quadrants, especially in front of new development area | 2 | Potential for high quality urban realm in all quadrants, especially in front of new development area. The slip lane on the north western quadrant reduces the effectiveness of this area. |

Table 21 Utilisation and Effectiveness of Space

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| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|---|------------------------------|----------|-----------------|----------|-----------------|----------|-----------------|---|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| <i>Utilisation and effectiveness of space. Measures in alignment with Good Public Space Index variables</i> | 1 | | 2 | | 3 | | 2 | The slip lane makes the north western quadrant less useful. |

Table 22 Supporting Wider Regeneration

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|--------------------------------------|------------------------------|----------|-----------------|----------|-----------------|----------|-----------------|---------|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| <i>Supporting wider regeneration</i> | 1 | | 3 | | 3 | | 3 | |

Table 23 Potential Redevelopment Land

| | Baseline - Current Situation | | Option 1 | | Option 2 | | Option 4 | |
|-------------------------------------|------------------------------|----------|-----------------|----------|-----------------|----------|-----------------|---------|
| | Baseline Rating | Comments | Option 1 Rating | Comments | Option 2 Rating | Comments | Option 4 Rating | Comment |
| <i>Potential Redevelopment Land</i> | 1 | | 2 | | 3 | | 3 | |

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5.10 Preferred Option

Each of these measured are ranked out of three, with the Walking and Cycling, Public Transport and Urban Design/Placemaking categories being weighted by 2, indicated their increased priority for assessment. This therefore means that the maximum each option could accrue is 105 with the score for each of the categories as follows:

Table 24 Maximum Scoring for each Category

| Category | Maximum Score |
|--------------------------|---------------|
| Network Performance | 15 |
| Public Transport | 18 |
| Walking and Cycling | 30 |
| Environment | 6 |
| Urban Design/Placemaking | 30 |
| Buildability | 12 |

The weighted scoring for each of the options from the final assessment is as follows:

Table 25 Option Assessment Scoring by Category

| Category | Baseline | Option 1 | Option 2 | Option 4 |
|--------------------------|----------|----------|----------|----------|
| Network Performance | 11.83 | 9.93 | 8.90 | 9.18 |
| Public Transport | 10.00 | 11.67 | 11.33 | 9.67 |
| Walking and Cycling | 8.00 | 17.80 | 18.20 | 15.40 |
| Environment | 2.60 | 5.60 | 5.80 | 5.80 |
| Urban Design/Placemaking | 10.00 | 26.00 | 30.00 | 24.00 |
| Buildability | 11.00 | 7.00 | 7.00 | 7.00 |
| Total | 53.43 | 77.99 | 81.24 | 71.04 |

This scoring of multiple metrics identified **Option 2** as the best performing and Likewise Modelling Report has assessed this option in greater detail prior to it being taken forward for further detailed design and costing.

6 Development of the Elliptical Roundabout

6.1 Introduction

This chapter describes the feedback on the Consulted Option from the consultation and engagement and how that led to the development of the design into an elliptical roundabout.

6.2 Feedback on the Consulted Option

As noted in Chapter 4, in June and July 2023 ECC and CCC consulted on the Option 2 'crossroad' design (the consulted option) with a right turn from St Botolph's Street to A134 Southway. This was consulted on in conjunction with the CCMP. As part of the consultation there were two public events as well as six separate engagement meetings. This included Councillor briefings, a Colchester residents panel, a briefing to a group of statutory stakeholders, a meeting with the Colchester Civic Society and an event with a local sixth form college.

As well as display boards and the chance to speak to Officers and Designers, a 35-page electronic and printed public consultation brochure was produced and made available. This was supported by a dedicated website in relation to the consultation.

In conjunction with these events, feedback was sought in terms of a structured questionnaire, but also with the option of including free text responses. This was collected using an online form, but also paper copies were available. Other responses such as general letters / emails were also collated.

In total, 532 responses to the consultation were received, including 499 survey responses. A large majority of these survey responses (88%) were sent by residents of Colchester, and 98% of respondents said they currently use St Botolph's junction.

A Consultation Report has been produced as well as a Promoters Response, These can be seen in Appendix E and Appendix F respectively.

Table 26 below summarises the elements of the consulted design which people liked and disliked.

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Table 26 Summary from Public Consultation

| Liked | Disliked |
|--|---|
| <ul style="list-style-type: none"> • Removal of subways to improve accessibility • Improving the look and feel of the area • Creating better accessibility for the transport interchange, city gateway and improved accessibility | <ul style="list-style-type: none"> • Impact on traffic – perception crossroads is worse than a roundabout • Traffic movements – need to go into Stanwell Street to return westbound • Layout of crossing points / cycleway • Impact on the environment – reduction of green space / removal of trees on the roundabout • Construction duration and disruption • Value for money (not a priority?) • Lack of focus on buses/bus station |

Throughout the consultation report, the public offered a mixed view, with responses highlighting both positive and negative elements of the proposals. Among the survey's key findings were:

- 54% agreed or were neutral that the proposals would make St Botolph's safer and more attractive.
- 46% agreed or were neutral that the proposals would encourage more people to walk, cycle or use public transport in the area. However, respondents were supportive of removing the underpasses and improving accessibility.
- 48% supported the proposed layout option, but there was general support highlighting the need of improving the 'look and feel' of the area.
- 61% agreed or were neutral that improving the transport interchange at St Botolph's Circus is important.

From the consultation feedback, the priorities for the development of the design of the St Botolph's junction were:

- Retain the gateway design, with urban realm improvement around St Botolph's Circus area – creating public realm space.

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- Remove the existing subways to improve accessibility and reduces anti-social behaviour.
- A new active travel crossing on the western arm of the junction.
- Shorter crossing times with revised traffic signal cycle times.
- Do not make air quality any worse, and if possible, make it better.
- Retain some of the current trees and retain green space for enhanced biodiverse/ecologically rich planting.
- Shorter queues and reduced delays at the junction compared with the consulted option.
- Remove the necessity for the Stanwell Street right hand turn for western return traffic movement and associated risk of induced vehicle movements through Osborne Street.

6.3 Buildability and Cost Review

Following the identification that Option 2 was the preferred option for consultation, a full detailed buildability review was undertaken, keeping in mind the funding envelope provided by the LUF. This included reviewing the cost in light of high inflation for building materials and construction works, length of construction and disruption caused by construction.

The construction programme of the Option 2 scheme was estimated to be three months of mobilisation plus 21 months of construction, giving 24 months in total. Option 2 also included a additional works of a new junction at Stanwell Street and Southway to enable the right turn for westbound traffic. This is potentially complex to build due to the different levels on either side of the Southway carriageway which would need to be evened out.

The updated cost estimate showed that the Option 2 proposals would cost around £15.2m which would be £3.4m above the scheme budget of £11.8m. With no additional funding being available this meant that the consulted scheme would be unaffordable. The costings are described in more detail in Chapter 9.

6.4 Design Review

Taking consultation feedback into account and the outcome of the buildability review with rising costs for construction work, it was agreed that a design review be undertaken, retaining the elements that the public 'liked', addressing those that people 'disliked', ensuring affordability and retaining a focus on the objectives and alignment with the CCMP. This design review resulted in the development of the 'elliptical roundabout' option as shown below.

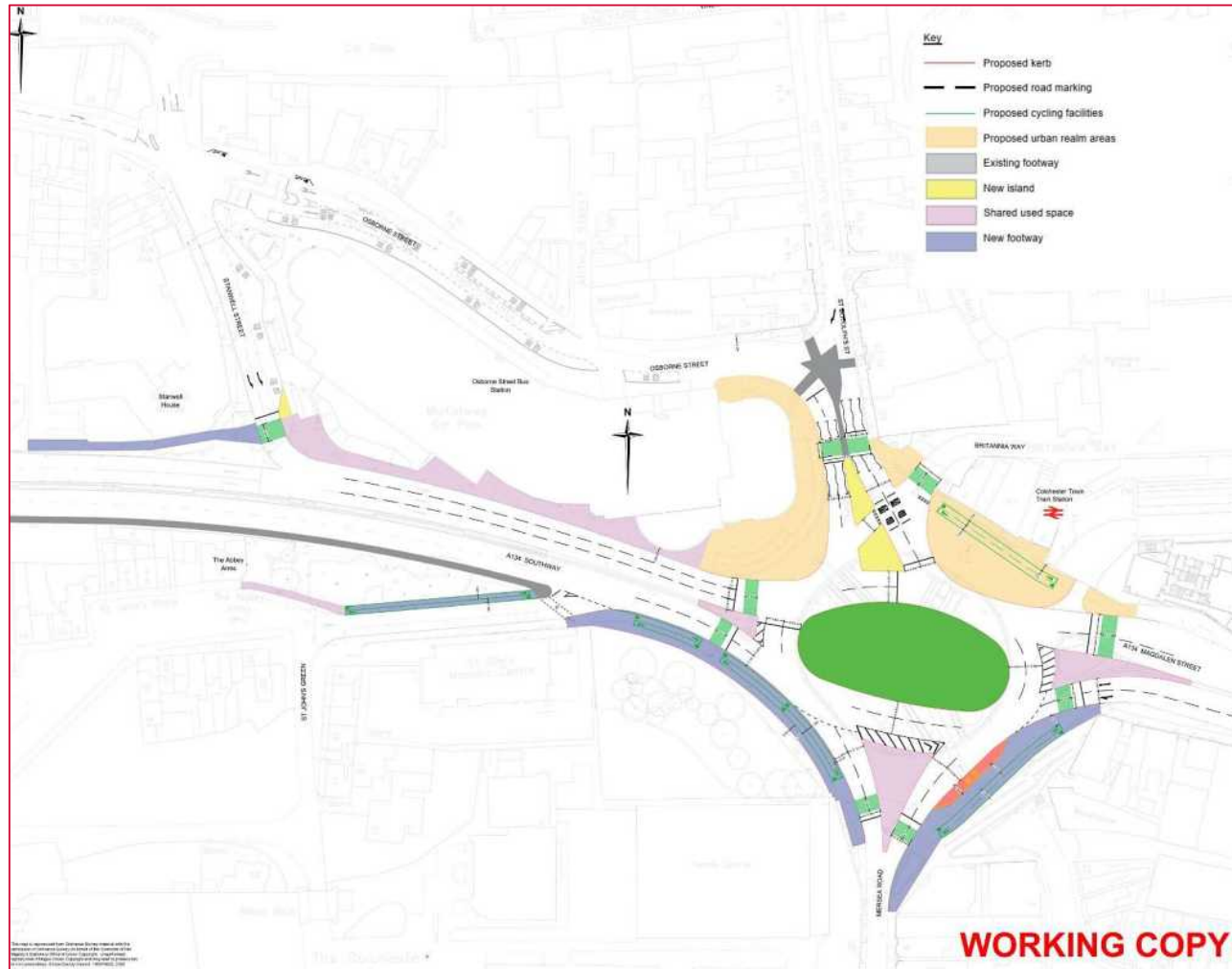


Figure 33 - Elliptical Roundabout Design Concept

6.5 Traffic Modelling

Linsig modelling was undertaken for this elliptical roundabout option, with the vehicle delay across the roundabout being compared with the consulted option.

As set out in detail in the next chapter, the elliptical roundabout has a slightly higher capacity than the consulted option resulting in slightly lower queues and delays to general traffic during the modelled periods.

Across the St Botolph's junction itself, in the AM peak average delays were reduced by 13 seconds compared with the consulted option. In the PM peak the delays were reduced by 14 seconds. This reflects only a 28 second and 38 second increase in delay compared to the current roundabout layout.

When looking more widely at the change in delay along local routes, in the AM peak average delays were reduced by 30 seconds compared with the current layout. In the PM peak, there was a marginal increase in delay of 1.5 minutes compared with the existing option, dependent upon the frequency of pedestrian crossing use.

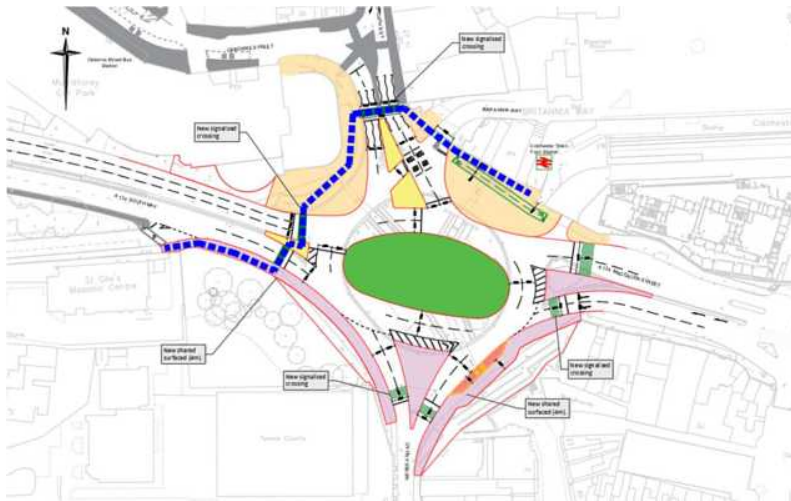
This will be looked at further under the next design stage (Stage 3) to refine further.

6.6 Air Quality

Air quality modelling was undertaken for this elliptical roundabout, given the proximity to the AQMA area.

- There are no modelled exceedances of the annual mean NO₂ AQO of 40 ug/m³ with the Elliptical Roundabout in place.
- Modelling of the Elliptical Roundabout shows a reduction in annual mean NO₂ concentrations along Mersea Road compared to the existing junction.
- Replacement of the existing junction with the Elliptical Roundabout also leads to the removal of two modelled exceedances of the AQO on Mersea Road.

The overall effect of the elliptical roundabout on air quality is assessed to be not significant with some local reductions in NO₂ emissions along Mersea Road compared with the consulted option, meaning the elliptical roundabout performs slightly better than the consulted option in terms of air quality.

[illegible]

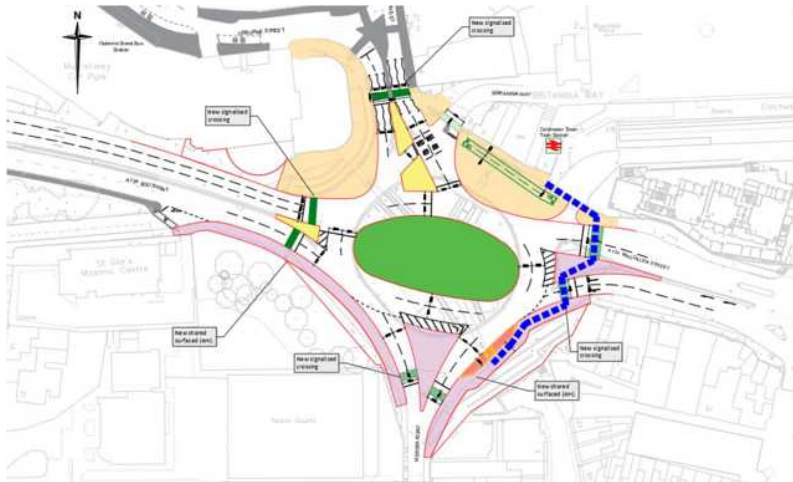


Figure 34 - Walking & Cycling routes Elliptical Roundabout

6.8 Public Realm

To align with the objectives and principles of the CCMP, creating a gateway to the city centre in this location, the public realm and landscaping of this elliptical roundabout was reviewed.

Compared with the existing situation, the available space for pedestrians, cyclists and public realm is increased to 3,451m², which represents a net gain of 753m² compared to the consulted option.

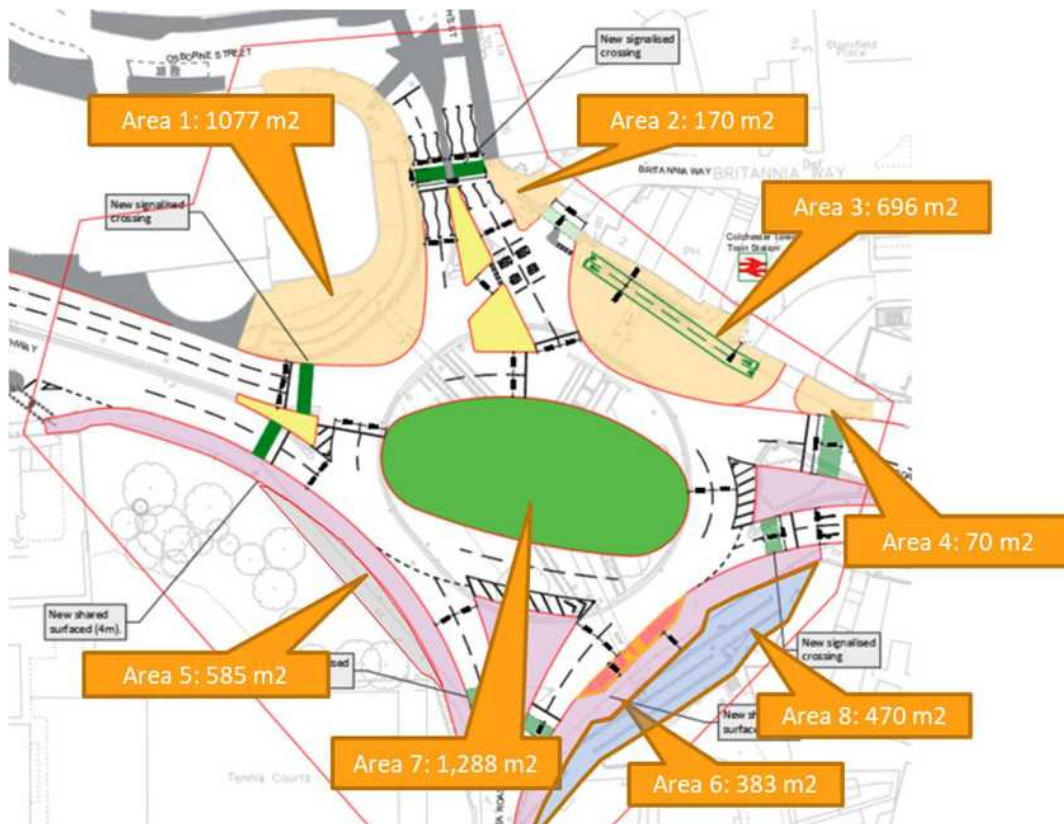


Figure 35 - Reclamation of road space Elliptical Roundabout

It has been identified through this review that the centre of the roundabout and the subsequent reclamation of road space would provide the opportunity for planting (as picked up within the consultation by the public) and in turn creating biodiversity within an attractive gateway to the city.

6.9 Economic Growth

The elliptical roundabout design has been reviewed to identify the potential for economic development and growth, to align with the ambitions of the CCMP.

- The proposed scheme does not provide any highways land for redevelopment to the SE of the roundabout (possible capacity for around 20-30 units)
- Detailed feasibility / viability work for evaluating the site had not been carried out, although it is known that the site is subject to significant utilities constraints (circa £325k) that would have needed to be relocated.

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- The site was not a core objective of the LUF bid and, being set away from the city centre and is not core to the achievement of wider CCMP objectives.
- Retention of additional public realm to the north side of St Botolph's is a key economic growth benefit (continuing to be delivered)—retaining a significantly improved gateway from the city train station and south Colchester.
- The remaining reduced SE corner plot will still create a much-improved environment for the St Botolph's area, with appropriate high-quality landscaping meeting the objectives for the regeneration of the location.

6.10 Bus Interchange

Following feedback from the public consultation, the impact on the bus interchange at Osborne Street has been assessed. It is considered that the elliptical roundabout would lay the foundations for an improved bus provision under future phases of the CCMP, which included the identification of additional areas for bus interchange capacity.

- Elliptical design retains a roundabout design that negates the immediate need to have a right hand turn out of Stanwell St and removes risk of induced traffic in Osbourne Street and Stanwell Street compared to the consulted option.
- Buses are able to travel westbound via St John Street bus gate.
- Elliptical design retains an overall better traffic performance across the junction layout over the consulted option – reducing impact of changes.
- Continues to support better connectivity and public realm space between the station, bus interchange and city centre.

The next chapter compares the performance of the elliptical roundabout to the Option 2 as the consulted option (the crossroad design).

7 Comparison with the Consulted Option

7.1 Introduction

Chapter 5 described the assessment and scoring of the 'Option 2' crossroad design compared to the baseline and with alternative designs of Options 1 and 4, and how Option 2 became the consulted option. Chapter 6 described the development of the elliptical roundabout design.

This chapter describes how the elliptical roundabout performs against the Option 2 crossroad design using the same MCA used to assess options 1, 2 and 4 against the baseline and how the elliptical roundabout has become the preferred design to be taken forward and developed in Stage 3 of the MPCM.

The MCA criteria are as below, and as set out in Table 6 earlier in this report.

7.2 Network Performance

As with the earlier Options 1, 2 and 4, evaluation of the network performance of the elliptical roundabout was undertaken on the basis of a 'basket' of five measures, including:

- Traffic flows: based on flows on four links.
- Degree of saturation: based on six junction locations.
- Area wide delay changes.
- Point to point journey times: based on nineteen routes.
- Re-routing impacts on other routes.

The modelling of the elliptical roundabout undertaken at this stage used the same forecast flows from the strategic traffic model as the consulted option to provide a direct comparison of junction performance between the two options. This also assumes the two options have the same impact on traffic routings on the wider network as both options reduce capacity for vehicle movements at the St. Botolph's junction to similar extents.

It is recommended that strategic modelling of the elliptical roundabout option to be undertaken the Stage 3 development of the scheme following refinement of the design to further establish its impact on traffic routings. In addition, further optimisation of the traffic signals can be carried out using the microsimulation model as the scheme design is progressed. In order to give a fair comparison

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between options, the same scoring has been used for the elliptical roundabout as Option 2.

Performance on each of the other four metrics was scored individually, based on local junction traffic model outputs for the AM and PM peaks, then summed to generate a consolidated score for each option.

As outlined in Section 5.10 in relation to the other options assessed, the Network Performance score was subsequently weighted by a factor of 1 to give the final option scores for this measure.

The following sections provide a summary for the elliptical roundabout on each of the four assessed measures.

7.2.1 Traffic Flows

As noted above, the same scores have been assumed for the elliptical roundabout as with option 2, as shown in the below table.

Table 27: Network Performance, Traffic flows

| | Option 2 | | Elliptical Rbt | |
|--|-----------------|---|-----------------------|------------------------------------|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Traffic Flow (compared with Do Nothing scenario) <i>Takes an average of the individual route scoring</i> | 1.50 | | 1.50 | |
| St Botolph's St | 2 | Increase of 23veh in the AM and decrease of 13veh in the PM | 2 | Assumed to be the same as Option 2 |
| Mersea Road | 2 | Increase of 26veh in the AM and 19veh in the PM | 2 | Assumed to be the same as Option 2 |
| A134 EB | 1 | Decrease of 251veh in the AM and decrease of 283veh in the PM | 1 | Assumed to be the same as Option 2 |
| A134 WB | 1 | Decrease of 239veh in the AM and decrease of 298veh in the PM | 1 | Assumed to be the same as Option 2 |

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7.2.2 Junction performance (degree of saturation)

Junction performance has been evaluated based on the degree of saturation for six locations (the four arms of St Botolph's junction and two arms of the Stanwell Street / A134 junction).

Each location is evaluated on a 1-3 scale using the following criteria:

1 – In excess of 100% saturation

2 – 90-100% saturation

3 – below 90% saturation

Table 28 below summarises this evaluation, which shows the elliptical roundabout performs better on the degree of saturation on the Mersea Road and A134 EB @ St. Botolph's. Therefore the elliptical roundabout performs better than the consulted option for this measure.

Table 28: Network Performance, Junction performance

| | Option 2 | | Elliptical Rbt | |
|---|-----------------|----------|-----------------------|----------|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Degree of Saturation - Overall Junction Wide <i>Takes an average of the individual arm scoring</i> | 2.67 | | 3.00 | |
| St. Botolph's Street | 3 | | 3 | |
| Mersea Road | 2 | | 3 | |
| A134 EB @ St. Botolph's | 2 | | 3 | |
| A134 WB | 3 | | 3 | |
| Stanwell Street | 3 | | 3 | |
| A134 EB @ Stanwell St. junction | 3 | | 3 | |

7.2.3 Area wide delays

The third measure of network performance was the change in area wide delays relative to the Do-Minimum scenario. This would need to be assessed in the strategic traffic model, which as described above has not been done for this option. Therefore this is can only be assessed as the same as Option 2.

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Table 29: Network Performance, Area wide delays

| | Option 2 | | Elliptical Rbt | |
|---|-----------------|--|-----------------------|------------------------------------|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Delay over an area – Network Statistics | 2 | 1.2% increase in travel time for the Network in the AM, 0.8% Increase in travel time for the network in the PM peak. | 2 | Assumed to be the same as Option 2 |

7.2.4 Point to point journey-time

The point to point journey-time metric compares the options on the basis of the journey times offered for 15 unique routes through St Botolph's and Stanwell Street junction and four longer distance routes via St Botolph's.

Journey-times are evaluated relative to the Do-Minimum, based on the following categorisation:

- 1 - Journey time >15% or 60s of baseline
- 2 - Journey time within 15% or 60s of baseline
- 3 - Journey time better than the baseline

As shown in Table 30, the elliptical roundabout performs better on some journeys but less well on others. However, overall the elliptical roundabout performs better than the consulted option, with an overall score of 1.79 compared to 1.74.

In the AM peak, for the elliptical roundabout average delays are reduced by 13 seconds compared to the consulted option, which is only a 28 second increase over existing St Botolph's Circus junction. In the PM peak average delays for the elliptical roundabout are reduced by 14 seconds, which is only a 38 second increase over existing junction.

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Table 30: Network Performance, Point to point journey time

| | Option 2 | | Elliptical Rbt | |
|---|-----------------|----------|-----------------------|----------|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Point to point journey time <i>Takes an average of the individual route scoring - modelled all journey times for all routes for vehicle users through the junction</i> | 1.74 | | 1.79 | |
| Mersea Road to Osborne St | 1 | | 2 | |
| Mersea Road to Magdalen St | 2 | | 3 | |
| Mersea Road to Southway | 1 | | 2 | |
| Southway to Osborne St | 2 | | 1 | |
| Southway to Magdalen St | 2 | | 2 | |
| Southway to Mersea Rd | 2 | | 2 | |
| St. Botolph's St to Magdalen St | 2 | | 2 | |
| St. Botolph's St. to Mersea Rd | 2 | | 2 | |
| St. Botolph's St to Southway | 2 | | 2 | |
| Magdalen Street to Mersea Rd | 1 | | 2 | |
| Magdalen Street to Southway | 1 | | 2 | |
| Magdalen Street to Osborne St | 2 | | 2 | |
| Stanwell Street to Magdalen St | 1 | | 1 | |
| Stanwell Street to Mersea Rd | 1 | | 1 | |
| Stanwell Street to Southway | 3 | | 2 | |
| A134 EB | 2 | | 1 | |
| A134 WB | 2 | | 1 | |
| NB - Pownall Cres to Osborne St. | 2 | | 2 | |
| SB - Queen Street to Pownall Cres | 2 | | 2 | |

7.2.5 Re-routing to other key routes

The final network performance metric relates to re-routing to other key routes, providing an opportunity to capture any re-routing effects of the options which impact on other key routes. This would also need to be assessed in the strategic traffic model, which as described above has not been done for this option. Therefore this is can only be assessed as the same scoring as Option 2.

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Table 31: Network Performance, Re-routing to other key routes.

| | Option 2 | | Elliptical Rbt | |
|---|-----------------|---|-----------------------|------------------------------------|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Re-routing to key routes/public transport corridor (East Hill etc.) | 1 | <p>Minor flow increases and some decreases on sections of East Hill/ Ipswich Road/ Cowdry AV in the AM with some additional queueing WB on East Hill and SB on Ipswich Road.</p> <p>Flow increases on Cowdry AV WB PM 62 veh. with decreases on sections of East Hill. No changes predicted to Cowdry Av WB queueing. Some additional queueing WB on East Hill in the PM.</p> | 1 | Assumed to be the same as Option 2 |

7.2.6 Traffic flow summary

Overall in terms of Network Performance, the elliptical roundabout performs better than the Option 2 consulted option. This addresses one of the key points raised in the consultation feedback. The elliptical roundabout has a slightly higher overall capacity, and the average AM and PM peak delays are reduced by 13 and 14 seconds respectively compared to the consulted option.

7.3 Public Transport

As with Network Performance described above, the elliptical roundabout was compared to the Option 2 consulted option using the same MCA. This looked at the number of bus stands; point to point journey time (check we have this); and quality of interchange/sense of arrival.

7.3.1 Bus Stands

There is no difference to the number of bus stands for the elliptical roundabout compared to the Option 2 consulted option. As with the consulted option, it is proposed to include a new crossing across Stanwell street at the junction with the A134 Southway. This will require the reduction of one bus stand, bus stand number bC.

Table 32: Public Transport, Bus stands

| | Option 2 | | Elliptical Rbt | |
|---|-----------------|--|-----------------------|--|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Bus Stands <i>Only focuses on additional capacity in existing highway. Excludes Stanwell St House, UKPN site, Vineyard Gate area</i> | 1 | Reduction in length of bus stop bC on Stanwell St. to accommodate new crossing | 1 | Reduction in length of bus stop bC on Stanwell St. to accommodate new crossing |

7.3.2 Point to point journey time

As with the option options earlier, the elliptical roundabout has been assessed in terms of its impacts on a range of twelve point to point movements to/from Osborne Street/Stamwell Street.

Journey times are evaluated relative to the Do-Minimum, based on the following categorisation:

- 1 - Journey time >15% or 60s of baseline
- 2 - Journey time within 15% or 60s of baseline
- 3 - Journey time better than the baseline

Evaluation for each of the twelve routes is presented in the table below, with overall option scores taken as the average across all routes.

This shows that the elliptical roundabout performs better than the Option 2 consulted scheme on five of the 12 routes, and less well on two. This gives an overall score of 1.92 for the elliptical roundabout compared to 1.67 for the Option 2.

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Table 33: Public Transport, Point to point journey time

| | Option 2 | | Elliptical Rbt | |
|---|-----------------|----------|-----------------------|----------|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Point to point journey time <i>Takes an average of the individual route scoring - modelled all journey times for all routes for buses through the junction</i> | 1.67 | | 1.92 | |
| Mersea Road to Osborne St | 1 | | 2 | |
| Mersea Road to Southway | 1 | | 2 | |
| Southway to Osborne St | 2 | | 1 | |
| Southway to Mersea Rd | 2 | | 2 | |
| St. Botolph's St to Magdalen St | 2 | | 2 | |
| St. Botolph's St. to Mersea Rd | 2 | | 2 | |
| St. Botolph's St to Osborne St | 2 | | 2 | |
| Magdalen Street to Southway | 1 | | 2 | |
| Magdalen Street to Osborne St | 2 | | 2 | |
| Stanwell Street to Magdalen St | 1 | | 2 | |
| Stanwell Street to Mersea Rd | 1 | | 2 | |
| Stanwell Street to Southway | 3 | | 2 | |

7.3.3 Quality of interchange/sense of arrival

Again as with the earlier options, quality of interchange / sense of arrival has been evaluated based on qualitative review of the design options against the baseline with a score on a 1-3 scale based on the following criteria.

1 - No improvement in quality of interchange and wayfinding

2 - Moderate improvement in directional quality in public realm design, leading to different interchange opportunities, wayfinding and sight lines

3 - High directional quality in public realm design, leading to different interchange opportunities, high quality wayfinding & clear sight lines

This shows that as with the Option 2 consulted scheme, the elliptical roundabout scores the same, with the same opportunities for high quality improvements in the quality of interchange / sense of arrival.

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Table 34: Public Transport, Quality of interchange/sense of arrival

| | Option 2 | | Elliptical Rbt | |
|--|-----------------|----------|-----------------------|--|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Quality of interchange/ sense of arrival at interchange (bus/rail/mobility hub) | 3 | | 3 | Same opportunities for high quality improvements in the quality of interchange / sense of arrival as option 2 |

7.4 Walking and Cycling

The elliptical roundabout has been assessed against the same criteria as with the option options described earlier, and the results are shown with the results for the Option 2 consulted option.

In evaluating the performance of the elliptical roundabout, walking and cycling impacts have been assessed over same four metrics:

- Point to point journey time.
- Links to existing and proposed provision.
- Alignment with LTN1/20.
- Journey quality.

These have been evaluated using a mix of quantitative and qualitative approaches. As outlined earlier in this report, the final walking and cycling score was subsequently weighted by a factor of 2 to give the final option scores for this measure.

The following sections provide a summary of the options on each of the three measures.

7.4.1 Point to point journey-times

Point to point journey-times for pedestrian and cyclists have been reviewed for the elliptical roundabout, based on ten individual routes. As with the assessment of the other options described earlier, due to the scale of the changes and the accessibility issues with the existing layout, the evaluation reviewed the three options in a comparative fashion based on distance, number of crossings traversed and signal times per crossing. As previously, the two options were evaluated against each other. Also as previously, where options provide equivalent performance for a given route, a shared rating can be used.

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Total scores on this metric are based on the average of the ten routes, giving a potential range of 1-3 with the baseline (Do-Minimum) layout scored as 1.

As shown in the table below, the elliptical roundabout is considered to perform better than the consulted option with an overall average score of 2.6 compared to 2.1 for the Option 2.

Table 35: Walking and cycling, Point to point journey time

| | Option 2 | | Elliptical Rbt | |
|--|-----------------|----------|-----------------------|---|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Point to point journey time - Not possible to compare against baseline so comparison between the options <i>Takes an average of the individual route scoring.</i> | 2.10 | | 2.60 | |
| Mersea Road to UKPN Site | 2 | | 3 | Shorter wait times due to shorter cycle time at the signals |
| Mersea Road to Train Station | 2 | | 3 | Shorter wait times due to shorter cycle time at the signals |
| Magdalen Street to St Botolph's Street | 2 | | 3 | Shorter wait times due to shorter cycle time at the signals |
| Magdalen Street to Southway (via Mersea Rd) | 2 | | 2 | Shorter wait times due to shorter cycle time at the signals |
| Southway to Train Station (via St. Botolph's St.) | 2 | | 2 | Straight crossing but located further away from desire line |
| UKPN Site to Mersea Road | 2 | | 3 | More direct with the crossing on Southway |
| Train Station to Mersea Road | 2 | | 3 | Shorter wait times due to shorter cycle time at the signals |
| St. Botolph's Street to Magdalen Street | 2 | | 3 | Shorter wait times due to shorter cycle time at the signals |
| Southway to Magdalen Street (via Mersea Rd) | 3 | | 2 | Less direct with two-stage crossing on Mersea Rd |
| Train Station to Southway | 2 | | 2 | Straight crossing but located further away from desire line |

7.4.2 Links to existing and proposed cycle provision

Links to existing and proposed cycle provision is evaluated based on the level of coordination achieved with existing and proposed provision. Given the lack of existing cycling facilities in this location, alignment with nearby LCWIP proposals is a key factor. As with other measures Options were scored on a 1-3 scale.

1 - No improvement in connectivity between cycling schemes compared to current situation

2 - Moderate improvement in connectivity between cycling schemes compared to the current situation

3 - Significantly improved connectivity between cycling schemes compared with the current situation

The elliptical roundabout is considered to offer significant improvements on this dimension compared to the baseline, and higher than the moderate improvement of option 2 due to the additional crossing on the western side of the roundabout.

7.4.3 Alignment with LTN1/20

As shown in the table below, a high degree of alignment with LTN1/20 is anticipated for the elliptical roundabout. However formal appraisal using the junction appraisal tool is not however possible at this early stage of the design process. The elliptical roundabout is therefore given the same score of 2 as the Option 2 consulted design.

7.4.4 Journey quality (walking and cycling)

A qualitative appraisal of journey quality was undertaken to support the evaluation of this fourth walking and cycling metric. This seeks to identify impacts on traveller stress, route uncertainty and levels of cleanliness, facilities, information and environment, using the following three point scale.

1. Levels of traveller stress, route uncertainty neutral. Levels of cleanliness, facilities, information and environment neutral to current situation.
2. Levels of traveller stress, route uncertainty moderately improved. Levels of cleanliness, facilities, information and environment moderately improved compared to current situation.
3. Levels of traveller stress, route uncertainty significantly improved. Levels of cleanliness, facilities, information and environment significantly improved compared to current situation.

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As shown in the table below, the elliptical roundabout is identified as offering a significant improvement, as was Option 2, so both have the same score of 3.

Table 36: Walking and cycling, Other metrics

| | Option 2 | | Elliptical Rbt | |
|--|-----------------|--|-----------------------|---|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Links to existing and proposed cycle provision <i>Qualitative comments essential in detailed assessment</i> | 2 | Toucan crossing on Southway provide connection to LCWIP | 3 | pedestrian and cycling crossings on all four arms of the elliptical roundabout |
| Alignment with LTN1/20 <i>Level of service score from the LTN1/20 junction assessment tool</i> | 2 | The designs for cycling facilities not yet fully developed, but high degree of compliance anticipated. | 2 | The designs for cycling facilities not yet fully developed, but high degree of compliance anticipated. |
| Journey quality - walking and cycling <i>Qualitative comments RAG specification derived from Transport Appraisal Guidance (TAG) Journey Quality Worksheet</i> | 3 | Well located crossing across St Botolph's Street and direct crossing on Mersea Road. | 3 | New segregated cycleways and pavements on most sides of the roundabout. Scope for the same on the N-E corner as the design is developed |

7.5 Environment

For the elliptical roundabout, an assessment has been undertaken for air quality but not for noise. Therefore for noise, the same scoring has been used for the elliptical roundabout as with the Option 2 design.

7.5.1 Air Quality

The air quality modelling of the elliptical roundabout shows there is very little difference between the Option 2 consulted design and the elliptical roundabout, but that there are some local reductions in NO₂ emissions along Mersea Road as shown in the table below.

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Table 37: Air Quality Assessment Against Baseline

| | Option 2 | | Elliptical Rbt | |
|---|-----------------|----------|-----------------------|--|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Air Quality to meet thresholds in NO2 concentrations. Options are compared against the future Baseline (opening year) <i>Takes an average of five key road areas in the Study Area</i> | 2.8 | | 2.8 | |
| Osborne Street | 3 | | 3 | |
| Mersea Road | 2 | | 3 | some local reductions in NO2 emissions along Mersea Road |
| A134 Southway | 3 | | 3 | |
| Queen Street | 3 | | 3 | |
| A134 Magdalen Road | 3 | | 3 | |

7.6 Urban Design / Placemaking

7.6.1 Elliptical Roundabout

The objectives for St Botolph's of people and place-based Urban Design and Placemaking was described earlier in this report. The elliptical roundabout offers a larger area for public realm than option 2 with an increase of 22% in space, and therefore is given a score of 4 compared to the score of 3 for the option 2. It offers the same potential for high quality public realm, so is given the same score of 3 as Option 2. It also scores a three which is the same on utilisation and effectiveness of space as Option 2, also scores the same score of a three on supporting wide regeneration.

However, whilst Option 2 scored a three in terms of potential redevelopment land, the elliptical roundabout scores a two as there is less potential for redevelopment in the south-east corner of the roundabout than with Option 2. These scores are shown in the table below.

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Table 38: Urban Design Criteria

| | Option 2 | | Elliptical Rbt | |
|--|-----------------|---|-----------------------|---|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Reclamation of road space for placemaking to create a gateway. RAG measures relate to comparative view of the scale of change between each option compared to each other | 3 | An even distribution of reclaimed space on all quadrants. Highest level of reallocation of road space for placemaking opportunities. Lesser carriageway. More opportunities for placemaking on all quadrants. | 4 | Given a score of 4 to reflect the increase of 22% in public realm over option 2 |
| Quality of public realm Measures in alignment with TfL Interchange Best Practice | 3 | Potential for high quality public realm areas. The space in front of the station has potential for a café kiosk, seating, planting and places to gather and interchange efficiently. Potential for high quality urban realm in all quadrants, especially in front of new development area | 3 | Potential for high quality public realm areas. The space in front of the station has potential for a café kiosk, seating, planting and places to gather and interchange efficiently. Potential for high quality urban realm in all quadrants, especially in front of new development area |
| Utilisation and effectiveness of space. Measures in alignment with Good Public Space Index variables | 3 | | 3 | |
| Supporting wider regeneration | 3 | | 3 | |
| Potential Redevelopment Land | 3 | | 2 | Smaller area than option 2 for potential new development |

7.7 Buildability

As with Option 2, the buildability of the elliptical Roundabout has been assessed against four criteria of:

1. Cost
2. Programme
3. Being commercially committed by March 2025 in line with LUF funding programme
4. Complexity of construction

The result of this analysis is shown in the table below.

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Table 39 Buildability Criteria

| | Option 2 | | Elliptical Rbt | |
|-----------------------------------|-----------------|---|-----------------------|--|
| | Option 2 Rating | Comments | Elliptical Rbt Rating | Comments |
| Cost | 1 | Option 2 is unaffordable, exceeding the budget by £3.4m | 2 | The elliptical rbt is affordable at £11.8m |
| Programme (excluding procurement) | 2 | | 3 | Scored as a 3 as three months shorter programme meaning less disruption to residents, business and all junction users. |
| Programme Commercially Committed | 2 | | 2 | Scored the same as option 2 although neither are now possible to be commercially committed by March 2024 |
| Complexity of Construction | 2 | It is anticipated that the majority of the works would involve typical construction methodology. However, construction is likely to be complex with multiple traffic management phases due to the requirement to maintain traffic movements, extent of utilities requiring diversion and further complexities associated with varying carriageway levels. | 2.5 | Scored as 2.5 as simpler construction than option 2 (no Stanwell Street new junction) but still some complex operations in relation to the fill of the subways |

This shows that in terms of buildability, the elliptical roundabout scores better than the Option 2 consulted option in terms of being within the scheme budget of £11.8m and better in terms of programme and buildability.

7.8 Scoring of the Elliptical Roundabout

The weighted scoring for each of Option 2 as the consulted scheme and the elliptical roundabout are shown in the table below:

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Table 40 Option Assessment Scoring by Category

| Category | Option 2 | Elliptical Rbt |
|--------------------------|----------|----------------|
| Network Performance | 8.90 | 9.29 |
| Public Transport | 11.33 | 11.83 |
| Walking and Cycling | 18.20 | 21.2 |
| Environment | 5.80 | 6.00 |
| Urban Design/Placemaking | 30.00 | 30.00 |
| Buildability | 7.00 | 9.50 |
| Total | 81.24 | 87.82 |

This scoring of multiple metrics identified **the elliptical roundabout** as a better performing design than Option 2.

7.9 Summary

The elliptical roundabout gives improvements compared to the consulted option, taking on board key themes of feedback from the consultation about the effect of the new junction design on traffic flow and the need to offer shorter crossing times for active travel modes. It performs better than the consulted option and is considered to provide a balanced response to achieving public realm and accessibility improvements.

The elliptical roundabout has a shorter construction period compared with the consulted option. This reduces construction from 21 months to 18 months, which would reduce the level of disruption along this key strategic route through the city centre.

The consulted option has costs in excess to the LUF funding envelope, with a deficit of £3.4m to be found, while the elliptical roundabout would be within budget, offering additional float to help manage further risk, or allow for enhancements or upgrades to the public realm.

In addition to these key measures, the following benefits would be seen from the development of the elliptical roundabout design:

- Retain gateway, urban realm improvement around St Botolph's circus area – Creating public realm space.
- Still removes existing subways to improve accessibility and reduces anti-social behaviour.
- A new active travel crossing on the western arm of the junction.
- Shorter crossing times due to shorter traffic signal cycle times.

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- Air Quality – consistent with the AQMA - no modelled exceedances of the annual mean NO2 AQO.
- Retain some of the current trees and retain green space for enhanced biodiverse/ecologically rich planting.
- Shorter queues and reduced delays at the junction compared with the consulted option.
- Remove necessity for Stanwell Street right hand turn for western return traffic movement (and associated risk of induced vehicle movements through Osborne St).

The next chapter gives a summary of the work undertaken for the stage 2 design as described in this report and makes recommendation for the next steps.

8 Summary and Next Steps

8.1 Summary

The St Botolph's scheme has taken a people-oriented approach to develop a gateway to the city centre, as identified within the CFTS. It follows significant development work with a focus now on an elliptical roundabout design of the junction with the following attributes:

- Create a good quality public realm and gateway to the city centre.
- Develop an improved, safer environment for everyone.
- Improve connectivity for communities to local and wider transport networks through bus, rapid transit, rail services, walking and cycling routes.
- Ensure an inclusive and accessible area for all.
- Balance the requirements of different travel modes.
- Reduce anti-social behaviour and the fear of crime.
- Improve health and wellbeing for Colchester residents.
- Increase footfall to encourage wider economic growth of the area, provide development opportunities and support local business.

'The roundabout is a prime example of poor public realm design that reinforces severance from the town for some of our most deprived communities. Private car has primacy over active and safe routes for pedestrians and cyclists exemplified by 1960's underpass walking routes'¹⁶.

Each of the scheme options identified for the area looked at carefully balancing the needs of the highway (having minimal effect on capacity), alongside prioritising walking, cycling and public transport, in alignment with the outlined objectives.

The development of the options for appraisal arose from an initial sifting undertaken following the LUF bid process, where two options were sifted out of the assessment. Three of the options proposed remained for assessment.

Traffic modelling both strategic and local was undertaken, alongside air quality and noise assessments, highway design and urban design for each of the options taken forward for appraisal. For each of these, appraisal metrics were

¹⁶ LUF Bid 2022

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identified, with each option being scored against designated criteria. The result of which identified Option 2 as the consulted option.

A buildability and cost review of the preferred option alongside feedback from the public consultation in conjunction with the CCMP, where the consulted option was presented, resulted in a design review of the consulted option. This resulted in the development of the scheme into an elliptical roundabout configuration.

Overall, the elliptical roundabout performs better than the consulted option and is considered to provide a balanced response to achieving public realm and accessibility improvements, and is affordable within the LUF budget.

8.2 Next steps

Following the identification of the elliptical roundabout option and its benefits in comparison with Option 2 (the consulted option), it is recommended that the elliptical roundabout is taken forward for the next stage of preliminary design.

Given the LUF funding terms, there is no need to undertake a business case appraisal of the scheme, so design work can progress to take this scheme to commence construction in 2025.

9 Supporting Information

9.1 Introduction

This chapter summarises various Stage 2 supporting information including:

- Statutory Undertakers
- Road Safety Review
- Programme
- Risk
- Cost Estimate

9.2 Statutory Undertakers

As with most major projects, statutory undertakers' plant is a key consideration in the development of the scheme, both in terms of ~~both~~ existing services and any new services and/or connections that may be required. ~~in relation to the scheme~~. This can be a substantial cost to the project, so wherever possible, schemes should be designed to take into account existing and potentially new services to reduce the impact of the scheme on this plant, and therefore reduce the overall project cost.

For St Botolph's Stage 2 work and the development of the consulted option, specialists in statutory utilities were utilised on the project. These specialists are experienced in analysing plans and searches of statutory utilities' services, and in assessing the likely costs of alterations and diversions of these services. As part of the value engineering work for the development of the elliptical roundabout, they were also able to suggest changes to the design to avoid the need for expensive diversions.

The main likely statutory utilities for the St Botolph's junction and the elliptical roundabout design are detailed in the RAG table in Appendix G, but the key high risk (red categorisation) in terms of ones to note are:

- Amphora; St Botolph's Circus, Crossing from east side of Mersea Street across St Botolph's Circus, into east verge of St Botolph's Street. Fibre Cabling located within the Openreach assets. Cost estimate £25,000.
- Anglian Water Potable Water; St Botolph's Circus, Centre of Southway into the north verge of Magdalen Street. 15" AC trunk water main. Cost estimate £300,000.
- BT Openreach; St Botolph's Circus, Crossing from east side of Mersea Street across St Botolph's Circus, into east verge of St Botolph's Street.

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Levels and change from Footpath to carriageway way require new Manhole to be built. Cost estimate £25,000.

- Cadent; St Botolph's Circus, West verge of St Botolph's Street, crossing St Botolph's Circus and into the south verge of Magdalen Street. 24" CI gas main. - Assume at high level therefore cover may be shallow in roundabout footprint. Cost estimate £250,000.
- Virgin Media; St Botolph's Circus, South verge of St Botolph's Circus. 4 way duct fibre route along Southway crossing Mersea Road and staying in southern footpath of Magdalen Street Underground cable routes and associated chambers. Cost estimate £50,000.

There are also additional communications services for Colchester Fibre in the St Botolph's junction area. These include:

- A city centre fibre loop passes through the northern part of the island.
- A link to the east of the city.
- A north-south link through the island.
- A major connection outside the entrance to St Botolph's station.

These need to be scoped as part of the Stage 3 works, so are not part of the current RAG table, but are taken into account in the QRA as this is a key risk.

The cost estimates for Statutory Undertakers' works are £2.45m for the Consulted Option and £0.875m for the Elliptical Roundabout, excluding Colchester Fibre works / diversions, which is included in the QRA as a risk until more work is done to identify these costs.

For Stage 3 these cost estimates will be worked up in more detail, in conjunction with the Statutory Utilities, seeking to make changes to the design where possible to reduce these cost estimates further. This includes work with Colchester Fibre as well as the other already identified Statutory Utilities.

9.3 Road Safety Review

As part of the development of the consulted option, a road safety review was carried out by specialists independent of the Stage 2 design. This road safety review identified aspects of the design to be considered in the development of the consulted option if taken forwards. These aspects included:

- Significant level differences between the two Southway carriageways at the proposed new Stanwell Street junction. This difference in levels may lead to a higher than acceptable gradient for vehicles turning right from Stanwell Street and users at the A134 Southway crossing point which is

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of particular concern for wheelchair users or pedestrians with pushchairs as they may inadvertently roll into the carriageway and be struck by an oncoming vehicle.

- Some lane designation arrows and text are shown on the plans, but additional lane designation arrows and text should be considered so drivers are provided with adequate information on the approach to the signalised junction.
- It was unclear from the plan provided as to whether or not the cycle routes around the junction and adjacent paved areas are to have colour contrasting surfacing. If the surfacing is similar in colour, visually impaired users may not be aware of the difference in usage and inadvertently travel within the cycle lanes and be struck by an oncoming cyclist.
- It is unclear from the plan provided as to whether or not dropped kerbs have been provided at the cycle on/off carriageway facilities or pedestrian crossing points. If cyclists have to traverse a full height kerb, they may fall from there resulting in injury. If a pedestrian has to traverse a full height kerb they may trip and fall resulting in injury.
- The nearside lane on St Botolph's Street, northbound, appears to be narrow in places, which may lead to drivers inadvertently striking the adjacent kerb line resulting in loss of control collisions or drivers inadvertently crossing the centre line, into the adjacent running lane, resulting in side impact collisions.

However, and as described earlier in this report, the consulted option is not being taken forwards, and an alternative design of the elliptical roundabout has been developed. Due to the tight timescales to develop the elliptical roundabout, at the end of the Stage 2 a road safety review was not undertaken, but will be undertaken as a priority task at the start of the Stage 3 work.

9.4 Programme

An outline programme for the Stage 3 work and for the construction of the works has been produced as of November 2023 and can be seen in Appendix H. The key dates / durations are:

- Stage 3A (Preliminary Design) to commence in December 2023. This will run for a 5 month duration until the end of April 2024.
- Stage 3C (Detailed Design and Tender Preparation) to commence in May 2024. This will run for a 5 month duration until the end of September 2024.

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- Stage 3D Tender Period to be October to Dec 2024, with Tender Evaluation to be in January and February 2025.
- Tender notification is expected to be at the end of April, with Mobilisation from May to July 2025.
- Construction is expected to take place over an 18 month period of August 2025 to end of Jan 2027.

All of the above headline dates are to be reviewed in an interactive programme planning session and detail added to each task as part of the stage 3 work. Dates for on-site preparatory surveys are also to be defined in this period.

9.5 Risk

In order to identify the key risks to the St Botolph's Circus project, a Quantitative Risk Workshop was held in August 2023. This was an in-person workshop with 14 attendees. The purpose of the workshop was to review the scheme and identify the key risks, including any mitigating measures to reduce or eliminate them. From this, the attendees discussed and agreed a likely percentage probability of the risk being realised, and discussed and agreed a minimum, most likely and maximum cost of the risk is realised.

These costs not only reflected the cost of additional plant, equipment, materials, and structures, but the cost of delay caused by the risk being realised in terms of additional project management, construction supervision and an extension to the preliminaries (site costs) and traffic management.

These risks and values were entered into a Qualitative Risk Assessment (QRA), which were then used in the '@Risk' software to determine a risk exposure for each risk, for each iteration at different probability levels. The Monte Carlo simulation used 10,000 iterations to determine the percentile risk values.

It was agreed that P(80) 80% probability level was appropriate for a complex scheme at the Stage 2. As the scheme progresses, the QRA will be kept under review and probabilities and likely costs reviewed with the expectation these will decrease given greater certainty on the design. It is also expected that a lower overall probability will be used such as P(50) or P(mean).

The P(80) QRA value for the elliptical roundabout preferred scheme is £1,368,479. This is the figure used in the cost estimate as described below.

The five largest risks as determined by the @Risk simulation are:

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Table 36 – The Top 5 risks

| Rank | Risk Cause | Risk Event | Risk Effect |
|------|--|--|--|
| 1 | Additional Utilities Work | Additional utilities diversions may be required over and above those designed and budgeted for. | There could be additional cost for extra design work and utility works and delay |
| 2 | Utilities diversions | Utilities diversions may be delayed | There could be a delay to construction |
| 3 | Requirements for CCC / ECC Highway and Public Safety CCTV are yet to be determined with Colchester Amphora | A cost allowance will be needed to move CCTV and possibly new ducting to be provided | Additional cost (no extra delay) |
| 4 | Unexpected Ground Conditions | There may be the need for additional groundworks / earthworks / material removal including contaminated | There could be additional cost and delay |
| 5 | Drainage | Extra drainage work may be required when 3D design is undertaken / may need extra work to large chambers (e.g. working sewers) | There could be additional cost and delay |

The QRA report can be found in Appendix I

9.6 Cost Estimate

Cost estimates have been made for the crossroad layout as the original consulted scheme and for the elliptical roundabout as the preferred scheme. These have been made in accordance with the MPCM and to appropriate levels of confidence for a Stage 2 design.

The table below summarises the costs by heading for each:

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Table 37 – Estimated costs of the elliptical roundabout

| | | <i>Crossroad</i> | <i>Elliptical Rbt</i> |
|---------|---|--------------------|-----------------------|
| Element | Description | Cost | Cost |
| 0 | Design and development for Stage 2 | £500,000 | £436,817 |
| 1 | Measured works | £5,152,000 | £3,791,000 |
| 2A | Preliminaries | £1,546,000 | £1,309,000 |
| 2B | Traffic Management | £761,000 | £643,000 |
| 3 | Statutory Utilities | £1,450,000 | £875,000 |
| 4 | Implementation cost | £445,450 | £331,000 |
| 5A | Design and development - Stages 3A to 3D | £1,000,000 | £1,063,183 |
| 5B | Construction Supervision - Stage 3E | £519,000 | £445,000 |
| 6 | Inflation (excluding risk and contingency) | £1,308,466 | £749,000 |
| 7 | Risk (QRA) | £1,992,487 | £1,368,479 |
| 8 | Contingency | £515,200 | £788,521 |
| | Totals | £15,189,603 | £11,800,000 |
| | Project Budget | £11,800,000 | £11,800,000 |
| | <i>Total of Risk (item 7) and Contingency (item 8) as a % of capital costs (items 1 to 6)</i> | 23.1% | 23.6% |

This shows that the consulted option was estimated to be £3,389,603 (~£3.4m) over the available funding from LUF and Section 106 contributions and therefore unaffordable.

However the elliptical roundabout is estimated to be affordable, even with a suitable allowance for inflation, risk (QRA) and contingency.

The decrease in cost for both Preliminaries and Traffic Management are a reflection of the shorter construction duration.

The decrease in cost for utilities reflect the design of the elliptical roundabout which avoids some of the more costly statutory utility diversions and associated costs.

The cost report for the preferred scheme can be found in Appendix J.

Appendix A: Policy & Literature

| Strategy / Policy | Publication Date | Aims / Objectives / Ambitions |
|---|--|---|
| National | | |
| Decarbonising Transport | DfT, March 2020 | <ul style="list-style-type: none"> Accelerating modal shift to public transport – wanting it to be the first choice for daily activities Decarbonisation of road vehicles Place-based solutions for emissions reduction – including within city-centres |
| Levelling Up White Paper | January 2022 | <ul style="list-style-type: none"> By 2030, local public transport connectivity across the country will be significantly closer to the standards of London, with improved services, simpler fares and integrated ticketing See public transport improvements across all areas where performance is currently lagging |
| Build Back Better High Street Strategy | Ministry of Housing, Communities and Local Government, Department for Levelling up, Housing and Communities, July 2021 | <ul style="list-style-type: none"> Improving the public realm- placemaking relies on being able to create high streets and other public spaces that are clean, sustainable, welcoming and accessible for everyone Creating safe, green and clean spaces- clean environment is good for the wellbeing, and good for the economy |
| National Bus Strategy (Bus Back Better) | DfT, March 2020 | <ul style="list-style-type: none"> Making buses more frequent, faster and more reliable, cheaper, more comprehensive coverage, easier to understand, easier to use, better to ride in, better integrated with other modes and each other, greener, accessible and inclusive by design, innovative, and seen as a safe mode of transport |
| Cycling and Walking Plan | DfT, Active Travel England, July 2020 | <ul style="list-style-type: none"> Healthier, happier and greener communities (more people walking and cycling and the number of journeys made by car is reduced) Safer streets (all road users treat each other with mutual respect) Convenient and accessible travel by cycling and walking At the heart of transport decision-making (better cycling and walking infrastructure has allowed more efficient use of road space, to the benefit of all road users & cycling and walking routes are well |

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| Strategy / Policy | Publication Date | Aims / Objectives / Ambitions |
|--|---|---|
| | | connected with wider public transport services) |
| Ten Point Plan for a Green Industrial Revolution | Department for Energy Security and Net Zero, Department for Business, Energy and Industrial Strategy, November 2020 | <ul style="list-style-type: none"> Accelerating the Shift to Zero Emission Vehicles (from 2030 we will end the sale of new petrol and diesel cars and vans) Green Public Transport, Cycling and Walking (increase the share of journeys taken by public transport, cycling and walking) |
| Health White Paper | Department of Health and Social Care, February 2022 | <ul style="list-style-type: none"> By 2024- have shared care records for all citizens that provide a single, functional health and care record which citizens, caregivers and care teams can all safely access Reduce regional disparities in efficiency and health outcomes |
| UK Shared Prosperity Fund | Department for Levelling up Housing and Communities, August 2022 | <ul style="list-style-type: none"> Restore a sense of community, local pride and belonging, especially in those places where they have been lost Empower local leaders and communities, especially in those places lacking local agency By 2030, to rise pride in place, such as people's satisfaction with their town centre and engagement in local culture and community |
| LCWIP Guidance | DfT, April 2017 | <p>By 2025:</p> <ul style="list-style-type: none"> to aim to double cycling, where cycling activity is measured as the estimated total number of cycle stages made each year to aim to increase walking activity, where walking activity is measured as the total number of walking stages per person per year to increase the percentage of children aged 5 to 10 that usually walk to school from 49% in 2014 to 55% in 2025 By 2040:to deliver better safety, mobility and streets |
| Tourism Recovery Plan | Department for Culture, Media and Sport, | <ul style="list-style-type: none"> To build back better with a more productive, innovative and resilient tourism industry |

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| Strategy / Policy | Publication Date | Aims / Objectives / Ambitions |
|---------------------------------------|--|---|
| | Department for Digital, Culture, Media & Sport, March 2023 | <ul style="list-style-type: none"> To ensure the tourism industry contributes to the enhancement and conservation of the country's cultural, natural and historic heritage and minimises damage to the environment To ensure the tourism industry provides an accessible and inclusive offer that is open to all |
| Regional | | |
| Transport East Strategy | July 2022 | <ul style="list-style-type: none"> Decarbonising transport (reduce demand for trips, shift modes, switch fuels and plan for zero carbon) Connecting growing places – better links within towns and cities, deliver faster and more reliable transport connections and fully integrate transport Energising rural and coastal communities (increase accessibility to education, training, services and employment for rural communities and improve connectivity along our 500 miles of coastline) Global gateways – improve connectivity, journey time and reliability at ports and airports, move goods and people sustainably to ports and airports & increase use of alternative fuels |
| Local | | |
| Colchester Town Investment Plan | October 2020 | <ul style="list-style-type: none"> All parts of the town are connected by integrated transport systems offering a range of modes to get around and powered by sustainable energy. Active modes of travel become an attractive lifestyle choice whilst an enabler to inclusivity and choice The benefits of good growth including wellbeing and quality of life are felt by all |
| Colchester Local Plan – Core Strategy | 2008 (policies revised to July 2014) | <ul style="list-style-type: none"> Improve accessibility and change travel behaviour as part of a comprehensive transport strategy for Colchester Enhancing sustainable travel links and encouraging development that reduces the need to travel Provide better connections between the community and their needs Prioritise the movement of sustainable transport Colchester's role as a Regional Transport Node will be promoted by optimising connections with the regional network and improving the frequency, speed, reliability and promotion of public transport services |

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| Strategy / Policy | Publication Date | Aims / Objectives / Ambitions |
|--|--|---|
| | | <ul style="list-style-type: none"> Demand Responsive services will be promoted to help rural communities access their needs Improvements to bus interchanges will be sought to assist interchange between modes and sustainable travel behaviour |
| North Essex Economic Strategy | October 2019 | <ul style="list-style-type: none"> Drive forward a long-term, coordinated sustainable transport strategy Developing options for improved sustainable transport connectivity |
| Colchester Future Transport Strategy | July 2022 | <ul style="list-style-type: none"> Improving sustainable transport modes Supporting economic growth and connectivity Providing a safer transport environment Managing demand Managing highways assets Providing attractive and healthy environments |
| Colchester's Strategic Plan 2020-23 | October 2020 | <ul style="list-style-type: none"> Creating safe, healthy and active communities Tackling the climate challenge and leading sustainability by enabling more opportunity for walking and cycling around Colchester |
| Colchester City Centre Masterplan (CCMP) | December 2022 | <ul style="list-style-type: none"> Re-connecting neighbourhoods to the city centre with attractive and easy walking and cycling routes Improving public transport, particularly bus provision and including the new Rapid Transit System Reducing unnecessary car traffic from the city centre Improved accessibility, connectivity and movement as key drivers for change for achieving social inclusivity |
| Colchester's Bus Network Review | September 2022 | <ul style="list-style-type: none"> Buses that serve the right locations Buses that are available at the right time Buses with the right frequency Affordable ticketing and easy to understand network Services that are reliable at all times Inclusive provision that is reliable and high profile for all Safety and comfort at all points of journey Provide a greener transport network |
| Essex Local Transport Plan 3 | June 2011 (note a new transport plan is under | <ul style="list-style-type: none"> Provide connectivity for Essex communities and international gateways to support sustainable economic growth and regeneration |

Stage 2 Technical Report

| Strategy / Policy | Publication Date | Aims / Objectives / Ambitions |
|-------------------|------------------------------------|--|
| | development and is due later 2024) | <ul style="list-style-type: none">• Improve safety on the transport network and enhance and promote a safe travelling environment• Secure and maintain all transport assets to an appropriate standard and ensure that the network is available for use• Provide sustainable access and travel choice for Essex residents to help create sustainable communities• Provide connectivity for Essex communities and international gateways to support sustainable economic growth and regeneration |

Appendix B: Land Use and Demographics

Schools

Colchester has an established city centre, schools and community facilities. The city centre includes a mix of comparison and convenience retail stores, with larger retail units towards the periphery of the centre.

Across Colchester, there are a number of schools both state and independent. The closest school to the St Botolph's scheme areas is St John's Green Primary School, to the west of the junction and south of the A134. Around the City Centre, within 20 minutes' walk of the junction is:

- Colchester Institute
- The Sixth Form College, Colchester
- St James Church of England Primary School
- St Thomas More's Catholic Primary School
- Oxford House School
- Colchester Royal Grammar School
- Colchester Prep and High School
- St John's Green Primary School

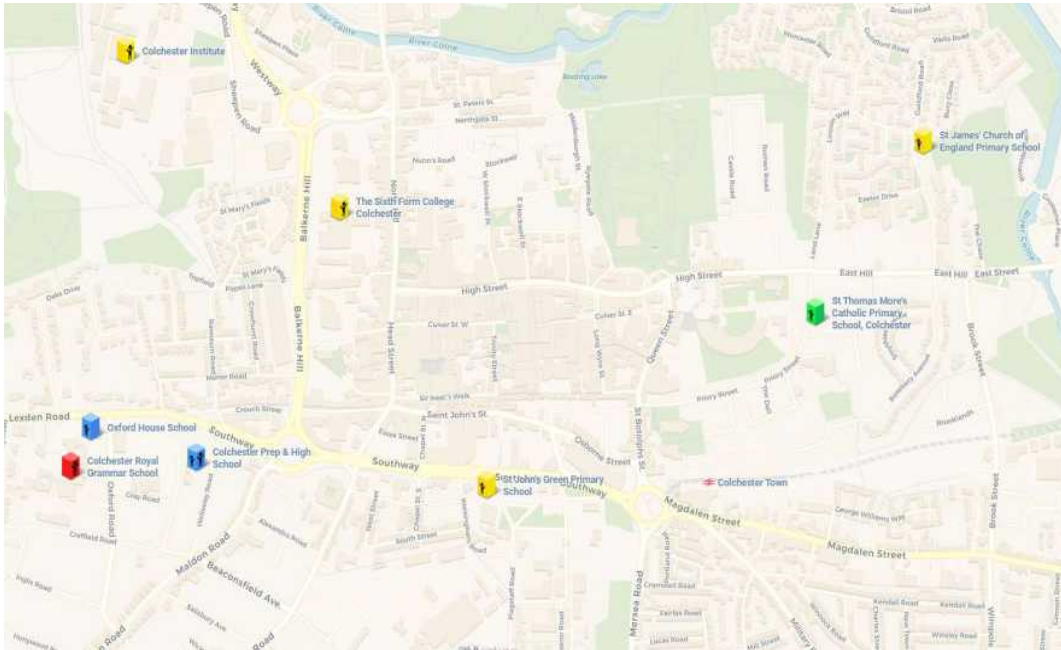


Figure 38 Colchester schools (Source: Locorating.com)

Land Use

The land use surrounding the St Botolph's junction to the south is predominantly residential, with the A134 and railway track crosscutting east-west between the residential area and the city centre retail land use to the north-west of the junction. Greenspaces surrounding and in close proximity to the junction is limited. This is shown in Figure 38 below.

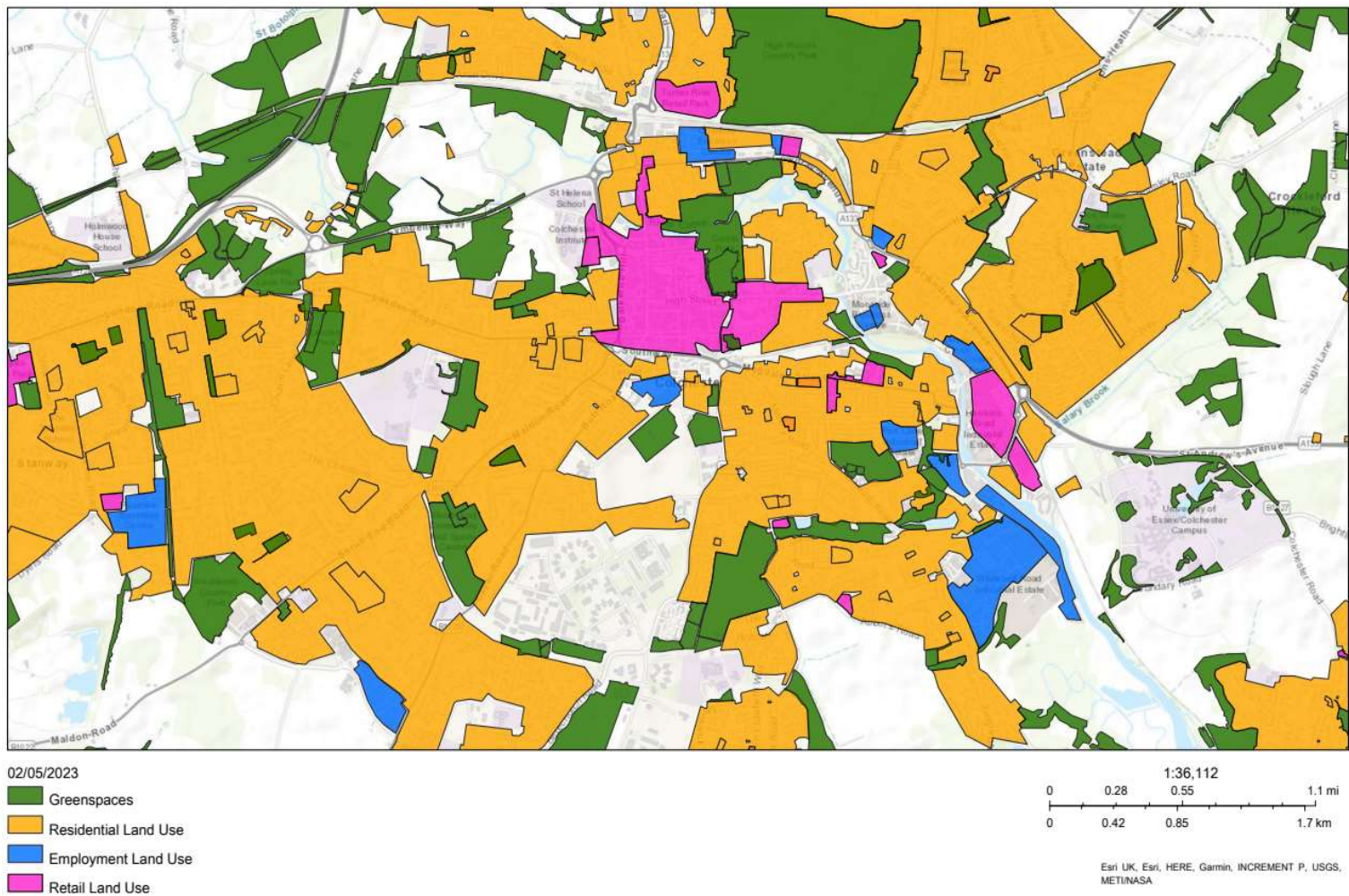


Figure 39 –Colchester City Centre Land Use (Source: Essex IPTU Project

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Population

The 2021 Census shows that Colchester district has a population of 192,716 which has increase of approximate 70,000 people since the 2011 Census. This indicates that there is greater pressure on services across the district, but most notably in the city centre where the majority of the population is concentrated.

Car ownership

Using Census 2021 for the whole of Colchester district, 82% of households own at least one car or van, which is very high and likely reflects the rural nature of areas outside of the city centre. On a more focused scales, the LSOA areas (as shown in Figure 39) directly around the St Botolph's junction show that 61% (1,816 households) of households have access to one or more car or van. 31% (1,155 households) do not have access to either.

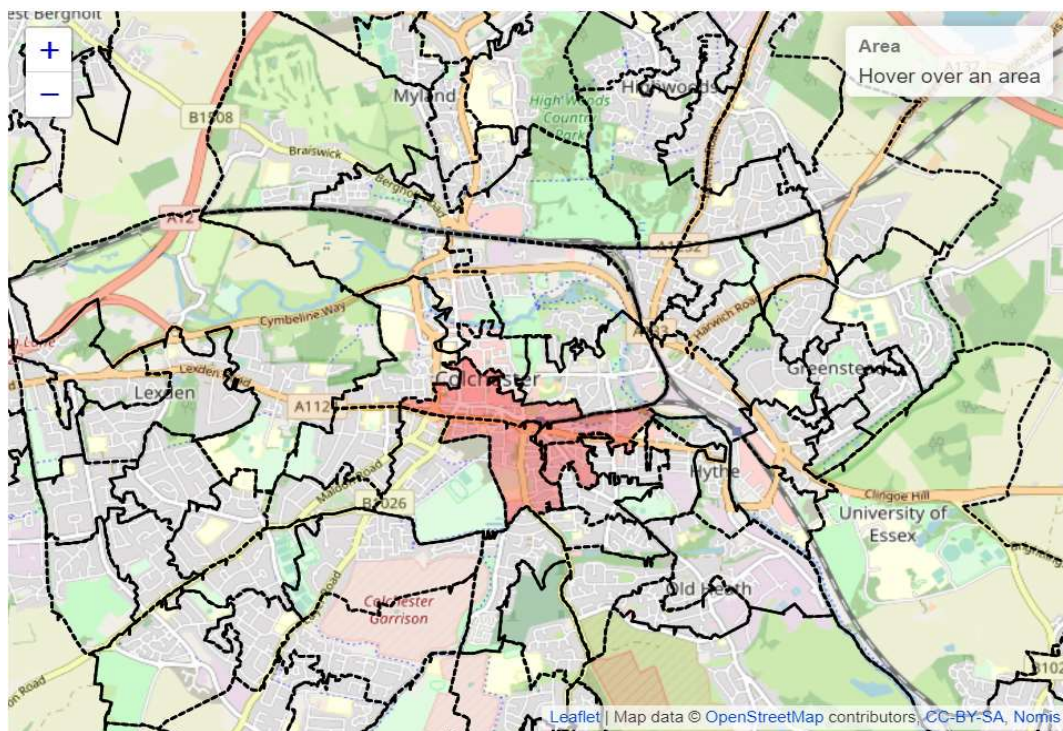


Figure 40 –2021 Census geography LSOA around St Botolph's junction (Source: NomisWeb)

Travel to Work

Travel to work data has been assessed using Census 2021 data, however it should be noted that this data may not be accurate based upon the Covid-19 lockdown being in operation at the time of the data collection. For this reason, the method of travel to work has not been assessed using this up to date Census data.

Stage 2 Technical Report

Looking at those who own a car or van in the MSOA areas (as shown in Figure 40) around the junction, 20% travel less than 10km to get to work, which shows a high potential within the centre of the city for travel mode behaviour change to access work.

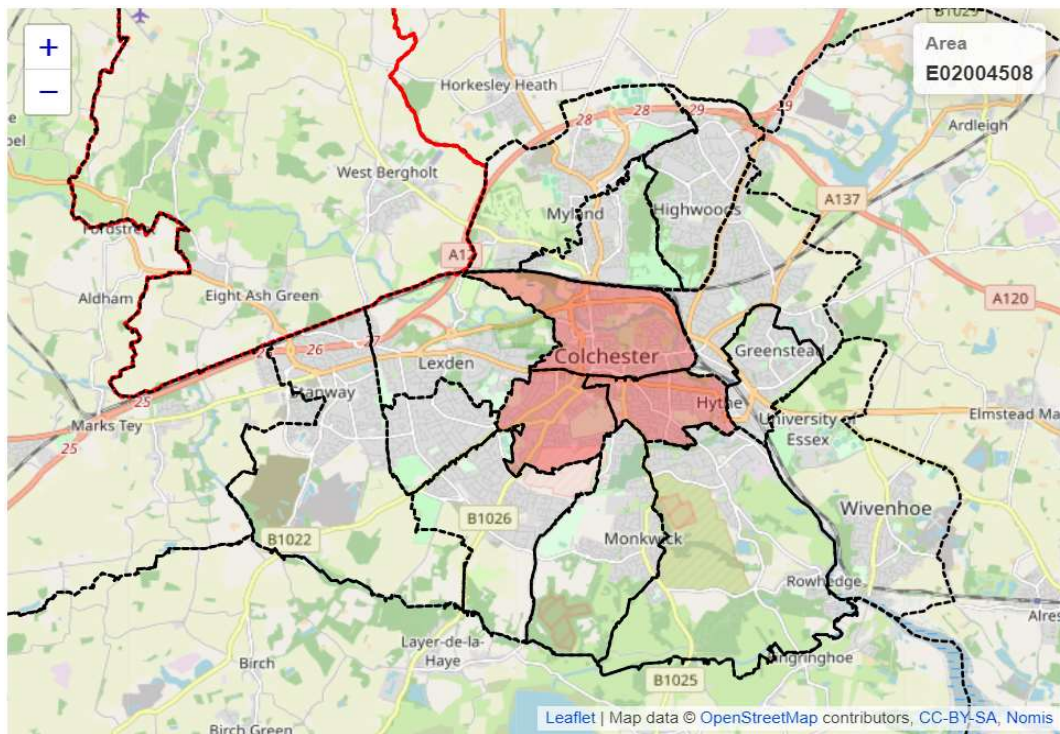


Figure 41 – 2021 Census geography MSOA around St Botolph's junction (Source: NomisWeb)

The previous Census 2011 data shows that across Colchester the predominant mode of travel to work was by car or van, with public transport and active mode share being very low in comparison (Figure 41). It can be inferred that this proportion has not drastically changed since that assessment.

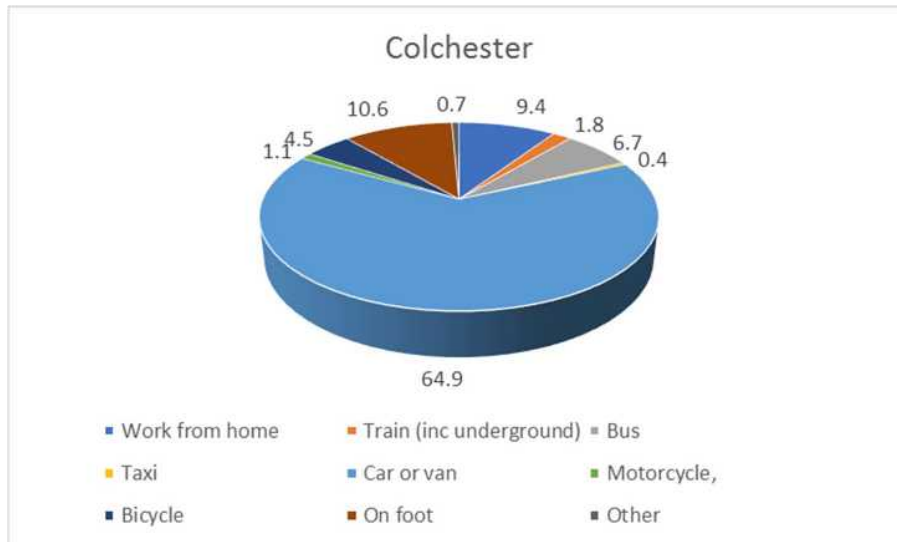


Figure 42 –2011 Census man method of travel to work (Source: ONS)

Job density and employment

In 2020, Colchester Borough had a job density (ratio of total jobs to working age population) of 0.74 (NOMIS), which is equal to the figure for Essex, and higher than the neighbouring districts of Braintree, Tendring and Maldon.

Colchester itself is a key area of employment, with a significant proportion of those commuting for work remaining within the borough. Colchester City Centre offers the highest concentration of employment opportunities with industrial parks, business parks and retail centres. According to NOMIS data, there are three sectors which stand out for employee jobs which are Education (12% employee jobs), Health/Social Work (18% employee jobs) and Wholesale/Retail (16.9% employee jobs), all of which are higher than the Eastern region and Great Britain job figures.

In close proximity to the scheme area (5 mins on foot) there are predominantly retail opportunities such as local shops and supermarkets as well as restaurants or take away shops – see section Land Use.

Colchester General Hospital, Tollgate Retail Centre, Colchester Retail Park, Cowdray Avenue, University of Essex, Tesco Superstore and Wilkin & Sons Ltd have been identified as 'Major Employment' locations within Colchester. These are all some way from the St Botolph's junction scheme area, however given the strategic nature of the junction location, trips heading particularly for Tollgate Retail Centre and the University of Essex will likely have to use this junction.

Appendix C: Traffic Modelling Report

Appendix D: Option Assessment Measures

| Category | Measure | Rating Criteria | | |
|---------------------|--|--|--|---|
| | | 1 (Green) | 2 (Amber) | 3 (Red) |
| Network Performance | Traffic Flow (Compared with Do Nothing scenario) | Improvement compared with the baseline scenario | Has negligible impact on the highway performance | Worsening compared with the baseline scenario |
| | Degree of Saturation (Overall Junction) | Below 90% | 90-100% | In excess of 100% |
| | Delay over and area – Network Statistics | Improvement compared with the baseline scenario | Has negligible impact on the highway performance | Worsening compared with the baseline scenario |
| | Point to Point Journey Time (for all vehicles) | Journey time better than the baseline | Journey time within 15% or 60s of baseline | Journey time >15% or 60s of baseline |
| | Reallocation to key routes | Reallocation of vehicles onto key routes having a negligible impact | Reallocation of vehicles onto key routes having an impact but still operating within capacity | Reallocation of vehicles onto key routes causing unmanageable impacts |
| Public Transport | Bus Stands (additional capacity) | Additional bus stands | No change | Reduction in bus stands |
| | Bus Delay | Improvement compared with the baseline scenario | No change | Delay greater than the baseline |
| | Point to Point Journey Time – Buses | Journey time better than the baseline | Journey time within 15% or 60s of baseline | Journey time >15% or 60s of baseline |
| | Quality of Interchange / Sense of arrival at interchange (bus/rail/mobility hub) | High directional quality in public realm design, leading to different interchange opportunities, high quality wayfinding & clear sight lines | Moderate improvement in directional quality in public realm design, leading to different interchange opportunities, wayfinding and sight lines | No improvement in quality of interchange and wayfinding |
| Walking and Cycling | Point to Point Journey Time (pedestrians and cyclists) | Best of the three scheme options | Second of the three scheme options | Worst of the three scheme options |

Stage 2 Technical Report

| Category | Measure | Rating Criteria | | |
|----------------------------|--|---|---|---|
| | | 1 (Green) | 2 (Amber) | 3 (Red) |
| Walking and Cycling | Links to existing and proposed cycling provision | Significantly improved connectivity between cycling schemes compared with the current situation | Moderate improvement in connectivity between cycling schemes compared to the current situation | No improvement in connectivity between cycling schemes compared to current situation |
| | Alignment with LTN1/20 | All cycle provision compliant with LTN1/20 | Over 70% of cycling provision compliant with LTN1/20 | Less than 20% of cycling provision compliant with LTN1/20 |
| | Links to existing and proposed cycling provision | Levels of traveller stress, route uncertainty significantly improved. Levels of cleanliness, facilities, information and environment significantly improved compared to current situation | Levels of traveller stress, route uncertainty moderately improved. Levels of cleanliness, facilities, information and environment moderately improved compared to current situation | Levels of traveller stress, route uncertainty neutral. Levels of cleanliness, facilities, information and environment neutral to current situation |
| Environment | Air Quality to meet annual mean NO ₂ Concentration thresholds | NO ₂ concentration at sensitive receptors < 36 µg/m ³ | NO ₂ concentration at sensitive receptors > 36 µg/m ³ and < 40 µg/m ³ | NO ₂ concentration at sensitive receptors > 40 µg/m ³ |
| | Noise to meet DMRB LA111 threshold criteria | Reduction in basic noise level of 1dB or more | Increase in basic noise level of 1dB to 2.9dB | Increase in basic noise level of 3dB or more |
| Urban Design / Placemaking | Reclamation of road space for placemaking to create a gateway | Highest reclamation of road space | Medium reclamation of road space | Lowest reclamation of road space |
| | Quality of public realm | High level of permeability, accessibility and legibility with movement spaces which are inclusive of sustainable and active modes. Opportunity for seating & greening | Moderate level of permeability, accessibility and legibility with movement spaces broadly inclusive of sustainable and active modes. Limited opportunity for seating & greening | Low level of permeability, accessibility and legibility with movement spaces broadly inclusive of sustainable and active modes. No opportunity for seating & greening |

Stage 2 Technical Report

| Category | Measure | Rating Criteria | | |
|-------------------------------------|--|--|---|--|
| | | 1 (Green) | 2 (Amber) | 3 (Red) |
| Urban Design and Placemaking | Utilisation and effectiveness of space | Active public space with a high diversity of users, variety of uses and high duration of stay | Moderately active public space with a minimal diversity of users, variety of uses and minimal duration of stay | Public space has a low level of activity with a low level of user diversity, minimal if any variety in use, with no staying potential |
| | Supporting wider regeneration | Significant improvement in local environment, with junction improvements significantly improving the attractiveness for shops and employment in the vicinity | Moderate improvement in local environment, with junction improvements improving the attractiveness for shops and employment in the vicinity | Minimal improvement in local environment, with junction improvements having little impact on the attractiveness for shops and employment in the vicinity |
| | Potential redevelopment land | Area available for potential redevelopment in excess of 3,000sq/m | Area available for potential redevelopment up to 3,000sq/m | No area for development |
| Buildability | Cost | Less than LUF funding allocation | Aligned with LUF funding allocation | Funding Gap - requires additional funding to the LUF funding allocation |
| | Programme (excluding procurement) | Delivery completed before the LUF required timescales | Aligned with LUF funding timescales | Delivery programme extends beyond the LUF required timescales |
| | Programme Commercially Committed | Construction tender award before March 2025 | Construction tender award aligned with March 2025 timescales | Construction tender award beyond March 2025 |
| | Complexity of construction | Normal construction methods that are reasonably expected for the entire scheme | Mostly normal construction methods but does include some specific/specialised construction methods | Some normal construction methods but mixed with some specialised extraordinary construction methods |

Appendix E: Consultation Report

Appendix F: Promoter's Response Report

Appendix G: Statutory Undertakers

Appendix H: Programme

Appendix I: QRA Report

Appendix J: Cost Estimate Report